

Surface Mount

NON-CATALOG

Diplexer

TDP-871-75+

75Ω 5 to 870 MHz
(5-38, 49-870 MHz)



CASE STYLE: HR1176

The Big Deal

- Low insertion loss
- High rejection
- 75Ω Impedance
- Miniature shielded package

Product Overview

TDP-871-75+ is a low-pass + high-pass combination device. Low pass port is designed for 5 to 38 MHz and high pass port is designed for 49 to 870 MHz. This diplexer can be used in satellite systems, vehicle tracking, communication test sets and other multiband radio systems.

Key Features

Feature	Advantages
Low passband insertion loss	Suitable for high performance application
Excellent stopband rejection	Spurious rejection and avoids using additional filters
Miniature shielded package	Reduced interference with the surrounding components.

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/MCLStore/terms.jsp



75Ω 5 to 870 MHz (5-38, 49-870 MHz)

Maximum Ratings

Operating Temperature -40° to 85°C

Storage Temperature -55°C to 100°C

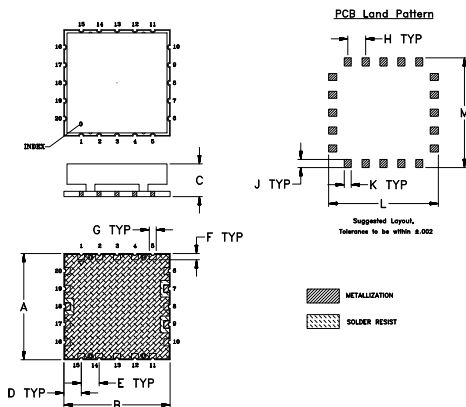
RF Power Input 250mW at 25°C

Permanent damage may occur if any of these limits are exceeded. These ratings are not intended for continuous normal operation

Pin Connections

HIGH PASS PORT	7
LOW PASS PORT	9
COMMON PORT	18
GROUND	1-6,8,10-17,19,20

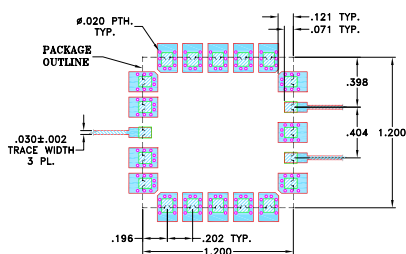
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F
1.200 (30.48)	1.200 (30.48)	.370 (9.40)	.196 (4.98)	.202 (5.13)	.071 (1.80)
G	H	J	K	L	M
.079 (2.01)	.202 (5.13)	.091 (2.31)	.079 (2.01)	1.240 (31.50)	1.240 (31.50)
					wt grams
					8.5

Demo Board MCL P/N: TB-563+ Suggested PCB Layout (PL-228)



- NOTES:
- TRACE WIDTH IS SHOWN FOR OAK WITH DIELECTRIC THICKNESS .022"±.002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH 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 SOLDERMASK

Features

- Low insertion loss
- 75Ω Impedance
- Combination of Low pass and High pass filters
- Miniature shielded case
- Aqueous washable

Applications

- Satellite systems
- Vehicle tracking
- Radio



CASE STYLE: HR1176

+RoHS Compliant

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

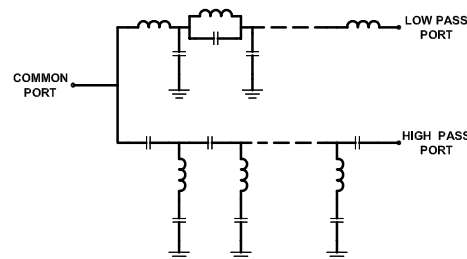
Electrical Specifications at 25°C

Parameter	Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Low Pass	5-38	-	1.0	2.0	dB
	High Pass	49-870	-	1.0	2.5	
	Low Pass	5-38	12	25	-	dB
	High Pass	49-870	12	17	-	
Stop Band Isolation	Common	5-38	12	24	-	
	Common	49-870	12	17	-	
Stop Band Isolation	Low Pass	49-870	25	47	-	dB
	High Pass	5-38	25	46	-	

