



Mini-Circuits

SURFACE MOUNT

top hat



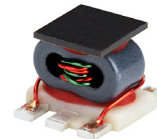
RF Transformer

TCM1.5-63WX+

50/75Ω 200 to 6000 MHz

KEY FEATURES

- Ultra-wide bandwidth 200 – 6000 MHz
- One model covers all telecommunication bands
- Aqueous washable
- Protected by US Patent 9,071,229B1



Generic photo used for illustration purposes only

APPLICATIONS

- Differential modulator/demodulator and active mixers
- Wideband push-pull amplifiers
- LTE, Cellular, PCS, UMTS, Wi-Fi, WiMAX

CONFIGURATION G



PRODUCT OVERVIEW

Mini-Circuits' TCM1.5-63WX+ is a surface-mount, transmission line, core and wire transformer covering a very wide frequency range, specified from 200 to 6000 MHz and usable from 100 to 6000 MHz. The transformer provides a 1:1.5 impedance ratio with low insertion loss, excellent flatness, as well as low phase and amplitude unbalance. Featuring core and wire construction on a 6-lead plastic base with tin over nickel termination finish. The unit measures 0.16" x 0.15" x 0.16" accommodating dense circuit board layouts. It also incorporates the Mini-Circuits' Top Hat® feature for faster, more accurate pick-and-place assembly and easy visual inspection.

ELECTRICAL SPECIFICATIONS¹ AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Impedance Ratio			1.5		
Frequency Range		200		6000	MHz
Insertion Loss (Avg.)	200 – 4300	—	1	1.5	dB
	4300 – 6000	—	2	2.6	
Amplitude Unbalance	200 – 4300	—	1.2	—	dB
	4300 – 6000	—	0.6	—	
Phase Unbalance	200 – 4300	—	8	—	Degree
	4300 – 6000	—	4	—	
Primary Return Loss (Input)	200 – 4300	—	15	—	dB
	4300 – 6000	—	12	—	

1. Performance is specified with shunt capacitor of 0.1pF suggested value of 0402 size between Pri Dot (Pin 3) and Pri (Pin2, GND)

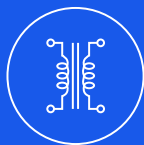
ABSOLUTE MAXIMUM RATINGS²

Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power	0.2 W

2. Permanent damage may occur if any of these limits are exceeded.

REV. A
ECO-025232
TCM1.5-63WX+
URJ
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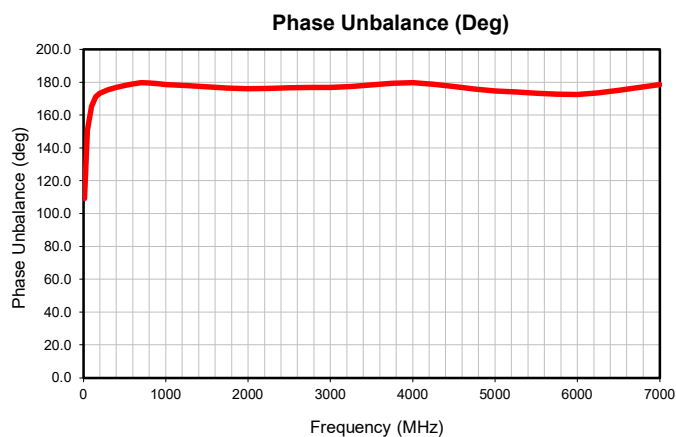
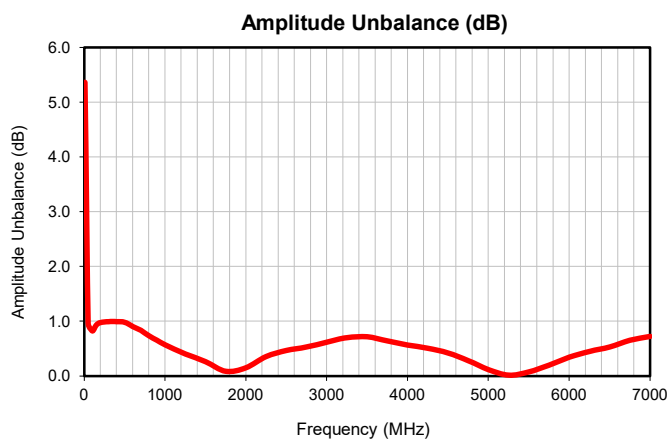
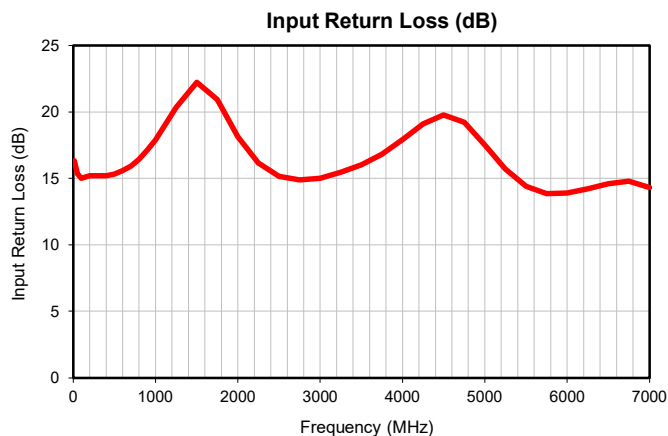
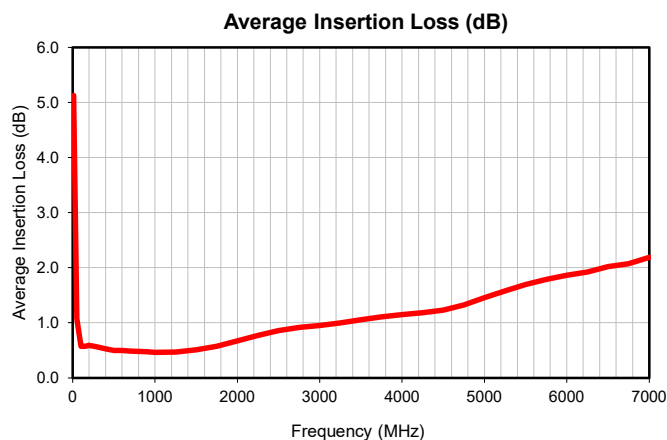
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TYPICAL PERFORMANCE GRAPHS





