

Agilent V2920A Vector Signal Generator

Specifications



Agilent Technologies

Notices

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- www.agilent.com/find/V2920A (product-specific information and support)
- www.agilent.com/find/assist (worldwide contact information for repair and service)

Information on preventing damage to your Agilent equipment can be found at www.agilent.com/find/tips.

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Safety Notices

The following safety precautions should be

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.

Specification notes

Specifications (warranted performance)

Specifications describe the instrument's warranted performance. All units are warranted to meet performance specifications under the following conditions:

- Ambient operating temperature of 18°C to 28°C, unless otherwise noted.
- After specified warm-up time of 30 minutes and self calibration at ambient temperature.

Note: All items are specifications unless otherwise noted.

Typical (mean plus three standard deviations)

"Typical" indicates performance that units will meet under the following conditions:

- Ambient operating temperature of 23°C, unless otherwise noted.
- After specified warm-up time of 30 minutes and self calibration at ambient temperature.
- This performance is not warranted.

Nominal (mean or expected value)

"Nominal" values indicate expected performance, or describe product performance that is useful in the application of the product, but is not covered by product warranty.

Basic modes of operation

CW (continuous waveform) Signal Generator mode: CW signal generator. Default mode.

Analog and Digital Signal Generator Personalities: general-purpose analog and digital modulation.

Vector Signal Generator Personalities: modulation quality source for GSM, GPRS, EDGE, GPS, cdma2000, and WCDMA mobile phone transmitter signals.

Specifications

Frequency

Frequency parameters		Specification
Frequency range		V2920A-504: 10 MHz to 4.0 GHz
		V2920A-506: 10 MHz to 6.0 GHz ¹
Frequency input units		Hz, kHz, MHz, GHz
Frequency setting resolution		0.1 Hz
Frequency accuracy		Same as frequency reference + synthesizer resolution term ²
Frequency switching time ³	Via remote command after receipt of end-of-operation indicator (EOI)	≤ 2 ms (nominal) ≤ 1 ms (nominal) using Series V2900A Desktop Control Panel
	List or Swept Mode ⁴	≤ 350 μs standard (300 μs typical) ≤ 750 μs V2920A-UPN

Frequency and amplitude switching time (standard or V2920A-UPN options) ⁵				
Frequency Band	Mode	From final value (dB)	Standard Time (μs)	V2920A-UPN Time (μs)
10 MHz ≤ frequency ≤ 6000 MHz	Open loop	0.25	600	750
	Closed loop (fast)	0.25	750	750
	Sample and hold	0.25	900	900
(Band 1) 10 MHz ≤ frequency < 330 MHz	Open loop	0.20	450	750
	Closed loop (fast)	0.20	600	750
	Sample and hold	0.25	900	900
(Band 2) 330 MHz ≤ frequency < 3400 MHz	Open loop	0.20	450	750
	Closed loop (fast)	0.20	600	750
	Sample and hold	0.25	900	900
(Band 3) 3400 MHz ≤ frequency ≤ 6000 MHz	Open loop	0.25	550	750
	Closed loop (fast)	0.25	700	750
	Sample and hold	0.25	900	900

Internal frequency reference

Internal frequency reference parameters	Specification
Aging rate	≤ 1 ppm/year
Temperature stability	≤ 0.2 ppm ⁶

Frequency reference output

Frequency reference parameters	Specification
Impedance	50 Ω (nominal), AC coupled
Ref output signal	10 MHz, +7 dBm ± 3 dB (nominal)

¹ Over range operation provided: 10 MHz to 6.9 GHz. Performance above 6.0 GHz is not specified.

² Synthesizer resolution term: ≤ 5 μHz.

³ To within 0.1 ppm or 100 Hz of final value, whichever is greater. ALC on or off. Modulation on or off.

⁴ Start and stop frequencies remain in the same Frequency band: Band 1 = 10 MHz to 330 MHz, Band 2 = 330 MHz to 3400 MHz, Band 3 = 3400 MHz to 6000 MHz. No change in programmed level.

⁵ To within 0.1 ppm of final frequency value. List mode or sweep mode. Start and stop frequencies remain in the same Frequency band. If the start and stop frequencies cross frequency bands, use the 10 MHz to 6000 MHz row. Blank on tuning disabled.

⁶ Total variation relative to 0°C to 50°C ambient temperature range.

External frequency reference input

External frequency reference parameters		Specification
Frequency lock range	Hardware lock mode ⁷	10 MHz \pm 10 Hz (1ppm) input frequency lock range
	Variable input frequency mode	1 MHz to 60 MHz ⁸
Amplitude		Lock range: -3 to +15 dBm ⁹
Impedance		50 Ω (nominal)

List and step sweep modes

Parameter	Specification
Frequency step/sweep	Start, stop, number of points, dwell time
Amplitude step/sweep	Start, stop, number of points, dwell time
Dwell time min/max	0 sec to 999.9999 sec
Dwell time resolution	0.1 ms
Arbitrary List	List of frequency / amplitude/ dwell time sets
	Maximum number of sets = 1000

Spectral purity

Spectral purity parameters			
	Carrier frequency (GHz)	Specification	Nominal
Standard SSB phase noise; 300 kHz offset	1	≤ -118 dBc/Hz	≤ -122 dBc/Hz
	2	≤ -112 dBc/Hz	≤ -117 dBc/Hz
	3	≤ -109 dBc/Hz	≤ -114 dBc/Hz
	4	≤ -106 dBc/Hz	≤ -110 dBc/Hz
	5.8	≤ -101 dBc/Hz	≤ -105 dBc/Hz
Harmonics and sub-harmonics ¹⁰	Fundamental frequency (Ff)	Harmonics specification (typical)	Sub-harmonics specification (typical)
	20 MHz \leq Ff < 120 MHz ¹¹	≤ -25 dBc	Not Applicable
	120 MHz \leq Ff < 4.0 GHz	≤ -30 dBc	≤ -40 dBc
	4.0 GHz \leq Ff \leq 6.0 GHz	≤ -40 dBc	≤ -40 dBc
Non-harmonic spurious ¹²	Fundamental frequency (Ff)	Specification	Nominal
	10 MHz \leq Ff < 330 MHz	≤ -55 dBc	≤ -64 dBc
	330 MHz \leq Ff < 1.0 GHz	≤ -55 dBc	≤ -64 dBc
	1.0 GHz \leq Ff < 3.0 GHz	≤ -55 dBc	≤ -60 dBc
	3.0 GHz \leq Ff < 4.0 GHz	≤ -55 dBc	≤ -58 dBc
4.0 GHz \leq Ff \leq 6.0 GHz	≤ -50 dBc	≤ -55 dBc	

