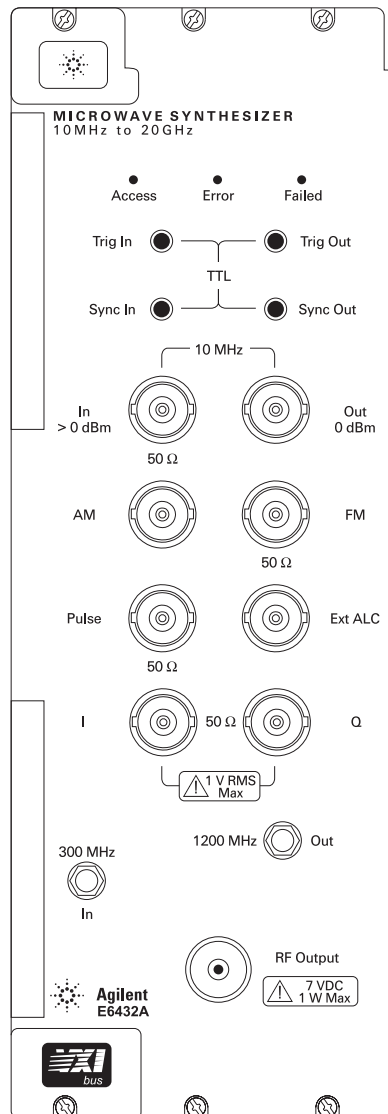


Agilent E6432A

VXI Microwave Synthesizer

Technical Specifications



Summary

The Agilent E6432A is a three-slot register-based VXI microwave synthesizer that delivers 10 MHz to 20 GHz signals. Signals can be CW or modulated with AM, FM, pulse, or I and Q vectors. Optimized for system use, the VXI form factor and register-based design make the E6432A ideal for system integrators who want a fast, flexible signal source to act as a local oscillator or signal stimulus within an automated environment. The VXI *Plug&Play* driver is your assurance that the E6432A conforms to the VXI standard and will integrate into your custom, VEE™ or LabView™ system software.

Key features include:

- 3-slot VXI register-based design
- 10 MHz to 20 GHz frequency range
- -90 to +20 dBm output power
- 1 Hz tuning resolution
- < 400 μs frequency switching time
- AM, FM and pulse modulators standard
- Optional I/Q modulator for digital modulation up to 40 MHz bandwidth.
- System optimized hardware and software interfaces.



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Specifications

Frequency Characteristics

Range	10 MHz to 20 GHz
Accuracy	same as time base
Resolution	1 Hz
Switching time	< 400 μ s, < 220 μ s (typical)

Output Characteristics

Output power	
Range	-20 to +17 dBm
(with Option 1E1) ¹	-90 to +16 dBm

Maximum leveled output power

Without step attenuator¹

Frequency range	Standard	Option UNF	Option UNH	Options UNF & UNH
10 MHz to 2 GHz	+17 dBm	+17 dBm	+13 dBm	+13 dBm
2 GHz to 20 GHz	+17 dBm	+20 dBm	+17 dBm	+20 dBm

Vernier accuracy	± 0.5 dB from -10 to +10 dBm ± 1.3 dB from -20 to +20 dBm
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Resolution	0.02 dB
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Switching time	< 50 μ s across ALC range, < 20 ms with attenuator step change
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External ALC range	40 dB
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Power level accuracy and flatness

These specifications apply to frequencies between 100 MHz and 2 GHz after a power correction is performed. For frequencies < 100 MHz accuracy and flatness degrade by 0.5 dB. For frequencies > 2 GHz, accuracy and flatness degrade by 0.1 dB

Output power range	Accuracy	Flatness
-10 dBm to max. power	± 1.2 dB	± 0.9 dB
-10 to +10 dBm	± 0.8 dB	± 0.5 dB
-20 to -10 dBm	± 1.1 dB	± 0.7 dB
-60 to -20 dBm	± 1.1 dB	± 0.7 dB
-90 to -60 dBm	± 1.4 dB	± 1.1 dB

VSWR at 50 Ω	1.6:1 (typical)
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Spectral Purity

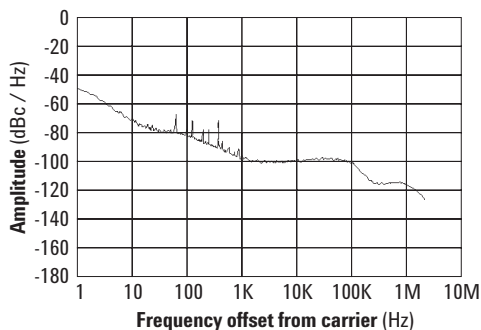
Harmonics

10 MHz to 2 GHz (with Option UNH)	< -25 dBc < -55 dBc
2-20 GHz	< -55 dBc < -65 dBc (typical)

Spurious response	< -55 dBc < -70 dBc (typical)
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SSB phase noise	< -70 dBc/Hz at 100 Hz < -90 dBc/Hz at 10 kHz
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Phase noise of carrier frequency 8.1 GHz



