

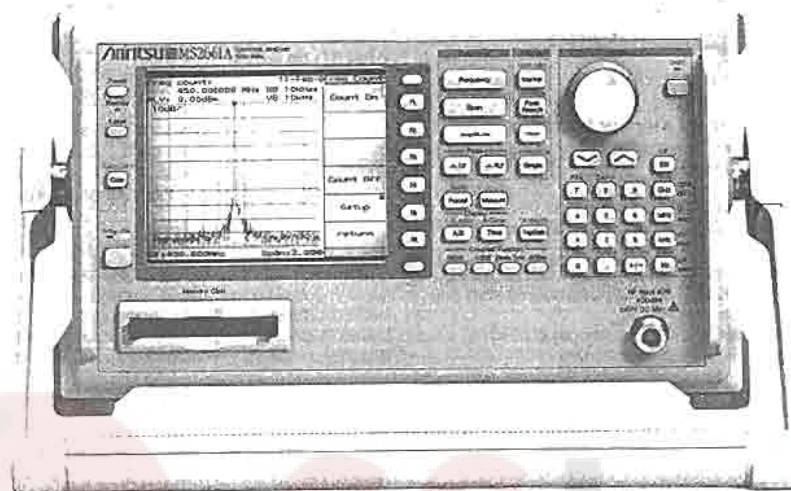
SPECTRUM ANALYZERS

Anritsu

SPECTRUM ANALYZER MS2651A/2661A

9 kHz to 3 GHz

NEW



CE GPIB
 OPTION

In the latest radio communications systems, the development of improved frequency efficiency and sophisticated digital functions are emphasized. The MS2651A/2661A portable spectrum analyzers are ideal for analyzing the signals of above systems, device and related equipment. They are synthesized spectrum analyzer covering a wide frequency range from 9 kHz to 3 GHz. The MS2651A/2661A have superior basic performance such as high C/N ratio, low distortion, and high frequency/level accuracies and are easy to operate.

A large selection of options enables customers to configure a spectrum analyzer with a superior cost/performance ratio for a given application. For manufacturing and installation involving radio equipment and devices choose the MS2661A; for maintenance, choose the MS2651A.

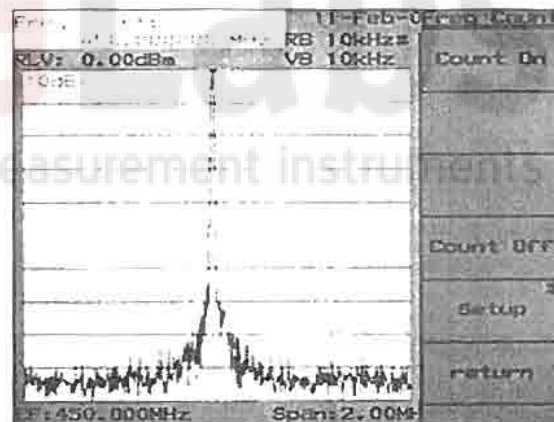
Features

- Compact, lightweight (10 kg)
- Synthesized local oscillator
- Convenient and easy-to-use
- Full range of uses
- Easy automation

Functions and performance

• Counter with 1 Hz resolution (option 03)

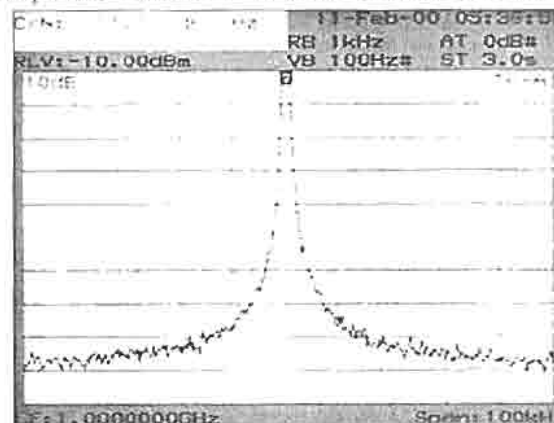
A full complement of frequency counter functions are provided. Resolution is a high ± 1 Hz even at full span, and high-speed frequency measurements can be performed in 2 seconds. The high sensitivity compared with ordinary counters makes it easy to select one signal from many and to determine its frequency.



