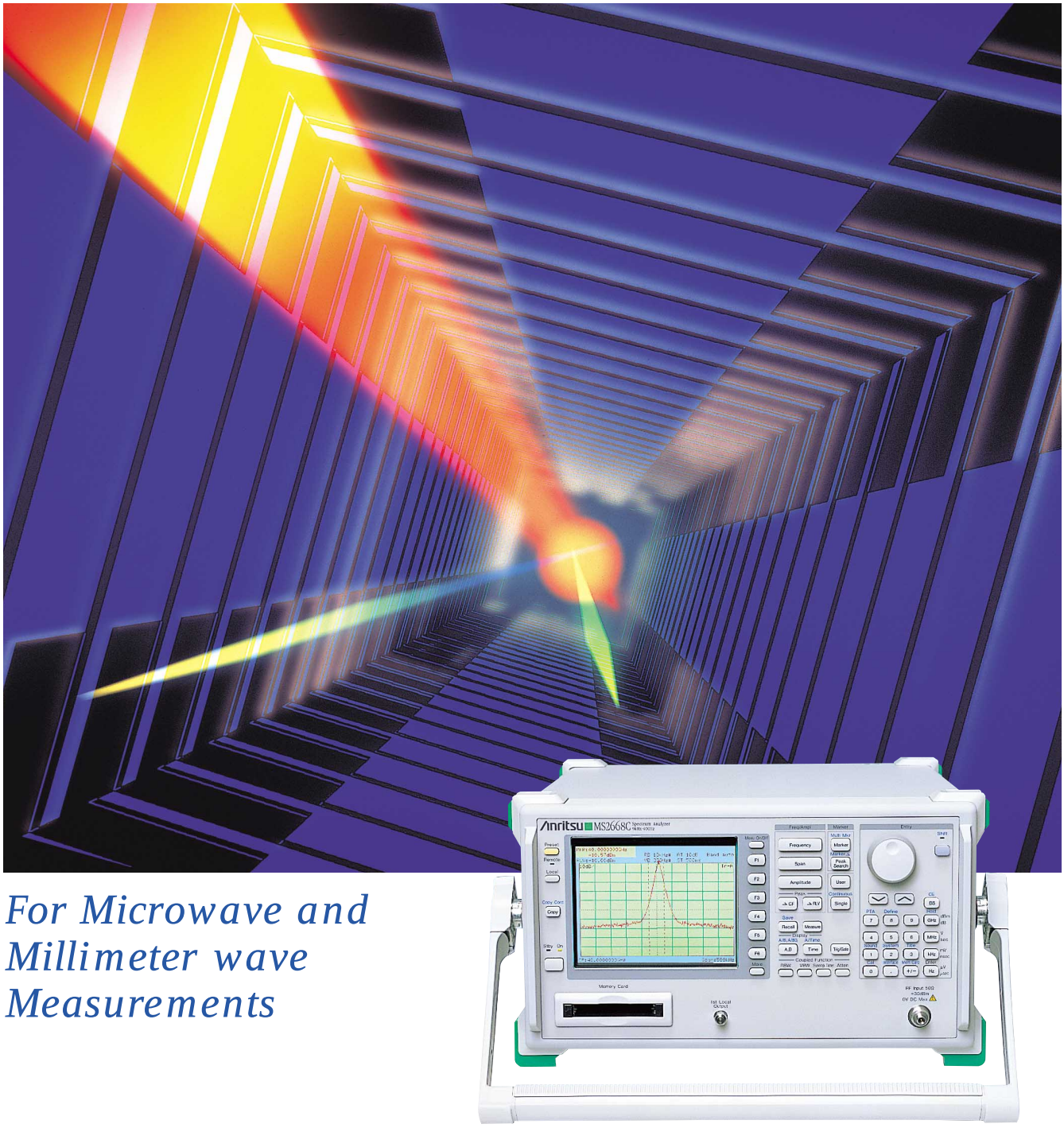
Discover What's Possible™

Anritsu

MS2668C

Spectrum Analyzer

9 kHz to 40 GHz

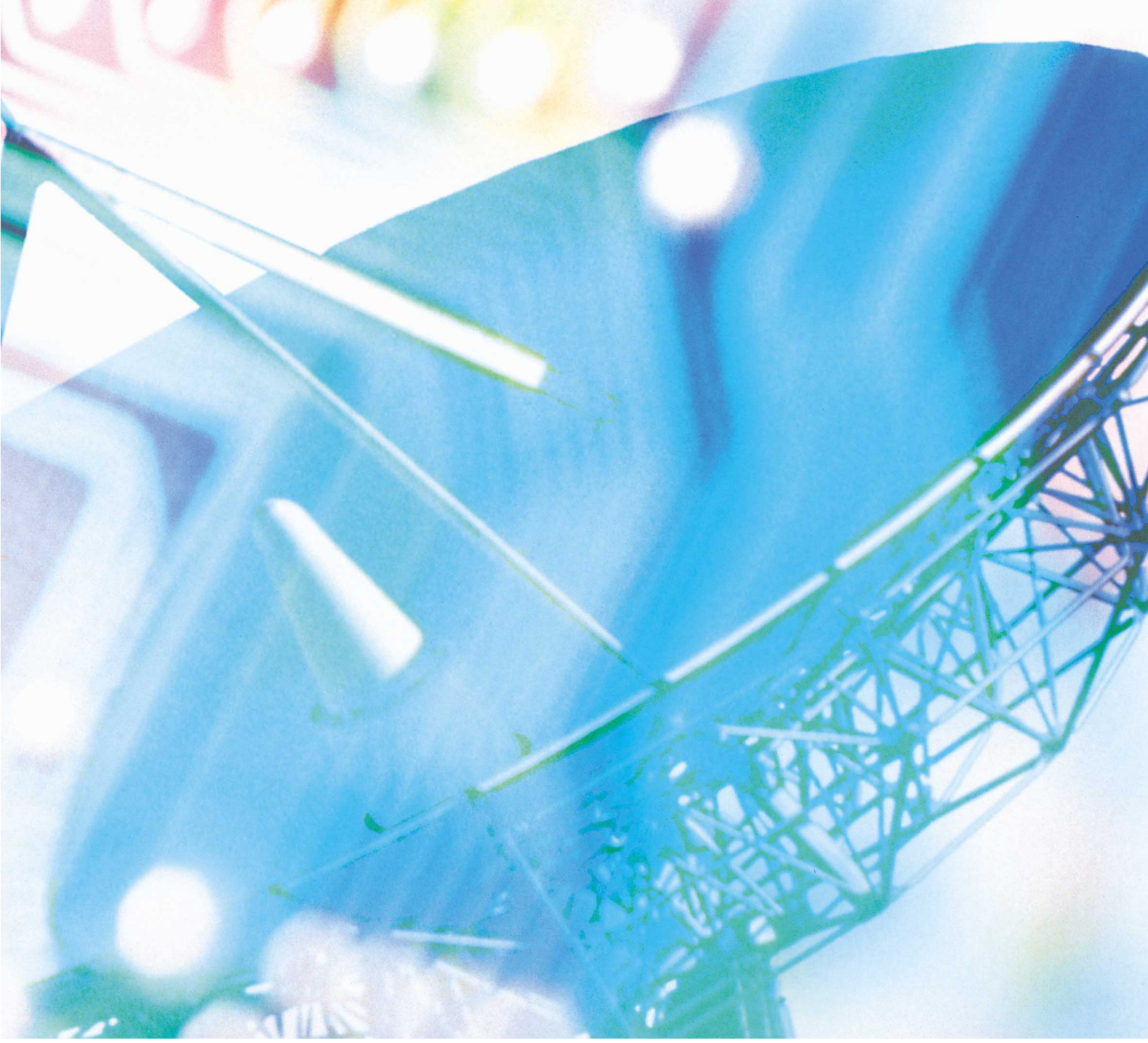


For Microwave and Millimeter wave Measurements

MS2668C

Spectrum Analyzer

In recent wireless communication market, the utilization of microwave/millimeter wave band frequencies is being considered in order to realize high-speed and large-capacity data communication. In the markets of ITS and ultrahigh-speed wireless LAN, aiming for the speedup of wireless LAN which began to be spread as a typical application, millimeter wave band is used for realizing collision avoidance radar.
MS2668C is a portable and high-performance spectrum analyzer that has various radio evaluation functions for microwave/millimeter wave devices and systems.



