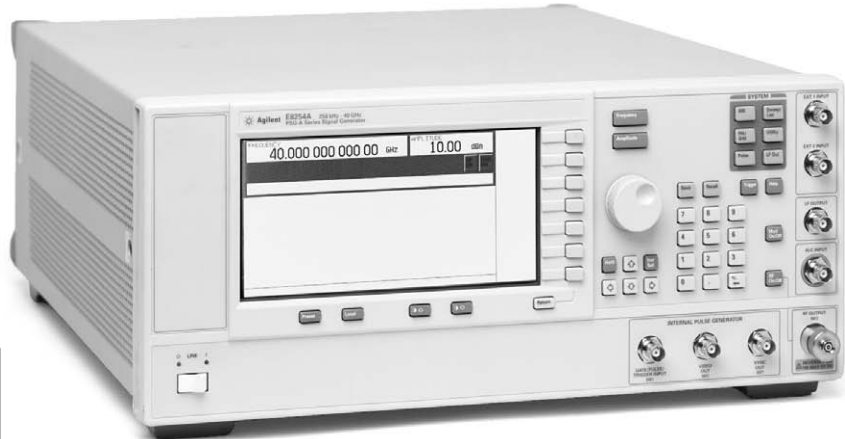




Agilent E8241A/44A/51A/54A PSG Family Performance Signal Generator

Data Sheet



| | CW only PSG-L Series | Analog PSG-A Series |
|-------------------|-------------------------|------------------------|
| 250 kHz to 20 GHz | E8241A | E8251A |
| 250 kHz to 40 GHz | E8244A | E8254A |

All specifications and characteristics apply over a 0 to 55°C range (unless otherwise stated) and apply after a 45 minute warm-up time. Supplemental characteristics, denoted as typical or nominal, provide additional (non-warranted) information.

Definitions

Specifications (spec): represent warranted performance.

Typical (typ): performance is not warranted. It applies at 25°C. 80% of all products meet typical performance.

Nominal (nom): values are not warranted. They represent the value of a parameter that is most likely to occur; the expected or mean value. They are included to facilitate the application of the product.

Standard (std): No options are included when referring to the signal generator unless noted otherwise.



Specifications

L and A Series

| Frequency | | |
|-----------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Range¹ | | |
| Frequency Range | PSG-L Series | PSG-A Series |
| 250 kHz to 20 GHz | E8241A | E8251A |
| 250 kHz to 40 GHz | E8244A | E8254A |
| Resolution | 0.01 Hz | |
| Accuracy | Calibration = aging rate ± temperature effects ± line voltage effects | |
| Switching speed (typical)² | | |
| Analog modulation | < 15 ms | |
| Modulation off | < 15 ms | |
| Phase offset | Adjustable in nominal 0.1° increments. | |
| Frequency bands | | |
| Band | Frequency range | N # |
| 1 | 250 kHz to 250 MHz | 1/8 |
| 2 | > 250 to 500 MHz | 1/16 |
| 3 | > 500 MHz to 1 GHz | 1/8 |
| 4 | > 1 to 2 GHz | 1/4 |
| 5 | > 2 to 3.2 GHz | 1/2 |
| 6 | > 3.2 to 10 GHz | 1 |
| 7 | > 10 to 20 GHz | 2 |
| 8 | > 20 to 40 GHz | 4 |
| Internal timebase reference oscillator | | |
| | Standard | Option UNJ |
| Aging rate | < ±1 x 10 ⁻⁷ /year or < ±4.5 x 10 ⁻⁹ /day after 45 days | < ±3 x 10 ⁻⁸ /year or < ±2.5 x 10 ⁻¹⁰ /day after 24 hours |
| Temperature effects (typical) | < ±5 x 10 ⁻⁸ 0 to 55°C | < ±4.5 x 10 ⁻⁹ 0 to 55°C |
| Line voltage effects (typical) | < ±2 x 10 ⁻⁹ for +5% -10% change | < ±2 x 10 ⁻¹⁰ for ±10% change |
| External reference frequency | 1, 2, 2.5, 5, 10 MHz (within 1 ppm) | 10 MHz only (within 1 ppm) |
| Reference output | | |
| Frequency | 10 MHz | |
| Amplitude | > +4 dBm typical into 50Ω load | |
| External reference input | | |
| Amplitude | > -3 dBm | |
| Opt UNJ | 5 dBm ±5 dB ³ | |
| Input impedance | 50Ω↔ nominal | |
| Digital sweep | | |
| Operating modes | Step sweep of frequency or amplitude or both (Start to stop) | |
| | List sweep of frequency or amplitude or both (Arbitrary list) | |

