SPECTRUM ANALYZER
MS2602A
100 Hz to 8.5 GHz

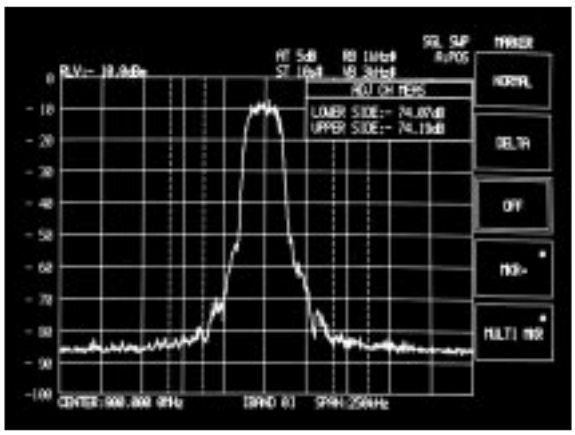
CE GPIB

The MS2602A is a modern high-performance spectrum analyzer. It has been designed to meet the needs of a new era of expanded use of frequencies in the quasi-microwave band and the trend toward higher performance and more digitized radio equipment.
The MS2602A covers frequencies between 100 Hz to 8.5 GHz, and can analyze frequencies up to three to five times the higher harmonics range of domestic digital cordless telephones (1.9 GHz), digital car phones and portable phones (1.5 GHz) and private mobile telephones (1.5 GHz). The MS2602A has a high signal purity (C/N –120 dBc/Hz, 100 kHz offset) and low distortion (–100 dBc, 850 MHz minimum) and can accurately measure high performance radio equipment and electronic parts over a wide dynamic range. Time domain and burst measurement functions allow analysis of various burst signals, including time division multiplex (TDM) digital radio communication systems. Adjacent channel leakage power and other high-speed analysis functions for evaluating the performance of radio equipment are provided as standard.
An optional PTA function, which allows the test method for each application to be freely programmed, is also available.

Features
- High C/N, low distortion, high accuracy
- Time domain measurement (high speed, high resolution, pre-trigger function)
- Dual-display mode (frequency domain/time domain, foreground/background)
- Many marker functions (zone marker, multi-marker, etc.)
- FM demodulated waveform display
- PTA (Personal Test Automation: option)

Quality basic function
- **High C/N**

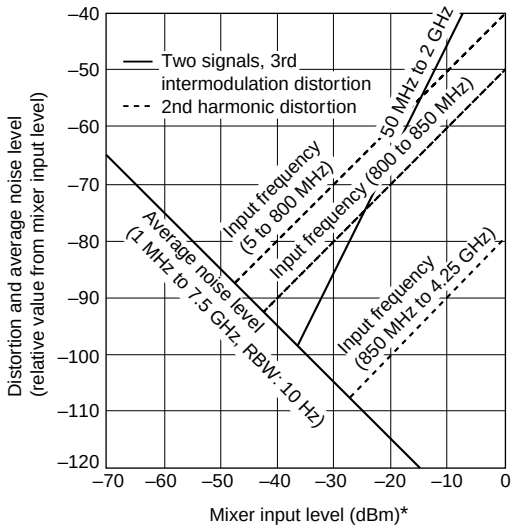
The excellent low wideband noise level (–120 dBc/Hz or better, 100 kHz offset) of the MS2602A is more than enough to measure the adjacent channel leakage power of digital mobile communication equipment. This is essential to cope with the widening of the communication channel bandwidth by digitization.



Adjacent channel leakage power measurement

- **Low distortion characteristics**

Second harmonic distortion: The MS2602A has a wide dynamic range with a second harmonic distortion of only –100 dBc for signals over 850 MHz.
–100 dBc (mixer input level –20 dBm, frequency 0.85 to 4.25 GHz)
Two signals, 3rd intermodulation distortion: The superior intermodulation distortion of the MS2602A is perfect for nonlinear evaluation of such devices as high-power amplifiers. (–85 dBc: mixer input level –30 dBm, 50 kHz separation)



