

MODEL 66203/66204

KEY FEATURES

- Voltage Ranges:
15/30/60/150/300/600 Vrms, 1200Vrms
and 1800Vrms with optional kits
- Current Ranges:
0.005/0.02/0.05/0.2/0.5/2/5/20 Arms
- Frequency Range: DC, 10Hz to 10kHz
- High-speed DSP technology,
16-bit analog-to-digital converters
- Half-rack form factor, 4 measurement
modules (66204)
- Supports measurement in 1P2W, 1P3W,
3P3W, 3P4W, and 3V3A wiring configurations
- Supports external shunts and CTs for current
measurement applications
- 5mA minimum current range and 0.1mW
power resolution
- Supports power measurements for
ENERGY STAR/IEC 62301/ErP/EN 50564/
SPEC Power
- Energy integration for power measurements
on products with fluctuating loads
- Automatic PASS/FAIL indication based on
user-defined limits
- Dual-shunt design for high-accuracy
measurements over wide current range
- THD measurement with user-selectable
maximum harmonic order
- Inrush current and energy measurements
- Voltage and current harmonic measurements
up to the 50th order
- Supports optional high-precision DCCT
accessories

DIGITAL POWER METER MODEL 66203/66204

The Chroma 66203/66204 Digital Power Meters deliver accurate multiphase AC power measurements for a wide range of electrical equipment and appliances. The 66203 features three measurement modules, while the 66204 provides four. Both models support 1P2W, 1P3W, 3P3W, 3P4W, and 3V3A input wiring configurations. Users can select the appropriate mode to measure voltage, current, power, and other parameters for their application.

Multiple voltage and current ranges support accurate measurements across a wide range of applications. The 66203/66204 use high-resolution 16-bit analog-to-digital converters, sampling rates of up to 250kHz, and high-speed digital signal processing (DSP) to deliver accurate parameter measurements in place of traditional analog-circuit designs.

The 66203/66204 Digital Power Meters feature four display windows for simultaneous readings of different parameters. Users can easily select the values they want to view. Each window uses a 7-segment display with 5-digit

measurement resolution. For remote control, two rear-panel interface configurations are available: USB with GPIB or USB with CAN.

The 66203/66204 support power measurements for ENERGY STAR, IEC 62301, and ErP testing. Their dual-shunt design delivers accurate measurements across a wide current range, with a minimum range of 5mA for measuring no-load power below 30mW. External shunts or current transformers (CTs) extend measurement capability to currents above 20A.

Measurement functions include voltage (Vrms), current (Irms), frequency (Hz), active power (W), apparent power (VA), reactive power (VAR), power factor (PF), and current crest factor (CF), as well as inrush current, total harmonic distortion (THD), and energy in joules. These capabilities meet the measurement needs of R&D and quality control, while the compact 3U-high, half-rack form factor facilitates integration into automated systems.



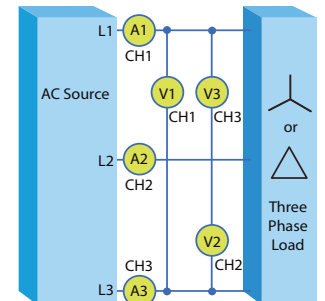
Chroma
Advancing Excellence

FUNCTIONS AND APPLICATIONS

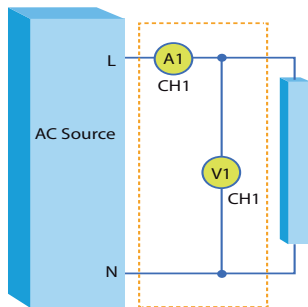
The multichannel 66203/66204 Power Meters support power measurements in the wiring configurations shown below. Users can select the appropriate mode to measure voltage, current, power, and other parameters for their application.