¹ Useable to 100 kHz

² To within 0.1 ppm of final frequency above 250 MHz or within 100 Hz below 250 MHz

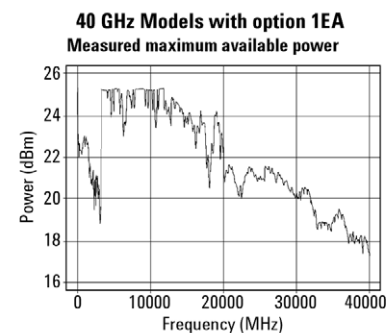
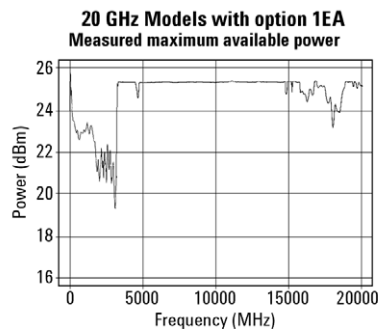
³ To optimize phase noise 5 dBm ± 2 dB

L and A Series

| | |
|--------------------------------|-----------------------------------|
| Sweep range | |
| Frequency sweep | Within instrument frequency range |
| Amplitude sweep | Within attenuator hold range |
| Dwell time | 1 ms to 60 s |
| Frequency settling time | 28 ms typical |
| Amplitude settling time | 10 ms typical |
| Number of points | 2 to 1601 |
| Triggering | Auto, external, single, or GPIB |

Output

| Power ⁴ (dBm) | Standard | Option 1EA |
|--------------------------------------|-------------------------------------|-------------|
| Frequency range | | |
| 20 GHz Models | | |
| 250 kHz to 3.2 GHz | -20 to +13 | -20 to +16 |
| > 3.2 to 20 GHz | -20 to +13 | -20 to +20 |
| 40 GHz Models | | |
| 250 kHz to 3.2 GHz | -20 to +9 | -20 to +15 |
| > 3.2 to 20 GHz | -20 to +9 | -20 to +18 |
| > 20 to 40 GHz | -20 to +9 | -20 to +14 |
| 20 GHz Models with option 1E1 | | |
| 250 kHz to 3.2 GHz | -135 to +11 | -135 to +15 |
| > 3.2 to 20 GHz | -135 to +11 | -135 to +18 |
| 40GHz Models with option 1E1 | | |
| 250 kHz to 3.2 GHz | -135 to +7 | -135 to +14 |
| > 3.2 to 20 GHz | -135 to +7 | -135 to +16 |
| > 20 to 40 GHz | -135 to +7 | -135 to +12 |
| Option 1E1 step attenuator | 0 dB and 5 to 115 dB in 10 dB steps | |



Attenuator hold range
(Same as max power sweep range)

Minimum

From -20 dBm to maximum specified output power.
Can be offset using Option 1E1 attenuator.

Amplitude switching speed⁵

CW or analog modulation < 25 ms, typical

When using power search < 25 ms, typical

CW level accuracy⁶ (dB)

| Frequency | > +10 dBm | +10 to -10 dBm | -10 to -20 dBm |
|------------------|-----------|----------------|----------------|
| 250 kHz to 2 GHz | ±0.6 | ±0.6 | ±1.4 |
| 2 GHz to 20 GHz | ±0.8 | ±0.8 | ±1.2 |
| > 20 to 40 GHz | ±1.0 | ±0.9 | ±1.3 |

⁴ Maximum power specification is warranted from 15 to 35°C, and is typical from 0 to 15°C. Maximum power over the 35 to 55°C range typically degrades less than 2 dB.

⁵ To within 0.1 dB of final amplitude within one attenuator range

⁶ Specifications apply over the 15 to 35°C temperature range. Degradation outside this range, for power levels > -10 dBm, is typically < 0.3 dB.

For instruments with type-N connectors (Option 1ED), specifications are degraded typically 0.2 dB above 18 GHz.

