

LB559A USB PowerSensor+™

Data Sheet

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.

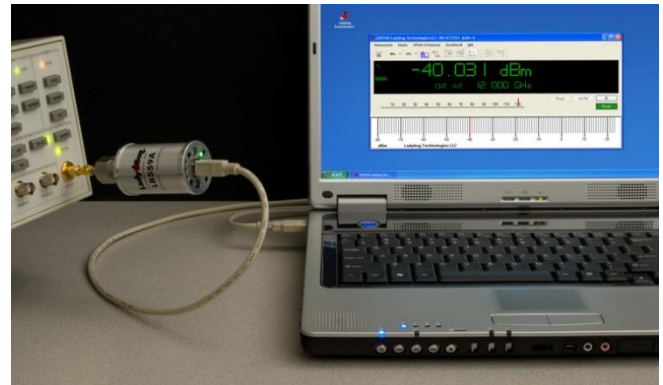
Get up and running quickly with the supplied power meter panels. Use the supplied drivers and programming examples for ATE applications. Easily integrate the power sensors into Lab View, C, VB and other programming environments.

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).

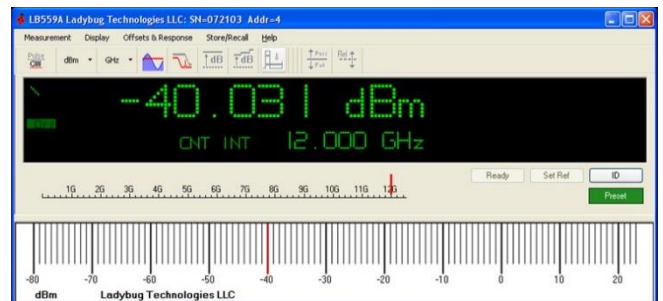
Order option 003 for triggering on the RF input level and general TTL triggering. Order option 001 recorder out when a slow moving (<3 Hz) analog output is required.

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



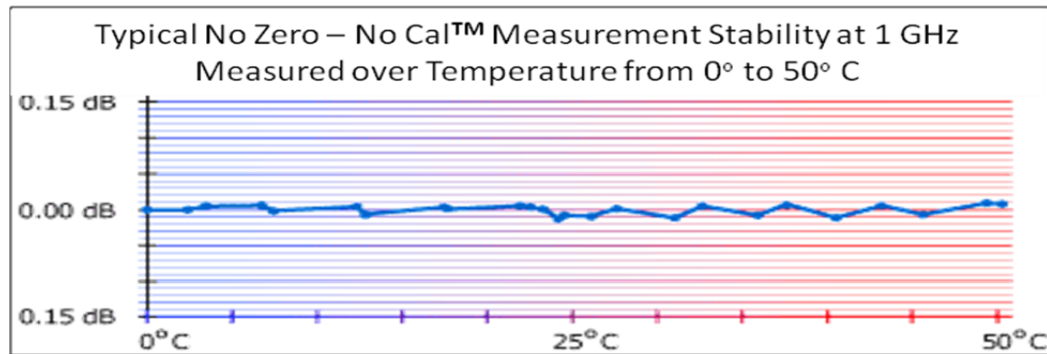
Power Meter Panel

Applications

- 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.

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Parameter	LB559A
Frequency Range	10 MHz to 12.5 GHz
Dynamic Range	
Standard	-55 dBm to +20 dBm
Accuracy	Total Error (RSS) = $\sqrt{(Mm^2 + CF^2 + L^2 + N^2 + T^2 + Z^2)}$ Note 1
Calibration Factor	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%
Linearity Note 3	
+15 to +20 dBm	3.0%
-15 to +15 dBm	2.5%
-55 to -15 dBm	2.0%
Noise	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%
Zero Offset Note 3	$\{(3.0 \text{ nW @ } 25^\circ\text{C}) + \Delta T \times (0.075 \text{ nW / } ^\circ\text{C})\} \pm 0.01 \text{ nW / month}$ Note 2

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LB559A PowerSensor+™ Specifications (continued)

Parameter	LB559A
Match	
(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)
Temperature (°C)	
40 - 50	2.00%
30 - 40	0.75%
20 - 30	0.00%
10 - 20	0.75%
0 - 10	2.00%
Maximum Average Power	+20 dBm (100 mW)
Damage Level	+23 dBm (200 mW)
Maximum Pulse Power	+20 dBm (100 mW)
Damage Level	+23 dBm (200 mW)
Video Bandwidth	
Standard	100 Hz
Time Base	±50 ppm
Measurements	2000/second (100 settled measurements per second typical)
Recommended Calibration Cycle	1 year

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LB559A PowerSensor+™ Specifications (continued)

