

E5055A SSA-X

Signal Source Analyzer

1 MHz to 8 GHz



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Definition

Specification (spec.)¹

Warranted performance. Specifications include guardbands to account for the expected statistical performance distribution, measurement uncertainties, and changes in performance due to environmental conditions. All specifications and characteristics apply over a $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ range (unless otherwise stated).

The following conditions must be met:

- Instrument has been turned on for 90 minutes with SSA-X application running.
- Instrument is within its calibration cycle.
- Instrument remains at a stable surrounding environment temperature (between $0\text{ }^{\circ}\text{C}$ to $40\text{ }^{\circ}\text{C}$) for 60 minutes prior to turn-on.

Characteristics (char.)

A performance parameter that the product is expected to meet before it leaves the factory, but that is not verified in the field and is not covered by the product warranty. A characteristic includes the same guardbands as a specification.

Typical (typ.)

Expected performance of an average unit at a stable temperature between $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ for 60 minutes prior to turn-on and during operation; does not include guardbands. It is not covered by the product warranty. The instrument must be within its calibration cycle.

Nominal (nom.)

A general, descriptive term or design parameter. It is not tested, and not covered by the product warranty.

Supplemental information

A performance parameter that is tested on sampled product during design validation. It does not include guardbands and is not covered by the product warranty.

1. For all tables in this data sheet, the specified performance at the exact frequency of a break is the better value of the two specifications at that frequency.

Phase Noise Measurement

Table 1. Phase noise measurement performance

Description	Specification (E5055A Opt.100)	Specification (E5055A Opt.200)
RF frequency range	1 MHz to 8 GHz	
Minimum offset frequency	1 mHz	
Maximum offset frequency ^{1,2}	Max. offset extension mode: OFF (default) 300 kHz : 1 MHz $\leq$ carrier $\leq$ 2 MHz 1 MHz : 2 MHz < carrier $\leq$ 7.6 MHz 3 MHz : 7.6 MHz < carrier $\leq$ 28 MHz (Offset is settable up to 5 MHz) 10 MHz : 28 MHz < carrier $\leq$ 41 MHz 30 MHz : 41 MHz < carrier $\leq$ 152 MHz 100 MHz : 152 MHz < carrier $\leq$ 502 MHz 300 MHz : 502 MHz < carrier $\leq$ 1.61 GHz 1 GHz : 1.61 GHz < carrier $\leq$ 7.19 GHz 300 MHz : 7.19 GHz < carrier < 7.89 GHz 100 MHz : 7.89 GHz $\leq$ carrier $\leq$ 8 GHz Max. offset extension mode: ON 8 GHz : 51 MHz < carrier < 150 MHz 3 GHz : 150 MHz $\leq$ carrier < 5.19 GHz	
Offset setting resolution	1 – 3 steps	
Input power range	-20 dBm to +20 dBm -50 dBm to +20 dBm (typ.) (Enable search off)	
Phase noise measurement accuracy ³	Signal level -20 dBm to +20 dBm <1.5 dB: offset to 1 MHz <2 dB: offset 1 M to 30 MHz <3 dB: offset 30 M to 100 MHz ⁴	
SSB phase noise sensitivity ⁵	See Table 3, Figure 3 and 4	See Table 2, Figure 1 and 2
Cross correlation factor	1 to 100,000 (required S963015B for 2 to 100,000) (See Table 5)	
Residual spurious level	Offset frequency: 1 kHz to 100 MHz < -50 dBc: carrier <100 MHz (typ.) < -80 dBc: carrier $\geq$ 100 MHz (typ.)	
Level measurement uncertainty	Input signal : sinusoidal wave, 1 MHz to 8 GHz ± 1.2 dB: -20 dBm $\leq$ signal level < -10 dBm (spec.) ± 1 dB: -10 dBm $\leq$ signal level $\leq$ +15 dBm (spec.) ± 1.5 dB: +15 dBm < signal level $\leq$ +20 dBm (spec.) Input signal : sinusoidal wave, 1 MHz to 8 GHz ± 0.5 dB: -20 dBm $\leq$ signal level $\leq$ +15 dBm (typ.) ± 0.8 dB: +15 dBm < signal level $\leq$ +20 dBm (typ.)	
Measurement time	See Table 6	
Receiver ranging	Auto, Manual (0 dB to 30 dB, 1 dB step)	
Sweep type	Auto (one RBW for all segments) Segment sweep (unique RBW and cross-correlation factor settable for each segment)	
RBW setting	0.1% to 30% (1/2/3/5 step) (Start offset $\geq$ 10 mHz) 0.3% to 30% (1/2/3/5 step) (Start offset 3 mHz) 1% to 30% (1/2/3/5 step) (Start offset 1 mHz)	

1. Offset >30 MHz: AM + PM composite measurement.
2. Offset frequency on half decade (300 kHz, 3 MHz, etc.) do not have measurement point because measurement points are log spacing.
3. For carrier frequency $\leq$ 152 MHz, the accuracy is specified up to maximum offset frequency in the maximum offset extension mode OFF.
4. Specification is applied under the PM noise of the device under test(DUT) = AM noise and decomposition model (PM = AM model) for offset >30 MHz and the noise level of the lower/upper sidebands should be identical.
5. without spurious, decomposition model(PM = AM model) for offset >30 MHz

Table 2. SSB phase noise sensitivity (dBc/Hz) (E5055A Opt.200), Cross correlation factor = 1, signal level = +10 dBm, Auto range ON, start offset = 1 Hz ¹

RF input frequency		Offset frequency [Hz] from the carrier									
		1	10	100	1 k	10 k	100 k	1 M	10 M	30 M	100 M
1 MHz	specification	-124	-148	-158	-164	-170	-174	–	–	–	–
	typical	-138	-157	-164	-169	-175	-180	–	–	–	–
10 MHz	specification	-113	-138	-152	-162	-168	-173	-175	–	–	–
	typical	-119	-145	-159	-168	-174	-179	-181	–	–	–
100 MHz	specification	-93	-118	-140	-156	-163	-168	-170	-170	-170	–
	typical	-100	-130	-148	-161	-169	-174	-176	-176	-176	–
1 GHz	specification	-73	-98	-121	-150	-164	-169	-170	-170	-170	-168
	typical	-80	-111	-130	-156	-169	-175	-177	-177	-177	-176
3 GHz	specification	-63	-88	-111	-140	-159	-167	-170	-170	-170	-168
	typical	-70	-101	-120	-147	-165	-173	-177	-177	-177	-176
8 GHz	specification	-55	-80	-103	-132	-151	-160	-166	-166	-166	-164
	typical	-62	-93	-112	-139	-158	-167	-175	-175	-175	-174

1. decomposition model(PM = AM model) for offset >30 MHz

Table 3. SSB phase noise sensitivity (dBc/Hz) (E5055A Opt.100), Cross correlation factor = 1, signal level = +10 dBm, Auto range ON, start offset = 1 Hz ¹

RF input frequency		Offset frequency [Hz] from the carrier									
		1	10	100	1 k	10 k	100 k	1 M	10 M	30 M	100 M
1 MHz	specification	-124	-148	-158	-164	-170	-174	–	–	–	–
	typical	-132	-157	-164	-169	-175	-180	–	–	–	–
10 MHz	specification	-107	-137	-152	-162	-168	-173	-175	–	–	–
	typical	-115	-141	-159	-168	-174	-179	-181	–	–	–
100 MHz	specification	-87	-117	-137	-156	-163	-168	-170	-170	-170	–
	typical	-95	-121	-146	-161	-169	-174	-176	-176	-176	–
1 GHz	specification	-66	-97	-117	-146	-164	-169	-170	-170	-170	-168
	typical	-75	-101	-124	-152	-169	-175	-177	-177	-177	-176
3 GHz	specification	-56	-87	-107	-136	-159	-167	-170	-170	-170	-168
	typical	-65	-91	-114	-142	-165	-173	-177	-177	-177	-176
8 GHz	specification	-48	-79	-99	-128	-151	-160	-166	-166	-166	-164
	typical	-57	-83	-106	-134	-158	-167	-175	-175	-175	-174

1. decomposition model(PM = AM model) for offset >30 MHz

Table 4. Allan variance

Description	Specification (E5055A Opt.100)	Specification (E5055A Opt.200)
Frequency range	1 MHz to 8 GHz	
Measurement range	100 nsec to 1000 sec	
Allan deviation	4.0 x 10E-13 at tau(τ) = 1 sec (nominal data for Opt.200)	

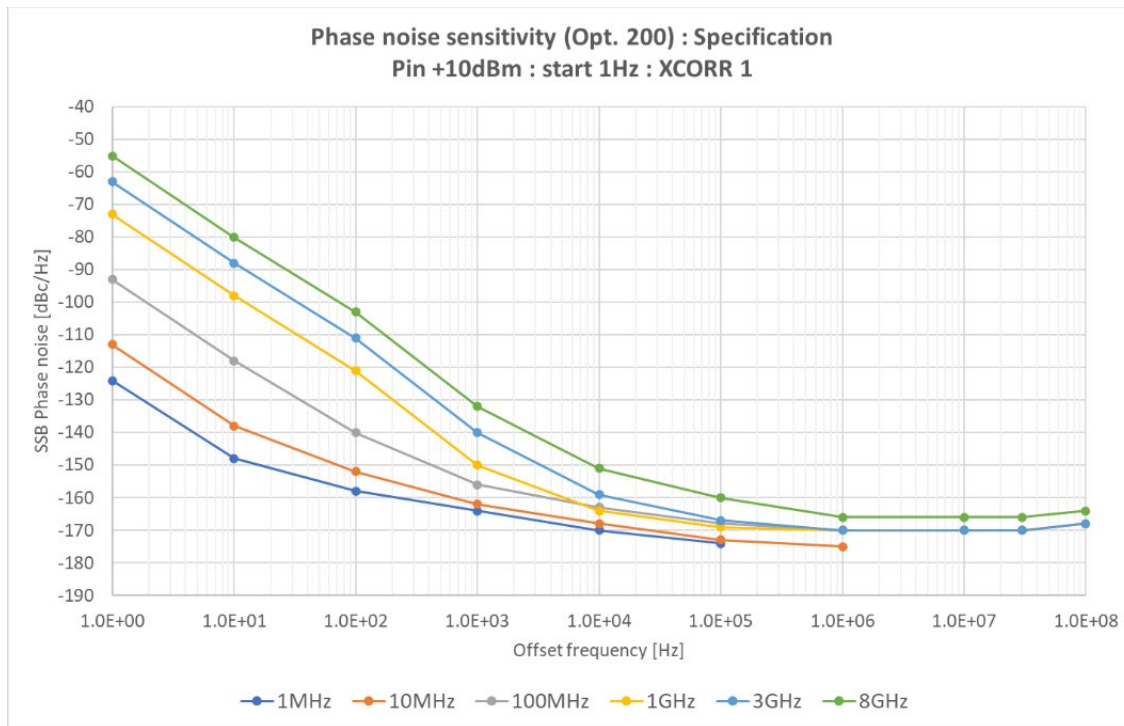


Figure 1. SSB Phase noise sensitivity (Option 200): Specification, +10 dBm input, Auto Range On, start offset frequency = 1 Hz, Cross correlation factor = 1)

