Surface Mount

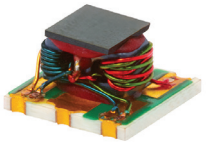
RF Transformer

TRS2-32-75+

75Ω 1 to 300 MHz

The Big Deal

- Low insertion loss, 0.5 dB typ.
- Good return loss, 25 dB typ.
- Low unbalance, 0.2 dB, 2°
- Power handling up to 0.25W



CASE STYLE: AT577-2

Product Overview

Mini-Circuits TRS2-32-75+ is a 75Ω surface mount balun transformer with a 1:2 secondary/primary impedance ratio covering the 1 to 300 MHz band. This model handles RF input power up to 0.25W and provides low insertion loss, good return loss, low amplitude unbalance, and low phase unbalance. Measuring only 0.2 x 0.2 x 0.15", the unit features core and wire, all-welded construction mounted on a six-lead printed wiring laminate base with wraparound terminations for excellent solderability. The unit also includes Mini-Circuits' Top Hat™ feature for faster more accurate pick-and-place assembly.

Key Features

Feature	Advantages
Wideband, 1 to 300 MHz, Usable to 500 MHz	TRS2-32-75+ supports a variety of applications including CATV and DOCSIS® 3.1 upstream paths.
Low insertion loss, 0.5 dB	Enables excellent signal power transmission from input to output.
Good return loss, 25 dB typ.	Excellent matching for 75Ω systems with minimal signal reflection.
Low unbalance • 0.2 dB amplitude unbalance • 2° phase unbalance	Low unbalance can improve a system's electromagnetic compatibility by rejecting unwanted common-mode noise.
Small footprint, 0.2 x 0.2"	Accommodates tight space requirements for dense PCB layouts.
Top Hat® feature	Improves speed and accuracy of pick and place assembly and provides clear device marking for visual inspection

Ceramic Balun

RF Transformer

TRS2-32-75+

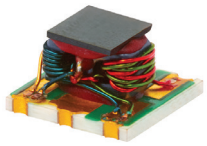
75Ω 1 to 300 MHz

Features

- wideband, 1 to 300 MHz
- useable up to 500 MHz
- good return loss
- flat insertion loss

Applications

- impedance matching
- balanced to unbalanced transformer
- push-pull amplifiers
- CATV



Generic photo used for illustration purposes only

CASE STYLE:AT577-2

+RoHS Compliant

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

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio (secondary/primary)			0.5		
Frequency Range		1	—	300	MHz
Insertion Loss	1-300	—	0.6	1.1	dB
Amplitude Unbalance	1-300	—	0.2	0.5	dB
Phase Unbalance	1-300	—	2	6	Degree

Note: External capacitors Cp= 2.0pF and Cs1=Cs2=18pF must be added to achieve specify performance. Suggested size 0402.

Maximum Ratings

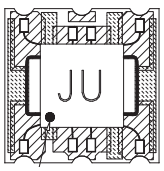
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	0.25W
DC Current	30mA

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

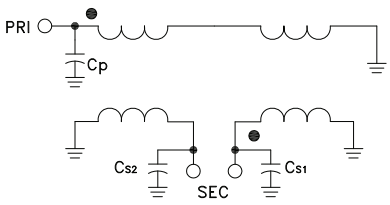
Pin Connections

Function	Pin Number
PRIMARY DOT	3
PRIMARY	1
SECONDARY DOT	6
SECONDARY	4
AC GND (DC BIAS)	2
ISOLATED	5

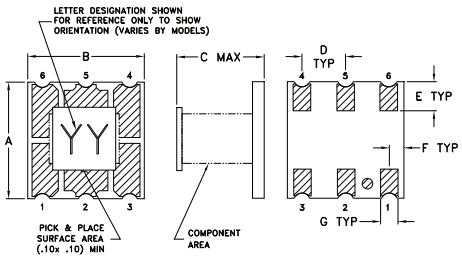
Product Marking



Configuration J1



Outline Drawing

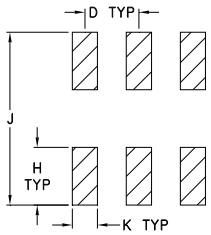


Outline Dimensions (inch / mm)