Typical Performance Data at 25°C

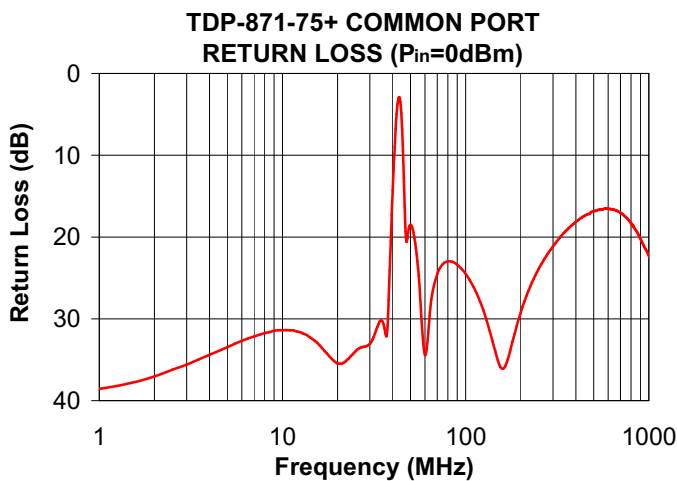
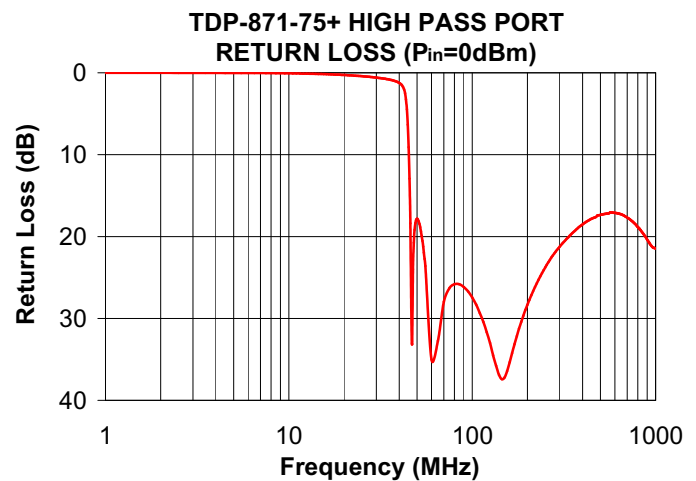
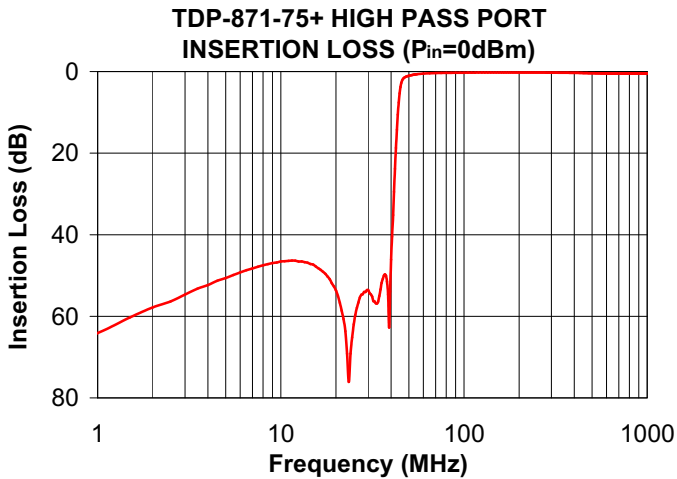
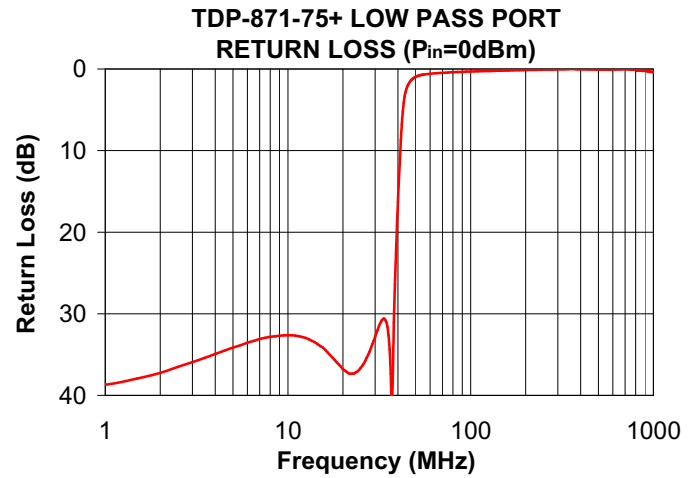
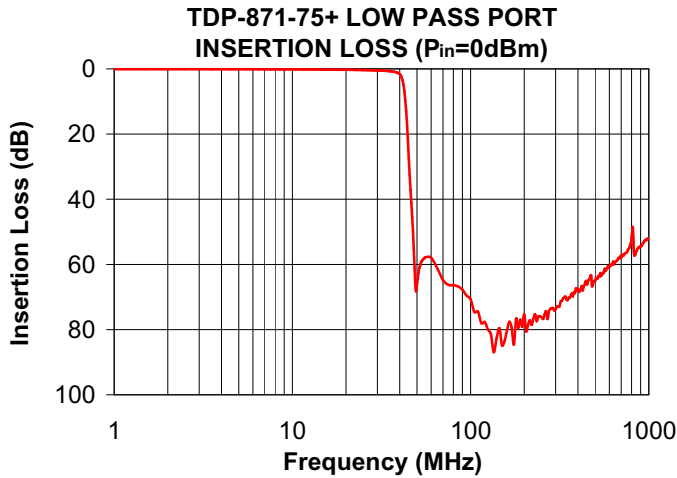
FREQUENCY (MHz)	INSERTION LOSS (dB)			RETURN LOSS (dB)	
	Low Pass Port	High Pass Port	Common Port	Low Pass Port	High Pass Port
1.0	0.10	64.11	38.55	38.69	0.00
5.0	0.13	50.61	33.47	34.15	0.02
20.0	0.28	53.65	35.48	36.79	0.27
30.0	0.48	53.59	33.06	32.84	0.59
38.0	0.99	51.51	27.71	31.08	1.02
39.0	1.20	62.76	20.55	22.57	1.11
40.0	1.62	46.09	14.28	16.29	1.24
41.5	3.50	29.50	6.76	8.74	1.56
42.0	4.89	23.86	4.96	6.80	1.75
43.0	9.58	14.27	3.00	4.13	2.49
44.0	17.23	7.59	3.50	2.81	4.46
44.5	22.16	5.34	4.78	2.43	6.35
45.0	27.50	3.77	6.79	2.14	9.09
47.0	45.34	1.55	19.30	1.43	33.12
48.0	55.16	1.29	20.22	1.22	20.76
49.0	66.66	1.14	18.94	1.07	18.34
100.0	70.66	0.28	24.49	0.31	27.45
150.0	84.81	0.23	35.11	0.20	37.22
300.0	73.80	0.26	21.14	0.04	21.23
500.0	65.00	0.39	16.85	0.05	17.36
800.0	52.29	0.51	18.32	0.11	18.85
870.0	55.02	0.49	19.55	0.22	19.86

