DATA SHEET

U8480 Series
USB Thermocouple Power Sensors

DC/10 MHz to 18/33/50/67/120 GHz



KEYSIGHT TECHNOLOGIES

Improve your Power Measurement Throughput

Improve your power measurement throughput with the world's fastest USB thermocouple power sensors. The Keysight Technologies, Inc. U8480 Series USB thermocouple power sensors come with a measurement speed of 900 readings/second and power linearity of less than 0.8%, providing high accuracy and stability to help you make average power measurements quickly and confidently. With the U8480 Series USB sensors, one of the most cost-effective solutions in Keysight's power meter and sensor portfolio, you get top performance features at costs so affordable that every engineer can carry one in their bags.

Broad frequency coverage from DC to 120 GHz

Keysight's first power sensor with the capability to measure down to DC cover various test applications and can be used for broadband applications up to 120 GHz without the change of power sensors.

- U8481A DC/10 MHz to 18 GHz
- U8485A DC/10 MHz to 33 GHz
- U8487A DC/10 MHz to 50 GHz
- U8488A DC/10 MHz to 67 GHz
- U8489A DC to 120 GHz

Built-in trigger in function

Synchronize your measurement capture with the built-in trigger in function, without the need of an external module. The trigger-in function allows you to connect an external trigger signal from a signal source or the device-under-test directly to the USB sensor through a standard BNC to SMB cable.



The external trigger input port on the U8481A.

Internal calibration

Save time and reduce measurement uncertainty with the internal calibration function. These sensors come with technology that integrates a DC reference source and switching circuits into the body of the sensor so you can calibrate the sensor while it is connected to a device-under-test. This feature removes the need for connection and disconnection from an external calibration source, speeding up testing and reducing connector wear and tear. To perform zeroing, simply turn off the device-under-test.

Legacy excellence in a compact and portable form factor

The U8480 Series is based on the same front-end design as the Keysight 8480 and N8480 Series power sensors, now equipped with USB capabilities and improved specifications such as a measurement speed ten times faster than the legacy series.

The U8480 Series plugs directly into your PC or USB-enabled Keysight instrument and gives you the capability to measure power without needing an external power meter or power supply. The sensors draw power directly from a USB port and do not need additional triggering modules to operate.

The U8480 Series is supported by the Keysight BenchVue software and BV0007B power meter/sensor control and analysis app. Once you plug the USB power sensor into a PC and run the software you can see measurement results in a wide array of display formats and log data without any programming.

For more information: www.keysight.com/find/BenchVue



The U8480 Series fits easily in your bag, making the sensors ideal solutions for field applications such as base station testing.

Fast measurement speed

The U8480 Series USB thermocouple power sensors offer a measurement speed of 900 readings/second (in fast mode), making them the world's fastest USB thermocouple power sensors. This feature is especially important in high volume manufacturing, where fast measurement speed is essential to maximize production throughput and increase productivity. By increasing the speed of measurements, test engineers can shorten the design cycle and accelerate the product time-to-market as they would require less time to carry out the same number of tests.

Real time measurement uncertainty

Measurement uncertainty is normally calculated manually by the user. The U8480 Series USB thermocouple power sensors now compute this value in real time and at any given point, removing the need for manual MU calculations, shortening test time, and providing highly accurate measurements. Users can also display power measurements and their measurement uncertainty simultaneously.

Gamma correction

In an ideal measurement scenario, the reference impedance of the power sensor and device-under-test (DUT) impedance should equal the reference impedance (Z0); however, this is rarely the case in practice. The mismatch in impedance values results in a portion of the signal voltage being reflected, and this reflection is quantified by the reflection coefficient, gamma.

Using the gamma correction function, users can simply input the DUT's gamma into the USB power sensor using SCPI commands or BenchVue BV0007B power meter/sensor control and analysis app. This will remove the mismatch error, yielding more accurate measurements.

S-parameter correction

Additional errors are often caused by components that are inserted between the DUT and the power sensor, such as in base station testing where a high power attenuator is connected between the sensor and base station to reduce the output power to the measurable power range of the sensor.

The S-parameters of these components can be obtained with a vector network analyzer in the touchstone format, and inputted into the sensor using SCPI commands or BenchVue BV0007B power meter/sensor control and analysis app. This error can now be corrected using the U8480 Series USB power sensor's S-parameter correction function. The sensor will behave as though it is connected directly to the DUT, giving users highly accurate power measurements.

Compatibility with other Keysight instruments

The U8480 Series, like all other Keysight USB power sensors, can be used as an accessory for other Keysight instruments, allowing these instruments to perform specific power measurement applications without needing to connect to a PC or laptop.

