

USB Smart Power Sensor

PWR-8FS

50Ω -30 dBm to +20 dBm, 1 MHz to 8000 MHz

The Big Deal

- Fast measurement speed, 10 msec
- USB HID device compatible with 32/64 Bit operating systems
- Includes “Measurement Application” GUI (Graphical User Interface) software with an API-DLL com object
- High speed measurement capability



CASE STYLE: JL1504

Product Overview

The Mini-Circuits PWR-8FS Smart Power Sensor is a pocket-sized, 4.89” x 1.74” x 0.95”, precision test USB HID device (no driver installation required) that turns a Windows® or Linux® PC into a power meter. All specifications provided in the data sheet apply to continuous wave (CW) signals. Each unit is shipped with our N-to-SMA adapter and a quick-locking USB cable for reliable connectivity. Native software and detailed user guides are available for download from <http://www.minicircuits.com/softwaredownload/pm.html> anywhere an internet connection is available, providing a full range of data analysis options.

Key Features

Feature	Advantages
Fast measurement speed (10 msec typical)	Reduces the time needed to perform measurements, and allows the power sensor to be included in fast automated test setups.
USB HID (Human Interface Device)	Plug-and-Play (no need to install driver for the device).
GUI Measurement Application Software built-in	Enables the user to perform measurements on RF components such as Couplers, Filters, Amplifiers etc. and displays numerical data and graphs.
32/64 Bit operating systems	Compatible with Windows® and Linux® operating systems.
No calibration required before taking measurement	The PWR-8FS does not require any reference signal for calibration.

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Wide Dynamic Range

USB Smart Power Sensor

PWR-8FS

50Ω 1 MHz to 8000 MHz

Product Features

- Wide bandwidth, 1 to 8000 MHz
- 50 dB Dynamic Range, -30 to +20 dBm
- Good VSWR, 1.1:1 typ.
- Fast measurement speed, 10 msec typ.
- Automatic frequency calibration & temperature compensation
- Multi-sensor capability (up to 24)
- Built in Application Measurement Software
- Remote operation via internet
- Effective, easy-to-use Windows® GUI
- Compatible with 32/64-bit Windows® or Linux® operating systems
- Supports a wide range of programming environments (See application note [AN-49-001](#) for details)
- CE Compliant



Case Style: JL1504

Model No.	Description
PWR-8FS	USB smart Power Sensor
Included Accessories	
PWR-SEN-8FS	Power Sensor Head
USB-CBL+	Data cable (USB Type-A plug)
NF-SM50+	N-Type (F) to SMA(M) Adapter

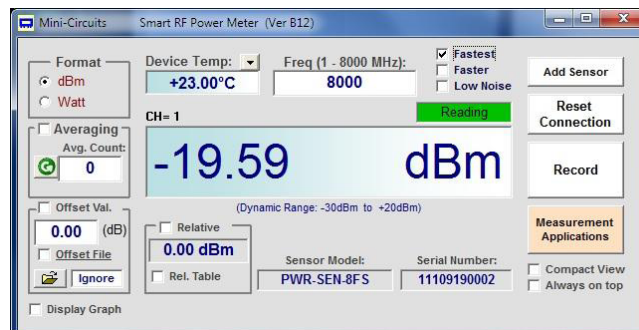
Typical Applications

- Turn almost any Windows or Linux PC into a Power Meter
- Pocket-sized portability for benchtop testing anywhere
- Remote location monitoring
- Automatic, scheduled data collection
- Evaluate high-power, multi-port devices with built-in virtual couplers/attenuators & other software tools

