Chroma 2227/2327 Video Pattern Generators not only combine the signals of analog (250MHz) and digital (165MHz) to provide the VESA standard video signal source for LCD Monitor/CRT Monitor, it also integrates the TV (NTSC / PAL/SECAM) signal to fit in the multimedia display applications for the newly risen LCD TV, PDP TV, LCOS TV and DLP RPTV industries. Users can utilize the software application, VPG PLUS, either on PC or on the Video Pattern Generator itself to edit various timing parameters, patterns and test procedures. Its complete test functions can fully meet the requirements for R&D, production test and quality assurance in all video related industries.

Analog/TMDS/SDTV/HDTV Signals Support
The 2227/2327 Video Pattern Generators equipped with microprocessor and precision Phase Locked Loop (PLL) circuit have accuracy up to 25PPM/1PPM after calibration are featured in high accuracy, high stability and high speed. Moreover, all of its horizontal timing parameters are in one-pixel resolution, which can provide the video signal with 256-color per pixel. For analog signal output, its pixel frequency can up to 250MHz and the RGB signals meet the RS-343A standard. It also supports Y/R-Y/B-Y, Y/Pb/Pr, Y/Cb/Cr and sync signals for tri-level output to fulfill the test requirements for HDTV.

The digital signal is in TMDS output with pixel frequency from 25~165MHz and test screen resolution up to UXGA. Its DVI-I Connector containing digital, analog and DDC2B signals meet the DDWG DVI standard. In addition Electrostatic Discharge (ESD) and Surge are designed for protection.

As to the TV output spec, the image and chromaticity of 2227/2327 meet the regulations of NTSC/PAL/SECAM, which the output signals include VBS composite signal with BNC and Y/C (Luminance/Chrominance) image/chromaticity separation signal with S-Video output connector.

Chroma 2227/2327 Video Pattern Generators have built in rich timing files and various patterns selections to increase the product usage as well as to decrease the engineer workload for setting operation. The embedded NVRAM memory device and optional memory card allow users to save the data files of accomplished settings for recall. The parameters for output patterns and timings can be programmed by PC via RS232C and loaded to memory card via the 22xx Series VPGs, meanwhile the operation sequences can be programmed and controlled by VPGplus on PC via RS232C interface. VPGplus provides a convenient operating environment for VPG users. Users can set the VPG parameters for the data of timing, pattern, program and icon, etc.

Following the rising market of multi-media display the competition and demand for product quality are getting more and more sever as consumers often request and search for higher pixels with less bad cells as well as low cost video display products before purchasing. Under this circumstance, the Chroma 2227/2327 Video Pattern Generators with high resolution test quality can meet the multi-media display applications at present, and the features described above make the Video Pattern Generator a indispensable testing tool for the RD engineers and production manufacturers.
### Programmable Video Pattern Generator

#### 1. LCD Display
#### 2. Icon Keys: For icon type selection
#### 3. Function Key: Timing & Pattern
#### 4. Alphanumeric Keys: For data input
#### 5. Config Key: General information setting
#### 6. Memory Card: For storage memory expansion
#### 7. Analog Signal Output R.G.B.
#### 8. Sync Output
#### 9. I/O Port
#### 10. RS-232 Interface
#### 11. AC Input
#### 12. DVI Output
#### 13. TV Output
#### 14. HDTV output: D5-Terminal

---

### SPECIFICATIONS

#### ANALOG OUTPUT
- **Display Size**: 2048x2048 / 4096x2048 (Option)
- **Pixel Rate Range**: 3.125 - 250 MHz
- **Video Level**: R, G, B (75 ohms) 0 - 1.0V programmable
- **Sync on Green / Level**: 0 - 0.5V On/Off programmable
- **White Level**: 0 - 1.0V programmable
- **Black Level**: 7.5 IRE / 0 IRE programmable

#### TMDS OUTPUT
- **Pixel Rate Range**: 25MHz - 165MHz
- **EDID**: Read / Write / Compare / Edit / Analyzer
- **HDCP**: Support HDCP V.1.0 Production-Key
- **Compliant**: DVI 1.0 specification
- **Video Signal Type**: RGB or YCbCr
- **Sampling Mode**: 4:4:4

