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Counters & Power Meters

6910/20/30 RF Power Sensors



A range of 17 power sensors available for use with 6200B series MTS, CPM, 6960B and 6970 power meters

- Wide frequency coverage 30 kHz to 46 GHz
- Power levels from: -70 dBm (100 pW) to +44 dBm (25 W)
- 50 Ω and 75 Ω sensors
- Low VSWR reduces measurement uncertainty
- Linearity correction data supplied
- Field replaceable RF assembly
- High overload capability

These stable and accurate power sensors operate at frequencies up to 46 GHz. They are for use with the 6960B and 6970 Power Meters as well as the CPM 20, 46 Counter Power Meter and the 6200B series Microwave Test Set.

High Measurement Accuracy

High measurement accuracy over a wide frequency range is ensured by low input VSWR - the result of innovative design.

Fully Interchangeable

The sensors are fitted with precision connectors. They have a multiway socket for cable connection to the Power Meter, and are interchangeable.

Small and Lightweight

The small size and light weight of these sensors makes them very adaptable for use anywhere without requiring additional mechanical support.

Rugged Construction

Rugged mechanical construction makes them ideal for both bench and field use. Minimum down-time is ensured by using a pre-calibrated field replaceable RF sensing assembly. Unit lifetime is enhanced by high overload capabilities. Seventeen different sensors are currently available covering a range of frequencies from 30 kHz to 46 GHz. Type N, APC-7, MPC 3.5 and 2.92 mm connectors are available from -70 dBm (100 pW) to +44 dBm (25 W). A 75 Ω sensor is also available.

For the 40 GHz sensors (6914, 6924 and 6934) a waveguide 22 transformer is optionally available. By ordering version '/002' the transformer (54417/002) is supplied as well as a calibration table to give both accurate waveguide and coaxial measurements. The calibration information is traceable to national standards.

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6910 series: Medium Power Thermocouple Power Sensors

	6910	6911	6912
FREQUENCY RANGE	10 MHz - 20 GHz	10 MHz - 20 GHz	30 kHz - 4.2 GHz
POWER RANGE	-30 dBm to +20 dBm (1 μW to 100 mW)	-30 dBm to +20 dBm (1 μW to 100 mW)	-30 dBm to +20 dBm (1 μW to 100 mW)
MAX RF INPUT	+25 dBm (300 mW) CW +42 dBm (15 W) peak for 2 μs	+25 dBm (300 mW) CW +42 dBm (15 W) peak for 2 μs	+25 dBm (300 mW) CW +42 dBm (15 W) peak for 2 μs
SENSING ELEMENT	Semiconductor thermocouple	Semiconductor thermocouple	Semiconductor thermocouple
VSWR	<1.25 10 MHz - 30 MHz <1.1 30 MHz - 2GHz <1.18 2 GHz - 16 GHz <1.28 16 GHz - 18 GHz <1.4 typical 18 GHz - 20 GHz	<1.25 10 MHz - 30 MHz <1.15 30 MHz - 2 GHz <1.18 2 GHz - 16 GHz <1.28 16 GHz - 18 GHz <1.4 typical 18 GHz - 20 GHz	<1.6 30 kHz - 100 kHz <1.2 100 kHz - 300 kHz <1.1 300 kHz - 4.2 GHz
LINEARITY FACTOR	Provided with sensor	Provided with sensor	Provided with sensor
Accuracy	±0.5% at 25°C between +10 and +20 dBm Improves by a factor of 10 for each lower range	±0.5% at 25°C between +10 and +20 dBm Improves by a factor of 10 for each lower range	±0.5% at 25°C between +10 and 20 dBm Improves by a factor of 10 for each lower range
CALIBRATION FACTOR	Provided with sensor	Provided with sensor	Provided with sensor
Accuracy	Uncertainty provided with sensor	Uncertainty provided with sensor	Uncertainty provided with sensor
Resolution	0.01%	0.01%	0.01%
RF CONNECTOR	Precision N-type, male 50 Ω	APC-7, 50 Ω	Precision N-type, male 50 Ω
SIZE & WEIGHT	87 mm long, 33.5 mm dia. 140g	87 mm long, 33.5 mm dia. 140 g	87 mm long, 33.5 mm dia. 140 g
ORDER CODES	56910/900	56911/900	56912/900