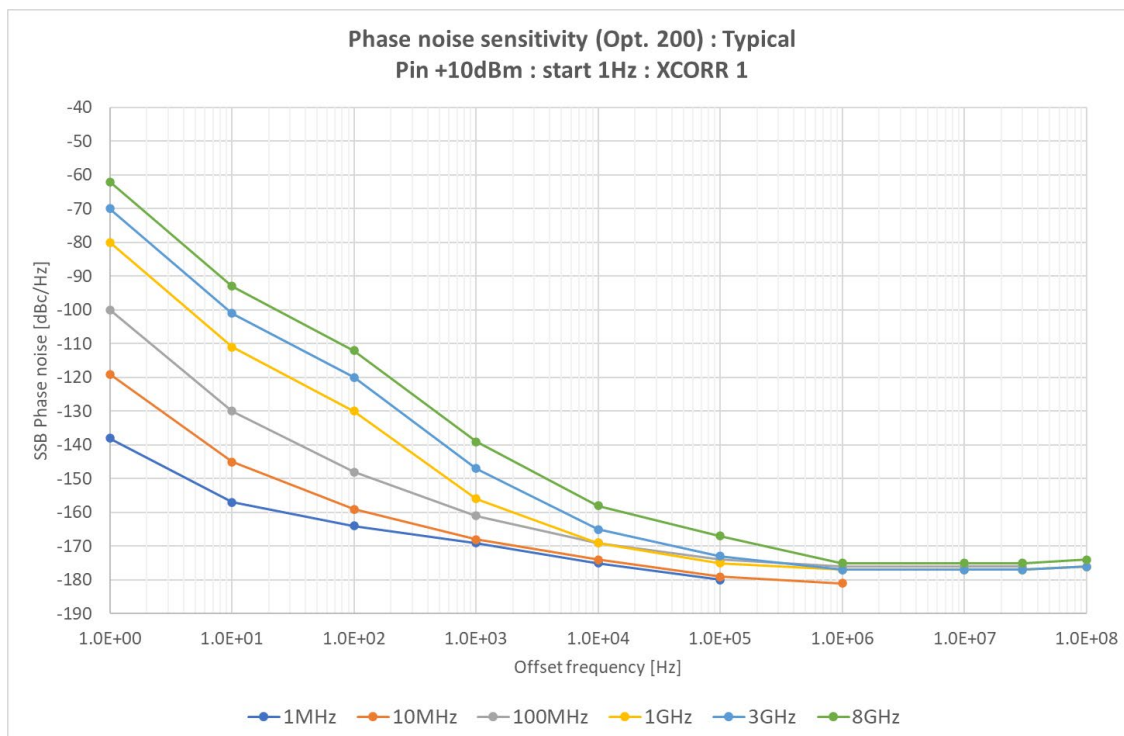


Figure 2. SSB Phase noise sensitivity (Option 200): Typical, +10 dBm input, Auto Range On, start offset frequency = 1 Hz, Cross correlation factor = 1)

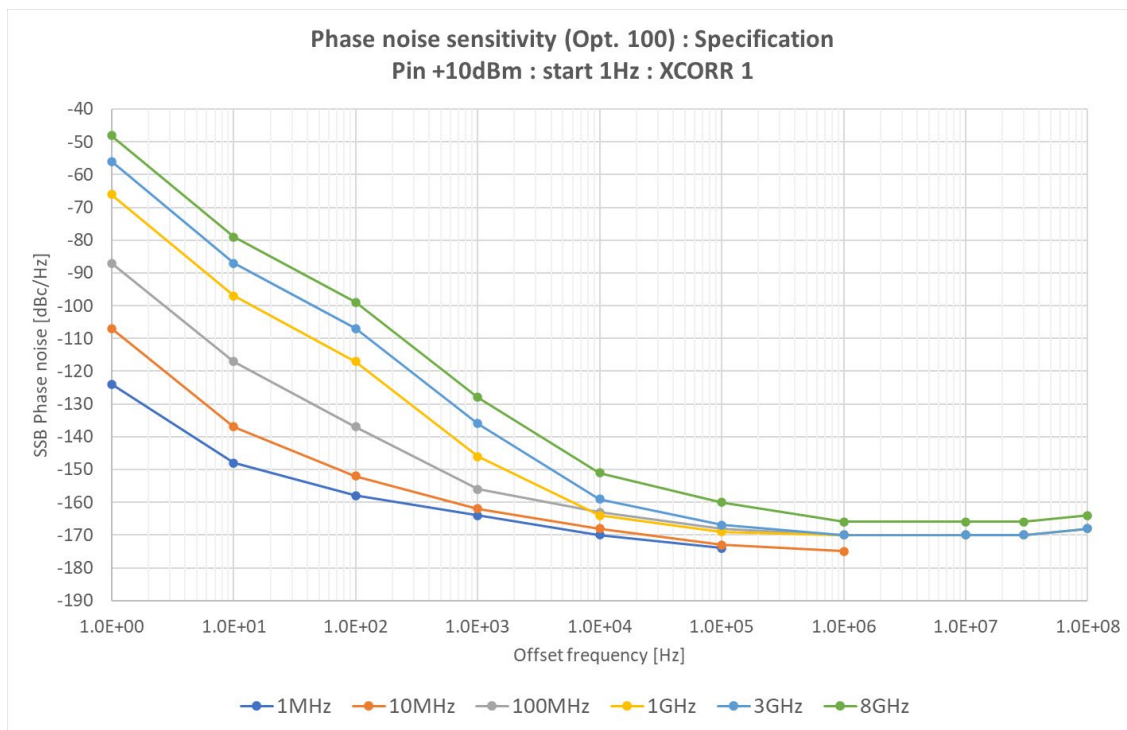


Figure 3. SSB Phase noise sensitivity (Option 100): Specification, +10 dBm input, Auto Range On, start offset frequency = 1 Hz, Cross correlation factor = 1)

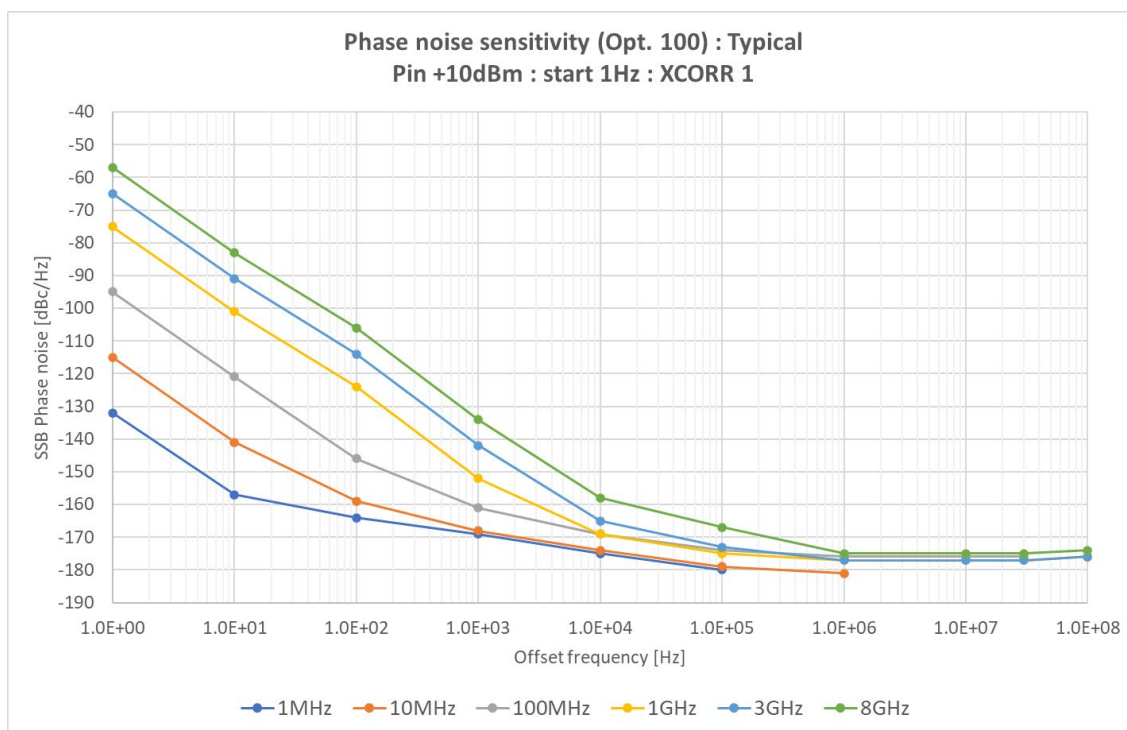


Figure 4. SSB Phase noise sensitivity (Option 100): Typical, +10 dBm input, Auto Range On, start offset frequency = 1 Hz, Cross correlation factor = 1)

Table 5. SSB phase noise sensitivity improvement by correlation ¹

Number of correlations	10	100	1,000	10,000	100,000
Improvement factor	5 dB	10 dB	15 dB	20 dB	25 dB

1. Requires S963015B Advanced Features for E5055A. These are the theoretical values and actual improvement is limited by the internal common noise and/or other factors.