■ Compact and lightweight (15 kg in standard configuration)

- ●Easy portability for installation and maintenance

■ High C/N and superior distortion characteristics

- ●High-stability crystal oscillator as standard

■ Easy-to-use, simple operation

- ●Built-in “Measure” function for evaluation of radio equipment (frequency counter, C/N, channel power, adjacent channel power, occupied frequency bandwidth, burst average power and template pass/fail function)
- ●User-defined function
- ●Zone marker/zone sweep
- ●Two-screen display
- ●FM demodulation waveform display
- ●Memory card interface (for saving/recalling trace data and set up parameter and for saving screen image in bitmap format)

■ Millimeter wave applications

- ●External mixer input/output as standard
- ●Up to 110 GHz with an external mixer

■ Options support wide range of applications

- ●Narrow resolution bandwidth (10 to 300 Hz)
- ●High-speed time domain sweep
- ●Trigger/gate circuit
- ●AM/FM demodulator (sound monitor)
- ●Centronics interface (cannot be installed with GPIB simultaneously)

■ Easy to set up automatic measurements

- ●Controller function built-in (PTA)

Compact and Powerful

Synthesized local oscillator

The synthesized local oscillator design permits stable measurements without disturbance due to frequency drift of the spectrum analyzer itself. The level stabilizes in 30 minutes after power-on, making this unit especially suitable for on-site maintenance and adjustment where work must be completed quickly.

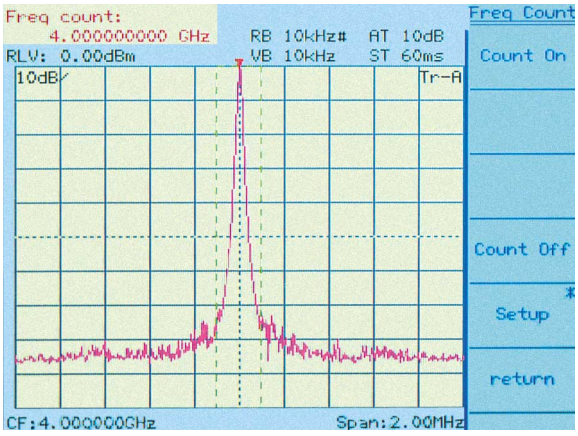
Excellent cost vs performance and the superior average noise level at 40 GHz

The superior basic performance, including noise sideband, average noise level, and spurious response, provides excellent cost vs performance. 10 Hz RBW (option 03) is provided.

Average noise level (RBW:1 kHz)	≤–115 dBm (1 MHz to 1 GHz) ≤–115 dBm +1.5f [GHz] dB (1.0 to 3.1 GHz, band 0) ≤–114 dBm (3.1 to 8.1 GHz) ≤–113 dBm (8.0 to 14.3 GHz) ≤–105 dBm (14.1 to 26.5 GHz) ≤–101 dBm (26.2 to 40 GHz)
Noise sideband	≤–95 dBc/Hz +20 log (n) ✻1 MHz to 40 GHz, 10 kHz offset, n: local harmonic order
Spurious response	2nd harmonic distortion: ≤–60 dBc (10 to 200 MHz, mixer input: –30 dBm) ≤–70 dBc (0.2 to 1.55 GHz, mixer input: –30 dBm) ≤–90 dBc or noise level (1.55 to 20 GHz, mixer input: –10 dBm) Two signal 3rd intermodulation distortion: ≤–70 dBc (10 to 100 MHz) ≤–80 dBc (0.1 to 8.1 GHz) ≤–75 dBc or noise level (8.1 to 26.5 GHz) ≤–75 dBc or noise level (typical, 26.5 to 40 GHz) ✻Frequency difference of two signals: ≥50 kHz, mixer input: –30 dBm

Counter with 1 Hz resolution

A full complement of frequency counter functions are provided. Resolution is as high as ±1 Hz even at full span, and high-speed frequency measurements can be performed. The high sensitivity compared with ordinary counters makes it easy to select one signal from many and to determine its frequency.



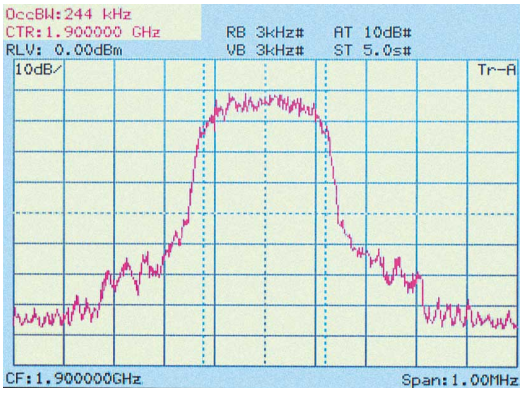
Frequency measurement (1 Hz resolution)

100 dB display dynamic range

For measurements requiring a wide dynamic range such as adjacent channel power measurements, MS2668C can display nearly 90 dB on a single screen.

Highly-accurate measurement

Automatic calibration ensures a high level accuracy. A span accuracy of 5% and 501 sampling points ensure accurate occupied frequency bandwidth and adjacent channel power measurements.



Occupied bandwidth measurement

Convenient, Easy-to-Use Functions

Simple operation

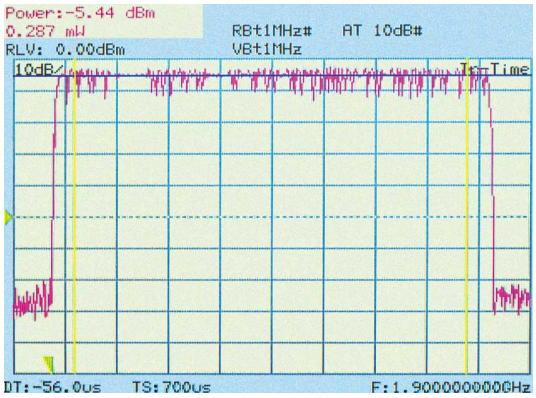
Users require ease of operation in a wide variety of contexts. The front panel, key layout, and softkey menu were simplified for ease-of-use. Also, “page-learning” and “user-defined” functions have been added to minimize the steps required for a given procedure.

Bright color screen

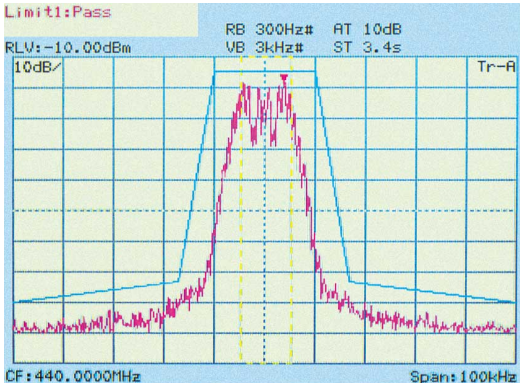
A 5.5 inch bright color TFT-LCD is used to custom configure the display scales, measured waveform data, settings and other parameters for easy viewing. Each color can be changed independently. When the soft key display is turned off, the scale area enlarges to 80 (H) × 180 (W) mm, comparable to an 8 inch CRT.

Radio equipment evaluation functions (“measure” functions)

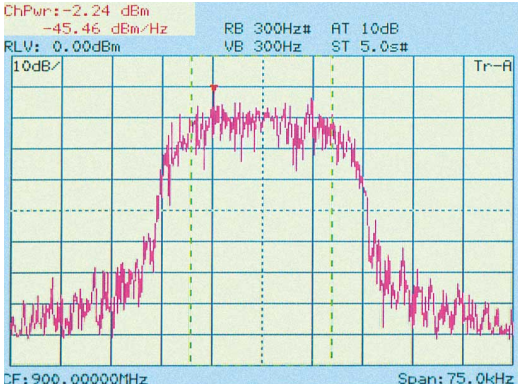
A full range of functions including measurement of power levels, frequencies, adjacent channel power, and mask and time template measurements are provided for performance evaluation of radio equipment. Key operation is simple and high-speed calculations make the measurement fast and efficient.



