



FLAT PANEL DISPLAY TESTER MODEL 27014

Chroma 27014 Flat Panel Display Tester is a complete testing solution that meets the Liquid Crystal Module testing requirements of a production line. With integrated video generator, multi-channel precision power supply and process control unit, the system allows a complete test of signal, pattern and electrical parameters of LCM through a PC or remote control box.

Software parameter interface allows the adjustments of Timing, Pattern and Power values to match the specifications of the LCM, followed by Program sequence scenario setting creating a comprehensive and effortless testing environment. Features of the Chroma 27014 FPD Tester include:

Testing Program Sequences

Setting the parameters of Turn On/Turn Off, Timing, Pattern and OCP/OVP/UCP/UVP values according to the LCM specifications provides complete and accurate testing conditions.

Timing and Pattern Editing

With the standard VESA timings and patterns already built into the system, custom geometric patterns could easily be created by importing pictures with BMP file format or assembling icons as desired within the software; all is done conveniently with the embedded real-time preview function.

Programmable Power Module

The built-in programmable DC power source adjusts power to accommodate LCM control chip, driver chip and the backlight module. Real-time readings of voltage and current are displayed and monitored. Its unique design avoids the transmission voltage drop which ensures the measurement accuracy when performing LCM operating status analysis. Each output channel is equipped with over voltage/over current protection and programmable timing relationship for Power On/Off.

