BALANCED top hat

RF Transformer

TRS1.5-182+

50Ω 10 to 1800 MHz 1.5:1 Ratio

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 website for methodologies and qualifications

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[1]	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	
	10-1800		0.7	1.70	
Phase Unbalance	50-500		2	8	Degree
	500-1000		3	9	
	10-1800		7.5	10	
Primary Return Loss (Input)	50-500		18		dB
	500-1000		17		
	1000-1200		17		
	10-1800		14		

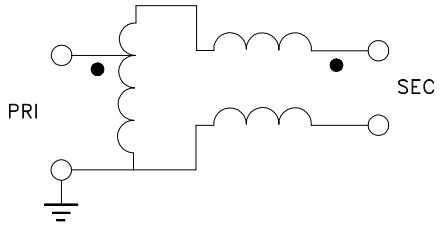
1. Insertion Loss is referenced to mid-band loss, 0.65 dB typ.

ABSOLUTE MAXIMUM RATINGS

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

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

CONFIG. P



REV. C
ECO-029976
TRS1.5-182+
MCL NY
260831

BALANCED top hat

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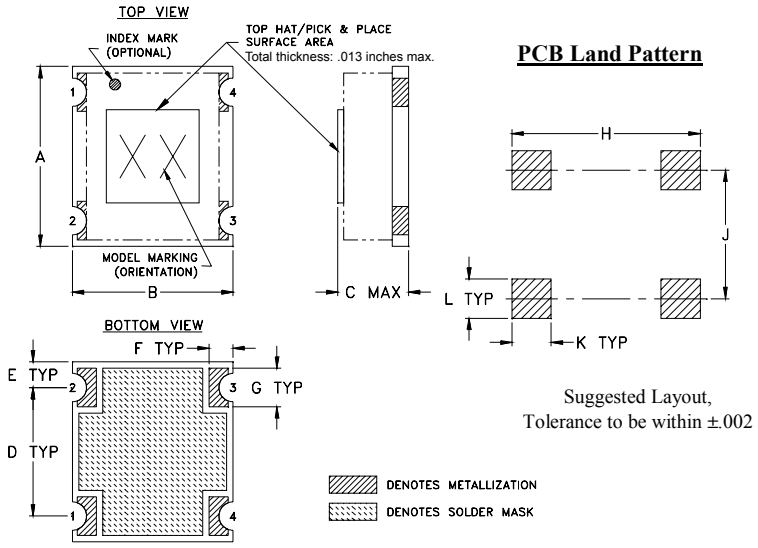
PIN CONNECTIONS

