

Surface Mount

RF Transformer

TRC1-1-122-75+

75Ω 5 to 1250 MHz 1:1 Ratio

The Big Deal

- Low insertion loss, 0.6 dB typ.
- Good return loss, 22 dB typ.
- Low unbalance, 0.7 dB, 4°
- Power handling up to 2.0W



CASE STYLE: GU2644

Product Overview

The TRC1-1-122-75+ is a 75Ω surface mount transmission line transformer with a 1:1 secondary/primary impedance ratio covering the 5 to 1250 MHz band, meeting bandwidth requirements for DOCSIS® 3.1 compliant systems and equipment, among other applications. This model handles RF input power up to 2W and provides low insertion loss, good return loss and low unbalance. Measuring only 0.12 x 0.17 x 0.13", the unit features core and wire construction mounted on a 4-pad plastic base, ideal for dense PCB layouts.

Key Features

Feature	Advantages
Wideband, 5 to 1250 MHz	TRC1-1-122-75+ supports a variety of applications including CATV and DOCSIS 3.1 systems and equipment.
Low insertion loss, 0.6 dB	Enables excellent signal power transmission from input to output.
Good return loss, 22 dB typ.	Excellent matching for 75Ω systems with minimal signal reflection.
Low unbalance, 0.7 dB, 4°	Low unbalance can improve a system's electromagnetic compatibility by rejecting unwanted common-mode noise.
Small footprint, 0.12 x 0.17"	Accommodates tight space requirements for dense PCB layouts.

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



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75Ω 5 to 1250 MHz 1:1 Ratio

Maximum Ratings

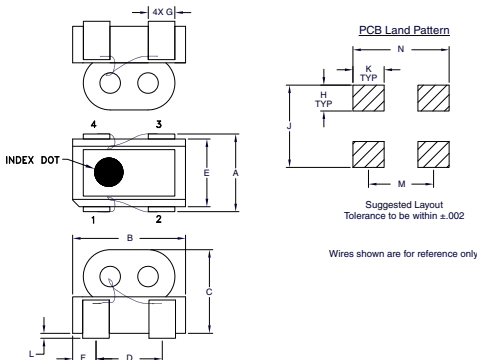
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
DC Current	300mA

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

Pin Connections

PRIMARY DOT (INPUT)	1
PRIMARY (GND)	2
SECONDARY DOT (OUTPUT)	3
SECONDARY (OUTPUT)	4

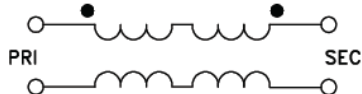
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.117	.170	.130	.100	.102	.035	.040
2.97	4.32	3.30	2.54	2.59	0.89	1.02
H	J	K	L	M	N	wt
.039	.124	.047	.007	0.098	.145	grams
0.99	3.15	1.19	0.18	2.49	3.68	0.10

Config. G



Features

- wideband, 5 to 1250 MHz
- balanced transmission line
- good return loss, 22 dB typ.
- excellent amplitude unbalance, 0.7 dB typ. and phase unbalance, 4 deg typ.
- plastic base with leads

Applications

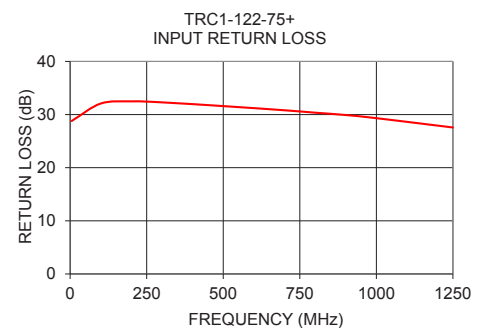
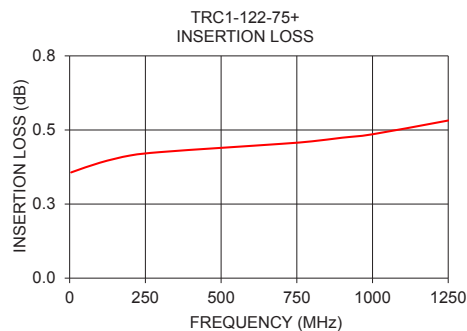
- balanced to unbalanced transformation
- push-pull amplifiers
- PCS/DCS
- MMDS
- DOCSIS 3.1

