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.

3D signal standard format output: It is a fast operating interface designed specially for 3D only that can adjust and switch to various 3D output easily.

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: 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, Ch, Cr/Y, B-Y.

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

The digital signal output is TMDS with pixel rate up to 330MHz and the test screen resolution supports beyond WQXUGA. 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 & 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.
**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
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

**Rear View**

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

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**Specifications**

**Display output**
- Display Size: 4096 x 2160
- Pixel Rate Range: 0.5-250MHz
- Video Level (R.G.B, 75ohms): 1-0.5V programmable

**HORIZONTAL timing**
- Total Pixels: 32-8192 pixels /1 pixels resolution
- Horizontal synch: 0-0.5V On/Off programmable
- Black Level: 7.5IRE /0IRE selectable

**Vertical timing**
- Total Pixels: 4-4096 lines (non-interlace)
- Vertical synch: 2160 lines (interface) /1 line programmable

**Composite sync**
- H+, H EXOR V, Equalization & Serration Pulse

**Separate sync**
- BNC: Hs/Vs, Xs: D-SUB: Hs(Xs), Vs

**Video format**
- R, G, B / RS-343A
- Y, R-Y, B-Y
- Y, Cb, Cr / ITU 601
- Y, Pb, Pr / ITU 709, RP177, SMPTE 240M
- DCC II (D-SUB)

**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
- DCC II (D-SUB)

**Composite sync**
- H+, H EXOR V, Equalization & Serration Pulse

**Separate sync**
- BNC: Hs/Vs, Xs: D-SUB: Hs(Xs), Vs

**Video format**
- R, G, B / RS-343A
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- Y, Cb, Cr / ITU 601
- Y, Pb, Pr / ITU 709, RP177, SMPTE 240M
- DCC II (D-SUB)

**DVI (TMDS) output**
- Pixel Rate Range: 25 ≤ 1 link ≤ 165MHz/165 ≤ 2 link ≤ 330MHz
- EDID Read / Write / Compare / Edit
- HDCP Support HDCP V1.2 (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-861-E)
- Pixel Repetition: 4
- Video Signal Type: RGB or YCbCr
- Sampling Mode: RGB 4:4:4 / YCbCr 4:2:2 / or 4:2:2
- Bits per Component: Deep Color 8 / 10 / 12 @RGB & YCbCr
- HDCP: 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/LR/RR/FC/FL/FC/RL/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 Response: 1Hz / Step
- External Audio Input:
  - Optical and Coaxial (S/PDIF)
  - Special Control Mode: Tone / Sweep / Mute / Repeat / Play Time

**Data storage device**
- Default: 2000 times + 2000 patterns
- Internal Memory: 3000 times + 3000 patterns + 1000 programs
- External Memory: USB Host interface

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

**3D Scanning mode**
- Field
- Line
- Alternative
- Side-by-Side (Full)
- L + depth
- L + depth + graphics + graphics-depth
- Top & Bottom
- Side-by-Side (Half)

**Dimensions & weight**
- 22294: 88 x 350 x 350 mm / 3.46 x 13.78 x 13.78 inches (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.

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**Ordering information**

22294: Video Pattern Generator
222906: Remote Controller
222910: IR Controller
222914: USB Disk 1GB
222905: USB Disk 1GB

Developed and Manufactured by:

CHROMA ATE INC.

Data sheet for product CHROMA ATE IN.

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**Specifications**

**TV output**
- Output Mode: NTSC
- PAL
- SECAM
- Subcarrier Frequency: 443 / 4.43 MHz
- 6.43 / 3.57 MHz
- 8.43 / 3.58 MHz
- 5.43 / 3.48 MHz
- Closed Caption (NTSC): C1, C2, C3, C4 / 1, 2, 3, 4
- V-Chip (NTSC):
  - MPAA Rating: G, PG, PG-13, R, NC-17, X
- Canada English Rating: C, C8+, G, PG, 14+, 18+
- Canada French Rating: G, Bans, 13 ans, 16 ans, 18 ans, 18+ ans
- Teletext (PAL):
  - Teletext System B Level 1, 1.5

**SRTD / HDTV format**
- Timing: Progressive Mode Frame Rate (Hz)
- Interface Mode Frame Rate (Hz)
- Standard
  - 59.94P: 60/1.001
  - 59.94I: 59.942
  - SMPTE 293
  - ITU 601
  - SMPTE 170M
  - 50P: 50
  - 60I: 25
  - ITU 1382
  - SMPTE 274
  - 60P: 60
  - 60I: 50
  - SMPTE 240
  - SMPTE 296
  - 50P: 50
  - SMPTE 274
  - SMPTE 240
  - SMPTE 296
  - 30P: 30
  - SMPTE 274
  - 29.97P: 30/1.001
  - SMPTE 274
  - 25F: 25
  - SMPTE 274
  - 24F: 24
  - SMPTE 274
  - 23.98P: 24/1.001
  - SMPTE 274
  - 60I: 50
  - SMPTE 274
  - 59.94I: 30/1.001
  - SMPTE 296
  - SMPTE 296

**3D video format output**
- 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 times + 2000 patterns
- Internal Memory: 3000 times + 3000 patterns + 1000 programs
- External Memory: USB Host interface

**Others**
- AC Input: 100-240V, 50-60Hz, 5A maximum
- Operation/Storage Temp. +5 to +40 deg.C / -20 to +60 deg.C
- Humidity: 20-80 %

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