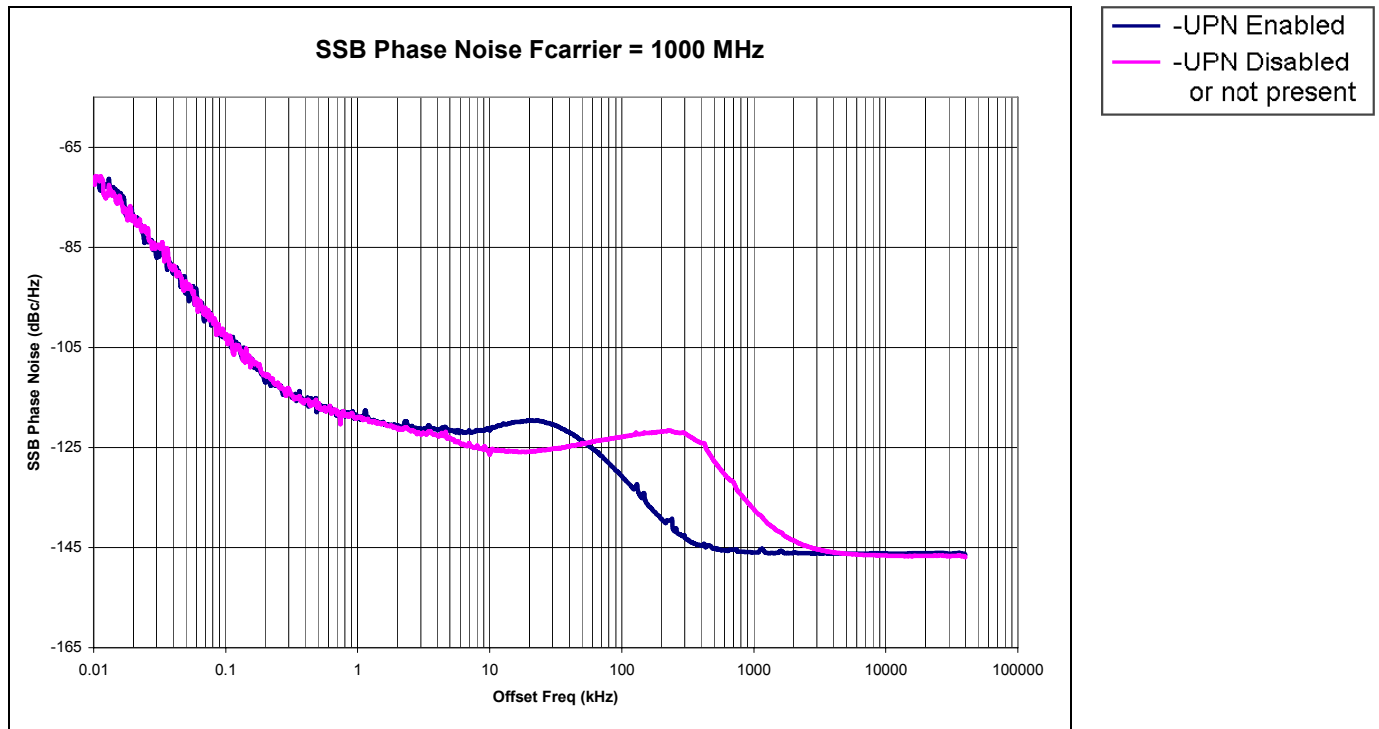
⁷ Factory preset setting⁸ On 10Hz boundaries Freq = 1 MHz + n * 10 Hz. Reference accuracy: $\leq \pm 1$ ppm. Sine or square wave inputs acceptable. Lock time may be up to 30 seconds.⁹ For optimum phase noise performance use hardware lock mode. Reference input power 0 to +10 dBm.¹⁰ Pout \leq +4 dBm. Specifications apply to harmonic and sub-harmonic responses within the specified operating range of the instrument.¹¹ Pout \leq 0 dBm.¹² Valid for responses offset from carrier >10 kHz, Pout = 0 dBm and modulation off, specifications apply to responses within the specified operating range of the instrument.

