ASTRO

VG Series

Interface Unit

Instruction Manual

Ver. 2.80

ASTRODESIGN, Inc.

Before Operation

Introduction

Thank you for purchasing the VG Series programmable video signal generator.

This Instruction Manual (called “this manual” below) explains how to use the VG Series interface units and provides information that you should know before using them. Be sure to read this manual and use the unit correctly.

Keep this manual in a safe place for later reference.

Notational Conventions

For conciseness, this manual uses the following shorter descriptions for some terms.

Item	Term used in this manual
VG Series Interface Units	System

Contents

Chapter 1 VG Series Interface Unit Overview

1.1 Relationship between interface unit and compatible products

The interface units included in the VG Series differ depending on the product.

See the following table for information on the relationship between your product and compatible interface units.

Model number	Interface name / explanation section	Applicable models				
		VG-876	VG-877	VG-878	VG-878-A	VG-879
VM-1876-MA	3.1.1 Analog Unit	○	○	-	-	○
Internal Analog Output Section	3.1.2 Internal Analog Unit	-	-	○	○	-
VM-1876-M0 VM-1876A-M0	4.1.1 HDMI Unit	○	○	-	-	○
VM-1876-M6 VM-1876A-M6	4.1.2 HDMI 6G Unit	○	○	-	-	○
VM-1876-M7	4.1.3 HDMI HDCP 2.2 Unit	○	○	-	-	○
VM-1876-M8	4.1.4 HDMI 6G HDCP 2.2 Unit	○	○	-	-	○
Built in HDMI Output Section	4.1.6 Internal HDMI Unit	-	-	○	○	-
VM-1876A-M1	4.2.2 DisplayPort Unit	○	○	-	-	○
VM-1876-M5	4.3.1 SDI Unit	○	-	-	-	-
VM-1876-MB	4.3.2 SDI 12G Unit	-	○	-	-	○
VM-1876-M2	4.4.1 V-By-One HS Unit	○	○	-	-	○
VM-1876-M9	4.5.1 iTMDS Unit	○	-	-	-	○
VM-1876-MX	4.6.1 Synchronization Unit	○	-	-	-	○
VM-1876-MC	4.7.1 HDBaseT Unit	○	○	-	-	○
VM-1876-MD	4.1.5 HDMI2.1 Unit	-	-	-	-	○

Important

- **Set “ON” of “VM-1876-MD Mode” in「4.1.10 HDMI configuration setting items」.**
- **If you output other VMs except VM-1876-MD, set “OFF” of “VM-1876-MD Mode”**
- **If you set “ON” of “VM-1876-MD Mode”, other boards does not output signal.**
- **When 8K timing is output, scroll function is not guaranteed.**

Chapter 2 Common Setting Items (ALL OUTPUT)

This section describes setting items common to all interface units.

The following items show settings common to multiple video and audio output interfaces.

Item
Output interface ON/OFF settings
Synchronization ON/OFF and polarity settings
Level mode settings
Dot clock operation mode (DotClk Mode) settings
Aspect ratio settings
Pattern rendering Color Depth (gradation) settings
RGB/YPbPr selection and color difference coefficient settings
Digital Level settings

2.1 ALL OUTPUT

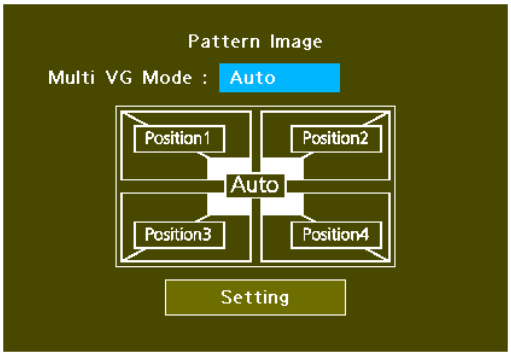
Common setting item details for each unit are as follows.

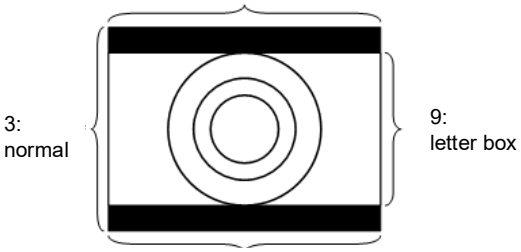
Level 1	Level 2	Level 3	Setting item	Setting value
All Output				
	Output OFF/ON Sets output ON/OFF for each output terminal.	**HDMI**	**[VG-876,877] Port1 to Port16**	**0: OFF / 1: ON**
			[VG-878,878-A] Port1 to Port4	
		DP	**Port1 to Port8**	
		V-by-One HS	**Port1 to Port16**	
		SDI	**Port1 to Port16**	
		iTMDS	**Port1 to Port8**	
		Analog	**[VG-876, 877]** **VGA1 to 4** **YPbPr1 to 4** **Composite1 to 4**	
			[VG-878,878-A] **VGA, YPbPr, Composite, Y/C, SCART**	
		HDBaseT	**Port 1 to 16**	
	Sync Sets synchronization signal ON/OFF, and polarity settings for each output terminal. Note) VM-1876-MD does not support this item.		**HS** Sets output for the HS terminal.	**0: OFF** No output. **1: Nega** Output as negative polarity. **2: Posi** Output as positive polarity.
			VS Sets output for the VS terminal.	
			CV Sets Video-On-Sync superimposition for the analog component signal.	**0: OFF / 1: R / 2: G / 3: RG / 4: B / 5: RB / 6: GB / 7: RGB**
	HDCP **(Note: this item is in "HDMI Output" on VG-878,878-A)**		**Execute Enable**	**0: Disable / 1: Enable**
			Port Type (*VG-876, 877 and VG-879 only)	**0: HDMI / 1: DP/** **2: HDBaseT**
			Port No. Sets which output port information to display when displaying the HDCP pattern.	**[VG-876, 877, 879]** **(HDMI) 0 to 16**
All Output				**[VG-878,878-A]** **0: Disable,** **1 to 4: HDMI1 to HDMI4**
	HDCP **(* In HDMI Output on VG-878,878-A)**		**Auth Version** Set the HDCP version.	**0: Auto** **1: HDCP1.4**

Level 1	Level 2	Level 3	Setting item		Setting value
			Relies on the connection destination supported version when set to Auto.		**2: HDCP2.3**
	Level Mode **(This item is In Analog Output and HDMI Output on VG-878,878-A)**		**HDMI**		**0: Full / 1: Limited**
			DP		
			SDI		
			V-by-One HS		
			iTMDS		
			Analog (for VG-876/877)		
			HDBaseT		
	DotClk Mode **Important** ● In Auto, single/dual/quad clock modes are automatically selected according to dot clock. Screen splitting method is disabled.* ● When Auto is selected on the V-by-One®HS unit and iTMDS unit, the number of data lanes automatically switches according to single/dual/quad clock mode.		**0: Auto** Operates by automatically selecting the clock mode from the dot clock.		
			1: Single Operates as single clock mode.		
			2: Dual Operates as dual clock mode (double speed).		
			3: Quad Operates as quad clock mode (quadruple speed).		
			The following Split Mode setting is displayed when dual clock mode and quad clock mode are set.		
		Split Mode	For dual clock mode		Setting unit
			MODE0(HDiv)	2 panes horizontal output	H: 2dot V: 2line
			MODE1(VDiv)	2 panes vertical output	H: 4dot V: 1line
			MODE2(HDiv)	2 panes horizontal output	H: 2dot V: 2line
			MODE3(VDiv)	2 panes vertical output	H: 4dot V: 1line
			MODE4(No Div)	No divisions	H: 4dot V: 1line
			MODE5(No Div)	No divisions	H: 4dot V: 1line
			MODE6(No Div)	No divisions	H: 4dot V: 1line
			MODE7(No Div)	No divisions	H: 4dot V: 1line
			MODE8(VDiv)	2 panes vertical output	H: 4dot V: 1line
			MODE9(VDiv)	2 panes vertical output	H: 4dot V: 1line
			For quad clock mode		Setting unit
			MODE0(H2/V2Div)	4 quarter panes	H: 4dot V: 2line
			MODE1(V4Div)	4 panes vertical	H: 4dot V: 1line
			MODE2(H2/V2Div)	4 quarter panes	H: 4dot V: 2line
			MODE3(V4Div)	4 panes vertical	H: 4dot V: 1line
			MODE4(V2Div)	2 panes vertical	H: 4dot V: 1line
			MODE5(V2Div)	2 panes vertical	H: 4dot V: 1line
			MODE6(V2Div)	2 panes vertical	H: 4dot V: 1line
			MODE7(V4Div)	4 panes vertical	H: 4dot V: 1line
			MODE8(V4Div)	4 panes vertical	H: 4dot V: 1line
			MODE9(No Div)	No divisions	H: 4dot V: 1line
			MODE10(2SI)	2-sample Interleave Division	H: 4dot V: 2line

Important

For the V-by-One HS unit and iTMDS unit, it is possible to set more than 4 panes using Split Mode settings.

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Setting item</th><th>Setting value</th></tr>
<tr><td rowspan="3">All Output</td><td colspan="2">Multi VGMode (* VG-876 and VG-879 only)
Sets the splitting method for each VG1 when multiple VG units are synchronized.
Note) the setting image is displayed like the below pop-up image.
 
</td><td colspan="2">0: Auto Default is 4 quarter panes
When Dot Clock exceeds 1320MHz, it split into Tile split mode. When 1320MHz or less, it does not split.
1: H2/V2Div 4 quarter panes
2: V4Div 4 vertical panes
3: V2Div 2 vertical panes</td></tr>
<tr><td colspan="2">Aspect Mode:
Sets the video signal aspect ratio.

Important
Normal images are output at a ratio of 4:3, however, because images are output as 16:9 when 4:3 Letter Box is selected, black bars will appear on the top and bottom of images.
Images are output in the following way when 4:3 Letter Box is selected.
4: When normal
 

16: When letter box</td><td colspan="2">0: 4:3
1: 4:3 Letter Box
* 4:3 Letter Box settings are only available for SDTVTiming.
2: 16:9
3: Resolution
The aspect ratio can be set at the same ratio as screen resolution.

4: User
Sets any aspect ratio.
H Sets the horizontal direction aspect ratio. Setting range: 0 to 255
V Sets the vertical direction aspect ratio. Setting range: 0 to 255

* When output at a 21:9 ratio, set the Aspect Mode to User, H = 21 and V = 9.</td></tr>
<tr><td colspan="2">Color Depth
The Color Depth (gradation) can be set for rendering a test pattern.
The following two options are available: setting individually for each Program, or locking the Color Depth regardless of the Program.
Set the Color Depth for each Program in this menu.
* To specify a constant Color Depth, go to MENU. > Configuration > General</td><td colspan="2">8bit to 16bit</td></tr>
</table>

RGB/YPbPr (0/1): **(* In Analog Output on VG-878,878-A)** *** VM-1876-MD does not support this item.**	**0: RGB / 1: YPbPr**	Selects the output color difference mode.
The color difference coefficient is applied for YPbPr (YCbCr) output.		
YPbPr Select(0-4):	**0: SMPTE274M/296M/RP-177** **1: SMPTE240M** **2: SMPTE293M** **3: SMPTE125M** **4: User** **5: ITU-R BT.2020**	Sets User and any coefficient.
Sets any color difference coefficient when User is selected above.		
User YPbPr Coefficient	**Y** (The total for line Y must be 1.0000.)	Sets Y/Pb/Pr items.
	Pb (The coefficient totals for Pb and Pr must be 0.)	
	Pr	

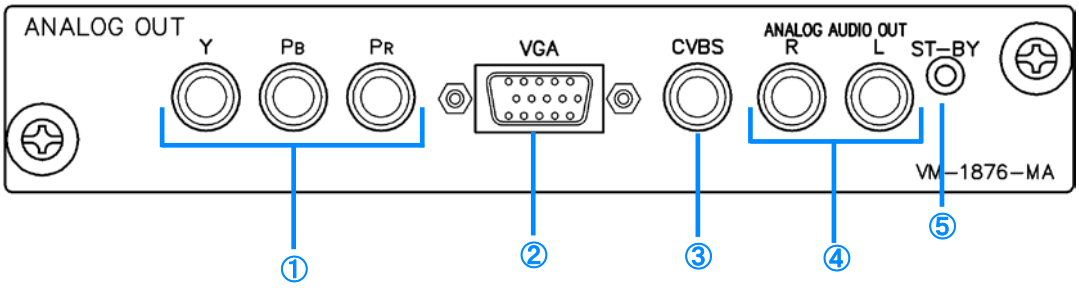
Chapter 3 Analog Output Settings (ANALOG OUTPUT)

3.1 Analog unit functions and settings

The applicable unit is as follows.

3.1.1 Analog Unit VM-1876-MA

● Unit exterior diagram



No.	Name	Description
①	Component output	Can output YPBPR analog component signals. (RCA connector)
②	VGA output	Can output analog component signal (RGB) and H/V separate sync. (DSUB connector, shrink D-Sub 15-pin)
③	CVBS output	Can output NTSC/PAL composite (VBS) signal. (RCA connector)
④	Analog audio output	Can output analog audio (L/R). (RCA connector)
⑤	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

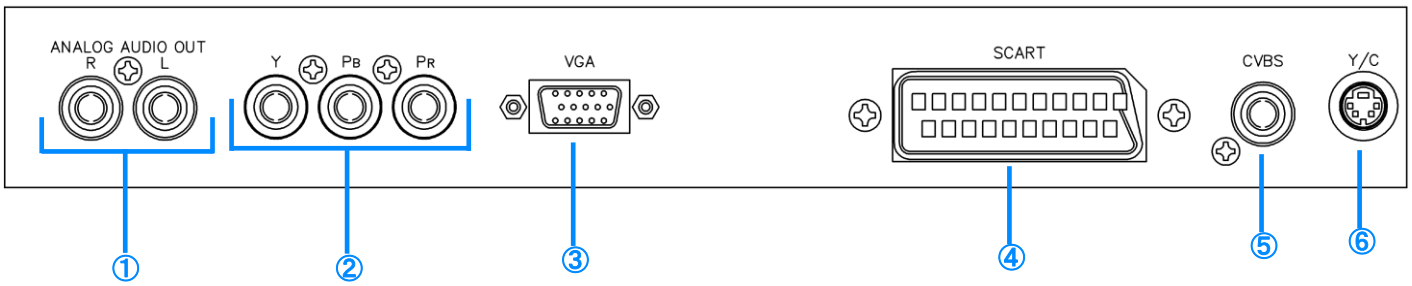
● Specifications

VGA	DotCLK	5 to 165 MHz
	Number of colors, bit length	RGB - 8 bit each
	Connector	Dsub x1
YPbPr	Resolution	HDTV, SDTV
	Number of colors, bit length	YPbPr - 8 bit each
	Connector	RCA x3
CVBS	Resolution	NTSC-M/J/443, PAL (B/D/G/H/I)/M/Nc
	Number of colors, bit length	YPbPr - 8 bit each
	Connector	RCA x1
	Added functions	Teletext, ClosedCaption, Vchip, Macrovision*
AUDIO L/R	Output frequency	100 to 20 kHz (Sampling frequency: 48 kHz)
	Output level	0 to 4000 mV
	Connector	RCA x2

* Macrovision function is available when a license is purchased.

3.1.2 Internal analog output section

● Unit exterior diagram



No.	Name	Description
①	Analog audio output	Can output analog audio (L/R). (RCA connector)
②	Component output	Can output YPBPR analog component signals. (RCA connector)
③	VGA output	Can output analog component signal (RGB) and H/V separate sync. (DSUB connector, shrink D-Sub 15-pin)
④	SCART output	Can output NTSC/PAL/SECAM composite (VBS) signal, Y/C signal, analog component signal (RGB), and analog audio. (SCART connector) [VG-878,878-A only]
⑤	CVBS output	Can output NTSC/PAL composite (VBS) signal. (RCA connector)
⑥	Y/C output	Can output Y/C signal (S terminal)

● Specifications（VG-878）

AUDIO L/R	Output frequency	100 to 20 kHz (Sampling frequency: 48 kHz)
	Output level	0 to 4000 mV
	Connector	RCA x2
YPbPr	Resolution	HDTV, SDTV
	Number of colors, bit length	YPbPr - 8 bit each
	Connector	RCA x3
VGA	DotCLK	5 to 165 MHz
	Number of colors, bit length	RGB - 8 bit each
	Connector	Dsub x1
SCART	Resolution***1**	NTSC-M/J/443, PAL-B/D/G/H/I/M/N/Nc/60, SECAM
	Number of colors, bit length	YPbPr, RGB - 8 bit each
	Connector	SCART x1
	Added functions***1**	Teletext, ClosedCaption, Vchip, Macrovision***2**
CVBS Y/C	Resolution***1**	NTSC-M/J/443, PAL-B/D/G/H/I/M/N/Nc/60, SECAM
	Number of colors, bit length	YPbPr - 8 bit each
	Connector	RCA (CVBS) x1, S-Video (Y/C) x1
	Added functions***1**	Teletext, ClosedCaption, Vchip, Macrovision***2**

*1 Parts of the TV option function and TV timing signal may not be supported on items other than VG-878.

*2 Macrovision function is available when a license is purchased.

● Specifications (VG-878-A)

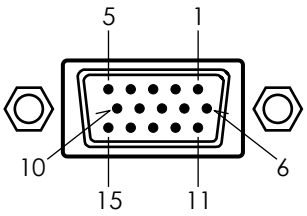
AUDIO L/R	Output frequency	100 to 20 kHz (Sampling frequency: 48 kHz)
	Output level	0 to 4000 mV
	Connector	RCA x2
YPbPr	Resolution	HDTV, SDTV
	Number of colors, bit length	YPbPr - 8 bit each
	Connector	RCA x3
VGA	DotCLK	5 to 165 MHz
	Number of colors, bit length	RGB - 8 bit each
	Connector	Dsub x1
SCART	Resolution***1**	NTSC-M/J/443, PAL-B/D/G/H/I/M/Nc
	Number of colors, bit length	YPbPr, RGB - 8 bit each
	Connector	SCART x1
	Added functions***1**	Teletext, ClosedCaption, Vchip, Macrovision***2**
CVBS Y/C	Resolution***1**	NTSC-M/J/443, PAL-B/D/G/H/I/M/Nc
	Number of colors, bit length	YPbPr - 8 bit each
	Connector	CVBS (RCA) x1, Y/C (S-Video) x1
	Added functions***1**	Teletext, ClosedCaption, Vchip, Macrovision***2**

*1 Parts of the TV option function and TV timing signal may not be supported on items other than VG-878-A.

*2 Macrovision function is available when a license is purchased.

3.1.3 Connector and pin assignment

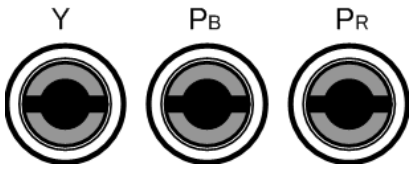
● VGA (D-SUB) output



Pin No.	Signal	Pin No.	Signal
1	R	9	+5 V (DDC power supply***1**)
2	G	10	GND
3	B	11	GND
4	NC	12	DDC DATA
5	NC	13	HS
6	GND(R)	14	VS
7	GND(G)	15	DDC CLK
8	GND(B)		

*1 The supply current of the DDC power supply is limited. Refer to “5.1DDC power supply max power current consumption“.

● YPbPr output

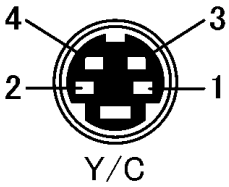


Connector name	Signal
Y	Y
PB	Pb
PR	Pr

● CVBS output

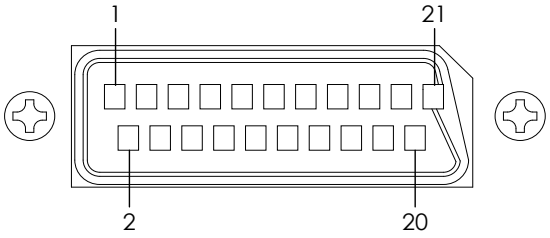
Connector name	Signal
CVBS	Composite video

● Y/C output



Pin No.	Signal
1	GND
2	GND
3	Y
4	C

● SCART output



Pin No.	Signal	Pin No.	Signal
1	Audio R output	11	Component G output
2	NC	12	NC
3	Audio L output	13	GND
4	GND	14	GND
5	GND	15	Component R output / C output
6	GND	16	RGB status
7	Component B output	17	GND
8	Video Status	18	GND
9	GND	19	Composite / Y output / CS
10	NC	20	NC
		21	GND

● Analog audio output

Connector name	Signal
R	Audio R
L	Audio L

3.1.4 Setting item

Level 1	Level 2	Level 3	Setting item	Setting value
Analog Output				
	Output OFF/ON Sets ON/OFF for each Port.	**[VG-876, 877, 879]** **VGA1 to 4** **YPbPr1 to 4** **Composite1 to 4**		**0: OFF / 1: ON**
		[VG-878,878-A] **VGA** **YPbPr** **Composite** **Y/C** **SCART**		**0: OFF / 1: ON**
	General Sets the output signal for each program from the analog component signal, HS, and CS terminals. * Only available for VGA and YPbPr.	**Level Video** **All Output Sync CV setting is**	**Other than OFF**	**0.30 to 1.20 [V]**
			OFF	**0.05 to 1.20 [V]**
		Setup Sets the setup level.		**0.00 to 0.25 [V]**
		Sync Synchronization signal (Video-On-Sync)		**0.00 to 0.60 [V]**
	Audio Output Outputs analog audio.			**0: OFF / 1: ON**
	Y/C Aspect (*VG-878,878-A only) Set DC voltage for the C signal.			**0: 4:3 Normal**
				1: 4:3 Letter Box
				2: 16:9 Squeeze
				3: Auto **Auto follows the program aspect ratio setting.**
	SCART (*VG-878,878-A only)			
		Output Select Sets the video signal format output from SCART.		**0: Composite**
				1: Y/C
				2: RGB
		Video Status Sets the Video Status signal output from SCART.		**0: Auto**
				1: 4:3 (Identification voltage 12 V (9.5 to 12.0 V))
				2: 16:9 (Identification voltage 5 V (4.5 to 7.0 V))
				3: No Signal (Identification voltage 5 V (4.5 to 7.0 V))
		RGB Status Sets the RGB Status signal output from SCART.		**0: Auto**
				1: VBS
				2: RGB
				3: Fast Blanking
		Configures the following settings when Fast Blanking is selected above.		
		Fast Blanking Area: Sets the Fast Blanking output range.	H	Sets the horizontal direction output range as a percentage for H-Disp. Setting range: 0 to 100 [%]
			V	Sets the vertical direction output range as a percentage for H-Disp. Setting range: 0 to 100 [%]

3.2 TV standard signal functions

3.2.1 Explanation of terms

● Macrovision

■ What is Macrovision?

This is a copy protection system developed by ROVI (formerly “Macrovision”).
It is used in a wide range of applications from VHS and DVD video to commercially available video sources and satellite broadcasts. The copy protection system introduces an error into a VCR's AGC (Automatic Gain Control), making it impossible to record the output source normally.
The AGC input signal gain is automatically adjusted to maintain the proper sensitivity via a circuit, and nearly all consumer use VTRs contain this circuit. The function brightens and preserves dark screens and darkens video that is too bright.
The Macrovision copy protection signal introduces the AGC error by mixing in a non-standard level signal during the vertical blanking period while maintaining the video signal brightness and color signal components. Therefore, even if recording is possible, the screen brightness fluctuates. This signal also hinders the synchronization signal, scrambling the screen.
This impediment makes it impossible to dub an enjoyable video.

■ What is color striping?

Part of the Macrovision standard duplicates the normal Macrovision signal.
The altered color burst signal is superimposed on a video signal, and is also called color burst copy protection.
Color striping inserts thin horizontal lines into dubbed video, hindering enjoyment in the same way as Macrovision.
* Color stripes are only applied to NTSC-M and J Type 2 and 3 modes.

■ Macrovision specifications

Macrovision is compatible with the following TV signals.
Macrovision is superimposed on composite signals, and Y/C signals.

- NTSC-M, NTSC-J, NTSC-443
- PAL-60, PAL, PAL-M, PAL-N, PAL-Nc
- SECAM

■ Patent

Macrovision incorporates copyright protection technology protected by US patents and other intellectual property rights. Permission from ROVI is required to use this copyright protection technology. Without permission from ROVI, it can only be used for commercial testing purposes. Reverse engineering and disassembly are prohibited.

Important

・Macrovision is an optional function. For details, contact a retailer or ASTRODESIGN, Inc. sales representative.
・The Macrovision signal operates differently depending on the VHS and DVD type. Make sure to check the contents of the agreement with ROVI before use.

● Closed captioning / V-Chip

■ What is closed captioning?

This is a subtitled broadcast developed in the US so that hearing impaired viewers can enjoy movies and news.
Because it does not appear on the screen during usual playback, it is called “closed.“ On the other hand, subtitles in Japanese that are permanently embedded into video from the start are called “open captioning. “
Although CC technology was originally developed for visually impaired persons, it is now gaining attention as a tool to assist educators, those engaged in language study, and for listening practice.

CC subtitle data is superimposed on and output from NTSC output line 21 (1st field) and line 284 (2nd field). Subtitle data includes two modes: captions and text. Extended Data Service (EDS) is also available. This service uses line 284 (2nd field) to transfer program information such as titles and ratings. The V-chip described later uses the EDS function.
Up to 32 characters per line can be displayed in CC. Although 15 lines are available, the maximum number of lines is limited to 4 in caption mode (CC1 to 4). Up to 15 lines can be displayed in text mode (T1 to 4).

■ What is the V-chip?

The V-chip is a semiconductor chip that removes TV programs containing violent and sexual content. V stands for “violence”, and this chip blocks programs which are rated according to extreme content. When ratings are set on a receiver (TV) that includes a V-chip function, EDS rating information is decoded and automatically determined whether or not to output the program to the screen.

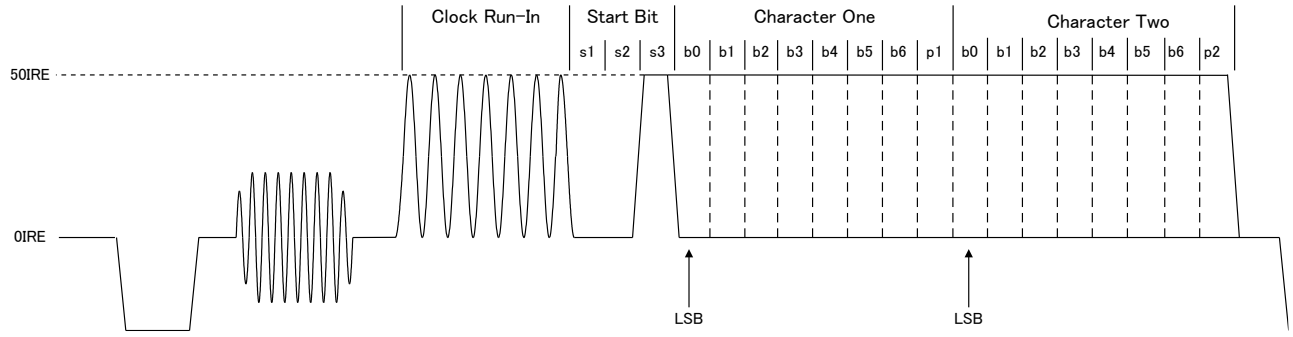
■ Closed captioning/V-chip specifications

Closed captioning/V-chip are compatible with the following TV signals.
Closed captioning is superimposed on composite signals, and Y/C signals.

- NTSC-M, NTSC-J, NTSC-443
- PAL-60, PAL, PAL-M, PAL-N, PAL-Nc

* However, caption data is superimposed on 21 lines (334 lines) during 625-line timing (PAL, PAL-Nc) output.

Waveforms for closed captioning/V-chip are shown below. Color burst is followed with a sin wave called Clock Run-In, then start bit. Start bit is always “001. “ Two bytes of data (Char1, Char2) are sent on each line. Char1 and Char2 are decoded from LSB, and usually an odd parity is appended to MSB (Bit8).



Closed Caption / V-Chip (21Line System)

● Teletext

■ What is teletext?

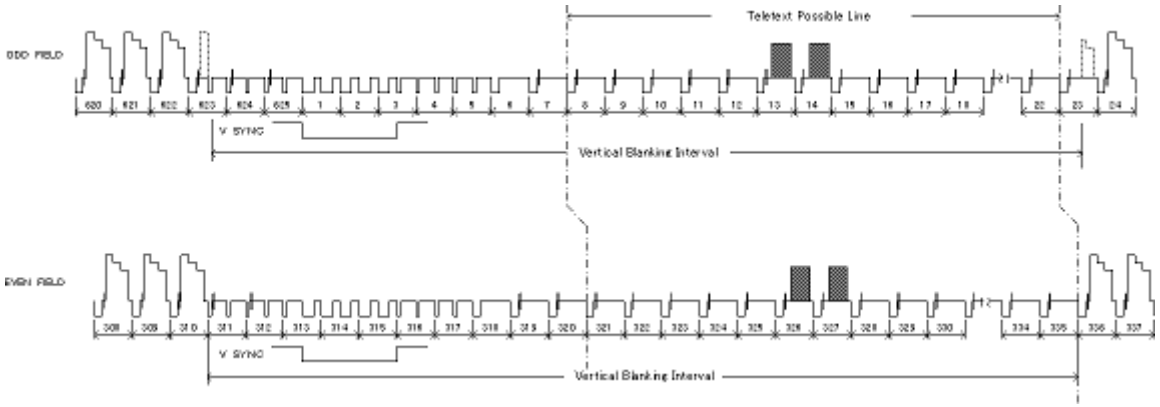
Teletext is the name of a system that multiplexes and sends text and graphic still image program data during the TV signal vertical blanking interval. Program content includes subtitle broadcasts, news broadcasts, weather forecasts, stock information, etc., with many countries adopting the European and Southeast Asian 625/50i system.
In teletext, 40 characters x 25 lines can be displayed per page (1 screen), from 100 to 899 pages.

■ Teletext specifications

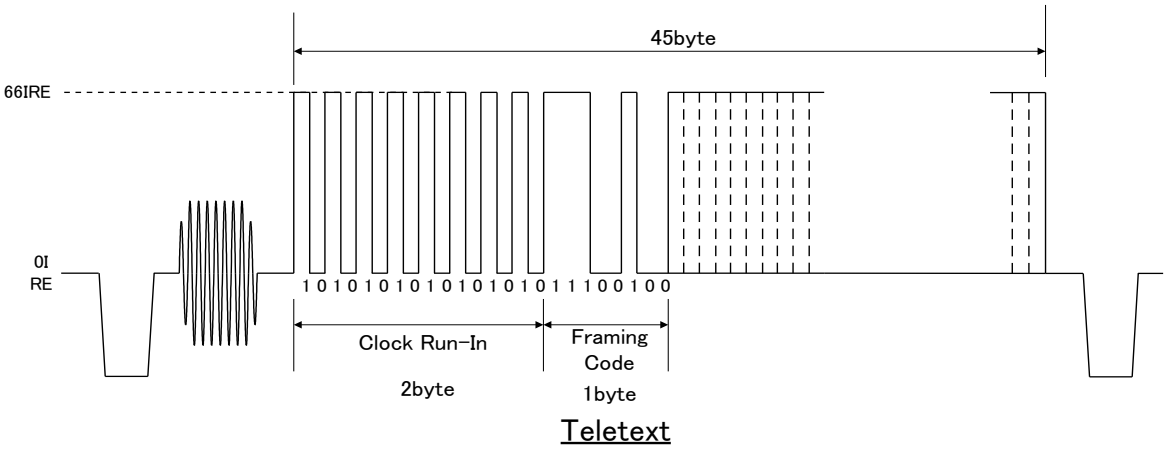
Teletext is compatible with the following TV signals.
Teletext is superimposed on composite signals, and Y/C signals.

- PAL (Does not include PAL-60, PAL-N, PAL-Nc)

The vertical blanking interval (VBI) and teletext waveform are shown below.
Teletext data is output in PAL signal vertical blanking interval lines 8 to 22 (1st field) and lines 321 to 335 (2nd field).
Additionally, data superimposed on line 1 is 45 bytes of Clock Run-IN and Framing Code data (42 bytes).



VBI waveform



Teletext waveform

● WSS

■ What is WSS (Wide Screen Signaling)?

WSS (Wide Screen Signaling) is a system that multiplexes and sends video aspect information in the vertical blanking interval.

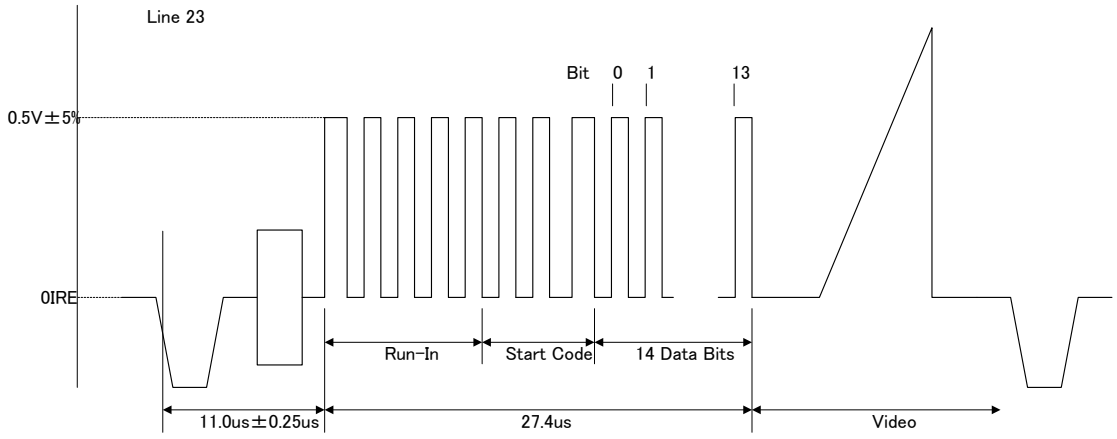
■ WSS specifications

WSS is compatible with the following TV signals.

WSS is superimposed on composite signals, and Y/C signals.

- PAL, PAL-N, PAL-Nc
- SECAM

WSS aspect information is superimposed in line 23 of the first field. WSS waveforms consist of Run-In, Start Code, and 14-bit data. WSS waveforms and bit assignment are shown below.



WSS(Widscreen Signaling)

Bit0-3: Aspect

Bit		Aspect Ratio	Full format or Letterbox	Position
0 1 2	3			
0 0 0	1	4:3	Full format	Not applicable
1 0 0	0	14:9	Letterbox	Center
0 1 0	0	14:9	Letterbox	Top
1 1 0	1	16:9	Letterbox	Center
0 0 1	0	16:9	Letterbox	Top
1 0 1	1	>16:9	Letterbox	Center
0 1 1	1	14:9	Full format	Center
1 1 1	0	16:9	Full format	Not applicable

Bit3 is parity

Bit4-13: Other service information is not supported

● CGMS-A / ID-1

■What is CGMA-A (Copy Generation Management System)?

CGMS-A is a system that multiplexes and sends copy control information in the vertical blanking interval.

■What is ID-1?

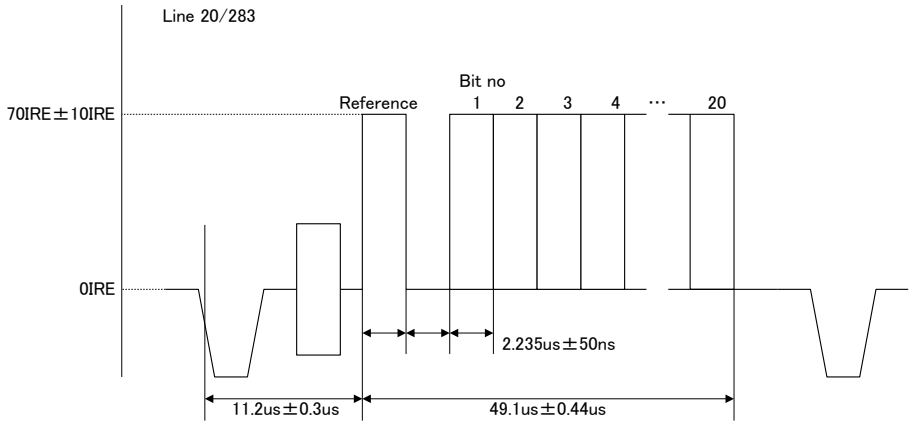
ID-1 is a system that multiplexes and sends aspect information in the vertical blanking interval.

■ CGMS-A/ID-1 specifications

CGMS-A/ID-1 is compatible with the following TV signals.
Additionally, CGMS-A/ID-1 is superimposed on composite signals, and Y/C signals.

- NTSC, NTSC-M, NTSC-443
- PAL-60, PAL-M

CGMS-A and ID-1 are superimposed on line 20 (1st field) and line 283 (2nd field). CGMS-A/ID-1 waveforms consist of reference bits and 20-bit data. CGMS-A/ID-1 waveforms and bit assignment are shown below.



CGMS-A / ID-1

- Bit1-0 : Aspect (ID-1)

Bit		Applications	
1	2	Aspect ratio	Picture display format
0	0	4:3	Normal
1	0	16:9	Normal
0	1	4:3	Letter Box
1	1	Not Defined	

- Bit6-2: Locked to “0000”

3.2.2 Setting item

This section describes settings for the VBI Function.

Level 1	Level 2	Level 3	Setting item	Setting value
VBI Function				
	Macrovision * Only displayed with a license	**Mode** Relies on V-Timing TV Mode	**NTSC-M**	**0: OFF**
				1: Type1 (AGC only)
				2: Type2 (AGC + 2Line Colorstripe)
				3: Type3 (AGC + 4Line Colorstripe)
				4: VHS USA
				5: VHS US obs.
			NTSC	**0: OFF**
				1: Type1 (AGC only)
				2: Type2 (AGC + 2Line Colorstripe)
				3: Type3 (AGC + 4Line Colorstripe)
				4: VHS JAPAN1
				5: VHS JAPAN2
			NTSC-443 **PAL-60** **PAL-M**	**0: OFF**
				1: Type1,2,3 (AGC only)
			PAL **PAL-N** **PAL-Nc** **SECAM**	**0: OFF**
				1: Type1,2,3 (AGC only)
				2: VHS
			Other	**OFF (fixed)**
	Closed Caption	**Mode** Relies on V-Timing TV Mode	**NTSC** **NTSC-M** **NTSC-443** **PAL-60** **PAL-M** **PAL** **PAL-N** **PAL-Nc**	**0: OFF**
				1: CC1
				2: CC2
				3: CC3
				4: CC4
				5: T1
				6: T2
				8: T4
				9: USER Data
			Other	**OFF (fixed)**
		CC1 - Primary Synchronous Caption Service (Caption service for primary language) **CC2** - Special Non-Synchronous Use Caption (Services that do not need to be synchronized with audio, etc.) **CC3** - Secondary Synchronous Caption Service (Caption service for secondary language) **CC4** - Special Non-Synchronous Use Caption (Services that do not need to be synchronized with audio, etc.) **T1** - First Text service (Text service) **T2** - Second Text service (Text service) **T3** - Third Text service (Text service) **T4** - Fourth Text service (Text service) * Refer to closed caption internal data.		

<table>
<tr><th>Level 1</th><th colspan="2">Level 2</th><th>Level 3</th><th>Setting item</th><th>Setting value</th></tr>
<tr><td>VBI Function</td><td colspan="5">● Data included in closed captions
<table>
<tr><th>Service</th><th>Caption style, lines, colors, optional settings, etc.</th><th>Characters</th></tr>
<tr><td>1 to CC4 Service</td><td>Roll-up2
ROW2
Background: Black, opaque
Text: White</td><td>Primary Synchronous
Caption Service -- CC1 (CC1)

Secondary Synchronous
Caption Service -- CC2 (CC2)

Special Non-Synchronous
Use Captions -- CC3 (CC3)

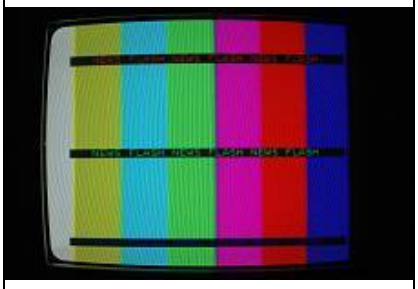
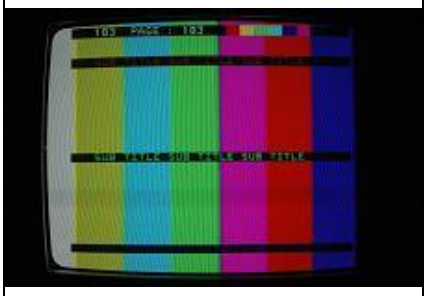
Special Non-Synchronous
Use Captions -- CC4 (CC4)</td></tr>
<tr><td></td><td>Roll-up3
ROW10
Background: Blue, opaque
Text: Yellow</td><td>Roll-up Style
Characters are always displayed immediately.
Each time a Carriage Return is received,
The text is scrolled up one row.</td></tr>
<tr><td></td><td>Roll-up4
ROW15, indent
Background: Cyan, opaque
Text: Red</td><td>Standard characters
0123456789
ABCDEFGHIJ
áàâçéèêíîÑñóôúû
!,.;:7”#% &@/()
[]+-÷<=>?
Music note, solid block, Transparent space, solid block, Music note, solid block, Transparent space</td></tr>
<tr><td></td><td>Pop-on
ROW1
ROW2
ROW3
Background: Red, semitransparent
Text: Cyan</td><td>Pop-on Style
Caption data are loaded into a non-displayed memory.</td></tr>
<tr><td></td><td>Pop-on
ROW4
ROW5
ROW6
Background: Green, semitransparent
Text: Blue, flash</td><td>End of Caption command (EOC)
“flips” displayed and non displayed memory.</td></tr>
<tr><td></td><td>Pop-on
ROW7 indent
ROW8 indent
ROW9 indent
Background: Magenta, opaque
Text: Green, italic</td><td>ABCDEFGHIJ
0123456789
Å Ø ø ┌┐ └┘</td></tr>
<tr><td></td><td>Pop-on
ROW12 indent
ROW13 indent
ROW14 indent
ROW15 indent
Background: White, opaque
Text: Red, underlined</td><td>ÁÉÓÚÜü, opening single quote, inverted exclamation mark
ÀÂÇÈÊËëÎÏïÔÙùÛ«»
ÃãÍÌìÒòÕõ{}＼^_|~
ÄäÖöß\¤|</td></tr>
<tr><td></td><td>Paint-on
ROW1
ROW3
ROW4
ROW6
ROW7
ROW9
Background: Yellow, semitransparent
Text: Blue</td><td>Paint-on Style
Characters are always displayed immediately.
Characters on next row will be erased by Backspace.
ABCDEFGH
(A to H is deleted by Backspace)</td></tr>
</table></td></tr>
</table>

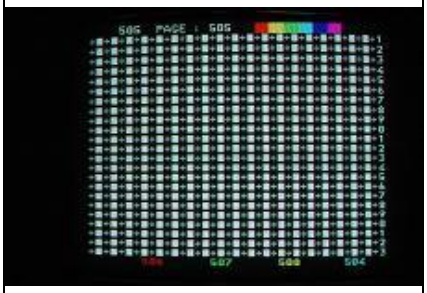
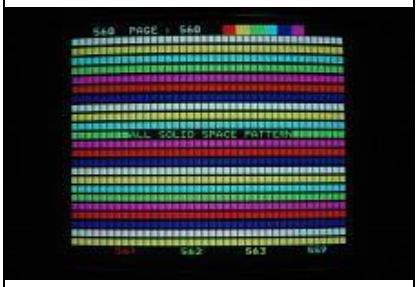
Level 1	Level 2	Level 3	Setting item	Setting value
VBI Function		Paint-on ROW5 ROW6 ROW7 ROW8 ROW9 ROW10 ROW12, indent ROW14, indent Background: Yellow, semitransparent Text: Blue	Once the cursor reaches the 32nd column position on any row, all subsequent characters will be displayed In that column replacing any previous character. ABCDEFGHIJKLMNOPQRSTUVWXYZ (S to Y are replaced by Z) Abcdefghijklmnopqrstuvwxyz (n to y are replaced by z)	
	T1	--	First Text Service -- T1 Text Mode is a data service, generally not program related, which may be transmitted using either field of line21. Text Mode data are always displayed as soon as they are received and are intended to be displayed in a manner which isolates them from the video program used to transmit the data. Once the display window is filled these data are always scrolled upward through the display window provided by the decoder.	
	T2	--	Second Text Service -- T2 ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789012345678 90 !”#$%&'()á+,-./ :;<=>?@[é]íóú *.–©SM•“”\	
	T3	--	Third Text Service -- T3 A Text Mode may be used that consists of data formatted to fill a box which in height is not less than 7 rows and not more than 15 rows (all of which should be contiguous), and in width is not less than 32 columns. Text should be displayed over a solid background to isolate it from the unrelated program video. Each row of text contains maximum of 32 characters.	
	T4	--	Fourth Text Service -- T4 ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789012345678 90 !”#$%&'()á+,-./ :;<=>?@[é]íóú *.–©SM•“”\	
	Closed Caption	**Interval**		**0 to 60 [s]**
		USER Data No. * Only displayed when Mode=USER Data is selected.		**1 to 20**
	V-Chip	**System** Relies on V-Timing TV Mode	**NTSC**	**0: OFF**
			NTSC-M	**1: MPAA**
			NTSC-443	**2: U.S.TV**
			PAL-60	**3: English**
			PAL-M	**4: French**
			PAL **PAL-N** **PAL-Nc**	
			Other	**OFF** (fixed)

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Setting item</th><th>Setting value</th></tr>
<tr><td rowspan="11">VBI Function</td><td rowspan="11">V-Chip</td><td colspan="3">MPAA: Motion Picture Association of America
This organization was established in order to popularize American movies. The MPAA is involved in a variety of activities including bolstering movie export to overseas markets and regulating pirated movies. Also, self-imposed restrictions are established regarding the depiction of violence, sex, and discrimination within the United States. Rating standards are strict, with even the most minor of images and words that are not of concern in Japan subject to review.
U.S.TV: U.S. TV Parental Guideline Rating System
This is a rating system built into household TVs in the United States.
English: Canadian English Language Rating System
This is a Canadian English language rating system.
French: Canadian French Language Rating System
This is a Canadian French language rating system.</td></tr>
<tr><td colspan="2">MPAA</td><td>0: G</td></tr>
<tr><td colspan="2"></td><td>1: PG</td></tr>
<tr><td colspan="2"></td><td>2: PG-13</td></tr>
<tr><td colspan="2"></td><td>3: R</td></tr>
<tr><td colspan="2"></td><td>4: NC-17</td></tr>
<tr><td colspan="2"></td><td>5: X</td></tr>
<tr><td colspan="2"></td><td>6: Not Rated</td></tr>
<tr><td colspan="2"></td><td>7: N/A</td></tr>
<tr><td colspan="3">G: General Audience All ages admitted.
PG: Parental Guidance Some material may not be suitable for children.
PG-13: Parents Strongly Cautioned Some material may be inappropriate for children under 13.
R: Restricted Under 17 requires accompanying parent or adult guardian.
NC-17: No One 17 and Under Admitted No One 17 and Under Admitted.
X: Adult Movie For adults only.
Not Rated Not Submitted for MPAA Review
N/A No restrictions.</td></tr>
<tr><td colspan="2">USTV</td><td>0: TV-Y</td></tr>
<tr><td colspan="2"></td><td>1: TV-Y7</td></tr>
<tr><td colspan="2"></td><td>2: TV-G</td></tr>
<tr><td colspan="2"></td><td>3: TV-PG</td></tr>
<tr><td colspan="2"></td><td>4: TV-14</td></tr>
<tr><td colspan="2"></td><td>5: TV-MA</td></tr>
<tr><td colspan="2"></td><td>6: Not Rated 1</td></tr>
<tr><td colspan="2"></td><td>7: Not Rated 2</td></tr>
<tr><td colspan="3">TV-Y: All children This program is designed to be appropriate for all children.
TV-Y7: Directed to older children This program is designed for children age 7 and above.
TV-G: General Audience Most parents would find this program suitable for all ages (contains no violence, strong language, or sexual situations).
TV-PG: Parental Guidance Suggested The program contains material that parents may find unsuitable for younger children, including a moderate amount of violence, sexual content and scenes that could induce them to use rough language or act inappropriately.
TV-14: Parents Strongly Cautioned This program contains material that many parents would find unsuitable for children under 14 years of age, including violence, sexual content and scenes that could induce them to use rough language or act inappropriately.
TV-MA: Mature Audience Only This program is specifically designed to be viewed by adults, and is generally not broadcast.
Not Rated1/2 No restrictions.</td></tr>
</table>

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Setting item</th><th>Setting value</th></tr>
<tr><td rowspan="20">VBI Function</td><td rowspan="11">V-Chip</td><td rowspan="5">USTV Extension</td><td rowspan="5">OFF/ON</td><td colspan="2">FV/V/S/L/D
Each bit 0: OFF / 1: ON
Editable bits depend on USTV.</td></tr>
<tr><td>TV-Y7:</td><td>F,V</td></tr>
<tr><td>TV-PG,TV-14:</td><td>V,S,L,D</td></tr>
<tr><td>TV-MA:</td><td>V,S,L</td></tr>
<tr><td>Other</td><td>None</td></tr>
<tr><td colspan="2">English</td><td colspan="2">0: E / 1: C / 2: C8+ / 3: G / 4: PG / 5: 14+ / 6: 18+</td></tr>
<tr><td colspan="4">E: Exempt No age restrictions.
C: Children Content suitable for children of all ages.
C8+: Children eight years and older Content suitable for children 8 years of age and older.
G: General Programming, suitable for all audiences Content suitable for general audiences.
PG: Parental Guidance Content that can be viewed with parental permission.
14+: Viewers 14 years and older Content suitable for children 14 years of age and older.
18+: Adult Programming Programming for viewers 18 years of age and older.</td></tr>
<tr><td colspan="2">French</td><td colspan="2">0: E / 1: G / 2: 8ans+ / 3: 13ans+ / 4: 16ans+ / 5: 18ans+</td></tr>
<tr><td colspan="4">E: Exempt No age restrictions.
G: General Content suitable for general audiences.
8ans+: Not recommended for young children Content not suitable for young children.
13ans+: Programming may not be suitable for children under 13
Content not suitable for children under 13 years of age.
16ans+: Programming is not suitable for children under 16
Content not suitable for children under 16 years of age.
18ans+: Programming restricted to adults
Programming for viewers 18 years of age and older.</td></tr>
<tr><td colspan="2">Interval</td><td></td><td>0 to 60 [s]</td></tr>
<tr><td rowspan="10">Teletext</td><td rowspan="2">Mode:
Relies on V-Timing TV Mode</td><td>PAL</td><td>0: OFF / 1: Default / 2: Page Select</td></tr>
<tr><td>Other</td><td>OFF (fixed)</td></tr>
<tr><td>Page
This product can register up to 20 pages of teletext screens.
Internal data numbers are set for each page.
Page data can be set from 100 to 899.</td><td>1: to 20:</td><td>100 to 899
* Refer to teletext default page list.</td></tr>
<tr><td rowspan="8">Line
Sets the line to output teletext data.
Numbers indicate the number of lines for the 1st and 2nd fields.</td><td>8,321:</td><td rowspan="8">0: Disable / 1: Enable</td></tr>
<tr><td>9,322</td></tr>
<tr><td>10,323</td></tr>
<tr><td>11,324</td></tr>
<tr><td>12,325</td></tr>
<tr><td>13,326</td></tr>
<tr><td>14,327</td></tr>
<tr><td>15,328</td></tr>
<tr><td>16,329</td></tr>
<tr><td>17,330</td></tr>
<tr><td>18,331</td></tr>
<tr><td>19,332</td></tr>
<tr><td>20,333</td></tr>
<tr><td>21,334</td></tr>
<tr><td>22,335</td></tr>
</table>

Level 1	Level 2	Level 3	Setting item	Setting value
VBI Function	● Teletext default page list			

Page No.	Details	Screen	Page No.	Details	Screen
100	Index Page		101	Test Page	 Including FLASH and CONCEAL
102	Newsflash		103	Subtitle	
200	Character (English)		201	Character (German)	
202	Character (Swedish/ Finnish/ Hungarian)		203	Character (Italian)	
204	Character (French)		205	Character (Portuguese/ Spanish)	

Level 1	Level 2		Level 3		Setting item		Setting value
VBI Function	206	Character (Czech /Slovak)		301	Colors		
	302	White Flat		505	Clock Cracker		
	515	Multi Page	 4 sub page	555	Test Pattern1		
	560	Test Pattern2		-	Other pages	 For 700 pages	

WSS	**OFF/ON** Relies on **V-Timing TV Mode**	**PAL**	**0: OFF / 1: ON**
		PAL-N	
		PAL-Nc	
		SECAM	
		Other	**OFF** (fixed)
	Aspect Ratio		**0: Full Format 4:3**
			1: LB 14:9 center
			2: LB 14:9 top
			3: LB 16:9 center
			4: LB 16:9 top
			5: LB >16:9 center
			6: Full Format 14:9
			7: Full Format 16:9

Level 1	Level 2	Level 3	Setting item	Setting value
VBI Function	**CGMS-A/ID-1**	**OFF/ON Field1** (Sets line 20 output for 1st field) **Field2** (Sets line 283 output for 2nd field) Relies on **V-Timing TV Mode**	**NTSC**	**0: OFF / 1: ON**
			NTSC-M	
			NTSC-443	
			PAL-60	
			PAL-M	
			Other	**OFF** (fixed)
		Aspect		**0: 4:3 Normal**
				1: 16:9 Normal
				2: 4:3 Letter Box
				3: Not Defined
		CGMS-A		**0: Copying Permitted** Enables copying.
				1: Not Used Condition Sets undefined condition.
				2: Copy Once Enables copying once.
				3: No Copying Permitted Disables copying.

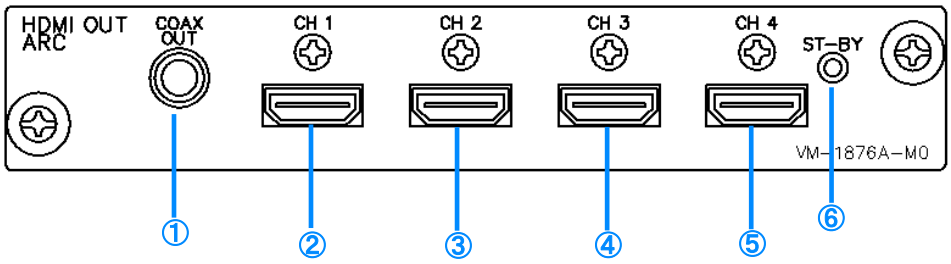
Chapter 4 Digital Output Settings (DIGITAL OUTPUT)

4.1 HDMI unit functions and settings

The applicable unit is as follows.

4.1.1 HDMI unit VM-1876-M0 and VM-1876A-M0

● Unit exterior diagram



No.	Name	Description
①	COAX digital audio output	Outputs audio to the selected Port when HDMI 1, 2, 3, 4 ARC signal is received.
②	HDMI 1	This is HDMI digital video/audio output terminal 1 to 4. (Supports HDCP)
③	HDMI 2	
④	HDMI 3	
⑤	HDMI 4	
⑥	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

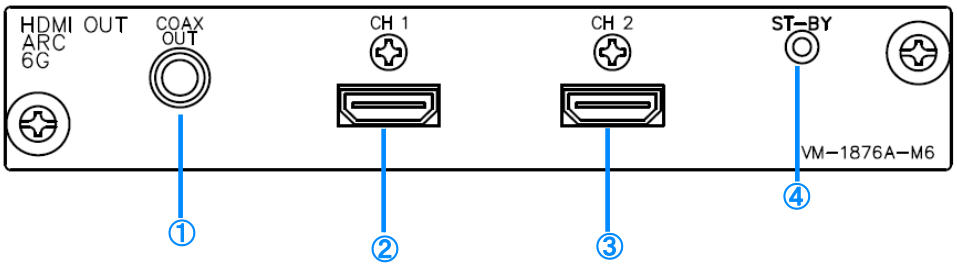
● Specifications

HDMI CH1 CH2 CH3 CH4	Connector			HDMI x4
	Dot clock *4		Single clock mode	<For RGB/YCbCr444> 8 bit: 25 to 300 MHz 10 bit: 25 to 240 MHz 12 bit: 25 to 200 MHz 16 bit: 25 to 150 MHz <For YCbCr422> 8 bit: 25 to 300 MHz 10 bit: 25 to 300 MHz 12 bit: 25 to 300 MHz
			Dual clock mode *1	<For RGB/YCbCr444> 8 bit: 50 to 600 MHz 10 bit: 50 to 480 MHz 12 bit: 50 to 400 MHz 16 bit: 50 to 300 MHz <For YCbCr422> 8 bit: 50 to 600 MHz 10 bit: 50 to 600 MHz 12 bit: 50 to 600 MHz <For YCbCr420> 8 bit: 50 to 600 MHz 10 bit: 50 to 480 MHz 12 bit: 50 to 400 MHz 16 bit: 50 to 300 MHz
			Quad clock mode *2	<For RGB/YCbCr444> 8 bit: 100 to 1200 MHz 10 bit: 100 to 960 MHz 12 bit: 100 to 800 MHz 16 bit: 100 to 600 MHz <For RGB/YCbCr422> 8 bit: 100 to 1200 MHz 10 bit: 100 to 1200 MHz 12 bit: 100 to 1200 MHz
	No. of colors			RGB 8/10/12/16bit each (RGB/ YCbCr444/ YCbCr422/ YCbCr420 compatible)
	Audio Output	HDMI	L-PCM	Sampling: 32k / 44.1k / 48k / 88.2k / 96k / 176.4k / 192 kHz Output frequency: 100 to 20 kHz No. of bits: 16 / 20 / 24bit
			Compression	AC3, AAC
			Option	Next-generation audio compatible*3 DSD, Dolby Digital Plus, Dolby True HD, DTS HD (High Resolution Audio), DTS HD (Master Audio) etc.
		COAX		Sampling: 32k / 44.1k / 48k / 88.2k / 96k / 176.4k / 192 kHz
	Copy protect			HDCP Ver1.4
	Added functions			E-EDID Ver1.4 (DDC2B), xvYCC, CEC

*1 Uses CH1-CH2 (CH3-CH4) for parallel output. However, distributes output for YCbCr420 only.
*2 Uses CH1-CH2-CH3-CH4 for parallel output.
*3 Next-generation audio function is available when a license is purchased.
*4 TMDSCLK 3GHz

4.1.2 HDMI 6G Unit VM-1876-M6, VM-1876A-M6

● Unit exterior diagram



No.	Name	Description
①	COAX digital audio output	Outputs audio to the selected Port when HDMI 1 or 2 ARC signal is received.
②	HDMI 1	This is HDMI digital video/audio output terminal 1. (Supports HDCP)
③	HDMI 2	This is HDMI digital video/audio output terminal 2. (Supports HDCP)
④	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

MEMO

- **When data transfer speed (TMDS clock) output is 3G or below, Timing edited in Timing editing can be output, however, Timing output that exceeds 3G will be output from CEA-861-F standard Video Identification Code (VIC) 93 to107 Timing only.**
  (Output of edited Timing that exceeds 3G is not available.)
  Additionally, VIC91 and VIC92 Timing output is not available.
  VIC91 : 2560x1080p Field Rate100Hz Pixel Frequency 371.25 MHz
  VIC92 : 2560x1080p Field Rate119.88/120 Hz Pixel Frequency 495 MHz
- **Deep Color output for Timing that exceeds 3G uses 8-bit display gradation for output color format YCbCr 4:2:0, and 12-bit display gradation for RGB and YCbCr4:4:4 16bit. (Low-level bits are output with 0 fill-in for Deep Color.)**
- **3D display for Timing that exceeds 3G is only compatible with Top and Bottom and Side By Side (Half).**

(TMDS clock calculation method)
Output color format coefficient
RGB=1.0, YCbCr4:4:4=1.0, YCbCr4:2:2=0.666(2/3) ,YCbCr4:2:0=0.5(1/2)

Output bit coefficient
8 bits = 1.0, 10 bits = 1.25, 12 bits = 1.5, 16 bits = 2.0

TMDS clock = dot clock x output color format coefficient x output bit coefficient

Ex. Dot clock: 148.5 MHz (1.485G)
Output color format: YCbCr4:2:2 (output color format coefficient 0.666(2/3))
Output bit coefficient: 10 bits (output bit coefficient 1.25)

TMDS clock = 1.485G x 0.666 (2/3) x 1.25
TMDS clock = 1.2375G

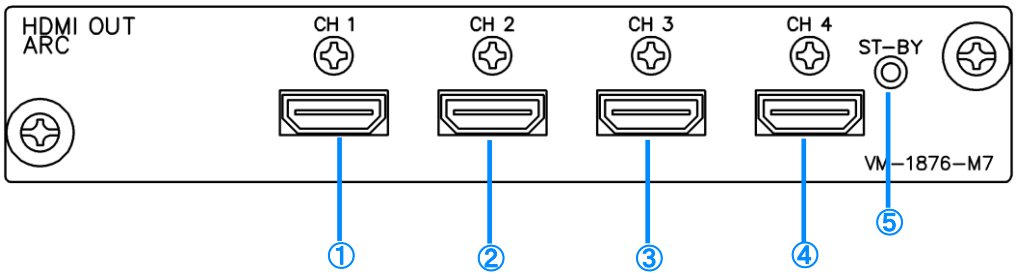
● Specifications

<table>
<tr><td rowspan="9">HDMI
CH1
CH2</td><td colspan="3">Connector</td><td colspan="2">HDMI x2</td></tr>
<tr><td colspan="3" rowspan="2">Dot clock
*1</td><td>Single clock mode</td><td><For RGB/YCbCr444>
8bit: 25 to 300 MHz
10bit: 25 to 240 MHz
12bit: 25 to 200 MHz
16bit: 25 to 150 MHz
<For YCbCr422>
8 / 10 / 12 bit: 25 to 300 MHz</td></tr>
<tr><td>Dual clock mode
*2</td><td><For RGB/YCbCr444>
8bit: 597 MHz
<For YCbCr422>
12bit: 597 MHz
<For YCbCr420>
8bit: 50 to 600 MHz
10bit: 50 to 480 MHz
12bit: 50 to 400 MHz
16bit: 50 to 300 MHz</td></tr>
<tr><td colspan="3">No. of colors
*3*4</td><td colspan="2">RGB 8 / 10 / 12bit / 16bit each
(RGB / YCbCr444 / YCbCr422 / YCbCr420 compatible)</td></tr>
<tr><td rowspan="4">Audio Output</td><td rowspan="3">HDMI</td><td>L-PCM</td><td colspan="2">Sampling: 32k / 44.1k / 48k / 88.2k / 96k / 176.4k / 192k
Output frequency: 100 to 20 kHz
No. of bits: 16 / 20 / 24bit</td></tr>
<tr><td>Compression</td><td colspan="2">AC3, AAC</td></tr>
<tr><td>Option</td><td colspan="2">Next-generation audio compatible*5
DSD, Dolby Digital Plus, Dolby Ture HD,
DTS HD (High Resolution Audio), DTS HD (Master Audio) etc.</td></tr>
<tr><td colspan="2">COAX</td><td colspan="2">Sampling: 32k / 44.1k / 48k / 88.2k / 96k / 176.4k / 192k</td></tr>
<tr><td colspan="3">Copy protect</td><td colspan="2">HDCP Ver1.4</td></tr>
<tr><td colspan="3">Added functions</td><td colspan="2">E-EDID Ver1.4 (DDC2B), xvYCC, CEC</td></tr>
</table>

*1 Quad clock mode is not supported.
*2 The same data is constantly output from CH1 and CH2 (distributed output). Distributed output is not supported.
*3 Up to 8-bit gradation is available for YCbCr4:2:0.
*4 Up to 12-bit gradation is available for 4K output.
*5 Next-generation audio function is available when a license is purchased.

4.1.3 HDMI HDCP2.2 Unit VM-1876-M7

● Unit exterior diagram



No.	Name	Description
①	HDMI 1	This is HDMI digital video/audio output terminal 1 to 4. (Supports HDCP)
②	HDMI 2	
③	HDMI 3	
④	HDMI 4	
⑤	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

MEMO

[Compatible Formats]

2D Video Resolution	Pixel Format	Color Depth (bits per pixel)	Maximum Frame Rate (Hz)
VGA	RGB	24	60
WVGA	RGB	24	60
SVGA	RGB	24	60
XGA	RGB	24	60
UXGA	RGB	24	60
WUXGA	RGB	24	60
QXGA	RGB	24	60
WQXGA	RGB	24	60
480p/i	RGB YCbCr 4:4:4	24, 36	60
	YCbCr 4:2:2	16, 24	
576p/i	RGB YCbCr 4:4:4	24, 36	50
	YCbCr 4:2:2	16, 24	
720p	RGB YCbCr 4:4:4	24, 36	50/60
	YCbCr 4:2:2	16, 24	
1080i	RGB YCbCr 4:4:4	24, 36	50/60
	YCbCr 4:2:2	16, 24	
1080p	RGB YCbCr 4:4:4	24, 36	50/60
	YCbCr 4:2:2	16, 24	
4K x 2K	RGB YCbCr 4:4:4	24, 36	24/25/30
	YCbCr 4:2:2	16, 24	
	YCbCr 4:2:0	12	50/60

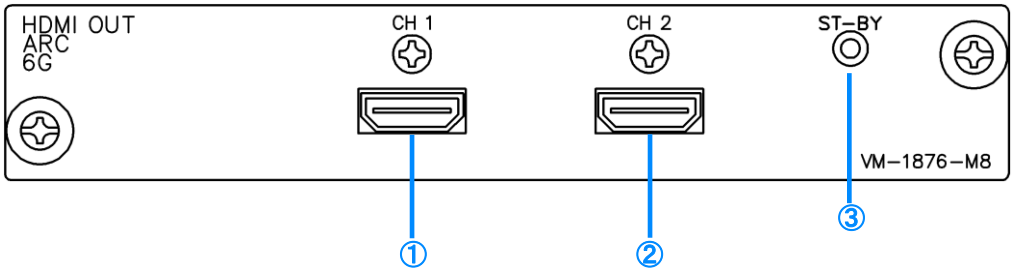
● Specifications

<table>
<tr><td rowspan="10">HDMI
CH1
CH2
CH3
CH4</td><td colspan="3">Connector</td><td colspan="2">HDMI x4</td></tr>
<tr><td colspan="3" rowspan="3">Dot clock
*4</td><td>Single clock mode</td><td><For RGB/YCbCr444>
8 bit: 25 to 300 MHz
10 bit: 25 to 240 MHz
12 bit: 25 to 200 MHz
<For YCbCr422>
8 / 10 / 12 bit: 25 to 300 MHz</td></tr>
<tr><td>Dual clock mode
*1</td><td><For RGB/YCbCr444>
8 bit: 50 to 600 MHz
10 bit: 50 to 480 MHz
12 bit: 50 to 400 MHz
<For YCbCr422>
8 / 10 /12 bit: 50 to 600 MHz
<For YCbCr420>
8 bit: 50 to 600 MHz
10 bit: 50 to 480 MHz
12 bit: 50 to 400 MHz</td></tr>
<tr><td>Quad clock mode
*2</td><td><For RGB/YCbCr444>
8 bit: 100 to 1200 MHz
10 bit: 100 to 960 MHz
12 bit: 100 to 800 MHz
<For RGB/YCbCr422>
8 / 10 / 12 bit: 100 to 1200 MHz</td></tr>
<tr><td colspan="3">No. of colors</td><td colspan="2">RGB 8/10/12 bit each (RGB/ YCbCr444/ YCbCr422/ YCbCr420 (8-bit only compatible))</td></tr>
<tr><td rowspan="4">Audio Output</td><td rowspan="3">HDMI</td><td>L-PCM</td><td colspan="2">Sampling: 32k / 44.1k / 48k / 88.2k / 96k / 176.4k / 192 kHz
Output frequency: 100 to 20 kHz
No. of bits: 16 / 20 / 24bit</td></tr>
<tr><td>Compression</td><td colspan="2">AC3, AAC</td></tr>
<tr><td>Option</td><td colspan="2">Next-generation audio compatible*3
DSD, Dolby Digital Plus, Dolby True HD,
DTS HD (High Resolution Audio), DTS HD (Master Audio) etc.</td></tr>
<tr><td colspan="2">COAX</td><td colspan="2">Sampling: 32k / 44.1k / 48k / 88.2k / 96k / 176.4k / 192 kHz</td></tr>
<tr><td colspan="3">Copy protect</td><td colspan="2">HDCP Ver2.2 or Ver1.4 (relies on Sink)</td></tr>
<tr><td colspan="3">Added functions</td><td colspan="2">E-EDID Ver1.4 (DDC2B), xvYCC, CEC</td></tr>
</table>

*1 Uses CH1-CH2 (CH3-CH4) for parallel output. However, distributes output for YCbCr420 only.
*2 Uses CH1-CH2-CH3-CH4 for parallel output.
*3 Next-generation audio function is available when a license is purchased.
*4 TMDSCLK 3GHz

4.1.4 HDMI 6G HDCP2.2 Unit VM-1876-M8

● Unit exterior diagram



No.	Name	Description
①	HDMI 1	This is HDMI digital video/audio output terminal 1. (Supports HDCP)
②	HDMI 2	This is HDMI digital video/audio output terminal 2. (Supports HDCP)
③	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

MEMO

● Data transfer speed (TMDS clock) is CEA-861-F standard Video Identification Code Only (VIC) VIC1 to 90, 93 to 108, and the following VESA compatible format Timing are available for output.

● 3D display is only compatible with Top and Bottom and Side By Side (Half).

