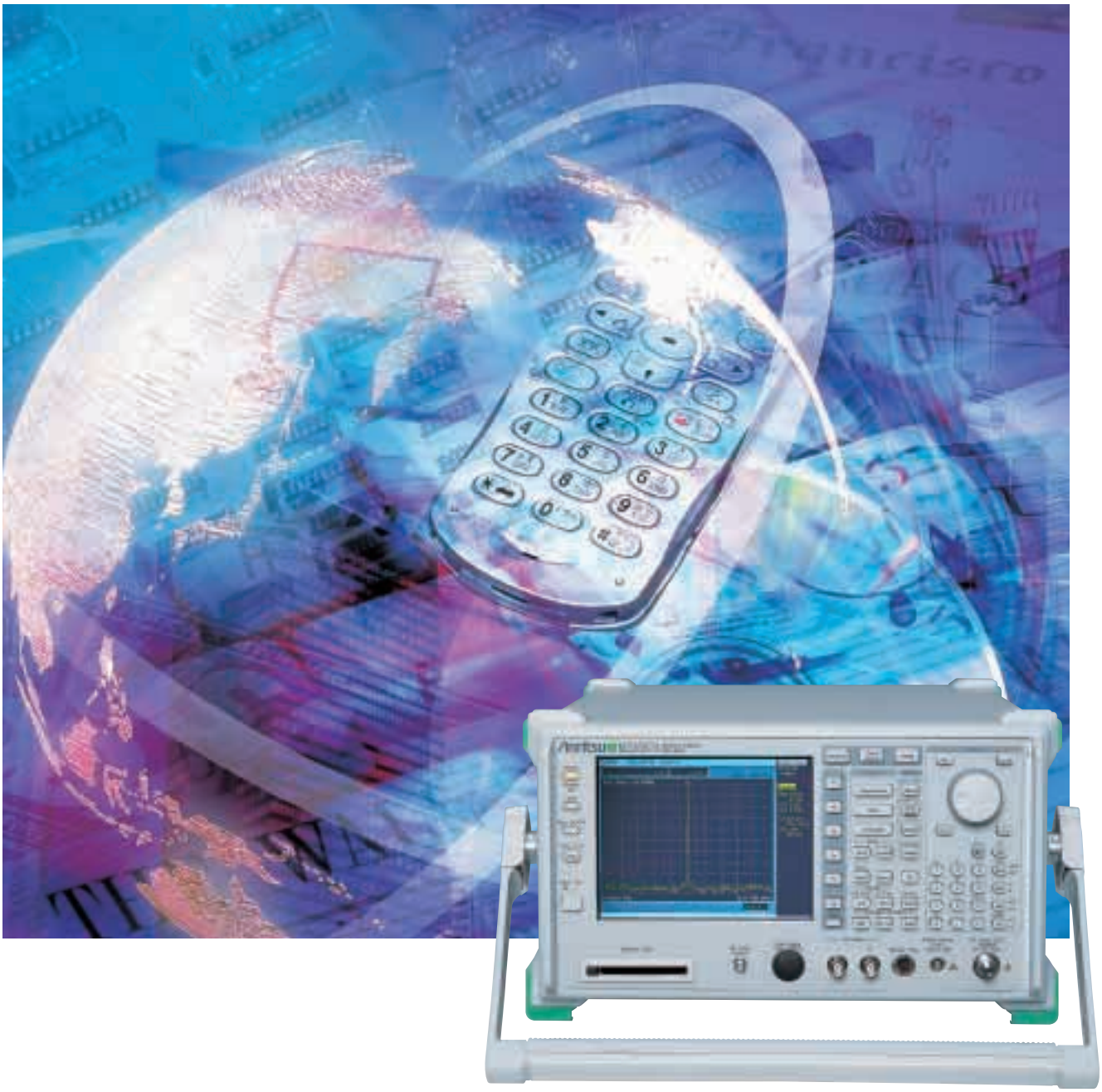
Anritsu

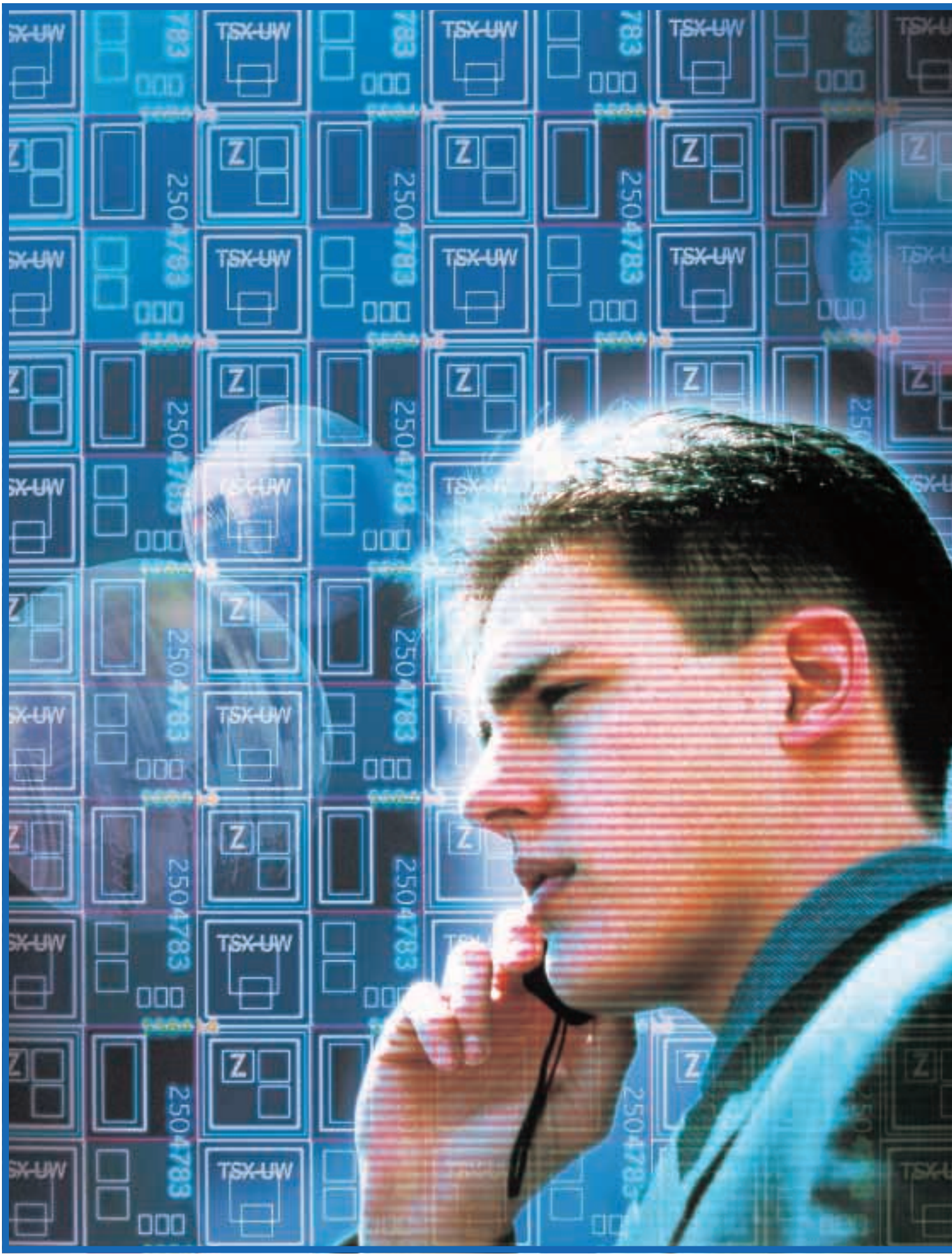
MS2687A

Spectrum Analyzer

9 kHz to 30 GHz



From installation of IMT-2000 station to maintenance of microwave entrance line


TSX-UW
2504783

Intelligent microwave spectrum analyzer handy for use in the field

The IMT-2000 (2 GHz band) service for third-generation mobile radio communication has finally started. Microwave entrance lines that are the backbone of these mobile radio communications will increase dramatically. The MS2687A is a compact, lightweight, and intelligent microwave spectrum analyzer ideal for constructing and maintaining the infrastructure of these highly sophisticated radio communication systems. The main body is equipped with a high-speed DSP as standard. The unit can be used not only as a spectrum analyzer, but also to perform various measurements easily and quickly by installing measurement software. Options such as a rubidium reference oscillator with short warm-up time and power meter function help deliver efficient measurement in the field. Features such as high-speed sweep and high-speed data transfer make the analyzer suitable for automatic measurement on production lines and the like.