The U8480 Series power sensors are compatible with the Keysight FieldFox RF analyzers and MXG signal generator, giving them power meter functionalities, and with the MXG signal generator, user flatness correction (UFC) with external leveling as well. The U8480 Series also performs source power calibration with the Keysight PNA, PNA-L and PNA-X network analyzers. Please refer to the application note, Compatibility of USB Power Sensors with Keysight Instruments (5989-8743EN) for the latest compatibility information.

Firmware upgrade

The latest firmware for the U8480 Series includes executable file and help file for installing the Firmware Upgrade Utility application to upgrade the USB thermocouple power sensors. To download the latest firmware version for the U8480 Series, visit: www.keysight.com/find/pm_firmware

Performance Specifications

Specification definitions

There are two types of product specifications:

- Warranted specifications are specifications which are covered by the product warranty and apply over a range of 0 to 55 °C unless otherwise noted. Warranted specifications include measurement uncertainty calculated with a 95% confidence
- Characteristic specifications are specifications that are not warranted. They describe product performance that is useful in the application of the product. These characteristic specifications are shown in italics.

Characteristic information is representative of the product. In many cases, it may also be supplemental to a warranted specification. Characteristics specifications are not verified on all units. There are several types of characteristic specifications. They can be divided into two groups.

One group of characteristic types describes ‘attributes’ common to all products of a given model or option. Examples of characteristics that describe ‘attributes’ are the product weight and ’50-Ω input Type-N connector’. In these examples, product weight is an ‘approximate’ value and a 50-Ω input is ‘nominal’. These two terms are most widely used when describing a product’s ‘attributes’.

The second group describes ‘statistically’ the aggregate performance of the population of products. These characteristics describe the expected behavior of the population of products. They do not guarantee the performance of any individual product. No measurement uncertainty value is accounted for in the specification. These specifications are referred to as ‘typical’.

Conditions

For optimum performance aligned with its specification, use a power sensor.

- Stored for a minimum of two hours at a stable temperature within the operating temperature range, and turned on for at least 30 minutes
- Calibrated within its recommended calibration period, and
- In accordance to the information provided in the User’s Guide.

U8480 Series USB Power Sensors Specifications

Key specifications		
Frequency range	U8481A Option 100	10 MHz to 18 GHz
	U8481A Option 200	DC to 18 GHz
	U8485A Option 100	10 MHz to 33 GHz
	U8485A Option 200	DC to 33 GHz
	U8487A Option 100	10 MHz to 50 GHz
	U8487A Option 200	DC to 50 GHz
	U8488A Option 100	10 MHz to 67 GHz *67 GHz to 70 GHz*
	U8488A Option 200	DC to 67 GHz *67 GHz to 70 GHz*
	U8489A Option 200	DC to 120 GHz
Power range	–35 dBm to 20 dBm	
Power linearity[1]	≤+15 dBm	± 0.50% (25 °C ± 10 °C)
		± 0.55% (0 to 55 °C)
	>+15 to +20 dBm	± 0.55% (25 °C ± 10 °C)
		± 0.60% (0 to 55 °C)
Zero set (20% to 70% RH)[2]	± 25 nW[3] ± 35nW[3] (U8489A)	
Internal calibration accuracy[4]	± 0.52% (25 ± 10 °C)	
	± 0.59% (0 to 55 °C)	
Zeroing duration	16 s	
Internal calibration duration	1.5 s	
External calibration duration	9 s	
Damage level	AC coupled (option 100)	*25 dBm (average power), 50 V (DC)* *15 W (2 µs duration) (peak power)*
	DC coupled (option 200)	*25 dBm (average power), 4 V (DC)* *15 W (2 µs duration) (peak power)*

1. After zeroing and calibration at room temperature. Power Linearity is negligible below -1 dBm. Linearity specifications do not include zero set, zero noise or measurement noise that dominantly contribute to the measurement uncertainty at the power levels within 10 dB of the lowest measurable power. Typical performance is given in Figure 1.
2. RH is the abbreviation for relative humidity.
3. Tested at 50 MHz. After the sensor has been turned on for a minimum of 1 hour. Number of averages at 256.
4. The U8480 Series is equipped with an internal calibration capability, which means that it does not require a 1 mW power reference for calibration. This specification applies for the 50 MHz frequency.