Specifications

V2920A-UPN ultra low phase noise option

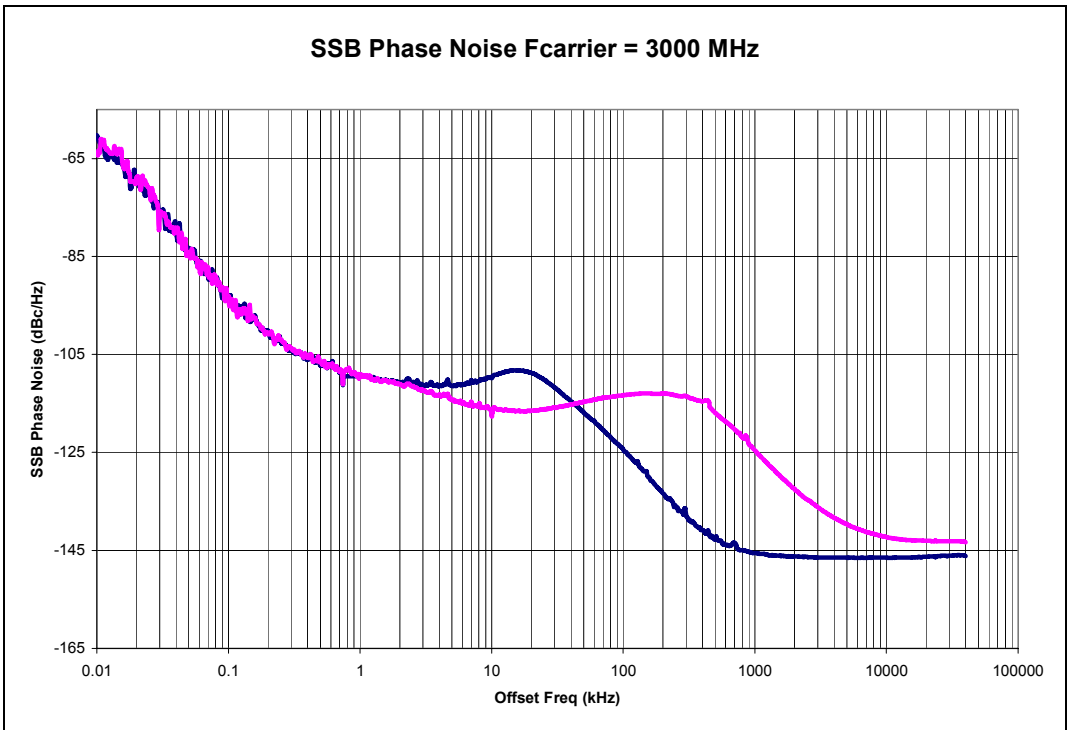
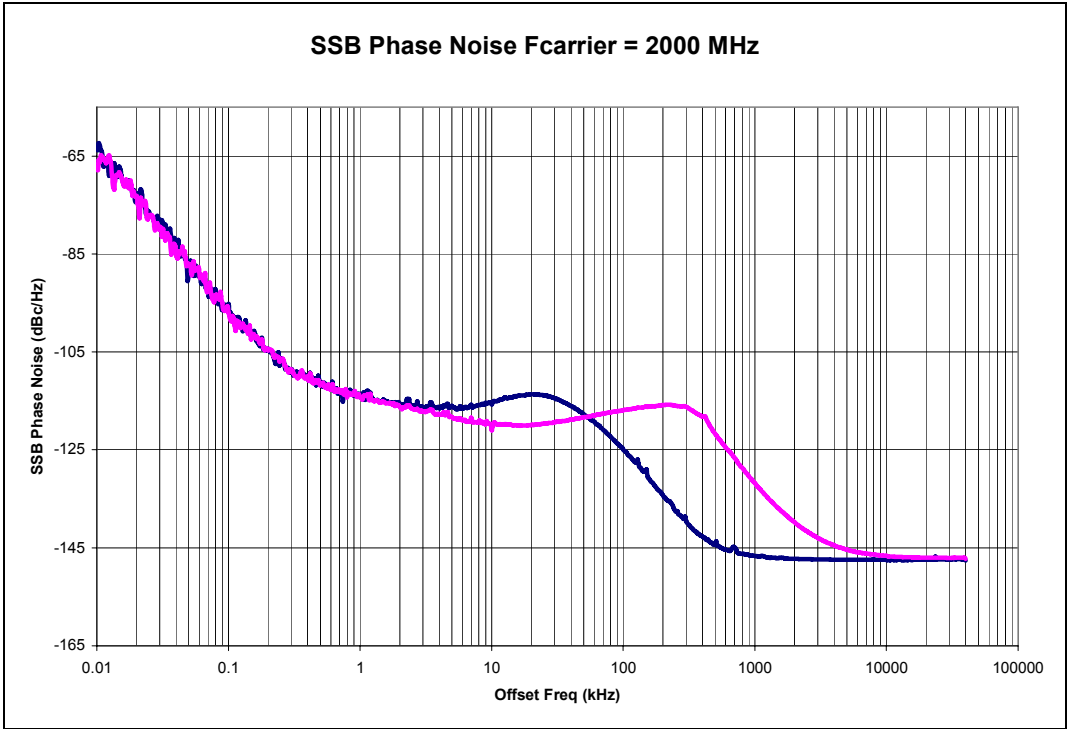
Ultra s				
	Carrier frequency	Specification (nominal) at offset frequency		
		100 kHz	300 kHz	1 MHz
SSB phase noise; dBc/Hz ¹³	1.0 GHz	≤ -126 (-131)	≤ -138 (-143)	≤ -141 (-146)
	2.0 GHz	≤ -120 (-125)	≤ -135 (-139)	≤ -141 (-146)
	3.0 GHz	≤ -117 (-122)	≤ -133 (-137)	≤ -141 (-146)
	4.0 GHz	≤ -114 (-119)	≤ -129 (-133)	≤ -137 (-142)
	5.8 GHz	≤ -109 (-113)	≤ -125 (-129)	≤ -137 (-142)

