



## CERAMIC BALUN

# RF Transformer

# TCW2-2700+

50Ω 500 to 2700 MHz 1:2 Ratio

### THE BIG DEAL

- Wideband. 500-2700 MHz
- Miniature size 0603 (1.6x0.8mm)
- LTCC construction
- Low cost
- Aqueous washable



Generic photo used for illustration purposes only

CASE STYLE: JC0603C

### +RoHS Compliant

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

### APPLICATIONS

- L-Band
- A/D conversion
- GPS
- Cellular

### PRODUCT OVERVIEW

Mini-Circuits' TCW2-2700+ is a tiny ceramic RF balun transformer with an impedance ratio of 1:2, covering a variety of wireless communications applications from 500 to 2700 MHz. This model provides, low amplitude unbalance, and RF input power handling up to 0.5W. It provides DC isolation from input to output allowing it to be used for DC biasing of external circuits at the output. Fabricated using LTCC technology, the unit comes housed in a tiny, rugged ceramic package (0.06 x 0.03 x 0.02") suitable for harsh operating environments.

### KEY FEATURES

Feature	Advantages
Low unbalance, 0.6 dB	Low unbalance can improve a system's electromagnetic compatibility by rejecting unwanted common-mode noise.
Wideband Performance	Supports a wide range of wireless applications.
Tiny size, 0603	Accommodates tight space requirements for dense PCB layouts.
LTCC construction	LTCC process enables tiny size and low cost, suitable for high-volume production. Rugged ceramic package provides excellent reliability in harsh operating environments.

REV. B  
ECO-010340  
TCW2-2700+  
MY/CP/AM  
221005





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### ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Units
Impedance Ratio (Secondary/ Primary)			2		
Frequency Range		500		2700	MHz
Insertion Loss <sup>1</sup>	500-2700	—	1.3	1.7	dB
Amplitude Unbalance	500-2700	—	0.6	1	dB
Phase Unbalance <sup>2</sup>	500-2150	—	—	13	Degree
	2150-2700	—	19	—	
Return Loss	500-2700	9.5	12.5	—	dB

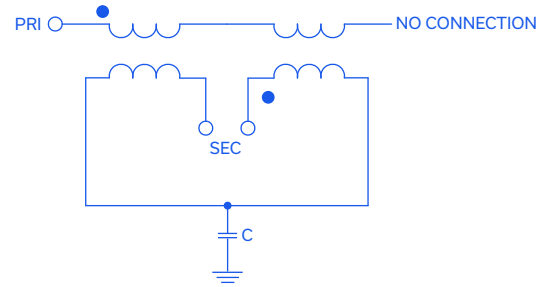
- 1. Reference Demo Board TB-TCW2-2700+
- 2. Relative to 180°

### MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-55°C to 125°C
Storage Temperature	-55°C to 125°C
RF Power Input	0.5W max.

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

### CONFIGURATION R





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Mini-Circuits

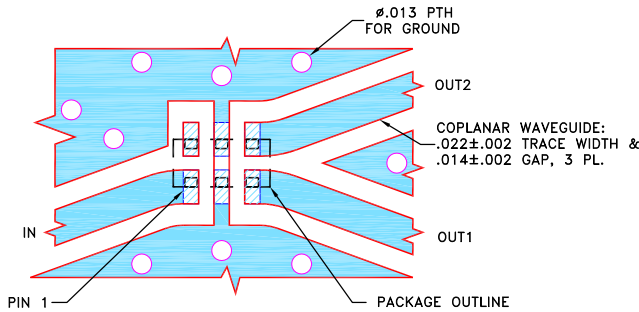
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### PAD CONNECTIONS