Frequency measurement (1 Hz resolution)

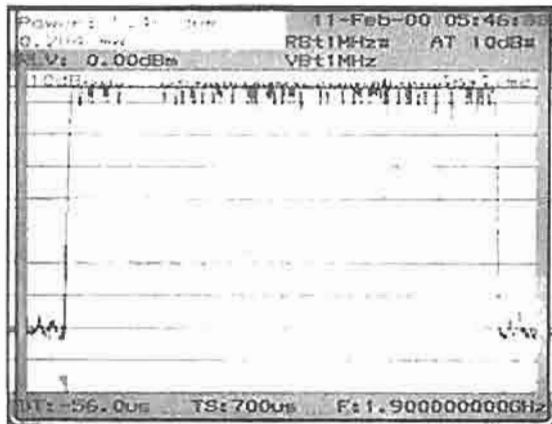
• High C/N ratio

Excellent noise sideband characteristics are required for analysis of weak signals adjacent to strong signals. The MS2661A has low noise sidebands of below -100 dBc (10 kHz offset) and -118 dBc (100 kHz offset), making it suitable for measurement of adjacent channel leakage power of both analog and digital radio communication equipment.

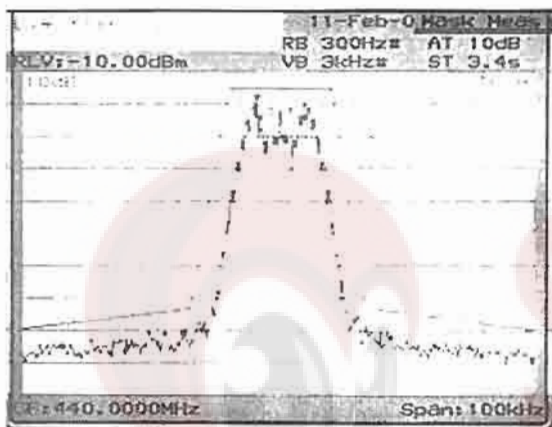


Noise sidebands measurement (10 kHz offset)

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



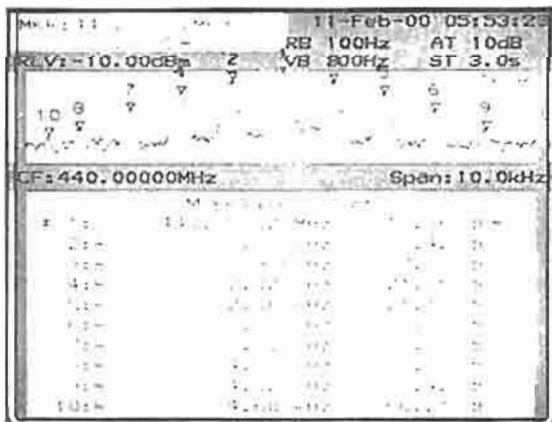
Burst average power measurement



Mask measurement

● **Zone markers and multimarkers**

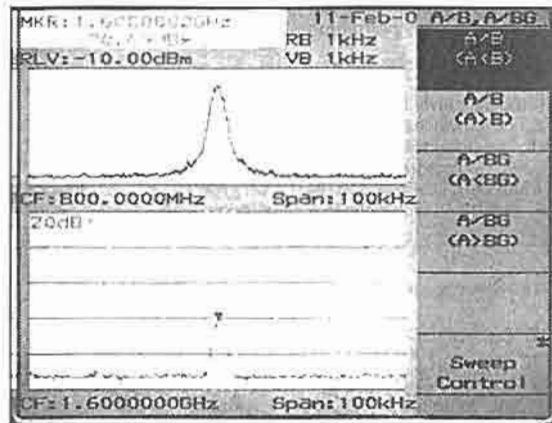
Zone markers can be set automatically at the peak signal within a given marker range, enabling quick measurement. By using the multimarker function, automatic measurements can be performed at up to ten marker points, and the results displayed in a table. Multimarkers have functions for harmonic measurements, and highest 10 points and manual setting functions.



