

WAVEGUIDE THERMAL TERMINATIONS (HOT LOADS)

MT70xx() Series

Features

- *Accurate Noise Temperature For Laboratory or Field Use*
- *Low VSWR Across The Full Frequency Range*
- *Highly Accurate Noise Figure or Effective Input Noise Temperature Measurements*
- *Typical Applications Include Radiometric Measurement, Antenna System Calibration and Parametric Amplifier Performance Evaluation*
- *CE Approved*



General

Maury thermal terminations are low-mismatch, heated loads in a precisely controlled thermal environment, which provide an accurately known noise power. Used with ambient and/or cryogenic terminations and a noise figure meter, these terminations provide the hot termination temperature needed for highly accurate noise figure or effective input noise temperature measurements. Because of the accuracy of the noise output, thermal terminations are often used as a noise standard for calibration of solid state noise generators.

The accuracy achieved by these terminations is possible because they utilize the proven concept of thermal (Johnson) noise operating in a precision thermal environment provided by the MT151C temperature controller. (The MT151C is a highly stable, proportional temperature controller that is accurately calibrated against NIST-traceable temperature measuring equipment.) This is the same concept used in several national standards laboratories and NIST at the higher microwave frequencies.

The termination and the controller are matched during calibration; therefore, the two instruments must be purchased as a unit. Line voltage for the controller must be specified at the time of purchase, from the following.

AC power options:

- Option 22 100/120 VAC, 50/60 Hz
- Option 32 220/240 VAC, 50/60 Hz

Each unit is provided with a calibration report which includes VSWR and available output noise temperature at specific frequencies.

Options for additional or alternative user-selected frequencies are available. (Maury also offers the MT7250 series Noise Calibration Swept Data Module as a tool that allows users to work with other non-standard data points in addition to, or in place of the factory standards.¹) Other accessories are available, such as special instrument cases and calibrated adapters to other coaxial series or waveguide.

¹ Maury data sheet 4E-020 provides specifics on the MT7250 series.



Description

Maury offers waveguide thermal terminations in a wide range of waveguide sizes, from WR430 through WR10. The table below represents a typical sample of the available terminations.

Waveguide terminations are generally calibrated at three frequencies – high, low, and arithmetic center – within the applicable frequency range; however, they can be calibrated at any user-specified frequency within the waveguide band. Additional user-specified calibration frequencies are also available as an option. (Maury's MT7250 series Noise Calibration Swept Data Module is offered as a software tool that allows users to work with non-standard data points in addition to, or in place of the factory standards.²) Please contact our Sales Department for more information.

The physical temperature of the waveguide terminations is 350 kelvins with a stability of ± 0.2 kelvins. Each termination is calibrated with a specific temperature controller, and the two instruments are provided as a unit.



MT151C

MT7090J

Calibration Uncertainty

Frequency Band (GHz)	Uncertainty (Kelvins)
< 18.0	± 0.70 K
18.0 – 40.0	± 0.60 K
40.0 – 50.0	± 0.65 K
50.0 – 110.0	± 1.00 K

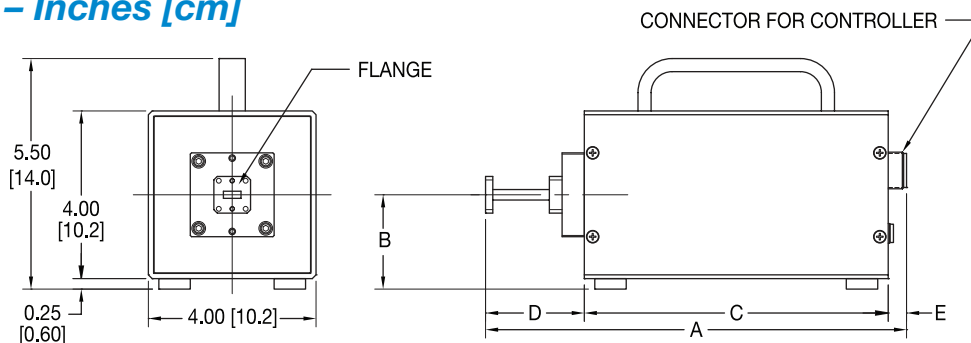
Accessories Provided

- One (1) MT151C controller
- One (1) MT151P controller cable
- One (1) Instrument case

Available Models

Model	Frequency Range (GHz)	EIA Waveguide Size	Maximum VSWR	Flange Specification	Dimensions - Inches [cm] (See drawing below)					
					A	B	C	D	E	
MT7081A	10.0 – 12.4	WR90 ³	1.10	UG39/U	11.765	2.00	10.125	1.64	0.56 [1.40]	
MT7082A	10.0 – 15.0	WR75 ³	1.08	MPF75	[29.90]	[5.10]	[25.700]	[4.20]		
MT7009B	15.0 – 22.0	WR51	1.10	MPF51	9.605 [24.40]	2.25 [5.7]	7.25 [18.4]	2.355 [6.00]		
MT7084A	18.0 – 26.5	WR42 ³	1.08	UG595/U						
MT7085A	26.5 – 40.0	WR28 ³	1.10	UG599/U						
MT7086A	33.0 – 50.0	WR22 ³	1.10	UG383/U	9.330 [23.70]			2.080		0.44
MT7088B	50.0 – 75.0	WR15 ³	1.20	UG385/U				[5.300]		[1.10]
MT7090J	75.0 – 110.0	WR10 ³	1.15	UG387/U						

Dimensions – Inches [cm]



² See Maury data sheet 4E-020.

³ Flange mates with the applicable military (UG) flange.