

# MODEL A223802

## KEY FEATURES

- Option module for Chroma 2238 Video Pattern Generator
- Supports HDMI 2.0b
- 4 HDMI output ports
- Supported resolutions:
  - up to 8K x 4K@60 / 50Hz (4 ports)
  - up to 4K x 2K@60 / 50Hz (1 port content independent)
- RGB 4:4:4 & YCbCr 4:4:4 / 4:2:2 / 4:2:0 formats
- HDCP 2.2 and 1.4 testing
- HDR testing (HDR Infoframe & Metadata / EOTF)
- Supports wide gamut color space:
  - RGB / ITU-R BT.601 / ITU-R BT.709 / xvYcc / SYCC / AdobeRGB / AdobeYCC / ITU-R BT.2020 YC / ITU-R BT.2020 RGB / DCI-P3
- SCDC information reading
- 8 built-in audio channels
- ESD protection
- 10-bit BMP format image output



## HDMI SIGNAL MODULE MODEL A223802

Chroma HDMI Signal Module A223802 features a built-in high-speed graphics processing unit and provides test signals and images for display devices of various resolutions. In compliance with the HDMI 2.0b specification, the module supports a single-port maximum bandwidth of 18 Gbps and resolutions up to 4Kx2k@60Hz. Supported test functions include both basic image output as well as HDCP, SCDC, and HDR testing. The A223802 supports a wide gamut color space and a color depth of up to 36 bits, including ITU-R BT.601, ITU-R BT.709, xvYcc, SYCC, AdobeRGB, AdobeYCC, ITU-R BT.2020 and DCI-P3 gamut output, as well as YCbCr 4:4:4, 4:2:2 and 4:2:0 pixel encoding modes. In addition, programmable automated test functions enable the user to tailor test programs to each DUT's specific requirements and start testing with just a single tap on the screen.

### 8K UHD (Ultra High Definition) Output

The HDMI 2.0b specification supports transmission rates up to 18Gbps, using TMDS (Transition-minimized differential signaling). Chroma A223802 features 4 built-in HDMI output ports and supports resolutions up to 8Kx4K@60Hz, significantly improving overall image transmission efficiency compared to HDMI 1.4. The next-generation color standard ITU-R BT.2020 provides a wider color range for true natural color and high resolution images, complying with today's high-spec 8K video testing needs.

### SCDC Information Reading

SCDC (Status and Control Data Channel) is an HDMI 2.0 communication protocol that enables exchanging status and control information between the signal source and

sink. The A223802 can display important signal indicators of the SCDC such as TMDS Scrambler Status and Channel Error Count on the output screen in real time, allowing the user to conveniently appraise the information during the testing process.

### HDR (High Dynamic Range) Testing

HDR output greatly improves brightness range and color level, closely approaching real image quality as seen by the human eye. HDR test items include the factors that most affect the consumer's visual perception, such as brightness, contrast, color, sharpness and moving image. Users can freely adjust the HDR metadata to carry out HDR related tests. The module also comes with built-in HDR test patterns, such as grayscale images, color bars and various window types.

### HDCP Testing

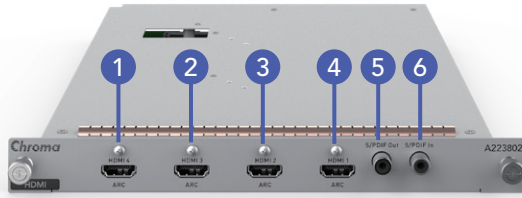
HDCP (High-Bandwidth Digital Content Protection) prevents illegal copying of data as it is transmitted through the interface. The A223802 supports HDCP versions 2.2 and 1.4 and allows the user to freely switch between the two versions. The built-in dedicated HDCP image test function can be output directly on the screen of the DUT, enabling users to instantly view related HDCP handshaking information.

### 8 Independent Audio Channels

Chroma A223802 comes with eight independent audio test signal generators (FL, FR, RL, RR, FC, LFE, RLC, RRC) that can each be modulated by enabling or disabling volume, tone, tone frequency, sample rate, sample bit, and sweep signal, providing a total of 48 different test combinations.



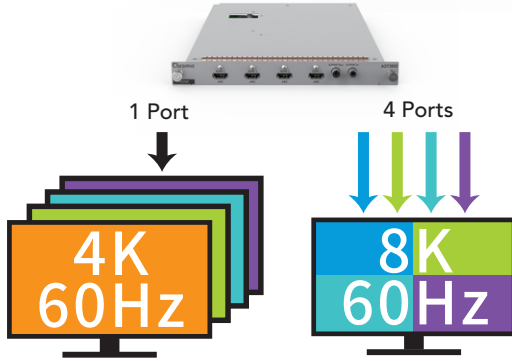
## PANEL DESCRIPTION



### HDMI SIGNAL MODULE

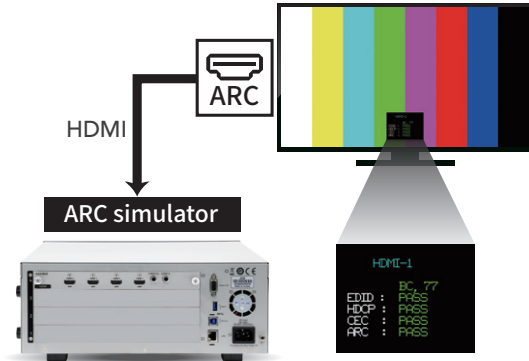
- |           |               |
|-----------|---------------|
| 1. HDMI 4 | 4. HDMI 1     |
| 2. HDMI 3 | 5. S/PDIF Out |
| 3. HDMI 2 | 6. S/PDIF In  |

## APPLICATIONS



### 8K UHD (Ultra High Definition)

- 1 Port 4K@60Hz video output
- 4 ports 8K@60Hz video output
- Supports bandwidths up to 18Gbps



### ARC (Audio Return Channel)

- 192 KHz sample rate per channel, 5.1 audio channels
- Quickly view ARC signal testing results
- 16 / 20 / 24 bits per sample


## SPECIFICATIONS

HDMI Signal Module A223802	
Video Output	
Resolution	4K x 2K@60Hz (1 port) 8K x 4K@60Hz (4 ports)
3D Format	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 / Dual Pipe 3D
Support Timing	CEA-861-F
Pixel Repetition	1 ~ 10
Sampling Mode	RGB 4:4:4 YCbCr 4:4:4 or 4:2:2 or 4:2:0
Color Depth	24 / 30 / 36 @ RGB & YCbCr
Color Space	RGB / ITU-R BT.601 / ITU-R BT.709 / xvYcc (IEC61966-2-4) / SYCC / Adobe RGB / Adobe YCC / ITU-R BT.2020/ DCI-P3
HDCP	HDCP v2.2 / v1.4
HDR	HDR 10 / HLG
E-EDID	Version 1.3 Read / Write / Compare / Edit / Analysis


Audio	
Channel	8 channels (FL / FR / RL / RR / FC / LFE / RLC / 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
ARC Output	S/PDIF (coaxial)
Other	
Connector	HDMI Type A 19 pin x 4 S/PDIF In x 1 (coaxial) S/PDIF Out x 1 (coaxial)
Dimensions (H x W x D)	25 x 232 x 300 mm
Operating Temperature	+5 ~ +40°C
Storage Temperature	-20 ~ 60°C
Humidity	20 ~ 90%
Weight	< 2 kgs


\*All specifications are subject to change without prior notices.

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