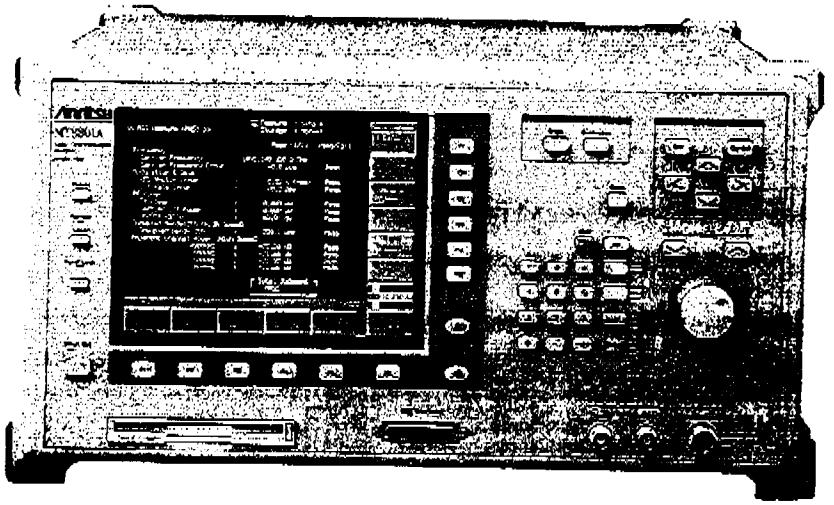
RADIO COMMUNICATION ANALYZER
MT8801A
300 kHz to 3 GHz

NEW



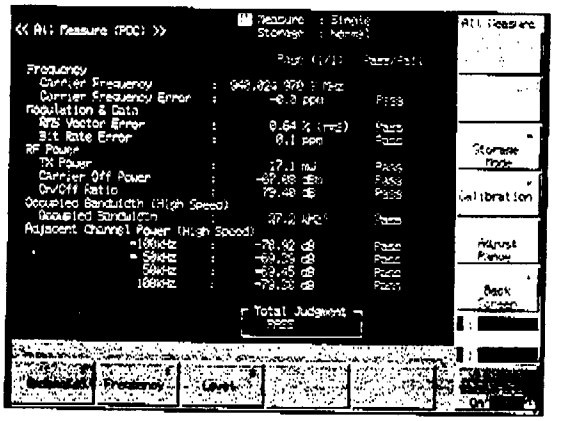
GPIB

The MT8801A can be used to test mobile and base station equipment of PDC or PHS by installing exclusive measurement software options. It incorporates a thermocouple power meter, a transmitter tester, a digital modulation signal generator and a bit error tester, covering the frequency range from 300 kHz to 3 GHz, for efficient and reliable transmission and reception testing.
In transmission tests, Anritsu's unique DSP (digital signal processing) high-speed measurement method has been developed in addition to measurement methods based on RCR and MKK standards. As a result, measurement time is greatly reduced for improved efficiency in production and maintenance.
Occupied bandwidth and adjacent channel power can be measured either by methods conforming to RCR standards and Technical Standard Conformity Certification, or using Anritsu's unique high-speed DSP measurement method.
For RCR standards, a spectrum analyzer is used to determine the occupied bandwidth and adjacent channel power from the burst signal frequency spectrum. In this method, frequency sweeps must be performed slowly to obtain an accurate burst wave spectrum, so measurement speed falls. For example, more than 10 seconds are required when measuring PDC. With Anritsu's unique measurement method, digital signal processing is used to compute the frequency components from a signal burst signal waveform, and the occupied bandwidth and adjacent channel power are computed from the results. Measurement time of approx.1 second and less are possible for PDC transmitters.
GPIB and RS-232C interfaces are standard, so MT8801A can be incorporated easily into automated production lines or on-site automated testing systems.