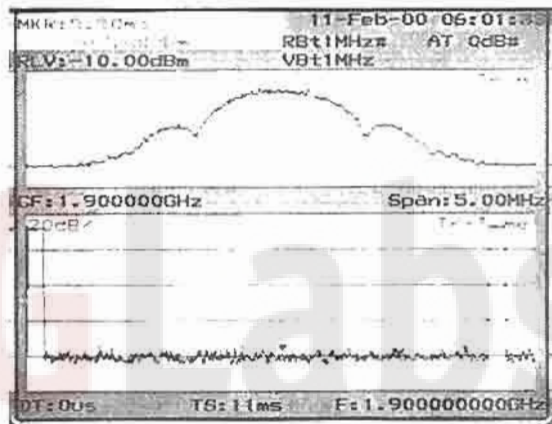
Multi-marker (Highest 10 points)

● **Two-screen display**

Two traces with different frequencies can be displayed simultaneously. This is very useful in investigation of spurious components and other problems. In addition, a given signal can be displayed simultaneously as both a frequency domain and a time domain to increase analysis efficiency. In the time domain display, both the amplitude, and the FM demodulated waveform (option 05) can be displayed.



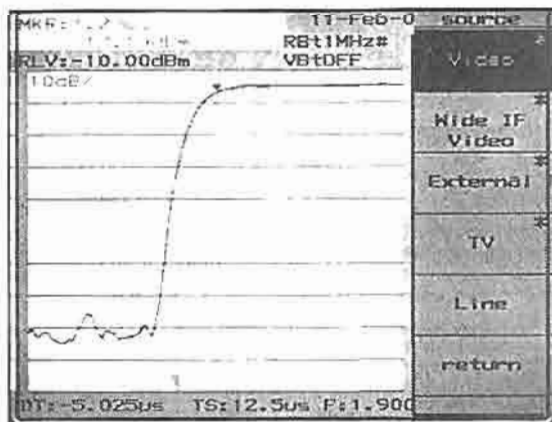
Two traces with different frequencies



Spectrum and time domain measurement

● **High-speed time domain sweeping (option 04)**

Testing of TDMA-type radio equipment (PDC, PHS, GSM, NADC, etc.) includes time domain (zero-span) measurements of antenna power, transient response characteristics of burst transmissions, transmission timing, and other quantities. The high-speed time domain sweeping option boasts a sweep time of 12.5 μs and resolution of 0.025 μs. This option must be used with the trigger/gate circuit (option 06).



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

2

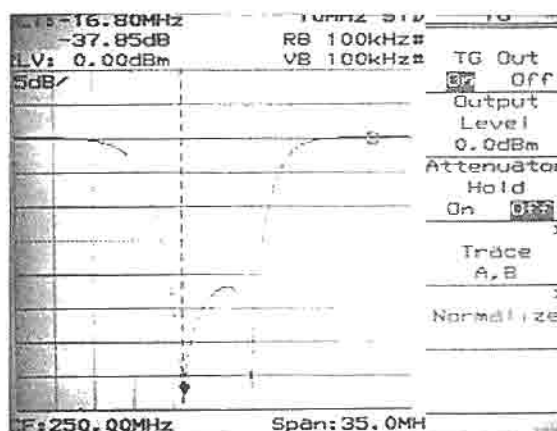
SPECTRUM ANALYZERS

Anritsu

Tracking generator (Option 20)

Option 20 is a built-in high-performance tracking generator covering a frequency range of 100 kHz to 3 GHz at levels of 0 to -60 dBm. It has a wide range of applications including measurement of filters and amplifiers.

