



BALANCED

RF Transformer

TRS1-23-75+

Mini-Circuits

75Ω 10 to 2200 MHz 1:1 Ratio

THE BIG DEAL

- Very Wide Band Balun, with Excellent Performance from 10 to 2200 MHz
- Excellent Amplitude Unbalance, 0.3 dB Typ.
- Good Return Loss, 20 dB Typ. at 1 dB Band
- Suitable for Tin/Lead and RoHS Solder Systems
- Balanced Transmission Line
- Aqueous Washable



Generic photo used for illustration purposes only

CASE STYLE: AT577-1

+RoHS Compliant

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

APPLICATIONS

- Balanced to Unbalanced Transformation
- Push-Pull Amplifiers
- PCS/DCS
- Cable TV
- Cellular

PRODUCT OVERVIEW

Mini-Circuits' TRS1-23-75+ is a balanced-to-unbalanced 75Ω transmission line transformer, 0.2x0.2x0.2" in size. This rugged, wire welded, rectangular core design is rated for up to 0.5 W maximum power, in an aqueous washable case suitable for both RoHS and tin/lead solder systems.

KEY FEATURES

Features	Advantages
Very Wide Bandwidth	10 to 2200 MHz bandwidth covers CATV (forward & return), medical wireless and D2A/A2D, and other communications applications.
Excellent Amplitude and Phase Unbalance	0.4 dB amplitude and 3° phase unbalance aid rejection of even harmonics (in push-pull amplifiers) and common mode signals (when used as a balun).
Good Return Loss	Provides excellent matching for 75Ω circuitry.
Low and Flat Insertion Loss	Consistently low signal loss, ±0.2 dB across all 50 to 1000 MHz CATV bands.

REV. C
ECO-028366
TRS1-23-75+
MCL NY
260330





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ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio			1		
Frequency Range		10		2200	MHz
Insertion Loss ¹	10-2200		3		dB
	30-1500		2		
	50-1000		1		
Phase Unbalance	50-1000		3		Deg.
	30-1500		5		
Amplitude Unbalance	50-1000		0.4		dB
	30-1500		0.6		

1. Insertion Loss is referenced to mid-band loss, 0.2 dB typ.

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
RF Power	0.5 W
DC Current	300 mA

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





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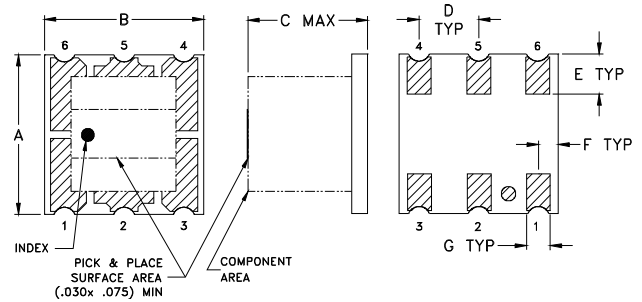
75Ω 10 to 2200 MHz 1:1 Ratio

PIN CONNECTIONS

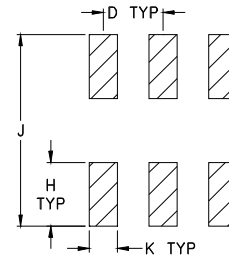
PRIMARY DOT	1
PRIMARY	3
SECONDARY DOT	6
SECONDARY	4
NOT USED	2,5

PRODUCT MARKING: N/A

OUTLINE DRAWING



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

OUTLINE DIMENSIONS (Inch mm)

A	B	C	D	E	F
.200	.200	.15	.075	.050	.025
5.08	5.08	3.81	1.91	1.27	0.64
G	H	J	K		wt
.030	.080	.240	.035		grams
0.76	2.03	6.10	0.89		0.15

