CERAMIC BALUN

RF Transformer

TCW1-362+

50Ω 2150 to 3600 MHz 1:1 Ratio

THE BIG DEAL

- Tiny size, 0603
- Low cost
- DC feeding capability
- Rugged LTCC construction

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

- 5G sub 6GHz
- Wireless Communication

PRODUCT OVERVIEW

Mini-Circuits' TCW1-362+ is a tiny ceramic RF balun transformer with an impedance ratio of 1:1, covering a variety of wireless communications applications from 2150 to 3600 MHz. This model provides low insertion loss, low phase unbalance (relative to 180°), low amplitude unbalance. 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
DC Isolated from input to output	Can be used to DC bias external circuits at the output.
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. OR
ECO-012161
TCW1-362+
AVB/CP/AM
221003

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ELECTRICAL SPECIFICATIONS AT 25°C

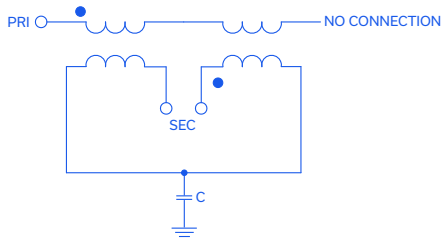
Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Impedance Ratio			1		
Frequency Range		2150		3600	MHz
Average Insertion Loss (over 3 dB)	2150-3600			1.5	dB
Amplitude Unbalance	2150-3600			1.5	dB
Phase Unbalance	2150-3600			13	Degree
Return Loss Unbalanced Port	2150-3600	9.5			dB

MAXIMUM RATINGS

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

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

CONFIGURATION R



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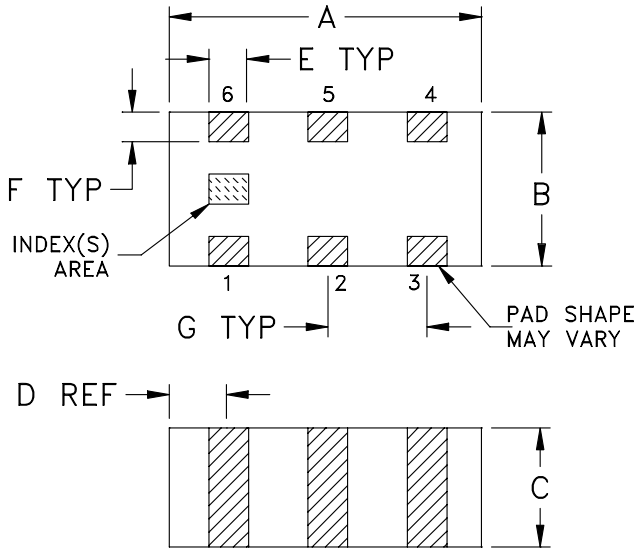
PAD CONNECTIONS

UNBALANCED PORT	1
BALANCED PORT	3,4
GROUND	5
NOT CONNECT	6
GND or DC feed	2

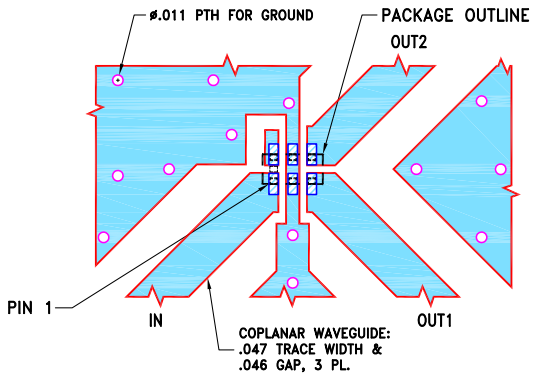
OUTLINE DRAWING



PRODUCT MARKING: N/A

DEMO BOARD MCL P/N: TB-TCW1-362+

SUGGESTED PCB LAYOUT (PL-574)



