

# 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

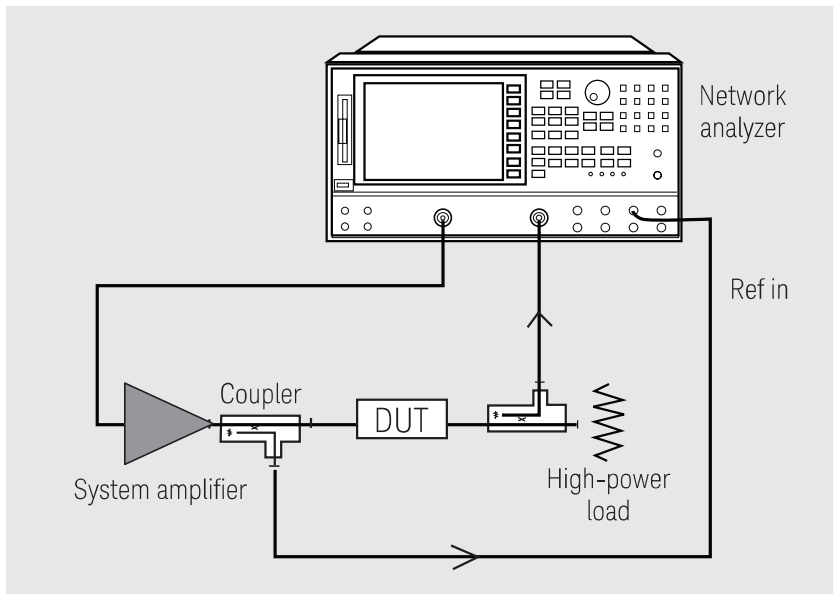


Figure 1. Amplifiers increase available power from instruments

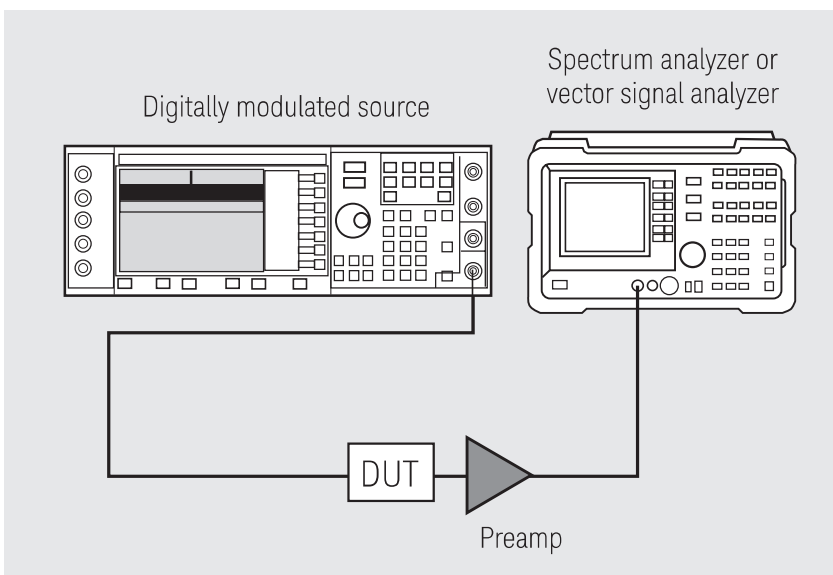


Figure 2. Preamplifiers reduce system noise figure

## 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 ( $F_{\text{cascade}}$ ):

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

## RF & Microwave Amplifiers

Amplifier							
Model number	Frequency range (GHz)	Output power at P <sub>sat</sub> (dBm)	Output power at P <sub>1dB</sub> (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 <sup>1</sup>	0.5 to 26.5	+20 to 20 GHz +15 to 26.5 GHz	+18 to 20 GHz +13 to 26.5 GHz <sup>2</sup>	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 <sup>1</sup>	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 <sup>1</sup>	2 to 26.5	+30 to 20 GHz +25 to 26.5 GHz <sup>2</sup>	+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 <sup>3</sup>	+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.  $\Delta f = f(\text{GHz}) - 20$

3.  $\Delta f = f(\text{GHz}) - 40$

## 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

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Published in USA, December 1, 2017  
5989-6949EN  
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## Web Resources

For more information on Keysight Test Accessories

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Or order a Keysight RF & Microwave Test Accessories catalog at

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## 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

