

SPECTRUM ANALYZER
MS2667C
 9 kHz to 30 GHz

For Evaluating LMDS Subscriber Radio Systems



6

The MS2667C is a compact, lightweight, and low-price spectrum analyzer that covers a frequency range of 9 kHz to 30 GHz. It has superior basic performance, such as high C/N ratio, low distortion, and high frequency/level accuracies, and is easy to operate. A large selection of options is provided to handle a wide range of applications at reasonable cost.

Features

- Compact and lightweight (15 kg in standard configuration)
- High C/N and superior distortion characteristics
- Easy-to-use, simple operation
- Millimeter applications
- Options support wide range of applications

Performance and functions

• Counter with 1 Hz resolution

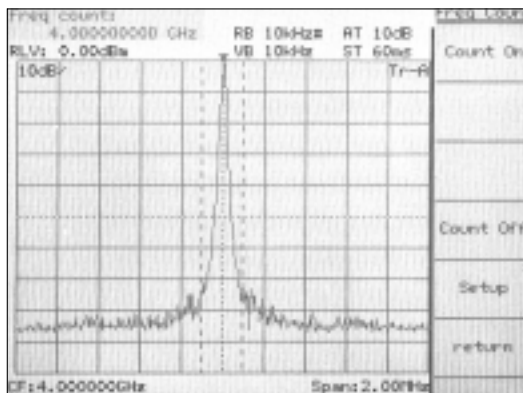
A full complement of frequency counter functions are provided. Resolution is as high as ± 1 Hz even at full span, and high-speed frequency measurements can be performed. The high sensitivity compared with ordinary counters makes it easy to select one signal from many and to determine its frequency.

• 100 dB display dynamic range

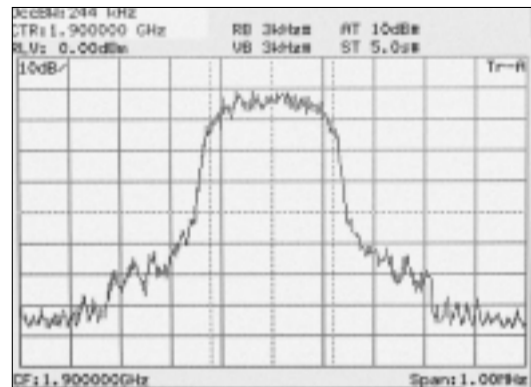
For measurements requiring a wide dynamic range such as adjacent channel power measurements, the MS2667C can display nearly 90 dB on a single screen.

• Highly-accurate measurement

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

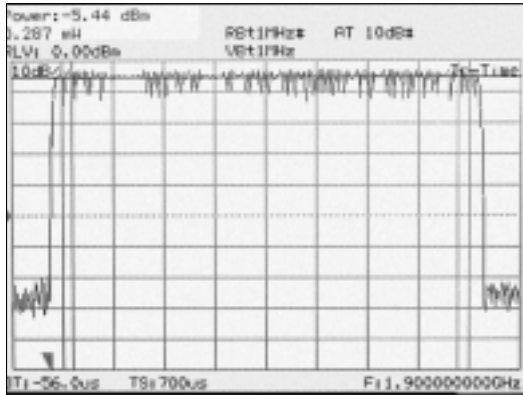


Frequency measurement (1 Hz resolution)

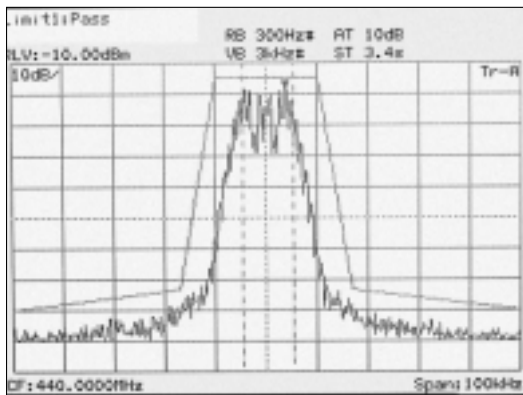


Occupied bandwidth measurement

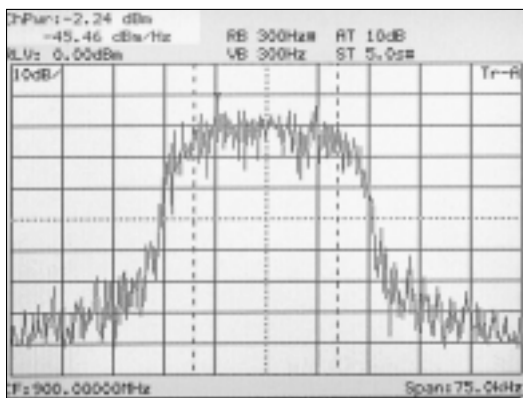
• **Radio equipment evaluation functions (“measure” functions)**
 A full range of functions including measurement of power levels, frequencies, adjacent channel power, and mask and time template measurements are provided for performance evaluation of radio equipment. Key operation is simple and high-speed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



