



HDMI SIGNAL MODULE MODEL A223814

Chroma's next-generation HDMI Signal Module A223814 offers high-refresh rate testing for applications such as gaming, movies, and healthcare. It comes with 2 HDMI output ports and supports HDMI 2.1a 48G bandwidth transmission, FRL, DSC, HDCP, eARC channel and Dynamic HDR (HDR 10+, Dolby Vision) test functions.

Gaming Display Testing

The A223814 comes with built-in CTA-861-H and a variety of VESA standard timings, allows editing of horizontal/vertical timing parameters and supports testing at various high frame rates used in the industry (such as 144Hz, 165Hz and 240Hz). Furthermore, VRR (Variable Refresh Rate) and FVA (Fast VActive) test functions are supported, offering combined testing for a wide timing range of DUTS and applications. Combined with the ALLM (Auto Low-Latency Mode) function, the module provides a complete testing solution for gaming display applications.

VRR (Variable Refresh Rate)

VRR, or Gaming-VRR, is a new video processing technology. It reduces or eliminates lag, jitter, choppiness and screen tearing by continuously and smoothly changing the refresh rate whenever a particularly dynamic scene is displayed, which makes for a much smoother gaming experience. The A223814 supports a wide range of testing frame rates from VRR 20 Hz up to 480 Hz. The FVA function reduces image transmission time, improves performance, reduces latency, and saves power. Users can adjust FVA factor range from 1 to 16, and set up multi-faceted test combinations in conjunction with Gaming-VRR.

QMS (Quick Media Switching)

When the display device has to quickly switch between different refresh rates (e.g. between 60fps and 24fps movies), screen lag may occur. With its adjustable QMS, QMS-TFR_{MIN} and QMS-TFR_{MAX} parameters, Chroma A223814 supports QMS-VRR testing at various video frequencies, enabling stable

and seamless output of video signals for smooth playback without screen blackouts.

ALLM (Auto Low-Latency Mode)

The user can adjust the various parameters of Gaming-VRR and QMS-VRR to slow down the display's image transmission, which can lead to smoother and uninterrupted video playback. The A223814 supports editing the ALLM's parameters, and its convenient On Screen Display enables the user to view both the resulting changes happening on the screen and the test status in real-time.

FRL (Fixed Rate Link)

FRL mode improves on the TMDS (Transition-Minimized Differential Signaling) mode previously used in HDMI 1.4/2.0 and enables more efficient image transmission. A single port can output 8K/10K signals in FRL mode, the data rate can be set to 3, 6, 8, 10 or 12Gbps according to different resolutions, and the number of lanes can be set to 3 or 4 lanes, providing a wide variety of different transmission specifications to test.

DSC (Display Stream Compression)

VESA DSC has been adopted by the HDMI Association in its HDMI 2.1 specification. Chroma A223814 supports VESA DSC1.2a with a maximum 3:1 compression ratio. With the DSC function, users can transmit a larger amount of data under the same bandwidth conditions.

HDR (High Dynamic Range) / Dolby Vision

HDR output is supported, including HDR 10/HLG/ HDR 10+ and Dolby Vision HDR format settings, with freely adjustable HDR metadata for relevant tests. Chroma A223814 has a built-in library of indispensable HDR testing patterns that mainly serve to measure brightness, contrast, color, and sharpness, such as grayscale, color bars and window shapes, providing testing patterns in line with today's richly colored video output. The built-in Dolby Vision test pattern additionally enables users to quickly assess the DUT's Dolby Vision function.

MODEL A223814

KEY FEATURES

- Option module for 2238 Video Pattern Generator
- Supports HDMI 2.1a
- FRL output mode
 - up to 10K@30Hz video output
 - 3 / 6 / 8 / 10 / 12 Gbps modes
 - 3 / 4 Lanes modes
- VRR (Variable Refresh Rate)
- ALLM (Auto Low-Latency Mode)
- QMS (Quick Media Switching)
- RGB / ITU-601 / ITU-709 / xvYCC-601 / xvYCC-709 / sYCC-601 / Adobe YCC-601 / Adobe RGB / BT.2020-YC / DCI-P3 RGB / BT.2020-RGB color space
- 24 / 30 / 36 bits color depth
- YCbCr 4:4:4, 4:2:2, 4:2:0 formats
- DSC (Display Stream Compression)
- Timing and Frame Rate parameters editing
- Supports HDCP 2.3 / 2.2 / 1.4
- Built-in CTA-861-H and VESA standard timing parameters
- eARC testing
- FEC (Forward Error Correction)
- HDR
 - HDR Metadata display and editing
 - HDR 10 / HLG / HDR 10+ / Dolby Vision formats