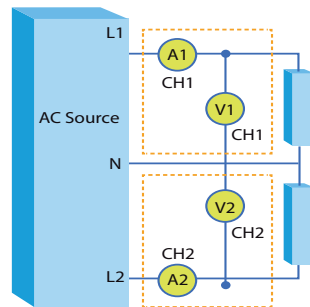
	Channel 1	Channel 2	Channel 3	Channel 4
1P2W (Single Phase Two Wire)	1P2W	1P2W	1P2W	1P2W
1P3W (Single Phase Three Wire)	1P3W		1P2W	1P2W
3P3W (Three Phase Three Wire-Two Watt Meter Method)	3P3W		1P2W	1P2W
3V3A (Three Phase Three Wire-Three Watt Meter Method)	3V3A			1P2W
3P4W (Three Phase Four Wire)	3P4W			1P2W



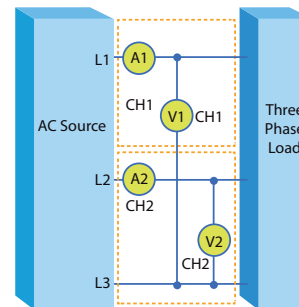
3V3A (Three Phase Three Wire)



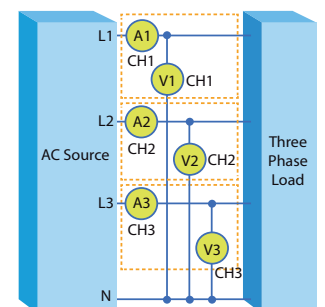
1P2W (Single Phase Two Wire)



1P3W (Single Phase Three Wire)

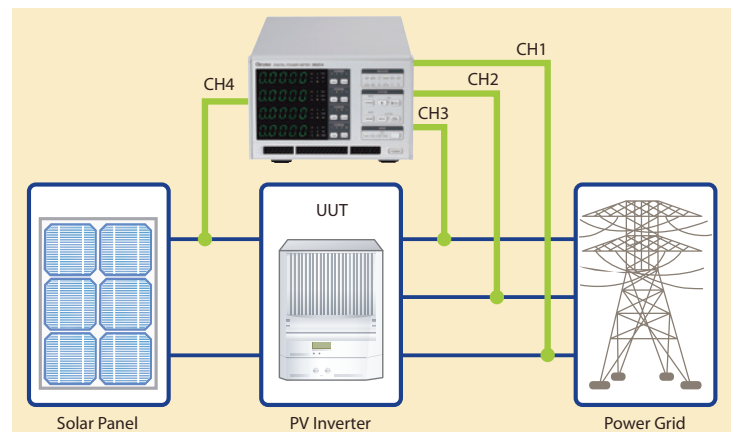


3P3W (Three Phase Three Wire)

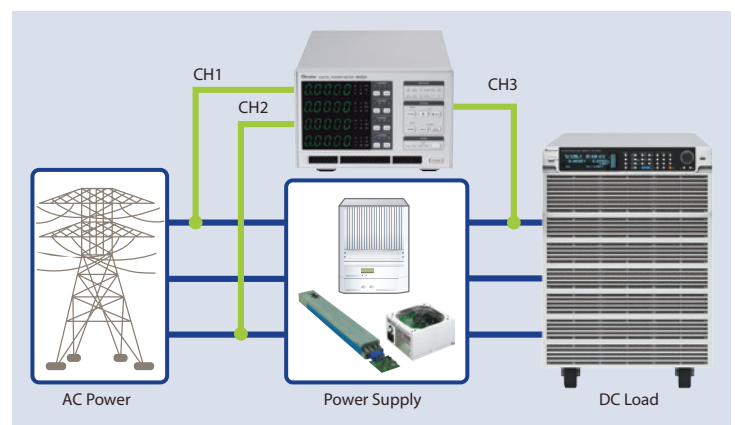


3P4W (Three Phase Four Wire)