PRIMARY DOT	4
PRIMARY	1
SECONDARY DOT	2
SECONDARY	3

PRODUCT MARKING: WT

DEMO BOARD MCL P/N: TB-TRS1.5-182+

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

TAPE & REEL INFORMATION: F2

BALANCED top hat

RF Transformer

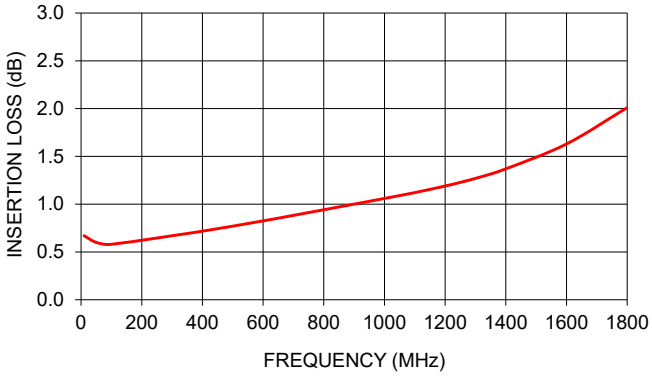
TRS1.5-182+

50Ω 10 to 1800 MHz 1.5:1 Ratio

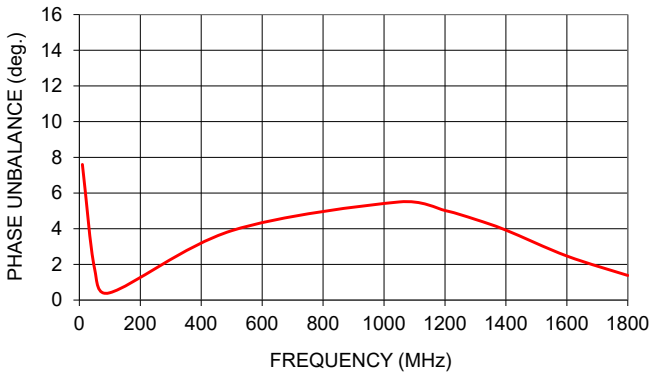
TYPICAL PERFORMANCE DATA

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
10	0.67	20.51	0.85	7.60
50	0.60	25.09	0.68	1.76
100	0.58	23.52	0.62	0.41
500	0.77	16.29	0.33	3.89
1050	1.09	14.27	0.45	5.50
1200	1.19	14.14	0.65	5.02
1300	1.27	13.80	0.78	4.52
1400	1.37	13.30	0.88	3.92
1600	1.63	11.87	1.04	2.47
1800	2.01	10.08	1.15	1.38

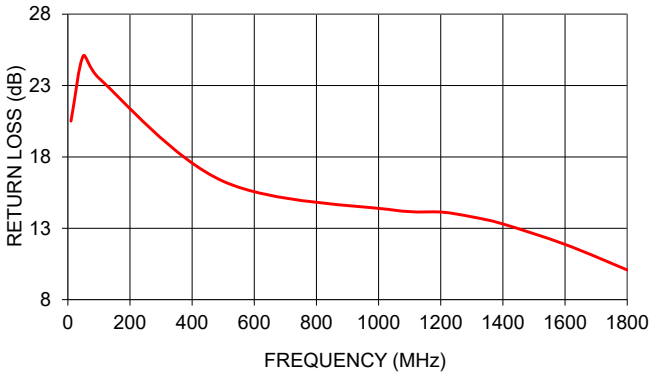
INSERTION LOSS



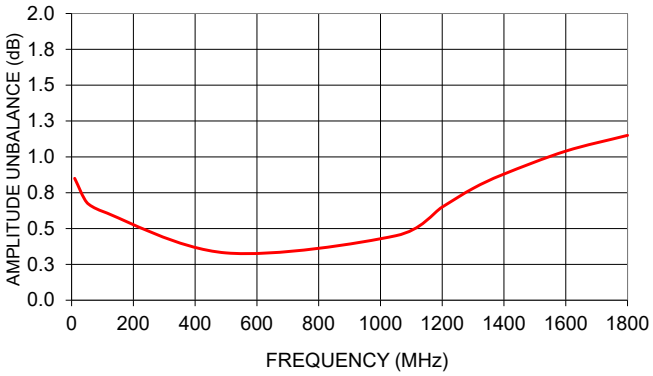
PHASE UNBALANCE



INPUT RETURN LOSS



AMPLITUDE UNBALANCE



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-Circuit's 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