Features
- 1 unit for both PDC and PHS systems
- All basic transmission and reception measurements performed by 1 unit
- Ten transmission tests in approx. 1 second

Transmission test
- **Batch measurements of transmission test items**

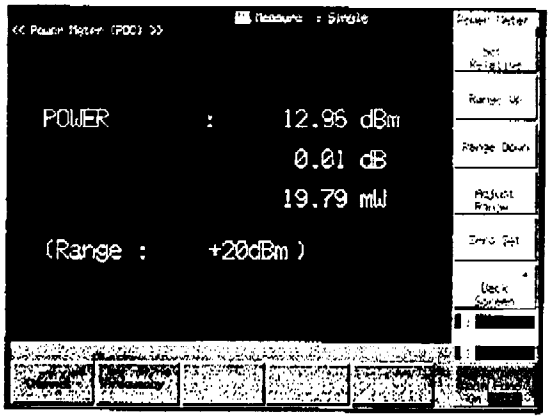
Only about 1 second is required to measure all major transmission test items, transmission frequency, modulation accuracy, origin offset, transmission rate, transmission power, leakage power during carrier-off, GO/NO decision of rise/fall edge characteristics with template (limit line), rise/fall time, occupied bandwidth, and adjacent channel power. Pass/fail decisions for limit value of each test item can also be displayed.



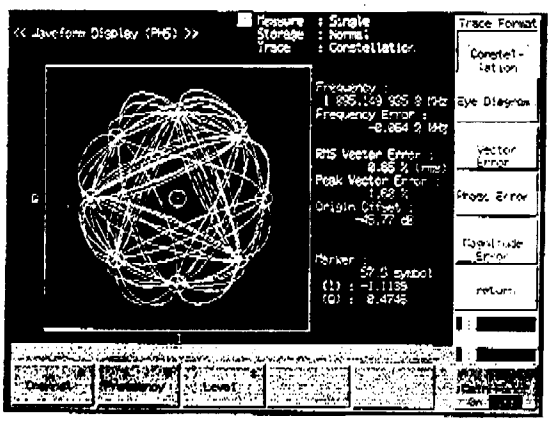
- **Calibration functions**

A built-in thermocouple power sensor is used for calibration, providing accurate measurement of absolute values such as average power during burst-on and leakage power during carrier-off. There is no need for other instruments; Just one press of the CAL key during measurement performs calibration.

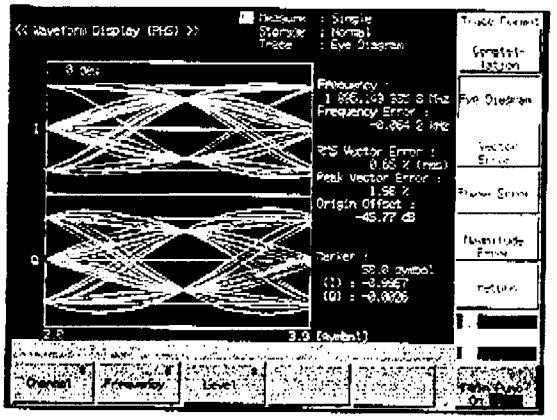
• Wide-band power meter
The power meter with built-in thermocouple power sensor can accurately measure power between 0 and +40 dB.



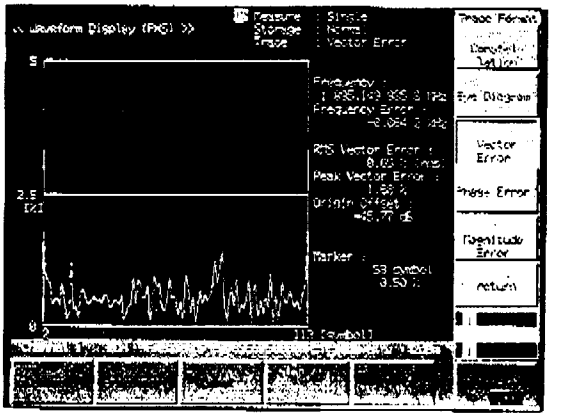
• Constellation display functions
The I/Q vector components of measured signals are displayed. The frequency error, RMS/PEAK vector errors, and origin offset can be shown on the same screen.



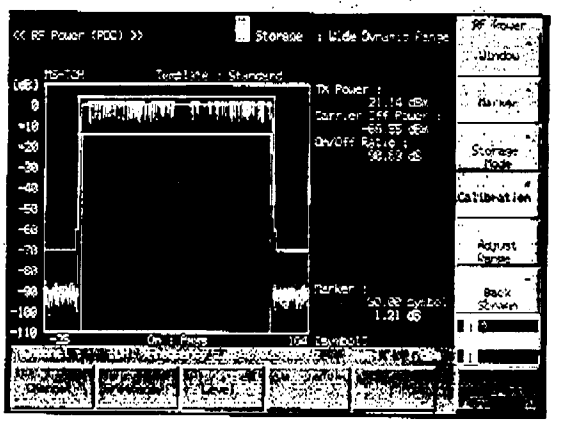
• Eye diagrams
Eye margins at symbol points are displayed.