When the tracking generator is combined with the separately-available reflection bridge (MR63 series), return loss can be measured at very high accuracy. In addition, the instant normalize function provides one-touch calibration permitting almost instantaneous measurement start.



Return loss measurement

Specifications

Model		MS2651A	MS2661A
Frequency	Frequency range	9 kHz to 3 GHz	
	Center frequency display accuracy	$\pm(\text{display frequency} \times \text{reference frequency accuracy} + \text{span} \times \text{span accuracy} + 100 \text{ Hz})$ * Span ≥ 10 kHz, after calibration	
	Marker frequency display accuracy	Normal: Same as center frequency display accuracy, Delta: Same as frequency span accuracy	
	Frequency span	Setting range: 0 Hz, 1 kHz to 3.1 GHz Accuracy: $\pm 2.5\%$ (span: ≥ 10 kHz), $\pm 5\%$ (span: < 10 kHz with option 02)	
	Resolution bandwidth (3 dB BW)	Setting range: 1 kHz, 3 kHz, 10 kHz, 30 kHz, 100 kHz, 300 kHz, 1 MHz, 5 MHz (manually or automatically settable according to frequency span) * Option 02 (MS2661A only): 30 Hz, 100 Hz, and 300 Hz are added. Measurements of such as noise, C/N, adjacent channel leakage power by measure function are executed with the calculated equivalent noise bandwidth of the resolution bandwidth.	
	Selectivity (60 dB : 3 dB)	$\leq 10:1$ (RBW: 1 to 300 kHz) $\leq 15:1$ (RBW: 1 MHz, 5 MHz)	
	Video bandwidth	1 Hz to 3 MHz (1-3 sequence), through (manually or automatically settable according to resolution bandwidth)	
	Signal purity and stability	Noise sidebands : ≤ -90 dBc/Hz (1 GHz, 10 kHz offset)	Noise sidebands : ≤ -100 dBc/Hz (1 GHz, 10 kHz offset)
	Reference oscillator	Frequency: 10 MHz Aging rate: 2×10^{-6} /year (typical); Option 01: 1×10^{-7} /year, 2×10^{-8} /day Temperature characteristics: 1×10^{-5} (typical, 0° to 50°C); Option 01: $\pm 5 \times 10^{-8}$ (0° to 50°C)	
	Level measurement	Measurement range	Average noise level to +30 dBm
Maximum input level		+30 dBm (CW average power, input attenuator ≥ 10 dB), ± 50 Vdc	
Average noise level		≤ -110 dBm (1 MHz to 1 GHz), ≤ -110 dBm + f [GHz] dB (> 1 GHz) * Resolution bandwidth 1 kHz, video bandwidth 1 Hz, input attenuator 0 dB	≤ -115 dBm (1 MHz to 1 GHz), ≤ -115 dBm + f [GHz] dB (> 1 GHz) * Resolution bandwidth 1 kHz, video bandwidth 1 Hz, input attenuator 0 dB
Residual response		≤ -100 dBm (input attenuator: 0 dB)	
Total level accuracy		± 1.1 dB, Total level accuracy: reference level accuracy (0 to -50 dBm) + frequency response + log linearity (0 to -20 dB) + calibration signal accuracy	
Amplitude	Reference level	Setting range Log scale: -100 to +30 dBm, or equivalent level Linear scale: 224 μ V to 7.07 V Unit Log scale: dBm, dB μ V, dBmV, V, dB μ Vemf, W Linear scale: V Reference level accuracy: ± 0.3 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 frequency, span 2 MHz (when input attenuator, resolution bandwidth, video bandwidth, and sweep time set to AUTO) Resolution bandwidth switching deviation: ± 0.3 dB Input attenuator Setting range: 0 to 70 dB (10 dB steps) * Manual settable, or automatically settable according to reference level Switching deviation: ± 0.3 dB (0 to 50 dB), ± 1 dB (0 to 70 dB) * After calibration, frequency 100 MHz, input attenuator 10 dB	
	Frequency response	± 0.5 dB (100 kHz to 3 GHz, referenced to 100 MHz, input attenuator 10 dB, temperature 18° to 28°C) ± 1.0 dB (100 kHz to 3 GHz, referenced to 100 MHz, input attenuator 0 to 50 dB) ± 1.5 dB (9 kHz to 100 kHz, referenced to 100 MHz, input attenuator 10 dB, temperature 18° to 28°C)	

