

## Programmable AC Power Source

### MODEL 61500 SERIES

#### Key Features:

- Power:
  - 500VA (61501), 1000VA (61502)
  - 1500VA (61503), 2000VA (61504)
  - 4000VA (61505)
- Voltage range: 0-150V/0-300V/Auto
- Compact size and weight attributable to advance PWM technology
- AC+DC output mode for voltage DC offset simulation
- Programmable slew rate setting for changing voltage and frequency
- Low output impedance for testing IEC 61000-3-2 (61505)
- Programmable output impedance for testing IEC 61000-3-3
- LIST, PULSE, STEP mode function for testing power line disturbance (PLD) simulation capability
- IEC 61000-4-11 voltage dips, short and variation simulation
- Harmonics, inter-harmonics waveform synthesizer for testing IEC 61000-4-13
- Programmable voltage, current limit
- Comprehensive measurement capability, including current harmonics
- High output current crest factor, ideal for inrush current testing
- Turn on, turn off phase angle control
- TTL signal which indicates output transient
- Analog programmable interface
- 3 units combined to 3-phase power output
- Easy-use software for operation and IEC regulation test
- Optional GPIB and RS-232C interface



# Chroma



## PROGRAMMABLE AC POWER SOURCE MODEL 61500 SERIES

Chroma AC power source 61500 series sets up the new standard for high performance AC power source. It equips with all powerful features such as power line disturbance (PLD) simulation, programmable output impedance, comprehensive measurement functions, wave-shape synthesis and regulation test software. These features make the 61500 series ideal for commercial, power electronics, avionics, military and regulation test applications from bench-top testing to mass production.

Line up from 500VA to 4000VA with one phase output, the 61500 series give users the maximum choices from R/D design verification, quality assurance, to production test.

Using the state-of-the art PWM technology, the 61500 series is capable of delivering up to 6 times of peak current compared to its maximum rated current that makes it ideal for inrush current test.

The AC+DC modes extend the applications not only pure AC voltage but also DC component for testing DC offset in laboratory. Applying the advanced DSP technology, the 61500 series is

able to provide precision and transient voltage waveform as well as measurements such as RMS voltage, RMS current, true power, power factor, current crest factor and up to 40 orders of current harmonic components.

The 61500 series allows users to compose different harmonic components to synthesize their own harmonic distorted wave-shapes. To simulate the natural waveform, the 61500 series also provides an external analog input to amplify the analog signal from arbitrary signal generator. Thus, it is capable of simulating the unique waveform observed in the field.

With the versatile programmable voltage functions and easy-use operation software, the 61500 series enables users to perform the pre-compliance tests against IEC 61000-4-11 and compliance test against IEC 61000-4-13/-4-14/-4-28 immunity test regulations. With low impedance and low voltage harmonic character, model 61505 can be a standard source for 230V/16A IEC 61000-3-2 testing. With programmable output impedance function, 61500 series provide a solution for testing IEC 61000-3-3 regulations by incorporating a flicker meter.



### 1. ADVANCED PWM TECHNOLOGY

Chroma AC power source 61500 series is able to provide the highest power density by its superior PWM mode design and the incorporated power factor correction function.



### 2. AC/ DC OUTPUT CAPABILITY

Chroma AC power source 61500 series provide output DC component for simulating AC voltage with DC offset condition. It can test the unbalance input current for rectified load. Users also can use an optional DC noise filter to get low noise and good stability DC voltage for testing.