A	B	C	D	E	F
.063	.031	.024	.012	.008	.006
1.60	0.79	0.61	0.30	0.20	0.15

G	H	J	K	wt
.020	.010	.022	.053	grams
0.51	0.25	0.56	1.35	0.005

PCB Land Pattern

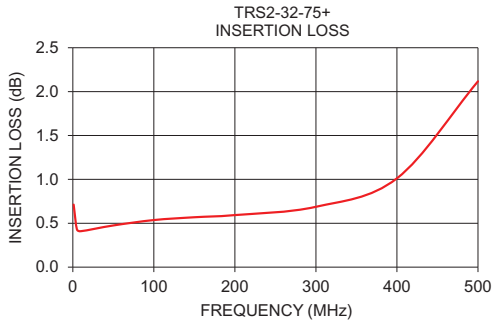


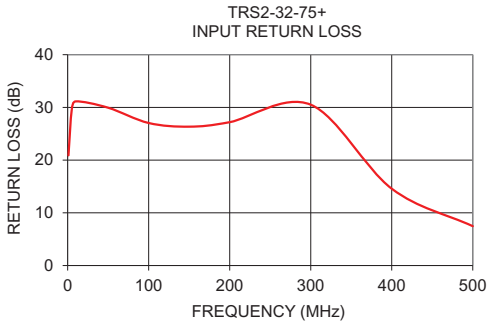
Suggested Layout,
Tolerance to be within±.002

Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
1	0.71	20.90	0.08	0.53
5	0.43	29.49	0.03	0.29
10	0.41	31.14	0.02	0.33
50	0.48	29.94	0.01	0.52
100	0.54	27.04	0.01	1.05
150	0.57	26.34	0.04	1.61
200	0.59	27.20	0.08	2.07
300	0.69	30.51	0.22	2.88
400	1.01	14.58	0.53	3.97
500	2.12	7.47	1.02	5.40