Phase noise for standard product vs. V2920A-UPN option



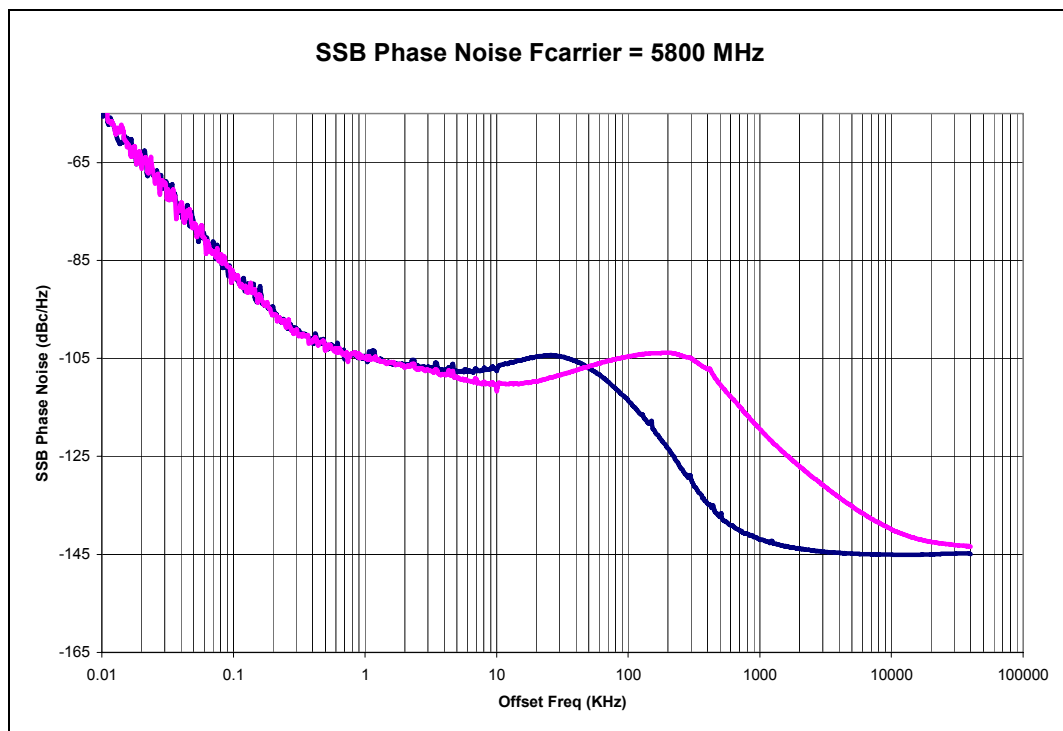
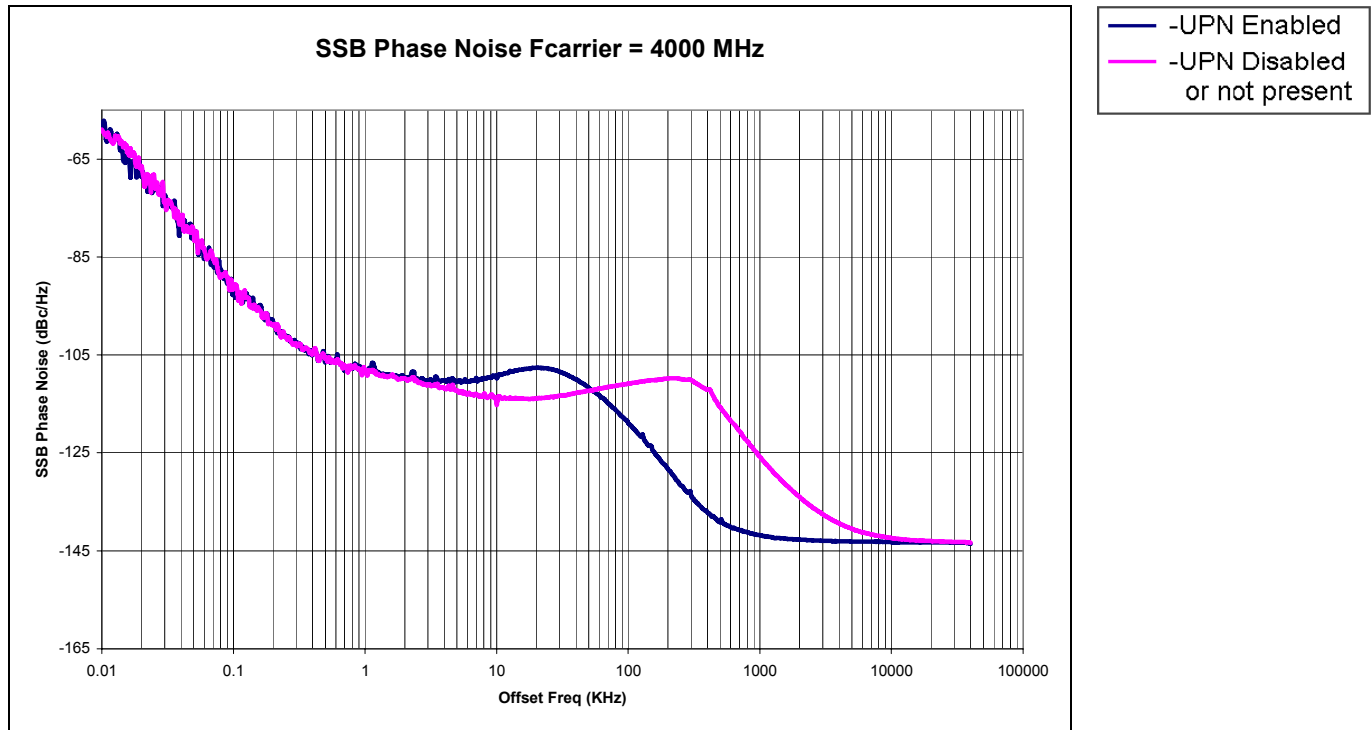
¹³ RF output power set to 0 dBm.

- UPN Enabled
- UPN Disabled or not present



Specifications are subject to change without notice.

Specifications



Amplitude¹⁴

Amplitude parameters						
Amplitude level range (CW)	Specification					
	Carrier frequency	Standard		V2920A-LAR		
	10 MHz to < 330 MHz	-110 to +10 dBm		-130 to +10 dBm		
	330 MHz to < 3.0 GHz	-110 to +13 dBm		-130 to +13 dBm		
3.0 GHz to ≤ 6.0 GHz	-110 to +12 dBm		-130 to +12 dBm			
Using built in waveforms						
Amplitude level range (GSM)		-110 to +6dBm		-130 to +6dBm		
Amplitude level range (EDGE)		-110 to +6dBm		-130 to +6dBm		
Amplitude level range (cdma2000) ¹⁵		-110 to +3dBm		-130 to +3dBm		
Amplitude level range (WCDMA) ¹⁶		-110 to +4dBm		-130 to +4dBm		
Amplitude setting resolution			0.01dB			
Amplitude input units			dBm			
Absolute amplitude level accuracy (CW); dB	Amplitude level setting	Frequency (typical)				
		10 MHz to < 330 MHz	330 MHz to < 3.0 GHz	3.0 GHz to 4.0 GHz	4.0 GHz to 6.0 GHz	
	Maximum to > -75 dBm	≤ ± 0.6 (0.3)	≤ ± 0.6 (0.3)	≤ ± 0.7 (0.4)	≤ ± 0.7 (0.4)	
	-75 dBm to ≥ -110 dBm	≤ ± 0.6 (0.3)	≤ ± 0.6 (0.3)	≤ ± 0.8 (0.4)	≤ ± 0.8 (0.4)	
	V2920A-LAR		-110 dBm to > -120 dBm	≤ ± 0.6 (0.3)	≤ ± 1.0 (0.6)	≤ ± 1.5 (0.7)
		-120 to dBm ≥ -125 dBm	≤ ± (0.6)	≤ ± (0.6)	≤ (0.7)	≤ ± (0.7)
User flatness correction max number of points = 20 (points are amplitude correction & frequency pairs)						
Power change over temperature 0°C to 50°C (nominal)			0.02 dB/°C			
Relative amplitude accuracy - linearity ¹⁷ (nominal)			≤ ± 0.05 dB			
Amplitude repeatability ¹⁸ (nominal)			≤ ± 0.05 dB			
Output match – VSWR	Carrier frequency; Fc		Specification	Typical		
	10 MHz ≤ Fc ≤ 3.4 GHz		< 1.45:1	< 1.3:1		
	3.4 GHz < Fc ≤ 6.0 GHz		< 1.60:1	< 1.4:1		
Reverse power protection ¹⁹			+35 dBm or 10 VDC			
Amplitude switching time	Specification		≤ 2 ms (nominal)			
	Via remote command – after receipt of end-of-operation indicator (EOI)		≤ 1 ms (nominal) using Series V2900A Desktop Control Panel			

¹⁴ Specifications apply when ALC is in auto mode, unless otherwise stated.

