USB CE VESA HDMI DP xvYCC ANALOG DVI Dual HDCP

NTSC/PAL SECAM | Close Caption | Teletext | V-Chip | SDTV | HDTV | Ture Color | Multi-Port

KEY FEATURES

- Comply with DisplayPort 1.2a standard
  - 4K x 2K 60/50Hz
  - Pixel rate support up to 600MHz
  - Auto / Manual training mode
  - 1.62 / 2.7 / 5.4Gbps per lane
  - 1 / 2 / 4 Link
  - 0 / 3.5 / 6 / 9.5 dB pre-emphasis
  - 400 / 600 / 800 / 1200mV Swing level
  - MST(Multi Stream Transport)
  - DPCD Analyze
- HDMI support up to 300MHz
  - 4K x 2K 24/30Hz
  - 1080p 120Hz
  - 3D format with 1080p 60Hz (Frame packing / Side-by-Side Full)
- 2 HDMI ports + 2 DisplayPort output
- Analog support up to 300MHz
- Support HDCP function
- S-Video/CVBS/SCART/RGB/Component/ D-terminal NTSC/PAL/SECAM standard
- Dual link DVI support up to 330MHz
- EDID Read/Write/Compare/Analyze
- Support Pattern Scrolling Function
- ESD Protection Circuit
- Front Panel USB Port & Control Interface
- Graphic Operating & Editing Interface

Chroma 2235 is a programmable video pattern generator that equipped with various standard analog/digital signal output functions. The built-in high speed graphic engine is able to provide standard test signals and patterns for display devices with various resolutions to meet the requirements of multimedia display industries today and in the future for R&D and test applications.

The Video Pattern Generator supports the up-to-date high resolution multimedia digital audio and video transmission interface HDMI and DisplayPort specification with the following features:

Support 4Kx2K ultra high resolution

For digital interface, the DisplayPort supports 600MHz, the HDMI supports 300MHz and DVI supports up to 330MHz (Dual link). For analog interface, the signal supports up to 300MHz. The high bandwidth signal output capability supports the testing for the newest generation of 4K ultra high resolution displays.

DP 1.2a standard format signal output

Supports DisplayPort 1.2a standard HBR2(High Bit Rate 2, 5.4Gbps) bandwidth transmission up to 4K x 2K 60Hz resolution. Supports MST(Multi Stream Transport) function, with one DisplayPort output testing 4 Full HD(1080P) monitors at once. The 3D function is fully supported with abundant 3D test patterns, and provided for the user to download customized 3D patterns (splitting left/ right images in Bitmap
file format).

Fully support HDMI defined functions

The 2235 is equipped with HEAC (Ethernet / Audio Return Channel) / Lipsync / HDCP / CEC / EDID functions and supports 24 / 30 / 36 bit color depth (RGB or YCbCr) and newest generation of color standard xvYCC / sYCC601/ Adobe RGB / Adobe YCC601.

Multi-signal port for simultaneous output

The 2235 has 2 HDMI / DisplayPort output ports that can provide multi-signal output simultaneously to meet the test applications for multi-port displays nowadays.

The RGB (BNC / D-Sub) and component (YPbPr / D-Terminal) signals provided by 2235 are able to output all kinds of standard signal formats to test the displays with traditional analog interface. The digital DVI output signal supports dual channels HDCP which is most applicable for high resolution display testing.

For TV signals, the 2235 is able to output the signals that comply with NTSC, PAL and SECAM specifications, also to support CVBS and Y/C separation signal formats for BNC / S-Video / SCART output ports. Special TV function tests such as Closed Caption, V-chip and Teletext are also supported.

Chroma 2235 has full color graphic interface and super large capacity of storage memory with lots of special test patterns built-in such as xvYCC, HDCP, E-EDID Deep color, CEC, Lipsync and high-definition test images defined by China to give the user an easy way to judge the test result and save the time for production improvement as well as to achieve cost effective control. In addition to the panel editing of standalone device, remote control can be applied also the application software VPG Master can be utilized to edit various test programs and parameters. Its easy-to-use interface and complete test functions are most suitable for the applications of R&D, production tests and quality assurance in all video and associate industries.

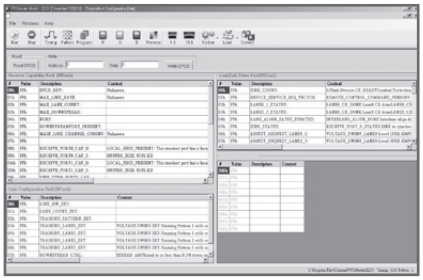
Model 2235 Rear View

ORDERING INFORMATION

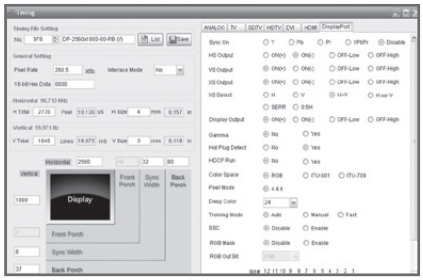
2235 : Video Pattern Generator
Analog 300MHz/DVI 330MHz/HDMI 300MHz (TMDS Rate 300MHz)/DisplayPort 600MHz
A240001 : Remote Controller

Multi-Stream Transport (MST)