RF Transformer TRS1.5-182+

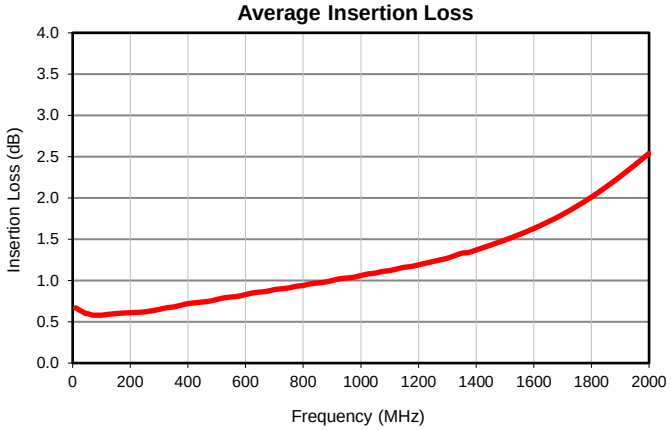
Typical Performance Data

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

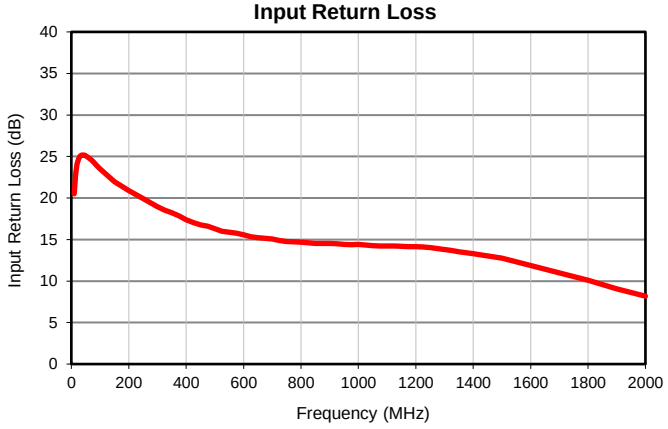
RF Transformer TRS1.5-182+

Typical Performance Data

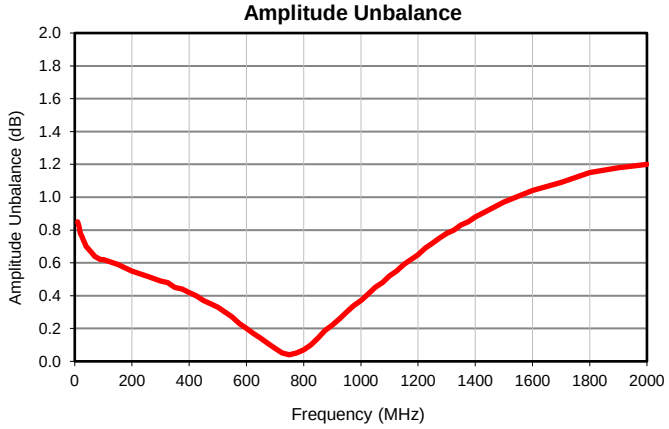
Average Insertion Loss



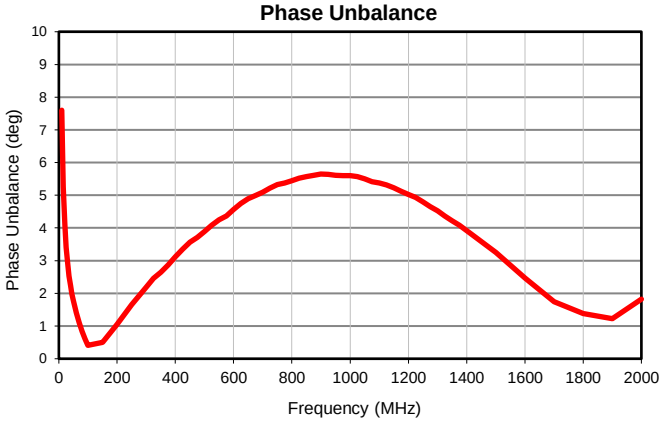
Input Return Loss



Amplitude Unbalance



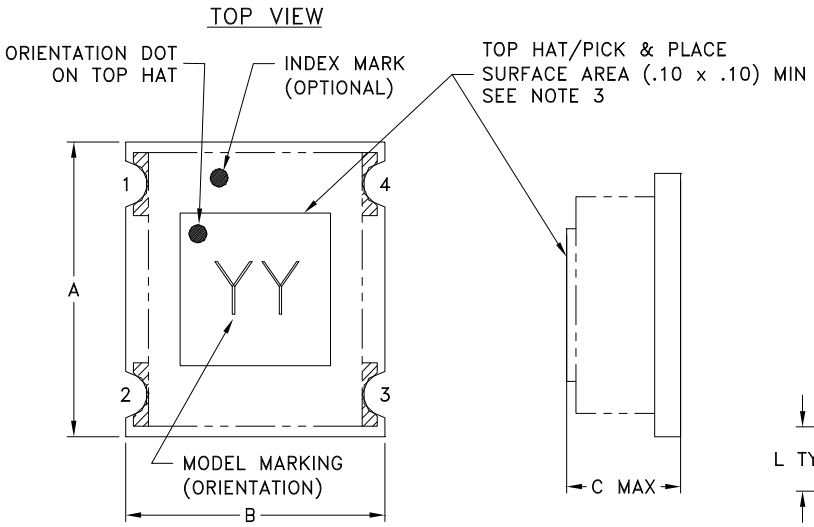
Phase Unbalance

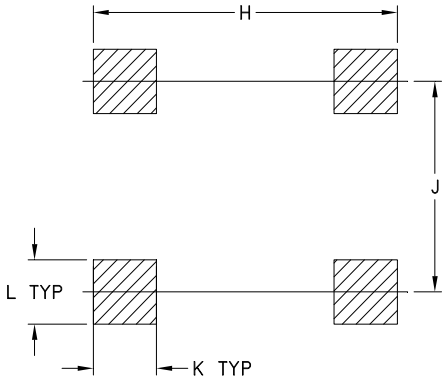


Case Style TT

Outline Dimensions

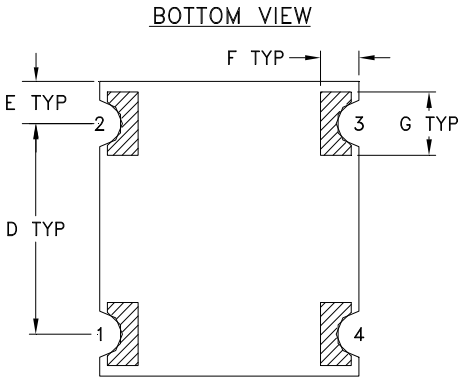
TT1618

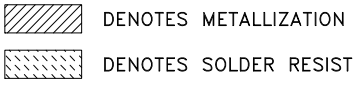




PCB Land Pattern

SUGGESTED LAYOUT
TOLERANCE TO BE WITHIN ±.002





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