TAPE & REEL INFORMATION: F73



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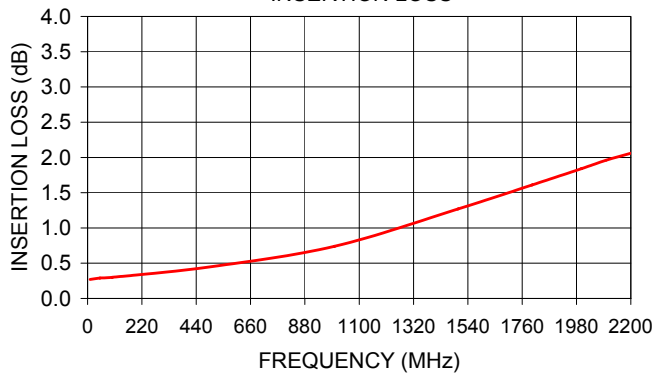
Mini-Circuits

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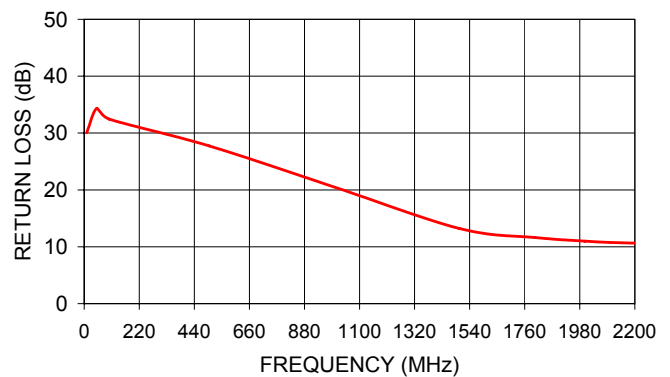
TYPICAL PERFORMANCE DATA

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
10	0.27	30.06	0.58	6.13
30	2.71	34.11	0.59	2.24
50	0.29	34.32	0.55	1.33
100	0.30	32.46	0.51	0.30
500	0.45	27.73	0.33	2.61
1000	0.74	20.49	0.10	2.40
1500	1.27	13.21	0.27	1.23
1800	1.61	11.64	0.18	3.21
2000	1.84	10.99	0.05	4.05
2200	2.06	10.63	0.14	4.39