Features

- Optional measurement software (sold separately) for high-speed modulation analysis (approx. 1.5 sec. with W-CDMA)
- Optional rubidium reference oscillator for warm-up time of just 7 minutes
- Optional power meter that measures up to 32 GHz
- Data transmission speed approximately 10 times faster*
  (GPIB transmission speed: 120 kbytes/s) * Comparison with our conventional models
- Optional wide resolution bandwidth up to 20 MHz and narrow resolution bandwidth from 1 Hz

Basic Specifications

For installation of IMT-2000 stations

Frequency range: 9 kHz to 30 GHz
Reference oscillator start-up characteristics:
5 x 10^{-8} or lower (standard)
1 x 10^{-9}/7 min. or lower (option 5)
Span accuracy: ±1%
Resolution bandwidth:
300 Hz to 3 MHz, 5 MHz, 10 MHz, 20 MHz
1 Hz to 1 kHz (option 02, FFT)
10 Hz to 1 MHz (option 04)
Average noise level: ≤–146 dBm/Hz (1 MHz to 2.5 GHz)
Input attenuator: 0 to 70 dB (10 dB step)
W-CDMA ACP measurement performance:
–68 dBc (5 MHz offset at 3.84 MHz)
–75 dBc (10 MHz offset at 3.84 MHz)

For installation and maintenance of radio stations

Save/recall of set parameters: up to 12 into/from internal memory
Output of measurement results: BMP, CSV format or printer (ESC/P compatible model)
PC card interface: PC compatible ATA card (ATA card equipped as standard for 20 Mbytes or over)
Display: 6.5 inch (17 cm) color TFT-LCD
Dimensions, weight: 320 (W) x 177 (H) x 411 (D) (mm), 16 kg

For maintenance of microwave entrance lines

Frequency range: 9 kHz to 30 GHz
(When using external mixer: to 110 GHz)
Measure: One-touch measurement of occupied bandwidth, channel power, and adjacent channel leakage power
Power meter function: 100 kHz to 32 GHz
(Power sensor optionally available)
A carrybone and soft carrying case convenient for field use is also available.

For development and production line of various radio frequency parts

Reference oscillator stability:
±2 x 10^{-8}/day (standard)
±5 x 10^{-9}/day (option 01)
Sweep time: 10 ms to 1000 s (frequency span)
1 µs to 1000 s (time span)
Sweep refresh rate: 20 trace/s
I/O interface:
GPIB, RS-232C, and Centronics equipped as standard
Ethernet (option 09) allows network control by 10base-T.
GPIB transfer rate: 120 kbytes/s

Options

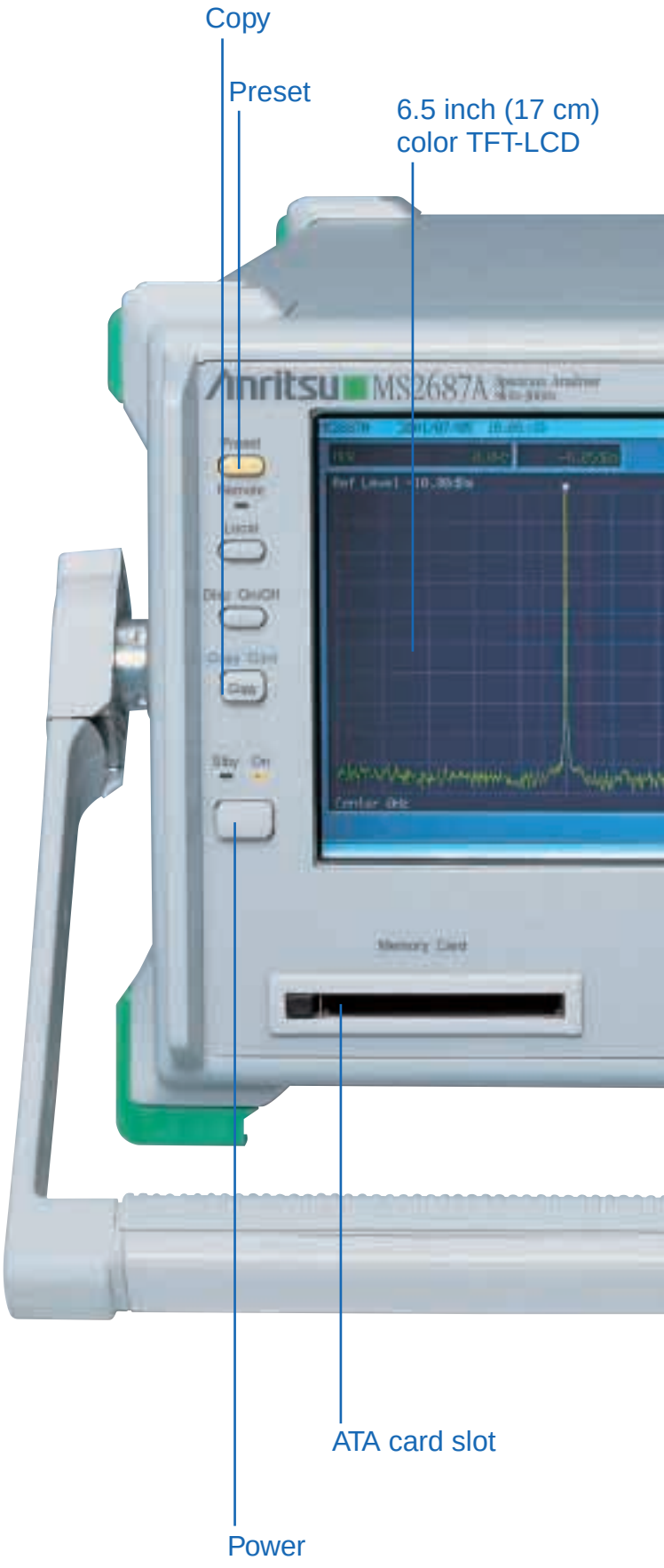
Option 01: Precision frequency reference
(aging rate: 5 x 10^{-10}/day)
Option 02: Narrow resolution bandwidth (FFT)
Option 04: Digital resolution bandwidth (RMS detection)
Option 05: Rubidium reference oscillator*1
Option 09: Ethernet interface
Option 18: I/Q unbalanced input
Option 21: Power meter function
Option 22: 13 GHz low noise*1
Option 34: 4 GHz LO output
Option 46: Auto power recovery
Option 47: Rack mount (IEC) without handles
Option 48: Rack mount (JIS) without handles

*1 Cannot be mounted at the same time

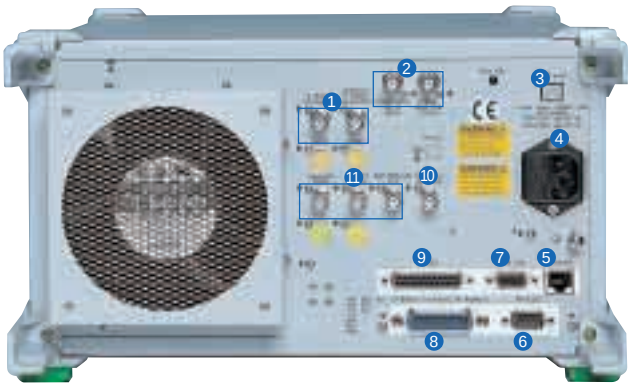
Warranty

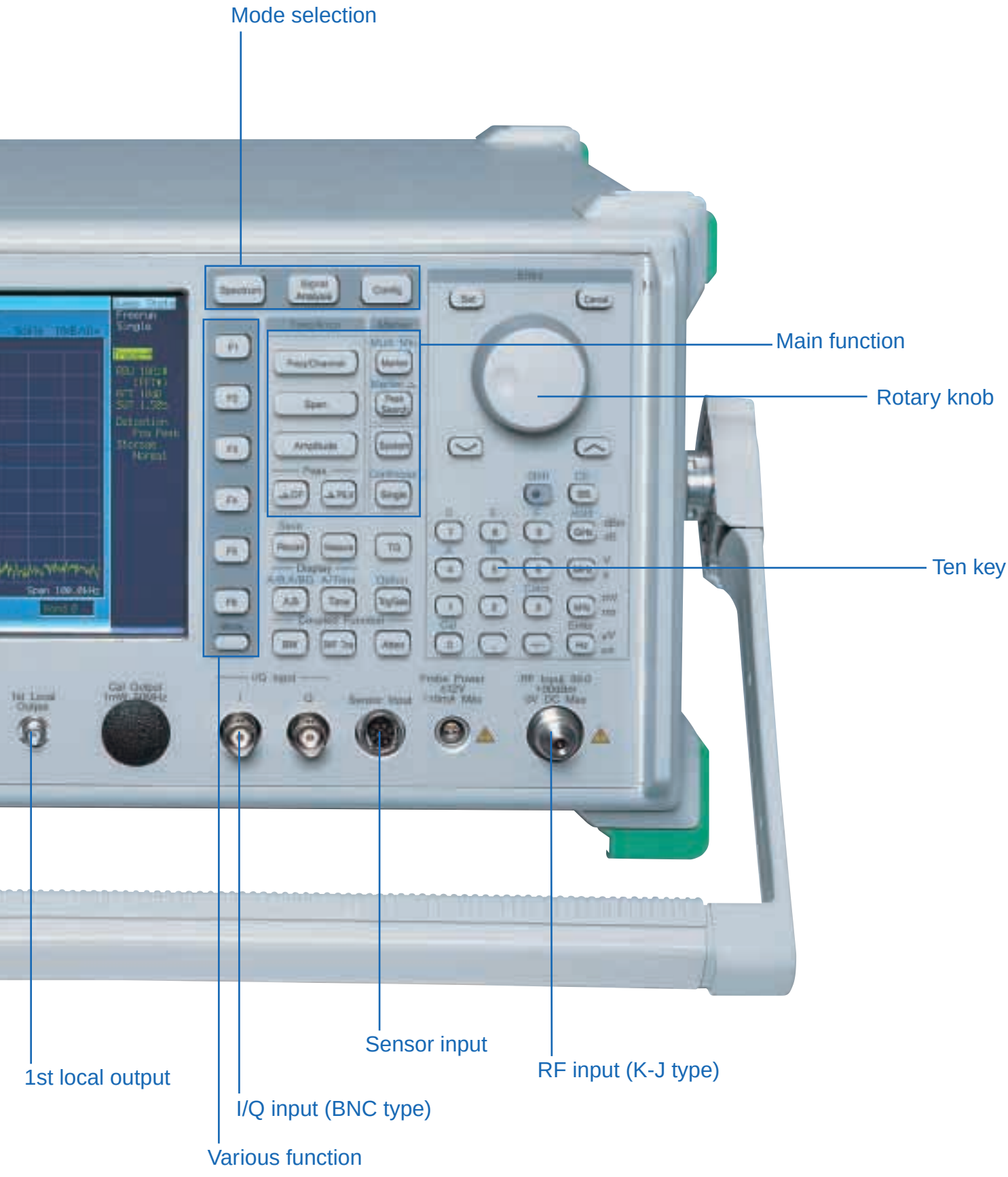
Option 90: Extended three years warranty service
Option 91: Extended five years warranty service

