

# Ceramic Balun RF Transformer

## TCN4-162+

50Ω 720 to 1600 MHz



CASE STYLE: FV1206-1

### Maximum Ratings

Operating Temperature -40°C to 85°C

Storage Temperature -55°C to 100°C

Input RF Power\*\*\* 3W

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

### Pad Connections

PRIMARY DOT (Unbalanced Port) 5

PRIMARY (GND) 4,6

SECONDARY DOT (Balanced) 3

SECONDARY (Balanced) 1

NO CONNECTION 2

Pads 1,3,4,6 are DC-connected internally

### Features

- wideband, 720 to 1600 MHz
- low phase unbalance, 2 deg. typ. and amplitude unbalance, 0.3 dB typ.
- miniature size, 0.12"x.06"x.037"
- LTCC construction
- low cost
- aqueous washable

### Applications

- GSM
- WCDMA
- GPS
- ISM

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

Ω RATIO (Secondary/Primary)	FREQUENCY (MHz)	INSERTION* LOSS (dB)	PHASE UNBALANCE† (Deg.) Typ.	AMPLITUDE UNBALANCE (dB) Typ.
4	720-1600	1.0	2.0	0.4

\* Insertion Loss is referenced to mid-band loss, 0.7 dB. Reference Demo Board TB-417+

† Relative to 180°

### +RoHS Compliant

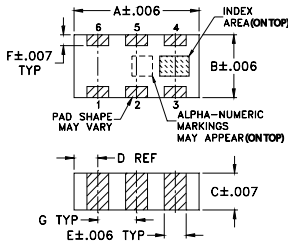
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications



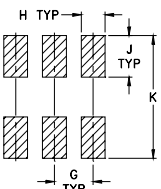
Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500, 1000, 3000

### Outline Drawing



### PCB Land Pattern

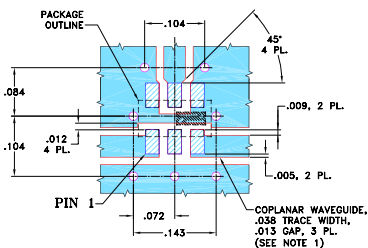


Suggested Layout, Tolerance to be within ±0.02

### Outline Dimensions (Inch/mm)

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-417+ Suggested PCB Layout (PL-265)



### NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
  2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

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



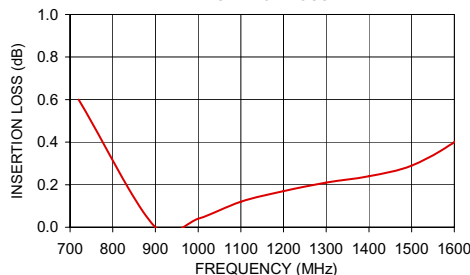
[www.minicircuits.com](http://www.minicircuits.com) P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

### Typical Performance Data at 25°C\*\*

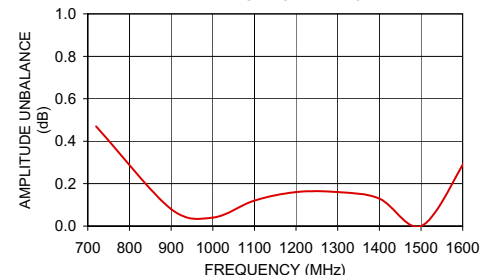
FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
720.00	0.60	10.28	0.47	1.21
900.00	0.00	25.18	0.08	2.81
1000.00	0.04	19.64	0.04	3.39
1100.00	0.12	16.88	0.12	3.44
1200.00	0.17	16.38	0.16	3.09
1300.00	0.21	17.28	0.16	2.31
1400.00	0.24	19.25	0.13	1.33
1500.00	0.29	21.00	0.00	0.19
1600.00	0.40	19.65	0.29	1.10

\*\* Measured with Agilent E5071B network analyzer using impedance conversion and port extension.

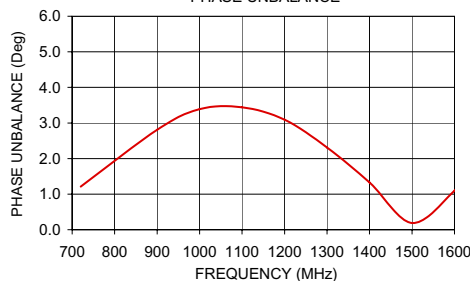
### TCN4-162+ INSERTION LOSS



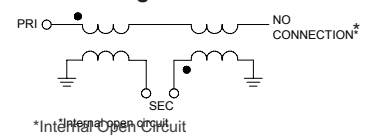
### TCN4-162+ AMPLITUDE UNBALANCE



### TCN4-162+ PHASE UNBALANCE



### configuration J



\* Internal Open Circuit

REV. C  
M151107  
TCN4-162+  
ED-12817/34B2  
RS/CP/AM  
170410