RoHS Compliant

See our web site for RoHS Compliance methodologies and qualifications

Mini-Circuits Power Meter Program for Smart USB Power Sensor



Electrical Specifications (CW)¹, -30 dBm to +20 dBm, 1 to 8000 MHz

Parameter		Freq. Range (MHz)	Min.	Typ.	Max.	Units
Dynamic Range ²		1 - 8000	-30	-	+20	dBm
VSWR		1 - 8000	-	1.1	1.3	:1
Uncertainty of Power Measurement @ 25°C	@ -30 to -20 dBm Low noise mode ^{3,4}	1 - 3000	-	± 0.10	± 0.30	dB
		3000 - 8000	-	± 0.15	± 0.40	dB
	@ -20 to +5 dBm Low noise/Faster/Fastest modes	1 - 3000	-	± 0.10 / ± 0.10 / ± 0.10	± 0.30 / ± 0.30 / ± 0.35	dB
		3000 - 8000	-	± 0.15 / ± 0.15 / ± 0.15	± 0.40 / ± 0.40 / ± 0.50	dB
	@ +5 to +15 dBm Low noise/Faster/Fastest modes	1 - 3000	-	± 0.15 / ± 0.15 / ± 0.15	± 0.30 / ± 0.35 / ± 0.35	dB
		3000 - 8000	-	± 0.15 / ± 0.15 / ± 0.15	± 0.40 / ± 0.40 / ± 0.40	dB
	@ +15 to +20 dBm Low noise/Faster/Fastest modes	1 - 3000	-	± 0.15 / ± 0.15 / ± 0.15	± 0.40 / ± 0.40 / ± 0.40	dB
		3000 - 8000	-	± 0.20 / ± 0.20 / ± 0.20	± 0.45 / ± 0.50 / ± 0.50	dB
Uncertainty of Power Measurement @ 0°C to 50°C	@ -30 to -20 dBm Low noise mode ^{3,4}	1 - 3000	-	± 0.20	-	dB
		3000 - 8000	-	± 0.20	-	dB
	@ -20 to +5 dBm Low noise/Faster/Fastest modes	1 - 3000	-	± 0.20 / ± 0.20 / ± 0.20	-	dB
		3000 - 8000	-	± 0.20 / ± 0.20 / ± 0.20	-	dB
	@ +5 to +15 dBm Low noise/Faster/Fastest modes	1 - 3000	-	± 0.20 / ± 0.20 / ± 0.20	-	dB
		3000 - 8000	-	± 0.20 / ± 0.20 / ± 0.20	-	dB
	@ +15 to +20 dBm Low noise/Faster/Fastest modes	1 - 3000	-	± 0.20 / ± 0.20 / ± 0.25	-	dB
		3000 - 8000	-	± 0.20 / ± 0.20 / ± 0.25	-	dB
Linearity @ 25°C, Low noise mode		1 - 8000	-	± 3.0	-	%
Measurement Resolution		1 - 8000	0.01	-	-	dB
Averaging Range		1 - 8000	1	-	999	-
Measurement Speed	@ Low Noise Mode	1 - 8000	-	100	-	msec
	@ Faster Mode		-	30	-	
	@ Fastest Mode		-	10	-	
Current (via host USB)		1 - 8000	-	40	70	mA

Minimum System Requirements

Parameter	Requirements
Interface	USB HID
Host operating system	Windows 32/64 Bit operating system: Windows 98®, Windows XP®, Windows Vista®, Windows 7®, Windows 8®, Windows 10® Linux® support: 32/64 Bit operating system
Hardware	Pentium® II or higher, RAM 256 Mb, USB port
Control cable (supplied)	Power sensor to be used with the supplied control cable only

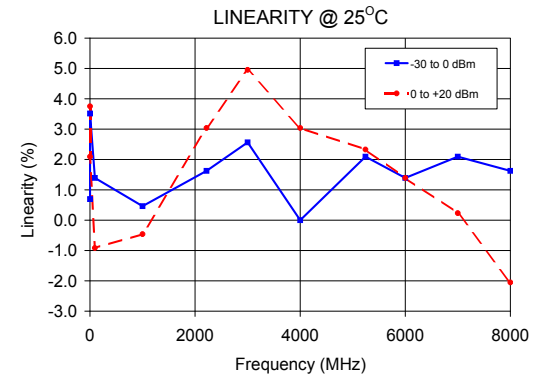
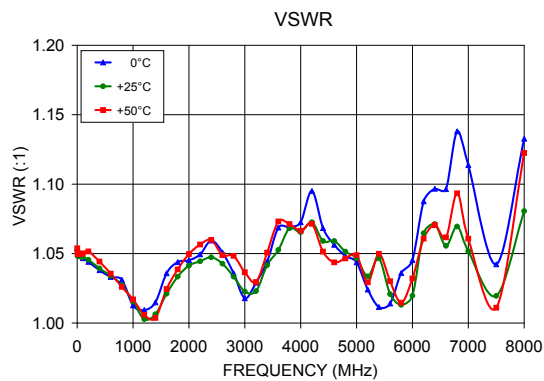
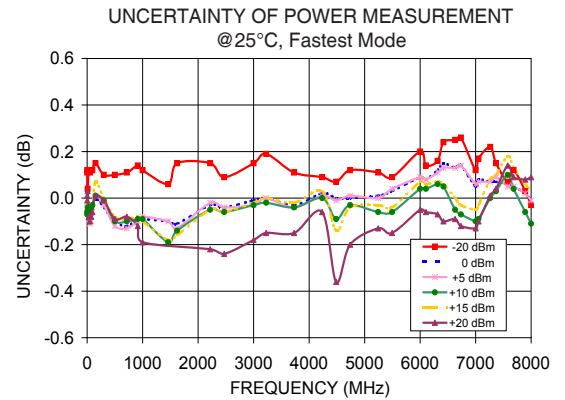
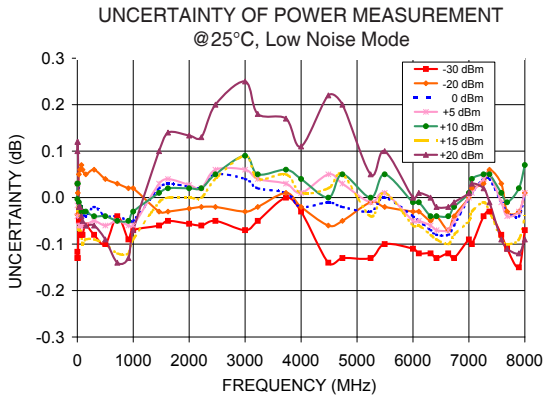
Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	0°C to 50°C
Storage Temperature	-30°C to 70°C
DC Voltage at RF port	15V
CW Power	+27dBm