*: Mixer input level = input level – input attenuator set value

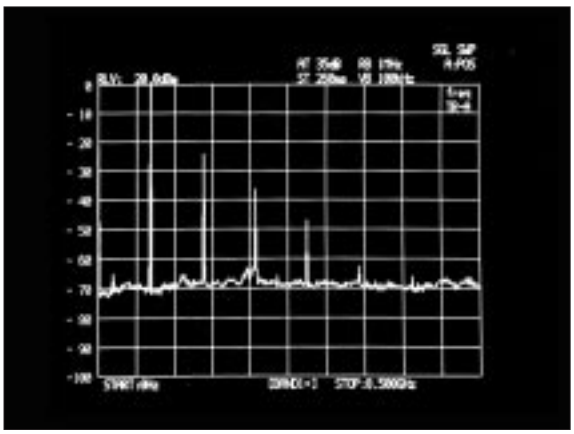
Distortion dynamic range (standard value)

- **High accuracy**

The MS2602A provides highly accurate measurement of level and span. Its excellent reference level accuracy and amplitude frequency characteristics allow measurements up to 2.0 GHz with an accuracy of ±1.1 dB (total level accuracy). Calibration is performed automatically from a precision internal calibration signal source. When measuring the occupied bandwidth, the span accuracy of the spectrum analyzer has a large influence on measurement accuracy. The span accuracy of the MS2602A is a high ±2.5%. The number of sampling points on the horizontal axis can be selected as either 501 or 1002 points, depending on the application.

- **Linear spectrum analysis**

Because the MS2602A uses an analog horizontal sweep signal, it accurately traces the linear spectrum and can accurately measure the level of fine linear peaks, such as spurious signals, without any vertical jitter.

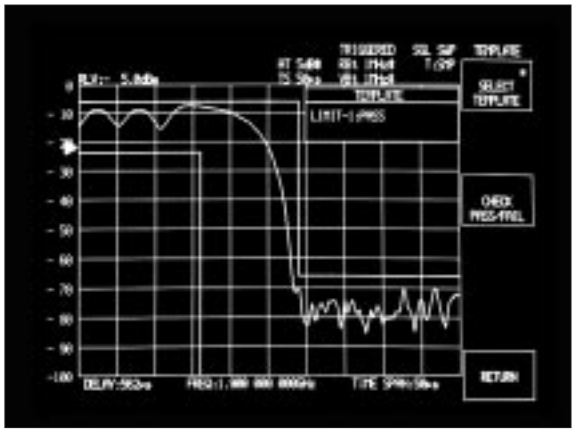


0 to 8.5 GHz band continuous sweep waveform

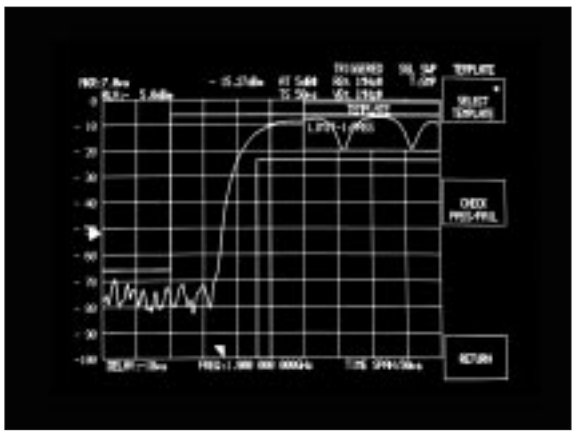
Enhanced burst signal analysis function

- **Time domain measurements**

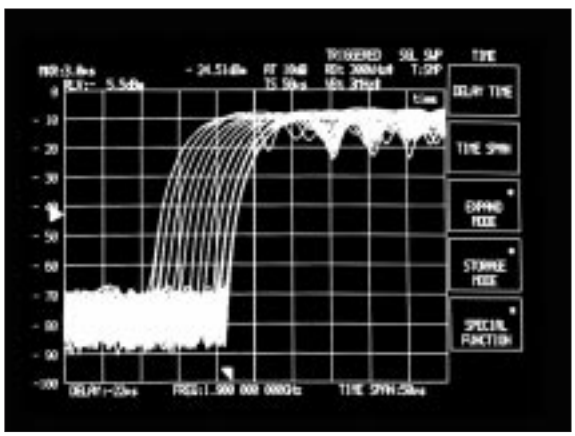
High-speed, high resolution: High-speed sweep of 5 µs/div allows accurate measurement of the rising/falling edge times (10.4 µs) of digital cordless telephone burst signals. A high-speed 10-bit A/D converter permits high accuracy template (limit line) comparison measurement at a vertical axis resolution of 0.1 dB at 10 dB/div.