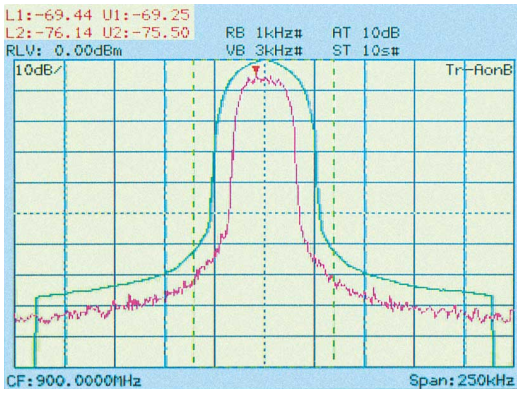
Burst average power measurement



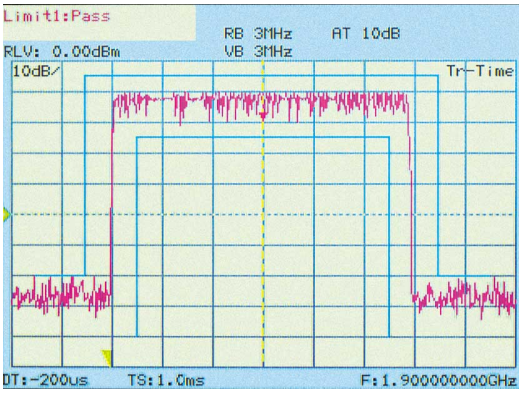
Mask measurement



Channel power measurement



Adjacent channel power measurement

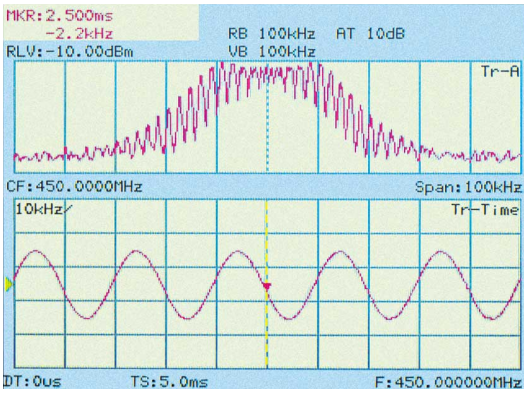


Time template measurement

Convenient Easy-to-Use Functions

FM-demodulated waveform display function

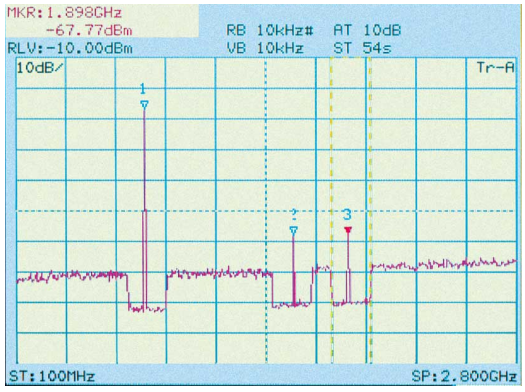
This function displays FM-demodulated waveforms with an accuracy of 5% over the range ±10 kHz to ±1 MHz. When used with high-speed time domain sweep (Option 04) and trigger/gate circuit (Option 06), frequency deviation of the modulated signal, as well as frequency switching times of radio equipment and VCOs, can be measured.



Spectrum and FM-demodulation waveform

Zone sweep and multi-zone sweep functions

Sweeps can be limited to zones defined by zone markers which results in reduced sweep time. This zone sweep function can be combined with “measure” functions such as “noise measure” which can directly read out the total noise power within the zone, to reduce measurement time greatly. The multi-zone sweep function enables up to ten zones to be swept.

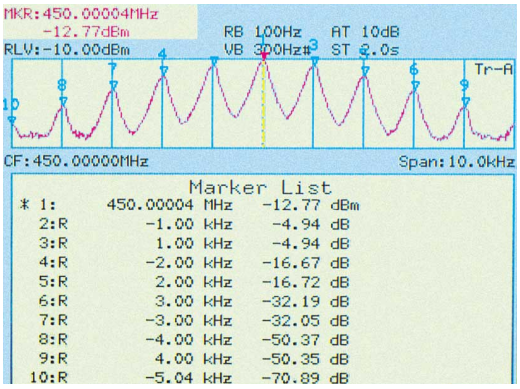


Multi-zone sweep

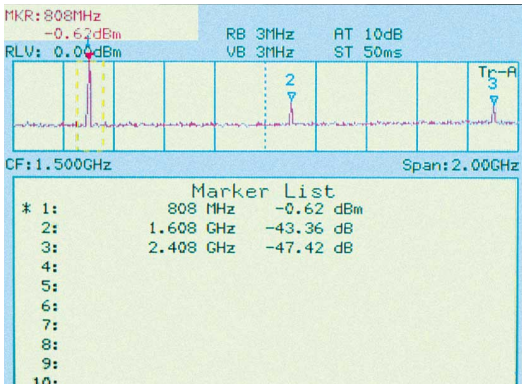
Zone markers and multimarkers

Zone markers can be set automatically at the peak signal within a given marker range, enabling quick measurement.

By using the multimarker function, automatic measurements can be performed for up to ten markers, with the results displayed in a table. With the multimarker function, up to 10 harmonics of the carrier can be measured, as well as the 10 highest spurious levels within the frequency span. Also, up to 10 markers can be manually set for automatic frequency and amplitude measurements.



Multi-marker (highest 10 points)

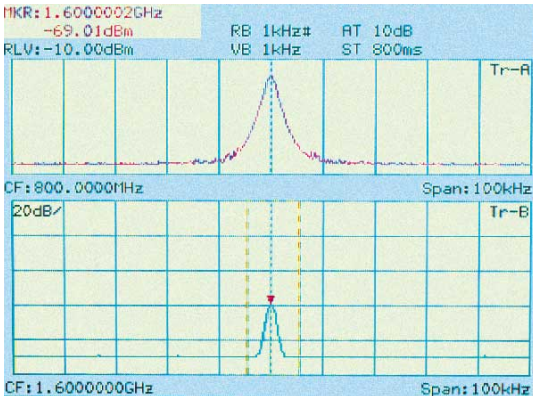


Multi-marker (harmonics measurement)

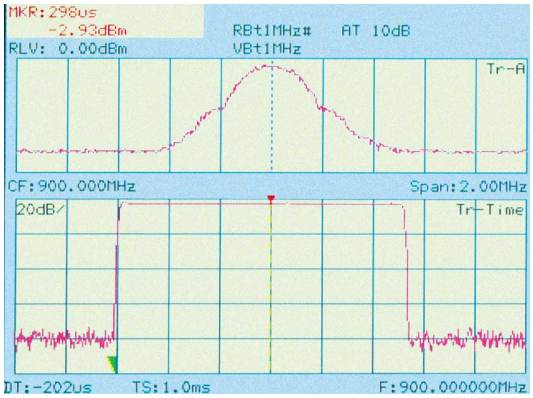
Convenient Easy-to-Use Functions

Multi-screen display

The Trace A and Trace B waveforms are superimposed on the same screen, and two spectra with different frequencies are displayed simultaneously. In addition, it is possible to simultaneously display spectrum and time domain screens for the same signal. The multi-screen display permits efficient signal level adjustment and harmonic distortion measurement, too. Furthermore, in addition to being able to display amplitude in the time domain, it is also possible to display the FM demodulation waveform.



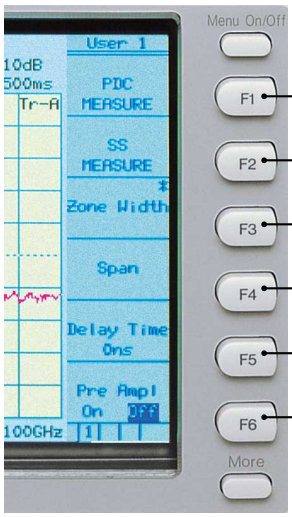
Two traces with different frequencies



Spectrum and time domain measurement

User-defined functions

Measurement programs downloaded to the spectrum analyzers from a personal computer or memory card can be executed by defining menu keys. The measurement program is executed simply by pressing the predefined key, with no further operation. Other panel and function keys can also be predefined in the same way.



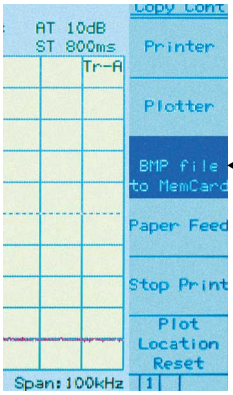
Measurement programs definition (downloaded from personal computer)

Panel and function keys definition

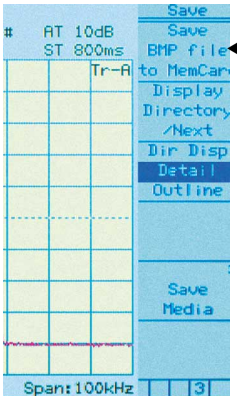
User-defined menu

Screen image bitmap saved to memory card

Instead of printing a hard copy of the screen, it is also possible to save the screen image to a memory card in bitmap format. Editing the saved bitmap data using a PC, makes report writing easy.



When the mode to save the screen image in bitmap format to the memory card is selected as a copy method at the hard copy function, just one press of the copy key saves the screen image as a bitmap format to the memory card. And the file number of each saved file is incremented automatically.



The screen image data can also be saved to the memory card using the save function. In this case, the file number of the saved file can be specified.

Versatile Options

The enhanced performance and digital functions of recent radio equipment necessitate measuring equipment with even more sophisticated functions and performance. Versatile options are available to meet such needs.

To boost basic performance

Narrow resolution bandwidth (Option 02/03)

The frequency resolution is improved by adding an optional narrow resolution bandwidth filter. Option 02 (30, 100, and 300 Hz) and 03 (10, 30, 100, 300 Hz) are provided. In Option 03, average noise level at RBW 10 Hz is specified.

For testing digital mobile communication equipment

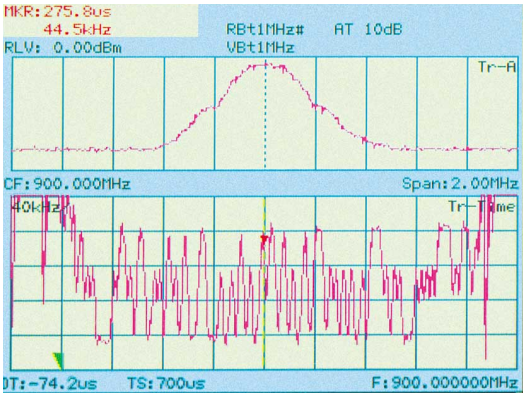
High-speed time domain sweep (Option 04)

Testing of TDMA-type radio equipment requires time domain (zero-span) measurements of antenna power, transient response characteristics of burst transmissions, transmission timing, and other characteristics. The high-speed time domain sweep option boosts a sweep time to 12.5 µs and resolution to 0.025 µs. ∗This option must be used with the trigger/gate circuit (Option 06).

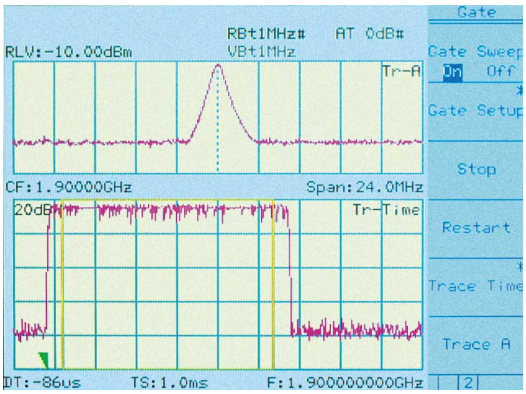
High-speed time-domain measurement (TS = 12.5 µs)

Trigger/gate circuit (Option 06)

The trigger function provides stable measurements of burst signals in the time domain. External, video, wide IF video, or line trigger can be selected.
PASS/FAIL measurements are easily made on TDMA radio burst signals using limit lines created in the template function.
Pre-trigger and post trigger delays can be used.
Burst signals can also be measured in the frequency domain using the gate sweep function. A wide IF video trigger function is used, eliminating the need for an external trigger source that was previously required.

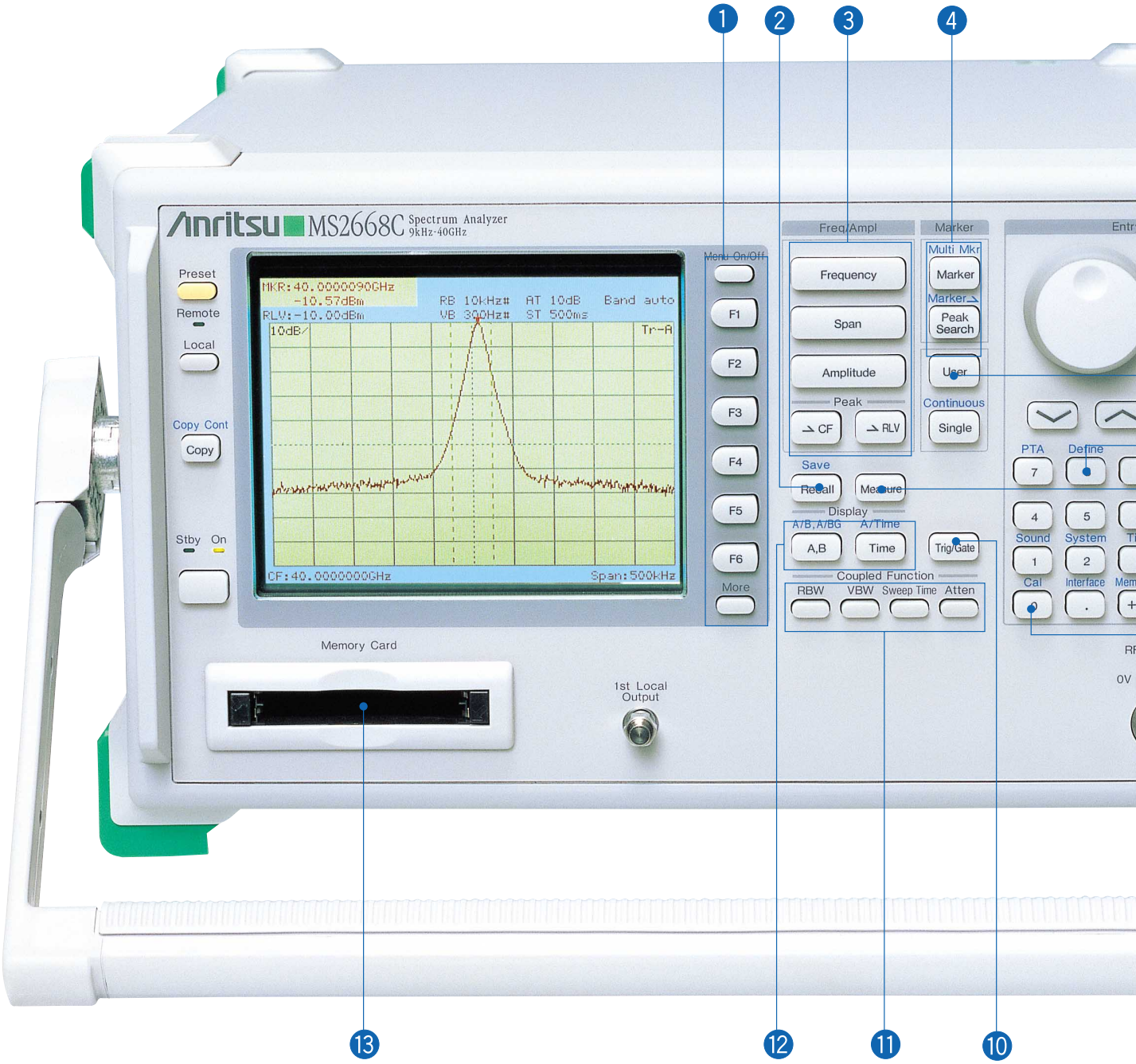


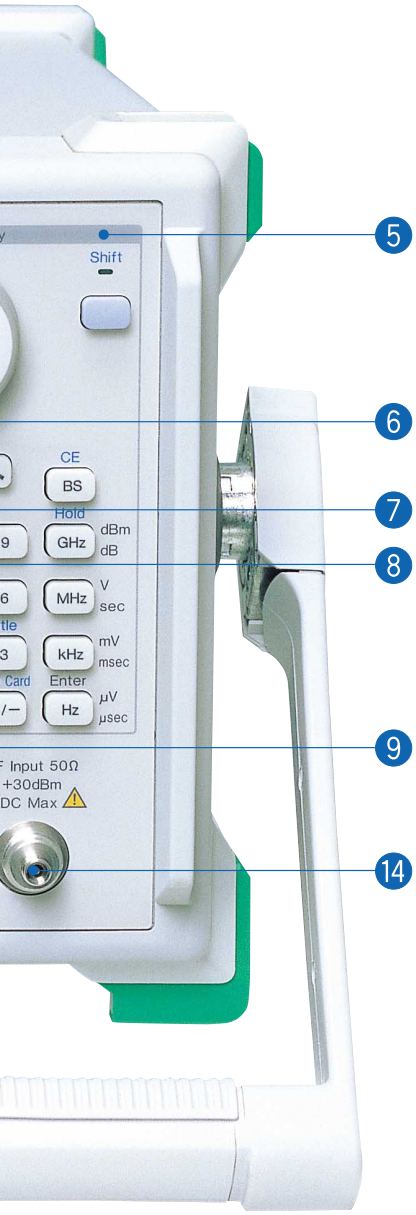
Wide IF video trigger function



Wide IF video trigger and gate functions

Easy-to-Use Key Layout





❶ Function keys F1 to F6
Select on-screen menu items
Menu on/off keys turn menus on and off, and [more] key turns menu pages.

❷ Save/recall
Saves and recalls measurement settings and measured waveforms
Data can be saved either to internal memory or to a memory card. (In internal memory, up to 12 data sets can be saved.)

