

Balanced ^{top hat} RF Transformer

50Ω 10 to 1800 MHz

TRS1.5-182+

Features

- suitable for tin/lead and RoHS solder systems
- wideband, 10 to 1800 MHz
- balanced transmission line
- good return loss, 20 dB typ. at 1 dB band
- excellent amplitude unbalance, 0.3 dB typ.
- aqueous washable
- excellent intermod suppression



Generic photo used for illustration purposes only
CASE STYLE: TT1618

+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
13"	900

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio (secondary / primary)			1.5		
Frequency Range		10		1800	MHz
Insertion Loss*	50 -1200	—	0.6	1.4	dB
	10-1800	—	0.9	2.8	
Amplitude Unbalance	50-1000	—	0.3	0.95	dB
	1000-1200	—	0.5	0.90	
Phase Unbalance	10-1800	—	0.7	1.70	Degree
	50-500	—	2	8	
Primary Return Loss (Input)	500-1000	—	3	9	dB
	10-1800	—	7.5	10	
	50-500	—	18	—	
	500-1000	—	17	—	
Primary Return Loss (Input)	1000-1200	—	17	—	dB
	10-1800	—	14	—	

*Insertion Loss is referenced to mid-band loss, 0.65 dB typ.

Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	1W
DC Current	30mA

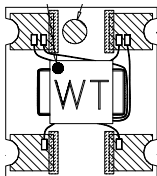
Permanent damage may occur if any of these limits are exceeded.

Pin Connections

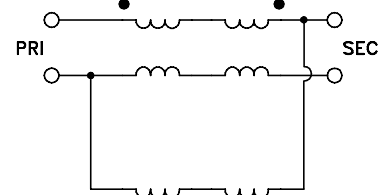
Function	Pin Number
PRIMARY DOT	4
PRIMARY	1
SECONDARY DOT	2
SECONDARY	3

Demo Board MCL P/N: TB-789+

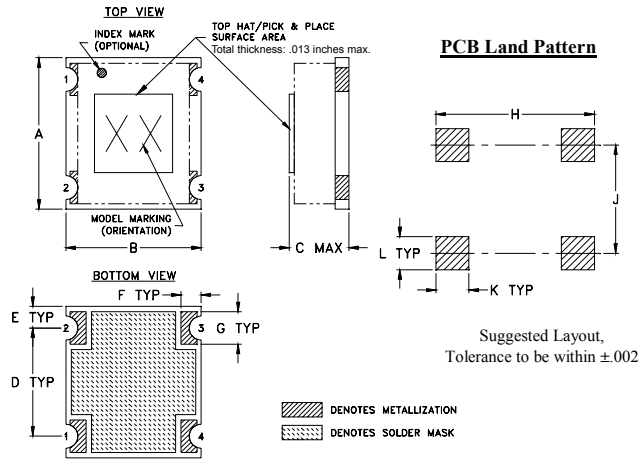
Product Marking



Config. K



Outline Drawing

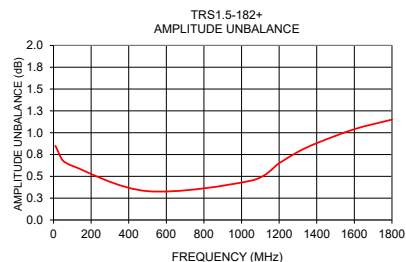
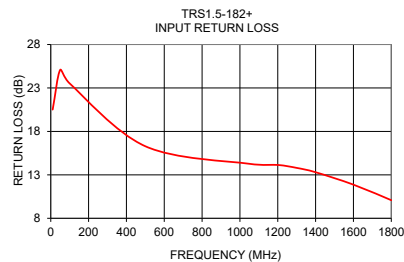
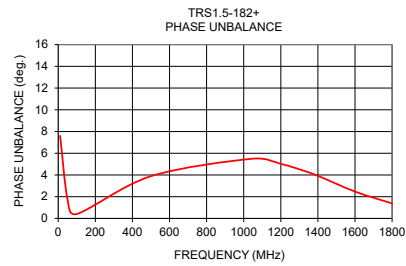
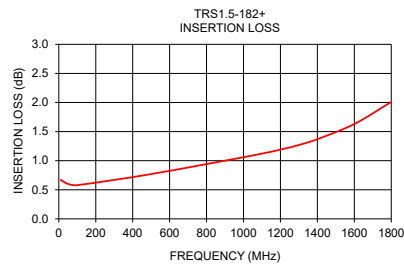


Outline Dimensions (inch/mm)

A	B	C	D	E	F
.280	.250	.12	.200	.040	.037
7.11	6.35	3.05	5.08	1.02	0.94
G	H	J	K	L	wt.
.060	.293	.200	.061	.061	grams
1.52	7.44	5.08	1.55	1.55	2.8

Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
10.0	0.67	20.51	0.85	7.60
50.0	0.60	25.09	0.68	1.76
100.0	0.58	23.52	0.62	0.41
500.0	0.77	16.29	0.33	3.89
1050.0	1.09	14.27	0.45	5.50
1200.0	1.19	14.14	0.65	5.02
1300.0	1.27	13.80	0.78	4.52
1400.0	1.37	13.30	0.88	3.92
1600.0	1.63	11.87	1.04	2.47
1800.0	2.01	10.08	1.15	1.38



RF Transformer


TRS1.5-182+

Typical Performance Data

FREQUENCY (MHz)	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (deg.)
10	0.67	20.51	0.85	7.60
15	0.66	22.93	0.82	5.26
20	0.65	24.10	0.78	4.12
25	0.64	24.71	0.76	3.41
30	0.63	25.02	0.74	2.91
35	0.62	25.15	0.72	2.53
40	0.61	25.17	0.70	2.23
45	0.60	25.15	0.69	1.98
50	0.60	25.09	0.68	1.76
60	0.59	24.87	0.66	1.40
70	0.58	24.58	0.64	1.10
80	0.58	24.22	0.63	0.83
90	0.58	23.86	0.62	0.61
100	0.58	23.52	0.62	0.41
150	0.60	21.98	0.59	0.50
200	0.61	20.90	0.55	1.05
250	0.62	19.93	0.52	1.66
300	0.65	18.97	0.49	2.18
325	0.67	18.55	0.48	2.46
350	0.68	18.21	0.45	2.64
375	0.70	17.83	0.44	2.87
400	0.72	17.39	0.42	3.11
425	0.73	17.02	0.40	3.35
450	0.74	16.75	0.37	3.56
475	0.75	16.60	0.35	3.71
500	0.77	16.29	0.33	3.89
525	0.79	16.01	0.30	4.08
550	0.80	15.86	0.27	4.25
575	0.81	15.75	0.23	4.37
600	0.83	15.55	0.20	4.56
625	0.85	15.34	0.17	4.75
650	0.86	15.21	0.14	4.90
675	0.87	15.15	0.11	4.99
700	0.89	15.05	0.08	5.09
725	0.90	14.88	0.05	5.22
750	0.91	14.76	0.04	5.33
775	0.93	14.73	0.05	5.37
800	0.94	14.70	0.07	5.44
825	0.96	14.60	0.10	5.52
850	0.97	14.51	0.14	5.57
875	0.98	14.51	0.19	5.61
900	1.00	14.53	0.22	5.65
925	1.02	14.48	0.26	5.64
950	1.03	14.41	0.30	5.61
975	1.04	14.39	0.34	5.60
1000	1.06	14.41	0.37	5.60
1025	1.08	14.35	0.41	5.57
1050	1.09	14.27	0.45	5.50
1075	1.11	14.22	0.48	5.41
1100	1.12	14.22	0.52	5.37
1125	1.14	14.22	0.55	5.32
1150	1.16	14.18	0.59	5.23
1175	1.17	14.14	0.62	5.12
1200	1.19	14.14	0.65	5.02
1225	1.21	14.12	0.69	4.93
1250	1.23	14.03	0.72	4.80
1275	1.25	13.91	0.75	4.65
1300	1.27	13.80	0.78	4.52
1325	1.30	13.67	0.80	4.37
1350	1.33	13.53	0.83	4.22
1375	1.34	13.40	0.85	4.08
1400	1.37	13.30	0.88	3.92
1500	1.49	12.77	0.97	3.25
1600	1.63	11.87	1.04	2.47
1700	1.80	10.98	1.09	1.74
1800	2.01	10.08	1.15	1.38
1900	2.26	9.05	1.18	1.23
2000	2.54	8.18	1.20	1.82



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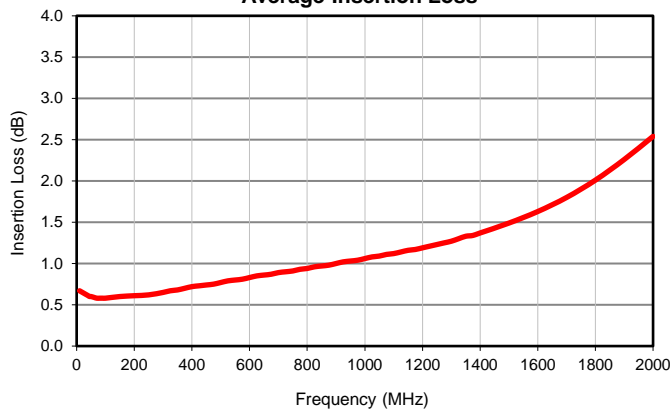
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IF/RF MICROWAVE COMPONENTS