PRIMARY DOT	1
GND or DC feed + RF	2
SECONDARY DOT	3
SECONDARY	4
NO CONNECTION	6
GND	5

PRODUCT MARKING: N/A

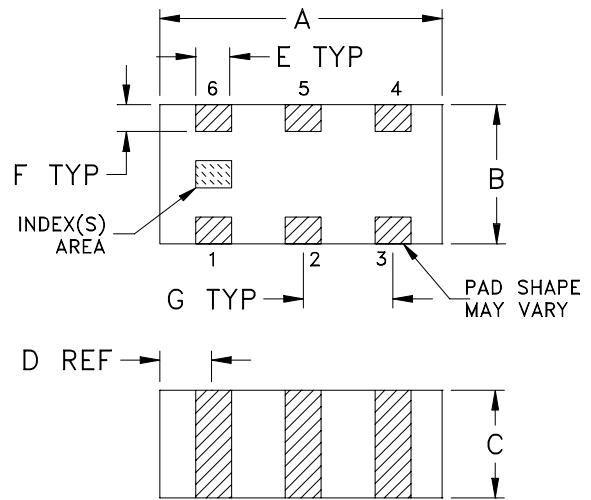
### DEMO BOARD MCL P/N: TB-TCW2-2700+ SUGGESTED PCB LAYOUT (PL-513)



- TRACE WIDTH AND GAP PARAMETERS ARE SHOWN FOR ROGERS R04350B 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.

### OUTLINE DRAWING



### OUTLINE DIMENSIONS (Inches/mm)

A	B	C	D	E	F	G	wt
.063	.031	.024	.012	.008	.006	.020	grams
1.60	0.79	0.61	0.30	0.20	0.15	0.51	0.005

### TAPE & REEL INFORMATION: F114



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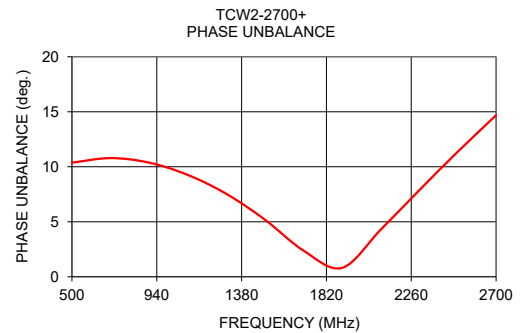
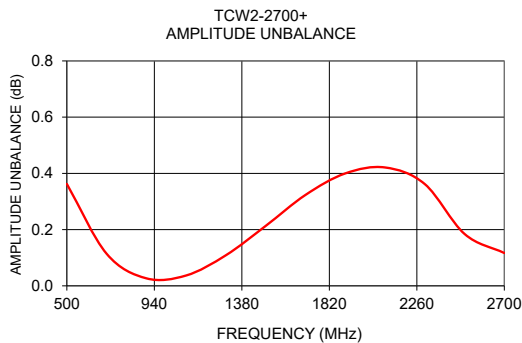
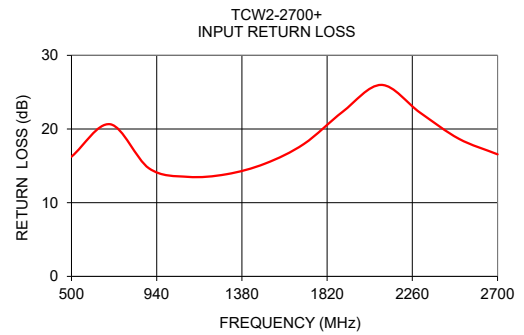
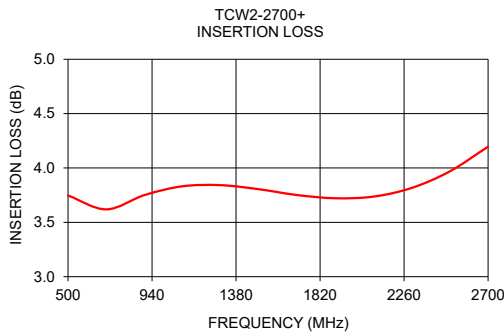
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### TYPICAL PERFORMANCE DATA<sup>3</sup>

Frequency (MHz)	Insertion Loss (dB)	Input Return Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance (deg)
500	3.75	16.25	0.36	10.38
700	3.62	20.65	0.11	10.79
900	3.75	14.67	0.03	10.38
1100	3.83	13.51	0.04	9.26
1300	3.84	13.86	0.11	7.55
1500	3.80	15.31	0.21	5.20
1700	3.75	17.97	0.32	2.39
1900	3.72	22.34	0.40	0.80
2100	3.74	25.99	0.42	4.25
2300	3.82	22.22	0.36	7.84
2500	3.97	18.68	0.18	11.35
2700	4.20	16.57	0.12	14.68

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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)