[VESA Compatible Formats]

PrgNo	Program Name	PrgNo	Program Name	PrgNo	Program Name
1602	VESA640x400@85	1628	VESA1280x800@60	1652	VESA1600x1200@65
1603	VESA720x400@85	1629	VESA1280x800@75	1653	VESA1600x1200@70
1604	VESA640x480@60	1630	VESA1280x800@85	1654	VESA1600x1200@75
1605	VESA640x480@72	1631	VESA1280x800@120CVT	1655	VESA1600x1200@85
1606	VESA640x480@75	1632	VESA1280x960@60	1656	VESA1600x1200@120CVT
1607	VESA640x480@85	1633	VESA1280x960@85	1657	VESA1680x1050@60CVT
1608	VESA800x600@56	1634	VESA1280x960@120CVT	1658	VESA1680x1050@60
1609	VESA800x600@60	1635	VESA1280x1024@60	1659	VESA1680x1050@75
1610	VESA800x600@72	1636	VESA1280x1024@75	1660	VESA1680x1050@85
1611	VESA800x600@75	1637	VESA1280x1024@85	1661	VESA1680x1050@120CVT
1612	VESA800x600@85	1638	VESA1280x1024@120CVT	1668	VESA1920x1200@60CVT
1613	VESA800x600@120CVT	1639	VESA1360x768@60	1669	VESA1920x1200@60
1614	VESA848x480@60	1640	VESA1360x768@120CVT	1670	VESA1920x1200@75
1615	VESA1024x768@43	1641	VESA1400x1050@60CVT	1671	VESA1920x1200@85
1616	VESA1024x768@60	1642	VESA1400x1050@60		
1617	VESA1024x768@70	1643	VESA1400x1050@75		
1618	VESA1024x768@75	1644	VESA1400x1050@85		
1619	VESA1024x768@85	1645	VESA1400x1050@120CVT		
1620	VESA1024x768@120CVT	1646	VESA1440x900@60CVT		
1622	VESA1280x768@60CVT	1647	VESA1440x900@60		
1623	VESA1280x768@60	1648	VESA1440x900@75		
1624	VESA1280x768@75	1649	VESA1440x900@85		
1625	VESA1280x768@85	1650	VESA1440x900@120CVT		
1627	VESA1280x800@60CVT	1651	VESA1600x1200@60		

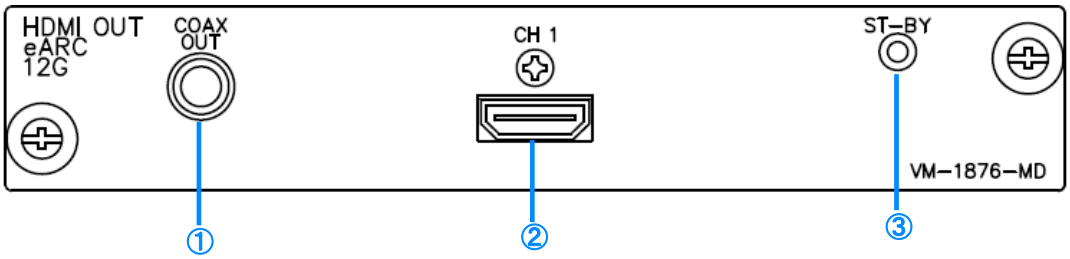
● Specifications

<table>
<tr><td rowspan="10">HDMI
CH1
CH2</td><td colspan="3">Connector</td><td colspan="2">HDMI x2</td></tr>
<tr><td colspan="3" rowspan="2">Dot clock
*1</td><td>Single clock mode</td><td><For RGB/YCbCr444>
8bit: 25 to 300 MHz
10bit: 25 to 240 MHz
12bit: 25 to 200 MHz
16bit: 25 to 150 MHz
<For YCbCr422>
8 / 10 / 12 bit: 25 to 300 MHz</td></tr>
<tr><td>Dual clock mode
*2</td><td><For RGB/YCbCr444>
8bit: 597 MHz
<For YCbCr422>
12bit: 597 MHz
<For YCbCr420>
8bit: 50 to 600 MHz
10bit: 50 to 480 MHz
12bit: 50 to 400 MHz
16bit: 50 to 300 MHz</td></tr>
<tr><td colspan="3">No. of colors
*3*4</td><td colspan="2">RGB 8 / 10 / 12bit / 16bit each
(RGB / YCbCr444 / YCbCr422 / YCbCr420 compatible)</td></tr>
<tr><td rowspan="4">Audio Output</td><td rowspan="3">HDMI</td><td>L-PCM</td><td colspan="2">Sampling: 32k / 44.1k / 48k / 88.2k / 96k / 176.4k / 192k
Output frequency: 100 to 20 kHz
No. of bits: 16 / 20 / 24bit</td></tr>
<tr><td>Compression</td><td colspan="2">AC3, AAC</td></tr>
<tr><td>Option</td><td colspan="2">Next-generation audio compatible*5
DSD, Dolby Digital Plus, Dolby Ture HD,
DTS HD (High Resolution Audio), DTS HD (Master Audio) etc.</td></tr>
<tr><td colspan="2">COAX</td><td colspan="2">Sampling: 32k / 44.1k / 48k / 88.2k / 96k / 176.4k / 192k</td></tr>
<tr><td colspan="3">Copy protect</td><td colspan="2">HDCP Ver2.2 or Ver1.4</td></tr>
<tr><td colspan="3">Added functions</td><td colspan="2">E-EDID Ver1.4 (DDC2B), xvYCC, CEC</td></tr>
</table>

*1 Quad clock mode is not supported.
*2 The same data is constantly output from CH1 and CH2 (distributed output). Distributed output is not supported.
*3 Up to 8-bit gradation is available for YCbCr4:2:0.
*4 Up to 12-bit gradation is available for 4K output.
*5 Next-generation audio function is available when a license is purchased.

4.1.5 HDMI 2.1 Unit VM-1876-MD

● Unit exterior diagram



No.	Name	Description
①	COAX Digital Audio Output	Outputs audio when receiving ARC and eARC signals in HDMI1.
②	HDMI 1	This is HDMI digital video/audio output terminal 1. (Supports HDCP)
③	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

MEMO

- TMDS clock and FRL clock can only output Timing of the following formats.
- 3D is not supported.

[TMDS Support Format]

●	Supported
x	The format that VM-1876-MD does not support.
–	The format that HDMI2.1 does not support.

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
1	640x480p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
1	640x480p	59.94Hz/60Hz	RGB/YC444	10	●	●	●	●	●	●	●
1	640x480p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
1	640x480p	59.94Hz/60Hz	YC422		●	●	●	●	●	●	●
2	720x480p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
2	720x480p	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x
2	720x480p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
2	720x480p	59.94Hz/60Hz	YC422		●	●	●	●	●	●	●
3	720x480p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
3	720x480p	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x
3	720x480p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
3	720x480p	59.94Hz/60Hz	YC422		●	●	●	●	●	●	●
4	1280x720p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
4	1280x720p	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x
4	1280x720p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
4	1280x720p	59.94Hz/60Hz	YC422		●	●	●	●	●	●	●
5	1920x1080i	59.94Hz/60Hz	RGB/YC444	8	●	x	x	x	x	x	x
5	1920x1080i	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x
5	1920x1080i	59.94Hz/60Hz	RGB/YC444	12	●	x	x	x	x	x	x
5	1920x1080i	59.94Hz/60Hz	YC422		●	x	x	x	x	x	x
6	720(1440)x480i	59.94Hz/60Hz	RGB/YC444	8	●	x	x	x	x	x	x
6	720(1440)x480i	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x
6	720(1440)x480i	59.94Hz/60Hz	RGB/YC444	12	●	x	x	x	x	x	x
6	720(1440)x480i	59.94Hz/60Hz	YC422		●	x	x	x	x	x	x
7	720(1440)x480i	59.94Hz/60Hz	RGB/YC444	8	●	x	x	x	x	x	x
7	720(1440)x480i	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x
7	720(1440)x480i	59.94Hz/60Hz	RGB/YC444	12	●	x	x	x	x	x	x
7	720(1440)x480i	59.94Hz/60Hz	YC422		●	x	x	x	x	x	x
8	720(1440)x240p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
8	720(1440)x240p	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x
8	720(1440)x240p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
8	720(1440)x240p	59.94Hz/60Hz	YC422		●	x	x	x	x	x	x
9	720(1440)x240p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
9	720(1440)x240p	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
9	720(1440)x240p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
9	720(1440)x240p	59.94Hz/60Hz	YC422		●	x	x	x	x	x	x
10	2880x480i	59.94Hz/60Hz	RGB/YC444	8	x	x	x	x	x	x	x
10	2880x480i	59.94Hz/60Hz	RGB/YC444	10	x	x	x	x	x	x	x
10	2880x480i	59.94Hz/60Hz	RGB/YC444	12	x	x	x	x	x	x	x
10	2880x480i	59.94Hz/60Hz	YC422		x	x	x	x	x	x	x
11	2880x480i	59.94Hz/60Hz	RGB/YC444	8	x	x	x	x	x	x	x
11	2880x480i	59.94Hz/60Hz	RGB/YC444	10	x	x	x	x	x	x	x
11	2880x480i	59.94Hz/60Hz	RGB/YC444	12	x	x	x	x	x	x	x
11	2880x480i	59.94Hz/60Hz	YC422		x	x	x	x	x	x	x
12	2880x240p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
12	2880x240p	59.94Hz/60Hz	RGB/YC444	10	x	x	x	x	x	x	x
12	2880x240p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
12	2880x240p	59.94Hz/60Hz	YC422		x	x	x	x	x	x	x
13	2880x240p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
13	2880x240p	59.94Hz/60Hz	RGB/YC444	10	x	x	x	x	x	x	x
13	2880x240p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
13	2880x240p	59.94Hz/60Hz	YC422		x	x	x	x	x	x	x
14	1440x480p	59.94Hz/60Hz	RGB/YC444	8	●	x	x	x	x	x	x
14	1440x480p	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x
14	1440x480p	59.94Hz/60Hz	RGB/YC444	12	●	x	x	x	x	x	x
14	1440x480p	59.94Hz/60Hz	YC422		●	x	x	x	x	x	x
15	1440x480p	59.94Hz/60Hz	RGB/YC444	8	●	x	x	x	x	x	x
15	1440x480p	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x
15	1440x480p	59.94Hz/60Hz	RGB/YC444	12	●	x	x	x	x	x	x
15	1440x480p	59.94Hz/60Hz	YC422		●	x	x	x	x	x	x
16	1920x1080p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
16	1920x1080p	59.94Hz/60Hz	RGB/YC444	10	●	●	●	●	●	●	●
16	1920x1080p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
16	1920x1080p	59.94Hz/60Hz	YC422		●	●	●	●	●	●	●
17	720x576p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
17	720x576p	50Hz	RGB/YC444	10	●	x	x	x	x	x	x
17	720x576p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
17	720x576p	50Hz	YC422		●	●	●	●	●	●	●
18	720x576p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
18	720x576p	50Hz	RGB/YC444	10	●	x	x	x	x	x	x
18	720x576p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
18	720x576p	50Hz	YC422		●	●	●	●	●	●	●
19	1280x720p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
19	1280x720p	50Hz	RGB/YC444	10	●	●	●	●	●	●	●
19	1280x720p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
19	1280x720p	50Hz	YC422		●	●	●	●	●	●	●
20	1920x1080i	50Hz	RGB/YC444	8	●	x	x	x	x	x	x
20	1920x1080i	50Hz	RGB/YC444	10	●	x	x	x	x	x	x
20	1920x1080i	50Hz	RGB/YC444	12	●	x	x	x	x	x	x
20	1920x1080i	50Hz	YC422		●	x	x	x	x	x	x
21	720(1440)x576i	50Hz	RGB/YC444	8	●	x	x	x	x	x	x
21	720(1440)x576i	50Hz	RGB/YC444	10	●	x	x	x	x	x	x
21	720(1440)x576i	50Hz	RGB/YC444	12	●	x	x	x	x	x	x
21	720(1440)x576i	50Hz	YC422		●	x	x	x	x	x	x
22	720(1440)x576i	50Hz	RGB/YC444	8	●	x	x	x	x	x	x
22	720(1440)x576i	50Hz	RGB/YC444	10	●	x	x	x	x	x	x
22	720(1440)x576i	50Hz	RGB/YC444	12	●	x	x	x	x	x	x
22	720(1440)x576i	50Hz	YC422		●	x	x	x	x	x	x
23	720(1440)x288p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
23	720(1440)x288p	50Hz	RGB/YC444	10	●	●	●	●	●	●	●
23	720(1440)x288p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
23	720(1440)x288p	50Hz	YC422		●	x	x	x	x	x	x
24	720(1440)x288p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
24	720(1440)x288p	50Hz	RGB/YC444	10	●	●	●	●	●	●	●
24	720(1440)x288p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
24	720(1440)x288p	50Hz	YC422		●	x	x	x	x	x	x
25	2880x576i	50Hz	RGB/YC444	8	x	x	x	x	x	x	x
25	2880x576i	50Hz	RGB/YC444	10	x	x	x	x	x	x	x
25	2880x576i	50Hz	RGB/YC444	12	x	x	x	x	x	x	x
25	2880x576i	50Hz	YC422		x	x	x	x	x	x	x
26	2880x576i	50Hz	RGB/YC444	8	x	x	x	x	x	x	x
26	2880x576i	50Hz	RGB/YC444	10	x	x	x	x	x	x	x
26	2880x576i	50Hz	RGB/YC444	12	x	x	x	x	x	x	x
26	2880x576i	50Hz	YC422		x	x	x	x	x	x	x
27	2880x288p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
27	2880x288p	50Hz	RGB/YC444	10	●	●	●	●	●	●	●
27	2880x288p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
27	2880x288p	50Hz	YC422		x	x	x	x	x	x	x
28	2880x288p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
28	2880x288p	50Hz	RGB/YC444	10	●	●	●	●	●	●	●
28	2880x288p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
28	2880x288p	50Hz	YC422		x	x	x	x	x	x	x
29	1440x576p	50Hz	RGB/YC444	8	●	x	x	x	x	x	x

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
29	1440x576p	50Hz	RGB/YC444	10	●	x	x	x	x	x	x
29	1440x576p	50Hz	RGB/YC444	12	●	x	x	x	x	x	x
29	1440x576p	50Hz	YC422		●	x	x	x	x	x	x
30	1440x576p	50Hz	RGB/YC444	8	●	x	x	x	x	x	x
30	1440x576p	50Hz	RGB/YC444	10	●	x	x	x	x	x	x
30	1440x576p	50Hz	RGB/YC444	12	●	x	x	x	x	x	x
30	1440x576p	50Hz	YC422		●	x	x	x	x	x	x
31	1920x1080p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
31	1920x1080p	50Hz	RGB/YC444	10	●	●	●	●	●	●	●
31	1920x1080p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
31	1920x1080p	50Hz	YC422		●	●	●	●	●	●	●
32	1920x1080p	23.98Hz/24Hz	RGB/YC444	8	●	●	●	●	●	●	●
32	1920x1080p	23.98Hz/24Hz	RGB/YC444	10	●	x	x	x	x	x	x
32	1920x1080p	23.98Hz/24Hz	RGB/YC444	12	●	●	●	●	●	●	●
32	1920x1080p	23.98Hz/24Hz	YC422		●	●	●	●	●	●	●
33	1920x1080p	25Hz	RGB/YC444	8	●	●	●	●	●	●	●
33	1920x1080p	25Hz	RGB/YC444	10	●	●	●	●	●	●	●
33	1920x1080p	25Hz	RGB/YC444	12	●	●	●	●	●	●	●
33	1920x1080p	25Hz	YC422		●	●	●	●	●	●	●
34	1920x1080p	29.97Hz/30Hz	RGB/YC444	8	●	●	●	●	●	●	●
34	1920x1080p	29.97Hz/30Hz	RGB/YC444	10	●	●	●	●	●	●	●
34	1920x1080p	29.97Hz/30Hz	RGB/YC444	12	●	●	●	●	●	●	●
34	1920x1080p	29.97Hz/30Hz	YC422		●	●	●	●	●	●	●
35	2880x480p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
35	2880x480p	59.94Hz/60Hz	RGB/YC444	10	●	●	●	●	●	●	●
35	2880x480p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
35	2880x480p	59.94Hz/60Hz	YC422		x	x	x	x	x	x	x
36	2880x480p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
36	2880x480p	59.94Hz/60Hz	RGB/YC444	10	●	●	●	●	●	●	●
36	2880x480p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
36	2880x480p	59.94Hz/60Hz	YC422		x	x	x	x	x	x	x
37	2880x576p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
37	2880x576p	50Hz	RGB/YC444	10	●	●	●	●	●	●	●
37	2880x576p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
37	2880x576p	50Hz	YC422		x	x	x	x	x	x	x
38	2880x576p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
38	2880x576p	50Hz	RGB/YC444	10	●	●	●	●	●	●	●
38	2880x576p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
38	2880x576p	50Hz	YC422		x	x	x	x	x	x	x

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
39	1920x1080i (1250 total)	50Hz	RGB/YC444	8	x	x	x	x	x	x	x
39	1920x1080i (1250 total)	50Hz	RGB/YC444	10	x	x	x	x	x	x	x
39	1920x1080i (1250 total)	50Hz	RGB/YC444	12	x	x	x	x	x	x	x
39	1920x1080i (1250 total)	50Hz	YC422		x	x	x	x	x	x	x
40	1920x1080i	100Hz	RGB/YC444	8	x	x	x	x	x	x	x
40	1920x1080i	100Hz	RGB/YC444	10	x	x	x	x	x	x	x
40	1920x1080i	100Hz	RGB/YC444	12	x	x	x	x	x	x	x
40	1920x1080i	100Hz	YC422		x	x	x	x	x	x	x
41	1280x720p	100Hz	RGB/YC444	8	●	●	●	●	●	●	●
41	1280x720p	100Hz	RGB/YC444	10	●	●	●	●	●	●	●
41	1280x720p	100Hz	RGB/YC444	12	●	●	●	●	●	●	●
41	1280x720p	100Hz	YC422		●	●	●	●	●	●	●
42	720x576p	100Hz	RGB/YC444	8	●	x	x	x	x	x	x
42	720x576p	100Hz	RGB/YC444	10	●	x	x	x	x	x	x
42	720x576p	100Hz	RGB/YC444	12	●	x	x	x	x	x	x
42	720x576p	100Hz	YC422		●	x	x	x	x	x	x
43	720x576p	100Hz	RGB/YC444	8	●	x	x	x	x	x	x
43	720x576p	100Hz	RGB/YC444	10	●	x	x	x	x	x	x
43	720x576p	100Hz	RGB/YC444	12	●	x	x	x	x	x	x
43	720x576p	100Hz	YC422		●	x	x	x	x	x	x
44	720(1440)x576i	100Hz	RGB/YC444	8	●	x	x	x	x	x	x
44	720(1440)x576i	100Hz	RGB/YC444	10	●	x	x	x	x	x	x
44	720(1440)x576i	100Hz	RGB/YC444	12	●	x	x	x	x	x	x
44	720(1440)x576i	100Hz	YC422		●	x	x	x	x	x	x
45	720(1440)x576i	100Hz	RGB/YC444	8	●	x	x	x	x	x	x
45	720(1440)x576i	100Hz	RGB/YC444	10	●	x	x	x	x	x	x
45	720(1440)x576i	100Hz	RGB/YC444	12	●	x	x	x	x	x	x
45	720(1440)x576i	100Hz	YC422		●	x	x	x	x	x	x
46	1920x1080i	119.88/120Hz	RGB/YC444	8	●	x	x	x	x	x	x
46	1920x1080i	119.88/120Hz	RGB/YC444	10	●	x	x	x	x	x	x
46	1920x1080i	119.88/120Hz	RGB/YC444	12	●	x	x	x	x	x	x
46	1920x1080i	119.88/120Hz	YC422		●	x	x	x	x	x	x
47	1280x720p	119.88/120Hz	RGB/YC444	8	●	●	●	●	●	●	●
47	1280x720p	119.88/120Hz	RGB/YC444	10	●	x	x	x	x	x	x
47	1280x720p	119.88/120Hz	RGB/YC444	12	●	●	●	●	●	●	●
47	1280x720p	119.88/120Hz	YC422		●	●	●	●	●	●	●

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
48	720x480p	119.88/120Hz	RGB/YC444	8	●	x	x	x	x	x	x
48	720x480p	119.88/120Hz	RGB/YC444	10	●	x	x	x	x	x	x
48	720x480p	119.88/120Hz	RGB/YC444	12	●	x	x	x	x	x	x
48	720x480p	119.88/120Hz	YC422		●	x	x	x	x	x	x
49	720x480p	119.88/120Hz	RGB/YC444	8	●	x	x	x	x	x	x
49	720x480p	119.88/120Hz	RGB/YC444	10	●	x	x	x	x	x	x
49	720x480p	119.88/120Hz	RGB/YC444	12	●	x	x	x	x	x	x
49	720x480p	119.88/120Hz	YC422		●	x	x	x	x	x	x
50	720(1440)x480i	119.88/120Hz	RGB/YC444	8	●	x	x	x	x	x	x
50	720(1440)x480i	119.88/120Hz	RGB/YC444	10	●	x	x	x	x	x	x
50	720(1440)x480i	119.88/120Hz	RGB/YC444	12	●	x	x	x	x	x	x
50	720(1440)x480i	119.88/120Hz	YC422		●	x	x	x	x	x	x
51	720(1440)x480i	119.88/120Hz	RGB/YC444	8	●	x	x	x	x	x	x
51	720(1440)x480i	119.88/120Hz	RGB/YC444	10	●	x	x	x	x	x	x
51	720(1440)x480i	119.88/120Hz	RGB/YC444	12	●	x	x	x	x	x	x
51	720(1440)x480i	119.88/120Hz	YC422		●	x	x	x	x	x	x
52	720x576p	200Hz	RGB/YC444	8	●	x	x	x	x	x	x
52	720x576p	200Hz	RGB/YC444	10	●	x	x	x	x	x	x
52	720x576p	200Hz	RGB/YC444	12	●	x	x	x	x	x	x
52	720x576p	200Hz	YC422		●	x	x	x	x	x	x
53	720x576p	200Hz	RGB/YC444	8	●	x	x	x	x	x	x
53	720x576p	200Hz	RGB/YC444	10	●	x	x	x	x	x	x
53	720x576p	200Hz	RGB/YC444	12	●	x	x	x	x	x	x
53	720x576p	200Hz	YC422		●	x	x	x	x	x	x
54	720(1440)x576i	200Hz	RGB/YC444	8	●	x	x	x	x	x	x
54	720(1440)x576i	200Hz	RGB/YC444	10	●	x	x	x	x	x	x
54	720(1440)x576i	200Hz	RGB/YC444	12	●	x	x	x	x	x	x
54	720(1440)x576i	200Hz	YC422		●	x	x	x	x	x	x
55	720(1440)x576i	200Hz	RGB/YC444	8	●	x	x	x	x	x	x
55	720(1440)x576i	200Hz	RGB/YC444	10	●	x	x	x	x	x	x
55	720(1440)x576i	200Hz	RGB/YC444	12	●	x	x	x	x	x	x
55	720(1440)x576i	200Hz	YC422		●	x	x	x	x	x	x
56	720x480p	239.76/240Hz	RGB/YC444	8	●	x	x	x	x	x	x
56	720x480p	239.76/240Hz	RGB/YC444	10	●	x	x	x	x	x	x
56	720x480p	239.76/240Hz	RGB/YC444	12	●	x	x	x	x	x	x
56	720x480p	239.76/240Hz	YC422		●	x	x	x	x	x	x
57	720x480p	239.76/240Hz	RGB/YC444	8	●	x	x	x	x	x	x
57	720x480p	239.76/240Hz	RGB/YC444	10	●	x	x	x	x	x	x
57	720x480p	239.76/240Hz	RGB/YC444	12	●	x	x	x	x	x	x
57	720x480p	239.76/240Hz	YC422		●	x	x	x	x	x	x

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
58	720(1440)x480i	239.76/240Hz	RGB/YC444	8	●	x	x	x	x	x	x
58	720(1440)x480i	239.76/240Hz	RGB/YC444	10	●	x	x	x	x	x	x
58	720(1440)x480i	239.76/240Hz	RGB/YC444	12	●	x	x	x	x	x	x
58	720(1440)x480i	239.76/240Hz	YC422		●	x	x	x	x	x	x
59	720(1440)x480i	239.76/240Hz	RGB/YC444	8	●	x	x	x	x	x	x
59	720(1440)x480i	239.76/240Hz	RGB/YC444	10	●	x	x	x	x	x	x
59	720(1440)x480i	239.76/240Hz	RGB/YC444	12	●	x	x	x	x	x	x
59	720(1440)x480i	239.76/240Hz	YC422		●	x	x	x	x	x	x
60	1280x720p	23.98Hz/24Hz	RGB/YC444	8	●	x	x	x	x	x	x
60	1280x720p	23.98Hz/24Hz	RGB/YC444	10	●	x	x	x	x	x	x
60	1280x720p	23.98Hz/24Hz	RGB/YC444	12	●	x	x	x	x	x	x
60	1280x720p	23.98Hz/24Hz	YC422		●	x	x	x	x	x	x
61	1280x720p	25Hz	RGB/YC444	8	●	x	x	x	x	x	x
61	1280x720p	25Hz	RGB/YC444	10	●	x	x	x	x	x	x
61	1280x720p	25Hz	RGB/YC444	12	●	x	x	x	x	x	x
61	1280x720p	25Hz	YC422		●	x	x	x	x	x	x
62	1280x720p	29.97Hz/30Hz	RGB/YC444	8	●	x	x	x	x	x	x
62	1280x720p	29.97Hz/30Hz	RGB/YC444	10	●	x	x	x	x	x	x
62	1280x720p	29.97Hz/30Hz	RGB/YC444	12	●	x	x	x	x	x	x
62	1280x720p	29.97Hz/30Hz	YC422		●	x	x	x	x	x	x
63	1920x1080p	119.88/120Hz	RGB/YC444	8	●	●	●	●	●	●	●
63	1920x1080p	119.88/120Hz	RGB/YC444	10	●	-	●	●	●	●	●
63	1920x1080p	119.88/120Hz	RGB/YC444	12	●	-	●	●	●	●	●
63	1920x1080p	119.88/120Hz	YC422		●	●	●	●	●	●	●
64	1920x1080p	100Hz	RGB/YC444	8	●	●	●	●	●	●	●
64	1920x1080p	100Hz	RGB/YC444	10	●	-	●	●	●	●	●
64	1920x1080p	100Hz	RGB/YC444	12	●	-	●	●	●	●	●
64	1920x1080p	100Hz	YC422		●	●	●	●	●	●	●
65	1280x720p	23.98Hz/24Hz	RGB/YC444	8	●	x	x	x	x	x	x
65	1280x720p	23.98Hz/24Hz	RGB/YC444	10	●	x	x	x	x	x	x
65	1280x720p	23.98Hz/24Hz	RGB/YC444	12	●	x	x	x	x	x	x
65	1280x720p	23.98Hz/24Hz	YC422		●	x	x	x	x	x	x
66	1280x720p	25Hz	RGB/YC444	8	●	x	x	x	x	x	x
66	1280x720p	25Hz	RGB/YC444	10	●	x	x	x	x	x	x
66	1280x720p	25Hz	RGB/YC444	12	●	x	x	x	x	x	x
66	1280x720p	25Hz	YC422		●	x	x	x	x	x	x
67	1280x720p	29.97Hz/30Hz	RGB/YC444	8	●	x	x	x	x	x	x
67	1280x720p	29.97Hz/30Hz	RGB/YC444	10	●	x	x	x	x	x	x
67	1280x720p	29.97Hz/30Hz	RGB/YC444	12	●	x	x	x	x	x	x
67	1280x720p	29.97Hz/30Hz	YC422		●	x	x	x	x	x	x

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
68	1280x720p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
68	1280x720p	50Hz	RGB/YC444	10	●	●	●	●	●	●	●
68	1280x720p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
68	1280x720p	50Hz	YC422		●	●	●	●	●	●	●
69	1280x720p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
69	1280x720p	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x
69	1280x720p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
69	1280x720p	59.94Hz/60Hz	YC422		●	●	●	●	●	●	●
70	1280x720p	100Hz	RGB/YC444	8	●	●	●	●	●	●	●
70	1280x720p	100Hz	RGB/YC444	10	●	●	●	●	●	●	●
70	1280x720p	100Hz	RGB/YC444	12	●	●	●	●	●	●	●
70	1280x720p	100Hz	YC422		●	●	●	●	●	●	●
71	1280x720p	119.88/120Hz	RGB/YC444	8	●	●	●	●	●	●	●
71	1280x720p	119.88/120Hz	RGB/YC444	10	●	x	x	x	x	x	x
71	1280x720p	119.88/120Hz	RGB/YC444	12	●	●	●	●	●	●	●
71	1280x720p	119.88/120Hz	YC422		●	●	●	●	●	●	●
72	1920x1080p	23.98Hz/24Hz	RGB/YC444	8	●	●	●	●	●	●	●
72	1920x1080p	23.98Hz/24Hz	RGB/YC444	10	●	x	x	x	x	x	x
72	1920x1080p	23.98Hz/24Hz	RGB/YC444	12	●	●	●	●	●	●	●
72	1920x1080p	23.98Hz/24Hz	YC422		●	●	●	●	●	●	●
73	1920x1080p	25Hz	RGB/YC444	8	●	●	●	●	●	●	●
73	1920x1080p	25Hz	RGB/YC444	10	●	●	●	●	●	●	●
73	1920x1080p	25Hz	RGB/YC444	12	●	●	●	●	●	●	●
73	1920x1080p	25Hz	YC422		●	●	●	●	●	●	●
74	1920x1080p	29.97Hz/30Hz	RGB/YC444	8	●	●	●	●	●	●	●
74	1920x1080p	29.97Hz/30Hz	RGB/YC444	10	●	●	●	●	●	●	●
74	1920x1080p	29.97Hz/30Hz	RGB/YC444	12	●	●	●	●	●	●	●
74	1920x1080p	29.97Hz/30Hz	YC422		●	●	●	●	●	●	●
75	1920x1080p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
75	1920x1080p	50Hz	RGB/YC444	10	●	●	●	●	●	●	●
75	1920x1080p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
75	1920x1080p	50Hz	YC422		●	●	●	●	●	●	●
76	1920x1080p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
76	1920x1080p	59.94Hz/60Hz	RGB/YC444	10	●	●	●	●	●	●	●
76	1920x1080p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
76	1920x1080p	59.94Hz/60Hz	YC422		●	●	●	●	●	●	●
77	1920x1080p	100Hz	RGB/YC444	8	●	●	●	●	●	●	●
77	1920x1080p	100Hz	RGB/YC444	10	●	-	●	●	●	●	●
77	1920x1080p	100Hz	RGB/YC444	12	●	-	●	●	●	●	●
77	1920x1080p	100Hz	YC422		●	●	●	●	●	●	●

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
78	1920x1080p	119.88/120Hz	RGB/YC444	8	●	●	●	●	●	●	●
78	1920x1080p	119.88/120Hz	RGB/YC444	10	●	-	●	●	●	●	●
78	1920x1080p	119.88/120Hz	RGB/YC444	12	●	-	●	●	●	●	●
78	1920x1080p	119.88/120Hz	YC422		●	●	●	●	●	●	●
79	1680x720p	23.98Hz/24Hz	RGB/YC444	8	●	x	x	x	x	x	x
79	1680x720p	23.98Hz/24Hz	RGB/YC444	10	●	x	x	x	x	x	x
79	1680x720p	23.98Hz/24Hz	RGB/YC444	12	●	x	x	x	x	x	x
79	1680x720p	23.98Hz/24Hz	YC422		●	x	x	x	x	x	x
80	1680x720p	25Hz	RGB/YC444	8	●	x	x	x	x	x	x
80	1680x720p	25Hz	RGB/YC444	10	●	x	x	x	x	x	x
80	1680x720p	25Hz	RGB/YC444	12	●	x	x	x	x	x	x
80	1680x720p	25Hz	YC422		●	x	x	x	x	x	x
81	1680x720p	29.97Hz/30Hz	RGB/YC444	8	●	x	x	x	x	x	x
81	1680x720p	29.97Hz/30Hz	RGB/YC444	10	●	x	x	x	x	x	x
81	1680x720p	29.97Hz/30Hz	RGB/YC444	12	●	x	x	x	x	x	x
81	1680x720p	29.97Hz/30Hz	YC422		●	x	x	x	x	x	x
82	1680x720p	50Hz	RGB/YC444	8	●	x	x	x	x	x	x
82	1680x720p	50Hz	RGB/YC444	10	●	x	x	x	x	x	x
82	1680x720p	50Hz	RGB/YC444	12	●	x	x	x	x	x	x
82	1680x720p	50Hz	YC422		●	x	x	x	x	x	x
83	1680x720p	59.94Hz/60Hz	RGB/YC444	8	●	x	x	x	x	x	x
83	1680x720p	59.94Hz/60Hz	RGB/YC444	10	●	x	x	x	x	x	x
83	1680x720p	59.94Hz/60Hz	RGB/YC444	12	●	x	x	x	x	x	x
83	1680x720p	59.94Hz/60Hz	YC422		●	x	x	x	x	x	x
84	1680x720p	100Hz	RGB/YC444	8	●	x	x	x	x	x	x
84	1680x720p	100Hz	RGB/YC444	10	●	x	x	x	x	x	x
84	1680x720p	100Hz	RGB/YC444	12	●	x	x	x	x	x	x
84	1680x720p	100Hz	YC422		●	x	x	x	x	x	x
85	1680x720p	119.88/120Hz	RGB/YC444	8	●	x	x	x	x	x	x
85	1680x720p	119.88/120Hz	RGB/YC444	10	●	x	x	x	x	x	x
85	1680x720p	119.88/120Hz	RGB/YC444	12	●	x	x	x	x	x	x
85	1680x720p	119.88/120Hz	YC422		●	x	x	x	x	x	x
86	2560x1080p	23.98Hz/24Hz	RGB/YC444	8	●	●	●	●	●	●	●
86	2560x1080p	23.98Hz/24Hz	RGB/YC444	10	●	x	x	x	x	x	x
86	2560x1080p	23.98Hz/24Hz	RGB/YC444	12	●	●	●	●	●	●	●
86	2560x1080p	23.98Hz/24Hz	YC422		●	●	●	●	●	●	●
87	2560x1080p	25Hz	RGB/YC444	8	●	●	●	●	●	●	●
87	2560x1080p	25Hz	RGB/YC444	10	●	●	●	●	●	●	●
87	2560x1080p	25Hz	RGB/YC444	12	●	●	●	●	●	●	●
87	2560x1080p	25Hz	YC422		●	●	●	●	●	●	●

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
88	2560x1080p	29.97Hz/30Hz	RGB/YC444	8	●	●	●	●	●	●	●
88	2560x1080p	29.97Hz/30Hz	RGB/YC444	10	●	●	●	●	●	●	●
88	2560x1080p	29.97Hz/30Hz	RGB/YC444	12	●	●	●	●	●	●	●
88	2560x1080p	29.97Hz/30Hz	YC422		●	●	●	●	●	●	●
89	2560x1080p	50Hz	RGB/YC444	8	●	●	●	●	●	●	●
89	2560x1080p	50Hz	RGB/YC444	10	●	●	●	●	●	●	●
89	2560x1080p	50Hz	RGB/YC444	12	●	●	●	●	●	●	●
89	2560x1080p	50Hz	YC422		●	●	●	●	●	●	●
90	2560x1080p	59.94Hz/60Hz	RGB/YC444	8	●	●	●	●	●	●	●
90	2560x1080p	59.94Hz/60Hz	RGB/YC444	10	●	●	●	●	●	●	●
90	2560x1080p	59.94Hz/60Hz	RGB/YC444	12	●	●	●	●	●	●	●
90	2560x1080p	59.94Hz/60Hz	YC422		●	●	●	●	●	●	●
91	2560x1080p	100Hz	RGB/YC444	8	●	–	●	●	●	●	●
91	2560x1080p	100Hz	RGB/YC444	10	●	–	x	x	x	x	x
91	2560x1080p	100Hz	RGB/YC444	12	●	–	●	●	●	●	●
91	2560x1080p	100Hz	YC422		●	–	●	●	●	●	●
92	2560x1080p	119.88/120Hz	RGB/YC444	8	●	–	●	●	●	●	●
92	2560x1080p	119.88/120Hz	RGB/YC444	10	–	–	●	●	●	●	●
92	2560x1080p	119.88/120Hz	RGB/YC444	12	–	–	–	●	●	●	●
92	2560x1080p	119.88/120Hz	YC422		●	–	●	●	●	●	●
93	3840x2160p	23.98Hz/24Hz	RGB/YC444	8	●	●	●	●	●	●	●
93	3840x2160p	23.98Hz/24Hz	RGB/YC444	10	●	–	●	●	●	●	●
93	3840x2160p	23.98Hz/24Hz	RGB/YC444	12	●	–	●	●	●	●	●
93	3840x2160p	23.98Hz/24Hz	YC422		●	●	●	●	●	●	●
94	3840x2160p	25Hz	RGB/YC444	8	●	●	●	●	●	●	●
94	3840x2160p	25Hz	RGB/YC444	10	●	–	●	●	●	●	●
94	3840x2160p	25Hz	RGB/YC444	12	●	–	●	●	●	●	●
94	3840x2160p	25Hz	YC422		●	●	●	●	●	●	●
95	3840x2160p	29.97Hz/30Hz	RGB/YC444	8	●	●	●	●	●	●	●
95	3840x2160p	29.97Hz/30Hz	RGB/YC444	10	●	–	●	●	●	●	●
95	3840x2160p	29.97Hz/30Hz	RGB/YC444	12	●	–	●	●	●	●	●
95	3840x2160p	29.97Hz/30Hz	YC422		●	●	●	●	●	●	●
96	3840x2160p	50Hz	RGB/YC444	8	●	–	●	●	●	●	●
96	3840x2160p	50Hz	RGB/YC444	10	–	–	–	●	●	●	●
96	3840x2160p	50Hz	RGB/YC444	12	–	–	–	●	●	●	●
96	3840x2160p	50Hz	YC422		●	–	●	●	●	●	●
96	3840x2160p	50Hz	YC420	8	●	●	●	●	●	●	●
96	3840x2160p	50Hz	YC420	10	●	–	●	●	●	●	●
96	3840x2160p	50Hz	YC420	12	●	–	●	●	●	●	●
97	3840x2160p	59.94Hz/60Hz	RGB/YC444	8	●	–	●	●	●	●	●

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
97	3840x2160p	59.94Hz/60Hz	RGB/YC444	10	–	–	–	●	●	●	●
97	3840x2160p	59.94Hz/60Hz	RGB/YC444	12	–	–	–	●	●	●	●
97	3840x2160p	59.94Hz/60Hz	YC422		●	–	●	●	●	●	●
97	3840x2160p	59.94Hz/60Hz	YC420	8	●	●	●	●	●	●	●
97	3840x2160p	59.94Hz/60Hz	YC420	10	●	–	●	●	●	●	●
97	3840x2160p	59.94Hz/60Hz	YC420	12	●	–	●	●	●	●	●
98	4096x2160p	23.98Hz/24Hz	RGB/YC444	8	●	●	●	●	●	●	●
98	4096x2160p	23.98Hz/24Hz	RGB/YC444	10	●	–	●	●	●	●	●
98	4096x2160p	23.98Hz/24Hz	RGB/YC444	12	●	–	●	●	●	●	●
98	4096x2160p	23.98Hz/24Hz	YC422		●	●	●	●	●	●	●
99	4096x2160p	25Hz	RGB/YC444	8	●	●	●	●	●	●	●
99	4096x2160p	25Hz	RGB/YC444	10	●	–	●	●	●	●	●
99	4096x2160p	25Hz	RGB/YC444	12	●	–	●	●	●	●	●
99	4096x2160p	25Hz	YC422		●	●	●	●	●	●	●
100	4096x2160p	29.97Hz/30Hz	RGB/YC444	8	●	●	●	●	●	●	●
100	4096x2160p	29.97Hz/30Hz	RGB/YC444	10	●	–	●	●	●	●	●
100	4096x2160p	29.97Hz/30Hz	RGB/YC444	12	●	–	●	●	●	●	●
100	4096x2160p	29.97Hz/30Hz	YC422		●	●	●	●	●	●	●
101	4096x2160p	50Hz	RGB/YC444	8	●	–	●	●	●	●	●
101	4096x2160p	50Hz	RGB/YC444	10	–	–	–	●	●	●	●
101	4096x2160p	50Hz	RGB/YC444	12	–	–	–	●	●	●	●
101	4096x2160p	50Hz	YC422		●	–	●	●	●	●	●
101	4096x2160p	50Hz	YC420	8	●	●	●	●	●	●	●
101	4096x2160p	50Hz	YC420	10	●	–	●	●	●	●	●
101	4096x2160p	50Hz	YC420	12	●	–	●	●	●	●	●
102	4096x2160p	59.94Hz/60Hz	RGB/YC444	8	●	–	●	●	●	●	●
102	4096x2160p	59.94Hz/60Hz	RGB/YC444	10	–	–	–	●	●	●	●
102	4096x2160p	59.94Hz/60Hz	RGB/YC444	12	–	–	–	●	●	●	●
102	4096x2160p	59.94Hz/60Hz	YC422		●	–	●	●	●	●	●
102	4096x2160p	59.94Hz/60Hz	YC420	8	●	●	●	●	●	●	●
102	4096x2160p	59.94Hz/60Hz	YC420	10	●	–	●	●	●	●	●
102	4096x2160p	59.94Hz/60Hz	YC420	12	●	–	●	●	●	●	●
103	3840x2160p	23.98Hz/24Hz	RGB/YC444	8	●	●	●	●	●	●	●
103	3840x2160p	23.98Hz/24Hz	RGB/YC444	10	●	–	●	●	●	●	●
103	3840x2160p	23.98Hz/24Hz	RGB/YC444	12	●	–	●	●	●	●	●
103	3840x2160p	23.98Hz/24Hz	YC422		●	●	●	●	●	●	●
104	3840x2160p	25Hz	RGB/YC444	8	●	●	●	●	●	●	●
104	3840x2160p	25Hz	RGB/YC444	10	●	–	●	●	●	●	●
104	3840x2160p	25Hz	RGB/YC444	12	●	–	●	●	●	●	●
104	3840x2160p	25Hz	YC422		●	●	●	●	●	●	●

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
105	3840x2160p	29.97Hz/30Hz	RGB/YC444	8	●	●	●	●	●	●	●
105	3840x2160p	29.97Hz/30Hz	RGB/YC444	10	●	-	●	●	●	●	●
105	3840x2160p	29.97Hz/30Hz	RGB/YC444	12	●	-	●	●	●	●	●
105	3840x2160p	29.97Hz/30Hz	YC422		●	●	●	●	●	●	●
106	3840x2160p	50Hz	RGB/YC444	8	●	-	●	●	●	●	●
106	3840x2160p	50Hz	RGB/YC444	10	-	-	-	●	●	●	●
106	3840x2160p	50Hz	RGB/YC444	12	-	-	-	●	●	●	●
106	3840x2160p	50Hz	YC422		●	-	●	●	●	●	●
106	3840x2160p	50Hz	YC420	8	●	●	●	●	●	●	●
106	3840x2160p	50Hz	YC420	10	●	-	●	●	●	●	●
106	3840x2160p	50Hz	YC420	12	●	-	●	●	●	●	●
107	3840x2160p	59.94Hz/60Hz	RGB/YC444	8	●	-	●	●	●	●	●
107	3840x2160p	59.94Hz/60Hz	RGB/YC444	10	-	-	-	●	●	●	●
107	3840x2160p	59.94Hz/60Hz	RGB/YC444	12	-	-	-	●	●	●	●
107	3840x2160p	59.94Hz/60Hz	YC422		●	-	●	●	●	●	●
107	3840x2160p	59.94Hz/60Hz	YC420	8	●	●	●	●	●	●	●
107	3840x2160p	59.94Hz/60Hz	YC420	10	●	-	●	●	●	●	●
107	3840x2160p	59.94Hz/60Hz	YC420	12	●	-	●	●	●	●	●
108	1280x720p	47.95Hz/48Hz	RGB/YC444	8	●	x	x	x	x	x	x
108	1280x720p	47.95Hz/48Hz	RGB/YC444	10	●	x	x	x	x	x	x
108	1280x720p	47.95Hz/48Hz	RGB/YC444	12	●	x	x	x	x	x	x
108	1280x720p	47.95Hz/48Hz	YC422		●	x	x	x	x	x	x
109	1280x720p	47.95Hz/48Hz	RGB/YC444	8	●	x	x	x	x	x	x
109	1280x720p	47.95Hz/48Hz	RGB/YC444	10	●	x	x	x	x	x	x
109	1280x720p	47.95Hz/48Hz	RGB/YC444	12	●	x	x	x	x	x	x
109	1280x720p	47.95Hz/48Hz	YC422		●	x	x	x	x	x	x
110	1680x720p	47.95Hz/48Hz	RGB/YC444	8	●	x	x	x	x	x	x
110	1680x720p	47.95Hz/48Hz	RGB/YC444	10	●	x	x	x	x	x	x
110	1680x720p	47.95Hz/48Hz	RGB/YC444	12	●	x	x	x	x	x	x
110	1680x720p	47.95Hz/48Hz	YC422		●	x	x	x	x	x	x
111	1920x1080p	47.95Hz/48Hz	RGB/YC444	8	●	x	x	x	x	x	x
111	1920x1080p	47.95Hz/48Hz	RGB/YC444	10	●	x	x	x	x	x	x
111	1920x1080p	47.95Hz/48Hz	RGB/YC444	12	●	x	x	x	x	x	x
111	1920x1080p	47.95Hz/48Hz	YC422		●	x	x	x	x	x	x
112	1920x1080p	47.95Hz/48Hz	RGB/YC444	8	●	x	x	x	x	x	x
112	1920x1080p	47.95Hz/48Hz	RGB/YC444	10	●	x	x	x	x	x	x
112	1920x1080p	47.95Hz/48Hz	RGB/YC444	12	●	x	x	x	x	x	x
112	1920x1080p	47.95Hz/48Hz	YC422		●	x	x	x	x	x	x
113	2560x1080p	47.95Hz/48Hz	RGB/YC444	8	●	x	x	x	x	x	x
113	2560x1080p	47.95Hz/48Hz	RGB/YC444	10	●	x	x	x	x	x	x

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
113	2560x1080p	47.95Hz/48Hz	RGB/YC444	12	●	x	x	x	x	x	x
113	2560x1080p	47.95Hz/48Hz	YC422		●	x	x	x	x	x	x
114	3840x2160p	47.95Hz/48Hz	RGB/YC444	8	●	–	x	x	x	x	x
114	3840x2160p	47.95Hz/48Hz	RGB/YC444	10	–	–	–	x	x	x	x
114	3840x2160p	47.95Hz/48Hz	RGB/YC444	12	–	–	–	x	x	x	x
114	3840x2160p	47.95Hz/48Hz	YC422		●	–	x	x	x	x	x
114	3840x2160p	47.95Hz/48Hz	YC420	8	●	x	x	x	x	x	x
114	3840x2160p	47.95Hz/48Hz	YC420	10	●	–	x	x	x	x	x
114	3840x2160p	47.95Hz/48Hz	YC420	12	●	–	x	x	x	x	x
115	4096x2160p	47.95Hz/48Hz	RGB/YC444	8	●	–	x	x	x	x	x
115	4096x2160p	47.95Hz/48Hz	RGB/YC444	10	–	–	–	x	x	x	x
115	4096x2160p	47.95Hz/48Hz	RGB/YC444	12	–	–	–	x	x	x	x
115	4096x2160p	47.95Hz/48Hz	YC422		●	–	x	x	x	x	x
115	4096x2160p	47.95Hz/48Hz	YC420	8	●	x	x	x	x	x	x
115	4096x2160p	47.95Hz/48Hz	YC420	10	●	–	x	x	x	x	x
115	4096x2160p	47.95Hz/48Hz	YC420	12	●	–	x	x	x	x	x
116	3840x2160p	47.95Hz/48Hz	RGB/YC444	8	●	–	x	x	x	x	x
116	3840x2160p	47.95Hz/48Hz	RGB/YC444	10	–	–	–	x	x	x	x
116	3840x2160p	47.95Hz/48Hz	RGB/YC444	12	–	–	–	x	x	x	x
116	3840x2160p	47.95Hz/48Hz	YC422		●	–	x	x	x	x	x
116	3840x2160p	47.95Hz/48Hz	YC420	8	●	x	x	x	x	x	x
116	3840x2160p	47.95Hz/48Hz	YC420	10	●	–	x	x	x	x	x
116	3840x2160p	47.95Hz/48Hz	YC420	12	●	–	x	x	x	x	x
117	3840x2160p	100Hz	RGB/YC444	8	–	–	–	–	●	●	●
117	3840x2160p	100Hz	RGB/YC444	10	–	–	–	–	–	●	●
117	3840x2160p	100Hz	RGB/YC444	12	–	–	–	–	–	–	●
117	3840x2160p	100Hz	YC422		–	–	–	–	●	●	●
117	3840x2160p	100Hz	YC420	8	●	–	●	●	●	●	●
117	3840x2160p	100Hz	YC420	10	–	–	–	●	●	●	●
117	3840x2160p	100Hz	YC420	12	–	–	–	●	●	●	●
118	3840x2160p	119.88/120Hz	RGB/YC444	8	–	–	–	–	●	●	●
118	3840x2160p	119.88/120Hz	RGB/YC444	10	–	–	–	–	–	●	●
118	3840x2160p	119.88/120Hz	RGB/YC444	12	–	–	–	–	–	–	●
118	3840x2160p	119.88/120Hz	YC422		–	–	–	–	●	●	●
118	3840x2160p	119.88/120Hz	YC420	8	●	–	●	●	●	●	●
118	3840x2160p	119.88/120Hz	YC420	10	–	–	–	●	●	●	●
118	3840x2160p	119.88/120Hz	YC420	12	–	–	–	x	●	●	●
119	3840x2160p	100Hz	RGB/YC444	8	–	–	–	–	●	●	●
119	3840x2160p	100Hz	RGB/YC444	10	–	–	–	–	–	●	●
119	3840x2160p	100Hz	RGB/YC444	12	–	–	–	–	–	–	●

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
119	3840x2160p	100Hz	YC422		–	–	–	–	●	●	●
119	3840x2160p	100Hz	YC420	8	●	–	●	●	●	●	●
119	3840x2160p	100Hz	YC420	10	–	–	–	●	●	●	●
119	3840x2160p	100Hz	YC420	12	–	–	–	●	●	●	●
120	3840x2160p	119.88/120Hz	RGB/YC444	8	–	–	–	–	●	●	●
120	3840x2160p	119.88/120Hz	RGB/YC444	10	–	–	–	–	–	●	●
120	3840x2160p	119.88/120Hz	RGB/YC444	12	–	–	–	–	–	–	●
120	3840x2160p	119.88/120Hz	YC422		–	–	–	–	●	●	●
120	3840x2160p	119.88/120Hz	YC420	8	●	–	●	●	●	●	●
120	3840x2160p	119.88/120Hz	YC420	10	–	–	–	●	●	●	●
120	3840x2160p	119.88/120Hz	YC420	12	–	–	–	x	●	●	●
121	5120x2160p	23.98Hz/24Hz	RGB/YC444	8	x	–	●	●	●	●	●
121	5120x2160p	23.98Hz/24Hz	RGB/YC444	10	x	–	●	●	●	●	●
121	5120x2160p	23.98Hz/24Hz	RGB/YC444	12	x	–	●	●	●	●	●
121	5120x2160p	23.98Hz/24Hz	YC422		–	–	●	●	●	●	●
122	5120x2160p	25Hz	RGB/YC444	8	x	–	●	●	●	●	●
122	5120x2160p	25Hz	RGB/YC444	10	x	–	●	●	●	●	●
122	5120x2160p	25Hz	RGB/YC444	12	x	–	●	●	●	●	●
122	5120x2160p	25Hz	YC422		x	–	●	●	●	●	●
123	5120x2160p	29.97Hz/30Hz	RGB/YC444	8	x	–	●	●	●	●	●
123	5120x2160p	29.97Hz/30Hz	RGB/YC444	10	x	–	●	●	●	●	●
123	5120x2160p	29.97Hz/30Hz	RGB/YC444	12	x	–	●	●	●	●	●
123	5120x2160p	29.97Hz/30Hz	YC422		x	–	●	●	●	●	●
124	5120x2160p	47.95Hz/48Hz	RGB/YC444	8	–	–	–	x	x	x	x
124	5120x2160p	47.95Hz/48Hz	RGB/YC444	10	–	–	–	–	x	x	x
124	5120x2160p	47.95Hz/48Hz	RGB/YC444	12	–	–	–	–	x	x	x
124	5120x2160p	47.95Hz/48Hz	YC422		–	–	–	x	x	x	x
124	5120x2160p	47.95Hz/48Hz	YC420	8	x	–	x	x	x	x	x
124	5120x2160p	47.95Hz/48Hz	YC420	10	x	–	x	x	x	x	x
124	5120x2160p	47.95Hz/48Hz	YC420	12	x	–	x	x	x	x	x
125	5120x2160p	50Hz	RGB/YC444	8	–	–	–	●	●	●	●
125	5120x2160p	50Hz	RGB/YC444	10	–	–	–	–	●	●	●
125	5120x2160p	50Hz	RGB/YC444	12	–	–	–	–	●	●	●
125	5120x2160p	50Hz	YC422		–	–	–	●	●	●	●
125	5120x2160p	50Hz	YC420	8	x	–	●	●	●	●	●
125	5120x2160p	50Hz	YC420	10	x	–	●	●	●	●	●
125	5120x2160p	50Hz	YC420	12	x	–	●	●	●	●	●
126	5120x2160p	59.94Hz/60Hz	RGB/YC444	8	–	–	–	●	●	●	●
126	5120x2160p	59.94Hz/60Hz	RGB/YC444	10	–	–	–	–	●	●	●
126	5120x2160p	59.94Hz/60Hz	RGB/YC444	12	–	–	–	–	●	●	●

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
126	5120x2160p	59.94Hz/60Hz	YC422		–	–	–	●	●	●	●
126	5120x2160p	59.94Hz/60Hz	YC420	8	x	–	●	●	●	●	●
126	5120x2160p	59.94Hz/60Hz	YC420	10	x	–	x	x	x	x	x
126	5120x2160p	59.94Hz/60Hz	YC420	12	x	–	●	●	●	●	●
127	5120x2160p	100Hz	RGB/YC444	8	–	–	–	–	–	●	●
127	5120x2160p	100Hz	RGB/YC444	10	–	–	–	–	–	–	–
127	5120x2160p	100Hz	RGB/YC444	12	–	–	–	–	–	–	–
127	5120x2160p	100Hz	YC422		–	–	–	–	–	●	●
127	5120x2160p	100Hz	YC420	8	–	–	–	●	●	●	●
127	5120x2160p	100Hz	YC420	10	–	–	–	–	●	●	●
127	5120x2160p	100Hz	YC420	12	–	–	–	–	●	●	●
193	5120x2160p	119.88/120Hz	RGB/YC444	8	–	–	–	–	–	●	●
193	5120x2160p	119.88/120Hz	RGB/YC444	10	–	–	–	–	–	–	–
193	5120x2160p	119.88/120Hz	RGB/YC444	12	–	–	–	–	–	–	–
193	5120x2160p	119.88/120Hz	YC422		–	–	–	–	–	●	●
193	5120x2160p	119.88/120Hz	YC420	8	–	–	–	●	●	●	●
193	5120x2160p	119.88/120Hz	YC420	10	–	–	–	–	x	x	x
193	5120x2160p	119.88/120Hz	YC420	12	–	–	–	–	●	●	●
194	7680x4320p	23.98Hz/24Hz	RGB/YC444	8	–	–	–	–	●	●	●
194	7680x4320p	23.98Hz/24Hz	RGB/YC444	10	–	–	–	–	–	●	●
194	7680x4320p	23.98Hz/24Hz	RGB/YC444	12	–	–	–	–	–	–	x
194	7680x4320p	23.98Hz/24Hz	YC422		–	–	–	–	●	●	●
194	7680x4320p	23.98Hz/24Hz	YC420	8	●	–	●	●	●	●	●
194	7680x4320p	23.98Hz/24Hz	YC420	10	–	–	–	●	●	●	●
194	7680x4320p	23.98Hz/24Hz	YC420	12	–	–	–	●	●	●	●
195	7680x4320p	25Hz	RGB/YC444	8	–	–	–	–	●	●	●
195	7680x4320p	25Hz	RGB/YC444	10	–	–	–	–	–	●	●
195	7680x4320p	25Hz	RGB/YC444	12	–	–	–	–	–	–	●
195	7680x4320p	25Hz	YC422		–	–	–	–	●	●	●
195	7680x4320p	25Hz	YC420	8	●	–	●	●	●	●	●
195	7680x4320p	25Hz	YC420	10	–	–	–	●	●	●	●
195	7680x4320p	25Hz	YC420	12	–	–	–	●	●	●	●
196	7680x4320p	29.97Hz/30Hz	RGB/YC444	8	–	–	–	–	●	●	●
196	7680x4320p	29.97Hz/30Hz	RGB/YC444	10	–	–	–	–	–	●	●
196	7680x4320p	29.97Hz/30Hz	RGB/YC444	12	–	–	–	–	–	–	●
196	7680x4320p	29.97Hz/30Hz	YC422		–	–	–	–	●	●	●
196	7680x4320p	29.97Hz/30Hz	YC420	8	●	–	●	●	●	●	●
196	7680x4320p	29.97Hz/30Hz	YC420	10	–	–	–	●	●	●	●
196	7680x4320p	29.97Hz/30Hz	YC420	12	–	–	–	●	●	●	●
197	7680x4320p	47.95Hz/48Hz	RGB/YC444	8	–	–	–	–	–	–	–

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
197	7680x4320p	47.95Hz/48Hz	RGB/YC444	10	–	–	–	–	–	–	–
197	7680x4320p	47.95Hz/48Hz	RGB/YC444	12	–	–	–	–	–	–	–
197	7680x4320p	47.95Hz/48Hz	YC422		–	–	–	–	–	–	–
197	7680x4320p	47.95Hz/48Hz	YC420	8	–	–	–	–	x	x	x
197	7680x4320p	47.95Hz/48Hz	YC420	10	–	–	–	–	–	x	x
197	7680x4320p	47.95Hz/48Hz	YC420	12	–	–	–	–	–	–	x
198	7680x4320p	50Hz	RGB/YC444	8	–	–	–	–	–	–	–
198	7680x4320p	50Hz	RGB/YC444	10	–	–	–	–	–	–	–
198	7680x4320p	50Hz	RGB/YC444	12	–	–	–	–	–	–	–
198	7680x4320p	50Hz	YC422		–	–	–	–	–	–	–
198	7680x4320p	50Hz	YC420	8	–	–	–	–	●	●	●
198	7680x4320p	50Hz	YC420	10	–	–	–	–	–	●	●
198	7680x4320p	50Hz	YC420	12	–	–	–	–	–	–	●
199	7680x4320p	59.94Hz/60Hz	RGB/YC444	8	–	–	–	–	–	–	–
199	7680x4320p	59.94Hz/60Hz	RGB/YC444	10	–	–	–	–	–	–	–
199	7680x4320p	59.94Hz/60Hz	RGB/YC444	12	–	–	–	–	–	–	–
199	7680x4320p	59.94Hz/60Hz	YC422		–	–	–	–	–	–	–
199	7680x4320p	59.94Hz/60Hz	YC420	8	–	–	–	–	●	●	●
199	7680x4320p	59.94Hz/60Hz	YC420	10	–	–	–	–	–	●	●
199	7680x4320p	59.94Hz/60Hz	YC420	12	–	–	–	–	–	–	●
200	7680x4320p	100Hz	RGB/YC444	8	–	–	–	–	–	–	–
200	7680x4320p	100Hz	RGB/YC444	10	–	–	–	–	–	–	–
200	7680x4320p	100Hz	RGB/YC444	12	–	–	–	–	–	–	–
200	7680x4320p	100Hz	YC422		–	–	–	–	–	–	–
200	7680x4320p	100Hz	YC420	8	–	–	–	–	–	–	–
200	7680x4320p	100Hz	YC420	10	–	–	–	–	–	–	–
200	7680x4320p	100Hz	YC420	12	–	–	–	–	–	–	–
201	7680x4320p	119.88/120Hz	RGB/YC444	8	–	–	–	–	–	–	–
201	7680x4320p	119.88/120Hz	RGB/YC444	10	–	–	–	–	–	–	–
201	7680x4320p	119.88/120Hz	RGB/YC444	12	–	–	–	–	–	–	–
201	7680x4320p	119.88/120Hz	YC422		–	–	–	–	–	–	–
201	7680x4320p	119.88/120Hz	YC420	8	–	–	–	–	–	–	–
201	7680x4320p	119.88/120Hz	YC420	10	–	–	–	–	–	–	–
201	7680x4320p	119.88/120Hz	YC420	12	–	–	–	–	–	–	–
202	7680x4320p	23.98Hz/24Hz	RGB/YC444	8	–	–	–	–	●	●	●
202	7680x4320p	23.98Hz/24Hz	RGB/YC444	10	–	–	–	–	–	●	●
202	7680x4320p	23.98Hz/24Hz	RGB/YC444	12	–	–	–	–	–	–	x
202	7680x4320p	23.98Hz/24Hz	YC422		–	–	–	–	●	●	●
202	7680x4320p	23.98Hz/24Hz	YC420	8	●	–	●	●	●	●	●
202	7680x4320p	23.98Hz/24Hz	YC420	10	–	–	–	●	●	●	●

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
202	7680x4320p	23.98Hz/24Hz	YC420	12	–	–	–	●	●	●	●
203	7680x4320p	25Hz	RGB/YC444	8	–	–	–	–	●	●	●
203	7680x4320p	25Hz	RGB/YC444	10	–	–	–	–	–	●	●
203	7680x4320p	25Hz	RGB/YC444	12	–	–	–	–	–	–	●
203	7680x4320p	25Hz	YC422		–	–	–	–	●	●	●
203	7680x4320p	25Hz	YC420	8	●	–	●	●	●	●	●
203	7680x4320p	25Hz	YC420	10	–	–	–	●	●	●	●
203	7680x4320p	25Hz	YC420	12	–	–	–	●	●	●	●
204	7680x4320p	29.97Hz/30Hz	RGB/YC444	8	–	–	–	–	●	●	●
204	7680x4320p	29.97Hz/30Hz	RGB/YC444	10	–	–	–	–	–	●	●
204	7680x4320p	29.97Hz/30Hz	RGB/YC444	12	–	–	–	–	–	–	●
204	7680x4320p	29.97Hz/30Hz	YC422		–	–	–	–	●	●	●
204	7680x4320p	29.97Hz/30Hz	YC420	8	●	–	●	●	●	●	●
204	7680x4320p	29.97Hz/30Hz	YC420	10	–	–	–	●	●	●	●
204	7680x4320p	29.97Hz/30Hz	YC420	12	–	–	–	●	●	●	●
205	7680x4320p	47.95Hz/48Hz	RGB/YC444	8	–	–	–	–	–	–	–
205	7680x4320p	47.95Hz/48Hz	RGB/YC444	10	–	–	–	–	–	–	–
205	7680x4320p	47.95Hz/48Hz	RGB/YC444	12	–	–	–	–	–	–	–
205	7680x4320p	47.95Hz/48Hz	YC422		–	–	–	–	–	–	–
205	7680x4320p	47.95Hz/48Hz	YC420	8	–	–	–	–	x	x	x
205	7680x4320p	47.95Hz/48Hz	YC420	10	–	–	–	–	–	x	x
205	7680x4320p	47.95Hz/48Hz	YC420	12	–	–	–	–	–	–	x
206	7680x4320p	50Hz	RGB/YC444	8	–	–	–	–	–	–	–
206	7680x4320p	50Hz	RGB/YC444	10	–	–	–	–	–	–	–
206	7680x4320p	50Hz	RGB/YC444	12	–	–	–	–	–	–	–
206	7680x4320p	50Hz	YC422		–	–	–	–	–	–	–
206	7680x4320p	50Hz	YC420	8	–	–	–	–	●	●	●
206	7680x4320p	50Hz	YC420	10	–	–	–	–	–	●	●
206	7680x4320p	50Hz	YC420	12	–	–	–	–	–	–	●
207	7680x4320p	59.94Hz/60Hz	RGB/YC444	8	–	–	–	–	–	–	–
207	7680x4320p	59.94Hz/60Hz	RGB/YC444	10	–	–	–	–	–	–	–
207	7680x4320p	59.94Hz/60Hz	RGB/YC444	12	–	–	–	–	–	–	–
207	7680x4320p	59.94Hz/60Hz	YC422		–	–	–	–	–	–	–
207	7680x4320p	59.94Hz/60Hz	YC420	8	–	–	–	–	●	●	●
207	7680x4320p	59.94Hz/60Hz	YC420	10	–	–	–	–	–	●	●
207	7680x4320p	59.94Hz/60Hz	YC420	12	–	–	–	–	–	–	●
208	7680x4320p	100Hz	RGB/YC444	8	–	–	–	–	–	–	–
208	7680x4320p	100Hz	RGB/YC444	10	–	–	–	–	–	–	–
208	7680x4320p	100Hz	RGB/YC444	12	–	–	–	–	–	–	–
208	7680x4320p	100Hz	YC422		–	–	–	–	–	–	–

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
208	7680x4320p	100Hz	YC420	8	–	–	–	–	–	–	–
208	7680x4320p	100Hz	YC420	10	–	–	–	–	–	–	–
208	7680x4320p	100Hz	YC420	12	–	–	–	–	–	–	–
209	7680x4320p	119.88/120Hz	RGB/YC444	8	–	–	–	–	–	–	–
209	7680x4320p	119.88/120Hz	RGB/YC444	10	–	–	–	–	–	–	–
209	7680x4320p	119.88/120Hz	RGB/YC444	12	–	–	–	–	–	–	–
209	7680x4320p	119.88/120Hz	YC422		–	–	–	–	–	–	–
209	7680x4320p	119.88/120Hz	YC420	8	–	–	–	–	–	–	–
209	7680x4320p	119.88/120Hz	YC420	10	–	–	–	–	–	–	–
209	7680x4320p	119.88/120Hz	YC420	12	–	–	–	–	–	–	–
210	10240x4320p	23.98Hz/24Hz	RGB/YC444	8	–	–	–	–	x	x	x
210	10240x4320p	23.98Hz/24Hz	RGB/YC444	10	–	–	–	–	–	x	x
210	10240x4320p	23.98Hz/24Hz	RGB/YC444	12	–	–	–	–	–	–	x
210	10240x4320p	23.98Hz/24Hz	YC422		–	–	–	–	x	x	x
210	10240x4320p	23.98Hz/24Hz	YC420	8	–	–	–	x	x	x	x
210	10240x4320p	23.98Hz/24Hz	YC420	10	–	–	–	x	x	x	x
210	10240x4320p	23.98Hz/24Hz	YC420	12	–	–	–	x	x	x	x
211	10240x4320p	25Hz	RGB/YC444	8	–	–	–	–	x	x	x
211	10240x4320p	25Hz	RGB/YC444	10	–	–	–	–	–	x	x
211	10240x4320p	25Hz	RGB/YC444	12	–	–	–	–	–	–	x
211	10240x4320p	25Hz	YC422		–	–	–	–	x	x	x
211	10240x4320p	25Hz	YC420	8	–	–	–	x	x	x	x
211	10240x4320p	25Hz	YC420	10	–	–	–	x	x	x	x
211	10240x4320p	25Hz	YC420	12	–	–	–	x	x	x	x
212	10240x4320p	29.97Hz/30Hz	RGB/YC444	8	–	–	–	–	x	x	x
212	10240x4320p	29.97Hz/30Hz	RGB/YC444	10	–	–	–	–	–	x	x
212	10240x4320p	29.97Hz/30Hz	RGB/YC444	12	–	–	–	–	–	–	x
212	10240x4320p	29.97Hz/30Hz	YC422		–	–	–	–	x	x	x
212	10240x4320p	29.97Hz/30Hz	YC420	8	–	–	–	x	x	x	x
212	10240x4320p	29.97Hz/30Hz	YC420	10	–	–	–	x	x	x	x
212	10240x4320p	29.97Hz/30Hz	YC420	12	–	–	–	x	x	x	x
213	10240x4320p	47.95Hz/48Hz	RGB/YC444	8	–	–	–	–	–	–	–
213	10240x4320p	47.95Hz/48Hz	RGB/YC444	10	–	–	–	–	–	–	–
213	10240x4320p	47.95Hz/48Hz	RGB/YC444	12	–	–	–	–	–	–	–
213	10240x4320p	47.95Hz/48Hz	YC422		–	–	–	–	–	–	–
213	10240x4320p	47.95Hz/48Hz	YC420	8	–	–	–	–	x	x	x
213	10240x4320p	47.95Hz/48Hz	YC420	10	–	–	–	–	–	x	x
213	10240x4320p	47.95Hz/48Hz	YC420	12	–	–	–	–	–	–	x
214	10240x4320p	50Hz	RGB/YC444	8	–	–	–	–	–	–	–
214	10240x4320p	50Hz	RGB/YC444	10	–	–	–	–	–	–	–

VIC	Formats	Field Rate	RGB/YCC	Bit	TMDS	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
214	10240x4320p	50Hz	RGB/YC444	12	–	–	–	–	–	–	–
214	10240x4320p	50Hz	YC422		–	–	–	–	–	–	–
214	10240x4320p	50Hz	YC420	8	–	–	–	–	x	x	x
214	10240x4320p	50Hz	YC420	10	–	–	–	–	–	x	x
214	10240x4320p	50Hz	YC420	12	–	–	–	–	–	–	x
215	10240x4320p	59.94Hz/60Hz	RGB/YC444	8	–	–	–	–	–	–	–
215	10240x4320p	59.94Hz/60Hz	RGB/YC444	10	–	–	–	–	–	–	–
215	10240x4320p	59.94Hz/60Hz	RGB/YC444	12	–	–	–	–	–	–	–
215	10240x4320p	59.94Hz/60Hz	YC422		–	–	–	–	–	–	–
215	10240x4320p	59.94Hz/60Hz	YC420	8	–	–	–	–	x	x	x
215	10240x4320p	59.94Hz/60Hz	YC420	10	–	–	–	–	–	x	x
215	10240x4320p	59.94Hz/60Hz	YC420	12	–	–	–	–	–	–	x
216	10240x4320p	100Hz	RGB/YC444	8	–	–	–	–	–	–	–
216	10240x4320p	100Hz	RGB/YC444	10	–	–	–	–	–	–	–
216	10240x4320p	100Hz	RGB/YC444	12	–	–	–	–	–	–	–
216	10240x4320p	100Hz	YC422		–	–	–	–	–	–	–
216	10240x4320p	100Hz	YC420	8	–	–	–	–	–	–	–
216	10240x4320p	100Hz	YC420	10	–	–	–	–	–	–	–
216	10240x4320p	100Hz	YC420	12	–	–	–	–	–	–	–
217	10240x4320p	119.88/120Hz	RGB/YC444	8	–	–	–	–	–	–	–
217	10240x4320p	119.88/120Hz	RGB/YC444	10	–	–	–	–	–	–	–
217	10240x4320p	119.88/120Hz	RGB/YC444	12	–	–	–	–	–	–	–
217	10240x4320p	119.88/120Hz	YC422		–	–	–	–	–	–	–
217	10240x4320p	119.88/120Hz	YC420	8	–	–	–	–	–	–	–
217	10240x4320p	119.88/120Hz	YC420	10	–	–	–	–	–	–	–
217	10240x4320p	119.88/120Hz	YC420	12	–	–	–	–	–	–	–
218	4096x2160p	100Hz	RGB/YC444	8	–	–	–	–	●	●	●
218	4096x2160p	100Hz	RGB/YC444	10	–	–	–	–	–	●	●
218	4096x2160p	100Hz	RGB/YC444	12	–	–	–	–	–	–	●
218	4096x2160p	100Hz	YC422		–	–	–	–	●	●	●
218	4096x2160p	100Hz	YC420	8	●	–	●	●	●	●	●
218	4096x2160p	100Hz	YC420	10	–	–	–	●	●	●	●
218	4096x2160p	100Hz	YC420	12	–	–	–	●	●	●	●
219	4096x2160p	119.88/120Hz	RGB/YC444	8	–	–	–	–	x	●	●
219	4096x2160p	119.88/120Hz	RGB/YC444	10	–	–	–	–	–	x	●
219	4096x2160p	119.88/120Hz	RGB/YC444	12	–	–	–	–	–	–	●
219	4096x2160p	119.88/120Hz	YC422		–	–	–	–	x	●	●
219	4096x2160p	119.88/120Hz	YC420	8	●	–	●	●	●	●	●
219	4096x2160p	119.88/120Hz	YC420	10	–	–	–	●	●	●	●
219	4096x2160p	119.88/120Hz	YC420	12	–	–	–	x	●	●	●

