

Mini-Circuits

BALANCED TO UNBALANCED



# RF Transformer

## TC1-1T-152X+

50  $\Omega$  5 to 1500 MHz Ratio 1:1

### THE BIG DEAL

- Super wideband, 5 to 1500 MHz
- Low insertion loss, 1.5 dB typ., 5 to 1500 MHz
- Amplitude unbalance,  $\pm 0.2$  dB typ.
- Good input return loss, 14 dB typ., 5 to 1500 MHz
- Low phase unbalance,  $\pm 1.5^\circ$  typ.
- Common mode rejection, 30 dB typ. 1000 MHz



Generic photo used for illustration purposes only

CASE STYLE: AT1521

### +RoHS Compliant

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

### APPLICATIONS

- VHF/UHF transmitters
- Cellular
- GPS
- Communication

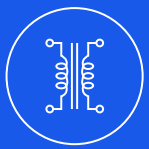
### PRODUCT OVERVIEW

Mini-Circuits' TC1-1T-152X+ is a surface-mount transmission line transformer (with bias center tap) covering a very wide frequency range from 5 to 1500 MHz. The transformer provides low insertion loss with excellent phase and amplitude performance. Featuring core and wire construction on a 5-lead unit measures 0.15 x 0.15 x 0.16 inch.

### KEY FEATURES

| Feature                            | Advantages                                                                                                                           |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Wideband, 5 to 1500 MHz            | Super wide frequency range covers bandwidth requirements for many broadband applications.                                            |
| Low insertion loss, 1.5 dB typ.    | This unit provides excellent signal transmission from input to output with consistent performance across its entire frequency range. |
| Good Phase and Amplitude Unbalance | Provides good CMRR.                                                                                                                  |
| DC current 200 mA                  | Supply DC current from center tap.                                                                                                   |





Mini-Circuits®

BALANCED TO UNBALANCED



## RF Transformer

TC1-1T-152X+

50  $\Omega$  5 to 1500 MHz Ratio 1:1

## ELECTRICAL SPECIFICATIONS AT +25°C

| Parameter             | Frequency (MHz) | Min. | Typ. | Max. | Units  |
|-----------------------|-----------------|------|------|------|--------|
| Impedance Ratio       |                 |      | 1    |      |        |
| Frequency Range       |                 | 5    | —    | 1500 | MHz    |
| Insertion Loss*       | 5-870           | —    | 1.0  | 1.6  | dB     |
|                       | 870-1000        | —    | 1.2  | 1.7  |        |
|                       | 1000-1500       | —    | 1.8  | 2.5  |        |
| Amplitude Unbalance   | 5-870           | —    | 0.1  | 0.7  | dB     |
|                       | 870-1000        | —    | 0.3  | 0.9  |        |
|                       | 1000-1500       | —    | 0.5  | 1.8  |        |
| Phase Unbalance       | 5-870           | —    | 1.0  | 6    | Degree |
|                       | 870-1000        | —    | 2.0  | 8    |        |
|                       | 1000-1500       | —    | 3.0  | 10   |        |
| Common mode rejection | 5-1000          | 22   | 33   | —    | dB     |
|                       | 1000-1500       | 20   | 28   | —    |        |
| Input Return Loss     | 5-870           | —    | 15   | —    | dB     |
|                       | 870-1000        | —    | 12   | —    |        |

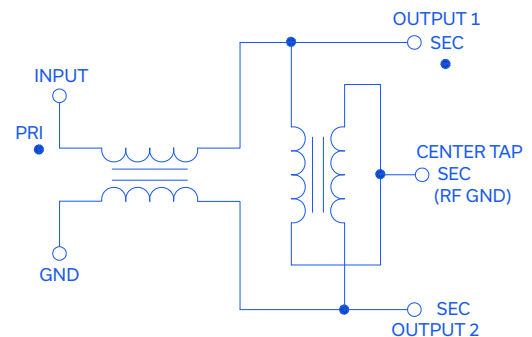
\* Insertion Loss is referenced to mid-band loss, 0.7 dB typ.

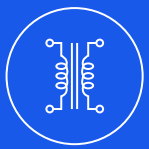
## MAXIMUM RATINGS

| Parameter             | Ratings        |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Power              | 0.5W           |
| DC Current            | 200mA          |

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

## CONFIGURATION M1





Mini-Circuits

BALANCED TO UNBALANCED



# RF Transformer

TC1-1T-152X+

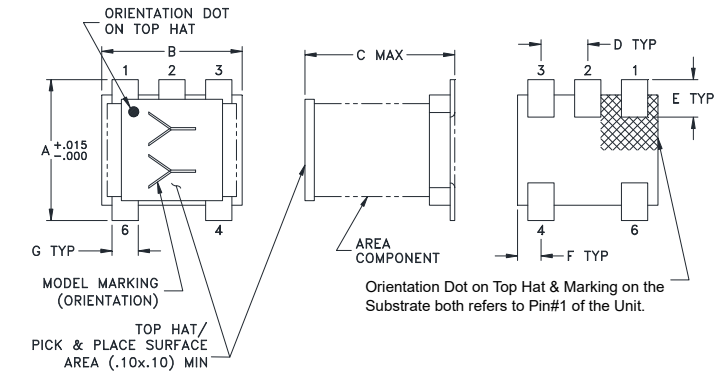
50  $\Omega$  5 to 1500 MHz Ratio 1:1

## PIN CONNECTIONS

|               |   |
|---------------|---|
| PRIMARY DOT   | 6 |
| PRIMARY       | 4 |
| SECONDARY DOT | 1 |
| SECONDARY     | 3 |
| SECONDARY CT  | 2 |

