

MODEL 66203/66204

KEY FEATURES

- Voltage Ranges :
15/30/60/150/300/600 Vrms,
1200Vrms, 1800Vrms (optional kits)
- Current Ranges :
0.005/0.02/0.05/0.2/0.5/2/5/20 Arms
- Frequency Range : DC, 10Hz~10kHz
- Embedded high speed DSP,
16 bits Analog/Digital converters
- Half rack size, up to 4 input modules
- Supports various single and 3 phase
wiring configurations (see diagram)
- Supports external shunt and CT for
higher current applications
- 5 mA minimum current range &
0.1mW power resolution
- Meets ENERGY STAR / EN 50564 /
IEC 62301 / ErP / SPEC Power
- Includes accumulated energy methods for
unstable power measurement
- User-define criteria provides automatic
PASS/FAIL indications
- Dual current shunt design provides high
accuracy over a wide current range
- THD and user-specify order distortion
measurement
- Inrush current and energy measurements
- Voltage / Current harmonics measurements
up to 50 orders
- Support ultra high precision DCCT
60A/200A optional kit for high current
measurement application

DIGITAL POWER METER MODEL 66203/66204

Chroma 66203/66204 Power Meters are designed for multiple phase power measurement applications. The wiring mode function allows the user to take accurate power measurements for various wiring modes 1P2W/1P3W/3P3W/3P4W/3V3A as well as providing accurate standard power measurements common for most electrical devices. A unique feature of the 66203/66204 is its state-of-the-art DSP digitizing technology instead of less accurate and slower traditional analog circuits. The internal 16 bits analog/digital converters with sampling rates of up to 250kHz provide both high speed and high accuracy measurements which is unprecedented within the industry for this class of power meters.

The instruments include a four part display with 7-segment LED front panel readouts. Users can easily select desired parameters and readouts with a touch of a button. The 66203/66204 meters also include remote control using USB and GPIB/CAN (alternative) standard interfaces via rear panel connections.

The 66203/66204 are packaged in a 3U high, half rack enclosure suitable for bench top or system integration. The power meters are capable of supporting external shunts and CT for higher current application. The 4 channel 66204 is suitable for input and output parameter measurement and efficiency of 3 phase PV inverters can be calculated with measurement of the DC voltage/current at the input side of the inverter.

The 66203/66204 power meters include a 2-shunt design to provide high accurate readings for both low and high current measurements. The power meters also support features such as Inrush current, Total Harmonic Distortion of V/I, and Energy measurements. With these practical functions, the 66203/66204 power meters are suitable for meeting the demanding tasks of R&D, production and quality control departments.



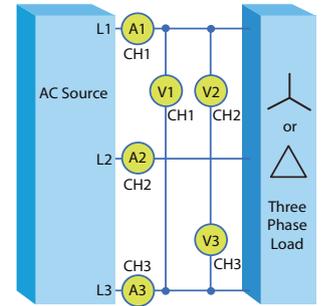
Chroma

FUNCTIONS AND APPLICATIONS

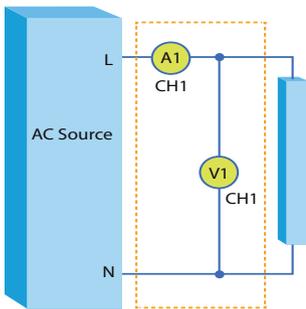
The multi-channel of 66203/66204 Power Meters are capable of supporting different wiring modes. As shown the instruments can be configured for single and 3 phase configurations by selection preset modes.



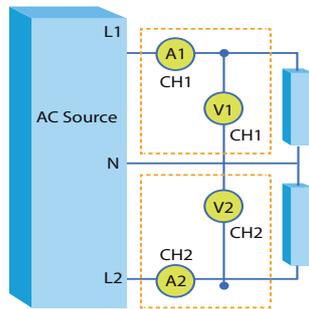
| | Channel 1 | Channel 2 | Channel 3 | Channel 4 |
|---|-----------|-----------|-----------|-----------|
| 1P2W (Single Phase Two Wire) | 1P2W | 1P2W | 1P2W | 1P2W |
| 1P3W (Single Phase Three Wire) | 1P3W | | 1P2W | 1P2W |
| 3P3W (Three Phase Three Wire-Two Watt Meter Method) | 3P3W | | 1P2W | 1P2W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