❸ Main Functions
Set frequency, span, amplitude and other parameters

❹ Markers
Normal markers, multimarkers (maximum 10 numbers), zone markers and zone sweeping are provided.

❺ Entry keys
Input numeric values, units, and alphabetic characters

❻ User keys
Register any panel and menu key functions, as well as application software functions to user keys.

❼ User define key
Define's functions of user-defined keys
Up to 3-pages can be predefined.

❽ Measure key
Executes various operations based on waveform data
High-speed measurements and computations are performed without the need for an external personal computer.

❾ Calibration
The built-in high-precision calibration signal source provides accurate measurements.

❿ Trigger/gate
The trigger can be set in the time domain mode.

⓫ Coupled-function keys
Set parameters other than those set using main function keys
Normally set "Auto" for optimum values.

⓬ Display
Can be switched between frequency and time domains, and has two-screen display modes.

⓭ Memory card slots
Support memory cards up to 2 Mbytes
Two type-1 memory cards conforming to PCMCIA ver. 2.0 standards can be used simultaneously.

⓮ RF connector
For input of signals at levels up to +30 dBm (maximum DC input: ±0 V)

Configuring Automated Measurement System

RS-232C interface (standard)

The RS-232C interface can be used to output hard copy data to a printer or plotter and for remote control of the analyzer. A notebook computer can be used for automated control and data collection in the field. In addition, a modem can be used for easy remote operation.

GPIB interface (standard)

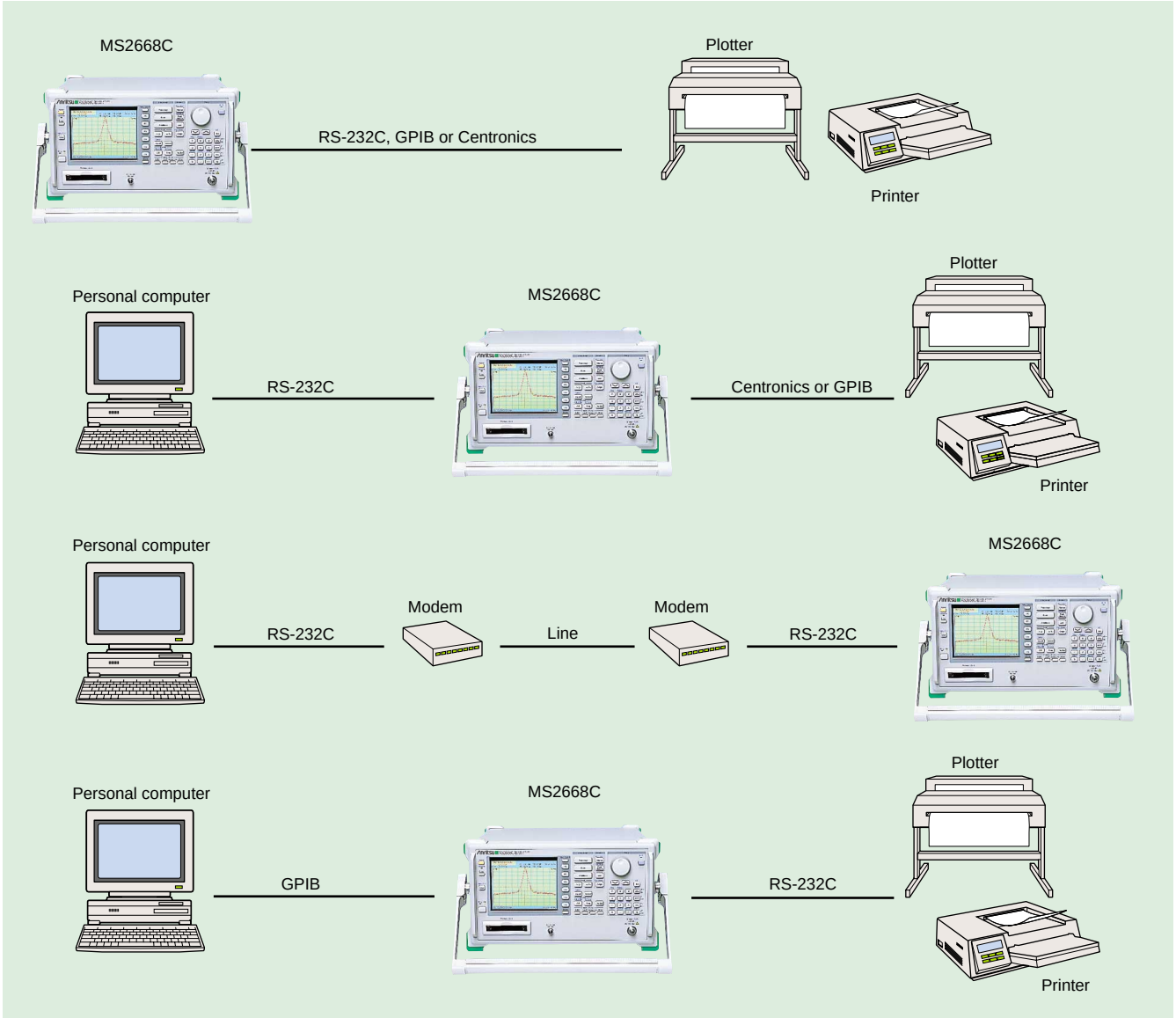
In addition to remote control, the GPIB interface can also be used to output data to a printer/plotter. (GPIB and Option 10 can not be installed simultaneously.)

Centronics interface (Option 10)

The Centronics interface is used to output data to a printer. (GPIB and Option 10 can not be installed simultaneously.)

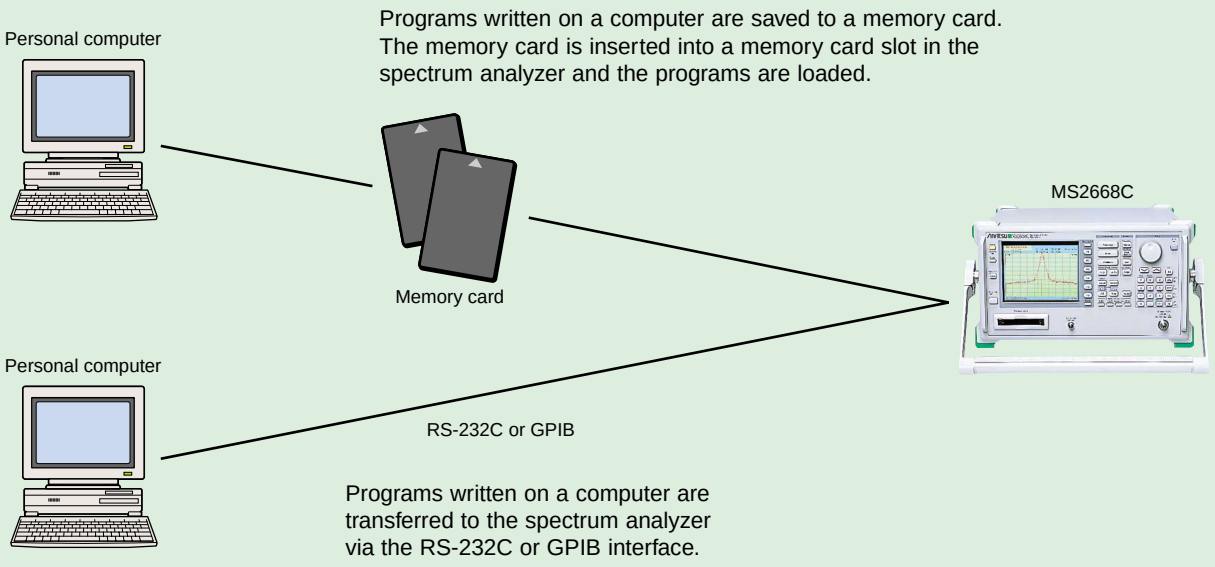
Memory card interface (standard)

Memory cards are used to save and recall measurement settings and waveform data, as well as to upload and download PTA programs. Cards up to 2 Mbytes are supported (PCMCIA ver. 2.0, type-I, 2-slots)



Automated measurement without external controller

The built-in microcomputer (PTA) functions which utilize the spectrum analyzer as a controller, make an external controller unnecessary. An automated measurement system including control of other instruments is easily configured. The two methods for loading programs are shown below.