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio			1		
Frequency Range		5	—	1250	MHz
Insertion Loss (Average)	5 - 1000 1000 - 1250	— —	0.5 0.6	0.7 0.8	dB
Amplitude Unbalance	5 - 1000 1000 - 1250	— —	1.0 0.7	1.5 1.0	dB
Phase Unbalance	5 - 1250	—	4	9	Degree
Input Return Loss	5 - 1250	14	22	—	dB
Input Power	5 - 45 45 - 1250	— —	— —	0.5 2.0	Watt

Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (Avg.) (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
5.00	0.36	28.79	1.14	3.50
100.00	0.39	32.07	1.13	0.52
200.00	0.41	32.48	1.14	0.97
300.00	0.43	32.29	1.11	1.41
500.00	0.44	31.59	0.99	2.32
700.00	0.45	30.81	0.82	3.27
800.00	0.46	30.35	0.72	3.63
900.00	0.47	29.91	0.61	3.92
1000.00	0.49	29.32	0.50	4.15
1250.00	0.53	27.57	0.21	4.36



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RF Transformer

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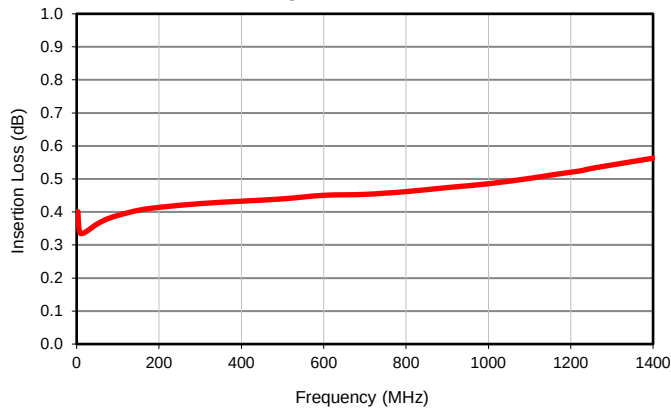
Typical Performance Data

FREQUENCY (MHz)	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (deg.)
3	0.40	26.88	1.32	6.36
5	0.36	28.79	1.14	3.50
7	0.34	29.92	1.07	2.48
10	0.33	30.70	1.04	1.63
20	0.34	31.45	1.03	0.48
40	0.36	31.62	1.07	0.12
45	0.36	31.66	1.08	0.18
50	0.36	31.71	1.09	0.23
70	0.38	31.86	1.12	0.40
100	0.39	32.07	1.13	0.52
150	0.41	32.51	1.15	0.70
200	0.41	32.48	1.14	0.97
300	0.43	32.29	1.11	1.41
400	0.43	32.11	1.06	1.88
500	0.44	31.59	0.99	2.32
600	0.45	31.19	0.90	2.82
700	0.45	30.81	0.82	3.27
800	0.46	30.35	0.72	3.63
900	0.47	29.91	0.61	3.92
1000	0.49	29.32	0.50	4.15
1100	0.50	28.76	0.39	4.26
1150	0.51	28.27	0.33	4.33
1200	0.52	28.08	0.27	4.34
1218	0.52	27.91	0.25	4.34
1230	0.53	27.78	0.24	4.36
1250	0.53	27.57	0.21	4.36
1400	0.56	26.34	0.04	4.44

