CERAMIC BALUN

RF Transformer

TCW1-3901+

50Ω 3300 to 3900 MHz 1:1 Ratio

FEATURES

- Wideband, 3300 to 3900 MHz
- Tiny Size 0603 (1.6x0.8 mm)
- LTCC Construction
- Low Cost

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

- Wi-Fi
- ISM
- LTE
- A/D Conversion
- Aviation/Aeronautical

PRODUCT OVERVIEW

Mini-Circuits' TCW1-3901+ is a tiny ceramic RF balun transformer with an impedance ratio of 1:1, covering a variety of wireless communications applications from 3300 to 3900 MHz. This model provides low insertion loss, low phase unbalance (relative to 180°), low amplitude unbalance, and RF input power handling up to 1 W. Fabricated using LTCC technology, the unit comes housed in a tiny, rugged ceramic package (0.06x0.03x0.02") suitable for harsh operating environments.

KEY FEATURES

Feature	Advantages
Low Insertion Loss, 0.9 dB	Enables excellent signal power transmission from input to output.
Low Unbalance, 0.4 dB, 4° (Relative to 180°)	Low unbalance can improve a system's electromagnetic compatibility by rejecting unwanted common-mode noise.
1 W 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.

REV. A
ECO-010340
TCW1-3901+
MCL NY
250709

ELECTRICAL SPECIFICATIONS[1] AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Impedance Ratio			1		
Frequency Range		3300		3900	MHz
(Avg.) Insertion Loss	3300-3900		0.9	1.5	dB
Amplitude Unbalance	3300-3900		0.4	0.9	dB
Phase Unbalance[2]	3300-3900		4	11	Degree
Input VSWR	3300-3900		1.4		(:1)

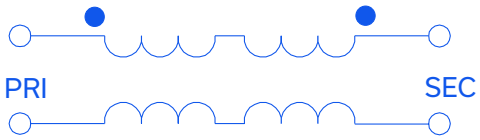
1. Tested on TB-TCW1-3901+ and with pin 2 grounded.
2. Relative to 180°.

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
RF Power Input[3]	1 W at +25°C

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

CONFIGURATION G



CERAMIC BALUN

RF Transformer

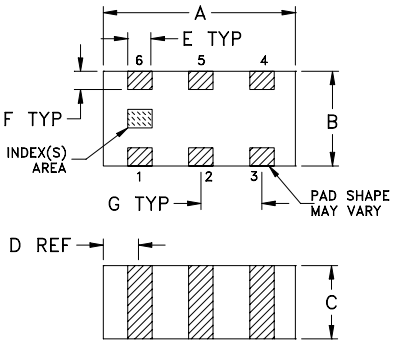
TCW1-3901+

50Ω 3300 to 3900 MHz 1:1 Ratio

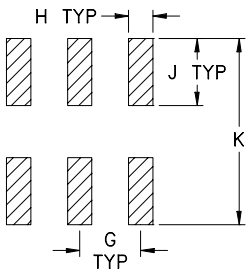
PAD CONNECTIONS

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

OUTLINE DRAWING



PCB Land Pattern

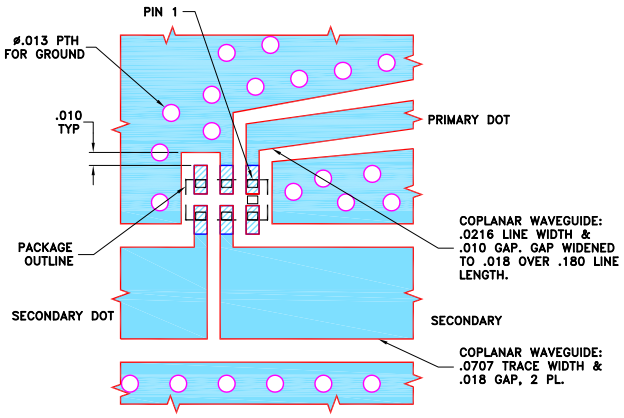


Suggested Layout,
Tolerance to be within ±.002

PRODUCT MARKING: N/A

DEMO BOARD MCL P/N: TB-TCW1-3901+

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.

OUTLINE DIMENSIONS (Inches / 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

TAPE & REEL INFORMATION: F114

RF Transformer

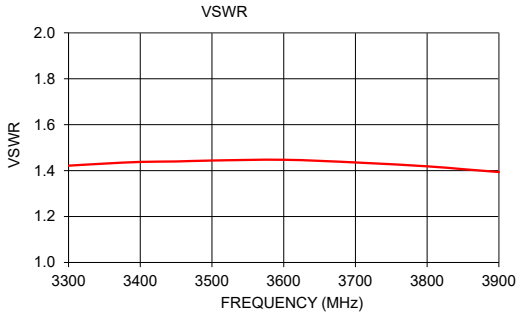
TCW1-3901+

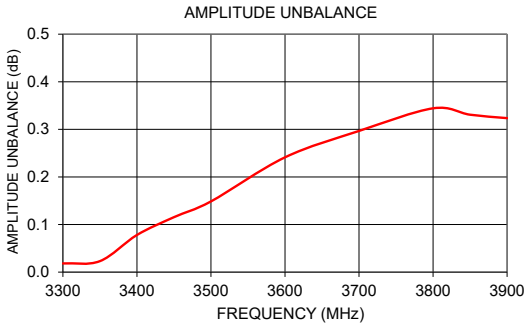
50Ω 3300 to 3900 MHz 1:1 Ratio

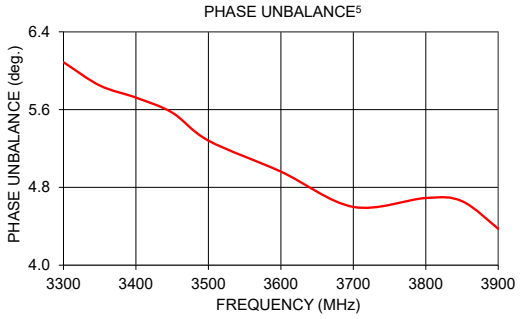
TYPICAL PERFORMANCE DATA[4]

Frequency (MHz)	Insertion Loss (dB)	Input Return Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance[5] (deg)
3300	0.80	1.42	0.02	6.09
3350	0.81	1.43	0.02	5.85
3400	0.82	1.44	0.08	5.72
3450	0.83	1.44	0.12	5.57
3500	0.84	1.44	0.15	5.28
3600	0.86	1.45	0.24	4.96
3700	0.87	1.44	0.30	4.60
3800	0.88	1.42	0.34	4.69
3850	0.88	1.41	0.33	4.66
3900	0.88	1.39	0.32	4.37

4. Measured with Agilent N5242A network analyzer using impedance conversion and port extension.
5. Relative to 180°.







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