RF Transformer

NCS2-112+

50Ω 800 to 1100 MHz

CASE STYLE: GE0805C-1

The Big Deal

- Low Unbalance, 0.8 dB & 8 deg. typ.
- Industry leading combination of size/performance

Product Overview

Mini-Circuits new RF Transformer, NCS2-112+ converts single ended, unbalanced RF signals, that propogate 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 buidling block for use in a variety of systems and sub-system designs.

Key Features

Feature	Advantages
Small Size	Offered in the EIA-0805 package size, the NCS2-112+ 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.
Low Phase and Amplitude Unbalance	Supporting 8 deg. and 0.8 dB unbalance make this RF Transformer applicable for use in higher level integrated components such as A/D converters and system on a chip.

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

Ceramic Balun

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+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, 2000

Maximum Ratings

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

*** Derate linearly to 2W at 85°C.
Permanent damage may occur if any of these limits are exceeded.

Pad Connections

PRIMARY DOT (Unbalanced Port)	1
PRIMARY (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

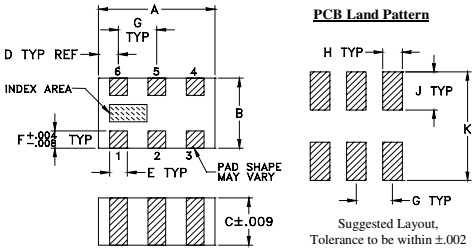
Features

- wideband, 800 to 1100 MHz
- low phase unbalance, 8 deg. and amplitude unbalance, 0.8 dB typ.
- miniature size, 0.079"x0.049"x0.033"
- LTCC construction
- low cost
- aqueous washable

Applications

- WCDMA
- PCS
- GPS

Outline Drawing

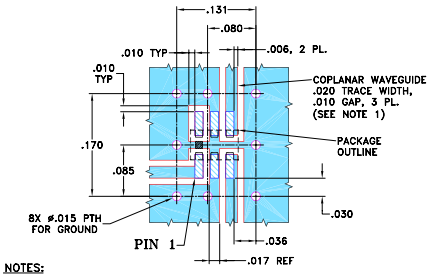


Outline Dimensions (inch / mm)

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:
1. 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.
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

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio (secondary/primary)			2		:1
Frequency Range		800	—	1100	MHz
Insertion Loss*	800-1100	—	0.9	1.6	dB
Amplitude Unbalance	800-1100	—	0.8	1.3	dB
Phase Unbalance†	800-1100	—	8	16	Degree

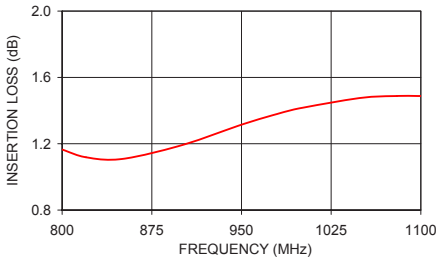
* Insertion Loss is referenced to mid-band loss, 1.1 dB. Reference Demo Board TB-419+
† Relative to 180°

Typical Performance Data at 25°C**

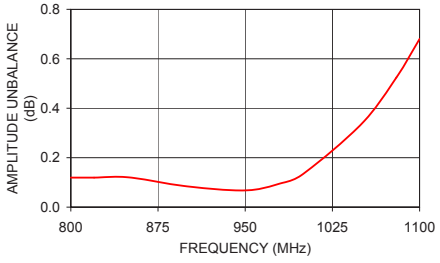
FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
800.00	1.17	24.69	0.12	3.99
820.00	1.12	44.63	0.12	3.94
850.00	1.11	22.39	0.12	3.70
900.00	1.19	15.13	0.08	2.80
950.00	1.32	12.44	0.07	1.05
980.00	1.38	11.62	0.10	0.45
1000.00	1.42	11.27	0.13	1.54
1050.00	1.48	11.05	0.34	4.62
1080.00	1.49	11.28	0.52	6.43
1100.00	1.49	11.63	0.68	7.59

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

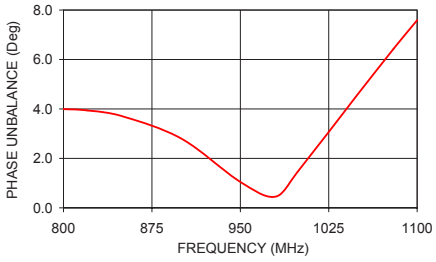
NCS2-112+
INSERTION LOSS



NCS2-112+
AMPLITUDE UNBALANCE



NCS2-112+
PHASE UNBALANCE



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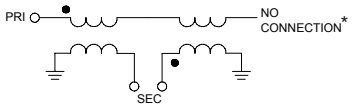

*Internal Open Circuit

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