Easy-to-Use Panel Design



1. IF output (BNC type)
2. Reference input/output (BNC type)
3. Power
4. AC input
5. Ethernet interface (10base-T, optional)
6. RS-232C interface
7. VGA output
8. GPIB interface
9. Parallel interface (D-sub25)
10. Trigger input (BNC type)
11. Video signal output (BNC type)

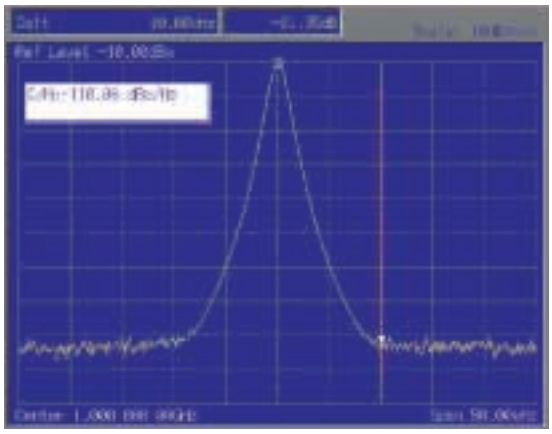



Mode selection
Main function
Rotary knob
Ten key
1st local output
I/Q input (BNC type)
Various function
Sensor input
RF input (K-J type)

Excellent Basic Performance

High C/N ratio to securely capture adjacent signals

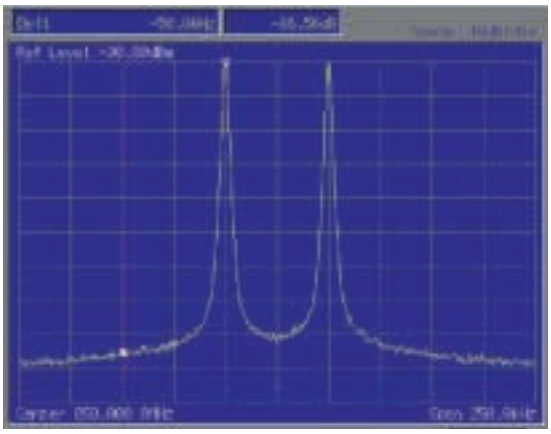
The MS2687A has excellent noise sideband characteristics of –108 dBc/Hz or lower (1 GHz, 10 kHz offset), which is ideal for analyzing weak signals adjacent to strong signals or a narrow bandwidth carrier.



Example of C/N characteristics waveform

Extremely low distortion rate suitable for power amplification or harmonic measurement

The MS2687A has extremely low harmonic distortion levels, including second harmonic distortion of –90 dBc and two-signal third-order distortion of –85 dBc, making it suitable for evaluating the non-linearity of high-power amplifiers and for measuring harmonics.



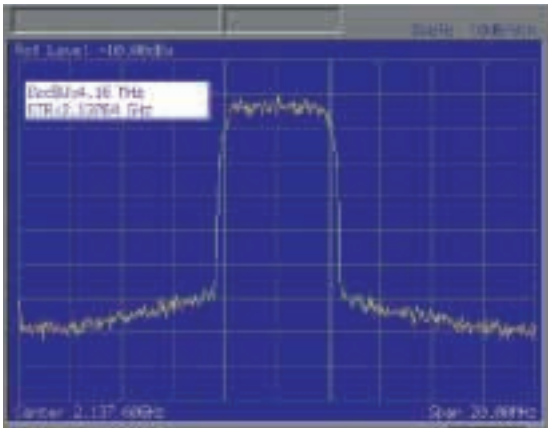
Example of two-signal third-order distortion waveform

Broad dynamic range that accurately captures weak signals

With the development of digital radio technology, analyzed signals are becoming weaker and broader than ever. With the MS2687A, a dynamic range display of up to 156 dB (typical value) has been achieved, thus allowing accurate analysis of even weak signals.
The resolution bandwidth of up to 20 MHz permits the analysis of broadband signals and can handle the broader bandwidths of the future.

Instantaneous evaluation of various radio devices
Standard measure functions

The MS2687A has a wealth of measuring functions to perform various high-speed evaluations of radio devices such as power measurement, frequency measurement, adjacent channel leakage power measurement, and mask measurement.
Optional measurement software is also available for instantaneously analyzing various digital communication systems by just installing the software.

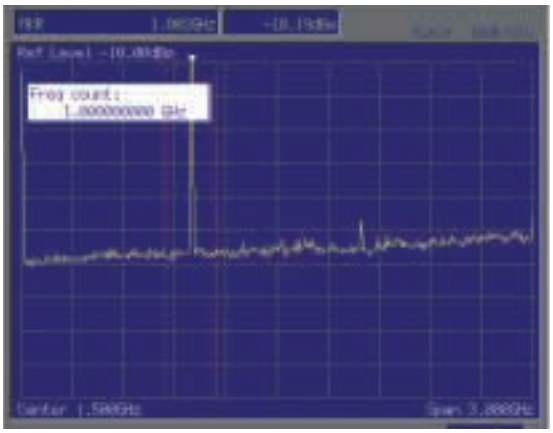


Example of occupied bandwidth

Convenient and Easy-to-Use Functions

1 Hz resolution Built-in frequency counter

The built-in frequency counter is convenient for measuring frequency signals arbitrarily selected from multiple signals. High resolution of 1 Hz even at full span is assured.



Example of frequency counter

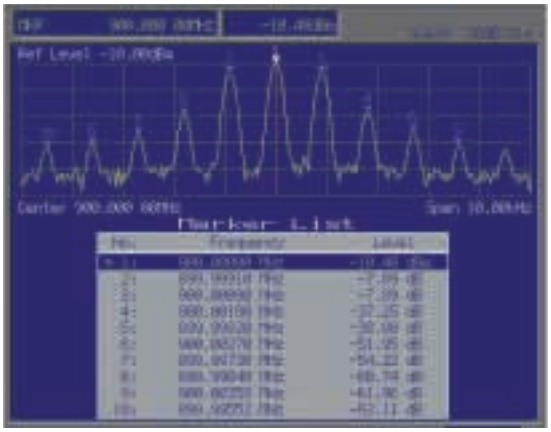
Bright and easy-to-see 6.5 inch (17 cm) color TFT display

The MS2687A has a 6.5 inch (17 cm) color TFT-LCD. Intensity and color can be adjusted freely according to the operating conditions.

Example of coloring change

Multiple waveform display and multimarkers

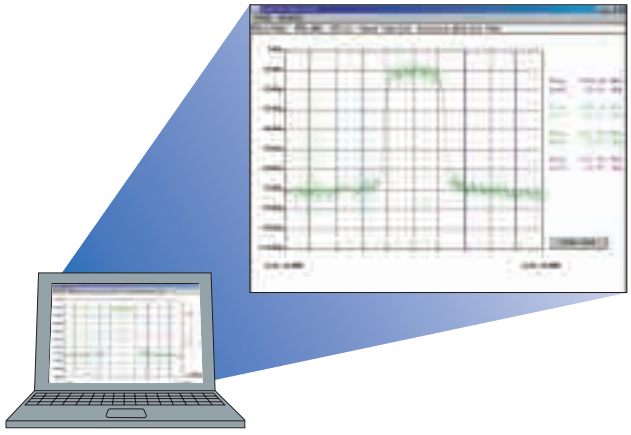
The MS2687A is equipped with multiple waveform display function that allows superimposition of two waveforms or simultaneous display of analysis of frequency domain and time domain.
It also has substantial marker functions that allow up to 10-point multimarkers to be displayed for comparison of waveforms and measurement of harmonics.



Example of harmonics measurement

Easy measurement data control allowed by various interfaces

The results of measurement with the MS2687A can be saved at the touch of a button (in BMP or CSV format; data can also be output to a printer). The large-capacity memory card instead of a floppy disk which is susceptible to mechanical failure allows accurate and high-speed storage of important data. Various interfaces such as RS-232C, Centronics, GPIB, and Ethernet (optional) permit easy connection to a PC for data collection.



Example of capture soft (standard)

Ideal for installation and maintenance of radio stations
Short warm-up time of just 7 minutes

The MS2687A is a portable spectrum analyzer ideal for installing and maintaining various radio stations. A frequency range of 9 kHz to 30 kHz has been achieved, and by using an external mixer, this can be extended up to 110 GHz.
This range covers the frequencies of various mobile communication systems and applications such as microwave entrance lines. The warm-up time of the optional rubidium reference oscillator (option 05) is just 7 minutes, making it ideal if you have to move from one site to another.

