



CERAMIC BALUN

RF Transformer

NCS2-282+

Mini-Circuits

50Ω 625 to 2815 MHz 1:2 Ratio

FEATURES

- Wideband, 625 to 2815 MHz
- Miniature size 0805, 0.079"x0.049"x0.033"
- LTCC construction
- Industry leading combination of size/performance
- Low cost
- Aqueous washable



Generic photo used for illustration purposes only

CASE STYLE: GE0805C-9

APPLICATIONS

- GPS
- WCDMA
- PCS
- Cellular

+RoHS Compliant

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

PRODUCT OVERVIEW

Mini-Circuits new RF Transformer, NCS2-282+ converts single ended, unbalanced RF signals, that propagate through systems, to balanced signals that are required for many semiconductor devices. The NCS series offers a low cost small size alternative for matching, A/D converters, System on Chips, and up/down converters. The outstanding phase and amplitude unbalance make this component a versatile building block for use in a variety of systems and sub-system designs.

KEY FEATURES

| Feature | Advantages |
|---------------------------|--|
| Wideband, 625 to 2815 MHz | Supporting wideband, 625 to 2815 MHz make this RF Transformer applicable for use in higher level integrated components such as A/D converters and system on a chip. |
| Small Size | Offered in the EIA-0805 package size, the NCS2-282+ offers an industry leading combination of size and performance. The small footprint (2.0 mm x 1.25 mm) allows for reduced parasitics in systems with improved performance and simplified layout. |





ELECTRICAL SPECIFICATIONS AT 25°C

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Units |
|-------------------------------------|-----------------|------|------|------|--------|
| Impedance Ratio (Secondary/Primary) | | | 2 | | |
| Frequency Range | | 625 | | 2815 | MHz |
| Insertion Loss ¹ | 625 - 2815 | — | 1 | 2 | dB |
| Amplitude Unbalance | 625 - 2815 | — | 0.8 | 1.8 | dB |
| Phase Unbalance ² | 625 - 2815 | — | 6 | 15 | Degree |
| Return Loss | 625 - 2815 | — | 11 | — | dB |

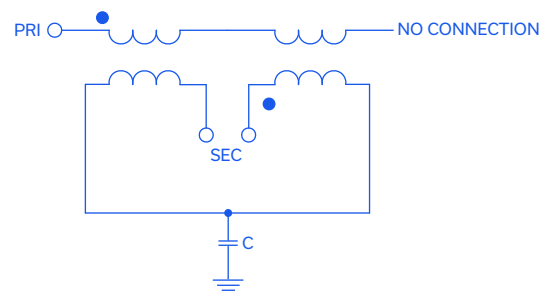
- 1. Reference Demo Board TB-NCS2-282+
- 2. Relative to 180°

MAXIMUM RATINGS

| Parameter | Ratings |
|-----------------------|----------------|
| Operating Temperature | -55°C to 125°C |
| Storage Temperature | -55°C to 125°C |
| RF Power ³ | 3W at 25°C |

- 3. Passband rating , derate linearly to 1W at 125°C ambient.
Permanent damage may occur if any of these limits are exceeded.

