Surface Mount

RF Transformer

TX-2-5-1+

75Ω 20 to 1250 MHz

Generic photo used for illustration purposes only

CASE STYLE: TT240

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Maximum Ratings

Operating Temperature	-20°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	0.25W
DC Current	30mA

Permanent damage may occur if any of these limits are exceeded.

Pin Connections

PRIMARY DOT	6
PRIMARY	4
SECONDARY DOT	3
SECONDARY	1
SECONDARY CT	2
NOT USED	5

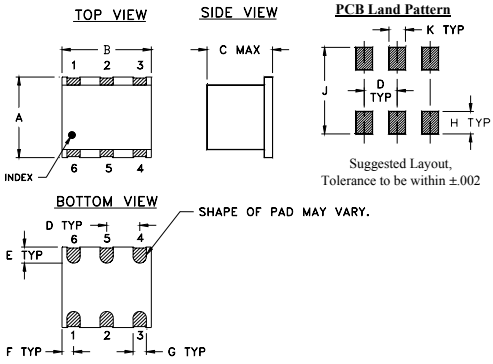
Features

- leadless surface mount
- excellent return loss, 25 dB in 1 bandwidth
- excellent amplitude balance, 0.4 dB typ. and phase unbalance, 3 deg typ.

Applications

- balanced amplifiers
- VHF/UHF

Outline Drawing

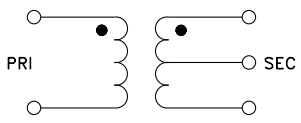


Outline Dimensions (inch / mm)

A	B	C	D	E	F
.250	.31	.20	.100	.050	.055
6.35	7.87	5.08	2.54	1.27	1.40

G	H	J	K	wt
.040	.070	.270	.050	grams
1.02	1.78	6.86	1.27	0.50

Config. A



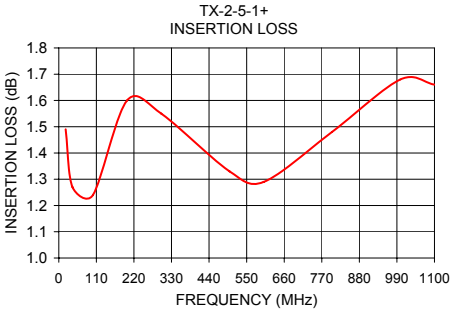
Electrical Specifications

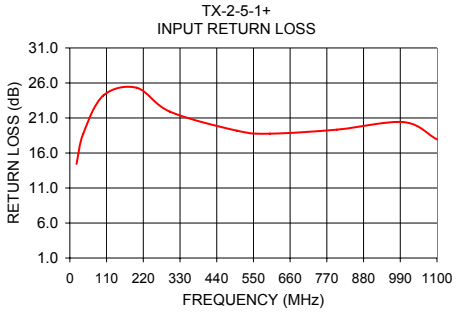
Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio** (secondary/primary)			2		
Frequency Range		20	—	1250	MHz
Insertion Loss*	100 - 800	—	0.5	1.0	dB
	30 - 1100	—	0.8	1.8	
	20 - 1250	—	1.2	2.5	
Amplitude Unbalance	100 - 800	—	0.4	0.8	dB
	30 - 1100	—	0.7	1.2	
	20 - 1250	—	1.0	1.9	
Phase Unbalance***	100 - 800	—	3	—	Degree
	30 - 1100	—	5	—	
	20 - 1250	—	8	—	
Return Loss	100 - 800	—	20.8	—	dB
	30 - 1100	—	15.5	—	
	20 - 1250	—	12.7	—	

* Insertion Loss is reference to mid-band loss, 1.3 dB typ.
** Impedance ration= secondary (150 ohms)/(primary (75 ohms)
*** Deviation from 180°

Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
20.00	1.49	14.44	0.06	0.46
40.00	1.27	18.74	0.05	0.57
100.00	1.24	24.19	0.09	1.01
200.00	1.60	25.31	0.07	3.30
300.00	1.55	21.89	0.06	3.49
500.00	1.33	19.19	0.03	2.60
600.00	1.29	18.76	0.01	1.79
800.00	1.48	19.33	0.01	0.55
1000.00	1.68	20.40	0.24	3.66
1100.00	1.66	17.94	0.46	5.47