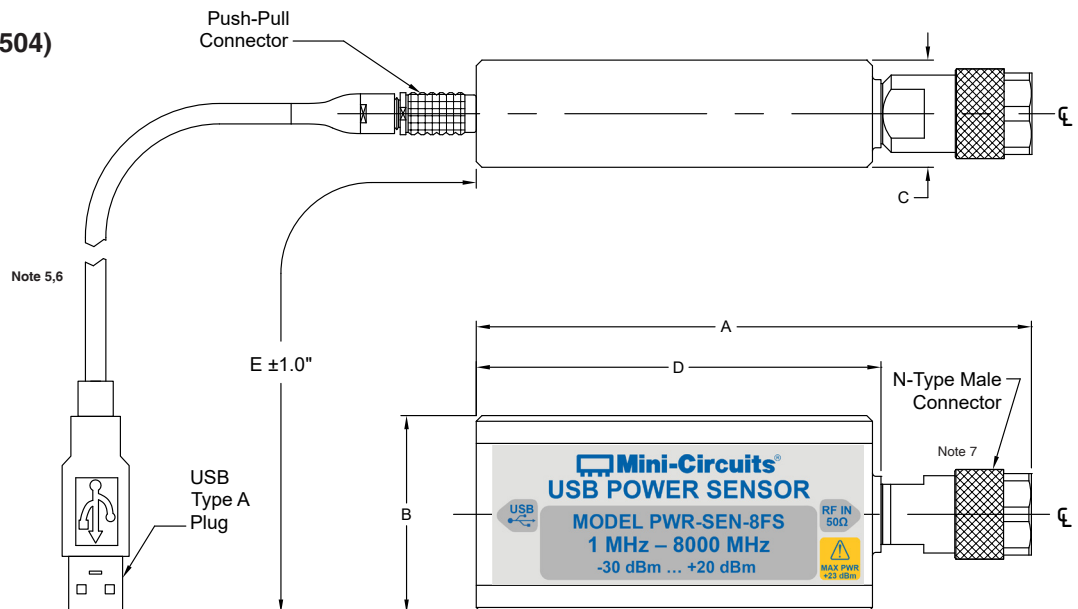
Permanent damage may occur if any of these limits are exceeded. Operating in the range between operating power limits and absolute maximum ratings for extended periods of time may result in reduced life and reliability.

- ¹ All specifications apply to continuous wave (CW) signals.
- ² Maximum continuous safe operational power limit: +23 dBm. Performance is guaranteed up to +20 dBm.
- ³ When using Faster mode at high frequencies below -20dBm, use of averaging is recommended to prevent noise errors.
- ⁴ When using Faster mode below -20dBm, accuracy value may increase by up to 0.2 dB relative to Low noise mode

Typical Performance Curves



Outline Drawing (JL1504)



Outline Dimensions (inch/mm)

A	B	C	D	E	WT. GRAMS
4.89	1.74	.95	3.50	81.9	250
124.2	44.2	24.1	88.9	2080	




⁵ Power sensor to be used with the supplied control cable only.

⁶ Length shown for USB-CBL+. USB-CBL-2+ length is :15.2 in / 385 mm

⁷ Maximum torque 8 in-lb (90 N-cm).

Ordering Information

Model	Description
PWR-8FS	USB Smart Power Sensor

Included Accessories	Part No.	Description
	PWR-8FS	Power Sensor Head
	USB-CBL+ ⁸	6.6 ft data cable with USB Type-A plug connector
	NF-SM50+	N-Type Female to SMA Male Adapter.

⁸ Power Sensor to be used with the supplied control cable only.

Optional Accessories	Description
PWR-SEN-CD ⁹	Software CD
USB-CBL+ (spare)	6.6 ft data cable with USB Type-A plug connector
USB-CBL-2+	15 in data cable with USB Type-A plug connector
NF-SM50+ (spare)	N-Type Female to SMA Male Adapter
NF-SF50+	N-Type Female to SMA Female Adapter
NF-BM50+	N-Type Female to BNC Male Adapter

⁹ To receive the CD at no extra cost, request when placing order. CD contents can be downloaded from Mini-Circuits website at <http://www.minicircuits.com/softwaredownload/pm.html>

Calibration	Description
CALSEN-PWR-8FS	Calibration Service Click Here

Additional Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp