

## Video Pattern Generator

### MODEL 22294

#### Key Features:

- Comparable with HDMI 1.4 Standard
  - 3D Format Output
  - Audio Return Channel
  - Ethernet Channel
  - sYCC601 / Adobe RGB / Adobe YCC601
  - CEC / Deep Color / Lip-Sync / xvYCC
- 4Kx2K Graphic Size
- Multi ports output test application
  - HDMI port output x 3
  - SCART port x 2
- 330MHz digital (DVI) frequency
- Support Dual HDCP in DVI test application
- HDCP supports Auto / Manual Mode
- Ethernet Browser on Screen
- HDCP ON / OFF IN DVI & HDMI Interface
- S-Video / CVBS / SCART / RGB / Y.Pb.Pr / Y.Cb.Cr / Y,R-Y,B-Y / D-terminal
- NTSC / PAL / SECAM signals
- EDID Read/ Write/Compare
- Optical / coaxial audio input (SPDIF)
- Support pattern dynamic scrolling
- Built-in China high definition standard HD patterns
- HDMI/DVI Hot-Plug function
- Support Gamma calibration
- ESD protection circuit
- Front USB & control interface
- PIP & OSD function



## VIDEO PATTERN GENERATOR MODEL 22294

Chroma 22294 Programmable Video Pattern Generator is a multi-functional test device with high speed signal transmission features. It has high resolution test quality and multiple outputs support that can meet the test requirements for the multimedia display industries such as LCD Monitor / LCD TV / PDP / Projector of today and in the future.

Chroma 22294 supports the up-to-date high resolution multimedia digital/video interface, HDMI V1.4, with the features described below.

The VPG has 3D signal standard format output, Audio Return function that is able to test the external audio source and the Ethernet function that is able to do two-way data transmission. In addition, higher bandwidth and Color Deep are equipped to support 24, 30, 36 bit (RGB or YCbCr) and the new generation color standard xvYCC, sYCC601, Adobe RGB as well as Adobe YCC601 for the implementation of 4Kx2K real natural colors and high resolution image screens with larger color range.

**CEC(Consumer Electronics Control) Function:** Chroma 22294 is able to set the CEC test parameters automatically or manually and support TX (transmission) / RX (reception) / MONITOR (monitoring) & FEATURE (user property) test modes.

**Lip Sync :** Since the technology of digital signal process improves progressively, potential factors may exist to cause delay when processing the video for a high definition presentation. The HDMI 1.3 allows CE devices to compensate the time difference automatically by synchronizing both of the video and audio to enhance viewer's experience.

This video pattern generator is able to provide analog/digital/TV control signals concurrently: For the analog signal RGB output, the pixel rate is up to 250MHz that

meets the RS-343A signal standard, and it supports Y, Pb, Pr/Y, Cb, Cr/Y, R-Y, B-Y.

The digital signal output is TMDS with pixel rate up to 330MHz and the test screen resolution supports beyond WQUXGA. Furthermore, to cope with the higher frequency signal tests, Chroma 22294 also supports DVI Dual HDCP test for dual channel DVI test application.

As to the specification of TV output, the image and chrominance signals of Chroma 22294 meet the NTSC, PAL and SECAM standards. The output signals include CVBS compound signals, BNC and Y/C (Luminance/ Chrominance) separated signals as well as S-Video/SCART output connectors. Tests for special TV functions such as Closed Caption, V-chip and Teletext are also supported.

For the application of multiple tests, Chroma 22294 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 have been built in to reduce a great deal of test time and finish the tests in the fastest way possible.

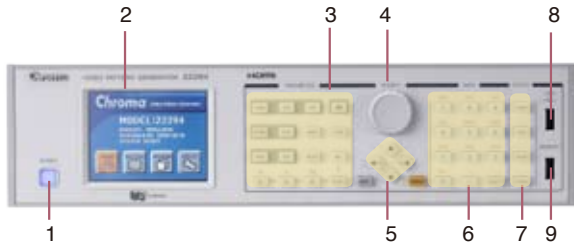
For operation, Chroma 22294 has adopted full color graphic interface and built in super capacity memory for storage with the diversified special test patterns like xvYCC, HDCP&E-EDID, 8/10/12bit deep color, CEC, Lipsync and Chinese high definition test patterns embedded for use. Tests can be performed easily and rapidly to save the time and control the cost. Besides using the panel or remote controller for editing, users can edit various timing parameters and test patterns via the VPG Master application. Its easy operating interface and complete test functions are applicable for all video and related industries in R&D, production test and quality assurance.



# Chroma

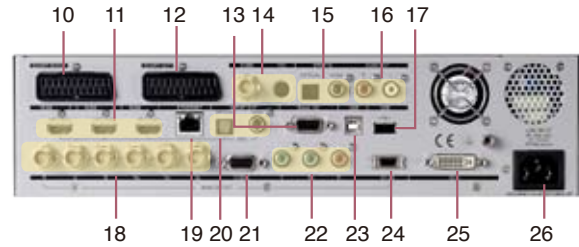
## PANEL DESCRIPTIONS

**Front 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

**Rear View**



- 10. SCART Input/Output
- 11. HDMIx3 Output
- 12. SCART Output
- 13. Smart I/O Control
- 14. CVBS: BNC, Y/C Output
- 15. Digital Audio Input: Optical & Coaxial
- 16. Analog Audio Output: R/L
- 17. Device 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. Host 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	0.5~250MHz
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) 2160 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 V1.4a (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	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 M,J BDGHI M 60 N Nc 4.41/4.25 MHz
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
720 x 483	59.94P	60/1.001	SMPTE 293
			ITU 601 SMPTE 170M
720 x 576	50P	50	ITU 1382
			ITU 601
1920 x 1080	60P	60	SMPTE 274
	59.94P	60/1.001	SMPTE 274
	50P	50	SMPTE 274
	30P	30	SMPTE 274
	29.97P	30/1.001	SMPTE 274
	25P	25	SMPTE 274
1920 x 1035	24P	24	SMPTE 274
	23.98P	24/1.001	SMPTE 274
			SMPTE 240
1280 x 720			SMPTE 240
	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	
22294	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.

## ORDERING INFORMATION

- 22294 : Video Pattern Generator
- A222906 : IR Controller
- A240001 : Remote Controller
- A240100 : USB Disk 1GB

Developed and Manufactured by :

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