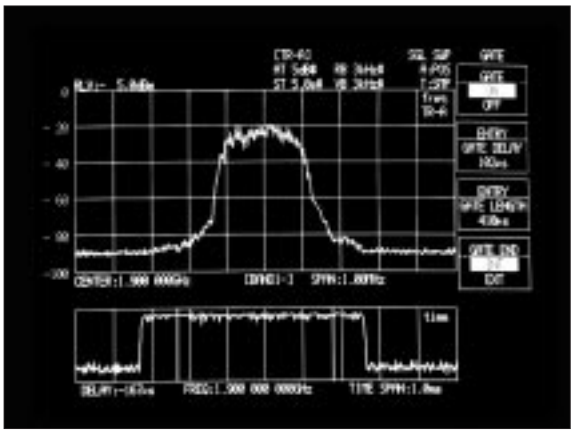
Standard pre-trigger function: The pre-trigger function displays the waveforms before the trigger point (one screen) and allows the rising/ falling edge times of burst signals to be measured accurately. An internal video trigger allows stable pre-trigger operation without an external trigger signal.



Overwrite display function: The convenient overwrite display function lets you monitor changes in the rising/falling edge characteristics of burst analysis waveforms.



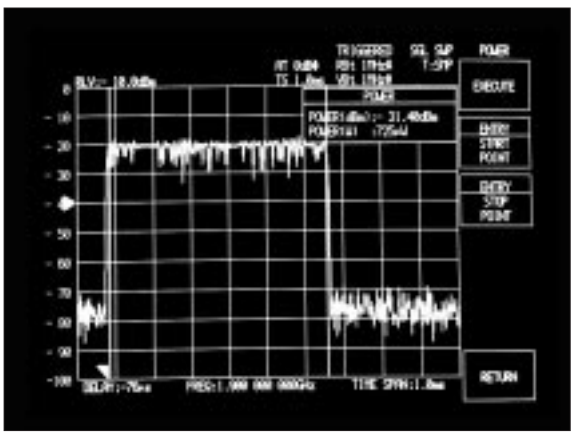
• Burst spectrum measurements
The gate width can be set with the cursor while viewing time domain burst waveforms. The gate width can also be set in the time domain mode while observing the spectrum after the gate by displaying both the frequency domain and time domain on the dual display.



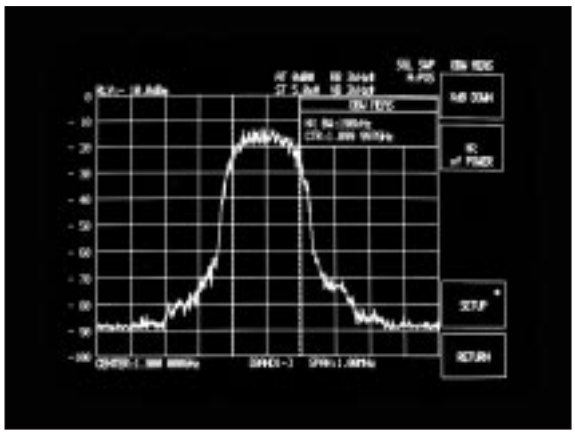
Radio equipment evaluation functions are standard features

• Simple measurement of official standards
The MS2602A simplifies such complicated measurements as average burst signal power, adjacent channel leakage power, occupied bandwidth, and burst rising/falling edge time template comparison measurement. High-speed processing displays the measured result in 0.8 seconds (processing time).

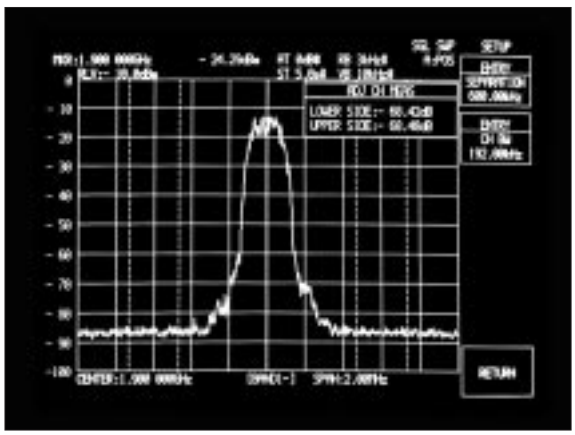
• Average burst power measurement
The burst signal power is measured by separating it into on and off power period. The MS2602A uses time domain measurement to measure the average power of the selected zone by the marker.