Table 6. E5055A Typical measurement time (sec) for phase noise, Enable Search OFF, Sweep type = Log frequency, RBW 10%, Cross correlation factor ≥ 10 and measurement times ≥ 2 sec, Measurement times normalized to Cross correlation factor = 1

Stop frequency	Start frequency			
	1 Hz	10 Hz	100 Hz	1 kHz
100 kHz	5.96	0.79	0.09	0.05
1 MHz	5.96	0.79	0.09	0.05
10 MHz	5.96	0.84	0.11	0.05
30 MHz	8.25	1.23	0.17	0.07
100 MHz	9.56	1.44	0.20	0.07
1 GHz	25.19	3.99	0.51	0.11

AM Noise Measurement

Table 7. AM noise measurement performance

Description	Specification
RF frequency range	1 MHz to 8 GHz
Minimum offset frequency	1 mHz
Maximum offset frequency ¹	300 kHz (1 MHz $\leq$ carrier $\leq$ 2 MHz) 1 MHz (2 MHz < carrier $\leq$ 7.6 MHz) 3 MHz (7.6 MHz < carrier $\leq$ 28 MHz) (Offset is settable up to 5 MHz) 10 MHz (28 MHz < carrier $\leq$ 41 MHz) 30 MHz (41 MHz < carrier $\leq$ 8 GHz)
Offset setting resolution	1 – 3 steps
Input power range	-20 dBm to +20 dBm -50 dBm to +20 dBm (typ.) (Enable Search off)
AM noise sensitivity ²	See Table 8, Figure 5 and 6
AM noise measurement accuracy	Signal level: -20 dBm to +20 dBm < 2 dB: offset to 1 MHz < 2.5 dB: offset 1 MHz to 30 MHz
Level measurement uncertainty	Input signal : sinusoidal wave, 1 MHz to 8 GHz ± 1.2 dB: -20 dBm $\leq$ signal level < -10 dBm (spec.) ± 1 dB: -10 dBm $\leq$ signal level $\leq$ +15 dBm (spec.) ± 1.5 dB: +15 dBm < signal level $\leq$ +20 dBm (spec.) Input signal : sinusoidal wave, 1 MHz to 8 GHz ± 0.5 dB: -20 dBm $\leq$ signal level $\leq$ +15 dBm (typ.) ± 0.8 dB: +15 dBm < signal level $\leq$ +20 dBm (typ.)
Residual spurious level	Offset: 1 kHz to 30 MHz < -50 dBc: carrier < 100 MHz (typ.) < -80 dBc: carrier $\geq$ 100 MHz (typ.)
Cross correlation factor	1 to 100,000 (required S963015B for 2 to 100,000)
Receiver ranging	Auto, Manual (0 dB to 30 dB, 1 dB step)
RBW setting	0.1% to 30% (1/2/3/5 step) (Start offset $\geq$ 10 mHz) 0.3% to 30% (1/2/3/5 step) (Start offset 3 mHz) 1% to 30% (1/2/3/5 step) (Start offset 1 mHz)

1. Offset frequency on half decade (300 kHz, 3 MHz, 30 MHz, etc.) do not have measurement point because measurement points are log spacing.
2. without spurious.

Table 8. AM noise sensitivity [dBc/Hz] (Option 100, 200), Cross correlation factor = 1, signal level = +10 dBm, Auto range ON, start offset = 1 Hz

RF input frequency		Offset frequency [Hz] from the carrier								
		1	10	100	1 k	10 k	100 k	1 M	10 M	30 M
1 MHz	specification	-100	-120	-135	-145	-158	-165	–	–	–
	typical	-113	-128	-142	-153	-168	-178	–	–	–
10 MHz	specification	-100	-120	-135	-145	-158	-165	-167	–	–
	typical	-113	-128	-142	-153	-168	-178	-181	–	–
100 MHz	specification	-100	-120	-135	-145	-158	-165	-167	-167	-167
	typical	-112	-127	-141	-152	-166	-174	-176	-176	-176
1 GHz	specification	-100	-120	-135	-145	-158	-165	-167	-167	-167
	typical	-112	-127	-142	-153	-167	-174	-176	-176	-176
3 GHz	specification	-100	-117	-132	-145	-157	-165	-167	-167	-167
	typical	-112	-127	-141	-152	-166	-174	-176	-176	-176
8 GHz	specification	-100	-117	-132	-145	-157	-165	-167	-167	-167
	typical	-112	-127	-141	-152	-166	-173	-175	-175	-175

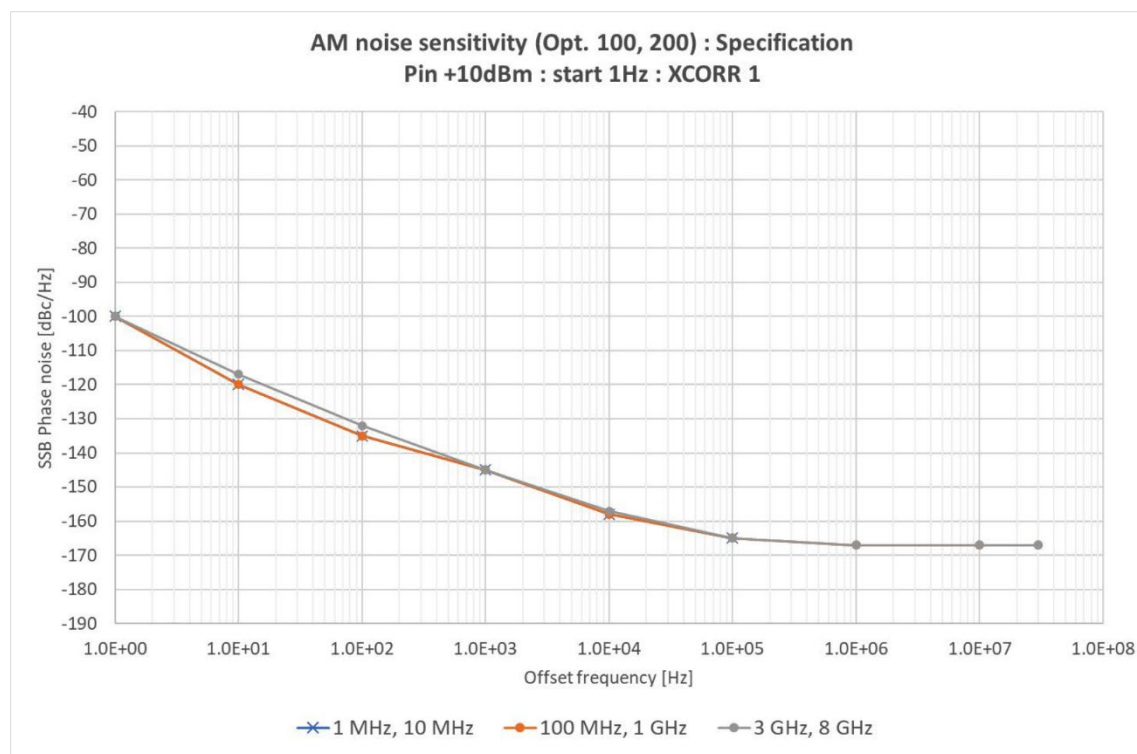


Figure 5. SSB AM noise sensitivity (Option 100, 200): Specification, +10 dBm input, Auto Range On, start offset frequency = 1 Hz, Cross correlation factor = 1

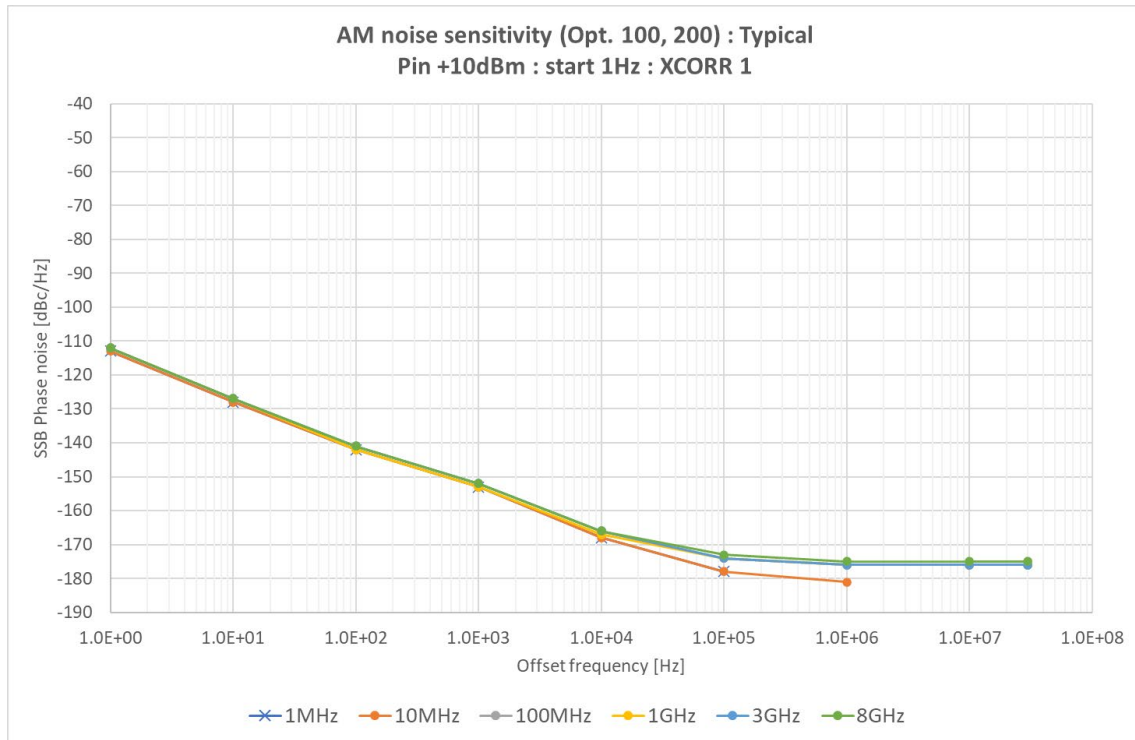


Figure 6. SSB AM noise sensitivity (Option 100, 200): Typical, +10 dBm input, Auto Range On, start offset frequency = 1 Hz, Cross correlation factor = 1