NOTES:
1. TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020±.0015. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & 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	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

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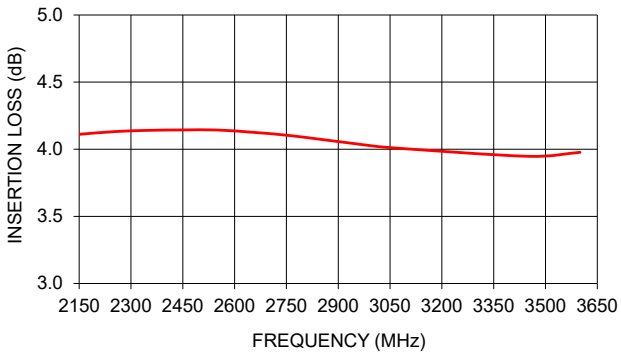
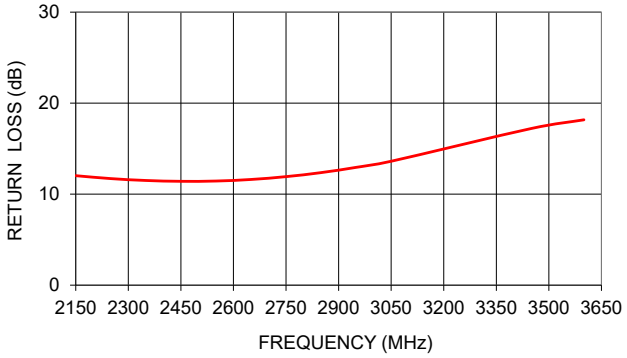
TYPICAL PERFORMANCE DATA

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance (deg)
2150	4.11	12.03	0.60	5.69
2250	4.13	11.71	0.51	5.17
2350	4.14	11.50	0.43	4.62
2450	4.14	11.41	0.37	4.01
2550	4.14	11.44	0.31	3.44
2650	4.13	11.61	0.28	2.79
2750	4.10	11.93	0.25	2.18
2850	4.07	12.37	0.25	1.53
2950	4.04	12.94	0.27	0.82
3050	4.01	13.62	0.31	0.18
3450	3.95	17.22	0.69	-2.65
3600	3.98	18.17	0.95	-3.68

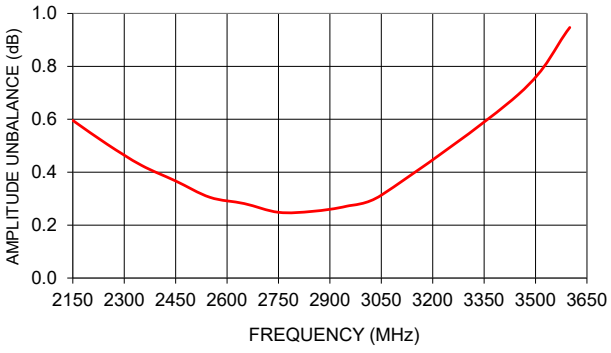
TCW1-362+
INSERTION LOSS



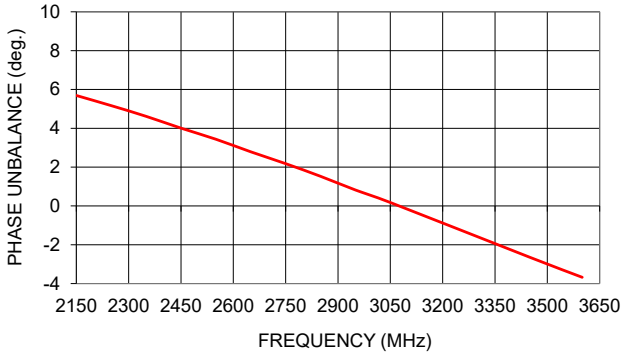
TCW1-362+
INPUT RETURN LOSS



TCW1-362+
AMPLITUDE UNBALANCE



TCW1-362+
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/terms/viewterm.html