# MODEL 5840B
# ULTRA-BROADBAND AMPLIFIER
## PRODUCT SPECIFICATION

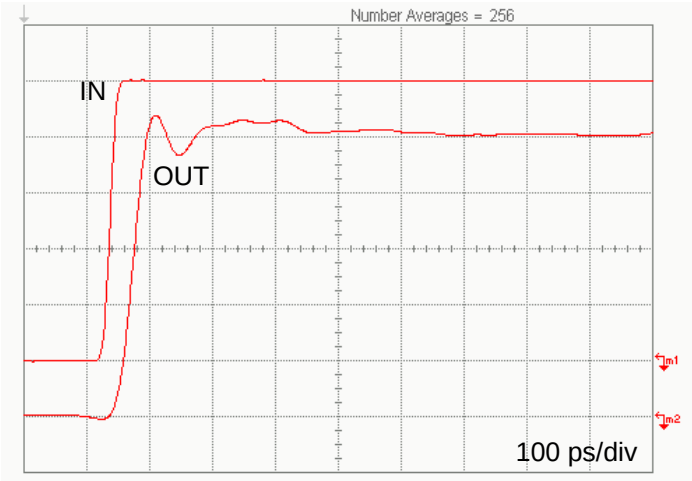
- **21 dB Gain**
- **32 ps Risetime**
- **13.5 GHz Bandwidth**
- **+12 dBm Max. Power Out**
- **5.8 dB Noise Figure**



This Ultra-Broadband Amplifier is an excellent choice for either pulse or RF applications. It offers a very attractive price/performance ratio. It is AC-coupled and extremely broadband, covering 5 ½ decades from 80 kHz to 13.5 GHz. It has a clean transient response and smooth gain vs. frequency response. This is a stable 50 Ω amplifier, and several can be connected in cascade for higher gains.

**Time Domain Pulse Response at 100 ps/div; Input is 20 ps Risetime**

**Time domain measurements were recorded using an Agilent 86100A Sampling Oscilloscope and 86109A 40GHz Plug-in.**




Input: Step from PSPL 4022
Responses normalized to 20 ps risetime

## Ordering Information

| Model Number | Description |
|---|---|
| 5840B-107 | SMA jack (f) – jack (f), solder pin on DC |

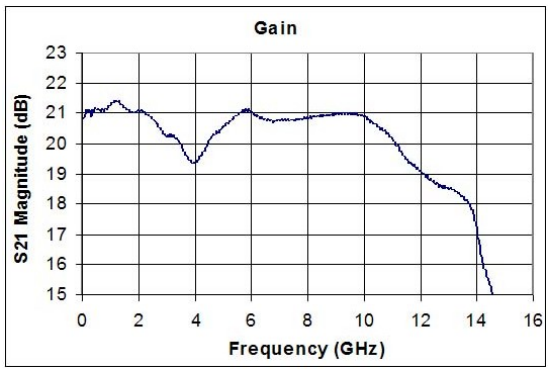
PICOSECOND PULSE LABS, P.O. BOX 44, BOULDER, CO 80306, USA, TEL: 1.303.443.1249, FAX: 1.303.447.2236
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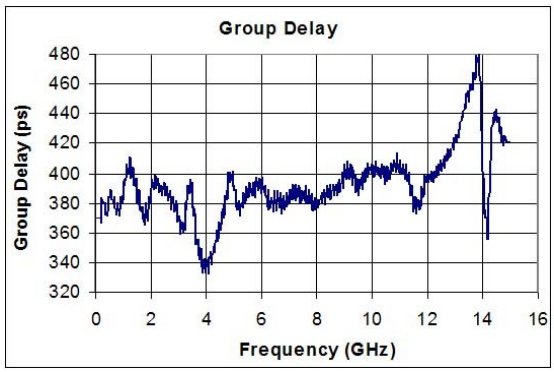
## Specifications