• Vector errors at symbols
The vector errors at each symbol points are displayed.

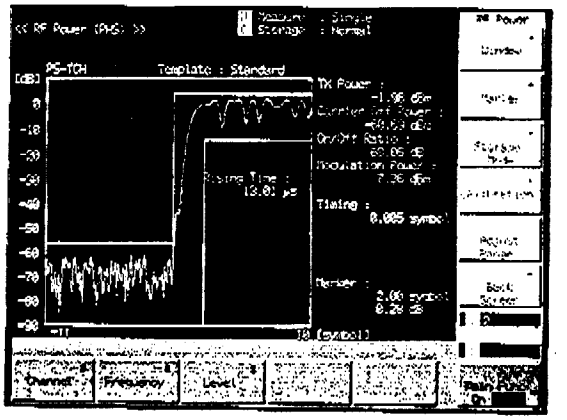


• Measurement of antenna power and leakage power during carrier-off
At measurement of burst signal antenna power, the burst-on section are auto-detected based on the modulated wave, so an external synchronization trigger is not needed. In addition, the average power during burst-on section is automatically matched to a template value, simplifying measurement automation. Any template can be set, and three types can be stored. The leakage power during carrier-off can be measured as either an absolute value or as an on/off ratio. When the carrier-off power is low, measurements can be performed in wide-dynamic-range mode (during single-mode measurements with synchronizing word).



Wide-dynamic-range mode

• Measurement of antenna power rise/fall edge characteristics
Antenna power rise/fall edge characteristics can be measured simultaneously with antenna power measurements. In addition, the marker points can be moved and the power can be read directly on 1/10 symbol resolution.



Rise edge characteristics

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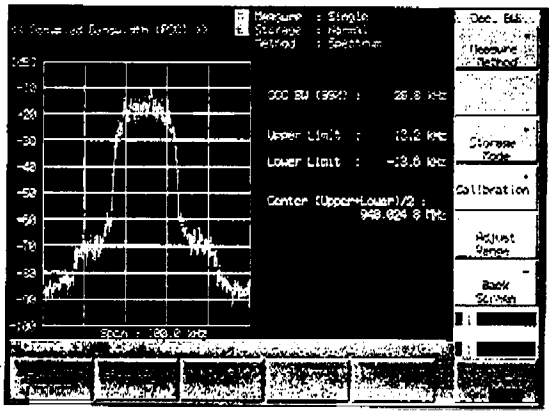
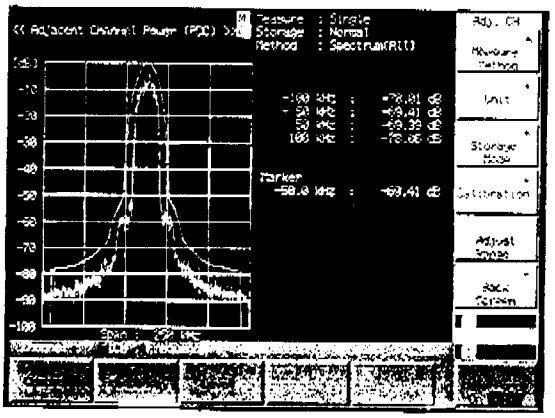
● Measurement of occupied bandwidth
The standard measurement mode using the spectrum analyzer method, or the high-speed measurement mode, which reduces measurement time, can be used.



Standard measurement mode

● Measurement of adjacent channel power
The standard measurement mode using the spectrum analyzer method, or the high-speed measurement mode, which reduces measurement time, can be used.