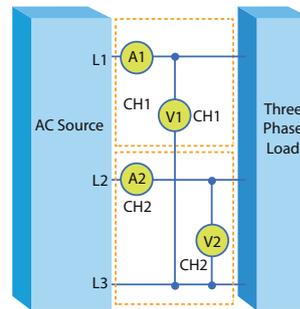
3V3A (Three Phase Three Wire)



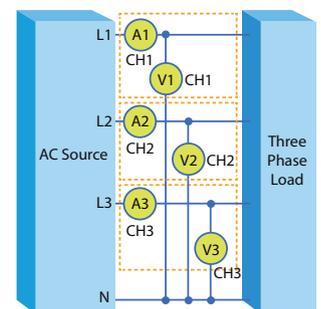
1P2W (Single Phase Two Wire)



1P3W (Single Phase Three Wire)

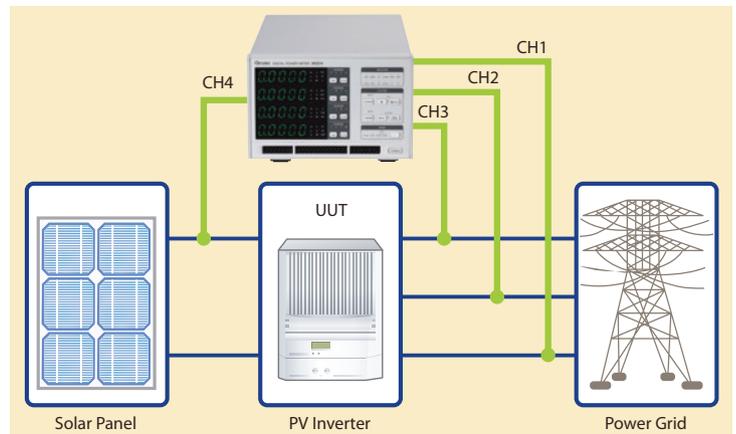


3P3W (Three Phase Three Wire)

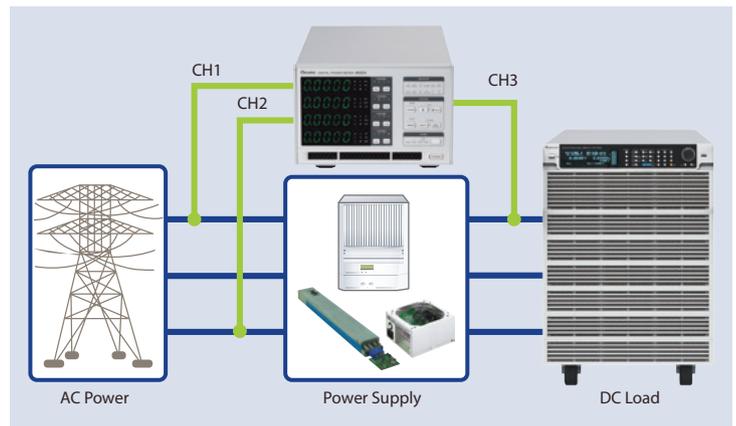


3P4W (Three Phase Four Wire)

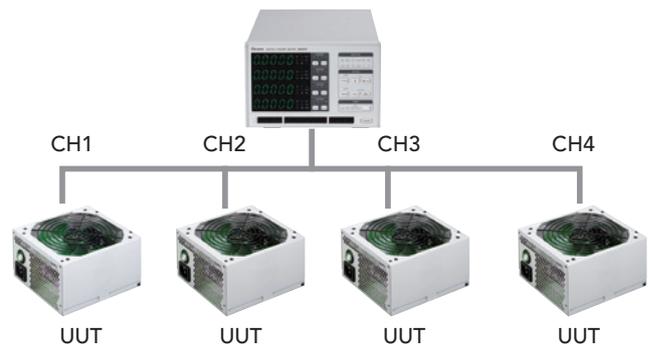
Each channel of 66203/66204 has the ability to provide independent measurements; hence the meters are suitable for multi-point measurement applications such as PV inverter testing. Instruments are designed for measuring DC input parameters as well as three phase AC readings on the output side. The overall efficiency for the PV inverter can easily be obtained by built-in functions. In order to meet high voltage applications (up to 1800Vrms) Chroma offers an HV option kit.