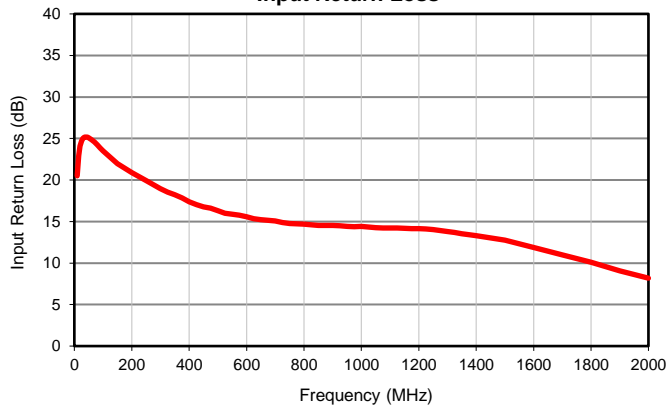
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Typical Performance Data

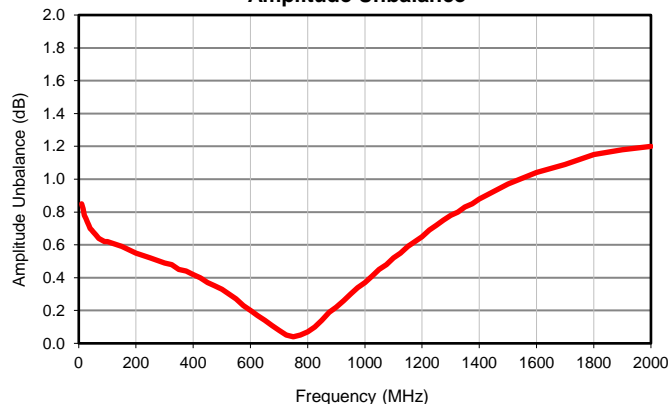
Average Insertion Loss



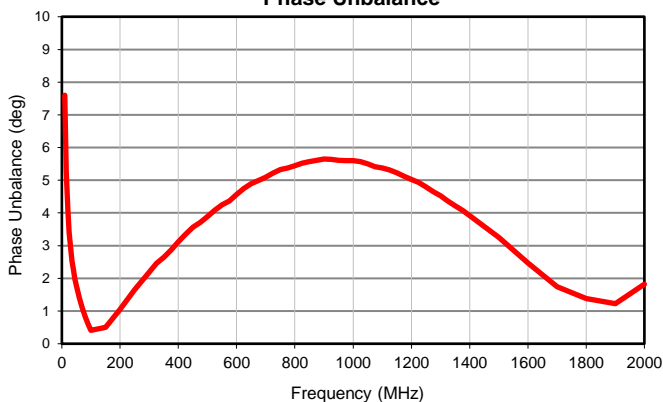
Input Return Loss



Amplitude Unbalance

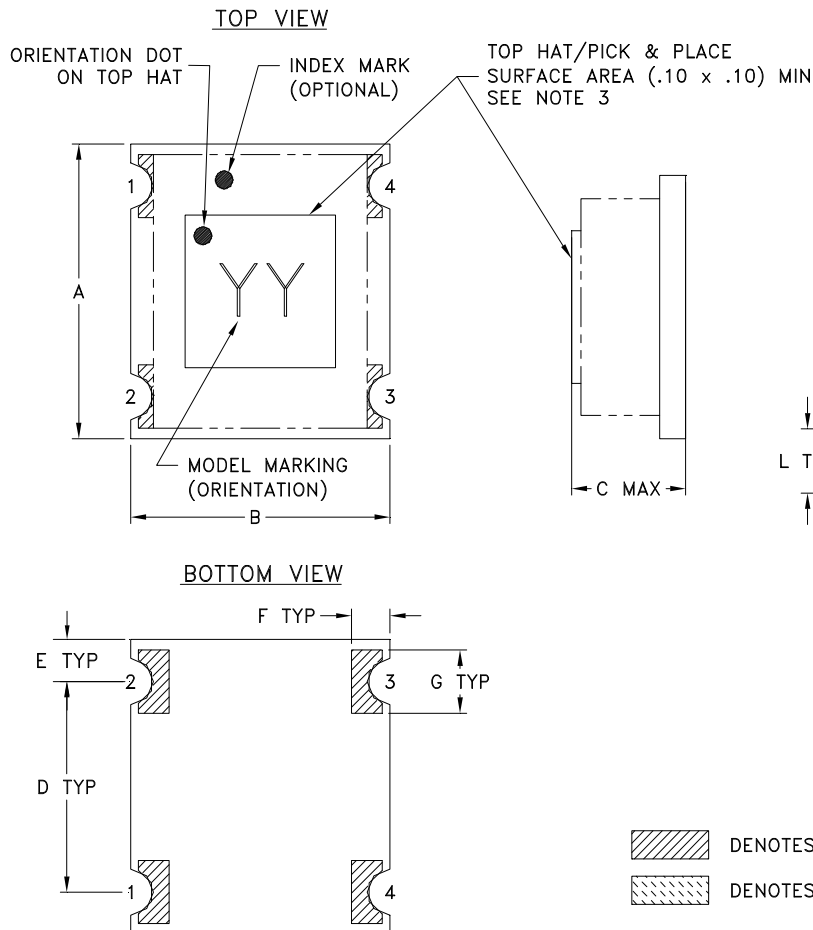


Phase Unbalance

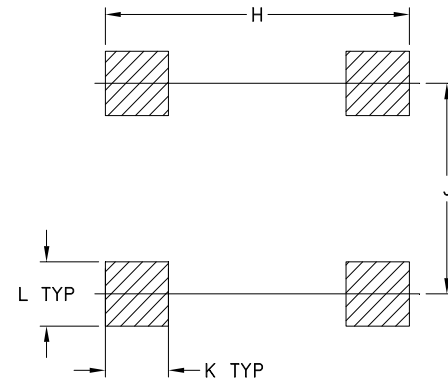


Outline Dimensions



TT1618



PCB Land Pattern



SUGGESTED LAYOUT
TOLERANCE TO BE WITHIN ± 0.02

 DENOTES METALLIZATION
 DENOTES SOLDER RESIST

CASE #	A	B	C	D	E	F	G	H	J	K	L	WT GRAMS
TT1618	.280 (7.11)	.250 (6.35)	.12 (3.05)	.200 (5.08)	.040 (1.02)	.037 (.94)	.060 (1.52)	.293 (7.44)	.200 (5.08)	.061 (1.55)	.061 (1.55)	2.80

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .01$; 3 Pl. $\pm .005$

