

22 ps Risetime 15 GHz Bandwidth

The 5800 Series of Ultra-Broadband Amplifiers is an excellent choice for either pulse or RF applications. They offer a very attractive price/performance ratio. They are AC coupled and are extremely broadband covering 5 $\frac{1}{2}$ decades from 65 kHz



to 15 GHz. They have clean transient responses and smooth gain vs. frequency responses. Gains up to 24 dB and risetimes as fast as 22 ps are available. These are stable, 50 Ω amplifiers and several can be connected in cascade for higher gains. A selection of various models is available to allow the user to optimize risetime, bandwidth, noise figure, VSWR, or max. power output. Models 5828 and 5840 are particularly ideal for 10 Gbit systems.

Time Domain Pulse Responses at 50 ps /div Input is 15 ps Risetime

Measured with a PSPL Model 4015C, 15 ps Pulse Generator and an HP-54750, 50 GHz digital sampling oscilloscope



* The max power output of the 5826 and 5850 drops for f > 1/3*BW.

** The 5830 is not recommended for new designs. The 5828 is an improved version of the 5830.

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Model 5800 Series 5824, 5826, 5828, 5830, 5840, 5850 Ultra-Broadband Amplifiers

| Parameter | 5824 | 5826 tive | 5828 | 5830 | <mark>e</mark> 5840 | 5850 tive |
|--|---|--|---|---|---|--|
| Gain, S ₂₁ (100 MHz) | 19 dB 0050 | 11 dB | 10 dB | 11 dB | 23 dB | 24 dB |
| min limit | 18 dB min. | 10 dB min. | 9 dB min. | 10 dB min. | 21 dB min. | 22 dB min. |
| Polarity | inverting | inverting | inverting | inverting | Non- inverting | Non- inverting |
| Bandwidth (-3 dB) [3] | 3.5 GHz | 9 GHz | 15 GHz | 11 GHz | 9.5 GHz | 7 GHz |
| min limit | 2.8 GHz min. | 7.5 GHz min. | 12 GHz min. | 10 GHz min. | 8 GHz min. | 5 GHz min. |
| Gain Elatnoss [2] | ± 0.5 dB | ± 0.5 dB | ± 0.5 dB | ± 0.5 dB | ± 0.5 dB | ± 0.5 dB |
| Gain Flatness [5] | f<1 GHz | f<4 GHz | f<4 GHz | f<4 GHz | f<3 GHz | f<2GHz |
| Low Frequency (-3 dB) | 70 kHz | 70 kHz | 65 kHz | 65 kHz | 80 kHz | 80 kHz |
| Risetime (10%-90%) | 100 ps | 38 ps | 22 ps | 31 ps | 41 ps | 54 ps |
| [4] max. limit | 125 ps max. | 50 ps max. | 30 ps max. | 35 ps max. | 50 ps max. | 70 ps max. |
| Overshoot [4] | 0.7% | 7% | 5% | 3% | 4% | 5% |
| max limit | 3% max. | 10% max. | 8% max. | 6% max. | 8% max. | 10% max. |
| Max Power Out (-1 dB gain comp) | +20 dBm (100 MHz) +19 dBm (2.5 GHz) | +19 dBm (100 MHz) +18 dBm (2.5 GHz) +13 dBm (5 GHz) | +12 dBm (100 MHz) +14 dBm (5 GHz) +11 dBm (10 GHz) | +12 dBm (100 MHz) +14 dBm (5 GHz) +11 dBm (10 GHz) | +12 dBm (100 MHz) +14 dBm (5 GHz) +11 dBm (10 GHz) | +19 dBm (100 MHz) +18 dBm (2.5 GHz) +13 dBm (5 GHz) |
| Noise Figure (100 MHz) max limit typical NF vs. frequency | 3.8 dB 4.5 dB max. 4.5 dB (3.5 GHz) 5 dB (6 GHz) | 6.3 dB 7.5 dB max. 7.5 dB (6 GHz) 9 dB (10 GHz) | 6.2 dB 8 dB max. 6.7 dB (5 GHz) 7.5 dB (10 GHz) | 5.0 dB 7 dB max. 6 dB (5 GHz) 8 dB (10 GHz) | 5.8 dB 8 dB max. 7 dB (5 GHz) 8 dB (10 GHz) | 6.0 dB 8 dB max. 6 dB (3.5 GHz) 6.5 dB (5 GHz) |
| Effective Input RMS Noise Voltage | 41 µV rms | 88 µV rms | 112 µV rms | 83 µV rms | 85 μV rms | 75 μV rms |
| TDR Refl. Input | -12% | ±1% | ±1% | -20% | ±1% | ±1% |
| output | -21% | -29% | -35% | -28% | -9% | -7% |
| Max. RF In (cw) | +17 dBm | +17 dBm | +10 dBm | +10 dBm | 0 dBm | +10 dBm |
| or peak pulse | 2.2 V | 2.2 V | 1 V | 1 V | 315 mV | 1 V |
| Return Loss S ₁₁ input | 20 dB | >40 dB | >40 dB | 14 dB | >40 dB | >40 dB |
| (100 MHz) S ₂₂ output | 13 dB | 11 dB | 9 dB | 11 dB | 21 dB | 22 dB |
| (100 MHz) | 24 dB | 20 dB | 19 dB | 17 dB | 35 dB | 37 dB |
| DC Current | 96 mA | 96 mA | 53 mA | 53 mA | 106 mA | 149 mA |
| DC Voltage | 12 V DC, ± 0.5 V | | | | | |
| Temperature | -25 C to +75 C case temperature operating, -25 C to +90 C storage | | | | | |
| Temp Coeff - Gain | -0.003 dB/C | -0.002 dB/C | -0.002 dB/C | -0.004 dB/C | -0.007 dB/C | -0.01 dB/C |
| Temp Coeff - BW | -0.1%/C | -0.1%/C | -0.16%/C | -0.2%/C | -0.1%/C | -0.1%/C |
| Connectors | RF in and out = SMA jacks (f), DC in = solder pin | | | | | |
| Warranty | Static-sensitive devices. Limited 30-day warranty | | | | | |