6910 Series: Medium Power Thermocouple Power Sensors (continued)

	6913	6914	6914S	6919
FREQUENCY RANGE	10 MHz - 26.5 GHz	10 MHz - 40 GHz	10 MHz - 46 GHz	30 kHz - 3 GHz
POWER RANGE	-30 dBm to +20 dBm (1 mW to 100 mW)	-30 dBm to +20 dBm (1 mW to 100 mW)	-30 dBm to +20 dBm (1 mW to 100 mW)	-30 dBm to +20 dBm (1 mW to 100 mW)
MAX RF INPUT	+25 dBm (300 mW) CW +42 dBm (15 W) peak for 2 ms	+25 dBm (300 mW) CW +42 dBm (15 W) peak for 2 ms	+25 dBm (300 mW) CW +42 dBm (15 W) peak for 2 ms	+25 dBm (300 mW) CW +42 dBm (15 W) peak for 2 ms
SENSING ELEMENT	Semiconductor thermocouple	Semiconductor thermocouple	Semiconductor thermocouple	Semiconductor thermocouple
VSWR	<1.4 10 MHz - 40 MHz <1.15 40 MHz - 100 MHz <1.1 100 MHz - 2 GHz <1.15 2 GHz - 12.4 GHz <1.2 12.4 GHz - 18 GHz <1.25 18 GHz - 26.5 GHz	<1.58 10 MHz - 40 MHz <1.15 40 MHz - 100 MHz <1.1 100 MHz - 2 GHz <1.15 2 GHz - 12.4 GHz <1.21 12.4 GHz - 18 GHz <1.25 18 GHz - 26.5 GHz <1.43 26.5 - 40 GHz (vers. /001) <1.55 26.5 - 40 GHz (vers. /002)	<1.58 10 MHz - 40 MHz <1.15 40 MHz - 100 MHz <1.1 100 MHz - 2 GHz <1.15 2 GHz - 12.4 GHz <1.43 12.4 GHz - 33 GHz <2.32 33 GHz - 40 GHz <3.6 40 GHz - 46 GHz	<1.4 30 kHz - 100 kHz <1.15 100 kHz - 300 kHz <1.1 300 kHz - 2 GHz <1.2 typical 2 GHz - 3 GHz
LINEARITY FACTOR	Provided with sensor	Provided with sensor	Provided with sensor	Provided with sensor
Accuracy	±0.5% at 25°C between +10 and +20 dBm. Improves by a factor of 10 for each lower range	±0.5% at 25°C at 100 mW, decreasing by 0.005% per mW	±0.5% at 25°C at 100 mW, decreasing by 0.005% per mW	±0.5% at 25°C between +10 and +20 dBm. Improves by a factor of 10 for each lower range
CALIBRATION FACTOR	Provided with sensor	Provided with sensor	Provided with sensor	Provided with sensor
Accuracy	Uncertainty provided with sensor	Uncertainty provided with sensor	Uncertainty provided with sensor	Uncertainty provided with sensor
Resolution	0.01%	0.01%	0.01%	0.01%
RF CONNECTOR	MPC 3.5 mm, male 50 Ω	MPC 2.92 mm, male 50 Ω	MPC 2.92 mm, male 50 Ω	Precision N-type, male, 75 Ω
SIZE & WEIGHT	80 mm long, 33.5 mm dia. 140g	88.5 mm long, 33.5 mm dia. 140g	88.5 mm long, 33.5 mm dia. 140g	89 mm long, 33.5 mm dia. 140g
ORDER CODES	56913/900	56914/001 56914/002 includes waveguide 22 coax transition and cal table	56914/003	56919/900
Supplied with	Adapter part no. 23443/822 for connection between 6913 and 0 dBm Power Reference.	Adapter part no. 23443/822 for connection between 6914 and 0 dBm Power Reference.	Adapter part no. 23443/822 for connection between 6914 and 0 dBm Power Reference.	Adapter part no. 23443/842 for connection between 6919 and 0 dBm Power Reference.

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6920 Series: High Sensitivity Diode Sensors