Continued on next page

Model	MS2651A	MS2661A
Amplitude	CRT display Scale: 10 div (at single scale) Log scale: 10, 5, 2, 1 dB/div Linear scale: 10, 5, 2, 1% Linearity (after calibration): Log scale: ± 0.3 dB (0 to -20 dB, RBW ≤ 1 MHz), ± 1 dB (0 to -70 dB, RBW ≤ 100 kHz), ± 1.5 dB (0 to -85 dB, RBW ≤ 10 kHz), ± 2.5 dB (0 to -90 dB, RBW ≤ 10 kHz) Linear scale: $\pm 3\%$ (compared to reference level) Marker level resolution: Log scale: 0.01 dB Linear scale: 0.01% of reference level	
	Spurious response 2nd harmonic distortion: -55 dBc (10 to 100 MHz, mixer level -30 dBm) -60 dBc (10 to 1500 MHz, mixer level -30 dBm) Two signal 3rd intermodulation distortion: -70 dBc (10 MHz to 3 GHz, frequency difference of two signals >50 kHz, mixer input level -30 dBm)	2nd harmonic distortion: -60 dBc (10 to 200 MHz, mixer level -30 dBm) -75 dBc (200 to 1500 MHz, mixer level -30 dBm) -80 dBc (800 to 1000 MHz, mixer level -30 dBm) Two signal 3rd intermodulation distortion: -70 dBc (10 to 100 MHz), -80 dBc (100 MHz to 3 GHz) * Frequency difference of two signals >50 kHz, mixer input level -30 dBm
	1 dB gain compression ≥ -5 dBm (≥ 100 MHz, at mixer input level)	
Sweep	Maximum dynamic range 1-dB gain compression level to average noise level: >105 dB (100 MHz to 1 GHz), >105 dB -f [GHz] dB Distortion characteristics (1 kHz RBW): 2nd harmonic: >67.5 dB (10 to 100 MHz), >70 dB (100 to 500 MHz), >70 -f [GHz] dB (500 to 1000 MHz) 3rd intermodulation: >76.7 dB (10 to 1000 MHz), >76.7 -2/3f [GHz] dB (1 to 3 GHz)	
	1-dB gain compression level to average noise level: >110 dB (100 MHz to 1 GHz), >110 dB -f [GHz] dB (>1 GHz) Distortion characteristics (1 kHz RBW): 2nd harmonic: >72.5 dB (10 to 200 MHz), >80 dB (200 to 500 MHz), >80 -f [GHz] dB (500 to 1500 MHz), >82.5 -f [GHz] dB (800 to 1000 MHz) 3rd intermodulation: >80 dB (10 to 100 MHz), >83.3 dB (100 to 1000 MHz), >83.3 -2/3f [GHz] dB (1 to 3 GHz)	
Functions	Sweep time Setting range: 20 ms to 1000 s (manual settable, or automatically settable according to span, resolution bandwidth and video bandwidth) Accuracy: $\pm 15\%$ (20 ms to 100 s), $\pm 45\%$ (110 to 1100 s), $\pm 1\%$ (time domain sweep)	
	Sweep mode Continuous, single	
	Zone sweep Sweeps only in frequency range indicated by zone marker	
	Tracking sweep Sweeps while tracing peak points within zone marker (zone sweep also possible)	
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 error: ± 0.5 dB (at reference level)		
Display Color TFT-LCD Size: 5.7" Number of colors: 17 (RGB, each 64-scale 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		
Storage functions NORMAL VIEW, MAX HOLD, MIN HOLD, AVERAGE, CUMULATIVE, OVER WRITE		
Input connector N-J, 50 Ω		
Auxiliary signal input and output IF OUTPUT: 455 kHz (RBW ≤ 30 kHz), 10.695 MHz (RBW ≥ 100 kHz), BNC connector VIDEO OUTPUT (Y): 0 to 0.5 V ± 0.1 V (100 MHz input, 75 Ω termination, LOG: 10 dB/div, from lower edge to upper edge, BNC connector) COMPOSITE OUTPUT: For NTSC, 1 Vp-p (75 Ω terminated), BNC connector EXT REF INPUT: 10 MHz ± 10 Hz, 2 to 5 Vp-p, ≥ 200 Ω , BNC connector		
Signal search AUTO TUNE, PEAK \rightarrow CF, PEAK \rightarrow REF, SCROLL		
Zone marker NORMAL, DELTA		
Marker MARKER \rightarrow CF, MARKER \rightarrow REF, MARKER \rightarrow CF STEP SIZE, Δ MARKER \rightarrow SPAN, ZONE \rightarrow SPAN		
Peak search PEAK, NEXT PEAK, NEXT RIGHT PEAK, NEXT LEFT PEAK, MIN DIP, NEXT DIP		
Multi-marker 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 leakage power (REF: total power method, reference level method, channel designate display: 2 channels \times 2, graphic display), average power of burst signal (average power in designated time range of time domain waveform), template comparison (upper/lower limits \times each 2, time domain), MASK (upper/lower \times each 2, frequency domain)		
Save/recall Save and recall setting conditions and waveform data to internal memory (max. 12) or memory card (Option 11)		
Hard copy Printer (HP dotmatrix, EPSON dotmatrix or compatible models): Display data can be hard-copied via the RS-232C, GPIB (Option 09), or parallel (Option 10) interface Plotter (HP-GL, GP-GL or compatible models): Display data can be output via the RS-232C, and GPIB (Option 09) interface		