Modulation

AM depth	-20 dBm in normal mode 50 dB below max. output in deep mode
AM rate	DC to 250 kHz (typical)
AM accuracy	< 7% of depth
FM maximum deviation	> 8 MHz
Option 002	> ± 85 MHz
FM rate	100 kHz to 8 MHz
Option 002	1 kHz to 10 MHz
FM sensitivity	1 MHz/V
Option 002	100 kHz/V, 1 MHz/V, 10 MHz/V
FM accuracy	30% at 1 V p-p and 1 MHz rate
FM flatness	± 1 dB over specified rate range
Maximum FM index Option 002	> 180

Pulse modulation

RF > 560 MHz to < 2 GHz

On/off ratio:	> 68 dB at +10 dBm; degrades 1 dB/dB
PRF range:	10 Hz to 10 MHz, (DC to 10 MHz; ALC off)
Minimum pulse width:	3.0 µs (leveled), 50 ns (unleveled)
Rise/fall time:	< 25 ns
Power level accuracy: (relative to CW)	0.3 dB (typical, leveled) 0.5 dB (typical, unleveled, following power search)
Video feedthrough:	< 5% of envelope (typical)
Compression:	< ± 16 ns (typical)
Overshoot and ringing:	< ± 15% (typical)

Pulse Modulation

RF 2–20 GHz

On/off ratio:	> 80 dB
PRF range:	10 Hz to 10 MHz (DC to 10 MHz; ALC off)
Minimum pulse width:	3.0 µs (leveled), 15 ns (unleveled)
Rise/fall time:	< 10 ns
Power level accuracy: (relative to CW)	0.3 dB (typical, leveled) 0.5 dB (typical, unleveled, following power search)
Video feedthrough:	< 5 mV (typical)
Compression:	< ± 15 ns (typical)
Overshoot and ringing:	< ± 10% (typical)

I/Q modulation (Option UNG only)

I/Q bandwidth:	> 40 MHz (typical, ±2 dB uncorrected)
I/Q sensitivity:	0.5 V pk for 100% modulator drive level
I and Q offset range:	± 100%
I and Q gain range:	± 4 dB
Quadrature adjustment range:	± 10 degrees
I and Q input attenuator range:	0 to 12 dB in 2 dB steps
Origin offset:	< -45 dBc (typical)
Dynamic error vector magnitude ^{2,3} :	< 1.2% rms (typical)

¹ Adding step attenuator (Option 1E1) degrades maximum output power by 1 dB, 2 to 20 GHz.

² These I/Q specifications apply only after an internal calibration, and are valid for 10 days at a calibration temperature of ±5 degrees. These specifications include I/Q impairments of an Agilent Technologies ESG-D Series signal generator with Option UND as the baseband I/Q source.

³ Measured at 2 MS/s QPSK, root raised cosine filter with $\alpha = 0.35$, 14 dB IF attenuation, maximum output level = 0 dBm, and ALC off.

List mode

Accuracy	same as time base
Minimum step size	same as frequency resolution
Number of points	128 k
Switching time	same as CW
Dwell time	5 µs to 32 ms

VXI characteristics

Size	C
Slots	3
VXI device type	register based servant
Instrument driver	VXI <i>plug&play</i> using Windows NT®

General specifications

Operating temperature range	0 to +55° C							
Size mm (in)	91.4 (3.6) W x 261.6 (10.3) H x 370.8 (14.6) D							
Weight	7.16 KG (15.8 lbs)							
RF output connector	3.5 mm							
Power Supply Requirements								
(V)	+5	-5.2	-2	+12	-12	+24	-24	+5
DC current (A)	10	2.35	0	2.4	1.0	0.4	0.15	0
Dynamic current (A)	2	0.1	0	0.8	0.05	0.5	0.03	0
						(w/step att.)		

Ordering Information

Agilent E6432A VXI Microwave Synthesizer

Option 002 Add enhanced frequency modulation

Option 1E1 Add 70 dB step attenuator

Option UNF Add high power (+20 dBm) 2–20 GHz

Option UNH Add improved spectral purity (10 MHz to 2 GHz)

Option UNG Add I/Q modulator

Contact your Agilent sales representative for more information.

Warranty Information

All Agilent products described in this document are warranted against defects in material and workmanship for a period of one year from date of shipment.

Related Agilent Literature

An Introduction to the Agilent E6432A plug&play Driver
Product Note
literature number 5968-3660E

Creating Frequency Lists Using a Spreadsheet and ActiveX Product Note
literature number 5968-8434E

E6432A Configuration Guide
literature number 5967-6272E

E6432A Product Overview
literature number 5967-6178E

High Performance Microwave Capability in VXI Brochure
literature number 5967-6313E

Test Systems and VXI Products Catalog
literature number 5980-0307E

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