User could implement 3P3W (Three Phase Three Wire) wiring mode for three phase power measurement application. Such as Power Supplies.

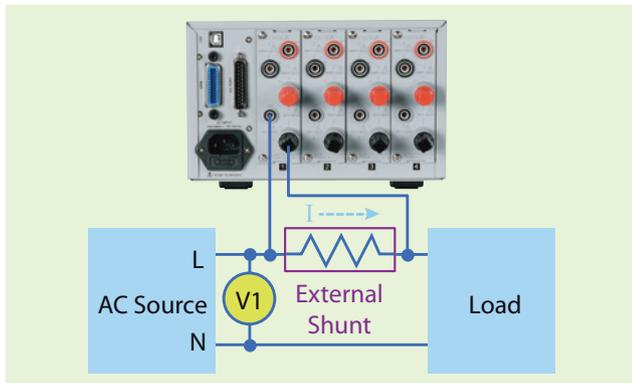


With the wiring mode set as 1P2W, the 66204 Power Meter has the capability of performing up to 4 simultaneous power measurements as shown. The meters are also designed to comply with power measurement requirements in accordance to many international standards such as Energy Star/EN 50564/IEC 62301/ErP.



User-defined Criteria for GO/NG Test

The Power Meters allow users to perform GO/NG functions by presetting pass/fail limits. If the measured values are within these limits, the Pass indicator illuminates green. Fail results in red illumination.



66203/66204 Power Meters support external shunt function for high current (>20A) measurement application.

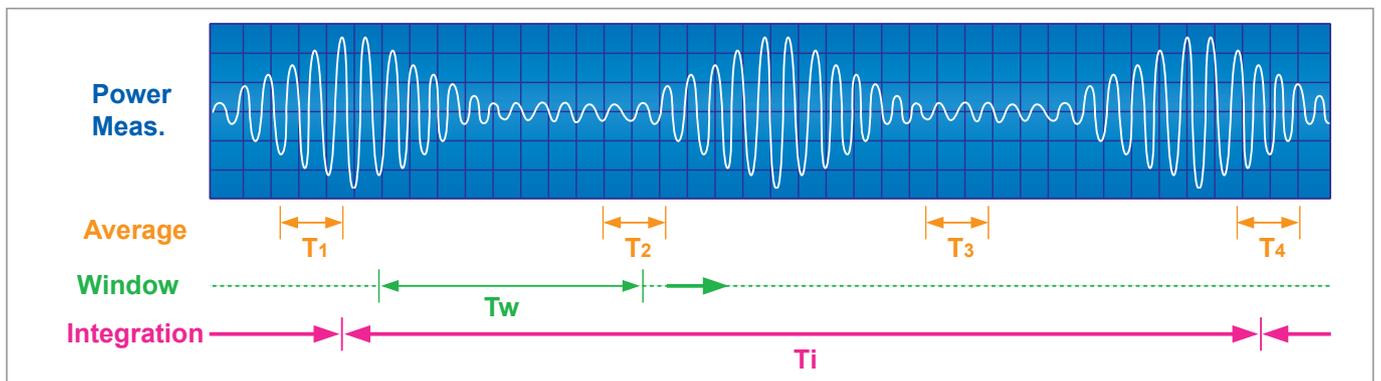


Compact size design allows two 66203/66204 Power Meters to be configured side-by-side in a standard 19" rack

Average Mode and Integration Mode for Power Measurement

When using a traditional power meter, unstable measurements can occur if the UUT's power consumption are unstable or operating in non-linear modes (i.e. a power supply's hiccup mode). In these cases the load levels maybe different at different measurement aperture windows (T1, T2, T3 and T4 below). A simple averaging calculation can only provide a visual stable value but provides inaccurate power readings.