** Measured with Agilent N5242A network analyzer using impedance conversion and port extension.





Additional 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

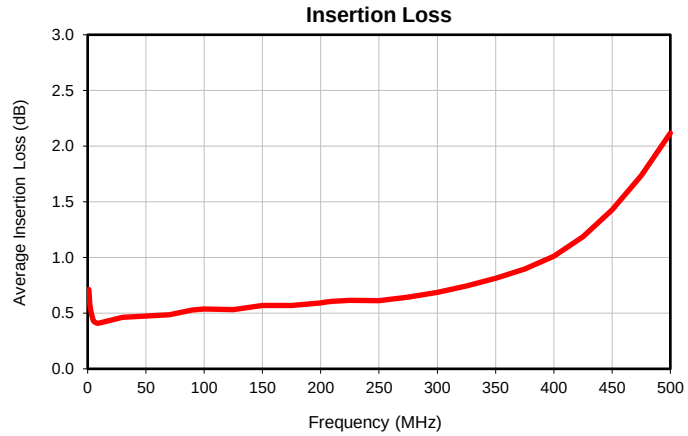
RF Transformer TRS2-32-75+

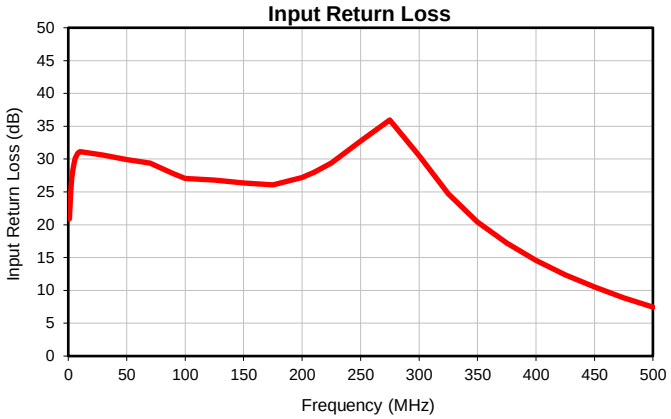
Typical Performance Data

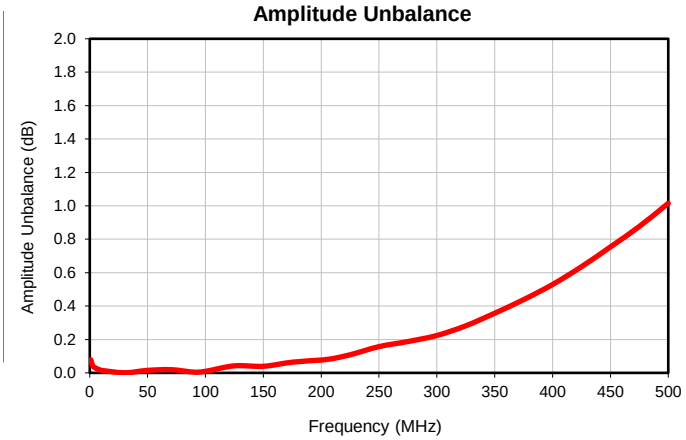
FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg)
1	0.71	20.90	0.08	0.53
2	0.57	24.93	0.05	0.40
3	0.50	26.98	0.04	0.34
4	0.46	28.43	0.03	0.31
5	0.43	29.49	0.03	0.29
6	0.42	30.11	0.03	0.31
8	0.41	30.90	0.02	0.31
10	0.41	31.14	0.02	0.33
30	0.46	30.61	0.00	0.39
50	0.48	29.94	0.01	0.52
70	0.49	29.40	0.02	0.81
90	0.53	27.78	0.00	1.01
100	0.54	27.04	0.01	1.05
125	0.53	26.78	0.04	1.34
150	0.57	26.34	0.04	1.61
175	0.57	26.09	0.06	1.77
200	0.59	27.20	0.08	2.07
205	0.60	27.59	0.08	2.13
210	0.61	27.99	0.09	2.19
225	0.61	29.36	0.11	2.32
250	0.61	32.76	0.16	2.44
275	0.64	35.96	0.19	2.61
300	0.69	30.51	0.22	2.88
325	0.74	24.69	0.28	3.20
350	0.81	20.42	0.36	3.48
375	0.90	17.20	0.44	3.71
400	1.01	14.58	0.53	3.97
425	1.19	12.40	0.64	4.26
450	1.43	10.51	0.75	4.54
475	1.74	8.87	0.88	4.90
500	2.12	7.47	1.02	5.40

