Power Electronics Testing

PROGRAMMABLE AC POWER SOURCES
PROGRAMMABLE DC POWER SUPPLIES
PROGRAMMABLE AC ELECTRONIC LOADS
PROGRAMMABLE DC ELECTRONIC LOADS
DIGITAL POWER METERS
AUTOMATIC TEST SYSTEMS

Chroma

TurnKey Test & Automation Solution Porvider

Programmable AC Power Sources

MODEL

61500/61600 Series

High power

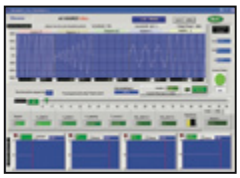
Advance IEC Test & Measurement/ Cost Effective AC Power Sources

The 61500 series defines a new standard in high performance AC power sources. It's equipped with powerful features such as power line disturbance simulation, programmable output impedance, comprehensive measurement functions and regulation test software. With the same H/W power stages, the 61600 series delivers pure, instrument grade AC power at a very low cost.

Chroma also provides a software suitable for aerospace testing, including MIL-STD-704F, RTCA DO-160D, and ABD100. These features make Chroma's 61500 Series ideal for commercial, power electronics, avionics, marine, military and regulation test applications from bench-top testing to mass productions.

Key Features :

- ☑ Output : 500VA~90kVA/0~300VAC/424VDC
- ☑ AC, DC, AC+DC output mode
- ☑ IEC 61000-4-11, 61000-4-13, 61000-4-14, 61000-4-28 regulation testing (61500)
- ☑ LIST, PULSE, STEP mode functions for testing power line disturbance (PLD) simulation (61500)
- ☑ Harmonics, inter-harmonics waveform synthesizer (61500)
- ☑ Power rating:12~36kVA 1-phase or 3-phase output selectable



List Mode: voltage transient programming

Distorted Waveform Editor

MODEL

61700 Series

Three-phase AC Power Sources

The 61700 series AC Power Source delivers pure, 5-wire, 3-phase AC power. Unlike traditional 3-phase AC power sources, it includes low power rating models at a very low cost. Users can program voltage, frequency and measure the critical characteristics of the output on its LCD display. It delivers the right solution to simulate many input conditions of a UUT, which makes it ideal for R&D and QA applications. It is also suitable for commercial applications including laboratory testing to mass production.

Key Features :

- ☑ Output Rating :
  Power : 1500VA~12kVA, 3-phase output
  Voltage : 0~150V/0~300VAC
- ☑ Frequency : 15Hz~1.2kHz
- ☑ Phase Angle: 0~360° programmable
- ☑ Turn on, turn off phase angle control
- ☑ Transient voltage programming:
  LIST, PULSE, STEP mode (Optional)
- ☑ Distorted waveform editor (Optional)

List Mode : voltage trasient programming

MIL-STD-704F Testing

MODEL

6400/6500 Series

AC Sources with advance features up to 9KVA

The 6400 series Programmable AC Power Source delivers pure, instrument grade AC power at a very low cost.

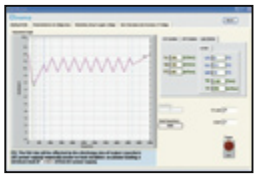
The 6500 series is capable of simulating a wide variety of AC line conditions, harmonic waveforms, accurate power measurement and analysis. It delivers the right solution to simulate all kinds of normal/abnormal input conditions and measures the critical characteristics of the product under test.

Key Features :

- ☑ Power rating : 375VA~9kVA
- ☑ Voltage range : 0~500V
- ☑ Current range : Up to 90Arms
- ☑ Programmable Sine, Square, or Clipped Sine waveform output
- ☑ Programmable voltage, current limit, frequency, phase and distortion
- ☑ PLD simulation capability, 30 factory installed harmonic waveforms in the waveform library
- ☑ Powerful measurement of Vrms, Irms, Ipk+, Ipk-, power etc.

List Mode:Transient Voltage Programming

MODEL
62000P Series


ISO-16750-2 4.5.1 Starting Profile

4 times VxI Constant Power Operating Envelope

The 62000P series Programmable DC Power Supplies offer many unique advantages for ATE integration and testing. These advantages include constant power operating envelope, precision readback of output current and voltage, output trigger signals as well as the ability to create complex DC transient waveforms. Designed for automated testing DC-DC converters and similar products.

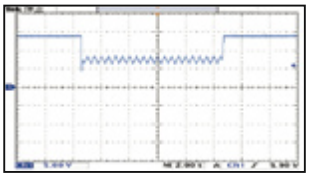
Key Features :

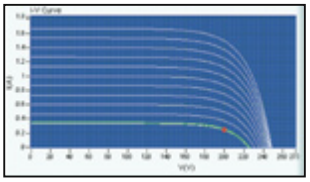
- ☑ Power rating : 600W, 1200W, 2400W, 5000W
  Voltage range : 0~600V
  Current range : 0~120A
- ☑ Wide range of voltage & current combinations with constant power
- ☑ High-speed Programming
- ☑ Precision V&I Measurements
- ☑ Current sharing for parallel operation with Master/Slave Control
- ☑ Auto Sequencing Programming:
  10 Programs/100 Sequences/8 bit TTL
- ☑ Voltage & Current Slew Rate Control
- ☑ OVP, Current Limit, Thermal protection

MODEL
62000H Series
62150H-600S/1000S Series

NEW

Solar Array Simulator


Engine Starting Profile of ISO 16750-2


EN50530 & Sandia Dynamic MPPT Test

High power density (15KW) in 3U Programmable DC Power Supply

The new 62000H series Programmable DC Power Supplies offer many unique advantages for telecom, automated test systems & integration, industrial, battery charge & simulation for hybrid car. These advantages include high power density of 15kW in 3U, precision readback of output current and voltage, output trigger signals, as well as the ability to create complex DC transient waveforms to test device behavior with spikes, drops, and other voltage deviations.

Model 62150H-600S/1000S provides an unique feature to simulate the output characteristics of a solar array. This function is useful for MPPT performance evaluation of solar inverter device.

Key Features :

62000H Series

- ☑ Power range : 5kW/10kW/15kW
- ☑ Voltage range: 0~1000V,
  Current range: 0~375A
- ☑ High power density (15kW in 3U)
- ☑ Current sharing operation
- ☑ Voltage ramp function (time range: 10 ms~ 99 hours)
- ☑ Sequencing Programming:
  10 Programs/100 Sequences
- ☑ Standard Analog Programming interface
- ☑ USB/RS232/RS485 Interface,
  Optional : GPIB/Ethernet

62150H-600S/1000S Series

- ☑ Voltage range: 0-600V & 1000V
- ☑ Power range: 5/10/15/30 up to 150kW
- ☑ Real time analysis of PV inverter's MPPT tracking & data record
- ☑ Real world weather simulation & fast I-V curve update rate: 1s
- ☑ Built-in SAS modeling in firmware
- ☑ Free graphic user interface - SoftPanel

MODEL
62000B Series

Modular DC Power Supply

The new 62000B series Modular DC Power Supplies offer many unique features for Burn-in and plating/electrolysis applications. The features include a N+1 redundancy, high power densities, hot-swappable maintenance, remote ON/OFF and programmable control via the CAN bus.

The 62000B family offers 5 types of power module with ranging from 1V to 150V, current from 10A to 90A, and offers two mainframe types six and three position. The six-position mainframe can envelop in up to six power modules paralleled operation for 9kW power output. The 62000B can easily parallel up to fourteen mainframe to 120kW with current sharing and CAN bus control for bulk power applications.

Key Features :

- ☑ Voltage range: 1 ~ 150V
- ☑ Current range: Up to 2000A (System)
- ☑ Power range up to 1.5kW per module
  up to 120kW per system
- ☑ N+1 Redundancy
- ☑ Hot-swappable
- ☑ Remote Sense
- ☑ Remote ON / OFF
- ☑ CAN Bus Control


Main Operation Menu

Programmable DC Electronic Loads

MODEL

63600 Series

NEW

High power density DC loads with unique CZ operation mode

New generation 63600 series DC Electronic Load provides innovative Dynamic Sweep mode with Vpk measurements. Dynamic mode can be run independently on each module or in parallel for high power loading. Also provided are three measurement ranges for precise voltage and current measurements making it ideal for Energy Star testing requirements.

With the VFD display and rotary knob, the 63600 loads offer versatile front panel operation. Users are able to control the 63600 family remotely via Ethernet, USB, or GPIB interface.

