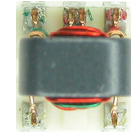


# Surface Mount RF Transformer

50Ω 2 to 200 MHz

TC9-1+

TC9-1X+  
Upgraded Version\*



CASE STYLE: AT224-1  
PRICE: \$2.29 ea. QTY (20)  
\$1.29 ea. QTY (100)

\*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

## Maximum Ratings

|                       |                |
|-----------------------|----------------|
| Operating Temperature | -20°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 |
| SECONDARY CT  | 2 |

## Features

- good return loss
- excellent amplitude unbalance, 0.1 dB typ. and phase unbalance, 1 deg typ. in 1dB band width
- plastic base with leads
- aqueous washable

## Applications

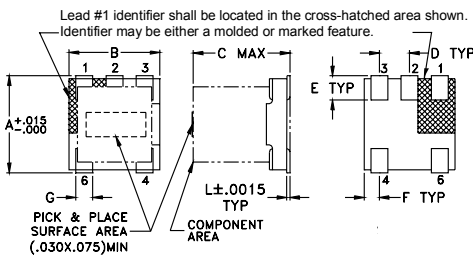
- impedance matching

## Transformer Electrical Specifications

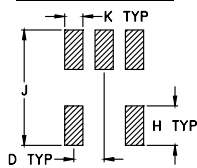
| Ω<br>RATIO<br>(Secondary/Primary) | FREQUENCY<br>(MHz) | INSERTION LOSS* |             |             |
|-----------------------------------|--------------------|-----------------|-------------|-------------|
|                                   |                    | 3 dB<br>MHz     | 2 dB<br>MHz | 1 dB<br>MHz |
| 9                                 | 2-200              | 2-200           | 3-100       | 5-40        |

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

## 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  |

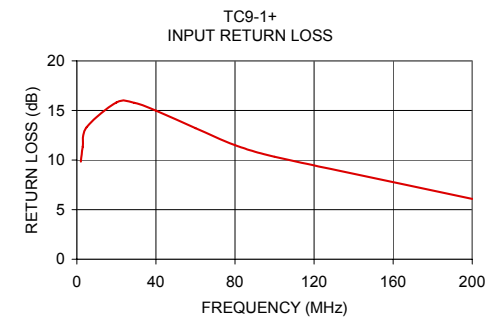
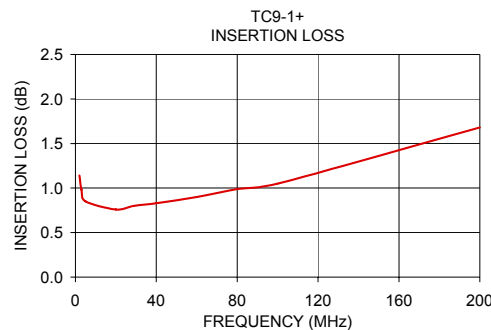
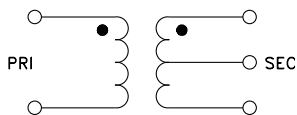
Available Tape and Reel at no extra cost

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

## Typical Performance Data

| FREQUENCY (MHz) | INSERTION LOSS (dB) | INPUT R. LOSS (dB) |
|-----------------|---------------------|--------------------|
| 2.00            | 1.14                | 9.85               |
| 3.00            | 0.98                | 11.35              |
| 5.00            | 0.85                | 13.33              |
| 20.00           | 0.76                | 15.80              |
| 29.00           | 0.80                | 15.77              |
| 40.00           | 0.83                | 14.99              |
| 60.00           | 0.90                | 13.22              |
| 80.00           | 0.99                | 11.50              |
| 100.00          | 1.05                | 10.34              |
| 200.00          | 1.68                | 6.08               |

## Config. A



## 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/WCLStore/terms.jsp](http://www.minicircuits.com/WCLStore/terms.jsp)

