

## Video Pattern Generator

### MODEL 22293

#### Key Features:

- 4K x 2K Graphic size
- Analog pixel rate 250MHz
- DVI pixel rate 330MHz
- HDMI V1.3b  
(with 24, 30, 36 bit deep color/xvYCC)
- CEC Control
- DVI & HDMI with HDCP output
- Y、Pb、Pr / Y、Cb、Cr /  
Y、R-Y、B-Y output
- S-Video / CVBS / SCART / RGB /  
Color Component / D-terminal
- NTSC / PAL / SECAM signal
- Bi-level SDTV format support
- Tri-level HDTV format support
- Closed Caption function (NTSC)
- V-Chip function (NTSC)
- Teletext function (PAL)
- Optical/Coaxial audio input (SPDIF)
- EDID Read / Write / Compare
- Easy and variable pattern edit
- HDMI/DVI Plug & Play function
- Gamma correction
- ESD protection circuit
- USB Host / Device
- 3.5" LCD panel display performance



## VIDEO PATTERN GENERATOR MODEL 22293

Chroma 22293 Programmable Video Pattern Generator provides a total solution for multi-media tests that are applied in the industries of high frequency digital and analog displays such as LCM Monitor / LCD TV / PDP / Projector of today and in the future.

Large scale and high definition have become the trend as the development of video industry goes. Chroma 22293 has high speed signal transmission features that presented in a user friendly interface not only provide complete and standard digital and analog signals but also support the up-to-date interface, HDMI V1.3, for video image transmission with higher speed bandwidth and deep color.

HDMI (High Definition Multimedia Interface) is the digital signal standard interface of the latest generation. A single cable can synchronize the video image signals without any interrupts during transmission. The advantage of simple layout and high speed transmission capability has become the interface that can provide various audio and video sources in-between for the equipment like Set Top Box, DVD Player, A/V Receiver, Amplifier and all kinds of video monitors.

Chroma 22293 is able to provide analog/digital/TV signals concurrently: For the analog signal RGB output, the pixel frequency is up to 250MHz that meets the RS-343A standard, and it supports Y, Pb, Pr/Y, Cb, Cr/Y, R-Y, B-Y. Meanwhile it can select the sync signal of 3-step output to fit in the HDTV test application. For the digital signal TMDS output, the pixel frequency is 25~330MHz and resolution of test screen supports UXGA and higher.

As to the specification of TV output, the image and chrominance signals of Chroma 22293 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.

Chroma 22293 is designed with embedded architecture that uses Power PC to carry the high speed/high density FPGA as Graphics Rendering Engine to provide highly efficient system control and save the test time.

Chroma 22293 equipped with 3.5 inches super large screen and graphic operation interface is convenient for users to edit various timing parameters and patterns directly via the panel icon. The comprehensive, rapid and easy to understand user interface can improve the test efficiency effectively. The USB interface using VPG MASTER control software on PC can also be applied to show the patterns on display for test by running automatically or manually.

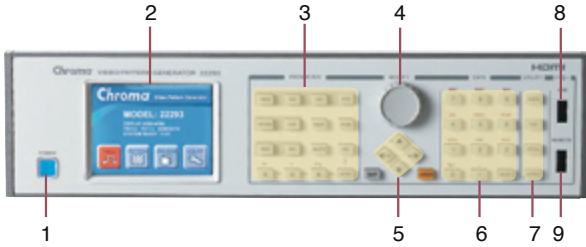
Following the rising market of new generation display the competition and demand for product quality are getting more and more sever. Under the consideration of quality and cost, Chroma 22293 Video Pattern Generator has built in the most complete multi-media test interfaces covering all standard signals output that can meet the requirements for various video tests in the industry. It is the best solution for the users in the field of RD, production and inspection.