¹⁵ +3 dBm max for Pilot only. +0.5 dBm max for Forward 9 channel.

¹⁶ +4 dBm max for CPICH only. -1.0 dBm max for Test Model 1 with 16 DPCH.

¹⁷ Applies for changes in amplitude setting only. -110 dBm < Pout < Pmax, CW signal, ALC mode: Auto.

¹⁸ -110 dBm < Pout < Pmax, CW signal, ALC mode: Auto.

¹⁹ Up to 50 VDC with optional external DC block, Agilent part number, V2999A-DCB.

Specifications

V2900A-101: Analog modulation personality²⁰

Frequency modulation parameter		Specification
FM modulation frequency range		1 Hz to 100 kHz
FM modulation frequency setting resolution		1 Hz
FM deviation internal sine wave only		0 Hz to 1 MHz
FM distortion		< 1.5% (nominal)
Internal modulation waveform types		Sine, ramp up, ramp down and triangle waves
Amplitude modulation parameter		Specification
AM modulation frequency range		1 Hz to 100 kHz
AM modulation frequency setting resolution		1 Hz
AM modulation depth		0 to 100%
AM distortion ²¹		< 1.5% (nominal)
Internal modulation waveform types		Sine, ramp up, ramp down and triangle waves
Phase (Φ) modulation parameter		Specification
Φ modulation frequency range		1 Hz to 100 kHz
Φ modulation frequency setting resolution		1 Hz
Φ deviation		0 to 100 radians
Φ distortion		< 1.5% (nominal)
Internal modulation waveform type		Sine wave only
Pulse modulation parameter		Specification
PM pulse repetition rate		1 Hz to 100 kHz
PM pulse repetition rate setting resolution		1 Hz
PM minimum pulse width ²²		1.2 μ s (nominal)
PM rise/fall time (10% to 90%) ²³		< 600 ns (nominal)
PM on-off ratio ²⁴	Pulse width	Nominal
	< 5 μ s	> 40 dB
	\geq 5 μ s	> 100 dB
Two-tone parameters		Specification
Two-tone CW frequency separation settings		2 Hz to 2 MHz
Noise modulation parameters		Specification
Modulation bandwidth ²⁵		1 kHz to 2.5 MHz

²⁰ Frequency ranges and resolution can be multiplied by up to 40 times with V2920-Bxx license. For example, FM deviation can be extended to 40 MHz.

²¹ Output power \leq 0 dBm.

²² Can be decreased by up to 40 times with V2920A-Bxx license.

²³ Can be decreased by up to 40 times with V2920A-Bxx license.

²⁴ Valid when Pulse Modulation is the only active modulation type. The higher on-off ratio is attained using Arb Blanking feature.

²⁵ 6 dB double sided. Can be increased up to 40 times with V2920A-Bxx license.

V2920A-BBA Baseband analog I-Q inputs and outputs option

Baseband analog inputs		Specification (nominal)
External IQ input 3dB bandwidth ²⁶		I channel: (DC-200 MHz) Q channel: (DC-200 MHz)
Input impedance (single-ended only)		50 Ω (nominal) , DC coupled, SMB (m) connector
Maximum input V (DC + AC peak) ²⁷		$\pm 3V$ peak damage level
Baseband analog outputs		Specification (nominal)
0.2 dB Bandwidth ²⁸		I channel: (DC-40 MHz); Q channel: (DC-40 MHz)
Output impedance (single ended only)		50 Ω (nominal), DC coupled, SMB (m) connector
Full scale output V (DC +AC peak)		$\pm 1.0 V$ peak
Maximum reverse input voltage (damage level)		$\pm 1.0 V$
IQ offset (DC & quadrature adjustment)		$\pm 12.5\%$ of full scale $\pm 10^\circ$
IQ gain		0 to full scale
Accuracy ²⁹	Parameter	Specification (typical)
	Carrier suppression	≤ -60 (-65) dBc
	Image rejection	≤ -50 (-55) dBc

V2920A-Bxx: Arbitrary waveform generator

Parameter		Specification
Maximum modulation bandwidth for internal modulation generation	V2920A-B20	20 MHz (25 MSa/sec)
	V2920A-B40	40 MHz (50 MSa/sec)
	V2920A-B80	80 MHz (100 MSa/sec)
Waveform memory		100 megasamples
Minimum segment length		1000 samples
Maximum segment length		100 megasamples
Max number of segments in a sequence		400 segments
Non-volatile memory		2 GB

²⁶ 3 dB BW. With inputs applied directly to I/Q modulator. User needs to provide correction for I/Q AC and DC amplitude and phase skew and offsets.

²⁷ Maximum voltage includes Offsets and Signal for nominal input of 50 Ω . Optimal drive voltage is $\pm 0.8 V$.

²⁸ Into 50 Ω impedance.