Optional power meter function for highly accurate power measurement

The MS2687A has an optional power meter function that permits measurement of up to 32 GHz. Just by mounting a power sensor to the full-face connector, highly accurate power measurement can be performed.
Use of the MS2687A eliminates the need to carry a power meter to the site, and enables more efficient measurement at the site.

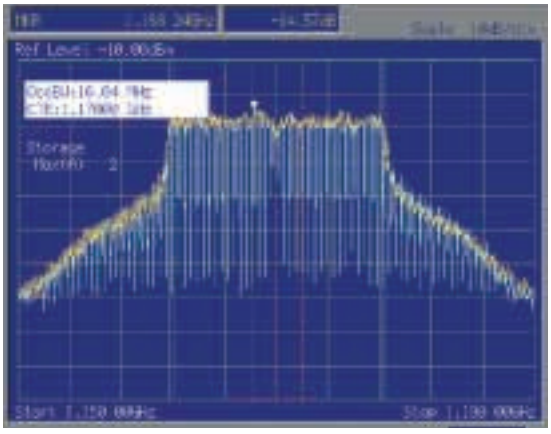
Example of power measurement

Various accessories ideal for field use

A carrybone and soft carrying case are available for installation and maintenance of radio stations in the field. Various accessories such as a rubber protector to be mounted on the back of the analyzer properly are useful precautions for field use.

Suitable for analysis of broadband signals Wide resolution bandwidth of up to 20 MHz

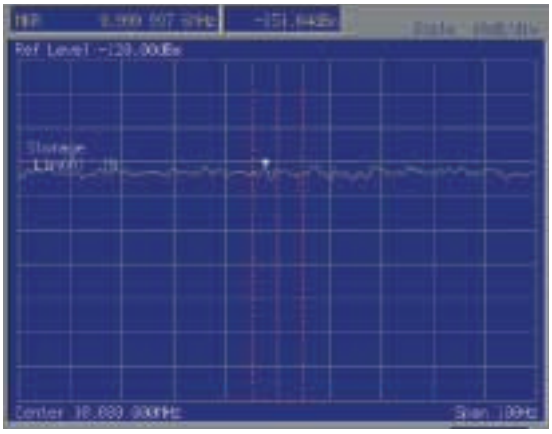
The MS2687A comes with a high-performance DSP as standard. Various modulation analysis functions can be added simply by installing measurement software. In signal analysis mode, analysis by I/Q input (option 18 required) can be performed.
The resolution bandwidth is up to 20 MHz, which allows the analysis of wireless LAN.



Example of wide bandwidth signal measurement

High-speed sweep by FFT Narrow resolution bandwidth (optional)

Optional narrow resolution bandwidth with FFT (fast Fourier transform) is available (option 02, 1 Hz to 1 kHz). This option permits state-of-the-art high-speed measurement in a narrow band that used to be impossible with the conventional sweep method.



Example of narrow resolution bandwidth measurement

High-speed measurement for construction of automatic manufacturing lines

The MS2687A has a high sweep rate of more than 20 times/s. A slight change of the signal can thus be accurately captured and measured at high speed. The GPIB transfer speed of the measured data is as fast as 120 kbytes/s, making it approximately 10 times faster than our conventional model. Use of the optional Ethernet interface allows connection to a LAN for centralized management and high-speed measurement, and thus efficient construction of production lines.

Versatile Options for Improving Performance and Functions

[option 01]

Precision frequency reference

Highly-stable reference crystal oscillator option with frequency of 10 MHz, and aging rate of 5 x 10^{-10}/day.

[option 02]

Narrow resolution bandwidth

Realizes narrow RBW of 1 Hz to 1 kHz with FFT adopted.

[option 04]

Digital resolution bandwidth

Adds RMS director and expands resolution bandwidth (10 Hz to 1 MHz).

[option 05]

Rubidium reference oscillator

Offers excellent start-up characteristics of 10 MHz oscillation frequency and start-up characteristics of 1 x 10^{-9}/7 min.

[option 09]

Ethernet interface

Allows external control via 10base-T.

[option 18]

I/Q unbalanced input

Mounts 2 connectors for I/Q sync inputs and operating inputs (BNC type) to the front panel. Measurement software corresponding to I/Q input is required for actual measurement.

[option 21]

Power meter function

The main unit can be used as a power meter with the upper limit of 32 GHz by mounting an external power sensor (see ordering information for details) to the connector on the front panel.

[option 22]

13 GHz low noise

Required for measurement such as spurious measurement specified by 3GPP. Lowers the level of noise generated by band switching operation in the range from 7.9 GHz to 13 GHz.

[option 34]

4 GHz LO output

Outputs internal 2nd local signal through rear connector.

[option 46]

Auto power recovery

Disables the power switch on the front panel. Power is automatically reset after the line is restored.

[option 47]

Rack mount (IEC) without handles

Mounts an IEC standard rack mount. When mounted, the tilt handle (standard) is eliminated.

[option 48]

Rack mount (JIS) without handles

Mounts a JIS standard rack mount. When mounted, the tilt handle (standard) is eliminated.

Application Software

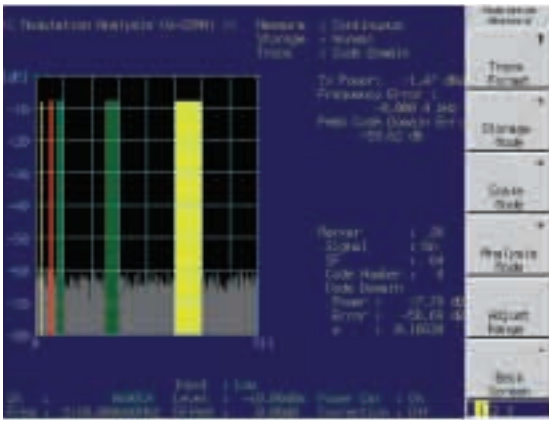
W-CDMA measurement software MX268701A (optional)

• Measuring function

Modulation analysis: Carrier frequency, vector error, phase error, magnitude error
Code domain analysis: Code domain power, code domain error, peak code domain error
Amplitude measurement: Transmitted power, power transmission control
Adjacent channel leakage power measurement
Occupied bandwidth measurement
I/Q level measurement (option 18 required)

• Performance

Modulation accuracy:
Residual vector error (rms): <1% (typical value)
Adjacent channel leakage power measurement (filter method, typical value)
≥55 dBc (5 MHz offset, typical value)
≥62 dBc (10 MHz offset, typical value)
Adjacent channel leakage power measurement (sweep method, typical value)
≥68 dBc (5 MHz offset), ≥75 dBc (10 MHz offset)



Example of MX268701A Code domain power measurement

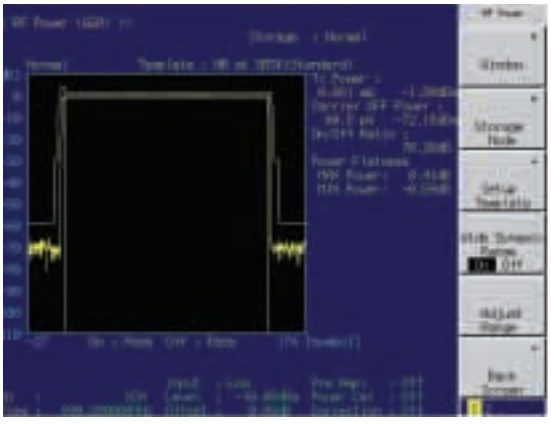
GSM measurement software MX268702A (optional)

• Measuring function

Modulation analysis: Carrier frequency, RMS phase error, peak phase error, magnitude error
(EDGE: Filter is compatible with ETSI standard)
Amplitude measurement: Transmitted power
Measurement of rise/fall characteristics of antenna power
Adjacent channel leakage power measurement
Occupied bandwidth measurement
I/Q level measurement (option 18 required)

• Performance

Modulation accuracy:
Residual phase difference < 0.5 degree (rms) (at the time of GMSK modulation)
Residual EVM < 1.0% (rms) (at the time of 8PSK modulation)
Transmitted power: Highly accurate measurement of power transmission
±2.0 dB (typical value)



Example of MX268702A RF power measurement

MS2687A Specifications

Specified values are obtained after warming up the equipment for 30 minutes at a constant ambient temperature and then performing calibration. The typical values are given for reference, and are not guaranteed.