Notes

[1] Parameters listed are typical values. Guaranteed at +12 V and 23 C only when max/min limits are given. [2] Gain, return loss, isolation, noise figure and max. power output all measured at 100 MHz. [3] Frequency response measured using a Wiltron 5447A, 10 MHz - 20 GHz network analyzer. [4] Time domain step responses measured with an HP-54121A, 20 GHz oscilloscope and 25 ps risetime test pulse. [5] PSPL does 100% QA testing on amplifiers. All amps are stored at -25 C and +90 C and then receive a minimum of 24 hours burn-in. QA tests include gain and noise figure at 100 MHz, S21 frequency response including -3 dB bandwidth, time domain pulse response risetime, overshoot, pulse fidelity and low frequency square wave response. All parameters measured with +12 V DC power at +23 C ambient temperature. [6] The Model 5830 is not recommended for new designs. The Model 5828 is an improved version of the 5830. [7] These specs are not valid for early serial numbers for dates prior to 6/99. They reflect the statistical performance of current production. [8] Static sensitive! Avoid static discharges. Do not exceed max. input limits.

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Mounting Instructions for Models 5828 and 5830



These amplifiers are not normally supplied with a mounting plate. If you desire to mount the amplifier permanently to some other object, it is necessary for you to purchase the optional mounting plate shown here as the dashed lines. This mounting plate must be ordered at the same time the amplifier is ordered. Order it as extra cost option, OPT-MP.

Heatsink and mounting Instructions for Models 5824, 5826, 5840 and 5850



These amplifiers are supplied attached to a heatsink. With the heatsink attached, the amplifiers can be used in an ambient temperature up to approximately 50 C in still air. These amplifiers can be mounted by removing the heatsink. The heatsink attachment holes can then be used as mounting holes for the amplifier. If the amplifier's heatsink is removed, it must be mounted to another surface that provides a low enough thermal impedance that the amplifier case will never exceed +75 C while in operation.

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