

Keysight Technologies

RF & Microwave Amplifiers

Data Sheet



Key Features

- Broadband performance up to 50 GHz optimizes the operating range of your test systems
- Excellent noise figure and high gain significantly reduce overall test system noise figure
- High output power boosts available power for measurements

Keysight RF & Microwave Amplifiers

Keysight Technologies, Inc. amplifiers offer ultra-broad bandwidths—such as 0.01 to 26.5 GHz, 0.045 to 50 GHz, and ranges in between. These high-performance amplifiers eliminate crossover networks and multiple power supplies from multiple narrow band amplifiers. Excellent noise figure and high gain, up to 30 dB, significantly reduce test system noise figure, thus increasing the dynamic range. High output power improves recovery of system losses and boost available power in ATE systems.

Amplifiers Applications

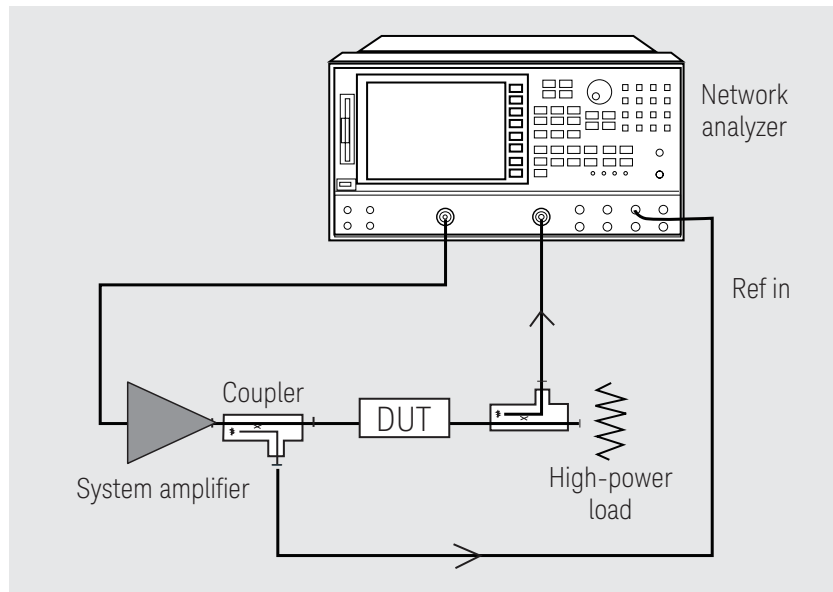


Figure 1. Amplifiers increase available power from instruments

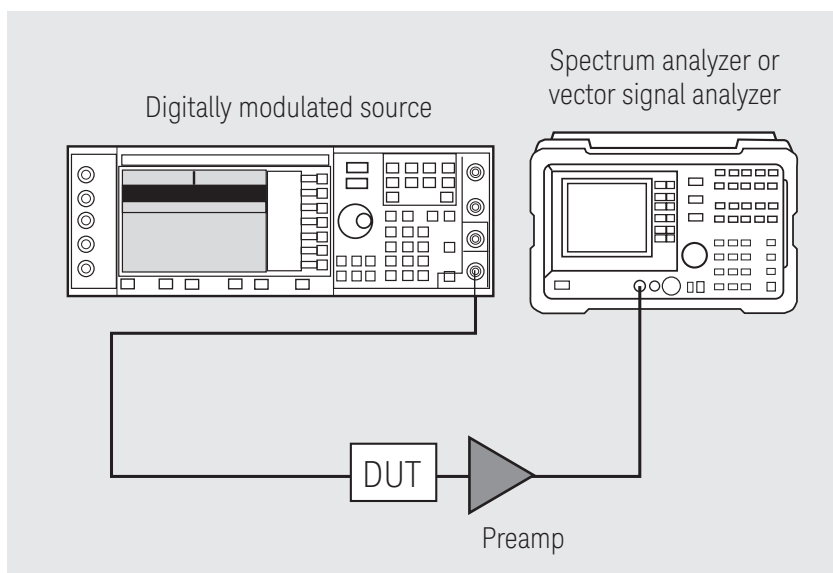


Figure 2. Preamplifiers reduce system noise figure

Did you know that...

- Keysight 83017A, 83018A and 83020A system amplifiers provide internal directional detectors for external leveling applications. By providing feedback to the ALC input of an external source, system designers can level output power at the test port, negating the effects of post-sweep reflections and losses.
- Keysight 87405B/C preamplifiers provide exceptional gain and flatness. These small preamplifiers are very portable and come with a convenient probe-power bias connection which eliminates the need for an additional DC power supply, making them an ideal front-end preamplifier for a variety of Keysight instruments.

Did you know that...