### 3. COMPREHENSIVE MEASUREMENTS

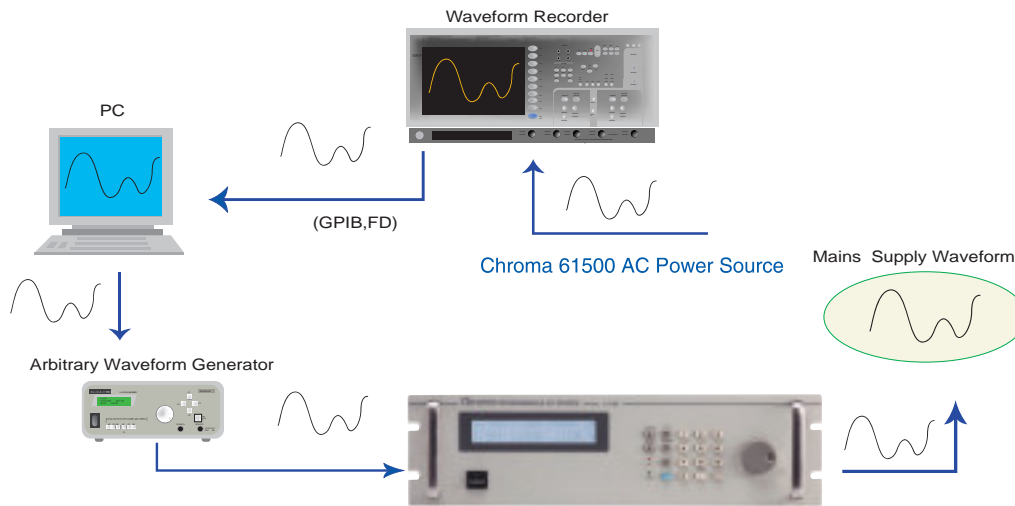
Chroma AC power source 61500 series has built in a 16-bit measurement circuit and firmware utilities to measure the steady and transient responses of true RMS voltage, current, true power, VA(apparent power), VAR(reactive power), power factor, current crest factor, peak repetitive current and inrush current. Using the advanced DSP technology, it can measure up to 40 orders of current harmonics. It makes 61500 series not only a power source but also a powerful analyzer.

Vac = 110.0	F = 60.00	Vdc = 0.0	L
V = 110.0	F = 60.00	I = 0.74	▲
P = 34.2	PF = 0.42	CF = 5.14	▼

Vac = 110.0	F = 60.00	Vdc = 0.0	L
Vdc = 0.0	Idc = 0.00	Ip = 3.8	▲
Is = 10.2	VA = 81.4	VAR = 73.9	▼

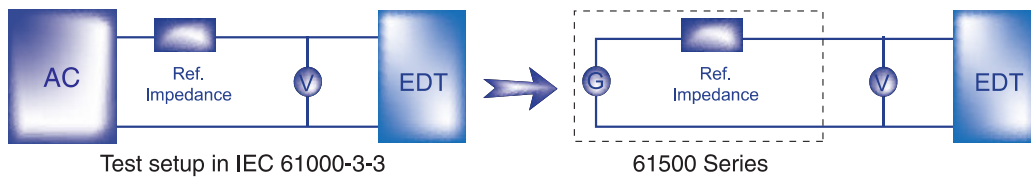
### 4. ARBITRARY POWER AMPLIFIER

The external voltage programming input of Chroma AC power source 61500 series allows users to feed any AC+DC waveform from an arbitrary signal generator. And amplify the signal accordingly. It can be used to simulate the real mains supply waveforms observed in the field.



### 5. PROGRAMMABLE OUTPUT IMPEDANCE

Chroma AC source 61500 series allows users to program output impedance. A current feedback control circuit makes the output voltage changed with the load. This feature is suitable for IEC 61000-3-3 Flicker tests or other test condition with particular output impedance requirement. It provides users a convenient and cost effective way to implement the reference impedance.