Continued on next page

SPECTRUM ANALYZERS



Model		MS2651A	MS2661A
Functions	PTA	Language: PTL (interpreter based on BASIC) Programming: Using editor of external computer Program memory: Memory card (Option 11), upload/download to/from external computer Programming capacity: 192 Kbyte 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)	
Others	Power	85 to 132 Vac/170 to 250 Vac (automatic voltage switching), 47.5 to 63 Hz, ≤ 200 VA (100 Vac), ≤ 220 VA (200 Vac)	
	Dimensions and mass	177 (H) \times 320 (W) \times 351 (D) mm, ≤ 10.4 kg (without option, ≤ 9.8 kg when handle is removed)	
	Ambient temperature	0° to 50°C (operate), -30° to +75°C (storage)	
	EMC*1	EN55011: 1991, Group 1, Class A EN50082-1: 1992	

*1: Electromagnetic compatibility

Option 03: Frequency counter

Resolution	1 Hz, 10 Hz, 100 Hz, 1 kHz
Accuracy	Display frequency \times reference frequency accuracy ± 1 count (when S/N is ≥ 20 dB)

Option 04: High-speed time domain sweep

Sweep time	12.5 μ s, 25 μ s, 50 μ s, 100 to 900 μ s (one most significant digit settable) 1.0 to 19 ms (two upper significant digits settable)
Accuracy	$\pm 1\%$
Marker level resolution	0.1 dB (log scale), 0.2% (linear scale, relative to reference level)

Option 05: FM demodulation waveform display function

Demodulation range	2, 5, 10, 20, 50, 100, 200 kHz/div
Marker display	Accuracy: $\pm 5\%$ of full scale (referenced to center frequency after calibration, DC-coupled, RBW 5 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)

