

## Key PowerSensor+™ Specifications

10 MHz to 12.5 GHz

-55 dBm to +20 dBm

1.95% Total Error\*

1.20:1 VSWR

\* Measuring a well matched DUT (-20 dBm @ 1 GHz)

## Key PowerSensor+™ Capability

General purpose power and scalar measurements

## General Description

The LB559A is an easy to use high performance general purpose power meter and power sensor in one. It features high speed measurements and temperature compensated accuracy with superior in-class performance. The standard product can measure signals below -55 dBm.

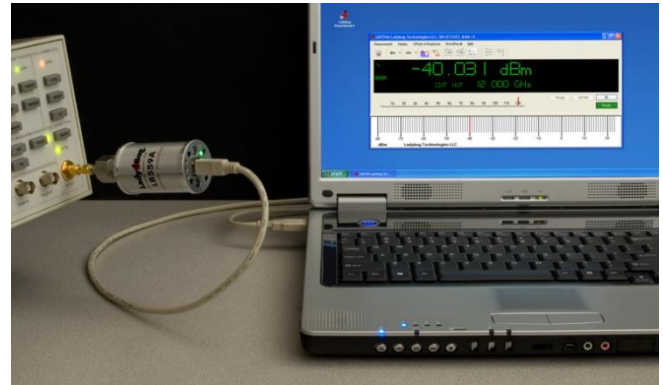
Get up and running quickly with the supplied power meter panels. Use the supplied drivers and programming examples for ATE applications. Easily integrate the power sensors into Lab View, C, VB and other programming environments.

Integration and usability are further simplified because calibration and zeroing are not required before use and, you have the flexibility of selecting from a variety of connector types including SMA, N, and TNC (male or female).

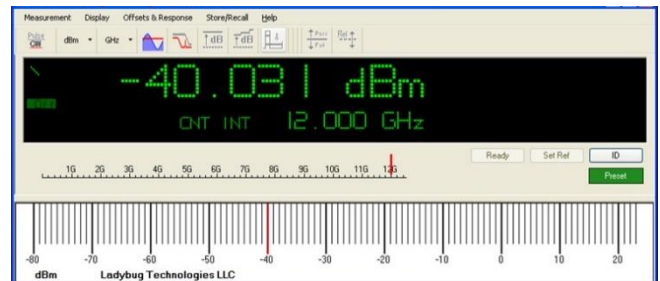
Order option 003 for triggering on the RF input level and general TTL triggering. Order option 001 recorder out when a slow moving (<3 Hz) analog output is required.

## Features

- Best in-class price
- Superior in-class performance
- Compact - 1/10 the volume of competitive sensors
- Ruggedized USB connector - does not fatigue or break like competitive sensors
- Trigger on the RF input level
- Fully calibrated over temperature
- Unlimited signal bandwidth measurements
- Offered with 30 day return policy

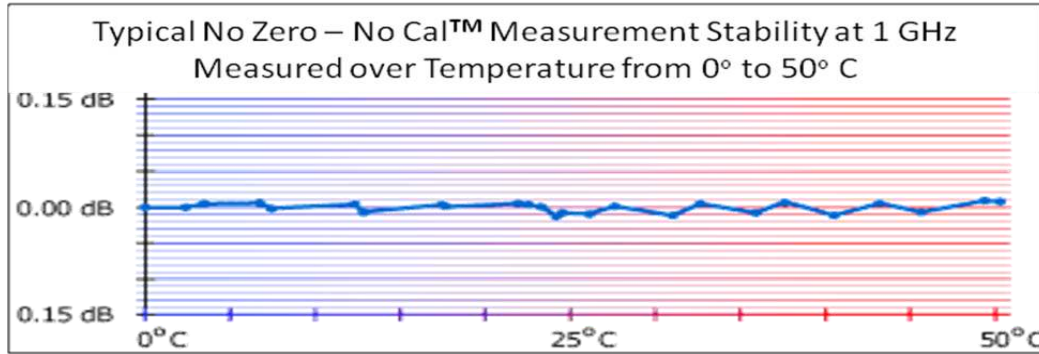


## Test Setup for One Sensor Measurements



## Power Meter Panel

- General purpose scalar measurements
- General average RF and microwave power measurements requiring leading edge accuracy:
  - CW & pulsed signals
  - Narrow and wide band signals: CDMA, W-CDMA, QAM, OFDM, GSM, TDMA, QPSK, FSK, AM, FM, etc.
  - Recorders, power monitoring and ALC loops
- Research & development and manufacturing
- Maintenance, repair, installation and service
- Communications
- Radar, wireless, satellite, radio links, etc.