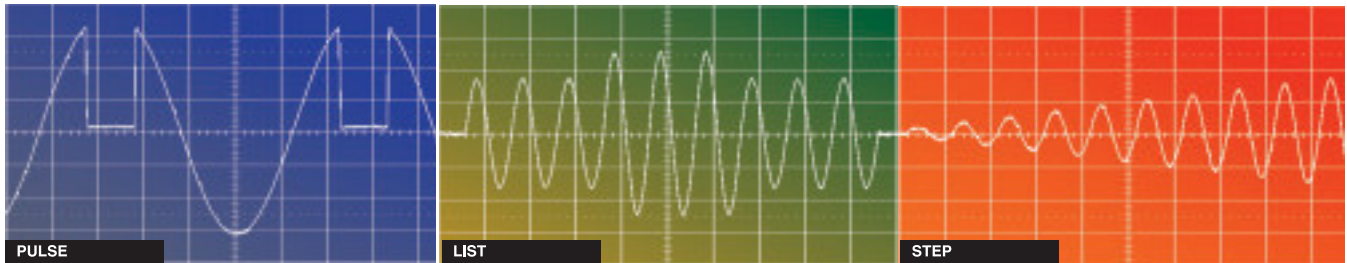


IEC 61000-3-3 Voltage Fluctuation & Flicker Test Setup

## 6. POWER LINE DISTURBANCE SIMULATION

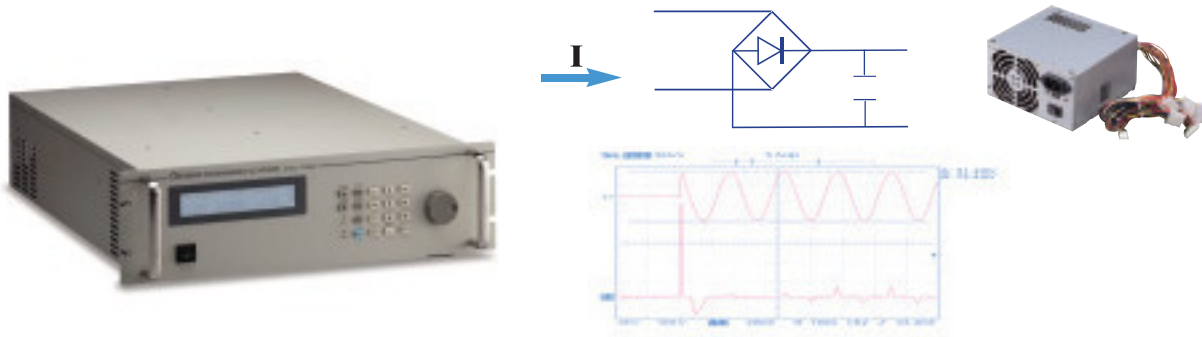
In addition to the steady output voltage and frequency programming, Chroma AC power source 61500 series provides powerful functions to simulate all kinds of power line disturbance conditions. The STEP and PULSE modes offer an easy and convenient method to execute a single step or continuous output changes. The changes may be triggered by an internal or external event. With this capability, it is easy to simulate power line disturbances such as cycle dropout, transient spike, brown out and etc.

The LIST Mode extends this function for more complex waveform generator needs. Up to 100 sequences with different start-end conditions, that can perform almost any waveform by AC and DC components. It also allows users to synchronize external events as well as measurement devices with output changes



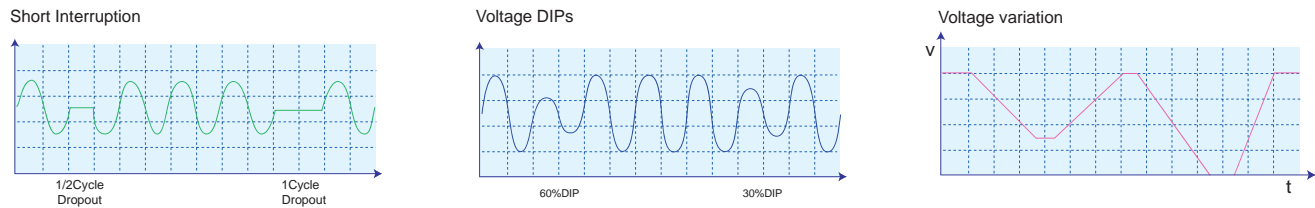
## 7. HIGH OUTPUT CURRENT CREST FACTOR AND TURN ON / OFF PHASE ANGLE CONTROL

Chroma AC power source 61500 series is capable of providing high output current crest factor (Max. 6). It delivers sufficient transient power required for testing most of the rectified input type power circuits. The programmable turn on (off) phase angle control makes the 61500 series AC source ideal for inrush current test.



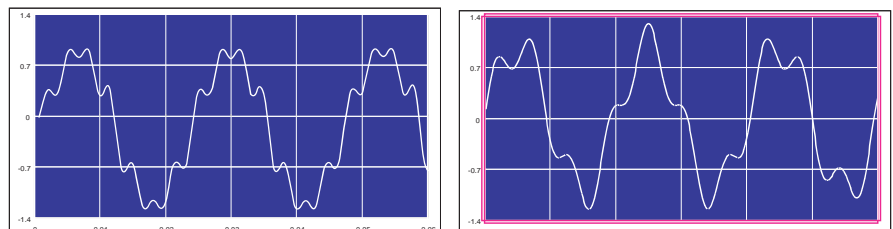
## 8. VOLTAGE DIPS AND VARIATION SIMULATION

IEC 61000-4-11 voltage dips, short interruption and variation standard have become mandatory in EMC directives for the CE mark. Chroma AC power source 61500 series is capable of simulating all sorts of voltage dips, interruptions and variation waveforms for IEC 61000-4-11 pre-compliance tests with an easy-use software.