INSERTION LOSS



RETURN LOSS



- 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/terms/viewterm.html



RF Transformer

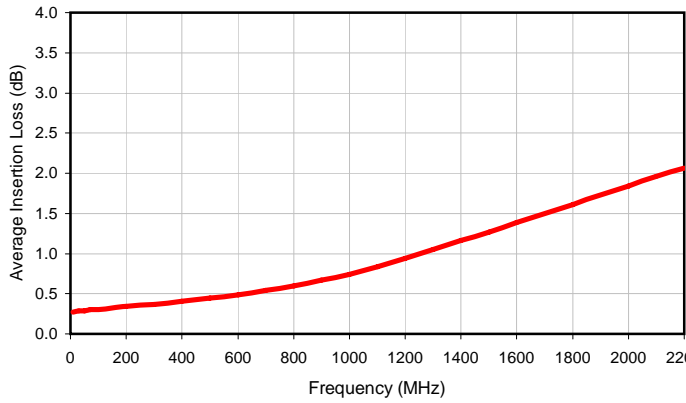
TRS1-23-75+

Typical Performance Data

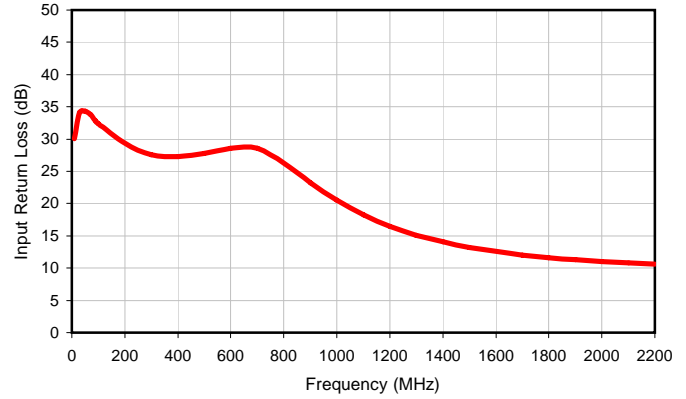
FREQUENCY MHz	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (deg.)
10.0	0.27	30.06	0.58	6.13
30.0	0.29	34.11	0.59	2.24
50.0	0.29	34.32	0.55	1.33
70.0	0.30	33.79	0.53	0.83
90.0	0.30	32.87	0.52	0.45
100.0	0.30	32.46	0.51	0.30
200.0	0.34	29.38	0.48	0.74
300.0	0.37	27.62	0.44	1.49
400.0	0.41	27.27	0.39	2.09
500.0	0.45	27.73	0.33	2.61
600.0	0.49	28.55	0.26	2.92
700.0	0.54	28.58	0.17	3.07
800.0	0.60	26.33	0.09	3.04
900.0	0.67	23.24	0.01	2.82
1000.0	0.74	20.49	0.10	2.40
1100.0	0.84	18.26	0.17	1.81
1200.0	0.94	16.51	0.23	1.09
1300.0	1.05	15.12	0.26	0.33
1400.0	1.16	14.04	0.28	0.43
1500.0	1.27	13.21	0.27	1.23
1600.0	1.39	12.57	0.25	1.95
1700.0	1.50	12.05	0.22	2.62
1800.0	1.61	11.64	0.18	3.21
1900.0	1.73	11.28	0.12	3.67
2000.0	1.84	10.99	0.05	4.05
2100.0	1.96	10.77	0.03	4.28
2200.0	2.06	10.63	0.14	4.39