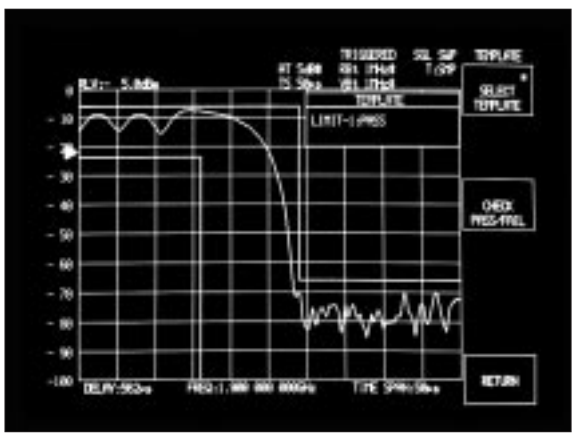
• Occupied bandwidth measurement
High span width accuracy permits the occupied bandwidth to be accurately measured. The occupied bandwidth can be measured by the percent method or X dB method. The measurement center frequency is simultaneously displayed.



• Adjacent channel leakage power measurements
The channel separation of digital mobile communications equipment is wide and requires a high C/N over a wide frequency range of fifty to several hundred kilohertz.
The MS2602A uses a high purity local oscillator to realize a high C/N and wide dynamic range. The channel separation and bandwidth parameters of the adjacent channel leakage power measurement can be freely set.



• Template (limit line) comparison measurement
The rising/falling edge of burst waveform with template comparison measurements can be performed and GO/NO-GO decisions can be made. Up to two upper and lower limit lines can be set on one template. For instance, up to five official standards and in-house standards can be set and stored.