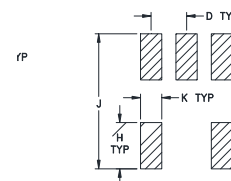
PRODUCT MARKING: WH

## OUTLINE DRAWING



Top-hat total thickness: .013 inches MAX.

## PCB Land Pattern



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

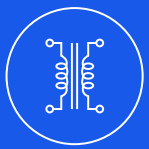
## OUTLINE DIMENSIONS (Inch mm)

| A    | B    | C    | D    | E    | F    | G    | H    | J    | K    |
|------|------|------|------|------|------|------|------|------|------|
| .150 | .150 | .160 | .050 | .040 | .025 | .028 | .065 | .190 | .030 |
| 3.81 | 3.81 | 4.06 | 1.27 | 1.02 | 0.64 | 0.71 | 1.65 | 4.83 | 0.76 |

Weight: 0.15 grams

## TAPE & REEL INFORMATION: F17





Mini-Circuits

BALANCED TO UNBALANCED



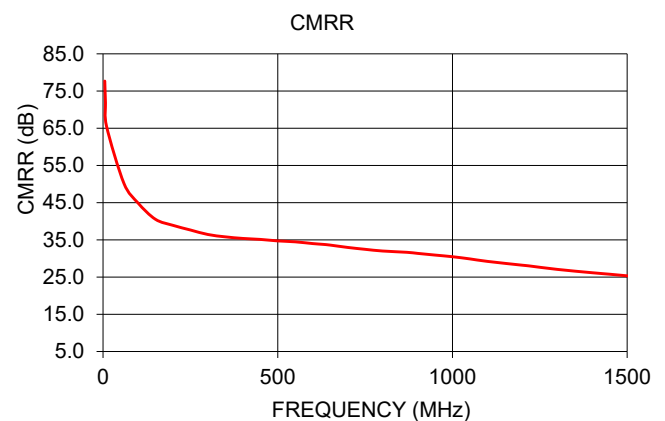
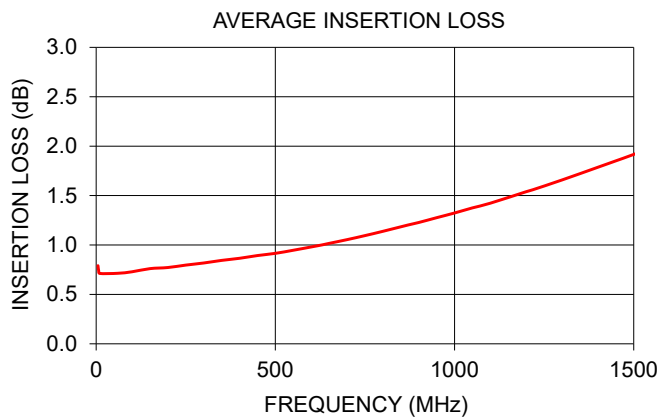
# RF Transformer

TC1-1T-152X+

50  $\Omega$  5 to 1500 MHz Ratio 1:1

## TYPICAL PERFORMANCE DATA AT 25°C

| Frequency (MHz) | Insertion Loss (dB) | Return Loss (dB) | Amplitude Unbalance (dB) | Phase Unbalance (deg) | CMRR (dB) |
|-----------------|---------------------|------------------|--------------------------|-----------------------|-----------|
| 5               | 0.79                | 21.59            | 0.00                     | 0.00                  | 77.68     |
| 10              | 0.71                | 24.37            | 0.00                     | 0.06                  | 65.55     |
| 100             | 0.73                | 24.80            | 0.02                     | 0.64                  | 44.93     |
| 200             | 0.77                | 21.92            | 0.05                     | 1.25                  | 38.91     |
| 400             | 0.87                | 17.73            | 0.11                     | 1.80                  | 35.39     |
| 600             | 0.98                | 15.25            | 0.04                     | 2.27                  | 34.01     |
| 800             | 1.14                | 13.56            | 0.05                     | 2.86                  | 32.01     |
| 1000            | 1.32                | 12.43            | 0.24                     | 3.05                  | 30.47     |
| 1200            | 1.54                | 11.48            | 0.47                     | 3.23                  | 28.19     |
| 1400            | 1.79                | 10.65            | 0.70                     | 3.24                  | 26.17     |
| 1500            | 1.92                | 10.27            | 0.81                     | 3.16                  | 25.34     |



### NOTES

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Mini-Circuits:](#)

[TC1-1T-152X+](#)