ГЕНЕРАТОРЫ ВИДЕОИЗОБРАЖЕНИЙ

2234, 2235, 2238, 2401, 2402, 2403, 22294-A, 23294, 2333-B

ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

По вопросам продаж и поддержки обращайтесь:

Архангельск (8182)63-90-72
Астана +7(7172)727-132
Астрахань (8512) 99-46-04
Барнаул (3852) 73-04-60
Белгород (4722)40-23-64
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Пермь (342)205-81-47
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Смоленск (4812)29-41-54
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Тверь (4822)63-31-35
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Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
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Хабаровск (4212) 92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

сайт: chrm.nt-rt.ru || эл. почта: cmr@nt-rt.ru

VIDEO PATTERN GENERATOR MODEL 2238

The 2238 Video Pattern Generator is equipped with various video standards including analog and digital signal output functions. A modular design with built-in high-speed independent graphics core provides standard test signals and patterns for the required resolutions. This unit can be used in a variety of display test requirement for today's multimedia industry. It supports the latest high-definition multimedia interface, HDMI as well as DisplayPort standard with key features listed below.

8K Super Hi-Vision

Full 8K (7680x4320/8192x4320) resolution is provided for testing @30/60Hz (HDMI, Display Port interface).

Modular Signal Interface Design

This VPG supports up to 4 signal modules for various test requirement. The Multi-out function can provide 4 different types of timing and pattern from each of the 4 modules simultaneously. Each module has a built-in high-speed independent graphics core that significantly increase video speed for drawing and data transmission applications. 8K SHV image switch occurs in less than 200ms.

HDMI 2.0a Testing (HDMI module)

This VPG supports HDMI 2.0a highest 6Gbps TMDS signal output (TMDS rate), 24/30/36 bit for color depth (RGB/YCbCr) and YCbCr 4:2:0 signal sampling output formats. It provides high resolution test functions with color standard ITU-R BT2020 and HDCP 2.2 & 1.4/ ARC/CEC/EDID/SCDC (Status & Control Data Channel)/HDR (High Dynamic Range).

DisplayPort 1.3 Testing (DP module)

The 2238 VPG supports the highest HBR3 (High Bit Rate 3, 8.1Gbps bandwidth) output as defined by DisplayPort 1.3 with audio transmission and 3D/EDID/MST/DPCD (Display Port Configuration Data).

Intuitive Touch Panel and Graphical User Interface

Equipped with a 7 inch 1024x600 touch panel and a friendly graphical user interface, this VPG unit has an Instant Pattern View function that allows users to view and edit patterns directly on the device screen. The Program function allows a combination of timing/ pattern/audio as required for testing to increase production efficiency. Its VPG Master software allows users to edit distinctive programs and parameters. Complete test functions and an easy-to-operate interface make it suitable for a variety of R&D and production test as well as quality verification in all video related industries.

Network Management via Ethernet

The 2238 VPG also has a built-in Ethernet high-speed network communication interface that provides remote setting functions, along with uploading and downloading of data such as BMP File/Timing /Pattern/Program /Setting/FW Update. For test security and revision control, the unit is password protected. Its unique serial no. and IP address allows system managers to remotely monitor production throughput, efficiency and yield.

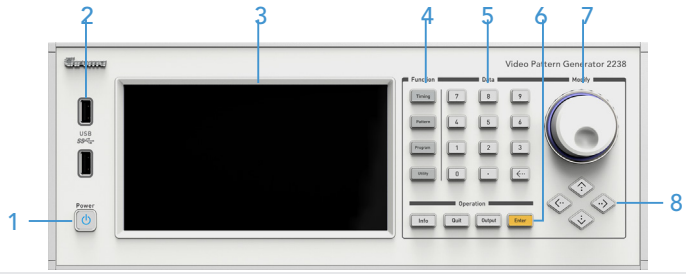
MODEL 2238

KEY FEATURES

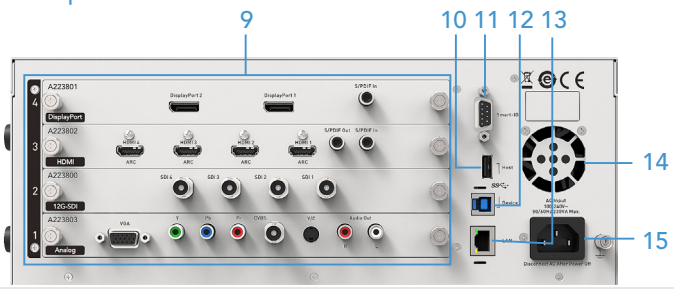
- Support 8K Super Hi-Vision (7680x4320/8192x4320)
- Independent graphics core for 8K Super Hi-Vision pattern with less than 200 ms switch time
- Up to 4 signal modules per unit
- Multi-out function
- 7 inch 1024x 600 high-resolution touch panel, GUI interface
- BMP file format support
- USB 3.0 data access
- Gigabit Ethernet high-speed network interface
- HDMI 2.0a signal module (option)
  - 8K x 4K 60 Hz (4 HDMI port)
  - 4K x 2K 60 Hz (1 HDMI port)
  - Pixel rate up to 600MHz (6Gbps TMDS rate)
  - RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2 or 4:2:0
  - HDCP 2.2 / 1.4
  - Wide color gamut
  - HDR (High Dynamic Range) Testing (HDR infoframe & metadata / EOTF)
  - SCDC (status & control data channel) Reader
- DisplayPort 1.3 signal module (option)
  - 8K x 4K 60 Hz (2 DP port)
  - 8K x 4K 30 Hz (1 DP port)
  - 1.62 / 2.7 / 5.4 / 8.1 Gbps per lane
  - HDCP 2.2 / 1.3
  - DPCD (Display Port Configuration Data) Reader
  - MST (Multi-Stream Transport) testing

PANEL DESCRIPTION

Front panel



Real panel



1. Power Switch
2. USB Port
3. 7" Touch Panel
4. Function Group
5. Data Group
6. Operation Group
7. Rotary Selector
8. Cursor
9. Modules
10. Host USB Port
11. SMART I/O Control
12. Device USB Port
13. Ethernet
14. Fan
15. AC Power Input

SPECIFICATIONS

Model 2238 Main Frame	
SYSTEM	
Display	1024 x 600
Signal Slot	4 signal slot
Data Storage	5000 timings + 5000 patterns + 2000 programs
AC input Voltage Range	100 ~ 240V, 50~60Hz, 1.5 A Max.
Fan Noise	< 65dB (with fan control circuit)
Operating Temperature	+5˚C ~ +40˚C
Storage temperature	-20˚C ~ 60˚C
Humidity	20% ~ 90%
Dimensions	132 x 350 x 350 mm (HxWxD)

A223800 12G-SDI SIGNAL MODULE	
VIDEO OUTPUT	
Signal Compliant	SD/HD/3G/6G/12G - SDI Specification
Video Signal Type	RGB / YCbCr
Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2 or 4:2:0
Color Depth	8 / 10 / 12 / 16 bits per component
Color Space	RGB / ITU-R BT.601 / ITU-R BT.709
AUDIO OUTPUT	
Channel	8 Channel (L-PCM)
Sample Rate	48KHz

A223801 DISPLAYPORT SIGNAL MODULE	
VIDEO OUTPUT	
Signal Compliant	Display Port v1.3 Specification
Resolution	8Kx4K@30Hz (1Port) ; 8Kx4K@60Hz (2 Port)
Main Link Data Rate	1.62 / 2.7 / 5.4 / 8.1 (HRB3) Gbps per lane
Pixel Rate Range	25 MHz~2.4GHz
Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2 or 4:2:0
Color Depth	6 / 8 / 10 / 12 / 16 bits per component
HDCP	v1.3 / v2.2
MST	4K (3840x2160) x 4 stream max
AUDIO OUTPUT	
Channel	2 Channel (L-PCM)-Internal 8 Channel (AC3/DTS)-External 8 Channel HBR-audio
Sample Rate	32, 44.1, 48, 88.2, 96, 176.4, 192KHz, +/-1000ppm

* All specifications are subject to change without notice. Please visit our website for the most up to date specifications.

