

KEYSIGHT TECHNOLOGIES (AGILENT HP)

E4420A

The Keysight Agilent E4420A is a member of the ESG-A series of analog RF signal generators, offering frequency coverage from 250 kHz to 2000 MHz. Known for its exceptional level accuracy, wideband FM, and Phase Modulation capabilities, the E4420A is designed to meet the rigorous demands of receiver testing, component evaluation, and local oscillator applications. It features an electronic attenuator for high reliability and repeatability, and features a recommended two-year calibration cycle to minimize the cost of ownership.

SPECIFICATIONS

Frequency

Minimum Frequency	250 kHz Hz
Maximum Frequency	2000 MHz Hz
Frequency Resolution	0.01 Hz
Frequency Range	250 kHz to 2000 MHz
Internal Reference Frequency	10 MHz
Frequency Switching Speed	< 50 ms (typical)

Output

Maximum Output Power	+13 dBm dBm
Output Power Range	+13 to -136 dBm
Phase Noise	<-116 dBc/Hz @ 20 kHz offset, 1 GHz carrier (typical)

Modulation

Modulation	AM, FM, Phase Modulation
Sweep Modes	Step sweep (frequency, power, and list)

General

Reference Oscillator	10 MHz internal reference oscillator
Interfaces	GPIO (IEEE-488), RS-232
Display	Liquid crystal display (LCD)

Physical

Power Supply	90 to 254 VAC, 45 to 440 Hz
Dimensions (W×H×D)	426 mm x 133 mm x 482 mm mm
Weight	12.7 kg kg

Amplitude

Minimum Output Power	-136 dBm
Amplitude Resolution	0.02 dB
Amplitude Accuracy	±0.5 dB to ±0.9 dB
Attenuator Type	Electronic
Output SWR	< 1.5:1 (typical)

Spectral Purity

SSB Phase Noise at 500 MHz	<-120 dBc/Hz (typical, at 20 kHz offset)
SSB Phase Noise at 1000 MHz	<-116 dBc/Hz (typical, at 20 kHz offset)
SSB Phase Noise at 2000 MHz	<-110 dBc/Hz (typical, at 20 kHz offset)
Harmonics	<-30 dBc (<= +4 dBm output level)
Non-Harmonics (250 kHz to 1000 MHz)	<-65 dBc (>3 kHz offset, <+7 dBm output level)
Non-Harmonics (>1000 MHz to 2000 MHz)	<-59 dBc (>3 kHz offset, <+7 dBm output level)
Subharmonics (>1000 MHz)	<-40 dBc
Subharmonics (>1000 MHz to 2000 MHz)	<-40 dBc

Analog Modulation

Modulation Capabilities	Wideband FM, Phase Modulation (ΦM), Amplitude Modulation (AM)
Internal Modulation Source	Built-in function generator
Internal Modulation Waveforms	Sine, square, triangle, ramp, noise

Sweep and Operating Modes

Sweep Range	Full frequency and power range
Sweep Number of Points	2 to 401
Sweep Trigger Modes	Auto, key, external, GPIB

System Connectivity & Interfaces

RF Output Connector Type	Type-N female
RF Output Impedance	50 ohms nominal
GPIB Interface	IEEE-488.2 compliant
RS-232 Interface	Standard
External Reference Input Connector	BNC female (rear panel)
Reference Output Connector	BNC female (rear panel)
Trigger Input Connector	BNC female (rear panel)
Trigger Output Connector	BNC female (rear panel)

Physical & Environmental

Operating Temperature Range	0 to 55 °C
Storage Temperature Range	-40 to 71 °C

Power Requirements

Line Voltage	90 to 254 VAC
Line Frequency	45 to 440 Hz
Power Consumption	< 200 W

Compliance & Calibration

Recommended Calibration Cycle	3 years
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Protection

Reverse Power Protection (Max RF Power)	50 W (from a 50 ohm source)
Reverse Power Protection (Max DC Voltage)	50 VDC

Amplitude Modulation

AM Depth Range	0% to 100%
AM Resolution	0.1%
AM AC-coupled 3 dB Bandwidth	10 Hz to 10 kHz
AM DC-coupled 3 dB Bandwidth	DC to 10 kHz

Frequency Modulation

FM High-Bandwidth Mode 3 dB Bandwidth	DC to 10 MHz
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Phase Modulation

Phase Modulation AC-coupled 3 dB Bandwidth	20 Hz to 100 kHz
Phase Modulation DC-coupled 3 dB Bandwidth	DC to 100 kHz
Phase Modulation High-Bandwidth Mode 3 dB Bandwidth	DC to 1 MHz

Internal Modulation Source

Internal Modulation Source Frequency Range (Sine)	0.1 Hz to 50 kHz
Internal Modulation Source Frequency Range (Square, Triangle, Ramp, Noise)	0.1 Hz to 10 kHz
Internal Modulation Source Frequency Resolution	0.1 Hz
LF Output Voltage Range	0 to 3 V _{peak} into 50 ohms
LF Output Voltage Resolution	1 mV

Sweep

Sweep Dwell Time Range	2 ms to 60 s
Sweep Dwell Time Resolution	1 ms

Frequency Reference (Option-Dependent)

Option 1E5 Reference Oscillator Aging Rate	< 1 x 10 ⁻¹⁰ per day (after 72 hours warm-up)
Option 1E5 Reference Oscillator Temperature Stability	< ±2 x 10 ⁻¹⁰ (0 to 55 °C)

Inputs & Outputs

External 1 Modulation Input Connector	BNC female (front panel)
External 2 Modulation Input Connector	BNC female (front panel)
External 1/2 Input Impedance	50 ohms / 600 ohms (nominal, selectable)
Sweep Out Connector	BNC female (rear panel)
Internal Modulation Output Connector	BNC female (front panel)

Environmental

Operating Altitude Limit	4,600 meters (15,000 feet)
Operating Humidity Range	Up to 95% relative humidity at 40 °C

Modulation (AM)

AM Distortion (30% depth, 1 kHz rate)	< 1.5%
AM Distortion (90% depth, 1 kHz rate)	< 4.0%

Modulation (FM)

FM Distortion (100 kHz deviation, 1 kHz rate)	< 1.0%
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Storage & Memory

Save/Recall Registers	100 registers
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Programming & Control

Command Language	SCPI (Standard Commands for Programmable Instruments)
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TECHNOLOGY

Analog RF Signal Generation

APPLICATIONS

Receiver test, component test, local oscillator applications

Generated by SpecAtlasHub (specatlashub.com). Specifications are compiled from available sources and are subject to change — verify critical values against the manufacturer before purchase.