Baseband Noise Measurement

Table 9. Baseband noise measurement performance

Description	Specification
Baseband input connector	BNC, 50 Ω nominal, AC coupled
Measurement frequency range	1 Hz to 100 MHz (AC(LF), DC block cutoff low) 1 kHz to 100 MHz (AC(HF), DC block cutoff high)
Measurement parameters	dBV/Hz, dBm/Hz, $V/\sqrt{Hz}$
Measurement level range	< +5 dBm @Gain 0 dB
Level measurement uncertainty (typ.)	DC block cutoff low: <3 dB (1 Hz to 100 Hz) <2 dB (100 Hz to 100 MHz) DC block cutoff high: <3 dB (1 kHz to 100 kHz) <2 dB (100 kHz to 100 MHz)
Gain setting	0 - 50 dB (10 dB step)
Cross correlation factor	1 to 100,000 (required S963015B for 2 to 100,000)
Noise floor level	See Table 10 (without spurious)

Table 10. Baseband noise floor [dBm/Hz], baseband input: 0 Ω terminated, Cross correlation factor = 1, Gain = 50 dB, Start offset = 1 Hz, DC block cutoff low, (without spurious)

	Frequency [Hz]								
	1	10	100	1k	10k	100k	1M	10M	100M
Specification	-127	-139	-150	-159	-165	-167	-167	-167	-162
Typical	-134	-147	-154	-166	-172	-175	-175	-175	-166

DC Voltage Output

Table 11. DC supply and control voltage performances

Description	Specification
DC supply (Vs) output	
Number of outputs	2
Floating/Grounded	Floating
Setting range	DC Supply1: 0 V to +16 V DC Supply2: -16 V to 0 V
Setting resolution	1 mV
Output voltage accuracy	+/- (0.2% of setting + 2 mV)
Current reading uncertainty	+/- (0.2% of reading + 160 μ A) (0 to 100 mA) +/- (0.5% of reading + 1.5 mA) (100 mA to 1 A)
Maximum output current	DC Supply1: 1 A [2 A] (0 V to 8 V) 0.3 A [0.6 A] (8 V to 16 V) DC Supply2: 0.3 A (-16 V to -8 V) 1 A (-8 V to 0 V) values in [] are the maximum current from DC Supply 1 in the VSupply Parallel mode (DC Supply 2 must be unconnected in the Parallel mode.).
Noise level (typical)	<3 nVrms/ $\sqrt{Hz}$ at 10 kHz
Output resistance (typical)	<0.6 Ω
Output settling time (typical)	<150 msec @0.1% uncertainty
DC control voltage (VC) output	
Number of outputs	1
Floating/Grounded	Floating
Setting range	-35 V to +35 V
Setting resolution	0.1 mV
Output voltage accuracy	+/- (0.1% of setting + 2 mV) (typ.)
Current reading uncertainty	+/- (0.15% of reading + 50 μ A) (typ.)
Maximum output current	20 mA (typ.)
Noise level	<1 nVrms/ $\sqrt{Hz}$ at 10 kHz (Low noise mode) (typ.)
Output resistance	<30 Ω (typ.)
Output settling time	<20 msec @0.1% uncertainty (High speed mode) (typ.)
Tune VCO function	Available

VCO Characterization Measurements (required S963015B SSA-X Signal Source Analyzer advanced features for E5055A)

Table 12. Frequency and RF power measurement performances in the VCO characterization measurements

Description	Specification
RF frequency range	1 MHz to 8 GHz
Measurement frequency bands	1 MHz to 40 MHz, 10 MHz to 1.5 GHz, 250 MHz to 8 GHz
Sweep parameters	VControl(VC), VSupply1(VS1), VSupply2(VS2)
Measurement parameters	Frequency, Frequency/V, Δfrequency, Power, CurrentVC, CurrentVS1, CurrentVS2
Settable frequency resolution	0.1 Hz, 1 Hz, 10 Hz, 1 kHz, 64 kHz
Frequency uncertainty	± (frequency setting resolution + time-base uncertainty)
RF power measurement range	Measurement frequency band: 250 MHz to 8 GHz -15 dBm to +20 dBm: 250 MHz ≤ signal frequency < 400 MHz -20 dBm to +20 dBm: 400 MHz ≤ signal frequency < 8 GHz Measurement frequency band: other than 250 MHz to 8 GHz -20 dBm to +20 dBm
RF power resolution	0.01 dB (typ.)
RF power uncertainty (by peak detection)	Input signal : sinusoidal wave, 1 MHz to 8 GHz ±1.2 dB: -20 dBm ≤ signal level < -10 dBm (spec.) ±1 dB: -10 dBm ≤ signal level ≤ +15 dBm (spec.) ±1.5 dB: +15 dBm < signal level ≤ +20 dBm (spec.) Input signal : sinusoidal wave, 1 MHz to 8 GHz ±0.5 dB: -20 dBm ≤ signal level ≤ +15 dBm (typ.) ±0.8 dB: +15 dBm < signal level ≤ +20 dBm (typ.)
Swept measurement points	1 to 100,003

Transient Measurement (required S963015B SSA-X Signal Source Analyzer advanced features for E5055A)

Table 13. Transient measurement performance

Description	Specification
Target frequency range	1 MHz to 8 GHz
Input Power Range	Wide mode: Measurement frequency band: 256 MHz to 8 GHz -15 dBm to +20 dBm: 256 MHz $\leq$ signal frequency $\square$ 400 MHz -20 dBm to +20 dBm: 400 MHz $\square$ signal frequency $\square$ 8 GHz Measurement frequency band: other than 256 MHz to 8 GHz -20 dBm to +20 dBm Narrow mode: -20 dBm to +20 dBm
Measurement mode and parameters	
Measurement mode	Wideband - Narrowband (synchronous) Narrowband - Narrowband (synchronous)
Measurement parameters	Wideband mode: Frequency Narrowband mode: Frequency, phase, power (Frequency span $\leq$ 30 MHz) Frequency, phase (Frequency span $\geq$ 80 MHz)
Frequency transient bandwidth	
Wideband	1 M to 40 MHz 40 M to 160 MHz 80 M to 320 MHz 160 M to 640 MHz 320 M to 1.28 GHz 640 M to 2.56 GHz 1.28 G to 5.12 GHz 2.56 G to 8 GHz 256 M to 8 GHz
Narrowband	320 MHz (carrier $\geq$ 800 MHz) 160 MHz (carrier $\geq$ 400 MHz) 80 MHz (carrier $\geq$ 200 MHz) 30 MHz (carrier $\geq$ 200 MHz) 10 MHz (carrier $\geq$ 100 MHz) 2.5 MHz (carrier $\geq$ 5 MHz) 312.5 kHz/25 kHz/3.125 kHz
Frequency measurement	
Uncertainty	$\pm$ (Resolution + Time-base uncertainty + Residual FM)
Resolution ¹	See Table 14 (Wideband mode) and Table 15 (Narrowband mode)
Time-base uncertainty	See Table 18 (for E5055A Internal reference mode)
Residual FM (Supplemental information) ²	Time span $\leq$ 10 sec, VBW auto 1 mHzrms/(Time span ^{1.5}) + 40 mHzrms/GHz
RF power measurement (Narrow band mode only)	
Power level range	-20 dBm to +20 dBm
Resolution	< 0.1 dB (typ.)
Uncertainty	< 2 dB (typ.)
Phase measurement (Narrow band mode only, when DUT signal is locked to a target frequency)	
Uncertainty	$\pm$ (Trace noise + stability) (typ.)
Trace noise	Frequency span $\leq$ 30 MHz : 0.1 deg + 0.1 deg/GHz (typ.) Frequency span $\geq$ 80 MHz : 1 deg + 0.1 deg/GHz (typ.)
Stability	Time span $\leq$ 10 sec

$$1 \text{ deg} * \text{TimeSpan} + 0.02 \text{ deg} * \text{TimeSpan}/\text{GHz (typ.)}$$

Sweep measurement time	
Time span ³	10 µsec to 1,000 sec
Time resolution ⁴	≥20 nsec
Measurement trigger	
Video trigger	Wide(Frequency), Narrow(Frequency, Power) Positive/Negative/Holdoff

- Resolution is defined as minimum frequency difference of readings.
- Spurious response(ripple trace) may be observed depending on the measurement condition. Setting narrower VBW will improve the spurious response.
Wideband transient mode : <200 ppm of input signal frequency (VBW 3 MHz)
Narrowband transient mode : <10 kHzrms (frequency span ≤30 MHz, VBW 3 MHz)
 <100 kHzrms (frequency span □ 80 MHz, input signal frequency ≥2 GHz, VBW 3 MHz)
 <200 kHzrms (frequency span □ 80 MHz, input signal frequency <2 GHz, VBW 200 kHz)
- Minimum time span depends on frequency span or frequency range.
- Time resolution can change by VBW setting and minimum time resolution depends on frequency span and time span. See the table 14 and 15.