A223802 HDMI SIGNAL MODULE	
VIDEO OUTPUT	
Signal Compliant	HDMI v2.0a Specification
Resolution	4Kx2K@60Hz (1Port) ; 8Kx4K@60Hz (4 Port)
Pixel Rate Range	25 ~ 600 MHz (TMDS CLK : Max. 300MHz)
Video Signal Type	RGB / YCbCr
Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2 or 4:2:0
Color Depth	24 / 30 / 36 / 48* @ RGB & YCbCr (*Max. 150MHz)
Color Space	RGB / ITU-R BT.601 / ITU-R BT.709 / SYCC/ xvYcc (IEC61966-24) / Adobe RGB / Adobe YCC / ITU-R BT.2020
HDCP	v1.4 / v2.2
AUDIO OUTPUT	
Channel	8 Channel (FL / FR / RL / RR / FC / LFE / RLC / RRC)
Sample Rate	32 , 44.1 , 48 , 88.2 , 96 , 176.4 , 192KHz +/-1000ppm

A223803 ANALOG SIGNAL MODULE									
ANALOG									
Pixel Rate Range	0.5 MHz ~ 300 MHz								
Video Signal	R, G, B (75 ohms)								
Video Level	0~1.0V, 1 mV/step								
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
Subcarrier Stability	±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								
AUDIO OUTPUT									
Channel	2 Channel (R , L)								
Sample Rate	32 , 44.1, 48, 88.2, 96, 176.4, 192KHz								
Frequency	10 Hz ~20 KHz, 1 Hz/ step								

A223806 DVI SIGNAL MODULE	
VIDEO OUTPUT	
Signal Compliant	DVI 1.0 specification
Video Signal Type	RGB
Pixel Rate Range	25 MHz ＜1 link ≦165MHz ; 165＜2 link ≦330MHz
Sampling Mode	4:4:4
EDID	Version 1.3 (Read/Write/Compare/Edit/Analysis)
HDCP	Version 1.0 (with Dual-link mode)

VIDEO PATTERN GENERATOR MODEL 22294-A

22294-A 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 V1.4b specification with the following features:

Support up to 4K x 2K ultra high resolution
For digital interface, 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 x 2K ultra high resolution displays.

3D standard format signal output
The 3D format defined by HDMI specification 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 22294-A 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 22294-A has 4 HDMI 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 22294-A are able to output all kinds of standard signal formats to test the displays with traditional analog interface. For digital DVI output signal, the pixel rate is up to 330MHz and supports dual channels HDCP which is most applicable for high resolution display testing.

For TV signals, the 22294-A 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.

22294-A 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.

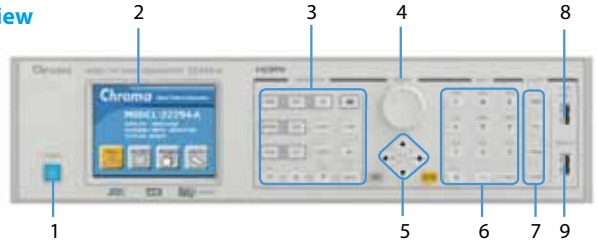
MODEL 22294-A

Key Features

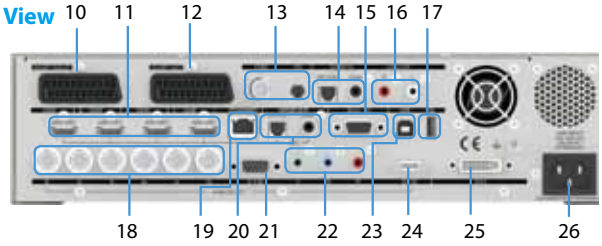
- HDMI TMDS Clock support up to 300MHz
  - 4K x 2K 24/30Hz
  - 1080p 120Hz
  - 3D format with 1080p 60Hz
    (Frame packing / Side-by-Side Full)
- Comply with HDMI 1.4b standard
  - 24 / 30 / 36 bit color depth
  - 3D standard format output
  - ARC (Audio Return Channel)
  - HEC (Ethernet Channel)
  - Color space standard sYCC601 / Adobe RGB / Adobe YCC601 / xvYCC
- 4 HDMI ports output
- Analog support up to 300MHz
- DVI support up to 330MHz
- Support HDCP function
- S-Video / CVBS / SCART / RGB / Component / D-terminal
- NTSC / PAL / SECAM standard
- EDID Read / Write / Compare / Analyze
- Optical / Coaxial audio input (SPDIF)
- Pattern scrolling function
- Built in China high-definition test pattern
- ESD protection circuit
- Front panel USB and control interface
- Graphic operating and editing interface

PANEL DESCRIPTIONS

Front View



Rear View



1. Power Switch
2. 3.5" LCD Display
3. Function Group
4. Selection Rotary
5. Arrow Keys
6. Numeric Keys
7. Function Keys
8. Device USB Interface
9. Remote Control Device Interface
10. SCART Input/Output
11. HDMIx4 Output
12. SCART Output
13. CVBS: BNC, Y/C Output
14. Digital Audio Input: Optical & Coaxial
15. Smart I/O Control
16. Analog Audio Output: R/L
17. Host USB Interface
18. R/G/B/Hs/Vs/Xs BNC Analog Output
19. Ethernet Interface
20. ARC Digital Audio Output: Optical & Coaxial
21. D-SUB Analog Output
22. YPbPr Output
23. Device USB Interface
24. D-Terminal (D1-D5) Output
25. DVI-I Output
26. AC Power Input

SPECIFICATIONS

Analog output	
Display Size	4096 x 2160
Pixel Rate Range	0.5MHz~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 pixel 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 V1.0 (with Dual Mode)
Compliant	DVI 1.0
Video Signal Type	RGB
Sampling Mode	4:4:4

HDMI video output	
Version	HDMI 1.4b (3D Format / ARC / HEC / CEC / Lip Sync)
Pixel Rate Range	25 ~ 300 MHz
Support HDMI Timing	88 Timing(CEA-861E)
Pixel Repetition	4
Video Signal Type	RGB or YCbCr
Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2
Color depth	8 / 10 / 12 @ RGB & YCbCr
Color Space	RGB / ITU-R BT.601 / ITU-R BT.709 / xvYCC (IEC61966-2-4) / sYcc601 / Adobe RGB / Adobe sYcc601
HDCP	HDCP V1.2
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/RL/RR/FC/LFE/RLC/RRC)
Bits per Sample	16 / 24 bit
Waveform	Sine wave
Amplitude	-90.3 to 0.0 dBFS / -138.4 to 0.0dBFS
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

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 mode	Composite (BNC),S-Video								
	Burst On/Off (NTSC,PAL)								
	Contrast / Brightness / Saturation / Hue programmable								
Closed Caption (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

3D video format output	
3D Scanning Mode	Frame packing
	Field alternative
	Line alternative
	Side-by-Side (Full)
	L + depth
	L + depth + graphics + graphics-depth
	Top & Bottom
	Side-by-Side (Half)
	Frame sequential
	Line-by-Line
	Checkerboard

Data storage device	
Default	2000 timings + 2000 patterns
Internal Memory	3000 timings + 3000 patterns + 1000 programs
External Memory	USB Host interface
Other	
AC Input	1Ø 110~240V ±10% V_{LN} 47~63Hz
Operation/Storage Temp	+5~+40 deg.C / -20~+60 deg.C
Humidity	20~90 %
Dimension & Weight	
22294-A	88 x 350 x 350 mm / 3.46 x 13.78 x 13.78 inch (HxWxD) 5.6 kg / 12.33 lbs

VIDEO PATTERN GENERATOR MODEL 2234

In order to perform motion pictures on the displays nowadays, the 2234 Video Pattern Generator has integrated the Multi-Media playback technology to provide versatile motion pictures for display quality evaluation test. It has high resolution test quality and multiple outputs support that can meet the requirements for multimedia video tests such as LCD Monitor / LCD TV / PDP / Projector of today and in the future.

This Video Pattern Generator provides both analog and digital signals, also supports multiple ports for independent output test and multimedia audio/video formats for play application. For the digital signal, the pixel rate of TMDS output is up to 330MHz and the test screen resolution is able to support beyond WQUXGA. Moreover, to cope with the higher frequency signal test for DVI Dual HDCP tests, it also supports dual link DVI test application.

2234 has built in the up to date high resolution multimedia digital video transmission interface, HDMI V1.3, to provide high speed bandwidth and color depth. It supports 24, 30, 36 bits (RGB or YCbCr) and new color standard xvYCC along with sYCC, Adobe RGB, and Adobe YCC(CEA-861E) to implement the real natural colors and high resolution images.

DisplayPort is the state-of-the-art video output interface defined by VESA. The signal transmission is mainly composed of main channel, AUX CH and hot plug (HPD) 3 types of signals. The main channel is formed by 4 lanes (1, 2, 4 Lane) and each lane can support 2.7Gbps or 1.62Gbps transmission rate. Up to 10.8Gbps can be transmitted by 4 lanes. 2234 supports the DisplayPort standard formats with the following key features:

DPCD (DisplayPort Configuration Data) is the main function of DisplayPort that acted as a communication bridge between source and sink. 2234 is able to adjust the parameters such as Lane, Main link rate and etc. automatically or manually after connection. As the signal attenuation may occur during long distance transmission for DisplayPort, the Pre-emphasis and Swing voltage can also be adjusted.