Power Linearity

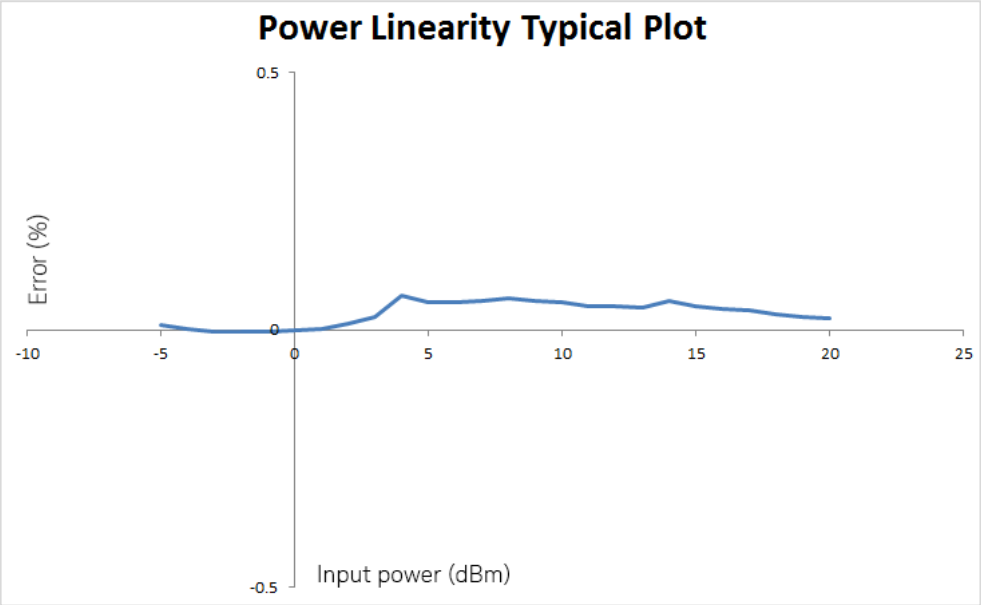


Figure 1. Typical U8480 Series power linearity at 25 °C with measurement uncertainty of ± 0.21%

Maximum SWR

Frequency band	U8481A		Frequency band	U8485A	
	25 °C ± 10 °C	0 °C to 55 °C		25 °C ± 10 °C	0 °C to 55 °C
DC to < 10 MHz[1]	1.11	1.14	DC to < 10 MHz[1]	1.07	1.07
10 MHz to 30 MHz	1.37	1.57	10 MHz to 50 MHz	1.33	1.53
>30 MHz to 50 MHz	1.14	1.16	>50 MHz to 100 MHz	1.08	1.11
>50 MHz to 2 GHz	1.08	1.11	>100 MHz to 2 GHz	1.05	1.07
>2 GHz to 12.4 GHz	1.16	1.16	>2 GHz to 12.4 GHz	1.14	1.14
>12.4 GHz to 18 GHz	1.23	1.25	>12.4 GHz to 18 GHz	1.19	1.20
—	—	—	>18 GHz to 26.5 GHz	1.26	1.28
—	—	—	>26.5 GHz to 33 GHz	1.37	1.45

1. Only applicable for Option 200

Frequency band	U8487A		Frequency band	U8488A	
	25 °C ± 10 °C	0 °C to 55 °C		25 °C ± 10 °C	0 °C to 55 °C
DC to < 10 MHz[1]	1.05	1.05	DC to < 10 MHz[1]	1.06	1.17
10 MHz to 50 MHz	1.35	1.64	10 MHz to 100 MHz	1.06	1.06
>50 MHz to 100 MHz	1.08	1.10	>100 MHz to 2.4 GHz	1.06	1.07
>100 MHz to 2 GHz	1.05	1.07	>2.4 GHz to 12.4 GHz	1.13	1.14
>2 GHz 12.4 GHz	1.10	1.10	>12.4 GHz to 18 GHz	1.14	1.14
>12.4 GHz to 18 GHz	1.16	1.16	>18 GHz to 26.5 GHz	1.20	1.20
>18 GHz to 26.5 GHz	1.22	1.22	>26.5 GHz to 40 GHz	1.25	1.25
>26.5 GHz to 40 GHz	1.30	1.30	>40 GHz to 67 GHz	1.42	1.43
>40 GHz to 50 GHz	1.34	1.33	*>67 GHz to 70 GHz*	*1.36*	*1.41*

Frequency band	U8489A	
	25 °C ± 10 °C	0 °C to 55 °C
DC to < 10 MHz	1.02	1.03
10 MHz to 100 MHz	1.02	1.02
>100 MHz to 2 GHz	1.05	1.05
>2 GHz to 12.4 GHz	1.10	1.10
>12.4 GHz to 18 GHz	1.11	1.12
>18 GHz to 26. 5 GHz	1.14	1.14
>26.5 GHz to 40 GHz	1.21	1.21
>40 GHz to 67 GHz	1.42	1.41
>67 GHz to 80 GHz	1.49	1.50
>80 GHz to 95 GHz	1.57	1.58
>95 GHz to 110 GHz	1.73	1.74
>110 GHz to 120 GHz	1.76	1.77
>120 GHz to 125 GHz	*1.71*	*1.72*

