CERAMIC BALUN

RF Transformer

TCW2-8600+

50Ω 4300 to 8600 MHz Ratio 1:2

KEY FEATURES

- Ultra-Wideband Coverage of 4.3 to 8.6 GHz
- Low Insertion Loss of 1.1 dB Typ.
- Excellent Return Loss of 12.5 dB Typ.
- Compact 0603 footprint (1.6 × 0.8 mm)
- High Common-Mode Rejection

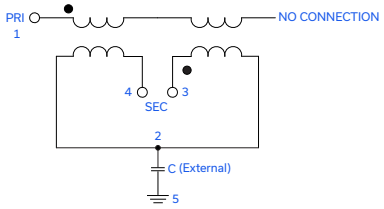


Generic photo used for illustration purposes only

APPLICATIONS

- Wireless Infrastructure
- 5G sub-6 GHz Systems
- Wi-Fi 6E/Wi-Fi 7
- Test and Measurement Systems
- Satellite Communications

CONFIGURATION R



PRODUCT OVERVIEW

Mini-Circuits' TCW2-8600+ is a high-performance ceramic RF balun transformer featuring a 1:2 impedance ratio, optimized for 4.3 to 8.6 GHz – a key frequency range for wireless infrastructure, SATCOM uplinks and 5G sub-6 GHz systems. Engineered for demanding RF applications, it delivers low insertion loss, excellent return loss and high common-mode rejection to ensure superior signal integrity in both transmit and receive paths. Tight amplitude and phase unbalance further support accurate differential signaling in high-performance RF chains.

ELECTRICAL SPECIFICATIONS[1] AT +25 °C, Z_0=50Ω

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Impedance Ratio (Secondary/Primary)			2		
Frequency Range		4300		8600	MHz
Average Insertion Loss[2]	4300–8600	-	1.1	1.5	dB
Return Loss Unbalanced Port	4300–8600	-	12.5	-	dB
Return Loss Balanced Port[2]	4300–8600	-	12.5	-	dB
CMRR	4300–8600	-	19	-	dB
Amplitude Unbalance	4300–8600	-	±1.1	±1.4	dB
Phase Unbalance[3]	4300–8600	-	±11	±15	Deg.

1. Tested in Evaluation Board P/N TB-TCW2-8600C+
2. Based on mixed-mode parameters
3. Relative to 180°

ABSOLUTE MAXIMUM RATINGS[4]

Operating Temperature	-55 °C to +125 °C
Storage Temperature	-55 °C to +125 °C
Input Power[5]	5 W

4. Permanent damage may occur if any of these limits are exceeded.
5. At +25 °C, derate linearly to 0.5 W at +125 °C.

REV. OR
ECO-031207
TCW2-8600+
MCL NY
260916

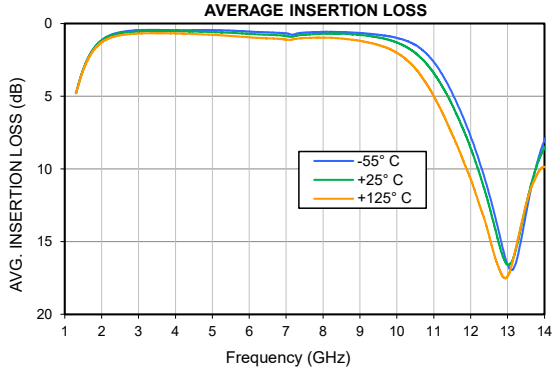
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TCW2-8600+