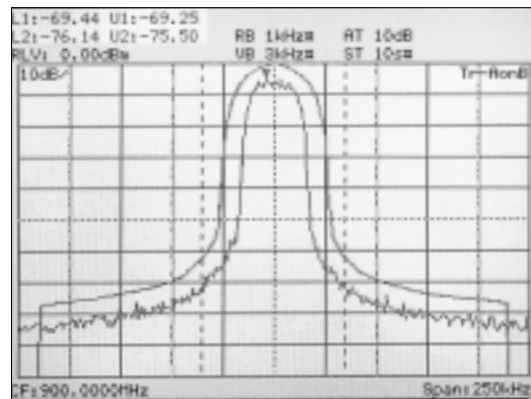
Burst average power measurement



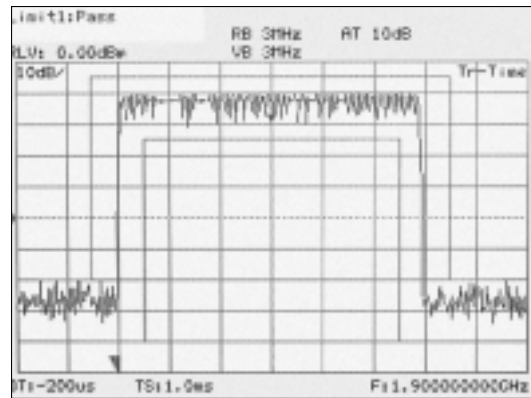
Mask measurement



Channel power measurement



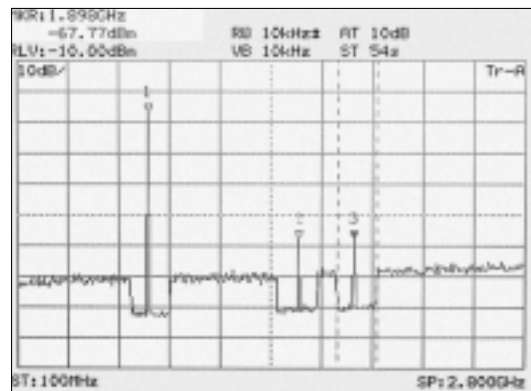
Adjacent channel power measurement



Time template measurement

• **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 readout the total noise power within the zone to reduce measurement time greatly. The multi-zone sweep function enables up to 10 zones to be swept.



