



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

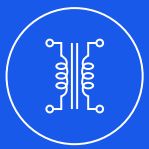
- 5G application
- Wireless Communication

PRODUCT OVERVIEW

Mini-Circuits' TCW1-422+ is a tiny ceramic RF balun transformer with an impedance ratio of 1:1, covering a variety of wireless communications applications from 3100 to 4200 MHz. This model provides low insertion loss, low phase unbalance (relative to 180°), low amplitude unbalance, and RF input power handling up to 2W. 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
2W power handling	Supports a wide range of power requirements
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.



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CERAMIC BALUN

RF Transformer

TCW1-422+

50Ω 3100 to 4200 MHz 1:1 Ratio

ELECTRICAL SPECIFICATIONS AT 25°C

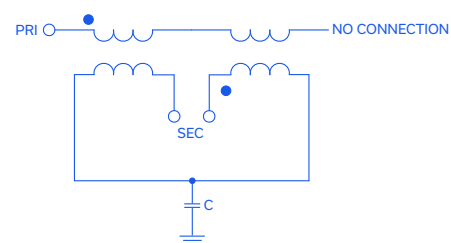
Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Impedance Ratio		50:50			
Frequency Range		3100		4200	MHz
Insertion Loss	3100-4200		1.1	1.5	dB
Amplitude Unbalance	3100-4200		1	1.5	dB
Phase Unbalance	3100-4200		7	13	Degree
Return Loss Unbalanced Port	3100-4200	9.5			dB

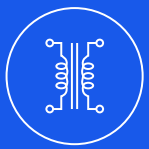
MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-55°C to 125°C
Storage Temperature	-55°C to 125°C
RF Power Input	2W*

*Room temperature; Linear derate to 0.5W at 125°C.
Permanent damage may occur if any of these limits are exceeded.

CONFIGURATION R





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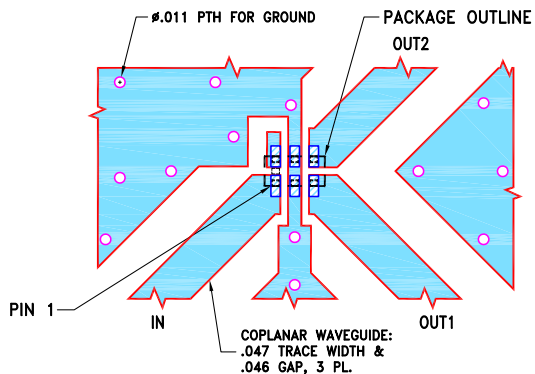
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PAD CONNECTIONS

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

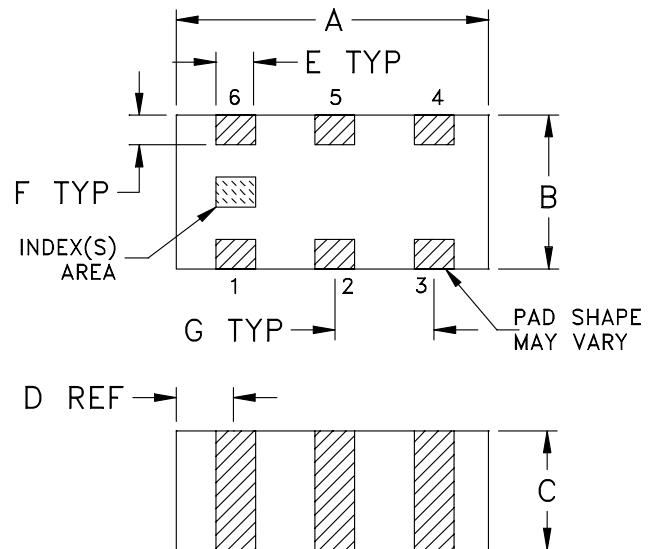
DEMO BOARD MCL P/N: TB-TCW1-422+
SUGGESTED PCB LAYOUT (PL-574)

NOTES:

- 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.
- 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.

