

Model F1135/M1135

RF CALIBRATION AND MEASUREMENT PRODUCTS

- Used to calibrate RF Power Sensors in the new wider frequency range of 10 MHz to 26.5 GHz
- Standards are directly traceable to NIST
- Thermistor Standards are temperature controlled
- 0.01 to 25 mW dynamic range
- Primary and Working Transfer Standard configurations.
- Rack mount option available
- Optional A2LA Accredited ISO/IEC 17025:1999 Compliant Calibration

Coaxial RF Power Transfer Standards

TEGAM Temperature Stabilized Coaxial RF Power Transfer Standards enable the precise measurement of microwave power in the 10 MHz to 26.5 GHz frequency range. With this wider frequency range, the F1135 and M1135 can be used in applications that previously required two standards.

These units are extremely rugged, highly accurate, and stable with time and temperature. They are ideal for use as standards for the transfer of calibration factors to other RF standards and power sensors. Units are supplied with ANSI/NCSL Z540-1-1994 NIST trace-able calibration data. A2LA Accredited Calibrations are optional.

These models are designed for use with DC self-balancing bridges such as the TEGAM Model 1806, 1806A and 1804, or with controllers such as the TEGAM Model 1805B.

System configurations employing instruments of this extreme accuracy

typically achieve calibration factor transfer results normally found only in primary standards laboratories.

The Model F1135 is a feedthrough Thermistor Standard and Power Splitter combination used for the calibration of bolometer, thermocouple, and diode terminating power sensors. Its expanded frequency range has been achieved without compromising the accuracy specifications after VSWR correction.

The Model M1135 is a terminating thermistor Primary Transfer Standard. It is designed to be calibrated directly by a national standards agency such as NIST. The M1135 is used for the calibration of feedthrough devices such as bolometer mount-coupler and bolometer mount-splitter RF Standards. It is also useful in other applications requiring direct measurement of RF power. The accuracy specifications are the same as the Models M1110 and M1118. The M1135 has better VSWR from 18 to 26.5 GHz.

Both models have the widest frequency band of any thermistor power standard commercially available. This reduces the number of standards needed to calibrate power sensors in the 10 MHz to 26.5 GHz frequency range and lowers annual calibration costs by up to 50 %.

The Model F1135 features a 3.5 mm female connector, and the M1135 features a compatible 2.92 mm male connector. Bias connectors are binding posts with standard 0.75 in. spacing for banana plugs. The internal heater is connected using cables provided with the models F1135, 1805B, 1806, and 1820.



Model F1135/M1135

COAXIAL RF POWER TRANSFER STANDARDS

Specifications

	F1135	M1135
Frequency Range	10 MHz to 26.5 GHz	10 MHz to 26.5 GHz
Power Range	0.01 to 25 mW (-20 to 14 dBm)	0.01 to 25 mW (-20 to 14 dBm)
Nominal Impedance	50 Ohms	50 Ohms
Max VSWR	1.25 from 0.01 to 18 GHz 1.35 from 18 to 26.5 GHz	1.50 from 10 to 20 MHz 1.40 from 20 to 50 MHz 1.30 from 50 to 100 MHz 1.20 from 0.1 to 4 GHz 1.30 from 4 to 8 GHz 1.40 from 8 to 14 GHz 1.60 from 14 to 18 GHz 1.75 from 18 to 26.5 GHz
Power Linearity	<0.1 % from 1 to 10 mW	<0.1 % from 1 to 10 mW
Insertion Loss	6 dB, 11 dB max	2.5 dB max
Individual calibrations traceable to NIST supplied at the following frequencies:	10 to 100 MHz in 10 MHz steps 100 MHz to 2 GHz in 50 MHz steps 2 GHz to 4 GHz in 100 MHz steps 4 to 12.4 GHz in 200 MHz steps 12.75 to 18 GHz in 250 MHz steps 18 to 26.5 GHz in 500 MHz steps	10 to 100 MHz in 10 MHz steps 100 MHz to 2 GHz in 50 MHz steps 2 GHz to 4 GHz in 100 MHz steps 4 to 12.4 GHz in 200 MHz steps 12.75 to 18 GHz in 250 MHz steps 18 to 26.5 GHz in 500 MHz steps
Calibration Factor Accuracy	+/-1.0 % from 0.01 to 0.04 GHz +/-1.25 % from 0.05 to 4.0 GHz +/-1.5 % from 4.20 to 12.0 GHz +/-2.2 % from 12.2 to 17.5 GHz +/-2.5 % from 17.75 to 26.5 GHz	+/-1.2 % from 0.01 to 0.04 GHz +/-1.4 % from 0.05 to 4.0 GHz +/-1.7 % from 4.20 to 12.0 GHz +/-2.3 % from 12.2 to 17.5 GHz +/-2.6 % from 17.75 to 26.5 GHz
Calibration Factor Drift	<0.5 % per year	<0.5 % per year
Thermistor DC Bias Power	30 +/- 0.7 mW	30 +/- 0.7 mW
Thermistor Resistance at Bias	200 Ohms	200 Ohms
Thermistor Power Sensitivity	Approximately 13 Ohms/mW	Approximately 13 Ohms/mW
Temperature		
Operating	+12 °C to +40 °C (+54 °F to +104 °F)	+12 °C to +40 °C (+54 °F to +104 °F)
Storage	-55 °C to +75 °C (-67 °F to +167 °F)	-55 °C to +75 °C (-67 °F to +167 °F)
Warm up time	2 hours	2 hours
Weight	2.84 kg (6.27 lb)	1.3 kg (2.875 lb)
Physical Dimensions		
Height	88.9 mm (3.5 in)	73.15 mm (2.88 in)
Width	215.9 mm (8.5 in)	101.6 mm (4.00 in)
Depth	390.7 mm (15.4 in)	189.23 mm (7.45 in)
Included Accessories		
Operation Manual	P/N IM-300	
Heater Cable for F1135	P/N CBL-F1125-48	
Optional Accessories		
RF Mount Transport Case for F1135	P/N 8010	
RF Mount Transport Case for M1135	P/N 8000	
3 in. Stand for M1135	P/N M11XX-STAND	
Rack Mount Kit for F1135	P/N F1120-RMK	
A2LA Accredited ISO/IEC 17025:1999 Compliant Calibration for F1135 or M1135	P/N OPT-A2LA	



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