In addition 2234 supports SSC (Spread Spectrum Clock, the technology to eliminate EMI) test that can significantly reduce the EMI problems occurred among displays and components, and simplify the product design.

For the application of multiple tests, 2234 supports a variety of audio/video and pattern file formats for play with the resolution up to 1080p. Meanwhile, to fulfill the test application for multi ports output, 3 HDMI and 2 DisplayPorts of which the output settings can be executed separately have been built in to reduce a great deal of test time and finish the tests in the fastest way possible.

For operation, 2234 has adopted full color graphic interface and built in memory for storage with the diversified special test patterns like xvYCC, HDCP&E-EDID, 8/10/12bit deep color, CEC, Lipsync and China high definition test patterns embedded for use. Tests can be performed easily and rapidly to save the time and control the cost.

A remote controller (optional) can be used to replace the direct panel editing for flexible practice in a large test area. It is suitable for mass application in the production line. In addition, various timing parameters and test patterns can be edited via the VPG Master application on PC site. The easy operating interface and complete test functions of 2234 are applicable for all video and related industries in R&D, production test and quality assurance.

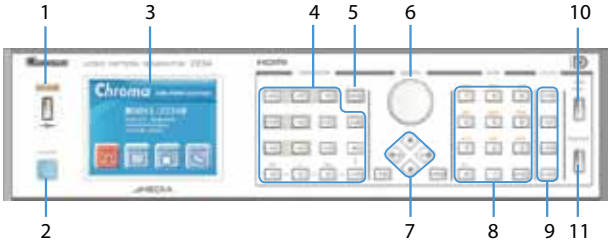
MODEL 2234

Key Features

- Support multimedia audio / video play formats
- Support up to 1080p high definition resolution
- Multi ports independent output test application
  - HDMI port output x 3
  - DisplayPort output x 2
  - SCART port x 2 (output x 1 / input x 1)
- DisplayPort V1.1a pixel rate 270MHz
- DisplayPort supports HDCP V1.3
- Support automatically & manually setting for DisplayPort function
  - 2 Link rate (1.62 / 2.7Gbps) selectable
  - 1, 2, 4 Video lane selectable
  - 0 / 3.5 / 6 / 9.5dB pre-emphasis selectable
  - 400 / 600 / 800 / 1200mV swing level selectable
- Support HDMI V1.3C (with 24, 30, 36bit color depth / xvYCC / CEC / Lip Sync)
- Support dual HDCP in DVI test application
- HDCP supports auto / manual mode
- HDMI and DisplayPort multiplexer function or switching for independent output
- HDCP ON/OFF in DVI, HDMI & DisplayPort interface
- Y, Pb, Pr / Y, Cb, Cr / Y, R-Y, B-Y output
- S-Video / CVBS / SCART / RGB / Color Component / D-terminal
- NTSC / PAL / SECAM signals
- EDID read / write / compare
- Optical / coaxial audio input (SPDIF)
- Scrolling pattern support
- Built-in China HD standard test patterns
- HDMI / DVI hot plug function

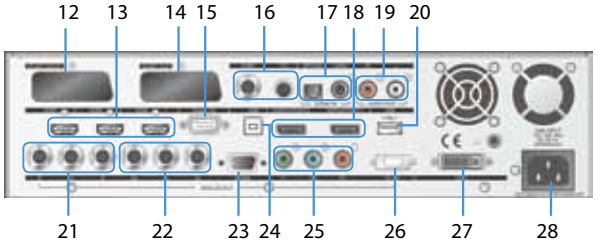
PANEL DESCRIPTIONS

Front View



1. Media USB Port
2. Power Switch
3. 3.5" LCD Display
4. Function Group
5. Media Play
6. Rotary Selector
7. Cursor
8. Data Group
9. Utility
10. Device USB Port
11. Remote for optional
12. SCART Input
13. HDMI Output
14. SCART Output
15. Smart I/O control
16. CVBS : BNC, Y/C

Rear View



17. Digital Audio Input Optical & Coaxial
18. DisplayPort Output
19. Analog Audio output : R/L
20. Device USB port
21. RGB/BNC Analog Output
22. Hs/Vs/Xs Sync Output
23. RGB/D-SUB Analog Output
24. Host USB port
25. YPbPr Component Output
26. D-Terminal (D1-D5)
27. DVI-I Output
28. AC Line Input

SPECIFICATIONS

ANALOG OUTPUT	
Display Size	4096 x 2160
Pixel Rate Range	0.5~250MHz
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 Pixels	32~8192 pixels / 1 pixels resolution
VERTICAL TIMING	
Total Pixels	4~4096 lines (non-interlace) 4~2048 lines (interlace) / 1 line programmable
COMPOSITE SYNC	
	H+V, H EXOR V, Equalization & Serration Pulse
SEPARATE SYNC	
	BNC : Hs,Vs,Xs ; D-SUB : Hs(Xs), Vs
VIDEO FORMAT	
Video Output	R, G, B / RS-343A Y, R-Y, B-Y Y, Cb, Cr / ITU 601 Y, Pb, Pr / ITU 709, RP177, SMPTE 240M DDC II B (D-SUB)

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

HDMI VIDEO OUTPUT	
Version	HDMI V1.3c (with 24,30,36 bit deep color/xvYCC/CEC)/Lip sync)
Pixel Rate Range	25 ~ 165 MHz (TMDS CLK : 225MHz)
Support HDMI Timing	77 Timing (CEA-861D)
Pixel Repetition	4
Video Signal Type	RGB or YCbCr
Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2
Bits per Component	8 / 10 / 12 @ RGB & YCbCr
Color Space	RGB/ITU-R BT.601/ITU-R BT.709/xvYCC (IEC61966-2-4)/ SYCC/Adobe RGB/Adobe YCC)
HDCP	HDCP V.1.2
EDID	Read / Write / Compare / Edit

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	10Hz / Step
External Audio Input	Optical and Coaxial (S/PDIF)
Special Control Mode	Tone / Sweep / Mute / Repeat / Play Time

DISPALYPORT OUTPUT	
Pixel Rate Range	25~270MHz
Video Signal Type	RGB/YCbCr
Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2
Color Depth Transmission	6/8/10/12 bits per component
HDCP	HDCP V1.3
Main Link Data Rate	2.7Gbps or 1.62Gbps per lane
Lane Count	1/2/4 Lanes
Pre-emphasis	0dB/3.5dB/6dB/9.5dB selectable
Swing level	400mV/600mV/800mV/1200mV selectable
Audio	2 Channel (L-PCM)-Internal ; 8 Channel (AC3/DTS)-External
Bit Per Sample	24bit
Sample Rate	32, 44.1, 48, 88.2, 96, 176.4, 192KHz

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
Subcarrier Stability	±50								Hz
Video Output	Composite (BNC), S-Video								
	Burst On/Off (NTSC, PAL)								
	Contrast programmable								
	Brightness programmable								
	Saturation programmable								
	Hue programmable								
Closed Caption Support (NTSC)	C1, C2, C3, C4/ T1, T2, T3, T4								
V-CHIP (NTSC)	MPAA Rating : G, PG, PG-13, R, NC-17, X								
	FCC Rating : TV-Y, TV-Y7, TV-G, TV-PG, TV-14, TV-MA								
	Canada English Rating : C, C8+, G, PG, 14+, 18+								
	Canada French Rating: G, 8ans+,13 ans+,16 ans+,18 ans+								
Teletext (PAL)	Teletext System B Level 1 , 1.5								

MULTIMEDIA PLAY	
Video Format	MPEG-1(.mpg, .dat) ; MPEG-2(.vob) MPEG-4(.avi, .mp4) ; Support Up to 40Mbps(1080p)
Audio Format	MPEG-1 Layer-3(.mp3) ; LPCM(.wav) ; AAC(.aac)
Picture Format	BitMap(.bmp) ; JPEG(.jpg)
Interface	USB 2.0
File system	Internal: EXT-3, External: EXT-3 / FAT-32
Storage method	Internal: 16GB Flash Memory, External: Media USB Port

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 110~240V ±10% V_{LN} 47~63Hz
Operation/Storage Temp.	+5~+40 deg.C / -20~+60 deg.C
Humidity	20~90 %
DIMENSION & WEIGHT	
2234	88 x 350 x 350 mm / 3.46 x 13.78 x 13.78 inch (HxWxD) 5.6 kg / 12.33 lbs

* All specifications are subject to change without notice.
* All other brand and logo are trademarks or registered trademarks of their respective holders.