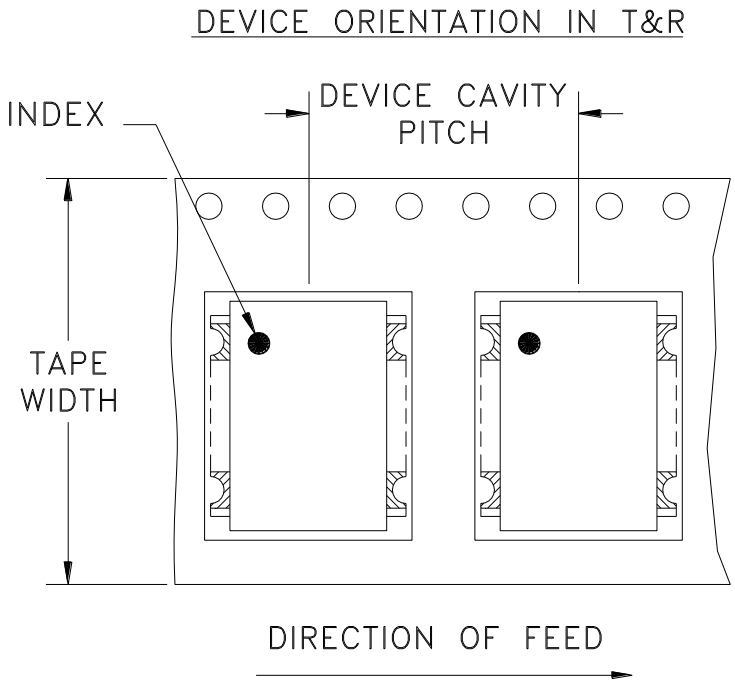
Dimensions are in inches (mm). Tolerances: 2Pl. ± .01; 3 Pl. ± .005

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.

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Tape & Reel Packaging TR-F2



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel See note
16	12	7	10
			20
			50
			100
			200
		13	500

Note: Please consult individual model data sheet to determine device per reel availability

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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Mini-Circuits

Environmental Specifications ENV02T1

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

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