

# Model F1109/M1110

RF CALIBRATION AND MEASUREMENT PRODUCTS

- Used to calibrate RF Power Sensors in the 10 MHz to 18 GHz frequency range
- Standards are directly traceable to NIST
- Thermistor Standards are temperature controlled
- 0.01 mW to 25 mW dynamic range can be extended to 250 mW
- Primary and Working Transfer Standard configurations
- Cased version also 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 18 GHz frequency range.

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 traceable calibration data. A2LA Accredited Calibrations are optional.

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

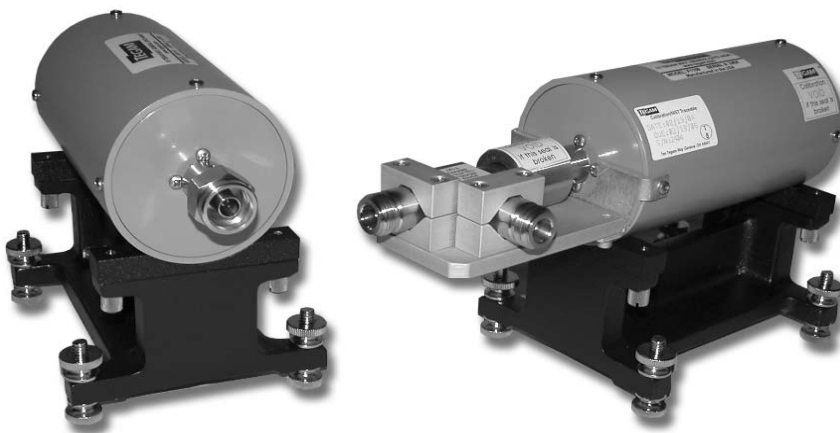
System configurations employing instruments of this extreme accuracy typically achieve calibration factor transfer results normally found only in primary standards laboratories.

The Model F1109 is a feedthrough Thermistor Standard and Power Splitter combination used for the calibration of bolometer, thermocouple and diode terminating power sensors.

The F1109H is a Thermistor Standard, Attenuator, and Power Splitter combination. It is used as a feedthrough standard for the calibration of higher power terminating sensors up to 250 mW. This combination provides broader bandwidth and lower VSWR than other solutions when calibrating 1 W to 5 W terminating sensors at typical operating power levels.

The Model M1110 is a terminating thermistor Primary Transfer Standard. It is designed to be calibrated directly by a national standards agency such as NIST. The M1110 is used for the calibration of feedthrough devices such as bolometer mount-coupler and bolometer mount-splitter RF Standards, and in other applications requiring direct measurement of RF power.

Both Models feature a Type N RF connector. Bias connectors are binding posts with standard 0.75 in. spacing for banana plugs. The connector for the internal heater is compatible with the heater control circuit on TEGAM Models 1805B, 1806, and 1820.



Prices and specifications subject to change without notice.

**TEGAM**®

YOUR GLOBAL SOURCE FOR TEST  
AND MEASUREMENT SOLUTIONS

# Model F1109/M1110

COAXIAL RF POWER TRANSFER STANDARDS

## Specifications

	F1109	M1110
Frequency Range	10 MHz to 18 GHz	10 MHz to 18 GHz
Power Range - F1109H	0.01 to 25 mW (-20 to 14 dBm) 0.1 to 250 mW (-10 to 24 dBm)	0.01 to 25 mW (-20 to 14 dBm)
Nominal Impedance	50 Ohms	50 Ohms
Max VSWR	1.06 from 0.01 to 6 GHz 1.10 from 6 to 15 GHz 1.14 from 15 to 18 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 18 GHz
Power Linearity - F1109H	<0.1 % from 1 to 10 mW <0.1 % from 10 to 100 mW	<0.1 % from 1 to 10 mW
Insertion Loss - F1109H	6 dB, 8.5 dB max 16 dB, 18.5 dB max	1 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	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
Calibration Factor Accuracy	+/-1.20 % from 0.01 to 0.04 GHz +/-1.00 % from 0.05 to 10 GHz +/-1.10 % from 10 to 18 GHz	+/-1.40 % from 0.01 to 0.04 GHz +/-1.20 % from 0.05 to 10 GHz +/-1.30 % from 10 to 18 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 Storage	+12 °C to +40 °C (+54 °F to +104 °F) -55 °C to +75 °C (-67 °F to +167 °F)	+12 °C to +40 °C (+54 °F to +104 °F) -55 °C to +75 °C (-67 °F to +167 °F)
Warm up time	2 hours	2 hours
Weight	1.5 kg (3.25 lb)*	1.3 kg (2.875 lb)
Physical Dimensions		
Height	133.35 mm (5.25 in)*	133.35 mm (5.25 in)
Width	101.6 mm (4.00 in)*	101.6 mm (4.00 in)
Depth	259.33 mm (10.21 in)*	189.23 mm (7.45 in)
Optional Accessories		
RF Mount Transport Case	P/N 8000	
A2LA Accredited ISO/IEC 17025:1999 Compliant Calibration for F1109 or M1110	P/N OPT-A2LA	

\*Weight and Physical dimensions will vary for High Power or Case mounted versions.



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