MODEL 27014

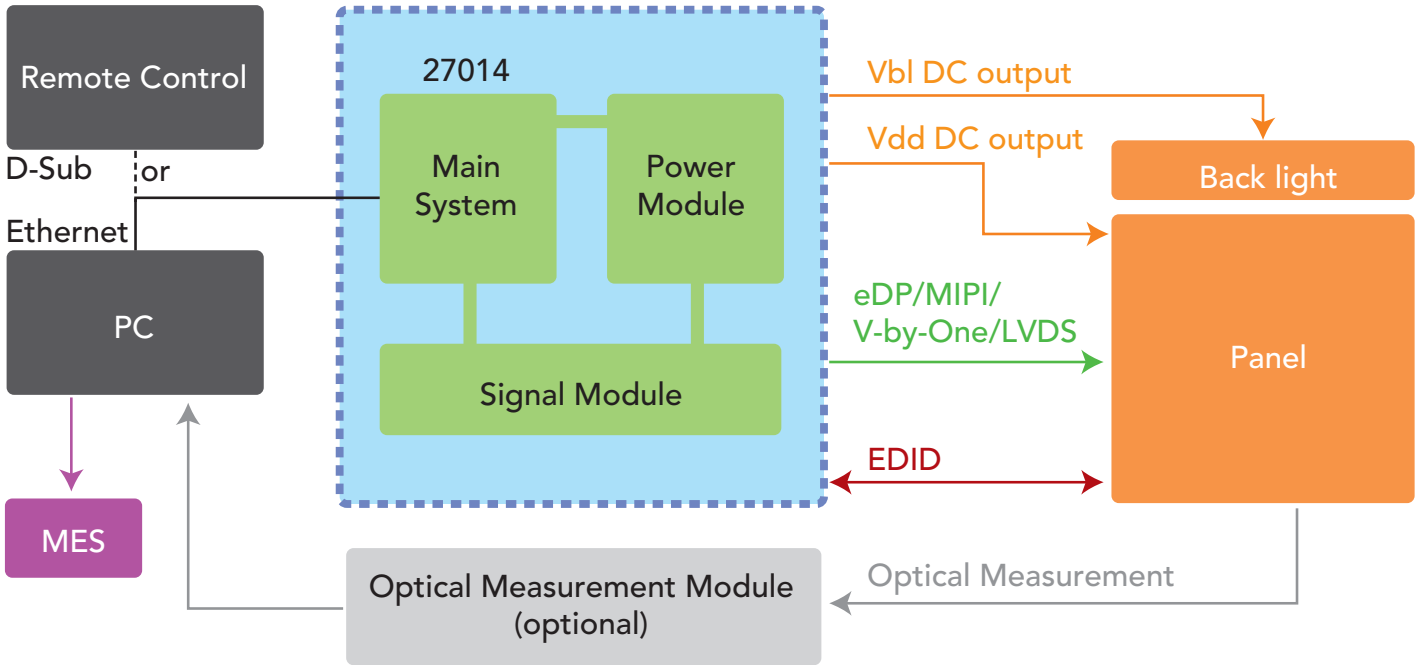
KEY FEATURES

- Modular interface design for various panel testing applications
 - One LVDS module (optional)+One MIPI/eDP/V-by-One signal module (optional)
- High accuracy programmable power supply
 - VDD 2~20V/10A max, 36W max
 - VBL 2~25V/20A max, 100W Max
 - Real-time voltage/current measurement
 - Programmable power protection function
 - Programmable On/off timing
- Editable timing, pattern and power source for test program sequences
- User friendly software
- Cross coordinate defect positioning
- Bitmap file display
- Scrolling pattern display
- eDP 1.4 signal module (optional)
 - Support up to Ultra High Definition (5Kx3K@60Hz)
 - 6/8/10 bit color depth
 - 1.62/2.16/2.43/2.7/3.24/4.32/5.4 Gbps per lane
 - 1/2/4/8 lane
 - 0/3.5/6/9.5 dB pre-emphasis
 - 200/250/300/350/400/450/600/800/1000mV swing level
 - PSR1 testing feature
 - PSR2 testing feature (optional)



Chroma

27014 SYSTEM APPLICATION BLOCK DIAGRAM



FPD MASTER AND GO NOGO SOFTWARE

Chroma 27014 FPD Tester integrates the signal source/power source for LCM patterns and electrical specification tests. It also features user friendly interfaces for Timing/Pattern/Power/Program editing, mouse/keypad for defect logging, system self-test for electricity analysis, and rapid selection for defect types, working altogether reduced the testing time in the production line.



FPD Master Start-up

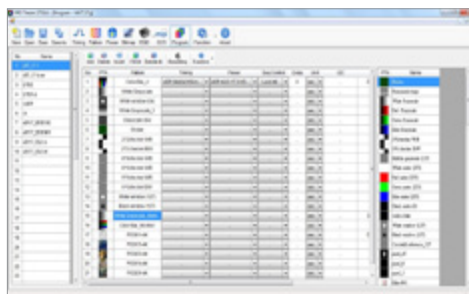
FPD Master Software

- Easy for Timing/Pattern/Power/Program Editing
- BMP Picture Playback
- EDID Read/Write/Compare
- Cross Coordinate Defect Positioning Function
- In-Line Process Control and Data Collection
- Operator Authority Control
- GO/NO GO Fast Measurement
- MES Network Management Function (optional)



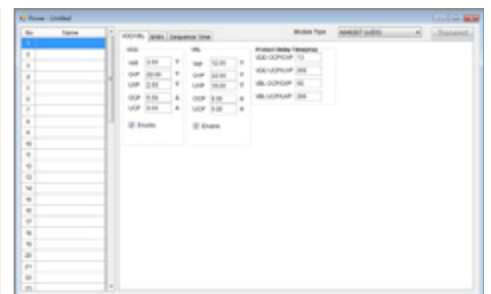
GO/NOGO Test Screen

- High efficiency design for operation
- In-line/off-line mode
- Power condition display (V, I by 2D)
- Over range display (OVP, OCP, UVP, UCP)
- Barcode management
- Production authority control (Lot No, Model No, ID No, Test Time, Fail Rate, etc.)
- Operation authority control (Factory, Area, Production Line, Operator, etc.) (optional)



Test Program Edit Screen

- TIMING/PATTERN/POWER for FPD test
- Loop function
- Pre-test function
- EDID/I²C test function



Power Edit Screen

- Multi-channel DC source setting
- OVP/OCP/UVP/UCP setting
- Vdd/Signal/Vbl On/Off sequence setting
- Vdd/Vbl/Idd/Ibl spec judgement
- Power sweep setting
- Real time simulation

MODULAR DESIGN

Chroma 27014 FPD Tester adopts compact and modular design that can integrate with the LVDS, eDP, MIPI or V-by-One signal modules as desired for different testing applications. The built-in programmable power modules provide a total solution for testing signals, and are able to control and power a broad range of flat panels.