[FRL(DSC) Support Format]

●	Supported Format
x	Unsupported Format

VIC	Formats	Field Rate	RGB/YCC	Bit	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
96	3840x2160p	50Hz	RGB/YC444	8	●	x	x	x	x	x
96	3840x2160p	50Hz	RGB/YC444	10	●	●	x	x	x	x
96	3840x2160p	50Hz	RGB/YC444	12	●	●	x	x	x	x
96	3840x2160p	50Hz	YC422		●	x	x	x	x	x
96	3840x2160p	50Hz	YC420	8	x	x	x	x	x	x
96	3840x2160p	50Hz	YC420	10	●	x	x	x	x	x
96	3840x2160p	50Hz	YC420	12	●	x	x	x	x	x
97	3840x2160p	59.94Hz/60Hz	RGB/YC444	8	●	x	x	x	x	x
97	3840x2160p	59.94Hz/60Hz	RGB/YC444	10	●	●	x	x	x	x
97	3840x2160p	59.94Hz/60Hz	RGB/YC444	12	●	●	x	x	x	x
97	3840x2160p	59.94Hz/60Hz	YC422		●	x	x	x	x	x
97	3840x2160p	59.94Hz/60Hz	YC420	8	x	x	x	x	x	x
97	3840x2160p	59.94Hz/60Hz	YC420	10	●	x	x	x	x	x
97	3840x2160p	59.94Hz/60Hz	YC420	12	●	x	x	x	x	x
101	4096x2160p	50Hz	RGB/YC444	8	●	x	x	x	x	x
101	4096x2160p	50Hz	RGB/YC444	10	●	●	x	x	x	x
101	4096x2160p	50Hz	RGB/YC444	12	●	●	x	x	x	x
101	4096x2160p	50Hz	YC422		●	x	x	x	x	x
101	4096x2160p	50Hz	YC420	8	x	x	x	x	x	x
101	4096x2160p	50Hz	YC420	10	●	x	x	x	x	x
101	4096x2160p	50Hz	YC420	12	●	x	x	x	x	x
102	4096x2160p	59.94Hz/60Hz	RGB/YC444	8	●	x	x	x	x	x
102	4096x2160p	59.94Hz/60Hz	RGB/YC444	10	●	●	x	x	x	x
102	4096x2160p	59.94Hz/60Hz	RGB/YC444	12	●	●	x	x	x	x
102	4096x2160p	59.94Hz/60Hz	YC422		●	x	x	x	x	x
102	4096x2160p	59.94Hz/60Hz	YC420	8	x	x	x	x	x	x
102	4096x2160p	59.94Hz/60Hz	YC420	10	●	x	x	x	x	x
102	4096x2160p	59.94Hz/60Hz	YC420	12	●	x	x	x	x	x
106	3840x2160p	50Hz	RGB/YC444	8	●	x	x	x	x	x
106	3840x2160p	50Hz	RGB/YC444	10	●	●	x	x	x	x
106	3840x2160p	50Hz	RGB/YC444	12	●	●	x	x	x	x
106	3840x2160p	50Hz	YC422		●	x	x	x	x	x
106	3840x2160p	50Hz	YC420	8	x	x	x	x	x	x
106	3840x2160p	50Hz	YC420	10	●	x	x	x	x	x
106	3840x2160p	50Hz	YC420	12	●	x	x	x	x	x

VIC	Formats	Field Rate	RGB/YCC	Bit	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
107	3840x2160p	59.94Hz/60Hz	RGB/YC444	8	●	x	x	x	x	x
107	3840x2160p	59.94Hz/60Hz	RGB/YC444	10	●	●	x	x	x	x
107	3840x2160p	59.94Hz/60Hz	RGB/YC444	12	●	●	x	x	x	x
107	3840x2160p	59.94Hz/60Hz	YC422		●	x	x	x	x	x
107	3840x2160p	59.94Hz/60Hz	YC420	8	x	x	x	x	x	x
107	3840x2160p	59.94Hz/60Hz	YC420	10	●	x	x	x	x	x
107	3840x2160p	59.94Hz/60Hz	YC420	12	●	x	x	x	x	x
117	3840x2160p	100Hz	RGB/YC444	8	x	●	●	x	x	x
117	3840x2160p	100Hz	RGB/YC444	10	x	●	●	●	x	x
117	3840x2160p	100Hz	RGB/YC444	12	x	●	●	●	●	x
117	3840x2160p	100Hz	YC422		x	x	x	x	x	x
117	3840x2160p	100Hz	YC420	8	x	x	x	x	x	x
117	3840x2160p	100Hz	YC420	10	x	x	x	x	x	x
117	3840x2160p	100Hz	YC420	12	x	x	x	x	x	x
118	3840x2160p	119.88/120Hz	RGB/YC444	8	x	●	●	x	x	x
118	3840x2160p	119.88/120Hz	RGB/YC444	10	x	●	●	●	x	x
118	3840x2160p	119.88/120Hz	RGB/YC444	12	x	●	●	●	●	x
118	3840x2160p	119.88/120Hz	YC422		x	x	x	x	x	x
118	3840x2160p	119.88/120Hz	YC420	8	x	x	x	x	x	x
118	3840x2160p	119.88/120Hz	YC420	10	x	x	x	x	x	x
118	3840x2160p	119.88/120Hz	YC420	12	x	x	x	x	x	x
119	3840x2160p	100Hz	RGB/YC444	8	x	●	●	x	x	x
119	3840x2160p	100Hz	RGB/YC444	10	x	●	●	●	x	x
119	3840x2160p	100Hz	RGB/YC444	12	x	●	●	●	●	x
119	3840x2160p	100Hz	YC422		x	x	x	x	x	x
119	3840x2160p	100Hz	YC420	8	x	x	x	x	x	x
119	3840x2160p	100Hz	YC420	10	x	x	x	x	x	x
119	3840x2160p	100Hz	YC420	12	x	x	x	x	x	x
120	3840x2160p	119.88/120Hz	RGB/YC444	8	x	●	●	x	x	x
120	3840x2160p	119.88/120Hz	RGB/YC444	10	x	●	●	●	x	x
120	3840x2160p	119.88/120Hz	RGB/YC444	12	x	●	●	●	●	x
120	3840x2160p	119.88/120Hz	YC422		x	x	x	x	x	x
120	3840x2160p	119.88/120Hz	YC420	8	x	x	x	x	x	x
120	3840x2160p	119.88/120Hz	YC420	10	x	x	x	x	x	x
120	3840x2160p	119.88/120Hz	YC420	12	x	x	x	x	x	x
194	7680x4320p	23.98Hz/24Hz	RGB/YC444	8	x	●	●	x	x	x
194	7680x4320p	23.98Hz/24Hz	RGB/YC444	10	x	●	●	●	x	x
194	7680x4320p	23.98Hz/24Hz	RGB/YC444	12	x	●	●	●	●	x
194	7680x4320p	23.98Hz/24Hz	YC422		x	x	●	x	x	x
194	7680x4320p	23.98Hz/24Hz	YC420	8	x	x	x	x	x	x

VIC	Formats	Field Rate	RGB/YCC	Bit	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
194	7680x4320p	23.98Hz/24Hz	YC420	10	x	x	x	x	x	x
194	7680x4320p	23.98Hz/24Hz	YC420	12	x	x	x	x	x	x
195	7680x4320p	25Hz	RGB/YC444	8	x	●	●	x	x	x
195	7680x4320p	25Hz	RGB/YC444	10	x	●	●	●	x	x
195	7680x4320p	25Hz	RGB/YC444	12	x	●	●	●	●	x
195	7680x4320p	25Hz	YC422		x	x	●	x	x	x
195	7680x4320p	25Hz	YC420	8	x	x	x	x	x	x
195	7680x4320p	25Hz	YC420	10	x	x	x	x	x	x
195	7680x4320p	25Hz	YC420	12	x	x	x	x	x	x
196	7680x4320p	29.97Hz/30Hz	RGB/YC444	8	x	●	●	x	x	x
196	7680x4320p	29.97Hz/30Hz	RGB/YC444	10	x	●	●	●	x	x
196	7680x4320p	29.97Hz/30Hz	RGB/YC444	12	x	●	●	●	●	x
196	7680x4320p	29.97Hz/30Hz	YC422		●	●	●	x	x	x
196	7680x4320p	29.97Hz/30Hz	YC420	8	●	x	x	x	x	x
196	7680x4320p	29.97Hz/30Hz	YC420	10	●	●	x	x	x	x
196	7680x4320p	29.97Hz/30Hz	YC420	12	●	●	x	x	x	x
197	7680x4320p	47.95Hz/48Hz	RGB/YC444	8	x	x	x	x	x	x
197	7680x4320p	47.95Hz/48Hz	RGB/YC444	10	x	x	x	x	x	x
197	7680x4320p	47.95Hz/48Hz	RGB/YC444	12	x	x	x	x	x	x
197	7680x4320p	47.95Hz/48Hz	YC422		x	x	x	x	x	x
197	7680x4320p	47.95Hz/48Hz	YC420	8	x	x	x	x	x	x
197	7680x4320p	47.95Hz/48Hz	YC420	10	x	x	x	x	x	x
197	7680x4320p	47.95Hz/48Hz	YC420	12	x	x	x	x	x	x
198	7680x4320p	50Hz	RGB/YC444	8	x	x	●	●	●	●
198	7680x4320p	50Hz	RGB/YC444	10	x	x	●	●	●	●
198	7680x4320p	50Hz	RGB/YC444	12	x	x	●	●	●	●
198	7680x4320p	50Hz	YC422		x	x	●	●	●	●
198	7680x4320p	50Hz	YC420	8	x	x	●	x	x	x
198	7680x4320p	50Hz	YC420	10	x	x	●	●	x	x
198	7680x4320p	50Hz	YC420	12	x	x	●	●	●	x
199	7680x4320p	59.94Hz/60Hz	RGB/YC444	8	x	x	●	●	●	●
199	7680x4320p	59.94Hz/60Hz	RGB/YC444	10	x	x	●	●	●	●
199	7680x4320p	59.94Hz/60Hz	RGB/YC444	12	x	x	●	●	●	●
199	7680x4320p	59.94Hz/60Hz	YC422		x	x	●	●	●	●
199	7680x4320p	59.94Hz/60Hz	YC420	8	x	x	●	x	x	x
199	7680x4320p	59.94Hz/60Hz	YC420	10	x	x	●	●	x	x
199	7680x4320p	59.94Hz/60Hz	YC420	12	x	x	●	●	●	x
200	7680x4320p	100Hz	RGB/YC444	8	x	x	x	x	x	x
200	7680x4320p	100Hz	RGB/YC444	12	x	x	x	x	x	x
200	7680x4320p	100Hz	YC422		x	x	x	x	x	x

VIC	Formats	Field Rate	RGB/YCC	Bit	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
200	7680x4320p	100Hz	YC420	8	x	x	x	x	x	x
200	7680x4320p	100Hz	YC420	10	x	x	x	x	x	x
200	7680x4320p	100Hz	YC420	12	x	x	x	x	x	x
201	7680x4320p	119.88/120Hz	RGB/YC444	8	x	x	x	x	x	x
201	7680x4320p	119.88/120Hz	RGB/YC444	10	x	x	x	x	x	x
201	7680x4320p	119.88/120Hz	RGB/YC444	12	x	x	x	x	x	x
201	7680x4320p	119.88/120Hz	YC422		x	x	x	x	x	x
201	7680x4320p	119.88/120Hz	YC420	8	x	x	x	x	x	x
201	7680x4320p	119.88/120Hz	YC420	10	x	x	x	x	x	x
201	7680x4320p	119.88/120Hz	YC420	12	x	x	x	x	x	x
202	7680x4320p	23.98Hz/24Hz	RGB/YC444	8	x	●	●	x	x	x
202	7680x4320p	23.98Hz/24Hz	RGB/YC444	10	x	●	●	●	x	x
202	7680x4320p	23.98Hz/24Hz	RGB/YC444	12	x	●	●	●	●	x
202	7680x4320p	23.98Hz/24Hz	YC422		x	x	●	x	x	x
202	7680x4320p	23.98Hz/24Hz	YC420	8	x	x	x	x	x	x
202	7680x4320p	23.98Hz/24Hz	YC420	10	x	x	x	x	x	x
202	7680x4320p	23.98Hz/24Hz	YC420	12	x	x	x	x	x	x
203	7680x4320p	25Hz	RGB/YC444	8	x	●	●	x	x	x
203	7680x4320p	25Hz	RGB/YC444	10	x	●	●	●	x	x
203	7680x4320p	25Hz	RGB/YC444	12	x	●	●	●	●	x
203	7680x4320p	25Hz	YC422		x	x	●	x	x	x
203	7680x4320p	25Hz	YC420	8	x	x	x	x	x	x
203	7680x4320p	25Hz	YC420	10	x	x	x	x	x	x
203	7680x4320p	25Hz	YC420	12	x	x	x	x	x	x
204	7680x4320p	29.97Hz/30Hz	RGB/YC444	8	x	●	●	x	x	x
204	7680x4320p	29.97Hz/30Hz	RGB/YC444	10	x	●	●	●	x	x
204	7680x4320p	29.97Hz/30Hz	RGB/YC444	12	x	●	●	●	●	x
204	7680x4320p	29.97Hz/30Hz	YC422		●	●	●	x	x	x
204	7680x4320p	29.97Hz/30Hz	YC420	8	●	x	x	x	x	x
204	7680x4320p	29.97Hz/30Hz	YC420	10	●	●	x	x	x	x
204	7680x4320p	29.97Hz/30Hz	YC420	12	●	●	x	x	x	x
205	7680x4320p	47.95Hz/48Hz	RGB/YC444	8	x	x	x	x	x	x
205	7680x4320p	47.95Hz/48Hz	RGB/YC444	10	x	x	x	x	x	x
205	7680x4320p	47.95Hz/48Hz	RGB/YC444	12	x	x	x	x	x	x
205	7680x4320p	47.95Hz/48Hz	YC422		x	x	x	x	x	x
205	7680x4320p	47.95Hz/48Hz	YC420	8	x	x	x	x	x	x
205	7680x4320p	47.95Hz/48Hz	YC420	10	x	x	x	x	x	x
205	7680x4320p	47.95Hz/48Hz	YC420	12	x	x	x	x	x	x
206	7680x4320p	50Hz	RGB/YC444	8	x	x	●	●	●	●
206	7680x4320p	50Hz	RGB/YC444	10	x	x	●	●	●	●

VIC	Formats	Field Rate	RGB/YCC	Bit	FRL 3G/3Lane	FRL 6G/3Lane	FRL 6G/4Lane	FRL 8G/4Lane	FRL 10G/4Lane	FRL 12G/4Lane
206	7680x4320p	50Hz	RGB/YC444	12	x	x	●	●	●	●
206	7680x4320p	50Hz	YC422		x	x	●	●	●	●
206	7680x4320p	50Hz	YC420	8	x	x	●	x	x	x
206	7680x4320p	50Hz	YC420	10	x	x	●	●	x	x
206	7680x4320p	50Hz	YC420	12	x	x	●	●	●	x
207	7680x4320p	59.94Hz/60Hz	RGB/YC444	8	x	x	●	●	●	●
207	7680x4320p	59.94Hz/60Hz	RGB/YC444	10	x	x	●	●	●	●
207	7680x4320p	59.94Hz/60Hz	RGB/YC444	12	x	x	●	●	●	●
207	7680x4320p	59.94Hz/60Hz	YC422		x	x	●	●	●	●
207	7680x4320p	59.94Hz/60Hz	YC420	8	x	x	●	x	x	x
207	7680x4320p	59.94Hz/60Hz	YC420	10	x	x	●	●	x	x
207	7680x4320p	59.94Hz/60Hz	YC420	12	x	x	●	●	●	x
208	7680x4320p	100Hz	RGB/YC444	8	x	x	x	x	x	x
208	7680x4320p	100Hz	RGB/YC444	10	x	x	x	x	x	x
208	7680x4320p	100Hz	RGB/YC444	12	x	x	x	x	x	x
208	7680x4320p	100Hz	YC422		x	x	x	x	x	x
208	7680x4320p	100Hz	YC420	8	x	x	x	x	x	x
208	7680x4320p	100Hz	YC420	10	x	x	x	x	x	x
208	7680x4320p	100Hz	YC420	12	x	x	x	x	x	x
209	7680x4320p	119.88/120Hz	RGB/YC444	8	x	x	x	x	x	x
209	7680x4320p	119.88/120Hz	RGB/YC444	10	x	x	x	x	x	x
209	7680x4320p	119.88/120Hz	RGB/YC444	12	x	x	x	x	x	x
209	7680x4320p	119.88/120Hz	YC422		x	x	x	x	x	x
209	7680x4320p	119.88/120Hz	YC420	8	x	x	x	x	x	x
209	7680x4320p	119.88/120Hz	YC420	10	x	x	x	x	x	x
209	7680x4320p	119.88/120Hz	YC420	12	x	x	x	x	x	x
218	4096x2160p	100Hz	RGB/YC444	8	x	●	●	x	x	x
218	4096x2160p	100Hz	RGB/YC444	10	x	●	●	●	x	x
218	4096x2160p	100Hz	RGB/YC444	12	x	●	●	●	●	x
218	4096x2160p	100Hz	YC422		x	●	●	x	x	x
218	4096x2160p	100Hz	YC420	8	x	x	x	x	x	x
218	4096x2160p	100Hz	YC420	10	x	x	x	x	x	x
218	4096x2160p	100Hz	YC420	12	x	x	x	x	x	x
219	4096x2160p	119.88/120Hz	RGB/YC444	8	x	●	●	x	x	x
219	4096x2160p	119.88/120Hz	RGB/YC444	10	x	●	●	●	x	x
219	4096x2160p	119.88/120Hz	RGB/YC444	12	x	●	●	●	●	x
219	4096x2160p	119.88/120Hz	YC422		x	●	●	x	x	x
219	4096x2160p	119.88/120Hz	YC420	8	x	x	x	x	x	x
219	4096x2160p	119.88/120Hz	YC420	10	x	x	x	x	x	x
219	4096x2160p	119.88/120Hz	YC420	12	x	x	x	x	x	x

[VESA Supported Format]

PrgNo	Program Name	PrgNo	Program Name	PrgNo	Program Name
1602	VESA640x400@85	1628	VESA1280x800@60	1652	VESA1600x1200@65
1603	VESA720x400@85	1629	VESA1280x800@75	1653	VESA1600x1200@70
1604	VESA640x480@60	1630	VESA1280x800@85	1654	VESA1600x1200@75
1605	VESA640x480@72	1631	VESA1280x800@120CVT	1655	VESA1600x1200@85
1606	VESA640x480@75	1632	VESA1280x960@60	1656	VESA1600x1200@120CVT
1607	VESA640x480@85	1633	VESA1280x960@85	1657	VESA1680x1050@60CVT
1608	VESA800x600@56	1634	VESA1280x960@120CVT	1658	VESA1680x1050@60
1609	VESA800x600@60	1635	VESA1280x1024@60	1659	VESA1680x1050@75
1610	VESA800x600@72	1636	VESA1280x1024@75	1660	VESA1680x1050@85
1611	VESA800x600@75	1637	VESA1280x1024@85	1661	VESA1680x1050@120CVT
1612	VESA800x600@85	1638	VESA1280x1024@120CVT	1668	VESA1920x1200@60CVT
1613	VESA800x600@120CVT	1639	VESA1360x768@60	1669	VESA1920x1200@60
1614	VESA848x480@60	1640	VESA1360x768@120CVT	1670	VESA1920x1200@75
1615	VESA1024x768@43	1641	VESA1400x1050@60CVT	1671	VESA1920x1200@85
1616	VESA1024x768@60	1642	VESA1400x1050@60		
1617	VESA1024x768@70	1643	VESA1400x1050@75		
1618	VESA1024x768@75	1644	VESA1400x1050@85		
1619	VESA1024x768@85	1645	VESA1400x1050@120CVT		
1620	VESA1024x768@120CVT	1646	VESA1440x900@60CVT		
1622	VESA1280x768@60CVT	1647	VESA1440x900@60		
1623	VESA1280x768@60	1648	VESA1440x900@75		
1624	VESA1280x768@75	1649	VESA1440x900@85		
1625	VESA1280x768@85	1650	VESA1440x900@120CVT		
1627	VESA1280x800@60CVT	1651	VESA1600x1200@60		

● Specifications

HDMI CH1	Connector			HDMI x 1ch	
	Dot Clock			TMDS	Refer to [TMDS Support Format]
				FRL	Refer to [FRL Support Format (uncompressed)] Refer to [FRL Support Format (DSC)]
	Number of Colors *1			RGB 8 / 10 / 12bit (RGB / YCbCr444 / YCbCr422 / YCbCr420)	
	Audio Output	HDMI	L-PCM	Sampling : 32k / 44.1k / 48k / 88.2k / 96k / 176.4k / 192k Output Frequency: 100 to 20kHz Bit: 16 / 20 / 24bit	
			Compressed	AC3, AAC	
			Option	Next generation audio *2 Dolby Digital Plus, DTS HD(High Resolution Audio)	
		COAX		Sampling: 32k / 44.1k / 48k / 88.2k / 96k / 176.4k / 192k	
	Copy Protection			HDCP Ver2.3 orVer1.4 *3	
	Additional Function			E-EDID Ver1.4(DDC2B)、xvYCC、CEC	

*1 The lower 2 bits of the 12 bit gradation are assigned by 0.

*2 Next generation audio is license option.

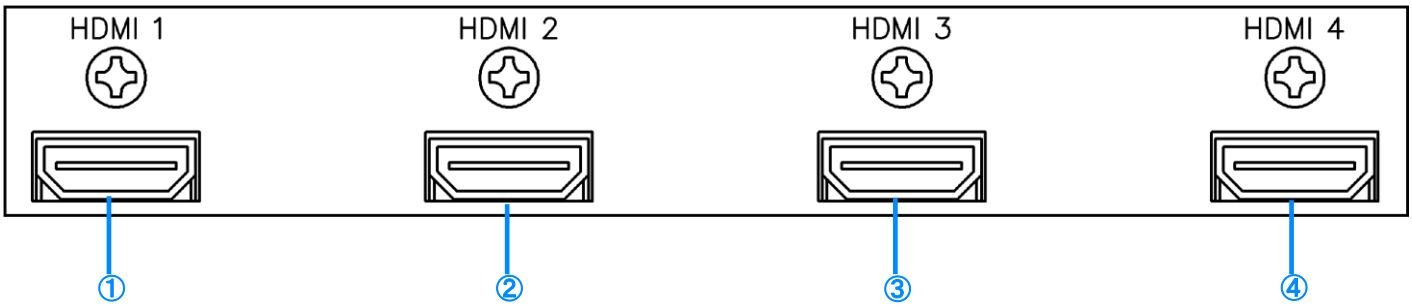
*3 When using FRL output, HDCP2.3 is only supported.

Important

- **Set “ON” of “VM-1876-MD Mode” in 4.1.10 HDMI configuration setting items**
- **If you output other VMs except VM-1876-MD, set “OFF” of “VM-1876-MD Mode”**
- **If you set “ON” of “VM-1876-MD Mode”, other boards does not output signal correctly.**
- **When 8K timing is output, scroll function is not guaranteed.**

4.1.6 Internal HDMI output section

● Unit exterior diagram



No.	Name	Description
①	HDMI 1	This is HDMI digital video/audio output terminal 1 to 4. (Supports HDCP)
②	HDMI 2	
③	HDMI 3	
④	HDMI 4	

MEMO

● Data transfer speed (TMDS clock) is CEA-861-F standard Video Identification Code Only (VIC) VIC1 to 90, 93 to 108, and the following VESA compatible format Timing are available for output.

● 3D display is only compatible with Top and Bottom and Side By Side (Half).

[VESA Compatible Formats]

PrgNo	Program Name	PrgNo	Program Name	PrgNo	Program Name
1602	VESA640x400@85	1628	VESA1280x800@60	1652	VESA1600x1200@65
1603	VESA720x400@85	1629	VESA1280x800@75	1653	VESA1600x1200@70
1604	VESA640x480@60	1630	VESA1280x800@85	1654	VESA1600x1200@75
1605	VESA640x480@72	1631	VESA1280x800@120CVT	1655	VESA1600x1200@85
1606	VESA640x480@75	1632	VESA1280x960@60	1656	VESA1600x1200@120CVT
1607	VESA640x480@85	1633	VESA1280x960@85	1657	VESA1680x1050@60CVT
1608	VESA800x600@56	1634	VESA1280x960@120CVT	1658	VESA1680x1050@60
1609	VESA800x600@60	1635	VESA1280x1024@60	1659	VESA1680x1050@75
1610	VESA800x600@72	1636	VESA1280x1024@75	1660	VESA1680x1050@85
1611	VESA800x600@75	1637	VESA1280x1024@85	1661	VESA1680x1050@120CVT
1612	VESA800x600@85	1638	VESA1280x1024@120CVT	1668	VESA1920x1200@60CVT
1613	VESA800x600@120CVT	1639	VESA1360x768@60	1669	VESA1920x1200@60
1614	VESA848x480@60	1640	VESA1360x768@120CVT	1670	VESA1920x1200@75
1615	VESA1024x768@43	1641	VESA1400x1050@60CVT	1671	VESA1920x1200@85
1616	VESA1024x768@60	1642	VESA1400x1050@60		
1617	VESA1024x768@70	1643	VESA1400x1050@75		
1618	VESA1024x768@75	1644	VESA1400x1050@85		
1619	VESA1024x768@85	1645	VESA1400x1050@120CVT		
1620	VESA1024x768@120CVT	1646	VESA1440x900@60CVT		
1622	VESA1280x768@60CVT	1647	VESA1440x900@60		
1623	VESA1280x768@60	1648	VESA1440x900@75		
1624	VESA1280x768@75	1649	VESA1440x900@85		
1625	VESA1280x768@85	1650	VESA1440x900@120CVT		
1627	VESA1280x800@60CVT	1651	VESA1600x1200@60		

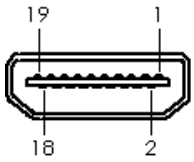
● Specifications

<table>
<tr><td rowspan="6">HDMI
CH1
CH2
CH3
CH4</td><td colspan="3">Connector</td><td colspan="2">HDMI x2</td></tr>
<tr><td colspan="3" rowspan="2">Dot clock
*1</td><td>Single clock mode</td><td><For RGB/YCbCr444>
8bit: 25 to 300 MHz
10bit: 25 to 240 MHz
12bit: 25 to 200 MHz
16bit: 25 to 150 MHz
<For YCbCr422>
8 / 10 / 12 bit: 25 to 300 MHz</td></tr>
<tr><td>Dual clock mode
*2</td><td><For RGB/YCbCr444>
8bit: 597 MHz
<For YCbCr422>
12bit: 597 MHz
<For YCbCr420>
8bit: 50 to 600 MHz
10bit: 50 to 480 MHz
12bit: 50 to 400 MHz
16bit: 50 to 300 MHz</td></tr>
<tr><td colspan="3">No. of colors
*3*4</td><td colspan="2">RGB 8 / 10 / 12bit / 16bit each
(RGB / YCbCr444 / YCbCr422 / YCbCr420 compatible)</td></tr>
<tr><td>Audio Output</td><td>HDMI</td><td>L-PCM</td><td colspan="2">Sampling: 32k / 44.1k / 48k / 88.2k / 96k / 176.4k / 192k
Output frequency: 100 to 20 kHz
No. of bits: 16 / 20 / 24bit</td></tr>
<tr><td colspan="3">Copy protect</td><td colspan="2">HDCP Ver2.2 or Ver1.4</td></tr>
<tr><td colspan="3">Added functions</td><td colspan="2">E-EDID Ver1.4 (DDC2B), xvYCC, CEC</td></tr>
</table>

*1 Quad clock mode is not supported.
*2 The same data is constantly output from CH1 and CH2 (distributed output). Distributed output is not supported.
*3 Up to 8-bit gradation is available for YCbCr4:2:0.
*4 Up to 12-bit gradation is available for 4K output.
*5 The next generation audio is an option.

4.1.7 Connector and pin assignment

● Connector: HDMI Type A



Pin No.	Signal
1	TMDS DATA2+
2	TMDS DATA2 SHIELD
3	TMDS DATA2-
4	TMDS DATA1+
5	TMDS DATA1 SHIELD
6	TMDS DATA1-
7	TMDS DATA0+
8	TMDS DATA0 SHIELD
9	TMDS DATA0-
10	TMDS CLK+
11	TMDS CLK SHIELD
12	TMDS CLK-
13	CEC
14	RESERVE/HEAC+
15	DDC CLK
16	DDC DATA
17	GROUND (for +5V)
18	+5 V (DDC power supply*1)
19	HOT PLUG DETECT/HEAC-
Shell	FG

*1 The supply current of the DDC power supply is limited. For details, refer to “5.1 DDC power supply max power current consumption”.

4.1.8 HDMI data transfer method

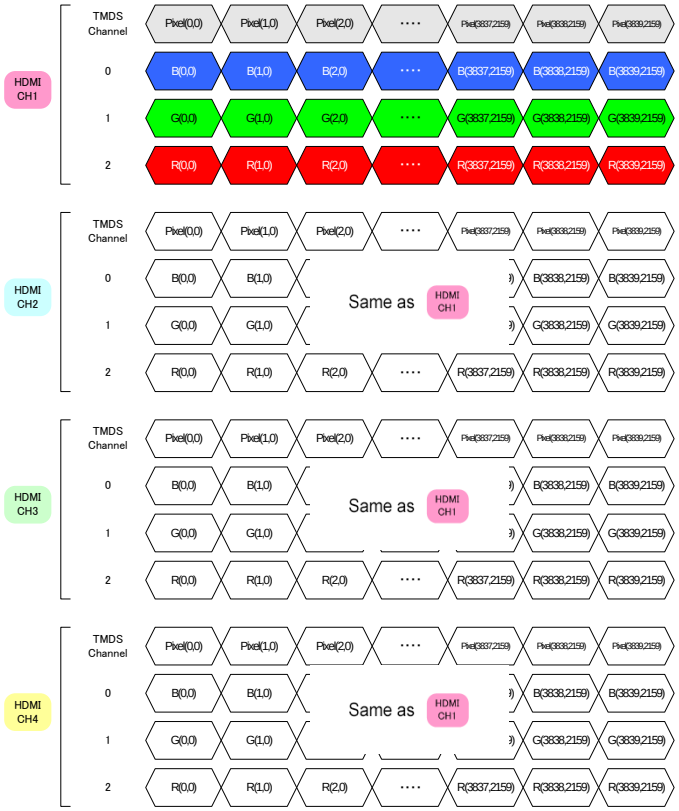
This section describes the data transfer method output from the HDMI unit.

Transfer method differs according to the dot clock operation mode (**DotClk Mode**).

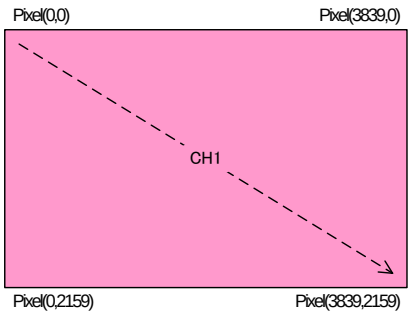
For details on how to set the dot clock operation mode (**DotClk Mode**), refer to **"Dot clock operation mode DotClk Mode settings" in the instruction manual of the corresponding VG unit.**

●《When single clock mode》

This mode outputs via 1 HDMI connectors. The following diagram shows video specifications and how data is transferred.



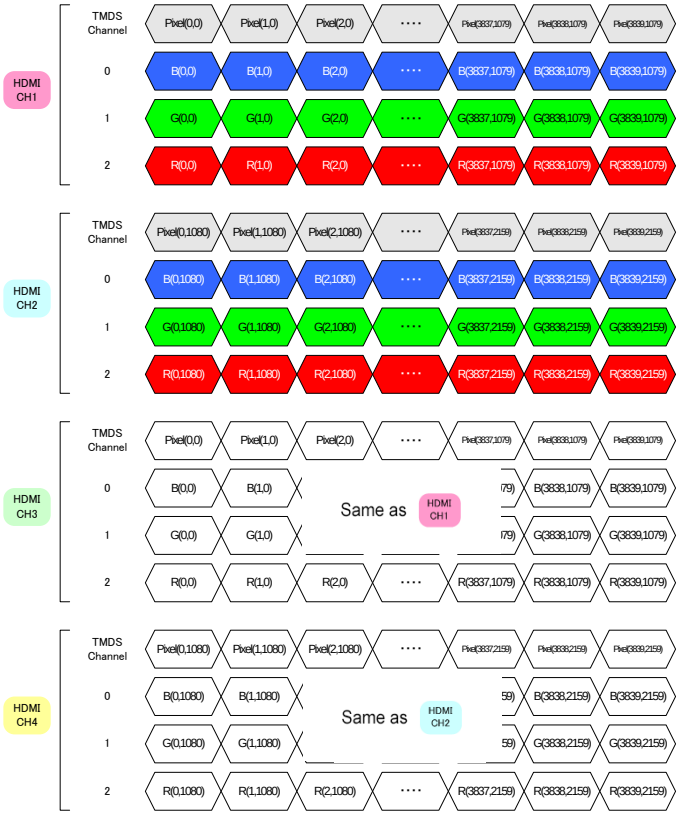
Data transfer method



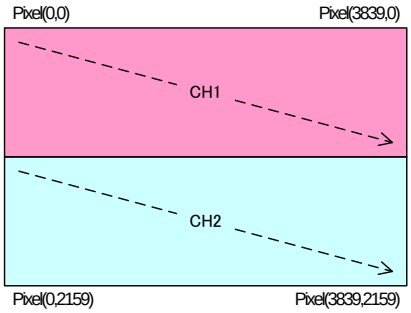
Screen panes

●《Dual clock mode / Mode0, Mode2 (for 2 horizontal panes)》

This mode outputs via 2 HDMI connectors. The following diagram shows video specifications and how data is transferred.



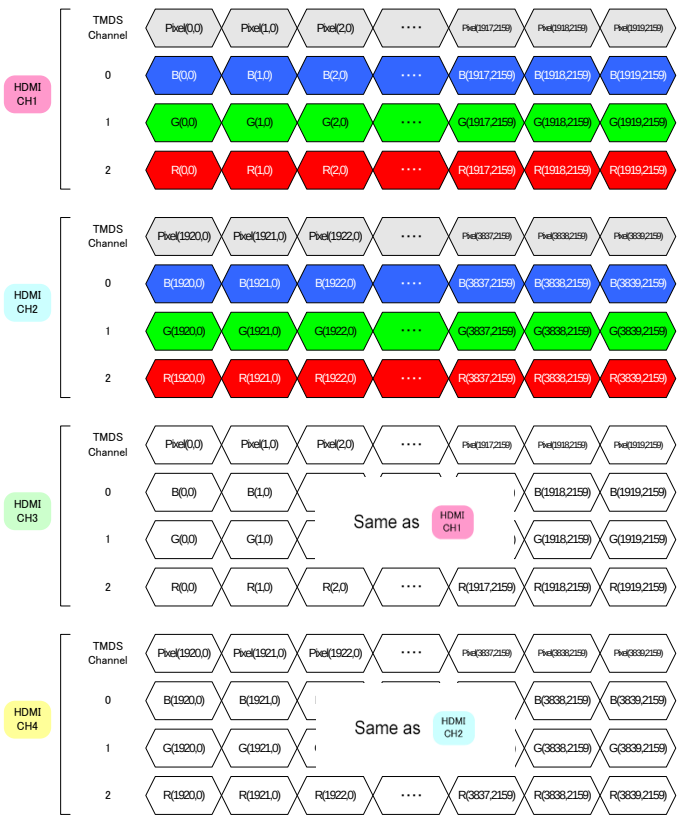
Data transfer method



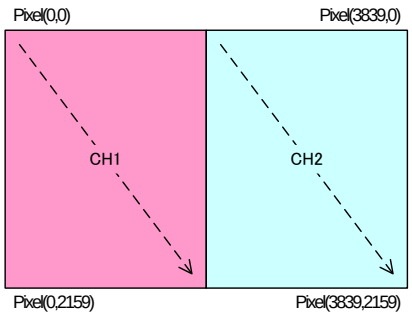
Screen panes

●《Dual clock mode/ Mode1, 3, 8, 9 (for 2 vertical panes)》

This mode outputs via 2 HDMI connectors. The following diagram shows video specifications and how data is transferred.



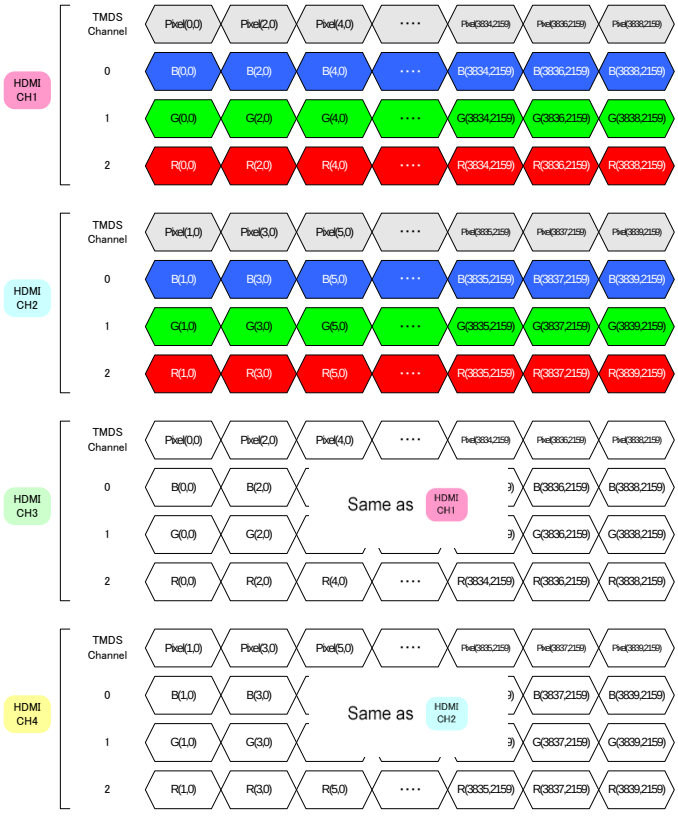
Data transfer method



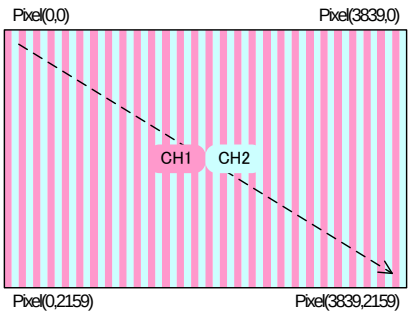
Screen panes

●《Dual clock mode/ Mode4, 5, 6, 7 (no panes)》

This mode outputs via 2 HDMI connectors. The following diagram shows video specifications and how data is transferred.



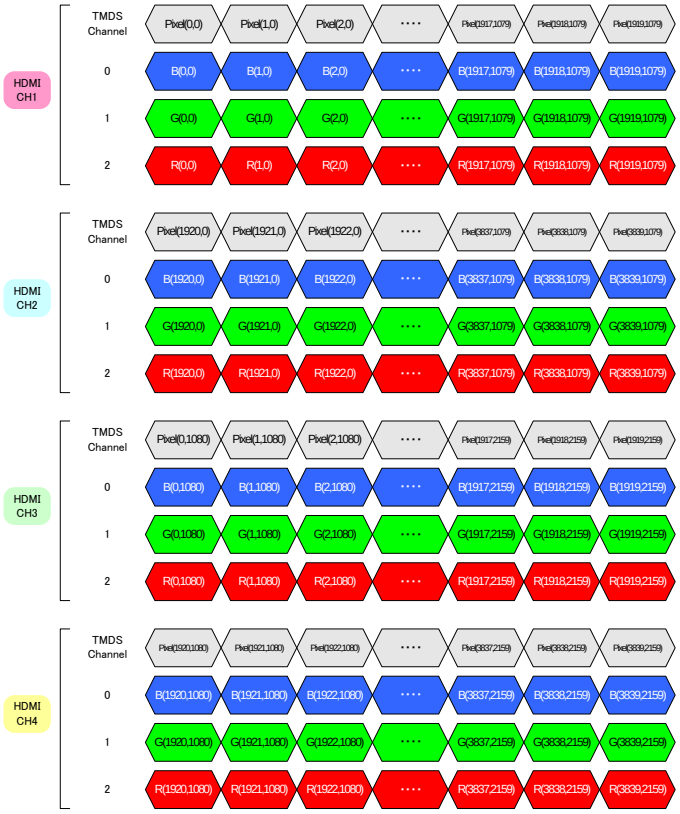
Data transfer method



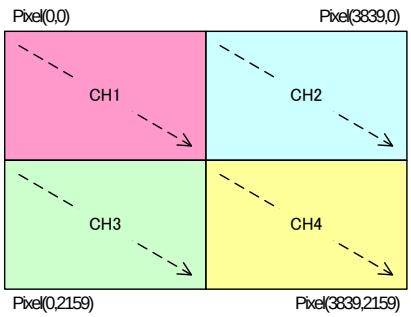
Screen panes

●《Quad clock mode/ Mode0, Mode2 (for 4 quarter panes)》

This mode outputs via 4 HDMI connectors. The following diagram shows video specifications and how data is transferred.



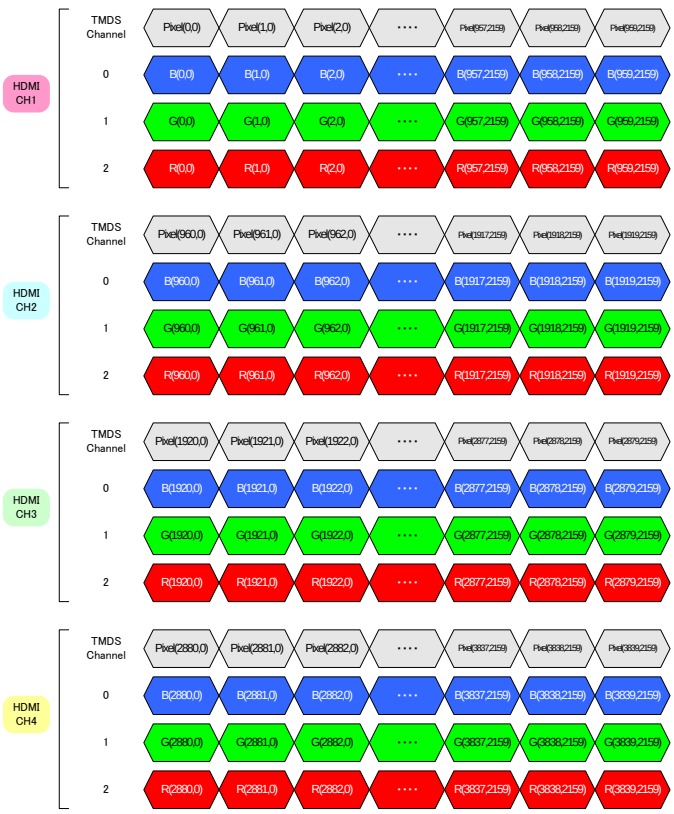
Data transfer method



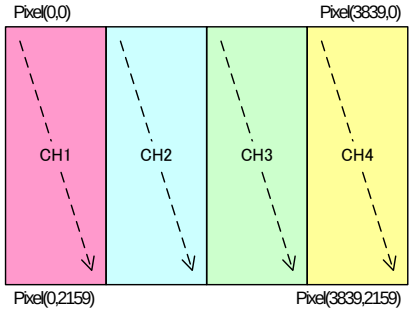
Screen panes

●《Quad clock mode/ Mode1, 3, 7, 8 (for 4 vertical panes)》

This mode outputs via 4 HDMI connectors. The following diagram shows video specifications and how data is transferred.



Data transfer method

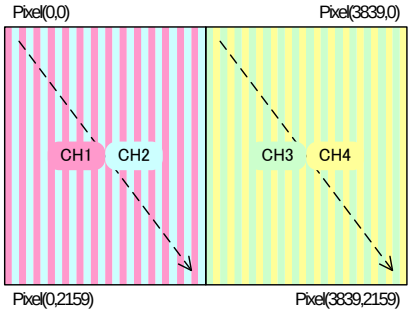


Screen panes

●《Quad clock mode/ Quad/Mode4, 5, 6 (for 2 vertical panes)》

This mode outputs via 4 HDMI connectors. The following diagram shows video specifications and how data is transferred.

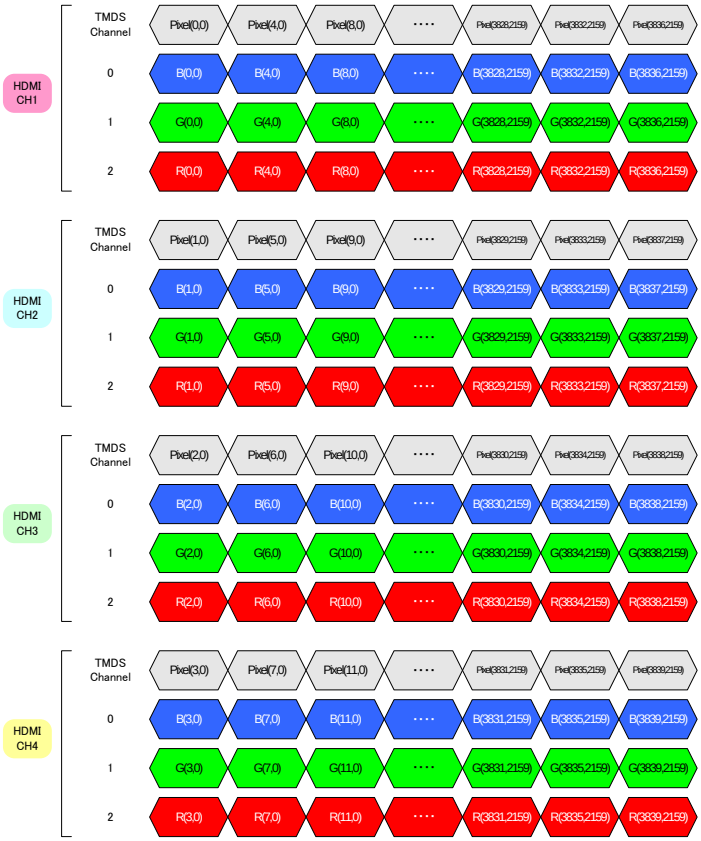
Data transfer method



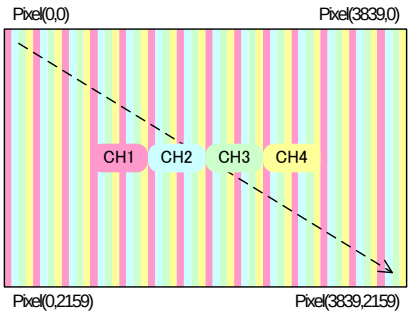
Screen panes

●《For quad clock mode/Mode9 (no panes)》

This mode outputs via 4 HDMI connectors. The following diagram shows video specifications and how data is transferred.



Data transfer method



Screen panes

4.1.9 Output setting items

This section describes output settings for the HDMI unit.

Level 1	Level 2	Level 3	Setting item	Setting value
HDMI				
	Output OFF/ON	**[VG-876, 877, 879] Port 1 to Port16**		**0: OFF / 1: ON**
		[VG-878,878-A] Port1 to Port4		
	HDMI or DVI			**0: HDMI / 1: DVI / 2: Auto**
	Video Format:			**0: RGB / 1: YCbCr4:4:4 /2: YCbCr4:2:2 / 3:YCbYr4:2:0**
	Width			**0: Auto / 1: 8 bit / 2: 10 bit / 3: 12 bit / 4: 16 bit**
	InfoFrame Auto Set If InfoFrame Auto Set is ON, changing the Video Format will cause the RGB or YCbCr item of AVI InfoFrame to follow and change			**0: OFF / 1: ON**
	Audio Output			**0: OFF / 1: ON**
	Scramble Important Only available for VM-1876-M6, VM-1876A-M6, VM-1876-M8, VG-878, and VG-878-A. *1 is only available for VM-1876-M8, VG-878, and VG-878-A. **The Scramble setting for configuration settings take priority for this item.**			**0: ON (over 3.4G)** A Scramble processed HDMI signal is output when TMDS clock 3.4G is exceeded. **1: OFF** HDMI signal is output without applying Scramble processing. **2: ON *1** A Scramble processed HDMI signal is output regardless of the TMDS clock. **3: Refer EDID *1** Checks EDID and determines whether or not to apply Scramble processing.
	5V Enable Important Only available for VM-1876-MD.			**0: Disable / 1: Enable**
	TMDS or FRL			**0: TMDS / 1: FRL**
	The below items are displayed only when FRL is selected.			
	Rate Per lane			**0:Auto (Refer EDID)** It depends on Max_FRL_Rate in EDID. **1:3Gbps 3Lanes** **2:6Gbps 3Lanes** **3:6Gbps 4Lanes** **4:8Gbps 4Lanes** **5:10Gbps 4Lanes** **6:12Gbps 4Lanes**
	FFE Level			**0 to 3** **Changes FFE Level of SCDC.**
	DSC Mode Performs DSC output control. When the rate value supported by MD is exceeded, automatically Output at the maximum supported rate. Refer to “FRL (DSC) supported format” of “4.1.5 HDMI 2.1 Unit VM-1876-MD”.			**0: OFF** **1: :Refer Rate Per Lane** The rate at the time of DSC output depends on the Rate Per Lane setting. **2: Refer EDID** The rate at the time of DSC output depends on the DSC_Max_FRL_Rate of EDID.
	InfoFrame/ Packet Important **Some settings are automatically configured**	**Vendor Specific InfoFrame 1, 2** Important Only VG-876/ 877/879 can set two Vendor Specific	**OFF/ON**	**0: OFF / 1: ON**
			Type	**1 (fixed)**
			Version	**1 (fixed)**
			IEEE RegID Sel	**0: Other / 1: H14b / 2: HF-VSIF**
			IEEE Regist. ID According to IEEE RegID Sel	**Other: 6 digits each 0 to F** **H14b: 000C03 (fixed)** **HF-VSIF: C45DD8 (fixed)**
			The following is only displayed when IEEE RegID Sel=Other is selected.	

Level 1	Level 2	Level 3	Setting item	Setting value
HDMI	**according to configuration setting Auto Select settings.** InfoFrame// Packet	InfoFrames. Vendor Specific InfoFrame 1,2	**Payload Length**	**0 to 24**
			Payload 1-24	**0x00 to 0xFF**
			The following is only displayed when IEEE RegID Sel=H14b is selected.	
			Video Format	**0: None / 1: Ext. Resolution / 2: 3D**
			HDMI VIC, * Only displayed when Video Format=Ext. Resolution is selected.	**0: 4Kx2K 29.97/30Hz**
				1: 4Kx2K 25Hz
				2: 4Kx2K 23.98/24Hz
				3: 4Kx2K 24Hz(SMPTE)
			3D Structure, * Only displayed when Video Format=3D is selected. Important **The output signal differs from the standards. The DE signal switches to HIGH for the current Field alternative Vblank3 interval.**	**0: Frame Packing**
				1: Field Alternative
				2: Line Alternative
				3: Side-by-Side (Full)
				4: L + depth
				5: L + d + G + G-d (L + depth + graphics + graphics-depth)
				6: Side-by-Side (Half)
				7: Top & Bottom
			3D Ext. Data	**1: Horizontal O/L, O/R** Horizontal sub-sampling Odd/Left picture, Odd/Right picture
				1: Horizontal O/L, E/R Horizontal sub-sampling Odd/Left picture, Even/Right picture
				2: Horizontal E/L, O/R Horizontal sub-sampling Even/Left picture, Odd/Right picture
				3:Horizontal E/L,E/R Horizontal sub-sampling Even/Left picture, Even/Right picture
				4: Quincunx O/L, O/R Quincunx matrix Odd/Left picture, Odd/Right picture
				5: Quincunx O/L, E/R Quincunx matrix Odd/Left picture, Even/Right picture
				6: Quincunx E/L, O/R Quincunx matrix Even/Left picture, Odd/Right picture
				7: Quincunx E/L, E/R Quincunx matrix Even/Left picture, Even/Right picture
			3DMeta Present * Only displayed when Video Format=3D is selected.	**0: Not Present / 1: Present**
			Metadata Type * Only displayed when Video Format=3D is selected.	**0** (fixed)
			Metadata Length * Only displayed when Video Format=3D is selected.	**0 to 21**
			Metadata 1-21: * Only displayed when Video Format=3D is selected.	**0x00 to 0xFF**
			The following is only displayed when IEEE RegID Sel=HF-VSIF is selected.	
			HF-VSIF Version	**1** (fixed)
			3D Valid	**0 / 1**
			ALLM_Mode	**0: Not Supported**
				1: Supported

Level 1	Level 2	Level 3	Setting item	Setting value
HDMI	InfoFrame/ Packet	Vendor Specific InfoFrame 1, 2	**CCBPC**	**0: No Indication**
				1-9: 8bit – 16bit
			3D F Structure * Only displayed when 3D Valid = 1 is selected. Important **The output signal differs from the standards. The DE signal switches to HIGH for the current Field alternative Vblank3 interval.**	**0: Frame Packing**
				1: Field Alternative
				2: Line Alternative
				3: Side-by-Side (Full)
				4: L + depth
				5: L + d + G + G-d (L + depth + graphics + graphics-depth)
				6: Side-by-Side (Half)
				7: Top & Bottom
			3D F Ext Data * Only displayed when 3D Valid = 1 is selected. Important **3D Ext Data values "0 to 3" are all switched to "Horizontal sub-sampling" in HDMI Ver.1.4a.** **In VG, the previous notation is included for distinguishing rendering methods in OPT Pattern 101 and compatibility.**	**0: Horizontal O/L, O/R** Horizontal sub-sampling Odd/Left picture, Odd/Right picture
				1: Horizontal O/L, E/R Horizontal sub-sampling Odd/Left picture, Even/Right picture
				2: Horizontal E/L, O/R Horizontal sub-sampling Even/Left picture, Odd/Right picture
				3: Horizontal E/L, E/R Horizontal sub-sampling Even/Left picture, Even/Right picture
				4: Quincunx O/L, O/R Quincunx matrix Odd/Left picture, Odd/Right picture
				5: Quincunx O/L, E/R Quincunx matrix Odd/Left picture, Even/Right picture
				6: Quincunx E/L, O/R Quincunx matrix Even/Left picture, Odd/Right picture
				7: Quincunx E/L, E/R Quincunx matrix Even/Left picture, Even/Right picture
			Additional Pre * Only displayed when 3D Valid = 1 is selected.	**0: Not Present / 1: Present**
			Dual View * Only displayed when 3D Valid = 1 is selected.	**0: Normal 3D/ 1: Dual View**
			View Dependency * Only displayed when 3D Valid = 1 is selected.	**0: No Indication**
				1: Right Originate
				2: Left Originate
				3: Both
			Preferred 2D * Only displayed when 3D Valid = 1 is selected.	**0: No Indication**
				1: Right View
				2: Left View
			Disparity Pre * Only displayed when 3D Valid = 1 is selected.	**0: Not Present / 1: Present**
			Disparity Ver * Only displayed when 3D Valid = 1 is selected.	**0 to 3**
			Disparity Length * Only displayed when 3D Valid = 1 is selected.	**Disparity Ver = when at 0**
				Length = 0
				Disparity Ver = when at 1
				Length = 3

Level 1	Level 2	Level 3	Setting item	Setting value
HDMI		Vendor Specific InfoFrame 1, 2		**Disparity Ver = when at 2**
				Disparity Data1 = 2h : Length = 3 Disparity Data1 = 3h : Length = 4 Disparity Data1 = 4h : Length = 5 Disparity Data1 = 5h : Length = 6 Disparity Data1 = ah : Length = 11 Disparity Data1 = 11h : Length = 18 Disparity Data1 = else : Length = 1
				Disparity Ver = when at 3
				Disparity Data4 = 0h : Length = 4 Disparity Data4 = 2h : Length = 6 Disparity Data4 = 3h : Length = 7 Disparity Data4 = 4h : Length = 8 Disparity Data4 = 5h : Length = 9 Disparity Data4 = ah: Length = 14 Disparity Data4 = else : Length = 4
			Disparity Data 1 to 18 * Only displayed when 3D Valid = 1 is selected.	00h to FFh
			Meta Present * Only displayed when 3D Valid = 1 is selected.	0: Not Present / 1: Present
			Metadata Type * Only displayed when 3D Valid = 1 is selected.	0 **(fixed)**
			Metadata Length * Only displayed when 3D Valid = 1 is selected. Because VSI InfoFrame is a maximum of 27 bytes, the maximum Length relies on other Data length.	0 to 20
			Metadata Data 1 to 20, * Only displayed when 3D Valid = 1 is selected. Because VSI InfoFrame is a maximum of 27 bytes, the maximum Length relies on other Data length.	00h to FFh
HDMI	InfoFrame/ Packet	AVI InfoFrame	OFF/ON	0: OFF / 1: ON
			Type :	2 **(fixed)**
			Version :	1 to 4
			Scan Info	0: No Data
				1: Overscanned
				2: Underscanned
			Bar Info	0: Data Not Valid
				1: Vertical Valid
				2: Horizontal Valid
				3: Vert.&Horiz. Valid
			ActiveF Info	0: No Data / 1: Valid
			RGB or YCbCr	0: RGB
				1: YCbCr 4:2:2
				2: YCbCr 4:4:4
				3: YCbCr 4:2:0
				4: (reserved1)
				5: (reserved2)
				6: (reserved3)
				7: IDO-Defined

Level 1	Level 2	Level 3	Setting item	Setting value
HDMI	InfoFrame/ Packet	AVI InfoFrame	ActiveF Aspect	0: Same Picture
				1: 4:3(center)
				2: 16:9(center)
				3: 14:9(center)
				4: box 16:9(top)
				5: box 14:9(top)
				6: box>16:9(center)
				7: 4:3(14:9 center)
				8: 16:9(14:9 center)
				9: 16:9(4:3 center)
			Picture Aspect	0: No Data
				1: 4:3
				2: 16:9
			Scaling	0: Unknown
				1: Horizontal
				2: Vertical
				3: Horiz. & Vert.
			Colorimetry	0: No Data
				1: SMPTE170M/ITU601
				2: ITU709
				3: Extended Valid
			Video Code :	0 to 219
			Repetition :	1 to 10
			Top Bar :	0 to 65535 Sets Line Number of End of Top Bar. (Sets letter BOX upper Bar size.)
			Bottom Bar :	0 to 65535 Sets Line Number of Start of Bottom Bar. (Sets letter BOX lower Bar size.)
			Left Bar :	0 to 65535 Sets Pixel Number of End of Left Bar. (Sets pillar BOX left side Bar size.)
			Right Bar :	0 to 65535 Sets Pixel Number of Start of Right Bar. (Sets pillar BOX right side Bar size.)
			RGB Quan.Range	0:Default
				1: Limited Range
				2: Full Range
			YCC Quan.Range	0: Limited Range / 1: Full Range
			Extended Colorimetry Referenced when Extended Valid is set in Colorimetry.	0: xvYCC601
				1: xvYCC709
				2: sYCC601
				3: AdobeYCC601
				4: AdobeRGB
				5: BT2020 YcCbcCrc
				6: BT2020 RGBorYCbCr
				7: Additional Colorimetry
			IT content	0: No Data / 1: IT content
			IT content Type	0: Graphics
				1: Photo
				2: Cinema
				3: Game
			Additional Colorimetry	0:DCI-P3 R'G'B' (D65)
				1:DCI-P3 R'G'B' (theater)
				2:ITU-R BT.2100 ICTCP
HDMI	InfoFrame/ Packet	SPD InfoFrame	OFF/ON	0: OFF / 1: ON

Level 1	Level 2	Level 3	Setting item	Setting value
			Type :	3 (fixed)
			Version :	1 (fixed)
			Vendor Name :	Maximum of 8 characters (0x20 to 0x7E ASCII 7 bit)
			Product Description:	Maximum of 16 characters (0x20 to 0x7E ASCII 7 bit)
			Source Device	0: Unknown
				1: Digital STB
				2: DVD player
				3: D-VHS
				4: HDD Video recorder
				5: DVC
				6: DSC
				7: Video CD
				8: Game
				9: PC general
				A: Blu-Ray Disc
				B: Super Audio CD
				C: HD DVD
				D: PMP
		Audio InfoFrame	OFF/ON	0: OFF / 1: ON
			Type :	4 (fixed)
			Version :	1 (fixed)
			Coding Type	0: Refer Stream Header
				1: IEC60958 PCM
				2: AC-3
				3: MPEG1 (Layers 1&2)
				4: MP3 (MPEG1 Layer 3)
				5: MPEG2 (multi ch.)
				6: AAC
				7: DTS
				8: ATRAC
				9: One Bit Audio
				A: Dolby Digital+
				B: DTS-HD
				C: MLP
				D: DST
				E: WMA Pro
				F: Refer Extension
HDMI	InfoFrame/ Packet	Audio InfoFrame	Coding ExtType	0: (not use1)
				1: (not use2)
				2: (not use3)
				3: HE-AAC
				4: HE-AACv2
				5: AAC LC
				6: DRA
				7: HE-AAC Surround
				8: (reserved)
				9: AAC-LC Surround
				A:MPEG-H 3D Audio
				B:AC-4
				C:L-PCM 3D Audio
			Channel Count	0: Refer Stream Header
				1: 2ch
				2: 3ch
				3: 4ch
				4: 5ch
				5: 6ch
				6: 7ch

Level 1	Level 2	Level 3	Setting item	Setting value
				7: 8ch
			Sampling Freq	0: Refer Stream Header
				1: 32kHz
				2: 44.1kHz
				3: 48kHz
				4: 88.2kHz
				5: 96kHz
				6: 176.4kHz
				7: 192kHz
			Sample Size	0: Refer Stream Header
				1: 16bit
				2: 20bit
				3: 24bit
			Channel Allocation :	0 to 50

	8ch	7ch	6ch	5ch	4ch	3ch	2ch	1ch
0		-	-	-	-	-	FR	FL
1		-	-	-	-	LFE	FR	FL
2		-	-	-	FC	-	FR	FL
3		-	-	-	FC	LFE	FR	FL
4		-	-	RC	-	-	FR	FL
5		-	-	RC	-	LFE	FR	FL
6		-	-	RC	FC	-	FR	FL
7		-	-	RC	FC	LFE	FR	FL
8		-	RR	RL	-	-	FR	FL
9		-	RR	RL	-	LFE	FR	FL
10		-	RR	RL	FC	-	FR	FL
11		-	RR	RL	FC	LFE	FR	FL
12		RC	RR	RL	-	-	FR	FL
13		RC	RR	RL	-	LFE	FR	FL
14		RC	RR	RL	FC	-	FR	FL
15		RC	RR	RL	FC	LFE	FR	FL
16	RRC	RLC	RR	RL	-	-	FR	FL
17	RRC	RLC	RR	RL	-	LFE	FR	FL
18	RRC	RLC	RR	RL	FC	-	FR	FL
19	RRC	RLC	RR	RL	FC	LFE	FR	FL
20	FRC	FLC	-	-	-	-	FR	FL
21	FRC	FLC	-	-	-	LFE	FR	FL
22	FRC	FLC	-	-	FC	-	FR	FL
23	FRC	FLC	-	-	FC	LFE	FR	FL
24	FRC	FLC	-	RC	-	-	FR	FL
25	FRC	FLC	-	RC	-	LFE	FR	FL
26	FRC	FLC	-	RC	FC	-	FR	FL
27	FRC	FLC	-	RC	FC	LFE	FR	FL
28	FRC	FLC	RR	RL	-	-	FR	FL
29	FRC	FLC	RR	RL	-	LFE	FR	FL
30	FRC	FLC	RR	RL	FC	-	FR	FL
31	FRC	FLC	RR	RL	FC	LFE	FR	FL
32	-	FCH	RR	RL	FC	-	FR	FL
33	-	FCH	RR	RL	FC	LFE	FR	FL
34	TC	-	RR	RL	FC	-	FR	FL
35	TC	-	RR	RL	FC	LFE	FR	FL
36	FRH	FLH	RR	RL	-	-	FR	FL
37	FRH	FLH	RR	RL	-	LFE	FR	FL
38	FRW	FLW	RR	RL	-	-	FR	FL
39	FRW	FLW	RR	RL	-	LFE	FR	FL
40	TC	RC	RR	RL	FC	-	FR	FL
41	TC	RC	RR	RL	FC	LFE	FR	FL
42	FCH	RC	RR	RL	FC	-	FR	FL

HDMI	InfoFrame/ Packet	Audio InfoFrame

Level 1	Level 2	Level 3	Setting item	Setting value
HDMI	InfoFrame/ Packet		43 FCH RC RR RL FC LFE FR FL 44 TC FCH RR RL FC - FR FL 45 TC FCH RR RL FC LFE FR FL 46 FRH FLH RR RL FC - FR FL 47 FRH FLH RR RL FC LFE FR FL 48 FRW FLW RR RL FC - FR FL 49 FRW FLW RR RL FC LFE FR FL 50 Reserved Channels according to Speaker mask Channels according to Channel index	
			Level Shift Value :	**0 to 15 [dB]**
			Down-mix	**0: Permitted/No Info** **1: Prohibited**
			LFE PB Level	**0: Unknown** **1: 0dB Playback** **2: +10dB Playback**
			When Channel Allocation = Channels according to Speaker Mask is selected.	
			Speaker Mask FL/FR, LFE1, FC, BL/BR, BC, FLC/FRC, RLC/RRC, FLW/FRW TpFL/TpFR, TpC, TpFC, LS/RS LFE2, TpBC, SiL/SiR, TpSiL/TpSiR, TpBL/TpBR, BtFC BtFL/BtFR, TpLS/TpRs	0:OFF / 1:ON
			When Channel Allocation = Channels according to Channel Index is selected.	
			Channel Index **CID00 to CID31**	**0:OFF / 1:ON**
		MPEG InfoFrame	**OFF/ON**	**0: OFF / 1: ON**
			Type :	**5 (fixed)**
			Version :	**1 (fixed)**
			Bit Rate :	**0 to 4294M967k295 [Hz]**
			Field Repeat	**0: New Field(picture)** **1: Repeated Field**
			Frame	**0: Unknown(No Data)** **1: I Picture** **2: B Picture** **3: P Picture**
		NTSC VBI InfoFrame	**OFF/ON**	**0: OFF / 1: ON**
			Type :	**6 (fixed)**
			Version :	**1 (fixed)**
			PES Length :	**0 to 27**
			PES 1-27 :	**0x0 to 0xFF**
		Dynamic Range and Mastering InfoFrame	**OFF/ON**	**0: OFF / 1: ON**
			Type :	**7 (fixed)**
			Version :	**1 (fixed)**
			EOTF	**0: SDR Range** **1: HDR Range** **2: SMPTE ST2084[2]** **3: Hybrid Log-Gamma**
			Metadata ID	**Metadata Type1 (fixed)**
			Disp Primaries x0	**0.00000 to 1.00000 (0.00002Step)**
			Disp Primaries y0	**0.00000 to 1.00000 (0.00002Step)**
			Disp Primaries x1	**0.00000 to 1.00000 (0.00002Step)**

Level 1	Level 2	Level 3	Setting item	Setting value
			Disp Primaries y1	0.00000 to 1.00000 (0.00002Step)
			Disp Primaries x2	0.00000 to 1.00000 (0.00002Step)
			Disp Primaries y2	0.00000 to 1.00000 (0.00002Step)
			White Point x	0.00000 to 1.00000 (0.00002Step)
			White Point y	0.00000 to 1.00000 (0.00002Step)
			Max Disp Mastering	1 to 65535
			Min Disp Mastering	0.0001 to 6.5535
			Content Light LV	1 to 65535
			Frame-ave Light LV	1 to 65535
		ACP Packet	OFF/ON	0: OFF / 1: ON
			ACP_Type	0: Generic Audio
				1: IEC60958 Audio
				2: DVD-Audio
				3: Super Audio CD
			DVD-Audio_Type	0 – 1
			Copy Permission	0: Copy Freely
				1: (reserved)
				2: Specify Copy Number
				3: No More Copies
			Copy_Number	0: 1 copies
				1: 2 copies
				2: 4 copies
				3: 6 copies
				4: 8 copies
				5: 10 copies
				6: 3 copies
				7: Copy One Generation
			Quality:	0 to 3
			Transaction (0/1):	0: Not Present / 1: (reserved)
			Count_A : Count_S : Count_U :	0 to 255
			CCI_Flags Q_A (0/1): Q_S (0/1): Q_U (0/1):	0: CD Quality / 1: Unlimited DSD Qual
			CCI_Flags Move_A (0/1): Move_S (0/1): Move_U (0/1):	0: Not Allowed / 1: Allowed
		ISRC Packet	OFF/ON ISRC1 (0/1): ISRC2 (0/1):	0: OFF / 1: ON
			ISRC_Cont (0/1):	0 to 1
			ISRC_Valid (0/1):	0 to 1
			ISRC_Status (0-2):	0: Starting
				1: Intermediate
				2: Ending
			Validity Info (0-3):	0: No Validity
				1: ISRC
				2: UPC/EAN
				3: UPC/EAN and ISRC
			Catalogue Code :	13 digits each 0 to 9
HDMI	InfoFrame/ Packet	ISRC Packet	Country Code :	2 characters 0x11 to 0x2A (ASCII upper-case characters - 0x30)

	Number of channels	Sampling frequency	Bit Width
0	2 ch or less	48kHz or lower	16 bit or less
1	2 ch or less	No restrictions	No restrictions
2	No restrictions	No restrictions	No restrictions
3	No restrictions	48kHz or lower	16 bit or less

Level 1	Level 2	Level 3	Setting item	Setting value	
			First Owner Code :	3 characters 0x00 to 0x09, 0x11 to 0x2A (ASCII upper-case characters/numerals - 0x30)	
			Year Of Rec. Code :	3 digits each 0 to 9	
			Recording-item Code:	5 digits each 0 to 9	
		Gamut Metadata Packet	OFF/ON (0/1):	0: OFF / 1: ON	
			Next_Field (0/1):	0 to 1	
			No_Current_GBD(0/1):	0 to 1	
			GBD_profile (0-3):	0: P0 / 1: P1 / 2: P2 / 3: P3	
			AffectedGamutSeqNum:	0 to 15	
			Current_GamutSeqNum:	0 to 15	
			Packet_Seq (0-3):	0: Intermediate	
				1: First	
				2: Last	
				3: Only	
			Format_Flag (0/1):	0: Vertices/Facets / 1: Range	
			ColorPrecision(0-2):	0: 8 bit / 1: 10 bit / 2: 12 bit	
			Color_Space (0-3):	For Format_Flag=Vertices/Facets	
				0: ITU-R BT.709	
				1: xvYCC601	
				2: xvYCC709	
				3: XYZ	
				For Format_Flag=Range	
				0: Reserved	
				1: xvYCC601	
				2: xvYCC709	
				3: Reserved	
			Number_Vertices : * Only displayed when Format_Flag=Vertices/Facets is selected.	Relies on Color Precision settings. 8 bit : 4 to 8 10 bit: 4 to 6 12 bit: 4 to 5	
			Packed_GBD_Vertices_Data * Only displayed when Format_Flag=Vertices/Facets is selected.	DATA 1	Relies on Color Precision settings. 8 bit : 0 to 255 10 bit : 0 to 1023 12 bit : 0 to 4095
				DATA 2	
				DATA 3	
				DATA 4	
			Packed_Range_Data * Only displayed when Format_Flag=Range is selected.	Min_Red	Relies on Color Precision settings. 8 bit: -3.96875 to +3.96875 10 bit: -3.9921875 to +3.9921875 12 bit: -3.998046875 to +3.998046875
				Max_Red	
				Min_Green	
				Max_Green	
				Min_Blue	
				Max_Blue	

4.1.10 HDMI configuration setting items

This section describes configuration settings for the HDMI unit.
Set these settings from MENU > Configuration.