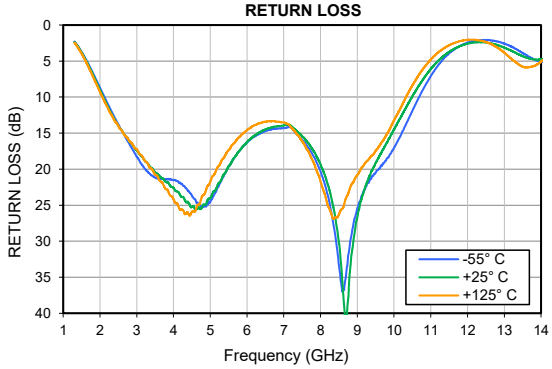
50Ω 4300 to 8600 MHz Ratio 1:2

TYPICAL PERFORMANCE GRAPHS

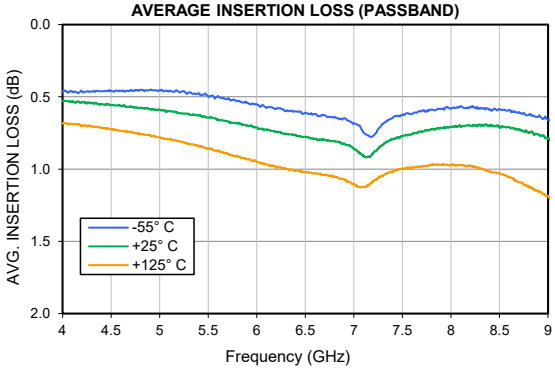
AVERAGE INSERTION LOSS



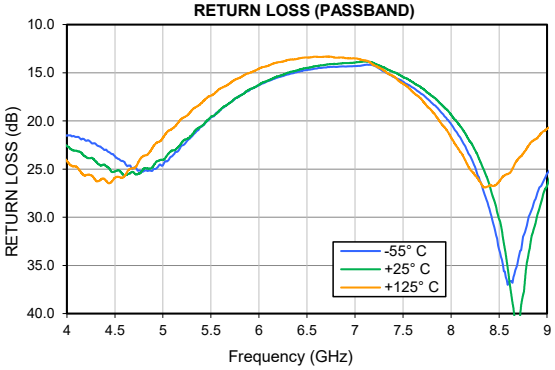
RETURN LOSS



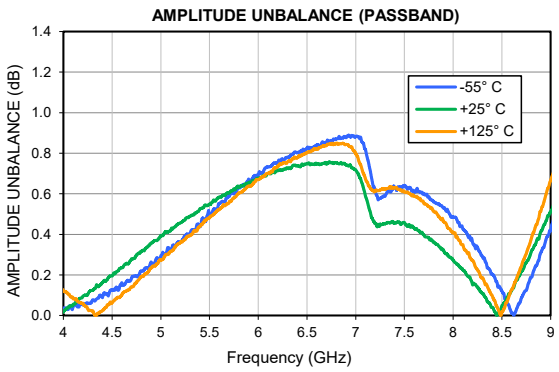
AVERAGE INSERTION LOSS (PASSBAND)



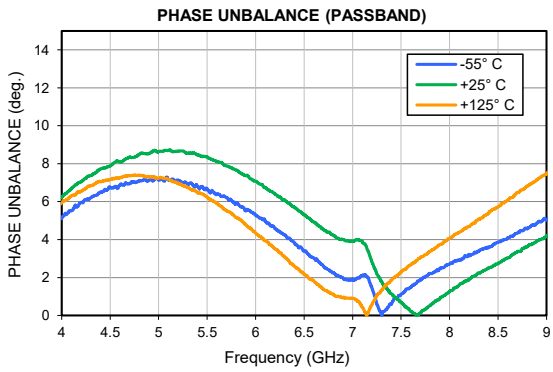
RETURN LOSS (PASSBAND)



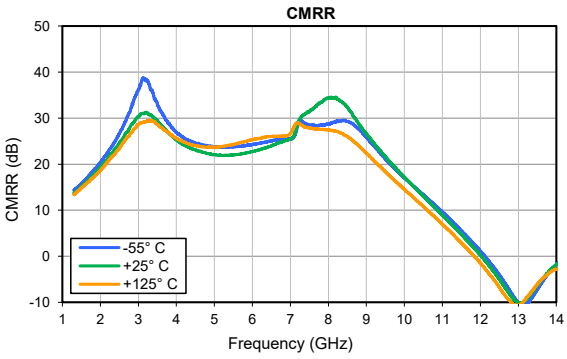
AMPLITUDE UNBALANCE (PASSBAND)