Key Features :

- ☑ Max. Power : 100W × 2(Dual), 300W & 400W
- ☑ Voltage Range : up to 80V
- ☑ 5 module mainframe Max. 2000W, load modules up to 400W/ea
- ☑ Up to 10 channels in one mainframe
- ☑ 0.4V @ 80A (Typical) low voltage operating characteristics
- ☑ Flexible CC, CR, CV and CP operating modes
- ☑ CZ mode for turn on capacitive load simulation
- ☑ Auto frequency sweep up to 50kHz
- ☑ Voltage, current and Pmax measurement for OCP/OLP testing

MODEL

6310A Series

NEW

Cost effective Modular Electronic Loads, up to 8 channels in one chassis

The 6310A loads are economical modular loads designed for power supply testing applications. Up to eight independent channels maybe configured into a single mainframe. Instruments come standard with front panel controls & RS232 or optional GPIB. Load modules are available from a wide range covering 0.1VDC to 500VDC, up to 240A and 1200W.

The 6310A series is the enhanced version of 6310 series, with advanced new features including USB interface, Constant Power (CP) mode, OCP test, Timing mode and Digital I/O.

Key Features :

- ☑ Power Levels : 200W, 100x2(Dual), 30W & 250W, 300W, 350W, 600W, 1200W
- ☑ Wide range 0~500V operating voltage
- ☑ Up to 8 channels in one mainframe, excellent for testing multiple output SMPS
- ☑ CC, CR, CV & CP operation modes
- ☑ Minimum input resistance allowing load to sink high current at low voltage
- ☑ High/Low limits of testing parameters to test GO/NG
- ☑ LED Load Simulator (63110A / 63113A)

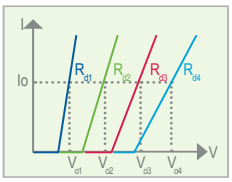
Battery Discharge Testing

Over-current Testing

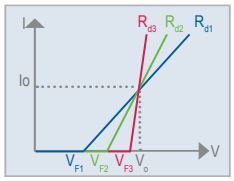
MODEL

63110A / 63113A

NEW



Different number of LEDs in series



Different charater of LEDs

LED Load Simulator

Chroma has created the first LED load simulator, model 63110A / 63113A, for testing LED power driver from 6310A series electronic loads. It privides a standard instrument that improve the life cycle and temperature variation of real LEDs. By setting the expected voltage, current and resistance of the LED operation point, 63110A / 63113A can simulate the different kind of LED's characteristics. It is also capable of simulating LED assembled in series, LED light bar, to test the matching character of LED power drivers.

Key Features :

- ☑ 63110A: Dual channel, Power: 100W, Voltage: 100V/500V, Current: 0.6A/2A
- ☑ 63113A: Single channel, Power: 300W, Voltage: 60V/300V, Current: 5A/20A
- ☑ Unique LED mode for LED driver test
- ☑ Programmable LED operating resistance (Rd)
- ☑ Fast response for PWM dimming test
- ☑ Up to eight channels in one mainframe (6314A)
- ☑ 16-bit precision voltage and current measurement with dual-range
- ☑ Full Protection: OC, OP, OT protection and OV alarm

MODEL
63200 Series

Key Features :

- ☑ Power Rating : 2.6kW, 5.2kW, 6.5kW, 10.4kW, 14.5kW, 15.6kW
- ☑ Voltage range : 0~80V/0~500V
- ☑ Current range : Up to 1000A
- ☑ CC, CR, CV & CP load modes
- ☑ Master/Slave parallel control mode, allow synchronous load control under static and dynamic loading mode
- ☑ Only 1V needed to draw the rated current
- ☑ External loading waveform simulation

High Power Loads with 2.5X times surge

The 63200 series loads are designed for telecom, fuel cell and other applications requiring high power or high current DC loading. Instruments use FET technology and are air cooled for simple operation and maintenance. Loads are parallelable allowing for loading systems of up to 93.6kW. Instruments come standard with front panel controls & RS-232C or optional GPIB .

Battery Charge/Discharge Testing Software

Battery Discharge Test & Record

Programmable AC&DC Electronic Loads

MODEL
63800 Series

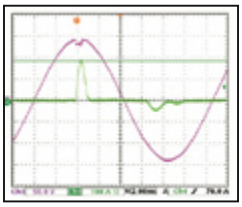
AC Loads with user programmable Power Factor and Crest Factor

The 63800 series AC&DC electronic loads are designed for testing uninterruptible power supplies(UPS), Off-Grid Inverters, AC sources and other power devices such as switches, circuit breakers, fuses and connectors. The 63800's state of the art design uses DSP technology to simulate non-linear rectified loads in a unique RLC operation mode.