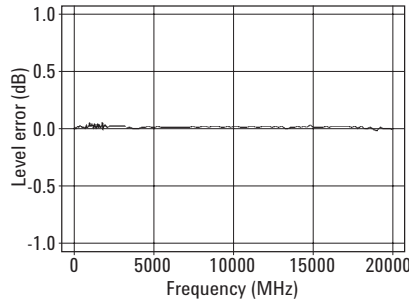
L and A Series

CW level accuracy with option 1E1⁷ (dB)

| Frequency | > +10 dBm | +10 to -10 dBm | -10 to -70 dBm | -70 to -90 dBm | -90 to -110 dBm |
|------------------|-----------|----------------|----------------|----------------|-----------------|
| 250 kHz to 2 GHz | ±0.6 | ±0.6 | ±0.7 | ±0.8 | ±1.4 |
| > 2 to 20 GHz | ±0.8 | ±0.8 | ±0.9 | ±1.0 | ±1.7 |
| > 20 to 40 GHz | ±1.0 | ±0.9 | ±1.0 | ±2.0 | |

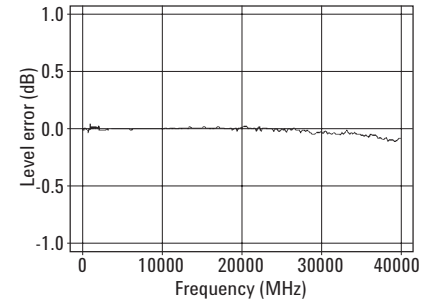
20 GHz level accuracy

Measured level accuracy +5 dBm option 1E1



40 GHz level accuracy

Measured level accuracy +5 dBm option 1E1



| | |
|------------------------------------------|----------------------------------------------------------------------------------|
| Resolution | 0.01 dB |
| Temperature stability | 0.01 dB/°C, typical |
| User flatness correction | |
| Number of points | 2 to 1601 points/table |
| Number of tables | Up to 10,000, memory limited |
| Path loss | Arbitrary, within attenuator range |
| Entry modes | Remote power meter ⁸ , remote bus, manual (user edit/view) |
| Output impedance | 50 Ω, nominal |
| SWR (internally leveled, typical) | |
| 250 kHz to 2 GHz | < 1.4:1 |
| > 2 GHz to 20 GHz | < 1.6:1 |
| > 20 GHz to 40 GHz | < 1.8:1 |
| Leveling modes | Internal leveling, external detector leveling, millimeter source module, ALC Off |
| External detector leveling | |
| Range | -0.2 mV to -0.5 V, nominal (-36 dBm to +4 dBm using Agilent 33330D/E detector) |
| Bandwidth | Typically 10 kHz (Note: not intended for pulsed operation) |
| Maximum reverse power | 1/2 Watt nominal |

Spectral purity

Harmonics⁹ (dBc at +10 dBm or maximum specified output power, whichever is lower)

| | |
|--------------------|-----------------|
| < 1 MHz | -30 dBc typical |
| 1 MHz to 2 GHz | -30 dBc |
| > 2 GHz to 20 GHz | -55 dBc |
| > 20 GHz to 40 GHz | -50 dBc typical |

⁷ Specifications apply over the 15 to 35°C temperature range, with attenuator lock off (normal operating mode). Degradation outside this range, for ALC power levels > -10 dBm, is typically < 0.3 dB.

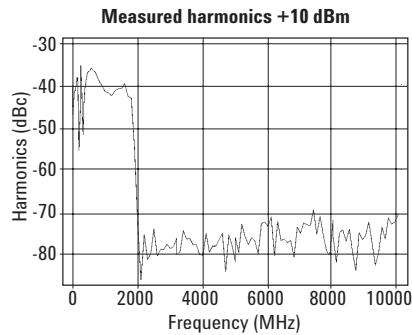
For instruments with type-N connectors (Option 1ED), specifications are degraded typically 0.2 dB above 18 GHz. Level accuracy is not specified below -110 dBm.

⁸ Compatible with Agilent Technologies EPM Series (E4418B and E4419B) power meters.

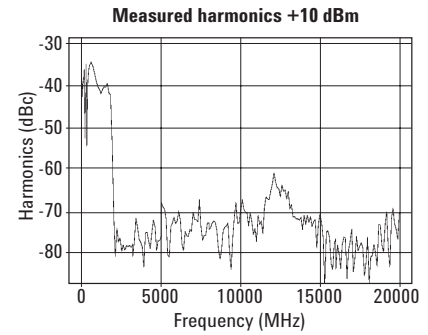
⁹ Specifications for harmonics beyond maximum instrument frequencies are typical.