Option 06: Trigger/gate circuit

Trigger switch	FREE RUN, TRIGGERED	
Trigger source	EXT	Trigger level: ± 10 V (resolution: 0.1 V) Trigger slope: RISE/FALL
	VIDEO	Trigger level: -100 to 0 dB (log scale, 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 to 63 Hz (line lock)
Trigger delay	TV	System: NTSC, PAL Sync.: V-SYNC, H-SYNC (ODD/EVEN) * Option 16 required
	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 μ s	
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 μ s) Gate width: 2 μ s to 65.5 ms (from gate delay point, or external control, resolution: 1 μ s)	

Option 07: AM/FM demodulator (voice monitor)

Voice output	With internal loudspeaker and earphone connector ($\phi 2.5$ mini jack), adjustable volume
--------------	---

Option 08: Pre-amplifier*1

Frequency range	100 kHz to 3 GHz
Gain	20 dB ± 2 dB (after calibration)
Noise figure*2	≤ 7 dB (<2 GHz), ≤ 12 dB (≥ 2 GHz)
Level measurement	Range: Average noise level to +10 dBm Max. input level CW average power: +10 dBm DC voltage: ± 50 V Average noise level (RBW: 1 kHz, VBW: 1 Hz, RF attenuator: 0 dB) MS2651A: ≤ -130 dBm (1 MHz to 1 GHz) ≤ -130 dBm +1.5 dB (>1 GHz, f: frequency; GHz) MS2661A: ≤ -134 dBm (1 MHz to 1 GHz) ≤ -134 dBm +2 dB (>1 GHz, f: frequency; GHz)
	Reference level
Frequency response	± 2.0 dB (100 kHz to 3 GHz) * Referenced to 100 MHz, input attenuator 0 to 50 dB
Display	Linearity (after calibration) Log scale: ± 0.5 dB (0 to -20 dB, RBW: ≤ 1 MHz) ± 1 dB (0 to -60 dB, RBW: ≤ 100 kHz) ± 1.5 dB (0 to -75 dB, RBW: ≤ 10 kHz) Linear scale: $\pm 5\%$ (compared to reference level)
Spurious response	Two signal 3rd intermodulation distortion: ≤ -70 dBc (input frequency 10 MHz to 3 GHz, frequency difference of two signals ≥ 50 kHz, pre-amplifier level*3 -55 dBm)
1 dB gain compression	≥ -35 dBm (≥ 100 MHz), pre-amplifier input level*3

*1: When pre-amplifier is set to ON, above performance is specified as total performance. Noise figure is specified as only pre-amplifier.

*2: Typical values for reference; not guaranteed specifications

*3: Pre-amplifier input level is calculated as following formula. Pre-amplifier input level = RF input level - input attenuator setting value

Option 09: GPIB interface

Functions	Meets IEEE488.2. Can be controlled as device from external computer (excluding power switch). Or can control external equipment as controller
Interface	SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C1, C2, C3, C4, C28

Option 10: Parallel interface

Function	Output data to printer (Centronics standard)
Connector	D-sub 25-pin (fack)

Option 11: Memory card interface

Functions	Save/recall measurement settings and data. Uploads/downloads PTA programs. Accesses SRAM, EPROM, and flash EEROM (writes to SRAM only). Supports cards up to 2 MB.
Connector	PCMCIA Ver. 2.0, 2 slots

Option 15: Sweep signal output

Sweep output (X)	0 to 10 V \pm 1 V (\geq 100 k Ω termination, from left side to right side display scale). BNC connector
Sweep status output (Z)	TTL level (low level with sweeping). BNC connector

Option 16: Television monitor*

Video	NTSC/PAL, color
Audio	Simultaneous monitor of video and audio needs Option 07
Function	Channel: Automatic setting of Japan and U.S. channel frequencies Trigger (Option 06 required): Trigger sweep by V-SYNC, H-SYNC (EVEN), H-SYNC (ODD) possible