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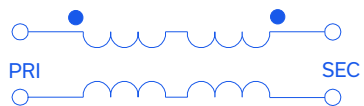
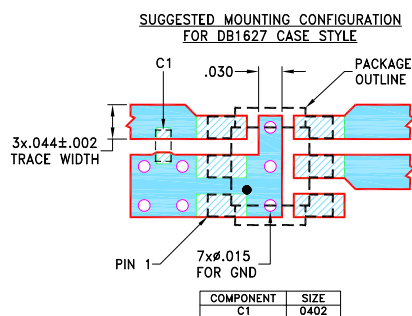


Figure 1. TCM1.5-63WX+ Configuration

PAD DESCRIPTION

Function	Pad Number	Description
Primary Dot	3	Connects to RF - IN
Primary	1,2	Connects to GND
Secondary Dot	5	Out 1
Secondary	4	Out 2
Not Connected (NC)	6	Not Used

SUGGESTED PCB LAYOUT (PL-819)

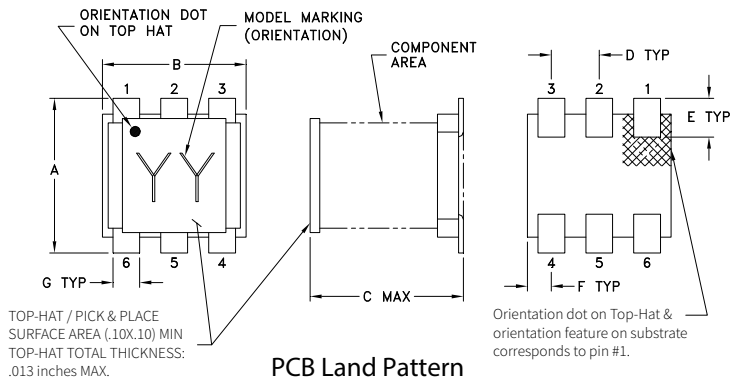


NOTES:

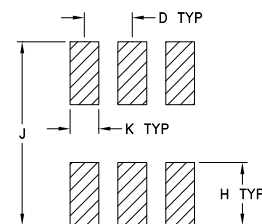
- TRACE WIDTH IS SHOWN FOR ROGERS (R04350B) WITH DIELECTRIC THICKNESS .020±.0015 COPPER: 1/2 Oz ON EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 - CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-717-1+.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
-  DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
-  DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK.

Figure 2. Suggested PCB Layout PL-819

CASE STYLE DRAWING



PCB Land Pattern

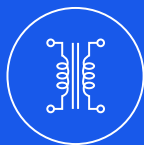
SUGGESTED LAYOUT
TOLERANCE TO BE WITHIN ±.002

OUTLINE DIMENSIONS (Inch mm)

A	B	C	D	E	F
.160	.150	.160	.050	.040	.025
4.06	3.81	4.06	1.27	1.02	0.64
G	H	J	K		wt
.028	.065	.190	.030		grams
0.71	1.65	4.83	0.76		0.15

PRODUCT MARKING*: BH

*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 (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	DB1627 Lead Finish: Pure Tin
RoHS Status	Compliant
Tape and Reel	F47
Suggested Layout for PCB Design	PL-819
Evaluation Board	TB-TCM1.5-63WX+ Gerber File
Environmental Rating	ENV02T1

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-Circuits' 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