L and A Series

20 GHz Measured harmonics



40 GHz Measured harmonics



Sub-harmonics: ¹⁰ (dBc at +10 dBm or maximum specified output power, whichever is lower)

| | |
|--------------------|-----------|
| 250 kHz to 10 GHz | None |
| > 10 GHz to 20 GHz | < -60 dBc |
| > 20 GHz to 40 GHz | < -50 dBc |

Non-harmonics: (dBc at +10 dBm or maximum specified output power, whichever is lower, for offsets > 3 KHz (>300 Hz with Option UNJ))¹¹

| Frequency | Spec | Typical |
|--------------------|-------|--------------------------|
| 250 kHz to 250 MHz | < -65 | -72 for > 10 kHz offsets |
| > 250 MHz to 1 GHz | < -80 | < -88 |
| > 1 to 2 GHz | < -74 | < -82 |
| > 2 to 3.2 GHz | < -68 | -76 |
| > 3.2 to 10 GHz | < -62 | -70 |
| > 10 to 20 GHz | < -56 | -64 |
| > 20 to 40 GHz | < -50 | -58 |

SSB phase noise (CW)
Offset from Carrier (dBc/Hz)

| Frequency | 20 kHz | 20 kHz typical |
|--------------------|--------|----------------|
| 250 kHz to 250 MHz | -130 | -134 |
| > 250 to 500 MHz | -136 | -140 |
| > 500 MHz to 1 GHz | -130 | -134 |
| > 1 to 2 GHz | -124 | -128 |
| > 2 to 3.2 GHz | -120 | -124 |
| > 3.2 to 10 GHz | -110 | -113 |
| > 10 to 20 GHz | -104 | -108 |
| > 20 to 40 GHz | -98 | -102 |

¹⁰ Specifications for harmonics beyond maximum instrument frequencies are typical.

¹¹ Performance is typical for spurs at frequencies above the maximum operating frequency of the instrument. Specifications apply for CW mode only. Performance typically is -60 dBc between 200 and 250 MHz.

L and A Series

Option UNJ: Improved SSB phase noise

Offset from carrier (dBc/Hz)

| Frequency | 100 Hz spec (typ) | 1 kHz spec (typ) | 10 kHz spec (typ) | 100 kHz spec (typ) |
|--------------------|----------------------|---------------------|----------------------|-----------------------|
| 250 kHz to 250 MHz | -94 (-115) | -110 (-123) | -128 (-132) | -130 (-133) |
| > 250 to 500 MHz | -100 (-110) | -124 (-130) | -132 (-136) | -136 (-141) |
| > 500 MHz to 1 GHz | -94 (-104) | -118 (-126) | -130 (-135) | -130 (-135) |
| > 1 to 2 GHz | -88 (-98) | -112 (-120) | -124 (-129) | -124 (-129) |
| > 2 to 3.2 GHz | -84 (-94) | -108 (-116) | -120 (-125) | -120 (-125) |
| > 3.2 to 10 GHz | -74 (-84) | -98 (-106) | -110 (-115) | -110 (-115) |
| > 10 to 20 GHz | -68 (-78) | -92 (-100) | -104 (-107) | -104 (-109) |
| > 20 to 40 GHz | -62 (-72) | -86 (-94) | -98 (-101) | -98 (-103) |

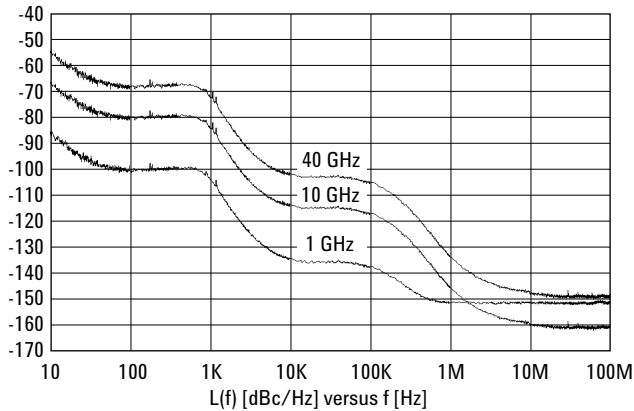
Residual FM < N x 6 Hz, typical

Option UNJ < N x 4 Hz, typical
(rms, 50 Hz to 15 kHz bandwidth)

