

# Ceramic Balun RF Transformer

## TCW4-262+

50Ω 2300 to 2600 MHz 1:4 Ratio

### The Big Deal

- Tiny size, 0603
- Low cost



CASE STYLE: JC0603C

### Product Overview

Mini-Circuits' TCW4-262+ is a tiny ceramic RF balun transformer with an impedance ratio of 1:4, covering a variety of wireless communications applications from 2300 to 2600 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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Generic photo used for illustration purposes only

CASE STYLE: JC0603C

**+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, 1000, 4000

### Features

- miniature size 0603 (0.063" [1.6mm] x 0.031" [0.8mm] x 0.024" [0.6mm])
- low cost
- aqueous washable

### Applications

- ISM Band
- WLAN
- Bluetooth
- Zigbee

### Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio			4		
Frequency Range		2300	—	2600	MHz
Insertion Loss <sup>1</sup>	2300 - 2600	—	—	1.8	dB
Amplitude Unbalance	2300 - 2600	—	1	—	dB
Phase Unbalance <sup>2</sup>	2300 - 2600	—	7	—	Degree
Unbalance Return Loss	2300 - 2600	9.5	13.5	—	dB

1. Tested on Evaluation Board TB-TCW4-262+

2. Relative to 180°

### Maximum Ratings

Parameter	Ratings
Operating Temperature	-55°C to 125°C
Storage Temperature <sup>3</sup>	-55°C to 125°C
RF Power <sup>4</sup>	2W

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.

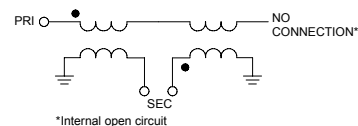
Permanent damage may occur if any of these limits are exceeded.

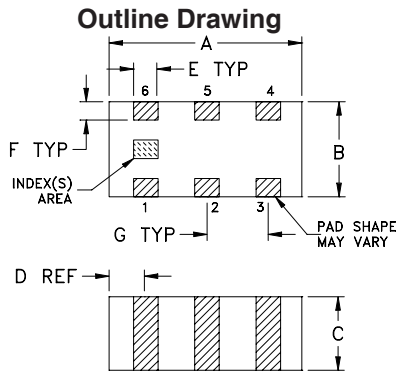
4. Derate linearly to 0.5W at 125°C.

### Pad Connections

Function	Pin Number
PRIMARY DOT	1
GND or DC FEED	3
SECONDARY DOT (Balanced)	4
SECONDARY (Balanced)	6
NO CONNECTION	2,5

### Configuration J

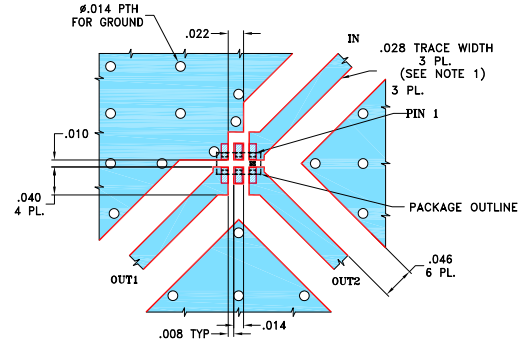




### Outline Dimensions (inch/mm)

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

### Demo Board MCL P/N: TB-TCW4-262+ Suggested PCB Layout (PL-559)



#### NOTES:

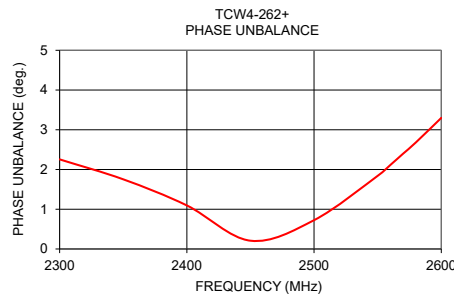
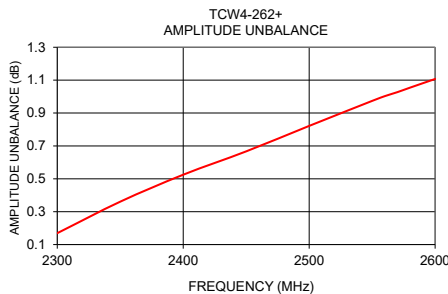
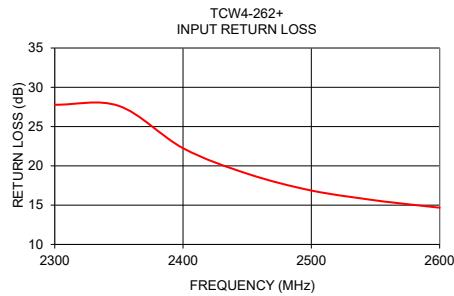
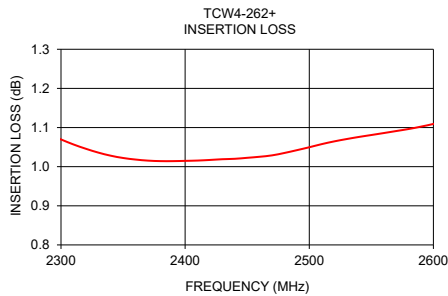
- TRACE WIDTH IS SHOWN FOR FR4, GRADE IT-180TC (ITEQ CORP.) WITH DIELECTRIC THICKNESS .018±.0015. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

### Typical Performance Data<sup>5</sup>

Frequency (MHz)	Insertion Loss (dB)	Input R. Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance (Deg.)
2300	1.07	27.78	0.17	2.26
2350	1.02	27.63	0.36	1.75
2400	1.01	22.25	0.52	1.10
2450	1.02	19.01	0.67	0.21
2500	1.05	16.86	0.82	0.72
2550	1.08	15.60	0.97	1.84
2560	1.09	15.40	1.00	2.12
2570	1.09	15.21	1.03	2.40
2580	1.10	15.03	1.05	2.68
2600	1.11	14.68	1.11	3.30

5. Measured with Agilent N5242A network analyzer using impedance conversion and port extension.



#### Additional 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.
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