Specifications

Except where noted otherwise, specified values were 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 40 GHz
	Frequency band	Band 0: 0 kHz to 3.2 GHz (n=1), Band 1–: 3.1 to 5.6 GHz (n=1), Band 1+: 5.4 to 8.1 GHz (n=1), Band 1+: 8.0 to 14.3 GHz (n=2), Band 2–: 14.1 to 26.5 GHz (n=4), Band 3–: 26.2 to 40 GHz (n=6) ✻n: local harmonic order
	Pre-selector range	3.1 to 40 GHz
	Frequency setting resolution	(1 × n) Hz ✻n: local harmonic order
	Frequency display accuracy	± (display frequency × reference frequency accuracy + span × span accuracy)
	Marker frequency display accuracy	Normal marker: Same as display frequency accuracy Delta marker: Same as frequency span accuracy
	Frequency counter	Resolution: 1 Hz, 10 Hz, 100 Hz, 1 kHz Accuracy: Display frequency × reference frequency accuracy ±1 LSD (at S/N: ≥20 dB)
	Frequency span	Setting range: 0 Hz, (100 × n) Hz to 40.0 GHz ✻n: local harmonic order Accuracy:±5%
	Resolution bandwidth (RBW) (3 dB bandwidth)	Setting range: 1 kHz, 3 kHz, 10 kHz, 30 kHz, 100 kHz, 300 kHz, 1 MHz, 3 MHz (manually settable, or automatically settable according to frequency span) Option 02: 30 Hz, 100 Hz, and 300 Hz are added Option 03: 10, 30, 100, 300 Hz are added Bandwidth accuracy: ±20% (1 kHz to 1 MHz), ±30% (3 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 and stability	Noise sidebands: ≤ –95 dBc/Hz + 20 log n (1 MHz to 40 GHz, 10 kHz offset) ✻n: local harmonic order Residual FM: ≤20 Hzp-p/0.1 s (1 GHz, span: 0 Hz) Frequency drift: ≤200 × n Hz/min (span: ≤10 kHz, sweep time: ≤100 s) ✻After 1-hour warm-up at constant ambient temperature; n: local harmonic order
	Reference oscillator	Frequency: 10 MHz Start-up characteristics: $\leq 5 \times 10^{-8}$/year (after 10 minutes warm-up, referenced to frequency after 24 hours warm-up) Aging rate: $\leq 1 \times 10^{-7}$/year, $\leq 1 \times 10^{-8}$/day Temperature characteristics: $\pm 5 \times 10^{-8}$ (0° to 50°C, referenced to frequency at 25°C)
	Level measurement	Measurement range: Average noise level to +30 dBm Maximum input level: +30 dBm (CW average power, RF ATT: ≥10 dB), ±0 Vdc Average noise level: ≤–115 dBm (1 MHz to 1 GHz), ≤–115 dBm +1.5f [GHz] dB (1 to 3.1 GHz), ≤–114 dBm (3.1 to 8.1 GHz), ≤–113 dBm (8.0 to 14.3 GHz), ≤–105 dBm (14.1 to 26.5 GHz), ≤–101 dBm (26.2 to 40 GHz) ✻RBW: 1 kHz, VBW: 1 Hz, RF ATT: 0 dB Residual response: ≤–90 dBm (RF ATT: 0 dB, input: 50 Ω terminated, 1 MHz to 8.1 GHz)
	Reference level	Setting range Log scale: –100 to +30 dBm, Linear scale: 224 µV to 7.07 V Unit Log scale: dBm, dBµV, dBmV, V, dBµVemf, W Linear scale: V Reference level accuracy: ±0.4 dB (–49.9 to 0 dBm), ±0.75 dB (–69.9 to –50 dBm, 0.1 to +30 dBm), ±1.5 dB (–80 to –70 dBm) ✻After calibration, at 100 MHz, span: 1 MHz (when RF ATT, RBW, VBW, and sweep time set to AUTO) RBW switching uncertainty: ±0.3 dB (1 kHz to 1 MHz), ±0.4 dB (3 MHz) ✻After calibration, referenced to RBW: 3 kHz Input attenuator (RF ATT) Setting range: 0 to 70 dB (10 dB steps) ✻Manual settable, or automatically settable according to reference level Switching uncertainty: ±0.3 dB (0 to 50 dB), ±1.0 dB (0 to 70 dB) ✻After calibration, frequency: 100 MHz, referenced to RF ATT: 10 dB

Specifications

Amplitude	Frequency response	Relative: ±1.5 dB (9.0 kHz to 3.2 GHz), ±1.0 dB (100 kHz to 3.2 GHz), ±1.5 dB (3.1 to 8.1 GHz), ±3.0 dB (8.0 to 14.3 GHz), ±4.0 dB (14.1 to 26.5 GHz), ±4.0 dB (26.2 to 40 GHz) ✻After pre-selector tuning at microwave band, referenced to midpoint between highest and lowest frequency deviation in each band. Absolute: ±5.0 dB (9 kHz to 40 GHz, RF ATT: 10 dB, referenced to 100 MHz) ✻After pre-selector tuning at microwave band
	Waveform display	Scale (10 div.) 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 MHz), ±1.0 dB (0 to –70 dB, RBW: ≤100 kHz), ±1.5 dB (0 to –85 dB, RBW: ≤3 kHz), ±2.5 dB (0 to –90 dB, RBW: ≤3 kHz) Linear scale: ±4% (compared to reference level) Marker level resolution Log scale: 0.01 dB, Linear scale: 0.02% of reference level
	Spurious response	2nd harmonic distortion: ≤–60 dBc (10 to 200 MHz, mixer input: –30 dBm), ≤–70 dBc (0.2 to 1.55 GHz, mixer input: –30 dBm), ≤–90 dBc or noise level (1.55 to 20 GHz, mixer input: –10 dBm) Two signal 3rd order intermodulation distortion: ≤–70 dBc (10 to 100 MHz), ≤–80 dBc (0.1 to 8.1 GHz), ≤–75 dBc or average noise level (8.1 to 26.5 GHz), ≤–75 dBc or average noise level (typical, 26.5 to 40 GHz) ✻Frequency difference of two signals: ≥50 kHz, mixer input: –30 dBm Image response: ≤–65 dBc (≤18 GHz), ≤–60 dBc (≤22 GHz), ≤–55 dBc (≤40 GHz) Multiple/out of band response: ≤–70 dBc(≤14 GHz), ≤–60 dBc (≤26 GHz), ≤–55 dBc (≤40 GHz)
	1 dB gain compression	≥–5 dBm (≥100 MHz, at mixer input)
Sweep	Sweep time	Setting range: 20 ms to 1000 s (manually settable, or automatically settable according to span, RBW, and VBW) Accuracy: ±15% (20 ms to 100 s), ±25% (110 to 1000 s), ±1% (time domain sweep: digital zero span mode)
	Sweep mode	Continuous, single
	Time domain sweep mode	Analog zero span, digital zero span
	Zero sweep	Sweeps only in frequency range indicated by zone marker.
	Tracking sweep	Sweeps while tracing peak points within zone marker (zone sweep also possible).
Functions	Number of data points	501
	Detection mode	NORMAL: Simultaneously displays max. and min. points between sample points. POS PEAK: Displays max. point between sample points. NEG PEAK: Displays min. point between sample points. SAMPLE: Displays momentary value at sample points. Detection mode switching uncertainty: ±0.5 dB (at reference level)
	Display	Color TFT-LCD, Size: 5.5 inch, Number of colors: 17 (RGB, each 64-scale settable), Intensity adjustment: 5 steps settable
	Display functions	Trace A: Displays frequency spectrum. Trace B: Displays frequency spectrum. Trace Time: Displays time domain waveform at center frequency. Trace A/B: Displays Trace A and Trace B simultaneously. Simultaneous sweep of same frequency, alternate sweep of independent frequencies. Trace A/BG: Displays frequency region to be observed (background) and object band (foreground) selected from background with zone marker simultaneously. Trace A/Time: Displays frequency spectrum, and time domain waveform at center frequency simultaneously. Trace move/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
	FM demodulation waveform display function	Demodulation range: 2, 5, 10, 20, 50, 100, 200 kHz/div Marker display Accuracy: ±5% of full scale (referenced to center frequency, DC-coupled, RBW: 3 MHz, VBW: 1 Hz, CW) Demodulation frequency response: DC (50 Hz at AC-coupled) to 100 kHz (range: ≤20 kHz/div, VBW: off, at 3 dB bandwidth) DC (50 Hz at AC-coupled) to 500 kHz (range: ≤50 kHz/div, VBW: off, at 3 dB bandwidth) ✻RBW: ≥1 kHz to 3 MHz usable
	Input connector	K-J, 50 Ω

Specifications

Functions	Auxiliary signal input and output	IF OUTPUT: –10 dBm (typical, 100 MHz, upper edge of scale, 50 Ω terminated), 10.69 MHz, BNC connector VIDEO OUTPUT (Y): 0 to 0.5 V ± 0.1 V (typical, from lower edge to upper edge at 10 dB/div) 0 to 0.4 V± 0.1 V (typical, from lower edge to upper edge at 10%/div) BNC connector ✻75 Ω terminated at 100 MHz input COMPOSITE OUTPUT: For NTSC, 1 Vp-p (75 Ω terminated), BNC connector EXT REF INPUT: 10 MHz ± 10 Hz, –10 to +2 dBm (50 Ω terminated), BNC connector REF BUFFERED OUTPUT: ≥0 dBm (50 Ω terminated), BNC connector 1ST LOCAL OUTPUT: 4 to 7 GHz, ≥+8 dBm, 50 Ω, SMA-J connector
	Signal search	AUTO TUNE, PEAK → CF, PEAK → REF, SCROLL
	Zone marker	NORMAL, DELTA
	Marker →	MARKER → CF, MARKER → REF, MARKER → CF STEP SIZE, Δ MARKER → SPAN, ZONE → SPAN
	Peak search	PEAK, NEXT PEAK, NEXT RIGHT PEAK, NEXT LEFT PEAK, MIN DIP, NEXT DIP
	Multimarker	Number of markers: 10 max. (HIGHEST 10, HARMONICS, MANUAL SET)
	Measure	Noise power (dBm/Hz, dBm/ch), C/N (dBc/Hz, dBc/ch), occupied bandwidth (power N% method, X-dB down method), adjacent channel power (REF: total power/reference level/in-band level method, channel designate display: 2 channels × 2 graphic display), average power of burst signal (average power in designated time range of time domain waveform), channel power (dBm, dBm/Hz), template comparison (upper/lower limits × each 2, time domain), MASK (upper/lower × each 2, frequency domain)
	Save/recall	Saves setting conditions and waveform data to internal memory (max. 12) or memory card.
	Hard copy	Printer (HP dotmatrix, EPSON dotmatrix compatible models): Display data can be hard-copied via RS-232C, GPIB and Centronics (Option 10) interface. Plotter (HP-GL, GP-GL compatible models): Display data can be output via RS-232C and GPIB interface.
	PTA	Language: PTL (interpreter based on BASIC) Programming: Using external computer. Program memory: Memory card, upload/download to/from external computer Programming capacity: 192 kB Data processing: Directly accesses measurement data according to system variables, system subroutines, and system functions
	RS-232C	Outputs data to printer and plotter. Control from external computer (excluding power switch).
	GPIB	Meets IEEE488.2. Controlled by external computer (excluding power switch). Or controls external equipment with PTA. Interface function: SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C1, C2, C3, C4, C28
	Correction	Automatic correction of insertion loss of MA1621A Impedance Transformer Correction accuracy (RF ATT: ≥10 dB): ±2.5 dB (9 to 100 kHz), ±1.5 dB (100 kHz to 2 GHz), ±2.0 dB (2 to 3 GHz) ✻Typical value
	Memory card interface	Functions: Saving/recalling measurement parameters/waveform data, uploading/downloading PTA programs; Applicable cards: SRAM, EPROM, Flash EPROM (Only SRAM writable; Card capacity: 2 MB max.) Connector: Meets the PCMCIA Rel. 2.0; 2 slots
External mixer	Frequency	Frequency range: 18 to 110 GHz Frequency band configuration Band K: 18 to 26.5 GHz (n=4), Band A: 26.5 to 40 GHz (n=6), Band Q: 33 to 50 GHz (n=8), Band U: 40 to 60 GHz (n=9), Band V: 50 to 75 GHz (n=11), Band E: 50 to 90 GHz (n=13), Band W: 75 to 110 GHz (n=16) Span setting range: 0 Hz, (100 × n) Hz to each bandwidth ✻n: local harmonic order
	Amplitude	Level measurement Mixer conversion loss setting range: 15 to 85 dB Maximum input level: Depends on the external mixer used Average noise level: Depends on the external mixer used Reference level setting range: –100 dBm to (–25 to M) dBm ✻Log scale, M: mixer conversion loss Frequency response: Depends on the external mixer used
	Input/output	Suitable mixer: 2-port mixer only (local frequency: 4 to 7 GHz, IF frequency: 689.31 MHz) Display gain: 0 ±2 dB (external mixer input: –10 dBm, when the mixer conversion loss is 15 dB)
Others	EMC	EN61326: 1997/A2: 2001 (Class A) EN61000-3-2: 2000 (Class A) EN61326: 1997/A2: 2001 (Annex A)
	LVD	EN61010-1: 2001 (Pollution Degree 2)
	Vibration	Meets the MIL-STD-810D
	Power (operating range)	85 to 132/170 to 250 Vac (automatic voltage switching), 47.5 to 63 Hz, ≤400 VA
	Dimensions and mass	320 (W) × 177 (H) × 381 (D) mm, ≤15 kg (without option)
	Ambient temperature	0° to +50°C (operate), –40° to +75°C (storage)

Option 02: Narrow resolution bandwidth

Resolution bandwidth (3 dB)	30 Hz, 100 Hz, 300 Hz
Resolution bandwidth switching uncertainty	±0.4 dB (RBW 3 kHz reference)
Resolution bandwidth accuracy	±20%
Selectivity (60 dB : 3 dB)	≤15:1

Option 03: Narrow resolution bandwidth

Resolution bandwidth (3 dB)	10 Hz, 30 Hz, 100 Hz, 300 Hz
Resolution bandwidth switching uncertainty	±0.4 dB (RBW 3 kHz reference)
Resolution bandwidth accuracy	±20%
Selectivity (60 dB : 3 dB)	≤15:1
Average noise level	≤–135 dBm (1 MHz to 1 GHz), ≤–135 dBm + 1.5f [GHz] dB (1 to 3.1 GHz), ≤–132 dBm (3.1 to 8.1 GHz), ≤–131 dBm (8.0 to 14.3 GHz), ≤–123 dBm (14.1 to 26.5 GHz), ≤–119 dBm (26.2 to 40 GHz) ✻RBW: 10 Hz, VBW: 1 Hz, RF ATT: 0 dB

Option 04: High-speed time domain sweep

Sweep time	12.5 µs, 25 µs, 50 µs, 100 to 900 µs (one most significant digit settable), 1.0 to 19 ms (two upper significant digits settable)
Accuracy	±1%
Marker level resolution	Log scale: 0.1 dB, Linear scale: 0.2% (relative to reference level)

✻ : This option is recommended to be mounted together with option 06.

Specifications

Option 06: Trigger/gate circuit

Trigger switch	FREERUN, TRIGGERED
Trigger source	EXT Trigger level: ±10 V (resolution: 0.1 V), TTL level Trigger slope: Rise/fall Connector: BNC VIDEO Log scale: –100 to 0 dB (resolution: 1 dB) Trigger slope: Rise/fall WIDE IF VIDEO Trigger level: High, middle, or low selectable Bandwidth: ≥20 MHz Trigger slope: Rise/fall LINE Frequency: 47.5 to 63 Hz (line lock)
Trigger delay	Pre-trigger (displays waveform from previous max. 1 screen at trigger occurrence point) Range: –time span to 0 s, Resolution: time span/500 Post trigger (displays waveform from after max. 65.5 ms at trigger occurrence point) Range: 0 to 65.5 ms, Resolution: 1 µs
Gate sweep	In frequency domain, displays spectrum of input signal in specified gate interval. Gate delay: 0 to 65.5 ms (from trigger point, resolution: 1 µs) Gate width: 2 µs to 65.5 ms (from gate delay, resolution: 1 µs)

Option 07: AM/FM demodulator

Voice output	With internal loudspeaker and earphone connector (ø3.5 jack), adjustable volume

Option 10: Centronics interface*1

Function	Outputs data to printer (Centronics standard)
Connector	D-sub 25-pin (jack)

✻1: GPIB interface can not be installed simultaneously.