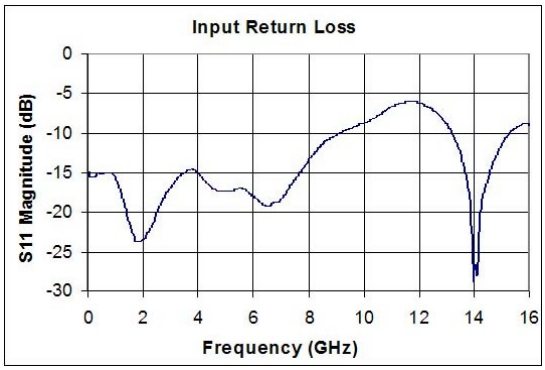
| | |
|---|---|
| **Gain**, $S_{21}$ (100 MHz)<br>min limit | 21 dB<br>20 dB min. |
| **Polarity** | Non-inverting |
| **Bandwidth** (-3 dB**) [3]**<br>min limit | 13.5 GHz<br>11.5 GHz min. |
| **Gain Flatness [3]** | ± 0.5 dB<br>f<2 GHz |
| **Low Frequency** (-3 dB) | 80 kHz |
| **Risetime** (10%-90%) **[4]** max. limit | 32 ps<br>34 ps max. |
| **Overshoot [4]**<br>max limit | 7%<br>8.5% max. |
| **Max. Power Out**<br>(-1 dB gain comp) | +12 dBm (100 MHz)<br>+14 dBm (5 GHz)<br>+11 dBm (10 GHz) |
| **Noise Figure** (100 MHz)<br>max limit | 5.8 dB<br>8 dB max. |
| **Effective Input RMS Noise Voltage** | 101 µV rms |
| **TDR Refl.** Input<br>output | ±1%<br>-9% |
| **Max. RF In** (cw)<br>or peak pulse | 0 dBm<br>315 mV |
| **Return Loss** $S_{11}$ input<br>(100 MHz) $S_{22}$ output | >16 dB<br>28 dB |
| **Isolation** $S_{12}$ (100 MHz) | 38 dB |
| **DC Current** | 106 mA |
| **DC Voltage** | 12 V DC, ± 0.5 V |
| **Temperature** | -25 C to +75 C case temperature operating,<br>-25 C to +90 C storage |
| **Temp Coeff - Gain** | -0.007 dB/C |
| **Temp Coeff - BW** | -0.1%/C |
| Connectors | RF in and out = SMA jacks (f), DC in = solder pin |
| **Warranty** | Static-sensitive devices. Limited 30-day warranty |

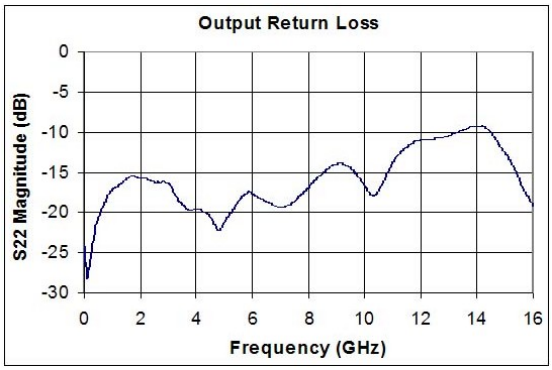
**Notes**

**[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 37369A 40 MHz – 40 GHz vector network analyzer.
**[4]** Time domain step responses measured with an Agilent 40 GHz oscilloscope and 20 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]** Static sensitive! Avoid static discharges. Do not exceed max. input limits.



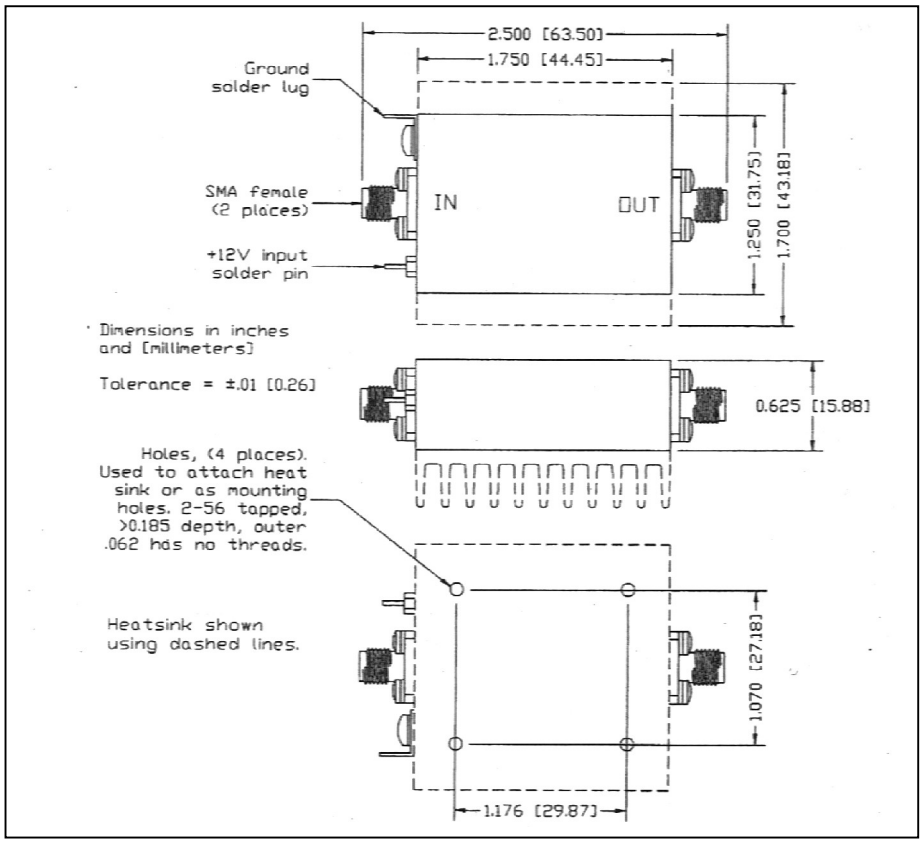




**Measured by a Wiltron 37369A vector network analyzer**

## Heatsink and Mounting Instructions




This amplifier is supplied attached to a heatsink. With the heatsink attached, the amplifier can be used in an ambient temperature up to approximately 50 C in still air. This amplifier 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.