

Agilent 89430A

2 MHz to 1.8 GHz Downconverter

Data Sheet

Specifications describe warranted performance over the temperature range of 0 to 55 °C (except where noted) and include a 30-minute warm-up from ambient conditions, unless noted otherwise. Supplemental characteristics identified as “typical” or “characteristic” provide useful information by giving non-warranted performance parameters. Typical performance is applicable from 20° to 30 °C.

Definitions

dBc = dB relative to input signal level

dBfs = dB relative to full scale amplitude range setting. Full scale corresponds to approximately -30 dBm at the mixer.

FS or fs = Full scale, synonymous with amplitude range or input range

TOI or Third-Order Intercept = the theoretical amplitude for a device at which the third-order intermodulation products would become equal in amplitude to one of the input signals.

Frequency

Frequency tuning

Frequency range	2 MHz to 1800 MHz
Center frequency tuning resolution	1 MHz
Output characteristics	
IF bandwidth	8 MHz
Centered on	6 MHz

Note: Spectral information within the IF bandpass is “flipped” or “mirrored” relative to input signals within the tuned span.

Frequency accuracy (with standard high-precision frequency reference)

Frequency accuracy is the sum of initial accuracy, aging, and temperature drift.

Initial accuracy	± 0.1 ppm
Aging	± 0.015 ppm/month
Temperature drift	± 0.005 ppm (0 to 55 °C)



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Stability (spectral purity) (with standard high-precision frequency reference or equivalent with ≥ 5 dBm level)

Phase noise (absolute and residual)

$F_{in} \leq 120$ MHz

100 Hz offset	< -100 dBc/Hz
1 kHz offset	< -102 dBc/Hz
10 kHz offset	< -102 dBc/Hz
100 kHz offset	< -110 dBc/Hz

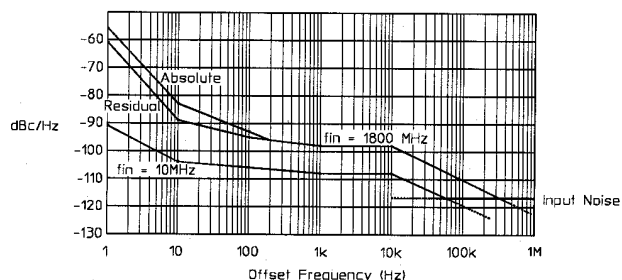
$120 \text{ MHz} \leq F_{in} \leq 500$ MHz

100 Hz offset	< -98 dBc/Hz
1 kHz offset	< -100 dBc/Hz
10 kHz offset	< -100 dBc/Hz
100 kHz offset	< -110 dBc/Hz

$500 \text{ MHz} \leq F_{in} \leq 1800$ MHz

100 Hz offset	< -89 dBc/Hz
1 kHz offset	< -92 dBc/Hz
10 kHz offset	< -93 dBc/Hz
100 kHz offset	< -105 dBc/Hz

LO spurious sidebands < -70 dBc



Typical spectral purity

Amplitude

Input range	-30 dBm to $+25$ dBm (5 dB steps)
Maximum safe input power	
Average continuous power	$+25$ dBm (300 mW)
DC voltage	25 V

Input port

Input channels	1
VSWR	
Range ≥ -25 dBm	1.5:1 (14 dB return loss)
Range $= -30$ dBm	1.8:1 (11 dB return loss)
Impedance	50 Ω
Connector	Type-N

IF output level accuracy

When tuned to a single full scale input signal, the output signal will be:

Nominal level	-13 dBm
Frequency	6 MHz

Amplitude accuracy is the sum of:

Conversion gain accuracy (at -20 dBm input range and 6 MHz input)	± 2 dB
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Input range attenuation accuracy	± 1.5 dB
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RF flatness (relative to 6 MHz)	± 3 dB
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IF flatness (over ± 4 MHz span, relative to center frequency)	± 1.5 dB
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The spectrum of the output signal will be “flipped” or “mirrored” about the 6 MHz center of the IF passband relative to the spectrum of the input signal. Therefore an input signal 10 kHz below the input tuned frequency will appear 10 kHz above 6 MHz at the output.

Dynamic range

Dynamic range indicates the amplitude range that is free of erroneous signals within the measurement bandwidth.

Harmonic distortion (with a single full scale signal at the input)	< -70 dBc
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Third-order intermodulation distortion (with two input tones at 6 dB below full scale)	< -78 dBc
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Third-order intercept (TOI)	$+33$ dB above range
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General spurious (with input signal level equal to range and input frequency ≤ 1800 MHz)	< -70 dBc
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Residual responses (50 Ω input)	< -80 dBfs
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Input noise density (50 Ω input, vector mode or scalar mode with sample detector)

20° to 30 °C	< -115 dBfs/Hz
0 to 55 °C	< -112 dBfs/Hz

Sensitivity (-30 dBm range)

20° to 30 °C	< -145 dBm/Hz
0 to 55 °C	< -142 dBm/Hz

Safety and environmental

Safety standards	CSA Certified for Electronic Test and Measurement Equipment per CSA C22.2, No. 231
Product designed for compliance to	UL1244 and IEC348, 1978
Acoustics	LpA <55 dB typical at 25 °C ambient
Temperature	
Operating	0 to 55 °C
Storage	–20° to 65 °C
Humidity, non-condensing	
Operating	10% to 90% at 40 °C
Storage	10% to 90% at 40 °C
Altitude	
Operating (above 2285 m (7,500 ft), derate operating temperature by –3.6 °C/1000 m (–1.1 °C/1000 ft))	4600 m (15,000 ft)
Storage	4600 m (15,000 ft)
Calibration interval	1 year
Warm-up time	30 minutes
Power requirements	
115 VAC operation	90 to 140 Vrms, 47 to 63 Hz
230 VAC operation	198 to 264 Vrms, 47 to 63 Hz
Maximum power dissipation	275 VA
IEC 801-3 (Radiated Immunity) Performance degradation may occur at Severity Level 2.	

Physical

Weight	25 kg (55 lb)
Dimensions	
Height	173 mm (6.8 in)
Width	419 mm (16.5 in)
Depth	495 mm (19.5 in)

Interfaces (characteristics only)

External reference in/out	
External reference input	Locks to a 1, 2, 5, or 10 MHz (± 10 ppm) with a level >0 dBm (use ≥ 5 dBm for optimum phase noise performance)
External reference output	Outputs 10 MHz at >0 dBm (+6 dBm typical) into a 50 Ω load
Serial communication port	
EIA 574	9-pin, RS-232 I/O port (to controller), nominally 9600 baud

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Printed in U.S.A. 10/00

5963-2282E

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