Zero drift and measurement noise

Conditions (RH)[2]	Zero drift[3, 4]	Measurement noise[3, 5]
up to 70%	*± 5.5 nW*	*± 45 nW*

1. Only applicable for Option 200
2. RH is the abbreviation for relative humidity.
3. Zero drift and measurement noise specifications are tested at 50 MHz.
4. Within 1 hour of warm up and after zeroing, at a constant temperature, taken over a period of 4 hours of the total measurement time. This drift is calculated based on the average of hourly drifts.
5. The number of averages at 16 for the normal mode, 32 for the ×2 mode, and 512 for the fast mode, at a constant temperature, measured over a 1-minute interval and two standard deviations.

Noise multiplier

Number of averages	1	2	4	8	16	32	64	128	256	512	1024
Normal mode	*3.17*	*2.62*	*2.02*	*1.54*	*1.00*	*0.82*	*0.60*	*0.50*	*0.37*	*0.27*	*0.15*
×2 mode	*4.55*	*3.76*	*3.00*	*2.25*	*1.59*	*1.00*	*0.85*	*0.63*	*0.47*	*0.42*	*0.23*
Fast mode	*46.88*	*33.06*	*24.00*	*17.19*	*12.24*	*8.39*	*4.93*	*4.11*	*2.48*	*1.00*	*0.83*

Measurement rate

Measurement speed mode	Measurement speed
Normal	*20 readings/s*
Double	*40 readings/s*
Fast[1]	*900 readings/s*[2]

1. To reduce sensor-dependent delay time, use the measurement buffer by setting the trigger count > 1.
2. The measurement is taken with the averaging state set to off.

Settling time

Number of averages	1	2	4	8	16	32	64	128	256	512	1024
Settling time(s) (Normal mode)[1]	*0.10*	*0.15*	*0.25*	*0.45*	*0.85*	*1.63*	*3.20*	*6.36*	*12.6*	*25.2*	*50.4*
Settling time(s) (×2 mode)[1]	*0.08*	*0.10*	*0.15*	*0.25*	*0.45*	*0.89*	*1.63*	*3.20*	*6.35*	*12.6*	*25.2*
Settling time(s) (Fast mode)[1,2]	*0.003*	*0.005*	*0.007*	*0.011*	*0.020*	*0.036*	*0.069*	*0.134*	*0.265*	*0.528*	*1.053*

1. Manual filter, 10 dB decreasing power step.
2. Noise measurement in fast mode fluctuates at lower power. Although the averaging count (filter) is initially set to 256, if any of the 256 measurement samples taken are higher than –30 dBm, the firmware automatically changes the averaging count to 128.

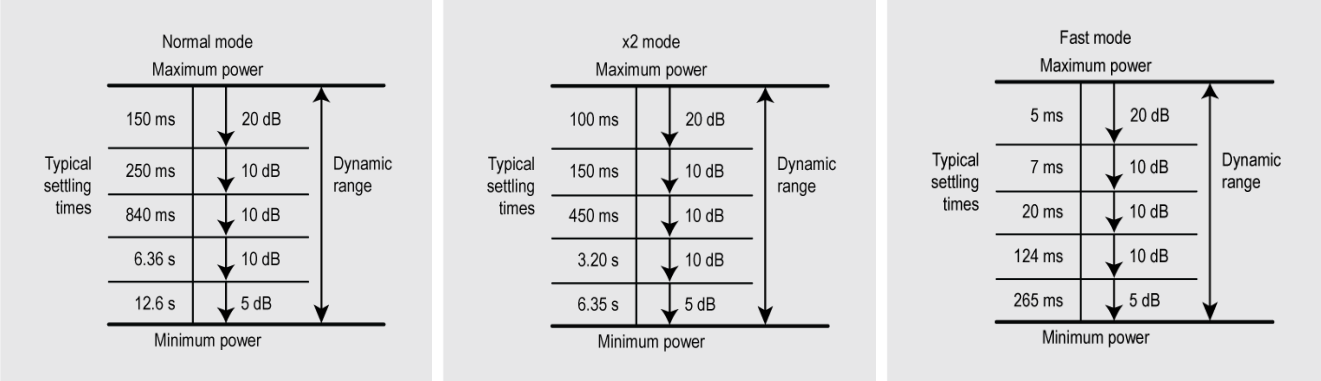


Figure 8. Auto-filter, default resolution, 10 dB decreasing power step

Calibration factor (CF) relative uncertainty[1]

Maximum relative uncertainties of the CF data are listed in the following table. The uncertainty analysis for the calibration data was done in accordance with the ISO Guide. The uncertainty data reported on the calibration certificate is the expanded uncertainty with a 95% confidence level and a coverage factor of 2.