Soft Panel



DPCD Screen



DisplayPort Timing Screen

SPECIFICATIONS

Analog Output	
Display Size	4096 x 2160
Pixel Rate Range	0.5~300MHz
Video Level	R,G,B (75 ohms) 0~1.0V programmable
Sync on Green/Level	0~0.5V On/Off programmable
White Level	0~1.2V programmable
Black Level	7.5 IRE / 0 IRE selectable
Horizontal Timing	
Total Pixel	32~8192 pixels / 1 pixels resolution
Vertical Timing	
Total Line	4~4096 lines (non-interlace) / 1 line programmable 4~2048 lines (interlace) / 1 line programmable
Composite Sync	
	Hs+ Vs, Hs EXOR Vs, Equalization & Serration Pulse
Separate Sync	
	BNC : Hs,Vs,Xs ; D-SUB : Hs(Xs), Vs

DVI (TMDS) Output	
Pixel Rate Range	25 < 1 link ≤ 165MHz/165 < 2 link ≤ 330MHz
EDID	Read / Write / Compare / Edit / Analysis
HDCP	Support HDCP V.1.0 (with Dual Mode)
Compliant	DVI 1.0
Video Signal Type	RGB
Sampling Mode	4:4:4

HDMI Video Output	
Version	HDMI 1.4b (3D / ARC / HEC / CEC / Lip Sync)
Pixel Rate Range	25 ~ 300 MHz (TMDS rate 300 MHz)
Support HDMI Timing	85 Timing(CEA-861E)
Pixel Repetition	4
Video Signal Type	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2
Color depth	24 / 30 / 36 bits per pixel
Color Space	RGB / ITU-R BT.601 / ITU-R BT.709 / xvYcc / sYcc601 / Adobe RGB / Adobe sYcc601
HDCP	HDCP V.1.2
EDID	Read / Write / Compare / Edit / Analysis
HDMI Audio Output	
Sample Rate	32, 44.1, 48, 88.2, 96,176.4, 192KHz
Number of Channel	8 Channel (FL/FR/LR/RR/FC/LFE/RLC/RRC)
Bits per Sample	16 / 24 bit
Waveform	Sine wave
Amplitude	-90.3 to 0.0 dBFS / -138.4 to 0.0 dBFs
Frequency Range	10Hz to 20KHz
Frequency Resolution	1Hz / Step
External Audio Input	Optical and Coaxial (S/PDIF)
Special Control Mode	Tone / Sweep / Mute / Repeat / Play Time

DISPLAYPORT Output	
Version	DISPLAYPORT 1.2a (3D)
Pixel Rate Range	25~600 MHz (4K x 2K 60Hz)
Main Link Data Rate	1.62 / 2.7 / 5.4 Gbps per lane
Lane Count	1/2/4 Lanes
Pre-emphasis	0dB/3.5dB/6dB/9.5dB selectable
Swing Level	400mV/600mV/800mV/1200mV selectable

Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2
Color Depth	6/8/10/12 bits per component
HDCP	HDCP V1.3
Audio	2 Channel internal (L-PCM)
Bit Per Sample	24bit
Sample Rate	32, 44.1, 48, 88.2, 96, 176.4, 192KHz
Frequency Range	10Hz to 20KHz
MST	FHD (1920 x 1080P60) x 4 max. (Simple/Split mode)

TV Output									
Output Mode	NTSC		PAL					SECAM	
Subcarrier Frequency	443 4.43	M,J 3.58	BDGHI 4.43	M 3.57	60 4.43	N 4.43	Nc 3.58	4.41/ 4.25	MHz
	±50								Hz
Video Output	Composite (BNC), S-Video								
	Burst On/Off (NTSC, PAL)								
	Contrast /Brightness/Saturation/Hue programmable								
Closed Caption Support (NTSC)	C1, C2, C3, C4/ T1, T2, T3, T4								
V-CHIP (NTSC)	MPAA/FCC/Canada English /Canada French Rating								
Teletext (PAL)	Teletext System B Level 1 , 1.5								

SDTV / HDTV Format					
Timing	Progressive Mode Frame Rate (Hz)		Interlace Mode Frame Rate(Hz)		Standard
1920X1080	60P	60	60I	30	SMPTE 274
	59.94P	60/1.001	59.94I	30/1.001	SMPTE 274
	50P	50	50I	25	SMPTE 274
	30P	30			SMPTE 274
	29.97P	30/1.001			SMPTE 274
	25P	25			SMPTE 274
	24P	24			SMPTE 274
	23.98P	24/1.001			SMPTE 274
1920X1035			60I	30	SMPTE 240
			59.94I	30/1.001	SMPTE 240
1280X720	60P	60			SMPTE 296
	59.94P	60/1.001			SMPTE 296
	50P	50			SMPTE 296

Data Storage Device	
Default	2000 timings + 2000 patterns
Internal Memory	3000 timings + 3000 patterns + 1000 programs
External Memory	USB Host interface
Others	
AC Input	1Ø 100~240V ±10% V_{LN} 47~63Hz
Operation/Storage Temp.	+5~+40 deg.C / -20~+60 deg.C
Humidity	20~90 %
Dimension & Weight	
2235 (HxWxD)	88x350x350 mm / 3.46x13.78x13.78 inch 5.6 kg / 12.33 lbs