



## CERAMIC BALUN

# RF Transformer

# NCS1-521+

Mini-Circuits

50Ω 223 to 520 MHz 1:1 Ratio

### FEATURES

- Wideband, 223 to 520 MHz
- Low phase unbalance, 5 deg. and amplitude unbalance, 0.7 dB typ.
- Miniature size, 0.079"x0.049"x0.033"
- LTCC construction
- Low cost
- Aqueous washable



Generic photo used for illustration purposes only

CASE STYLE: GE0805C-9

### APPLICATIONS

- WLAN
- GSM
- Two way trunked radio

#### +RoHS Compliant

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

### ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Impedance Ratio			1		
Frequency Range		223		520	MHz
Insertion Loss <sup>1</sup> (average)	223 - 520	—	—	1.5	dB
Amplitude Unbalance	223 - 520	—	—	1.5	dB
Phase Unbalance <sup>2</sup>	223 - 520	—	—	10	Degree

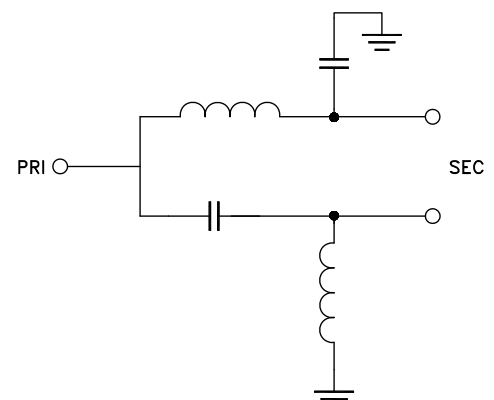
1. Reference Demo Board TB-419+
2. Relative to 180°

### MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	2W

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

### CONFIGURATION S



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REV. A  
ECO-010420  
NCS1-521+  
MCL NY  
211101

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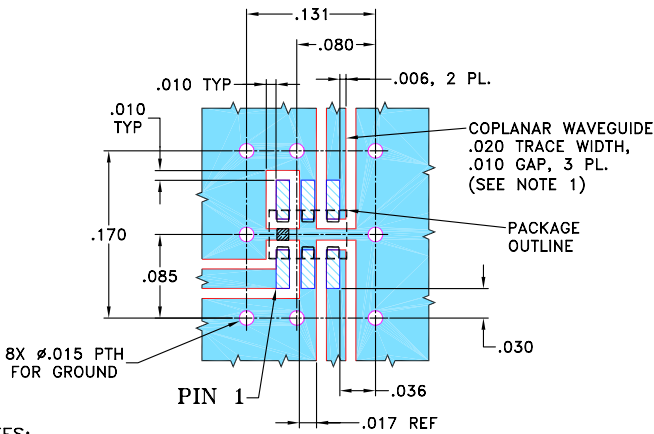


### PAD CONNECTIONS

PRIMARY DOT (Unbalanced Port)	1
PRIMARY (GND)	2
SECONDARY DOT (Balanced)	4
SECONDARY (Balanced)	3
NO CONNECTION	6
NOT USED (GND Externally)	5

PRODUCT MARKING: N/A

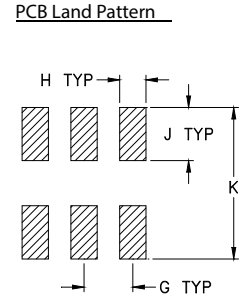
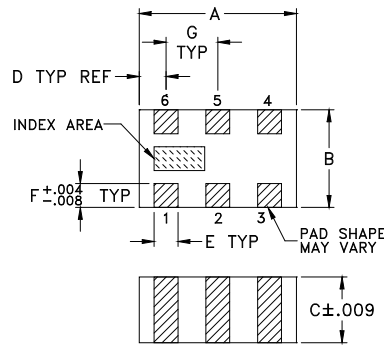
### DEMO BOARD MCL P/N: TB-419+ SUGGESTED PCB LAYOUT (PL-264)



**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 DRAWING



Suggested Layout,  
Tolerance to be within  $\pm .002$

### 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

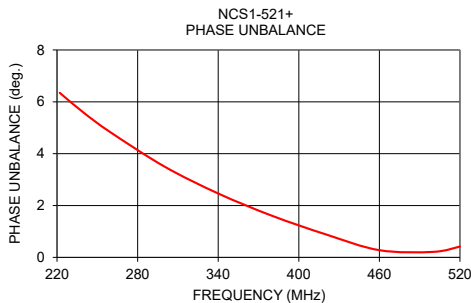
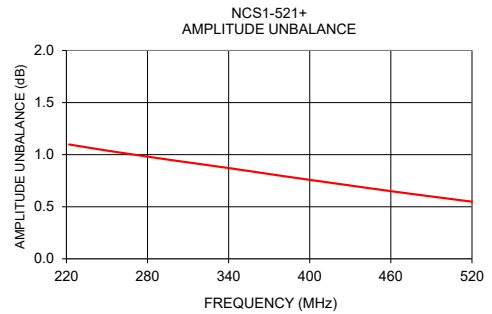
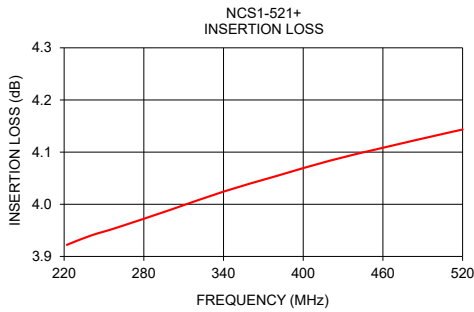
### TAPE & REEL INFORMATION: F74



### TYPICAL PERFORMANCE DATA<sup>3</sup>

Frequency (MHz)	Insertion Loss (dB)	Input Return Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance (deg)
222	3.92	15.51	1.10	6.35
240	3.94	15.25	1.06	5.57
260	3.96	14.97	1.02	4.82
300	3.99	14.46	0.94	3.50
340	4.02	14.00	0.87	2.47
380	4.05	13.63	0.80	1.61
420	4.08	13.31	0.72	0.89
460	4.11	13.05	0.65	0.28
500	4.13	12.89	0.58	0.21
520	4.14	12.82	0.55	0.42

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.
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