Functional Schematic



Notes

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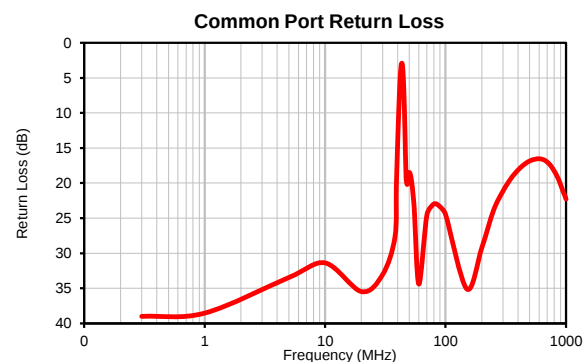
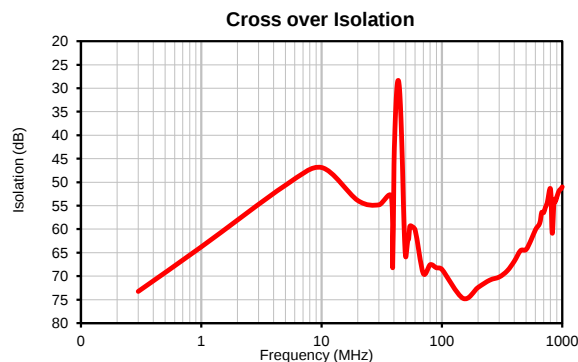
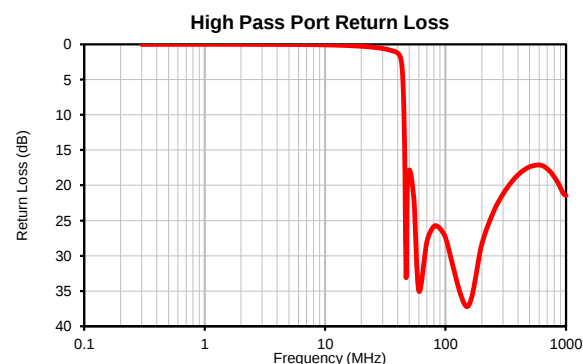
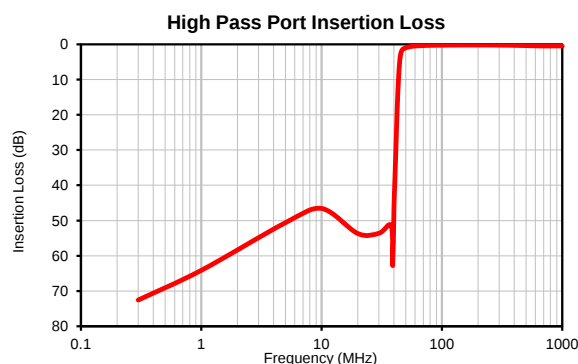
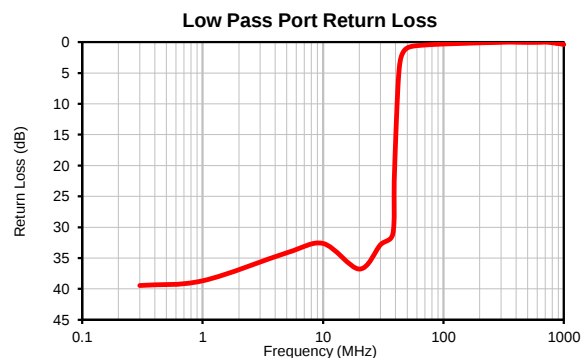
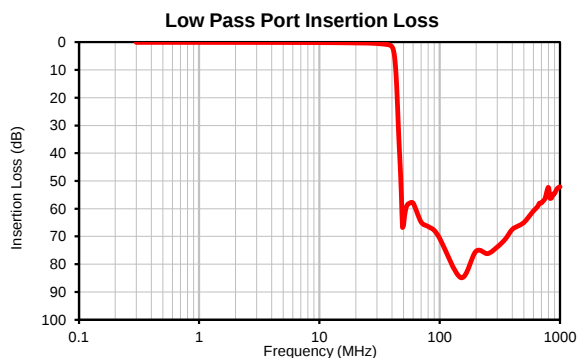
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Typical Performance Data

