Surface Mount top hat®

# RF Transformer

# TC4-6T-75X+

75Ω 0.6 to 600 MHz

## The Big Deal

- DC isolated
- Low unbalance, 0.6 dB, 3˚
- Power handling up to 0.25W
- Small size, 0.15 x 0.15 x 0.16”

CASE STYLE: AT1521

## Product Overview

TC4-6T-75X+ is a 75Ω surface-mount DC isolated transformer with a secondary center tap that covers the 0.6 to 600 MHz band. This model provides a 4:1 secondary/primary impedance ratio, 1.0 dB insertion loss (typ.), 0.25W RF input power handling, 0.6 dB amplitude unbalance and 3° 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”, accommodating dense circuit board layouts. It also incorporates Mini-Circuits’ Top Hat® feature for faster, more accurate pick-and-place assembly.

## Key Features

| Feature | Advantages |
|---|---|
| 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. |
| Low unbalance<br>• 0.6 dB amplitude unbalance<br>• 3° phase unbalance | Low unbalance can improve a system’s electromagnetic compatibility by rejecting unwanted common-mode noise. |
| 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

## TC4-6T-75X+

75Ω 0.6 to 600 MHz

CASE STYLE: AT1521

### Features

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

### Applications

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

*+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** (secondary/primary) | | | 4 | | |
| **Frequency Range** | | 0.6 | — | 600 | MHz |
| **Insertion Loss*** | 0.6-600<br>1- 300 | —<br>— | —<br>— | 1.8<br>1.0 | dB |
| **Amplitude Unbalance** | 0.6-600<br>1- 300 | —<br>— | 0.6<br>0.1 | 1.2<br>0.5 | dB |
| **Phase Unbalance** | 0.6-600<br>1- 300 | —<br>— | 3<br>0.2 | 8<br>2 | Degree |
| **Return Loss** | 0.6-600<br>1- 300 | 8<br>12 | 13<br>20 | —<br>— | dB |

*Insertion Loss is referenced to mid-band loss, 0.7 dB typ.

### Maximum Ratings

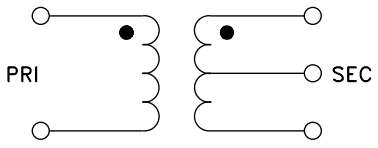
| Parameter | Ratings |
|---|---|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Power | 0.25W |
| DC Current | 30mA |

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

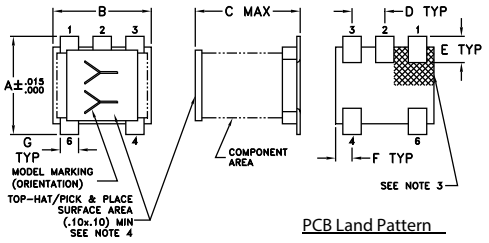
### Pin Connections

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

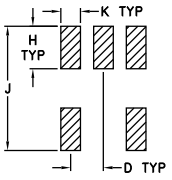
### Config. A



## 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: 0.13 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.) |
|---|---|---|---|---|
| 0.60 | 1.87 | 10.51 | 0.00 | 0.16 |
| 1.00 | 1.49 | 12.84 | 0.00 | 0.07 |
| 3.00 | 0.97 | 17.73 | 0.01 | 0.01 |
| 10.00 | 0.77 | 21.64 | 0.00 | 0.03 |
| 50.00 | 0.80 | 22.07 | 0.01 | 0.00 |
| 100.00 | 0.84 | 21.36 | 0.01 | 0.04 |
| 200.00 | 0.92 | 19.28 | 0.07 | 0.17 |
| 300.00 | 1.01 | 17.02 | 0.15 | 0.38 |
| 450.00 | 1.23 | 14.22 | 0.32 | 1.21 |
| 600.00 | 1.55 | 12.16 | 0.48 | 3.29 |