MIPI + eDP Signal Module - A040201	
MIPI	
Compliant	MIPI DSI v1.02.00 spec
Resolution	1920 x 1200@60Hz max
Lane Count	1/2/3/4 Lane
Pixel Format	RGB-565/RGB-666/RGB-888
eDP	
Compliant	eDP v1.3 spec
Resolution	2560 x 1600@60Hz max
Lane Count	1/2/4 Lane
Color Depth	6/8/10 bits
Lane Rate	1.62/2.7 Gbps

MIPI Signal Module - A040202	
Compliant	MIPI DSI v1.02.00 spec
Resolution	1920 x 1200@60Hz max(4 lane) 2560 x 1600@60Hz max(8 lane)
Lane Count	1/2/3/4/8 Lane
Pixel Format	RGB-565/RGB-666/RGB-888

eDP Signal Module - A040203	
Compliant	eDP v1.3 spec
Resolution	2560 x 1600@60Hz max (4 lane) 3840 x 2160@60Hz max (8 lane)
Lane Count	1/2/4/8 Lane
Color Depth	6/8/10 bits
Lane Rate	1.62/2.7 Gbps

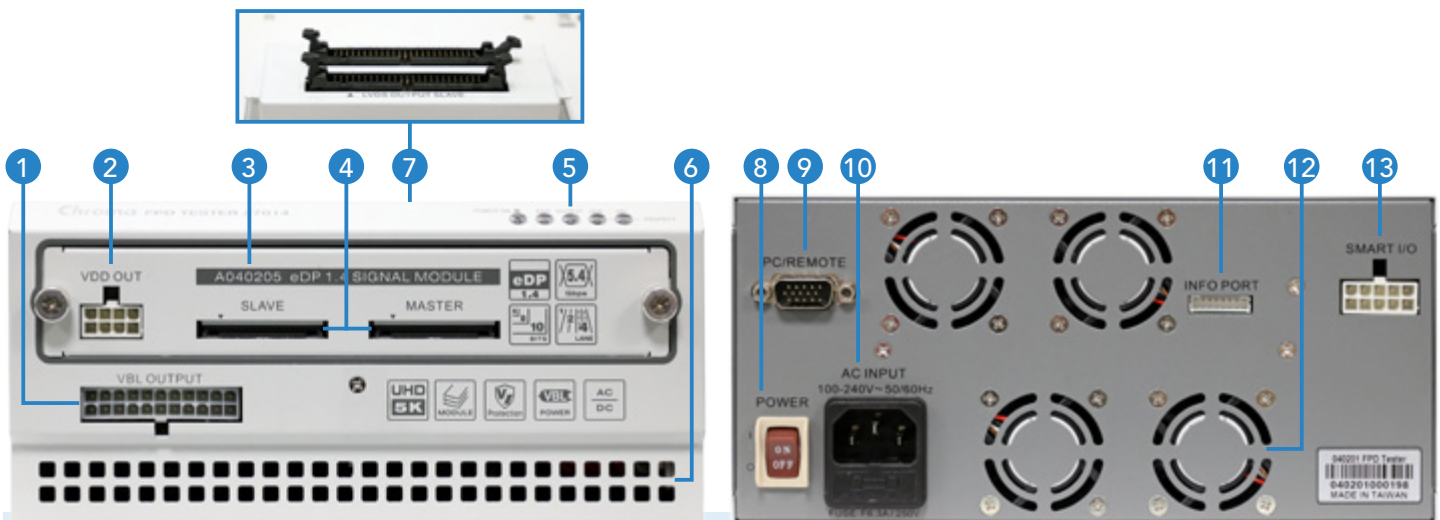
V-by-One Signal module - A040204	
Resolution	5120 x 2880@60Hz max
Lane Count	16/8/4 lane
Color Depth	8/10 bits
Data Mapping	Non/2/4/8 division

eDP 1.4 Signal Module - A040205	
Compliant	eDP v1.4 spec
Resolution	4096 x 2160 @ 60Hz max (4 lane) 5120 x 2880 @ 60Hz max (8 lane)
Lane Count	1/2/4/8 Lane
Color Depth	6/8/10 bits
Lane Rate	1.62Gbps/2.16Gbps/2.43Gbps/2.7Gbps/3.24Gbps/4.32Gbps/5.4Gbps Lane
Pre-emphasis	0/3.5/6/9.5 dB selectable
Swing Level	200mV/250mV/300mV/350mV/400mV/450mV/600mV/800mV/1000mV selectable

Remote Control Box - A040206	
Display	20 words x 4 lines Matrix LCD Display Jog dial x 1
Control Button	Panel ON/OFF x1 (with LED light) Increment key x1/Decrement key x1 Function key x 9
Connection type	D-sub 15 Pin
USB port	USB 2.0 Host port, HS mode support (480Mbps)