Transient Measurement/Wideband Mode

Table 14. Wideband mode frequency resolution vs. time span and frequency range

Frequency Range																						
Time Span [sec]		10 μ	20 μ	50 μ	0.1 m	0.2 m	0.5 m	1 m	2 m	5 m	10 m	20 m	50 m	0.1	0.2	0.5	1	2	5	10		
VBW (max) [Hz]	40 M - 160 MHz 80 M - 320 MHz 160 M - 640 MHz 320 M - 1.28 GHz 640 M - 2.56 GHz 1.28 G - 5.12 GHz 2.56 G - 8 GHz	3 M																				
VBW (min) [Hz]		600 k	300 k	120 k	60 k	30 k	12 k	6 k	3 k	1.2 k	600	300	120	60	30	12	6	3	1.2	0.6		
Time resolution (VBW max) [sec]		20 n											80 n	0.32 μ	0.64 μ	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	81.9 μ	164 μ
Time resolution (VBW auto) [sec]		20 n				80 n	0.16 μ	0.64 u	1.28 u	2.56 u	5.12 u	10.2 u	20.5 u	41.0 u	81.9 u	164 u	655 u	1.31 m	2.62 m	5.24 m	10.5 m	
Time resolution (VBW min) [sec]		0.16 μ		0.32 μ	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	41.0 μ	81.9 μ	164 μ	328 μ	1.31 m	2.62 m	5.24 m	10.5 m	21.0 m	41.9 m	83.9 m	168 m	
Frequency resolution (VBW auto) [Hz rms]	40 M - 160 MHz	6 k			5.1 k	1.8 k	450	160	57	14	5	1.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8		
	80 M - 320 MHz	12 k			6 k	2.1 k	530	190	67	17	6	2.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6		
	160 M - 640 MHz	24 k			12 k	4.2 k	1.1 k	380	140	34	12	5	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2		
	320 M - 1.28 GHz	48 k			24 k	8.4 k	2.2 k	750	270	70	24	9	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4		
	640 M - 2.56 GHz	96 k			48 k	16.8 k	4.3 k	1.5 k	540	140	50	17	13	13	13	13	13	13	13	13		
	1.28 G - 5.12 GHz	192 k			95 k	34 k	8.5 k	3 k	1.1 k	270	95	34	26	26	26	26	26	26	26	26		
	2.56 G - 8 GHz	384 k			190 k	67 k	17 k	6 k	2.2 k	540	190	67	26	26	26	26	26	26	26	26		
Time Span [sec]		10 μ	20 μ	50 μ	0.1 m	0.2 m	0.5 m	1 m	2 m	5 m	10 m	20 m	50 m	0.1	0.2	0.5	1	2	5	10		
VBW (max) [Hz]	1 M – 40 MHz 256 M – 8 GHz					150 k										130 k	65 k	32 k	16 k	8.1 k	2 k	1 k
VBW (min) [Hz]						30 k	12 k	6 k	3 k	1.2 k	600	300	120	60	30	12	6	3	1.2	0.6		
Time resolution (VBW max) [sec]		0.32 μ											0.64 μ	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	81.9 μ	164 μ		
Time resolution (VBW auto) [sec]						0.32 μ	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	50.0 μ	81.9 μ	164 μ	655 μ	1.31 m	2.62 m	5.24 m	10.5 m			
Time resolution (VBW min) [sec]						5.12 μ	10.2 μ	20.5 μ	41.0 μ	81.9 μ	164 μ	328 μ	1.31 m	2.62 m	5.24 m	10.5 m	21.0 m	41.9 m	83.9 m	168 m		
Frequency resolution (VBW auto) [Hz rms]	1 M – 40 MHz	40					20	8	4	2	0.8	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2			
	256 M – 8 GHz	2k					540	190	67	26	26	26	26	26	26	26	26	26	26	26		

Transient Measurement/Narrowband Mode

Table 15. Narrowband mode frequency resolution vs. time span and frequency span

Frequency Span																					
Time Span [sec]		10 μ	20 μ	50 μ	0.1 m	0.2 m	0.5 m	1 m	2 m	5 m	10 m	20 m	50 m	0.1	0.2	0.5	1	2	5	10	
VBW (max) [Hz]	320 MHz 160 MHz 80 MHz	3 M																			
VBW (min) [Hz]		600 k	300 k	120 k	60 k	30 k	12 k	6 k	3 k	1.2 k	600	300	120	60	30	12	6	3	1.2	0.6	
Time resolution (VBW max) [sec]		40 n									80 n	160 n	320 n	640 n	1.28 u	2.56 u	5.12 u	10.2 u	20.5 u	81.9 u	164 u
Time resolution (VBW auto) [sec]		40 n			80 n	0.16 μ	0.64 μ	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	41.0 μ	81.9 μ	164 μ	655 μ	1.31 m	2.62 m	5.24 m	10.5 m	
Time resolution (VBW min) [sec]		160 n	320 n	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	41.0 μ	81.9 μ	164 μ	328 μ	1.31 m	2.62 m	5.24 m	10.5 m	21.0 m	41.9 m	83.9 m	168 m	
Frequency resolution (VBW auto) [Hz rms]		320 MHz	24 k		20.2 k	7.2 k	1.8 k	640	320	128	64	32	12.8	6.4	6.4	6.4	6.4	6.4	6.4	6.4	
	160 MHz	12 k		10.2 k	3.6 k	905	320	160	64	32	16	6.4	3.2	3.2	3.2	3.2	3.2	3.2	3.2		
	80 MHz	6 k		5.1 k	1.8 k	450	160	80	32	16	8	3.2	1.6	1.6	1.6	1.6	1.6	1.6	1.6		
Time Span [sec]		10 μ	20 μ	50 μ	0.1 m	0.2 m	0.5 m	1 m	2 m	5 m	10 m	20 m	50 m	0.1	0.2	0.5	1	2	5	10	
VBW (max) [Hz]	30 MHz	3 M																			
VBW (min) [Hz]		600 k	300 k	120 k	60 k	30 k	12 k	6 k	3 k	1.2 k	600	300	120	60	30	12	6	3	1.2	0.6	
Time resolution (VBW max) [sec]		20 n	20 n	20 n	20 n	20 n	20 n	20 n	20 n	80 n	160 n	320 n	640 n	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	81.9 μ	164 μ	
Time resolution (VBW auto) [sec]		20 n	20 n	20 n	80 n	160 n	640 n	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	41.0 μ	81.9 μ	164 μ	655 μ	1.31 m	2.62 m	5.24 m	10.5 m	
Time resolution (VBW min) [sec]		160 n	320 n	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	41.0 μ	81.9 μ	164 μ	328 μ	1.31 m	2.62 m	5.24 m	10.5 m	21.0 m	41.9 m	83.9 m	168 m	
Frequency resolution (VBW auto) [Hz rms]		2000	2000	2000	1300	450	113	39	20	8	4	2	0.8	0.4	0.2	0.2	0.2	0.2	0.2	0.2	
Time Span [sec]		-	-	50 μ	0.1 m	0.2 m	0.5 m	1 m	2 m	5 m	10 m	20 m	50 m	0.1	0.2	0.5	1	2	5	10	
VBW (max) [Hz]	10 MHz	-	-	2 M																	
VBW (min) [Hz]		-	-	120 k	60 k	30 k	12 k	6 k	3 k	1.2 k	600	300	120	60	30	12	6	3	1.2	0.6	
Time resolution (VBW max) [sec]		-	-	80 n																	
Time resolution (VBW auto) [sec]		-	-	80 n		160 n	640 n	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	41.0 μ	81.9 μ	164 μ	655 μ	1.31 m	2.62 m	5.24 m	10.5 m	
Time resolution (VBW min) [sec]		-	-	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	41.0 μ	81.9 μ	164 μ	328 μ	1.31 m	2.62 m	5.24 m	10.5 m	21.0 m	41.9 m	83.9 m	168 m	
Frequency resolution (VBW auto) [Hz rms]		-	-	1260		450	110	39	20	8	4	2	0.8	0.4	0.2	0.2	0.2	0.2	0.2	0.2	
Time Span [sec]		-	-	-	0.1 m	0.2 m	0.5 m	1 m	2 m	5 m	10 m	20 m	50 m	0.1	0.2	0.5	1	2	5	10	
VBW (max) [Hz]	2.5 MHz	-	-	-	520 k																
VBW (min) [Hz]		-	-	-	60 k	30 k	12 k	6 k	3 k	1.2 k	600	300	120	60	30	12	6	3	1.2	0.6	
Time resolution (VBW max) [sec]		-	-	-	320 n																
Time resolution (VBW auto) [sec]		-	-	-	320 n		640 n	1.28 μ	2.56 μ	5.12 μ	10.2 μ	20.5 μ	41.0 μ	81.9 μ	164 μ	655 μ	1.31 m	2.62 m	5.24 m	10.5 m	
Time resolution (VBW min) [sec]		-	-	-	2.56 μ	5.12 μ	10.2 μ	20.5 μ	41.0 μ	81.9 μ	164 μ	328 μ	1.31 m	2.62 m	5.24 m	10.5 m	21.0 m	41.9 m	83.9 m	168 m	
Frequency resolution (VBW auto) [Hz rms]		-	-	-	110			39	20	8	4	2	0.8	0.4	0.2	0.2	0.2	0.2	0.2	0.2	

**Frequency
Span**

Time Span [sec]	-	-	-	-	-	-	1 m	2 m	5 m	10 m	20 m	50 m	0.1	0.2	0.5	1	2	5	10
VBW (max) [Hz]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBW (min) [Hz]	-	-	-	-	-	-	6 k	3 k	1.2 k	600	300	120	60	30	12	6	3	1.2	0.6
Time resolution (VBW max) [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time resolution (VBW auto) [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time resolution (VBW min) [sec]	-	-	-	-	-	-	20.5 μ	41.0 μ	81.9 μ	164 μ	328 μ	1.31 m	2.62 m	5.24 m	10.5 m	21.0 m	41.9 m	83.9 m	168 m
Frequency resolution (VBW auto) [Hz rms]	-	-	-	-	-	-	10	8	4	2	0.8	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Time Span [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBW (max) [Hz]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBW (min) [Hz]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time resolution (VBW max) [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time resolution (VBW auto) [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time resolution (VBW min) [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Frequency resolution (VBW auto) [Hz rms]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time Span [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBW (max) [Hz]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBW (min) [Hz]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time resolution (VBW max) [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time resolution (VBW auto) [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time resolution (VBW min) [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Frequency resolution (VBW auto) [Hz rms]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time Span [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBW (max) [Hz]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VBW (min) [Hz]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time resolution (VBW max) [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time resolution (VBW auto) [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Time resolution (VBW min) [sec]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Frequency resolution (VBW auto) [Hz rms]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spectrum Measurement (required S963015B for Spectrum monitor capability and S963905B for full-span/capability of spectrum analysis)

Table 16. Spectrum measurement performance (required S963905B spectrum analysis for E5055A)