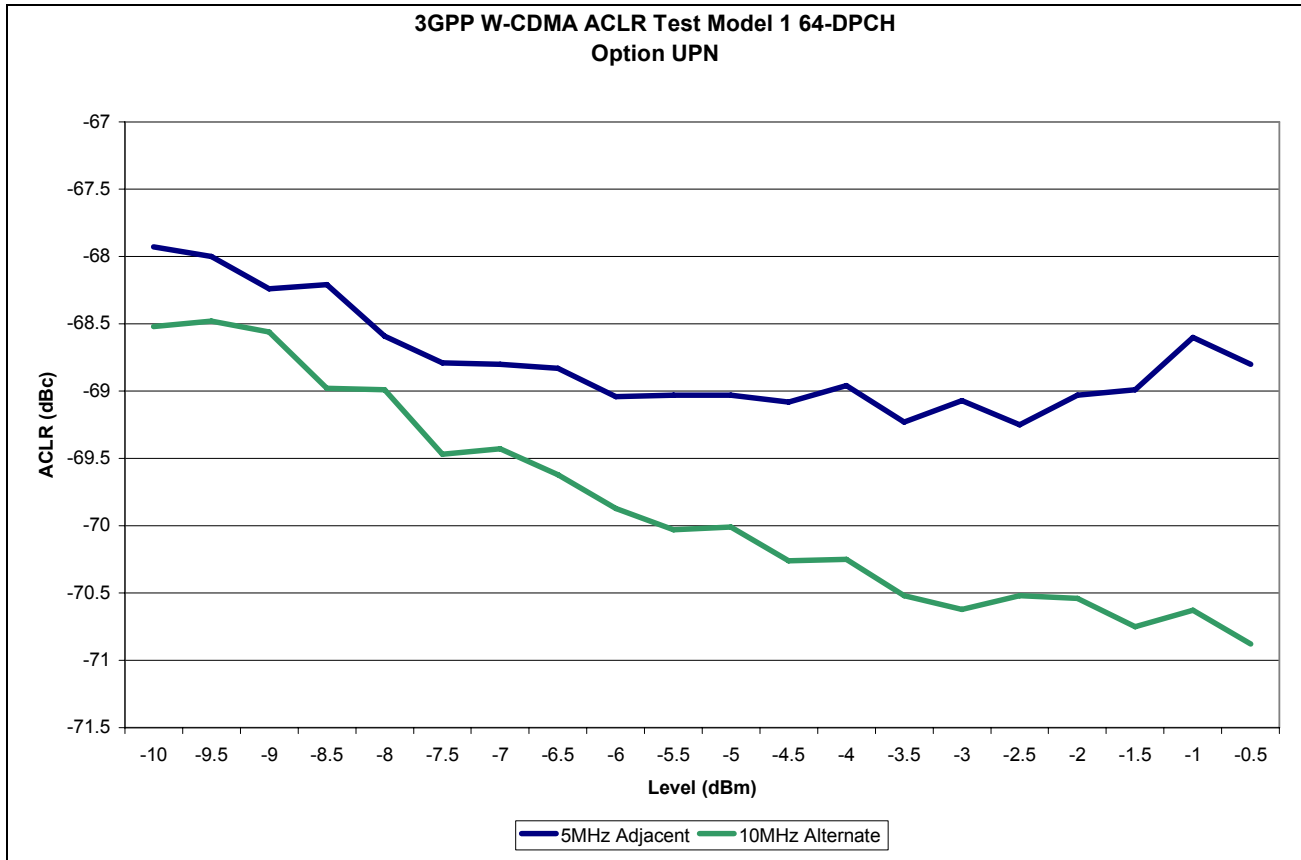
²⁹ At the V2920A output ports, 0.5V peak-to-peak output voltage.

Specifications

V2900A-105: W-CDMA FDD uplink and downlink signal generator personality

W-CDMA parameter		Specification	
Frequency range		1800 MHz to 2200 MHz	
		Typical	Nominal
EVM RMS ³⁰		< 0.85%	< 0.75%
ACLR ³¹	Adjacent	> 68 dBc	> 70 dBc
	Alternate	> 72 dBc	> 73 dBc
With V2920A-UPN			
ACLR ³²	Adjacent	> 68 dBc	> 70 dBc
	Alternate	> 73 dBc	> 73 dBc

ACLR vs. Output power nominal³³



³⁰ Pout ≤ -10 dBm.

³¹ CPICH only. Pout ≤ -1 dBm. Adjacent spacing 5 MHz offset. Alternate spacing 10 MHz offset.

³² CPICH only. Pout ≤ -1 dBm. Adjacent spacing 5 MHz offset. Alternate spacing 10 MHz offset.

³³ Single carrier

V2900A-104: Cdma2000 and IS-95A forward link signal generation personality

CDMA2000 and cdmaOne parameter			
Frequency range		800 MHz to 900 MHz; 1800 MHz to 1900 MHz	
		Typical	Nominal
RHO ³⁴		> 0.9995	> 0.9999
ACPR ³⁵	Adjacent at 750 kHz	> 70 dBc	> 72 dBc
	Adjacent at 885 kHz	> 75 dBc	> 78 dBc
	Alternate at 1980 kHz	> 85 dBc	> 90 dBc
With V2920A-UPN			
ACPR ³⁶	Adjacent at 750 kHz	> 70 dBc	> 73 dBc
	Adjacent at 885 kHz	> 77 dBc	> 83 dBc
	Alternate at 1980 kHz	> 87 dBc	> 91 dBc

V2900A-103: GSM modulation personality

EDGE/GSM parameter			
Frequency Range		800 MHz to 900 MHz, 1800 MHz to 1900 MHz	
		Typical	Nominal
EVM for EDGE ³⁷		< 0.60% RMS	< 0.35% RMS
Phase Error for GSM ³⁸		< 0.25° RMS	< 0.15° RMS
		Carrier Frequency; Fc	
ORFS for EDGE (nominal)	Frequency Offset; kHz	990 MHz Pout = +6 dBm	1955 MHz Pout = +6 dBm
	200	-38 dBc	-38 dBc
	400	-69 dBc	-65 dBc
	600	-75 dBc	-72 dBc
	1200	-82 dBc	-80 dBc
	1800	-79 dBc	-79 dBc
		Carrier Frequency; Fc	
ORFS for GSM (nominal)	Frequency Offset; kHz	990 MHz Pout = +6 dBm	1955 MHz Pout = +6 dBm
	200	-36 dBc	-36 dBc
	400	-69 dBc	-65 dBc
	600	-77 dBc	-72 dBc
	1200	-83 dBc	-81 dBc
	1800	-81 dBc	-79 dBc

³⁴ Pilot only.³⁵ Pilot only. Pout ≤ -4 dBm.³⁶ Pilot only. Pout ≤ -4 dBm.³⁷ Measured at Pout = 0 dBm.³⁸ Measured at Pout = +4 dBm.

Specifications

EDGE/GSM parameter			
With V2920A-UPN			
ORFS for EDGE (nominal)	Frequency Offset; kHz	Carrier Frequency; Fc	
		990 MHz Pout = +6 dBm	1955 MHz Pout =+6 dBm
	200	-38 dBc	-38 dBc
	400	-72 dBc	-72 dBc
	600	-80 dBc	-80 dBc
	1200	-83 dBc	-83 dBc
1800	-80 dBc	-80 dBc	
ORFS for GSM (nominal)	Frequency Offset; kHz	Carrier Frequency; Fc	
		990 MHz Pout = +6 dBm	1955 MHz Pout =+6 dBm
	200	-36 dBc	-36 dBc
	400	-71 dBc	-71 dBc
	600	-81 dBc	-81 dBc
	1200	-85 dBc	-85 dBc
1800	-81 dBc	-81 dBc	