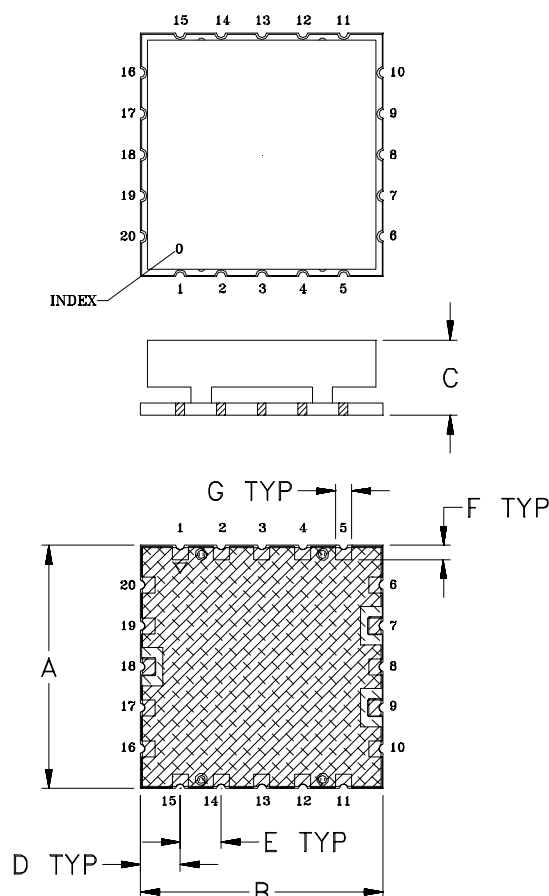
FREQUENCY (MHz)	INSERTION LOSS		CROSS OVER ISOLATION	RETURN LOSS		
	(dB)		(dB)	(dB)		
	Low Pass port	High Pass port	(between LPF and HPF)	Common port	Low Pass port	High Pass port
0.3	0.09	72.51	73.27	39.02	39.46	0.01
1.0	0.10	64.11	63.80	38.55	38.69	0.00
5.0	0.13	50.61	50.68	33.47	34.15	0.02
10.0	0.17	46.55	46.88	31.39	32.64	0.07
20.0	0.28	53.65	53.90	35.48	36.79	0.27
30.0	0.48	53.59	54.83	33.06	32.84	0.59
38.0	0.99	51.51	53.10	27.71	31.08	1.02
39.0	1.20	62.76	68.24	20.55	22.57	1.11
40.0	1.62	46.09	46.27	14.28	16.29	1.24
40.5	2.00	40.45	40.93	11.50	13.54	1.32
41.0	2.59	35.17	36.78	8.97	11.02	1.43
41.5	3.50	29.50	33.52	6.76	8.74	1.56
42.0	4.89	23.86	31.06	4.96	6.80	1.75
42.5	6.88	18.72	29.38	3.69	5.26	2.03
43.0	9.58	14.27	28.46	3.00	4.13	2.49
43.5	13.03	10.57	28.33	2.92	3.35	3.24
44.0	17.23	7.59	28.93	3.50	2.81	4.46
44.5	22.16	5.34	30.31	4.78	2.43	6.35
45.0	27.50	3.77	32.37	6.79	2.14	9.09
45.5	32.67	2.76	35.14	9.49	1.92	12.92
46.0	37.13	2.14	38.41	12.74	1.73	18.39
47.0	45.34	1.55	46.12	19.30	1.43	33.12
48.0	55.16	1.29	55.28	20.22	1.22	20.76
49.0	66.66	1.14	62.38	18.94	1.07	18.34
50.0	65.98	1.02	65.88	18.50	0.96	17.82
51.0	62.63	0.93	64.48	18.78	0.87	18.11
52.0	60.50	0.84	62.50	19.56	0.81	18.85
53.0	59.11	0.78	62.05	20.69	0.76	19.93
54.0	58.51	0.72	59.53	22.12	0.72	21.22
55.0	58.17	0.66	59.28	23.82	0.68	22.74
60.0	57.93	0.51	60.21	34.42	0.58	35.01
70.0	64.77	0.38	69.43	24.52	0.47	27.97
80.0	66.37	0.33	67.57	22.99	0.40	25.82
90.0	67.77	0.30	68.24	23.39	0.35	26.16
100.0	70.66	0.28	68.56	24.49	0.31	27.45
150.0	84.81	0.23	74.74	35.11	0.20	37.22
200.0	75.31	0.23	72.42	29.22	0.12	28.33
250.0	76.15	0.24	70.86	23.91	0.08	23.76
300.0	73.80	0.26	70.19	21.14	0.04	21.23
350.0	70.98	0.29	68.86	19.32	0.00	19.61
400.0	67.48	0.32	66.82	18.14	0.02	18.51
450.0	66.16	0.36	64.58	17.35	0.04	17.81
500.0	65.00	0.39	64.37	16.85	0.05	17.36
550.0	62.89	0.43	62.35	16.62	0.05	17.18
600.0	60.84	0.46	60.10	16.54	0.04	17.11
650.0	59.25	0.49	58.74	16.68	0.03	17.28
675.0	57.99	0.49	56.44	16.83	0.01	17.46
700.0	57.90	0.50	56.51	17.03	0.00	17.69
725.0	57.14	0.51	55.34	17.29	0.02	17.91
750.0	56.39	0.50	54.44	17.58	0.04	18.18
800.0	52.29	0.51	51.52	18.32	0.11	18.85
825.0	56.19	0.49	60.86	18.74	0.14	19.18
850.0	56.12	0.48	54.97	19.17	0.16	19.56
855.0	55.84	0.48	54.45	19.26	0.18	19.62
860.0	55.30	0.48	54.01	19.36	0.19	19.70
865.0	55.21	0.49	54.25	19.45	0.21	19.79
870.0	55.02	0.49	53.69	19.55	0.22	19.86
875.0	54.87	0.49	54.13	19.66	0.23	19.94
880.0	54.68	0.49	53.68	19.76	0.23	20.02
885.0	54.92	0.49	53.54	19.87	0.23	20.11
890.0	54.59	0.49	53.74	19.99	0.23	20.20
895.0	54.54	0.49	53.36	20.10	0.23	20.28
900.0	54.53	0.49	53.24	20.20	0.23	20.37
925.0	53.55	0.48	52.31	20.77	0.26	20.79
950.0	52.69	0.50	51.68	21.30	0.31	21.15
975.0	52.30	0.52	51.44	21.75	0.35	21.37
1000.0	52.09	0.54	51.00	22.29	0.39	21.43