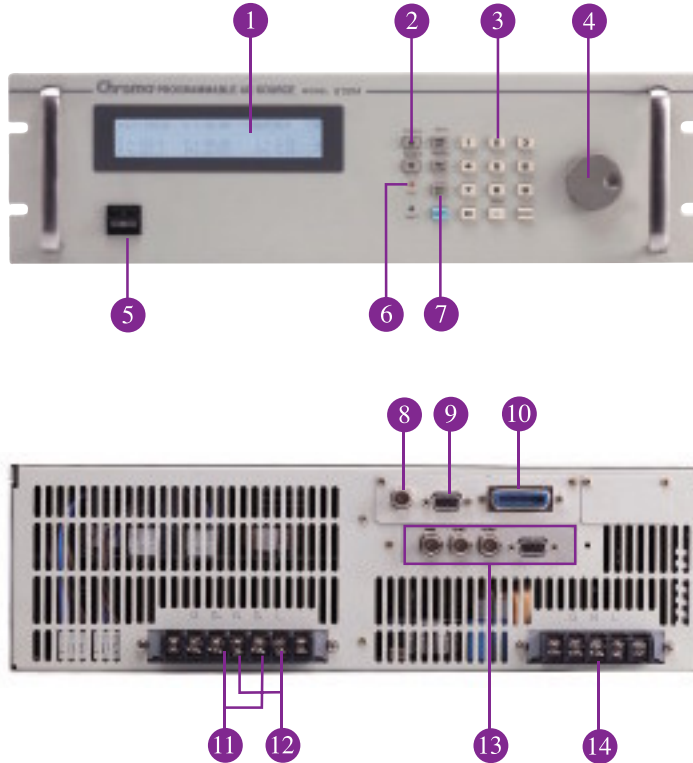


## 9. HARMONICS, INTERHARMONICS SYNTHESIS

Traditional type of AC source only allows users to composite integer orders of harmonic components into a periodic harmonics distortion waveform. IEC 61000-4-13 standard requires not only the harmonics waveform, but also interharmonics simulation. This means the fundamental frequency will incorporate with components frequencies between harmonics frequencies. Chroma AC power source 61500 series uses advanced DSP technology to synthesis the harmonics and interharmonics waveforms. Therefore, it is capable of generating a non-periodic harmonic distorted waveform to perform IEC 61000-4-13 compliance test with an easy-use software.



## PANEL DESCRIPTION



- 1. LCD Display**  
Show the test setup, operating status and readings
- 2. Page Up/Down Key**  
Facilitate parameter data editing
- 3. Numeric Key**  
Data entry for test parameters
- 4. Rotary Knob**  
Regulate for voltage, frequency and parameter setting
- 5. Power Switch**
- 6. Output Indicator**  
Lighten when output is enable.
- 7. Output Enable Key**  
Enable or disable output.
- 8. External V Reference**  
External programming voltage input
- 9. RS-232C Interface**
- 10. GPIB Interface**
- 11. Remote Sense Terminal**  
Use to compensate the line drop between source and testing point
- 12. Output Terminal**  
Connect output cable to the UUT
- 13. System Interface**  
For synchronizing signal and transient signal
- 14. Input Terminal**

## APPLICATIONS

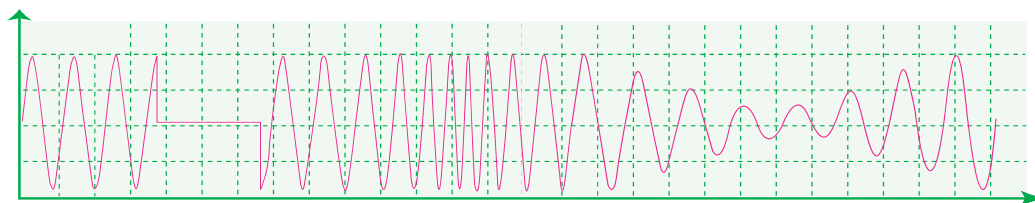
### 1. POWER SUPPLY TEST

The modern electronics or electrical devices are all built in with power supply to transfer the mains supply input to DC output voltages. Therefore, power supply is the device that directly faces the impact of abnormal line input. As a result, AC source is the basic instrument required for power supply test. The features of PLD simulation, distorted waveform, high output current crest factor, comprehensive measurement, wide range of voltage and frequency output capability make Chroma AC source 61500 series ideal for various power supplies test.