Level 1	Level 2	Level 3	Setting item	Setting value
Configura-tion	**HDMI**		**Auto Select** Automatically sends the following InfoFrame value.	**0: OFF / 1: ON**

- When Program Data is saved while AutoSelect is ON, the value set via automatic selection is saved.
- The item indicated by "-" uses the original setting value.

Item	Setting value/reference source			
AVI InfoFrame				
	AFD Pattern displayed			Other than at left
Active Format Information	Valid			-
Active Format Aspect	Follows AFD > **Type** settings			-
Top Bar	Value calculated from AFD and Timing			-
Bottom Bar				
Left Bar				
Right Bar				
RGB or YCbCr	Follows HDMI > **Video Format** settings			
Picture Aspect	Follows HDMI > AVI InfoFrame > **Video Code** (EIA/CEA-861compliant)			
Repetition	Follows H-Timing> **Repetition** settings			
Audio InfoFrame				
	Follows Digital Audio> **Source** settings			
	Ext.ANALOG to L-PCM Int.L-PCM Ext.I2S L-PCM (Option)	Ext.ANALOG to DSD	Int.DSD (Option)	Other than at left
Sampling Frequency	-	44.1 kHz	Follows DSD File information	-
Channel Count	Follows Digital Audio > **Output Channel** for which the number of channels are ON 0: Refer Stream Header 1: 2ch 2 to 8: 2 to 8ch			-
ACP Packet				
	Follows ACP Packet> **ACP_Type** settings			
	DVD-Audio			Other than at left
DVD-Audio_Type	1			0
Copy_Permission	-			0 (Copy Freely)
Copy_Number	-			0 (1 copies)
Quality	-			0
Transaction	-			0 (Not Present)

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Setting item</th><th>Setting value</th></tr>
<tr><td rowspan="11">Configuration</td><td colspan="4">ISRC Packet</td></tr>
<tr><td rowspan="3"></td><td colspan="3">Follows ACP Packet> ACP_Type settings</td></tr>
<tr><td colspan="2">DVD-Audio</td><td>Other than at left</td></tr>
<tr><td>OFF/ON ISRC1</td><td colspan="2">-</td><td>OFF</td></tr>
<tr><td>ISRC2</td><td colspan="2">Follows ISRC Packet> ISRC_Cont settings
<table><tr><th>0</th><th>1</th></tr><tr><td>OFF</td><td>-</td></tr></table></td><td>OFF</td></tr>
<tr><td rowspan="10">HDMI</td><td rowspan="2">Packet Changing</td><td rowspan="2"></td><td>0: Normal Mode
Disable HDMI output synchronization and change InfoFrame/Packet.</td></tr>
<tr><td>1: Game Mode
Only changes InfoFrame/Packet (does not disable synchronization).</td></tr>
<tr><td rowspan="5">Scramble

Important
Only available for VM-1876-M6, VM-1876A-M6, VM-1876-M8, VG-878, and VG-878-A.
*1 is only available for VM-1876-M8, VG-878, and VG-878-A.</td><td rowspan="5"></td><td>0: Refer Program
Follows output setting item Scramble settings.</td></tr>
<tr><td>1: OFF
HDMI signal is output without applying Scramble processing.</td></tr>
<tr><td>2: ON(3.4G over)
A Scramble processed HDMI signal is output when TMDS clock 3.4G is exceeded.</td></tr>
<tr><td>3: ON *1
A Scramble processed HDMI signal is output regardless of the TMDS clock.</td></tr>
<tr><td>3: Refer EDID *1
Checks EDID and determines whether or not to apply Scramble processing.</td></tr>
<tr><td rowspan="3">SCDC Send:

Important
Only available for VM-1876-M6, VM-1876A-M6, VM-1876-M8, VG-878, and VG-878-A.</td><td rowspan="3"></td><td>0: ON
Sends SCDC data.</td></tr>
<tr><td>1: OFF
Does not send SCDC data.</td></tr>
<tr><td>2: Refer EDID
References EDID data and sends SCDC data when HF-VSDB SCDC_Present=1.
(When HF-VSDB is not present, and SCDC_Present=0, SCDC data is not sent.)</td></tr>
<tr><td rowspan="2">HPD Negeate

Important
Only available for VM-1876-M6, VM-1876A-M6, VM-1876-M8, VG-878, and VG-878-A.</td><td rowspan="2"></td><td>0: Output OFF
Output is canceled when HotPlug is Negate.</td></tr>
<tr><td>1: Output ON
Also output when HotPlug is Negate.</td></tr>
<tr><td rowspan="3"></td><td rowspan="2">VM-1876-MD Mode
Turn it on when using VM-1876-MD.
If you want to use other than it, turn it off.
Important
If you turn it ON, it will not be output normally from other than VM-1876-MD.</td><td rowspan="2"></td><td>0:OFF</td></tr>
<tr><td>1:ON</td></tr>
<tr><td>FRL Rate Down Out</td><td></td><td>0:OFF</td></tr>
</table>

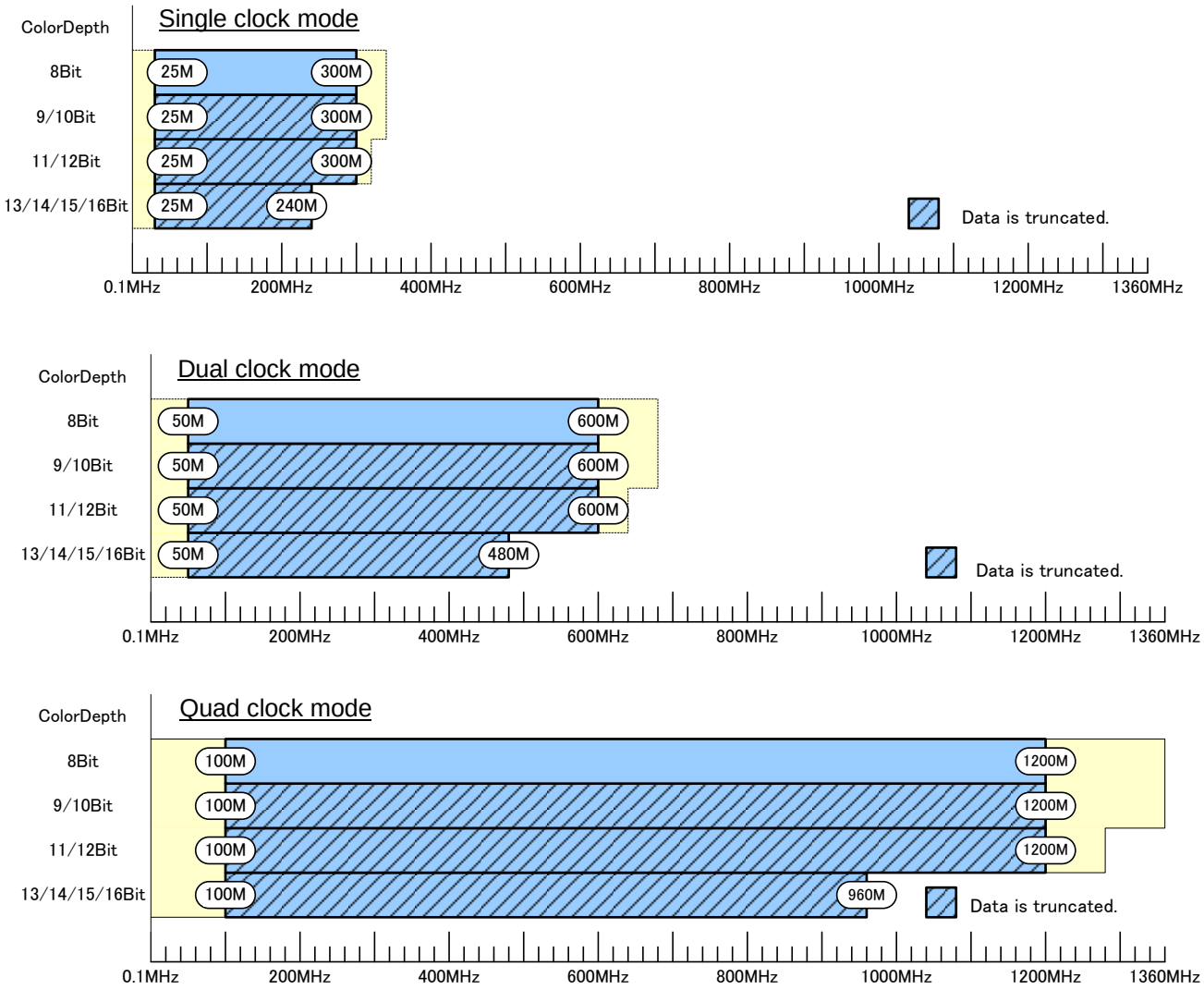
Level 1	Level 2	Level 3	Setting item	Setting value
		Set whether to output when rate down is requested at FRL output. Important This item is supported by VM-1876-MD only.		Output stops when ratedown is requested.
				1:ON Rate down Output at the requested rate when requested.
		Rate Per Lane Important This item is supported by VM-1876-MD only.		**0:Refer Program**
				1:Auto (Refer EDID) It depends on Max_FRL_Rate of EDID.
				2:3Gbps 3Lanes
				3:6Gbps 3Lanes
				4:6Gbps 4Lanes
				5:8Gbps 4Lanes
				6:10Gbps 4Lanes
				7:12Gbps 4Lanes
		TMDS or FRL Important This item is supported by VM-1876-MD only.		**0:Refer Program**
				1:TMDS
				2:FRL
		DSC Mode Important This item is supported by VM-1876-MD only.		**0:Refer Program**
				1:OFF
				2:Refer Rate Per Lane
				3:Refer EDID
		MD 8K Output Important This item is supported by VM-1876-MD only.		**0:Upconversion** The center 4K size image is upconverted to 8K.
				1:Capture 8K dot by dot display. It captures 4 pcs of 4K images, then combine it in 8K size.

4.1.11 Relationship between Pattern Rendering Bit Length and Dot Clock

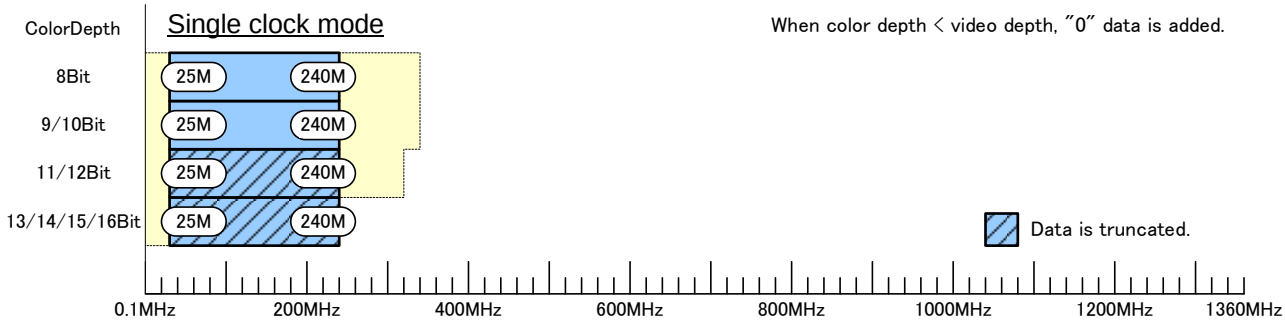
The dot clock is limited by the pattern rendering bit length (color depth) and dot clock operation mode (DotClk Mode) as shown in the following figures. Furthermore, when the output video bit length (video width) is smaller than the pattern rendering bit length (color depth), data thinning occurs.

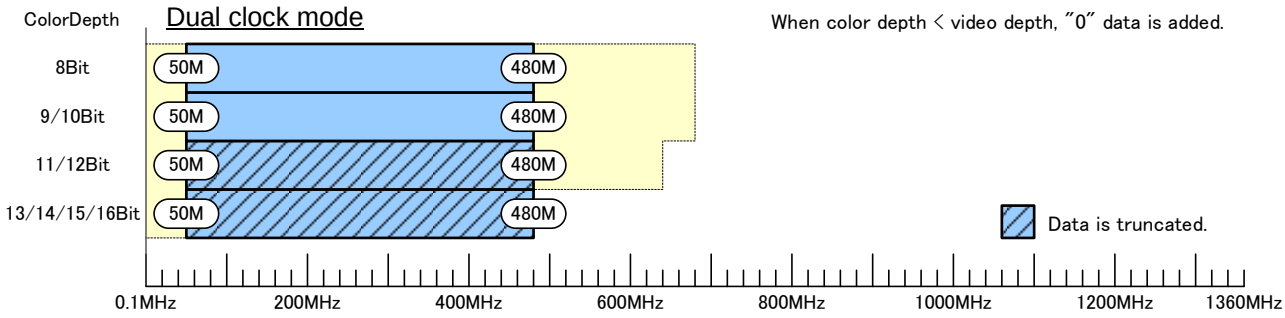
For details on the dot clock operation mode (DotClk Mode) and pattern bit length (color depth), refer to "**2.1 ALL OUTPUT**".
For details on the output video bit length (video width), refer to "**4.1.8 HDMI data transfer method**".

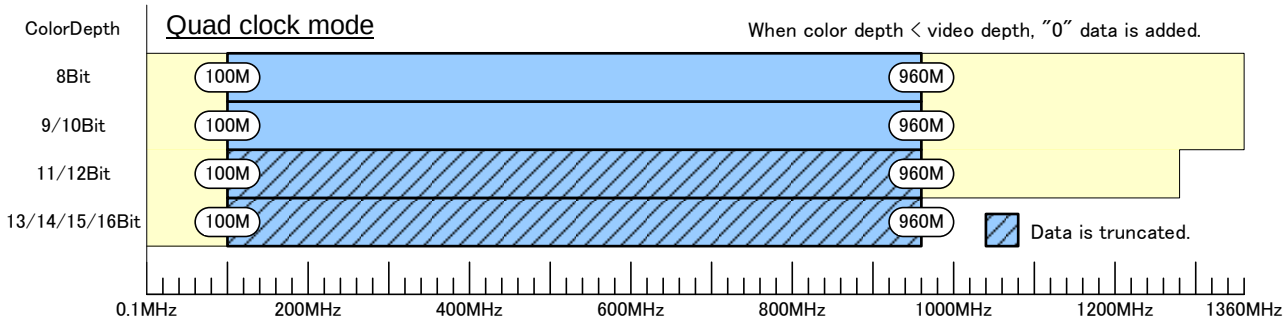
1) When the output video bit length (video width) is 8 bits



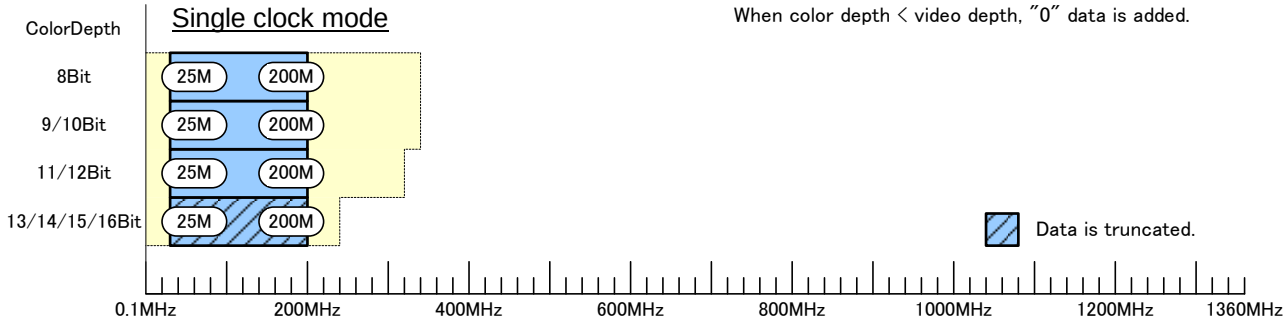
2) When the output video bit length (video width) is 10 bits

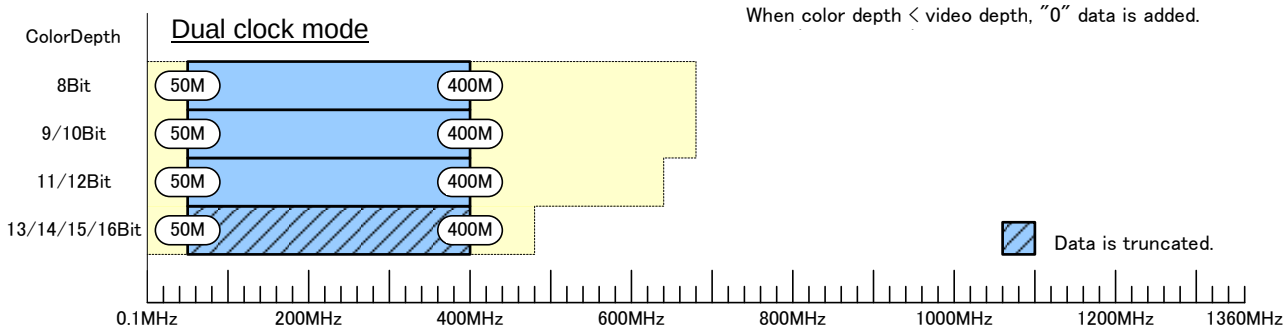


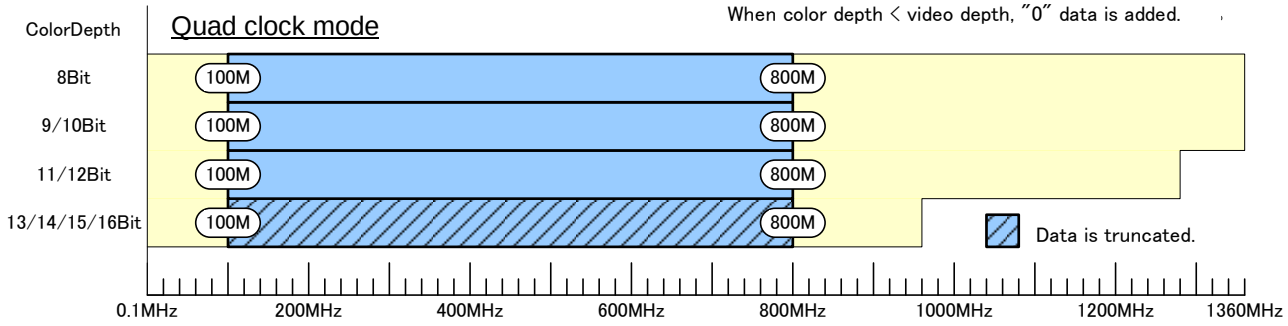




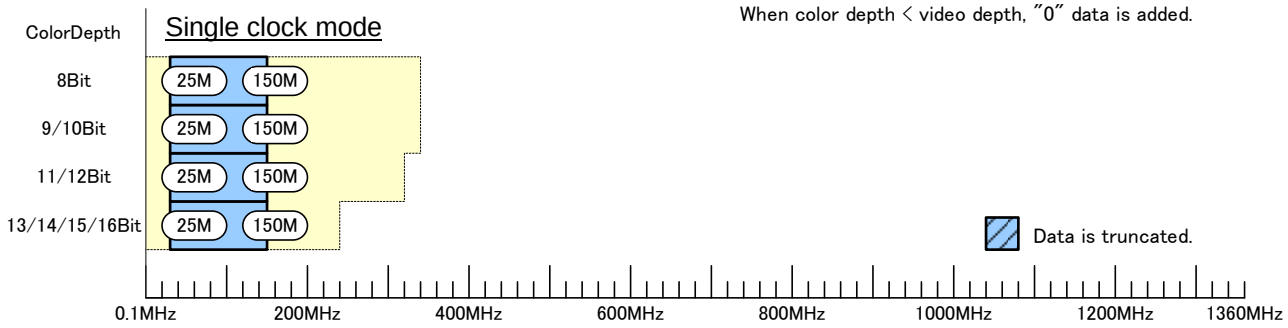
3) When the output video bit length (video width) is 12 bits

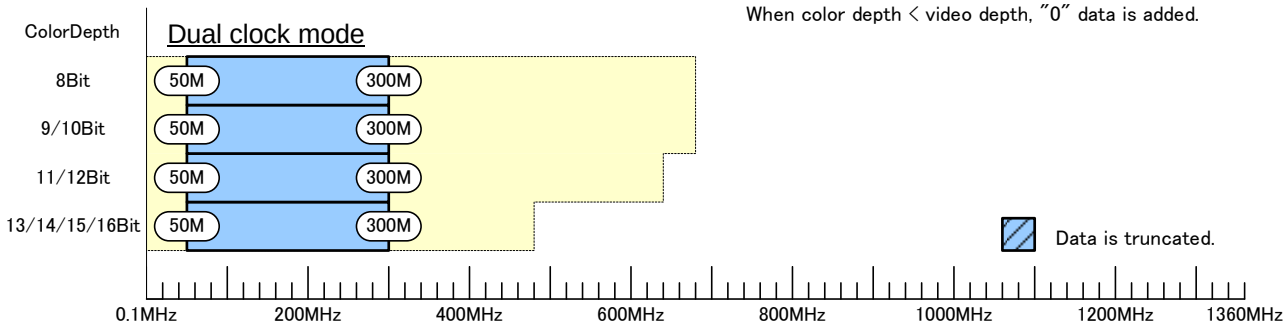


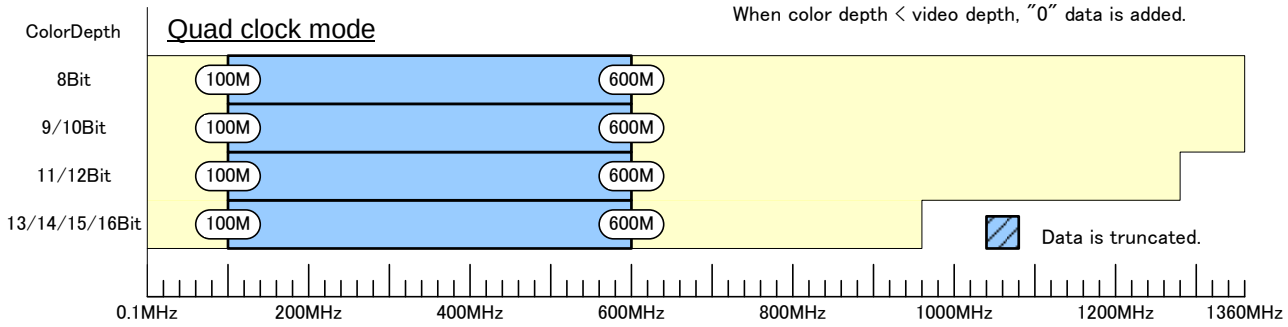




4) When the output video bit length (video width) is 16 bits





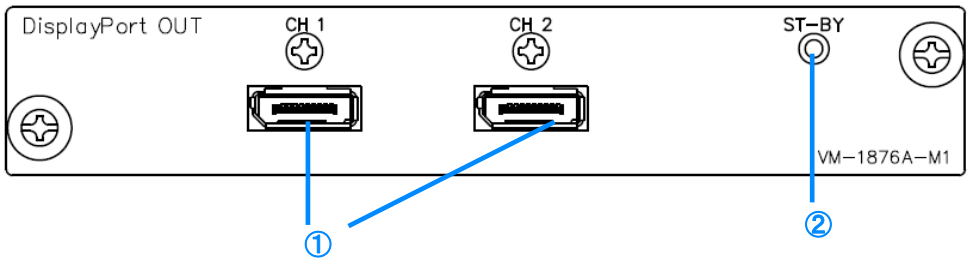


4.2 DisplayPort unit functions and settings

The applicable unit is as follows.

4.2.1 DisplayPort Unit VM-1876A-M1

● Unit exterior diagram



No.	Name	Description
①	DisplayPort outputs	The same video can be output from two lines at the same time Also, output with rendering split between the CH1 and CH2 set is possible. Multiple streams (maximum of 2 streams) can be transmitted from one connector by using Multi Stream Transport (MST) mode.
②	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

Important

- **HDCP settings**
  VM-1876A-M1 does not support HDCP.
- **After selecting function from 4.2.5 Select Function of DisplayPort configuration setting item, save the Config data with the SAVE key and restart the VG. After rebooting, the selected function is enabled.**
  ・Audio
  Use audio output function. When this function is used, MST is not supported.
  ・MST
  Use MST (Multi-Stream Transport) function. When using this function, the audio output function is not supported.

● Specifications

DisplayPort CH1 CH2	Standard		VESA DisplayPort Standard Ver1.2a		
	Connector		DisplayPort x2		
	Transfer modes		SST		
			MST		
	Video output	Dot clock	SST	Single clock mode **(*1)**	<For RGB/YCbCr444> 6 / 8 / 10 bit: 25 to 340 MHz <For YCbCr422> 6 / 8 / 10 bit: 25 to 340 MHz 12 bit: 25 to 320 MHz
				Dual clock mode **(*1)**	<For RGB/YCbCr444> 6 / 8 bit: 50 to 680 MHz (600 MHz) **(*2)** 10 bit: 50 to 680 MHz (576 MHz) **(*2)** <For YCbCr422> 6 / 8 / 10 bit: 50 to 680 MHz (600 MHz) **(*2)** 12 bit: 50 to 640 MHz (600 MHz) **(*2)**
				Quad clock mode **(*1)**	<For RGB/YCbCr444> 6 / 8/ 10 bit: 100 to 1200 MHz <For YCbCr422> 6 / 8 / 10 / 12 bit: 100 to 1200 MHz
			MST	Single clock mode	Output OFF
				Dual clock mode	<For RGB/YCbCr444> 6 / 8 bit: 50 to 600 MHz 10 bit: 50 to 576 MHz <For YCbCr422> 6 / 8 / 10 / 12 bit: 50 to 600 MHz
				Quad clock mode	<For RGB/YCbCr444> 6 / 8 bit: 50 to 600 MHz 10 bit: 50 to 576 MHz <For YCbCr422> 6 / 8 / 10 / 12 bit: 50 to 600 MHz
		Gradations and formats	RGB, YCbCr444		6 bit, 8 bit, 10 bit
			YCbCr422		6 bit, 8 bit, 10 bit, 12 bit
		Link rate	RBR : 1.62 Gbps HBR : 2.7 Gbps HBR2 : 5.4 Gbps		
	Audio output **(*3)**	L-PCM	Number of channels		Max.8CH
			Sampling frequency		32kHz, 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz
			Output frequency		20 to (1/2 of sampling frequency) Hz
	AUX-CH	Transfer rate	1 Mbps		
		Support functions	DPCD, E-EDID: Ver1.4, MCCS (DDC/CI): Ver1.1		
	External power supply		3.3 V / 500 mA with each channel		
	Copy protect		Not supported		

*1 For details, refer to "**4.2.33 DisplayPort data transfer method**".
*2 The values within () are the dot clock upper limit values when one image is output (rendered) with one connector.
*3 The sending of Audio InfoFrame and Channel Status Bit is not supported. Also, audio output is not supported when signal output in the MST mode.

■ **Unsupported timing**

Interlace timing at which V total (Field - 1 Total 1 + Field 2 Total 2) becomes even number cannot be output due to product specification restrictions.

Therefore, the following timing cannot be output among the built-in timing (subjected category: VESA, EIA, 4K) of VG-876, 877, 879

Program #	Timing
1075	EIA1920x1080i@50

■ **Amount of data that can be transferred (pixel clock upper limit)**

The amount of data that can be transferred (pixel clock upper limit) differs depending on the link rate, lane count, and output bit width.

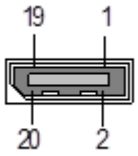
Link Configuration		Maximum Pixel Clock			
Link Rate	Lane Count	18 bpp	24 bpp	30 bpp	36 bpp
HBR2 (5.4 Gbps)	4 lanes	960 MHz	720 MHz	576 MHz	480 MHz
	2 lanes	480 MHz	360 MHz	288 MHz	240 MHz
	1 lane	240 MHz	180 MHz	144 MHz	120 MHz
HBR (2.7 Gbps)	4 lanes	480 MHz	360 MHz	288 MHz	240 MHz
	2 lanes	240 MHz	180 MHz	144 MHz	120 MHz
	1 lane	120 MHz	90 MHz	72 MHz	60 MHz
RBR (1.62 Gbps)	4 lane	288 MHz	216 MHz	172.8 MHz	144 MHz
	2 lane	144 MHz	108 MHz	86.4 MHz	72 MHz
	1 lane	72 MHz	54 MHz	43.2 MHz	36 MHz

*** The values included in this table are the standard values (theoretical values). A pixel clock that exceeds the specifications of the VG-876 and VG-879 units cannot be output.**

For details, refer to “4.2.88 Relationship between Pattern Rendering Bit Length and Dot Clock”.

4.2.2 Connector and pin assignment

● Connector: Hosiden TCX3250-111387



Pin No.	Signal
1	MainLink Lane0(p)
2	GND
3	MainLink Lane0(n)
4	MainLink Lane1(p)
5	GND
6	MainLink Lane1(n)
7	MainLink Lane2(p)
8	GND
9	MainLink Lane2(n)
10	MainLink Lane3(p)
11	GND
12	MainLink Lane3(n)
13	GND
14	GND
15	AUX CH(p)
16	GND
17	AUX CH(n)
18	Hot Plug Detect
19	PWR_Return (unused, OPEN)
20	DP_PWR(+3.3V)

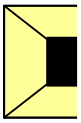
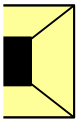
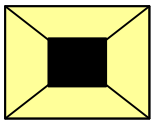
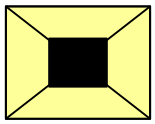
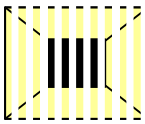
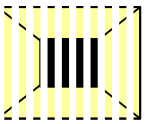
4.2.3 DisplayPort data transfer method

Output from DisplayPort IF BOARD is switched depending on the DotClk Mode and Split Mode setting values.
The supported split settings are as follows. Also, the examples show the case when the resolution is 3840 x 2160.
* The setting item "DotClk Range (Stream Count)" in DisplayPort output mode follows the setting of DotClk Mode in "2.1 ALL OUTPUT."
* The setting item "Output Mode" in DisplayPort output mode follows the setting of Split Mode in "2.1 ALL OUTPUT".
* For details on DotClk Mode and Split Mode setting, refer to "2.1 ALL OUTPUT".

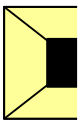
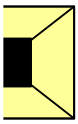
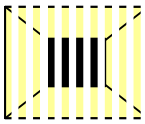
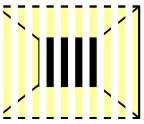
《Trans Mode=SST 1Board / DotClk Range=Under 340MHz》

No split

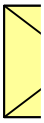
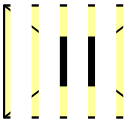
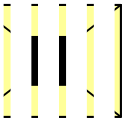
《Trans Mode=SST 1Board / DotClk Range=Under 680MHz》

Output Mode	CH 1	CH 2
Top/Bottom		
	Upper half	Lower half
Left/Right		
	Left half	Right half
NoSplit		
	No split	No split
Even/Odd		
	Even number pixel data (Pixel 0, 2, 4…)	Odd number pixel data (Pixel 1, 3, 5…)

《Trans Mode=SST 1Board / DotClk Range=Over 680MHz》

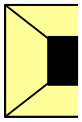
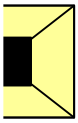
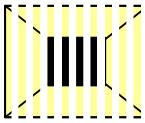
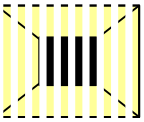
Output Mode	CH 1	CH 2
Top/Bottom		
	Upper half	Lower half
Left/Right		
	Left half	Right half
Even/Odd		
	Even number pixel data (Pixel 0, 2, 4…)	Odd number pixel data (Pixel 1, 3, 5…)

《Trans Mode=SST 2Boards / DotClk Range=Over 680MHz》

Output Mode	SLOT 1		SLOT 2	
	CH 1	CH 2	CH 1	CH 2
Square				
	Top left	Top right	Bottom left	Bottom right
4V Stripe				
	Block 1	Block 2	Block 3	Block 4
No Split				
	Pixel 0, 4, 8…	Pixel 1, 5, 9…	Pixel 2, 6, 10…	Pixel 3, 7, 11…

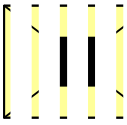
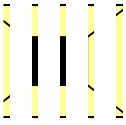
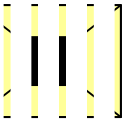
《Trans Mode=MST 1Board / Stream Count=2 Streams》

- The same Stream is output from both CH 1 and CH 2.

Output Mode	Stream 1	Stream 2
Top/Bottom		
	Upper half	Lower half
Left/Right		
	Left half	Right half
Even/Odd		
	Even number pixel data (Pixel 0, 2, 4…)	Odd number pixel data (Pixel 1, 3, 5…)

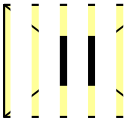
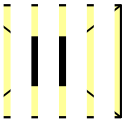
《Trans Mode=MST 1Board / Stream Count=4 Streams》

- The same Stream is output from both CH 1 and CH 2.

Output Mode	Stream 1	Stream 2	Stream 3	Stream 4
Square				
	Top left	Top right	Bottom left	Bottom right
4V Stripe				
	Block 1	Block 2	Block 3	Block 4
No Split				
	Pixel 0, 4, 8…	Pixel 1, 5, 9…	Pixel 2, 6, 10…	Pixel 3, 7, 11…

《Trans Mode=MST 2Boards(4s) / DotClk Range=Over 680MHz》

- The same Stream is output from both CH 1 and CH 2 in each slot.

Output Mode	SLOT 1		SLOT 2	
	Stream 1	Stream 2	Stream 1	Stream 2
Square				
	Top left	Top right	Bottom left	Bottom right
4V Stripe				
	Block 1	Block 2	Block 3	Block 4
No Split				
	Pixel 0, 4, 8…	Pixel 1, 5, 9…	Pixel 2, 6, 10…	Pixel 3, 7, 11…

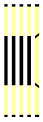
《Trans Mode=MST 2Boards(8s) / DotClk Range=Over 680MHz》

- The same Stream is output from both CH 1 and CH 2 in each slot.

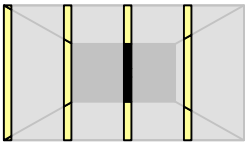
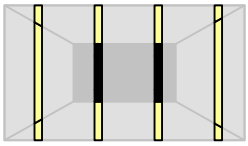
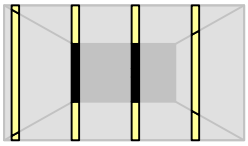
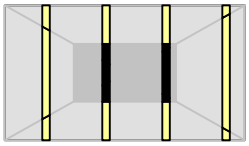
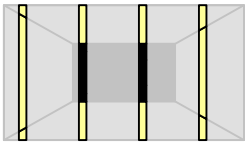
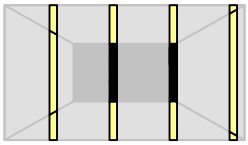
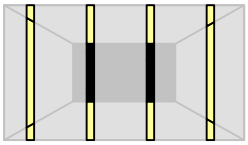
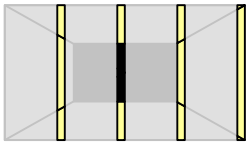
Output Mode=Square

SLOT	Stream 1	Stream 2	Stream 3	Stream 4
SLOT 1				
	Top left (Even number pixel data)	Top left (Odd number pixel data)	Top right (Even number pixel data)	Top right (Odd number pixel data)
SLOT 2				
	Bottom left (Even number pixel data)	Bottom left (Odd number pixel data)	Bottom right (Even number pixel data)	Bottom right (Odd number pixel data)

Output Mode=4V Stripe

SLOT	Stream 1	Stream 2	Stream 3	Stream 4
SLOT 1				
	Block 1 (Even number pixel data)	Block 1 (Odd number pixel data)	Block 2 (Even number pixel data)	Block 2 (Odd number pixel data)
SLOT 2				
	Block 3 (Even number pixel data)	Block 3 (Odd number pixel data)	Block 4 (Even number pixel data)	Block 4 (Odd number pixel data)

Output Mode=No Split

SLOT	Stream 1	Stream 2	Stream 3	Stream 4
SLOT 1				
	Pixel 0,8,16….	Pixel 4,12,20…	Pixel 1,9,17…	Pixel 5,13,21…
SLOT 2				
	Pixel 2,10,18….	Pixel 6,14,22…	Pixel 3,11,19…	Pixel 7,15,23…

Yellow and black part indicate pixel data.

4.2.4 DisplayPort output setting items

This section describes output settings for the DisplayPort unit.

Level 1	Level 2	Level 3	Setting item	Setting value
DisplayPort				
	Output OFF/ON	**[VG-876, 877, 879] Port1 to Port8** **Sets ON/OFF for each Port.**		**0: OFF / 1: ON**
	Video Output Sets video output to on or off.			**0: OFF / 1: ON**
	Audio Output Sets embedded audio output.			**0: OFF / 1: ON**
	Trans Mode Sets the video stream transmission mode. * The setting is enabled only for VM-1876A-M1. When selecting MST, set the Configuration → DP → Select Function setting to MST. For details, refer to "**4.2.55 DisplayPort configuration setting items**".			**0:SST 1Board** **1:MST 1Board** **2:SST 2Boards** **3:MST 2Boards (4S)** **4:MST 2Boards (8S)**
	When Trans Mode = 0 (SST) is selected, the following setting items are displayed.			
	DotClk Range * This is in accordance with the DotClk Mode setting in "**2.1 ALL OUTPUT**".			**0: Under 340MHz** **1: Under 680MHz** **2: Over 680MHz**
	Output Mode Sets the screen split output mode. * This is in accordance with the Split Mode setting in "**2.1 ALL OUTPUT**". * The items differ depending on DotClk Range.		**When DotClk Range = Under 680 MHz**	**0: Top / Bottom** **1: Left / Right** **2: Top / Bottom** **3: Left / Right** **4: No Split** **5: Even / Odd** **6: No Split** **7: Even / Odd** **8: Left / Right** **9: Left / Right**
			When DotClk Range = Over 680 MHz	**0: Top Bottom** **1: Reserve** **2: Top Bottom** **3: Reserve** **4: Left / Right** **5: Left / Right** **6: Left / Right** **7: Reserve** **8: Reserve** **9: Even / Odd** **A: No Output**
	When Trans Mode = 1 (MST) is selected, the following setting items are displayed.			
	Stream Count **Sets the number of streams to transmit.** *** This is in accordance with the DotClk Mode setting in "2.1 ALL OUTPUT".**			**0: No Output** **1: 2 Stream** **2: No Output**
	Output Mode **Sets the stream output mode.** * This is in accordance with the Split Mode setting in "**2.1 ALL OUTPUT**".		**Stream Count = 2**	**When 2 streams** **0: Top / Bottom** **1: Left / Right** **2: Top / Bottom** **3: Left / Right** **4: Even / Odd** **5: Even / Odd** **6: Even / Odd** **7: Even / Odd** **8: Left / Right** **9: Left / Right**

Level 1	Level 2	Level 3	Setting item	Setting value
Display Port			**Stream Count = 4**	**0:Square** **1:4V Stripe** **2:Square** **3:4V Stripe** **4:No Output** **5:No Output** **6:No Output** **7:4V Stripe** **8:4V Stripe** **9:No Split** **A:No Output**
	When Trans Mode = 2 (SST 2 boards) is selected, the following setting items are displayed.			
	DotClk Range *** This is in accordance with the DotClk Mode setting in "2.1 ALL OUTPUT".**			**0:No Output** **1:No Output** **2:Over 680MHz**
	Output Mode **Sets the image split mode.** * This is in accordance with the Split Mode setting in "**2.1 ALL OUTPUT**". Depends on DotClk Range, the setting item is different.		**DotClk Range=Over 680MHz**	**0:Square** **1:4V Stripe** **2:Square** **3:4V Stripe** **4:No Output** **5:No Output** **6:No Output** **7:4V Stripe** **8:4V Stripe** **9:No Split** **A:No Output**
	When Trans Mode = 3 (MST 2 boards (4S)) is selected, the following setting items are displayed.			
	DotClk Range *** This is in accordance with the DotClk Mode setting in "2.1 ALL OUTPUT".**			**0:No Output** **1:No Output** **2:Over 680MHz**
	Output Mode **Sets the image split mode.** * This is in accordance with the Split Mode setting in "**2.1 ALL OUTPUT**". Depends on DotClk Range, the setting item is different.		**DotClk Range=Over 680MHz**	**0:Square** **1:4V Stripe** **2:Square** **3:4V Stripe** **4:No Output** **5:No Output** **6:No Output** **7:4V Stripe** **8:4V Stripe** **9:No Split** **A:No Output**
	When Trans Mode = 4 (MST 2 boards (8S)) is selected, the following setting items are displayed.			
	DotClk Range *** This is in accordance with the DotClk Mode setting in "2.1 ALL OUTPUT".**			**0:No Output** **1:No Output** **2:Over 680MHz**
	Output Mode **Sets the image split mode.** * This is in accordance with the Split Mode setting in "**2.1 ALL OUTPUT**". Depends on DotClk Range, the setting item is different.		**DotClk Range=Over 680MHz**	**0:Square** **1:4V Stripe** **2:Square** **3:4V Stripe** **4:No Output** **5:No Output** **6:No Output** **7:4V Stripe** **8:4V Stripe** **9:No Split** **A:No Output**

Level 1	Level 2	Level 3	Setting item	Setting value
DisplayPort				
	Video Format Sets the color space of video output from DisplayPort. * When YCbCr4:2:2, use this as a parameter check of the Main Stream Attribute Data because gradation display in accordance with the set bit length (gradation) is not possible.			**0: RGB** **1: YCbCr4:4:4** **2: YCbCr4:2:2**
	Width Sets the output video bit length. This can be set to a bit length that is independent of pattern rendering, or the same bit length can be selected automatically. * The portion of the bit length of pattern rendering that exceeds the bit length set here will be truncated. Furthermore, if there is a missing portion, it will be compensated for with "0." * 12-bit is enabled only when Format is YCbCr4:2:2.			**0: Auto** **1: 6 bit** **2: 8 bit** **3: 10 bit** **4: 12 bit**
	Colorimetry Selects YCbCr Colorimetry of Main Stream Attribute. * This setting is a setting only for Main Stream Attribute. Change the setting for the color difference coefficient in "10.2.7 RGB/YPbPr selection and color difference coefficient settings".			**0: ITU601** **1: ITU709**
	Link Set Mode Selects the setting method for the link rate and number of lanes.			**0: Auto** **1: Manual**
	When Link Set Mode = 1 (Manual) is selected, the following setting items are enabled.			
	Link Rate Sets the link rate.			**0: RBR (1.62 Gbps)** **1: HBR (2.7 Gbps)** **2: HBR2 (5.4 Gbps)**
	Lane Count Sets the number of output lanes.			**0: 1 lane** **1: 2 lanes** **2: 4 lanes**
	Nvid Sets the Nvid value. * The Mvid value is calculated automatically from the DotClock and Nvid values. * The Nvid setting cannot be changed with the VM-1876A-M1. It is fixed to 0x8000(32768).			**1 to 1667216**
	InfoFrame/ Packet	**Audio InfoFrame**	**OFF/ON**	**0:OFF / 1:ON**
			Type :	**4 (fixed)**
			Version :	**1 (fixed)**
			Coding Type	**0:Refer Stream Header**
				1:IEC60958 PCM
				2:AC-3
				3:MPEG1(Layers 1&2)
				4:MP3(MPEG1 Layer 3)
				5:MPEG2(multi ch.)
				6:AAC
				7:DTS
				8:ATRAC
				9:One Bit Audio
				A:Dolby Digital+
				B:DTS-HD
				C:MLP
				D:DST
				E:WMA Pro
				F:Refer Extension
			Coding ExtType	**0:(not use1)**
				1:(not use2)
				2:(not use3)
				3:HE-AAC
				4:HE-AACv2
				5:AAC LC
				6:DRA
				7:HE-AAC Surround

Level 1	Level 2	Level 3	Setting item	Setting value
	InfoFrame/ Packet	Audio InfoFrame		8:(reserved)
				9:AAC-LC Surround
			Channel Count	0:Refer Stream Header
				1:2ch
				2:3ch
				3:4ch
				4:5ch
				5:6ch
				6:7ch
				7:8ch
			Sampling Freq	0:Refer Stream Header
				1:32kHz
				2:44.1kHz
				3:48kHz
				4:88.2kHz
				5:96kHz
				6:176.4kHz
				7:192kHz
			Sample Size	0:Refer Stream Header
				1:16bit
				2:20bit
				3:24bit
			Channel Allocation :	0 to 50

	8ch	7ch	6ch	5ch	4ch	3ch	2ch	1ch
0		–	–	–	–	–	FR	FL
1		–	–	–	–	LFE	FR	FL
2		–	–	–	FC	–	FR	FL
3		–	–	–	FC	LFE	FR	FL
4		–	–	RC	–	–	FR	FL
5		–	–	RC	–	LFE	FR	FL
6		–	–	RC	FC	–	FR	FL
7		–	–	RC	FC	LFE	FR	FL
8		–	RR	RL	–	–	FR	FL
9		–	RR	RL	–	LFE	FR	FL
10		–	RR	RL	FC	–	FR	FL
11		–	RR	RL	FC	LFE	FR	FL
12		RC	RR	RL	–	–	FR	FL
13		RC	RR	RL	–	LFE	FR	FL
14		RC	RR	RL	FC	–	FR	FL
15		RC	RR	RL	FC	LFE	FR	FL
16	RRC	RLC	RR	RL	–	–	FR	FL
17	RRC	RLC	RR	RL	–	LFE	FR	FL
18	RRC	RLC	RR	RL	FC	–	FR	FL
19	RRC	RLC	RR	RL	FC	LFE	FR	FL
20	FRC	FLC	–	–	–	–	FR	FL
21	FRC	FLC	–	–	–	LFE	FR	FL
22	FRC	FLC	–	–	FC	–	FR	FL
23	FRC	FLC	–	–	FC	LFE	FR	FL
24	FRC	FLC	–	RC	–	–	FR	FL
25	FRC	FLC	–	RC	–	LFE	FR	FL
26	FRC	FLC	–	RC	FC	–	FR	FL
27	FRC	FLC	–	RC	FC	LFE	FR	FL
28	FRC	FLC	RR	RL	–	–	FR	FL
29	FRC	FLC	RR	RL	–	LFE	FR	FL
30	FRC	FLC	RR	RL	FC	–	FR	FL
31	FRC	FLC	RR	RL	FC	LFE	FR	FL
32	–	FCH	RR	RL	FC	–	FR	FL
33	–	FCH	RR	RL	FC	LFE	FR	FL

Level 1	Level 2	Level 3	Setting item	Setting value

34	TC	–	RR	RL	FC	–	FR	FL
35	TC	–	RR	RL	FC	LFE	FR	FL
36	FRH	FLH	RR	RL	–	–	FR	FL
37	FRH	FLH	RR	RL	–	LFE	FR	FL
38	FRW	FLW	RR	RL	–	–	FR	FL
39	FRW	FLW	RR	RL	–	LFE	FR	FL
40	TC	RC	RR	RL	FC	–	FR	FL
41	TC	RC	RR	RL	FC	LFE	FR	FL
42	FCH	RC	RR	RL	FC	–	FR	FL
43	FCH	RC	RR	RL	FC	LFE	FR	FL
44	TC	FCH	RR	RL	FC	–	FR	FL
45	TC	FCH	RR	RL	FC	LFE	FR	FL
46	FRH	FLH	RR	RL	FC	–	FR	FL
47	FRH	FLH	RR	RL	FC	LFE	FR	FL
48	FRW	FLW	RR	RL	FC	–	FR	FL
49	FRW	FLW	RR	RL	FC	LFE	FR	FL
50	Reserved							

Level Shift Value　:	**0 ~ 15 [dB]**
Down-mix	**0:Permitted/No Info**
	1:Prohibited
LFE PB Level	**0:Unknown**
	1:0dB Playback
	2:+10dB Playback

● About Main Stream Attribute settings

The Main Stream Attributes used when performing DisplayPort transmission are reflected according to the following settings.

Item		Setting place
M and N for stream clock recovery	Mvid	The Mvid value is calculated automatically from the DotClock and Nvid values. (VG-876, 877 and VG-879 are fixed to Asynchronous mode so the Mvid value changes.)
	Nvid	VG-876, 877 and VG-879 are fixed to Asynchronous mode so the Nvid value is sent by 0x8000 (32,768).
Horizontal/Vertical Timing	Total / Active start Active video width Sync width	This is calculated from the value set in the timing setting.
	polarity	Follows the polarity setting of the synchronization signal settings in the output settings.
Miscellaneous0	Synchronous Clock	The mode is fixed to Asynchronous mode with the VG-876, 877 and VG-879.
	Component format	Follows “Video Format” in the DisplayPort settings. For this item, refer to《Setting parameters of DP unit》.
	Dynamic range	Follows the level mode setting in the output settings. Full　: VESA range　　Limited　: CEA range
	YCbCr Colorimetry	Follows “Colorimetry” in the DisplayPort settings. For this item, refer to《Setting parameters of DP unit》.
	Bit depth per color component	Follows “Width” in the DisplayPort settings. For this item, refer to《Setting parameters of DP unit》.
Other		Settings other than the above are not supported with the VG-876, 877 and VG-879.

4.2.5 DisplayPort configuration setting items

This section describes configuration settings for the DisplayPort unit.
Set these settings from MENU > Configuration.

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Setting item</th><th>Setting value</th></tr>
<tr><td>Configuration</td><td colspan="4"></td></tr>
<tr><td></td><td>DP</td><td colspan="3"></td></tr>
<tr><td></td><td></td><td>Select Function</td><td>Function</td><td>0: Audio
1: MST</td></tr>
<tr><td></td><td></td><td colspan="3">・ Audio
Uses the audio output function. MST is not supported when this function is used.
・ MST
Uses the Multi-Stream Transport (MST) function. The audio output function is not supported when this function is used.
* After selecting the function, save the configuration data with the SAVE key and restart the VG. The selected function will be enabled after the restart.</td></tr>
<tr><td></td><td></td><td>Analysis Port

* Select the port to use for DP analysis.</td><td colspan="2">0: DP1
1: DP2
2: DP3
3: DP4
4: DP5
5: DP6
6: DP7
7: DP8</td></tr>
<tr><td></td><td></td><td>Link Set Mode</td><td colspan="2">0: refer Program
Follows the program setting.
1: Auto
Output always follows DPCD of the sink device.
2: Manual
Output always follows the link rate and lane count set in the Configuration menu.</td></tr>
</table>

4.2.6 DP Analysis setting items

Set the DP Analysis settings.
Set these settings from MENU > DP Analysis.

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th colspan="4">Setting item</th><th>Setting value</th></tr>
<tr><td colspan="8">MENU</td></tr>
<tr><td></td><td>DP Analysis</td><td>I/F Check

* Performs a simple checks of the DisplayPort interface.
Page = 1 (VG-876, 877, 879 only)</td><td>7</td><td>LT</td><td colspan="2">Performs link training with each press.
The link rate and lane count when link training is executed follow the setting values in the DisplayPort Output Settings menu.</td><td></td></tr>
<tr><td></td><td></td><td></td><td>8</td><td>PW SAVE</td><td colspan="2">Sets the power save mode setting for the connected device. (*1)</td><td></td></tr>
<tr><td></td><td></td><td></td><td>4</td><td>AUD_MUTE</td><td colspan="2">Turns Audio MUTE on/off.</td><td></td></tr>
<tr><td></td><td></td><td></td><td>0</td><td>EDIT</td><td colspan="2">Enters the DisplayPort Output Settings menu. (*2)</td><td></td></tr>
<tr><td></td><td></td><td>Page = 2 (VG-876, 877, 879 only)</td><td>7</td><td>DEFAULT</td><td colspan="2">Restores the pattern of the currently selected program.</td><td></td></tr>
<tr><td></td><td></td><td></td><td>8</td><td>LIST</td><td colspan="2">Displays the DisplayPort display screen GUI (refer to “10.4.4 Displaying DisplayPort Setting Information”).</td><td></td></tr>
<tr><td></td><td></td><td></td><td>9</td><td>EDID</td><td colspan="2">Reads the EDID of the connected device. This is the same as the normal EDID Read.</td><td></td></tr>
<tr><td></td><td></td><td></td><td>0</td><td>EDIT</td><td colspan="2">Enters the DisplayPort Output Settings menu. (*2)</td><td></td></tr>
<tr><td></td><td></td><td>Training Pattern

* This is a mode for outputting any training pattern to use for the consistency check of the DisplayPort interface.</td><td colspan="4">Pattern Select
Sets the pattern.</td><td>0: TPS1 (D10.2)
Outputs Training Pattern Sequence 1 (D10.2 test pattern).</td></tr>
<tr><td></td><td></td><td></td><td colspan="4"></td><td>1: TPS2
Outputs Training Pattern Sequence 2.</td></tr>
<tr><td></td><td></td><td></td><td colspan="4"></td><td>2: Symbol Error Rate
Outputs Symbol Error Rate Measurement Pattern. (This outputs only and does not measure the error rate.)</td></tr>
<tr><td></td><td></td><td></td><td colspan="4"></td><td>3: PRBS7
Outputs PRBS7 Pattern.</td></tr>
<tr><td></td><td></td><td></td><td colspan="4"></td><td>4: TPS3
Outputs Training Pattern Sequence 3.</td></tr>
<tr><td></td><td></td><td></td><td colspan="4"></td><td>5: 80 bit Custom
Outputs 80bit custom pattern.</td></tr>
<tr><td></td><td></td><td></td><td colspan="4"></td><td>6: CP2520
Outputs HBR2 Compliance EYE pattern (CP2520).</td></tr>
<tr><td></td><td></td><td></td><td colspan="4">Link Rate
Sets the link rate.</td><td>0: RBR (1.62 Gbps)
1: HBR (2.7 Gbps)
2: HBR2 (5.4 Gbps)</td></tr>
<tr><td></td><td></td><td></td><td colspan="4">Lane Count
Sets the number of output lanes.</td><td>0: 1 lane
1: 2 lane
2: 4 lane</td></tr>
<tr><td></td><td></td><td></td><td colspan="4">Voltage Swing
Sets the voltage swing level (differential motion level).
* The setting range differs depending on the pre-emphasis.
<table><tr><th rowspan="2">Voltage Swing</th><th colspan="4">Pre-emphasis</th></tr><tr><th>0 dB</th><th>3.5 dB</th><th>6 dB</th><th>9.5 dB</th></tr><tr><td>0.4 V</td><td>○</td><td>○</td><td>○</td><td>○</td></tr><tr><td>0.6 V</td><td>○</td><td>○</td><td>○</td><td>×</td></tr><tr><td>0.8 V</td><td>○</td><td>○</td><td>×</td><td>×</td></tr><tr><td>1.2 V</td><td>○</td><td>×</td><td>×</td><td>×</td></tr></table></td><td>0: 0.4 V
1: 0.6V
2: 0.8V
3: 1.2V</td></tr>
<tr><td></td><td></td><td></td><td colspan="4">Pre-emphasis
* The setting range differs depending on the voltage swing.</td><td>0: 0 db
1: 3.5 db
2: 6.0 db
3: 9.5 db</td></tr>
</table>

***1 About the PW_SAVE setting**

When PW_SAVE is set, the VG876 and VG-879 execute the following processing.

<PW_SAVE=ON>

Writes “0x02” to DPCD 0x00600 Bits1:0 (SET_POWER) of the connected sync device and sets Main Link and AUXCH to the power down state.

<PW_SAVE=OFF>

Wakes up Main Link and AUXCH and writes “0x01” to DPCD 0x00600 Bits1:0 (SET_POWER) of the connected sync device. At this time, Link Training is not executed. Press “**LT**” to execute Link Training.

***2 About the EDIT settings**

If a setting item (e.g., Link Rate) in the EDIT menu is changed, the setting is also reflected for output ports other than the specified output port (analysis port).

4.2.7 Displaying setting information as patterns

The setting information (link rate, number of lanes, link training result, and DPCD) of DisplayPort can be displayed as patterns.

*** For details on the display procedure, refer to the "Pattern settings" section in this manual.**

● Setting display information (GUI Page 1)

This displays the settings for the DisplayPort interface (link rate, number of lanes, and Main Stream Attribute) and the link training result.

The following shows the details of the displayed information.

①	**DisplayPort Information**	**DPx**	Displays the port number (DP1 to DP8).
		Function	Displays the execution function (Audio/MST) of the VM-1876A-M1. (Only when VM-1876A-M1 implemented)
②	**Link Rate**	Displays the link rate.	
③	**Lane Count**	Displays the number of lanes.	
④	**Main Stream Attribute**	**Total, Active Start, Active Sync, Pol**	Displays the output MSA timing parameters.
		Synchronous Clock	Displays the output MSA MISC0 bit 0 value. * The VG-876, 877 and VG-879 are fixed to Asynchronous.
		Component Format	Displays the output MSA MISC0 bit7:1 value.
		Dynamic Range	
		YCbCr Colorimetry	
		Bit Depth per Color	
⑤	Result of link training of each lane	**Clock Recovery** Displays the values below DPCD Link Status Field.	**00202h Bit0(LANE0_CR_DONE)** **00202h Bit4(LANE1_CR_DONE)** **00203h Bit0(LANE2_CR_DONE)** **00203h Bit4(LANE3_CR_DONE)**
		Channel EQ Displays the values below DPCD Link Status Field.	**00202h Bit1(LANE0_CHANNEL_EQ_DONE)** **00202h Bit5 (LANE1_CHANNEL_EQ_DONE)** **00203h Bit1 (LANE2_CHANNEL_EQ_DONE)** **00203h Bit5 (LANE3_CHANNEL_EQ_DONE)**
⑥	Voltage swing and pre-emphasis of each lane	**Voltage Swing** Displays the values below DPCD Link Configuration Field.	**00103h(TRAINING_LANE0_SET)** **Bit1:0(VOLTAGE_SWING_SET)** **00104h(TRAINING_LANE1_SET)** **Bit1:0(VOLTAGE_SWING_SET)** **00105h(TRAINING_LANE2_SET)** **Bit1:0(VOLTAGE_SWING_SET)** **00106h(TRAINING_LANE3_SET)** **Bit1:0(VOLTAGE_SWING_SET)**
		Pre-emphasis Displays the values below DPCD Link Configuration Field.	**00103h(TRAINING_LANE0_SET)** **Bit4:3(PRE-EMPHASIS_SET)** **00104h(TRAINING_LANE1_SET)** **Bit4:3(PRE-EMPHASIS_SET)** **00105h(TRAINING_LANE2_SET)** **Bit4:3(PRE-EMPHASIS_SET)** **00106h(TRAINING_LANE3_SET)** **Bit4:3(PRE-EMPHASIS_SET)**

Display example

①DisplayPort Information (DP1) : VM-1876A-M1(Audio)

②Link Rate : 5.4Gbps (HBR2)
③Lane Count : 4 lanes

④---- Main Stream Attribute ----
M (at a certain time) : 18023
N : 32768

	H(dot)	V(Line)
Total	2200	1125
Active Start	192	41
Active	1920	1080
Sync	44	5
Pol	POSI	POSI

Synchronous Clock	Asynchronous
Component Format	RGB
Dynamic Range	VESA Range (Full Range)
YCbCr Colorimetry	ITU601
Bit Depth per Color/Component	8 bits

⑤

	LANE0	LANE1	LANE2	LANE3
Clock Recovery	PASS	PASS	PASS	PASS
Channel EQ	PASS	PASS	PASS	PASS

⑥

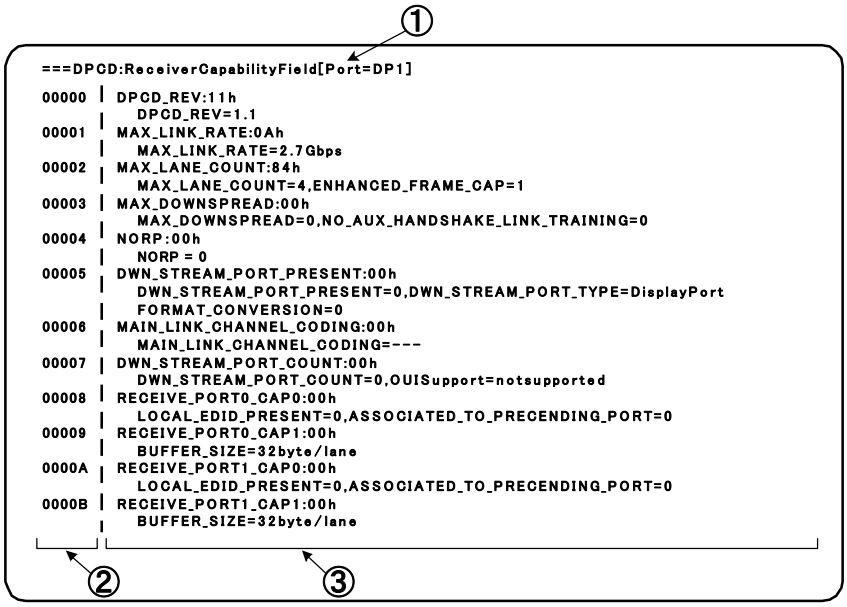
	LANE0	LANE1	LANE2	LANE3
Voltage Swing	0.4V	0.4V	0.4V	0.4V
Pre-emphasis	0dB	0dB	0dB	0dB

● DPCD display (from GUI Page 2, HEX is DPCD display only)

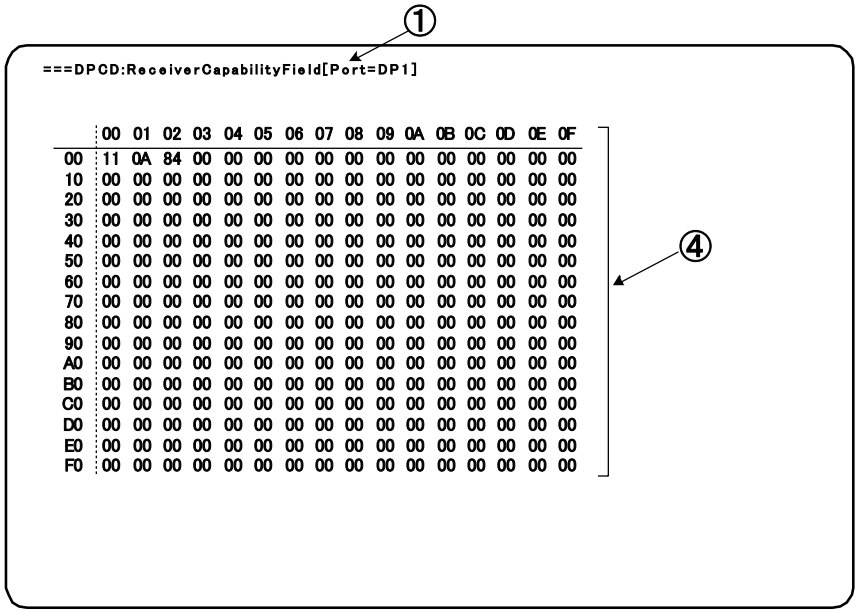
This displays the DisplayPort configuration data (DPCD). Change the addresses to display by changing the page.
The following shows the details of the information that can be displayed.

①	Fields of Port and DPCD displaying the setting states
②	DPCD addresses
③	Each parameter setting value
④	HEX display

DPCD display example (GUI)



DPCD display example (HEX)



The following items can also be displayed as patterns.
For details, refer to “Pattern Settings” in this manual.

● EDID
● DDC/CI

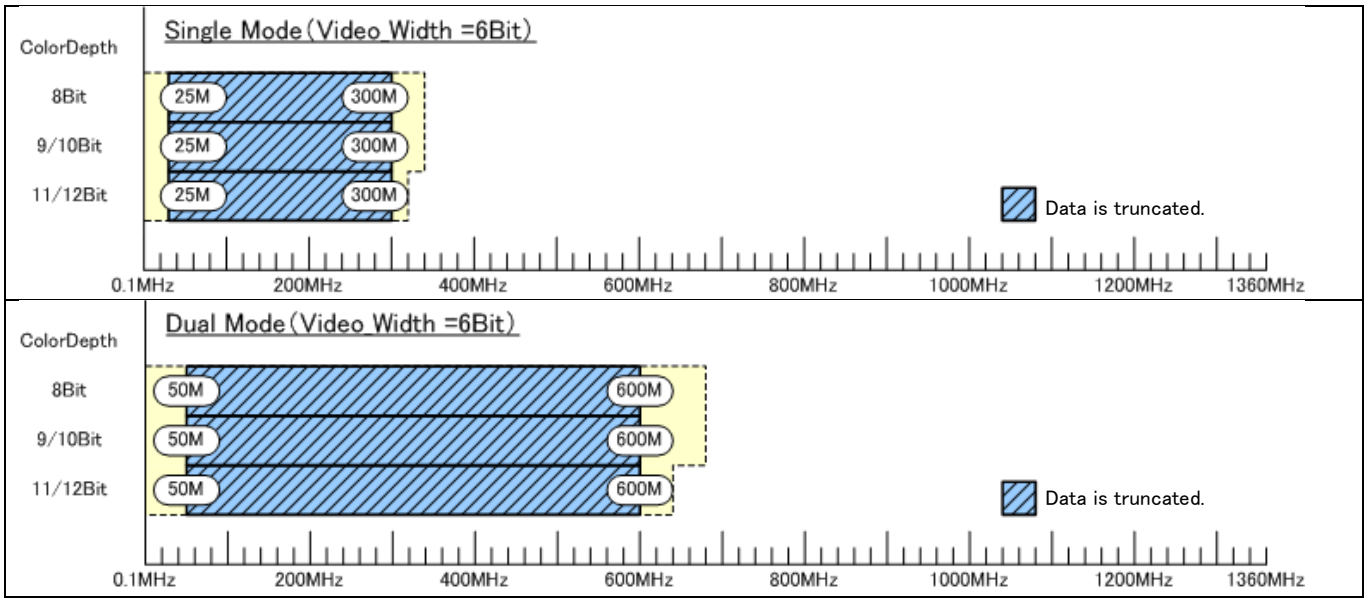
4.2.8 Relationship between Pattern Rendering Bit Length and Dot Clock

The dot clock is limited by the pattern rendering bit length (color depth) and dot clock operation mode (DotClk Mode) as shown below. Furthermore, when the output bit length (video width) of the DisplayPort interface is smaller than the pattern rendering bit length (color depth), data thinning occurs.

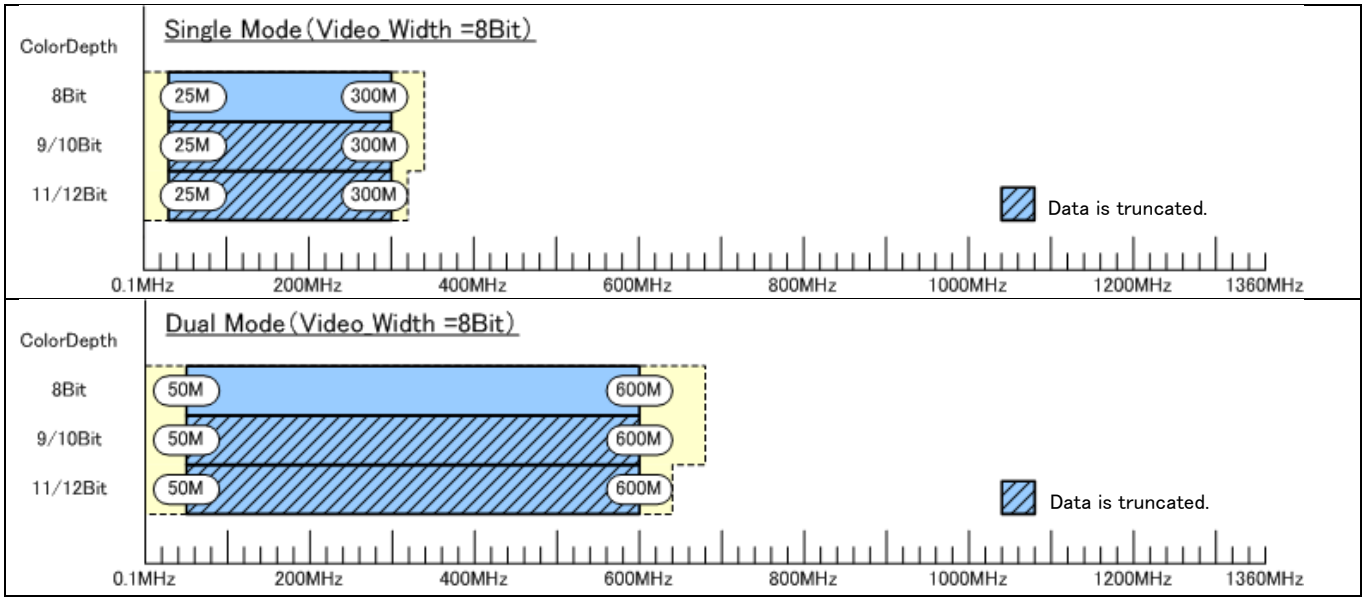
For details on the dot clock operation mode (DotClk Mode) and pattern bit length (color depth), refer to **"2.1 ALL OUTPUT**".
For details on the video width, refer to "**4.2.4 DisplayPort output setting items**".