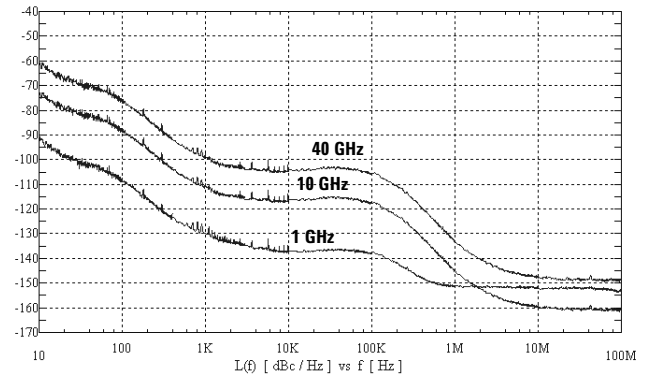
Broadband noise (CW mode at +10 dBm output,
for offsets > 10 MHz)

| | |
|------------------|-----------------------|
| > 0.25 to 20 GHz | < -148 dBc/Hz typical |
| > 20 to 40 GHz | < -141 dBc/Hz typical |

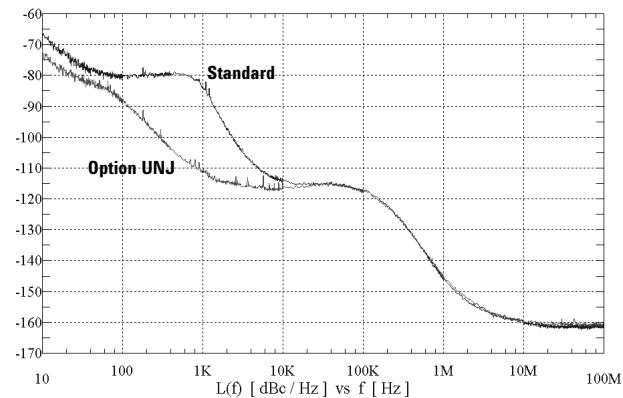
Measured phase noise Standard Product



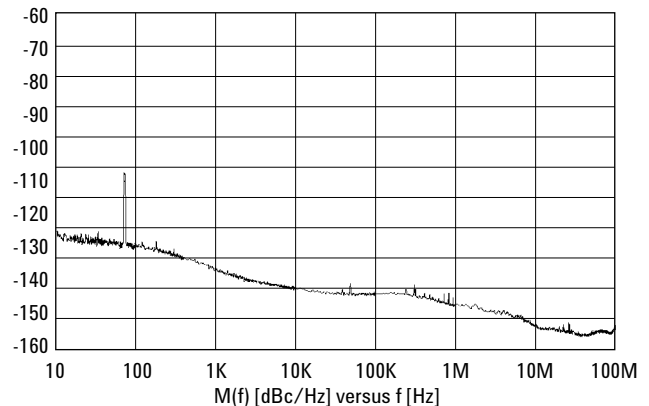
Option UNJ



Measured Standard vs. Option UNJ at 10 GHz



Measured AM noise at 10 GHz



A Series only

| Frequency modulation | | |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Maximum deviation | N x 8 MHz | |
| Resolution | 0.1% of deviation or 1 Hz, whichever is greater | |
| Deviation accuracy | < ± 3.5% of FM deviation + 20 Hz (1 kHz rate, deviations < N x 800 kHz) | |
| Modulation frequency response | | |
| Path | Rates (at 100 kHz deviation) | |
| | 1 dB Bandwidth | 3 dB Bandwidth, typical |
| FM 1 | dc/20 Hz to 100 kHz | dc/5 Hz to 10 MHz |
| FM 2 | dc/20 Hz to 100 kHz | dc/5 Hz to 1 MHz |
| dc FM¹² carrier offset | ±0.1% of set deviation + (N x 8 Hz) | |
| Distortion | < 1% (1 kHz rate, deviations < N x 800 kHz) | |
| Sensitivity | ±1 V _{peak} for indicated deviation | |
| Paths | FM1 and FM2 are summed internally for composite modulation. Either path may be switched to any one of the modulation sources: Ext1, Ext2, internal1, internal2. The FM2 path is limited to a maximum rate of 1 MHz. The FM2 path must be set to a deviation less than FM1. | |
| Phase modulation | | |
| Maximum deviation | N x 80 radians (N x 8 radians in high-bandwidth mode) | |
| Resolution | 0.1% of set deviation | |
| Deviation accuracy | < ±5% of deviation + 0.01 radians (1 kHz rate, normal BW mode) | |
| Modulation frequency response | | |
| Mode | Maximum Deviation | Rates (3 dB BW) |
| Normal BW | N x 80 rad | dc – 100 kHz |
| High BW | N x 8 rad | dc – 1 MHz (typ) |
| Distortion | < 1 % (1 kHz rate, THD, dev < N x 80 rad, normal BW mode) | |
| Sensitivity | ±1 V _{peak} for indicated deviation | |
| Path | ΦM1 and ΦM2 are summed internally for composite modulation. Either path may be switched to any one of the modulation sources: Ext1, Ext2, internal1, internal2. The ΦM2 path must be set to a deviation less than ΦM1. | |

¹² At the calibrated deviation and carrier frequency, within 5°C of ambient temperature at time of user calibration.