Note: The CF uncertainty is dependent on the calibration standard's uncertainty provided by Calibration Labs. For the exact uncertainty, refer to the individual sensor calibration report.

U8481A frequency band	25 °C ± 3 °C	25 °C ± 10 °C	0 °C to 55 °C
DC to < 10 MHz[2]	1.57%	2.24%	2.38%
10 MHz to 30 MHz	1.00%	1.20%	2.30%
>30 MHz to 500 MHz	0.87%	0.91%	1.12%
>500 MHz to 1.2 GHz	0.82%	0.91%	0.91%
>1.2 GHz to 6 GHz	0.96%	1.15%	1.56%
>6 GHz to 14 GHz	1.16%	1.37%	1.94%
>14 GHz to 18 GHz	1.47%	1.84%	2.27%

U8485A frequency band	25 °C ± 3 °C	25 °C ± 10 °C	0 °C to 55 °C
DC to < 10 MHz[2]	1.75%	2.18%	2.26%
10 MHz to 30 MHz	1.17%	1.29%	1.71%
>30 MHz to 500 MHz	0.95%	1.04%	1.56%
>500 MHz to 1.2 GHz	0.98%	1.24%	1.79%
>1.2 GHz to 6 GHz	1.18%	1.51%	2.23%
>6 GHz to 14 GHz	1.58%	2.18%	2.91%
>14 GHz to 18 GHz	1.69%	2.33%	3.21%
>18 GHz to 26.5 GHz	2.25%	3.33%	4.28%
>26.5 GHz to 33 GHz	2.63%	4.10%	5.72%

1. The characterized calibration factor should not deviate between periodic calibrations by more than the specified maximum relative uncertainty. Compliance is confirmed by the relative deviation $(\frac{|CF_1 - CF_2|}{CF_1} * 100)$ being less than or equal to √2 times the specified maximum uncertainty. $\sqrt{2} * Umax$ with a reference calibration factor of 100%.
2. Only applicable for Option 200

Calibration factor (CF) relative uncertainty[1] (continued)

U8487A frequency band	25 °C ± 3 °C	25 °C ± 10 °C	0 °C to 55 °C
DC to < 10 MHz[2]	1.87%	2.43%	2.47%
10 MHz to 30 MHz	1.11%	1.51%	3.47%
>30 MHz to 500 MHz	1.10%	1.22%	1.56%
>500 MHz to 1.2 GHz	1.10%	1.29%	1.65%
>1.2 GHz to 6 GHz	1.23%	1.47%	1.89%
>6 GHz to 14 GHz	1.61%	2.00%	2.26%
>14 GHz to 18 GHz	1.81%	2.27%	2.62%
>18 GHz to 26.5 GHz	2.31%	2.97%	3.45%
>26.5 GHz to 33 GHz	2.89%	3.58%	4.15%
>33 GHz to 34 GHz	2.85%	3.56%	4.29%
>34 GHz to 35 GHz	3.14%	3.87%	4.58%
>35 GHz to 40 GHz	3.73%	5.10%	5.76%
>40 GHz to 45 GHz	4.00%	4.85%	5.70%
>45 GHz to 50 GHz	4.04%	5.07%	6.04%

U8488A frequency band	25 °C ± 3 °C	25 °C ± 10 °C	0 °C to 55 °C
DC to < 10 MHz[2]	1.89%	2.44%	2.49%
10 MHz to 50 MHz	1.32%	1.42%	1.44%
>50 MHz to 100 MHz	1.72%	1.83%	1.83%
>100 MHz to 2 GHz	1.76%	1.96%	2.14%
>2 GHz to 12.4 GHz	1.94%	2.61%	3.37%
>12.4 GHz to 18 GHz	2.07%	2.84%	3.71%
>18 GHz to 26.5 GHz	2.42%	2.99%	3.79%
>26.5 GHz to 40 GHz	3.03%	3.86%	5.02%
>40 GHz to 50 GHz	4.82%	5.65%	6.81%
>50 GHz to 67 GHz	5.18%	6.10%	7.52%
>67 GHz to 70 GHz	*5.56%*	*8.00%*	*9.02%*

