Video Pattern Generator   Model 22294-A

USB | CE | VESA | HDMI™ HIGH-DEFINITION MULTIMEDIA INTERFACE | 3D VISION | 4K UHD | DVI | Dual HDCP | 8/10/12 BITS

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

Analog 300 MHz
DVI (TMDS) 330 MHz
HDMI V1.4a 300 MHz
(TMDS Rate 300 MHz)
Multi-port HDMIx4
3D Output

KEY FEATURES
- ■ Fully Comparable with HDMI 1.4 Standard
  - 3D Format Output
  - Audio Return Channel
  - Ethernet Channel
  - 4Kx2K / 1080P 120Hz
  - sYCC601 / Adobe RGB / Adobe sYCC601
  - CEC / Deep Color / Lip-Sync / xvYCC
- ■ Multi ports output test application
  - HDMI port output x 4
  - SCART port x 2 (output x1/input x1)
- ■ 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/Analysis
- ■ 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

Chroma 22294-A 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-A 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-A 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 experiance.

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 300MHz 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-A 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-A 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-A 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, multi-port 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-A 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.
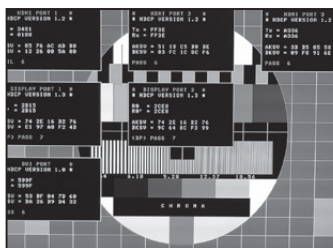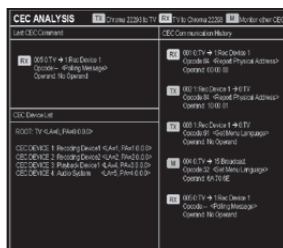
Model 22294-A Rear View

ORDERING INFORMATION
22294-A : Video Pattern Generator
Analog 300MHz/DVI 330MHz/HDMI 300MHz
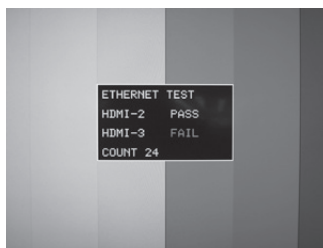(TMDS Rate 300MHz)/TV/HDTV
A240001: Remote Controller

Special Pattern

Multi-HDCP Pattern | CEC Analysis | HEC & ARC Test Pattern | 3D Operation Interface

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 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 / Analysis
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 V1.4b (3D Format / ARC / HEC / CEC / Lip Sync)
Pixel Rate Range	25~300MHz
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	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 0.0 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 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
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+, 13ans+, 16ans+, 18ans+
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
			59.94I	59.94/2	ITU 601 SMPTE 170M
720 x 576	50P	50			ITU 1382
			50I	25	ITU 601
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	1Ø 100~240V ±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 & Color | Flat Panel Display | LED/ Lighting | Optical Devices | Photovoltaic Test & Automation | Automated Optical Inspection | Power Electronics | Battery Test & Automation | Passive Component | Electrical Safety | Semiconductor/ IC | PXI Test & Measurement | General Purpose | Intelligent Manufacturing System | Turnkey Test & Automation