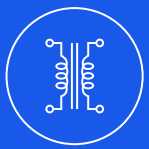
OUTLINE DRAWING



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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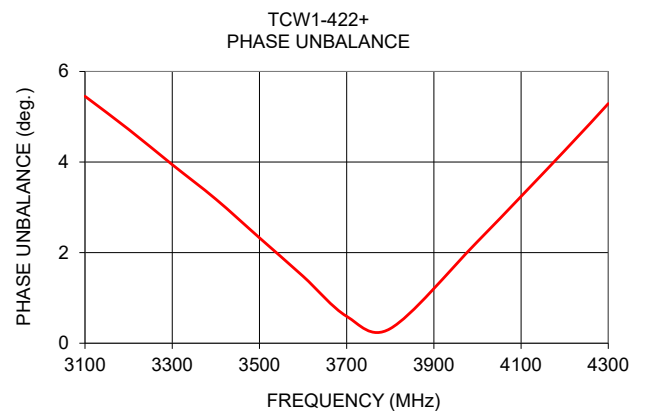
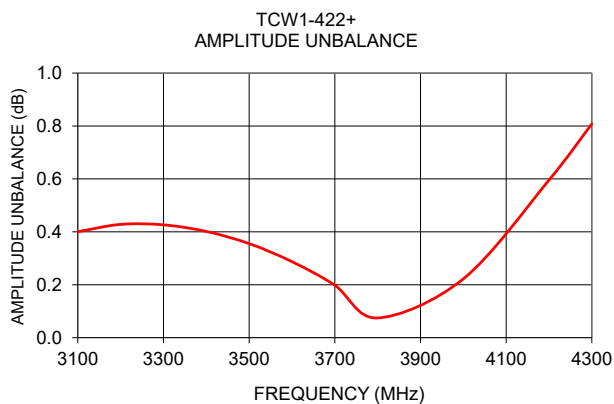
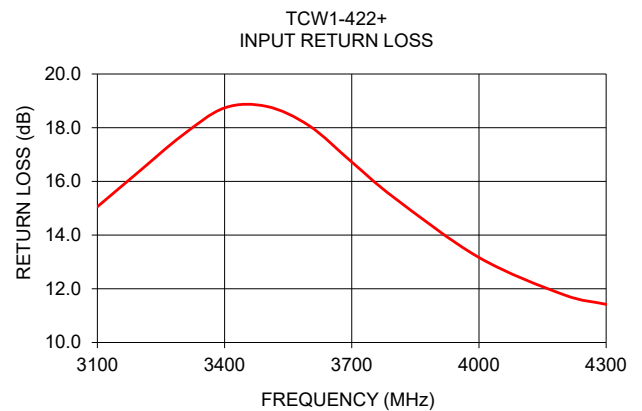
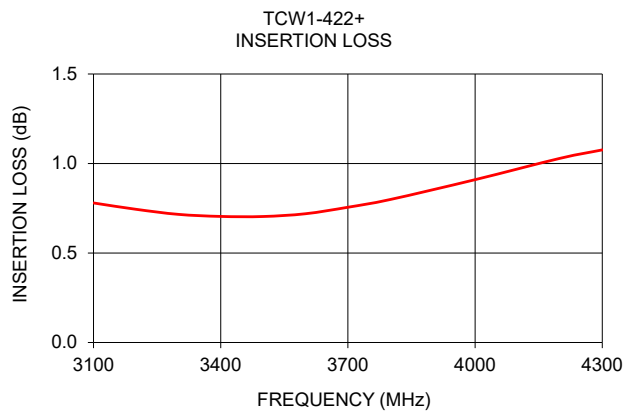
RF Transformer

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50Ω 3100 to 4200 MHz 1:1 Ratio

TYPICAL PERFORMANCE DATA

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance (deg)
3100	0.78	15.06	0.40	5.45
3200	0.74	16.39	0.43	4.72
3300	0.72	17.71	0.43	3.94
3400	0.70	18.74	0.40	3.18
3500	0.70	18.79	0.36	2.33
3600	0.72	18.07	0.29	1.48
3700	0.76	16.72	0.20	0.59
3800	0.80	15.39	0.07	0.32
4000	0.91	13.17	0.22	2.24
4200	1.03	11.78	0.60	4.25



- NOTES**
- 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.
 - Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
 - 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



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