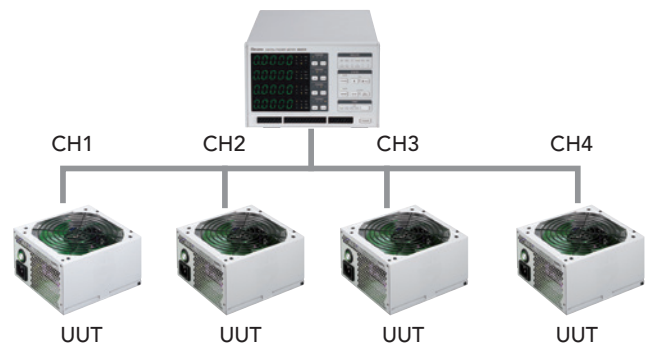
Each measurement channel operates independently, making the 66203/66204 suitable for multipoint measurements on a unit under test (UUT). For example, the four-channel 66204 can measure the DC input and three-phase AC output parameters of a PV inverter. Built-in power efficiency calculations determine the overall efficiency of the UUT. The HV function and an optional kit support high-voltage measurements at a PV inverter input of 1000Vdc.



The 3P3W (Three-Phase Three-Wire) wiring mode uses the two-wattmeter method to measure power in three-phase AC applications, such as power supply testing. Built-in efficiency calculations can also determine the overall efficiency of the power supply.

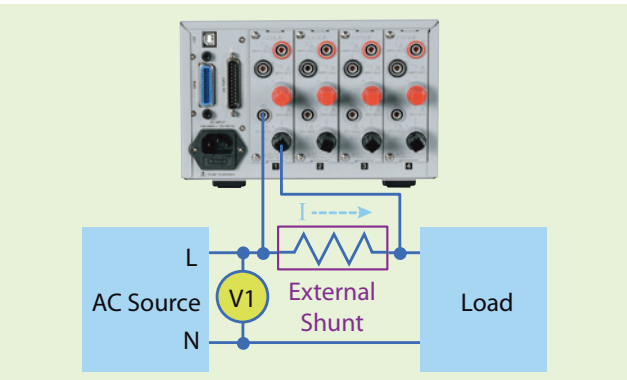
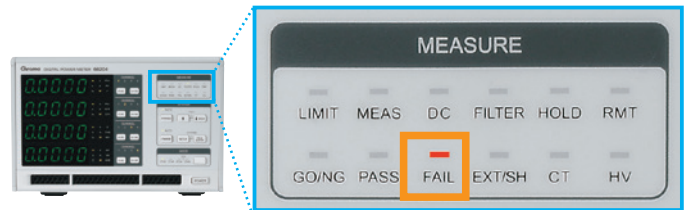


In 1P2W (Single-Phase Two-Wire) mode, the 66204 can measure up to four UUTs simultaneously. Each module provides a minimum current range of 5mA for no-load power measurements below 30mW and power measurements for ENERGY STAR, IEC 62301, and EN 50564 testing. Applications include computer servers, set-top boxes, televisions, LED lighting power supplies, and battery chargers.



User-Defined Limits for GO/NG Testing

The 66203/66204 Digital Power Meters allow users to define upper or lower limits for measurement parameters and perform GO/NG testing during measurement. If the measured values remain within the limits over the specified time period, the PASS indicator lights green. If a measured value falls outside the limits, the FAIL indicator immediately lights red.



External shunts support current measurements above 20Arms.