1. The characterized calibration factor should not deviate between periodic calibrations by more than the specified maximum relative uncertainty. Compliance is confirmed by the relative deviation $(\frac{|CF_1 - CF_2|}{CF_1} * 100)$ being less than or equal to √2 times the specified maximum uncertainty. $\sqrt{2} * Umax$ with a reference calibration factor of 100%.
2. Only applicable for Option 200

Calibration factor (CF) relative uncertainty[1] (continued)

U8489A frequency band	25 °C ± 3 °C	25 °C ± 10 °C	0 °C to 55 °C
DC to < 10 MHz	0.69%	1.16%	2.88%
10 MHz to 100 MHz	1.32%	1.79%	3.51%
>100 MHz to 2 GHz	1.60%	2.63%	3.96%
>2 GHz to 12.4 GHz	2.06%	3.01%	5.08%
>12.4 GHz to 18 GHz	2.08%	3.39%	5.39%
>18 GHz to 26.5 GHz	2.43%	3.97%	5.35%
>26.5 GHz to 50 GHz	4.28%	5.86%	7.94%
>50 GHz to 67 GHz	5.81%	7.33%	9.69%
>67 GHz to 80 GHz	6.46%	7.24%	11.96%
>80 GHz to 95 GHz	6.41%	9.02%	14.32%
>95 GHz to 110 GHz	7.63%	8.97%	11.97%
>110 GHz to 120 GHz	7.85%	9.19%	11.62%

1. The characterized calibration factor should not deviate between periodic calibrations by more than the specified maximum relative uncertainty. Compliance is confirmed by the relative deviation $(\frac{|CF_1 - CF_2|}{CF_1} * 100)$ being less than or equal to $\sqrt{2}$ times the specified maximum uncertainty. $\sqrt{2} * Umax$ with a reference calibration factor of 100%.

External trigger

Environmental compliance	
High	*> 1.9 V*
Low	*< 1.1 V*
Latency[1]	*11 µs ± 2 µs*
Minimum trigger pulse width	*35 ns*
Minimum trigger repetition period	*80 ns*
Impedance	*50 Ω or 1 MΩ*
Trigger delay	
Range	0 s to 1 s
Resolution	10 µs

1. External trigger latency is defined as the delay between the applied trigger crossing the trigger level and the U8480 Series switching into the triggered state.

General specifications

Acquisition		
Analog-to-digital converter (ADC) sampling rate	*192 kHz*	
ADC resolution	*24 bits*	
Integration time[1]	*1.024 ms*	
Other		
Current requirement	*400 mA (approximately)*	
	U8481A	N-Type (m), 50 Ω
	U8485A	3.5 mm (m), 50 Ω
	U8487A	2.4 mm (m), 50 Ω
	U8488A	1.85 mm (m), 50 Ω
	U8489A	1.0 mm (m), 50 Ω
Cable	USB 2.0 Type A to 5-pin Mini-B	
Interface	USB 2.0 interface, USB-TMC compliant	
Programmability	SCPI, Keysight VEE, LabVIEW, Microsoft Visual Basic	
Calibration	1 year	

1. Integration time is the period during which the U8480 Series ADC samples the input signal for a measurement.

Typical plot

The following typical plot is intended to provide additional information, useful in applying the U8480 Series by giving typical but not warranted performance parameters.