Multi-zone sweep

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 30 GHz
	Frequency band	Band 0: 0 to 3.2 GHz (n: 1); Band 1-: 3.1 to 6.5 GHz (n: 1); Band 1+: 6.4 to 8.1 GHz (n: 1); Band 2+: 8.0 to 15.3 GHz (n: 2); Band 3+: 15.2 to 22.4 GHz (n: 3); Band 4+: 22.3 to 30 GHz (n: 4) *n: harmonic order of the mixer
	Pre-selector range	3.1 to 30 GHz (band 1-, 1+, 2+, 3+, 4+)
	Frequency setting resolution	(1 x n) Hz *n: harmonic order of the mixer
	Frequency display accuracy	± (display frequency x reference frequency accuracy + span x span accuracy) *Span: ≥ (10 x n) kHz (n: harmonic order of the mixer, after calibration)
	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 x reference frequency accuracy ±1 LSD (at S/N: ≥20 dB)
	Frequency span	Setting range: 0 Hz, 100 Hz to 30 GHz 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, 300 Hz), Option 03 (10 Hz, 30 Hz, 100 Hz, 300 Hz) are added. Measurements of noise, C/N, adjacent channel power and channel power by measure function are executed with the calculated equivalent noise bandwidth of the RBW. 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 30 GHz, 10 kHz offset) *n: harmonic order of the mixer Residual FM: ≤20 Hzp-p/0.1 s (1 GHz, span: 0 Hz) Frequency drift: ≤200 x n Hz/min (span: ≤10 kHz x n, sweep time: ≤100 s) *After 1-hour warm-up at constant ambient temperature; n: harmonic order of the mixer	
Reference oscillator	Frequency: 10 MHz Aging rate: 1 x 10 ⁻⁷ /year, 2 x 10 ⁻⁸ /day Temperature characteristics: ±5 x 10 ⁻⁸ (0° to 50°C, referenced to frequency at 25°C)	
Amplitude	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, band 0), ≤-115 dBm + 1.5f [GHz] dB (1 to 3.1 GHz, band 0), ≤-110 dBm (3.1 to 8.1 GHz, band 1), ≤-102 dBm (8.0 to 15.3 GHz, band 2), ≤-98 dBm (15.2 to 22.4 GHz, band 3), ≤-91 dBm (22.3 to 30 GHz, band 4) *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) *Manually 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
	Frequency response	Relative: ±1.5 dB (9 to 100 kHz, band 0), ±1.0 dB (100 kHz to 3.2 GHz, band 0), ±1.5 dB (3.1 to 8.1 GHz, band 1), ±3.0 dB (8 to 15.3 GHz, band 2), ±4.0 dB (15.2 to 22.4 GHz, band 3), ±4.0 dB (22.3 to 30 GHz, band 4) *After pre-selector tuning at band 1, 2, 3 and 4, referenced to midpoint between highest and lowest frequency deviation in each band Absolute: ±5.0 dB (9 kHz to 30 GHz, RF ATT: 10 dB, referenced to 100 MHz) *After pre-selector tuning at band 1, 2, 3 and 4
	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, band 0, mixer input: -30 dBm), ≤-70 dBc (0.2 to 1.55 GHz, band 0, mixer input: -30 dBm), ≤-90 dBc or noise level (1.55 to 15 GHz, band 1/2/3/4, mixer input: -10 dBm) Two signals 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 30 GHz) *Frequency difference of two signals: ≥50 kHz, mixer input: -30 dBm Image response: ≤-65 dBc (≤18 GHz), ≤-60 dBc (≤22 GHz), ≤-55 dBc (≤30 GHz) Multiple/out of band response: ≤-60 dBc (≤22 GHz), ≤-55 dBc (≤30 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: $\pm 15\%$ (20 ms to 100 s), $\pm 25\%$ (110 to 1000 s), $\pm 1\%$ (time domain sweep: digital zero span mode)
	Sweep mode	Continuous, single
	Time domain sweep mode	Analog zero span, digital zero span
	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)
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 waveforms at center frequency simultaneously Trace move/calculation: A \rightarrow B, B \rightarrow A, A \leftrightarrow B, A + B \rightarrow A, A - B \rightarrow A, A - B + DL \rightarrow 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: $\pm 5\%$ 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
	Auxiliary signal input and output	IF OUTPUT: 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, $\geq +8$ dBm, 50 Ω , SMA-J connector
	Signal search	AUTO TUNE, PEAK \rightarrow CF, PEAK \rightarrow REF, SCROLL
	Zone marker	NORMAL, DELTA
	Marker \rightarrow	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
	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 x 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 x each 2, time domain), MASK (upper/lower x each 2, frequency domain)
	Save/recall	Saves and recalls 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 function.
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	

Continued on next page

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: 60 to 90 GHz (n: 13), Band W: 75 to 110 GHz (n: 16) Span setting range: 0 Hz, (100 x n) Hz to each bandwidth *n: harmonic order of the mixer
	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/A1, 1998 (Class A) EN61000-3-2: 1995/A2, 1998 (Class A) EN61326: 1997/A1, 1998 (Annex A)
	LVD	EN610101-1: 1993/A2, 1995 (Installation Category II, 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) x 177 (H) x 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 referenced)
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 referenced)
Resolution bandwidth accuracy	±20%
Selectivity (60 dB:3 dB)	≤15:1
Average noise level	≤-135 dBm (1 MHz to 1 GHz, band 0), ≤-135 dBm + 1.5f [GHz] dB (1 to 3.1 GHz, band 0), ≤-130 dBm (3.1 to 8.1 GHz, band 1), ≤-122 dBm (8.0 to 15.3 GHz, band 2), ≤-118 dBm (15.2 to 22.4 GHz, band 3), ≤-111 dBm (22.3 to 30 GHz, band 4) *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)

• 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 k Ω 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