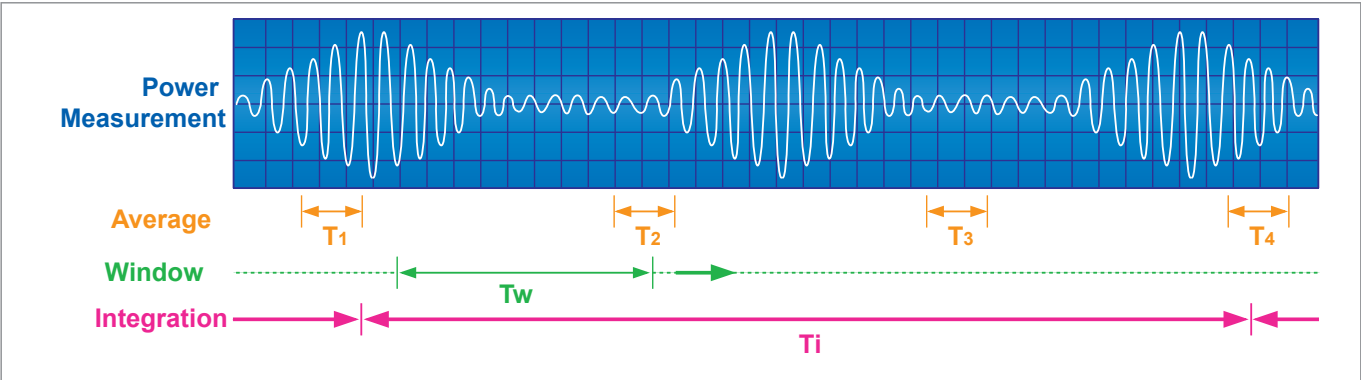


The compact design allows two power meters to be mounted side by side in a standard 19-inch rack, providing up to eight measurement channels when two 66204 units are used.

Power Measurement in Average Mode, Window Mode, and Integration Mode

On a traditional power meter, readings may fluctuate and become difficult to read if the UUT's power consumption varies, or if the UUT operates in a nonlinear mode such as burst mode. Different load currents within successive measurement aperture windows (T1 to T4 below) produce different readings. While simple averaging may produce what looks like a stable value, it fails to capture events outside the sampled windows, leading to inaccurate readings.

That's why besides Average Mode, the 66203/66204 provide a moving-window method that uses all data within a user-defined time window (Tw), enabling calculation of the average value without omitting data within that window. In addition, Integration Mode also measures power by integrating the instantaneous power calculated from voltage and current over a user-defined time period (Ti) to obtain energy in joules. Dividing this energy by the elapsed time gives the accurate average power over that period, including the contribution of transient events. The 66203/66204 Digital Power Meters provide a 5mA current range with a crest factor of 4, 0.1mW resolution for low-power measurements below 10W, and uncertainty below 2%, making them suitable for no-load power measurements. These functions support power measurements for ENERGY STAR/IEC 62301/ErP/SPEC Power testing.



THD Measurement with User-Selectable Maximum Harmonic Order

The 66203/66204 Digital Power Meters measure voltage and current total harmonic distortion (THD) and display the results directly. For certain applications, such as ENERGY STAR testing, users must verify that the AC supply voltage THD is below 2% when calculated up to and including the 13th harmonic.

Users can select the maximum harmonic order n , from 2 to 50, for distortion measurements using the formula below. This function supports the required distortion measurements for ENERGY STAR testing.

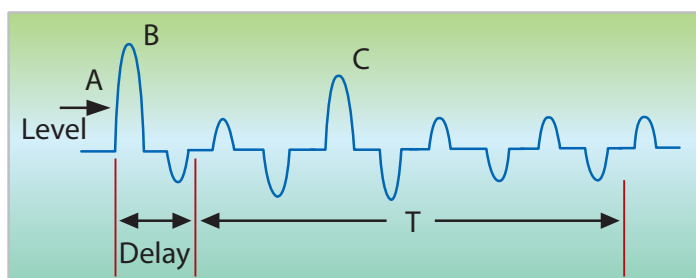
$$\text{THD}_V = \frac{\sqrt{V_2^2 + V_3^2 + V_4^2 + V_5^2 + \dots V_n^2}}{V_1}$$

where V_n is the RMS value of the n th harmonic of the voltage signal.