VIDEO PATTERN GENERATOR MODEL 2235

2235 is a programmable video pattern generator that is 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 1.2 standard format signal output

Supports DisplayPort 1.2 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 is 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.

2235 has a full color graphic interface and super large capacity of storage memory with many 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 the 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 associated industries.

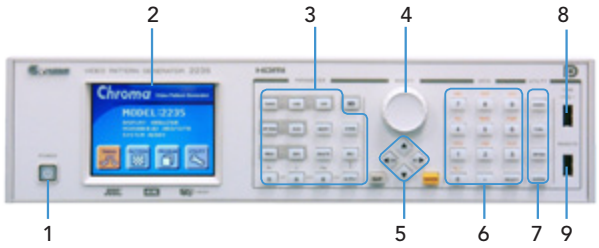
MODEL 2235

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

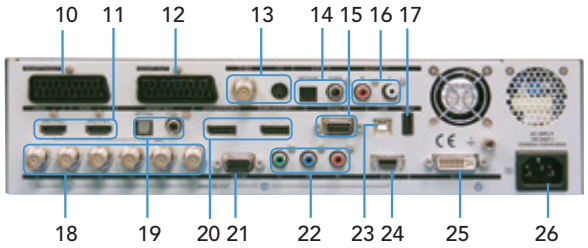
PANEL DESCRIPTION

Front panel



1. Power Switch
2. 3.5" LCD Display
3. Function Group
4. Rotary Selector
5. Cursor
6. Data Group
7. Utility
8. USB Port
9. Remote for optional

Rear panel



10. SCART Input
11. HDMI Output
12. SCART Output
13. CVBS: BNC, Y/C
14. Digital Audio Input : Optical & Coaxial
15. Smart I/O control
16. Analog Audio output : R/L
17. Host USB port
18. R/G/B/Hs/Vs/Xs BNC Analog Output
19. ARC Digital Audio Output : Optical & Coaxial
20. Display port Output
21. D-SUB Analog Output
22. YPbPr Component Output
23. Device USB port
24. D-Terminal (D1-D5)
25. DVI-I Output
26. AC Power Input

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 1080P @ 60) 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

* All specifications are subject to change without notice.
Please visit our website for the most up to date specifications.

VIDEO PATTERN GENERATOR MODEL 23294

23294 Video Pattern Generator provides various international standard signals with built-in 3 HDMI and 2 SCART ports that can satisfy the output tests for multiple ports to shorten the test time and improve productivity.

23294 adopts a brand new structure design with a high performance CPU to carry high speed / high density FPGA as the graphic engine. It has highly efficient system control and supports the up-to-date high definition multimedia digital video interface HDMI V1.4 standard to supply the following features:

3D signal standard format output:
It is fully competitable 8 different format of HDMI 1.4 3D standard, included Frame Packing, Field alternative, Line alternative, Side-by-Side(Full), L+depth, L+depth+graphics+graphics-depth, Top-and-Bottom, Side-by-Sdie(Half).

The ARC (Audio Return Channel) function is able to test the external audio source and the Ethernet (HDMI Ethernet Channel) function is able to provide dual data transmission test, higher speed bandwidth & Color Deep. It supports 24, 30, 36 byte (RGB or YCbCr) and the color standards of new generation such as xvYCC, sYCC601, Adobe RGB and Adobe YCC601 to realize the true natural color of 4Kx2K and high definition image with broader color range.

CEC (Consumer Electronics Control) Function: The CEC test parameters can be set via the proprietary software VPG MASTER which also supports the test modes of TX (send)/RX (receive)/MONITOR (monitor) & FEATURE (user's).

23294 has analog/digital/TV control signals as well.

For the analog RGB output, its pixel frequency is up to 250MHz that complies with the RS-343A signal standard and support Y,Pb,Pr / Y,Cb,Cr / Y,R-Y& B-Y. As to the digital signal, it is TMDS pixel frequency up to 330MHz with dual channel DVI output that can support DVI Dual HDCP tests to satisfy the application for testing higher bandwidth display.

In TV output specification, the image and chromaticity signals of 23294 comply with NTSC, PAL and SECAM regulations. The output signals include CVBS composite signals, BNC & Y/C (Luminance/ Chrominance) image/chromaticity separate signals and S-Video/SCART output connector. It can also support special TV test functions such as Closed Caption, V-chip and Teletext.

To supply multiple test applications, is able to play the picture file format up to 4Kx2K resolution. Moreover, 3 HDMI and 2 SCART ports are built in to satisfy the test for multiport independent output and reduce the test time substantially.

23294 has many special test patterns such as xvYCC, HDCP&E-EDID, 8/10/12bit deep color, CEC, Lipsync and China high definition patterns for easy test assessment to save the time and increase productivity efficiently. In addition, the equipped application VPG Master with easy-to-use interface and complete test functions that is capable of editing various kinds of test procedures and parameters makes 23294 suitable for the R&D, production test and quality assurance of all video and related industries.

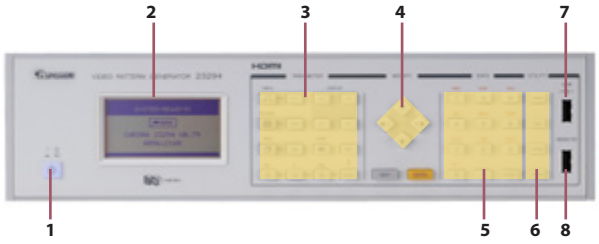
MODEL 23294

Key Features:

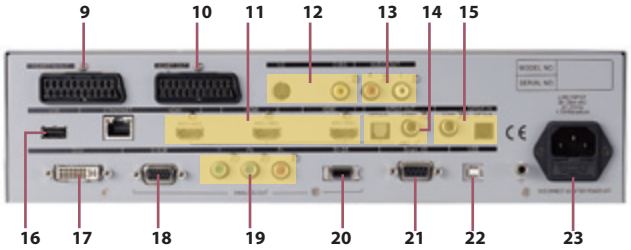
- Multiport independent output test application
  - 3 HDMI port output
  - 2 SCART port (Input/Output x1/Outputx1)
- Analog frequency 250MHz
- Digital (DVI) frequency 330MHz(dual channel)
- DVI Dual HDCP test application support
- HDMI 1.4 standard
  - 3D standard format output
  - ARC audio return function
  - HEC network test function
  - Color space sYCC601 / Adobe RGB / Adobe YCC601
  - CEC / Deep Color / Lip-Sync / xvYCC
- 4Kx2K graphic display capability
- CEC analysis & multi-directional monitor
- Real 30bit deep color output
- DVI & HDMI with HDCP output
- Support HDCP V1.0 (DVI) / V1.2(HDMI)
- Y, Pb, Pr / Y, Cb, Cr / Y,R-Y, B-Y Output
- S-Video / CVBS / SCART / RGB / Color component / D terminal
- NTSC / PAL / SECAM TV signals
- Support Close Caption / V-Chip / Teletext
- EDID read / write / compare
- HDMI supports fiber/coaxial audio input (S/PDIF)
- ARC supports fiber/coaxial audio output (S/PDIF)
- Built-in low distortion audio output (2ch / 8ch)
- Easy to use audio shortcuts
- Support graphic dynamic movement (Scrolling) function
- Built in China high definition standard test patterns / 3D test images
- HDMI / DVI plug and play function
- ESD protective circuit
- Front USB control interface
- User Key (maximum 32 combinations of serial actions)

PANEL DESCRIPTIONS

Front View



Rear View



1. Power Switch
2. 160x80 LCD Display
3. Function Group
4. Cursor
5. Data Group
6. Utility
7. USB Port
8. Remote for Optional
9. SCART Input / Output
10. SCART Output
11. HDMIx3 Output
12. Y/C, RCA Output
13. Analog Audio Output : R/L
14. Digital Audio Output : Optical & Coaxial
15. Digital Audio Input : Optical & Coaxial
16. Host USB Port
17. DVI-I Output
18. D-SUB Analog Output
19. YPbPr Output
20. D-Terminal (D1-D5) Output
21. Smart I/O Control
22. Device USB Port
23. AC Line Input

SPECIFICATIONS

ANALOG OUTPUT	
Display Size	4096 x 2160
Pixel Rate Range	0.5~250MHz
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 Pixels	32~8192 pixels / 1 pixels resolution
VERTICAL TIMING	
Total Pixels	4~4096 lines (non-interlace) 2160 lines (interlace) / 1 line programmable
COMPOSITE SYNC	
	H+V, H EXOR V, Equalization & Serration Pulse
SEPARATE SYNC	
	D-SUB : Hs(Xs), Vs
VIDEO FORMAT	
Video Output	R、G、B / RS-343A / RS-170 / VESA(VSIS) Y、R-Y、B-Y Y、Cb、Cr / ITU 601 Y、Pb、Pr / ITU 709、RP177、SMPTE 240M DDC II B (D-SUB)