The 66203/66204 includes a Window Mode method which calculates all data within the user-defined time window (Tw). In this manner users can obtain a real average value without data lose. An accumulated energy approach method (i.e. integration mode) for power measurements is also provided. This integration mode calculates active power values by integrating energy from V and I in a user-defined time period (Ti). In this way, users can achieve accurate readings with guaranteed transient-free variations. The 66203/66204 meters provide a 5mA minimum current range with crest factor 4, and 0.1mW measurement resolution for low power application (<10W), and less than 2% uncertainty even for No-Load mode power measurements. These functions make 66200 an ideal choice for ENERGY STAR / IEC 62301 / ErP / SPEC Power measurement.



THD Measurement and User Define Level of Distortion

The 66203/66204 Power Meters can measure voltage and current Total Harmonic Distortion (THD) directly which can be displayed in percentage format. For some requirements (ENERGY STAR), users need to verify the THD of AC supply voltage when supplying the UUT in the specified mode not to exceed 2%, up to and including the 13th harmonic (as specified in IEC 62301).

The 66203/66204 also provides a function to define a user-specify level of distortion n, (n is from 2 to 50) for measuring harmonic distortion. The calculation formula is listed below. Thus, the instrument can easily measure distortion values as required by the ENERGY STAR requirements.

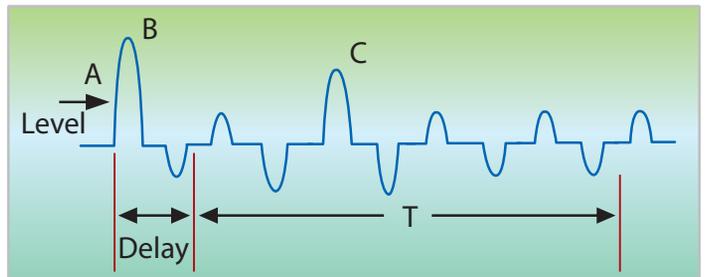
$$THD_V = \frac{\sqrt{V_2^2 + V_3^2 + V_4^2 + V_5^2 + \dots + V_n^2}}{V_1}$$

Where V_n = rms value of nth harmonic of the voltage signal.

Inrush Current Measurement

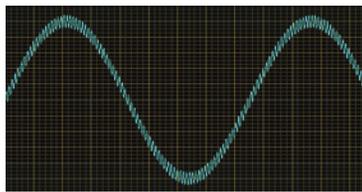
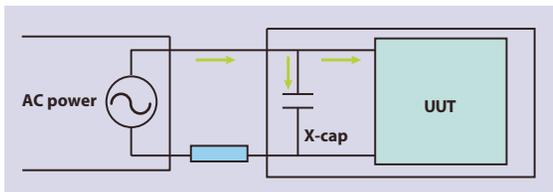
The 66203/66204 Power Meters include built-in inrush current (I_s) measurement functions. Users can even set a current level for triggering the starting point of the measurement. Users also can use an external TTL signal to trigger inrush current measurements through the control I/O signal port located at the rear side.

The delay parameter can help users to bypass the peak value B after the trigger point A. The parameter, T, allows a set time period to be established for measuring the peak value during a preset time (T). The main purpose is to avoid measuring the inrush current value that is generally caused by X-capacitor of a power supply.

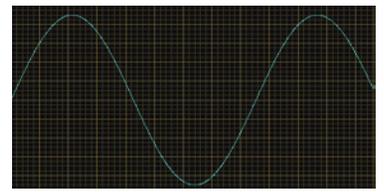


Low Pass Filter

The maximum measurement bandwidth of the 66203/66204 Power Meters is 50kHz. However, the high frequency component is not desirable in all applications. For example, the input switching noise of some power supplies may influence the power measurement. In order to achieve a proper value, a low pass filter is necessary to reject the switching component. Users can set the parameter filter ON in the system configuration setting. The bandwidth will be reduced to 5kHz to reject high frequency content but still meets the 3kHz requirement of ENERGY STAR test.