● DisplayPort Unit VM-1876-M1

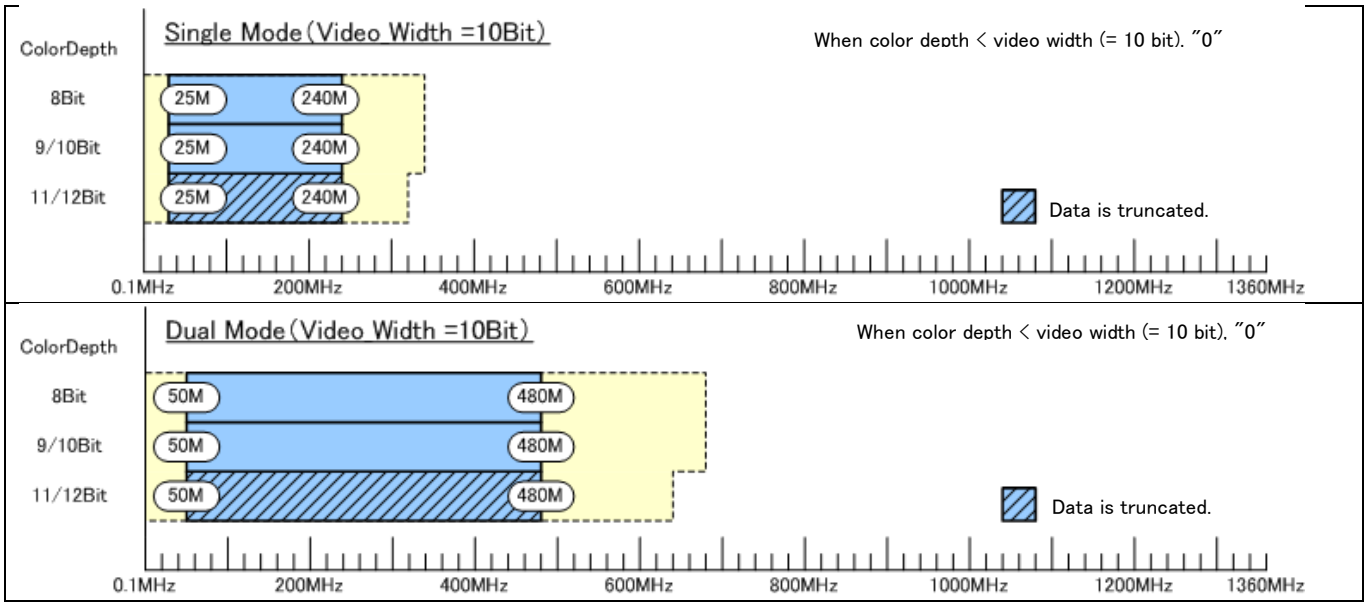
1) When the video width is 6 bits



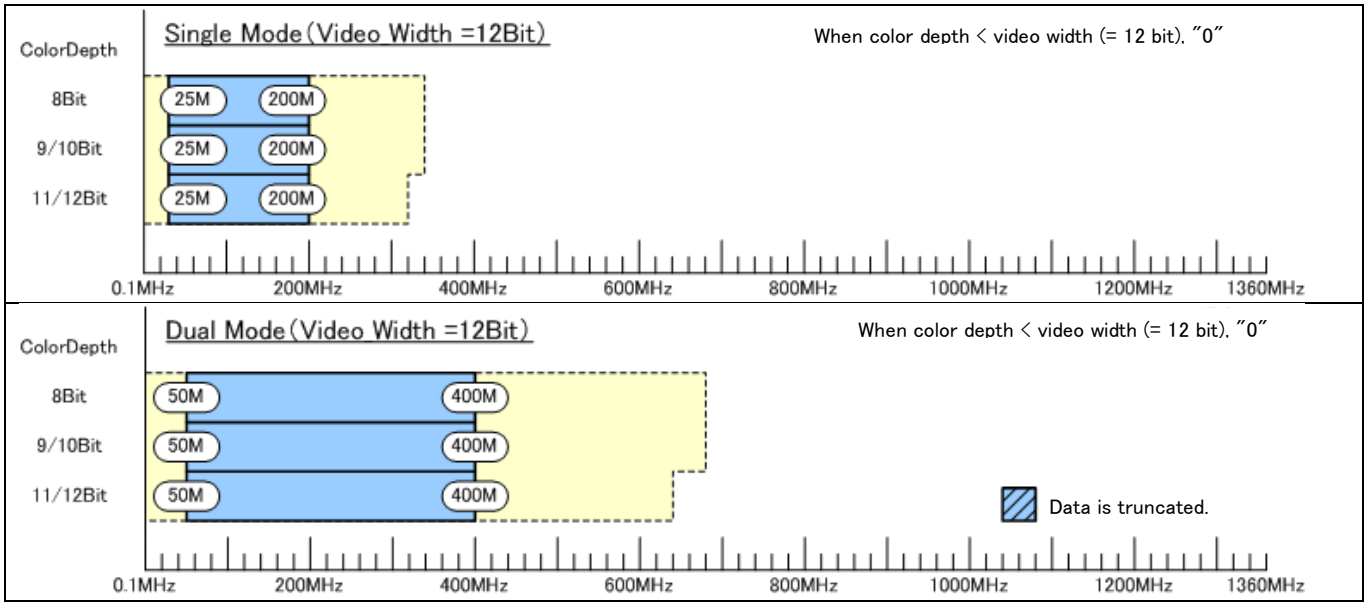
2) When the video width is 8 bits



3) When the video width is 10 bits



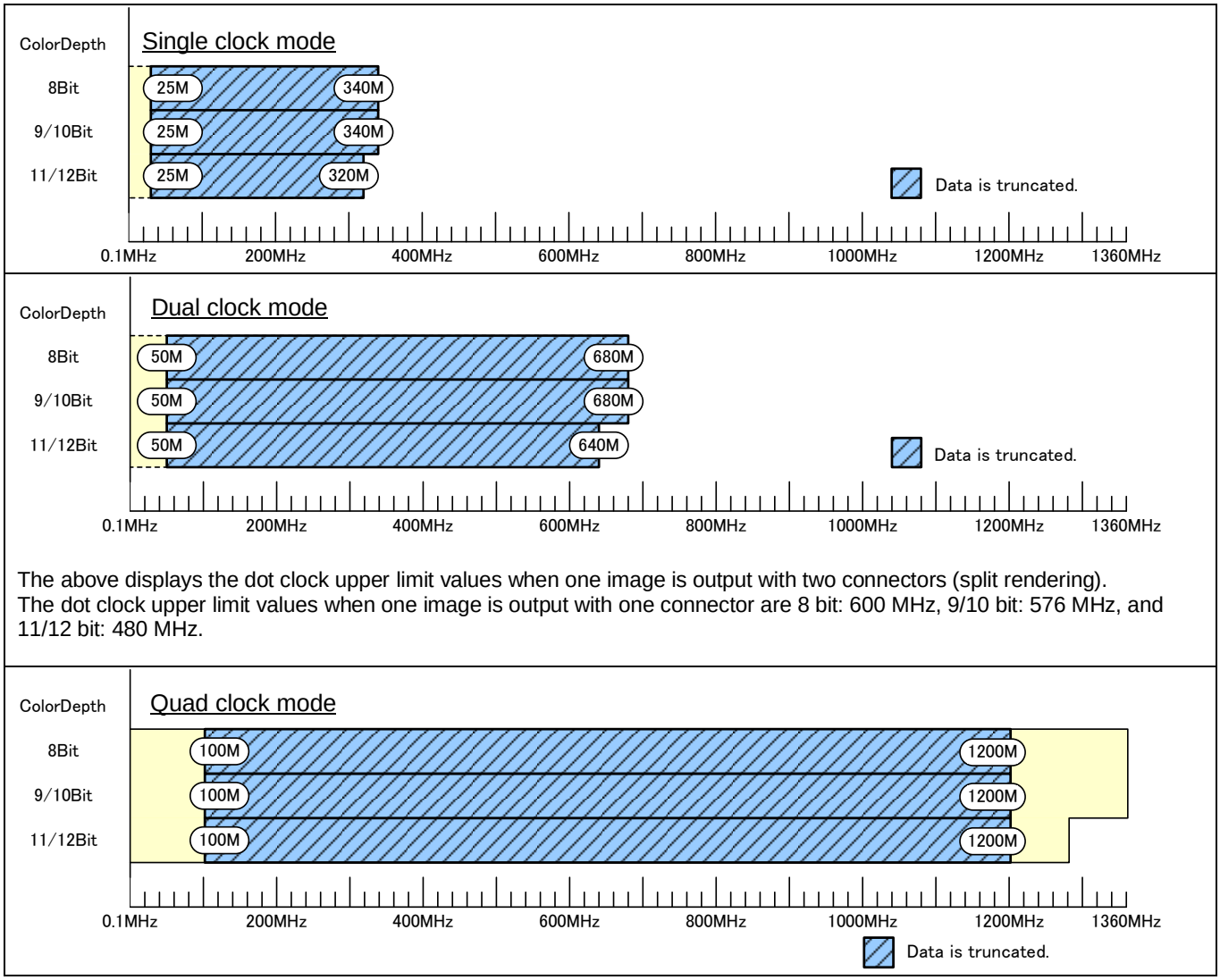
4) When the video width is 12 bits



● DisplayPort Unit VM-1876A-M1

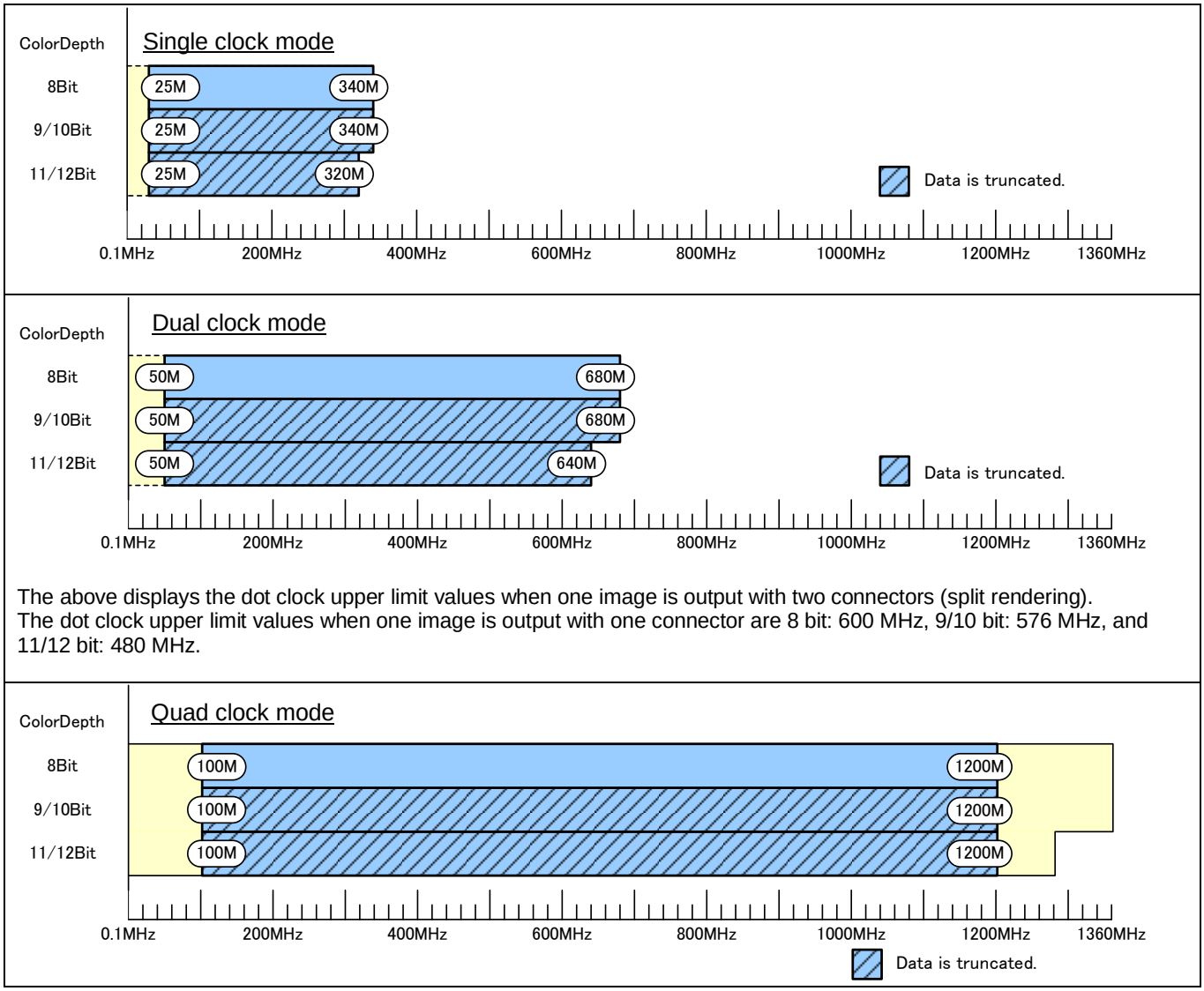
* The amount of data that can be transferred (pixel clock upper limit) differs depending on the combination of the link rate and lane count. For details, refer to "**4.2.1 DisplayPort Unit VM-1876A-M1**".

1) When the video width is 6 bits



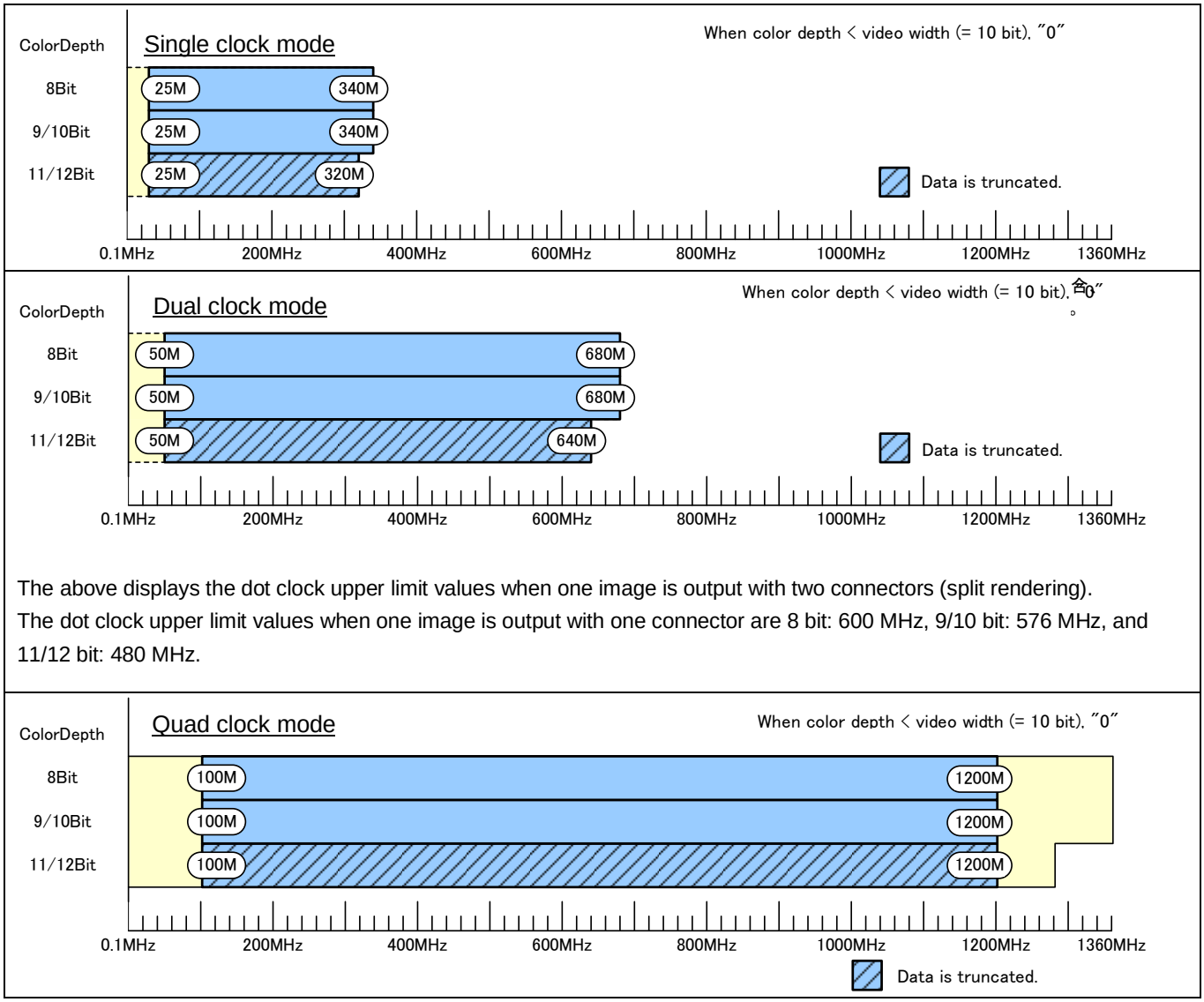
The above displays the dot clock upper limit values when one image is output with two connectors (split rendering).
The dot clock upper limit values when one image is output with one connector are 8 bit: 600 MHz, 9/10 bit: 576 MHz, and 11/12 bit: 480 MHz.

2) When the video width is 8 bits



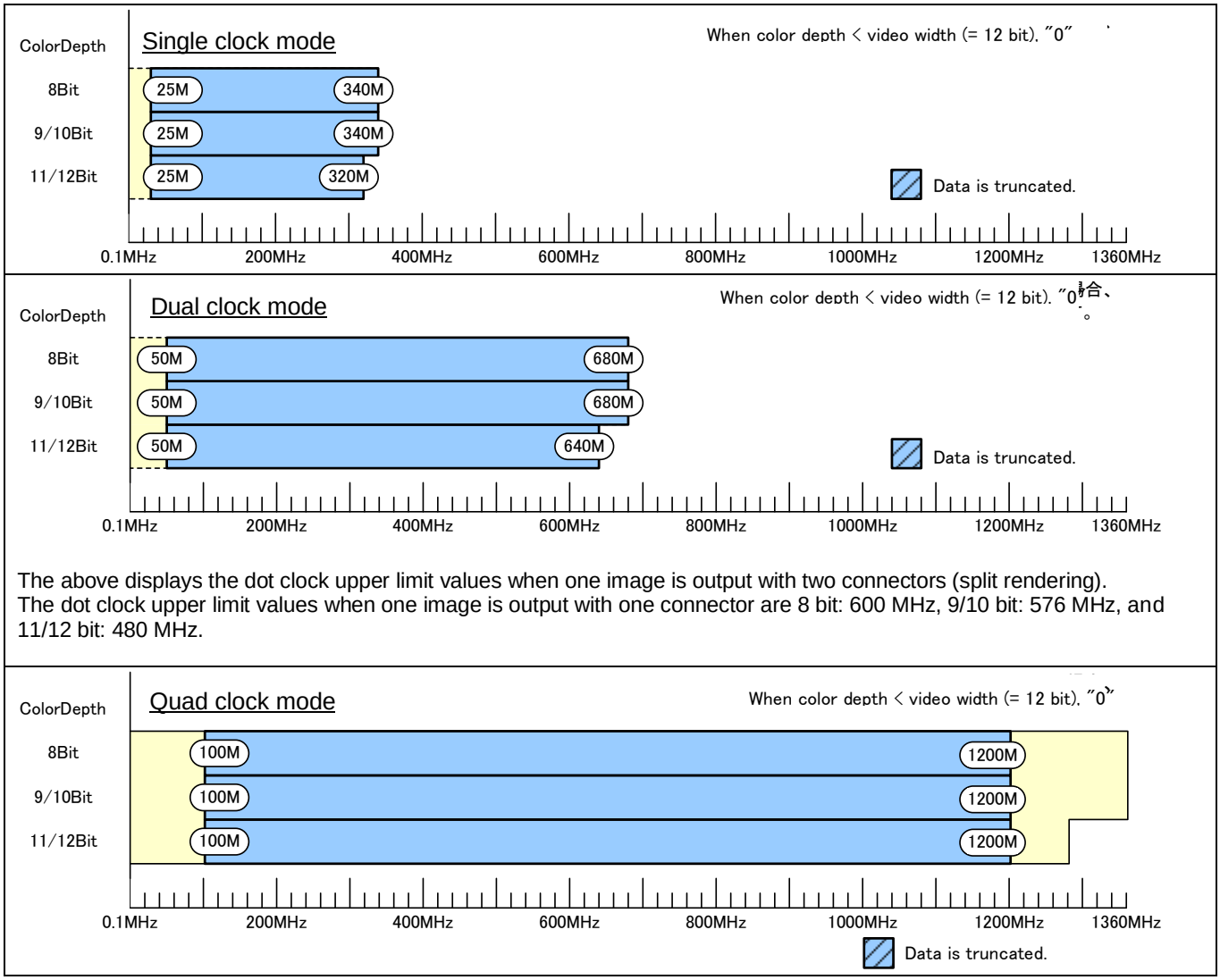
The above displays the dot clock upper limit values when one image is output with two connectors (split rendering).
The dot clock upper limit values when one image is output with one connector are 8 bit: 600 MHz, 9/10 bit: 576 MHz, and 11/12 bit: 480 MHz.

3) When the video width is 10 bits



The above displays the dot clock upper limit values when one image is output with two connectors (split rendering).
The dot clock upper limit values when one image is output with one connector are 8 bit: 600 MHz, 9/10 bit: 576 MHz, and 11/12 bit: 480 MHz.

4) When the video width is 12 bits



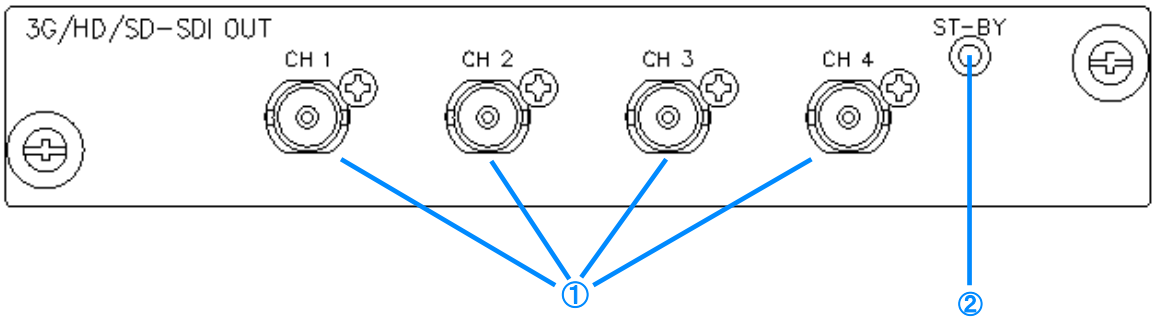
The above displays the dot clock upper limit values when one image is output with two connectors (split rendering).
The dot clock upper limit values when one image is output with one connector are 8 bit: 600 MHz, 9/10 bit: 576 MHz, and 11/12 bit: 480 MHz.

4.3 SDI unit functions and settings

The applicable unit is as follows.

4.3.1 SDI Unit VM-1876-M5

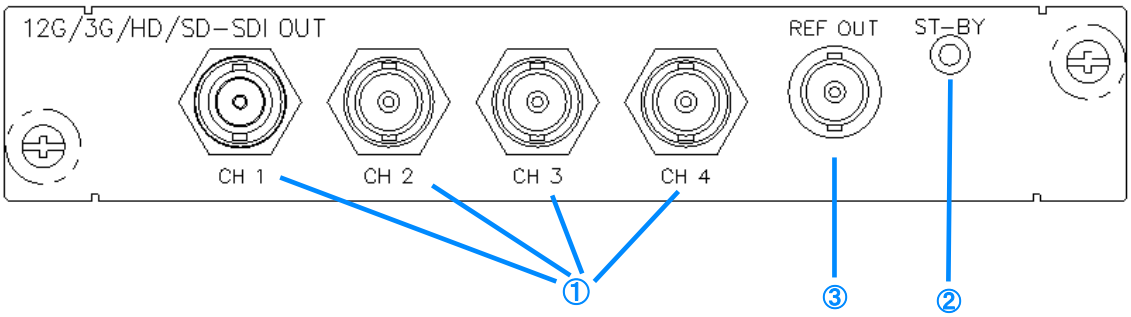
● Unit exterior diagram



No.	Name	Description
①	SDI output	Outputs in the specified format from four BNC connectors.
②	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

4.3.2 12G-SDI Unit VM-1876-MB

● Unit exterior diagram



No.	Name	Description
①	SDI output	Outputs in the specified format from four BNC connectors.
②	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)
③	External synchronization output	Outputs an external synchronization signal (3CS/BB). * Support in the future.

● Specifications

SDI output is only at the timing corresponding to each supported SDI standard (SMPTE) below.

［Component image format　SMPTE 259M］

Rate	Standard	Details		
270 Mb/s	SMPTE 259M SD-SDI Interlace	720 x 480, 720 x 525	525/59.94i 625/50i	YCbCr 4:2:2 10 bit

［1080 Line source image format　SMPTE 274M］

Rate	Standard	Details		
1.485 Gb/s	SMPTE 274M HD-SDI Interlace Progressive Segmented Frame	1920 x 1080	60i, 59.94i, 30p, 29.97p, 50i, 25p, 24p, 23.98p, 30PsF, 29.97PsF, 25PsF, 24PsF, 23.98PsF	YCbCr 4:2:2 10 bit

［720 Line source image format　SMPTE 296M］

Rate	Standard	Details		
1.485 Gb/s	SMPTE296M HD-SDI Progressive	1280 x 720	60p, 59.94p, 50p, 25p, 30p, 29.97p, 24p, 23.98p	YCbCr 4:2:2 10 bit

［1080 Line source image format　SMPTE 372］

Rate	Standard	Details		
1.485 Gb/s x2	SMPTE 372M DUAL LINK Progressive	1920 x 1080	60p, 59.94p, 50p	YCbCr 4:2:2 10 bit
	SMPTE 372M DUAL LINK Interlace Progressive Segmented Frame	1920 x 1080	60i, 59.94i, 30p, 29.97p, 25p, 24p, 23.98p, 30PsF, 29.97PsF, 25PsF, 24PsF, 23.98PsF	YCbCr 4:2:2 12 bit YCbCr 4:4:4 10 bit YCbCr 4:4:4 12 bit RGB　4:4:4 10 bit RGB　4:4:4 12 bit
	SMPTE 372M DUAL LINK Progressive Segmented Frame	2048 x 1080	60i, 59.94i, 30p, 29.97p, 25p, 24p, 23.98p, 30PsF, 29.97PsF, 25PsF, 24PsF, 23.98PsF	YCbCr 4:2:2 12 bit YCbCr 4:4:4 10 bit YCbCr 4:4:4 12 bit RGB　4:4:4 10 bit RGB　4:4:4 12 bit

[1080/720 Line source image format SMPTE 425-1]

Rate	Standard	Details		
2.97 Gb/s	SMPTE ST 425-1 3G-SDI Progressive	1920 x 1080	60p, 59.94p, 50p	YCbCr 4:2:2 10 bit
	SMPTE ST 425-1 3G-SDI Progressive	2048 x 1080	60p, 59.94p, 50p, 48p, 47.95p	YCbCr 4:2:2 10 bit
	SMPTE ST 425-1 3G-SDI Interlace Progressive Segmented Frame	1920 x 1080	60i, 59.94i, 50i, 30p, 29.97p, 25p, 24p, 23.98p 30PsF, 29.97PsF, 25PsF, 24PsF, 23.98PsF	YCbCr 4:2:2 12 bit YCbCr 4:4:4 10 bit YCbCr 4:4:4 12 bit RGB 4:4:4 10 bit RGB 4:4:4 12 bit
	SMPTE ST 425-1 3G-SDI Progressive	1280 x 720	60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 23.98p	YCbCr 4:4:4 10 bit RGB 4:4:4 10 bit

*** 4:4:4 format of 720p supports only Level.A.**

[2160/1080 Line source image format SMPTE 425-3]

Rate	Standard	Details		
2.97 Gb/s x2	SMPTE ST 425-3 3G-SDI Dual Link Progressive	1920 x 1080	60p, 59.94p, 50p	YCbCr 4:2:2 12 bit YCbCr 4:4:4 10 bit RGB 4:4:4 10 bit
	SMPTE ST 425-3 3G-SDI Dual Link Progressive	2048 x 1080	60p, 59.94p, 50p, 48p, 47.95p	YCbCr 4:2:2 12 bit YCbCr 4:4:4 10 bit RGB 4:4:4 10 bit
	SMPTE ST 425-3 3G-SDI Dual Link Progressive : 2SI	3840 x 2160	30p, 29.97p, 25p, 24p, 23.98p	YCbCr 4:2:2 10 bit YCbCr 4:2:0 10 bit
	SMPTE ST 425-3 3G-SDI Dual Link Progressive : 2SI	4096 x 2160	30p, 29.97p, 25p, 24p, 23.98p	YCbCr 4:2:2 10 bit

*** 2160 Line supports only Level.B.**

[2160 Line source image format SMPTE 425-5]

Rate	Standard	Details		
2.97 Gb/s x4	SMPTE ST 425-1 3G-SDI Quad Link Progressive	3840 x 2160	60p, 59.94p, 50p	YCbCr 4:2:2 10 bit YCbCr 4:2:0 10 bit
	SMPTE ST 425-1 3G-SDI Quad Link Progressive	4096 x 2160	60p, 59.94p, 50p, 48p, 47.95p	YCbCr 4:2:2 10 bit
	SMPTE ST 425-1 3G-SDI Quad Link Progressive	3840 x 2160	30p, 29.97p, 25p, 24p, 23.98p	YCbCr 4:2:2 12 bit YCbCr 4:4:4 10 bit YCbCr 4:4:4 12 bit RGB 4:4:4 10 bit RGB 4:4:4 12 bit
	SMPTE ST 425-1 3G-SDI Quad Link Progressive	4096 x 2160	30p, 29.97p, 25p, 24p, 23.98p	YCbCr 4:2:2 12 bit YCbCr 4:4:4 10 bit YCbCr 4:4:4 12 bit RGB 4:4:4 10 bit RGB 4:4:4 12 bit

[2160Line source image format HD-SDI Quad Link]

Rate	Standard	Details		
1.485 Gb/s x4	Quad LINK Progressive Segmented Frame	3840 x 2160	30p, 29.97p, 25p, 24p, 23.98p 30PsF, 29.97PsF, 25PsF, 24PsF, 23.98PsF	YCbCr 4:2:2 10 bit
	Quad LINK Progressive Segmented Frame	4096 x 2160	30p, 29.97p, 25p, 24p, 23.98p 30PsF, 29.97PsF, 25PsF, 24PsF, 23.98PsF	YCbCr 4:2:2 10 bit

[2160/1080 Line source image format SMPTE 2081-10] * Only supported for VM-1876-MB.

Rate	Standard	Details		
5.94 Gb/s	SMPTE ST 2081-10 6G-SDI Progressive : 2SI	1920 x 1080	60p, 59.94p, 50p	YCbCr 4:2:2 12 bit YCbCr 4:4:4 10 bit YCbCr 4:4:4 12 bit RGB 4:4:4 10 bit RGB 4:4:4 12 bit
	SMPTE ST 2081-10 6G-SDI Progressive : 2SI	2048 x 1080	60p, 59.94p, 50p, 48p, 47.95p	YCbCr 4:2:2 12 bit YCbCr 4:4:4 10 bit YCbCr 4:4:4 12 bit RGB 4:4:4 10 bit RGB 4:4:4 12 bit
	SMPTE ST 2081-10 6G-SDI Progressive : 2SI	3840 x 2160	30p, 29.97p, 25p, 24p, 23.98p	YCbCr 4:2:2 10 bit YCbCr 4:2:0 10 bit
	SMPTE ST 2081-10 6G-SDI Progressive : 2SI	4096 x 2160	30p, 29.97p, 25p, 24p, 23.98p	YCbCr 4:2:2 10 bit

[2160 Line source image format SMPTE 2081-11] * Only supported for VM-1876-MB.

Rate	Standard	Details		
5.94 Gb/s x2	SMPTE ST 2081-10 6G-SDI Dual Link Progressive : 2SI	3840 x 2160	60p, 59.94p, 50p	YCbCr 4:2:2 10 bit YCbCr 4:2:0 10 bit
	SMPTE ST 2081-10 6G-SDI Dual Link Progressive : 2SI	4096 x 2160	60p, 59.94p, 50p, 48p, 47.95p	YCbCr 4:2:2 10 bit
	SMPTE ST 2081-10 6G-SDI Dual Link Progressive : 2SI	3840 x 2160	30p, 29.97p, 25p, 24p, 23.98p	YCbCr 4:2:2 12 bit YCbCr 4:2:0 12 bit YCbCr 4:4:4 10 bit YCbCr 4:4:4 12 bit RGB 4:4:4 10 bit RGB 4:4:4 12 bit
	SMPTE ST 2081-10 6G-SDI Dual Link Progressive : 2SI	4096 x 2160	30p, 29.97p, 25p, 24p, 23.98p	YCbCr 4:2:2 12 bit YCbCr 4:4:4 10 bit YCbCr 4:4:4 12 bit RGB 4:4:4 10 bit RGB 4:4:4 12 bit

[2160 Line source image format SMPTE 2082-10] *** Only supported for VM-1876-MB.**

Rate	Standard	Details		
11.88 Gb/s	SMPTE2082-10 12G-SDI Progressive : 2SI	3840 x 2160	60p, 59.94p, 50p	YCbCr 4:2:2 10 bit YCbCr 4:2:0 10 bit
	SMPTE2082-10 12G-SDI Progressive : 2SI	4096 x 2160	60p, 59.94p, 50p, 48p, 47.95p	YCbCr 4:2:2 10 bit YCbCr 4:2:0 10 bit
	SMPTE2082-10 12G-SDI Progressive : 2SI	3840 x 2160	30p, 29.97p, 25p, 24p, 23.98p	YCbCr 4:2:2 12 bit YCbCr 4:2:0 12 bit YCbCr 4:4:4 10 bit YCbCr 4:4:4 12 bit RGB 4:4:4 10 bit RGB 4:4:4 12 bit
	SMPTE2082-10 12G-SDI Progressive : 2SI	4096 x 2160	30p, 29.97p, 25p, 24p, 23.98p	YCbCr 4:2:2 12 bit YCbCr 4:4:4 10 bit YCbCr 4:4:4 12 bit RGB 4:4:4 10 bit RGB 4:4:4 12 bit

4.3.3 SDI data transfer method

● SD-SDI and HD-SDI signals

The signals are output from the BNC connectors without being split.

● SMPTE372M (DUAL LINK)

Assigns to outputs 1 and 2 (3 and 4) is performed from the lowest slot number to output as follows.

BNC terminal	Signal name
CH1	Output 1 (3) LINK A
CH2	Output 1 (3) LINK B
CH3	Output 2 (4) LINK A
CH4	Output 2 (4) LINK B

● 3G-SDI signal

The signals are output from the BNC connectors without being split.

● 4K 3840x2160 (4096x2160) signals

[VM-1876-M5]

The signals are mapped to 3G-SDI or mapped to SMPTE372M (DUAL LINK) and then output.

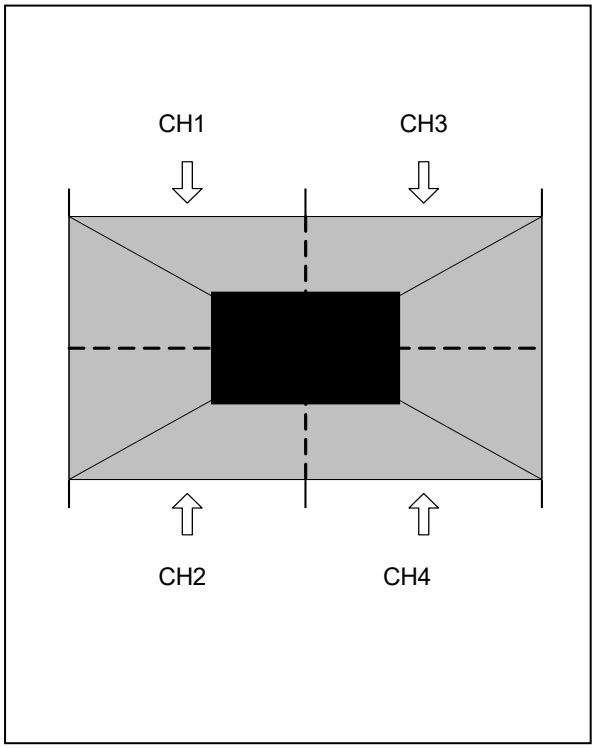
[VM-1876-MB]

The signals are mapped in accordance with various standards to 3G-SDI/6G-SDI/12G-SDI or mapped to HD-SDI and then output.

The mapping method is as follows.

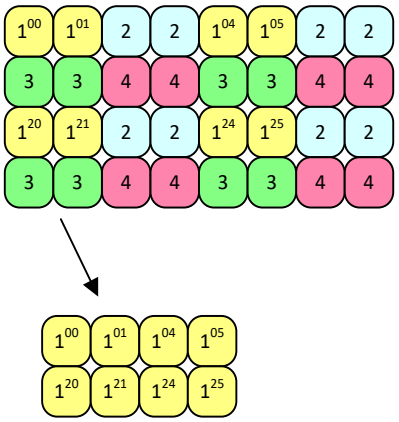
Mode 0 4Square Division (4 quarter panes)

The 3840x2160 format which cannot be represented with the resolution of an HD-SDI signal is split into 4 quarter panes and then output.



Mode A 2-sample interleave division (2SI)

The 3840 x 2160 format which cannot be represented with the resolution of an HD-SDI signal is split as follows and then output.



Example: When channel 1 output

Images containing a collection of groups (pixels classified by color) consisting of 2 pixels and 2 lines are output.
Output channels 1 to 4 output the data as images containing a collection of ① to ④.
The signals that were split in this way are mapped to 3G-SDI and then output.

4.3.4 SDI output setting items

Level 1	Level 2	Level 3	Setting item	Setting value
SDI				
	Output OFF/ON	Port1 to Port16	Sets ON/OFF for each Port.	0: OFF / 1: ON
	* The following cannot be set when other than Refer Program is selected for Mode in the SDI payload settings.			
	SDI Format Sets the SDI format.			0: SD 1: HD 2: 3G-A 3: 3G-B 4: Dual HD 5: 6G * VM-1876-MB only 6: 12G * VM-1876-MB only
	Video Format Sets the color space of video output from SDI.			0: RGB 1: YCbCr4:4:4 2: YCbCr4:2:2: 3: YCbCr4:2:0 * VM-1876-MB only
	Width Sets the output video bit length. This can be set to a bit length that is independent of pattern rendering, or the same bit length can be selected automatically. * The portion of the bit length of pattern rendering that exceeds the bit length set here will be truncated. Furthermore, if there is a missing portion, it will be compensated for with "0."			0: Auto 1: 10 bit 2: 12 bit
	Split Count Sets the number of screen splits. * This is in accordance with the DotClk Mode setting in "2.1 ALL OUTPUT".			0: No Split 1: 2Split(not use) 2: 4Split
	Split Mode Sets the split mode. * This is in accordance with the Split Mode setting of the DotClk Mode setting in "2.1 ALL OUTPUT". * Displayed only when 4Split			0: 4square 1: reserved1 2: reserved1 3. reserved1 4: reserved1 5: reserved1 6: reserved1 6: reserved1 7: reserved1 8: reserved1 9: reserved1 A: 2SI
	Audio Output Sets embedded audio output.			0: OFF / 1: ON
	Audio Copy Ch2 Audio Copy Ch3 Audio Copy Ch4 Sets whether or not to copy the audio of the channel 2 and subsequent channels of 3G SDI from Link 1.			0: No Copy Superimposes the audio data of only Link 1 (channel 1). 1: Copy Ch1 Copies the same audio data as Link 1 (channel 1) to channels 2, 3, and 4.

4.3.5 Payload

* These settings are only for payload identification data. For the settings that directly affect transmission signals, refer to each corresponding item.
* When the VM-1876-M5 is used, the payload settings cannot be configured when SD output is set.

Level 1	Level 2	Level 3	Setting item	Setting value
Payload				
			OFF/ON Enables payload identification data.	[VM-1876-M5] 0: OFF Does not multiplex the Payload ID. 1: ON Multiplexes the Payload ID. [VM-1876-MB] 0: OFF Does not multiplex the Payload ID. 1: Y ON Multiplexes the Payload ID with the Y stream. 2: C ON Multiplexes the Payload ID with the C stream. 3: Y/C ON Multiplexes the Payload ID with the Y/C stream.
			When OFF, the Mode and subsequent settings are not displayed.	
			Mode Determines the payload setting method.	0: Refer Program Determines the payload setting values depending on the SDI output data settings. * Byte 1 and lower are not displayed. 1: Manual Sets the payload settings manually. * Settings other than payload settings are not reflected. * SDI output settings become no longer able to be configured. 2: Hex Sets byte 1 to byte 4 of the payload with hex settings * SDI output settings become no longer able to be configured.
			Byte1 Sets the byte.	00h to FFh
			The following are displayed when Mode = 1: Manual is set.	
			Transport Sets the transport scan mode.	0: Interlace 1: Progressive
			Picture Sets the picture scan mode.	0: Interlace 1: Progressive
			Picture Rate Sets the frame rate.	0: 23.98 Hz 1: 24 Hz 2: 25 Hz 3: 29.97 Hz 4: 30 Hz 5: 50 Hz 6: 59.94 Hz 7: 60 Hz 8: 47.95 Hz 9: 48 Hz
			Aspect Ratio Sets the aspect ratio. *The bits that can be set vary depending on the setting of byte 1.	0: 4:3 Aspect ratio 4:3 1: 16:9 Aspect ratio 16:9

Level 1	Level 2	Level 3	Setting item	Setting value
	H Y-Sampling Sets the H or Y sampling value.			0: 2 1: 1
	Sampling Struc Sets the sampling structure (video format).			0: 4:2:2(YCbCr) 1: 4:4:4(YCbCr) 2: 4:4:4(RGB) 3: 4:4:4:4(YCbCr+A) 4: 4:4:4:4(RGB+A) 5: 4:4:4(XYZ) 6: 4:2:0 7: 4:2:2:4(YCbCr+A) 8: 4:2:2:4(YCbCr+D) 9: 4:4:4:4(YCbCr+D) A: 4:4:4:4(RGB+D)
	Ch1 LinkA Ch1 LinkB Ch2 LinkA Ch2 LinkB Ch3 LinkA Ch3 LinkB Ch4 LinkA Ch4 LinkB Sets the data stream.			0: Stream1(0h) 1: Stream2(2h) 2: Stream3(4h) 3: Stream4(6h) 4: Stream5(8h) 5: Stream6(Ah) 6: Stream7(Ch) 7: Stream8(Eh)
	Audio Copy Ch1 Audio Copy Ch2 Audio Copy Ch3 Audio Copy Ch4 Sets whether or not to copy the audio of the Link 2 and subsequent channels of 3G SDI from Link 1.			0: No Copy Superimposes the audio data of only Link 1 (channel 1). 1: Copy Link1 Copies the same audio data as Link 1 (channel 1) to channels 2, 3, and 4.
	Dynamic Range Set the dynamic range.			0: 100% 1: 200% 2: 400%
	Bit Depth Sets the bit length.			0: 8bit 1: 10 bit 2: 12 bit
	Transfer SetstheTransfer characteristics.			0:SDR-TV 1:HLG 2:PQ 3:Unspecified
	Colorimetry Sets the Colorimetry.			0:Rec709 1:Reserved 2:UHDTV 3:Unknown
	Luminance Sets the Luminance and color difference signal.			0:Y'C'bC'r 1:ICtCp
	The following are displayed when Mode = 2: Hex is set.			
	Byte 2 Sets byte 2.			00h to FFh
	Byte 3 Sets byte 3.			00h to FFh
	Byte 4 Ch1 LinkA Sets byte 4 of Channel 1 Link A.			00h to FFh
	Byte 4 Ch1 LinkB Sets byte 4 of Channel 1 Link B.			00h to FFh
	Byte 4 Ch2 LinkA Sets byte 4 of Channel 2 Link A.			00h to FFh
	Byte 4 Ch2 LinkB Sets byte 4 of Channel 2 Link B.			00h to FFh
	Byte 4 Ch3 LinkA Sets byte 4 of Channel 3 Link A.			00h to FFh
	Byte 4 Ch3 LinkB			00h to FFh

Level 1	Level 2	Level 3	Setting item	Setting value
	Sets byte 4 of Channel 3 Link B.			
	Byte 4 Ch4 LinkA Sets byte 4 of Channel 4 Link A.			**00h to FFh**
	Byte 4 Ch4 LinkB Sets byte 4 of Channel 4 Link B.			**00h to FFh**

4.3.6 SDI configuration setting items

This section describes configuration settings for the SDI unit.
Set these settings from MENU > Configuration.

[VM-1876-M5]

Level 1	Level 2	Level 3	Setting item	Setting value
Configuration				
	SDI	**Configuration SDI Setting Time Code**		
		Time Code OFF/ON	**0: OFF** Does not insert a time code. **1: ON** Inserts a time code.	
		Start Time Set	**h(0 - 23) :m(0 - 59) : s(0 - 59)** Sets the time of Time Code.	
		Time Set	Sets the time set in Start Time.	
		Configuration SDI Setting Clock Delay		
		Delay Clock1 - 8 Sets the delay on a clock basis for the SDI signal.	Sign: Sign (delay/advance)	
			0: + Advances by the clock amount set in Time. **1: -** Delays by the clock amount set in Time.	
			Time: Sets the time. **(Value that is half of the 0 to H period)**	

[VM-1876-MB]

Level 1	Level 2	Level 3	Setting item	Setting value
Configuration				
	SDI	**Configuration SDI Setting Time Code**		
		VITC Time Code OFF/ON	**0: OFF** Does not insert VITC. **1: ON** Inserts VITC.	
		LTC Time Code OFF/ON	**0: OFF** Does not insert LTC. **1: ON** Inserts LTC.	
		Drop Frame OFF/ON	**0: OFF** Does not use drop frames. **1: ON** Uses drop frames. *** Applicable only when 29.97, 59.94 fps.**	
		Start Time	**h(0 - 23) :m(0 - 59) : s(0 - 59)** Sets the time of Time Code.	
		Time Set	Sets the time set in Start Time.	
		Hold	Pauses the time code.	
		Reset	Resets the counter to zero for the time code.	
		Configuration SDI Setting Clock Delay		
		Delay Clock1 - 8 Sets the delay on a clock basis for the SDI signal.	Sign: Sign (delay/advance)	
			0: + Advances by the clock amount set in Time. **1: -** Delays by the clock amount set in Time.	
			Time: Sets the time. **(Value that is half of the 0 to H period)**	

[VM-1876-MB]

Level 1	Level 2	Level 3	Setting item	Setting value
Configuration				
	SDI	**Configuration SDI Setting Other**		
		Ancillary Packet Multiplexes arbitrary ancillary data specified by the user with SDI signals.	**ANC Packet OFF/ON**	**0: OFF** Does not insert the ANC packet. **1: Y ON** Inserts the ANC packet in the Y stream. **2: C ON** Inserts the ANC packet in the C stream.
			Embed Line1 Specifies the line for multiplexing the ANC packet. When '0,' does not multiplex.	**0 - VTotal**
			Embed Sample1 Specifies the sample position for multiplexing the ANC packet. When '0,' does not multiplex.	**0 - HTotal**
			Embed Line2 Specifies the line for multiplexing the ANC packet. When '0,' does not multiplex.	**0 - VTotal**
			Embed Sample2 Specifies the sample position for multiplexing the ANC packet. When '0,' does not multiplex.	**0 - HTotal**
			Parity OFF/ON	**0: OFF** Does not automatically calculate the parity. **1: ON** Automatically calculates the parity.
			DID Sets the DID data. Set this with 8 bit/10 bit depending on the Parity setting.	When Parity = OFF: 10 bit **0 to 0x2FF** When Parity = ON: 8 bit **0 to 0xFF**
			SDID Sets the SDID data. Set this with 8 bit/10 bit depending on the Parity setting.	
			DC Sets the DC data. Set this with 8 bit/10 bit depending on the Parity setting. When '0,' does not multiplex.	
			UDW[1 - UDW 255 Sets the user data word. Set this with 8 bit/10 bit depending on the Parity setting. Enables the data for the number of DC settings. However, the maximum is 255. When '0,' does not multiplex.	
			CheckSum Calc OFF/ON	**0: Manual** Uses a user checksum. **1: Auto** Automatically calculates the checksum.

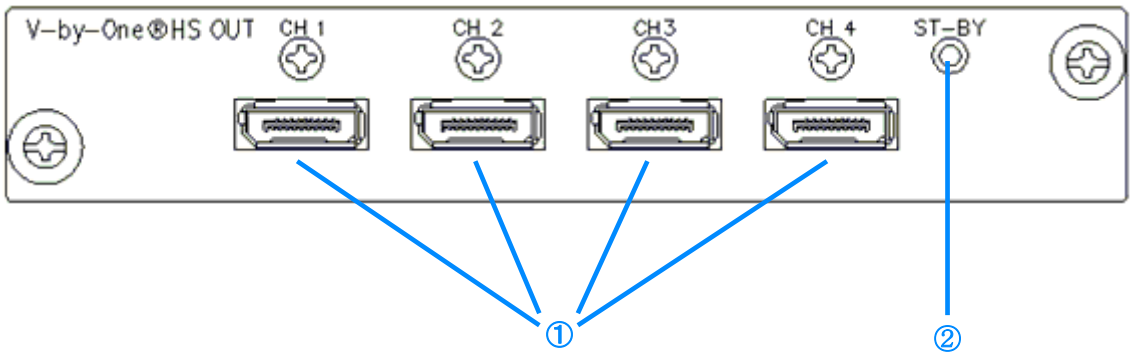
Level 1	Level 2	Level 3	Setting item	Setting value
			CheckSum Sets the user specified checksum with 10 bits.	**0x00 to 0x2FF**
			External Synchronization Performs external synchronization.	**0: OFF** **1: BB** **2: 3CS**

4.4 V-by-One HS unit functions and settings

The applicable unit is as follows.

4.4.1 V-by-One HS Unit VM-1876-M2

● Unit exterior diagram



①	V-by-One HS outputs	The output of four lanes per connector can be performed.
②	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

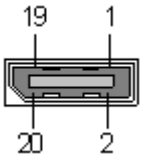
● Specifications

V-by-One HS CH1 CH2 CH3 CH4	Connector	V-by-One HS×4 (16Lane)	
	Dot clock	Number of data lanes: 1 lane Single clock mode	8 bit: 20 to 85 MHz 10 bit: 20 to 85 MHz 12 bit: 20 to 75 MHz
		Number of data lanes: 2 lanes Single clock mode	8 bit: 40 to 170 MHz 10 bit: 40 to 170 MHz 12 bit: 40 to 150 MHz
		Number of data lanes: 4 lanes Single clock mode	8 bit: 80 to 340 MHz 10 bit: 80 to 340 MHz 12 bit: 80 to 300 MHz
		Number of data lanes: 8 lanes Dual clock mode *1	8 bit: 160 to 680 MHz 10 bit: 160 to 680 MHz 12 bit: 160 to 600 MHz
		Number of data lanes: 16 lanes Quad clock mode *2	8 bit: 320 to 1360 MHz 10 bit: 320 to 1360 MHz 12 bit: 320 to 1200 MHz
	No. of colors		8/10/12 bit for each R, G, and B (RGB/YCbCr supported)

*1 Uses CH1-CH2 (CH3-CH4) for 8-lane output.
*2 Uses CH1-CH2-CH3-CH4 for 16-lane output.

4.4.2 Connector and pin assignment

● Connector: Hosiden TCX3250-111387

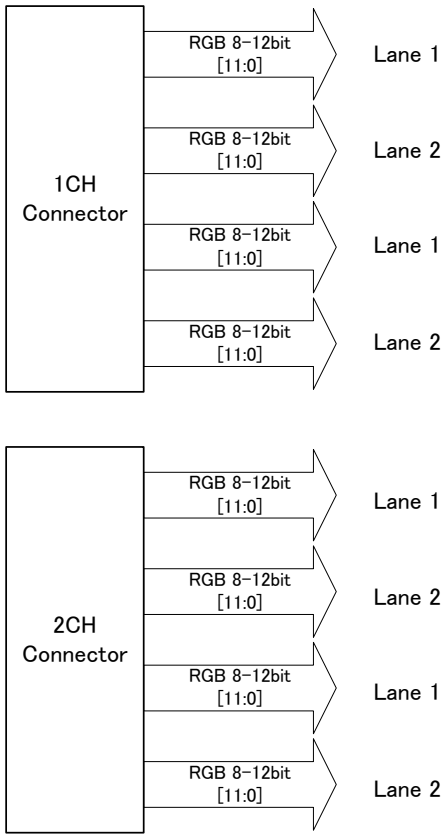


Pin No.	Signal
1	TX Lane0(p)
2	GND
3	TX Lane0(n)
4	TX Lane1(p)
5	GND
6	TX Lane1(n)
7	TX Lane2(p)
8	GND
9	TX Lane2(n)
10	TX Lane3(p)
11	GND
12	TX Lane3(n)
13	GND
14	GND
15	SCL
16	GND
17	SDA
18	HTPDN
19	LOCKN
20	NC

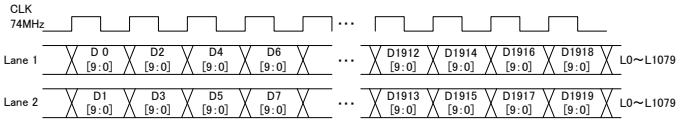
(Connectors 1 to 4 are common.)

4.4.3 V-by-OneHS data transfer method

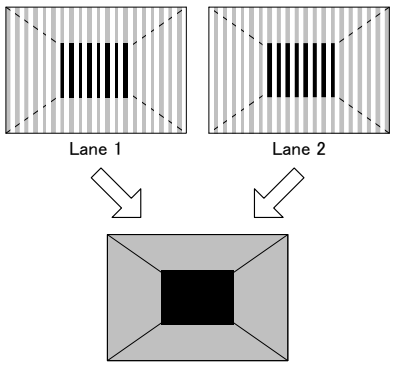
● <Normal MODE: 2-lane Output>



The case of a 1920 x 1080@60 Hz resolution, 148 MHz dot clock, and 10-bit output gradation is explained as an example.

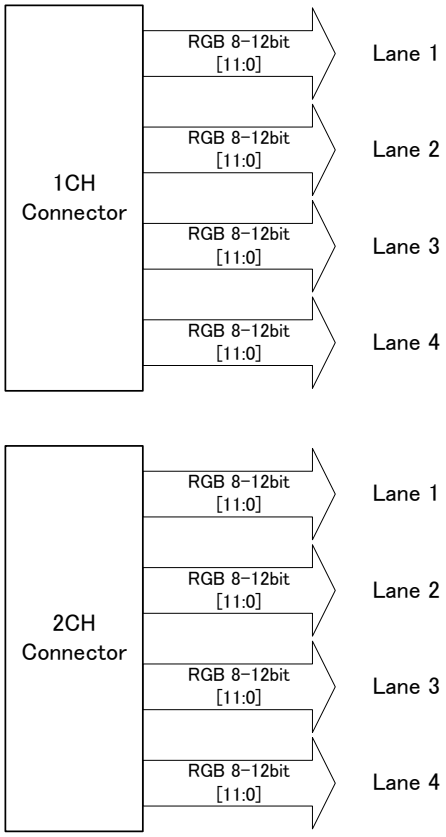


Data transfer method

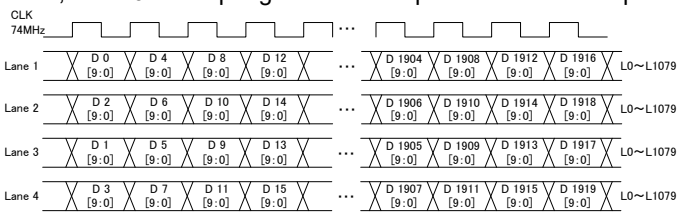


Assignment of each lane

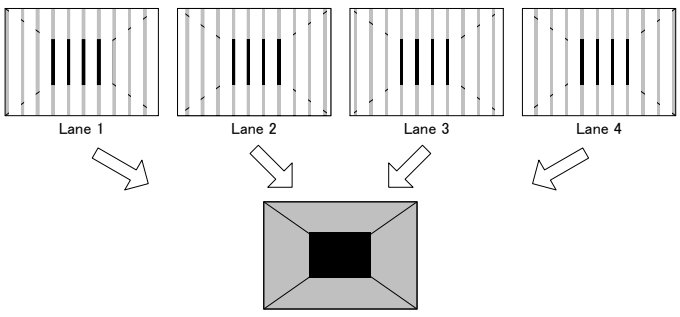
● <Normal MODE: 4-lane Output>



The case of a 1920 x 1080@120Hz resolution, 297 MHz dot clock, and 10-bit output gradation is explained as an example.

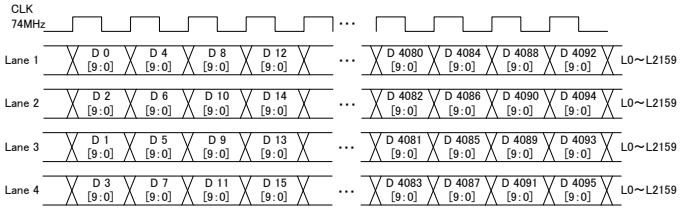


Data transfer method

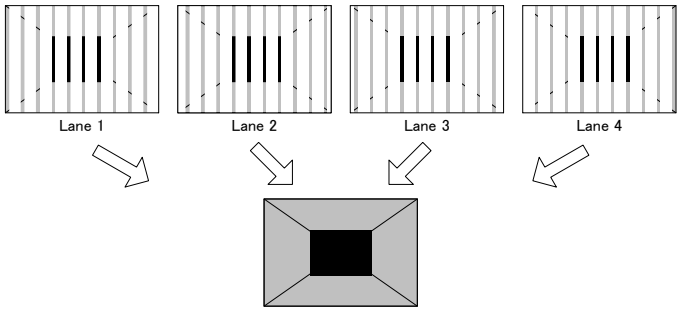


Assignment of each lane

The case of a 4096 x 2160@30 Hz resolution, 297 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

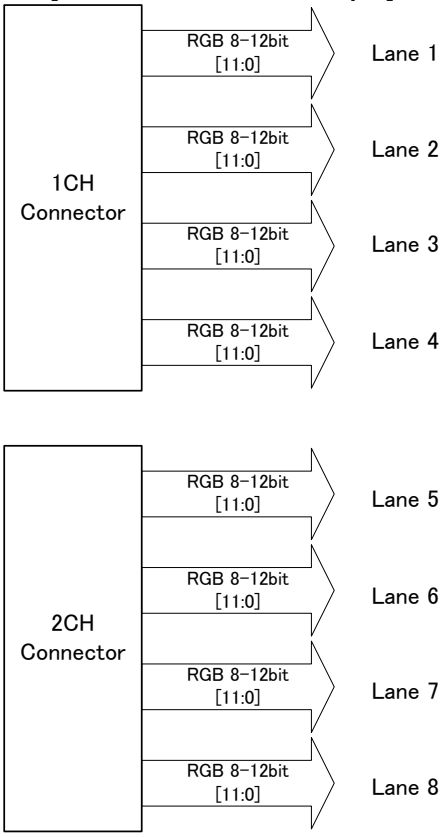


Assignment of each lane

● <Specifications of each mode when x4 mode output>

One screen is output with a combination of 8 lanes when full HD 240 Hz mode output.
This is basically the same as the transmission method of 4K-60P.
From Mode 0 (x4 mode) to Mode 4 (x4 mode) is explained here.

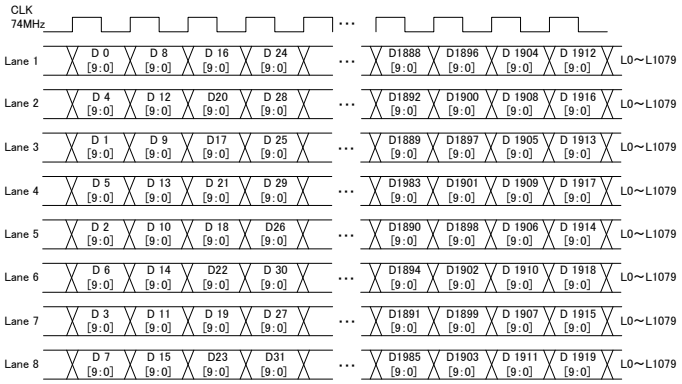
[Full HD 240 Hz 8-lane Output]



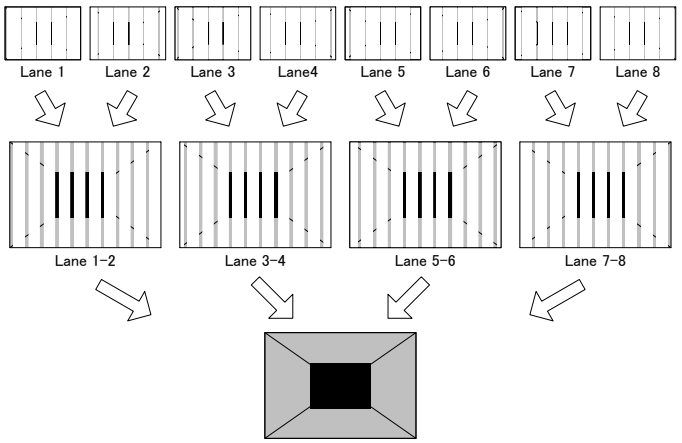
① Mode 0 (x4 mode) (8 lanes) - Mode0 x4 mode (Non Dividing Mode)

Output is with the pixel assignment shown below without splitting the screen and uses lanes 1 to 8.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

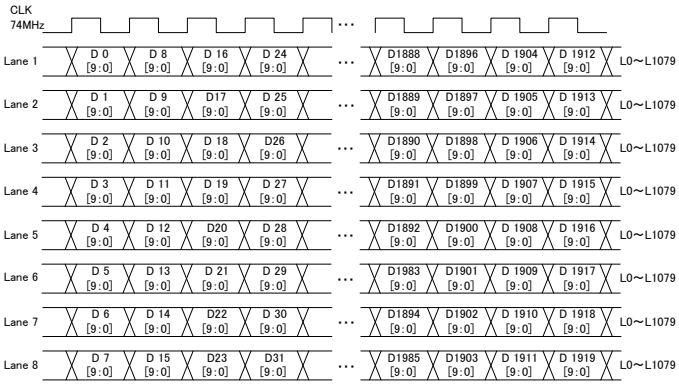


Assignment of each lane

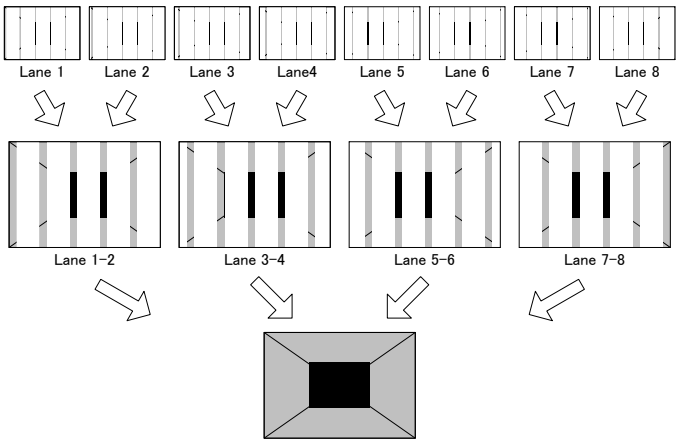
② Mode 1 (x4 mode) (8 lanes) - Normal Mode

Output is with the pixel assignment shown below without splitting the screen and uses lanes 1 to 8.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

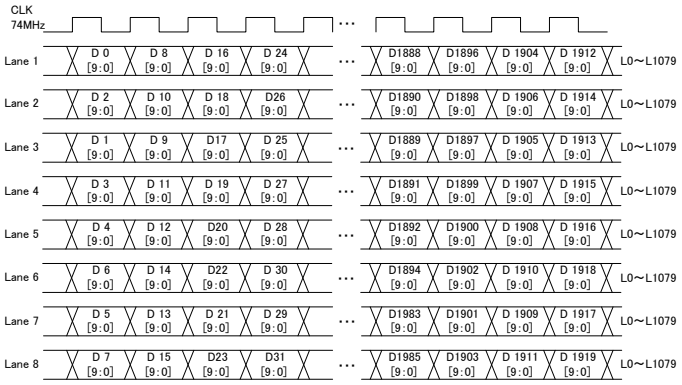


Assignment of each lane

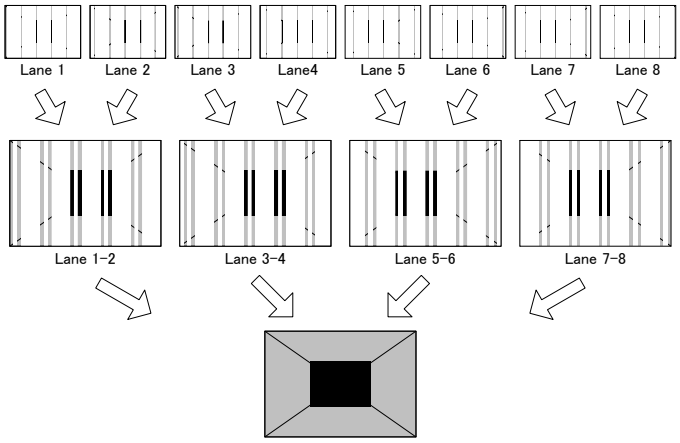
③ Mode 2 (x4 mode) (8 lanes) - Cross Mode

Output is with the pixel assignment shown below without splitting the screen and uses lanes 1 to 8.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

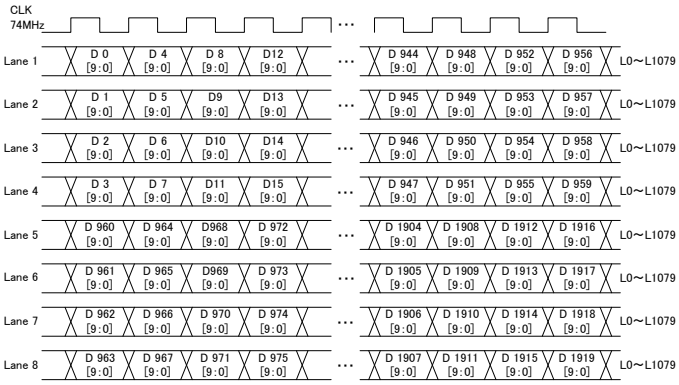


Assignment of each lane

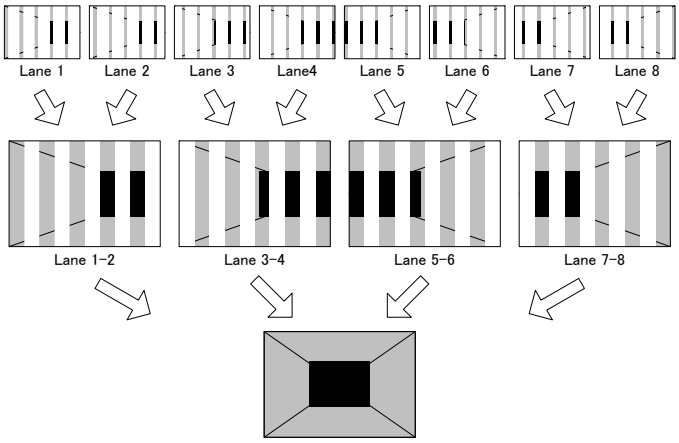
④ Mode 3 (x4 mode) (8 lanes) - Dividing Normal Mode

The left half of the image is output with EVEN and ODD using lanes 1 and 2 and lanes 3 and 4. The right half of the image is output with EVEN and ODD using lanes 5 and 6 and lanes 7 and 8.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

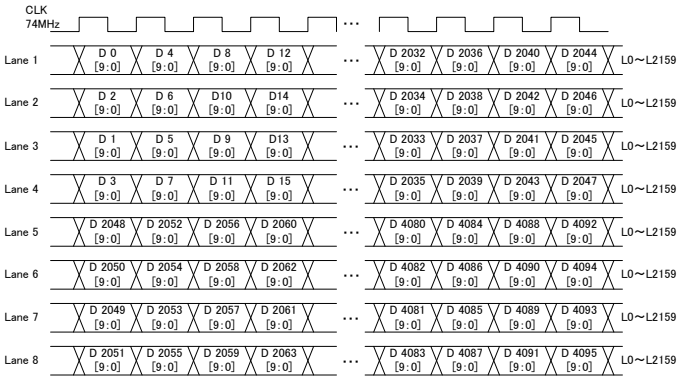


Assignment of each lane

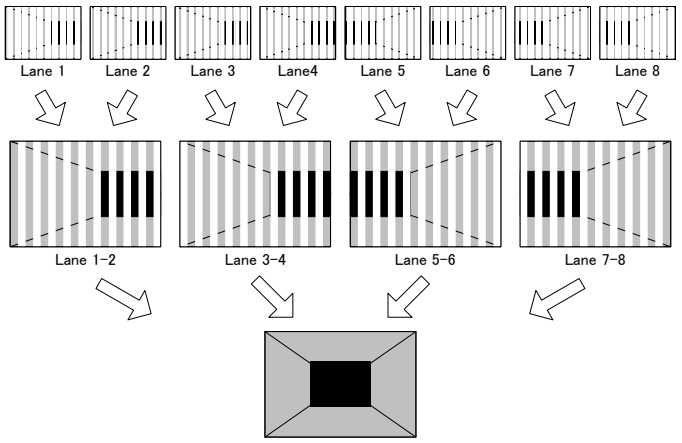
⑤ Mode 4 (x4 mode) (8 lanes) - Dividing Cross Mode

The left half of the image is output with EVEN and ODD using lanes 1 and 3 and lanes 2 and 4. The right half of the image is output with EVEN and ODD using lanes 5 and 7 and lanes 6 and 8.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

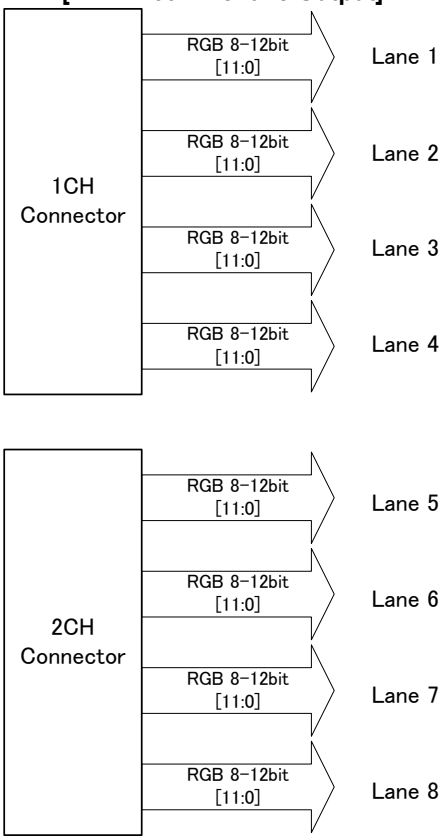


Assignment of each lane

● <Specifications of each mode when 4Kx2K mode output>

One screen is output with a combination of 8 lanes when 4Kx2K mode output.