Notes

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

RF Transformer TX-2-5-1+

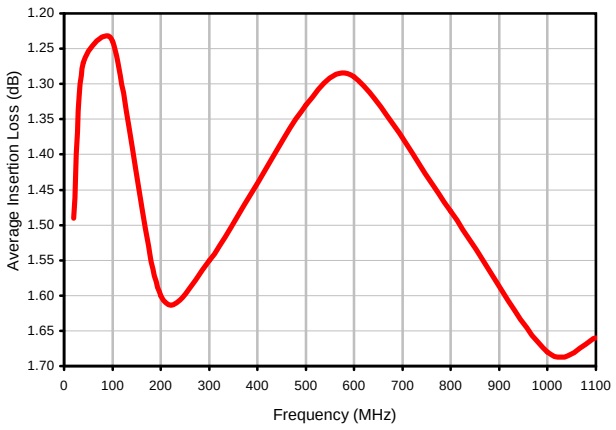
Typical Performance Data

FREQUENCY (MHz)	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (deg)
20	1.49	14.44	0.06	0.46
40	1.27	18.74	0.05	0.57
100	1.24	24.19	0.09	1.01
200	1.60	25.31	0.07	3.30
300	1.55	21.89	0.06	3.49
500	1.33	19.19	0.03	2.60
600	1.29	18.76	0.01	1.79
800	1.48	19.33	0.01	0.55
1000	1.68	20.40	0.24	3.66
1100	1.66	17.94	0.46	5.47