V2900A-106: GPS signal generation personality

GPS parameter	Specification
Carrier frequency	200 MHz to 2.5 GHz Button provided to set carrier frequency to L1 (1575.42 MHz)
C/A code ID range	1 through 37, Default value = 1
Data pattern	Selectable: PN9 (default), PN15, all ones, all zeros, square 1-bit [0 1] and square 2-bit [0011] User-defined: Pattern from a file, length range of 1 to 37,504 bits Default pattern = PN9
Doppler shift range	-10 kHz to +10 kHz, default value = 0 Hz
EVM	3.5% (nominal)

V2900A-102: General purpose digital modulation generation personality

Common parameters		Common specifications	
Symbol rate	Symbol rate resolution	1 Sps (symbols per second)	
	Minimum symbol rate	500 Sps	
	Maximum symbol rate	2 MSps for NRZ, Gaussian, and Wideband 25 MSps for RC and RRC	
Filters	Filter types	NRZ, RC, RRC, Gaussian, and Wideband	
Filter factor	RC, RRC Gaussian	Ratio is 0.2 to 1.0 Ratio is 0.2 to 3.0	
Symbol format	Differential encoding	On/Off	
Sequence format	Output inversion	On/Off	
Data pattern	PRBS	PN5, PN9, PN11, PN15	
	Count	Radix	
	Alternating 0,1	1-16	
Modulation format	Modulation type	Parameter	Specification
ASK	OOK (ASK2) ASK4 SASK2 SASK4	See <i>Common parameters</i> above	See <i>Common parameters</i> above
FSK	FSK2	Frequency separation resolution Frequency separation range	1 Hz 0 to 2 x symbol rate in Sps
PSK	BPSK QPSK QPSK- $\pi/4$ QPSK- $3\pi/4$ OQPSK 8PSK	See <i>Common parameters</i> above	See <i>Common parameters</i> above
QAM	QAM 16 QAM 32 QAM 64 QAM 128 QAM 256	See <i>Common Parameters</i> above	See <i>Common parameters</i> above
EVM nominal values for V2900A-102 ³⁹			
Format	Filter conditions	RMS EVM	
QPSK	RRC, α =default (0.35)	$\leq 1.5\%$	
16QAM	RRC, α =default (0.35)	$\leq 1.5\%$	
FSK	Gaussian BT = 0.7	$\leq 1.5\%$	

³⁹ Characterized at 2.5 GHz and 6.0 GHz. Symbol rates from minimum to maximum. For best results at low symbol rates, use the V2920A external reference hardware lock mode.

Supplementary Nominal Values

V2900A-201: SignalMeister license for cdmaOne®, cdma2000®, and 1xEV-DV forward and reverse Links

		V2920A	
RHO ⁴⁰ (ρ)	cdma2000 forward link	800 MHz to 2025 MHz	≥ 0.9999
	cdma2000 reverse link	800 MHz to 2025 MHz	≥ 0.9998
ACPR ^{40, 41}	cdma2000 forward link	800 MHz to 900 MHz	Adjacent: < -78 dBc Alternate: < -90 dBc
		1800 MHz to 1900 MHz	Adjacent: < -74 dBc Alternate: < -88 dBc
		1900 MHz to 2025 MHz	Adjacent: < -73 dBc Alternate: < -87 dBc
	cdma2000 reverse link	800 MHz to 900 MHz	Adjacent: < -80 dBc Alternate: < -91 dBc
		1800 MHz to 1900 MHz	Adjacent: < -76 dBc Alternate: < -88 dBc
		1900 MHz to 2025 MHz	Adjacent: < -75 dBc Alternate: < -88 dBc

V2900A-202: SignalMeister™ license for W-CDMA FDD uplink and downlink

V2900A-203: SignalMeister license for W-CDMA HSPA

Frequency range: 1800 MHz to 2200 MHz

		V2920A
EVM ⁴²	W-CDMA downlink	$\leq 0.4\%$
	W-CDMA uplink	$\leq 0.4\%$
	HSUPA	$\leq 0.4\%$
ACLR ⁴³	W-CDMA downlink	Adjacent: < -68 dBc Alternate: < -75 dBc
	W-CDMA uplink	Adjacent: < -66 dBc Alternate: < -76 dBc
	HSUPA	Adjacent: < -64 dBc Alternate: < -76 dBc

⁴⁰ RF amplitude setting: +3 dB (pilot only).

⁴¹ RF amplitude setting: (V2920A): -1 dBm (pilot only). Adjacent spacing: 750 kHz offset. Alternate spacing: 1.98 MHz offset.

⁴² RF amplitude setting: +3 dB (CPICH only).

⁴³ RF amplitude setting (V2920A): -3 dBm (CPICH only). Adjacent spacing: 5 MHz offset. Alternate spacing: 10 MHz offset.

V2900A-205: SignalMeister license for 802.11a, b, g, j WLAN signals

	Standard	Frequency band	V2920A
EVM ^{44, 45}	802.11a	5150 MHz to 5825 MHz	≤ -41 dB
	802.11b	2400 MHz to 2500 MHz	≤ -38 dB
	802.11g	2400 MHz to 2500 MHz	≤ -42 dB
	802.11j	4900 MHz to 5000 MHz	≤ -41 dB
ACP-adjacent ^{44, 45}	802.11a	5150 MHz to 5825 MHz	≤ -45 dBc
	802.11b	2400 MHz to 2500 MHz	≤ -36 dBc
	802.11g	2400 MHz to 2500 MHz	≤ -45 dBc
	802.11j	4900 MHz to 5000 MHz	≤ -55 dBc

V2900A-206 Signalmeister™ license for WLAN (802.11n)

Parameter	Signal Type (64 QAM)	Nominal EVM
Standard phase noise	20 MHz BW, 2.4 GHz	< -41 dB
	20 MHz BW, 3.5 GHz	< -41 dB
	40 MHz BW, 5.8 GHz	< -37 dB
V2920A-UPN	20 MHz BW, 2.4 GHz	< -48 dB
	20 MHz BW, 5.8 GHz	< -45 dB
	40 MHz BW, 5.8 GHz	< -43 dB

V2900A-208 Signalmeister™ license for WiMAX (802.16e)

WIMAX parameter 802.16e-2005 mobile WiMAX	Nominal
Carrier Frequency	Residual RCE ⁴⁶
2300 MHz to 2690 MHz	≤ -45 dB
3400 MHz to 3800 MHz	≤ -44 dB
4000 MHz to 4999 MHz	≤ -44 dB
5150 MHz to 5825 MHz	≤ -43 dB

⁴⁴ RF amplitude: -1 dBm (for V2920A EVM and ACP data).