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

HDMI VIDEO OUTPUT	
Version	HDMI V1.4a (3D Format / ARC / HEC / CEC / Lip Sync)
Pixel Rate Range	25 ~ 165 MHz (TMDS rate 225MHz)
Support HDMI Timing	85 Timing(CEA-861E)
Pixel Repetition	4
Video Signal Type	RGB or YCbCr
Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2
Bits per Component	Deep Color 8 / 10 / 12 @RGB & YCbCr
Color Space	RGB / ITU-R BT.601 / ITU-R BT.709 / xvYCC (IEC61966-2-4) / sYCC601 / Adobe RGB / Adobe YCC601)
HDCP	HDCP V.1.2
EDID	Read / Write / Compare / Edit
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	10Hz / Step
External Audio Input	Optical and Coaxial (S/PDIF)
Special Control Mode	Tone / Sweep / Mute / Repeat / Play Time

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								
Video Output	Composite (BNC),S-Video								
	Burst On/Off (NTSC,PAL)								
	Contrast programmable								
	Brightness programmable								
	Saturation programmable								
	Hue programmable								
Closed Caption (NTSC)	C1, C2, C3, C4/ T1, T2, T3, T4								
V-Chip (NTSC)	MPAA Rating : G, PG, PG-13, R, NC-17, X								
	FCC Rating : TV-Y, TV-Y7, TV-G, TV-PG, TV-14, TV-MA								
	Canada English Rating : C, C8+, G, PG, 14+, 18+								
	Canada French Rating: G, 8ans+,13 ans+,16 ans+,18 ans+								
Teletext (PAL)	Teletext System B Level 1 , 1.5								

SDTV / HDTV FORMAT					
Timing	Progressive Mode Frame Rate (Hz)		Interlace Mode Frame Rate (Hz)		Standard
1920 x 1080	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
1920 x 1035			60I	30	SMPTE 240
			59.94I	30/1.001	SMPTE 240
1280 x 720	60P	60			SMPTE 296
	59.94P	60/1.001			SMPTE 296
	50P	50			SMPTE 296

3D VIDEO FORMAT OUTPUT	
3D Scanning Mode	Frame packing
	Field alternative
	Line alternative
	Side-by-Side (Full)
	L + depth
	L + depth + graphics + graphics-depth
	Top & Bottom
	Side-by-Side (Half)

DATA STORAGE DEVICE	
Default	2000 timings + 2000 patterns
Internal Memory	3000 timings + 3000 patterns + 1000 programs
External Memory	USB Host interface
OTHERS	
AC Input	100-240V, 50-60Hz, 5A maximum
Operation/Storage Temp.	+5~+40 deg.C / -20~+60 deg.C
Humidity	20~90 %
DIMENSION & WEIGHT	
23294 (HxWxD)	88x350x350 mm / 4.5 kg 3.46x13.78x13.78 inch / 9.9 lbs

* All specifications are subject to change without notice.
* All other brand and logo are trademarks or registered trademarks of their respective holders.

VIDEO PATTERN GENERATOR
MODEL 2333-B

2333-B is a high value-added test equipment that can meet the diversified demands for multi-media displays. It has high resolution test quality and multiple output types that can support comprehensive tests for large-scale application in the field of R&D, quality assurance and mass production.

2333-B combines Analog / DVI / HDMI / DisplayPort / SDTV / HDTV signals that can satisfy the needs for testing various signals from multi-media displays.

For digital signal: The TMDS output with pixel rate 25~330MHz that supports the dual channel HDCP test is able to fit in the high bandwidth test requirements under 120Hz screen refresh rate.

For HDMI output: The 2333-B provides higher speed bandwidth and color depth. It supports 24,30 bits (RGB or YCbCr) and the new generation color standards xvYCC, sYCC, Adobe RGB and Adobe YCC to attain truly natural color and high resolution image screen. It also supports complete CEC and Lip Sync tests.

DisplayPort is the new video output interface promoted by Video Electronics Standards Ass ociation; VESA. It is an open and extendable interface standard for display devices. Its maximum transmission bandwidth is up to 10.8Gb/s. With the official certification of VESA, 2333-B is able to provide the consistency and integrity signals in highest standard.

DisplayPort is composed of main channel, auxiliary channel and hot swap (HPD) 3 types of signals. The main channel is made by 4 lanes (1, 2, 4 Lane) and each lane supports 2.7Gbps or 1.62Gbps transmission rate. The parameters can be adjusted automatically via DPCD connection and complete the test procedure in sequential.

For TV output, the image and chromaticity signals are complying with the NTSC, PAL and SECAM standards. Also, the tests for special TV functions such Closed Caption, V-chip and Teletext are supported.

To fulfill the application of multi-port output test, 2333-B has built-in 3 HDMI, 2 DisplayPort and 2 SCART ports that can finish testing the displays with multi-port in the fastest speed and reduce the test time in a great deal.

Various test patterns and timing parameters are built-in 2333-B for operation. Shortcuts are provide for Timing/Pattern/Program/Audio to simplify the settings. The test program edited by the user on PC can be downloaded to 2333-B directly for storage and recall next time.

Moreover, for the function keys used frequently a special User Key is designed to combine these functions. Up to 32 keys can be memorized for continuous actions and executed by a single key. Besides the panel operation, remote control can be enabled with a remote controller for users to operate the device more easily.

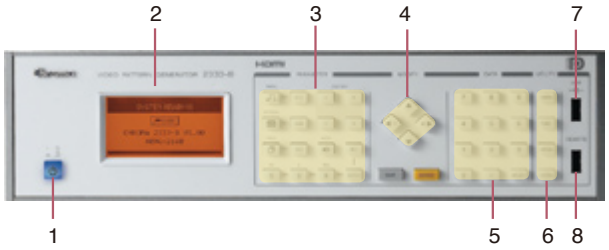
MODEL 2333-B

Key Features:

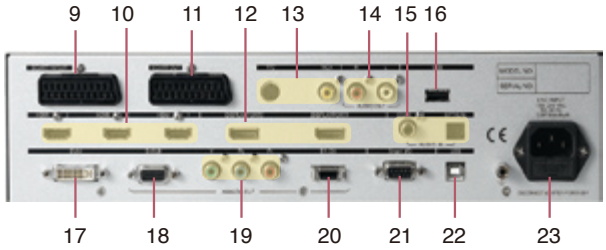
- Multi-port output tests
  - 3 HDMI output ports
  - 2 DisplayPort output ports
  - 2 SCART ports (output x1/ input x1)
- DisplayPort V1.1a pixel rate 270MHz
  - 2 Link Rate (1.62/2.7Gbps)
  - 1,2,4 Video Lane
- HDMI V1.3C
  - True 30 bits color depth output
  - Support xvYCC & sYCC, Adobe RGB, Adobe YCC color space
  - Support CEC Function
  - Built-in Lip Sync test pattern
  - Digital audio output
  - 3 HDMI outputs to provide individual HDCP Enable/Disable
- DVI pixel rate 330MHz (dual channel)
- DVI Dual HDCP test application support
- DVI, HDMI & DisplayPort with HDCP output
- Support HDCP V1.0 (DVI) / V1.2 (HDMI) / V1.3 (DisplayPort)
- Y, Pb, P r / Y, Cb, Cr / Y, R-Y, B-Y output
- S-Video / CVBS / SCART / RGB / color component / D-terminal output
- NTSC/PAL/SECAM TV signal
- Support Closed caption / V-Chip / Teletext
- Built-in low low-distortion audio output (2ch/8ch)
- Easy-to-use audio hot key
- EDID read/write/compare
- USB (Host & Device)
- User key (up to 32 continuous actions can be combined)

PANEL DESCRIPTIONS

Front View



Rear View



1. Power Switch
2. 160*80 LCD Display
3. Function Group
4. Cursor
5. Data Group
6. Utility
7. USB Port
8. Remote for optional
9. SCART Input/Output
10. HDMI Output
11. SCART Output
12. DisplayPort Output
13. Y/C,RCA
14. Analog Audio output : R/L
15. Digital Audio Input Optical & Coaxial
16. Host USB port
17. DVI-I Output
18. D-SUB Analog Output
19. YPbPr Component Output
20. D-Terminal (D1-D5)
21. Smart I/O control
22. Device USB port
23. AC Line Input