# Chroma

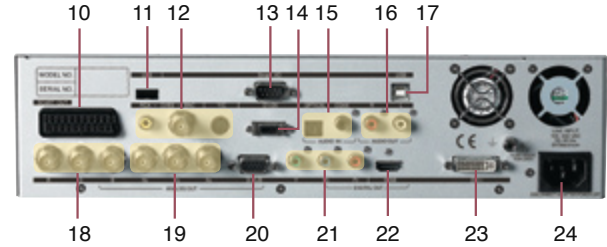
## PANEL DESCRIPTIONS

**Front View**



- 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 Chroma optional

**Rear View**



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

## SPECIFICATIONS

### ANALOG OUTPUT

Display Size	4096 x 2048
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

	BNC : Hs,Vs,Xs D-SUB : Hs(Xs), Vs
--	--------------------------------------

### VIDEO FORMAT

Video Output	R, G, B 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 Production-Key
Compliant	DVI 1.0 specification
Video Signal Type	RGB
Sampling Mode	4:4:4

### HDMI VIDEO OUTPUT

Version	HDMI V1.3b (with 24,30,36 bit deep color/xvYCC/CEC)
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
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

All specifications are subject to change without notice.

### TV OUTPUT

Output Mode	NTSC			PAL				SECAM	
Subcarrier Frequency	443	M,J	BDGHI	M	60	N	Nc	4.41/4.25	MHz
Subcarrier Stability	±50								Hz
Video Output	Composite (BNC, RCA), S-Video								
	Burst On/Off (NTSC, PAL)								
	Contrast programmable								
	Brightness programmable								
Closed Caption Support (NTSC)	C1, C2, C3, C4/ T1, T2, T3, T4								
	MPAA Rating : G, PG, PG-13, R, NC-17, X								
	FCC Rating : TV-Y, TV-Y7, TV-G, TV-PG, TV-14, TV-MA								
V-CHIP (NTSC)	Canada English Rating : C, C8+, G, PG, 14+, 18+								
	Canada French Rating : G, 8 ans+, 13 ans+, 16 ans+, 18 ans+								
	Teletext (PAL)								
Teletext (PAL)	Teletext System B Level 1 , 1.5								

### SDTV FORMAT

Timing	Progressive Mode Frame Rate (Hz)		Interlace Mode Frame Rate (Hz)		Standard
	720 x 483	59.94P	60/1.001	59.94I	
720 x 576	50P	50	50I	25	ITU 1382 ITU 601

### HDTV FORMAT

Timing	Progressive Mode Frame Rate (Hz)		Interlace Mode Frame Rate (Hz)		Standard
	1920 x 1080	60P	60	60I	
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

### 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

22293	350(W)x88(H)x350(D)mm / 5.6 kg
-------	--------------------------------

Developed and Manufactured by :

### CHROMA ATE INC.

致茂電子股份有限公司

#### HEADQUARTERS

66, Hwa-Ya 1st Rd., Hwa-Ya Technology Park, Kuei-Shan Hsiang, Taoyuan Hsien 333, Taiwan  
Tel: +886-3-327-9999  
Fax: +886-3-327-8898  
http://www.chromaate.com  
E-mail: chroma@chroma.com.tw

#### U.S.A.

CHROMA ATE INC. (U.S.A.)  
7 Chrysler Irvine, CA 92618  
Tel: +1-949-421-0355  
Fax: +1-949-421-0353  
Toll Free: +1-800-478-2026

#### EUROPE

CHROMA ATE EUROPE B.V.  
Morsestraat 32  
NL-6716 AH Ede  
The Netherlands  
Tel: +31-318-648282  
Fax: +31-318-648288

#### CHINA

CHROMA ELECTRONICS (SHENZHEN) CO., LTD.  
8F, No.4, Nanyou Tian An Industrial Estate, Shenzhen, China PC: 518054  
Tel: +86-755-2664-4598  
Fax: +86-755-2641-9620

#### BEIJING BRANCH OFFICE

TEL : +86-10-6803-9350; 6803-9361  
FAX : +86-10-6803-9852

#### SUZHOU BRANCH OFFICE

TEL : +86-512-6824-5425  
FAX : +86-512-6824-0732

Distributed by:

Worldwide Distribution and Service Network  
22293-E-200806-1000