⁴⁵ Signal characteristics: 802.11b: 11 Mbps, 50% duty cycle, Gaussian filter; 802.11a, g: 54 Mbps, 50% duty cycle, 20 MHz bandwidth, Bartlett filter; 802.11j: 27 Mbps, 90% duty cycle, 10 MHz, Bartlett filter.

⁴⁶ Signal nominal values: Pout: -2 dBm, DL subframe, 10 MHz bandwidth, 1024 subcarrier FFT, 1/8, 30-symbol guard period, PN9 data.

Specifications

Trigger and synchronization inputs and outputs

Parameters	Events
Trigger modes	<ul style="list-style-type: none"> ▪ Free run ▪ Trigger sweeps in sweep or list mode ▪ Trigger a sweep or list ▪ Trigger start of arb waveform
Arb sequence trigger modes	<ul style="list-style-type: none"> ▪ Stepping only ▪ Start and step
Trigger sources	<ul style="list-style-type: none"> ▪ SCPI or rear panel trigger ▪ Rising edge of external TTL input ▪ Falling edge of external TTL input
External trigger nominal values	<ul style="list-style-type: none"> ▪ Minimum input pulse width required 50nsec (nominal) ▪ Trigger repeatability ± 10 nsec
Trigger delay	0 sec to 1 sec
Sync output modes	Generate a sync pulse: <ul style="list-style-type: none"> ▪ Never (off) ▪ On arb waveform wrap ▪ At beginning of sweep, list or sequence ▪ At end of each step in sweep, list or sequence ▪ At end of dwell in sweep, list or sequence ▪ At end of sweep, list or sequence
Sync output polarity select	<ul style="list-style-type: none"> ▪ Sync out is on rising edge ▪ Sync out is on falling edge
Sync output nominal values	3.3 V CMOS, SMV (m) Minimum pulse width 200 ns
Even second clock input	External even second clock 3.3V CMOS, SMB (m)
Even second clock output	External even second clock 3.3V CMOS, SMB (m)

General specifications

Parameter	Specification										
IEC	This product is designed for use in INSTALLATION CATEGORY II and POLLUTION DEGREE 2, per IEC 61010-1 Second Edition.										
EMC compliance	<ul style="list-style-type: none"> ▪ Complies with European EMC Directive 2004/108/EC ▪ IEC/EN 61326-1 or IEC/EN 61326-2-1 ▪ CISPR Pub 11 Group 1, class A ▪ AS/NZS CISPR 11 ▪ ICES/NMB-001: This ISM device complies with Canadian ICES-001. (Cet appareil ISM est conforme a la norme NMB du Canada.) 										
Safety compliance	<ul style="list-style-type: none"> ▪ Complies with European Low Voltage Directive 2006/95/EC ▪ IEC/EN 61010-1, 2nd Edition ▪ Canada: CSA 22.2 NO. 61010-1-04 ▪ USA: UL Std No. 61010-1 (Second Edition) ▪ This instrument is in conformance with the German Regulation on Noise Declaration for Machines (Laermangabe nach der Maschinenlaermrerordnung - 3.GSGV Deutschland): <table border="1" data-bbox="544 724 1117 861" style="margin-left: 20px;"> <thead> <tr> <th>Acoustic noise emission</th> <th>Geraeuschemission</th> </tr> </thead> <tbody> <tr> <td>LpA < 70 dB</td> <td>LpA < 70 dB</td> </tr> <tr> <td>Operator position</td> <td>Am Arbeitsplatz</td> </tr> <tr> <td>Normal position</td> <td>Normaler Betrieb</td> </tr> <tr> <td>Per ISO 7779</td> <td>Nach DIN 45635 t.19</td> </tr> </tbody> </table> 	Acoustic noise emission	Geraeuschemission	LpA < 70 dB	LpA < 70 dB	Operator position	Am Arbeitsplatz	Normal position	Normaler Betrieb	Per ISO 7779	Nach DIN 45635 t.19
Acoustic noise emission	Geraeuschemission										
LpA < 70 dB	LpA < 70 dB										
Operator position	Am Arbeitsplatz										
Normal position	Normaler Betrieb										
Per ISO 7779	Nach DIN 45635 t.19										
Power requirements	100 VAC to 240 VAC; 50/60 Hz (automatically detected); 150 VA										
Calibration	Annual calibration cycle in system										
Environment (for indoor use only)	<ul style="list-style-type: none"> ▪ 18°C to 28°C specified operating, unless otherwise noted ▪ 0°C to 50°C operating range (+23°C is optimal) ▪ -25°C to 65°C storage (AC power off) ▪ Altitude: 2000 meters above sea level maximum specified operating ▪ Cooling forced air top, bottom and side intakes and rear exhaust. For proper cooling in a rack, use Agilent Technologies Inc. V2920A-1CM Rack Mount Kit 										
Digital inputs/outputs	4 bits, TTL-compatible										
Interfaces	<ul style="list-style-type: none"> ▪ IEEE-488.1 compliant. Supports IEEE-488.2 -common commands and status model topology ▪ LAN: 10/100BT Ethernet, RJ45, LXI Class C, no auto MDIX ▪ IVI-COM ▪ USB: USB full speed <ul style="list-style-type: none"> ○ B-style connector ("FROM HOST") is USB 2.0 compliant ○ All A-style connectors are USB 1.1 compliant ▪ Supports Agilent V3500A in pass-through mode using USB ▪ RF out: Type N connector 										
Mechanical vibration and shock (type tested)	<ul style="list-style-type: none"> ▪ Random Vibration: MIL-PRF-28800F CL3, 3 axes, 5-500 Hz, 2.09g RMS ▪ Sine-Sweep for resonances: 3 axes, 5-500 Hz, 0.5g ▪ Bench Handling: MIL-STD-810F, 4.5.7 Procedure VI 										
General mechanical information	<ul style="list-style-type: none"> ▪ Height: 3U (133 mm) (5.25 in.) ▪ Width: half-rack (213 mm) (8.4 in.) ▪ Depth: 464 mm (18.25 in.) ▪ Weight: 9.3 kg (20.5 lb) 										
Warranty	1 year										
Accessories supplied	<ul style="list-style-type: none"> ▪ AC power cable ▪ Printed Quick Start Guide ▪ CD-ROM containing V2920A VSG system help, utility programs, and PDF files (also available on-line at www.agilent.com). ▪ On-board, context-sensitive help system 										

Specifications are subject to change without notice.