#### COMPOSITE SYNC
- **H OR V, H XOR V, with RS-343A Equalization & Serration Pulse**

#### HORIZONTAL TIMING
- **Total Pixels**: 128~8192 pixels / 1 pixel resolution

#### VERTICAL TIMING
- **Total Pixels**: 64096 lines (non-interface) / 62047 lines (interface) / 1 line resolution

#### SEPARATE SYNC
- **Hs, Vs, VsXs**

#### SDTV OUTPUT: All SDTV Timing can be programmable
- **Timing**: Progressive Mode / Frame Rate (Hz) / Interface Mode / Frame Rate (Hz) / Standard

#### HDTV OUTPUT
- **Timing**: Progressive Mode / Frame Rate (Hz) / Interface Mode / Frame Rate (Hz) / Standard

#### DATA STORAGE DEVICE
- **Flash Memory (read only)**: 100 timings + 100 patterns
- **NVRAM (R/W)**: 300 timings + 100 patterns + 100 programs
- **Memory Card (R/W)**: Unlimited data storage

#### OTHERS
- **AC Input**: 90~132 V / 180~250 V, 47~63 Hz auto range
- **Operation/Storage Temp.**: +5~+40 deg.C / -20~+60 deg.C
- **Humidity**: 20~90%

<table>
<thead>
<tr>
<th>TV OUTPUT</th>
<th>NTSC 443</th>
<th>NTSC M.J</th>
<th>PAL</th>
<th>SECAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Mode</td>
<td>4.433618</td>
<td>3.579545</td>
<td>4.433618</td>
<td>4.462500</td>
</tr>
<tr>
<td>Subcarrier Frequency</td>
<td>4.433618</td>
<td>3.579545</td>
<td>4.433618</td>
<td>4.462500 MHz</td>
</tr>
<tr>
<td>Subcarrier Stability</td>
<td>+50 Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video Output</td>
<td>Composite (BNC, RCA), S-Video</td>
<td>Burst On/Off (NTSC, PAL)</td>
<td>Contrast programmable</td>
<td>Brightness programmable</td>
</tr>
<tr>
<td>Closed Caption Support (NTSC)</td>
<td>C1<del>C4, T1</del>T4</td>
<td>V-CHIP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SDTV OUTPUT: All SDTV Timing can be programmable

<table>
<thead>
<tr>
<th>Timing</th>
<th>Progressive Mode</th>
<th>Frame Rate (Hz)</th>
<th>Interface Mode</th>
<th>Frame Rate (Hz)</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>720X483</td>
<td>59.94</td>
<td>60/1.001</td>
<td>59.94I</td>
<td>60/1.001</td>
<td>SMPTE 293</td>
</tr>
<tr>
<td>720X576</td>
<td>50P</td>
<td>50I</td>
<td>50I</td>
<td>25</td>
<td>SMPTE 274</td>
</tr>
</tbody>
</table>

### HDTV OUTPUT

<table>
<thead>
<tr>
<th>Timing</th>
<th>Progressive Mode</th>
<th>Frame Rate (Hz)</th>
<th>Interface Mode</th>
<th>Frame Rate (Hz)</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920X1080</td>
<td>60P</td>
<td>60I</td>
<td>60I</td>
<td>30</td>
<td>SMPTE 274</td>
</tr>
<tr>
<td>1920X1035</td>
<td>59.94P</td>
<td>60/1.001</td>
<td>59.94I</td>
<td>60/1.001</td>
<td>SMPTE 240</td>
</tr>
<tr>
<td>1280X720</td>
<td>50P</td>
<td>50I</td>
<td>50I</td>
<td>25</td>
<td>SMPTE 296</td>
</tr>
</tbody>
</table>

### TMDS OUTPUT

### DATA STORAGE DEVICE
- Flash Memory (read only)
- NVRAM (R/W)
- Memory Card (R/W)

### OTHERS
- AC Input: 90~132 V / 180~250 V, 47~63 Hz auto range
- Operation/Storage Temp.: +5~+40 deg.C / -20~+60 deg.C
- Humidity: 20~90%

### Dimension / Weight
- 2227: 430x133x380 mm/9.0 kg
- 2227: 318x100x320 mm/5.0 kg

*All specifications are subject to change without notice*