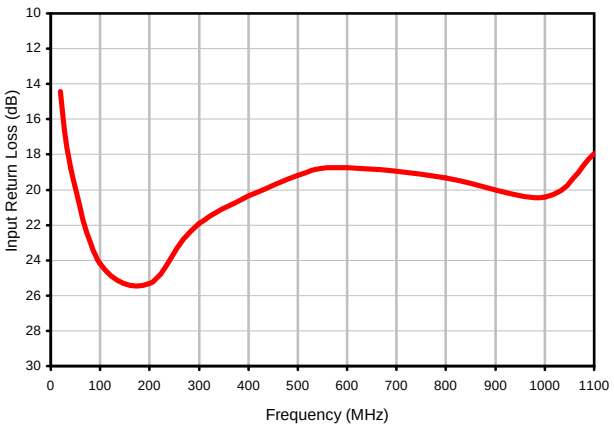
RF Transformer TX-2-5-1+

Typical Performance Curves

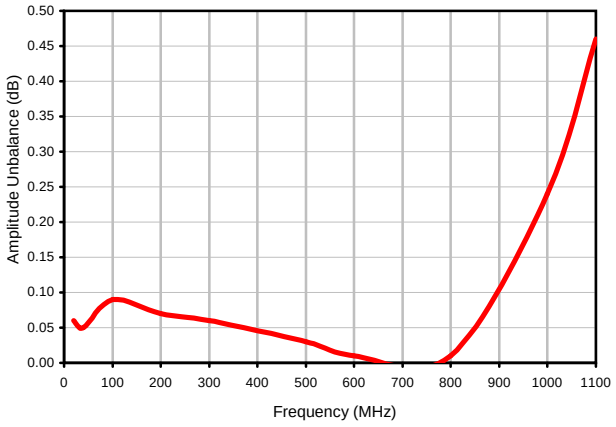
Average Insertion Loss



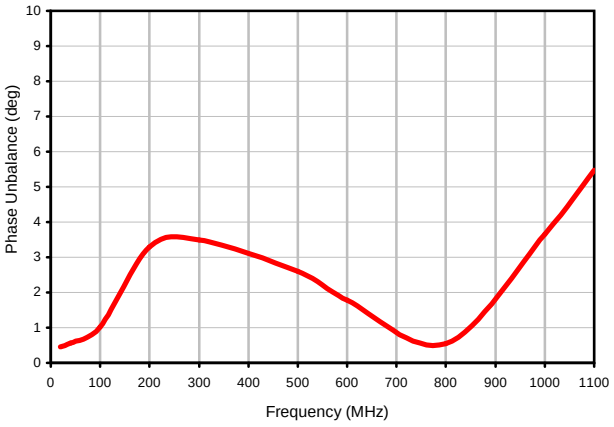
Input Return Loss



Amplitude Unbalance



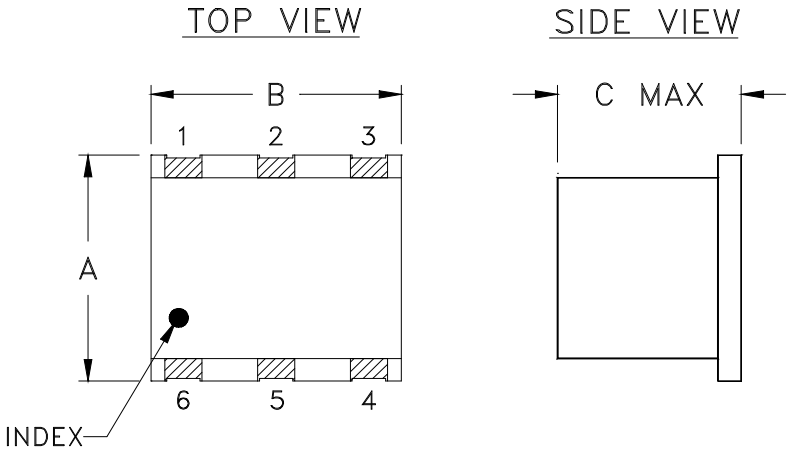
Phase Unbalance

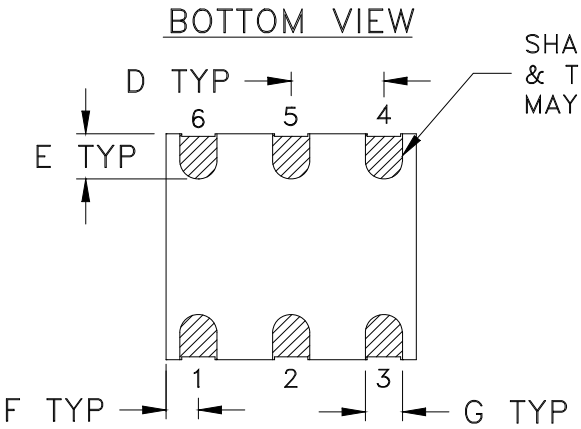


Case Style TT

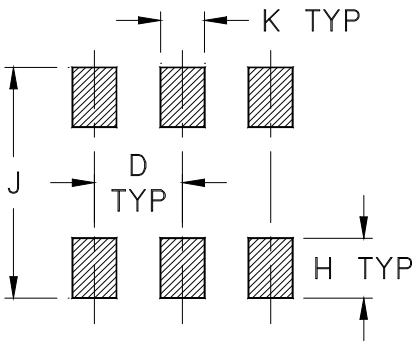
TT240

Outline Dimensions





PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

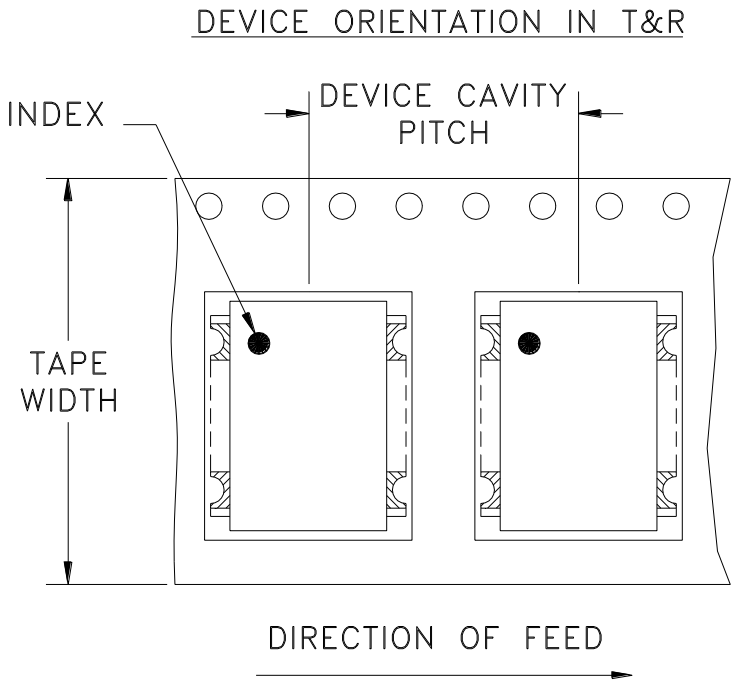
CASE #	A	B	C	D	E	F	G	H	J	K	WT. GRAM
TT240	.250 (6.35)	.31 (7.87)	.20 (5.08)	.100 (2.54)	.050 (1.27)	.055 (1.40)	.040 (1.02)	.070 (1.78)	.270 (6.86)	.050 (1.27)	.50