Inrush Current Measurement

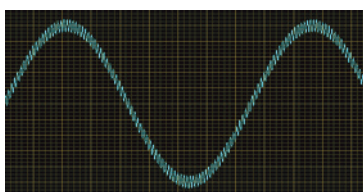
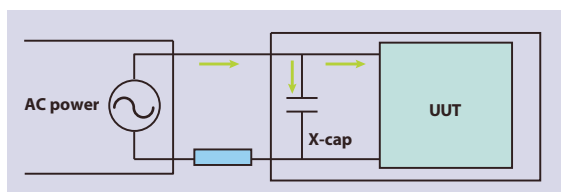
The 66203/66204 Digital Power Meters measure inrush current (I_s). Users can set a current threshold (A) or use an external TTL signal through the rear-panel control I/O port to trigger the measurement. The Delay parameter postpones waveform acquisition to exclude the initial peak B. The T parameter defines the waveform acquisition window.

These settings allow the meters to capture peak current C while excluding the initial effect of the UUT's input X-capacitor, helping users measure the inrush current associated with soft-start operation.

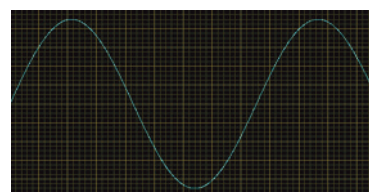


Low-Pass Filter Setting

The 66203/66204 Digital Power Meters offer wide measurement bandwidth. In some applications, however, users may wish to exclude high-frequency components. For example, high-frequency currents caused by switching can increase measured input current, particularly in low-power applications. Users can enable the 5kHz low-pass filter to suppress these components and obtain readings suited to their measurement needs.

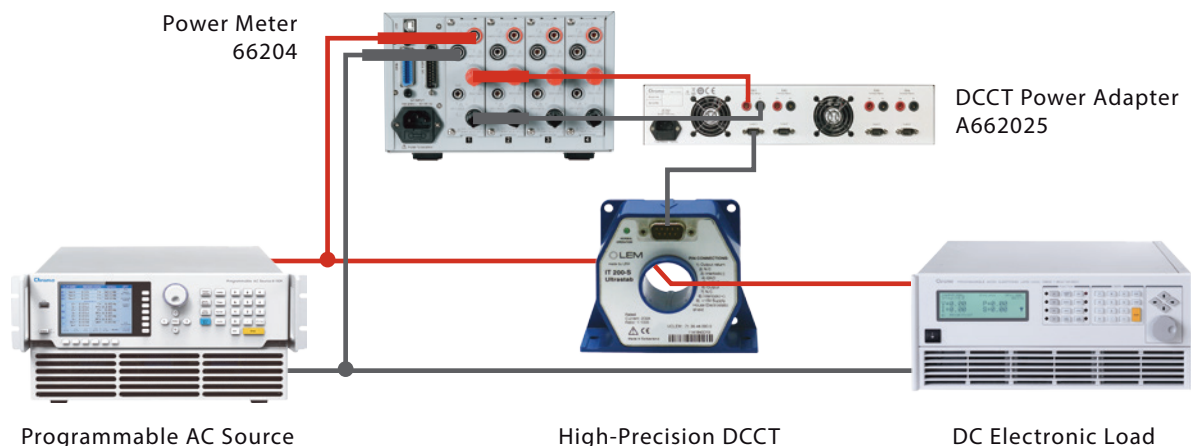


Filter Off: Bandwidth = 50kHz



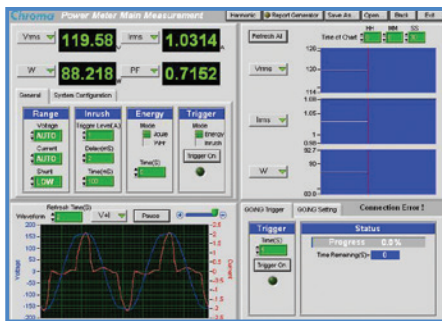
Filter On: Bandwidth = 5kHz (meets 3kHz bandwidth requirement for ENERGY STAR)