Frequency	Frequency range	9 kHz to 30 GHz
	Frequency band	Band / Frequency range / Mixer harmonics order 0 / 9 kHz to 3.2 GHz / 1 1– / 3.15 to 6.3 GHz / 1 1+ / 6.2 to 7.9 GHz / 1 2+ / 7.8 to 15.2 GHz / 2 3+ / 15.1 to 22.5 GHz / 3 4+ / 22.4 to 30 GHz / 4
	Pre-selector range	Pre-selector range: 3.15 to 30 GHz (band 1–, 1+, 2+, 3+, 4+)
	Display frequency accuracy	± (Display frequency x reference frequency accuracy + span x span accuracy + resolution bandwidth x 0.15 + 10 Hz x N Hz) Normal marker: same as frequency display accuracy, Delta marker: same as span accuracy
	Frequency counter resolution	1 Hz, 10 Hz, 100 Hz, 1 kHz (counts the received frequency at the peak point inside the zone)
	Frequency counter accuracy	± (Display frequency x reference frequency accuracy +2 x N Hz + 1 LSD) (at S/N 20 dB or more and RBW 3 MHz or less)
	Frequency span	Setting range: 0 Hz, and 5 kHz to 30 GHz, accuracy: ±1.0% (band 0, 1), ±2.5% (c band 2, 3, 4) ∗ At single band sweep, data point 1001
	Resolution bandwidth (RBW) [3 dB bandwidth]	Setting range: 300 Hz to 3 MHz (1, 3 sequence), 5 MHz, 10 MHz, 20 MHz ∗ Manually settable, or automatically settable according to frequency span Accuracy: ±20% (300 Hz to 10 MHz), ±40% (20 MHz) Selectivity (60 dB: 3 dB): ≤15 : 1
	Video bandwidth (VBW)	1 Hz to 3 MHz (1, 3 sequence), Off ∗ Manually settable, or automatically settable according to RBW
	Signal purity	Noise singleband: ≤–108 dBc/Hz (1 GHz, 10 kHz offset), ≤–120 dBc/Hz (1 GHz, 10 kHz offset) Spurious resulting from local cause: ≤–65 dBc (at harmonic mixing order 1)
	Reference oscillator	Frequency: 10 MHz Start-up characteristics: ≤5 x 10^{-8} (after 10 minutes warm-up, with frequency after 24 hours warm-up referenced) Aging rate: ≤2 x 10^{-8}/day, ≤1 x 10^{-7}/year (with frequency after 24 hours of warm-up referenced) Temperature characteristics: ±5 x 10^{-8} (0 to 50˚C, with frequency at 25˚C referenced)
Amplitude	Level measurement	Measurement range: Average noise level to +30 dBm Maximum input level: Continuous average power: +30 dBm (RF ATT: ≥10 dB) Peak pulse input: +47 dBm (pulse width ≤1 µs, duty ratio ≤1%, RF ATT: ≥30 dB) DC voltage: 0 Vdc Average noise level display RBW: 300 Hz, VBW: 1 Hz, RF ATT 0 dB, in SAMPLE detection mode ≤–124 dBm + f[GHz] dB (1 MHz to 2.5 GHz, band 0) ≤–120 dBm + f[GHz] dB (2.5 to 3.2 GHz, band 0) ≤–115 dBm (3.15 to 7.9 GHz, band 1) ≤–107 dBm (7.8 to 15.2 GHz, band 2) ≤–103 dBm (15.1 to 22.5 GHz, band 3) ≤–96 dBm (22.4 to 30.0 GHz, band 4) Residual response: RF ATT 0 dB, input terminated at 50 Ω ≤–100 dBm (1 MHz to 3.2 GHz, band 0), ≤–90 dBm (3.15 to 7.8 GHz, band 1)
	Reference level	Setting range Log scale: –100 to +40 dBm or equivalent level, Linear scale: 2.24 µV to 22.4 V Unit Log scale: dBm, dBµV, dBmV, dBµV (emf), W, V, dBµV/m Linear scale: V Reference level accuracy: ±0.5 dB (–49.9 to 0 dBm), ±0.75 dB (+0.1 to +30 dBm, –69.9 to –50 dBm), ±1.5 dB (–80 to –70 dBm) ∗ After calibration, at 50 MHz, span: 1 MHz (when RF ATT, RBW, VBW, and sweep time set to AUTO) RBW switching uncertainty: ±0.3 dB (300 Hz to 5 MHz), ±0.5 dB (10, 20 MHz) ∗ After calibration, with RBW 3 kHz referenced Input attenuator (RF ATT): Setting range: 0 to 70 dB (10 dB step), manually settable, or automatically settable according to reference level Switching uncertainty: ±0.3 dB (10 to 50 dB), ±0.5 dB (50 to 70 dB) ∗ With 50 MHz, RF ATT 10 dB referenced

Amplitude	Frequency response	Relative flatness: at RF ATT 10 dB with the center point of frequency response in the band referenced ±1.0 dB (9 kHz to 3.2 GHz, band 0), ±1.5 dB (3.15 to 7.9 GHz, band 1) ±3.0 dB (7.8 to 15.2 GHz, band 2), ±4.0 dB (15.1 to 22.5 GHz, band 3, 22.4 to 30 GHz, band 4) ∗ After pre-selector tuning for band 1, 2, 3, and 4 Absolute flatness: at RF ATT 10 dB with 50 MHz referenced ±5.0 dB (9 kHz to 30 GHz), ∗ After pre-selector tuning for band 1, 2, 3, and 4
	Waveform display	Scale: 10 div (single scale) Log scale: 10, 5, 2, 1 dB/div, Linear scale: 10, 5, 2, 1%/div Linearity (after calibration) Log scale: ±0.4 dB (0 to –20 dB, RBW ≤1 kHz), ±1.0 dB (0 to –70 dB, ≤1 kHz), ±1.2 dB (0 to –90 dB, ≤1 kHz) Linear scale: 4% of reference level Marker level resolution Log scale: 0.01 dB, linear scale: 0.02%
	Spurious response	2nd harmonic distortion: ≤–60 dBc (input frequency 10 to 200 MHz, Mixer input: –30 dBm) ≤–70 dBc (0.2 to 1.6 GHz, band 0, Mixer input: –30 dBm) ≤–90 dBc or lower than average noise level (1.6 to 15 GHz, band 1, 2, 3, and 4, Mixer input: –10 dBm) Two-signal third-order intermodulation distortion (Frequency difference of two signals: ≥50 kHz, Mixer input: –30 dBm) ≤–70 dBc (10 to 100 MHz), ≤–85 dBc (0.1 to 3.2 GHz, band 0) ≤–80 dBc (3.15 to 7.9 GHz, band 1) ≤–75 dBc or lower than average noise level (7.8 to 22.5 GHz, band 2, 3) ≤–75 dBc or lower than average noise level (22.5 to 30 GHz, band 4, Typical) Image response: ≤–65 dBc (≤18 GHz), ≤–60 dBc (≤22 GHz), ≤–55 dBc (≤30 GHz) Multiple response/spurious outside the band: ≤–60 dBc (≤22 GHz), ≤–55 dBc (≤30 GHz)
	1 dB gain compression	≥0 dBm (≥100 MHz), ≥+3 dBm (≥500 MHz, band 0), ≥–5 dBm (≥3150 MHz, band 1, 2, 3, and 4)
Frequency sweep	Sweep mode	Continuous, single
	Sweep time	Setting range: 10 ms to 1000 s ∗ Manual setting and span automatically settable according to RBW and VBW Set resolution: 5 ms (5 ms to 1 s), Top three digits (≥1 s) Accuracy: ±3%
	Trigger switch	Free run, triggered
	Trigger source	Wide IF video, external (TTL), external (±10 V), line
	Gate sweep mode	Off, random sweep mode Setting range Gate delay range: 0 to 65.5 ms (Resolution: 1 µs) Gate length range: 2 µs to 65.5 ms (Resolution: 1 µs) Gate end: Internal/external
	Zone sweep	Sweeps the indicated range in the zone only.
	Tracking sweep	Sweeps following the peak point inside the zone marker (zone sweep also available).
Time sweep	Sweep mode	Continuous, single
	Sweep time	Setting range/resolution: 1 to 50 µs (1, 2, 5 sequence), 100 µs to 4.9 ms (100 µs resolution) 5.0 ms to 1 s (5 ms resolution), 1 to 1000 s (setting of top three digits) Accuracy: ±1%
	Trigger switch	Free run, triggered
	Trigger source	Wide IF video, video, external (TTL), external (±10 V), line
	Trigger delay	Pre-trigger (displays waveform before trigger occurrence point) Setting range: –time span to 0 s Resolution: time span/500 or 100 ns, whichever is larger Post-trigger Setting range: 0 µs to 65.5 ms Resolution: 100 ns (sweep time: ≤4.9 ms), 1 µs (sweep time: ≥5 ms)
Functions	Number of data points	Selectable between 501 and 1001
	Detection mode	NORMAL, POSITIVE PEAK, NEGATIVE PEAK, SAMPLE, AVERAGE
	Display functions	TRACE A, TRACE B, TRACE A/BG, TRACE A/TIME Trace calculation: A→B, B→A, A<⇒>B, A + B→A, A – B→A, A – B + DL→A
	Storage functions	NORMAL, VIEW, MAX HOLD, MIN HOLD, AVERAGE, CUMULATIVE, OVER WRITE