Dimensions are in inches (mm). Tolerances: 2Pl. ± .01; 3 Pl. ± .005

Notes:

1. Case material: Ceramic.
2. Termination finish:
   For RoHS Case Styles: 2-10µ inch (.05-.25 microns) Gold plate over 100-300 µ inch (2.54-7.62 microns) Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

Tape & Reel Packaging TR-F2



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel See note
16	12	7	10
			20
			50
			100
			200
		13	500

Note: Please consult individual model data sheet to determine device per reel availability

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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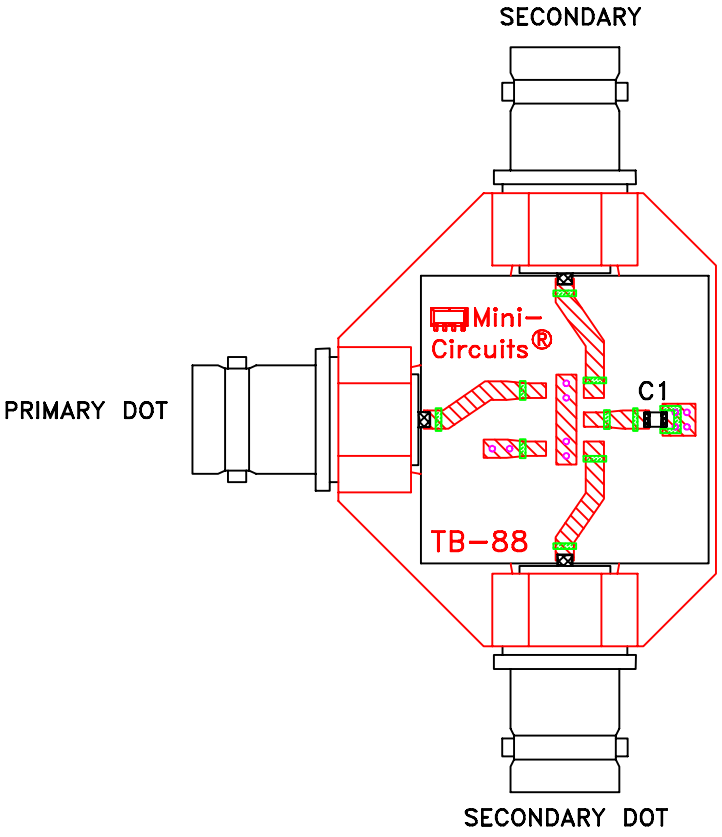
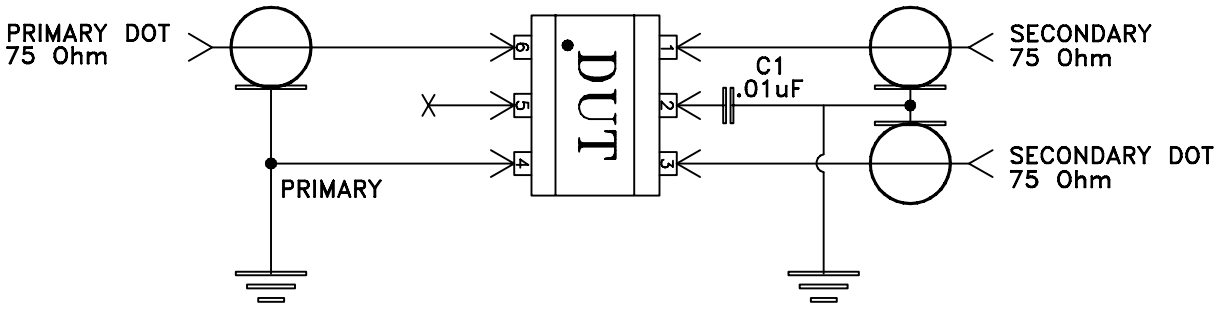
Evaluation Board and Circuit



TB-88



Schematic Diagram

Notes:

1. 75 Ohm BNC Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.060 inch.

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Environmental Specifications ENV02

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-20° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215