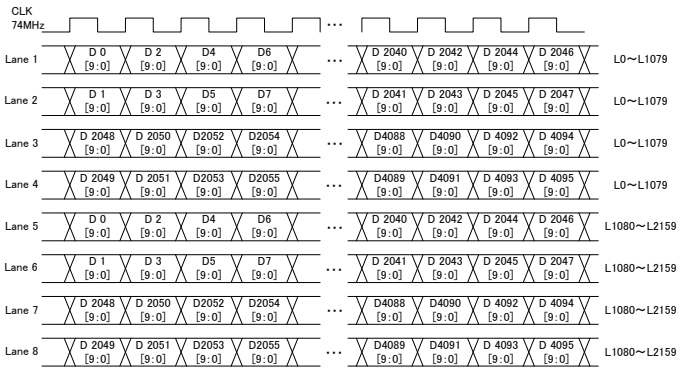
[4Kx2K 60 Hz 8-lane Output]



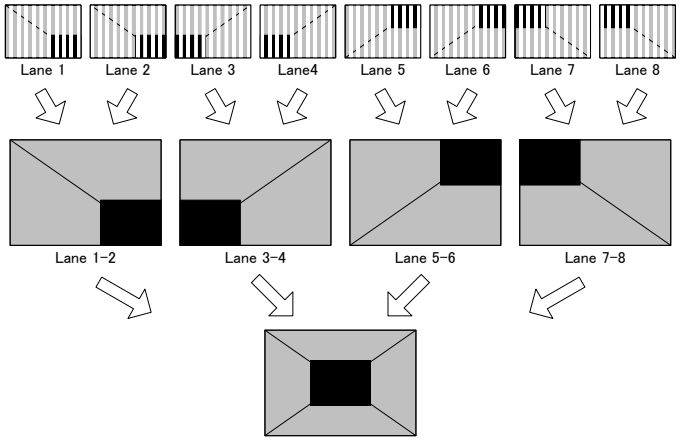
① Mode 0 (8 lanes) - Normal

The video is split into 4 quarters, which are assigned in the order of top left to lanes 1 and 2, top right to lanes 3 and 4, bottom left to lanes 5 and 6, and bottom right to lanes 7 and 8.

The case of a 4096 x 2048 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

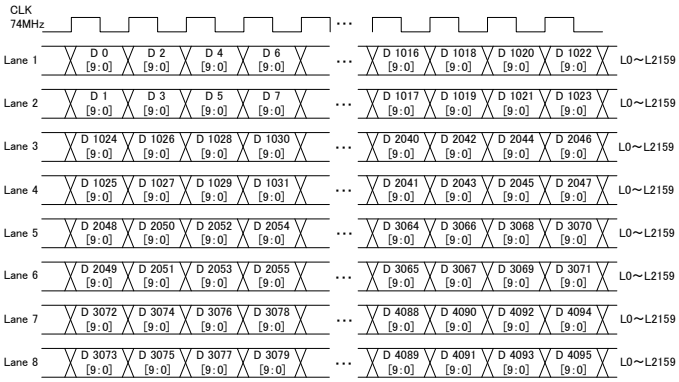


Assignment of each lane

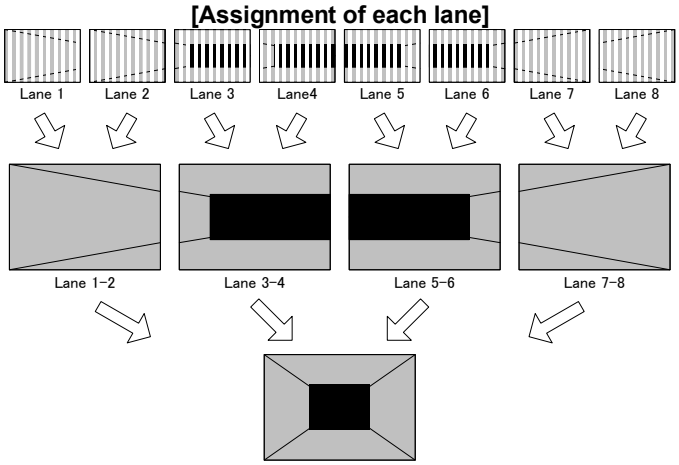
② Mode 1 (8 lanes) - 4Split

The video is split in to 4 in the horizontal direction, which are assigned from the left in the order of lanes 1 and 2, lanes 3 and 4, lanes 5 and 6, and lanes 7 and 8.

The case of a 4096 x 2048 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

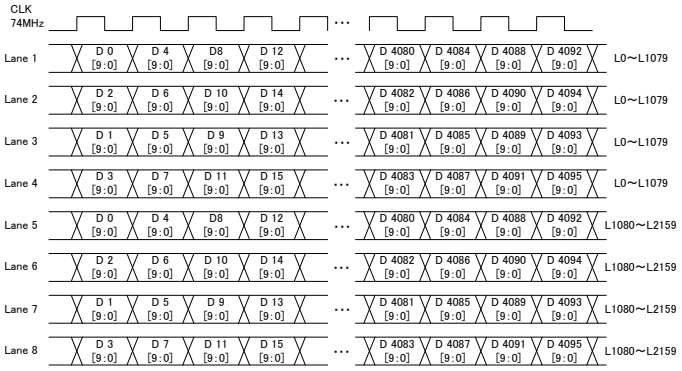


Assignment of each lane

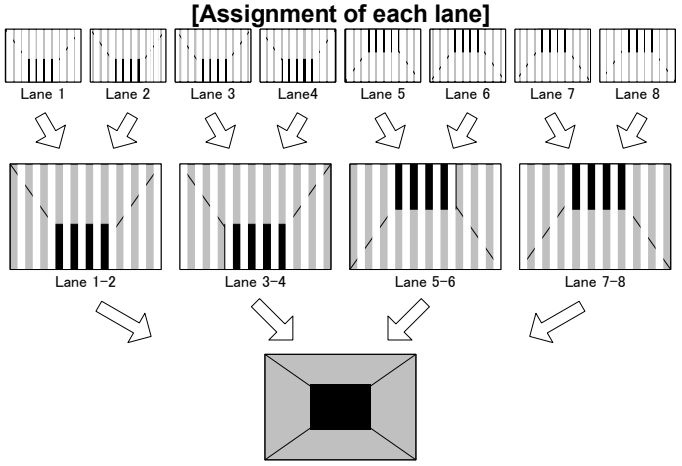
③ Mode 2 (8 lanes) (2 Panes Horizontal)

The upper half of the image is output with EVEN and ODD using lanes 1 and 2 and lanes 3 and 4. The lower half of the image is output with EVEN and ODD using lanes 5 and 6 and lanes 7 and 8.

The case of a 4096 x 2048 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

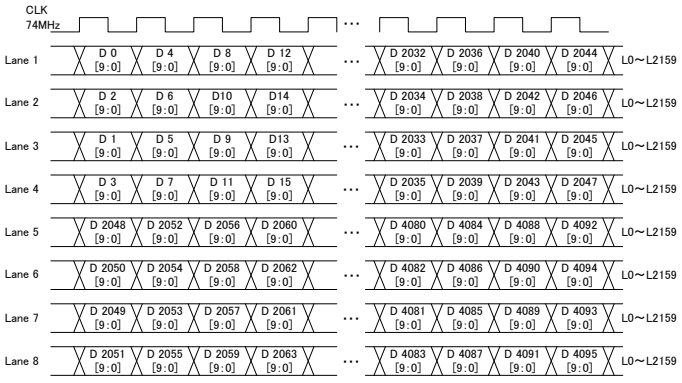


Assignment of each lane

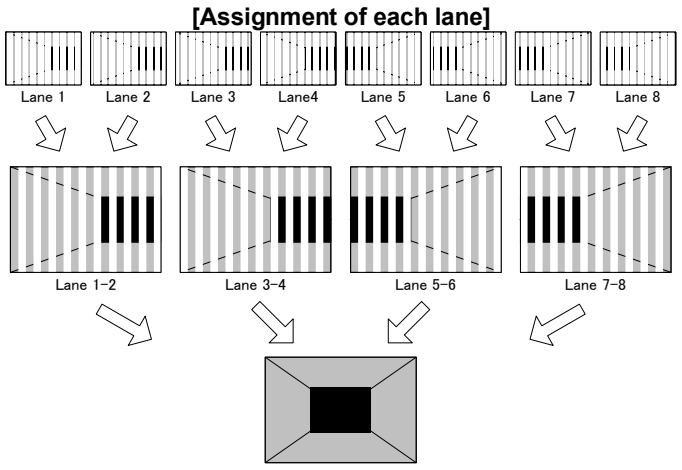
④ Mode 3 (8 lanes) - 2 Panes Vertical

The left half of the image is output with ODD and EVEN using lanes 1 and 2 and lanes 3 and 4. The right half of the image is output with ODD and EVEN using lanes 5 and 6 and lanes 7 and 8.

The case of a 4096 x 2048 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

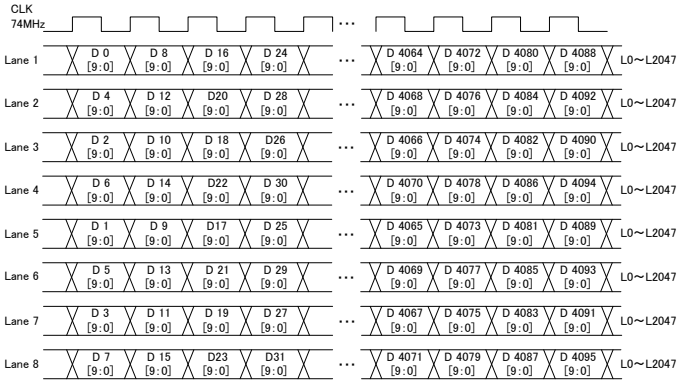


Assignment of each lane

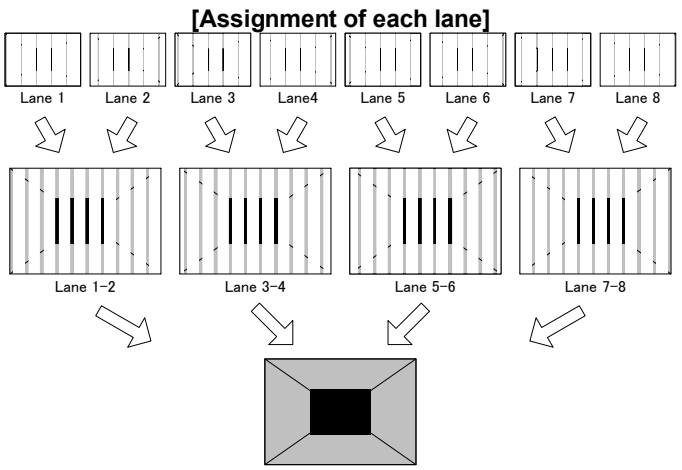
⑤ Mode 4 (8 lanes) - Without Splitting

EVEN is output using lanes 1 to 4 and ODD is output using lanes 5 to 8.

The case of a 4096 x 2048 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

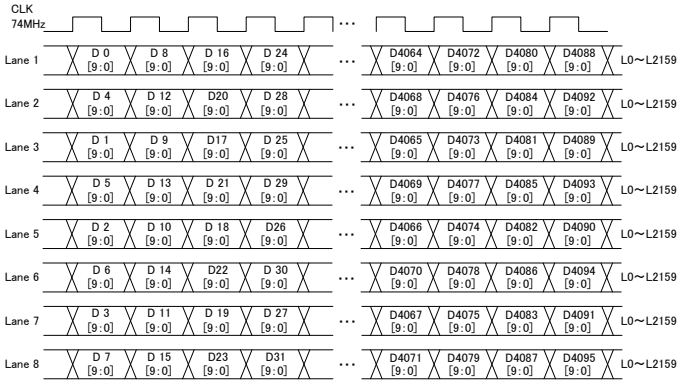


Assignment of each lane

⑥ Mode 0 (x4 mode) (8 lanes) - Mode0 x4 mode (Non Dividing Mode)

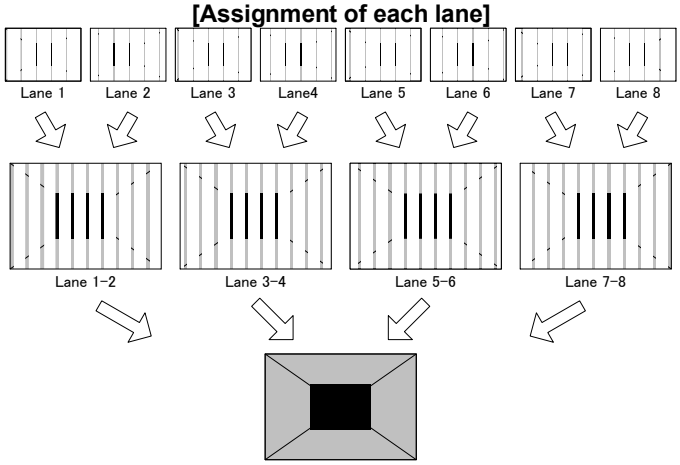
Output is with the pixel assignment shown below without splitting the screen and uses lanes 1 to 8.

The case of a 4096 x 2048 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

[Assignment of each lane]

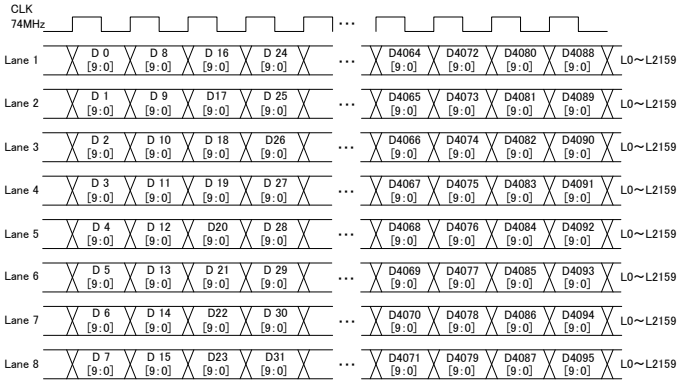


Assignment of each lane

⑦ Mode 1 (x4 mode) (8 lanes) - Normal Mode

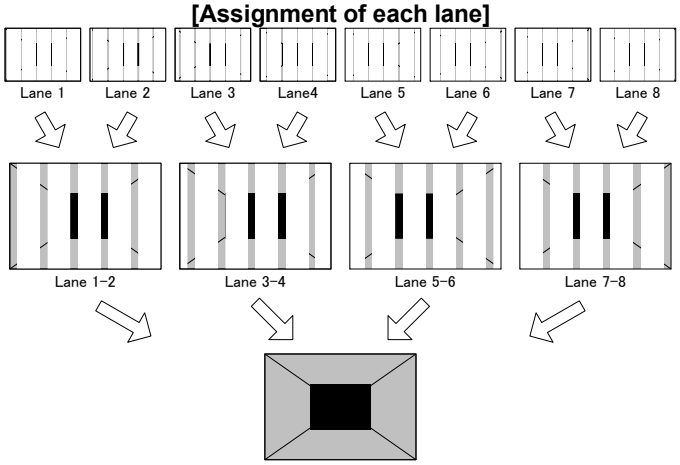
Output is with the pixel assignment shown below without splitting the screen and uses lanes 1 to 8.

The case of a 4096 x 2048 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

[Assignment of each lane]

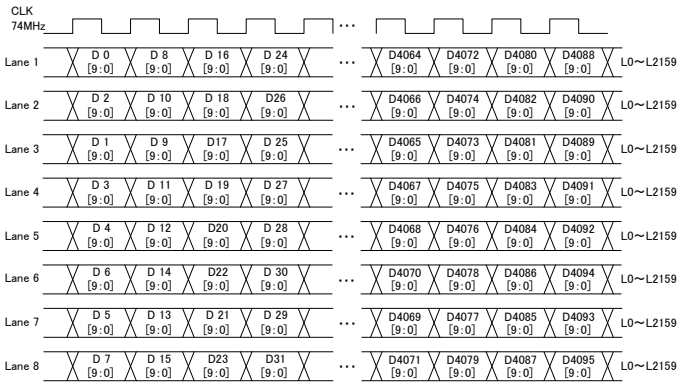


Assignment of each lane

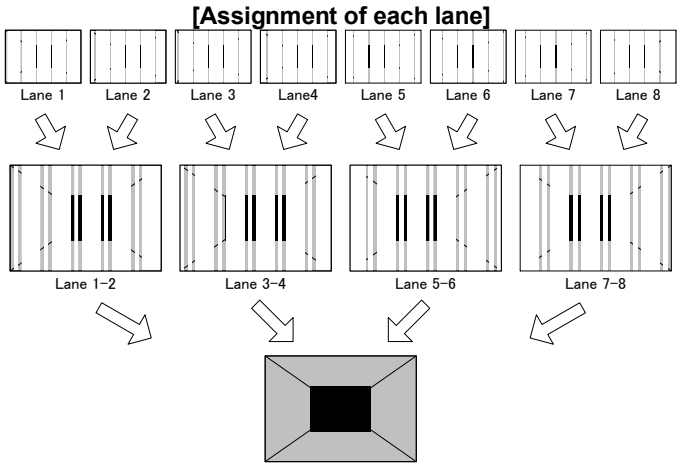
⑧ Mode 2 (x4 mode) (8 lanes) - Cross Mode

Output is with the pixel assignment shown below without splitting the screen and uses lanes 1 to 8.

The case of a 4096 x 2048 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

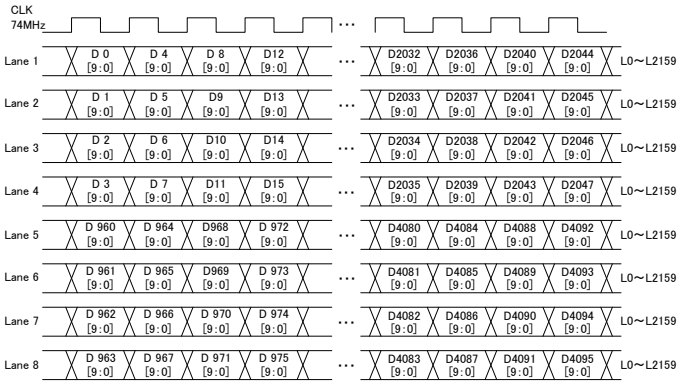


Assignment of each lane

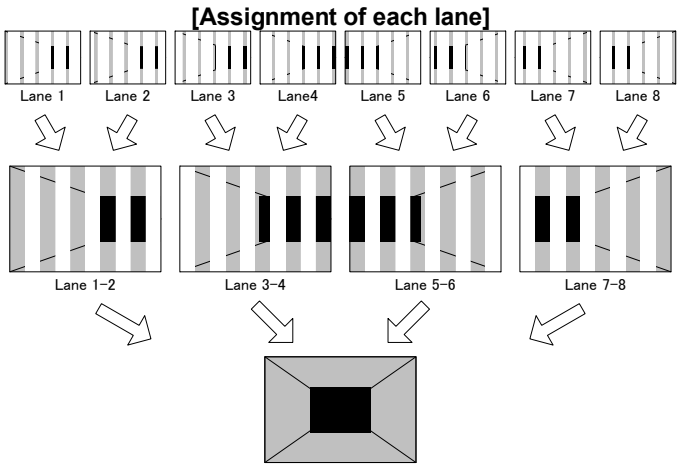
⑨ Mode 3 (x4 mode) (8 lanes) - Dividing Normal Mode

The left half of the image is output with EVEN and ODD using lanes 1 and 2 and lanes 3 and 4. The right half of the image is output with EVEN and ODD using lanes 5 and 6 and lanes 7 and 8.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

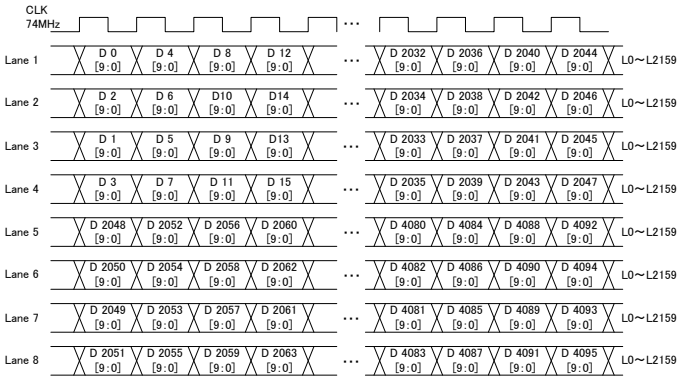


Assignment of each lane

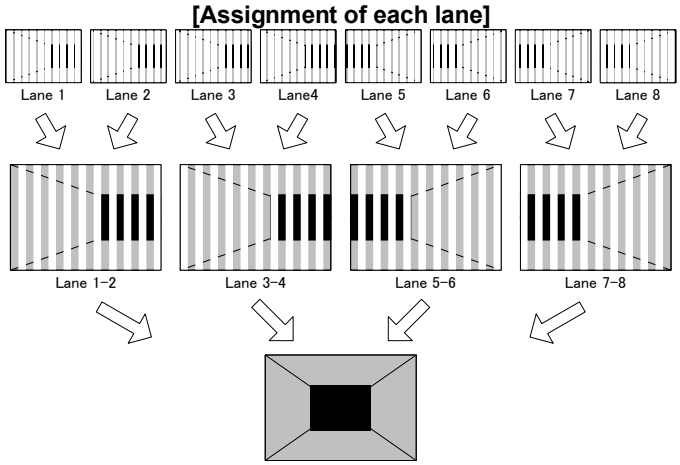
⑩ Mode 4 (x4 mode)　(8 lanes) - Dividing Cross Mode

The left half of the image is output with EVEN and ODD using lanes 1 and 3 and lanes 2 and 4. The right half of the image is output with EVEN and ODD using lanes 5 and 7 and lanes 6 and 8.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



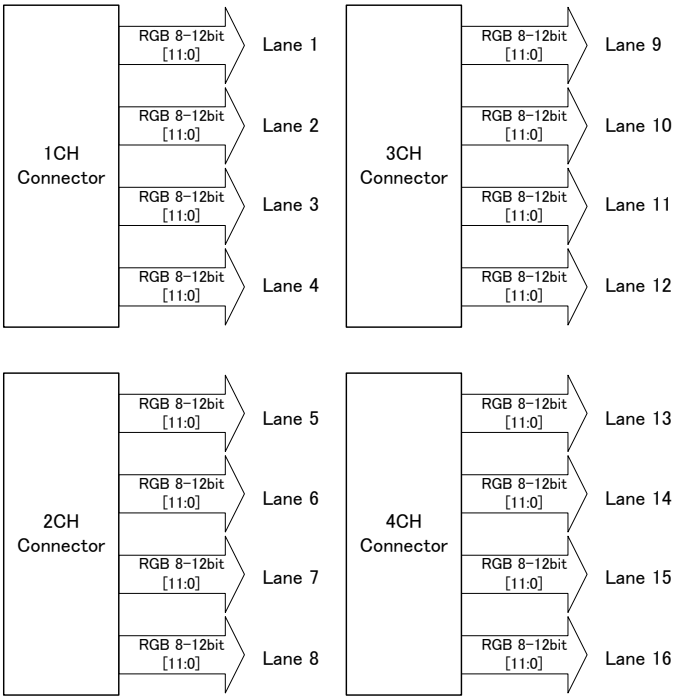
Data transfer method



Assignment of each lane

● [4Kx2K 120 Hz - 16-lane Output]

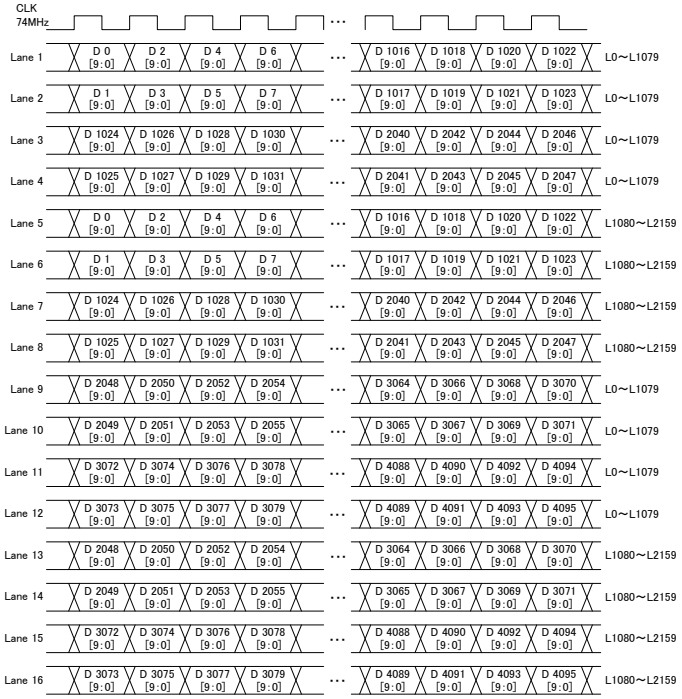
This mode is an output mode for the purpose of 4Kx2K 120 Hz testing.
One screen is output with a combination of 16 lanes using 4 output connectors when 4K x 2K 120 Hz mode output.



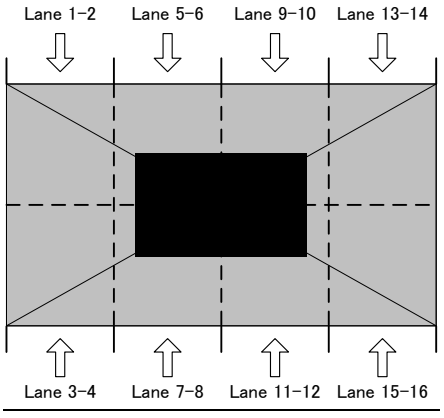
① Mode 0 (16 lanes) - 4 Quarter Panes + 2 Panes Vertical

The video is split into 4 quarters, which are assigned in the order of top left to lanes 1 and 2 and lanes 5 and 6, top right to lanes 9 and 10 and lanes 13 and 14, bottom left to lanes 3 and 4 and lanes 7 and 8, and bottom right to lanes 11 and 12 and lanes 15 and 16.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

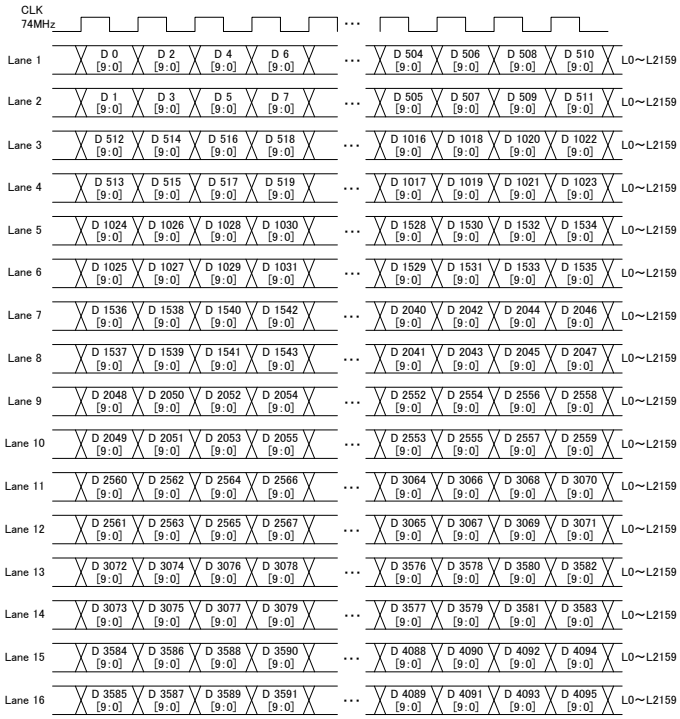


Assignment of each lane

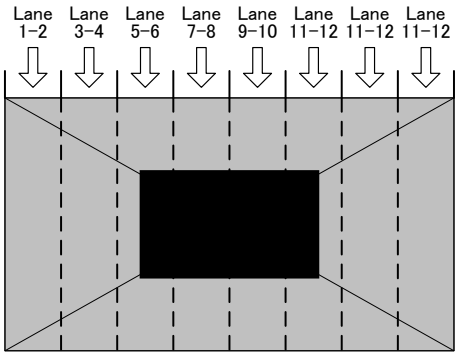
② Mode 1 (16 lanes) - (4 Panes Vertical + 2 Panes Vertical)

The video is split into 8 panes vertically, which are assigned from the left using two lanes each in the order of lanes 1 and 2, lanes 3 and 4, lanes 5 and 6, lanes 7 and 8, lanes 9 and 10, lanes 11 and 12, lanes 13 and 14, and lanes 15 and 16.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

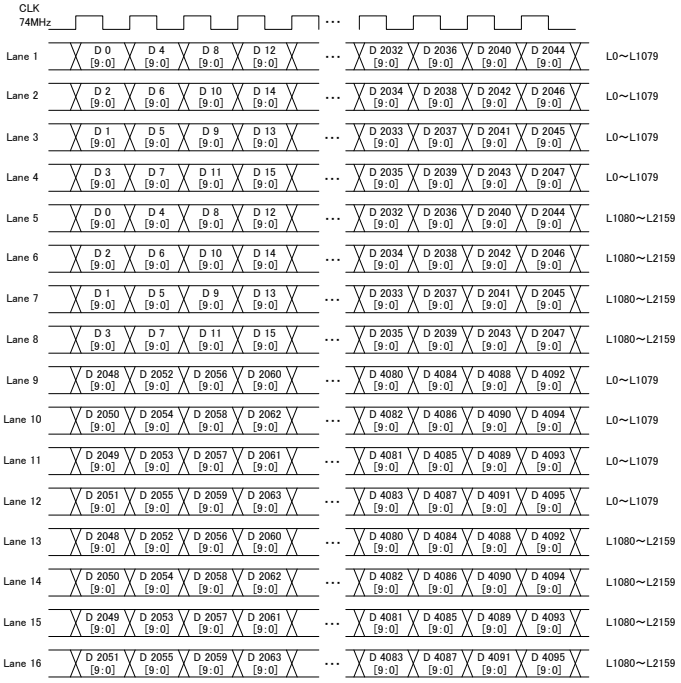


Assignment of each lane

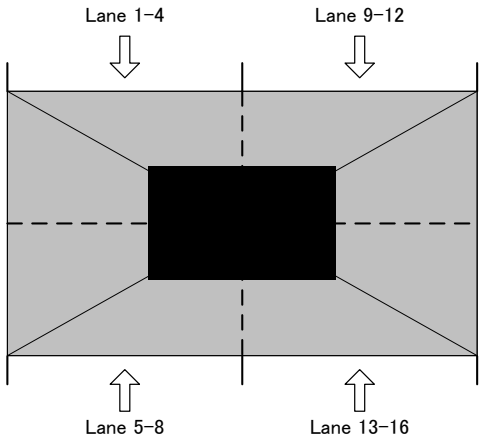
③ Mode 2 (16 lanes) - (2 Panes Horizontal + 2 Panes Vertical)

The upper half of the left of the image is output with EVEN and ODD using lanes 1 to 4. The lower half of the left of the image is output with EVEN and ODD using lanes 5 to 8, the upper half of the right of the image is output with EVEN and ODD using lanes 9 to 12, and the lower half of the right is output with EVEN and ODD using lanes 13 to 16.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

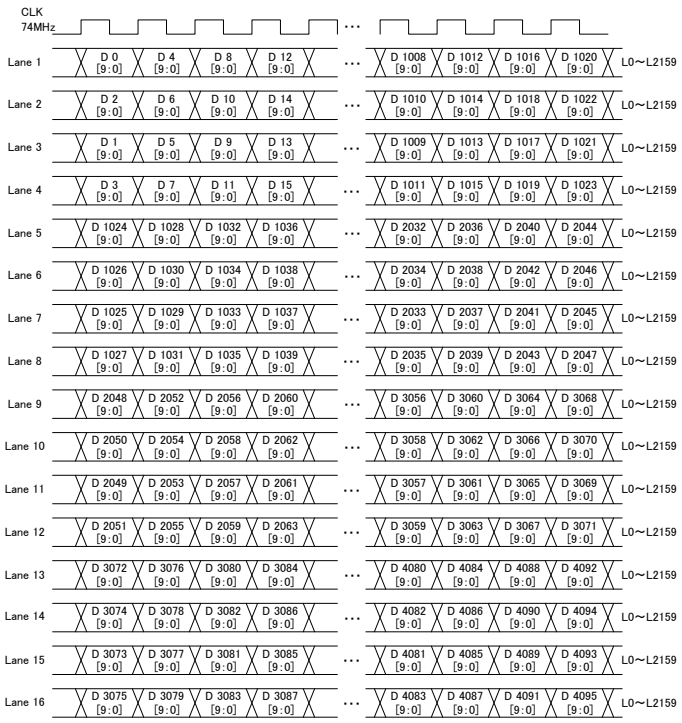


Assignment of each lane

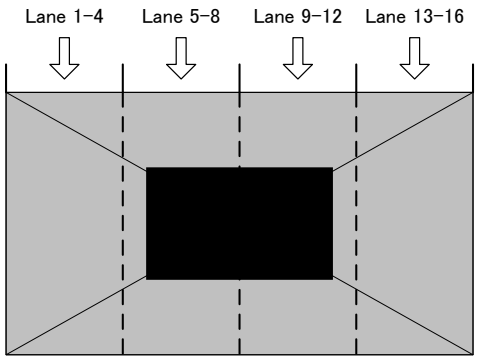
④ Mode 3 (16 lanes) - (2 panes vertical + 2 panes vertical)

The left half of the image is output with ODD and EVEN using lanes 1 to 4 and lanes 5 to 8. The right half of the image is output with ODD and EVEN using lanes 9 to 12 and lanes 13 to 16.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

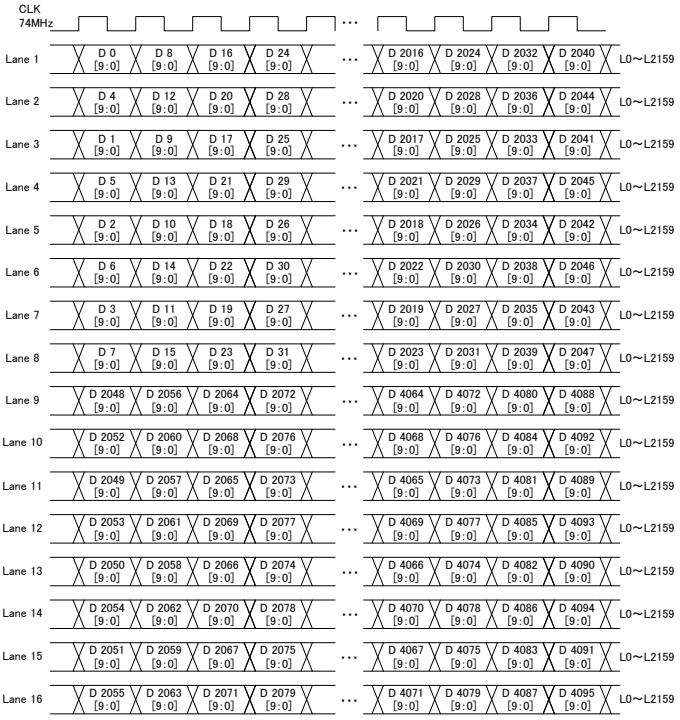


Assignment of each lane

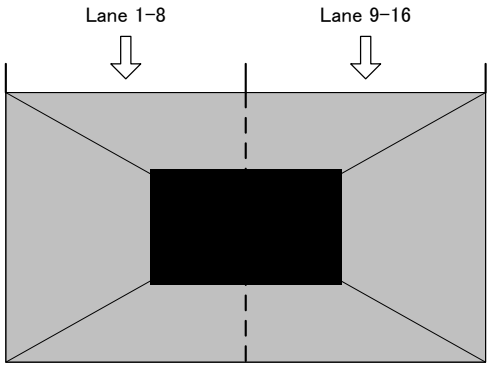
⑤ Mode 4 (16 lanes) - (2 panes vertical + Without splitting ①)

Outputs with ODD and EVEN using lanes 1 to 8 and outputs with ODD and EVEN using lanes 9 to 16.
Output is with the pixel assignment shown below for the mapping of each lane.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

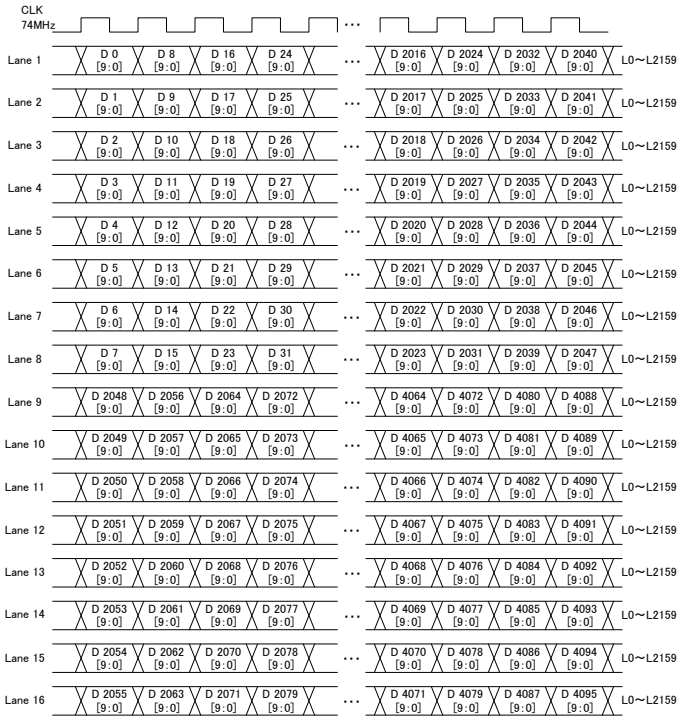


Assignment of each lane

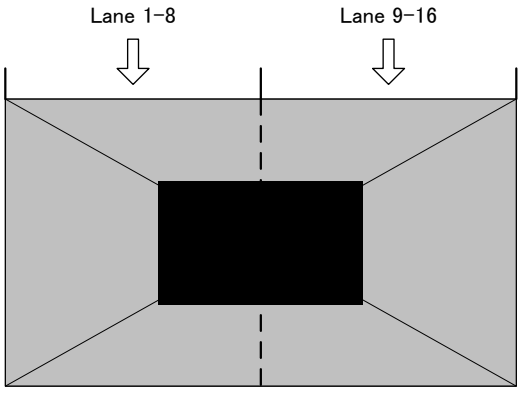
⑥ Mode 5 (16 lanes) - (2 panes vertical + Without splitting ②)

Outputs with ODD and EVEN using lanes 1 to 8 and outputs with ODD and EVEN using lanes 9 to 16.
Output is with the pixel assignment shown below for the mapping of each lane.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

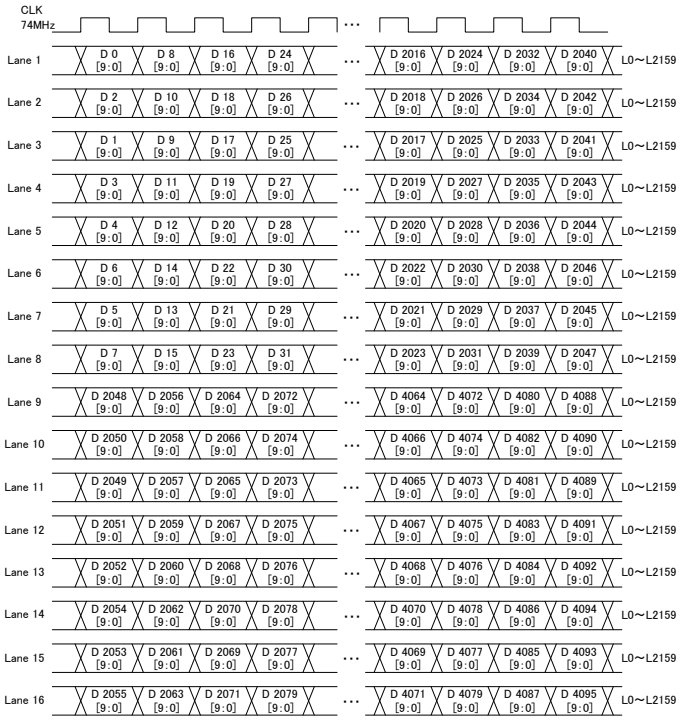


Assignment of each lane

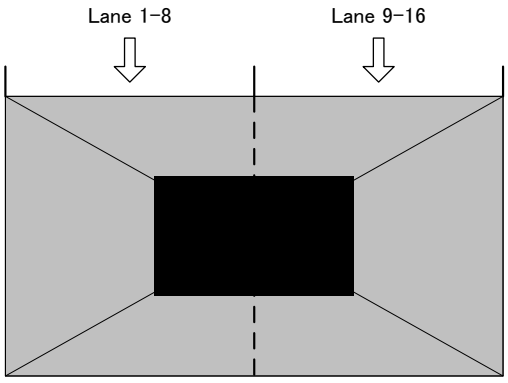
⑦ Mode 6 (16 lanes) - (2 panes vertical + Without splitting ③)

Outputs with ODD and EVEN using lanes 1 to 8 and outputs with ODD and EVEN using lanes 9 to 16.
Output is with the pixel assignment shown below for the mapping of each lane.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

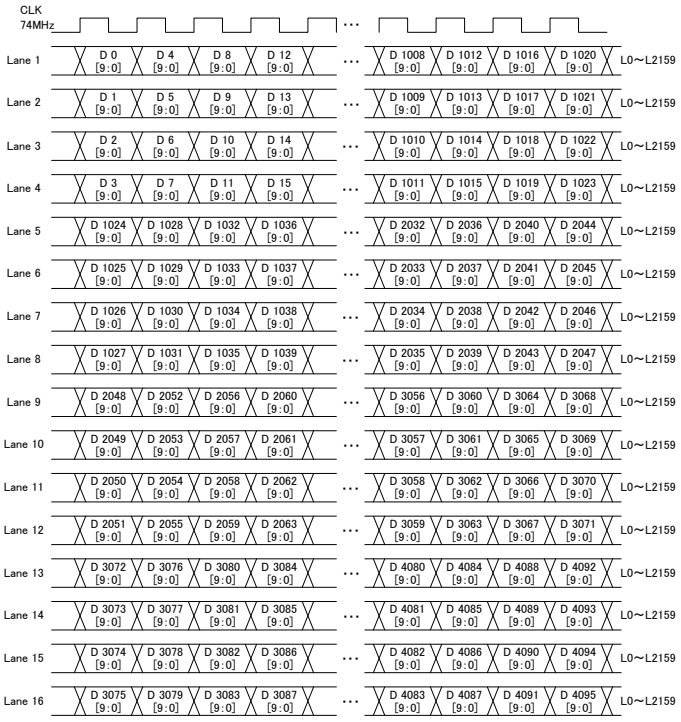


Assignment of each lane

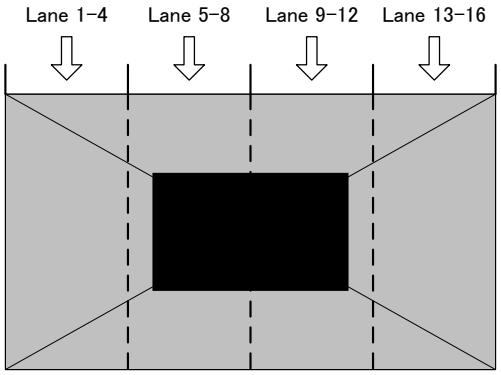
⑧ Mode 7 (16 lanes) - (2 panes vertical + With splitting ① Dividing Normal Mode)

The screen is split into 4 panes vertically to output with the following pixel assignment.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

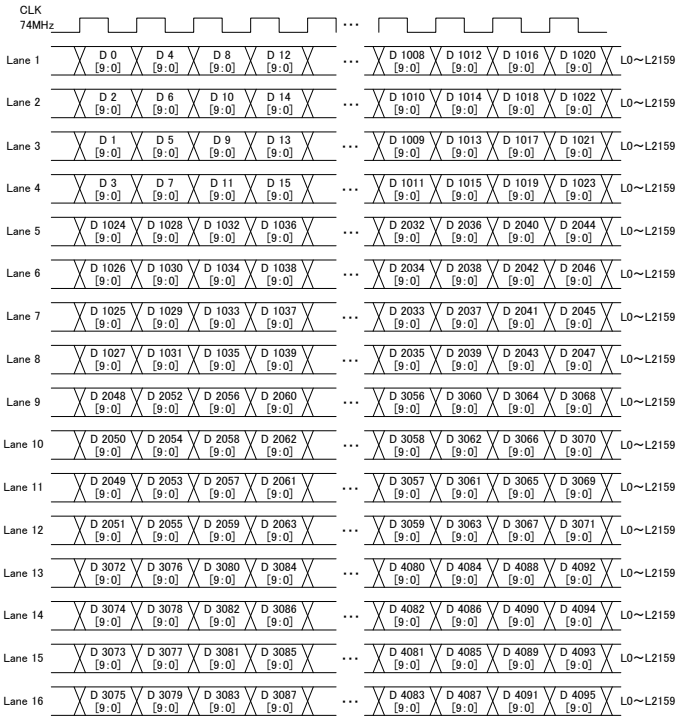


Assignment of each lane

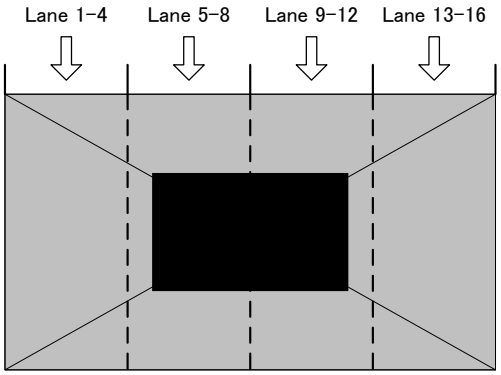
⑨ Mode 8 (16 lanes) - (2 Panes Vertical + With Splitting ② Dividing Cross Mode)

The screen is split into 4 panes vertically to output with the following pixel assignment.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

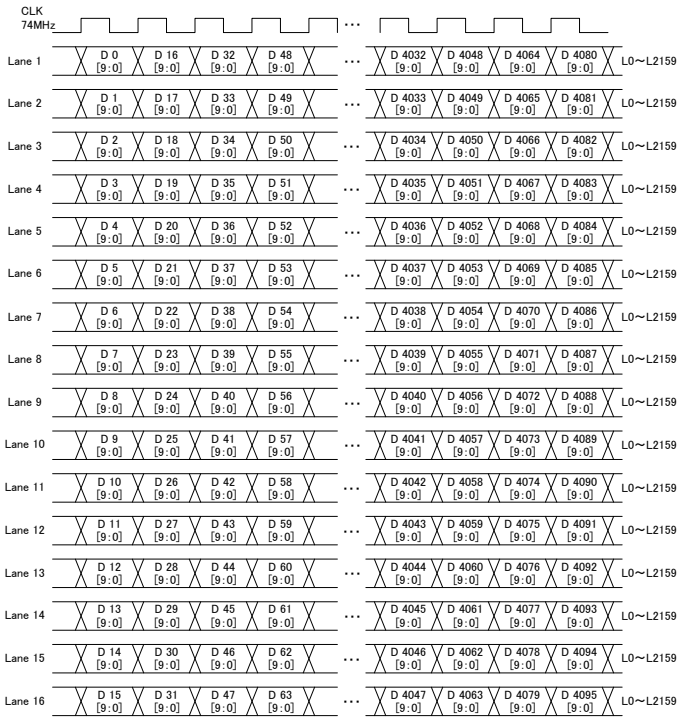


Assignment of each lane

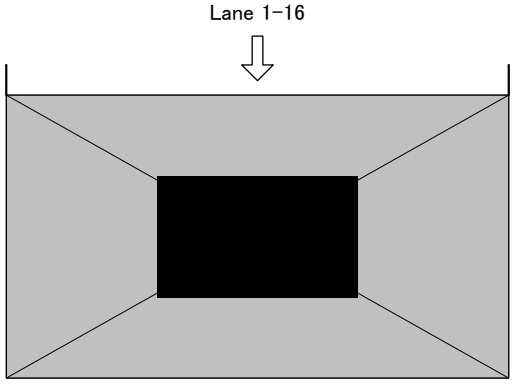
⑩ Mode 9 (16 lanes) (Without splitting)

Output is with the following pixel assignment without splitting the screen.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method



Assignment of each lane

4.4.4 V-by-One HS output setting items

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Setting item</th><th>Setting value</th></tr>
<tr><td colspan="5">V-by-One HS</td></tr>
<tr><td colspan="2"></td><td>Output OFF/ON</td><td>Port1 - Port16
Sets ON/OFF for each Port.</td><td>0: OFF / 1: ON</td></tr>
<tr><td colspan="3"></td><td>Number Of Lanes
Sets the number of data lanes for output from V-by-One HS.
* This is in accordance with the Dotclk Mode setting in “2.1 ALL OUTPUT”.</td><td>0: Auto
Sets the number of data lanes automatically to match Dot Clock.
20 M to 75 MHz — 1 lane
75 M to 150 MHz — 2 lanes
150 M to 300 MHz — 4 lanes
1: 1 lane
Outputs the same video from output channel 1 and channel 2.
2: 2 lanes
Outputs the same video from output channel 1 and channel 2.
3: 4 lanes
Outputs the same video from output channel 1 and channel 2.
4: 8 lanes
5: 16 lanes</td></tr>
<tr><td colspan="3"></td><td colspan="2">Split
Selects the screen split method of the 4Kx2K mode and x4 mode which use the frame memory in the board.
* This is in accordance with the Split Mode setting in “2.1 ALL OUTPUT”.</td></tr>
<tr><td colspan="4"></td><td>When the number of lanes is 8 lanes, the following setting items are displayed.
0: 4 quarter panes output
1: 4 panes vertical output
2: 2 panes horizontal output
3: 2 panes vertical output
4: Without splitting
5: Non Dividing Mode (Mode 0 x4mode)
6: Normal Mode (Mode 1 x4mode)
7: Cross Mode (Mode 2 x4mode)
8: Dividing Normal Mode (Mode 3 x4mode)
9: Dividing Cross Mode (Mode 4 x4mode)</td></tr>
<tr><td colspan="4"></td><td>When the number of lanes is 16 lanes, the following setting items are displayed.
0: 4 quarter panes output + 2 panes vertical output
1: 4 panes vertical output + 2 panes vertical output
2: 4 panes horizontal output + 2 panes vertical output
3: 2 panes vertical output + 2 panes vertical output
4: 2 panes vertical output + Without splitting ① (Non Dividing Mode)
5: 2 panes vertical output + Without splitting ② (Normal Mode)
6: 2 panes vertical output + Without splitting ③ (Cross Mode)
7: 2 panes vertical output + With splitting ① (Dividing Normal Mode)
8: 2 panes vertical output + With splitting ② (Dividing Cross Mode)
9: Without splitting
A: * Not output with V-by-One HS.</td></tr>
<tr><td colspan="3"></td><td>Pre-Emphasis
Sets pre-emphasis.</td><td>0: 0%
1: 100%</td></tr>
<tr><td colspan="3"></td><td>3D Flag
Sets the 3D flag.
* “3D flag on DE active period” defined in V-by-One HS Standard Ver.1.3 and later is supported.
“3D flag on blanking period” is not supported.</td><td>0: Disable
1: Enable</td></tr>
<tr><td colspan="3"></td><td>Field BET Mode
Sets Field BET Mode.</td><td>0: Disable
1: Enable</td></tr>
<tr><td colspan="3"></td><td>Control Mode
Sets the control method of HTPDN and LOCKN.</td><td>0: Separate
1: 1 -> 234</td></tr>
</table>

Level 1	Level 2	Level 3	Setting item	Setting value
	HTPDN Ctrl 1, 2, 3, 4 **LOCHN Ctrl 1, 2, 3, 4** **Controls channel 1, channel 2, channel 3, and channel 4.**			**0: Through** **1: Low** **2: High**

Important

- When the dot clock operation mode (DotClk Mode) is Auto, the number of data lanes is switched automatically according to the dot clock.
  For details, refer to the DotClk Mode settings of "**2.1ALL OUTPUT**".

4.4.5 V-by-One HS configuration setting items

This section describes configuration settings for the V-by-One HS unit.
Set these settings from MENU > Configuration.

Level 1	Level 2	Level 3	Setting item	Setting value
Configuration				
	V-by-One HS			
		Control Mode (0/1) Sets the control method of HTPDN and LOCKN.		**Separate** Sets each of channel 1, channel 2, channel 3, and channel 4. **1 -> 234** Sets the settings of channel 1 also for channels 2, 3, and 4.
		HTPDN Ctrl 1, 2, 3, 4 **LOCKN Ctrl 1, 2, 3, 4** **(0 to 2)** Controls channel 1, channel 2, channel 3, and channel 4.		**Through** Passes the signals from the receiver through the unit. **Low** Forcibly sets low. **High** Forcibly sets high.
		Wait Progexec time Sets the wait time for when transmitting ProgData to a slave.		**1 to 1000 ms**
		Wait HS Ctrl time Sets the wait time for when transmitting HsControl to a slave.		**1 to 30000 us**

4.4.6 V-by-One HS control

V-By-One HS control signals (HTPDN and LOCK) can be controlled with the VM-1876-M2.

Level 1	Level 2	Level 3	Setting item	Setting value
MENU				
	V-by-One HS Control			
		1CH	**HTPDN**	**-** Through Passes the signals from the receiver through the unit. **L** **Forced Low** Forcibly sets low. **H** **Forced High** Forcibly sets high.
			LOCK	**--/H/L**
		2CH	**HTPDN**	**--/H/L**
			LOCK	**--/H/L**

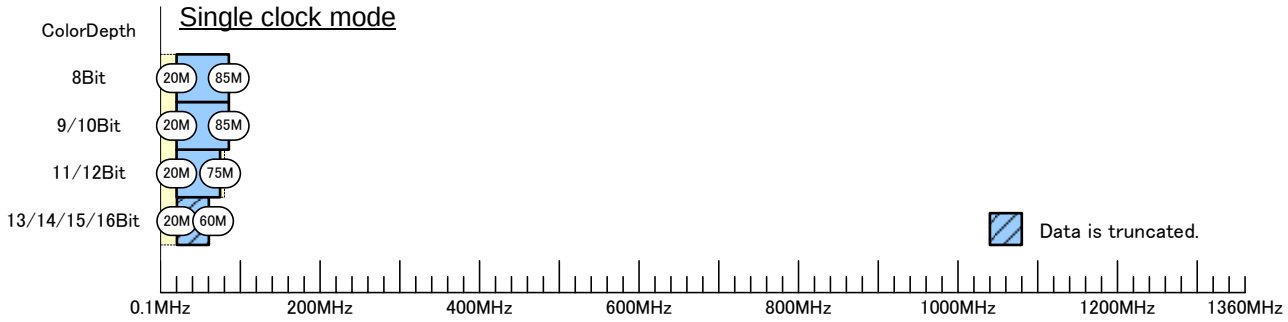
The STATUS display section displays the current statuses of channel 1, channel 2, channel 3, and channel 4.
When forced low or forced high is set, display is with outline characters on a colored background.

4.4.7 Relationship between Pattern Rendering Bit Length and Dot Clock

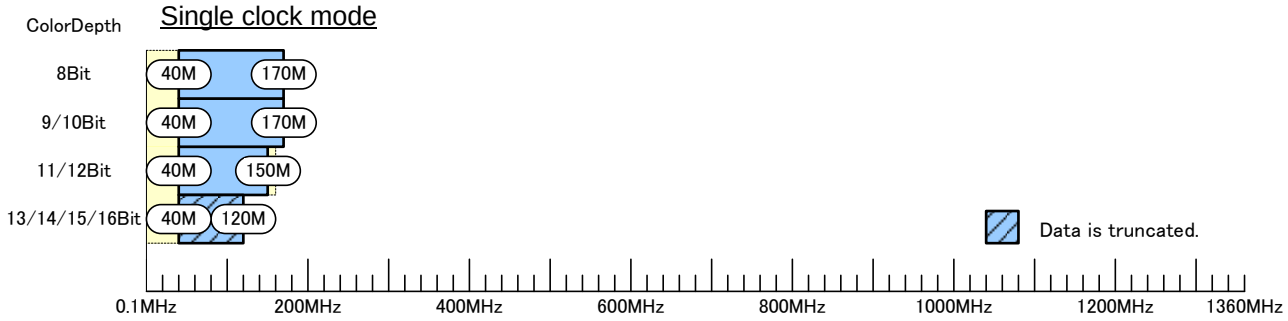
The dot clock is limited by the pattern rendering bit length (color depth) and dot clock operation mode (DotClk Mode) as shown in the following figures. The number of data lanes is determined by the dot clock operation mode (DotClk Mode).

For details on the dot clock operation mode (DotClk Mode) and pattern bit length (color depth), refer to "**2.1 ALL OUTPUT**". For details on the number of data lanes, refer to "**4.4.4 V-by-One HS output setting items**".

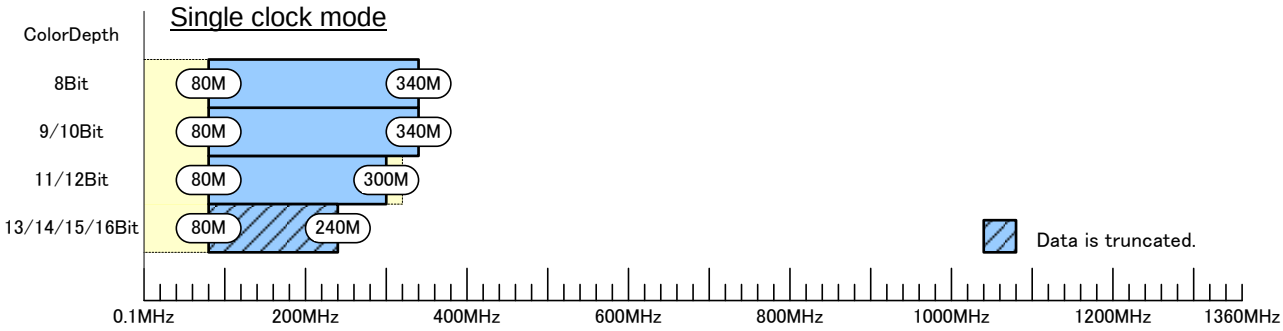
1) When number of data lanes is 1



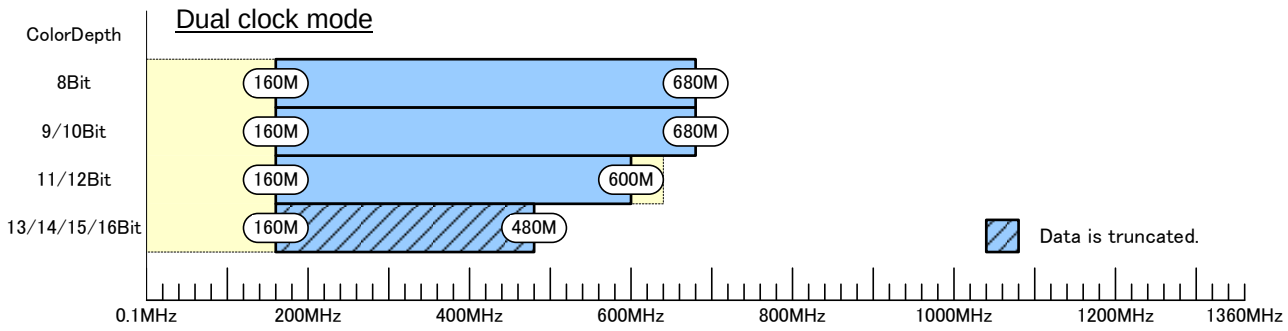
2) When number of data lanes is 2



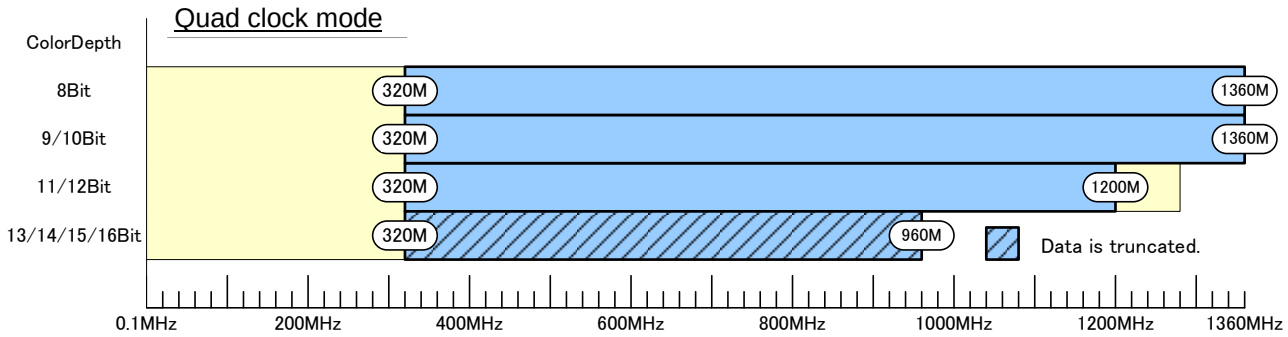
3) When number of data lanes is 4



4) When number of data lanes is 8



5) When number of data lanes is 16

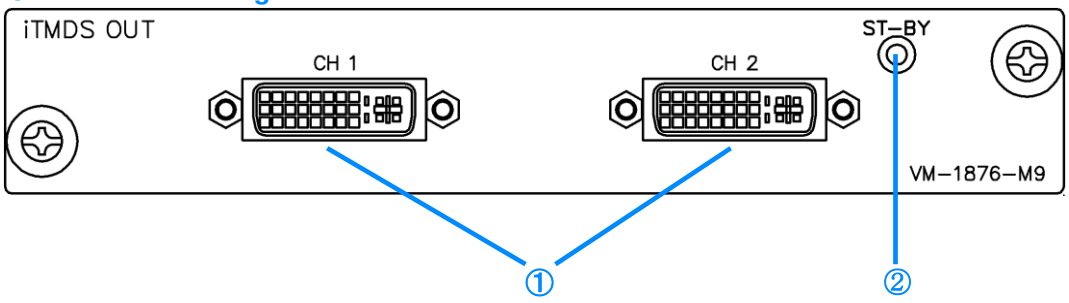


4.5 iTMDS unit functions and settings

The applicable unit is as follows.

4.5.1 iTMDS Unit VM-1876-M9

● Unit exterior diagram

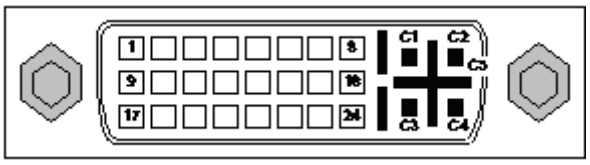


No.	Name	Description
①	iTMDS output	Can output digital signals only. (iTMDS connectors) Dual-Link is supported.
②	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

● Specifications

iTMDS CH1 CH2	Connector	DVI-I connector (x2)		
	Dot clock	DVI MODE	8 bit	25 to 165 MHz (Single) 50 to 330 MHz (Dual) 297 to 660 MHz (Quad) 594 to 1320 MHz (Octal)
			10 bit	25 to 165 MHz (Single (16 bit)) 50 to 330 MHz (Dual (16 bit))
			12 bit	25 to 165 MHz (Single (16 bit)) 50 to 320 MHz (Dual (16 bit))
			16 bit	25 to 165 MHz (Single (16 bit)) 50 to 240 MHz (Dual (16 bit))
		iTMDS MODE	8/10 bit	25 to 165 MHz (Single) 50 to 330 MHz (Dual) 297 to 660 MHz (Quad) 594 to 1320 MHz (Octal)
			12 bit	25 to 150 MHz (Single) 50 to 300 MHz (Dual) 297 to 600 MHz (Quad) 594 to 1200 MHz (Octal)
	Link Rate (R) * When iTMDS mode	R = 225 MHz (max) 8 bit: DotCLK=R, 10 bit: DotCLK=R/1.25, 12 bit: DotCLK=R/1.5		
	Video format	RGB, YCbCr 4:4:4		
	E-EDID	Ver. 1.3 (DDC2B) compliant		

4.5.2 Connector and pin assignment



Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	TMDS DATA2-	9	TMDS DATA1-	17	TMDS DATA0-
2	TMDS DATA2+	10	TMDS DATA1+	18	TMDS DATA0+
3	TMDS DATA2/4 G	11	TMDS DATA1/3 G	19	TMDS DATA0/5 G
4	TMDS DATA4-	12	TMDS DATA3-	20	TMDS DATA5-
5	TMDS DATA4+	13	TMDS DATA3+	21	TMDS DATA5+
6	DDC CLK	14	+5 V (DDC power supply*1)	22	TMDS CLK G
7	DDC DATA	15	GND	23	TMDS CLK+
8	Analog Vsync	16	SENSE	24	TMDS CLK-
C1	Analog Red				
C2	Analog Green				
C3	Analog Blue				
C4	Analog Hsync				
C5	Analog Ground				

*1 The supply current of the DDC power supply is limited. Refer to “**5.1 DDC power supply max power current consumption**”.

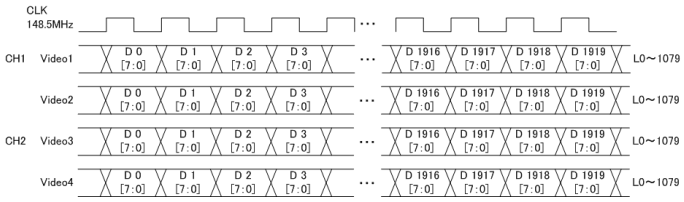
4.5.3 iTMDS data transfer method

● <Specifications when DVI mode output>

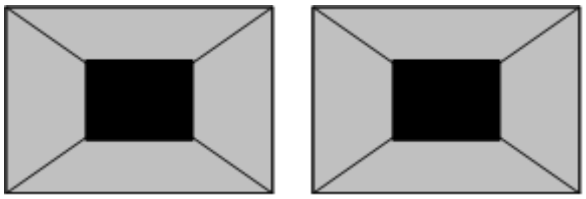
[Single (8 bit)]

The video is output for all two channels. Furthermore, the output gradation is 8-bit.

The case of a 1920 x 1080p60 resolution, 148.5 MHz dot clock, and 8-bit output gradation is explained as an example.



Data transfer method



CH1

(Video 1 and Video 2 are the same picture)

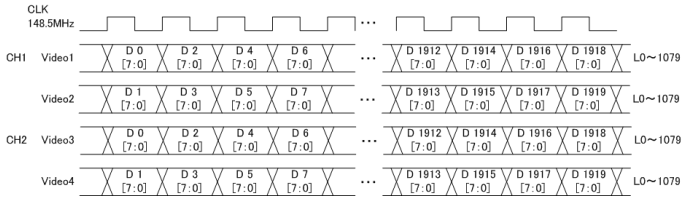
CH2

(Video 3 and Video 4 are the same picture)

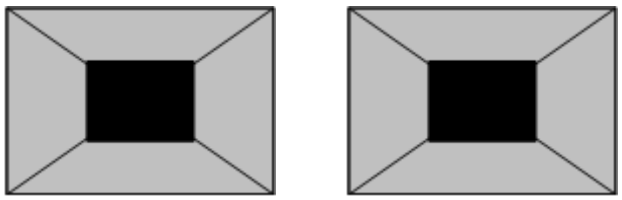
Assignment of each lane

[Dual (8 bit)]
Video is output as a combination of EVEN and OUT
Furthermore, the output gradation is 8-bit.

The case of a 1920 x 1080p120 resolution, 297 MHz dot clock, and 8-bit output gradation is explained as an example.
Channels 1 and 2 output the same picture.



Data transfer method



CH1

(Video1-EVEN / Video2-ODD)

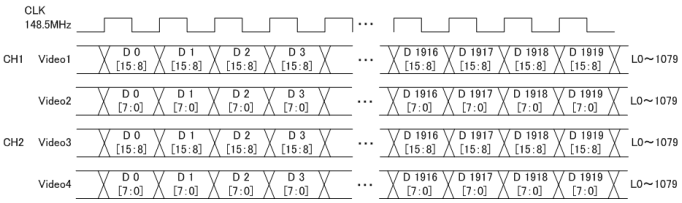
CH2

(Video3-EVEN / Video4-ODD)

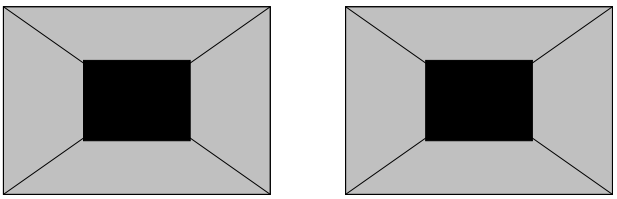
Assignment of each lane

[Single (16 bit)]
16-bit video is output as a combination of the upper 8 bits and lower 8 bits for one channel.

The case of outputting a 1920 x 1080p60 resolution, 148.5 MHz dot clock, 16-bit output gradation, and channel 1: 8 bits and channel 2: 8 bits is explained as an example.



Data transfer method



CH1

Video 1 is upper 8 bits [15:8], Video 2 is lower 8 bits [7:0]

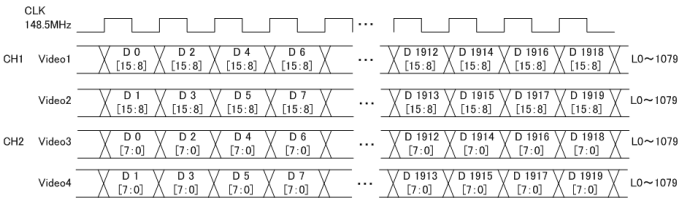
CH2

Video 3 is upper 8 bits [15:8], Video 4 is lower 8 bits [7:0]

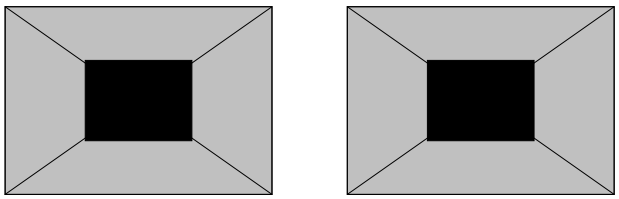
Assignment of each lane

[When dual (16-bit) DVI mode]
16-bit video is output by outputting the upper 8 bits from channel 1 and the lower 8 bits from channel 2.

The case of outputting a 1920 x 1080p120 resolution, 297 MHz dot clock, 16-bit output gradation, and channel 1: 8 bits and channel 2: 8 bits is explained as an example.



Data transfer method



CH1

Video 1 is the EVEN of upper 8 bits [15:8], Video 2 is ODD of upper 8 bits [15:8]

CH2

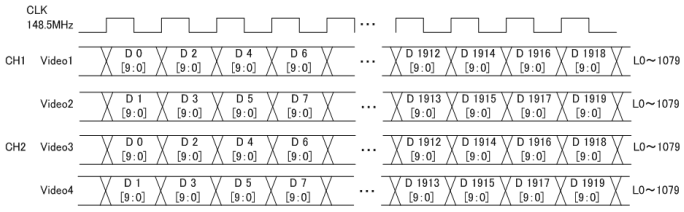
Video 3 is EVEN of lower 8 bits [7:0], Video 4 is ODD of lower 8 bits [7:0]

Assignment of each lane

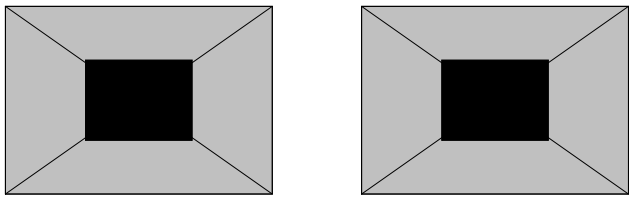
● <Specifications when iTMDS mode output>

[When dual (16-bit) iTMDS mode]
Output is with EVEN and ODD as a combination for 1 channel with EVEN from Video 1 and Video 3 and ODD from Video 2 and Video 4.