MS2687A Specifications

Functions	Marker	Single search: AUTO TUNE, PEAKRCF, PEAKRREF, SCROLL Zone marker: NORMAL, DELTA Marker functions: MARKERRCF, MARKERRREF, MARKERRCF STEP SIZE, Δ MARKERRSPAN, ZONERSPAN Peak search: PEAK, NEXT PEAK, MIN DIP, NEXT DIP Multi marker: 10 max. (highest 10, harmonics, manually set)
	Measure	Noise power: dBm/Hz, dBm/CH, dBμV/$\sqrt{\text{Hz}}$ C/N: dBc/Hz, dBc/CH Occupied bandwidth: power N% method, X-dB down method Adjacent channel leakage power REF: total power/reference level/in-band level method Display: channel designate display: (3 channels x 2), graphic display Average power within burst signal: average power in the designated range of time domain waveform Template comparison (at time sweep): upper limit x 2, lower limit x 2 MASK (at frequency sweep): upper limit x 2, lower limit x 2
	Correction	Frequency response can be corrected arbitrarily up to 150 points
Others	Display	Color TFT-LCD, VGA 17 cm (6.5 type)
	Color	Number of colors: 4096, RGB, each 16-scale settable
	Intensity	Settable in 5 steps (display off included)
	Contents	Scale, waveform data, setting condition, menu, title
	Save/recall	Saves and recalls setting conditions and waveform data to internal memory (max. 12) or memory card
	Hard copy	Displayed data can be hard-copied with the printer via parallel interface (PCL level 3 or lower, or ESC/P-J83, J84 compatible models only)
	GPIB	Meets IEEE488.2. Controllable with external controller (except for power switch) Interface function: SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0, E2
	Parallel interface	Centronics-compatible, outputs print data to printer, D-sub 25 pin connector (jack) Data line exclusive for output: 8, Control line: 4 (BUSY, $\overline{\text{DTSB}}$, $\overline{\text{ERROR}}$, PE)
	PC card interface	Saves and recalls setting condition and waveform data, ATA flash card accessible (3.3/5 V), Connector: Type Ⅰ or Type Ⅱ of PC card
	RS232C	Controllable with external controller (except for power switch) Baud rate: 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 56 k, 115 kbps
Input/output connector		Input connector: K-J, 50 Ω nominal value, Impedance: VSWR ≤1.5 Typical (RF ATT ≥10 dB) Video output: outputs analog RGB, D-sub 15-pin connector (jack) IF output: BNC connector, 50Ω nominal value, 66/10.69 MHz, Level: –10 dBm Typical, (frequency 50 MHz, display scale upper edge, 50 Ω terminated) Broadband IF output: BNC connector, 50 Ω nominal value, 60.69/66 MHz Gain: 0 dB Typical (50 MHz, RF ATT: 0 dB, for RF input level) Video output (Y): BNC connector Level: 0 to 0.5 V ± 0.1 V Typical (log scale), 0 to 0.4 V ± 0.1 V Typical (linear scale), (50 MHz, from upper edge to lower edge at 10 dB/div or 10%/div, 75 Ω terminated) Buffered Output: BNC connector, Level: 2 to 5 V (p-p) (200 Ω terminated) Sweep Output (X): BNC connector, Level: 0 to 10 V ± 0.1 V (≥100 kΩ termination, from the left edge to the right edge of the display scale, single band sweep) Sweep Status Output (Z): BNC connector, Level: TTL (low level at sweep) Probe source: 4-pole connector, +12 V, –12 V, ±10% each, 110 mA max. each. Trig/Gate input: BNC connector, level: ±10 V (0.1 V resolution), or TTL level External reference input: BNC connector, Frequency: 10 MHz ± 10 Hz, 13 MHz ± 13 Hz, level: ≥0 dBm
External mixer		Frequency range: 18 to 110 GHz, For the details, refer to the last page.
Dimensions, weight		320 (W) x 177 (H) x 411 (D) mm (handle, leg, front cover, fan cover excluded), ≤16 kg (nominal value)
Power		100 to 120/200 to 240 Vac (–15%/+10%, 250 V max., wide range input) 47.5 to 63 Hz, ≤400 VA
Ambient temperature and humidity		0 to 50˚C, RH ≤85% (no condensation allowed)
Storage temperature range		–20 to 60˚C
EMC		EN61326: 1997/A1: 1998 (Class A), EN61000-3-2: 1995/A2: 1998 (Class A) EN61326: 1997/A1: 1998 (Annex A)
LVD		EN61010-1: 1993/A2: 1995 (Installation Category Ⅱ, Pollution degree 2)

Options

Option 01: Precision frequency reference oscillator

Frequency	10 MHz
Start-up characteristics	≤5 x 10^{-8} (≤7 min. 25˚C, Typical)
Aging rate	≤±5 x 10^{-10}/day (With the frequency at 24 hours after the power is turned on referenced)
Temperature characteristics	≤±5 x 10^{-10} (With the frequency at 0 to 50˚C and 25˚C referenced)

Option 02: Narrow resolution bandwidths (FFT)

Resolution bandwidth	Setting range: 1 Hz to 1 kHz (1, 3 sequence) Bandwidth accuracy: ±10% (RBW = 30, 300 Hz) ±10% Typical (RBW = 1, 3, 10, 100, 1 kHz) RBW selectivity (60 dB: 3 dB): ≤5:1 RBW switching uncertainty: ±0.5 dB
Span setting	Minimum setting span: 100 Hz
Average noise level display	When RBW is 1 Hz, RF ATT is 0 dB ≤–146.5 dBm + 1.5f[GHz] dB Typical (1 MHz to 2.5 GHz, band 0) ≤–142.5 dBm + 1.5f[GHz] dB Typical (2.5 to 3.2 GHz, band 0) ≤–137.5 dBm Typical (3.15 to 7.9 GHz, band 1) ≤–129.5 dBm Typical (7.8 to 15.2 GHz, band 2) ≤–125.5 dBm Typical (15.1 to 22.5 GHz, band 3) ≤–118.5 dBm Typical (22.4 to 30 GHz, band 4)

Option 04: Digital resolution bandwidth

Resolution bandwidth	Setting range: 10 Hz to 1 MHz (1, 3 sequence) Bandwidth accuracy: ±10% (RBW ≥100 Hz) ±10% Typical (RBW ≤30 Hz) Bandwidth selectivity (60 dB: 3 dB): ≤5:1 (RBW ≥100 Hz) ≤5:1 Typical (RBW ≤30 Hz) RBW switching uncertainty: ±0.5 dB
Detection mode	NORMAL, POSITIVE PEAK, NEGATIVE PEAK, SAMPLE, RMS RMS: displays root-mean-square value of average power between sample points
Average noise level	When RBW is 10 Hz, RF ATT is 0 dB ≤–136.5 dBm + f[GHz]dB Typical (1 MHz to 2.5 GHz, band 0) ≤–132.5 dBm + f[GHz]dB Typical (2.5 to 3.2 GHz, band 0) ≤–127.5 dBm Typical (3.15 to 7.9 GHz, band 1) ≤–119.5 dBm Typical (7.8 to 15.2 GHz, band 2) ≤–115.5 dBm Typical (15.1 to 22.5 GHz, band 3) ≤–108.5 dBm Typical (22.4 to 30 GHz, band 4)

Option 05: Rubidium reference oscillator*

Frequency	10 MHz
Start-up characteristics	±1 x 10^{-9}/7 min. (with frequency one hour after the power is turned on referenced)
Aging rate	±1 x 10^{-10}/month (with frequency one hour after the power is turned on referenced)
Temperature characteristics	±1 x 10^{-9}/day (with frequency at 0 to 45˚C and 25˚C referenced)
Accessories	J1066 coaxial code 0.15 m (BNC211-LP4)

* Can not be installed with option 22

Option 09: Ethernet interface

Function	Control with external controller (except for power switch)
Connector	10base-T

Option 18: I/Q unbalanced input

Connector	BNC
Impedance	Selectable between 1 MΩ (parallel capacity <100 pF) and 50 Ω
Input level range	Differential voltage range: 0.1 to 1 Vp-p (at input terminal) Changeable between DC connection and AC connection

Options

Option 21: Power meter function

Frequency range	100 kHz to 32 GHz
Level range	–10 to +20 dBm
Applicable power sensor	MA4601A, MA4701A, MA4703A, MA4705A
Display	Selectable from W, dBm, and dB (RELATIVE), Digital 4 digit display, 20% over range, Power range: 4 range/10 dB step (Measurement level range is listed on the power sensor specifications.)
Range switching	Auto, manual (settable to arbitrary range irrespective of range hold or input level)
Accuracy	±0.7% (W mode), ±0.03 dB (dBm mode, dB (RELATIVE) mode) ∗ Pressing ZERO ADJ key allows automatic adjustment to zero point.
Zero setting	±0.5% of full scale Typical value (100µW range of maximum sensitivity)
Zero move between ranges	±0.2% (after zero setting at 100µW range of maximum sensitivity)
Calibration oscillator frequency	50 MHz
Calibration oscillator level	1 mW ± 1.2% (for one year)
Averaging	Sample rate time settable in 4 steps