Specifications

Frequency	Frequency range	100 Hz to 8.5 GHz
	Frequency band structure	Band 0 (0 to 2 GHz), band 1– (1.7 to 7.5 GHz), band 1+ (6.5 to 8.5 GHz)
	Pre-selector frequency range	1.7 to 8.5 GHz
	Frequency setting	Range: 100 Hz to 8.5 GHz (band 1–, 1+) Mode: CENTER-SPAN, START-SPAN, START-STOP Resolution: 1 Hz
	Frequency accuracy	Frequency display Resolution: 1/1000 digit of span (min. 1 Hz), fractions are rounded. Accuracy:±(display frequency x reference frequency accuracy + span x span accuracy) Marker frequency Resolution: 0.2% of span, fractions are rounded. Accuracy: same as display frequency accuracy (NORMAL), same as span accuracy (DELTA)
	Frequency measurement*1	Resolution: 1 Hz, 10 Hz, 100 Hz, 1 kHz Accuracy: Display frequency x reference frequency accuracy ±1 count (S/N ≥20 dB)
	Span	Setting range: 0 Hz, 100 Hz to 8.5 GHz Setting resolution: Ten-key/data knob: 3-digit value (100 to 999), step key: 1-2-5 sequence Accuracy: ±2.5% (span ≥1 kHz), ±5% (100 Hz ≤ span <1 kHz)
	Resolution bandwidth	Setting range: 10 Hz to 3 MHz (3 dB), 1-3 sequence (can be set manually, or automatically according to frequency span) Accuracy: ±20% Selectivity (60dB/3dB): ≤15:1 (100 kHz to 3 MHz), ≤12:1 (10 Hz to 30 kHz)
	Video bandwidth	1 Hz to 3 MHz, 1-3 sequence (can be set manually, or automatically according to resolution bandwidth), OFF
	Signal purity and stability	Sideband noise: ≤–105 dBc/Hz (10 kHz offset), ≤–115 dBc/Hz (50 kHz offset), ≤–120 dBc/Hz (100 kHz offset) at frequency of 1 MHz to 4 GHz Power spurious: ≤–60 dBc (frequency; ≤1 GHz, offset; <360 Hz), ≤–70 dBc (frequency; ≤1 GHz, offset; ≥360 Hz) Residual FM: ≤2 Hzp-p/0.1 s (frequency; ≤1 GHz, span; 0 Hz) Frequency drift: ≤20 Hz/min (span; ≤1 kHz), ≤200 Hz/min (span; ≤10 kHz) *After 1-hour warm-up at constant ambient temperature
	Reference oscillator	Frequency: 10 MHz Start-up characteristics: ≤5 x 10^{-8}(after 10-minute warm-up, compared to the frequency after 24-hour warm-up) Option 01: ≤2 x 10^{-8}(after 30-minute warm-up, compared to the frequency after 24-hour warm-up) Aging rate: ≤2 x 10^{-8}/day (option 01: ≤5 x 10^{-9}/day), ≤1 x 10^{-7}/year (option 01: ≤5 x 10^{-8}/year) *Compared to the frequency after 24-hour warm-up Temperature characteristics: ±5 x 10^{-8}(0° to 50°C), (option 01: ±3 x 10^{-8}, 0° to 50°C) *Relative to the frequency at 25°C
Amplitude	Level measurement	Measurement range: Average noise level to +30 dBm Maximum input: Average CW power: +30 dBm (input ATT; ≥5 dB), DC power: 0 Vdc Average noise level: ≤–135 dBm (1 MHz to 1.7 GHz), ≤–135 dBm (1.7 to 7.5 GHz), ≤–130 dBm (7.5 to 8.5 GHz) *At resolution bandwidth of 10 Hz, video bandwidth of 1 Hz, and input ATT of 0 dB Residual response: ≤–100 dBm (1 MHz to 8.5 GHz, input ATT; 0 dB)
	Reference level	Total level accuracy*2: ±1.1 dB (100 Hz to 2 GHz), ±1.6 dB (2 to 8.5 GHz) Setting range LOG: –100 to +30 dBm (or equivalent level), LIN: 22.4 µV to 7.07 V Setting resolution: 0.1 dB (or equivalent level) Level step setting range: 0.1 to 100.0 dB Unit LOG: dBm, dBµV, dBmV, V, dBµV (emf), W LIN: V Reference level accuracy: ±0.3 dB (–50 to 0 dBm), ±0.75 dB (–70 to –50 dBm, 0 to +30 dBm), ±1.5 dB (–90 to –70 dBm) *After calibration at frequency of 100 MHz for span of ≤2 MHz (when input ATT, resolution bandwidth, video bandwidth, and sweep time are set to AUTO) Resolution bandwidth switching deviation: ±0.3 dB (after calibration) Log/linear scale switching deviation: ±0.3 dB (after calibration) Input attenuator 0 to 55 dB, in 5 dB steps (can be set manually, or automatically according to reference level) Input ATT switching deviation: ±0.3 dB (at frequency of 100 MHz, referred to 10 dB) Pulse digitization uncertainty LOG: 1.2 dBp-p (resolution bandwidth; ≤1 MHz), 3 dBp-p (resolution bandwidth; 3 MHz) LIN: 4% of reference level (resolution bandwidth; ≤1 MHz), 12% of reference level (resolution bandwidth; 3 MHz) *In pulse measurement mode, at PRF > (number of data points/sweep time)
	Frequency characteristics	±0.5 dB (100 Hz to 2 GHz, band 0), ±1 dB (1.7 to 8.5 GHz, band 1–, band 1+) *At input ATT of 10 dB, in temperature range of 18° to 28°C, referred to 100 MHz, tune off pre-selector ±1 dB (100 Hz to 2 GHz, band 0), ±1.5 dB (1.7 to 8.5 GHz, band 1–, band 1+) *At input ATT of 5 to 55 dB, referred to 100 MHz, tune off pre-selector
	CRT display	Scale: 10 div (in single scale) LOG (/div): 10 dB, 5 dB, 2 dB, 1 dB LIN (/div): 10%, 5%, 2%, 1% Linearity (after calibration): LOG: ±0.3 dB (0 to –20 dB, resolution bandwidth; ≤1 MHz), ±1 dB (0 to –70 dB, resolution bandwidth; ≤100 kHz), ±1.5 dB (0 to –90 dB, resolution bandwidth; ≤10 kHz) LIN: ±3% (compared to reference level) Marker level resolution: LOG: 0.01 dB, LIN: 0.01% (compared to reference level)