**LB559A PowerSensor+™ Specifications**

Parameter	LB559A
<b>Frequency Range</b>	10 MHz to 12.5 GHz
<b>Dynamic Range</b>	
Standard	-55 dBm to +20 dBm
<b>Accuracy</b>	Total Error (RSS) = $\sqrt{(M^2 + CF^2 + L^2 + N^2 + T^2 + Z^2)}$ <i>Note 1</i>
<b>Calibration Factor</b>	NIST traceable
(Type N)	
10 MHz to 1 GHz	1.8%
1 GHz to 10 GHz	1.7%
10 GHz to 12.5 GHz	1.9%
(SMA)	
10 MHz to 1 GHz	2.5%
1 GHz to 10 GHz	2.4%
10 GHz to 12.5 GHz	2.7%
(3.5 mm)	
10 MHz to 1 GHz	2.5%
1 GHz to 10 GHz	2.4%
10 GHz to 12.5 GHz	2.7%
<b>Linearity</b> <i>Note 3</i>	
+15 to +20 dBm	3.0%
-15 to +15 dBm	2.5%
-55 to -15 dBm	2.0%
<b>Noise</b>	5 second integration
-30 to +20 dBm	0.10%
-40 to -30 dBm	0.25%
-50 to -40 dBm	0.50%
-55 to -50 dBm	1.00%
<b>Zero Offset</b> <i>Note 3</i>	$\{[(3.0 \text{ nW @ } 25^\circ\text{C}) +  \Delta T  \times (0.075 \text{ nW / } ^\circ\text{C})] \pm 0.01 \text{ nW / month}\}$ <i>Note 2</i>

**LB559A PowerSensor+™ Specifications (continued)**

Parameter	LB559A
<b>Match</b>	
(Type N)	
10 MHz to 1 GHz	1.20:1 VSWR (21 dB Return Loss)
1 GHz to 10 GHz	1.20:1 VSWR (21 dB Return Loss)
10 GHz to 12.5 GHz	1.29:1 VSWR (18 dB Return Loss)
(SMA)	
10 MHz to 1 GHz	1.20:1 VSWR (21 dB Return Loss)
1 GHz to 10 GHz	1.20:1 VSWR (21 dB Return Loss)
10 GHz to 12.5 GHz	1.29:1 VSWR (18 dB Return Loss)
(3.5 mm)	
10 MHz to 1 GHz	1.20:1 VSWR (21 dB Return Loss)
1 GHz to 10 GHz	1.20:1 VSWR (21 dB Return Loss)
10 GHz to 12.5 GHz	1.29:1 VSWR (18 dB Return Loss)
<b>Temperature (°C)</b>	
40 - 50	2.00%
30 - 40	0.75%
20 - 30	0.00%
10 - 20	0.75%
0 - 10	2.00%
<b>Maximum Average Power</b>	+20 dBm (100 mW)
Damage Level	+23 dBm (200 mW)
<b>Maximum Pulse Power</b>	+20 dBm (100 mW)
Damage Level	+23 dBm (200 mW)
<b>Video Bandwidth</b>	
Standard	100 Hz
<b>Time Base</b>	±50 ppm
<b>Measurements</b>	2000/second (100 settled measurements per second typical)
<b>Recommended Calibration Cycle</b>	1 year