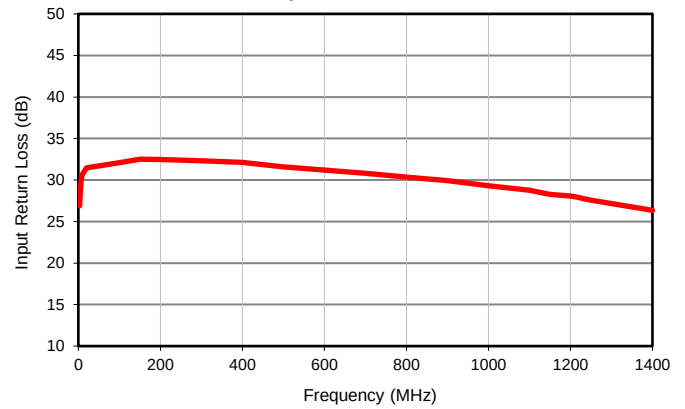


Typical Performance Data

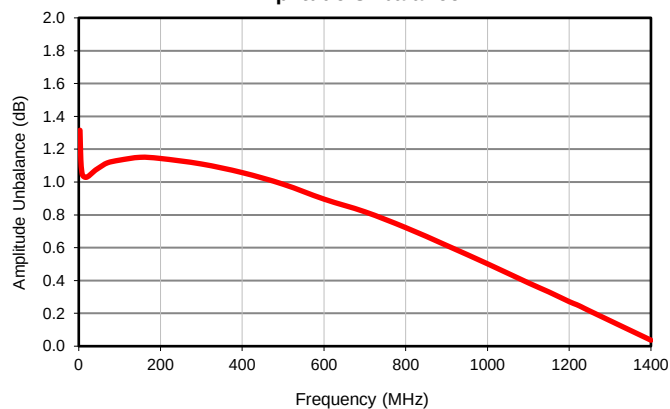
Average Insertion Loss



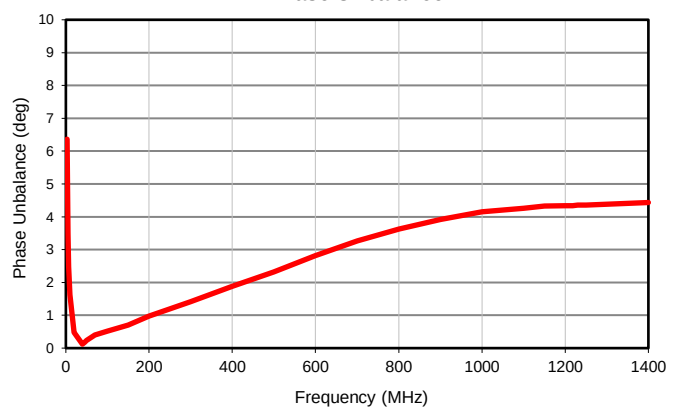
Input Return Loss



Amplitude Unbalance



Phase Unbalance

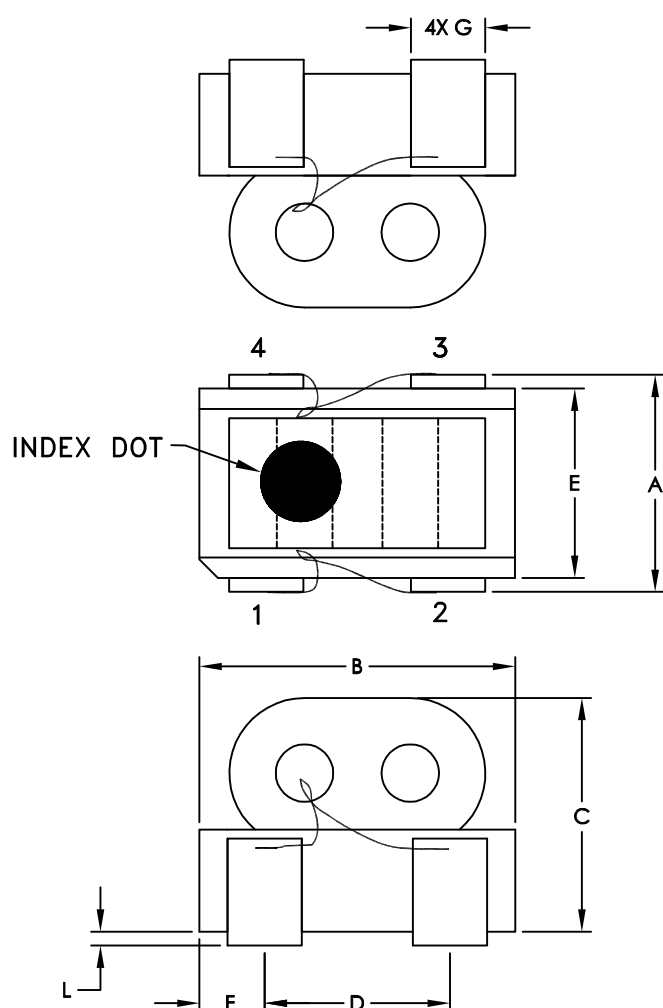


Case Style

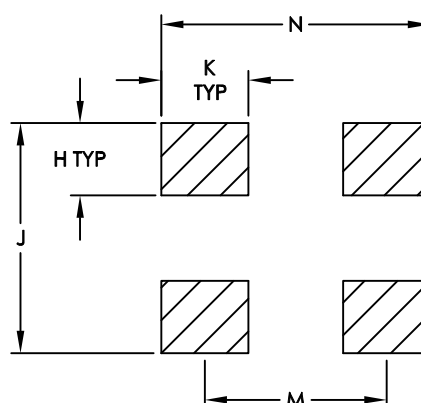
GU

Outline Dimensions

GU2644



PCB Land Pattern



Suggested Layout
Tolerance to be within $\pm.002$

Wires shown are for reference only.

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N	WT, GRAM
GU2644	.117 (2.97)	.170 (4.32)	.130 (3.30)	.100 (2.54)	.102 (2.59)	.035 (.89)	.040 (1.02)	.039 (.99)	.124 (3.15)	.047 (1.19)	.007 (.018)	.098 (2.49)	.145 (3.68)	.10

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

Notes:

1. Case material: Plastic Base.
2. Termination finish: Tin Plate.