Option 22: 13 GHz low noise∗

Function	Improves the average noise level of more than 7.9 GHz frequency. The following items are separately specified for the standard model.
Frequency band	Band / Frequency range / Mixer harmonics order / LO harmonics order (N) 0 / 9 kHz to 3.2 GHz / 1 / 1 1– / 3.15 to 5.8 GHz / 1 / 1 1+ (n=1) / 5.7 to 7.9 GHz / 1 / 1 1+ (n=2) / 7.8 to 14.05 GHz / 1 / 2 2– / 14.0 to 26.5 GHz / 2 / 4 3– / 26.5 to 30 GHz / 3 / 6
Pre-selector range	3.15 to 30 GHz (band 1–, 1+ (n=1), 1+ (n=2), 2–, 3–)
Span accuracy	±1% (band 0, 1–, 1+ (n=1), ±2.5% (band 1+ (n=2), 2–, 3–) ∗ Single band sweep, at data point 1001
Average noise level display	At RBW: 300 Hz, VBW 1 Hz, RF ATT: 0 dB, and detection mode set to SAMPLE ≤–124 dBm + f[GHz] dB (1 MHz to 2.5 GHz, band 0) ≤–120 dBm + f[GHz] dB (2.5 to 3.2 GHz, band 0), ≤–115 dBm (3.15 to 7.9 GHz, band 1) ≤–113 dBm (7.8 to 14.05 GHz, band 1 + (n=2)), ≤–105 dBm (14.0 to 26.5 GHz, band 2–), ≤–101 dBm (26.4 to 30 GHz, band 3–)
Frequency response	Relative flatness: ±1.0 dB (9 kHz to 3.2 GHz, band 0), ±1.5 dB (3.15 to 7.9 GHz, band 1) ±3.0 dB (7.8 to 14.05 GHz, band 1+ (n=1)), ±4.0 dB (14.0 to 26.5 GHz, band 2–, 26.4 to 30 GHz, band 3–) ∗ After pre-selector tuning for band 1, 2, 3 Absolute flatness: ±5.0 dB (9 kHz to 30 GHz) ∗ After pre-selector tuning for band 1, 2, 3
2nd harmonics distortion	≤–60 dBc (10 to 200 MHz), ≤–70 dBc (0.2 to 1.6 GHz, band 0), ≤–90 dBc or average noise level lower (1.6 to 15 GHz, band 1,2,3)
Two-signal third order intermodulation distortion	≤–70 dBc (10 to 100 MHz), ≤–85 dBc (0.1 to 3.2 GHz, band 0), ≤–80 dBc (3.15 to 14.05 GHz, band 1), ≤–75 dBc or average noise level or lower (14.0 to 26.5 GHz, band 2), ≤–75 dBc or average noise level or lower (26.4 to 30 GHz, band 3)

∗ Can not be installed with Option 05

Option 34: 4 GHz LO output

Frequency	Frequency: 4 GHz Frequency accuracy: ±(4 GHz x reference frequency accuracy) ±1 Hz
Output level	–10 dBm Typical
Spurious	≤–40 dBc Typical

Option 46: Auto power recovery

Function	Disables the power switch on the front panel and automatically restores power after power failure. ON/OFF operation can be performed using the standby switch on the rear panel. ∗ Power switch on the front panel of this unit does not have a latching function. Therefore, if power is interrupted in the ON status, the standby status is kept even after power is restored.

Option 47: Rack mount (IEC)

Function	Mounts the rack mount for IEC standard-compatible rack. When mounted, the tilt handle (standard) is eliminated.

Option 48: Rack mount (JIS)

Function	Mounts the rack mount for JIS standard-compatible rack. When mounted, the tilt handle (standard) is eliminated.

MX268701A W-CDMA measurement software

The following specifications are guaranteed after execution of internal level optimization of MS2687A (automatically executed by pressing the key).

Modulation/frequency measurement	Frequency measurement range	50 MHz to 3 GHz
	Measurement level range	–60 to +30 dBm (average power)
	Carrier frequency accuracy	Input: level ≥–30 dBm, at code channel 1CH ± (Reference crystal oscillator accuracy +10 Hz)
	Modulation accuracy	
	Residual vector error	Input: level ≥–30 dBm, <2.0% (rms) at code channel 1CH
	Origin point offset accuracy	Input level ≥–30 dBm, code channel 1CH only, ±0.5 dB for origin offset –30 dBc signal
	Waveform display	Indicates the following for 1CH to multi-CH input signals Constellation display Vector error vs. chip number display Phase error vs. chip number display Amplitude error vs. chip number display
Code domain analysis	Frequency measurement range	50 MHz to 3 GHz
	Measurement level range	–60 to +30 dBm (average power)
	Code domain power accuracy	Input level: ≥–10 dBm ±0.1 dB (code power ≥–10 dBc) ±0.3 dB (code power ≥–25 dBc)
	Code main error	Input level: ≥–10 dBm, diffusion coefficient: 512 (down link), 256 (up link)
	Residual error	<–50 dB
	Accuracy	±0.5 dB (for error –30 dBc)
	Display function	Code domain power, code domain error display Corresponding spread factor: 4 to 256 (up link), 4 to 512 (down link), With spread factor automatic detection function I/Q is separately displayed at up link.
Amplitude measurement	Frequency range	50 MHz to 3 GHz
	Measurement level range	–60 to +30 dBm (average power)
	Transmitted power measurement	After execution of level calibration
	Measurement range	–20 to +30 dBm (average power)
	Accuracy	±2.0 dB Typical
	Power measurement linearity	Input level: ≥–10 dBm, ±0.2 dB (0 to –40 dB) without changing reference level setting after range optimization
	Filter select function	Power when passing RRC (α =0.22) filter can be measured.
	Transmitted power control measurement function	Relative power per slot is displayed. Equipped with pass/fail judging function.
Occupied bandwidth	Frequency range	50 MHz to 3 GHz
	Measurement level range	–60 to +30 dBm (average power)
	Measurement method	
	Sweep method	After measuring the signal with the sweep type spectrum analyzer, performs calculation and displays the result.
	FFT method	After analyzing the signal with FFT, performs calculation and displays the result.
Adjacent channel leakage power measurement	Frequency range	50 MHz to 3 GHz
	Input level range	–10 to +30 dBm (average power)
	Measurement method	
	Sweep method (all)	After measuring the signal with the sweep type spectrum analyzer, performs calculation and displays the result.
	Sweep method (separate)	After measuring adjacent channel and the channel next to the adjacent channel with the sweep type spectrum analyzer, performs calculation and displays the result.
	Filter method	Measures power at adjacent channel and at the channel next to the adjacent channel after it passes the built-in receive filter (RRC: α =0.22) and displays the value.
	Measurement range	Input level: ≥0 dBm, filter method, in broad dynamic range mode At code channel 1CH 5 MHz offset: ≥55 dBc, 10 MHz offset: ≥62 dBc At multiple code channel 16CH 5 MHz offset: ≥50 dBc, 10 MHz offset: ≥60 dBc Input level: ≥–10 dBm, filter method, in broad dynamic range mode At code channel 1CH 5 MHz offset: 55 dBc Typical, 10 MHz offset: 62 dBc Typical At multiple code channel 16CH 5 MHz offset: 50 dBc Typical, 10 MHz offset: 60 dBc Typical

Spurious measurement	Frequency measurement range	9 kHz to 12.75 GHz, except for the range within carrier frequency
	Input level range (transmitted power)	0 to +30 dBm (average power)
	Measurement method	
	Sweep method	After sweeping the designated frequency range with the spectrum analyzer, detects the peak value and displays it. Calculates the ratio with the transmitted power value, which is the power ratio, and displays it. Detection mode should be AVERAGE.
	Spot method	After measuring the designated frequency in time domain of the spectrum analyzer, displays the average value. Calculates the ratio with the transmitted power value, which is the power ratio, and displays it. Detection mode should be AVERAGE.
	Search method	After sweeping the designated frequency range with the spectrum analyzer and detecting the peak value, measures the frequency in time domain, and displays the average value. Calculates the ratio with the transmitted power value, which is the power ratio, and displays it. Detection mode should be AVERAGE.
	Measurement range	Carrier frequency: 1800 to 2200 MHz (Exceptions are the following spurious frequencies.) ≥79 dB Typical (RBW: 1 kHz) (9 kHz to 150 kHz) ≥79 dB Typical (RBW: 10 kHz) (150 kHz to 30 MHz) ≥79 dB Typical (RBW: 100 kHz) (30 MHz to 1 GHz) ≥76–f[GHz] dB Typical (RBW: 1 MHz) (1 to 3.15 GHz), ≥76 dB Typical (RBW: 1 MHz), (3.15 to 7.9 GHz) Note: When the carrier frequency is in the range from 2030.354 to 2200 MHz, the following spurious frequency is generated. f(spurious) = f(input) – 2030.345 MHz
Electrical performance (I/Q input)		With option 18
	Input method	Selectable between balanced and unbalanced
	Input impedance	Selectable between 1 MΩ (parallel capacity <100 pF) and 50 Ω
	Input level range	
	Balanced input	Differential voltage range: 0.1 to 1 Vp-p (at input terminal) In-phase voltage range: ±2.5 V (at input terminal)
	Unbalanced input	0.1 to 1 Vp-p (at input terminal) Changeable between DC connection and AC connection
	Measurement item	Modulation accuracy, code domain power, amplitude, occupied bandwidth (FFT method), IQ level
	Modulation accuracy	Input level: ≥0.1 V (rms)
	Residual vector difference	<2% (rms), DC connection
	I/Q level	
	Level measurement	Measures input voltage (rms value and p-p value) of I and Q and displays them.
	I/Q phase difference	When CW signal is input to each input terminal of I and Q, measures the phase difference between I phase signal and Q phase signal and displays it.

MX268702A GSM measurement software

The following specifications are guaranteed after execution of internal level optimization of MS2687A (automatically executed by pressing the key).

