Ceramic Balun

RF Transformer

TCW1-272+

50Ω 1700 to 2700 MHz 1:1 Ratio

CASE STYLE: JC0603C

The Big Deal

- Tiny size, 0603
- Low unbalance, 0.6 dB, 4°
- Low insertion loss, 1.25 dB typ.
- Low cost

Product Overview

Mini-Circuits' TCW1-272+ is a tiny ceramic RF balun transformer with an impedance ratio of 1:1, covering a variety of wireless communications applications from 1700 to 2700 MHz. This model provides low insertion loss, low phase unbalance (relative to 180°), low amplitude unbalance, and RF input power handling up to 1W. 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 insertion loss, 1.25 dB	Enables excellent signal power transmission from input to output.
Low unbalance, 0.6 dB, 4°	Low unbalance can improve a system's electromagnetic compatibility by rejecting unwanted common-mode noise.
1W power handling	Supports a wide range of power requirements
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.

Surface Mount

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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, 4000

Maximum Ratings

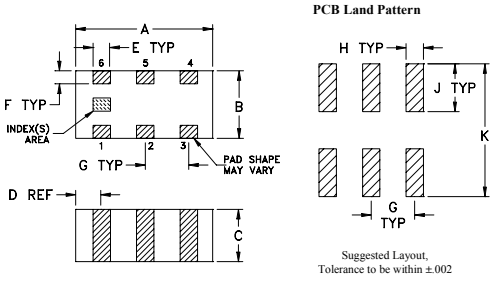
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Input RF Power*	1W

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

Pad Connections

PRIMARY DOT	1
PRIMARY	2
SECONDARY DOT	4
SECONDARY	5
NO CONNECTION	3,6

Outline Drawing

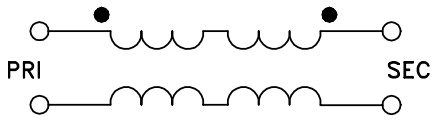


Outline Dimensions (inch / mm)

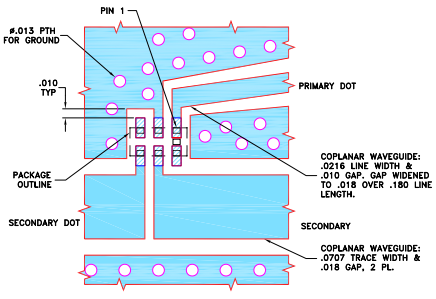
A	B	C	D	E	F
.063	.031	.024	.012	.008	.006
1.60	0.79	0.61	0.30	0.20	0.15

G	H	J	K	wt
.020	.010	.022	.053	grams
0.51	0.25	0.56	1.35	0.005

configuration G



Demo Board MCL P/N: TB-922+
Suggested PCB Layout (PL-537)



NOTES:
1. TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010"±.001". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS LINE 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.

Features

- wideband, 1700 to 2700 MHz
- miniature size 0603 (1.6x0.8mm)
- LTCC construction
- low cost

Applications

- Wi-Fi
- ISM
- LTE
- A/D conversion
- aviation/aeronautical
- radio astronomy
- radio navigation

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio			1		
Frequency Range		1700	—	2700	MHz
Avg. Insertion Loss (ref. to nominal loss)	1700 - 2700	—	—	1.8	dB
Amplitude Unbalance	1700 - 2700	—	0.6	1.5	dB
Phase Unbalance*	1700 - 2700	—	4	7	Degree
Input VSWR	1700 - 2700	—	1.6	—	(:1)

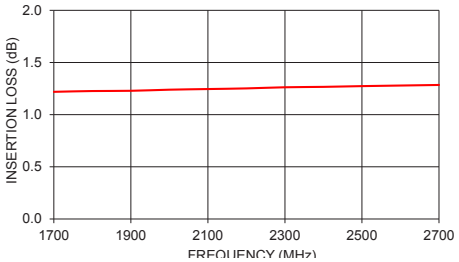
* Relative to 180°
Note: Tested on TB-922+ and with pin 2 grounded.

Typical Performance Data at 25°C**

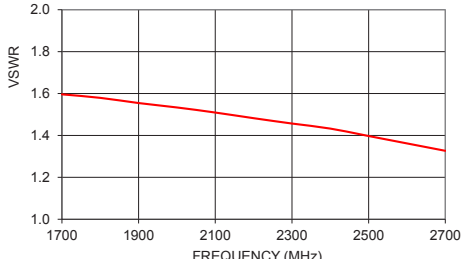
FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT VSWR (:1)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
1700	1.22	1.60	0.58	1.78
1800	1.23	1.58	0.29	1.69
1900	1.23	1.55	0.03	1.34
2000	1.24	1.53	0.16	0.84
2100	1.25	1.51	0.32	0.21
2200	1.25	1.48	0.41	0.34
2300	1.26	1.46	0.47	0.91
2400	1.27	1.43	0.47	1.49
2500	1.27	1.40	0.44	1.93
2700	1.28	1.33	0.30	2.56

** Measured with Agilent N5242A network analyzer using impedance conversion and port extension.

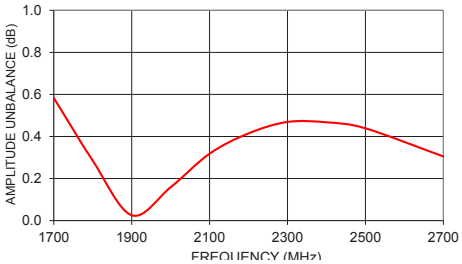
TCW1-272+
INSERTION LOSS



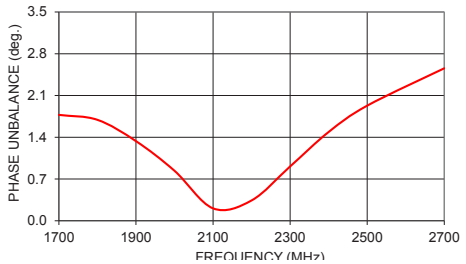
TCW1-272+
VSWR



TCW1-272+
AMPLITUDE UNBALANCE



TCW1-272+
PHASE UNBALANCE



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

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