

Balanced to Unbalanced

RF Transformer

TC1.33-282+

100 to 75Ω 5 to 2800 MHz

The Big Deal

- Very wide bandwidth, 5 to 2800 MHz
- Very good return loss over entire band
- Convenient 100/75Ω matching over a wide range of frequencies



CASE STYLE: AT224-1

Product Overview

The TC1.33-282+ is a mini wideband tri-filar transformer, measuring approximately 4 mm on all sides. The plastic substrate, 5-pad design is aqueous washable and RoHS compliant, featuring a square core and all welded wire construction for repeatability and reliability in balanced-to-unbalanced 100/75Ω implementations.

Feature	Advantages
Very wide bandwidth	5-2800 MHz bandwidth useful for CATV (forward & return), medical wireless and D2A/A2D, and communications applications
Excellent amplitude and phase unbalance	0.3 dB amplitude and 6° phase unbalance aid rejection of even harmonics (in push-pull amplifiers) and common mode signals (when used as a balun)
Good return loss	Efficient signal path across 100/75Ω transitions
Low and flat insertion loss	Flatness ±0.1 dB across 50-1000 MHz CATV bands preserves gain flatness after impedance transformation

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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TC1.33-282+

TC1.33-282X+
Upgraded Version*



Generic photo used for illustration purposes only

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- *Addition of Top hat™ feature Benefits
- Allows faster pick-and-place
 - Enables visual identification marking

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

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

Maximum 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

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

Features

- suitable for tin/lead and RoHS solder systems
- wideband, 5 to 2800 MHz
- balanced transmission line
- good return loss, 20 dB typ. at 1 dB band
- excellent amplitude unbalance, 0.3 dB typ.
- aqueous washable

Applications

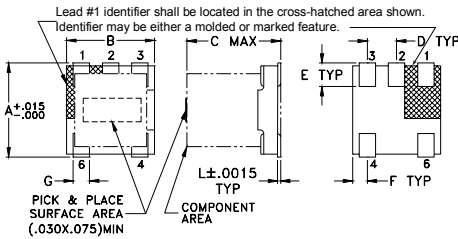
- balanced to unbalanced transformation
- push-pull amplifiers
- PCS/DCS
- cable TV
- cellular

Electrical Specifications at 25°C, 75Ω

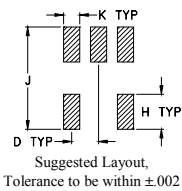
Ω RATIO (Secondary/Primary)	FREQUENCY (MHz)	INSERTION LOSS*			PHASE UNBALANCE (Deg.) Typ.		AMPLITUDE UNBALANCE (dB) Typ.	
		3 dB MHz	2 dB MHz	1 dB MHz	1 dB bandwidth	2 dB bandwidth	1 dB bandwidth	2 dB bandwidth
1.33	5-2800	5-2800	30-2000	50-1500	6	6	0.3	1.0

*Insertion Loss is referenced to mid-band loss, 1.0 dB typ. Measured in 75Ω system.

Outline Drawing AT224-1



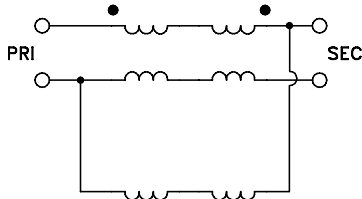
PCB Land Pattern



Outline Dimensions (inch/mm)

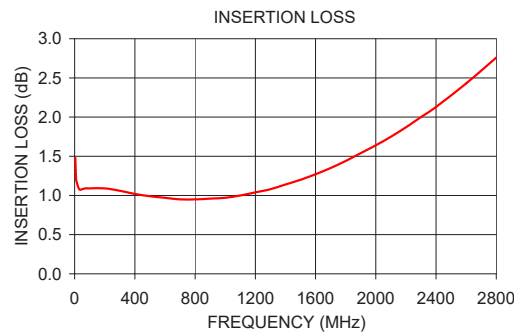
A	B	C	D	E	F
.150	.150	.160	.050	.040	.025
3.81	3.81	4.06	1.27	1.02	0.64
G	H	J	K	L	wt
.028	.065	.190	.030	.007	grams
0.71	1.65	4.83	0.76	0.18	0.15

Config. K



Typical Performance Data, 75Ω

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
5.00	1.48	17.72	0.38	3.28
10.00	1.20	21.95	0.21	2.17
30.00	1.08	27.05	0.11	0.55
50.00	1.08	28.04	0.09	0.06
100.00	1.09	28.09	0.08	1.09
500.00	0.99	24.29	0.21	5.00
1000.00	0.97	22.66	0.07	6.34
1500.00	1.20	22.41	0.71	5.18
2000.00	1.64	21.22	1.49	1.64
2400.00	2.13	17.79	2.00	3.40
2800.00	2.76	13.83	2.31	10.70



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