

# Surface Mount RF Transformer

50Ω

30 to 6000 MHz

## TCM2-63WX+

### The Big Deal

- Wideband, 30 to 6000 MHz
- Low insertion loss, 1.5 dB typ. up to 4 GHz
- Good amplitude unbalance,  $\pm 0.4$  dB typ.
- Good input return loss, 15 dB typ.
- Low phase unbalance,  $\pm 4^\circ$  typ.



CASE STYLE: DB1627

### Product Overview

Mini-Circuits' TCM2-63WX+ is a surface-mount transmission line core and wire transformer covering a very wide frequency range from 30 to 6000 MHz. The transformer provides low insertion loss. It achieves low phase and amplitude unbalance and excellent input return loss performance. 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 Mini-Circuits' Top Hat® feature for faster, more accurate pick-and-place assembly and easy visual inspection.

### Key Features

Feature	Advantages
Wideband, 30 to 6000 MHz	Very wide frequency range covers bandwidth requirements for many broadband applications.
Low insertion loss, 1.5 dB up to 4 GHz	TCM2-63WX+ provides excellent signal transmission from input to output with consistent performance across its entire frequency range.
Good input return loss, 15 dB	Provides good matching with minimal signal reflection.
Small footprint (0.16 x 0.15 x 0.16")	Accommodates tight space requirements for dense PCB layouts.
Top Hat® feature	Improves speed and accuracy of pick and place assembly and provides clear device marking for visual inspection.



# Surface Mount RF Transformer

50Ω 30 to 6000 MHz

## TCM2-63WX+

### Features

- wide bandwidth 20 to 4000 MHz
- balanced transmission line
- excellent CMRR
- aqueous washable

### Applications

- PCS
- wideband push-pull amplifiers
- cellular



Generic photo used for illustration purposes only

CASE STYLE: DB1627

**+RoHS Compliant**

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

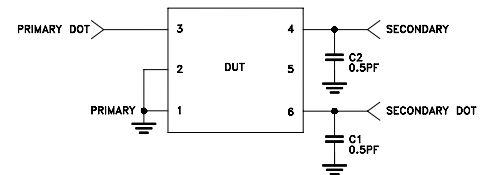
Available Tape and Reel at no extra cost	
Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500
13"	1000, 2000

### Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio ( <i>secondary/primary</i> )			2		
Frequency Range		30		6000	MHz
Average Insertion Loss*	100-4000	—	0.9	1.9	dB
	30-5000	—	1.5	2.9	
	5000-6000	—	2.5	3.9	
Phase Unbalance (±)	100-4500	—	4	—	Degree
	30-6000	—	5	—	
Amplitude Unbalance (±)	100-4500	—	0.4	—	dB
	30-6000	—	0.5	—	
Common Mode Rejection	100-4500	18	25	—	dB
	30-6000	15	20	—	

\*Average Insertion Loss is referenced to mid-band loss 0.9 dB.

### Electrical Schematic



### Maximum Ratings

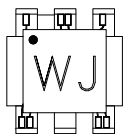
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	0.4W
DC Current	30mA

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

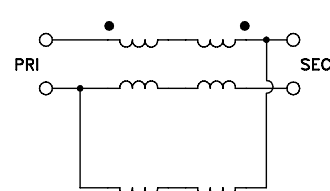
### Pin Connections

Function	Pin Number
PRIMARY DOT	3
PRIMARY	1,2
SECONDARY DOT	6
SECONDARY	4
GND	1,2
NOT USED	5

### Product Marking



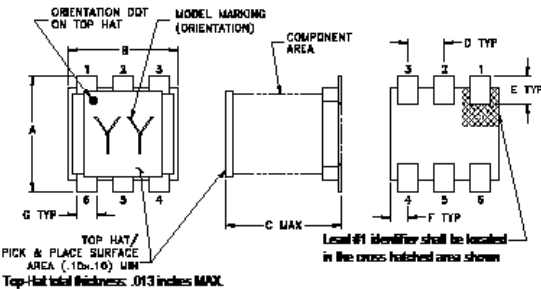
### Config. K





# TCM2-63WX+

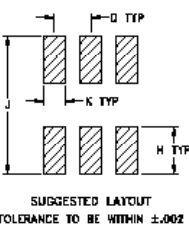
## Outline Drawing



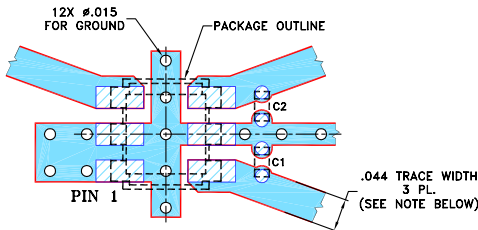
## Outline Dimensions (inch mm)

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

## PCB Land Pattern




Demo Board MCL P/N: TB-676+  
Suggested PCB Layout (PL-380)



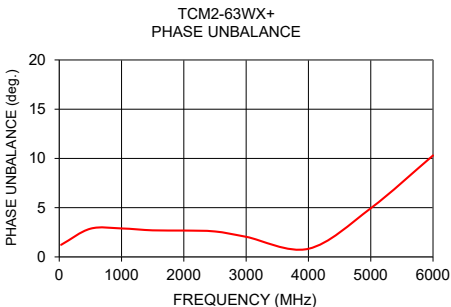
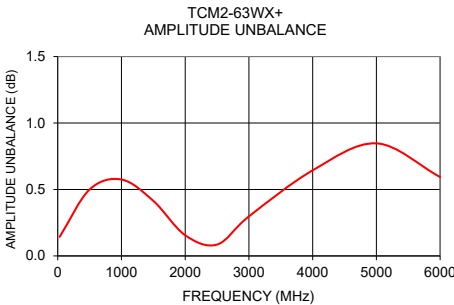
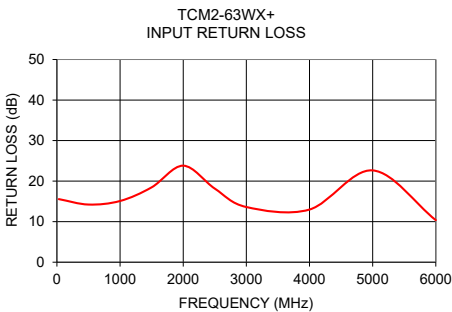
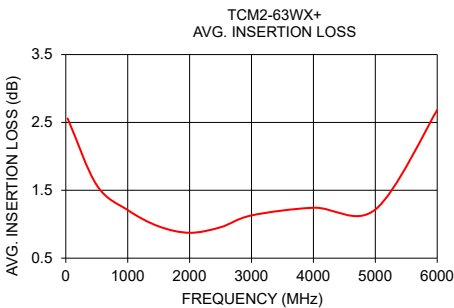
COMPONENT	SIZE
C1, C2	0402

- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020" ± .0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.  
3. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-676+.

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

## Typical Performance Data

Frequency (MHz)	Avg. Insertion Loss (dB)	Input R. Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance (Deg.)	CMRR (dB)
30	2.56	15.56	0.14	1.23	37.38
500	1.58	14.22	0.50	2.86	28.38
1000	1.21	15.10	0.57	2.89	27.62
1500	0.97	18.46	0.41	2.70	29.50
2000	0.87	23.81	0.16	2.68	32.03
2500	0.96	18.16	0.09	2.59	32.73
3000	1.13	13.61	0.30	2.04	32.14
4000	1.24	12.99	0.64	0.83	28.47
5000	1.22	22.65	0.85	4.94	23.73
6000	2.68	10.37	0.59	10.30	20.32



## Additional 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.  
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