All the models within the 63800 series can be used together for both parallel and 3-phase functions as well as paralled in a 3-phase configuration.

Key Features :

- ☑ Power Rating : 1800W, 3600W, 4500W
- ☑ Voltage Range : 50Vrms to 350Vrms
- ☑ Current Range : Up to 18Arms, 36Arms, 45Arms
- ☑ Frequency Range : 45 to 440Hz, DC
- ☑ CC, CR, CV, CP for DC Loading
- ☑ Constant & Rectified Load Modes for AC Loading
- ☑ Programmable Crest Factor : 1.414 to 5.0
- ☑ Programmable Power Factor : 0 to 1 lead or lag
- ☑ RLC, RLC CP & Inrush current modes
- ☑ Measurements : V, I, PF, CF, P, Q, S, F, R, Ip-/+ and THDv
- ☑ GPIB & RS-232 interfaces



AC Load Inrush Current Mode

Digital Power Meters

MODEL
66200 Series

Ideal for Energy-star & High Precision Power Measurement

The 66200 series Digital Power Meter is designed for single-phase measurements of AC power signals and related parameters common to most electronic products. Instead of traditional analog measurement circuits, the 66200 uses state-of-the-art DSP digitizing technology. The internal 16 bits analog/digital converters with sampling rates of up to 240kHz providing both high speed and highly accurate measurements, which is unmatched in the industry for this class of power meters.

Key Features :

- ☑ Current Range : 0.01/0.1/0.4/2 Arms (66201) 0.01/0.1/0.4/2 Arms, 0.2/2/8/20 Arms (66202)
- ☑ 10 mA minimum current range & 0.1mW power resolution
- ☑ Meets ENERGY STAR/IEC 62301/ErP measurement requirements
- ☑ Accumulated energy methods for unstable power measurement
- ☑ THD and user-specify order distortion measurement (Model 66202)
- ☑ Voltage/current harmonic measurement 50 orders (model 66202 remote only)

66200 Softpanel

Power EfficiencyTest Softpanel

Automatic Test Systems

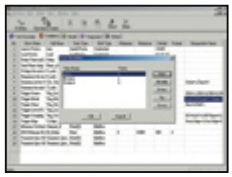
MODEL
8000

Switching Power Supply Testing

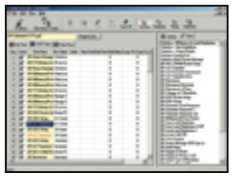
Chroma is the a leading worldwide supplier of automated testing equipment in the power conversion industries. Automated systems are available for R&D, design verification and production applications.

Key Features :

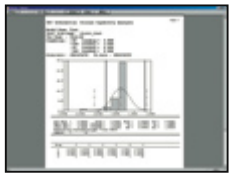
- ☑ Open architecture software platform
- ☑ Support any instrument with GPIB/RS-232/RS-485/I^2 C/CAN interface
- ☑ Test command optimizer helps to improve test speed
- ☑ Capability in coding for any power supply application
- ☑ Cost effective
- ☑ Windows 98/NT/2000 or higher based software
- ☑ Comprehensive hardware modules provide high accuracy and repetitive measurements
- ☑ Statistical and user editable test report
- ☑ User editable test item/ test program
- ☑ Remote monitoring via internet
- ☑ Support CAN Bus card for Car Electronics Testing application
- ☑ Capability in testing LED power board



Test Item Editor



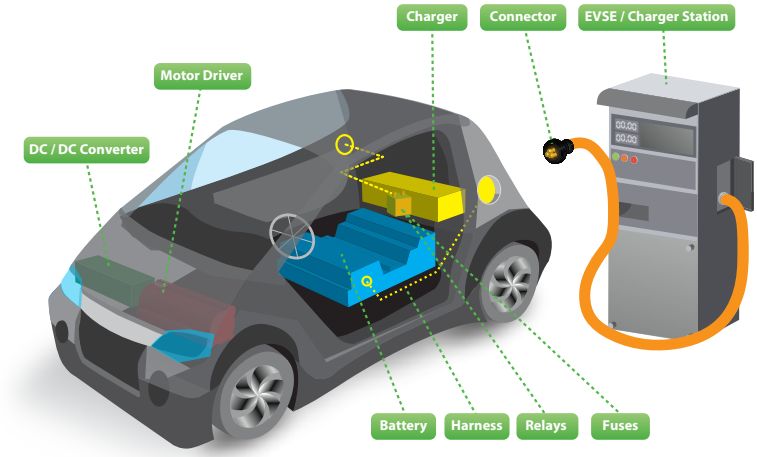
Test Program Editor



Statistical Report

Electric Vehicle Power Electronics Testing

The power conversion section of the EV/HEV is composed of several power electronic units, which include the EVSE (EV Supply Equipment), on-board charger, DC/DC converter, motor driver, etc. The following pictures of the Chroma ATS show some applications for EV/HEV.



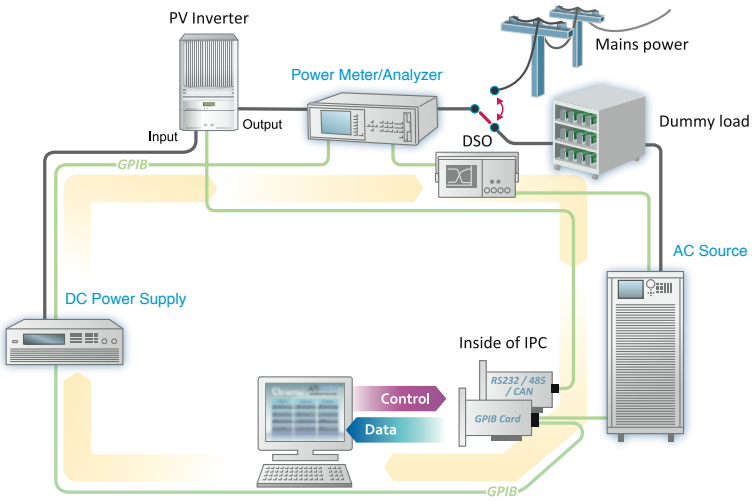
EV Charger ATS

DC-DC Converter ATS

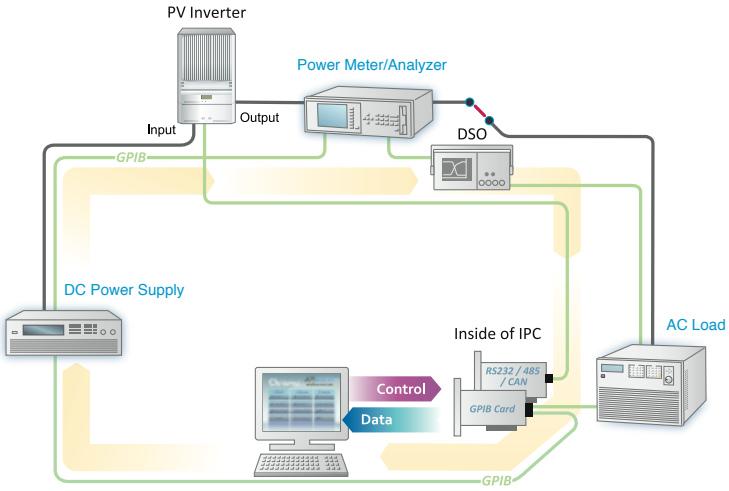
HEV Controller/ DC-DC ATS

EVSE (AC Level 2) ATS

Grid Connected PV Inverter Test Block Diagram



Off Grid PV Inverter Test Block Diagram



Photovoltaic Inverter Testing

Software :

Optimized Test Items

1. CEC/European/Conversion Efficiency Test
2. Current Harmonic Test
3. DC Injection Current Test
4. Input Operation Voltage Range
5. Input / Output Test
6. MPP Tarcking Delay Time Test
7. MPP Tracking Record Test
8. MPP Tracking Voltage Range Test
9. MPPT Efficiency Test
10. OFP/UFP Test
11. OVP/UVP Test
12. Trip Time Test

MODEL

8491

NEW

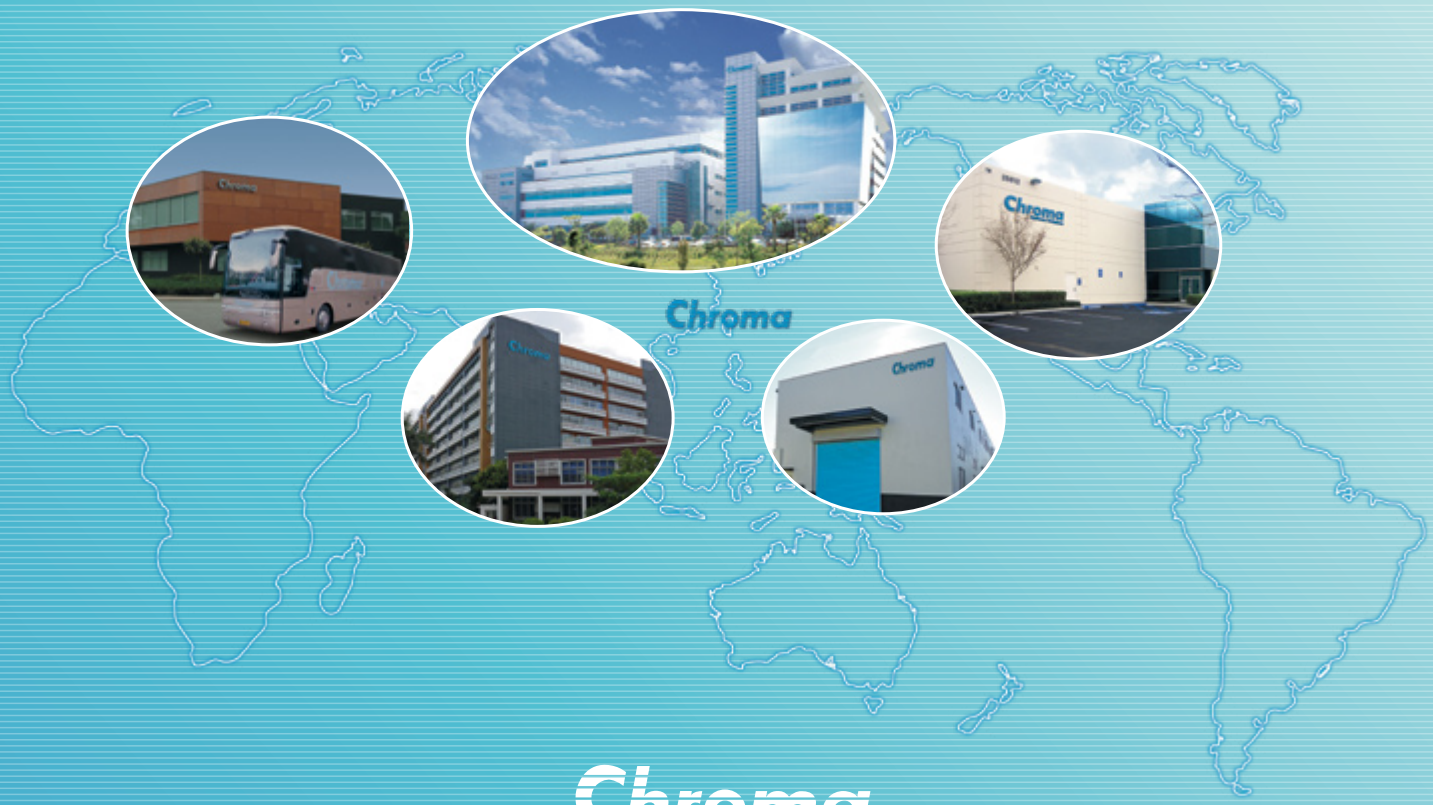
LED Power Driver ATS

Chroma 8491 LED Power Driver ATS is the ultimate test system for LED power driver. It is able to test Multi-UUT/Multi-output concurrently to improve the productivity significantly. The hardware devices available for selection include AC/DC power supply, power meter, PCI interface function card, transducer unit and the industries first LED load simulator for simulating LED loading with 6330A series electronic loads.

The PCI interface function card containing LED Power Driver Measurement Card & Control Card, industrial measures dimming current / frequency / duty and provides BL control signal (DC level, PWM, SM BUS) and Enable ON/OFF signal. Furthermore the Timing /Noise Card is used in ripple current measurement at 20MHz bandwidth.

Key Features :

- ☑ For LED Power Driver testing (lighting & TV backlight)
- ☑ Capable of testing Multi-UUT/Multi-output concurrently to improve productivity
- ☑ Provide optimized standard test items for the Unit Under Test (LED Power Driver) to deliver excellent test performance
- ☑ Windows 98/2000/NT/XP based software



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