High-Current Measurement with Optional High-Precision DCCT Accessories

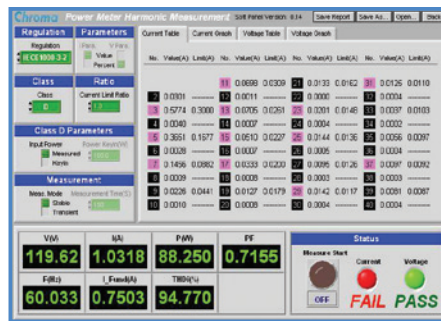


SOFTPANEL: GUI SOFTWARE

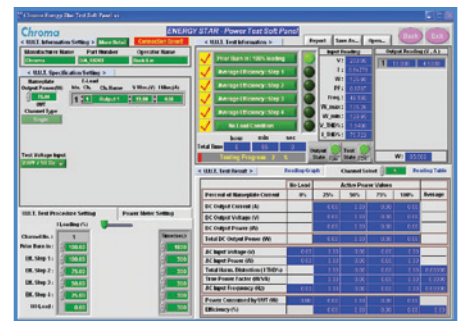
The 66200 Series Power Meters include standalone graphical user interface software (SoftPanel) for control and data acquisition from a computer via USB or GPIB. Users can view voltage and current waveforms, chart parameter readings over time, select recording parameters and durations, and save long-term measurement data to a file for analysis. In 1P2W (Single-Phase Two-Wire) mode using a designated single measurement channel, the software measures harmonic components for IEC 61000-3-2 harmonic current limit testing (pre-compliance). The Power Efficiency Test Softpanel integrates the 66203/66204 Power Meters, electronic loads, and AC sources in 1P2W mode using a designated single measurement channel. After users configure the test according to the applicable energy-efficiency requirements, the software automatically follows the specified test procedure and generates a report, supporting R&D and quality assurance testing.