A Series only

| Amplitude modulation ($f_c > 2$ MHz)¹³ (typical) | | |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Depth | Linear mode | Exponential (log) mode (Downward modulation only) |
| Maximum | > 90% | > 20 dB |
| Settable¹⁴ | 0 - 100 % | 0 to 40 dB |
| Resolution | 0.1% | 0.01 dB |
| Accuracy (1 kHz rate) | < $\pm(6\%$ of setting + 1 %) | < $\pm(2\%$ of setting + 0.2 dB) |
| Ext sensitivity | ± 1 V _{peak} for indicated depth | -1 V for indicated depth |
| Rates (3 dB bandwidth, 30% depth) | | dc/10 Hz to 100 kHz typical (useable to 1 MHz) |
| Distortion (1 kHz rate, linear mode, THD) | | |
| 30% AM | | < 1.5% |
| 90% AM | | < 4 % |
| Path | AM1 and AM2 are summed internally for composite modulation. Either path may be switched to any one of the modulation sources: Ext1, Ext2, internal1, internal2. | |
| External modulation inputs (Ext1 & Ext2) | | |
| Modulation types | AM, FM, and Φ M | |
| Input impedance | 50 or 600 Ω , nominal, switched | |
| High/low indicator (100 Hz to 10 MHz BW, ac coupled inputs only) | Activated when input level error exceeds 3%, nominal | |
| Simultaneous modulation | All modulation types may be simultaneously enabled except: FM with Φ M, and linear AM with exponential AM. AM, FM, and Φ M can sum simultaneous inputs from any two sources (Ext1, Ext2, internal1, or internal2) Any given source (Ext1, Ext2, internal1, or internal2) may be routed to only one activated modulation type. | |
| Internal modulation source | Dual function generators provides two independent signals (internal1 and internal2) for use with AM, FM, Φ M, or LF Out. | |
| Waveforms | Sine, square, positive ramp, negative ramp, triangle, Gaussian noise, uniform noise, swept sine, dual sine ¹⁵ | |
| Rate range | | |
| Sine | 0.5 Hz to 1 MHz | |
| Square, ramp, triangle | 0.5 Hz to 100 kHz | |
| Resolution | 0.5 Hz | |
| Accuracy | Same as timebase | |

¹³ For $f_c < 2$ MHz AM is usable but not specified. AM specifications apply with ALC on, and envelope peaks < maximum specified power. For instruments without Option 1E1 attenuator, specs apply for carrier amplitude > -2 dBm.

¹⁴ For AM depth settings > 90% or > 20 dB, deep AM mode or 1 kHz ALC BW is recommended.

¹⁵ Internal2 is not available when using swept sine or dual sine modes.

A Series only

| | | |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| LF out | | |
| Output | Internal1 or internal2. Also provides monitoring of internal1 or internal2 when used for AM, FM, or Φ M. | |
| Amplitude | 0 to 3 V _{peak} , nominal into 50 Ω | |
| Output impedance | 50 Ω , nominal | |
| Swept sine mode: (frequency, phase continuous) | | |
| Operating modes | Triggered or continuous sweeps | |
| Frequency range | 1 Hz to 1 MHz | |
| Sweep rate | 0.5 Hz to 100 k sweeps/s, equivalent to sweep times 10 μ s to 2 s | |
| Resolution | 0.5 Hz (0.5 sweep/s) | |
| Pulse modulation | | |
| | ≥ 500 MHz to ≤ 3.2 GHz¹⁶ | > 3.2 GHz |
| Power range | | |
| Internally leveled | 0 to +10 dBm | 0 to +10 dBm |
| With option 1E1 | -110 to +10 dBm | -110 to +10 dBm |
| On/off ratio | 80 dB typical | 80 dB |
| Rise/fall times (T_r, T_f) | 100 ns typical | 10 ns (6 ns typical) |
| Pulse width | | |
| Internally leveled | ≥ 2 μ s typical | ≥ 1 μ s |
| ALC Off | ≥ 0.5 μ s typical | ≥ 20 ns typical |
| Repetition freq | | |
| Internally leveled | 10 Hz to 250 kHz typical | 10 Hz to 500 kHz typical |
| ALC Off | dc to 1 MHz typical | dc to 10 MHz typical |
| Level accuracy (relative to CW) | | |
| Internally leveled | ± 0.5 dB | ± 0.4 dB (± 0.15 typical) |
| ALC Off with power search ¹⁷ | ± 0.5 dB typical | ≤ 20 GHz ± 0.8 dB typical ≤ 40 GHz ± 1.2 dB typical |
| Width compression | ± 50 ns typical | ± 5 ns typical |
| Video feedthrough¹⁸ | < 200 mV typical | < 2 mV typical |
| Pulse delay (ext input to RF output) | 300 ns nominal | 70 ns nominal |
| Pulse overshoot (V_{or}) | $< 10\%$ typical | |
| Input level | +1 V _{peak} = RF On | |
| Input impedance | 50 Ω , nominal | |