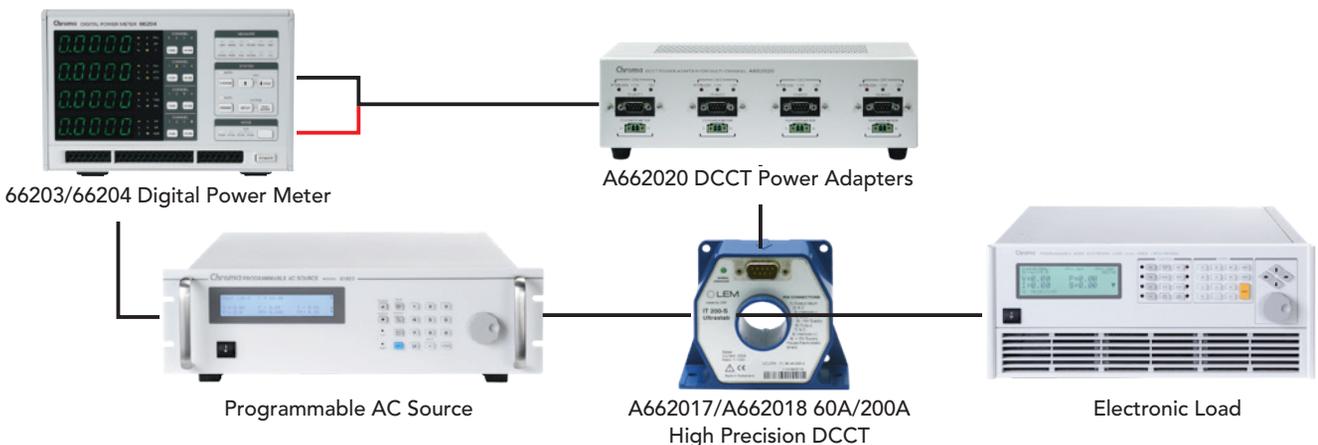


Filter Off : Bandwidth = 50kHz



Filter On: Bandwidth = 5kHz
(meets the 3kHz requirement of Energy Star)

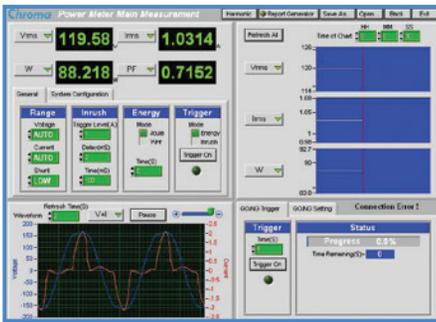
Support Ultra High Precision DCCT 60A/200A Optional Kit for High Current Measurement Application



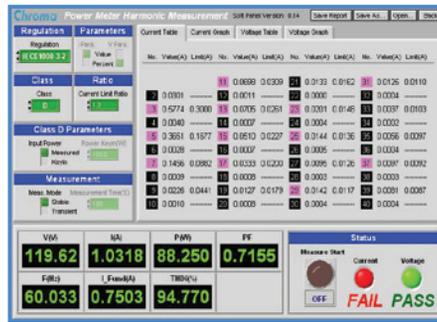
POWER EFFICIENCY SOFTPANELS

The 66200 Power Meters provide graphical user interface software (Softpanels) which allow users to control and read measured parameters from a computer via USB or GPIB interface. Users can easily observe measured voltage and current waveforms and monitor the changes in parameter readings by using the chart function. Additional features include a recording function which can record selected parameters and write data to a file for further analysis. The 66200 Softpanels supports IEC 61000-3-2* harmonic current limit test (pre-compliance) allowing users to examine whether the UUT has met the harmonic current requirement. The Power Efficiency Softpanel* also integrates with Chroma's electronic loads and AC Sources to provide an easy method of power efficiency testing and recording of data using the test report function which automatically generates a report at the completion of testing.

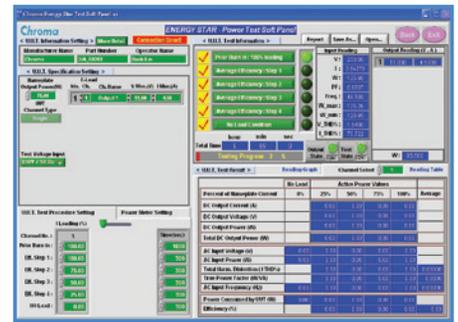
(*Only support by 1P2W with designated single channel)



