Surface Mount

RF Transformer

TC1.33-1T-75X+

75Ω 3 to 500 MHz

CASE STYLE: AT1521

The Big Deal

- Excellent return loss, 23dB typical
- Highly accurate 75Ω to 100Ω balanced transition
- Cost-effective design

Product Overview

This high-performance, low-cost transformer is ideal for use with push-pull amplifiers where balanced-to-unbalanced RF signal transformation is required. It is an ideal match for the inputs of Mini-Circuits dual MMIC amplifiers. When used in this configuration, the high phase and amplitude accuracy provides excellent IP2 and IP3 performance, making it ideal for use in 75Ω CATV return applications or any single-ended 75Ω to balanced 50Ω application.

Key Features

Feature	Advantages
Wideband	Usable range of 3MHz to 500MHz makes this transformer suitable for multiple applications and covers the entire spectrum of CATV return path applications.
Excellent phase and amplitude performance	Typical amplitude unbalance of 0.5dB and phase unbalance of 3° in a 1dB bandwidth is unmatched for a transformer in this price range.
DC isolation	This feature enables the TC1 series to work in applications down to very low frequencies and when isolation of the primary and secondary windings is required.
Highly accurate impedance matching	The very accurate matching makes this product ideal for CATV applications running parallel 75Ω single-ended signals into 100Ω circuits in a differential configuration.
Extremely low cost	Mini-Circuits's unique design approach enables a high-performance transformer to be available in the market at a low cost for high-volume production.

Surface Mount top hat®

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Generic photo used for illustration purposes only

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+RoHS Compliant

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

Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500
13"	1000, 2000

Features

- wideband, 3 to 500 MHz
- DC isolated
- good return loss
- excellent amplitude unbalance, 0.5 dB typ. and phase unbalance, 3 deg typ. in 1 dB bandwidth
- plastic base with leads
- aqueous washable

Applications

- balanced to unbalanced transformation
- push-pull amplifiers
- impendance matching
- CATV

Electrical Specifications at 25°C

Parameter	Condition	Min.	Typ.	Max.	Unit
Impedance Ratio (Secondary/Primary)			1.33		
Frequency Range		3		500	MHz
Insertion Loss*	3-500	—	2	—	dB
	5-300	—	1	—	
Amplitude Unbalance	1 dB bandwidth	—	0.5	—	dB
	2 dB bandwidth	—	0.9	—	
Phase Unbalance	1 dB bandwidth	—	3	—	Degree
	2 dB bandwidth	—	5	—	

*Insertion Loss is referenced to mid-band loss, 0.5 dB typ.

Maximum Ratings

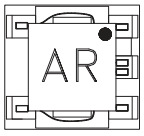
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	250mW
DC Current	30mA

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

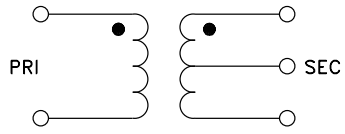
Pin Connections

Function	Pin Number
PRIMARY DOT	6
PRIMARY	4
SECONDARY DOT	1
SECONDARY	3
SECONDARY CT	2

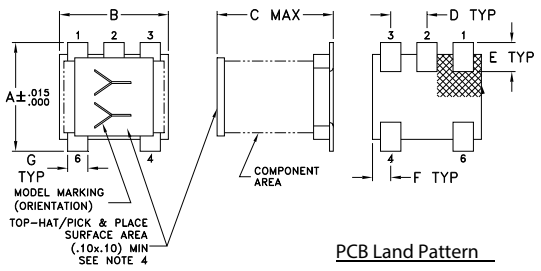
Product Marking



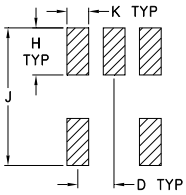
Config. A



Outline Drawing



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

Note:
1. Case Material Plastic
2. Termination Finish: Tin plate over Nickel plate.
3. Lead #1 identifier shall be located in the cross-hatched area shown, on bottom view. Identifier may be either a molded or marked feature.
4. Top-Hat total thickness: .013 inches max.

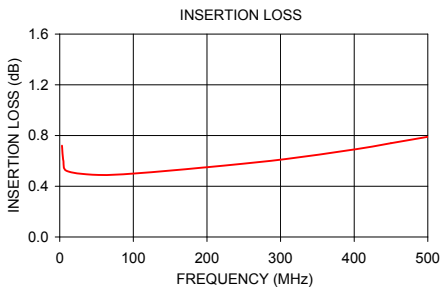
Outline Dimensions (inch / mm)

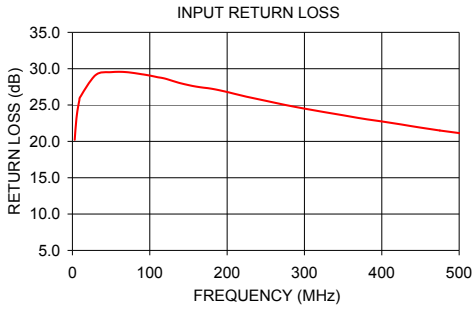
A	B	C	D	E	F
.150	.150	.160	.050	.040	.025
3.81	3.81	4.06	1.27	1.02	0.64

G	H	J	K	wt
.028	.065	.190	.030	grams
0.71	1.65	4.83	0.76	0.15

Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
3.00	0.72	20.21	0.03	0.05
5.00	0.60	22.88	0.03	0.08
10.00	0.52	26.09	0.02	0.17
50.00	0.49	29.53	0.00	0.67
100.00	0.50	29.06	0.05	1.30
200.00	0.55	26.79	0.25	2.48
300.00	0.61	24.51	0.56	3.37
400.00	0.69	22.74	0.96	4.07
450.00	0.74	21.90	1.18	4.37
500.00	0.79	21.14	1.44	4.62





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