CONFIGURATION R

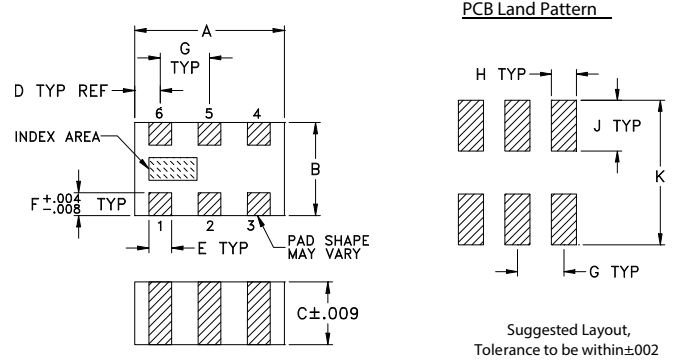




PAD CONNECTIONS

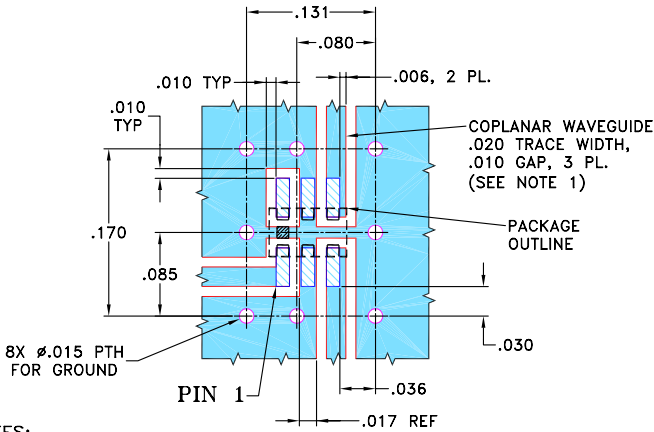
| | |
|-------------------------|---|
| Unbalanced Port (IN) | 1 |
| GND OR DC feed + RF GND | 2 |
| Balanced port (Out 1) | 3 |
| Balanced port (Out 2) | 4 |
| GND | 5 |
| NO CONNECTION | 6 |

OUTLINE DRAWING



PRODUCT MARKING: N/A

DEMO BOARD MCL P/N: TB-NCS2-282+ SUGGESTED PCB LAYOUT (PL-264)



NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS $.010'' \pm .001''$. 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

OUTLINE DIMENSIONS (Inches/mm)

| | | | | | |
|------|------|------|------|------|-------|
| A | B | C | D | E | F |
| .079 | .049 | .033 | .014 | .012 | .012 |
| 2.0 | 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 |

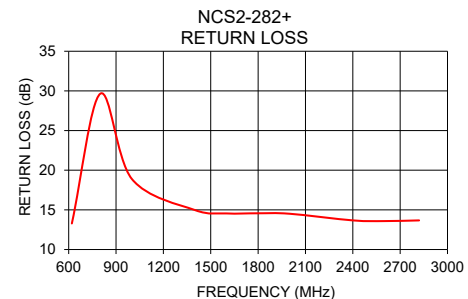
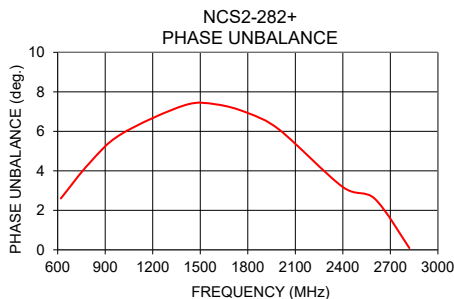
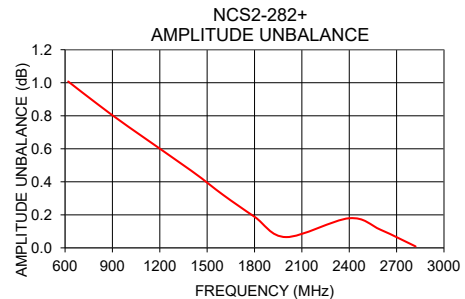
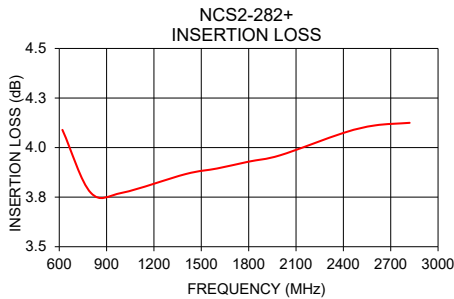
TAPE & REEL INFORMATION: F74



TYPICAL PERFORMANCE DATA³

| Frequency (MHz) | Insertion Loss (dB) | Input Return Loss (dB) | Amplitude Unbalance (dB) | Phase Unbalance (deg) |
|-----------------|---------------------|------------------------|--------------------------|-----------------------|
| 620 | 4.09 | 13.29 | 1.01 | 2.60 |
| 625 | 3.93 | 13.53 | 0.77 | 3.95 |
| 800 | 3.77 | 29.64 | 0.87 | 4.39 |
| 1000 | 3.77 | 18.90 | 0.73 | 5.85 |
| 1400 | 3.87 | 14.97 | 0.47 | 7.32 |
| 1600 | 3.89 | 14.55 | 0.32 | 7.36 |
| 1800 | 3.93 | 14.57 | 0.19 | 6.93 |
| 2000 | 3.96 | 14.51 | 0.07 | 6.08 |
| 2400 | 4.07 | 13.67 | 0.18 | 3.18 |
| 2600 | 4.11 | 13.59 | 0.11 | 2.60 |
| 2815 | 4.05 | 15.13 | 0.47 | 0.35 |
| 2820 | 4.12 | 13.67 | 0.01 | 0.09 |

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



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