*: Option 08 required

Option 20: Tracking generator

Frequency range	100 kHz to 3 GHz
Output level range	0 to -60 dBm
Setting resolution	0.1 dB
Output level accuracy	\pm 1.0 dB (at 100 MHz, 0 dBm)
Output level flatness	\pm 1.5 dB (relative to the level at 0 dBm, 100 MHz)
Output level linearity	\pm 1.0 dB (at 0 to -30 dBm), \pm 2.0 dB (at -30 to -60 dBm) *At 100 kHz to 3 GHz, compared to 0 dBm
Spurious	Harmonics: \leq -20 dBc, Non-harmonics: \leq -35 dBc
Tracking generator feed-through	\leq -95 dBm (Spectrum analyzer input and tracking generator output are terminated at 50 Ω .)
Output connector	N-J, 50 Ω

Ordering information

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

Model/order No.	Name
MS2651A	Main frame Spectrum Analyzer
MS2661A	Spectrum Analyzer
	Standard accessories
	Power cord, 2.5 m: 1 pc
F0013	Fuse, 5 A: 2 pcs
W1063AE	MS2651A/2661A operation manual: 1 copy
W1063BE	MS2651A/2661A service manual: 1 copy
	Options
MS2651A/2661A-01	Reference crystal oscillator (stability: \leq 2 \times 10 ⁻⁸ /day)
MS2661A-02	Narrow resolution bandwidth (30 Hz, 100 Hz, 300 Hz, MS2661A only)
MS2651A/2661A-03	Frequency counter
MS2651A/2661A-04	High-speed time domain sweep
MS2651A/2661A-05	FM demodulated waveform display function
MS2651A/2661A-06	Trigger/gate circuit
MS2651A/2661A-07	AM/FM demodulator (voice monitor)
MS2651A/2661A-08	Pre-amplifier
MS2651A/2661A-09	GPIO interface
MS2651A/2661A-10	Parallel interface
MS2651A/2661A-11	Memory card interface
MS2651A/2661A-15	Sweep signal output
MS2651A/2661A-16	Television monitor
MS2651A/2661A-20	Tracking generator
	Application parts
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
JS256G3-C-13	256 Kbyte memory card (meets PCMCIA Ver. 2.0)
JS512G3-C-13	512 Kbyte memory card (meets PCMCIA Ver. 2.0)
JS1024G3-C-13	1024 Kbyte memory card (meets PCMCIA Ver. 2.0)
JS2048G3-C-13	2048 Kbyte memory card (meets PCMCIA Ver. 2.0)
B0329G	Protective cover (3/4MW4U)
B0395A	Rack mount kit (IEC)
B0395B	Rack mount kit (JIS)
J0055	Coaxial adaptor (NC-P-BNC-J)
J0076	Coaxial adaptor (NC-P-F-J)
B0391A	Carrying case (hard type, with casters)
B0391B	Carrying case (hard type, without casters)
MP612A	RF Fuse Holder
MP613A	Fuse Element
MA8601A	DC Block Adaptor, 50 Ω
MA1621A	50 Ω \rightarrow 75 Ω Impedance Transformer (9 kHz to 3 GHz, with DC block capacitor; allowable voltage: 100 V)
MP614A	50 Ω \leftrightarrow 75 Ω Impedance Transformer
J0121	Coaxial cord, NC-P-3W-3C-2WS-NC-P-3W, 1 m
J0308	Coaxial cord, BNC-P-3C-2WS-NC-P-3W, 1 m
J0063	Fixed attenuator for high power (30 dB, 10 W, DC to 12.4 GHz)
J0395	Fixed attenuator for high power (30 dB, 10 W, DC to 9 GHz)
MP640A	Branch
MP654A	Branch
MP520A	CM Directional Coupler
MP520B	CM Directional Coupler
MP520C	CM Directional Coupler
MP520D	CM Directional Coupler
MP526A	High Pass Filter
MP526B	High Pass Filter
MP526C	High Pass Filter
MP526D	High Pass Filter
MP526G	High Pass Filter
J0007	GPIO cable, 1 m
J0008	GPIO cable, 2 m
J0742A	RS-232C cable, 1 m (D-sub 25 pins, straight)
J0743A	RS-232C cable, 1 m (for IBM PC/AT or compatible)