66200 Softpanel

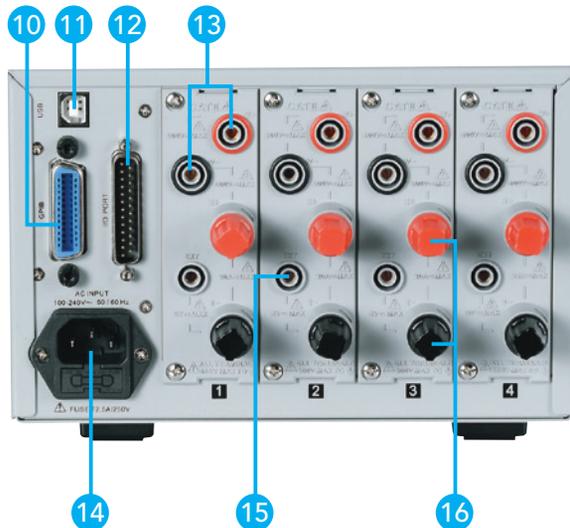
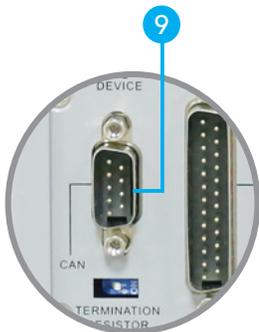
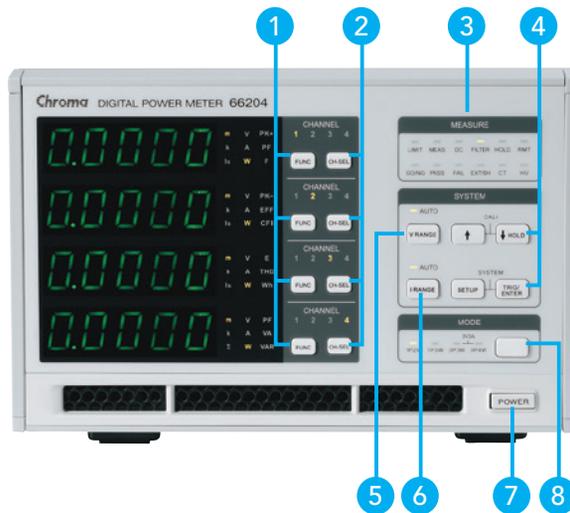


IEC 61000-3-2 Current Harmonics Test (Pre-compliance)



Power Efficiency Test Softpanel

PANEL DESCRIPTION



1. Parameter selection key
2. Channel selection key
3. System setting and function indicator
4. System configuration setting
5. Voltage range selection key
6. Current range selection key
7. Power ON/OFF switch
8. Wiring mode selection key
9. CAN interface (66204)
10. GPIB remote interface (66203/66204)
11. USB remote interface (66203/66204)
12. Control I/O signals
13. Voltage measurement inputs
14. AC input power
15. External shunt input
16. Current measurement inputs

SPECIFICATIONS

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

* The specifications are valid only after the power meter is turned on more than one hour in a thermally stable environment.

ORDERING INFORMATION

66203 : Digital Power Meter (3 CH with GPIB & 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 for Model 66203/66204
 A662014 : External CT 100Arms for Model 66203/66204

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
 A662019 : DCCT Power Adapter for single channel
 A662020 : DCCT Power Adapter for multi- channels
 A662023 : 1800V HV option kit

Get more product and global distributor information in Chroma ATE APP



A662019



A662020



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

EUROPE
 CHROMA ATE
 EUROPE B.V.
 Morsestraat 32,
 6716 AH Ede,
 The Netherlands
 T +31-318-648282
 F +31-318-648288
 www.chroma.eu.com
 salesnl@chroma.eu.com

CHROMA GERMANY GMBH
 Südtiroler Str. 9, 86165,
 Augsburg, Germany
 T +49-821-790967-0
 F +49-821-790967-600
 www.chroma.eu.com
 salesde@chroma.eu.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
 3F Richtogether
 Center, 14,
 Pangyoeyeok-ro 192,
 Bundang-gu,
 Seongnam-si,
 Gyeonggi-do
 13524, 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
 F +86-755-2641-9620
 www.chroma.com.cn
 info@chromaate.com

SOUTHEAST ASIA
 QUANTTEL PTE LTD.
 (A company of Chroma Group)
 25 Kallang Avenue #05-02
 Singapore 339416
 T +65-6745-3200
 F +65-6745-9764
 www.quanttel-global.com
 sales@quanttel-global.com