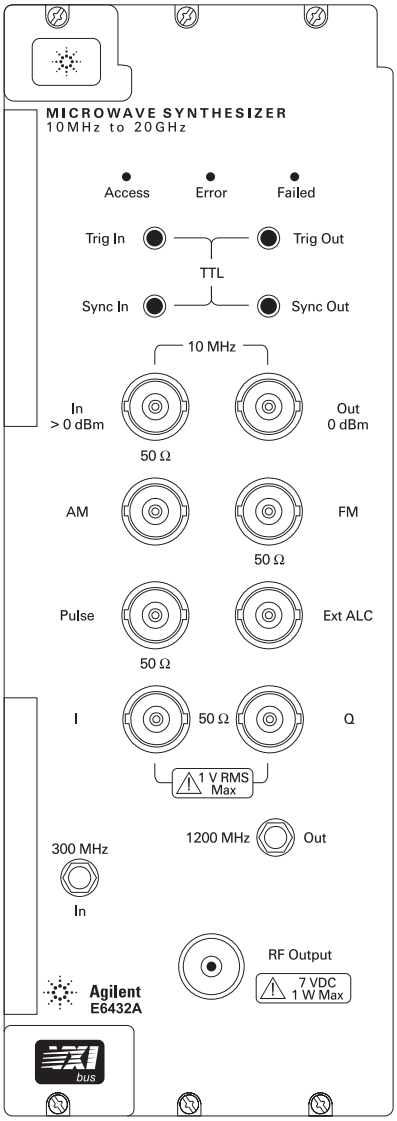
Agilent E6432A

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 µs, < 220 µs (typical)

Output Characteristics

Output power

Range	–20 to +17 dBm
(with Option 1E1)[1]	–90 to +16 dBm

Maximum leveled output power
Without step attenuator[1]

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
Resolution	0.02 dB
Switching time	< 50 µs across ALC range, < 20 ms with attenuator step change
External ALC range	40 dB

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

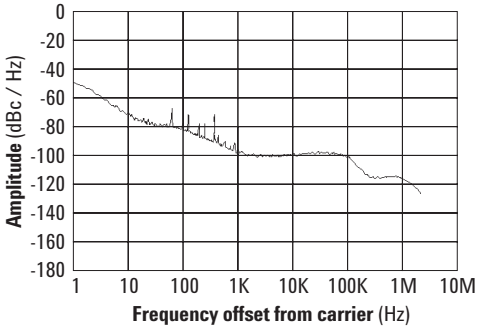
VSWR at 50 Ω	1.6:1 (typical)

Spectral Purity

Harmonics

10 MHz to 2 GHz	< –25 dBc
(with Option UNH)	< –55 dBc
2–20 GHz	< –55 dBc
	< –65 dBc (typical)
Spurious response	< –55 dBc
	< –70 dBc (typical)
SSB phase noise	< –70 dBc/Hz at 100 Hz
	< –90 dBc/Hz at 10 kHz

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 Option 002	> 8 MHz > ± 85 MHz
FM rate Option 002	100 kHz to 8 MHz 1 kHz to 10 MHz
FM sensitivity Option 002	1 MHz/V 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 (typica)
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)

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

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.

VXI characteristics

Size	C
Slots	3
VXI device type	register based servant
Instrument driver	VXI *plug&play* 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 (w/step att.)	0.03	0

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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