Option 15: Sweep signal output

Sweep output (X)	0 to 10 V ±1 V (≥100 kΩ termination, from left side to right side of display scale), BNC connector
Sweep status output (Z)	TTL level (low level with sweeping), BNC connector

External mixer

Models	Frequency range	Flange	Max. input power
MA2740A	18 to 26.5 GHz	MIL-F-3922/68-001KM	100 mW
MA2741A	26.5 to 40 GHz	MIL-F-3922/68-001AM	100 mW
MA2742A	33 to 50 GHz	MIL-F-3922/67B-006	100 mW
MA2743A	40 to 60 GHz	MIL-F-3922/67B-007	100 mW
MA2744A	50 to 75 GHz	MIL-F-3922/67B-008	100 mW
MA2745A	60 to 90 GHz	MIL-F-3922/68B-009	100 mW
MA2746A	75 to 110 GHz	MIL-F-3922/68B-010	100 mW

Ordering Information

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

Model/order No.	Name		Remarks
	Main frame		
MS2668C	Spectrum analyzer		
	Standard accessories		
	Power cord, 2.6 m	: 1 pc	
F0013	Fuse, 5 A	: 2 pcs	
W1335AE	MS2668C operation manual	: 1 copy	
B0329G	Front cover		3/4MW4U
	Options		
MS2668C-02	Narrow resolution bandwidth		30, 100, 300 Hz
MS2668C-03	Narrow resolution bandwidth		10, 30, 100, 300 Hz
MS2668C-04	High-speed time domain sweep		1.25 µs/div
MS2668C-06	Trigger/gate circuit		Pre-trigger and post trigger available
MS2668C-07	AM/FM demodulator		Outputs to loudspeaker or earphone connector
MS2668C-10	Centronics interface		GPIB interface can not be used simultaneously.
MS2668C-15	Sweep signal output		X, Z
MS2668C-90	Extended three year warranty service		
MS2668C-91	Extended five year warranty service		
	Application parts		
J0911	Coaxial cord (K-P • K-P), 1 m		DC to 40 GHz, SUCOFLEX 102A
J0912	Coaxial cord (K-P • K-P), 0.5 m		DC to 40 GHz, SUCOFLEX 102A
34AKNF50	Coaxial adaptor		DC to 20 GHz, SWR: 1.5 (ruggedized K-P•N-J)
J0322B	Coaxial cord (SMA-P • SMA-P), 1 m		DC to 18 GHz, SUCOFLEX 104
J0561	Coaxial cord (N-P-5W • 5D-2W • N-P-5W), 1 m		
J0104A	Coaxial cord (BNC-P • RG-55/U • N-P), 1 m		
CSCJ-256K-SM	256 KB memory card		Meets PCMCIA Rel. 2.0
CSCJ-512K-SM	512 KB memory card		Meets PCMCIA Rel. 2.0
CSCJ-001M-SM	1024 KB memory card		Meets PCMCIA Rel. 2.0
CSCJ-002M-SM	2048 KB memory card		Meets PCMCIA Rel. 2.0
B0395A	Rack mount kit (IEC)		
B0395B	Rack mount kit (JIS)		
MP612A	RF Fuse Holder		DC to 1000 MHz, 50 Ω (N-type)
MP613A	Fuse Element		For MP612A
J0805	DC block (Model 7003)		10 kHz to 18 GHz, ±50 V, N-type, Weinschel product
J0910	DC block (Model 7006)		10 kHz to 18 GHz, ±50 V, SMA-type, Weinschel product
MA2507A	DC Block Adaptor		50 Ω, 9 kHz to 3 GHz, ±50 V, N-type
MA8601A	DC Block Adaptor		50 Ω, 30 kHz to 2 GHz, ±50 V, N-type
MA8601J	DC Block Adaptor		75 Ω, 10 kHz to 2.2 GHz, ±50 V, NC-type
MA1621A	50 Ω → 75 Ω Impedance Transformer		75 Ω, 9 kHz to 3 GHz, ±100 V, NC-type
MP614B	50 Ω ←→ 75 Ω Impedance Transformer		50 to 1200 MHz (transformer type), NC-type
J0007	GPIB cable, 1 m		408JE-101
J0008	GPIB cable, 2 m		408JE-102
J0742A	RS-232C cable, 1 m		For PC-98 Personal Computer and VP-600, D-sub 25-pins (straight)
J0743A	RS-232C cable, 1 m		For PC/AT compatible, D-sub 9-pins (cross)
J0064A	7 GHz band coaxial/waveguide adaptor		5.8 to 8.6 GHz, N-J•BRJ-7
J0064C	10 GHz band coaxial/waveguide adaptor		8.2 to 12.4 GHz, N-J•BRJ-10
J0004	Coaxial adaptor (N-P • SMA-J)		
DGM010-02000EE	Coaxial cord, 2 m		N-type connector, general use
DGM024-02000EE	Coaxial cord, 2 m		N-type connector, low-loss type
J0063	Fixed attenuator for high power		30 dB, 10 W, DC to 12.4 GHz, N-type
J0395	Fixed attenuator for high power		30 dB, 30 W, DC to 9 GHz, N-type
J0078	Fixed attenuator for high power		20 dB, 10 W, DC to 18 GHz, N-type
MP526D	High Pass Filter		400 MHz band, N-type
MA1601A	High Pass Filter		800/900 MHz band, N-type
MA2740A	External mixer		18 to 26.5 GHz
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
B0421A	Carrying case (hard type)		With caster
B0421B	Carrying case (hard type)		Without caster
B0435A	Carrying case (soft type)		

Anritsu

Specifications are subject to change without notice.

ANRITSU CORPORATION
5-1-1 Onna, Atsugi-shi, Kanagawa, 243-8555 Japan
Phone: +81-46-223-1111
Fax: +81-46-296-1264

● **U.S.A.**
ANRITSU COMPANY
TX OFFICE SALES AND SERVICE
1155 East Collins Blvd., Richardson, TX 75081, U.S.A.
Toll Free: 1-800-ANRITSU (267-4878)
Phone: +1-972-644-1777
Fax: +1-972-644-3416

● **Canada**
ANRITSU ELECTRONICS LTD.
700 Silver Seven Road, Suite 120, Kanata,
ON K2V 1C3, Canada
Phone: +1-613-591-2003
Fax: +1-613-591-1006

● **Brasil**
ANRITSU ELETRÔNICA LTDA.
Praca Amadeu Amaral, 27 - 1 andar
01327-010 - Paraiso, Sao Paulo, Brazil
Phone: +55-11-3283-2511
Fax: +55-11-3886940

● **U.K.**
ANRITSU LTD.
200 Capability Green, Luton, Bedfordshire LU1 3LU, U.K.
Phone: +44-1582-433280
Fax: +44-1582-731303

● **Germany**
ANRITSU GmbH
Nemetschek Haus Konrad-Zuse-Platz 1 81829
München, Germany
Phone: +49 (0) 89 442308-0
Fax: +49 (0) 89 442308-55

● **France**
ANRITSU S.A.
9, Avenue du Québec Z.A. de Courtabœuf 91951 Les
Ulis Cedex, France
Phone: +33-1-60-92-15-50
Fax: +33-1-64-46-10-65

● **Italy**
ANRITSU S.p.A.
Via Elio Vittorini, 129, 00144 Roma EUR, Italy
Phone: +39-06-509-9711
Fax: +39-06-502-2425

● **Sweden**
ANRITSU AB
Borgafjordsgatan 13 164 40 Kista, Sweden
Phone: +46-853470700
Fax: +46-853470730

● **Finland**
ANRITSU AB
Teknobulevardi 3-5, FI-01530 Vantaa, Finland
Phone: +358-9-4355-220
Fax: +358-9-4355-2250

● **Denmark**
Anritsu AB Danmark
Korskildelund 6 DK - 2670 Greve, Denmark
Phone: +45-36915035
Fax: +45-43909371

● **Singapore**
ANRITSU PTE LTD.
10, Hoe Chiang Road #07-01/02, Keppel Towers,
Singapore 089315
Phone: +65-6282-2400
Fax: +65-6282-2533

● **Hong Kong**
ANRITSU COMPANY LTD.
Suite 923, 9/F., Chinachem Golden Plaza, 77 Mody
Road, Tsimshatsui East, Kowloon, Hong Kong, China
Phone: +852-2301-4980
Fax: +852-2301-3545

● **P. R. China**
ANRITSU COMPANY LTD.
Beijing Representative Office
Room 1515, Beijing Fortune Building, No. 5 North
Road, the East 3rd Ring Road, Chao-Yang District
Beijing 100004, P.R. China
Phone: +86-10-6590-9230

● **Korea**
ANRITSU CORPORATION
8F Hyun Juk Bldg. 832-41, Yeoksam-dong,
Kangnam-ku, Seoul, 135-080, Korea
Phone: +82-2-553-6603
Fax: +82-2-553-6604

● **Australia**
ANRITSU PTY LTD.
Unit 3/170 Forster Road Mt. Waverley, Victoria, 3149,
Australia
Phone: +61-3-9558-8177
Fax: +61-3-9558-8255

● **Taiwan**
ANRITSU COMPANY INC.
7F, No. 316, Sec. 1, NeiHu Rd., Taipei, Taiwan
Phone: +886-2-8751-1816
Fax: +886-2-8751-1817

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