Description	Specification
Frequency specifications	
Frequency readout accuracy (nom.)	$\pm [(\text{readout frequency} * \text{frequency reference accuracy}) + (<1\% * \text{RBW})]$
Frequency span	8.0991 GHz(max.) (with S963905B) 15 MHz (max.) (spectrum monitor, with S963015B)
Frequency resolution	1 Hz
Sweep (Trace) point range	11 to 100,001
Resolution bandwidth (RBW) range	10 Hz to 3 MHz in 10% steps (-3 dB bandwidth)
Bandwidth range accuracy (Supplemental information)	$\pm 1\%$, all RBW, except below 100 MHz with 3 MHz RBW
Selectivity (-60 dB / -3 dB) (Supplemental information)	Gaussian: 4.5 : 1, Flat top: 2.47 : 1, Kaiser: 3.82 : 1, Blackman: 3.58 : 1
Video bandwidth (VBW) range	10 Hz to 3 MHz
Time Specifications	
Sweep time and triggering range	
Sweep time range	Auto
Trigger types	Continuous, Single, Group, Manual, External
Trigger delay range	0 to 3 sec
Trigger delay resolution	1 μ sec
Measuring and display update rate (Supplemental information)	20 MHz Span, 3 kHz RBW, 3 kHz VBW : 60 msec 100 MHz Span, Auto RBW, Auto VBW : 66 msec 1 GHz Span, 3 kHz RBW, 3 kHz VBW : 370 msec 1 GHz Span, 300 kHz RBW, 300 kHz VBW : 320 msec 4 GHz Span, 3 kHz RBW, 3 kHz VBW : 1,300 msec 4 GHz Span, 300 kHz RBW, 300 kHz VBW : 1,000 msec 10 MHz to 8 GHz, RBW/VBW = 1 MHz : 1480 msec
Amplitude accuracy and range	
Amplitude measurement range	DANL to maximum input level
Receiver attenuation range	0 dB to 30 dB, 1 dB step
Display range	0.001 to 500 dB/div in 0.001 steps (log scale) 10 divisions (default) (linear scale) dBm, mW (Scale unit) Average, Sample, Peak, Negative peak, Peak sample, Peak average, Normal (Trace detector types)
RBW switching uncertainty (Supplemental information)	0.02 dB
Display scale fidelity (Supplemental information)	± 0.1 dB, -10 dBm to -70 dBm (Receiver attenuation 0 dB, IF Gain Auto)
Absolute level uncertainty	< 1dB at 50MHz (at Receiver attenuation 10dB, Pin -10 dBm, IF Gain Auto)
Frequency response	1 M to 1 GHz : < 2 dB 1 G to 3 GHz : < 1.5 dB 3 G to 8 GHz : < 2 dB (at Receiver attenuation 10 dB, Pin -10 dBm, reference to 50 MHz, IF Gain Auto)
Input attenuator switching uncertainty	<0.8 dB (@50MHz, Receiver attenuation=0 dB to 30 dB relative to 10 dB, IF Gain Auto) <0.5 dB (@other frequencies, Receiver attenuation=0 dB to 30 dB relative to 10 dB, IF Gain Auto) (typical)
Total measurement uncertainty	$\pm$ (Absolute level uncertainty + Input attenuator switching uncertainty) (@50 MHz, Pin=-10 dBm, IF Gain Auto) $\pm$ (Absolute level uncertainty + frequency response + Input attenuator switching uncertainty) (@other frequencies, Pin=-10 dBm, IF Gain Auto) (typical)
Spurious response	
Image response	Mostly eliminated. Intermittent image response may be seen when making multi-tone or modulated signal measurements.
LO related spurious	Eliminated
Other spurious (typ.)	-70 dBm (100 MHz), -90 dBm (300 MHz), and < -100 dBm (500 MHz, 700 MHz)

Description	Specification
Sensitivity	
Displayed average noise level (DANL)	-139 dBm/Hz, -145 dBm/Hz (typ.) (1 MHz to 50 MHz) -148 dBm/Hz, -152 dBm/Hz (typ.) (50 MHz to 1 GHz) -148 dBm/Hz, -152 dBm/Hz (typ.) (1 GHz to 3 GHz) -146 dBm/Hz, -150 dBm/Hz (typ.) (3 GHz to 5 GHz) -145 dBm/Hz, -149 dBm/Hz (typ.) (5 GHz to 6.5 GHz) -143 dBm/Hz, -148 dBm/Hz (typ.) (6.5 GHz to 8 GHz) (Receiver attenuation=0 dB, Tested with RBW = 1 kHz up to 50 MHz, and 10 kHz for above 50 MHz, terminated, average detector, averaging type=log, IF gain=auto, image rejection normal, random LO=OFF, IF Gain Auto)
Intermodulation	
2 nd harmonic intercept point (SHI)	$\geq +17$ dBm (1 MHz to 1 GHz) $\geq +20$ dBm (1 GHz to 4 GHz) (RF attenuation=0 dB, RF in= -10 dBm, IF Gain Auto)
3 rd order intercept point (TOI)	$\geq +8$ dBm, $\geq +11$ dBm (typ.) (1 MHz to 50 MHz) $\geq +8$ dBm, $\geq +11$ dBm (typ.) (50 MHz to 1 GHz) $\geq +7$ dBm, $\geq +10$ dBm (typ.) (1 GHz to 3 GHz) $\geq +6$ dBm, $\geq +9$ dBm (typ.) (3 GHz to 8 GHz) (Receiver attenuation=0 dB, RF in= -10 dBm, 100 kHz tone separation, IF Gain Auto)
Spectrum purity	
Option 100 standard phase noise (typ.)	Carrier frequency = 1 GHz -92 dBc/Hz (offset frequency: 10 Hz) -107 dBc/Hz (offset frequency: 100 Hz) -131 dBc/Hz (offset frequency: 1 kHz) -143 dBc/Hz (offset frequency: 10 kHz) -143 dBc/Hz (offset frequency: 100 kHz) -143 dBc/Hz (offset frequency: 1 MHz) -143 dBc/Hz (offset frequency: 10 MHz)
Option 200 Enhanced low phase noise (typ.)	Carrier frequency = 1 GHz -93 dBc/Hz (offset frequency: 10 Hz) -111 dBc/Hz (offset frequency: 100 Hz) -137 dBc/Hz (offset frequency: 1 kHz) -143 dBc/Hz (offset frequency: 10 kHz) -143 dBc/Hz (offset frequency: 100 kHz) -143 dBc/Hz (offset frequency: 1 MHz) -143 dBc/Hz (offset frequency: 10 MHz)

Pulsed-RF Phase Noise Measurements (required S96325B Pulsed-RF measurements for SSA-X Signal Source Analyzer)

Table 17. Pulsed-RF phase noise measurements performance

Description	Specification
RF frequency range	1 MHz to 8 GHz
Minimum offset frequency	1 mHz
Maximum offset frequency	(Tp: pulse repetition interval) 3 MHz: $50 \text{ nsec} \leq T_p \leq 139 \text{ nsec}$, carrier > 7.6 MHz 2.5 MHz: $139 \text{ nsec} < T_p \leq 279 \text{ nsec}$, carrier > 7.6 MHz 1 MHz: $279 \text{ nsec} < T_p \leq 559 \text{ nsec}$, carrier > 2 MHz 620 kHz: $559 \text{ nsec} < T_p \leq 1.1 \text{ usec}$, carrier > 2 MHz 300 kHz: $1.1 \text{ usec} < T_p \leq 2.2 \text{ usec}$ 150 kHz: $2.2 \text{ usec} < T_p \leq 4.4 \text{ usec}$ 78 kHz: $4.4 \text{ usec} < T_p \leq 8.9 \text{ usec}$ 39 kHz: $8.9 \text{ usec} < T_p \leq 17 \text{ usec}$ 19 kHz: $17 \text{ usec} < T_p \leq 35 \text{ usec}$ 9.7 kHz: $35 \text{ usec} < T_p \leq 71 \text{ usec}$ 4.8 kHz: $71 \text{ usec} < T_p \leq 140 \text{ usec}$ 2.4 kHz: $140 \text{ usec} < T_p \leq 280 \text{ usec}$ 1.2 kHz: $280 \text{ usec} < T_p \leq 570 \text{ usec}$ 610 Hz: $570 \text{ usec} < T_p \leq 1.1 \text{ msec}$ 300 Hz: $1.1 \text{ msec} < T_p \leq 2.2 \text{ msec}$ 150 Hz: $2.2 \text{ msec} < T_p \leq 4.5 \text{ msec}$ 76 Hz: $4.5 \text{ msec} < T_p \leq 9.1 \text{ msec}$ 38 Hz: $9.1 \text{ msec} < T_p \leq 10 \text{ msec}$
Pulse repetition interval	50 nsec to 10 msec (settable)
Pulse duty cycle (typ.)	0.01% to 50%, pulse width > 100 nsec
Phase noise/AM noise sensitivity (nom.)	The pulsed-RF phase noise/AM noise sensitivity is determined by the sum of the phase noise/AM noise sensitivity for CW signal (Table 2,3,8) and the noise floor expressed by the following equations which depends on the duty cycle of the input pulse signal. Start offset = 1 Hz, Cross correlation factor = 1, Signal level = +10 dBm, Receiver attenuation = 10 dB Offset frequency < 300 kHz 1 MHz $\leq$ carrier $\leq$ 3 GHz : $-177 \text{ dBc/Hz} - 20\log_{10}(\text{duty cycle}) - 5\log_{10}(\text{Offset frequency}/300 \text{ kHz})$ 3 GHz < carrier $\leq$ 6 GHz : $-175 \text{ dBc/Hz} - 20\log_{10}(\text{duty cycle}) - 5\log_{10}(\text{Offset frequency}/300 \text{ kHz})$ 6 GHz < carrier $\leq$ 8 GHz : $-172 \text{ dBc/Hz} - 20\log_{10}(\text{duty cycle}) - 5\log_{10}(\text{Offset frequency}/300 \text{ kHz})$ Offset frequency $\geq$ 300 kHz 1 MHz $\leq$ carrier $\leq$ 3 GHz : $-177 \text{ dBc/Hz} - 20\log_{10}(\text{duty cycle})$ 3 GHz < carrier $\leq$ 6 GHz : $-175 \text{ dBc/Hz} - 20\log_{10}(\text{duty cycle})$ 6 GHz < carrier $\leq$ 8 GHz : $-172 \text{ dBc/Hz} - 20\log_{10}(\text{duty cycle})$
Phase noise/AM noise measurement accuracy (typ.)	Phase noise: < 1.5 dB (offset $\leq$ 1 MHz) < 2 dB (offset > 1 MHz) AM noise: < 2 dB (offset $\leq$ 1 MHz) < 2.5 dB (offset > 1 MHz)
Spurious level (typ.)	< -60 dBc with cross correlation > 6 sec.