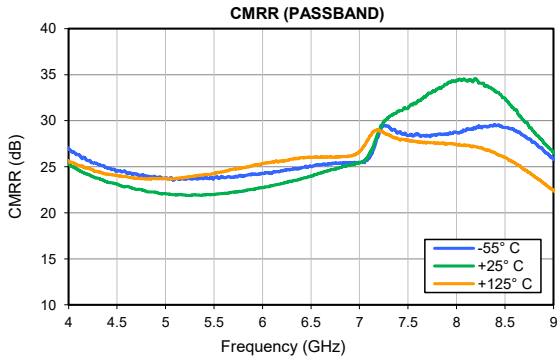
PHASE UNBALANCE (PASSBAND)



CMRR



CMRR (PASSBAND)



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CONFIGURATION R

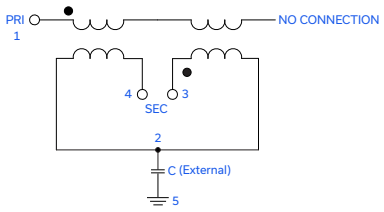
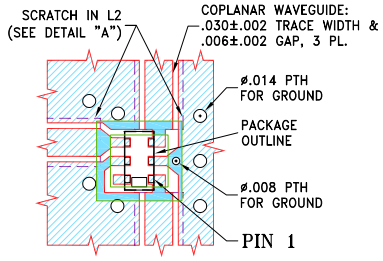


Figure 1. TCW2-8600+ Configuration

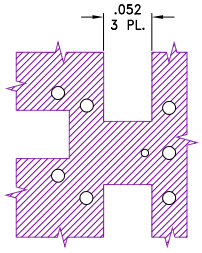
PAD DESCRIPTION

Function	Pad Number
PRIMARY DOT (Unbalanced Port)	1
GND or DC FEED + RF GND	2
SECONDARY DOT (Balanced)	3
SECONDARY (Balanced)	4
GND	5
NO CONNECTION	6

SUGGESTED PCB LAYOUT (PL-847)

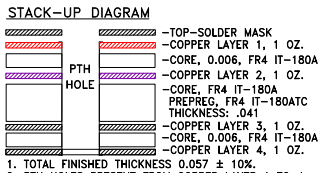


TOP VIEW (LAYER L1 & PTH)



DETAIL "A" (LAYER L2 & PTH)

STACK-UP DIAGRAM



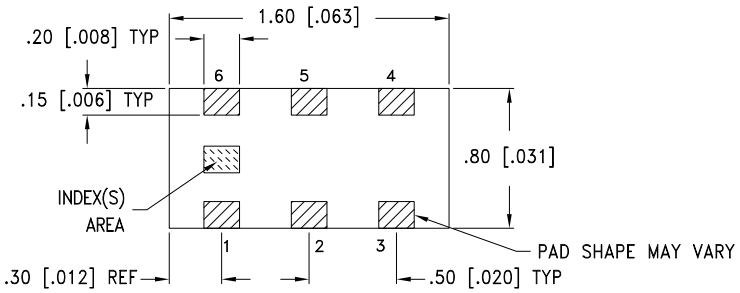
1. TOTAL FINISHED THICKNESS 0.057 ± 10%.
2. PTH HOLES PRESENT FROM COPPER LAYER 1 TO 4.
3. L3 & L4 ARE CONTINUOUS GROUND PLANE.

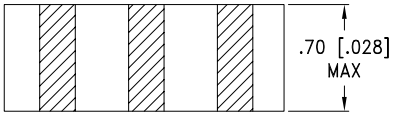
NOTES:
1. PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
2. TRACE WIDTH & GAP ARE SHOWN FOR 0.006 FR4 IT-180A, COPPER: 1 OZ. EACH LAYER. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

CASE STYLE DRAWING





METALLIZATION

Weight: .005 grams
Dimensions are in mm [inch]. Tolerances: ±0.13 mm

PRODUCT MARKING*: N/A

*Marking may contain other features or characters for internal lot control.

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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD. CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (S3P Files) Data Set (.zip file) De-embedded to device pads
Case Style	JC0603C Lead Finish: Tin over Nickel Plating
RoHS Status	Compliant
Tape and Reel	TR-F114
Suggested Layout for PCB Design	PL-847
Evaluation Board	TB-TCW2-8600C+ Gerber File
Environmental Rating	ENV06T10

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-Circuits' 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