Notes:

1. Open style, Base material: Printed wiring laminate.
2. Termination finish: 3-5 μ inch (.08-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
All models, (+) suffix.
3. Top-Hat total thickness: .013 inches MAX.
4. Orientation Dot on Top Hat & PCB corresponds to Pin #1.


ISO 9001 ISO 14001 CERTIFIED

ALL NEW

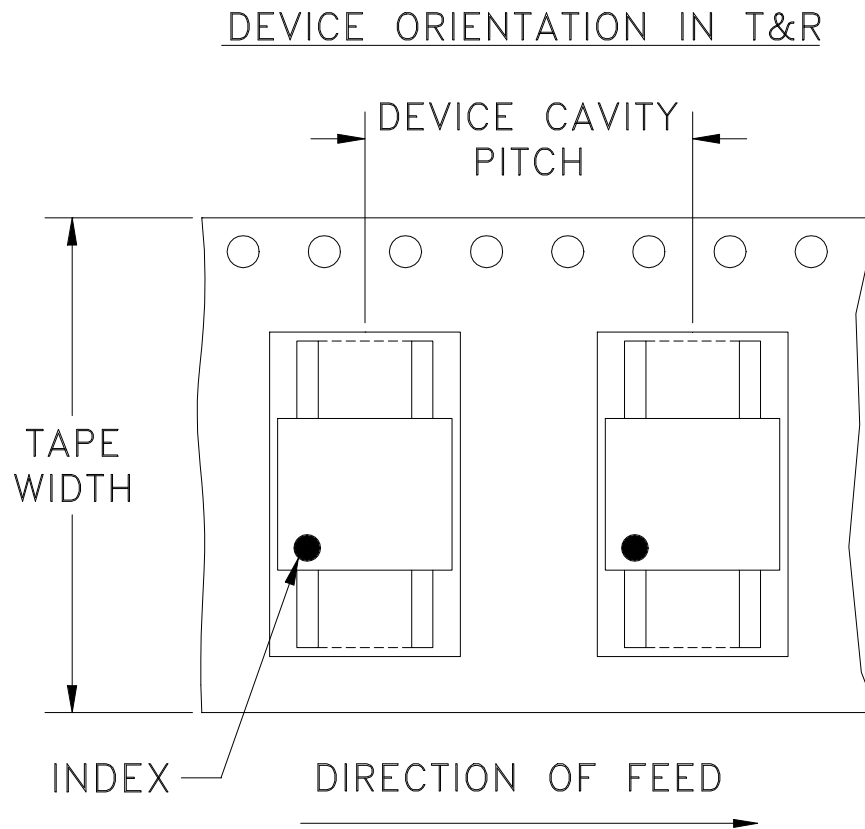

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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F1



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
24	12	13	900

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf



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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215