Internal Timebase

Table 18. Internal timebase (OCXO) performance

Description	Specification
Frequency uncertainty	10 MHz +/-0.45ppm
Frequency stability (typ.)	+/-10 ppb, Full temperature range (0 °C to +40 °C)
Frequency aging rate (typ.)	+/-0.5 ppb/day +/- 0.05 ppm/year (first year operation) +/- 0.03 ppm/year (second year)

General Information

Table 19. Miscellaneous information

Description	Specification
Operating System	Windows 10 (Supports both 32-bit and 64-bit applications)

Table 20. Front panel information

Description	Supplemental information (nominal)
RF In	
Connector	Type-N (female), 50 Ω
VSWR	1 MHz to 3 GHz : 1.2 (spec.) 3 GHz to 4 GHz : 1.4 (spec.) 4 GHz to 8 GHz : 1.6 (spec.)
Damage input level	+27 dBm or ± 35 VDC (warranted)
Baseband In	
Connector	BNC (female), 50 Ω , AC coupled
Impedance	50 Ω (nominal)
Damage input level	+23 dBm or ± 35 VDC (warranted)
DC Control	BNC (female)
DC Supply 1 and 2	BNC (female)
USB	4 ports (USB 2.0), Type-A female
Ground terminal	2
Display ¹	31 cm (12.1 inch) diagonal color active matrix LCD with multi-touch screen, 1280 (horizontal) x 800 (vertical) resolution

1. Valid pixels are 99.99% and more. Below 0.02% of fixed points of black, blue, green or red are not regarded as failure.

Table 21. Side panel information

Description	Specification
Display Output	DisplayPort and VGA (supports up to two simultaneous displays)
GPIOB (Option 172)	24-pin D-Sub (Type D-24), female; compatible with IEEE-488
USB Ports	Four SuperSpeed USB ports, one USB device port ¹ .
LAN	Two Gigabit Ethernet, RJ-45 LAN ports.

1. USB Test and Measurement Class (TMC) interface that communicates over USB, complying with the IEEE 488.1 and IEEE 488.2 standards.

Table 22. Rear panel information

Description	Specification
External Trigger Input	
Connector	BNC female
Input level	Low threshold voltage: 0.5 V, High threshold voltage: 2.1 V Input level range: 0 to +5 V
Pulse width	$\geq 2 \mu\text{sec}$
Polarity	Positive or negative
External Trigger Output / Measurement Trig Ready Output	
Connector	BNC female
Maximum output current	50 mA
Output level	Low level voltage: 0 V, High level voltage: 5 V
Pulse width	1 μsec (External Trigger Output only)
Polarity	Positive or negative
External Reference Input	
Connector	BNC female
Input frequency	10 MHz to 200 MHz
Frequency lock range	$\pm 1 \text{ ppm}$
Input level	-3 to +10 dBm
Input impedance	50 Ω (nominal)
Internal Reference Output	
Connector	BNC female
Output frequency	10 MHz or 100 MHz
Frequency uncertainty	See table 18 (Internal time base)
Output level	0 dBm $\pm 3 \text{ dB}$ into 50 Ω (typ.)
Output impedance	50 Ω (nominal)
Application I/O	
Connector	15-pin D-sub connector (female), Provides access to pulse modulators and generators
Device Test I/O	
Connector	25-pin D-sub connector (female), Provides serial and parallel digital signals for controlling device under test. Two independent 8-bit I/O
Handler I/O Port	
Connector	36-pin Centronics, female; provides connection to handler system
Line Power	
Voltage	100 to 240 VAC
Frequency	50/60 Hz
Maximum power	500 W

Table 23. Environmental and physical specifications

Description	Specification	
Descriptions	Samples of this product have been type tested in accordance with the Keysight Environmental Test Manual and verified to be robust against the environmental stresses of Storage, Transportation and End-use; those stresses include, but are not limited to, temperature, humidity, shock, vibration, altitude, and power line conditions. Test Methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F Class 3.	
Temperature	Operating	0 to 40 °C ambient
	Non-operating	-10 to 60 °C
Humidity	Operating	Type tested at 20 to 80%, wet bulb temperature < 29 °C (non-condensing)
	Non-operating	Type tested at 20 to 90 %, wet bulb temperature < 40 °C (non-condensing)
Altitude	Operating	Up to 2,000 meters (6,561 feet)
	Non-operating	Up to 4,572 meters (15,000 feet)
Vibration	Operating	0.21 G maximum, 5 Hz to 500 Hz
	Non-operating	0.5 G maximum, 5 Hz to 500 Hz
Instrument protection	IP 30 IEC/EN 60529	
Instrument calibration cycle	1 year	

EMC, Safety, Environment and Compliance

Table 24. EMC, safety, environment and compliance

EMC ¹	
Complies with the essential requirements of the European EMC Directive as well as current editions of the following standards (dates and editions are cited in the Declaration of Conformity).	
 ISM 1-A	The CE mark is a registered trademark of the European Community (if accompanied by a year, it is the year when the design was proven). This product complies with all relevant directives. • IEC 61326-1 • CISPR 11 Group 1, Class A
	UK conformity mark is a UK government owned mark. When affixed to the product is declaring all applicable Directives and Regulations have been met in full.
CAN ICES/NMB-001(A)	This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme a la norme NMB du Canada.
	The RCM mark is a registered trademark of the Australian Communications and Media Authority. AS/NZS CISPR 11
	South Korean Certification (KC) mark; includes the marking's identifier code: R-R-Kst-xxxxxx South Korean Class A EMC declaration: Information to the user: This equipment has been conformity assessed for use in business environments. In a residential environment this equipment may cause radio interference. ※ This EMC statement applies to the equipment only for use in business environment. 사 용 자 안 내 문 이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다. ※ 사용자 안내문은 “업무용 방송통신기자재”에만 적용한다.
Safety ¹	
Complies with the essential requirements of the European Low Voltage Directive as well as current editions of the following standards (dates and editions are cited in the Declaration of Conformity). This product is designed for use in INSTALLATION CATEGORY II and POLLUTION DEGREE 2 and MEASUREMENT CATEGORY NONE per IEC standards. This product is intended for indoor use.	
 ISM 1-A	IEC/EN 61010-1
	The CSA mark is a registered trademark of the CSA International. Canada: CSA C22.2 No. 610610-1 USA: UL std no. 61010-1
Environment	
	The crossed out wheeled bin symbol indicates that separate collection for waste electric and electronic equipment (WEEE) is required, as obligated by DIRECTIVE 2012/19/EU. Please refer to about.keysight.com/en/companyinfo/environment/takeback.shtml to understand your Trade in options with Keysight in addition to product takeback instructions.
Compliance	
	Class C (only applies to units that are shipped with firmware revision A.03.10 or later)

1. To find a current Declaration of Conformity for a specific Keysight product, go to: <http://www.keysight.com/conformity>

Weight and Dimensions

Table 25. Weight

Description	Characteristics
Weight	24.3 kg

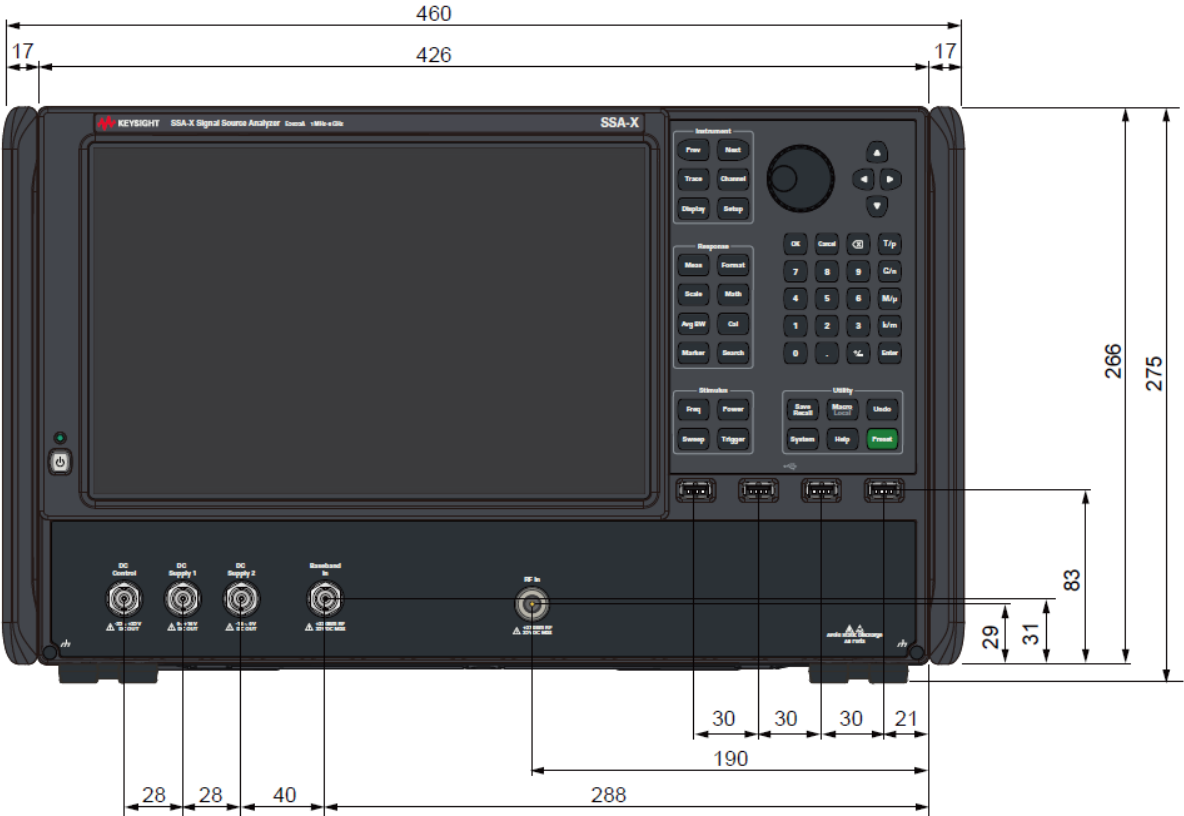


Figure 7. Front view (mm)