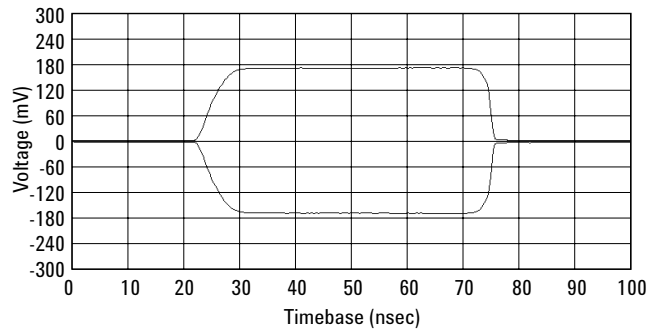
¹⁶ For improved performance ≤ 3.2 GHz, special Option HE6 is available. Contact your local Agilent Online representative.

¹⁷ Power search is a calibration routine that improves level accuracy in ALC-off mode. Unpulsed RF power will be present typically up to 5 ms when executing power search.

¹⁸ With attenuator in 0 dB position. Video feed-through decreases with attenuator setting.

A Series only

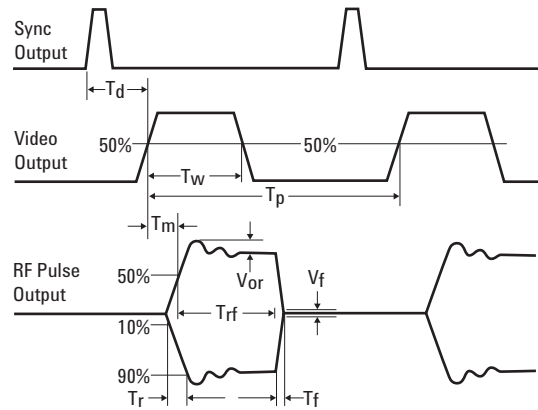
Measured pulse modulation envelope



Internal pulse generator

| | |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Modes | Free-run, triggered, triggered with delay, doublet, and gated. Triggered with delay, doublet, and gated require external trigger source. |
| Period (PRI) (T_p) | 70 ns to 42 s (Repetition frequency: 0.024 Hz to 14.28 MHz) |
| Pulse width (T_w) | 10 ns to 42 s |
| Delay (T_d) | |
| Free-run mode | 0 to ± 42 s |
| Triggered with delay and doublet modes | 75 ns to 42s with ± 10 ns jitter |
| Resolution | 10 ns (width, delay, and PRI) |
| RF delay (T_m) | < 20 ns typical |

- T_d Video delay (variable)
- T_w Video pulse width (variable)
- T_p Pulse period (variable)
- T_m RF delay
- T_{rf} RF pulse width
- T_f RF pulse fall time
- T_r RF pulse rise time
- V_{or} Pulse overshoot
- V_f Video feedthrough



L and A Series

Remote programming

| | |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interfaces | GPIB (IEEE-488.2,1987) with listen and talk, RS-232, and 10-base T-LAN interface. |
| Control languages | SCPI version 1992.0. Also will emulate most applicable Agilent 836xxB, Agilent 8373xB, and Agilent 8340/41B commands, providing general compatibility with ATE systems which include these signal generators. |
| IEEE-488 functions | SH1, AH1, T6, TE0, L4, LE0, SR1, RL1, PP0, DC1, DT0, C0, E2. |
| VXIplug&play drivers | Are available. |