66200 Softpanel

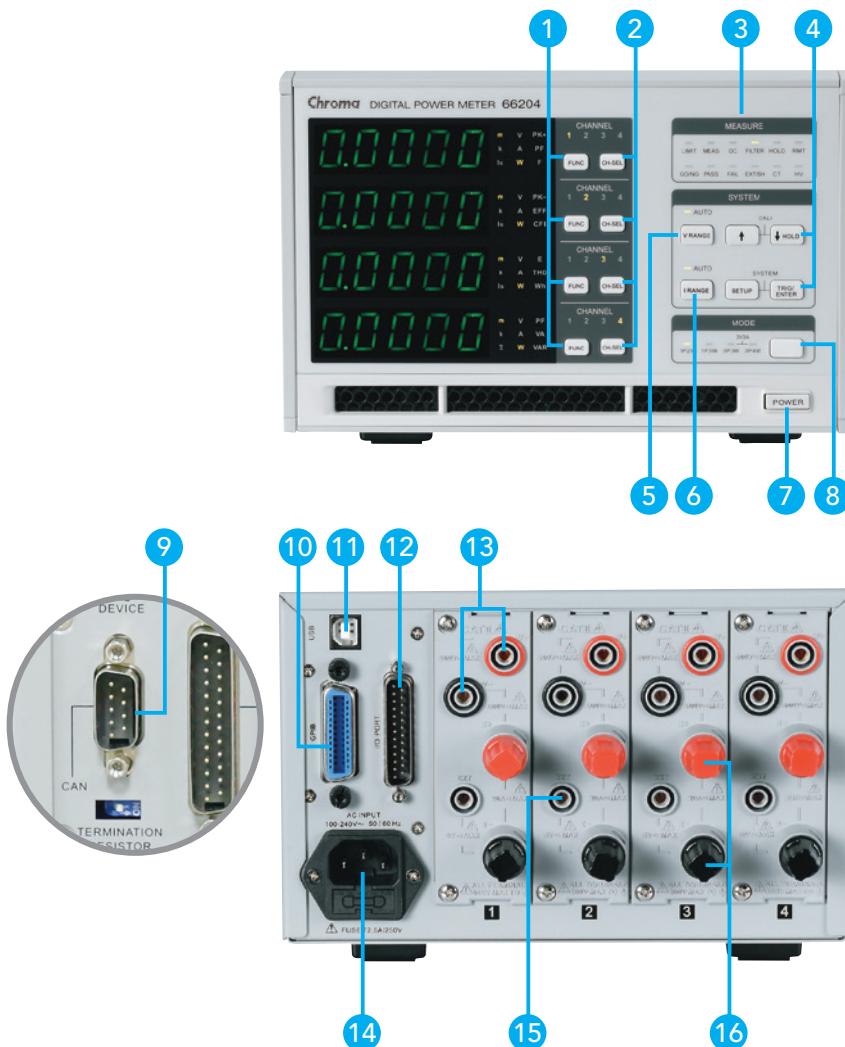


IEC 61000-3-2 Harmonic Current Test (Pre-Compliance)



Power Efficiency Test Softpanel

PANEL DESCRIPTION



1. Parameter selection key
2. Channel selection key
3. System and function indicators
4. System configuration keys
5. Voltage range selection key
6. Current range selection key
7. Power ON/OFF switch
8. Wiring mode selection key
9. CAN interface
10. GPIB remote interface
11. USB remote interface
12. Control I/O connector
13. Voltage measurement inputs
14. AC power input
15. External shunt input
16. Current measurement inputs

SPECIFICATIONS

Model	66203	66204
Channels	3	4
Parameters	V, Vpk, I, Ipk, Is, W, VA, VAR, PF, CFI, F, THD V, THD I, E	
Voltage	15V/30V/60V/150V/300V/600Vrms (CF=2), 6 range HV option up to 1800Vrms	
Range	DC, 10Hz to 1kHz: 0.1% RD + 0.08% RNG 1kHz to 10kHz: (0.1+0.05 x kHz)% RD + 0.08% RNG	
Accuracy	DC, 10Hz to 1kHz: 0.1% RD + 0.08% RNG 1kHz to 10kHz: (0.1+0.05 x kHz)% RD + 0.08% RNG	
Harmonics Accuracy	DC, 10Hz to 1kHz: 0.1% RD + 0.08% RNG 1kHz to 10kHz: (0.1+0.05 x kHz)% RD + 0.08% RNG	
Input Resistance	4MΩ	
AC/DC Current	5mA/20mA/50mA/200mA/500mA/2A/5A/20Arms (CF=4)	
Range	DC, 10Hz to 1kHz: 0.1% RD + 0.1% RNG 1kHz to 10kHz: (0.1+0.05 x kHz)% RD + 0.1% RNG	
Accuracy	10Hz to 1kHz: 0.1% RD + 0.1% RNG 1kHz to 10kHz: (0.1+0.05 x kHz)% RD + 0.1% RNG	
Harmonics Accuracy	0.1% RD + 0.1% RNG	
DC Current Accuracy	0.1% RD + 0.1% RNG	
Power	75mW to 12kW (48 ranges)	
Range	47Hz to 63Hz: 0.1% RD + 0.1% RNG 1KHz to 10KHz: (0.1+0.1 x kHz)% RD + 0.18% RNG	
Accuracy	0.001+(15ppm/PF) x Hz	
Power Factor Accuracy	0.001+(15ppm/PF) x Hz	
Frequency	DC, 10Hz to 10kHz	
Range	0.06% RD	
Accuracy	Voltage Source	
Frequency Source	Voltage Source	
Others	5 Digits	
Display Resolution	0.25 sec / 0.5 sec / 1 sec / 2 sec	
Display Update Rate	100 to 240V ± 10%, 50/60Hz	
Input Voltage	GPIB + USB or CAN + USB	
Interface	0°C to 40°C	
Operating Temperature	-40°C to 85°C	
Storage	CE (including EMC & LVD)	
Safety & EMC	133 x 212 x 420 mm / 5.25 x 8.25 x 16.3 inch	
Dimensions (H x W x D)	7.5 kg / 16.5 lbs	
Weight	8.5 kg / 18.7 lbs	

* The specifications are valid only after the power meter has been powered on for more than one hour in a thermally stable environment.