Model	Frequency range	Mate 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	Model/order No.	Name
MS2667C	Main frame Spectrum Analyzer	MA2507A	DC Block Adapter (50 Ω, 9 kHz to 3 GHz, ±50 V, N-type)
	Standard accessories	MA8601A	DC Block Adapter (50 Ω, 30 kHz to 2 GHz, ±50 V, N-type)
F0013	Power cord, 2.6 m: 1 pc	MA8601J	DC Block Adapter (75 Ω, 10 kHz to 2.2 GHz, ±50 V, NC-type)
W1335AE	Fuse, 5 A: 2 pcs	MA1621A	50 Ω → 75 Ω Impedance Transformer (9 kHz to 3 GHz, ±100 V, NC-type)
B0329G	MS2665C/MS2667C operation manual: 1 copy	MP614A	50 Ω ↔ 75 Ω Impedance Transformer (10 to 1200 MHz, transformer type, NC-type)
	Front cover (3/4MW4U)	J0007	GPIB cable, 1 m
MS2667C-02	Options	J0008	GPIB cable, 2 m
MS2667C-03	Narrow resolution bandwidth	J0742A	RS-232C cable, 1 m (for PC-98 Personal Computer and VP-600, D-sub 25-pins, straight)
MS2667C-04	Narrow resolution bandwidth	J0743A	RS-232C cable, 1 m (for PC/AT compatible, D-sub 9-pins, cross)
MS2667C-06	High-speed time domain sweep	J0064A	7 GHz band coaxial/waveguide adapter (5.8 to 8.6 GHz, N-J · BRJ-7)
MS2667C-07	Trigger/gate circuit	J0064C	10 GHz band coaxial/waveguide adapter (8.2 to 12.4 GHz, N-J · BRJ-10)
MS2667C-10	AM/FM demodulator (outputs to loudspeaker or earphone connector)	J0004	Coaxial adapter (N-P · SMA-J)
MS2667C-15	Centronics interface (GPIB interface cannot be installed simultaneously)	DGM010-02000EE	Coaxial cord, 2 m (N-type connector, general use)
	Sweep signal output	DGM024-02000EE	Coaxial cord, 2 m (N-type connector, low-loss type)
34AKNF50	Application parts	J0063	Fixed attenuator for high power (30 dB, 10 W, DC to 12.4 GHz, N-type)
	Coaxial adapter (DC to 20 GHz, SWR: 1.5, ruggedized K-P · N-J)	J0395	Fixed attenuator for high power (30 dB, 30 W, DC to 9 GHz, N-type)
J0561	Coaxial cord (N-P-5W · 5D-2W · N-P-5W), 1 m	J0078	Fixed attenuator for high power (20 dB, 10 W, DC to 18 GHz, N-type)
J0104A	Coaxial cord (BNC-P · RG-55/U · N-P), 1 m	MP526D	High Pass Filter (400 MHz band)
J0322B	Coaxial cord (SMA-P · SMA-P), 1 m (DC to 18 GHz, SUCOFLEX 104A)	MA1601A	High Pass Filter (800/900 MHz band, N-type)
J0911	Coaxial cord (K-P · K-P), 1 m (DC to 40 GHz, SUCOFLEX 102A)	MA2740A	External Mixer (18 to 26.5 GHz)
J0912	Coaxial cord (K-P · K-P), 0.5 m (DC to 40 GHz, SUCOFLEX 102A)	MA2741A	External Mixer (26.5 to 40 GHz)
CSCJ-256K-SM	256 KB memory card (meets PCMCIA Rel. 2.0)	MA2742A	External Mixer (33 to 50 GHz)
CSCJ-512K-SM	512 KB memory card (meets PCMCIA Rel. 2.0)	MA2743A	External Mixer (40 to 60 GHz)
CSCJ-001M-SM	1024 KB memory card (meets PCMCIA Rel. 2.0)	MA2744A	External Mixer (50 to 75 GHz)
CSCJ-002M-SM	2048 KB memory card (meets PCMCIA Rel. 2.0)	MA2745A	External Mixer (60 to 90 GHz)
B0395A	Rack mount kit (IEC)	MA2746A	External Mixer (75 to 110 GHz)
B0395B	Rack mount kit (JIS)	B0421A	Carrying case (hard type, with casters)
MP612A	RF Fuse Holder	B0421B	Carrying case (hard type, without casters)
MP613A	Fuse Element	B0435A	Carrying case (soft type)
J0805	DC block (Model 7003, 10 kHz to 18 GHz, ±50 V, Weinschel product, N-type)		