Typical Performance Curves

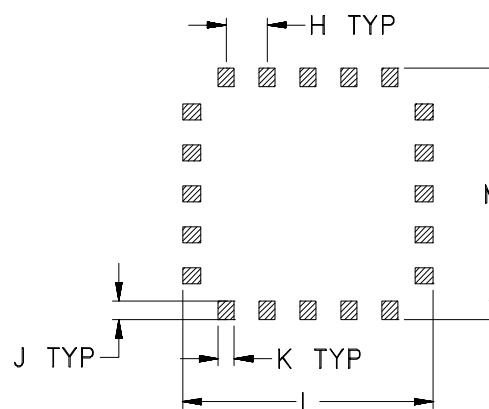


Outline Dimensions

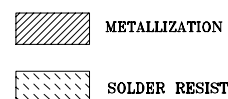
HR1176



PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAM
HR1176	1.200 (30.48)	1.200 (30.48)	.370 (9.40)	.196 (4.98)	.202 (5.13)	.071 (1.80)	.079 (2.01)	.202 (5.13)	.091 (2.31)	.079 (2.01)	1.240 (31.50)	1.240 (31.50)	8.5

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .03$; 3Pl. $\pm .015$

Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:

For RoHS Case Styles: 3-5 μ inch Gold over 120-240 μ inch Nickel plate.

For RoHS-5 Case Styles: Tin-Lead plate.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site