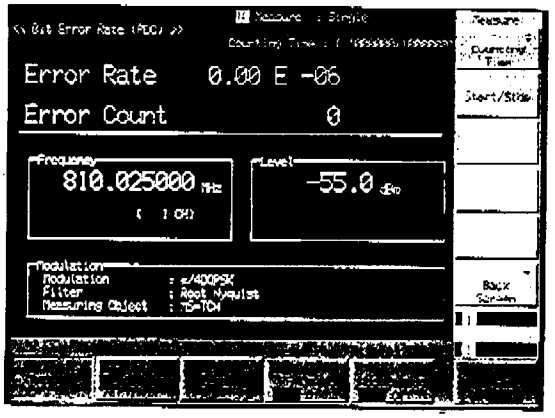


Standard measurement mode

Receiver test

● Digital modulation signal generator
The MT8801A has a digital modulation signal generator covering 300 kHz to 3 GHz for reception sensitivity measurement. And the MT8801A has a TDMA system frame structure and modulation patterns for each time slot covering the communication system standards. Modulation pattern for up/down communication channels are provided, and are output at the system required timing by using the trigger input/output signal. Hence the MT8801A can generate the burst signals needed to measure the receiver sensitivity.

● Measurement of reception sensitivity
PN9 and PN15 error rates can be measured. The number of measurement bits can be chosen from among 10^2, 2558, 10^3, 10^4, 10^5, 10^6, and ∞. The number of errors and error rate are displayed. When used with external signal generator for interference signal source, adjacent channel selectivity, intermodulation and other parameter can be measured.



BER measurement

Specifications

● MT8801A

Frequency range	300 kHz to 3 GHz
Maximum input level	+40 dBm (10 W): MAIN input, +20 dBm (100 mW): AUX input
Input/output impedance (MAIN)	50 Ω, VSWR: ≦1.2 (≦2.2 GHz), ≦1.3 (>2.2 GHz)
Input/output connector	N-type (MAIN), TNC-type (AUX)
Reference oscillator	Frequency: 10 MHz Starting characteristics: ≦5 × 10^{-8}/day (after 10 minutes of warm-up, compared to frequency after 24-hour warm-up) Aging rate: ≦2 × 10^{-8}/day, ≦1 × 10^{-7}/year (compared to frequency after 24-hour warm-up) Temperature characteristics: ≦5 × 10^{-8} (0° to 50°C, compared to frequency at 25°C) External reference input: 10 MHz or 13 MHz (±1 ppm), 2 to 5 Vp-p
Power meter	Frequency range: 300 kHz to 3 GHz Level range: 0 to +40 dBm Measurement accuracy: ±10% (after zero-calibration)

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Signal generator	Frequency Range: 300 kHz to 3 GHz Resolution: 1 Hz Accuracy: Reference oscillator accuracy ±10 mHz Output level Setting range: −143 to −28 dBm (MAIN output), −143 to −3 dBm (AUX output) Level accuracy: ±1.5 dB (≧10 MHz, ≦1 GHz, ≧−123 dBm), ±3 dB (≧10 MHz, ≦1 GHz, ≧−133 dBm), ±2 dB (>1 GHz, ≧−123 dBm), ±4 dB (>1 GHz, ≧−133 dBm), ±3 dB (<10 MHz, ≧−28 dBm) *At 18° to 28°C Radiated interference: 1 μV/50 Ω (carrier frequency measured, 25 mm from front panel with two-turn 25-mm diameter loop antenna) Signal purity Spurious: ≦−50 dBc (offset frequency of ≧100 kHz and ≦50 MHz, except carrier frequency of 1350 MHz ±50 MHz and 2050 MHz ±50 MHz), ≦−40 dBc (all range) Harmonics: ≦−25 dBc
Others	Display: Color TFT-LCD, 7.8 inches, 640 × 480 dots Hard copy: At external printer via parallel interface (printer: ESC/P compatible printer) GPIB: All functions except power switch controlled by external controller (interface functions: SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0, E2) Parallel interface: Centronics (for printer), D-sub 25-pin connector RS-232C: All functions except power switch controlled by external controller (baud rate: 1200, 2400, 4800, 9200 bps)
Dimensions and mass	221.5H × 426W × 451D mm, ≦22 kg
Power	85 to 132 Vac/170 to 250 Vac (automatic voltage change), 47.5 to 63 Hz, ≦300 VA
Operating temperature	0° to 50°C

● Option 11 (PDC measurement software)