ORDERING INFORMATION

66203: Digital Power Meter (3 CH with GPIB & USB interfaces)
 66203: Digital Power Meter (3 CH with CAN & USB interfaces)
 66204: Digital Power Meter (4 CH with GPIB & USB interfaces)
 66204: Digital Power Meter (4 CH with CAN & USB interfaces)
 A662008: Power Efficiency Test Softpanel
 A662009: Softpanel for 66200 Series
 A662010: Rack Mount Kit for 1 unit
 A662012: 1200V HV option kit
 A662013: External CT 50Arms
 A662014: External CT 100Arms
 A662015: Voltage and current measurement cables for Model 66204
 A662016: Voltage and current measurement cables for Model 66203
 A662017: Ultra High Precision DCCT 60A

A662018: Ultra High Precision DCCT 200A
 A662023: 1800V HV option kit
 A662024: DCCT Power Adapter for single channel
 A662025: DCCT Power Adapter for multiple channel
 B662002: Rack Mount Kit
 B662004: 1200A AC Current Clamp
 B662005: Alligator Clips
 L11-002987: Ultra High Precision DCCT 400A peak
 L11-002986: Ultra High Precision DCCT 600A peak
 L11-002985: Ultra High Precision DCCT 1000A peak

Get more product and global distributor information in the Chroma ATE APP



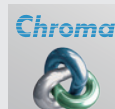
A662024



A662025



iOS



Android

Search Keyword
66203 or 66204

HEADQUARTERS
CHROMA ATE INC.
88 Wenmao Rd.,
Guishan Dist.,
Taoyuan City
333001, Taiwan
T +886-3-327-9999
F +886-3-327-8898
www.chromaate.com
info@chromaate.com

U.S.A.
CHROMA SYSTEMS
SOLUTIONS, INC.
19772 Pauling,
Foothill Ranch,
CA 92610
T +1-949-600-6400
F +1-949-600-6401
www.chromausa.com
sales@chromausa.com

GERMANY
CHROMA GERMANY GMBH
Südtiroler Str. 9, 86165,
Augsburg, Germany
T +49-821-790967-0
F +49-821-790967-600
www.chroma.eu.com
salesde@chromaeu.com

THE NETHERLANDS
CHROMA ATE EUROPE B.V.
Zonnebaan 35, 3542 EB
Utrecht, The Netherlands
T +31-318-648282
F +31-318-648288
www.chroma.eu.com
salesnl@chromaeu.com

JAPAN
CHROMA JAPAN
CORP.
888 Nippa-cho,
Kouhoku-ku,
Yokohama-shi,
Kanagawa,
223-0057 Japan
T +81-45-542-1118
F +81-45-542-1080
www.chroma.co.jp
info@chroma.co.jp

KOREA
CHROMA ATE
KOREA BRANCH
B-1002, 253, Pangyo-ro,
Bundang-gu,
Seongnam-si,
Gyeonggi-do,
Republic of Korea
T +82-31-781-1025
F +82-31-8017-6614
www.chromaate.co.kr
info@chromaate.com

CHINA
CHROMA ELECTRONICS
(SHENZHEN) CO., LTD.
8F, No.4, Nanyou Tian
An Industrial Estate,
Shenzhen, China
T +86-755-2664-4598
www.chroma.com.cn
info@chromaate.com

SINGAPORE & SEA
QUANTEL PTE LTD.
(A company of Chroma Group)
25 Kallang Avenue #05-02
Singapore 339416
T +65-6745-3200
F +65-6745-9764
www.quantel-global.com
sales@quantel-global.com