L and A Series

| | |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ISO compliant | This family of signal generators is manufactured in an ISO-9001 registered facility in concurrence with Agilent Technologies commitment to quality. |
| General | |
| Power requirements | 90 to 132 Vac 50 to 60 Hz, or 195 to 267 Vac 50 to 60 or 400 Hz, (automatically selected), 300 W maximum. |
| Operating temperature range | 0 to 55°C |
| Storage temperature range | -40 to 71°C |
| Shock and vibration | Meets MIL-STD-28800E Type III, Class 3. |
| EMC | Conducted and radiated interference and immunity meets IEC/EN 61326-1 and MIL-STD-461C Part 2, RE02. Meets radiated emission requirements of CISPR Pub 11/1997 Group 1 class A. |
| Storage registers | Memory is shared by instrument states, user data files, sweep list files, and waveform sequences. Depending on the number and size of these files, up to 800 storage registers and 10 register sequences are available. |
| Security | Display blanking. |
| Compatibility | Agilent 83550 Series millimeter heads |
| Self-test | Internal diagnostic routine tests most modules (including microcircuits) in a preset condition. For each module, if its node voltages are within acceptable limits, then module "passes" the test. |
| Weight | < 22 kg (48 lb.) net, < 30 kg (68 lb.) shipping. |
| Dimensions | 178 mm H x 426 mm W x 498 mm D (7" H x 16.8" W x 19.6" D in.). |
| Front panel connectors (All connectors are BNC female unless otherwise noted.) | |
| RF output | Nominal output impedance 50 Ω. |
| For 20 GHz models | Precision APC-3.5 male, or Type-N with Option 1ED. |
| For 40 GHz models | Precision 2.4 mm male; plus 2.4-2.4 mm and 2.4-2.9 mm female adaptors also included. |
| ALC input | Used for negative external detector leveling. Nominal input impedance 120 kΩ, damage level ±15 V. |
| LF output (PSG-A Series only) | Outputs the internally generated LF source. Nominal output impedance 50 Ω. |
| External input 1 (PSG-A Series only) | Drives either AM, FM, or ΦM. Nominal input impedance 50 or 600 Ω, damage levels are 5 Vrms and 10 Vpeak. |
| External input 2 (PSG-A Series only) | Drives either AM, FM, or ΦM. Nominal input impedance 50 or 600 Ω, damage levels are 5 Vrms and 10 Vpeak. |
| Pulse/trigger gate input (PSG-A Series only) | Accepts input signal for external fast pulse modulation. Also accepts external trigger pulse input for internal pulse modulation. Nominal impedance 50 Ω. Damage levels are 5 Vrms and 10 Vpeak. |
| Pulse video out (A series only) | Outputs a signal that follows the RF output in all pulse modes. TTL-level compatible, nominal source impedance 50 Ω. |

| | |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pulse sync out (A series only) | Outputs a synchronizing pulse, nominally 50 ns width, during internal and triggered pulse modulation. TTL-level compatible, nominal source impedance 50 Ω . |
| Rear panel connectors (All connectors are BNC female unless otherwise noted.) | |
| Serial interface | Used for serial communication (9-pin RS-232 connector female). |
| GPIB | Allows communication with compatible devices. |
| LAN | Allows LAN communication |
| 10 MHz input | Accepts an external reference (timebase) input (at 1, 2, 2.5, 5, 10 MHz for standard and 10 MHz only for option UNJ) Nominal input impedance 50 Ω . Damage levels > +10 dBm |
| 10 MHz output | Outputs internal or external reference signal. Nominal output impedance 50 Ω . Nominal output power +4 dBm |
| Sweep output | Generates output voltage, 0 to +10 V when signal generator is sweeping. Output impedance < 1 Ω , can drive 2000 Ω . |
| Trigger output | Outputs a TTL signal: high at start of dwell, or when waiting for point trigger in manual sweep mode; low when dwell is over or point trigger is received, high or low 4 us pulse at start of LF sweep. |
| Trigger input | Accepts TTL signal for triggering point-to-point in manual sweep mode, or to trigger start of LF sweep. Damage levels \geq +10 V or \leq -4 V. |
| Source module interface | Provides bias, flatness correction, and leveling connections to the model 83550 Series mm-wave source modules. |
| Source settled output | Provides an output trigger that indicates when the signal generator has settled to a new frequency or power level (open-collector output). |
| EFC | > 0.25 ppm for -5 to +5 V |
| Recommended calibration cycle | 24 months |

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