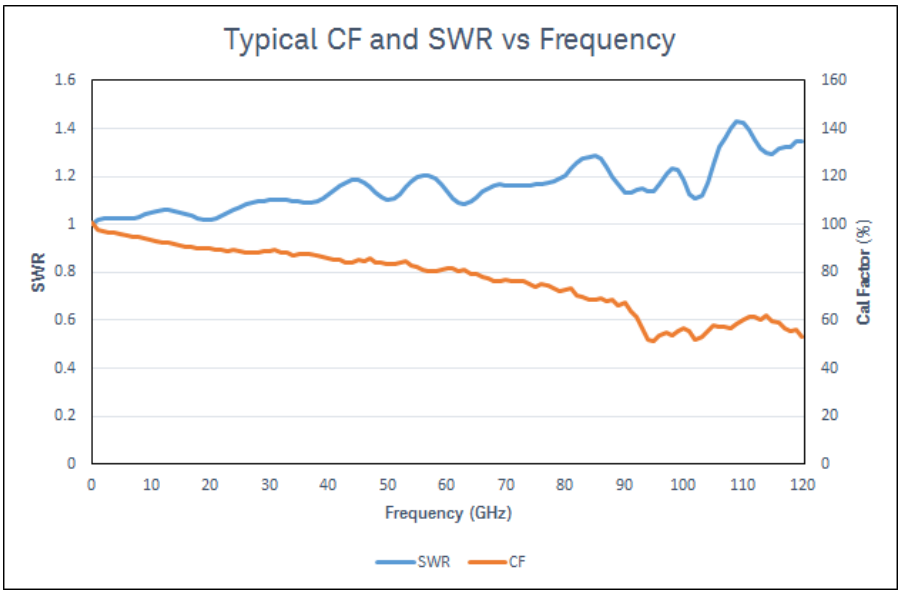


Figure 9. Typical calibration factor (CF) and SWR vs. frequency

General characteristics

Environmental compliance	
Temperature	Operating condition: 0 °C to 55 °C
	Storage condition: –40 °C to 71 °C
Humidity	Maximum Operating condition: 95% RH at 40 °C (non-condensing) Storage condition: Up to 90% RH at 65 °C (non-condensing)
Regulatory compliance	
The U8480 Series USB thermocouple power sensor complies with the following EMC requirements:	IEC61326-1:2012 / EN61326-1:2013 EN55011:2009/CISPR11:2009 Canada ICES/NMB-001: Issue 4, June 2006 Australia/New Zealand AS/NZS CISPR11:2011
(Length × Width × Height)	U8481A: *145 mm × 46 mm × 35.90 mm* U8485A: *136.50 mm × 46 mm × 35.90 mm* U8487A: *127.70 mm x 46 mm x 35.90 mm* U8488A: *128.50 mm x 46 mm x 35.90 mm* U8489A: *125.75 mm × 46 mm × 35.90 mm*
Weight	
Net weight	U8481A: *0.256 kg* U8485A: *0.25 kg* U8487A: *0.22 kg* U8488A: *0.22 kg* U8489A: *0.20 kg*
Shipping weight	U8481A: *1.35 kg* U8485A: *1.402 kg* U8487A: *1.37 kg* U8488A: *1.37 kg* U8489A: *0.97 kg*
Connectivity	
USB 2.0, with the following cable lengths	Option 301: 1.5 m Option 302: 3 m Option 303: 5 m
Recommended calibration interval	1 year
Pollution	Degree 2

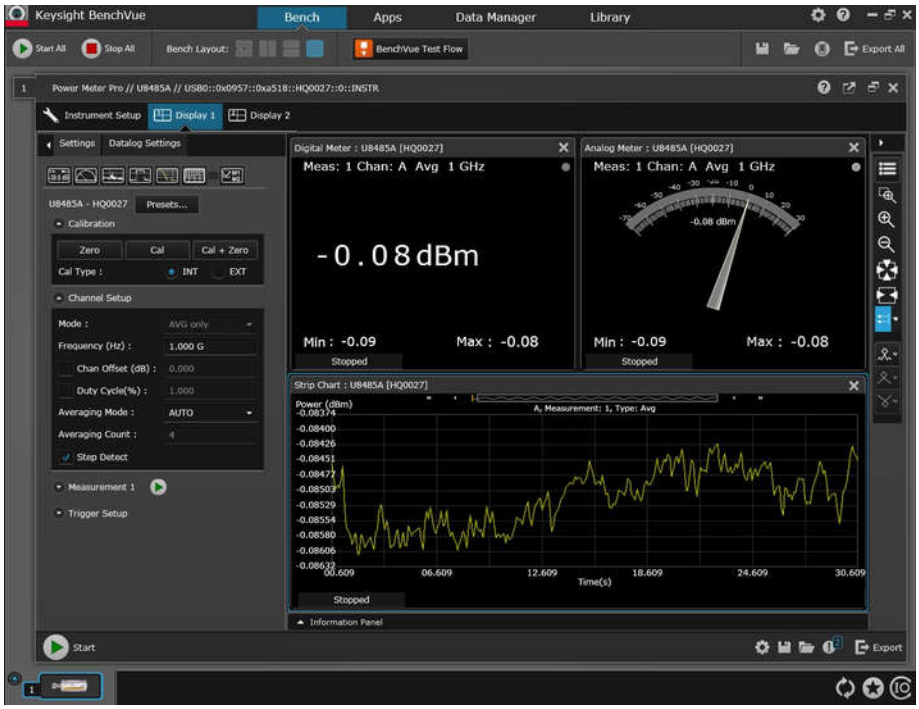
Mechanical characteristics

Mechanical characteristics such as center conductor protrusion and pin depth are not performance specifications. They are, however, important supplemental characteristics related to electrical performance. At no time should the pin depth of the connector be protruding.