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<table>
<tr><td rowspan="3">Amplitude</td><td>Spurious response</td><td>2nd harmonic distortion:
≤–70 dBc (input frequency; 5 to 800 MHz, band 0, mixer input level; –30 dBm)*3
≤–80 dBc (input frequency; 800 to 850 MHz, band 0, mixer input level; –30 dBm)
≤–100 dBc (input frequency; 0.85 to 4.25 GHz, band 1–/1+, mixer input level; –20 dBm)
Two signal 3rd inter-modulation distortion:
≤–70 dBc (frequency difference of two signal; ≥50 kHz, mixer input level; –30 dBm)
∗at input frequency of 10 to 50 MHz (band 0)
≤–85 dBc (frequency difference of two signal; ≥50 kHz, mixer input level; –30 dBm)
∗at input frequency of 50 MHz to 2 GHz
≤–80 dBc (frequency difference of two signal; ≥50 kHz, mixer input level; –30 dBm)
∗at input frequency of 2 to 7.5 GHz
Image and multiple response:
Image response; ≤–70 dBc, multiple response; ≤–70 dBc (band 1–/1+)</td></tr>
<tr><td>1 dB gain compression</td><td>≥–1 dBm (at 18° to 28°C and ≥100 MHz), ≥–3 dBm (at 0° to 50°C and ≥100 MHz)</td></tr>
<tr><td>Maximum dynamic range</td><td>dB gain compression level to noise level: >134 dB (1 MHz to 7.5 GHz), >129 dB (7.5 to 8.5 GHz)
Distortion characteristics
2nd harmonic: >87.5 dB (5 to 800 MHz), >92.5 dB (800 to 850 MHz), >107.5 dB (>850 MHz)
3rd mutual modulation: >93.3 dB (10 to 50 MHz), >98.3 dB (50MHz to 2 GHz), >96.6 dB (2 to 7.5 GHz)</td></tr>
<tr><td rowspan="5">Sweep</td><td>Sweep time</td><td>Setting: 20 ms to 1000 s (when data point is 501 in Trace A or Trace B, the two most significant digit can be set.)
50 to 1000 s (cases except above, the two most significant digit can be set.)
∗Can be set manually, or automatically according to span, resolution bandwidth, and video bandwidth
Accuracy: ±10% (20 ms to 200 s), ±15% (200 to 1000 s)</td></tr>
<tr><td>Sweep mode</td><td>CONTINUOUS, SINGLE</td></tr>
<tr><td>Trigger switch</td><td>FREE RUN, TRIGGERED</td></tr>
<tr><td>Trigger source</td><td>VIDEO, LINE, EXT (±10 V), EXT (TTL), TV-H, TV-V</td></tr>
<tr><td>Gate mode</td><td>OFF, random sweep mode
Setting range
GATE DELAY: 0 to 65.5 ms (1 µs unit),
GATE LENGTH: 20 µs to 65.5 ms (1 µs unit, GATE END: INT),
GATE END: INT/EXT</td></tr>
<tr><td rowspan="2">Zone sweep</td><td>Sweeps only in the range indicated by zone marker</td></tr>
<tr><td>Tracking sweep</td><td>Sweeps while tracing peak points within zone marker (zone sweep also possible)</td></tr>
<tr><td rowspan="3">Time domain waveform display</td><td>Sweep time</td><td>Setting: 50, 100 to 900 µs (data point is 501, the one most significant digits can be set.)
1 ms to 1000 s (data point is 501, the two most significant digits can be set.)
100, 200 to 800 µs (data point is 1002, even number of the one most significant digits can be set.)
1 ms to 1000 s (data point is 1002, even number of the two most significant digits can be set.)
Accuracy: ±0.5%</td></tr>
<tr><td>Delay Time setting range</td><td>Pre-trigger: –(minus) time span to 0 s (1-point unit)
Post-trigger: 0 to 65.5 ms (1 µs unit)</td></tr>
<tr><td>Amplitude resolution</td><td>50 µs to 49 ms, 10 bits A/D (0.1% of full-scale)
50 ms to 1000 s, 14 bits A/D (0.01% of full-scale)</td></tr>
<tr><td rowspan="8">Others</td><td>Number of data points</td><td>NORMAL: 501 points, DOUBLE: 1002 points</td></tr>
<tr><td>Detection mode</td><td>POS PEAK, SAMPLE, NEG PEAK</td></tr>
<tr><td>CRT display</td><td>Size: 7-inch, Color: green, Waveform display: 501-point horizontal axis; 322-point vertical axis</td></tr>
<tr><td>Display functions</td><td>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
Trace A/BG: displays frequency region to be observed (background) and object band (foreground) selected from the background with zone marker simultaneously
Trace A/Time: displays frequency spectrum, and time domain waveform at the center frequency simultaneously</td></tr>
<tr><td>Storage display</td><td>NORMAL, VIEW, MAX HOLD, MIN HOLD, AVERAGE, CUMULATIVE, OVERWRITE</td></tr>
<tr><td>AM/FM demodulation</td><td>Built-in loudspeaker, with earphone terminal
Frequency deviation measurement (demodulated waveform display):
<table>
<tr><td colspan="2">Range</td><td>2 kHz/div</td><td>20 kHz/div</td><td>200 kHz/div</td></tr>
<tr><td colspan="2">Resolution</td><td>50 Hz</td><td>500 Hz</td><td>5 kHz</td></tr>
<tr><td rowspan="2">Demodulated frequency (3 dB bandwidth)</td><td>AC mode</td><td colspan="2">50 Hz to 50 kHz</td><td>50 Hz to 1 MHz</td></tr>
<tr><td>DC mode</td><td colspan="2">DC to 50 kHz</td><td>DC to 1 MHz</td></tr>
</table></td></tr>
<tr><td>Input connector</td><td>50 Ω, N-type (receptacle), VSWR ≤1.5 (input ATT; ≥5 dB)</td></tr>
<tr><td>Auxiliary signal input and output</td><td>500 MHz OUTPUT: –18 dBm±3 dB (50 Ω termination, BNC connector)
21.4 MHz IF OUTPUT: –10 dBm±2 dB (50 Ω termination, upper edge, BNC connector)
521.4 MHz IF OUT: Gain; 5 dB±2 dB (50 Ω termination, typical value, input frequency; 1 GHz, input ATT; 0 dB, 18 to 28°C), 3 dB bandwidth; 10 MHz, (band 0; ≥30 MHz, band 1–/+)
X OUTPUT: 0 to 10 V±1 V (terminated at ≥100 kΩ, from left edge to right edge, BNC connector)
Y OUTPUT: 0 to 0.5 V±0.1 V(terminated at 75 Ω, LOG; 10 dB/div, LIN; 10%/div, frequency; 100 MHz, from lower edge to upper edge, BNC connector)
Z OUTPUT: TTL level (when sweeping, at low level, BNC connector)
VIDEO OUTPUT: Separate (8P round-DIN-connector), digital RGB (D-sub connector)
REF INPUT: 10 MHz±10 Hz, 2 to 5 Vp-p (BNC connector)
BUFF OUTPUT: 10 MHz, 2 to 3 Vp-p (terminated at 200 Ω, BNC connector)
Probe power source: +5 V, +15 V, –15 V (each ±10%, each max. 110 mA, 4-pole connector)
EXT TRIG/GATE INPUT: Max. ±10 V (in 0.1 V steps, selectable rising edge and falling edge, pulse width; ≥10 µs, BNC connector)
EXT TRIG INPUT: TTL level(selectable rising edge and falling edge, pulse width; ≥10 µs, BNC connector)</td></tr>
</table>

