

The Big Deal

- Supports DOCSIS® 3.1 upstream bandwidth
- Low insertion loss, 0.2 dB
- Good return loss, 28 dB
- Low amplitude / phase unbalance, 0.2 dB / 2°
- Small size, 0.15 x 0.15 x 0.16"



CASE STYLE: AT1521

Product Overview

TC1-1T-75X+ is a 75Ω surface-mount, DC-isolated transformer with a secondary center tap, covering the 5 to 120 MHz band, supporting upstream bandwidth requirements for DOCSIS 3.1 systems and equipment. This model provides a 1:1 secondary/primary impedance ratio and is capable of handling up to 0.25W RF input power. It provides 0.2 dB insertion loss, 28 dB return loss, 0.2 dB amplitude unbalance and 2° phase unbalance. Featuring core and wire construction mounted on a 5-lead plastic base with tin over nickel termination finish, the unit measures 0.15 x 0.15 x 0.16" to accommodate dense circuit board layouts. It also incorporates Mini-Circuits' Top Hat® feature for faster, more accurate pick-and-place assembly.

Key Features

Feature	Advantages
Supports DOCSIS 3.1 upstream bandwidth requirements	This model is optimized for use over the upstream bandwidth for CATV and broadband fiber networks including DOCSIS 3.1 systems.
Low insertion loss, 0.2 dB	Provides excellent transmission of signal power from input to output.
Good return loss, 28 dB	Provides excellent matching for 75Ω systems.
Low unbalance: - 0.2dB amplitude unbalance - 2° phase unbalance	Low unbalance improves a system's electromagnetic compatibility by rejecting unwanted common-mode noise.
DC isolation	Provides DC isolation between circuits and efficient AC transmission, eliminating the need for external DC biasing components.
Secondary center tap	Allows DC feed up to 30 mA and DC bias without adding bias tees into the signal chain.
Small footprint (0.15 x 0.15 x 0.16")	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.

Surface Mount ^{top hat}
RF Transformer
 75Ω 5 to 120 MHz

TC1-1T-75X+

Features

- DOCSIS 3.1 suitable
- plastic base with leads
- aqueous washable

Applications

- impedance matching
- unbalance to balance transformation
- cable/CATV and broadband fiber networks



CASE STYLE: AT1521

+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

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio			1		Ohm
Frequency Range		5	—	120	MHz
Insertion Loss*	5 - 75	—	0.1	0.4	dB
	75 - 120	—	0.3	0.6	
Amplitude Unbalance	5 - 75	—	0.1	0.2	dB
	75 - 120	—	0.2	0.3	
Phase Unbalance	5 - 75	—	1	4	Degree
	75 - 120	—	3	6	
Return Loss	5 - 20	25	30	—	dB
	20-75	23	28	—	
	75-120	20	25	—	

*Insertion Loss is referenced to mid-band loss, 0.25 dB typ.

Maximum Ratings

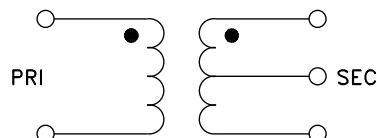
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	0.25W
DC Current	30mA

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

Pin Connections

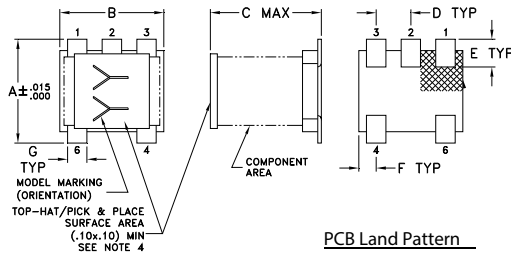
Function	Pin Number
PRIMARY DOT	6
PRIMARY	4
SECONDARY DOT	1
SECONDARY	3
SECONDARY CT	2

Config. A



TC1-1T-75X+

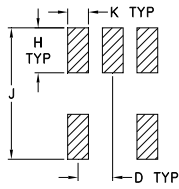
Outline Drawing



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: 0.13 inches max.

PCB Land Pattern



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

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.)
5.00	0.26	30.33	0.01	0.20
10.00	0.25	32.29	0.00	0.32
20.00	0.26	32.98	0.00	0.55
50.00	0.31	31.47	0.01	1.18
70.00	0.33	29.95	0.00	1.59
80.00	0.34	29.15	0.00	1.81
90.00	0.35	28.34	0.01	2.03
100.00	0.36	27.58	0.02	2.25
110.00	0.37	26.88	0.02	2.46
120.00	0.38	26.26	0.03	2.68