Using the U8480 Series with the BenchVue Software

Keysight BenchVue software for the PC accelerates testing by providing intuitive, multiple instrument measurement visibility and data capture with no programming necessary. You can derive answers faster than ever by easily viewing, capturing, and exporting measurement data and screenshots. The BenchVue software license (BV0007B) is now included with your instrument.

For more information, www.keysight.com/find/BenchVue



Digital meter, analog meter and datalog view

Attributes

Supported functionality	
Measurement displays	Digital meter Analog meter Data log view Multilist with ratio / delta function Compact mode display
Graph functions	Single marker (up to 5 markers per graph) Dual marker (up to 2 sets of markers per graph) Graph autoscaling Graph zooming
Instrument settings	Save and recall instrument state including graph settings Instrument preset settings FDO tables Gamma and S-parameters tables Full instrumentation control includes frequency/average/trigger settings, zero and calibration, etc.
Limit and alert function	Sensors Limit and alert notification

Supported functionality	
	Alert summary
Export data or screen shots	Data logging (HDF5/MATLAB/Microsoft Excel/Microsoft Word/CSV) Save screen capture (PNG/JPEG/BMP)

System and installation requirements

PC operating system	
Windows 10, 8 and 7	Windows 10 32-bit and 64-bit (Professional, Enterprise, Education, Home versions) Windows 8 32-bit and 64-bit (Core, Professional, Enterprise) Windows 7 SP1 and later 32-bit and 64-bit (Professional, Enterprise, Ultimate)
Computer hardware	Professor: 1 GHz or faster (2 GHz or greater recommended) RAM: 1 GB (32-bit) or 2 GB (64-bit) (3 GB or greater recommended)
Windows XP SP3 32-bit (Professional)	Processor: 600 MHz or faster (1 GHz or greater recommended) RAM: 1 GB (2 GB or greater recommended)
Interfaces	USB, GPIB, LAN, RS-232
Display resolution	1024 x 768 minimum for single instrument view (higher resolutions are recommended for multiple instrument view)

Additional requirements

Software: Keysight BenchVue requires a VISA (Keysight or National Instruments) when used to connect to physical instruments. Keysight IO Libraries, which contains the necessary VISA, will be installed automatically when BenchVue is installed.

IO Libraries information is available at: www.keysight.com/find/iosuite

Ordering information

Model	Description
U8481A	USB thermocouple power sensor (Type-N)
U8481A-100	Standard option – 10 MHz to 18 GHz
U8481A-200	DC coupled option – DC to 18 GHz
U8485A	USB thermocouple power sensor (3.5 mm)
U8485A-100	Standard option – 10 MHz to 33 GHz
U8485A-200	DC coupled option – DC to 33 GHz
U8487A	USB thermocouple power sensor (2.4 mm)
U8487A-100	Standard option – 10 MHz to 50 GHz
U8487A-200	DC coupled option – DC to 50 GHz
U8488A	USB thermocouple power sensor (1.85 mm)
U8488A-100	Standard option – 10 MHz to 67 GHz
U8488A-200	DC coupled option – DC to 67 GHz
U8489A	USB thermocouple power sensor (1.0 mm)
U8489A-200	DC coupled option - DC to 120 GHz
U8489A-501	1.0 mm (f) to N-Type (m) adapter
Standard shipped items	
	- Power sensor cable 5 ft (1.5 m), default cable length - Trigger cable, BNC male to SMB female, 50 Ω, 1.5 m - Certificate of calibration - U8485A: 3.5 mm (f) to N-Type (m) adapter[1] - U8487A/88A: 2.4 mm (f) to N-Type (m) adapter[1]

1. Not applicable to U8481A

Options	Description
Travel kits	
U2000A-201	Transit case
U2000A-202	Soft carrying case
U2000A-203	Holster
U2000A-204	Soft carrying pouch
Cables (selectable during sensor purchase)	
U2000A-301	Power sensor cable, 5 ft (1.5 m)
U2000A-302	Power sensor cable, 10 ft (3 m)
U2000A-303	Power sensor cable, 16.4 ft (5 m)
Cables	
U2031A	Power sensor cable, 5 ft (1.5 m)
U2031B	Power sensor cable, 10 ft (3 m)
U2031C	Power sensor cable, 16.4 ft (5 m)
U2032A	BNC male to SMB female trigger cable, 50 Ω, 1.5 m
Calibration	
U848xA-1A7	ISO 17025 compliant calibration and test data
U848xA-A6J	ANSI 540 compliant calibration and test data
U848xA-UK6	Commercial calibration certificate with test data
Software	
BV0007B	BenchVue power meter/sensor control and analysis app license

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