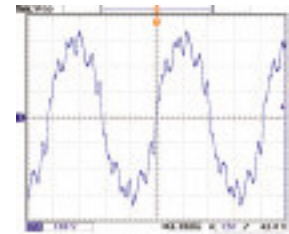
### 2. UPS/ AVR TEST

The Uninterruptible Power Supply (UPS) and Auto Voltage Regulator (AVR) are known as the safe-guard systems. This means they should be able to provide regulated output under any power outage situations and prevent the devices from receiving the distorted and abnormal mains supply if the UPS and AVR are used. Chroma AC power source 61500 series which equips with comprehensive features, provides a complete solution for AC/AC type of UPS and AVR test.



### 3. SIMULATE AC POWER DISTORTION

More and more electronics manufactures have expanded their business to acquire worldwide product distribution. When a problem is identified, sometimes it is necessary to check if the products are susceptible to ac line disturbances. However, precious time would be wasted on gathering and transferring test equipment, man power and other resources to do a simple onsite test. The purpose of this application is to provide a solution using Chroma Power Analyzer 6630 to measure the voltage harmonics of the ac main on site. All recorded data can be sent to the lab. According to the data, users can use synthesis function of AC source 61500 series to re-build the original distorted waveform. It can help engineers quickly point out the problem and come up with a solution.



### 4. AEROSPACE TESTING SOFTWARE FOR AC POWER

With the powerful programming capability, AC power source 61500 series can be used to test aircraft electrical equipment. Chroma also provides software for RTCA DO-160D and MIL-STD-704E test.



### 5. THE EASY-USE SOFTWARE: THE 61500 SERIES SOFTPANEL



Main Operation Menu



Transient Voltage Programming

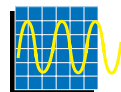


Distorted Waveform Editor



Voltage DIP, Short, Variation Regulation Test

### OTHER APPLICATIONS



Power line disturbance simulation testing



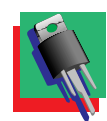
PC and monitor testing



Relays, switches testing



Avionics testing of military and aircraft



TRIACs, SCRs and passive components testing



Breakers, fuses testing



Servo motor, synchro motor testing



Air-conditioner testing



UPS function & environmental testing



IEC standard compliance testing



Lamp circuit testing



AC ballast testing



Transformers testing



Product safety testing

### ORDERING INFORMATION

- 61501 : Programmable AC Source 0~300V, 15~1KHz / 500VA
- 61502 : Programmable AC Source 0~300V, 15~1KHz / 1KVA
- 61503 : Programmable AC Source 0~300V, 15~1KHz / 1.5KVA
- 61504 : Programmable AC Source 0~300V, 15~1KHz / 2KVA
- 61505 : Programmable AC Source 0~300V, 15~1KHz / 4KVA
- A615001 : Remote Interface Board for Model 61500/61600 Series (External V Input, RS-232 Interface, GPIB Interface)

- A610004 : Universal Socket Center for Model 6512/6520/6530/6560/6415/6420/6430/61500/61600 Series
- A615007 : Softpanel for Model 61500/61600 Series
- A615008 : DC Noise Filter for Model 61500/61600 Series
- A600009 : GPIB Cable (200cm)
- A600010 : GPIB Cable (60cm)

## SPECIFICATIONS

Model	61501	61502	61503	61504	61505
<b>Output Phase</b>	1	1	1	1	1
<b>Output Rating - AC</b>					
<b>Power/Phase</b>	500VA	1000VA	1500VA	2000VA	4000VA
<b>Voltage</b>					
Range/Phase	150V/300V/Auto	150V/300V/Auto	50V/300V/Auto	150V/300V/Auto	150V/300V/Auto
Accuracy	0.2%+0.2%F.S.	0.2%+0.2%F.S.	0.2%+0.2%F.S.	0.2%+0.2%F.S.	0.2%+0.2%F.S.
Resolution	0.1V	0.1V	0.1V	0.1V	0.1V
Distortion	0.3% @ 50/60Hz 1%, 15-1KHz (Typical)	0.3% @ 50/60Hz 1%, 15-1KHz (Typical)	0.3% @ 50/60Hz 1%, 15-1KHz (Typical)	0.3% @ 50/60Hz 1%, 15-1KHz (Typical)	0.3% @ 50/60Hz 1%, 15-1KHz (Typical)
Line Regulation	0.1%	0.1%	0.1%	0.1%	0.1%
Load Regulation	0.2%	0.2%	0.2%	0.2%	0.2%
<b>Max. Current/Phase</b>					
R.m.s.	4A/2A (150V/300V)	8A/4A (150V/300V)	12A/6A (150V/300V)	16A/8A (150V/300V)	32A/16A (150V/300V)
Peak	24A/12A (150V/300V)	48A/24A (150V/300V)	72A/36A (150V/300V)	96A/48A (150V/300V)	192A/96A (150V/300V)
<b>Frequency</b>					
Range	DC, 15~1KHz	DC, 15~1KHz	DC, 15~1KHz	DC, 15~1KHz	DC, 15~1KHz
Accuracy	0.15%	0.15%	0.15%	0.15%	0.15%
<b>Output Rating - DC</b>					
<b>Power</b>	250W	500W	750W	1000W	2000W
<b>Voltage</b>	212V/424V	212V/424V	212V/424V	212V/424V	212V/424V
<b>Current</b>	2A/1A (212V/424V)	4A/2A (212V/424V)	6A/3A (212V/424V)	8A/4A (212V/424V)	16A/8A (212V/424V)
<b>Programmable Output Impedance</b>					
<b>Range</b>	0Ω +200μH~1Ω +1mH				
<b>Harmonics &amp; Inter-harmonics Simulation</b>					
<b>Bandwidth</b>	2400Hz	2400Hz	2400Hz	2400Hz	2400Hz
<b>Input Rating</b>					
<b>Voltage Range</b>	90~250V, 1ø	90~250V, 1ø	90~250V, 1ø	90~250V, 1ø	190~250V, 3ø
<b>Frequency Range</b>	47~63Hz	47~63Hz	47~63Hz	47~63Hz	47~63Hz
<b>Current (per phase)</b>	10A Max. @ 90V	18A Max. @ 90V	22A Max. @ 90V	28A Max. @ 90V	14A Max. @ 190V
<b>Power Factor</b>	0.97 Min.	0.97 Min.	0.98 Min.	0.98 Min.	0.98 Min.
<b>Measurement</b>					
<b>Voltage</b>					
Range/Phase	150V/300V	150V/300V	150V/300V	150V/300V	150V/300V
Accuracy	0.2%+0.2%F.S.	0.2%+0.2%F.S.	0.2%+0.2%F.S.	0.2%+0.2%F.S.	0.2%+0.2%F.S.
Resolution	0.1V	0.1V	0.1V	0.1V	0.1V
<b>Current (per phase)</b>					
Range (peak)	24A	48A	72A	96A	192A
Accuracy (r.m.s.)	0.4%+0.3%F.S.	0.4%+0.3%F.S.	0.4%+0.3%F.S.	0.4%+0.3%F.S.	0.4%+0.3%F.S.
Accuracy (peak)	0.4%+0.6%F.S.	0.4%+0.6%F.S.	0.4%+0.6%F.S.	0.4%+0.6%F.S.	0.4%+0.6%F.S.
<b>Power</b>					
Accuracy	0.4%+0.4%F.S.	0.4%+0.4%F.S.	0.4%+0.4%F.S.	0.4%+0.4%F.S.	0.4%+0.4%F.S.
Resolution	0.1W	0.1W	0.1W	0.1W	0.1W
<b>Harmonics</b>					
Range	2~40 orders	2~40 orders	2~40 orders	2~40 orders	2~40 orders
External voltage programming	Optional	Optional	Optional	Optional	Optional
<b>Others</b>					
<b>Interface</b>	GPIB, RS-232 (Optional)				
<b>Temperature</b>					
Operating	0 ~ 40°C	0 ~ 40°C	0 ~ 40°C	0 ~ 40°C	0 ~ 40°C
Storage	-40 ~ +85°C	-40 ~ +85°C	-40 ~ +85°C	-40 ~ +85°C	-40 ~ +85°C
<b>Safety &amp; EMC</b>					
CE ( include EMC & LVD )					
<b>Dimensions(WxHxD)</b>	482x132.6x570 mm	482x132.6x570 mm	482x132.6x570 mm	482x132.6x570 mm	482x265.9x570 mm
<b>Weight</b>	20 kg	20 kg	21 kg	21 kg	36 kg

All specifications are subject to change without notice.

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  
Technical 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.  
Max Planckstraat 4, 6716 BE  
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 P.c: 518054  
Tel: +86-755-2664-4598  
Fax: +86-755-2641-9620

Distributed by:

Worldwide Distribution and Service Network

61500-200505-1000