CERAMIC BALUN

RF Transformer

TCW4-582+

50Ω 5000 to 5800 MHz 1:4 Ratio

THE BIG DEAL

- Miniature size 0603 (0.063" [1.6mm] x 0.031" [0.8mm] x 0.024" [0.6mm])
- 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

- ISM Band
- WLAN

PRODUCT OVERVIEW

Mini-Circuits' TCW4-582+ is a tiny ceramic RF balun transformer with an impedance ratio of 1:4, covering a variety of wireless communications applications from 5000 to 5800 MHz. This model provides low insertion loss, low phase unbalance (relative to 180°), 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
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. B
ECO-010443
TCW4-582+
AVB/CP/AM
221006

ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Units
Impedance Ratio (Secondary/ Primary)			4		
Frequency Range		5000		5800	MHz
Insertion Loss Loss[1]	5000 - 5800	—	—	1.7	dB
Amplitude Unbalance	5000 - 5800	—	1	1	dB
Phase Unbalance[2]	5000 - 5800	—	10	13	Degree
Unbalance Return Loss	5000 - 5800	—	9.5	—	dB

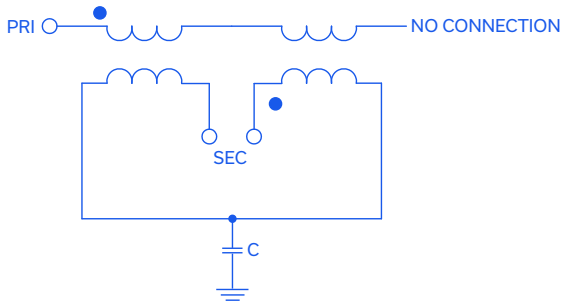
1. Tested on Evaluation Board TB-TCW4-582+
2. Relative to 180°

MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-55°C to 125°C
Storage Temperature[3]	-55°C to 125°C
RF Power[4]	0.5W

3.Refer to product storage temperature after installation. Suggestion for T&R unused product storage condition: +5~+35°C, Humidity 45~75%RH, 12 Month max.
4. Derate linearly to 0.1W at 125°C.
Permanent damage may occur if any of these limits are exceeded.

CONFIGURATION H



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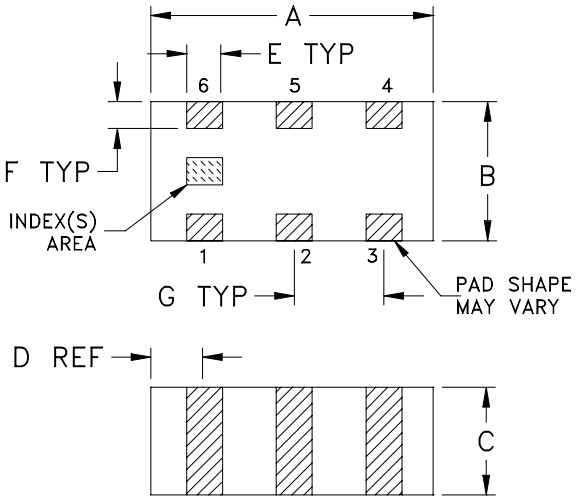
PAD CONNECTIONS

PRIMARY DOT (Unbalanced Port)	1
GND or DC feed	2
SECONDARY DOT (Balanced)	3
SECONDARY (Balanced)	4
NO CONNECTION	6
GND	5

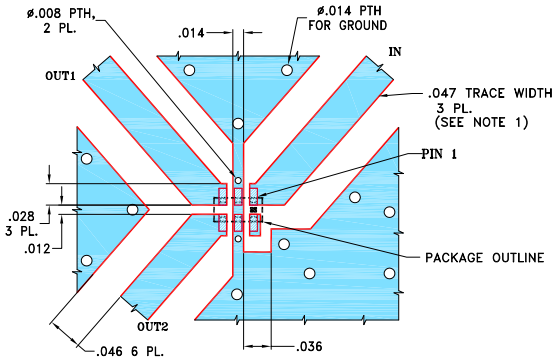
OUTLINE DRAWING



PRODUCT MARKING: N/A

DEMO BOARD MCL P/N: TB-TCW4-582+

SUGGESTED PCB LAYOUT (PL-561)



NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4233 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

TAPE & REEL INFORMATION: F114

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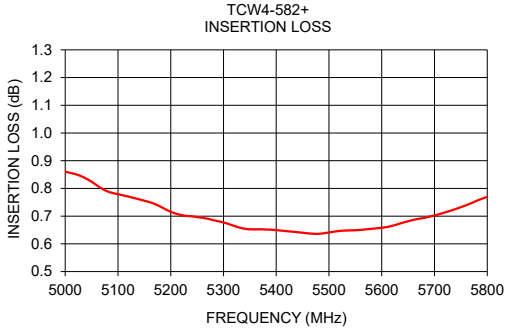
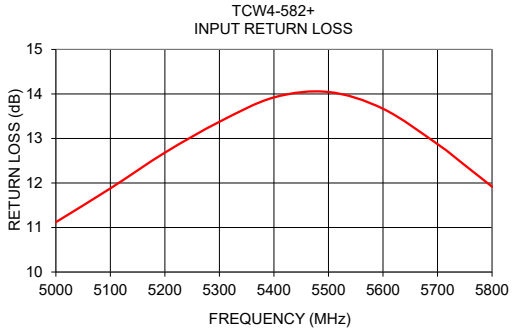
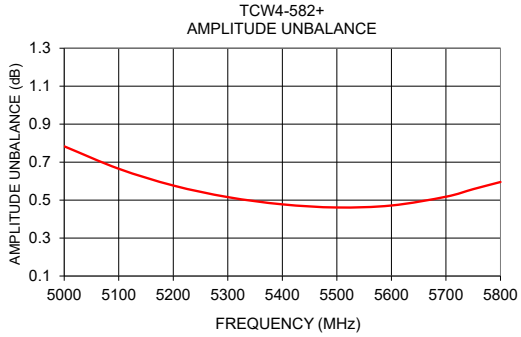
TYPICAL PERFORMANCE DATA[5]

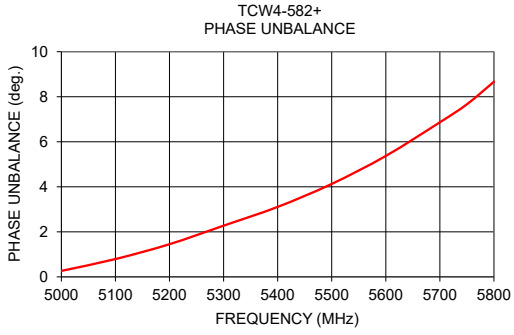
Frequency (MHz)	Insertion Loss (dB)	Input Return Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance (deg)
5000	0.86	11.12	0.78	0.27
5100	0.78	11.88	0.67	0.79
5200	0.72	12.68	0.58	1.45
5300	0.68	13.37	0.52	2.27
5400	0.65	13.92	0.48	3.11
5500	0.64	14.04	0.46	4.13
5600	0.66	13.67	0.47	5.37
5700	0.70	12.87	0.52	6.87
5750	0.73	12.40	0.56	7.66
5800	0.77	11.92	0.60	8.67

5. Measured with Agilent N5242A 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