	6920	6923	6924	6924S
FREQUENCY RANGE	10 MHz - 20 GHz	10 MHz - 26.5 GHz	30 kHz - 40 GHz	10 MHz - 46 GHz
POWER RANGE	-70 dBm to -20 dBm† (0.1 nW to 10 μW)	-70 dBm to -20 dBm* (0.1 nW to 10 μW)	-70 dBm to -20 dBm* (0.1 nW to 10 μW)	-70 dBm to -20 dBm* (0.1 nW to 10 μW)
MAX RF INPUT	+26 dBm (300 mW) CW +30 dBm (1 W) peak for 2 μs	+26 dBm (300 mW) CW +30 dBm (1 W) peak for 2 μs	+26 dBm (400 mW) CW +30 dBm (1 W) peak for 2 μs	+26 dBm (300 mW) CW +30 dBm (1 W) peak for 2 μs
SENSING ELEMENT	Shottky barrier diode	Shottky barrier diode	Shottky barrier diode	Shottky barrier diode
VSWR	<1.4-1.2 10 MHz - 40 MHz <1.2 40 MHz - 10 GHz <1.35 10 GHz - 18 GHz <1.4 typ 18 GHz - 20 GHz	<1.4 10 MHz - 40 MHz <1.15 40 MHz - 100 MHz <1.12 100 MHz - 2 GHz <1.17 2 GHz - 8 GHz <1.3 8 GHz - 18 GHz <1.5 18 GHz - 26.5 GHz	<1.58 10 MHz - 40 MHz <1.15 40 MHz - 100 MHz <1.12 100 MHz - 2 GHz <1.33 2 GHz - 18 GHz <1.50 18 GHz - 33 GHz <1.95 33 GHz - 40 GHz(vers./001) <1.97 26.5 - 40 GHz(vers./002)	<1.58 10 MHz - 40 MHz <1.15 40 MHz - 100 MHz <1.12 100 MHz - 2 GHz <1.33 2 GHz - 18 GHz <1.5 18 GHz - 33 GHz <1.95 33 GHz - 40 GHz <3.6 40 GHz - 46 GHz
LINEARITY FACTOR	Provided with sensor	Provided with sensor	Provided with sensor	Provided with sensor
Accuracy	±1% at 25°C between -30 and -20 dBm. Improves by a factor of 10 for each lower range	±1% at 25°C between -30 and -20 dBm. Improves by a factor of 10 for each lower range	±1% at 25°C between -30 and 20 dBm at 23°C	±1% at 25°C between -30 and -20 dBm at 23°C
CALIBRATION FACTOR	Provided with sensor	Provided with sensor	Provided with sensor	Provided with sensor
Accuracy	Uncertainty provided with sensor	Uncertainty provided with sensor	Uncertainty provided with sensor	Uncertainty provided with sensor
Resolution	0.01%	0.01%	0.01%	0.01%
RF CONNECTOR	Precision N-type, male 50 Ω	MPC 3.5 mm, male 50 Ω	MPC 2.92 mm, male 50 Ω†	MPC 2.92 mm, male 50 Ω†
SIZE & WEIGHT	104 mm long, 33.5 mm dia. 180 g	87 mm long, 33.5 mm dia. 180 g	88.5 mm long, 33.5 mm dia. 150 g	88.5 mm long, 33.5 mm dia. 150 g
ORDER CODES	56920/900	56923/900	56924/001 56924/002 includes waveguide 22 coax transition and calibration table	56924/003
Supplied with	Precision Attenuator part no. 23448/873. 30 dB ±0.05 dB at 50 MHz at 25°C	Precision Attenuator part no. 23448/873 30 dB ±0.05 dB at 50 MHz at 25°C Adapter part no. 23443/822 for connection between 6923 and 0 dBm Power Reference.	Precision Attenuator part no. 23448/873. 30 dB ±0.05 dB at 50 MHz at 25°C Adapter part no. 23443/822 for connection between 6924 and 0 dBm Power Reference.	Precision Attenuator part no. 23448/873. 30 dB ±0.05 dB at 50 MHz at 5°C Adapter part no. 23443/822 for connection between 6924 and 0 dBm Power Reference.

* Lower limit is -65 dBm (0.3 nW) when used with 6970 & -60 dBm when used the Counter Power Meter