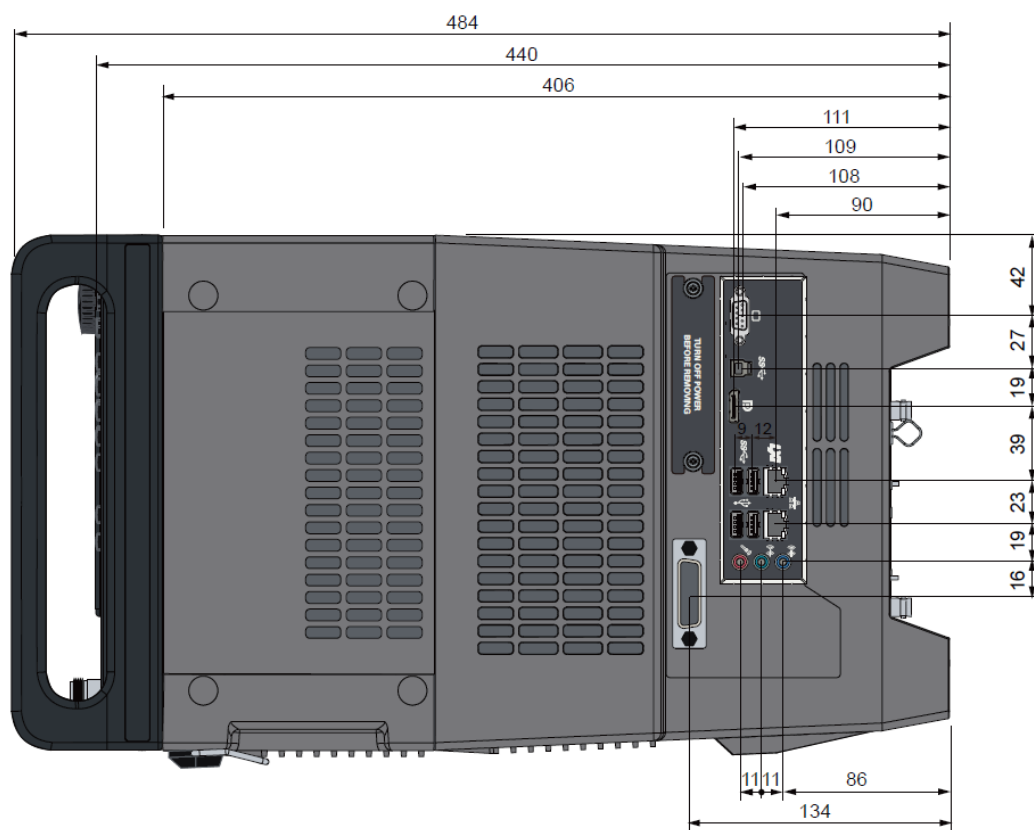
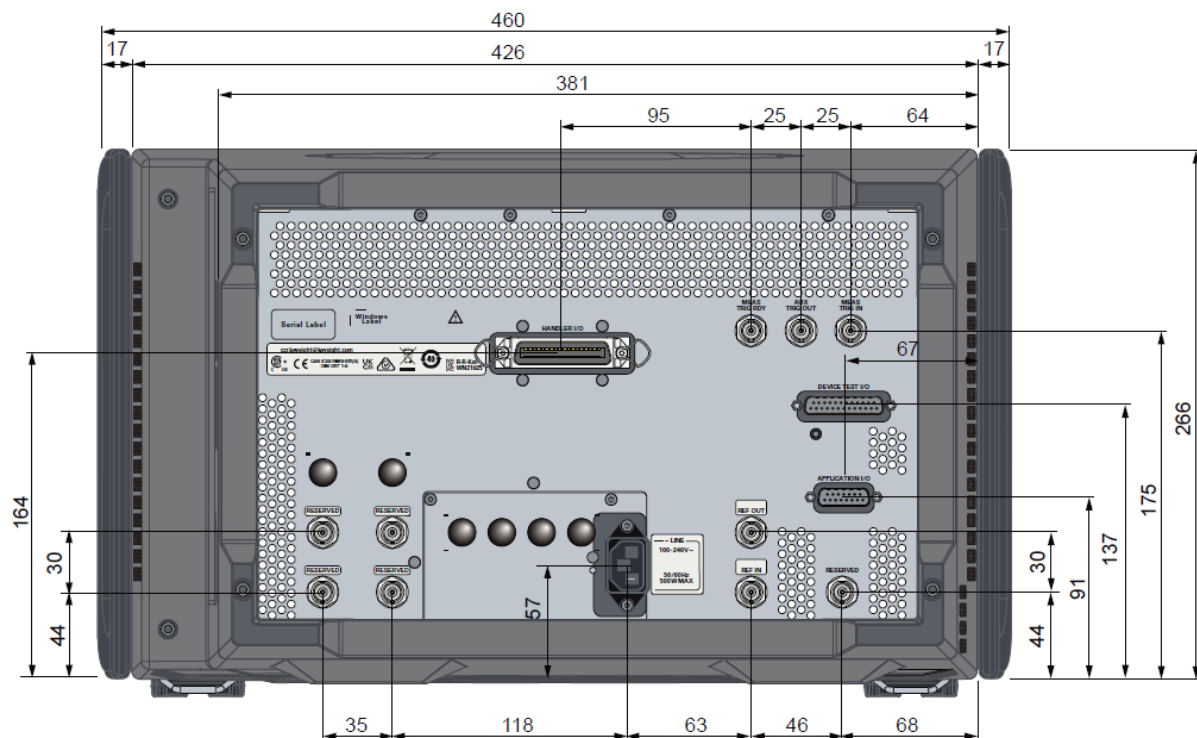


Figure 9. Side view (mm)

Software on E5055A SSA-X Signal Source Analyzer

Table 26. Optional application software

SW product number	Description and remarks
S963015B	SSA-X Signal Source Analyzer advanced features for E5055A • Node-locked, Transportable, Floating, USB license is selectable • Perpetual or subscription license is available • Available the following functionality and capabilities - Cross Correlation cycles(2 to 100,000) - Transient measurements - VCO characterization measurements - Spectrum monitor (15 MHz span)
S963905B	Spectrum analysis for E5055A • Node-locked, Transportable, Floating, USB license is selectable • Perpetual or subscription license is available • Full span, full function spectrum analysis (equivalent to the spectrum analysis capabilities on the E5080B ENA network analyzer.)
S96325B	Pulsed-RF measurements for SSA-X Signal Source Analyzer • Node-locked, Transportable, Floating, USB license is selectable • Perpetual or subscription license is available • Pulsed-RF AM/PM noise measurements

Web Sources

Visit our Signal Source Analyzer Web site for additional product information and literature:

www.keysight.com/find/E5055A

www.keysight.com/find/ssa

Phase noise measurements:

www.keysight.com/find/phasenoise

RF and microwave accessories:

www.keysight.com/find/mta

Confidently Covered by Keysight Services

Prevent delays caused by technical questions and reduce system downtime due to instrument maintenance and repairs with Keysight Services. Keysight Services are here to support your test needs with expert technical support, instrument repair and calibration, software support, training, alternative acquisition program options, and more.

A KeysightCare agreement provides dedicated, proactive support through a single point of contact for instruments, software, and solutions. KeysightCare covers an extensive group of instruments, application software, and solutions and ensures optimal uptime, faster response, faster access to experts, and faster resolution.

Keysight Services

Offering	Benefits
KeysightCare 	KeysightCare provides elevated support for Keysight instruments and software, with access to technical support experts that respond within a specified time and ensure committed repair and calibration turnaround times (TAT). KeysightCare offers multiple service agreement tiers, including KeysightCare Assured, Enhanced, and Application Software Support. See the KeysightCare data sheet for details.
KeysightCare Assured	KeysightCare Assured goes beyond basic warranty with repair services that include committed TAT and unlimited access to technical experts.
KeysightCare Enhanced	KeysightCare Enhanced includes all the benefits of KeysightCare Assured plus Keysight's accurate and reliable Calibration Services , accelerated, and committed TAT, and technical response.
Keysight Support Portal & Knowledge Center	All KeysightCare tiers include access to the Keysight Support Portal where you can manage support and service resources related to your assets such as service requests, and status, or browse the Knowledge Center.
Education Services	Build confidence and gain new skills to make accurate measurements, with flexible Education Services developed by Keysight experts. Including Start-up Assistance.
Alternative acquisition options	
KeysightAccess	Reduce budget challenges with a leased-based subscription service, that offers low monthly payments, enabling you to get the instruments, software, and technical support you want for your test needs.

Recommended services

Maximize your test system up-time by securing technical support, repair, and calibration services with committed response and turnaround times. 1-year KeysightCare Assured is included in every new instrument purchase. Obtain multi-year KeysightCare upfront to eliminate the need for lengthy and tedious paperwork and yearly requests for maintenance budget. Plus, you benefit from secured service for 2, 3, or 5 years.

Service	Function
KeysightCare Enhanced*	Includes tech support, warranty and calibration
R-55B-001-1	KeysightCare Enhanced – Upgrade 1 year
R-55B-001-2	KeysightCare Enhanced – Extend to 2 years
R-55B-001-3	KeysightCare Enhanced – Extend to 3 years (Recommended)
R-55B-001-5	KeysightCare Enhanced – Extend to 5 years (Recommended)
KeysightCare Assured	Includes tech support and warranty
R-55A-001-2	KeysightCare Assured – Extend to 2 years
R-55A-001-3	KeysightCare Assured – Extend to 3 years
R-55A-001-5	KeysightCare Assured – Extend to 5 years
Start-Up Assistance	
PS-S40-01	Included – instrument fundamentals and operations starter
PS-S40-04	Recommended – instrument fundamentals and operations starter
PS-S40-02	Optional, technology & measurement science standard learning

* Available in select countries. For details, please view the [datasheet](#). R-55B-001-2/3/5 must be ordered with R-55B-001-1.