**LB559A PowerSensor+™ Specifications (continued)**

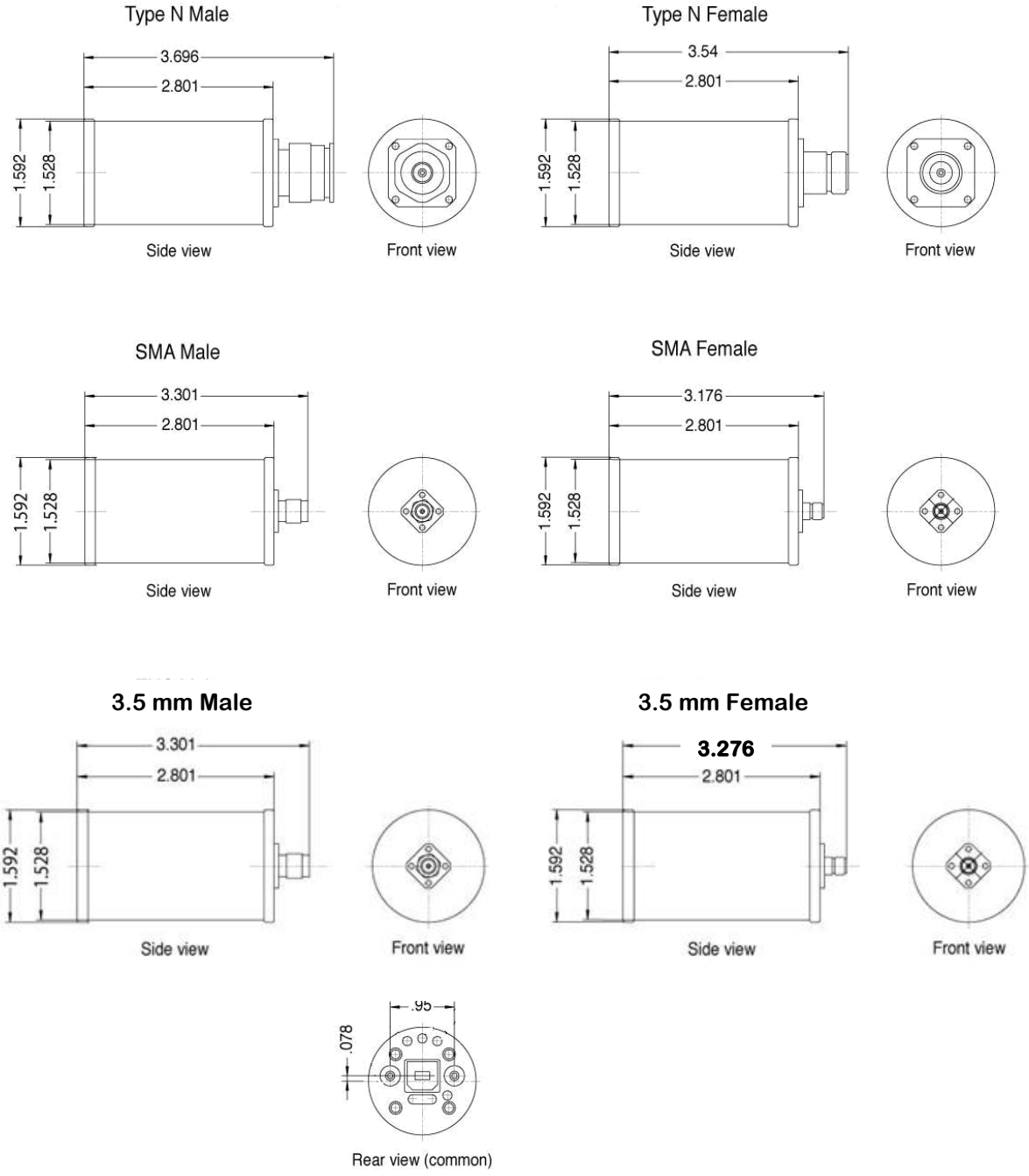
Parameter	LB559A
<b>Average Power Measurements</b>	Average Power, Duty Cycle-Computed Pulse Power, Data Logging
<b>Display &amp; Data Processing Capability</b>	Multiple sensors, displays, and traces
Scaling	Linear, dB
Memory	Unlimited
<b>Trigger</b>	Option 003
Resolution	2 us
Modes (GUI)	Single, Continuous
Source	External
Input	TTL compatible, rising or falling edge
V <sub>IH</sub> , minimum high-level input	2.0 V at +/- 10 uA
V <sub>IL</sub> , maximum low-level input	0.8 V at +/- 10 uA
Connector type	SMB male (shared with recorder output)
Absolute maximum levels	5.5 V maximum, -0.5 V minimum
Output	TTL compatible, rising or falling edge
V <sub>OH</sub> , minimum high-level output	4.6 V at 1 mA
V <sub>OL</sub> , maximum low-level output	0.8 V at -1 mA
Connector type	SMB male
Absolute maximum levels	5.5 V maximum, -0.5 V minimum
<b>Recorder Out</b>	Option 001
Range	
Operating	0 to 1 V typical
Maximum output	5 V, if in trigger mode (option 003)
Output impedance	1 K ohm typical
Sensitivity	
Scale	Linear or dB, factory default to Linear
Full Scale Value	User settable, factory default to Linear
Connector	SMB male (shared with trigger input)
<b>Environment, operating</b>	
Temperature	0 °C to 55 °C
Humidity	15% - 95% non-condensing
Altitude	10,000 feet (3,000 meters)
<b>Environment, storage</b>	
Temperature	-25 °C to 85 °C
Humidity	15% to 95% non-condensing
Altitude	50,000 feet (15,000 meters)
<b>Physical</b>	
Weight	4.4 oz (125 g), plus connector weight
Size	1.6" (40 mm) diameter by 2.80" (72 mm) long plus connector length

<sup>1</sup> Error term definitions: Mm (Mismatch); CF (Cal Factor); N (Noise); L (Linearity); T (Temperature); Z (Zero Offset). All error terms are converted to percentages for RSS calculation.

<sup>2</sup> Use the following formula to determine Zero Offset error (%):  $Z = (\text{Zero Offset Power} / \text{Measured Power})100$ .

<sup>3</sup> Linearity and Zero Offset are measured as a combined specification as LadyBug sensors require no meter zeroing or reference calibration before use.

**LB5XXA PowerSensor+ Outline Drawings**  
(dimensions are inches +/- 0.01)



**LB559A USB PowerSensor+™**  
Data Sheet



Revisions to data sheet by date:

03/19/09:

1. Accuracy updates: linearity, noise, temp; add zero offset.
2. Delete effective sample rate.
3. Add revision page.
4. Add mechanical outline drawings.

03/30/17:

Add data for 10-12.5 GHz

10/11/18:

Update specifications

07/20/2021

Correct page alignment