PANEL DESCRIPTION



HDMI SIGNAL MODULE

1. HDMI 2
2. HDMI 1
3. S/PDIF Out
4. S/PDIF In

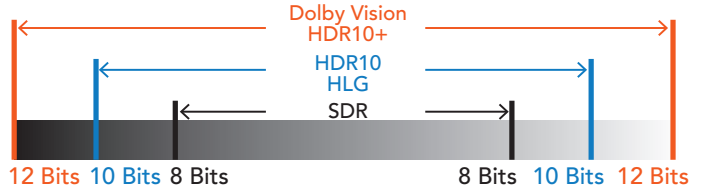


Chroma 2238 with A223814

APPLICATIONS



Variable Refresh Rate



Gaming Display Testing Functionality

- Supports Gaming-VRR / FVA / ALLM / QMS-VRR testing
- Gaming-VRR supports testing ranges from 20 Hz to 480 Hz
- Video Timing EMP (Extended Metadata Packet) display and editing

HDR (High Dynamic Range) Testing Functionality

- Supports HDR 10 / HLG / HDR 10+ / Dolby Vision formats
- Features in-built test patterns required for Dolby Vision and HDR bi-directional testing
- HDR Metadata display and editing

SPECIFICATIONS

HDMI Signal Module A223814

Video Output

Output	HDMI x 2 ports
Protocols	FRL 3&4 Lane Configuration/TMDS
FRL Bit Rates	Max 48Gbps (12Gbpsx4 lane) ; Support 3/6/8/10/12 Gbps
Resolution	Max. 10Kx5K@30Hz (4:2:0 without DSC, 4:2:2/4:4:4 with DSC)
Timing Standard	Follow CTA-861-H and VESA specification
Sampling Mode	RGB 4:4:4/YCbCr 4:4:4 or 4:2:2 or 4:2:0
Color depth	24/30/36 bits
Color Space	RGB/ITU-601/ITU-709/xvYCC-601/xvYCC-709/ sYCC-601/Adobe YCC-601/Adobe RGB/ BT.2020-YC/DCI-P3 RGB/BT.2020-RGB
HDCP	v2.3/2.2/1.4
DSC (software)	VESA DSC 1.2a
HDR	HDR 10/HLG/HDR 10+/Dolby Vision
Gaming-VRR	Frame rate 20~480Hz programmable
FVA	FVA_Factor 1~16 programmable
ALLM	Enable/Disable, Capability test
3D	Frame packing/Field alternative/Dual Pipe 3D/ Line alternative/Side-by-Side (Full)/L + depth/L + depth + graphics + graphics-depth/Top-and-Bottom/ Side-by-Side (Half)/Frame Sequential/Line-by-Line/ Checkerboard
E-EDID	Version 1.3 (Read/Write/Compare/Analysis)
SCDC	Read/Write
DDC/CI	Read/Write

Audio Output

Channel	8 Channel (FL/FR/RL/RR/FC/LFE/R/LC/RRC)
Sample Rate	32, 44.1, 48, 88.2, 96, 176.4, 192KHz +/- 1000ppm
Bits per sample	16/20/24 Bits
Amplitude	-90.3~0.0 dBFS/-138.47~0.0 dBFS programmable
Frequency	10 Hz~20 KHz, 1 Hz/step
eARC	Status and Capability test, output by S/PDIF (Coaxial)
Other	
Connector	HDMIx2, S/PDIF Inx1 (Coaxial), S/PDIF Outx1 (Coaxial)
Dimensions (HxWxD mm)	25 x 232 x 300 mm
Operating temperature	+5°C ~ +40°C
Weight	<2.5 kgs

*All specifications are subject to change without prior notices.

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