

# Ceramic Balun RF Transformer

50Ω 1650 to 2850 MHz 1:1 Ratio

## NCS1-292+

### Features

- wideband, 1650 to 2850 MHz
- low phase unbalance, 4 deg. and amplitude unbalance, 0.4 dB typ.
- miniature size, 0.079"x0.049"x0.033"
- LTCC construction
- low cost
- aqueous washable

### Applications

- WLAN
- WIMAX/WIBRO
- MMDS
- radar
- WCDMA



Generic photo used for illustration purposes only

CASE STYLE: GE0805C-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, 4000 |

### Electrical Specifications at 25°C

| Parameter                    | Frequency (MHz) | Min. | Typ. | Max. | Unit   |
|------------------------------|-----------------|------|------|------|--------|
| Impedance Ratio              |                 |      | 1    |      |        |
| Frequency Range              |                 | 1650 | —    | 2850 | MHz    |
| Insertion Loss <sup>1</sup>  | 1650-2850       | —    | 1.0  | —    | dB     |
| Amplitude Unbalance          | 1650-2850       | —    | 0.4  | —    | dB     |
| Phase Unbalance <sup>2</sup> | 1650-2850       | —    | 4    | —    | Degree |

1. Insertion Loss is referenced to mid-band loss, 0.7 dB. Reference Demo Board TB-419+

2. Relative to 180°

### Maximum Ratings

| Parameter             | Ratings        |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Power***           | 3W             |

\*\*\* Derate linearly to 2W at 85°C

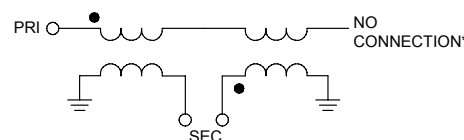
Permanent damage may occur if any of these limits are exceeded.

### Pad Connections

| Function                      | Pad Number |
|-------------------------------|------------|
| PRIMARY DOT (Unbalanced Port) | 1          |
| GND or DC FEED + RF GND       | 2          |
| SECONDARY DOT (Balanced)      | 4          |
| SECONDARY (Balanced)          | 3          |
| NO CONNECTION                 | 6          |
| NOT USED (GND Externally)     | 5          |

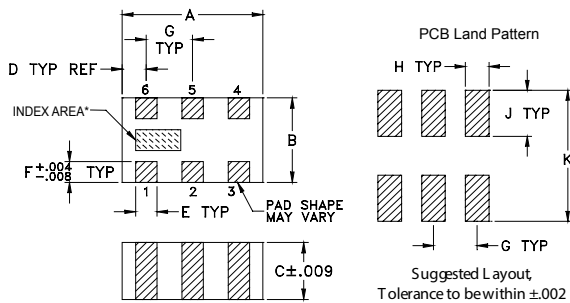
Pads 2,3,4 are DC-connected internally

### Configuration J



\*Internal open circuit

## Outline Drawing

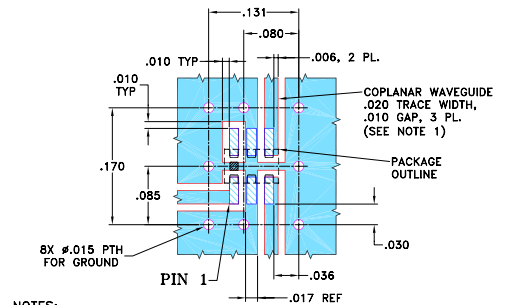


\*Shape of index marking may vary

## Outline Dimensions (inch mm)

| A    | B    | C    | D    | E     | F    |
|------|------|------|------|-------|------|
| .079 | .049 | .033 | .014 | .012  | .012 |
| 2.01 | 1.24 | 0.84 | 0.36 | 0.30  | 0.30 |
| G    | H    | J    | K    | wt    |      |
| .026 | .014 | .039 | .110 | grams |      |
| 0.66 | 0.36 | 1.00 | 2.80 | .008  |      |

## Demo Board MCL P/N: TB-419+ Suggested PCB Layout (PL-264)



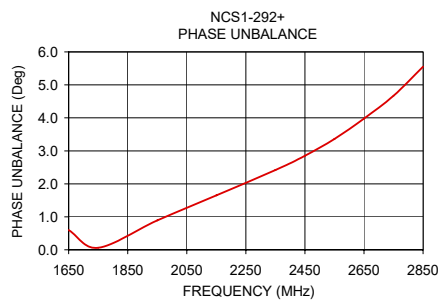
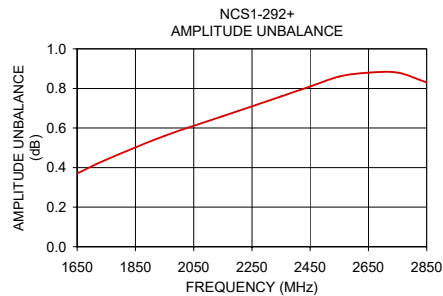
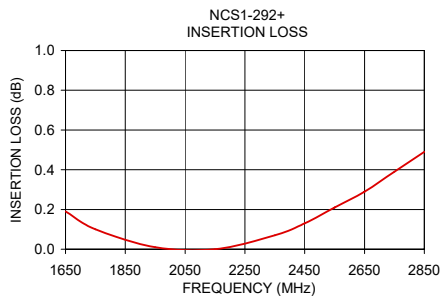
### NOTES:

- COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010" ± .001". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
  - 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

## Typical Performance Data at 25°C<sup>3</sup>

| FREQUENCY (MHz) | INSERTION LOSS (dB) | INPUT R. LOSS (dB) | AMPLITUDE UNBALANCE (dB) | PHASE UNBALANCE (Deg.) |
|-----------------|---------------------|--------------------|--------------------------|------------------------|
| 1650.00         | 0.19                | 12.97              | 0.37                     | 0.60                   |
| 1750.00         | 0.10                | 14.96              | 0.44                     | 0.06                   |
| 1950.00         | 0.01                | 20.60              | 0.56                     | 0.89                   |
| 2150.00         | 0.00                | 25.71              | 0.66                     | 1.65                   |
| 2350.00         | 0.07                | 19.38              | 0.76                     | 2.42                   |
| 2450.00         | 0.13                | 16.90              | 0.81                     | 2.85                   |
| 2550.00         | 0.21                | 15.01              | 0.86                     | 3.36                   |
| 2650.00         | 0.29                | 13.59              | 0.88                     | 3.98                   |
| 2750.00         | 0.39                | 12.46              | 0.88                     | 4.67                   |
| 2850.00         | 0.49                | 11.59              | 0.83                     | 5.55                   |

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



### Additional 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.
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