Typical Performance Data

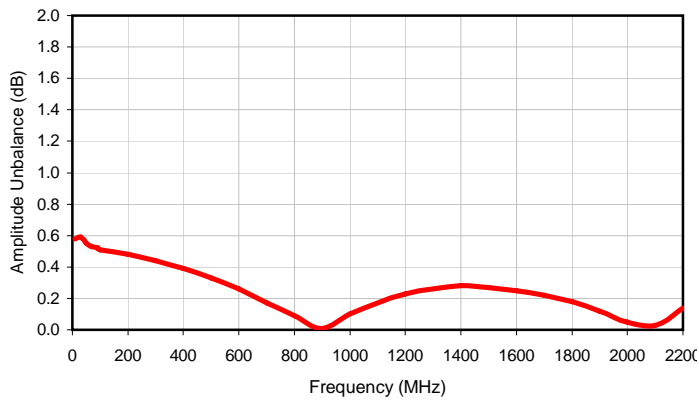
Average Insertion Loss



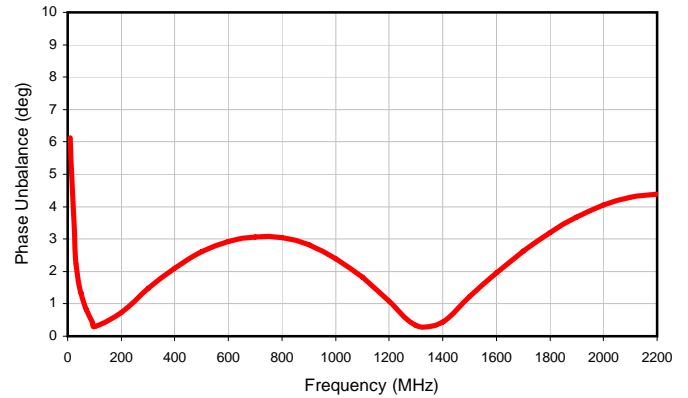
Input Return Loss



Amplitude Unbalance

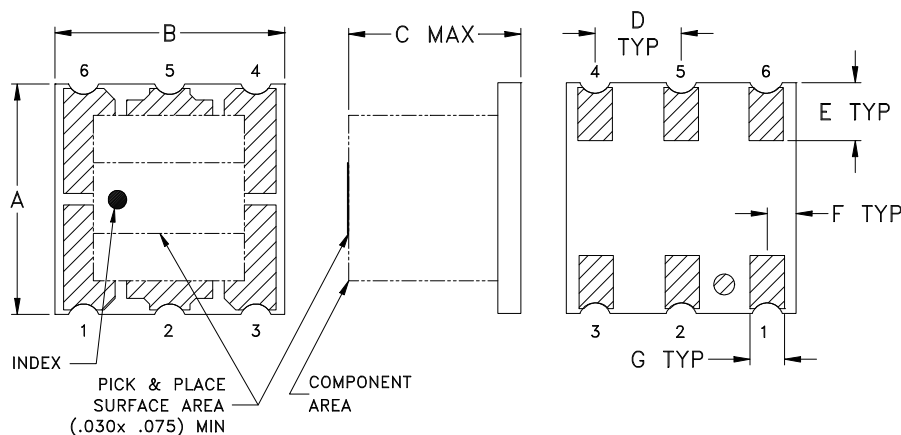


Phase Unbalance

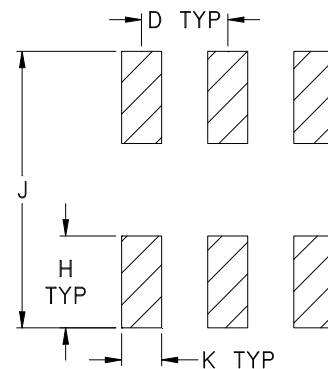


Outline Dimensions

AT577-1



PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K	L	WT. GRAMS
AT577-1	.200 (5.08)	.200 (5.08)	.15 (3.81)	.075 (1.91)	.050 (1.27)	.025 (0.64)	.030 (0.76)	.080 (2.03)	.240 (6.10)	.035 (0.89)	-- --	.15

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

Notes:

1. Base material: Printed wiring laminate.
2. Termination finish:
 - For RoHS Case Style: 3-5 μ inch (.08-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
 - For RoHS-5 Case Style: Tin-Lead plate. All models, no (+) suffix.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site

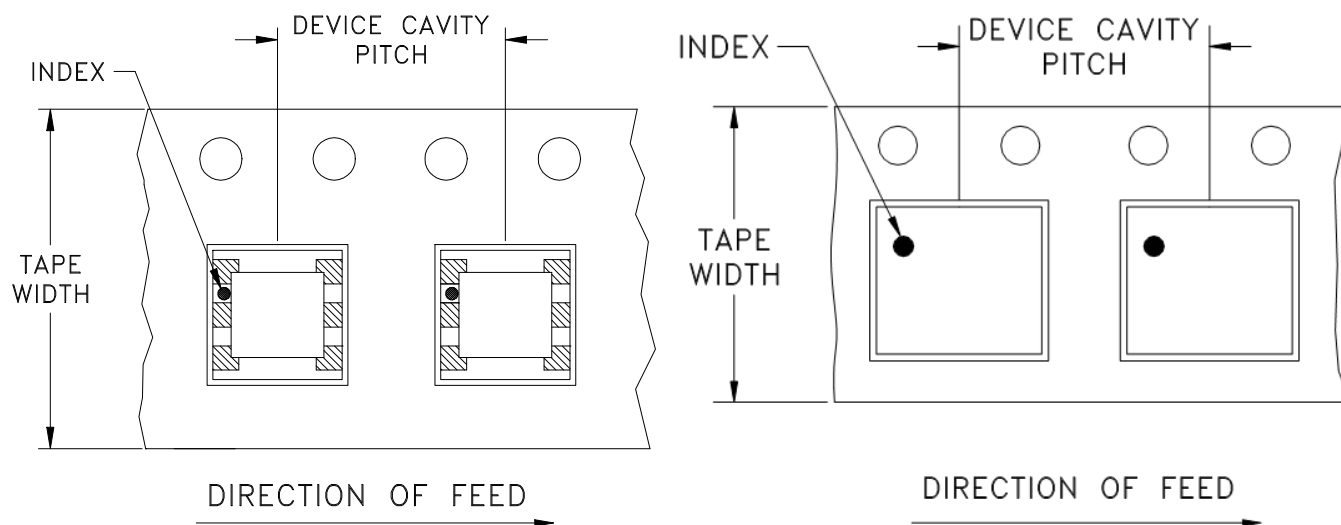


The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F73

DEVICE ORIENTATION IN T&R



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
		13	Standard	1000
		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.

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

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INTERNET <http://www.minicircuits.com>

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Mini-Circuits ISO 9001 & ISO 14001 Certified

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