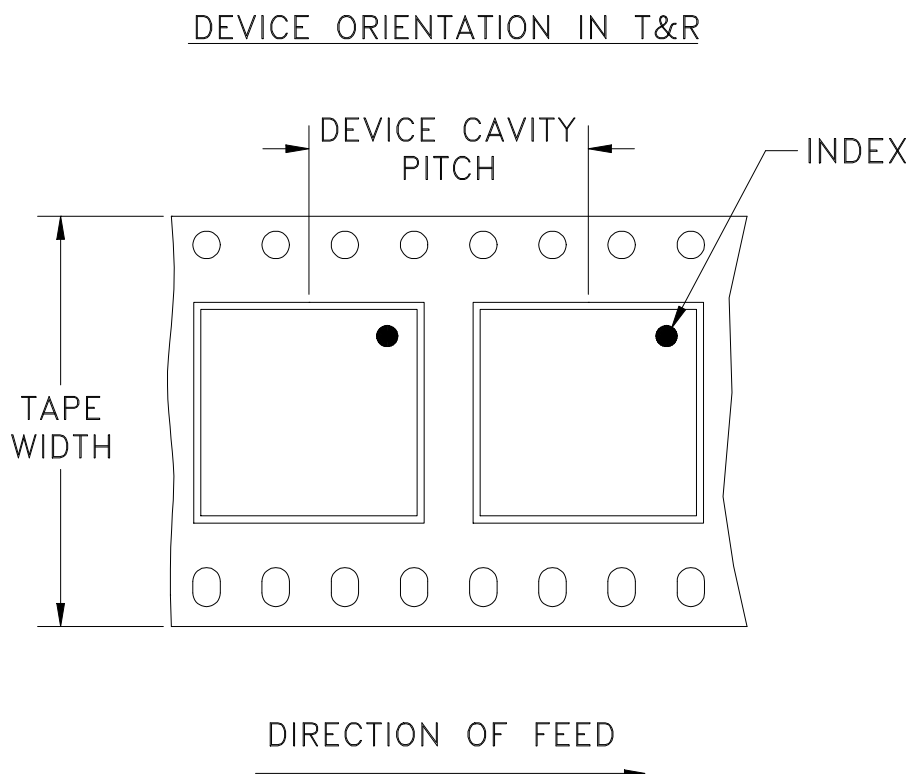


Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS



Tape & Reel Packaging TR-F80



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
44	40	13	100

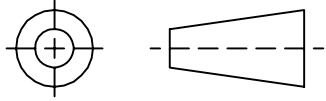
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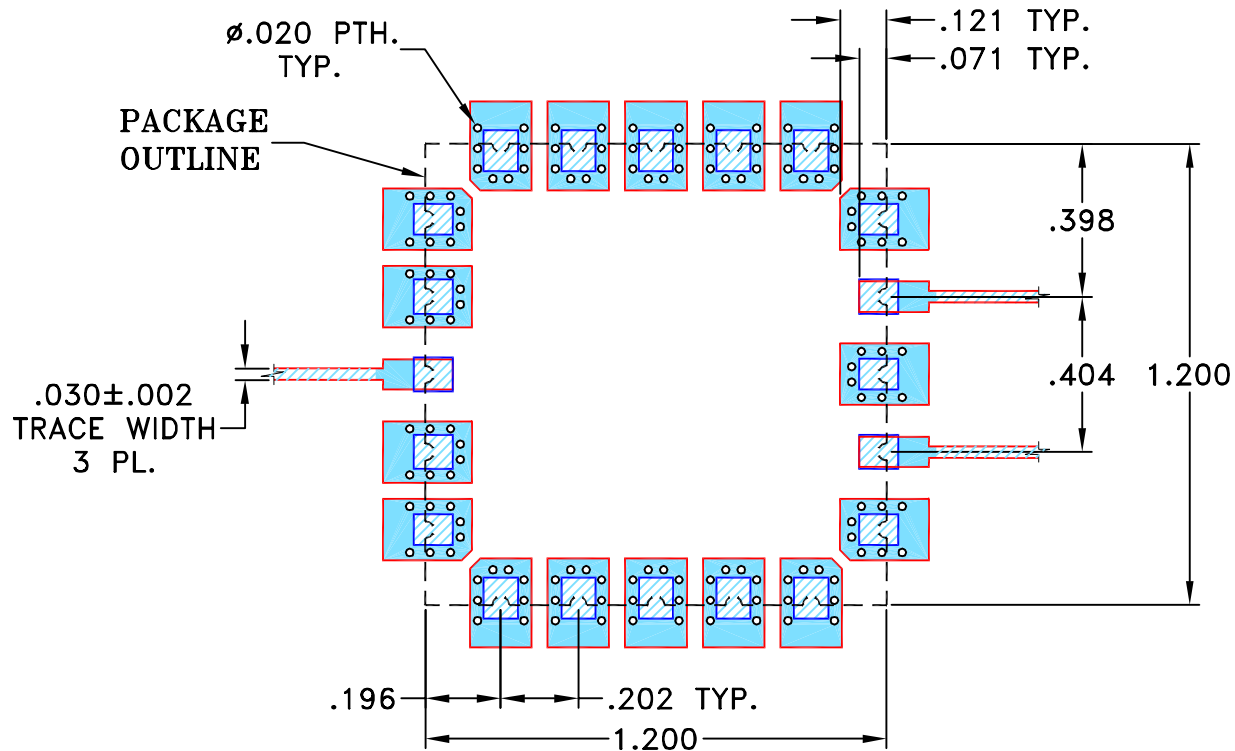
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THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M101264	NEW RELEASE (FROM RAVON)	12/05	DK	HH
A	M108938	SWITCH HATCHES	12/06	DK	HH
A	R67045	SWITCH HATCHES	12/06	DK	HH
B	M125793	LAND PATTERN CHANGED	01/10	RB	KG



NOTES:

- TRACE WIDTH IS SHOWN FOR OAK-602 WITH DIELECTRIC THICKNESS $.022'' \pm .002''$. COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH 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 SOLDERMASK

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

TOLERANCES ON:
2 PL DECIMALS $\pm$
3 PL DECIMALS $\pm .005''$
ANGLES $\pm$
FRACTIONS $\pm$

DRAWN

RB

24 JAN 10

CHECKED

MD

24 JAN 10

APPROVED

GM

24 JAN 10

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ASHEETA1.DWG REV:A DATE:01/12/95



Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

PL, rg, HR1176, DPLX,
TB-563+, 75 Ω

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-228

REV:

B

FILE:

98PL228

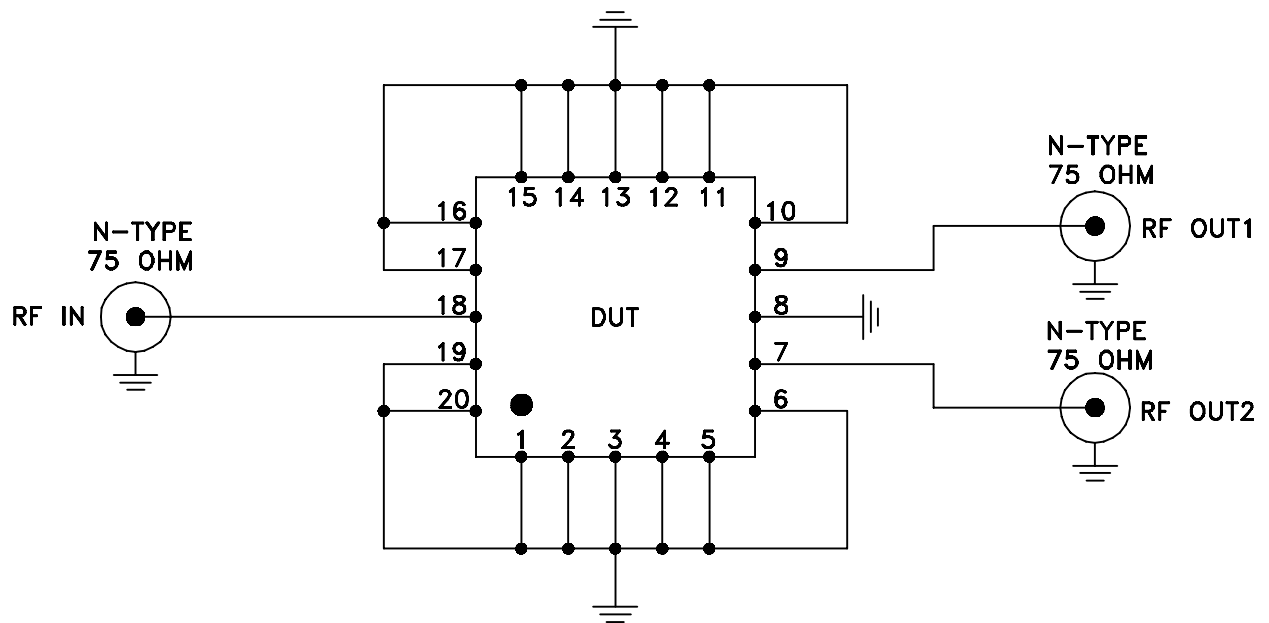
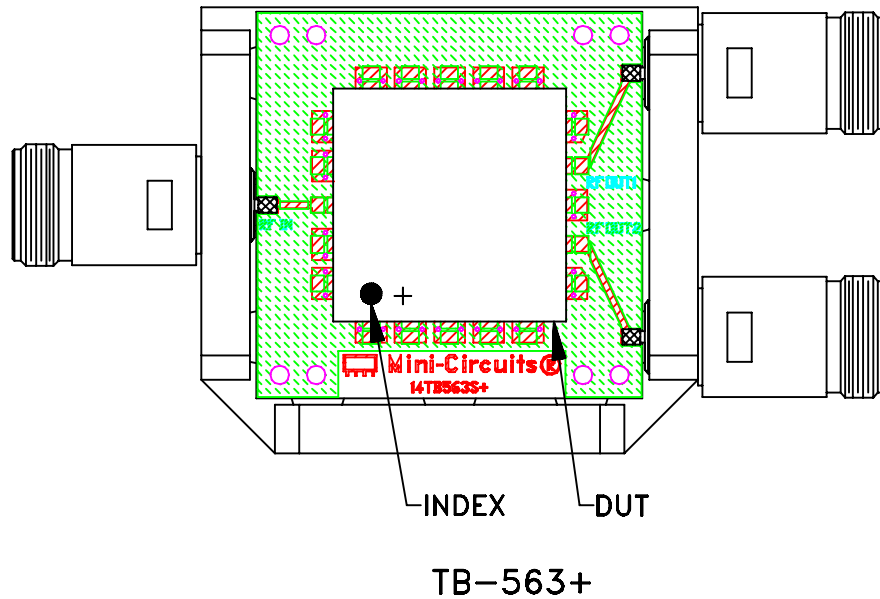
SCALE:

2:1

SHEET:

1 OF 1

Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 75 Ohm N-Type Female connectors.
2. PCB Material: OAK-602 or equivalent,
Dielectric Constant=2.5, Thickness=.022 inch.

Mini-Circuits®



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	-55° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
HAST	130°C, 85% RH, 96 hours	JESD22-A110
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 Eutectic Process: 225°C peak Pb-Free Process, 245°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 20-2000 Hz, 4 times in each of three axes (total 12)	MIL-STD-883, Method 2007.3, Condition A
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