The case of outputting a 1920 x 1080p120 resolution, 297 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method



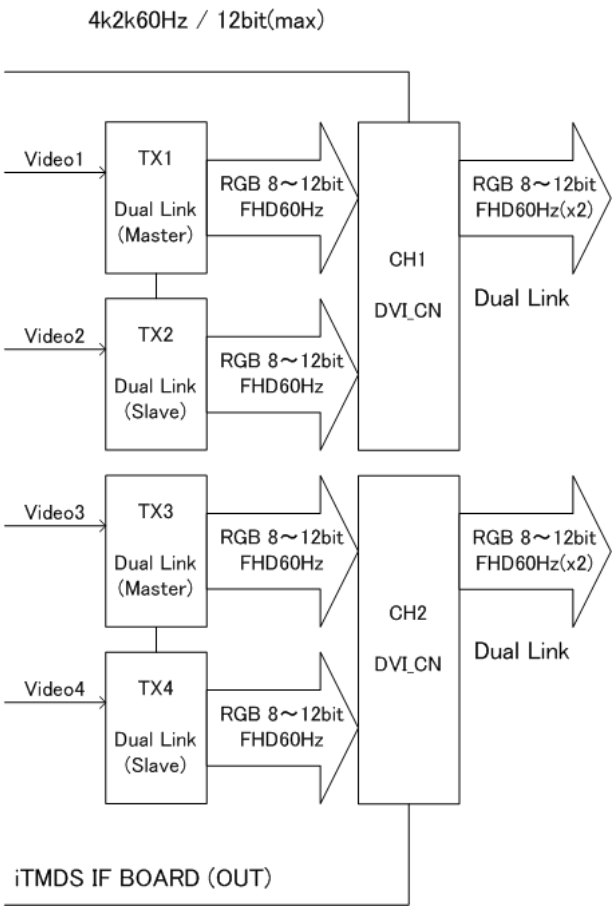
CH1
(Video1-EVEN / Video2-ODD)

CH2
(Video3-EVEN / Video4-ODD)

Assignment of each lane

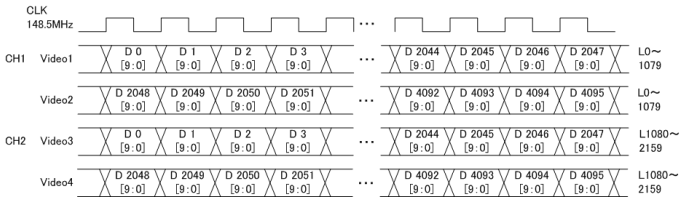
● Specifications of each mode when Quad Link

A maximum of 4K2K 60 Hz 12-bit can be output using channel 1 (Dual Link) and channel 2 (Dual Link).

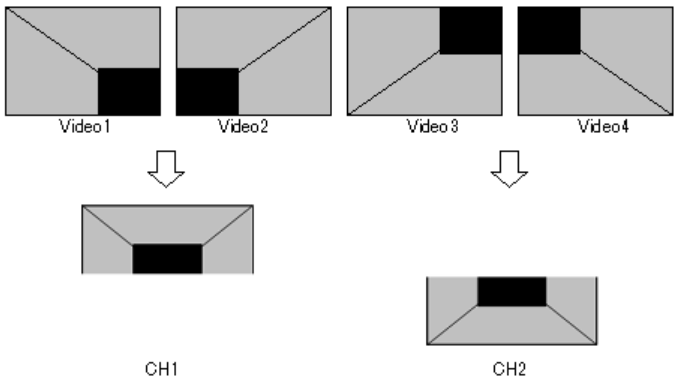


① MODE 0 (Quad Link) (4 quarter panes)
The video is split into 4 quarter panes and then output using Video 1, Video 2, Video 3, and Video 4.

The case of a 4096 x 2160 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

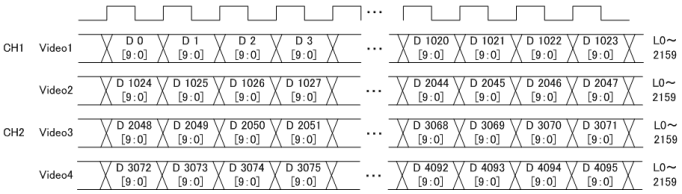


Assignment of each lane

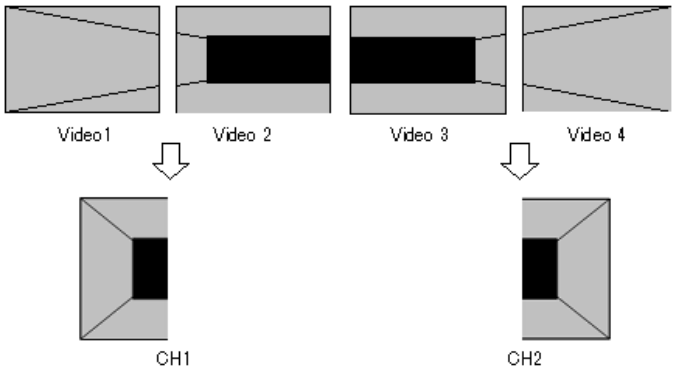
② MODE 1 (Quad Link) (4 panes vertical)

The video is split into 4 panes vertically, which are assigned from the left in order of video channel 1, video channel 2, video channel 3, and video channel 4.

The case of a 4096 x 2160 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

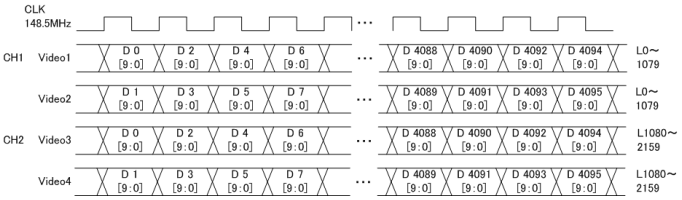


Assignment of each lane

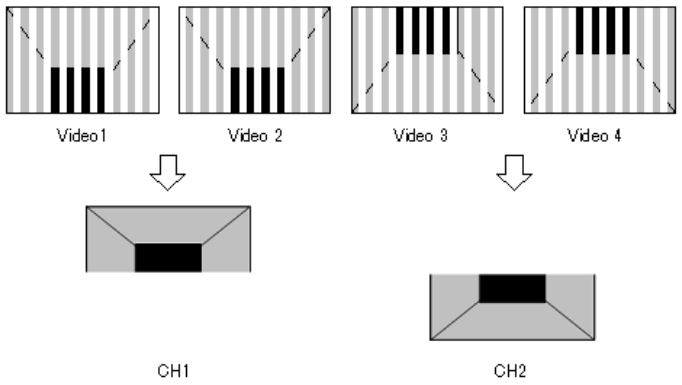
③ MODE 2 (Quad Link) (2 panes horizontal)

The video of the upper half is output with ODD and EVEN using Video 1 and Video 2.
The video of the lower half is output with ODD and EVEN using Video 3 and Video 4.

The case of a 4096 x 2160 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



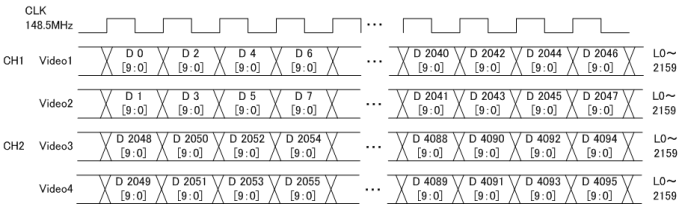
Data transfer method



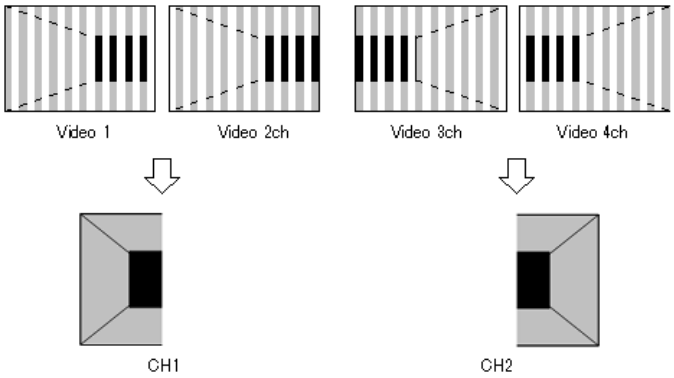
Assignment of each lane

④ MODE 3 (Quad Link) (2 panes vertical)
The video of the left half is output with ODD and EVEN using Video 1 and Video 2.
The video of the right half is output with ODD and EVEN using Video 3 and Video 4.

The case of a 4096 x 2160 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



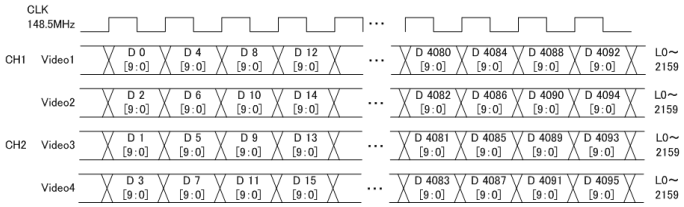
Data transfer method



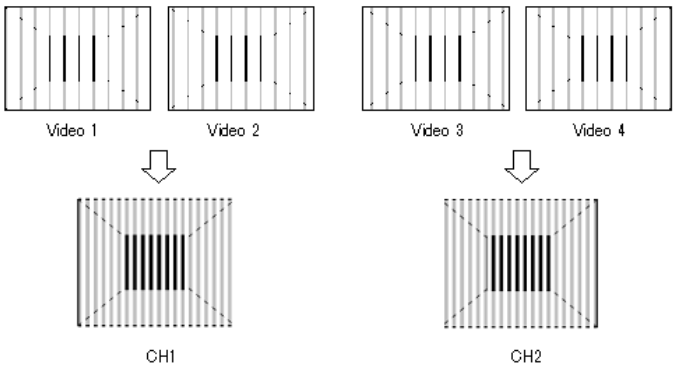
Assignment of each lane

⑤ MODE 4 (Quad Link) (Without splitting)
EVEN is output using Video 1 and Video 2 and ODD is output using Video 3 and Video 4.

The case of a 4096 x 2160 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



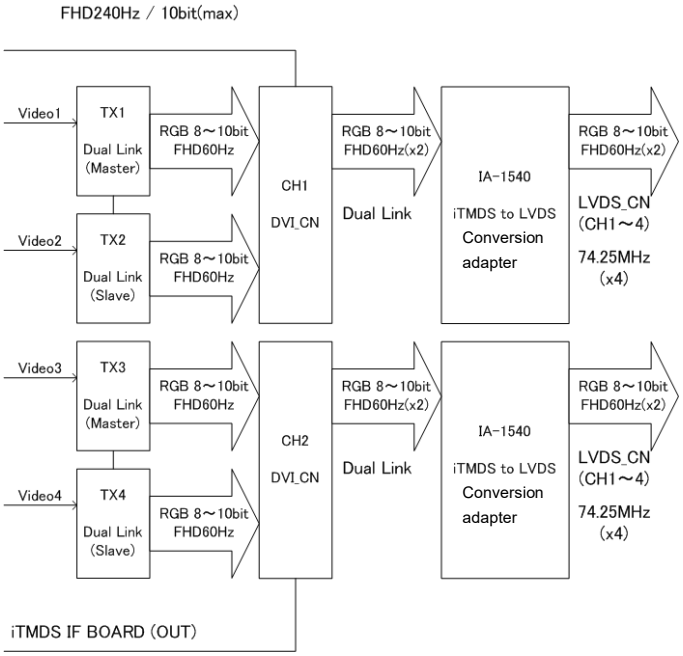
Data transfer method



Assignment of each lane

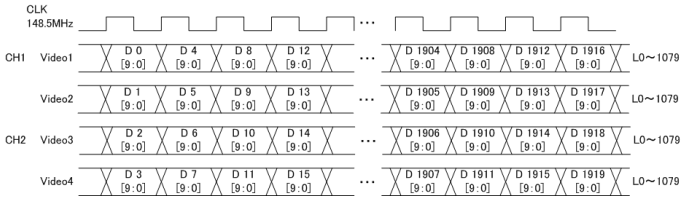
● Specifications of each mode when x4 mode output

X4 Mode enables output at a maximum of FHD 240 Hz 10-bit by converting to LVDS (x8) with IA-1540 (iTMDS to LVDS conversion adapter). Splitting into MODE 0 to MODE 4 is additionally performed according to the method of assigning the data to Video 1 to Video 4.

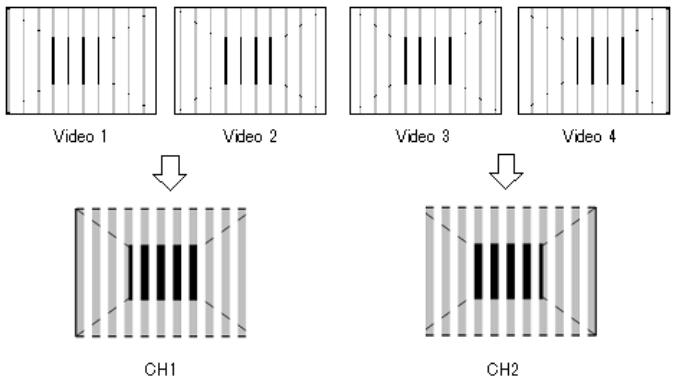


① MODE0 x4 Mode (Quad Link) (Non Dividing Mode)
Video 1, Video 2, Video 3, and Video 4 are used to output with the following pixel assignment without splitting the screen.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

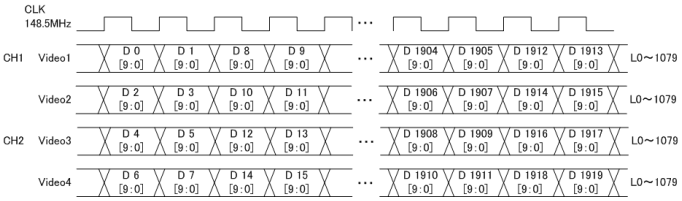


Assignment of each lane

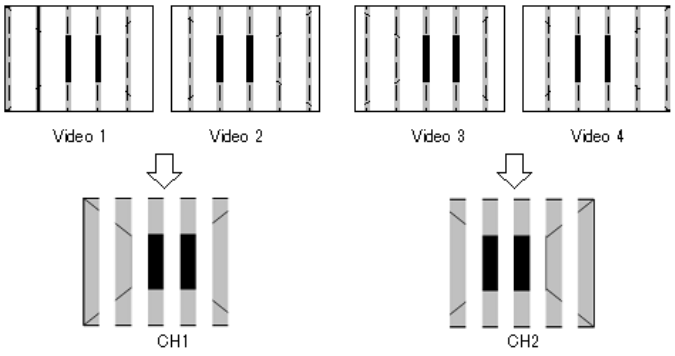
②MODE1 x4 Mode　(Quad Link) (Normal Mode)
Video 1, Video 2, Video 3, and Video 4 are used to output with the following pixel assignment without splitting the screen.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.

X4 Mode is an output mode for the purpose of Full HD 240 Hz compatible FPD testing. The VG output is connected to the IA-1540 (iTMDS-LVDS conversion box) to use as 8-channel output by halving the output using the conversion box.
The following explanation is for the signals of 4 channels output from the VG. For an explanation of when 8-channel output from the LVDS, refer to “**4.4.3 V-by-OneHS data transfer method**”.



Data transfer method

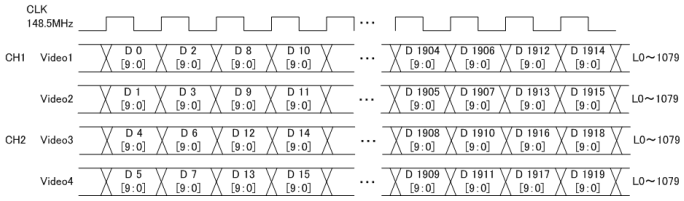


Assignment of each lane

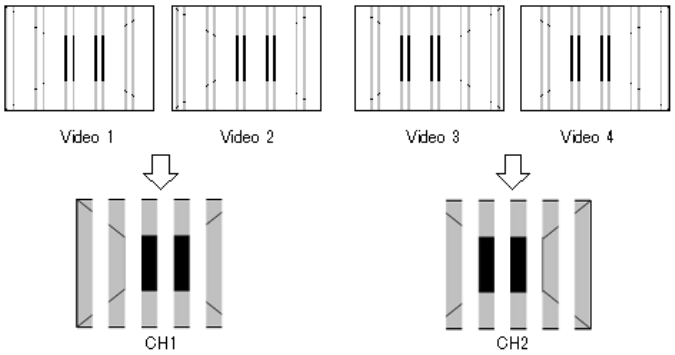
③ MODE2 x4 Mode　(Quad Link) (Cross Mode)
Video 1, Video 2, Video 3, and Video 4 are used to output with the following pixel assignment without splitting the screen.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.

X4 Mode is an output mode for the purpose of Full HD 240 Hz compatible FPD testing. The VG output is connected to the IA-1540 (iTMDS-LVDS conversion box) to use as 8-channel output by halving the output using the conversion box.
The following explanation is for the signals of 4 channels output from the VG. For an explanation of when 8-channel output from the LVDS, refer to “**4.4.3 V-by-OneHS data transfer method**”.



Data transfer method

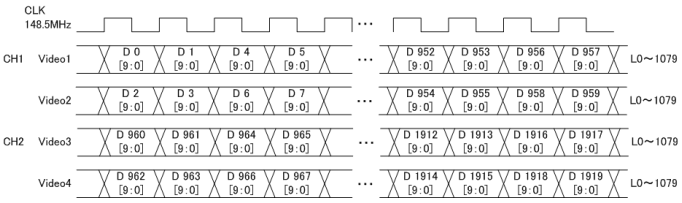


Assignment of each lane

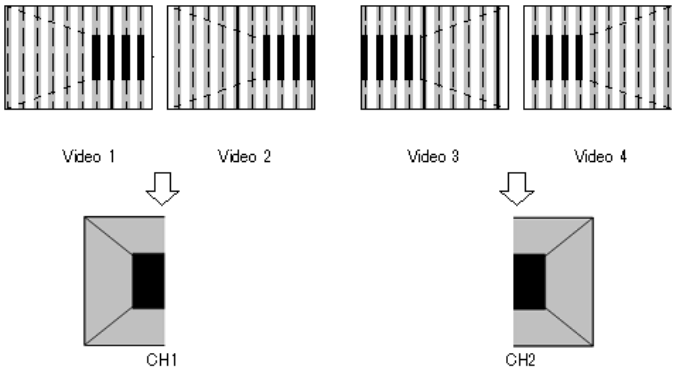
④MODE3 x4 Mode　(Quad Link) (Dividing Normal Mode)
The video of the right half is output using Video 1 and Video 2.
The video of the left half is output using Video 3 and Video 4.
The pixel assignment is as follows.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.

X4 Mode is an output mode for the purpose of Full HD 240 Hz compatible FPD testing. The VG output is connected to the IA-1540 (iTMDS-LVDS conversion box) to use as 8-channel output by halving the output using the conversion box.
The following explanation is for the signals of 4 channels output from the VG. For an explanation of when 8-channel output from the LVDS, refer to "**4.4.3 V-by-OneHS data transfer method**".



Data transfer method

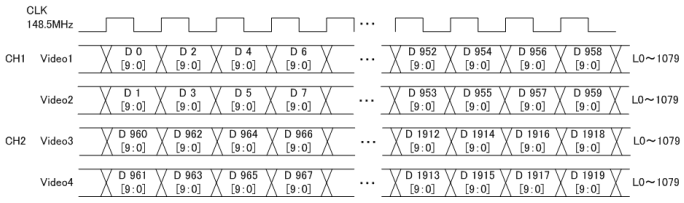


Assignment of each lane

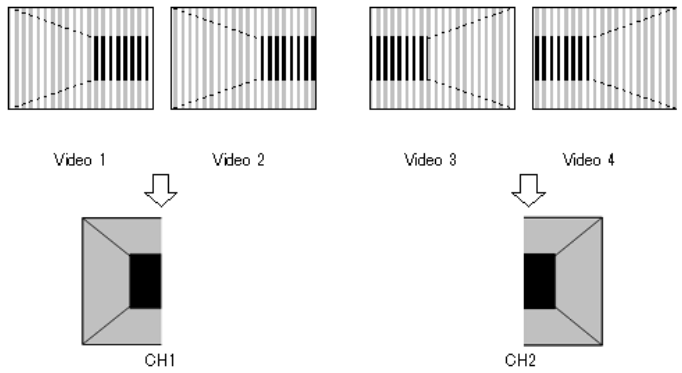
⑤MODE4 x4 Mode　(Quad Link) (Dividing Cross Mode)
The video of the right half is output using Video 1 and Video 2.
The video of the left half is output using Video 3 and Video 4.
The pixel assignment is as follows.

The case of a 1920 x 1080 resolution, 594 MHz dot clock, and 10-bit output gradation is explained as an example.

X4 Mode is an output mode for the purpose of Full HD 240 Hz compatible FPD testing. The VG output is connected to the IA-1540 (iTMDS-LVDS conversion box) to use as 8-channel output by halving the output using the conversion box.
The following explanation is for the signals of 4 channels output from the VG. For an explanation of when 8-channel output from the LVDS, refer to "**4.4.3 V-by-OneHS data transfer method**".



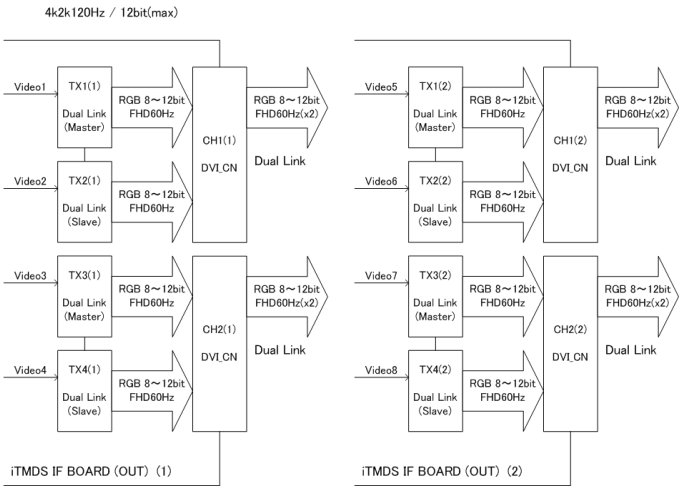
Data transfer method



Assignment of each lane

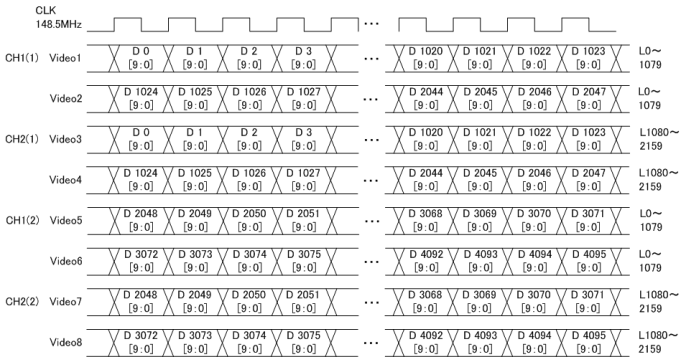
● Specifications of each mode when Octal Link

This mode enables output at a maximum of 4K2K 120 Hz 12-bit by using two of this product.
Splitting into MODE 0 to MODE 9 is additionally performed according to the method of assigning the data to Video 1 to Video 8.

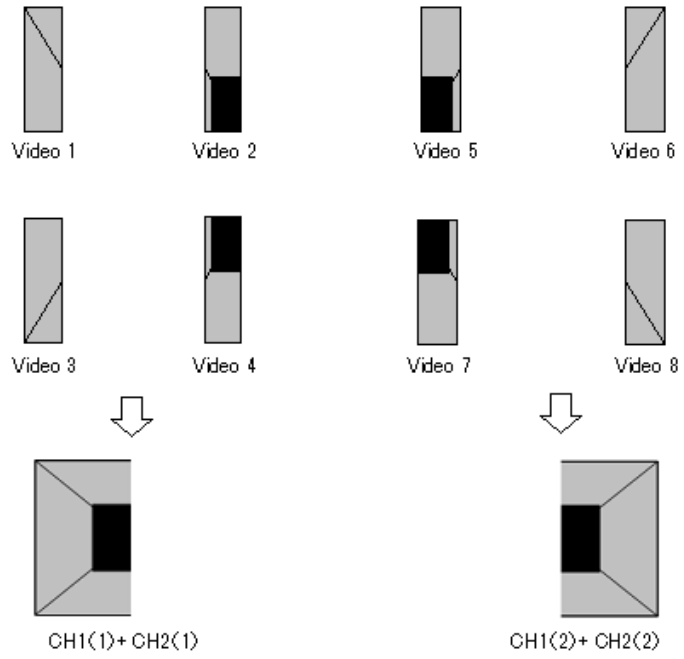


① MODE 0 (Octal Link) (4 quarter panes + 2 panes vertical)
This mode uses Video 1 to Video 8. The video from each output is split into 4 quarters for output then split into 2 vertically for each board and output.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



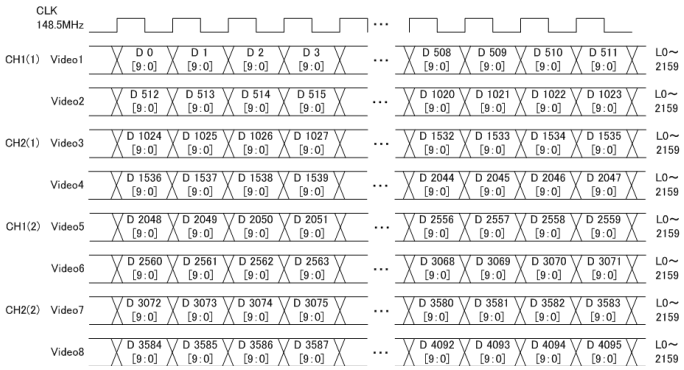
Data transfer method



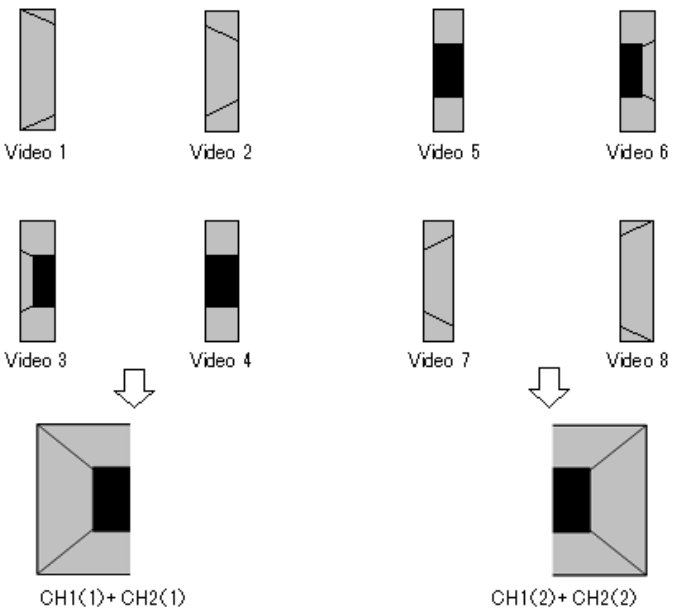
Assignment of each lane

② MODE 1 (Octal Link) (4 panes vertical + 2 panes vertical)
This mode uses Video 1 to Video 8. The video from each output is split into 4 vertically for output then split into 2 vertically for each board and output.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



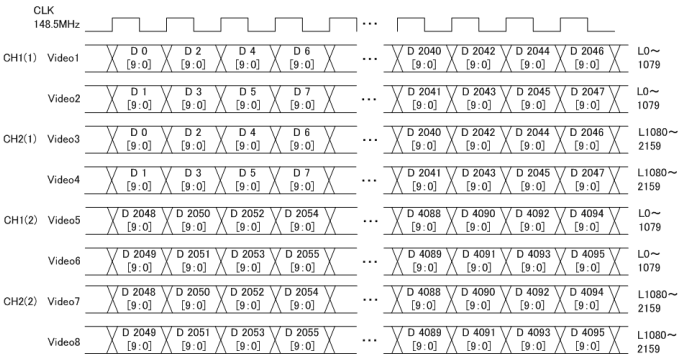
Data transfer method



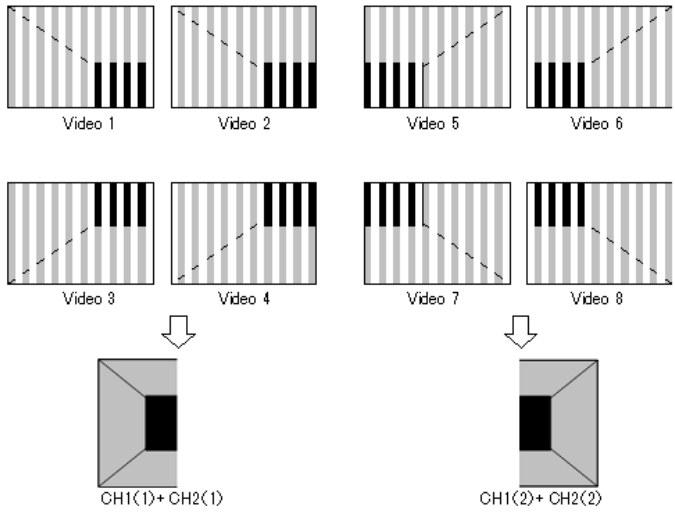
Assignment of each lane

③MODE 2 (Octal Link) (2 panes horizontal + 2 panes vertical)
This mode uses Video 1 to Video 8. The video from each output is split into 2 horizontally for output then split into 2 vertically for each board and output.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



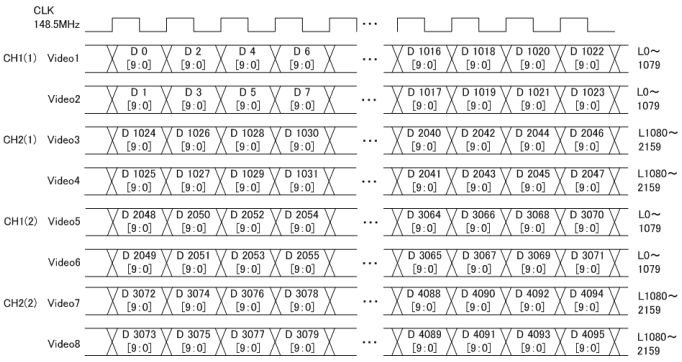
Data transfer method



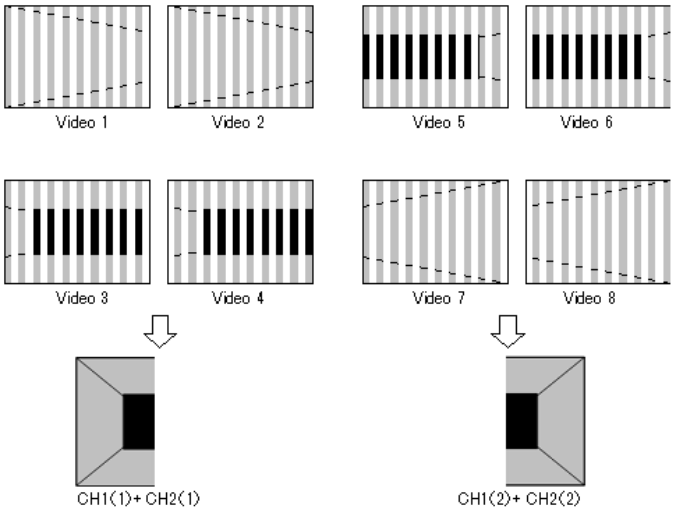
Assignment of each lane

④MODE 3 (Octal Link) (2 panes vertical + 2 panes vertical)
This mode uses Video 1 to Video 8. The video from each output is split into 2 vertically for output then split into 2 vertically for each board and output.

The case of a 4096 x 2048 resolution, 1184 MHz dot clock, and 10-bit output gradation is explained as an example.



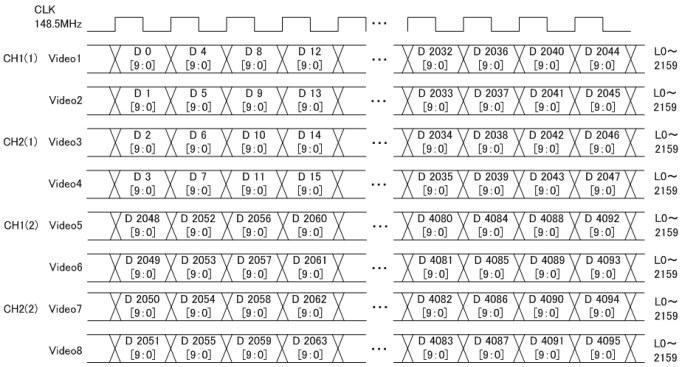
Data transfer method



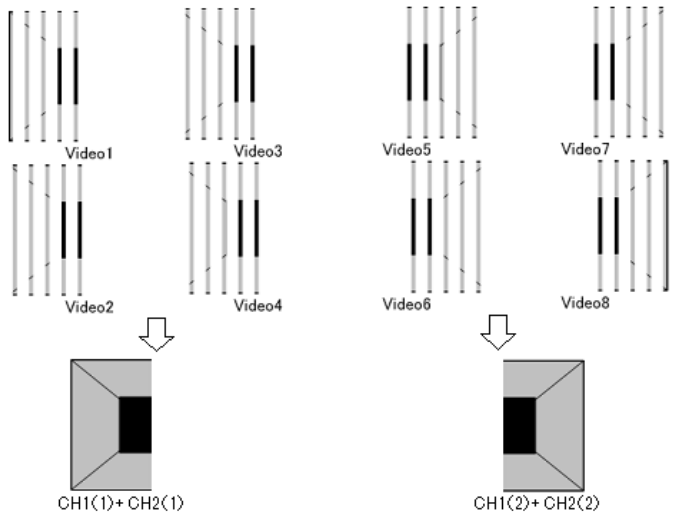
Assignment of each lane

⑤ MODE 4 (Octal Link) (2 panes vertical output + Without splitting ① (Non Dividing Mode))
This mode uses Video 1 to Video 8. The video from each output is split into 2 vertically then output with the left half output from Video 1 to Video 4 and the right half output from Video 5 to Video 8 with the following pixel assignment.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

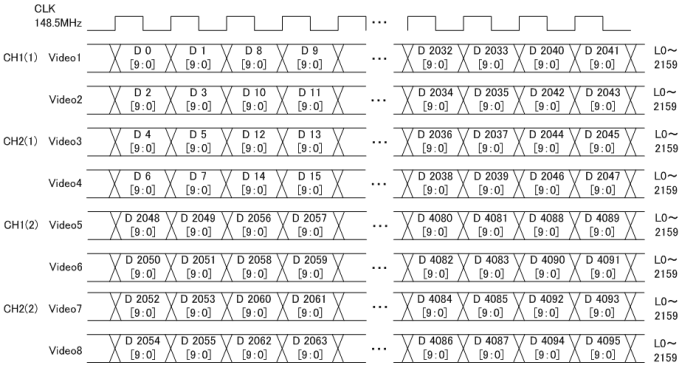


Assignment of each lane

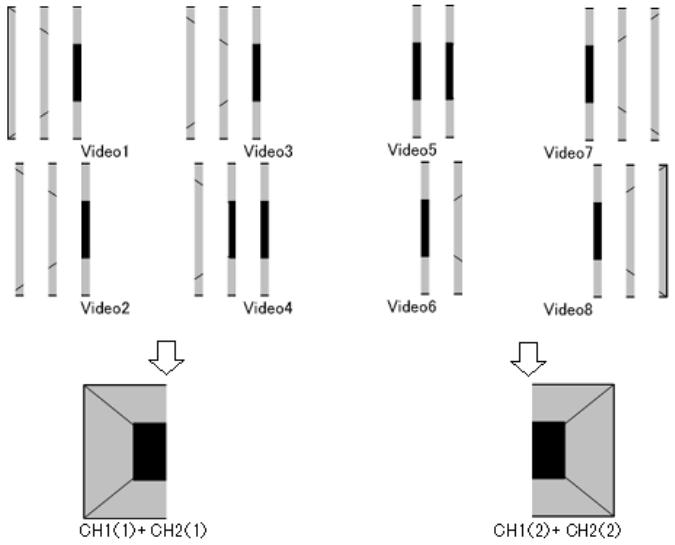
⑥ MODE 5 (Octal Link) (2 panes vertical output + Without splitting ② (Normal Mode))

This mode uses Video 1 to Video 8. The video from each output is split into 2 vertically then output with the left half output from Video channel 1 to Video channel 4 and the right half output from Video channel 5 to Video channel 8 with the following pixel assignment.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

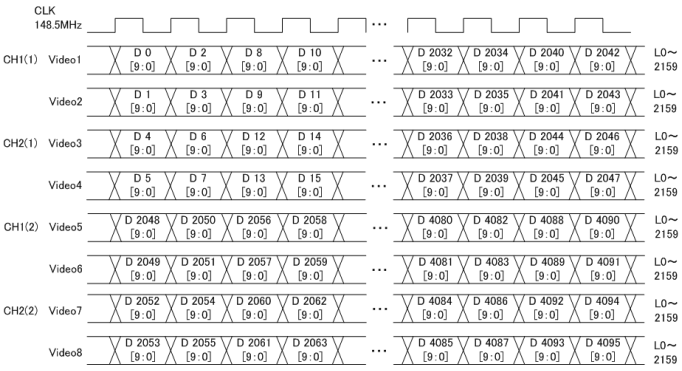


Assignment of each lane

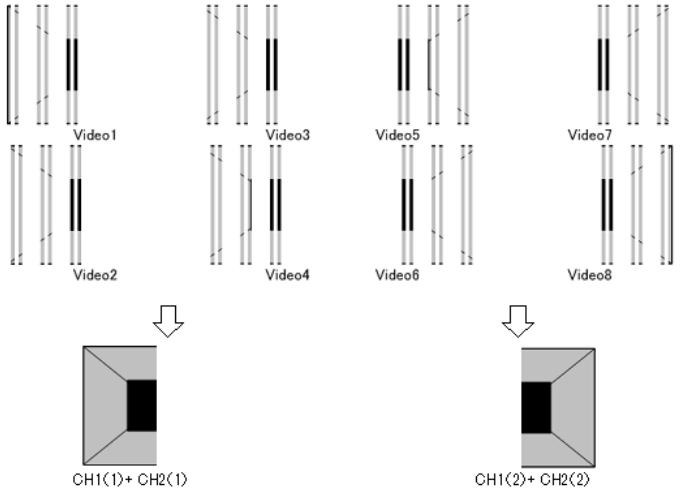
⑦ MODE 6 (Octal Link) (2 panes vertical output + Without splitting ③ (Cross Mode))

This mode uses Video 1 to Video 8. The video from each output is split into 2 vertically then output with the left half output from Video 1 to Video 4 and the right half output from Video 5 to Video 8 with the following pixel assignment.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

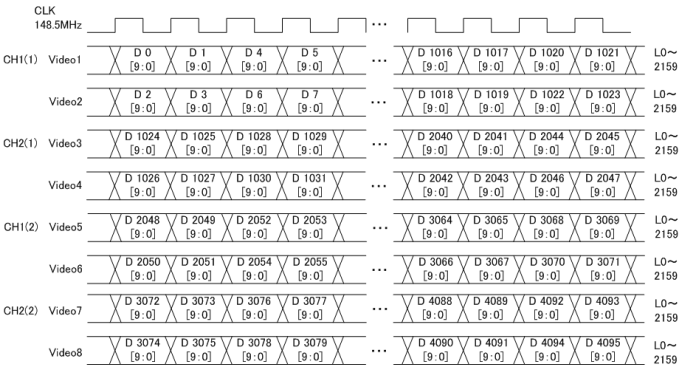


Assignment of each lane

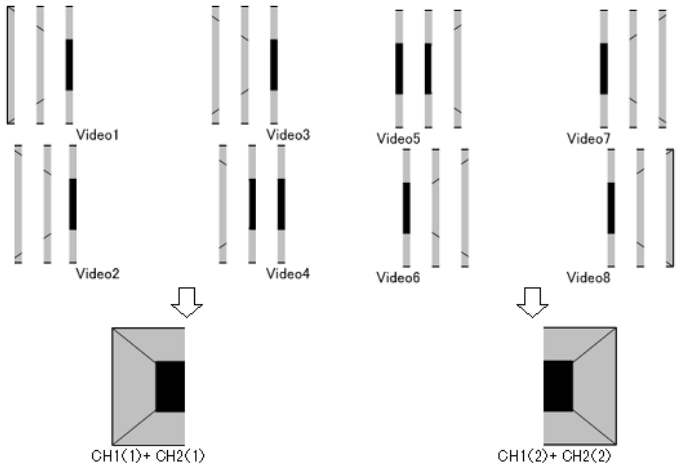
⑧ MODE 7 (Octal Link) (2 panes vertical output + With splitting ① (Dividing Normal Mode))

This mode uses Video 1 to Video 8. The video from each output is split into 2 vertically then output with the left half output from Video 1 to Video 4 and the right half output from Video 5 to Video 8 with the following pixel assignment.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method

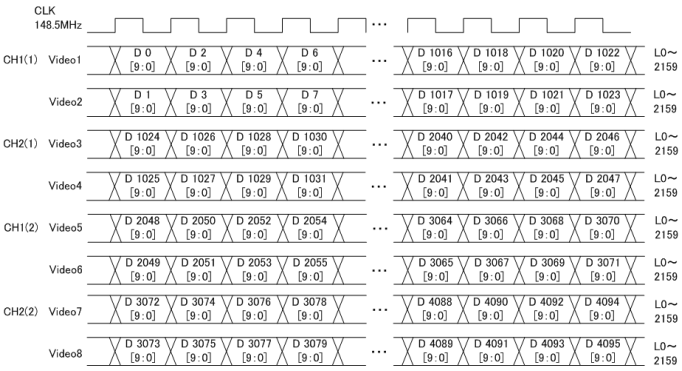


Assignment of each lane

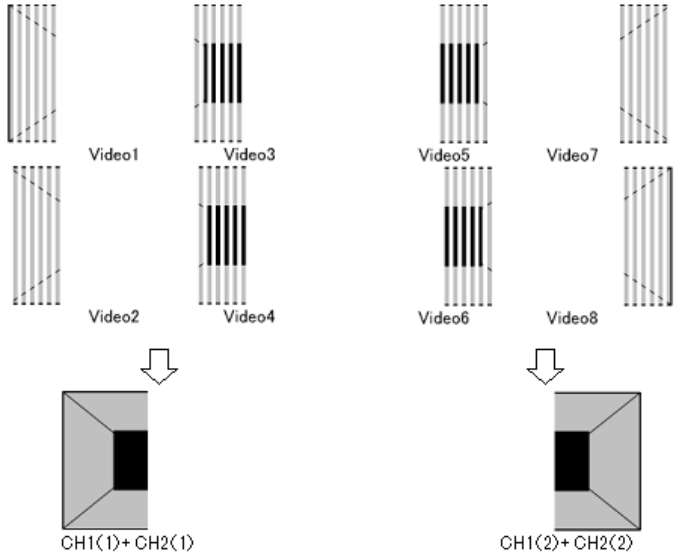
⑨ MODE 8 (Octal Link) (2 panes vertical output + With splitting ② (Dividing Cross Mode))

This mode uses Video 1 to Video 8. The video from each output is split into 2 vertically then output with the left half output from Video 1 to Video 4 and the right half output from Video 5 to Video 8 with the following pixel assignment.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



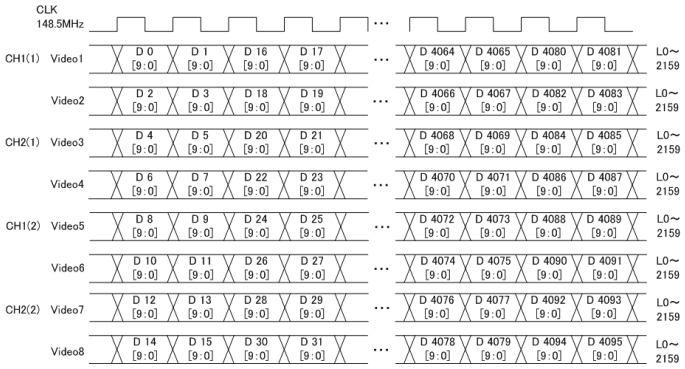
Data transfer method



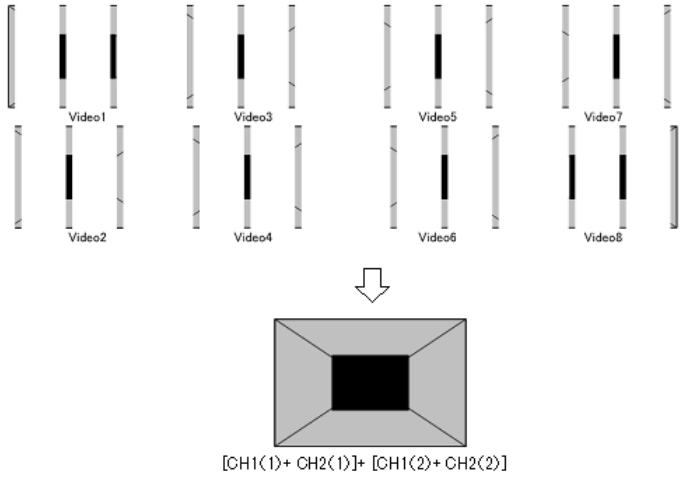
Assignment of each lane

⑩ MODE 9 (Octal Link) (Without splitting)
Channels 1 to 8 are used. Output is from each output board with the following pixel assignment without splitting.

The case of a 4096 x 2048 resolution, 1188 MHz dot clock, and 10-bit output gradation is explained as an example.



Data transfer method



Assignment of each lane

4.5.4 iTMDS output setting items

Level 1	Level 2	Level 3	Setting item	Setting value
iTMDS				
	OFF/ON	Port1 to Port8 Sets ON/OFF for each Port.		0: OFF / 1: ON
	iTMDS Or DVI Sets the output signal format.			0: DVI Outputs in DVI compatible format. Output is single link 8-bit. 1: iTMDS Outputs with iTMDS. Output is single link up to 12-bit.
	Mode Sets the signal bit length and link format for video output from iTMDS. Furthermore, the same bit length can also be selected automatically.		・ Select single when DotClk is within the range of 25 M to 165 MHz to enable distributed output from output channel 1 and channel 2. ・ Select dual when DotClk is within the range of 50 M to 330 MHz to enable distributed output from output channel 1 and channel 2. ・ Select quad when DotClk is within the range of 297 M to 660 MHz to enable distributed output from output channel 1 and channel 2. ・ Select octal when DotClk is within the range of 594 M to 1320 MHz to enable output with a combination of Board_1_Output channel 1/channel 2 and Board_2_Output channel 1/channel 2 by using two output boards.	
			0: Single (8 bit) Outputs with single link from output channel 1 and channel 2. The portion of the bit length of pattern rendering that exceeds 8 bits will be truncated. (Up to 12 bits when iTMDS) 1: Dual (8 bit) Outputs with dual link from output channel 1 and channel 2. The portion of the bit length of pattern rendering that exceeds 8 bits will be truncated. (Up to 12 bits when iTMDS) 2: Single (16 bit) Outputs a maximum of 16 bits with single link using the two links of master and slave of one connector. The portion of the bit length of pattern rendering that is short of the bit length set here will be compensated for with “0.” Outputs the upper bits to master and the lower bits to slave. 3: Dual (16 bit) Outputs a maximum of 16 bits with dual link using two connectors. The portion of the bit length of pattern rendering that is short of the bit length set here will be compensated for with “0.” 4: Single (Auto) Outputs with single link from output channel 1 and channel 2. Automatically switches to **Single (8 bit) or Single(16 bit)** according to the bit length of pattern rendering. 5: Dual (Auto) Outputs with dual link from output channel 1 and channel 2. Automatically switches to **Dual (8bit) or Dual (16 bit)** according to the bit length of pattern rendering. 6: Quad (8 bit) Outputs with quad link using output channel 1 and channel 2. The portion of the bit length of pattern rendering that exceeds 8 bits will be truncated. (Up to 12 bits when iTMDS) Refer to the following “Split” item for the screen splitting method. 7: Octal (8 bit) Outputs with octal link by using a combination of Board_1_Output channel 1/channel 2 and Board_2_Output channel 1/channel 2 by using two output boards. The portion of the bit length of pattern rendering that exceeds 8 bits will be truncated. (Up to 12 bits when iTMDS) Refer to the following “Split” item for the screen splitting method.	
	Split		Uses the frame memory in the board.	
			When Mode is Quad, the following setting items are enabled.	
			0: Mode0 4 quarter panes output 1: Mode1 4 panes vertical output 2: Mode2 2 panes horizontal output	

Level 1	Level 2	Level 3	Setting item	Setting value
			3: Mode3 2 panes vertical output 4: Mode4 No divisions 5: Mode0 (x4 Mode) Without splitting ① (Non Dividing Mode) 6: Mode1 (x4 Mode) Without splitting ② (Normal Mode) 7: Mode2 (x4 Mode) Without splitting ③ (Cross Mode) 8: Mode3 (x4 Mode) With splitting ① (Dividing Normal Mode) 9: Mode4(x4Mode) With splitting ② (Dividing Cross Mode)	
	Split		When Mode is Octal, the following setting items are enabled.	
			0: Mode0 4 quarter panes output + 2 panes vertical output 1: Mode1 4 panes vertical output + 2 panes vertical output 2: Mode2 2 panes horizontal output + 2 panes vertical output 3: Mode3 2 panes vertical output + 2 panes vertical output 4: Mode4 2 panes vertical output + Without splitting ① (Non Dividing Mode) 5: Mode5 2 panes vertical output + Without splitting ② (Normal Mode) 6: Mode6 2 panes vertical output + Without splitting ③ (Cross Mode) 7: Mode7 2 panes vertical output + With splitting ① (Dividing Normal Mode) 8: Mode8 2 panes vertical output + With splitting ② (Dividing Cross Mode) 9: Mode9 No divisions A: Mode10 * Not output with iTMDS.	
	CTL0 / CTL1		This is normally not used. Leave it set to Low.	

4.5.5 Polarity setting of synchronization signal

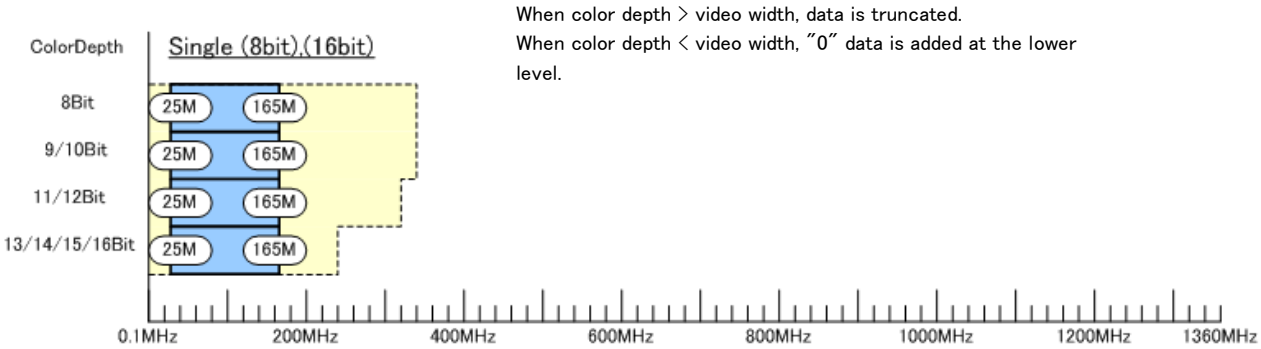
For the detailed setting procedure, refer to the Sync settings of “**2.1 ALL OUTPUT**”.

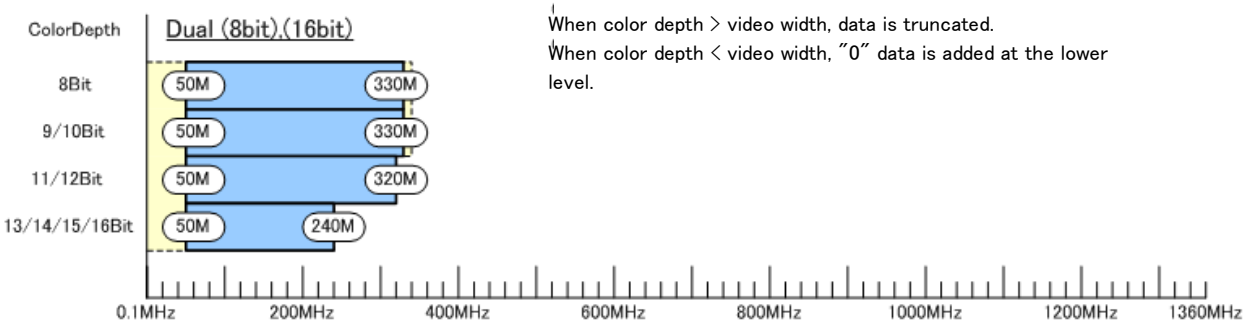
4.5.6 Relationship between Pattern Rendering Bit Length and Dot Clock

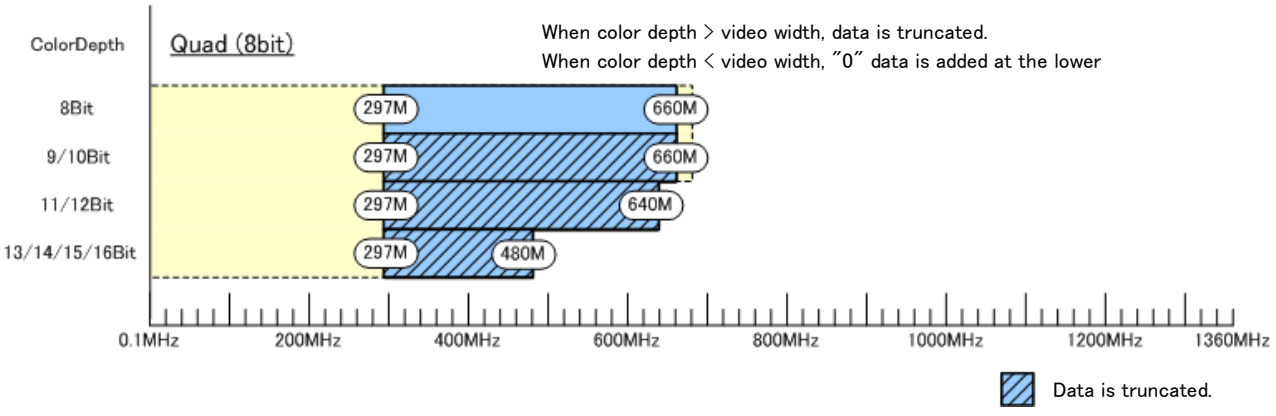
The dot clock is limited by the pattern rendering bit length (color depth) and dot clock operation mode (DotClk Mode) as shown in the following figures. The number of data lanes is determined by the dot clock operation mode (DotClk Mode).

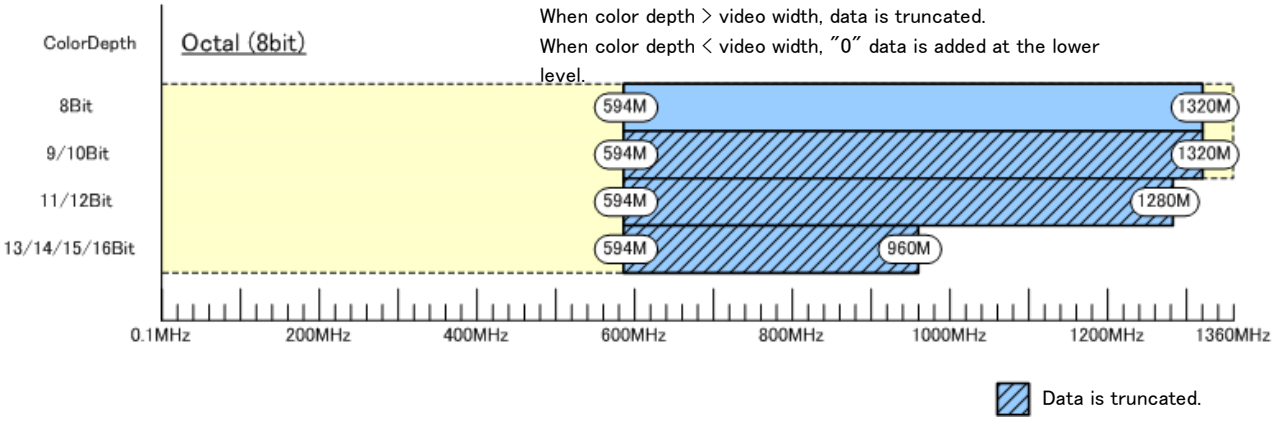
For details on the dot clock operation mode (DotClk Mode) and pattern bit length (color depth), refer to "**2.1 ALL OUTPUT**".

1) When DVI output

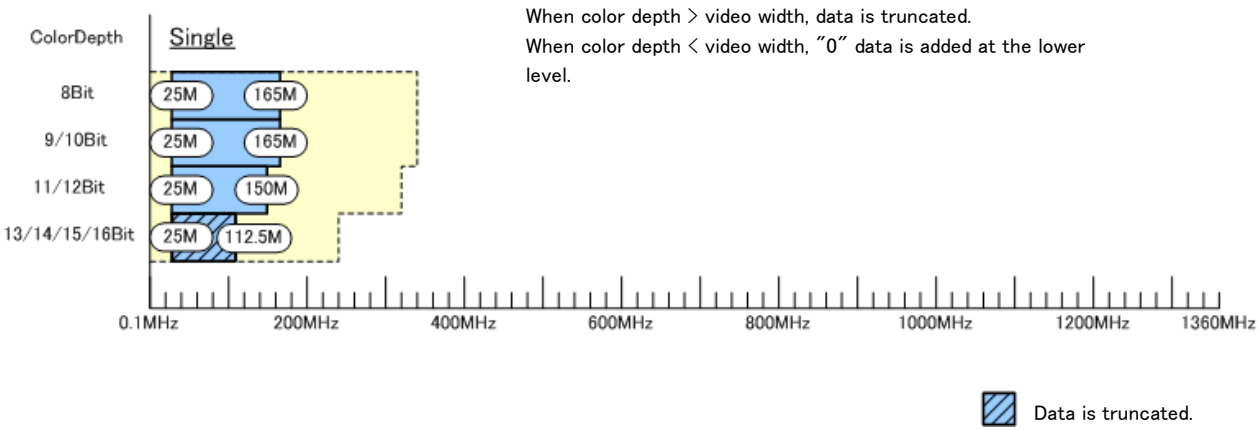






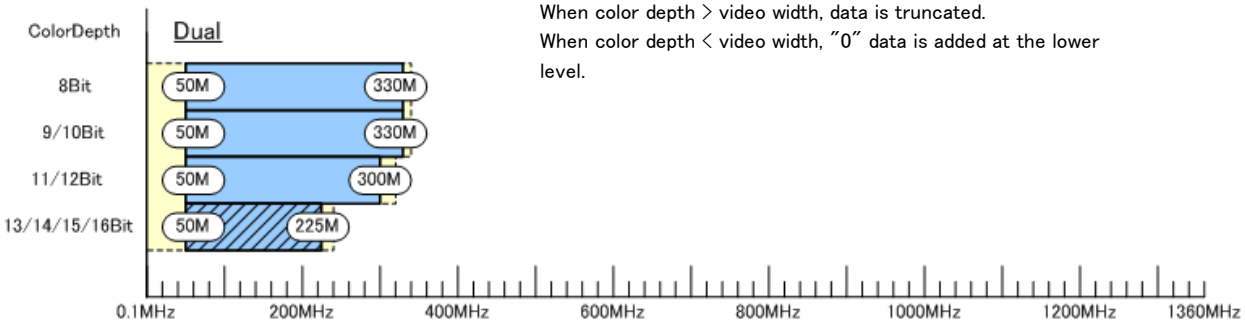


2) When iTMDS output



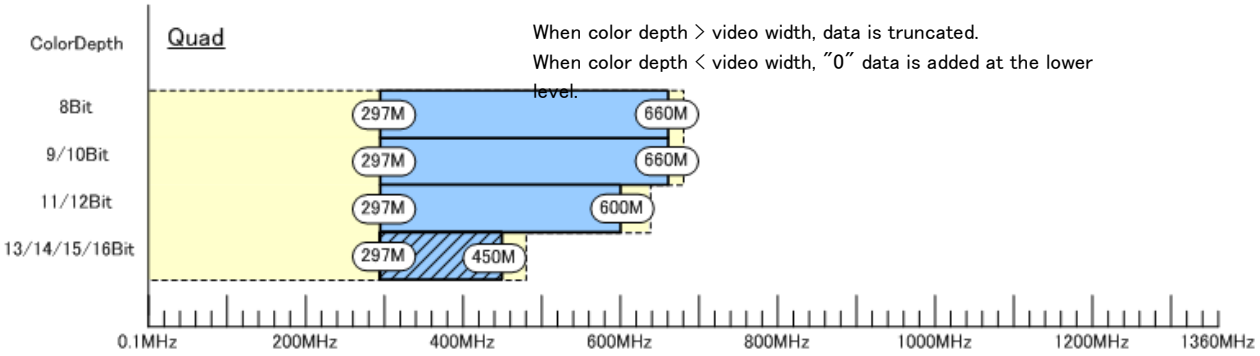
When color depth > video width, data is truncated.
When color depth < video width, "0" data is added at the lower level.

Data is truncated.



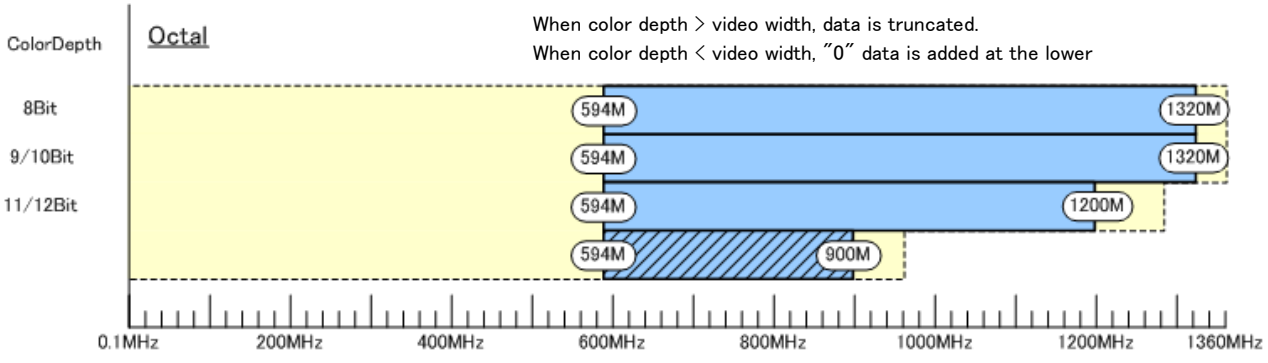
When color depth > video width, data is truncated.
When color depth < video width, "0" data is added at the lower level.

Data is truncated.



When color depth > video width, data is truncated.
When color depth < video width, "0" data is added at the lower level.

Data is truncated.



When color depth > video width, data is truncated.
When color depth < video width, "0" data is added at the lower

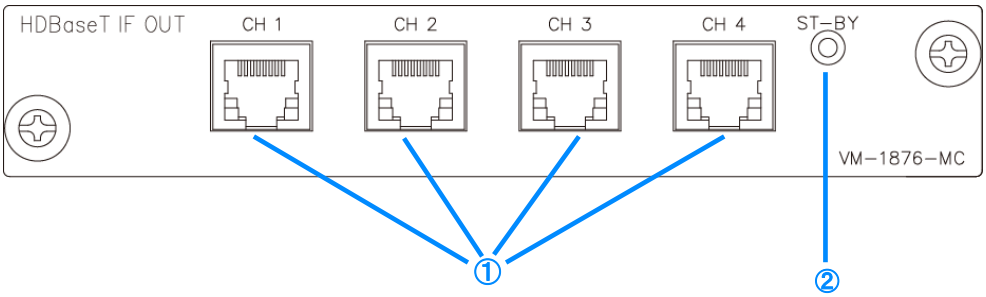
Data is truncated.

4.6 HDBaseT unit functions and settings

The applicable unit is as follows.

4.6.1 VM-1876-MC output

● Unit exterior diagram



No.	Name	Description
①	HDBaseT output	HDBaseT signal output terminal 1 to 4. (HDCP supported)
②	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

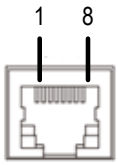
● Specifications

HDBaseT CH1 CH2 CH3 CH4	Connector			HDBaseT×4	
	Dot Clock *4		Single Clock Mode	<RGB/YCbCr444> 8 bit : 25 to 300 MHz 10 bit : 25 to 240 MHz 12 bit : 25 to 200 MHz 16 bit : 25 to 150 MHz <YCbCr422> 8 bit : 25 to 300 MHz 10 bit : 25 to 300 MHz 12 bit : 25 to 300 MHz	
			Dual Clock Mode *1	<RGB/YCbCr444> 8 bit : 50 to 600 MHz 10 bit : 50 to 480 MHz 12 bit : 50 to 400 MHz 16 bit : 50 to 300 MHz <YCbCr422> 8 bit : 50 to 600 MHz 10 bit : 50 to 600 MHz 12 bit : 50 to 600 MHz <YCbCr420> 8 bit : 50 to 600 MHz 10 bit : 50 to 480 MHz 12 bit : 50 to 400 MHz 16 bit : 50 to 300 MHz	
			Quad Clock Mode *2	<RGB/YCbCr444> 8 bit : 100 to 1200 MHz 10 bit : 100 to 960 MHz 12 bit : 100 to 800 MHz 16 bit : 100 to 600 MHz <RGB/YCbCr422> 8 bit : 100 to 1200 MHz 10 bit : 100 to 1200 MHz 12 bit : 100 to 1200 MHz	
	No. of colors			RGB each 8/10/12/16bit（RGB/ YCbCr444/ YCbCr422/ YCbCr420）	
	Audio Out	HDMI	L-PCM	Sampling : 32k/ 44.1k/ 48k/ 88.2k/ 96k/ 176.4k/ 192kHz Output Frequency: 100Hz to 20kHz Bit number: 16/20/24bit	
			Compre-ssion	AC3,AAC	
			Option	Next generation audio *3 DSD, Dolby Digital Plus, Dolby True HD, DTS HD (High Resolution Audio), DTS HD(Master Audio)	
	Copy Protection			HDCP Ver1.4	
	Added functions			E-EDID Ver1.4(DDC2B), xvYCC, CEC	

*1 Uses CH1-CH2 (CH3-CH4) for parallel output. However, distributes output for YCbCr420 only.
*2 Uses CH1-CH2-CH3-CH4 for parallel output.
*3 Next-generation audio function is available when a license is purchased.
*4 TMDSCLK 3GHz

4.6.2 Connector and pin assignment

● **Connector：HDBaseT**



Pin No.	Signal
1	TX0+
2	TX0-
3	TX1+
4	TX2+
5	TX2-
6	TX1-
7	TX3+
8	TX3-

PoE is not supported.

4.6.3 HDBaseT data transfer method

For the data transfer method of the HDMI signal output from the HDBaseT unit, see “4.1.7 HDMI data transfer method”.

4.6.4 Output setting items

This section describes output settings for the HDbaseT unit.

