

# Ceramic Balun RF Transformer

50Ω 3000 to 3900 MHz 1:2 Ratio

NCS2-392+

## Features

- wideband, 3000 to 3900 MHz
- low phase unbalance, 5 deg. and amplitude unbalance, 0.5 dB typ.
- miniature size, 0.079"x0.049"x0.033"
- LTCC construction
- low cost
- aqueous washable

## Applications

- WIMAX
- fixed satellite service
- radar



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 (Secondary/Primary)			2		
Frequency Range		3000	—	3900	MHz
Insertion Loss <sup>1</sup>	3000-3900	—	1.0	—	dB
Amplitude Unbalance	3000-3900	—	0.5	—	dB
Phase Unbalance <sup>2</sup>	3000-3900	—	5	—	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

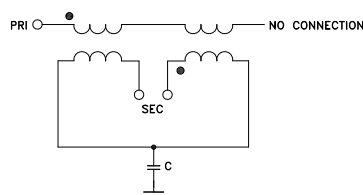
Permanent damage may occur if any of these limits are exceeded.

## Pad Connections

Function	Pad Number
PRIMARY DOT (Unbalanced Port)	1
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

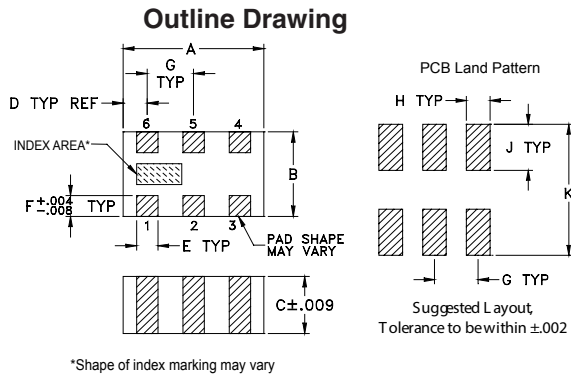
## Configuration R



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REV.D  
M172731  
NCS2-392+  
ED 12817/34B27  
RS/AM  
191120

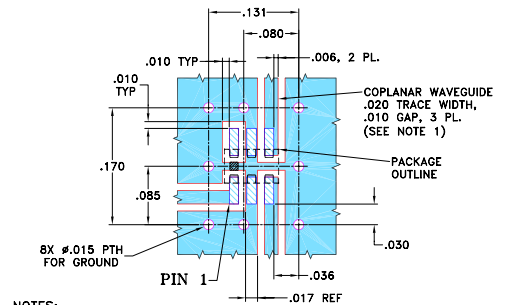
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## Outline Dimensions (inch/mm)

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)



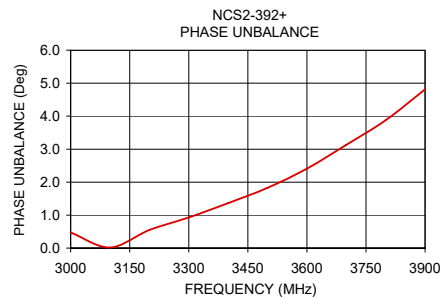
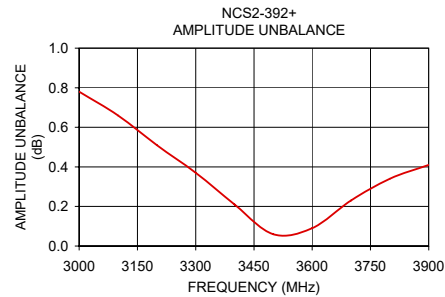
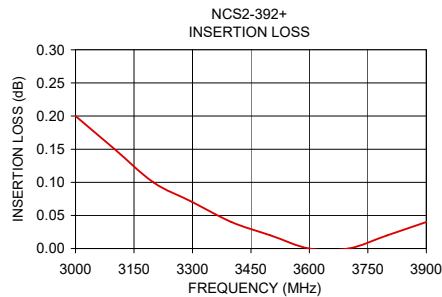
### NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS  $.010 \pm .001$ ". 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

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

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
3000.00	0.20	13.67	0.78	0.47
3100.00	0.15	14.72	0.66	0.02
3200.00	0.10	15.73	0.51	0.55
3300.00	0.07	16.86	0.37	0.93
3400.00	0.04	18.05	0.21	1.36
3500.00	0.02	19.30	0.06	1.83
3600.00	0.00	20.47	0.09	2.41
3700.00	0.00	21.56	0.23	3.13
3800.00	0.02	22.44	0.34	3.88
3900.00	0.04	22.99	0.41	4.81

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



### Additional 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-Circuits' applicable established test performance criteria and measurement instructions.
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