LVDS Output Module - A040207	
Resolution	4096 x 2160 @ 60Hz max
LVDS Mode	VESA/JEIDA
Color Depth	6/8/10 bits
Link Mode	4 channels
	1 Link : 10-150 MHz
	2 Link : 20- 300 MHz
	4 Link : 40- 600 MHz

PANEL DESCRIPTION



- VBL Output**
Provides VBL power for B/L power and control signal
- VDD Output**
Provides VDD power for T-CON board
- Signal module**
Used to extend eDP/MIPI/V-by-One signal (option)
- eDP Signal Output**
Supports eDP 1.4, master/slave ports
- Status Indicators**
Main power ON/OFF/Error status/Signal output status
VDD protection/VBL protection
- Air Ventilation**
Provides module vents

- LVDS Output (option)**
- Power Switch**
Main power ON/OFF
- PC/Remote connector**
Connect to computer or remote control box
- AC Power Input**
100~240V, 50/60Hz, auto range
- INFO PORT**
System debugging port for Chroma internal use
- System Fan**
Temperature controlled with PWM
- SMART I/O**
Application port for RS-485/GPIOx5/+17V power

SPECIFICATIONS

Model	27014
Main Frame	
Configuration	Embedded MCU with FPGA graphic engine
Signal interface	Slot front : option for eDP/MIPI/V-by-One Slot upper : option for LVDS 4 ch
I ² C x 1 (VBL output connector)	Floating/0V/3.3V/5 V programmable
Inverter On/Off Control (VBL output connector)	0V/3.3V/5V programmable
Analog Vdim control (VBL output connector)	0~8 V (20mA), 0.1Vstep programmable
Digital Vdim control (PWM) (VBL output connector)	3.3V/5V Frequency 100~15K Hz/1 Hz step Duty cycle 0~100% +/-1%

Data Store	
Timing	50
Pattern	Logic : 300 BMP : 8G Memory (999 BMP files max)
Program	50
Power	50
Communication I/O	
Remote/PC	D-Sub 15 pin
Application Functions	
Cursor	Display x, y coordinates and RGB values
Motion Pattern	Moving direction and speed programmable

Others	
AC Input	1Ø 100~240V ± 10% V _{LN} , 47~63Hz
Operating temperature	+10~40 °C
Storage temperature	0~80 °C
Humidity	20~90%
Dimensions	210(W) x 300(D) x 100(H) mm
Weight	5 kg/11 lbs

* All specifications are subject to change without notice.

Please visit Chroma's website for the latest information.

* All other brand and product names are trademarks or registered trademarks of their respective holders.

VDD Output	
Voltage range	2 ~ 20V/10A max, 36W max
Resolution	0.1 V/step
Accuracy	1% F.S.
Voltage ripple and noise	Under 100mV@20MHz
Rising time	1ms <Tr < 30ms
Falling time	< 30ms @ full load
Protection	OCP/OVP/UCP/UVPP/OPP
Measurement range	OVP/UVPP : 0~ 22V OCP/UCP : 0~ 11A OPP : 40W Protection delay range : 0~1000 ms programmable
Measurement accuracy	Voltage: ± 1% F.S. ; Current: ± 2% F.S.
Maximum remote sense	Maximum remote sense line drop compensation is 1V (If the voltage is compensated to maximum voltage, the voltage is no longer compensated)

VBL Output	
Voltage range	2 ~ 25V/20A max, 100W Max
Resolution	0.1 V/ step
Accuracy	1% F.S.
Voltage ripple and noise	Under 100mV@20MHz
Rising time	1ms <Tr < 30ms
Falling time	< 50ms@full load
Protection	OCP/OVP/UCP/UVPP/OPP
Measurement range	OVP/UVPP : 0~ 27V OCP/UCP : 0~ 22A OPP : 110W Protection delay range : 0~1000 ms programmable
Measurement accuracy	Voltage: ± 1% F.S. Current: ± 2% F.S.
Maximum remote sense	Maximum remote sense line drop compensation is 1V (If the voltage is compensated to maximum voltage, the voltage is no longer compensated)

ORDERING INFORMATION

27014 : FPD Tester

A040201 : eDP+MIPI Signal Module

A040202 : MIPI Signal Module

A040203 : eDP Signal Module

A040204 : V-by-One Signal Module

A040205 : eDP 1.4 Signal module

A040206 : Remote Control Box

A040207 : LVDS Output Module

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