Level 1	Level 2	Level 3	Setting item	Setting value
HDBaseT				
	Output OFF/ON	Port1 to Port16 ON/OFF setting by each port.		0:OFF / 1:ON
	HDMI or DVI			0:HDMI / 1:DVI / 2:Auto
	Video Format:			0:RGB/ 1:YCbCr4:4:4/ 2:YCbCr4:2:2/ 3:YCbYr4:2:0
	Width			0:Auto / 1:8bit / 2:10bit / 3:12bit / 4:16bit
	InfoFrame Auto Set If InfoFrame Auto Set is ON, changing the Video Format will cause the RGB or YCbCr item of AVI InfoFrame to follow and change.			0:OFF / 1:ON
	Audio Output			0:OFF / 1:ON
	InfoFrame/ Packet Important Some items are automatically set according to the setting of Auto Select of the configuration setting.	Vendor Specific InfoFrame 1, 2 Important It is only VG-876/877/879 that can set two InfoFrames.	OFF/ON	0:OFF / 1:ON
			Type	1 (fixed)
			Version	1 (fixed)
			IEEE RegID Sel	0:Other / 1:H14b / 2:HF-VSIF
			IEEE Regist. ID byIEEE RegID Sel	Other: 6-digit Each 0 to F
				H14b: 000C03 (Fixed)
				HF-VSIF: C45DD8 (Fixed)
			The following is only displayed when IEEE RegID Sel=Other is selected.	
			Payload Length	0 to 24
			Payload 1-24	0x00 ~ 0xFF
			The following is only displayed when IEEE RegID Sel=H14b is selected.	
			Video Format	0:None / 1:Ext. Resolution / 2:3D
			HDMI VIC, * Only displayed when Video Format=Ext. Resolution is selected.	0:4Kx2K 29.97/30Hz
				1:4Kx2K 25Hz
				2:4Kx2K 23.98/24Hz
				3:4Kx2K 24Hz(SMPTE)
			3D Structure, * Only displayed when Video Format=3D is selected. Important **The output signal differs from the standards. The DE signal switches to HIGH for the current Field alternative Vblank3 interval.**	0:Frame Packing
				1:Field Alternative
				2:Line Alternative
				3:Side-by-Side(Full)
				4:L + depth
				5:L + d + G + G-d (L + depth + graphics + graphics-depth)
				6:Side-by-Side(Half)
				7:Top & Bottom
			3D Ext Data,	1:Horizontal O/L,O/R Horizontal sub-sampling Odd/Left picture, Odd/Right picture
				1:Horizontal O/L,E/R Horizontal sub-sampling Odd/Left picture, Even/Right picture
				2:Horizontal E/L,O/R Horizontal sub-sampling Even/Left picture, Odd/Right picture
				3:Horizontal E/L,E/R Horizontal sub-sampling Even/Left picture, Even/Right picture
				4:Quincunx O/L,O/R Quincunx matrix Odd/Left picture, Odd/Right picture
				5:Quincunx O/L,E/R Quincunx matrix Odd/Left picture, Even/Right picture

Level 1	Level 2	Level 3	Setting item	Setting value
HDBaseT	InfoFrame/ Packet	Vendor Specific InfoFrame 1, 2	3D Ext Data,	6:Quincunx E/L,O/R Quincunx matrix Even/Left picture, Odd/Right picture
				7:Quincunx E/L,E/R Quincunx matrix Even/Left picture, Even/Right picture
			3DMeta Present * Only displayed when Video Format=3D is selected.	0:0 (Not Present) / 1:1
			Metadata Type * Only displayed when Video Format=3D is selected.	0 (fixed)
			Metadata Length * Only displayed when Video Format=3D is selected.	0 to 21
			Metadata 1-21 : * Only displayed when Video Format=3D is selected.	0x00 to 0xFF
			The following is only displayed when IEEE RegID Sel=HF-VSIF is selected.	
			HF-VSIF Version	1 (fixed)
			3D Valid	0 / 1
			3D F Structure * Only displayed when 3D Valid = 1 is selected. Important **The output signal differs from the standards. The DE signal switches to HIGH for the current Field alternative Vblank3 interval.**	0:Frame Packing
				1:Field Alternative
				2:Line Alternative
				3:Side-by-Side(Full)
				4:L + depth
				5:L + d + G + G-d (L + depth + graphics + graphics-depth)
				6:Side-by-Side(Half)
				7:Top & Bottom
			3D F Ext Data * Only displayed when 3D Valid = 1 is selected. Important **3D Ext Data values "0 to 3" are all switched to "Horizontal sub-sampling" in HDMI Ver.1.4a.** **In VG, the previous notation is included for distinguishing rendering methods in OPT Pattern 101 and compatibility.**	0:Horizontal O/L,O/R Horizontal sub-sampling Odd/Left picture, Odd/Right picture
				1:Horizontal O/L,E/R Horizontal sub-sampling Odd/Left picture, Even/Right picture
				2:Horizontal E/L,O/R Horizontal sub-sampling Even/Left picture, Odd/Right picture
				3:Horizontal E/L,E/R Horizontal sub-sampling Even/Left picture, Even/Right picture
				4:Quincunx O/L,O/R Quincunx matrix Odd/Left picture, Odd/Right picture
				5:Quincunx O/L,E/R Quincunx matrix Odd/Left picture, Even/Right picture
			3D F Ext Data	6:Quincunx E/L,O/R Quincunx matrix Even/Left picture, Odd/Right picture
				7:Quincunx E/L,E/R Quincunx matrix Even/Left picture, Even/Right picture
			Additional Pre * Only displayed when 3D Valid = 1 is selected.	0(Not Present) / 1

Level 1	Level 2	Level 3	Setting item	Setting value
HDBase T	InfoFrame/ Packet	Vendor Specific InfoFrame 1, 2	Dual View * Only displayed when 3D Valid = 1 is selected.	0:Normal 3D/ 1:Dual View
			View Dependency * Only displayed when 3D Valid = 1 is selected.	0:No Indication
				1:Right Originate
				2:Left Originate
				3:Both
			Preferred 2D * Only displayed when 3D Valid = 1 is selected.	0:No Indication
				1:Right View
				2:Left View
			Disparity Pre * Only displayed when 3D Valid = 1 is selected.	0(Not Present) / 1
			Disparity Ver * Only displayed when 3D Valid = 1 is selected.	0 to 3
			Disparity Length * Only displayed when 3D Valid = 1 is selected.	**Disparity Ver = 0**
				Length = 0
				Disparity Ver = 1
				Length = 3
				Disparity Ver = 2
				Disparity Data1 = 2h : Length = 3 Disparity Data1 = 3h : Length = 4 Disparity Data1 = 4h : Length = 5 Disparity Data1 = 5h : Length = 6 Disparity Data1 = ah : Length = 11 Disparity Data1 = 11h : Length = 18 Disparity Data1 = else : Length = 1
				Disparity Ver = 3 のとき
				Disparity Data4 = 0h : Length = 4 Disparity Data4 = 2h : Length = 6 Disparity Data4 = 3h : Length = 7 Disparity Data4 = 4h : Length = 8 Disparity Data4 = 5h : Length = 9 Disparity Data4 = ah: Length = 14 Disparity Data4 = else : Length = 4
			Disparity Data 1~20 * Only displayed when 3D Valid = 1 is selected.	00h to FFh
			Meta Present * Only displayed when 3D Valid = 1 is selected.	0(Not Present) / 1
			Metadata Type * Only displayed when 3D Valid = 1 is selected.	0 **(fixed)**
			Metadata Length * Only displayed when 3D Valid = 1 is selected. Because VSI InfoFrame is a maximum of 27 bytes, the maximum Length relies on other Data length.	0 to 20
			Metadata Data 1~20, * Only displayed when 3D Valid = 1 is selected. Because VSI InfoFrame is a maximum of 27 bytes, the maximum Length relies on other Data length.	00h to FFh

Level 1	Level 2	Level 3	Setting item	Setting value
HDBaseT	InfoFrame/ Packet	AVI InfoFrame	OFF/ON	0:OFF / 1:ON
			Type :	2 (fixed)
			Version :	1 to 3
			Scan Info	0:No Data
				1:Overscanned
				2:Underscanned
			Bar Info	0:Data Not Valid
				1:Vertical Valid
				2:Horizontal Valid
				3:Vert.&Horiz. Valid
			ActiveF Info	0:No Data / 1:Valid
			RGB or YCbCr	0:RGB
				1:YCbCr 4:2:2
				2:YCbCr 4:4:4
				3:YCbCr 4:2:0
				4:(reserved1)
				5:(reserved2)
				6:(reserved3)
				7:IDO-Defined
			ActiveF Aspect	0:Same Picture
				1:4:3(center)
				2:16:9(center)
				3:14:9(center)
				4:box 16:9(top)
				5:box 14:9(top)
				6:box>16:9(center)
				7:4:3(14:9 center)
				8:16:9(14:9 center)
				9:16:9(4:3 center)
			Picture Aspect	0:No Data / 1:4:3 / 2:16:9
			Scaling	0:Unknown
				1:Horizontal
				2:Vertical
				3:Horiz. & Vert.
			Colorimetry	0:No Data
				1:SMPTE170M/ITU601
				2:ITU709
				3:Extended Valid
			Video Code :	0 to 107
			Repetition :	1 to 10
			Top Bar :	0 to 65535 Sets Line Number of End of Top Bar. (Sets letter BOX upper Bar size.)
			Bottom Bar :	0 to 65535 Sets Line Number of Start of Bottom Bar. (Sets letter BOX lower Bar size.)
			Left Bar :	0 to 65535 Sets Pixel Number of End of Left Bar. (Sets pillar BOX left side Bar size.)
			Right Bar :	0 to 65535 Sets Pixel Number of Start of Right Bar. (Sets pillar BOX right side Bar size.)
			RGB Quan.Range	0:Default
				1:Limited Range
				2:Full Range
			YCC Quan.Range	0:Limited Range / 1:Full Range

Level 1	Level 2	Level 3	Setting item	Setting value
HDBaseT	InfoFrame/ Packet	AVI InfoFrame	Extended Colorimetry Referenced when Extended Valid is set in Colorimetry.	0:xvYCC601
				1:xvYCC709
				2:sYCC601
				3:AdobeYCC601
				4:AdobeRGB
				5:BT2020 YcCbcCrc
				6:BT2020 RGBorYCbCr
			IT content	0:No Data / 1:IT content
			IT contentType	0:Graphics
				1:Photo
				2:Cinema
				3:Game
		SPD InfoFrame	OFF/ON	0:OFF / 1:ON
			Type :	3 (fixed)
			Version :	1 (fixed)
			Vendor Name :	Max. 8 characters (0x20 to 0x7E ASCII 7bit)
			Product Description:	Max. 16 characters (0x20 to 0x7E ASCII 7bit)
			Source Device	0:Unknown
				1:Digital STB
				2:DVD player
				3:D-VHS
				4:HDD Video recorder
				5:DVC
				6:DSC
				7:Video CD
				8:Game
				9:PC general
				A:Blu-Ray Disc
				B:Super Audio CD
				C:HD DVD
				D:PMP
		Audio InfoFrame	OFF/ON	0:OFF / 1:ON
			Type :	4 (fixed)
			Version :	1 (fixed)
			Coding Type	0:Refer Stream Header
				1:IEC60958 PCM
				2:AC-3
				3:MPEG1(Layers 1&2)
				4:MP3(MPEG1 Layer 3)
				5:MPEG2(multi ch.)
				6:AAC
				7:DTS
				8:ATRAC
				9:One Bit Audio
				A:Dolby Digital+
				B:DTS-HD
				C:MLP
				D:DST
				E:WMA Pro
				F:Refer Extension
			Coding ExtType	0:(not use1)
				1:(not use2)
				2:(not use3)
				3:HE-AAC

Level 1	Level 2	Level 3	Setting item	Setting value
HDBaseT	InfoFrame/ Packet	Audio InfoFrame		4:HE-AACv2
				5:AAC LC
				6:DRA
				7:HE-AAC Surround
				8:(reserved)
				9:AAC-LC Surround
			Channel Count	0:Refer Stream Header
				1:2ch
				2:3ch
				3:4ch
				4:5ch
				5:6ch
				6:7ch
				7:8ch
			Sampling Freq	0:Refer Stream Header
				1:32kHz
				2:44.1kHz
				3:48kHz
				4:88.2kHz
				5:96kHz
				6:176.4kHz
				7:192kHz
			Sample Size	0:Refer Stream Header
				1:16bit
				2:20bit
				3:24bit
			Channel Allocation :	0 to 50

	8ch	7ch	6ch	5ch	4ch	3ch	2ch	1ch
0		-	-	-	-	-	FR	FL
1		-	-	-	-	LFE	FR	FL
2		-	-	-	FC	-	FR	FL
3		-	-	-	FC	LFE	FR	FL
4		-	-	RC	-	-	FR	FL
5		-	-	RC	-	LFE	FR	FL
6		-	-	RC	FC	-	FR	FL
7		-	-	RC	FC	LFE	FR	FL
8		-	RR	RL	-	-	FR	FL
9		-	RR	RL	-	LFE	FR	FL
10		-	RR	RL	FC	-	FR	FL
11		-	RR	RL	FC	LFE	FR	FL
12		RC	RR	RL	-	-	FR	FL
13		RC	RR	RL	-	LFE	FR	FL
14		RC	RR	RL	FC	-	FR	FL
15		RC	RR	RL	FC	LFE	FR	FL
16	RRC	RLC	RR	RL	-	-	FR	FL
17	RRC	RLC	RR	RL	-	LFE	FR	FL
18	RRC	RLC	RR	RL	FC	-	FR	FL
19	RRC	RLC	RR	RL	FC	LFE	FR	FL
20	FRC	FLC	-	-	-	-	FR	FL
21	FRC	FLC	-	-	-	LFE	FR	FL
22	FRC	FLC	-	-	FC	-	FR	FL
23	FRC	FLC	-	-	FC	LFE	FR	FL
24	FRC	FLC	-	RC	-	-	FR	FL
25	FRC	FLC	-	RC	-	LFE	FR	FL
26	FRC	FLC	-	RC	FC	-	FR	FL
27	FRC	FLC	-	RC	FC	LFE	FR	FL

Level 1	Level 2	Level 3	Setting item	Setting value
HDBaseT	InfoFrame/ Packet	Audio InfoFrame	28 FRC FLC RR RL - - FR FL 29 FRC FLC RR RL - LFE FR FL 30 FRC FLC RR RL FC - FR FL 31 FRC FLC RR RL FC LFE FR FL 32 - FCH RR RL FC - FR FL 33 - FCH RR RL FC LFE FR FL 34 TC - RR RL FC - FR FL 35 TC - RR RL FC LFE FR FL 36 FRH FLH RR RL - - FR FL 37 FRH FLH RR RL - LFE FR FL 38 FRW FLW RR RL - - FR FL 39 FRW FLW RR RL - LFE FR FL 40 TC RC RR RL FC - FR FL 41 TC RC RR RL FC LFE FR FL 42 FCH RC RR RL FC - FR FL 43 FCH RC RR RL FC LFE FR FL 44 TC FCH RR RL FC - FR FL 45 TC FCH RR RL FC LFE FR FL 46 FRH FLH RR RL FC - FR FL 47 FRH FLH RR RL FC LFE FR FL 48 FRW FLW RR RL FC - FR FL 49 FRW FLW RR RL FC LFE FR FL 50 Reserved	
			Level Shift Value :	0 to 15 [dB]
			Down-mix	0:Permitted/No Info
				1:Prohibited
			LFE PB Level	0:Unknown
				1:0dB Playback
				2:+10dB Playback
		MPEG InfoFrame	OFF/ON	0:OFF / 1:ON
			Type :	5 (fixed)
			Version :	1 (fixed)
			Bit Rate :	0 to 4294M967k295 [Hz]
			Field Repeat	0:New Field(picture)
				1:Repeated Field
			Frame	0:Unknown(No Data)
				1:I Picture
				2:B Picture
				3:P Picture
		NTSC VBI InfoFrame	OFF/ON	0:OFF / 1:ON
			Type :	6 (fixed)
			Version :	1 (fixed)
			PES Length :	0 ~ 27
			PES 1-27 :	0x0 ~ 0xFF
		Dynamic Range and Mastering InfoFrame	OFF/ON	0:OFF / 1:ON
			Type :	7 (fixed)
			Version :	1 (fixed)
			EOTF	0:SDR Range
				1:HDR Range
				2:SMPTE ST2084[2]
				3:Future EOTF
			Metadata ID	Metadata Type1 (fixed)
			Disp Primaries x0	0.00000 to 1.00000 (0.00002Step)
			Disp Primaries y0	0.00000 to 1.00000 (0.00002Step)
			Disp Primaries x1	0.00000 to 1.00000 (0.00002Step)
			Disp Primaries y1	0.00000 to 1.00000 (0.00002Step)

Level 1	Level 2	Level 3	Setting item	Setting value
HDBaseT	InfoFrame/ Packet		Disp Primaries x2	0.00000 to 1.00000 (0.00002Step)
			Disp Primaries y2	0.00000 to 1.00000 (0.00002Step)
			White Point x	0.00000 to 1.00000 (0.00002Step)
			White Point y	0.00000 to 1.00000 (0.00002Step)
			Max Disp Mastering	1 to 65535
			Min Disp Mastering	0.0001 to 6.5535
			Content Light LV	1 to 65535
			Frame-ave Light LV	1 to 65535
		ACP Packet	OFF/ON	0:OFF / 1:ON
			ACP_Type	0:Generic Audio
				1:IEC60958 Audio
				2:DVD-Audio
				3:Super Audio CD
			DVD-Audio_Type	0 – 1
			Copy Permission	0:Copy Freely
				1:(reserved)
				2:Specify Copy Number
				3:No More Copies
			Copy_Number	0:1 copies
				1:2 copies
				2:4 copies
				3:6 copies
				4:8 copies
				5:10 copies
				6:3 copies
				7:Copy One Generation
			Quality:	0 to 3
			Transaction (0/1):	0:Not Present / 1:(reserved)
			Count_A : Count_S : Count_U :	0 to 255
			CCI_Flags Q_A (0/1): Q_S (0/1): Q_U (0/1):	0:CD Quality / 1:Unlimited DSD Qual
			CCI_Flags Move_A (0/1): Move_S (0/1): Move_U (0/1):	0:Not Allowed / 1:Allowed
		ISRC Packet	OFF/ON ISRC1 (0/1): ISRC2 (0/1):	0:OFF / 1:ON
			ISRC_Cont (0/1):	0 to 1
			ISRC_Valid (0/1):	0 to 1
			ISRC_Status (0-2):	0:Starting
				1:Intermediate
				2:Ending
			Validity Info (0-3):	0:No Validity
				1:ISRC
				2:UPC/EAN
				3:UPC/EAN and ISRC
			Catalogue Code :	13-digit Each 0 to 9
			Country Code :	2 characters 0x11 to 0x2A (ASCII upper-case characters - 0x30)
			First Owner Code :	3 characters 0x00 to 0x09, 0x11 to 0x2A (ASCII upper-case characters/numerals - 0x2A)

	Number of CH	Sampling frequency	Bit Width
0	2 ch or less	48kHz or lower	16 bit or less
1	2 ch or less	No restrictions	No restrictions
2	No restrictions	No restrictions	No restrictions
3	No restrictions	48kHz or lower	16 bit or less

Level 1	Level 2	Level 3	Setting item	Setting value	
HDBaseT	InfoFrame/ Packet	ISRC Packet	Year Of Rec. Code :	3-digit Each 0 to 9	
			Recording-item Code:	5-digit Each 0 to 9	
		Gamut Metadata Packet	OFF/ON (0/1):	0:OFF / 1:ON	
			Next_Field (0/1):	0 to 1	
			No_Current_GBD(0/1):	0 to 1	
			GBD_profile (0-3):	0:P0 / 1:P1 / 2:P2 / 3:P3	
			AffectedGamutSeqNum:	0 to 15	
			Current_GamutSeqNum:	0 to 15	
			Packet_Seq (0-3):	0:Intermediate	
				1:First	
				2:Last	
				3:Only	
			Format_Flag (0/1):	0:Vertices/Facets / 1:Range	
			ColorPrecision(0-2):	0:8bit / 1:10bit / 2:12bit	
			Color_Space (0-3):	Format_Flag=Vertices/Facets	
				0:ITU-R BT.709	
				1:xvYCC601	
				2:xvYCC709	
				3:XYZ	
				Format_Flag=Range	
				0:Reserved	
				1:xvYCC601	
				2:xvYCC709	
				3:Reserved	
			Number_Vertices : It is displayed only when selecting “Format_Flag=Vertices/Facets”.	Follows the setting of Color Precision. 8bit : 4 to 8 10bit: 4 to 6 12bit: 4 to 5	
			Packed_GBD_Vertices_Data It is displayed only when selecting “Format_Flag=Vertices/Facets”.	DATA 1	Follows the setting of Color Precision 8bit : 0 - 255 10bit : 0 - 1023 12bit : 0 - 4095
				DATA 2	
				DATA 3	
				DATA 4	
			Packed_Range_Data It is displayed only when selecting”Format_Flag=Range”.	Min_Red	Follows the setting of Color Precision 8bit : -3.96875 - +3.96875 10bit: -3.9921875 - +3.9921875 12bit: -3.998046875 - +3.998046875
				Max_Red	
				Min_Green	
				Max_Green	
				Min_Blue	
				Max_Blue	

4.6.5 HDBaseT Config Setting Item

This section describes how to configure the HDBaseT unit.
Set it from MENU> Configuration.

Level1	Level2	Level3	Setting Item	Setting value
Configuration				

HDBaseT

Auto Select Send appropriate value of the following InfoFrame automatically.	**0:OFF / 1:ON**

・When Program Data is saved when AutoSelect is ON, the value set by automatic selection is sent.
・For the notation "-", use the value of the original setting.

Item	Setting Value / Reference Source			
AVI InfoFrame				
	AFD Pattern is being displayed.			Except the left.
Active Format Information	Valid			—
Active Format Aspect	Follow the setting of AFD> **Type.**			—
Top Bar Bottom Bar Left Bar Right Bar	The calculated value from the setting of AFD,Timing.			—
RGB or YCbCr	Follow the setting of HDBaseT> **Video Format.**			
Picture Aspect	Follow the setting of HDBaseT> AVI InfoFrame> **Video Code.**（EIA/CEA-861 conformed）			
Repetition	Follow the setting of H-Timing> **Repetition.**			
Audio InfoFrame				
	Follow the setting of Digital Audio> **Source.**			
	Ext.ANALOG to L-PCM Int.L-PCM Ext.I2S L-PCM (Option)	Ext.ANALOG to DSD	Int.DSD (Option)	Except the left.
Sampling Frequency	—	44.1kHz	Follow the information of DSD File.	—
Channel Count	Follow the channel number that is set as “ON” in Digital Audio> **Output Channel.** 0: Refer Stream Header 1: 2ch 2 to 8: 2 to 8ch			—
ACP Packet				
	Follow the setting of ACP Packet> **ACP_Type.**			
	DVD-Audio			Except the left
DVD-Audio_Type	1			0
Copy_Permission	—			0 (Copy Freely)
Copy_Number	—			0 (1 copies)
Quality	—			0

<table>
<tr><th>Level1</th><th>Level2</th><th>Level3</th><th>Setting Item</th><th>Setting value</th></tr>
<tr><td></td><td>Transaction</td><td colspan="2">—</td><td>0 (Not Present)</td></tr>
<tr><td></td><td colspan="4">ISRC Packet</td></tr>
<tr><td></td><td></td><td colspan="2">Follow the setting of ACP Packet> ACP_Type.</td></tr>
<tr><td></td><td></td><td>DVD-Audio</td><td>Except the left.</td></tr>
<tr><td></td><td>OFF/ON ISRC1</td><td colspan="2">—</td><td>OFF</td></tr>
<tr><td></td><td>ISRC2</td><td colspan="2">Follow the setting of ISRC Packet> ISRC_Cont.
<table><tr><th>0</th><th>1</th></tr><tr><td>OFF</td><td>—</td></tr></table></td><td>OFF</td></tr>
<tr><td></td><td>HDBaseT</td><td>Packet Changing</td><td></td><td>0：Normal Mode
Disconnect the Sync of HDMI output, and change InfoFrame/Packet.</td></tr>
<tr><td></td><td></td><td></td><td></td><td>1：Game Mode
Change InfoFrame/Packet.
(without disconnecting Sync.)</td></tr>
<tr><td></td><td></td><td>Link Mode</td><td></td><td>0：HDBaseT Mode
Set normal HDBaseT output mode.</td></tr>
<tr><td></td><td></td><td></td><td></td><td>1：Long Reach Mode
This is the setting which can support cable length up to 150m.
*1</td></tr>
</table>

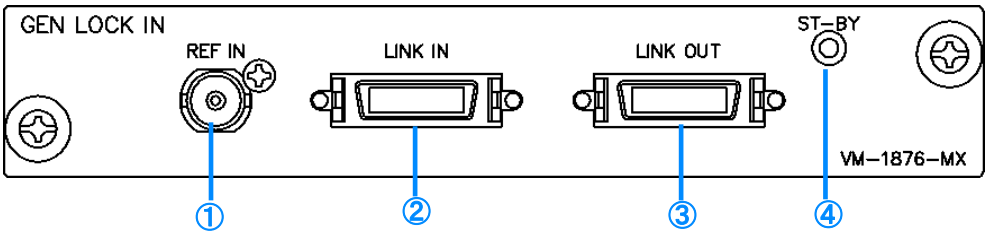
*1 “Long Reach Mode” supports up to 148.5MHz HDMI pixel clock.

4.7 Synchronization unit (multiple VG unit synchronization) functions and settings

The applicable unit is as follows.

4.7.1 VM-1876-MX output parts

● Unit exterior diagram



No.	Name	Description
①	External synchronization signal input	For future expansion.
②	Multi link input	Dedicated terminal for synchronization operation between other VG-876 synchronization units. (MDR 26-pin connector) Connect this with the multi link output of the synchronization unit at the previous stage.*
③	Multi link output	Dedicated terminal for synchronization operation between other VG-876 synchronization units. (MDR 26-pin connector) Connect this with the multi link input of the synchronization unit at the subsequent stage.*
④	Standby LED	Lights when output preparation is complete. On: Normal Off: Error (module damaged, wrong slot, etc.)

● Specifications

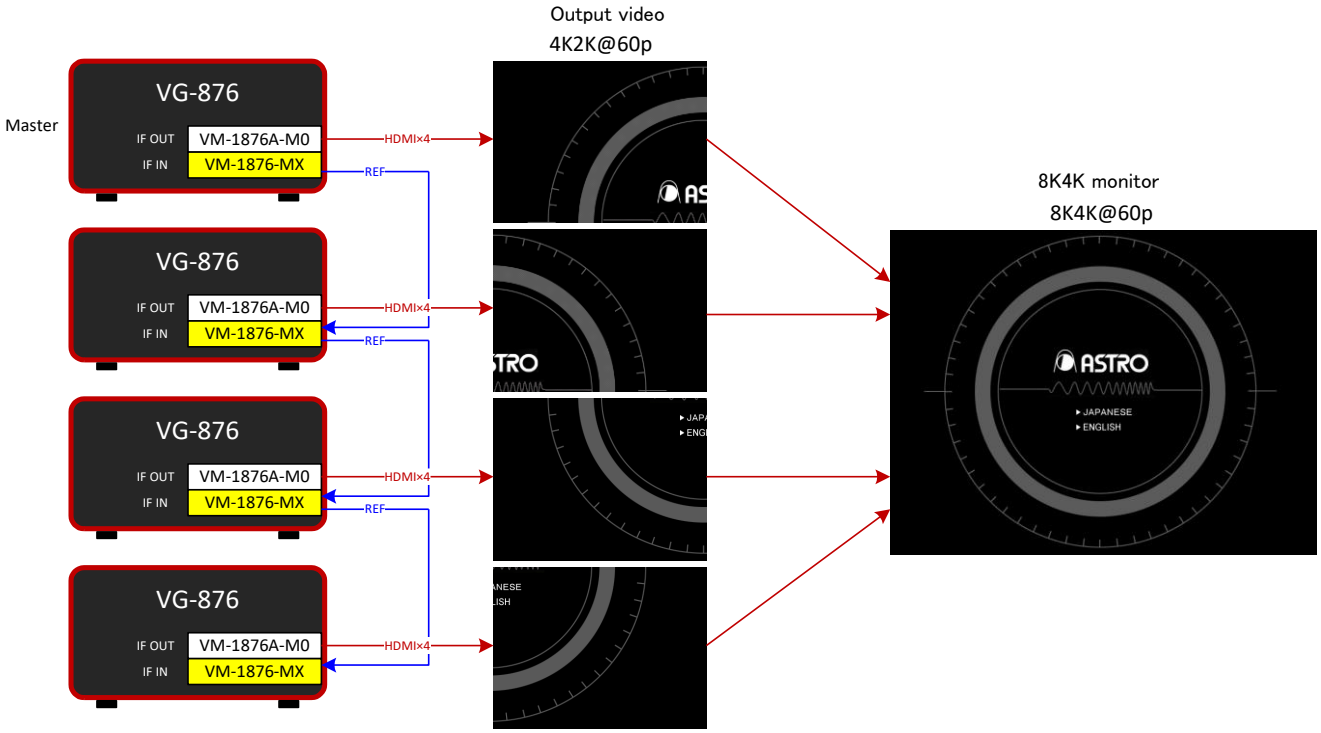
REF IN	Connector	BNC x1
	Signal level	For future expansion.
	Signal standard	For future expansion.
LINK IN/OUT	Connector	1 of each MDR -26-pin connector
	Signal level	LVDS

4.7.2 Overview of synchronization operation

Signals of a resolution such as 8K4K@60p that is higher than one VG unit support can be output by performing the operation to synchronize multiple units by using a synchronization unit.

As an example, the following shows an image of the operation for synchronizing four units.

《8K4K@60p with HDMI output by linking 4 units》



* **VM-1876-MX is installed in the IF IN slot of the VG unit.**

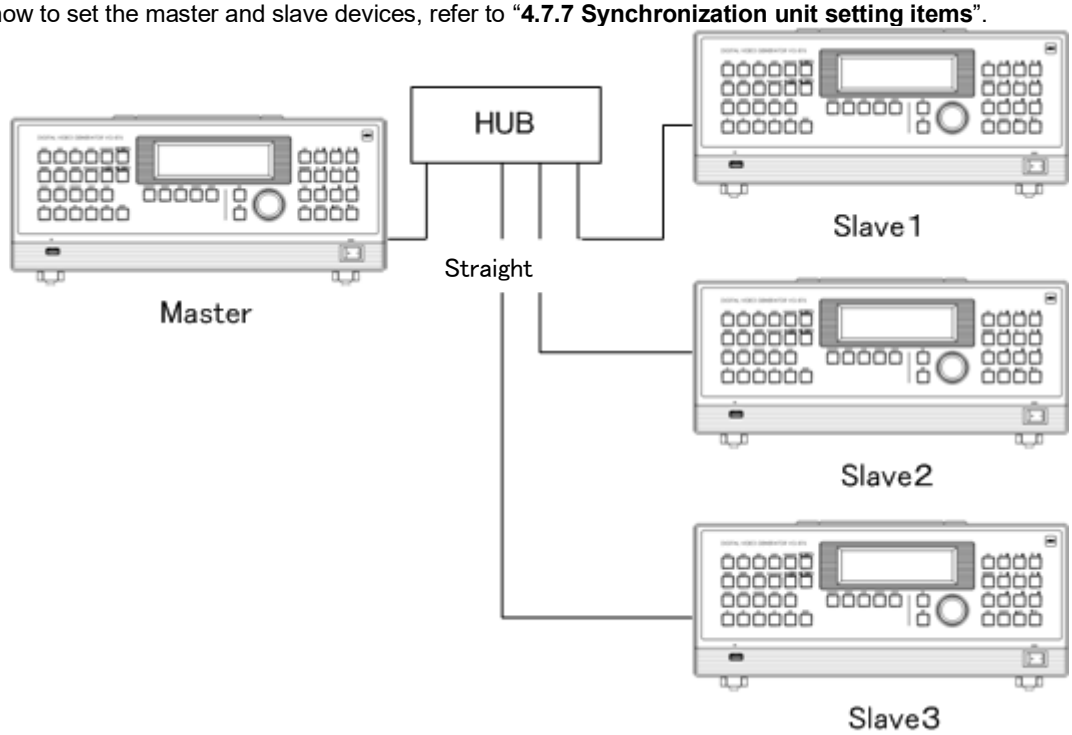
4.7.3 Connection method

The following shows an image of connecting the multi link connectors.

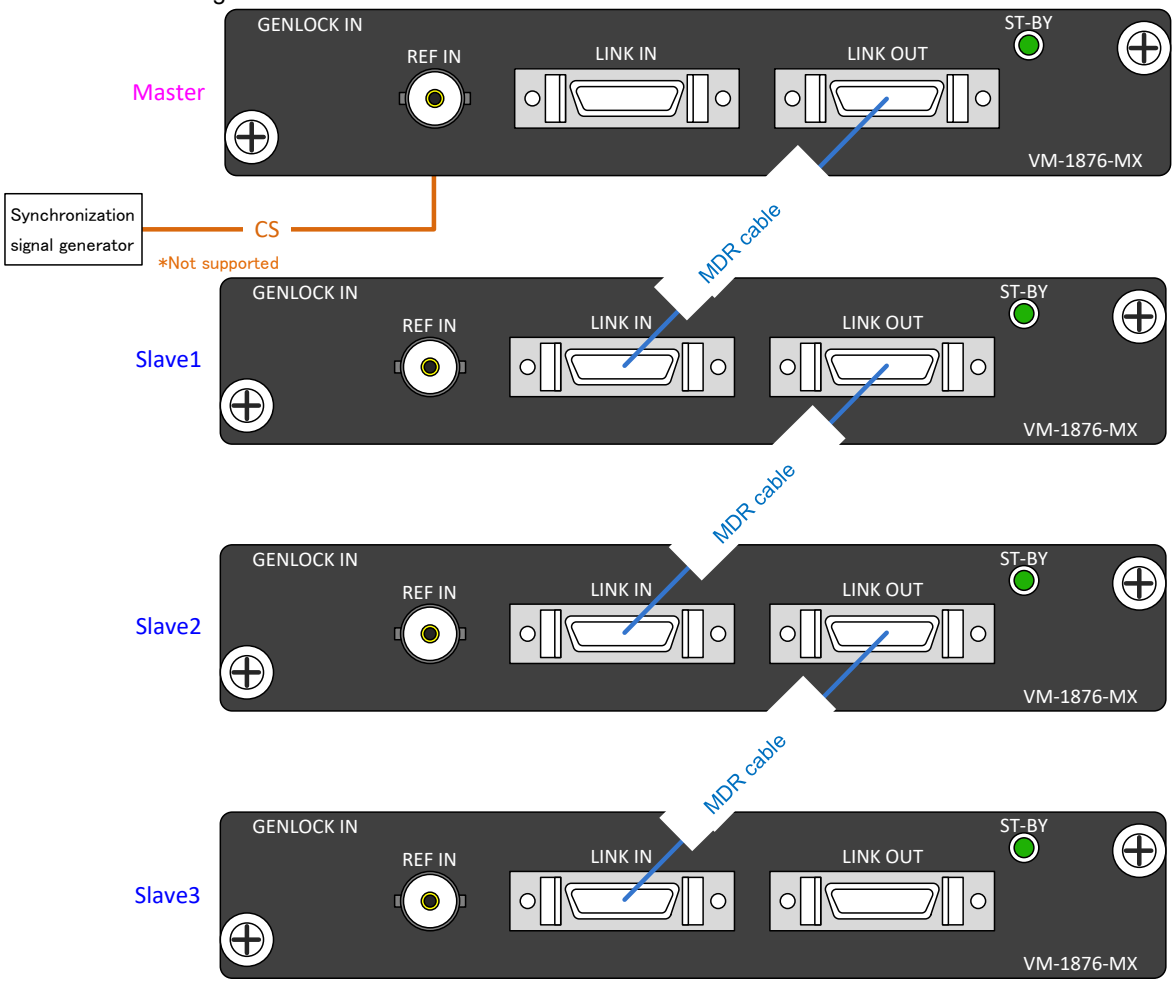
● VG unit connection diagram

The master and slave devices are connected by LAN (straight cable) via a hub.

For details on how to set the master and slave devices, refer to “**4.7.7 Synchronization unit setting items**”.



● VM-1876-MX connection diagram



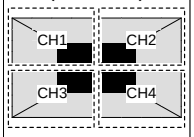
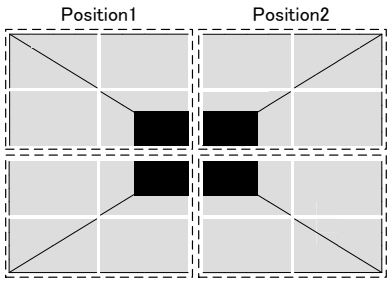
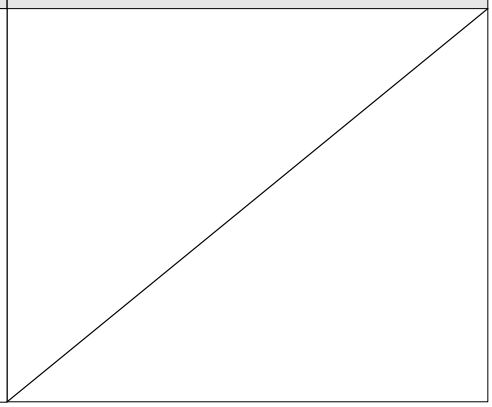
4.7.4 Image of splitting method when synchronizing 4 units

The screen split methods that can be supported when synchronizing 4 VG units are as follows.
For the dot clock and bit length area that can be output, refer to "**Relationship between Pattern Rendering Bit Length and Dot Clock**" included in the section for each unit.

The supported units are as follows.

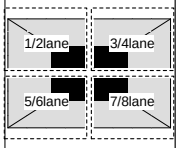
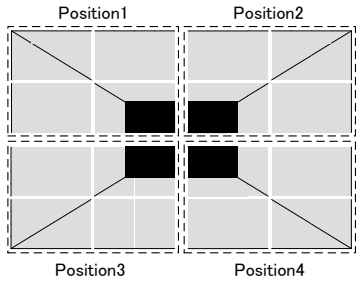
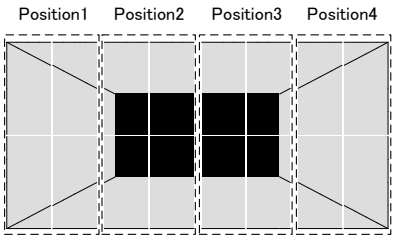
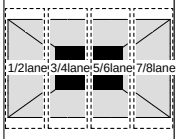
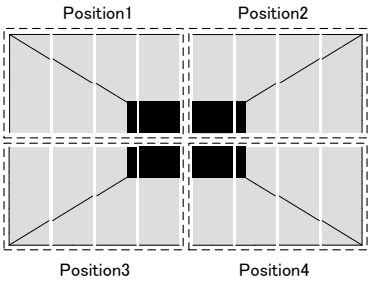
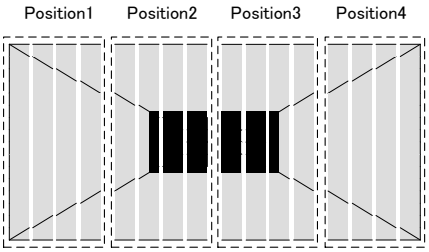
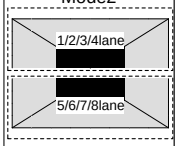
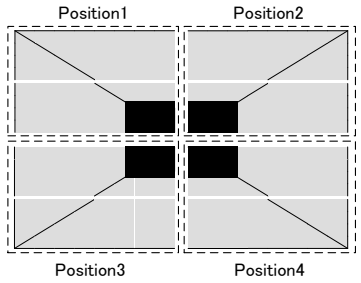
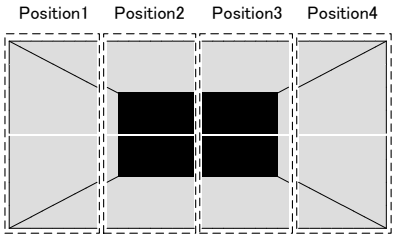
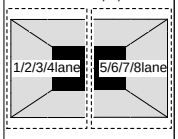
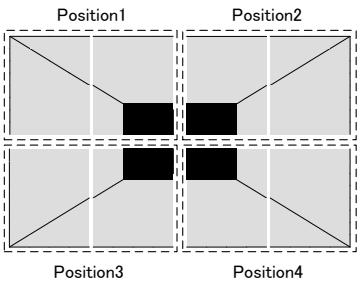
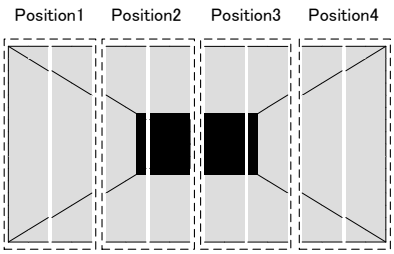
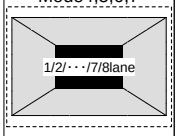
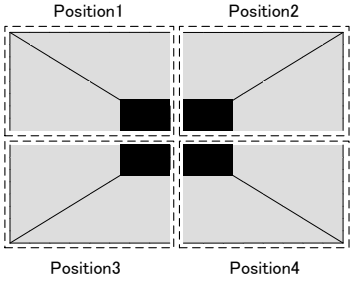
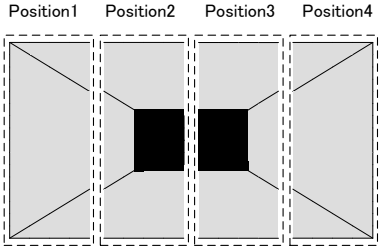
- **VM-1876A-M0** - **VM-1876-M2** - **VM-1876-M5**
- **VM-1876A-M6** - **VM-1876-M7** - **VM-1876-M8**

《VM-1876A-M0, VM-1876-M7》
*** Dual clock mode is not supported.**

DotClk Mode	Split Mode ***Modes 1 and 3 to 10 are not supported.**	Multi VGMode	Pattern image	Multi VGMode	Pattern image
Quad	Mode0,2 (H2/V2Div) 	H2/V2Div	 *1 Connector Output : 1920x1080 60Hz or 120Hz 2048x1080 60Hz or 120Hz (Set any value for VIC.)	V4Div	

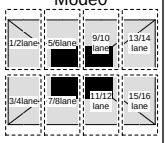
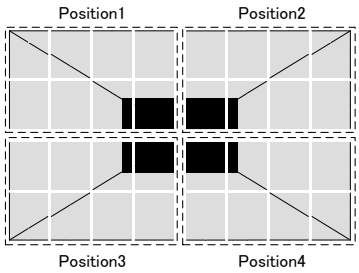
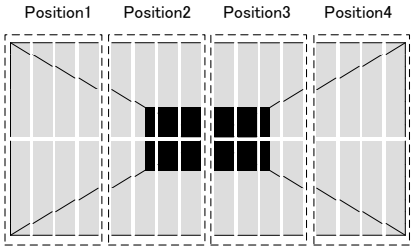
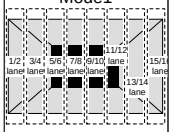
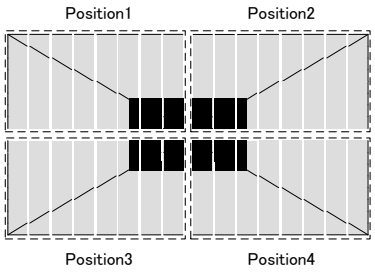
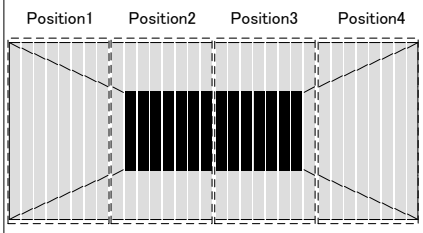
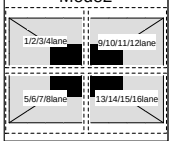
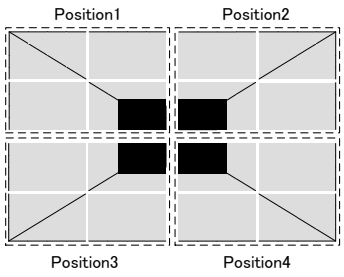
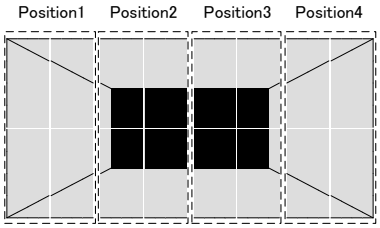
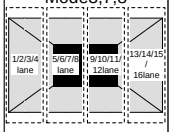
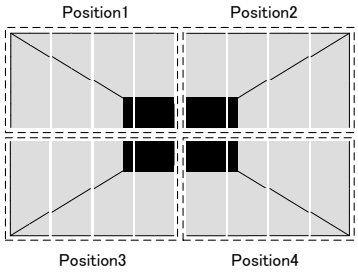
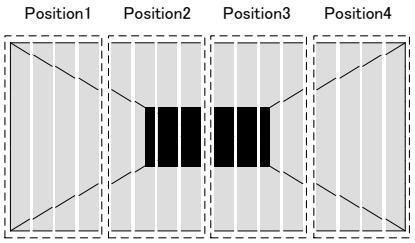
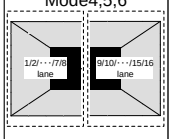
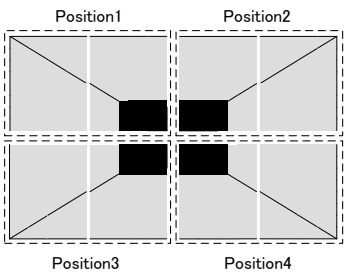
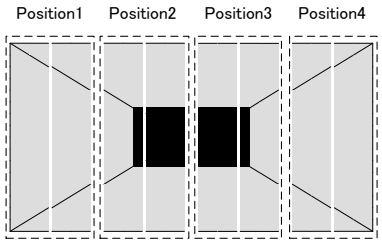
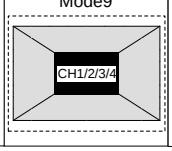
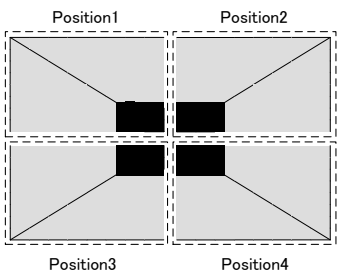
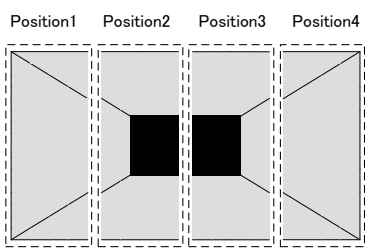
《VM-1876-M2》

● Number of Lane = 8 lanes x 4 (8K4K 60Hz)

DotClk Mode	Split Mode	Multi VGMode	Pattern image	Multi VGMode	Pattern image
Dual (8 lanes x 4)	Mode0 	H2/V2Div		V4Div	
	Mode1 				
	Mode2 				
	Mode3,8,9 				
	Mode4,5,6,7 				

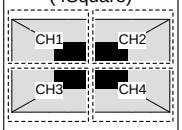
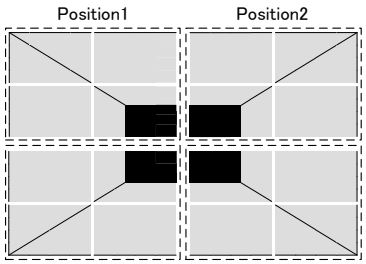
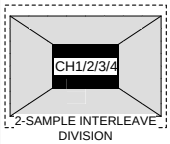
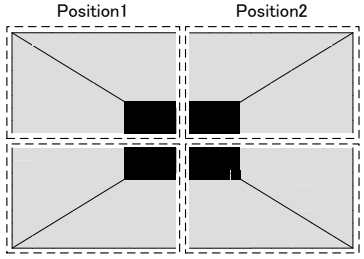
*Output of CH3 and CH4 is the same as that of CH1 and CH2

● Number of Lane = 16 lanes x 4 (8K4K 120Hz)

DotClk Mode	Split Mode ***Mode 10 is not supported.**	Multi VGMode	Pattern image	Multi VGMode	Pattern image
Quad (16 Lanes x 4)	Mode0 	H2/V2Div		V4Div	
	Mode1 				
	Mode2 				
	Mode3,7,8 				
	Mode4,5,6 				
	Mode9 				

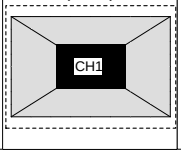
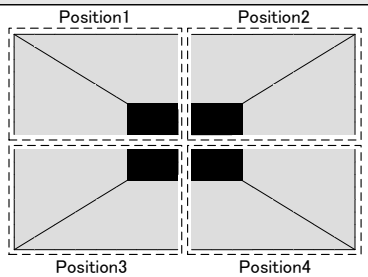
《VM-1876-M5》

*** Dual clock mode is not supported.**

DotClk Mode	Split Mode ***Modes 1 to 9 are not supported.**	Multi VGMode	Pattern image	Multi VGMode	Pattern image
Quad	Mode0 (4Square) 	H2/V2Div	 *1 Connector Output : 1920x1080 60Hz 2048x1080 60Hz	V4Div	
	Mode10 (2SI) 		 * 1 connector output: 1920 x 1080 60 Hz *1 Connector Output : 1920x1080 60Hz 2048 x 1080 60 Hz 2048x1080 60Hz		

《VM-1876A-M6, VM-1876-M8》

*** Quad clock mode is not supported.**

DotClk Mode	Split Mode ***Modes 0, 2, and 4 to 9 are not supported.**	Multi VGMode	Pattern image	Multi VGMode	Pattern image
Dual	Mode1,3 (VDiv) 	H2/V2Div	 *1 Connector Output : 3840x2160 60Hz 4096x2160 60Hz (Set any value for VIC.)	V4Div	

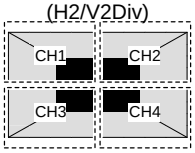
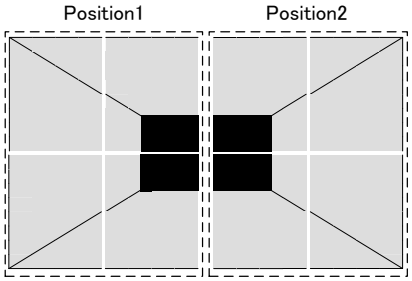
4.7.5 Image of splitting method when synchronizing 2 units

The screen split methods that can be supported when synchronizing 2 VG units are as follows.
For the dot clock and bit length area that can be output, refer to “Relationship between Pattern Rendering Bit Length and Dot Clock” included in the section for each unit.

The supported units are as follows.

- **VM-1876A-M0**
- **VM-1876-M2**
- **VM-1876-M7**

《VM-1876A-M0, VM-1876-M7》
*** Dual clock mode is not supported.**

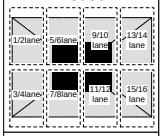
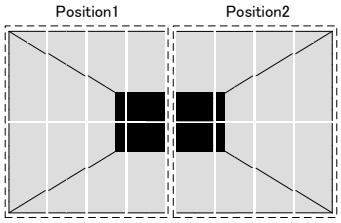
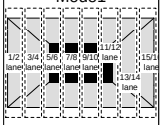
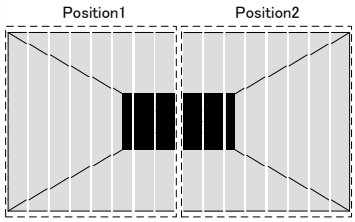
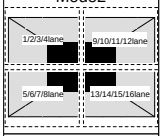
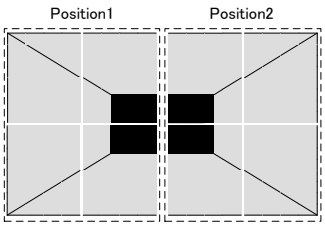
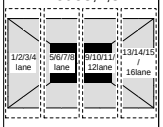
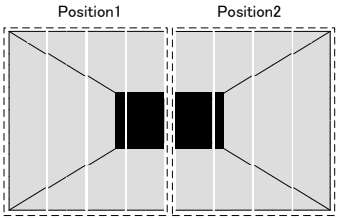
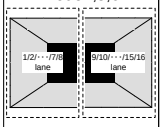
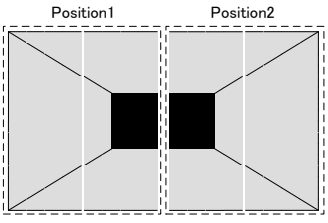
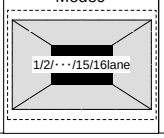
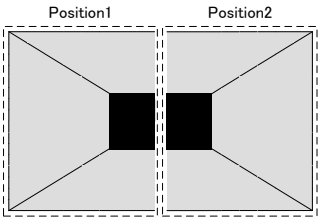
DotClk Mode	Split Mode ***Modes 1 and 3 to 10 are not supported.**	Multi VGMode	Pattern image
Quad	Mode0,2 (H2/V2Div) 	V2Div	 *1 Connector Output : 1920x1080 60Hz or 120Hz 2048x1080 60Hz or 120Hz (Set any value for VIC.)

*Positions 3 and 4 cannot be set.

《VM-1876-M2》

*** Dual clock mode is not supported.**

● Number of Lane = 16 lanes x 2 (8K4K 60Hz)

DotClk Mode	Split Mode ***Mode 10 is not supported.**	Multi VGMode	Pattern image
Quad (16 Lanes x 2)	Mode0 	V2Div	
	Mode1 		
	Mode2 		
	Mode3,7,8 		
	Mode4,5,6 		
	Mode9 		

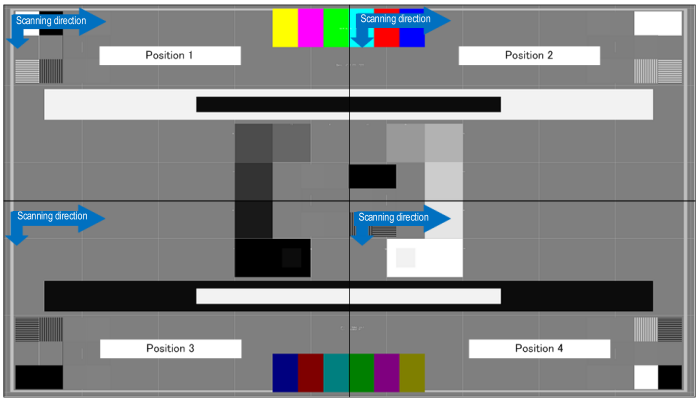
*Positions 3 and 4 cannot be set.

4.7.6 Scanning direction image

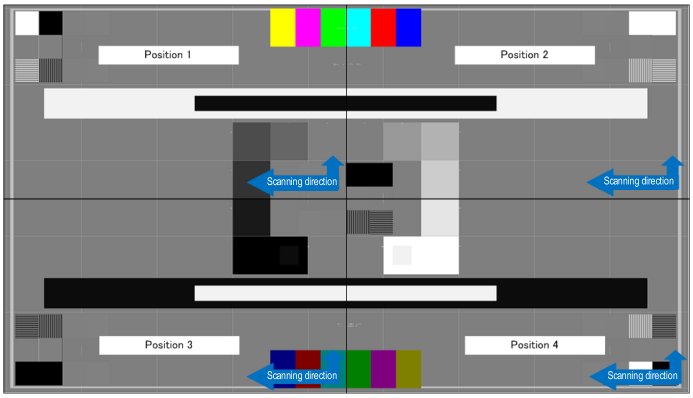
The scanning direction set in the Reverse Mode settings of Config is shown below.
An independent scanning direction can be set for each unit.
The following is the case when the same scanning direction is set for all four units.

●《Multi VGMode = H2V2Div (4 quarter panes)》

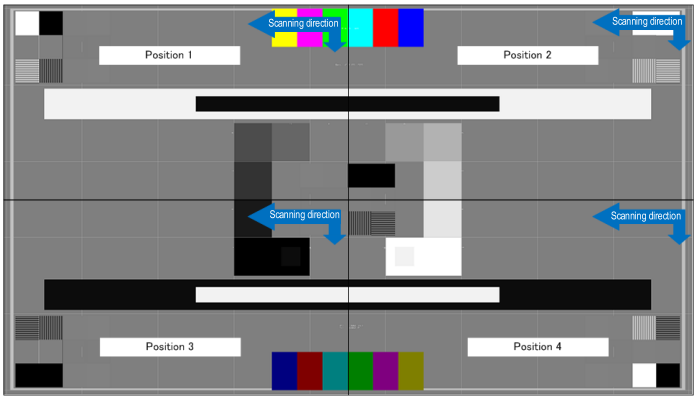
● Reverse Mode = No Reverse



● Reverse Mode = LR & TB

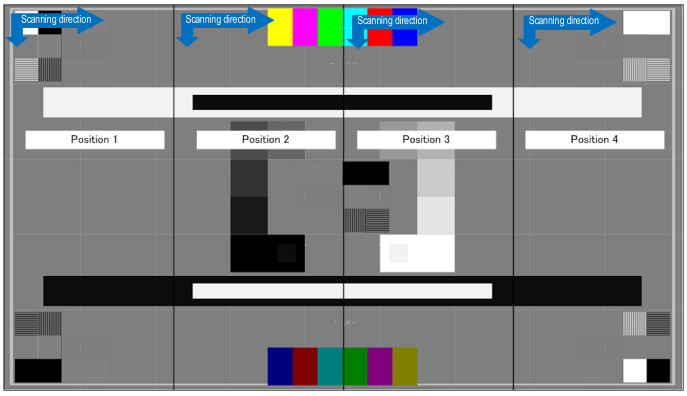


● Reverse Mode = Left Right

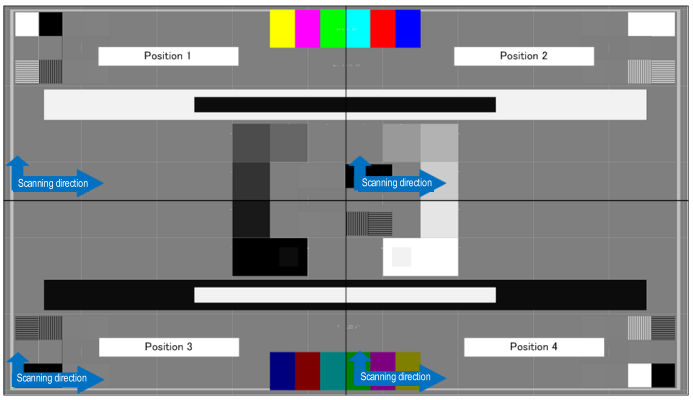


●《Multi VGMode = V4Div (4 panes vertical)》

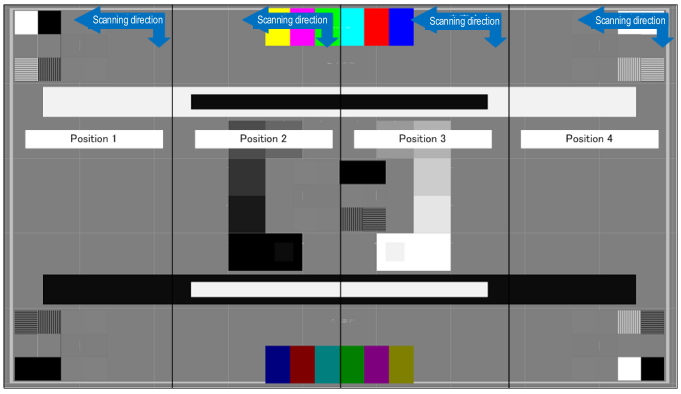
● Reverse Mode = No Reverse



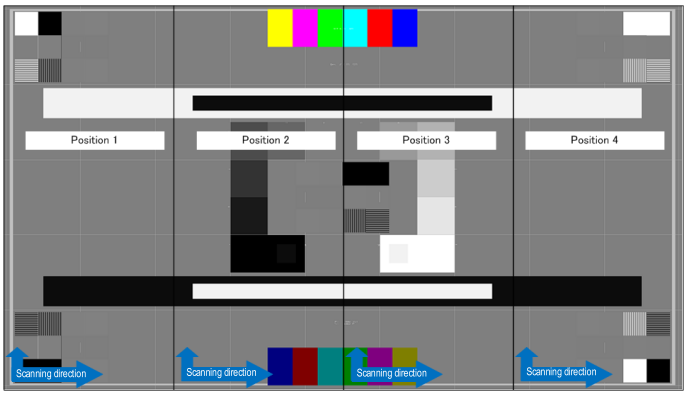
● Reverse Mode = Top Bottom



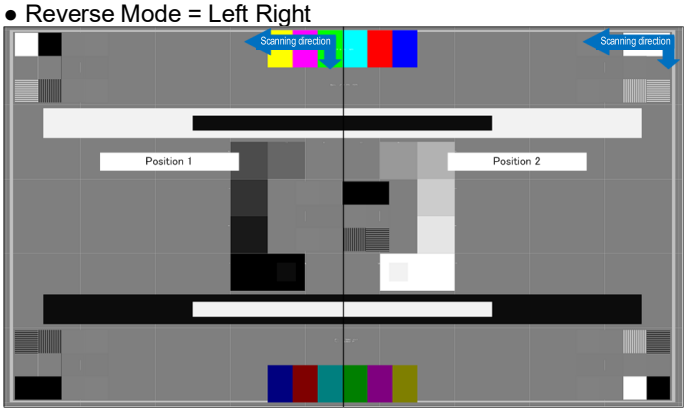
● Reverse Mode = Left Right



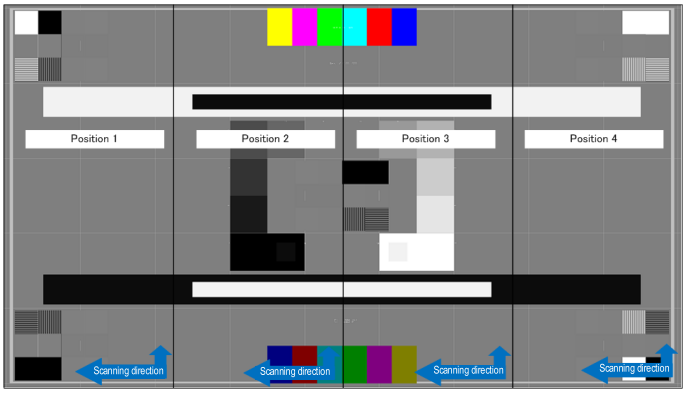
● Reverse Mode = Top Bottom



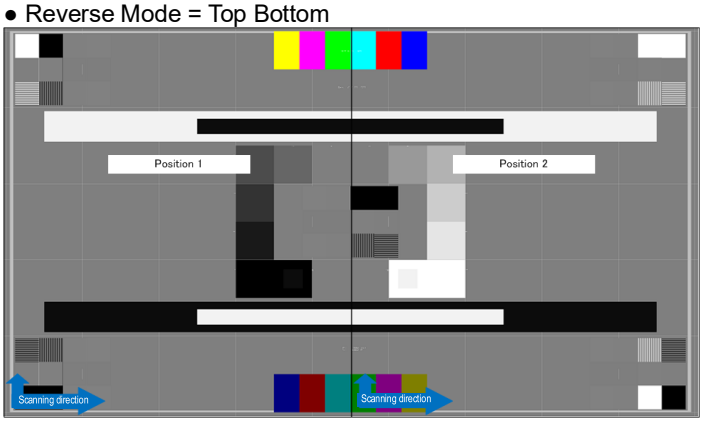
● Reverse Mode = Left Right



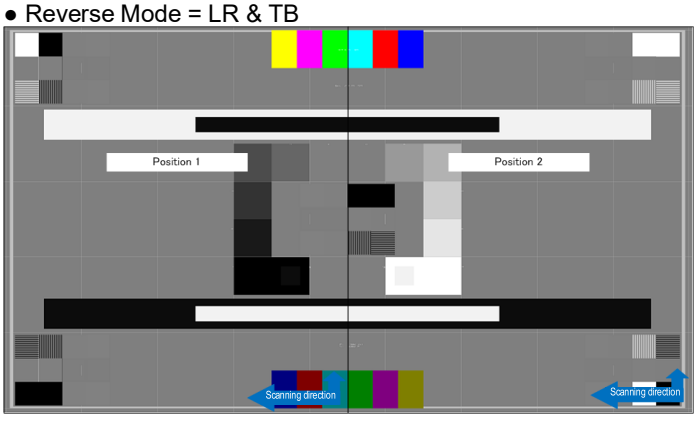
● Reverse Mode = LR & TB



● Reverse Mode = Top Bottom

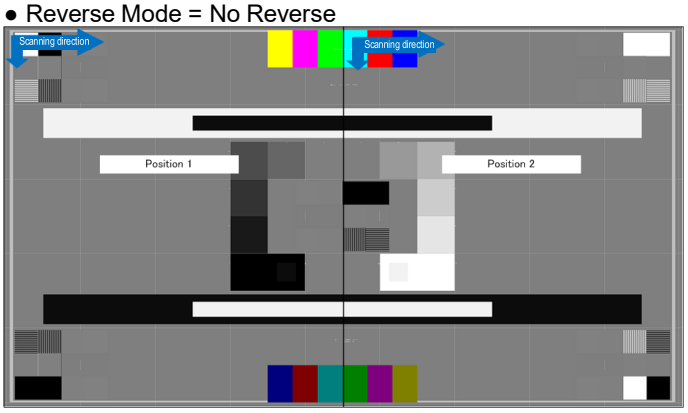


● Reverse Mode = LR & TB



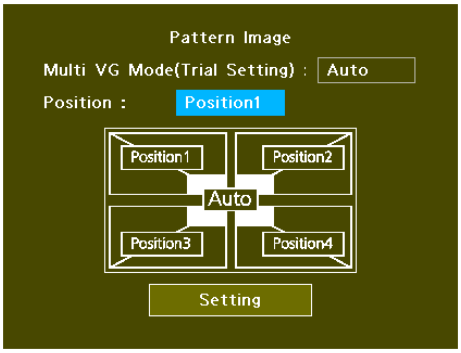
●《Multi VGMode = V2Div (2 panes vertical)》

● Reverse Mode = No Reverse



4.7.7 Synchronization unit setting items

《VM-1876-MX Setting Parameters》

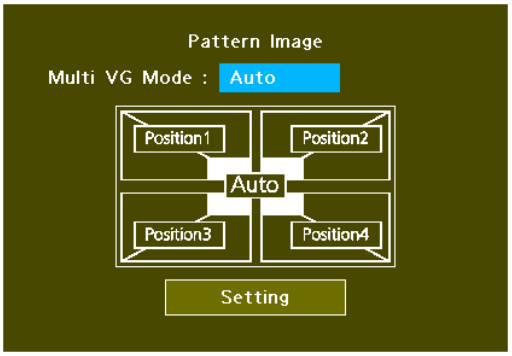
Level 1	Level 2	Level 3	Setting item	Setting value
Mode				
				0: OFF **Does not operate in the synchronization mode.** **1: Master** **Operates in the synchronization mode as the master device.** **2: Slave** **Operates in the synchronization mode as a slave device.**
Position **Sets the drawing position of the VG.** * This is dependent on the Multi VGMode setting of All Output. * Please do not set this to Position 3 and Position 4 when Multi VGMode = 2VDiv. For details on output, refer to "**4.7.4 Image of splitting method when synchronizing 4 units**" or "**4.7.5 Image of splitting method when synchronizing 2 units**". The setting is done by the below pop-up screen.  				**0: Position1** **Sets the rendering position to Position 1.** **1: Position2** **Sets the rendering position to Position 2.** **2: Position3** **Sets the rendering position to Position 3.** **3: Position4** **Sets the rendering position to Position 4.** **Multi VG Mode(Trial Setting)** **0:Auto** **1:H2/V2Div** **2:V4Div** **3:V2Div** **Set split mode of VG.** **This item is set only on the popup screen. When the setting is changed, a divided image for each setting value is displayed, but the Multi VG Mode setting of All Output itself is not changed.**
Unit Count **Sets the number of VG to synchronize.**				**Setting range: 1 to 4** *** At present, only 1, 2, and 4 are enabled.**
OFF/ON				**0: Slave1** **Sets the unit to the 1st slave when Mode is set to Slave.** **1: Slave2** **Sets the unit to the 2nd slave when Mode is set to Slave.** **2: Slave3** **Sets the unit to the 3rd slave when Mode is set to Slave.**
Time Out **Sets the timeout time of program execution completion.**				**Specification range: 0 to 255** *** Do not change the setting value from 0.**
Reverse Mode **Reverses the rendering direction.** **For details on output, refer to "10.11.7 Scanning Direction Image".**				**0: No Reverse** **This is the normal operation.** **1: Left Right** **Reverses the left/right direction.** **3: Top Bottom** **Reverses the top/bottom direction.** **4: LR & TB** **Reverses the top/bottom and left/right directions.**
Slave Control Cnt **Sets the number of units for slave control.**				**Setting range: 0 to 3** *** At present, only 0, 1, and 3 are enabled.** *** Set 1 when synchronizing two units.** *** Set 3 when synchronizing four units.**
Slave1 IP Address **Slave2 IP Address** **Slave3 IP Address**				**Setting range: 0 to 255**

Level 1	Level 2	Level 3	Setting item	Setting value
Sets the IP address for slave control. (XXX . XXX . XXX . XXX)				

4.7.8 Control method

Arbitrary program data set on the front panel of the VG master or with a connected remote box output.

《Distributed output settings》

Level 1	Level 2	Level 3	Setting item	Setting value
All Output	**Multi VGMode(* VG-876 and VG-879 only)** Sets the splitting method for each VG1 when multiple VG units are synchronized. The setting is done by the below pop-up screen. The split image of each setting item is displayed.  		**0: Auto** Splits into 4 quarters when 1320 MHz is exceeded with the dot clock. Splitting is not performed at 1320 MHz or less. **1: H2/V2Div** 4 quarter panes **2: V4Div** 4 panes vertical **3: V2Div** Displays with 2 vertical panes. (Synchronized output of two VG units)	

* For details on output, refer to "**4.7.4 Image of splitting method when synchronizing 4 units**" or "**4.7.5 Image of splitting method when synchronizing 2 units**".

Important

When multiple units are synchronized, there are the following restrictions.

Item	Restriction
Scrolling	Pausing is not linked. Only the master stops, and the scroll position for each slave is reset by canceling pause.
M-Blur	Random is not linked in order for each unit to generate a random number.
Cursor	Linked cursor display is not possible.
List display	HDCP, EDID, DDC, CEC, etc. are not supported.
APDC	Not supported.
3D patterns	Not supported.
Sync on/off	Not linked.
HDCP on/off	Not linked.
AudioMute on/off	Not linked.
Video level operation	Not linked. Only the master level is changed. * digiVideoLevel of the program data to send to the slave is updated with the next program execution.
Audio level operation	Not linked.
Image	The patterns you added and registered yourself, such as Image, OPT-USER, and SUBTITLE need to be registered and set on the VG units including the master unit.

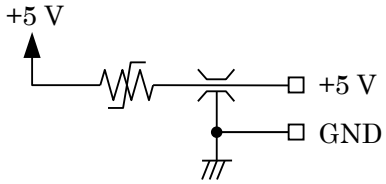
Chapter 5 Appendix

5.1 DDC power supply max power current consumption

DDC power supply runs to each VG outlet.
The maximum DCC power supply current value is as follows.

- HDMI output ・・・・・・・・・ 0.05 A total for 2CH
- DVI output ・・・・・・・・・・ 0.5 A total for 2CH
- Analog output ・・・・・・・・・ 0.5 A from VGA output

DDC power supply is output as follows.



DDC power supply output circuit

1） The supply voltage differs depending on the output connector.

- HDMI output ・・・・・・・・ Fixed to +5 V
- DVI output ・・・・・・・・・ Fixed to +5 V
- Analog (D-SUB) output ・・・・ Fixed to +5 V

Important

● Although the DDC power supply is equipped with an overcurrent protection element, avoid using it with amperage that exceeds rated values.

● Never supply power to the DDC power supply from the connected device. When connected, the VG or connected device may be damaged.

5.2 Trademarks

HDMI, HDMI logo, and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC.

Chapter 6 Revision History

Version	Date	Page	Item No.	Details
1.00	2017/02/24			First edition
2.11	2017/09/08			VG-878-A added.
		p.11	3.1.2	VG-878-A specification added.
		p.58	4.2.1	VM-1876-M1 added.
		p.60	4.2.2	VM-1876A-M1 added.
		p.83	4.3.1	VM-1876-M5 added.
		p.83	4.3.2	VM-1876-MB added.
		p.96	4.4.1	VM-1876-M2 added.
		p.120	4.5.1	VM-1876-M9 added.
		p.141	4.6.1	VM-1876-MX added.
2.20	2017/10/17			Delete VM-1876-M1 description.
		p44	4.1.8	Correct setting item of Vendor Specifc InfoFrame.
		p60	4.2.1	Correct setting value
		p63	4.2.3	Correct the contents of data transfer mode.
		p70	4.2.4	Correct setting value.
2.30	2017/12/22			Add VG-877.
		p8	2.1	Correct contents of Multi VG Mode.
		p44	4.1.3	Add items of InfoFrame Auto Set.
		p157	4.6.7	Correct contents of Position.
		p158	4.6.8	Correct contents of Multi VG Mode.
2.40	2018/07/11	p5	1.1	Add VM-1876-MC.
		p6	2.1	Add setting of HDBaseT.
		p146	4.6	Add “HDBaseT unit function and setting”.
2.50	2019/03/15	p5	1.1	Add VM-1876-MD
		p7	2.1	Change Auth Version of HDCP2.2 to 2.3.
		p37	4.1.5	Add HDMI2.1 unit VM-1876-MD.
		p42	4.1.9	Add item of output setting item.
		p60	4.1.10	Add HDMI Config setting item.
2.60	-	-	4.1.5	Add “FRL Support Format (DSC)”
		p71	4.1.9	Add FFE Level and DSC Mode in HDMI Ouput setting
2.70	-	-	4.1.5	Change the list to “TMDS Support Format”, “FRL Support Format (Uncompressed)”, and “FRL Support Format (DSC)”.
		p71	4.1.9	Add 5V Enable in HDMI Output Setting.
				Add 0: Auto (Refer EDID) in Rate Per Lane.
				Change itesm to [0:OFF, 1: Refer Rate Per Lane, 2: Refer EDID] in DSC Mode.
		p75	4.1.9	Add [2: ITU-R BT.2100 ICTCP] in Additional Colorimetry in AVI InfoFrame.
		p83	4.1.10	Add items of [TMDS or FRL], [DSC Mode] and [MD 8K Output] in HDMI Config.
2.80	2020/03/09	p38-62	4.1.5	Change list of [TMDS, FRL Support Format]
		P83	4.1.10	Add Rate Per Lane in HDMI Congif.

VG Series Interface Unit

Instruction Manual Ver. 2.80

- An incorrectly collated manual or a manual with missing pages will be replaced.
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