SPECIFICATIONS

ANALOG OUTPUT	
Display Size	4096 x 2160
Pixel Rate Range	0.5~250MHz
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
Blank Level	7.5 IRE / 0 IRE selectable
HORIZONTAL TIMING	
Total Pixels	32~8192 pixels / 1 pixels resolution
VERTICAL TIMING	
Total Pixels	4~4096 lines (non-interlace) 4~2048 lines (interlace) / 1 line programmable
COMPOSITE SYNC	
	H+V, H EXOR V, Equalization & Serration Pulse
SEPARATE SYNC	
	D-SUB : Hs(Xs), Vs
VIDEO FORMAT	
Video Output	R, G, B / RS-343A / RS-170 / VESA (VSIS) Y, R-Y, B-Y Y, Cb, Cr / ITU 601 Y, Pb, Pr / ITU 709, RP177, SMPTE 240M DDC II B (D-SUB)

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

HDMI VIDEO OUTPUT	
Version	HDMI 1.3C (with 24,30 bit deep color / xvYCC / CEC / Lip sync)
Pixel Rate Range	25 ~ 165 MHz (TMDS CLK : 225MHz)
Support HDMI Timing	77 Timing (CEA-861D)
Pixel Repetition	4
Video Signal Type	RGB or YCbCr
Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2
Bits per Component	8 / 10 @ RGB & YCbCr
Color Space	RGB / ITU-R BT.601 / ITU-R BT.709 / xvYCC (IEC61966-2-4) / SYCC / Adobe RGB / Adobe YCC)
HDCP	HDCP V.1.2
EDID	Read / Write / Compare / Edit
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 / 20 / 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	10Hz / Step
External Audio Input	Optical and Coaxial (S/PDIF)
Special Control Mode	Tone / Sweep / Mute / Repeat / Play Time

DISPLAYPORT OUTPUT	
Version	DisplayPort 1.1a
Pixel Rate Range	25~270MHz
Video Signal Type	RGB/YCbCr
Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2
Color Depth Transmission	6/8/10 bits per component
HDCP	HDCP V1.3
DPCD	Read / Write
Main Link Data Rate	2.7Gbps or 1.62Gbps per lane
Lane Count	1/2/4 Lanes
Audio	2 Channel (L-PCM)-Internal
Bit Per Sample	24bit
Sample Rate	32, 44.1, 48, 88.2, 96, 176.4, 192KHz

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
Subcarrier Stability	±50								Hz
Video Output	S-Video, RCA								
	Burst On/Off (NTSC, PAL)								
	Contrast programmable								
	Brightness programmable								
	Saturation programmable								
	Hue programmable								
Closed Caption Support (NTSC)	C1, C2, C3, C4/ T1, T2, T3, T4								
V-CHIP (NTSC)	MPAA Rating : G, PG, PG-13, R, NC-17, X								
	FCC Rating : TV-Y, TV-Y7, TV-G, TV-PG, TV-14, TV-MA								
	Canada English Rating : C, C8+, G, PG, 14+, 18+								
	Canada French Rating: G, 8ans+,13 ans+,16 ans+,18 ans+								
Teletext (PAL)	Teletext System B Level 1 , 1.5								

AUDIO (ANALOG) OUTPUT	
Number of Channel	2 Channel (R / L)
Sample Rate	32, 44.1 , 48 , 88.2 , 96 , 176.4 , 192KHz
Level Resolution	10mV / Step
Level Range	0V to 2V (at 600 Ohms Load)
Frequency Range	10Hz to 20KHz / 10Hz Step
Special Control Mode	Tone / Sweep / Mute / Repeat / Play Time

DATA STORAGE DEVICE	
Default	2000 timings + 2000 patterns
Internal Memory	3000 timings + 3000 patterns + 1000 programs
External Memory	USB Host interface
OTHERS	
AC Input	100-240V, 50-60Hz, 5A maximum
Operation/Storage Temp.	+5~+40 deg.C / -20~+60 deg.C
Humidity	20~90 %
DIMENSION & WEIGHT	
2333-B (H x W x D)	88 x 350 x 350 mm / 3.46 x 13.78 x 13.78 inch 4.5 kg / 9.9 lbs

All specifications are subject to change without notice.
Please visit our website for the most up to date specifications.

VIDEO PATTERN GENERATOR MODEL 2401

Along with the rapid development of LCD TV industry, all manufacturers are facing the competition of producing high value added and low cost products; and seeking for a total test solution to meet their needs has become the first priority.

2401 Video Pattern Generator with the features described below is specially designed to fit in the requirements and application of production line for LCD-TV manufacturers.

1. Various Analog TV Signals Support
It has many built-in standard Analog TV signal outputs , such as RGB, YPbPr, CVBS for tests in Multimedia Display, Monitor and TV production.

2. Lightweight Design
The size of 2401 VPG is close to A4 that is portable and handy for various kinds of spaces or locations.

3. Exclusive Signals
The mapped international standard signal sources are provided for diverse Video signals requirements such as the requisite TV and HDTV that are applied in the configuration of production line planning and test workstation.

4. Convenient & Rapid Function
The test programs created in advance increase the production efficiency; in addition for the frequently used function keys, users can edit the USER KEY to work with compound functions in specific test to save the test time.

5. USB Interface
The convenient USB interface can use USB Disk on PC to edit test programs, patterns and even to upload or download the upgrade programs to 2401 to reduce engineer's workload in setup and management.

6. Large Capacity
It has built in large capacity of storage memory that allows users to swap and save for different UUT without backup or download.(1000 TIMINGS and PATTERNS, 500 PROGRAMS)

7. Abundant Test Patterns
It includes standard static, dynamic and pattern screens to check the characteristics response, white balance and residual of UUT. Also it can use PC to create the test patterns required.

8. Extended Control
The default extended function on the front/ rear panel is able to add remote control device or output control device for on-line link automatically.

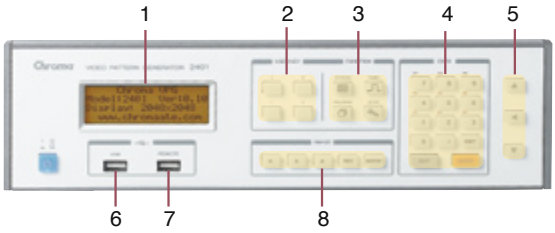
MODEL 2401

Key Features:

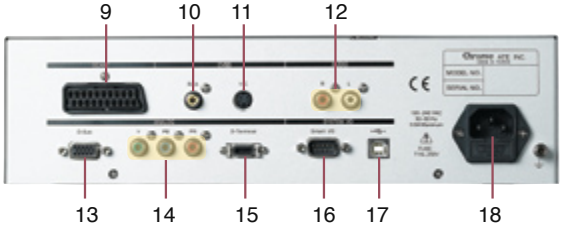
- Analog pixel rate 165MHz
- 2K x 2K Graphic size
- NTSC / PAL / SECAM signal
- S-Video / CVBS / SCART / RGB Color Component / D-Terminal
- Bi-level SDTV format
- Tri-level HDTV Format
- Closed Caption function (NTSC)
- V-Chip function (NTSC)
- Teletext function (PAL)
- Y, Pb, Pr/ Y, Cb, Cr / Y, R-Y, B-Y output
- PC remote control
- User Define Key
- Built-in variety of video timings & patterns
- Scrolling Pattern
- USB interface
- ESD protection circuit
- Economy

PANEL DESCRIPTIONS

Front View



Rear View



1. LCD Display
2. User Key
3. Function Group
4. Data Group
5. Direction Key
6. USB Port
7. Remote for optional
8. Image Group for signal on/off select
9. SCART output
10. CVBS output
11. S-Video output
12. Analog Audio output: R/L
13. RGB/D-sub Analog output
14. YPbPr Component output
15. D-Terminal output
16. Smart I/O for control
17. Host USB port
18. AC Line Input

SPECIFICATIONS

ANALOG OUTPUT	
Display Size	2048 x 2048
Pixel Rate Range	0.5~165MHz
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
Blank Level	7.5 IRE / 0 IRE selectable
HORIZONTAL TIMING	
Total Pixels	64~8192 pixels / 2 pixels resolution
VERTICAL TIMING	
Total Pixels	4~4096 lines (non-interlace) / 1 line programmable 4~2048 lines (interlace) / 1 line programmable
COMPOSITE SYNC	
	H+V, H EXOR V, Equalization & Serration Pulse
SEPARATE SYNC	
	Hs(Xs), Vs
VIDEO FORMAT	
Video Output (D-SUB)	R, G, B Y, R-Y, B-Y Y, Cb, Cr / ITU 601 Y, Pb, Pr / ITU 709, RP177, SMPTE 240M DDC II B

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	
Subcarrier Stability	±50								Hz	
Video Output	Composite (RCA), S-Video									
	Burst On/Off (NTSC, PAL)									
	Contrast programmable									
	Brightness programmable									
	Saturation programmable									
	Hue programmable									
Closed Caption Support (NTSC)	C1, C2, C3, C4/ T1, T2, T3, T4									
V-CHIP (NTSC)	MPAA Rating : G, PG, PG-13, R, NC-17, X									
	FCC Rating : TV-Y, TV-Y7, TV-G, TV-PG, TV-14, TV-MA									
	Canada English Rating : C, C8+, G, PG, 14+, 18+									
	Canada French Rating : G, 8 ans+, 13 ans+, 16 ans+, 18 ans+									
Teletext (PAL)	Teletext System B Level 1, 1.5									

* All specifications are subject to change without notice.