† Lower limit is -65 dBm (0.3 nW) when used with Counter Power Meter

6930 Series: High Power Thermocouple Sensors

	6930	6932	6934	6934S
FREQUENCY RANGE	10 MHz - 18 GHz	30 kHz - 4.2 GHz	10 MHz - 40 GHz	10 MHz - 46 GHz
POWER RANGE	-15 dBm to +35 dBm (30 μW to 3 W)	-15 dBm to +35 dBm (30 μW to 3W)	-15 dBm to +30 dBm (30 μW to 1W)	-15 dBm to +30 dBm (30 μW to 1 W)
MAX RF INPUT	+37 dBm (5 W) CW +50 dBm (100 W) peak for 2 μs	+37 dBm (5 W) CW +50 dBm (100 W) peak for 2 μs	+33 dBm (2 W) CW +45 dBm (32 W) peak for 2 μs	+33 dBm (2W) CW +45 dBm (32 W) peak for 2 μs
SENSING ELEMENT	Semiconductor thermocouple	Semiconductor thermocouple	Semiconductor thermocouple	Semiconductor thermocouple
VSWR	<1.1 10 MHz - 2 GHz <1.18 2 GHz - 16 GHz <1.28 16 GHz - 18 GHz	<1.1 30 kHz - 4.2 GHz	<1.12 10 MHz - 100 MHz <1.1 100 MHz - 2 GHz <1.15 2 GHz - 12.4 GHz <1.2 12.4 GHz - 18 GHz <1.25 18 GHz - 26.5 GHz <1.43 26.5 - 40 GHz (vers./001) <1.55 26.5 - 40 GHz (vers./002)	<1.12 10 MHz - 100 MHz <1.1 100 MHz - 2 GHz <1.15 2 GHz - 12.4 GHz <1.2 12.4 GHz - 18 GHz <1.25 18 GHz - 26.5 GHz <1.43 26.5 GHz - 40 GHz <2.3 40 GHz - 46 GHz
LINEARITY FACTOR	Provided with sensor	Provided with sensor	Provided with sensor	Provided with sensor
Accuracy	-1% to +5% between +25 and +35 dBm. Improves by a factor of 10 for each lower range.	-1% to +5% between +25 and +35 dBm. Improves by a factor of 10 for each lower range.	-1% to +5% between +25 and +30 dBm, less on other ranges.	-1% to +5% between +25 and +30 dBm, less on other ranges.
CALIBRATION FACTOR	Provided with sensor	Provided with sensor	Provided with sensor	Provided with sensor
Accuracy	Uncertainty provided with sensor	Uncertainty provided with sensor	Uncertainty provided with sensor	Uncertainty provided with sensor
Resolution	0.01%	0.01%	0.01%	0.01%
RF CONNECTOR	Precision N-type, male 50 Ω	Precision N-type, male 50 Ω	MPC 2.92 mm, male 50 Ω	MPC 2.92 mm, male 50 Ω
SIZE & WEIGHT	93 mm long, 33.5 mm dia. 190g	93 mm long, 33.5 mm dia. 190g	87 mm long, 33.5 mm dia. 150g	87 mm long, 33.5 mm dia. 150g
ORDER CODES	56930/900	56932/900	56934/001 56934/002 includes waveguide 22 coax transition and calibration table.	56934/003
Supplied with			Adapter part no. 23443/822 for connection between 6934 and 0 dBm Power Reference.	Adapter part no. 23443/822 for connection between 6934 and 0 dBm Power Reference.

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	6930 (Option 002) *(Comprises standard 6930 plus calibrated precision 10 dB attenuator)*	**6932 (Option 002)** *(Comprises standard 6932 plus calibrated precision 10 dB attenuator)*
FREQUENCY RANGE	10 MHz - 18 GHz	30 kHz - 4.2 GHz
POWER RANGE	-5 dBm to +44 dBm (0.3 mW to 25W)	-5 dBm to +44 dBm (0.3 mW to 25W)
MAX RF INPUT	+45 dBm (30 W) CW +60 dBm (1 kW) peak for 2 μs	+45 dBm (30 W) CW +60 dBm (1 kW) peak for 2 μs
Sensing element	Semiconductor thermocouple	Semiconductor thermocouple
VSWR	<1.2 10 MHz - 8 GHz <1.25 8 GHz - 12.4 GHz <1.35 12.4 GHz - 18 GHz	<1.2 30 kHz - 4.2 GHz
LINEARITY FACTOR	Provided with sensor	Provided with sensor
Accuracy	-2% to +6% between +35 and +44 dBm. Improves by a factor of 10 for each lower range	-2% to +6% between +35 and +44 dBm. Improves by a factor of 10 for each lower range
CALIBRATION FACTOR	Provided with sensor	Provided with sensor
Accuracy	Uncertainty provided with sensor	Uncertainty provided with sensor
Resolution	0.01%	0.01%
RF CONNECTOR	Precision N-type, male 50 Ω	Precision N-type, male 50 Ω
SIZE & WEIGHT	228 mm long, 64 mm dia. 533 g	228 mm long, 64 mm dia. 533 g
ORDER CODES	56930/002	56932/002

Notes: Specifications involving APC-7 and type N connectors above 18 GHz and 2.92 mm connectors above 40 GHz are not traceable to National Standards as these do not exist at present

2.92 mm connectors mate non-destructively with 3.5 mm and SMA connectors

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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.

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