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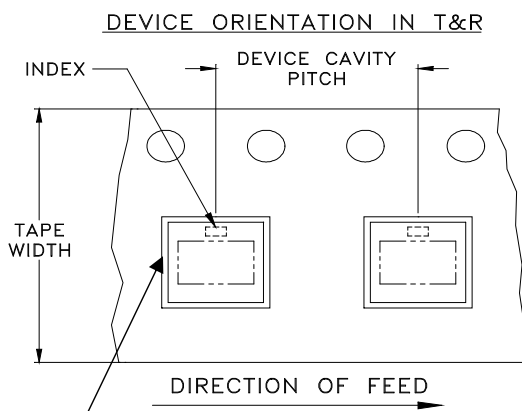
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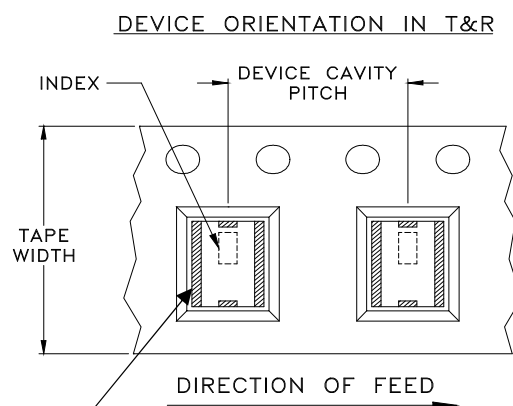
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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F77



Note: The shape of the pocket may differ



Note: The location and shape of the metallization may differ

Applicable Case Styles

GU1604, GU1804, GU2644,
TT1618-2

Applicable Case Styles

MZ4532C, NM1812C,
NM1812C-1, NM1812C-2,
NM1812C-3, NM1812C-5,
NM1812C-6, NM3237

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
12	8	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
		13	Standard	2000

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.

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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	-40° 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