Transmission measurement	Frequency/modulation measurement	Frequency: 10 MHz to 2.2 GHz Input level range: −5 to +40 dBm (average power of burst signal, MAIN connector) −30 to +15 dBm (average power of burst signal, AUX connector) Carrier frequency measurement accuracy: ±(reference oscillator accuracy + 1 Hz) Modulation accuracy: ±(2% of indicated value + 0.5%) Origin offset accuracy: ±0.5 dB (relative to signal of −30 dBc) Transmission rate Measurement range: 42 kHz ±100 ppm Accuracy: ±1 ppm Waveform display: Constellation display
	Amplitude measurement	Frequency range: 10 MHz to 2.2 GHz Input level range: +10 to +40 dBm (average power of burst signal, MAIN connector) Transmission power accuracy: ±10% (MAIN connector, after calibration) Carrier-off power measurement range: ≧65 dB (normal mode, compared to average power of burst signal) ≧95 dB (wide dynamic range mode, compared to average power of burst signal: 3 W) *Measured limit determined by average noise level (≦−60 dBm, 100 MHz to 2.1 GHz) Rise/fall edge characteristics: Displays waveform while synchronizing modulation data to measured signal, displays limit line, measures rise/fall edge time (measured at 100 kHz bandwidth)
	Occupied bandwidth measurement	Frequency range: 10 MHz to 2.2 GHz Input level range: +10 to +40 dBm (average power of burst signal, MAIN connector) Standard mode: Displays calculation result after signal measured with sweep-type spectrum analyzer High-speed mode: Displays calculation result after FFT of signal measured
	Adjacent channel power measurement	Frequency range: 100 MHz to 2.2 GHz Input level range: +10 to +40 dBm (average power of burst signal, MAIN connector) Standard mode: Displays calculation result after signal measured with sweep-type spectrum analyzer High-speed mode: Displays calculation result after analyzing signal (one burst) with spectrum analyzer emulation Measurement range: ≧60 dB (50 kHz offset), ≧65 dB (100 kHz offset)
	Batch measurement function	Measurement item: Transmission frequency, frequency error, modulation accuracy, origin offset, transmission rate, antenna power, leakage power during carrier-off, GO/NO decision of rise/fall edge characteristics with template (limit line), rise/fall time, occupied bandwidth, adjacent channel power Measurement time: ≦1.5 s (amplitude measurement: normal mode; occupied bandwidth and leakage power of adjacent channel measurement; high-speed mode), ≦2 s (amplitude measurement; wide dynamic range mode: occupied bandwidth and leakage power of adjacent channel measurement; high-speed mode)
Reception measurement	Signal generator	Frequency range: 10 MHz to 3 GHz Level setting range: −143 to −28 dBm (MAIN connector), −143 to −3 dBm (AUX connector) Modulation system: π/4 DQPSK, α = 0.5 (root-Nyquist filter) Modulation accuracy: ≦3%rms Burst repetition rate: 20 ms (normal), 40 ms (half rate) *Single burst output in one frame Modulation data At continuous signal output: PN9/PN15 pseudorandom pattern, any 4-bits repetition pattern At burst signal output: Up/down communication channel selectable, edits data within slots
	Error rate measurement	Function: Sync with signal generator modulation data and measures error rate Measurement pattern: PN9, PN15 Input level: TTL (NRZ) Number of measurement bits : 10^2, 2556, 10^3, 10^4, 10^5, 10^6, ∞ Input connector: BNC (rear panel) or DUT interface (front panel, D-sub 25-pin connector)

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● **Option 12 (PHS measurement software)**