Modulation/frequency measurement	Frequency measurement range	50 MHz to 2.7 GHz
	Measurement level range	–40 to +30 dBm (average power within burst signal)
	Carrier frequency accuracy	Input level (average power within burst signal): ≥–30 dBm ±(reference crystal oscillator accuracy +10 Hz)
	Modulation accuracy	Input level (average power within burst signal): ≥–30 dBm
	Residual phase error (GMSK modulation)	<0.5 dgree (rms) <2.0 degree (peak)
	Residual EVM (8PSK modulation)	<1.0% (rms)
	Waveform display	Trellis display (at GMSK modulation) Eye pattern display EVM vs. bit number display (at 8PSK modulation) Phase error vs. bit number display Amplitude error vs. bit number display IQ diagram display
Amplitude measurement	Frequency range	50 MHz to 2.7 GHz
	Measurement level range	–40 to +30 dBm (average power within burst signal)
	Transmitted power measurement	After execution of level calibration
	Measurement range	–10 to +30 dBm (average power within burst signal)
	Accuracy	±2.0 dB Typical
	Power measurement linearity	Input level (average power within burst signal): ≥–10 dBm, ±0.2 dBm (0 to –30 dB) without changing reference level setting after range optimization
	Power measurement when carrier is OFF	Input level (average power within burst signal): ≥–10 dBm
	Normal mode measurement range	≥60 dB (compared with average power within burst signal)
	Broad dynamic range	Average power within burst signal: compared with 10 mW
	Mode measurement range	≥80 dB Note that the measurement limit is determined depending on the average noise level: ≤–70 dBm (50 MHz to 2.7 GHz).
	Rise/fall characteristics	Waveform is displayed in synchronization with the data of measured signal. Specified line can be displayed (measured in 1 MHz bandwidth), equipped with pass/fail judging function
Output RF spectrum	Frequency range	100 MHz to 2.7 GHz
	Input level range	–10 to +30 dBm (average power within burst signal)
	Modulation measurement range (spectrum due to modulation)	At CW signal input ≥60 dB (≥200 kHz offset) ≥68 dB (≥250 kHz offset) (<1.8 MHz offset is RBW: 30 kHz, ≥1.8 MHz offset is RBW: 100 kHz)
	Transient section measurement range (Switching transient)	At CW signal input ≥63 dB (≥400 kHz offset)

Spurious measurement	Frequency measurement range	100 kHz to 12.75 GHz, except for the range within carrier frequency ±50 MHz
	Input level range (transmitted power)	0 to +30 dBm (average power within burst signal): when pre-amplifier is OFF
	Measurement method	
	Sweep method	After sweeping the designated frequency range with the spectrum analyzer, detects the peak value and displays it. Calculates the ratio with the transmitted power value, which is the power ratio, and displays it. Detection mode should be AVERAGE.
	Spot method	After measuring the designated frequency in time domain of the spectrum analyzer, displays the average value. Calculates the ratio with the transmitted power value, which is the power ratio, and displays it. Detection mode should be AVERAGE.
	Search method	After sweeping the designated frequency range with the spectrum analyzer and detecting the peak value, measures the frequency in time domain, and displays the average value. Calculates the ratio with the transmitted power value, which is the power ratio, and displays it. Detection mode should be AVERAGE.
	Measurement range	Carrier frequency: 800 MHz to 1 GHz and 1.8 to 2 GHz ≥72 dB Typical (RBW: 10 kHz) (100 kHz to 50 MHz) ≥72 dB Typical (RBW: 100 kHz) (50 to 500 MHz) ≥66–f[GHz] dB Typical (RBW: 3 MHz) (500 MHz to 3.15 GHz, band 0, except for harmonic frequency) ≥66 dB Typical (RBW: 3 MHz) (3.15 to 7.9 GHz, band 1)
Electrical performance (I/Q input)		With option 18
	Input method	Selectable between balanced and unbalanced
	Input impedance	Selectable between 1 MΩ (parallel capacity <100 pF) and 50Ω
	Input level range	
	Balanced input	Differential voltage range: 0.1 to 1 Vp-p (at input terminal) In-phase voltage range: ±2.5 V (at input terminal)
	Unbalanced input	0.1 to 1 Vp-p (at input terminal) Changeable between DC connection and AC connection
	Measurement item	Modulation accuracy, amplitude, IQ level
	Modulation accuracy	Input level: ≥0.1 V (rms), at ambient temperature 18 to 28˚C
	Residual vector error	<0.5 degree (rms), DC connection
	Residual EVM	<1.0% (rms), DC connection
	I/Q level	
	Level measurement	Measures input voltage (rms value and p-p value) of I and Q and displays them.
	I/Q phase difference	When CW signal is input to each input terminal of I and Q, measures the phase difference between I phase signal and Q phase signal and displays it.

Ordering Information

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

Model/order No.	Name
	– Main frame –
MS2687A	Spectrum analyzer
	– Standard accessories –
	Power cord, 2.6m: 1 pc.
J0266	Adapter (3-pole/2-pole changeable): 1 pc.
J0996B	RS-232C cable: 1 pc.
JT32MA3-NT1	PC-ATA card (32 MB): 1 pc.
F0014	Fuse, 6.3 A: 1 pc.
MX268001A	File transfer utility: 1 pc.
W1754AE	MS2681A/83A/87A operation manual: 1 copy
	– Options –
MS2687A-01	Precision frequency reference (Aging rate: 5 x 10^{-10}/day)
MS2687A-02	Narrow resolution bandwidths (FFT)
MS2687A-04	Digital resolution bandwidth
MS2687A-05	Rubidium reference oscillator ∗ Cannot be installed with MS2687A-22.
MS2687A-09	Ethernet interface
MS2687A-18	I/Q unbalanced input
MS2687A-21	Power meter function
MS2687A-22	13 GHz low noise ∗ Cannot be installed with MS2687A-05.
MS2687A-34	4 GHz LO output
MS2687A-46	Auto power recovery
MS2687A-47	Rack mount (IEC) without handles
MS2687A-48	Rack mount (JIS) without handles
	– Warranty –
MS2687A-90	Extended three years warranty service
MS2687A-91	Extended five years warranty service

Model/order No.	Name
	– Measurement software –
MX268701A	W-CDMA measurement software
MX268702A	GSM measurement software
	– Application parts –
J0561	Coaxial cord (N-P, 5D-2W, N-P), 2 m
J0104A	Coaxial cord (BNC-P, RG-55/U, BNC-P), 1 m
J0127A	Coaxial cord (BNC-P, RG-58A/U, BNC-P), 1 m
J0007	GPIB cable, 1 m
J0008	GPIB cable, 2 m
J1047	Ethernet cross cable, 5 m
MA1612A	Four-port junction pad (5 to 3000 MHz)
J0078	High power attenuator (N type, 20 dB, 10 W, DC to 18 GHz)
B0472	Fixed attenuator for high-power (N type, 30 dB, 100 W, DC to 18 GHz)
34AKNF50	Ruggedized K-to-Type N Adapter
MA2507A	DC block adaptor (50 Ω, 9 kHz to 3 GHz, ±50 V)
J0805	DC block, N type (10 kHz to 18 GHz, made by wineshell)
B0452A	Hard carrying case (with casters)
B0452B	Hard carrying case (without casters)
B0488	Rear panel protective pad
W1888AW	Assembling guide drawing for rear protective pad
B0481B	Carrybone
B0479	Soft carrying case (rucksack type)
MA4601A	Power sensor (100 kHz to 5.5 GHz, –30 to +20 dBm, N connector)
MA4701A	Power sensor (10 MHz to 18 GHz, –30 to +20 dBm, N connector)
MA4703A	Power sensor (50 MHz to 26.5 GHz, –30 to +20 dBm, N connector)
MA4705A	Power sensor (50 MHz to 32 GHz, –30 to +20 dBm, N connector)
MA2741A	External mixer (26.5 to 40 GHz)
MA2742A	External mixer (33 to 50 GHz)
MA2743A	External mixer (40 to 60 GHz)
MA2744A	External mixer (50 to 75 GHz)
MA2745A	External mixer (60 to 90 GHz)
MA2746A	External mixer (75 to 110 GHz)

Mainframe specifications when external mixer is used.

<table>
<tr><td rowspan="4">External Mixer</td><td>Frequency
Frequency range
Frequency band</td><td>18 to 110 GHz
<table><tr><th>Band</th><th>Frequency range</th><th>Mixer harmonics order [N]</th></tr><tr><td>K</td><td>18 to 26.5 GHz</td><td>4</td></tr><tr><td>Ka</td><td>26.5 to 40 GHz</td><td>6</td></tr><tr><td>Q</td><td>33 to 55 GHz</td><td>8</td></tr><tr><td>U</td><td>40 to 60 GHz</td><td>9 or 10</td></tr><tr><td>V</td><td>50 to 75 GHz</td><td>11 or 12</td></tr><tr><td>E</td><td>60 to 90 GHz</td><td>13 or 14</td></tr><tr><td>W</td><td>75 to 110 GHz</td><td>16</td></tr></table></td></tr>
<tr><td>Span setting range</td><td>0 Hz, (100xN) Hz to each bandwidth</td></tr>
<tr><td rowspan="3">Amplitude</td><td>Mixer transform Loss setting range</td><td>10 to 85 dB</td></tr>
<tr><td>Maximum input level
Average noise level</td><td>Depend of external mixer
Depend of external mixer</td></tr>
<tr><td>Frequency response</td><td>Depend of external mixer</td></tr>
<tr><td rowspan="4">Input/Output</td><td>Adaptive mixer</td><td>Only 2 port mixer</td></tr>
<tr><td>Local frequency</td><td>4 to 7 GHz</td></tr>
<tr><td>IF frequency</td><td>460.69 or 466 MHz</td></tr>
<tr><td>Display gain</td><td>0+/-2 dB (External mixer input level -10 dBm,Mixer transform loss 15 dB)</td></tr>
</table>

Anritsu

Specifications are subject to change without notice.

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