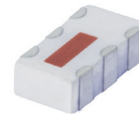


# Ceramic Balun RF Transformer

50Ω 1200 to 2200 MHz

## TCN4-22+ TCN4-22



Generic photo used for illustration purposes only

CASE STYLE: FV1206-1

**+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, 1000, 3000 |

### Maximum Ratings

Operating Temperature -55°C to 100°C

Storage Temperature -55°C to 100°C

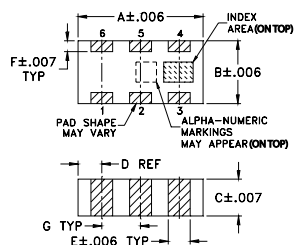
Input RF Power\*\* 5W

\*\*From 85°C derate linearly to 2.5W at 100°C  
Permanent damage may occur if any of these limits are exceeded.

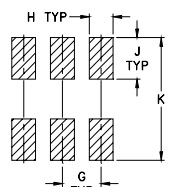
### Pin Connections

|               |     |
|---------------|-----|
| PRIMARY DOT   | 2   |
| PRIMARY(GND)  | 1,3 |
| SECONDARY DOT | 4   |
| SECONDARY     | 6   |
| GROUND        | 5   |

### Outline Drawing



#### PCB Land Pattern

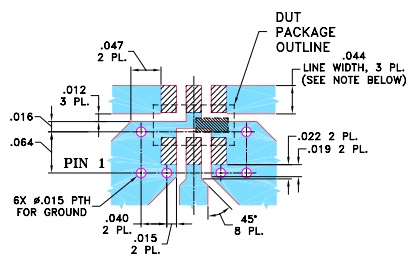


Suggested Layout,  
Tolerance to be within ±.002

### Outline Dimensions (inch)

| A    | B    | C    | D    | E     | F    |
|------|------|------|------|-------|------|
| .126 | .063 | .035 | .024 | .022  | .011 |
| 3.20 | 1.60 | 0.89 | 0.61 | 0.56  | 0.28 |
| G    | H    | J    | K    | wt    |      |
| .039 | .024 | .042 | .123 | grams |      |
| 0.99 | 0.61 | 1.07 | 3.12 | .020  |      |

### Demo Board MCL P/N: TB-298 Suggested PCB Layout (PL-162)



NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350 WITH DIELECTRIC THICKNESS .020 ± .0015. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

#### 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-Circuit's 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-Circuit's website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)

### Features

- wideband, 1200 to 2200 MHz
- low phase unbalance
- miniature size, 0.12"x.06"x.037"
- LTCC construction
- low cost
- aqueous washable

### Applications

- GSM
- CDMA
- GPS
- DECT
- PCN
- PCS
- ISM

### Electrical Specifications (T<sub>AMB</sub>=25°C)

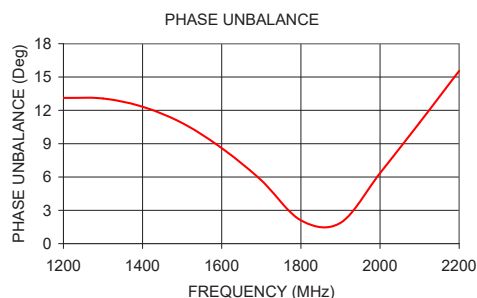
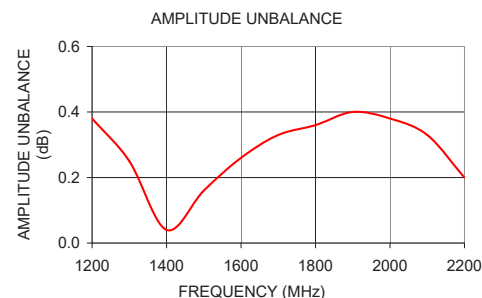
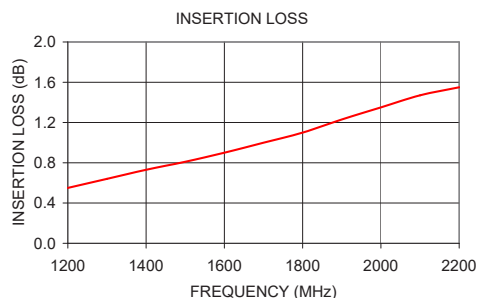
| Ω RATIO<br>(Secondary/Primary) | FREQUENCY<br>(MHz) | INSERTION*<br>LOSS<br>(dB) | PHASE<br>UNBALANCE †<br>(Deg.)<br>Typ. | AMPLITUDE<br>UNBALANCE<br>(dB)<br>Typ. |
|--------------------------------|--------------------|----------------------------|--|--|
| 4                              | 1200-2200          | 1.0                        | 10                                     | 0.6                                    |

\* Insertion Loss is referenced to mid-band loss, 0.9 dB

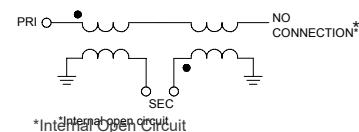
† Relative to 180°

### Typical Performance Data

| FREQUENCY<br>(MHz) | INSERTION<br>LOSS<br>(dB) | INPUT<br>R. LOSS<br>(dB) | AMPLITUDE<br>UNBALANCE<br>(dB) | PHASE<br>UNBALANCE<br>(Deg.) |
|--------------------|---------------------------|--------------------------|--------------------------------|------------------------------|
| 1200.00            | 0.55                      | 12.54                    | 0.38                           | 13.12                        |
| 1300.00            | 0.64                      | 13.68                    | 0.25                           | 13.07                        |
| 1400.00            | 0.73                      | 14.80                    | 0.04                           | 12.32                        |
| 1500.00            | 0.81                      | 15.52                    | 0.16                           | 10.86                        |
| 1600.00            | 0.90                      | 15.33                    | 0.26                           | 8.60                         |
| 1700.00            | 1.00                      | 14.39                    | 0.33                           | 5.70                         |
| 1800.00            | 1.10                      | 13.02                    | 0.36                           | 2.10                         |
| 1900.00            | 1.23                      | 11.67                    | 0.40                           | 1.87                         |
| 2000.00            | 1.35                      | 10.47                    | 0.38                           | 6.35                         |
| 2100.00            | 1.47                      | 9.46                     | 0.33                           | 10.89                        |
| 2200.00            | 1.55                      | 8.60                     | 0.20                           | 15.55                        |



### configuration J



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