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Others	Local leak	≤–50 dBm (at input ATT of 0 dB)
	Interference radiation	≤20 dBμV ⁎Can be measured on front panel using MA2601B EMI Probe, except horizontal synchronous signal (whole number multiples of 25 kHz)
Functions	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
	Multi-markers	HIGHEST 10, HARMONICS, MANUAL SET
	Measure (operation)	Noise level (dBm/Hz, dBm/ch), C/N (dBc/Hz, dBc/ch), occupied bandwidth measurement, adjacent channel leakage power measurement, burst average power measurement, template (limit line) comparison measurement
	External memory	Equipped with a slot for memory card (PMC)
	Saving/recalling	Can save and recall setting conditions and measured waveform data in internal memory (4 sets) and external memory (PMC). Can save max. 11 data (setting conditions and measured waveform data) in PMC (32 KB)
	Direct plotting	Can plot CRT information to the specified plotters or printers via GPIB 2
	PTA (Option 04)	Language: PTL (high level language interpreter based on BASIC) Programming: Built-in CRT editor for use with external keyboard Program storage: Can store PTA program in PMC Up-load and down-load functions are also provided by host computer Program memory: 192 KB (including fluent area) Data processing: Can directly access to measurement data as system variables using system functions and system subroutine
	External control	GPIB 1 (IEEE488.2): Can be controlled by external controller as standard device All panel functions except power switch and intensity knob can be controlled. SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0 (Option 04/05: C1, C2, C3, C24) GPIB 2 (IEEE488.1): As controller, can control external device. SH1, AH1, T6, L4, SR0, RL0, PP0, DC0, DT0, C1, C2, C3, C28 RS-232C (Option 02): Changes GPIB 2 to RS-232C I/O port (Option 03): Changes GPIB 2 to I/O port, controls external device equipped with parallel I/O interface by PTA
Power		85 to 132 Vac/170 to 250 Vac, 47.5 to 63 Hz, ≤300 VA
Operating temperature range		0° to 50°C
Dimensions and mass		426 (W) x 177 (H) x 451 (D) mm, ≤22 kg (typical value: 20 kg)
EMC⁎4		EN55011: 1991, Group 1, Class A EN50082-1: 1992