Transmission measurement	Frequency/modulation measurement	Frequency: 10 MHz to 2.2 GHz Input level range: −5 to +40 dBm (average power of burst signal, MAIN connector) −30 to +15 dBm (average power of burst signal, AUX connector) Carrier frequency measurement accuracy: ±(reference oscillator accuracy +10 Hz) Modulation accuracy: ±(2% of indicated value +0.7%) Origin offset accuracy: ±0.5 dB (relative to signal of −30 dBc) Transmission rate Measurement range: 384 kHz ±100 ppm Accuracy: ±1 ppm Waveform display: Constellation display
	Amplitude measurement	Frequency range: 10 MHz to 2.2 GHz Input level range: +10 to +40 dBm (average power of burst signal, MAIN connector) Transmission power accuracy: ±10% (MAIN connector, after calibration) Carrier-off power measurement range: ≧55 dB (normal mode, compared to average power of burst signal) ≧69 dB (wide dynamic range mode, compared to average power of burst signal: 80 mW) *Measured limit determined by average noise level (≦−50 dBm, 100 MHz to 2.2 GHz) Rise/fall edge characteristics: Displays waveform while synchronizing modulation data to measured signal, displays limit line, measures rise/fall edge time (measured at 1 MHz bandwidth) Transmission timing PS: Measures duration of CS, PS unique word send interval (capable of working with CS or signal generator equivalent to CS) CS: Measures slot send interval time
	Occupied bandwidth measurement	Frequency range: 10 MHz to 2.2 GHz Input level range: +10 to +40 dBm (average power of burst signal, MAIN connector) Standard mode: Displays calculation result after signal measured with sweep-type spectrum analyzer High-speed mode: Displays calculation result after FFT of measured signal
	Adjacent channel power	Frequency range: 100 MHz to 2.2 GHz Input level range: +10 to +40 dBm (average power of burst signal, MAIN connector) Standard mode: Displays calculation result after signal measured with sweep-type spectrum analyzer High-speed mode: Displays calculation result after analyzing signal (one burst) with spectrum analyzer emulation Measurement range: ≧60 dB (600 kHz offset), ≧65 dB (900 kHz offset)
	Batch measurement functions	Measurement item: Transmission frequency, frequency error, modulation accuracy, origin offset, transmission rate, antenna power, leakage power during carrier-off, GO/NO decision of rise/fall edge characteristics with template (limit line), rise/fall time, occupied bandwidth, adjacent channel power Measurement time: ≦1.5 s (amplitude measurement: normal mode; occupied bandwidth and adjacent channel power measurement: high-speed mode), ≦2 s (amplitude measurement: wide dynamic range mode; occupied bandwidth and leakage power of adjacent channel measurement: high-speed mode)
Reception measurement	Signal generator	Frequency range: 10 MHz to 3 GHz Level setting range: −143 to −28 dBm (MAIN connector), −143 to −3 dBm (AUX connector) Modulation system: π/4 DQPSK, α = 0.5 (root-Nyquist filter) Modulation accuracy: ≦3%rms Burst repetition rate: 5 ms (frame period, single burst output in one frame) Modulation data At continuous signal output: PN9/PN15 pseudorandom pattern, any 4-bits repetition pattern At burst signal output: Up/down communication channel selectable, edits data within slots *Scramble function on/off and scramble code setting
	Error rate measurement	Function: Sync with signal generator modulation data and measures error rate Measurement pattern: PN9, PN15 Input level: TTL (NRZ) Number of measurement bits : 10^2, 2558, 10^3, 10^4, 10^5, 10^6, ∞ Input connector: BNC (rear panel) or DUT interface (front panel, D-sub 25-pin connector)

Ordering information

Please specify model/order number, name and quantity when ordering.

Model/Order No.	Name	
	Main frame	
MT8801A	Radio Communication Analyzer	
	Standard accessories	
J0576B	Coaxial cord, N-P·5D-2W·N-P, 1 m:	1 pc
J0768	Coaxial adapter, N-J·TNC-P:	2 pcs
	Power cord:	1 pc
F0014	Fuse, 6.3 A:	2 pcs
W1106AE	MT8801A operation manual:	1 copy
	Options	
MT8801A-11	Measurement software (for PDC)	
MT8801A-12	Measurement software (for PHS)	
	Peripherals	
MS8604A	Digital Mobile Radio Transmitter Tester	
MD1620C	Signalling Tester	
MD6420A	Data Transmission Analyzer	
MS2602A	Spectrum Analyzer	
MG3670B	Digital Modulation Signal Generator	

Model/Order No.	Name
	Optional accessories
J0127C	Coaxial cord, BNC-P·RG-58A/U·BNC-P, 0.5 m
J0769	Coaxial adapter, BNC-J·TNC-P
J0040	Coaxial adapter, N-P·BNC-J
MN1607A	50 Ω Coaxial Switch
MA1612A	Four-Point Junction Pad
J0395	Fixed attenuator for high power (30 dB, 30 W, DC to 9 GHz)
J0007	GPIB cable, 1 m
J0008	GPIB cable, 2 m
B0329D	Front cover (1MW SU)
B0331D	Front handle kit (2 pcs/set)
B0332	Joint plate (4 pcs/set)
B0333D	Rack mount kit
B0334D	Carrying case (hard type with protective cover and casters)