SDTV FORMAT					
Timing	Progressive Mode Frame Rate (Hz)		Interlace Mode Frame Rate (Hz)		Standard
720x483	59.94P	60/1.001			SMPTE 293
			59.94I	59.94/2	ITU 601 SMPTE 170M
720x576	50P	50			ITU 1382
			50I	25	ITU 601

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

AUDIO (ANALOG) OUTPUT	
Frequency Range	50Hz ~ 20KHz
Waveform	Sine wave
Number of Channel	2 Channel (R / L)
Level Range	0V to 2V (at 600 Ohms Load)
Special Control Mode	Tone / Sweep / Mute / Repeat / Play Time

DATA STORAGE DEVICE	
Default	1000 timings + 1000 patterns
Internal Memory	1000 timings + 1000 patterns + 500 programs
External Memory	USB Host interface
OTHERS	
AC Input	100~240 VAC, 50~60Hz, 0.8A Maximum
Operation/Storage Temp.	+5~+40 deg.C / -20~+60 deg.C
Humidity	20~90 %
DIMENSION / WEIGHT	
2401	320(W)x88(H)x240(D)mm / 3.2kg

VIDEO PATTERN GENERATOR
MODEL 2402

Along with the development of display products moving toward multi-function composite and evolving to digital era, all manufacturers are facing the competition of producing high value added and low cost products to meet the diversified applications and quality demands. Seeking for a total test solution to meet those needs has become the first priority.

2402 Video Pattern Generator with the features described below is specially designed to fit in the requirements and application of production line for LCD-TV/PDP/Monitor manufacturers.

Support HDMI Function
I n order to meet the test requirement for multimedia display, 2402 suppor ts the state of the art HDMI V1.3 (High Definition Multimedia Interface) with video signal resolutions up to 1080p and xvYCC color standard.

Exclusive Digital Signals
It supports the digital signals of DVI, HDMI and HDTV that meet the video interface requirements of most up-to-date. The mapped international standard signal sources are provided and applied in the configuration of production line planning and test workstation. The enlarged screen is able to browse the data of production test.

Convenient & Rapid Function
The test programs built-in or created in advance by users increase the production efficiency. Users can edit the USER KEY to work with compound functions in specific test to save the test time.

Friendly USB Interface
2402 is equipped with a convenient and automatic operation inter face that all parameters can be easily set via panel or remote controlled PC through USB interface to control or save the downloaded settings or data. The data download and upload can also be done by flash disk to reduce engineer's workload in setup and management.

Large Capacity
It has built in large capacity of storage memory that allows users to swap different UUT without doing backup or download (1000 TIMINGS and PATTERNS, 500 PROGRAMS.) and save the customized test programs.

Multiple Outputs
2402 provides 2048x2048 Graphic Size that is qualified for the HDTV high quality image output. The standard signal interfaces HDMI, DVI-I, VGA D-Sub are built in for industry application.

Rich Timing & Pattern Database
Rich timings and diversified patterns are built in for selection including standard static, dynamic and pattern scroll screens to check the characteristics response and white balance of UUT with auto and manual operation process. It can also use the default front/rear panel expanded mechanism to add remote or output control devices to support the application of automatic production.

CE

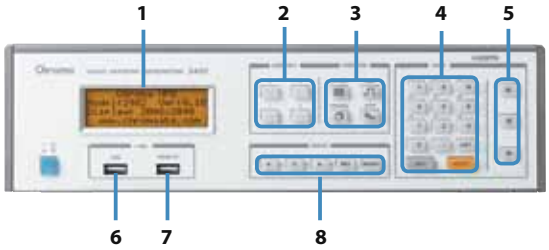
MODEL 2402

Key Features

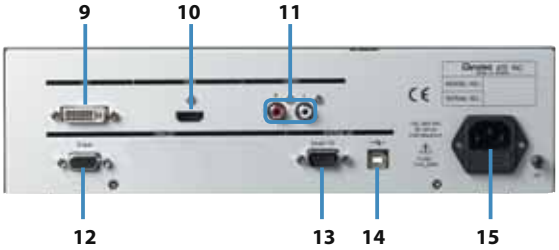
- Analog pixel rate 165MHz
- Analog output with DDC
- 2K x 2K Graphic size
- DVI pixel rate 165MHz
- HDMI V 1.3b (with xvYCC)
- DVI & HDMI with HDCP output
- Support Color Space (RGB / ITU601,70P / XvYCC)
- Audio output (Analog 2ch / Digital 8ch)
- PC remote control
- User Define Key
- Built-in variety of video timings & patterns
- High Capacity Memory
- Scrolling Pattern
- USB interface
- ESD protection circuit
- Economy

PANEL DESCRIPTIONS

Front View



Rear View



1. LCD Display
2. User Key
3. Function Group
4. Data Group
5. Direction Key
6. USB Port
7. Remote for optional
8. Image Group for signal on/off select
9. DVI output
10. HDMI output
11. Analog Audio output: R/L
12. RGB/D-Sub Analog output
13. Smart I/O control
14. Host USB port
15. AC Line Input

SPECIFICATIONS

ANALOG OUTPUT	
Display Size	2048 x 2048
Pixel Rate Range	0.5~165MHz
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
Blank Level	7.5 IRE / 0 IRE selectable
HORIZONTAL TIMING	
Total Pixels	64~8192 pixels / 2 pixels resolution
VERTICAL TIMING	
Total Pixels	4~4096 lines (non-interlace) / 1 line programmable 4~2048 lines (interlace) / 1 line programmable
COMPOSITE SYNC	
	H+V, H EXOR V, Equalization & Serration Pulse
SEPARATE SYNC	
	Hs(Xs), Vs
VIDEO FORMAT	
Video Output (D-SUB)	R, G, B Y, R-Y, B-Y Y, Cb, Cr / ITU 601 Y, Pb, Pr / ITU 709, RP177, SMPTE 240M DDC II B

AUDIO (ANALOG) OUTPUT	
Frequency Range	50Hz/100Hz/200Hz/500Hz/1KHz/2KHz/5KHz/10KHz /15KHz/20KHz
Waveform	Sine wave
Number of Channel	2 Channel (R / L)
Level Range	0V to 2V (at 600 Ohms Load)
Special Control Mode	Tone / Sweep / Mute / Repeat / Play Time

DVI (TMDS) OUTPUT	
Pixel Rate Range	25< 1 link< 165MHz (256 color)
EDID	Read / Write / Compare / Edit
HDCP	Support HDCP V.1.0 Production-Key
Compliant	DVI 1.0 specification
Video Signal Type	RGB
Sampling Mode	4:4:4

All specifications are subject to change without notice. Please visit our website for the most up to date specifications.

HDMI VIDEO OUTPUT	
Version	HDMI V1.3b (with xvYCC)
Pixel Rate Range	25MHz~165MHz
Support HDMI Timing	77 Timing (CEA-861D)
Pixel Repetition	4
Video Signal Type	RGB or YCbCr
Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2
Bits per Component	8 bits (1024 color)
Color Space	RGB / ITU-R BT.601 / ITU-R BT.709 / xvYCC
HDCP Support	HDCP V1.2
EDID	Read / Write / Compare / Edit
HDMI AUDIO OUTPUT	
Sample Rate	32, 44.1, 48, 88.2, 96, 176.4, 192KHz
Number of Channel	8 Channel (FL/FR/RL/RR/FC/LFE/RLC/RRC)
Bits per Sample	16
Waveform	Sine wave
Amplitude	-90.3 to 0.0 dBFS
Frequency Range	10Hz to 20KHz
Frequency Resolution	10Hz / Step
Special Control Mode	Tone / Sweep / Mute / Repeat / Play Time

SYSTEM	
Display	20x4 Character
USB Port	For Extend Device (Data/Firmware Download/Upload)
Remote Port	For optional remote controller
User Key	Marco Function for operation
Function Key	Fast Hot Key for setting
DATA STORAGE DEVICE	
Default	1000 timings + 1000 patterns
Internal Memory	1000 timings + 1000 patterns + 500 programs
External Memory	USB Host interface
OTHERS	
AC Input	1Ø 110~240V ±10% V_{LN} 47~63Hz
Operation/Storage Temp.	+5~+40 deg.C / -20~+60 deg.C
Humidity	20~90 %
Dimension(HxWxD)	88x320x240mm / 3.46x12.6x9.45inch
Weight	3.1kg / 6.83 lbs

VIDEO PATTERN GENERATOR MODEL 2403

2403 programmable video pattern generator is the perfect instrument for digital video signal interface testing. It provides users with a high performance low-cost test solution. 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 inter face HDMI and DisplayPort specification with the following features:

Supports 4K x 2K 60Hz

2403 is built-in with a high speed graphic engine. The output signal can reach up to 600MHz. It supports UHD(Ultra High Definition) 4K x 2K@60Hz ultra high resolution display testing.