The specifications applies to system setting, auto-sweep time, and normal function (SLOW).
⁎1: Counts received frequency of peak point within zone marker
⁎2: Total level accuracy: reference level accuracy (0 to –50 dBm) + frequency response + LOG linearity (0 to –20 dB) + calibration signal accuracy
⁎3: Mixer input level (dBm): input level (dBm) – input ATT (dB)
⁎4: Electromagnetic Compatibility

Ordering Information

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

Model/Order No.	Name	
	Main frame	
MS2602A	Spectrum Analyzer	
	Standard accessories	
J0114A	Coaxial cord, UG21D/U • RG-9A/U • UG-21D/U, 1 m:	1 pc
J0104A	Coaxial cord, BNC-P • RG-55/U • N-P, 1 m:	1 pc
J0017F	Power cord, 2.5 m:	1 pc
P0005	Memory card, 32 KB:	1 pc
F0014	Fuse, 6.3 A:	2 pcs
F0012	Fuse, 3.15 A:	2 pcs
W0653AE	MS2602A operation manual:	1 copy
W0653BE	MS2602A service manual:	1 copy
	Options	
MS2602A-01	Reference oscillator (stability: <5 x 10^{-9}/day)	
MS2602A-02	RS-232C interface (for GPIB 1 and RS-232C combination)	
MS2602A-03	I/O port (for GPIB 1 and I/O combination)	
MS2602A-04	PTA (with external JIS type PTA keyboard)	
MS2602A-05	PTA (without external PTA keyboard)	
	Optional equipment and parts	
MC3305A	JIS Type PTA Keyboard	
MC3306A	ASCII Type PTA Keyboard	
MH648A	Pre-Amplifier	
MA8610A	Pre-Amplifier	
MA2511A	Detector	
MP635A	Log-Periodic Antenna	
MP666A	Log-Periodic Antenna	
MB18B	Pole (for MP666A)	
MB9A	Tripod (for MP666A)	
MB19A	Tripod (for MP635A, with a pole)	
P6201	FET probe (DC to 900 MHz, Tektronix product)	
J0007	GPIB cable, 1 m	
J0008	GPIB cable, 2 m	
P0005	Memory card, 32 KB	
P0006	Memory card, 64 KB	

Model/Order No.	Name
P0007	Memory card, 128 KB
P0008	Memory card, 256 KB
P0009	Memory card, 512 KB
MP614A	50 Ω/75 Ω Impedance Transformer
MB-009	50 Ω/75 Ω Impedance Transformer
MP612A	RF Fuse Holder (DC to 1000 MHz, 50 Ω)
MP613A	Fuse Element (for MP612A, 5 pcs/set)
MP1607A	50 Ω Coaxial Switch (DC to 3 GHz, external control)
MP59B	50 Ω Coaxial Switch (DC to 3 GHz)
MP640A	Branch
MP654A	Directional Coupler
MP655A	Directional Coupler
MP520A	CM Directional Coupler
MP520B	CM Directional Coupler
MP520C	CM Directional Coupler
MP520D	CM Directional Coupler
J0063	Fixed attenuator for high power (30 dB, 10 W, DC to 12.4 GHz)
J0078	Fixed attenuator for high power (20 dB, 10 W, DC to 18 GHz)
J0395	Fixed attenuator for high power (30 dB, 10 W, DC to 8 GHz)
J0055	Coaxial adaptor (NC-P • BNC-J)
MR63J	SWR Bridge (5 MHz to 2 GHz, 50 Ω, N-P)
MP526A	High-Pass Filter (for 60 MHz)
MP526B	High-Pass Filter (for 150 MHz)
MP526C	High-Pass Filter (for 250 MHz)
MP526D	High-Pass Filter (for 400 MHz)
MP526G	High-Pass Filter (for 27 MHz)
562	DC Block (10 MHz to 12.4 GHz, NARDA product)
B0329C	Protect cover
B0311C	Front handle kit (2 pcs/set)
B0332	Joint plate (4 pcs/set)
B0333C	Rack mount kit
B0334C	Hard carrying case (with protect cover and casters)
Z0248	Service kit
J0780A	RGB cable, 2 m