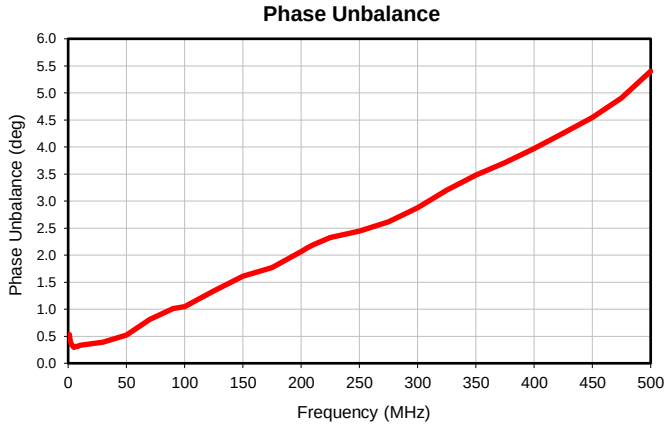
RF Transformer TRS2-32-75+

Typical Performance Data





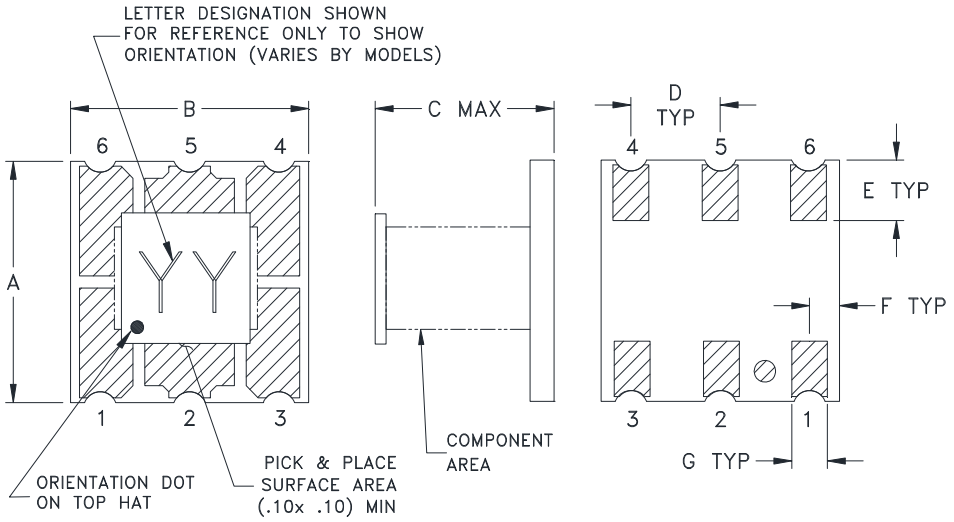




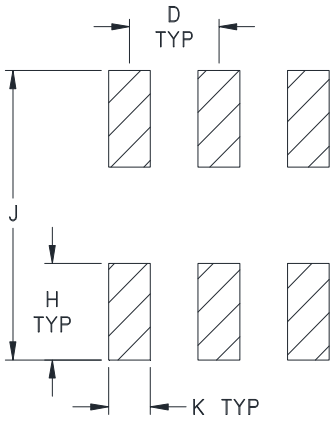
Case Style AT

Outline Dimensions

AT577-2



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	WT. GRAMS
AT577-2	.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

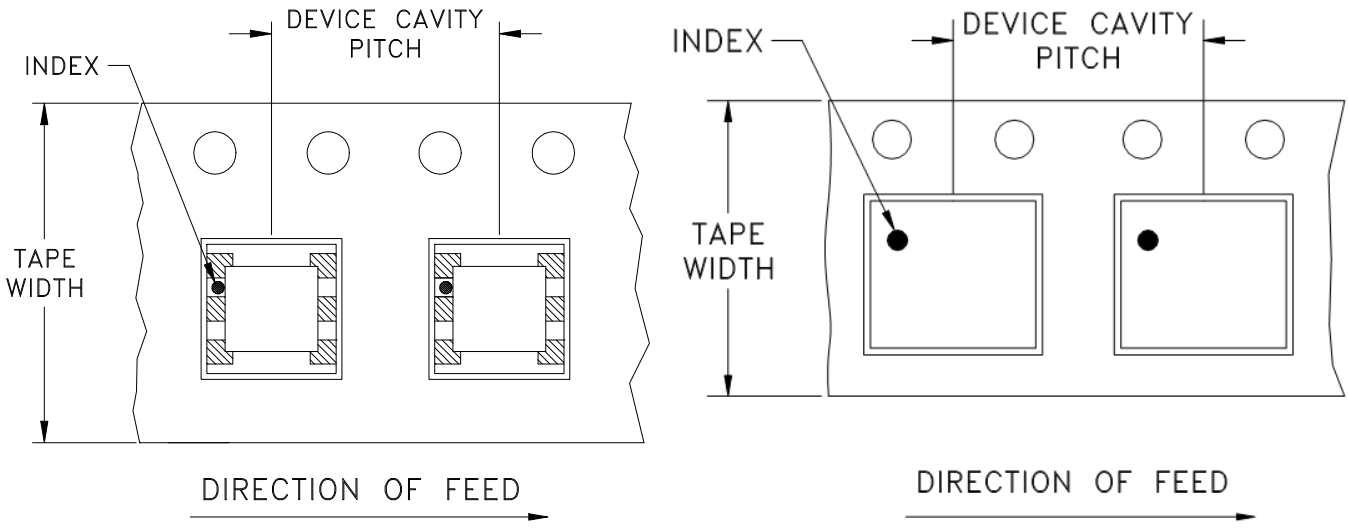
Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

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.
3. Orientation Dot on Top Hat & Marking on the Substrate both refers to Pin #1 of the Unit.

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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Mini-Circuits ISO 9001 & ISO 14001 Certified

Mini-Circuits

Environmental Specifications ENV02T1

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