

## Coaxial RF Power Transfer Standards



The Model F1135B is a feedthrough Thermistor Standard 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 M1135A is a terminating thermistor Primary Transfer Standard. It is designed to be calibrated directly by a national standards agency such as NIST. The M1135A 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 M1135A 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 F1135B features a 3.5 mm female connector, and the M1135A features a compatible 3.5 mm male connector. Bias connectors are binding posts with standard 0.75 in. spacing for banana plugs. The internal heater is compatible with Models 1830A, 1806A, 1806, 1805B and 1820 when the proper cable is selected.

- 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
- A2LA Accredited ISO/IEC 17025 Compliant Calibration

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 F1135B and M1135A 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 NIST traceable calibration data.

These RF Power Standards work with TEGAM's new 1830A RF Power Meter, as well as our legacy DC Self-Balancing Bridges, 1806, 1806A and 1805B.

System configurations employing instruments of this extreme accuracy typically achieve calibration factor transfer results normally found only in primary standards laboratories.



Specifications	F1135B	M1135A
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 Ω	50 Ω
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 0.1 to 10 mW	< 0.1 % from 0.1 to 10 mW
Insertion Loss	6 dB, 9 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 GHz in 1 GHz steps 26.5 GHz	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 GHz in 1 GHz steps 26.5 GHz
Calibration Factor Accuracy (typical)	± 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 Ω	200 Ω
Thermistor Power Sensitivity	Approximately 13 Ω/mW	Approximately 13 Ω/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	3.7 kg (8.2 lb)	1.5 kg (3.22 lb)
Physical Dimensions		
Height	8.89 cm (3.5 in)	83.8 mm (3.3 in)
Width	21.59 cm (8.5 in)	76.2 mm (3.0 in)
Depth	35.2 cm (13.875 in)	180.30 mm (7.1 in)
<b>Included Accessories</b>		
Operation Manual	P/N IM-300	
A2LA Accredited ISO/IEC 17025 Compliant Calibration		
<b>Optional Accessories</b>		
RF Mount Transport Case for F1135B	P/N 2500-910	
RF Mount Transport Case for M1135A	P/N 8000	
3 in. Stand for M1135A	P/N M11XX-STAND	
Single Rack Mount Kit for F1135B	P/N 1830-910	
Dual Rack Mount Kit for F1135B	P/N 1830-911	
RF, Bias and Heater Cables	Reference the PM Series Datasheet on our website for a complete listing.	