Modulized Signal Interface Design

The modulized design output interface has 2 signal module terminals for users to choose from based on their testing needs. The modules support multi-signal terminal synchronized output capability which meet the multi-input terminals displays testing.

HDMI 2.0 Testing Function (HDMI module)

The 2403 supports HDMI 2.0 standard 6Gbps TMDS signal output (TMDS rate), 24 / 30 / 36 bits color depth (RGB / YCbCr), HDMI 2.0 standard YCbCr 4:2:0 sampling format output and at the same time provides high resolution color standard ITU-R BT2020 and HDCP 2.2 & 1.4 / ARC / CEC / EDID / SCDC (Status & Control Data Channel) / HDR (High Dynamic Range) testing functions.

DisplayPort 1.2a Testing Function (DP module)

Supports DisplayPort 1.2 standard HBR2 (High Bit Rate 2, 5.4Gbps) bandwidth transmission up to 4Kx2K 60Hz. Also supports audio transmission and 3D/EDID/DPCD (Display Port Configuration Data) testing functions

Hot Key Function

The default or user-defined testing program can help to increase manufacturing efficiency. The 2403 is built with abundant timing and pattern, including standard static, motion and scrolling pattern. It supports the testing of the displays' performance. The modulized signal interface design allows flexibility of choice based on the testing application. The VPG Master supports programmable timing, pattern and program. Its user-friendly interface is suitable for R&D, production and QA verification.

CE

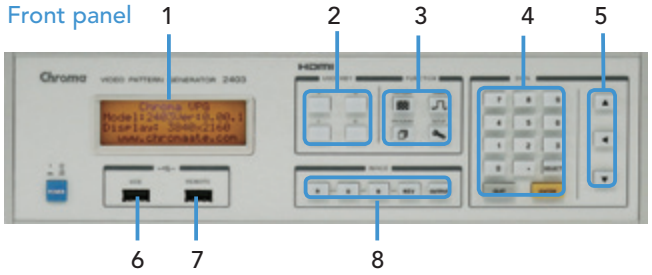
MODEL 2403

KEY FEATURES

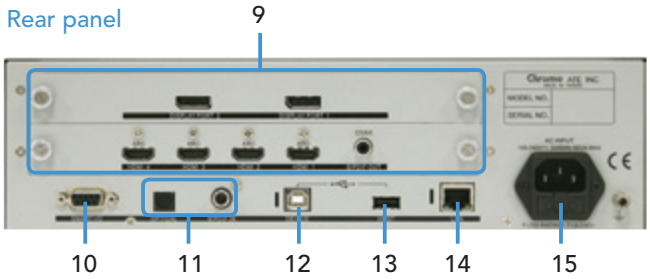
- Modular design
- HDMI 2.0 Signal module (Option)
  - Comply with HDMI 2.0 standard
  - 4K x 2K 60/50Hz
  - Pixel rate support up to 600MHz (6Gbps TMDS rate)
  - RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2 or 4:2:0
  - HDCP 1.4 / 2.2
  - CEA-861-F timing
  - 24 / 30 / 36 color depth
  - ARC (Audio Return Channel)
  - sYCC601 / Adobe RGB / Adobe YCC601 / xvYCC / ITU-R BT.2020
  - HDR (High Dynamic Range) Test Function (HDR Infoframe & Metadata / EOTF/ Wide Color Gamut)
  - SCDC (Status & Control Data Channel) Read Function
- DisplayPort Signal module (Option)
  - Comply with DisplayPort 1.2a standard
  - 4K x 2K 60/50Hz
  - Pixel rate support up to 600MHz
  - 1.62 / 2.7 / 5.4Gbps per lane
  - 1 / 2 / 4 Link
  - 2 Channel (L-PCM)
  - DPCD (Display Port Configuration Data) Read Function
- EDID Read / Write / Compare / Analyze
- Scrolling function
- Built in 4K/HDR/3D/China high-definition test patterns
- User Define Key(32 Key max.)
- One-touch function keys
- Front panel USB and control interface
- Graphical software user interface
- ESD protection circuit
- BMP file format support

PANEL DESCRIPTION

Front panel

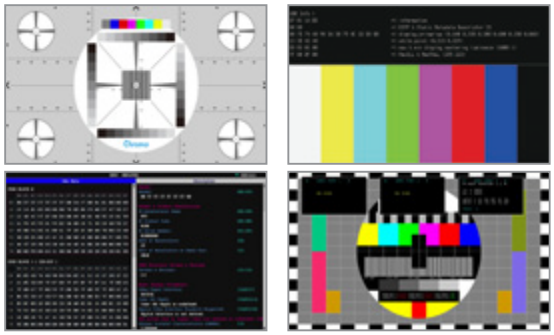


Rear panel

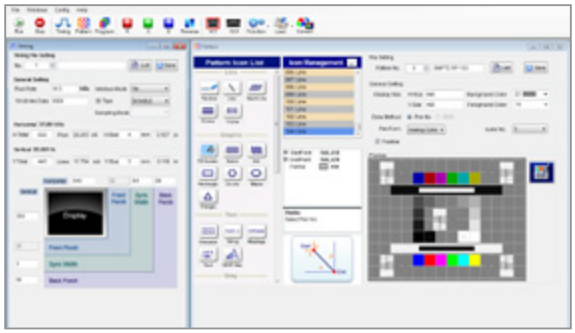


1. LCD Display
2. User Key
3. Function Group
4. Data Group
5. Direction Key
6. USB Port
7. Remote for optional
8. Image Group for signal on/off select
9. Video Signal Module
10. Smart I/O Control
11. Digital Audio Input (Optical & Coaxial)
12. Device USB Interface
13. Host USB Interface
14. Ethernet Interface
15. AC Power Input

PATTERNS AND VPG MASTER SOFEWARE



All Kinds of Test Pattern Support
- 4K/HDR/3D/China High Definition TV test pattern
- EDID/HDCP/DPCD INFO test pattern
- BMP filename can be imported



VPG Master Software
- Easy for Timing/Pattern/Program Editing
- Graphic User Interface
- Support Font/Audio/EDID/InfoFrame/HEAC Function

SPECIFICATIONS

2403 Main Frame	
Display Size	4096 x 2160
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

Data Storage Device	
Default	1000 timings+1000 patterns (depend on signal module)
Internal Memory	1000 timings + 1000 patterns + 500 programs
External Memory	USB Host interface
Others	
AC Input	100-240V, 50~60Hz, 1A Maximum
Operation/Storage Temprature	+5~+40 deg.C / -20~+60 deg.C
Humidity	20~90 %
2403 (HxWxD)	320x240mm / 3.46x12.6x9.45inch
Weight	3.1kg / 6.83 lbs

HDMI Signal Module A240301	
Version	HDMI 2.0 x 4ch (3D/ARC/CEC/HDR/SCDC)
Pixel Rate Range	25 ~ 600 MHz (TMDS rate 600 MHz)
Support HDMI Timing	125 Timing (CEA-861F)
Sampling Mode	RGB 4:4:4 / YCbCr 4:4:4 or 4:2:2 or 4:2:0
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 / ITU-R BT.2020
EDID	Read / Write / Compare / Edit / Analysis
HDCP	HDCP 2.2 / 1.4 (Automatic selection)
Audio	8 Channel (16 / 24 bit)

DisplayPort Signal Module A240302	
Version	DisplayPort 1.2a x 2ch (3D/DPCD)
Pixel Rate Range	25 ~ 600 MHz
Main Link Data Rate	1.62 / 2.7 / 5.4Gbps per lane
Lane Count	1 / 2 / 4 Lanes
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 1.3
Audio	2 Channel (16 / 24 bit)
MST	FHD (1920 x 1080P @ 60) x 4 max. (Simple/Split mode)

* All specifications are subject to change without notice.
Please visit our website for the most up to date specifications.

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сайт: chrm.nt-rt.ru || эл. почта: cmr@nt-rt.ru