Parameter	LB559A
Average Power Measurements	Average Power, Duty Cycle-Computed Pulse Power, Data Logging
Display & Data Processing Capability	Multiple sensors, displays, and traces
Scaling	Linear, dB
Memory	Unlimited
Trigger	Option 003
Resolution	2 us
Modes (GUI)	Single, Continuous
Source	External
Input	TTL compatible, rising or falling edge
V _{IH} , minimum high-level input	2.0 V at +/- 10 uA
V _{IL} , 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 _{OH} , minimum high-level output	4.6 V at 1 mA
V _{OL} , 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
Recorder Out	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)
Environment, operating	
Temperature	0 °C to 55 °C
Humidity	15% - 95% non-condensing
Altitude	10,000 feet (3,000 meters)
Environment, storage	
Temperature	-25 °C to 85 °C
Humidity	15% to 95% non-condensing
Altitude	50,000 feet (15,000 meters)
Physical	
Weight	4.4 oz (125 g), plus connector weight
Size	1.6" (40 mm) diameter by 2.80" (72 mm) long plus connector length

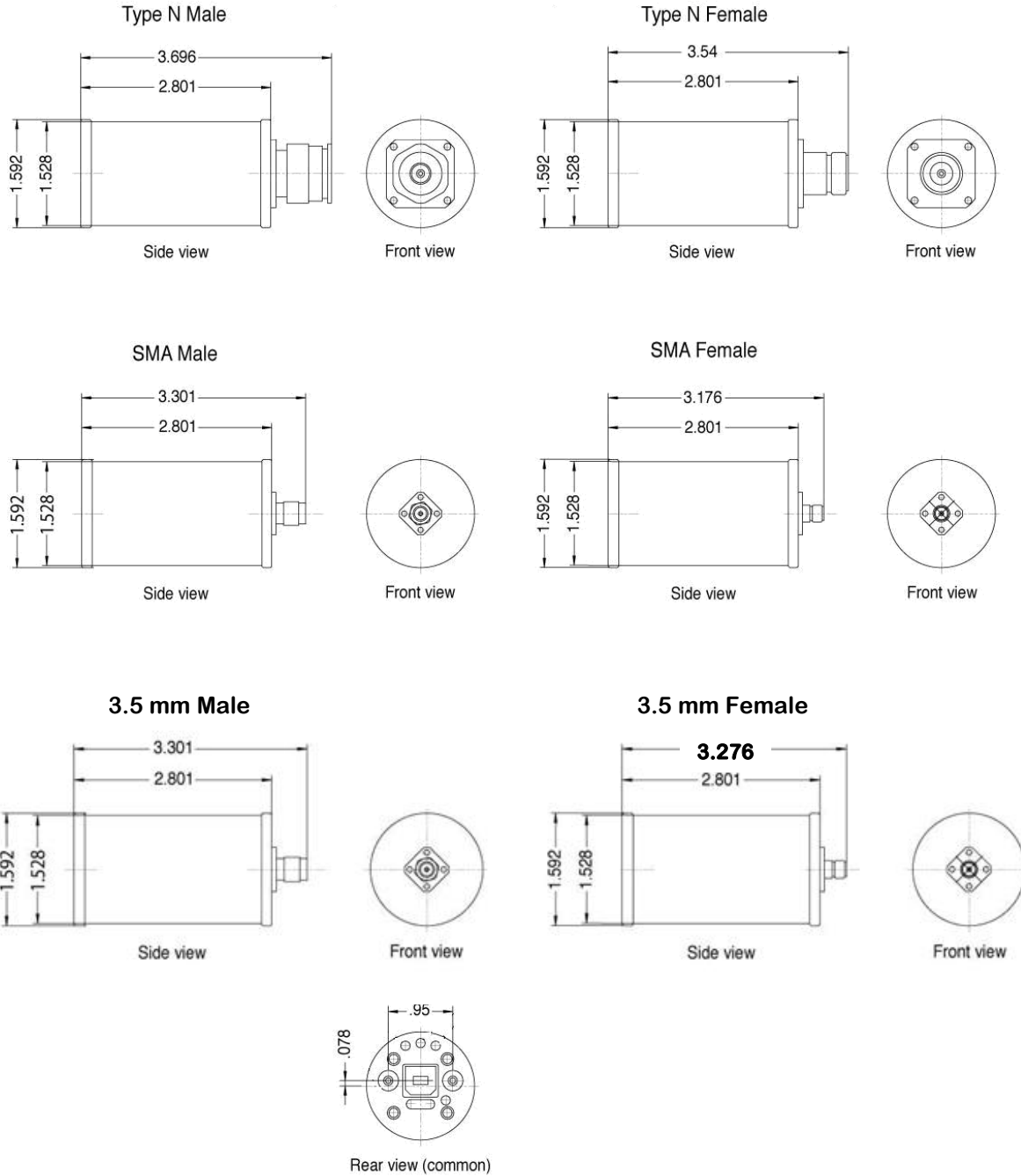
¹ Error term definitions: Mm (Mismatch); CF (Cal Factor); N (Noise); L (Linearity); T (Temperature); Z (Zero Offset). All error terms are converted to percentages for RSS calculation.

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

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

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



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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