By placing a preamplifier (PA) in front of a spectrum analyzer (SA), the effective noise figure for the system (preamplifier + spectrum analyzer) can be reduced to lower than that of the spectrum analyzer alone. The equation below shows how to calculate the total system noise figure (F_{cascade}):

$$F_{\text{cascade}} = F_{\text{PA}} + \frac{F_{\text{SA}} - 1}{G_{\text{PA}}}$$

RF & Microwave Amplifiers

Amplifier							
Model number	Frequency range (GHz)	Output power at P _{sat} (dBm)	Output power at P _{1dB} (dBm)	Gain (dB) (min)	Noise figure (dB) (typ)	Bias (nom)	RF Connectors (input/output)
87405B	0.01 to 4	+7 to 4 GHz	+8 to 4 GHz	22	5 to 4 GHz	+15 V at 105 mA	Type N (m,f)
87405C	0.1 to 18	+17 to 18 GHz	+15 to 4 GHz +14 to 18 GHz	25	6 to 4 GHz 4.5 to 18 GHz	+15 V at 140 mA -15 V at 3 mA	Type N (m,f)
87415A	2 to 8	+26 to 8 GHz	+23 to 8 GHz	25	13 to 8 GHz	+12 V at 900 mA	SMA (f)
83006A	0.01 to 26.5	+18 to 10 GHz +16 to 20 GHz +14 to 26.5 GHz	+13 to 20 GHz +10 to 26.5 GHz	20	13 to 0.1 GHz 8 to 18 GHz 13 to 26.5 GHz	+12 V at 450 mA -12 V at 50 mA	3.5 mm (f)
83017A ¹	0.5 to 26.5	+20 to 20 GHz +15 to 26.5 GHz	+18 to 20 GHz +13 to 26.5 GHz ²	25	8 to 20 GHz 13 to 26.5 GHz	+12 V at 700 mA -12 V at 50 mA	3.5 mm (f)
83018A ¹	2 to 26.5	+24 to 20 GHz +21 to 26.5 GHz	+22 to 20 GHz +17 to 26.5 GHz	27 dB at 20 GHz, 23 dB at 26.5 GHz	10 to 20 GHz 13 to 26.5 GHz	+12 V at 2 A -12 V at 50 mA	3.5 mm (f)
83020A ¹	2 to 26.5	+30 to 20 GHz +25 to 26.5 GHz ²	+27 to 20 GHz +23 to 26.5 GHz	30 dB at 20 GHz, 27 dB at 26.5 GHz	10 to 20 GHz 13 to 26.5 GHz	+15 V at 3.2 A -15 V at 50 mA	3.5 mm (f)
83050A	2 to 50	+20 to 40 GHz +17 to 50 GHz ³	+15 to 40 GHz +13 to 50 GHz	21	6 to 26.5 GHz 10 to 50 GHz	+12 V at 830 mA -12 V at 50 mA	2.4 mm (f)
83051A	0.045 to 50	+12 to 45 GHz +10 to 50 GHz	+8 to 45 GHz +6 to 50 GHz	23	12 to 2 GHz 6 to 26.5 GHz 10 to 50 GHz	+12 V at 425 mA -12 V at 50 mA	2.4 mm (f)

1. 83017A, 83018A and 83020A include internal directional detectors with BNC (f) DC connectors for external leveling applications.

2. Δf = f(GHz) – 20

3. Δf = f(GHz) – 40

Related Products

Model number	Description	Amplifier to bias
87421A	25 W power supply	All except 83020A, 87405B/C
87422A	70 W power supply	All except 87405B
11899A	Probe power supply	87405B/C only

myKeysight**myKeysight**www.keysight.com/find/mykeysight

A personalized view into the information most relevant to you.

**www.lxistandard.org**

LAN eXtensions for Instruments puts the power of Ethernet and the Web inside your test systems. Keysight is a founding member of the LXI consortium.

**Three-Year Warranty**www.keysight.com/find/ThreeYearWarranty

Keysight's commitment to superior product quality and lower total cost of ownership. The only test and measurement company with three-year warranty standard on all instruments, worldwide.

**Keysight Assurance Plans**www.keysight.com/find/AssurancePlans

Up to five years of protection and no budgetary surprises to ensure your instruments are operating to specification so you can rely on accurate measurements.

**www.keysight.com/quality**

Keysight Electronic Measurement Group

DEKRA Certified ISO 9001:2008

Quality Management System

Keysight Channel Partnerswww.keysight.com/find/channelpartners

Get the best of both worlds: Keysight's measurement expertise and product breadth, combined with channel partner convenience.

www.keysight.com/find/mta

Web Resources

For more information on Keysight Test Accessories

www.Keysight.com/find/mta

Or order a Keysight RF & Microwave Test Accessories catalog at

www.Keysight.com/find/mtacatalog

Related Literature

Preamplifiers and System Noise Figure,
literature number 5989-5742EN*10 Hints for Making Better Network Analyzer Measurements*,
literature number 5965-8166EN*Measuring Noise Figure with a Spectrum Analyzer*,
literature number 5988-8571EN

For more information on Keysight

Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at:

www.keysight.com/find/contactus**Americas**

Canada	(877) 894 4414
Brazil	55 11 3351 7010
Mexico	001 800 254 2440
United States	(800) 829 4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 6375 8100

Europe & Middle East

Austria	0800 001122
Belgium	0800 58580
Finland	0800 523252
France	0805 980333
Germany	0800 6270999
Ireland	1800 832700
Israel	1 809 343051
Italy	800 599100
Luxembourg	+32 800 58580
Netherlands	0800 0233200
Russia	8800 5009286
Spain	0800 000154
Sweden	0200 882255
Switzerland	0800 805353
	Opt. 1 (DE)
	Opt. 2 (FR)
	Opt. 3 (IT)
United Kingdom	0800 0260637

For other unlisted countries:

www.keysight.com/find/contactus

(BP-06-09-14)