

75Ω 5 to 1000 MHz (5-42, 88-1000 MHz)

Maximum Ratings

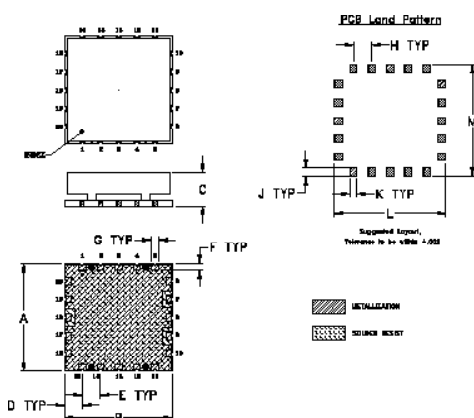
Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	250mW at 25°C

Note: 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	1,2,3,4,5,6,8,10,11,12,13,14,15,16,17,19,20

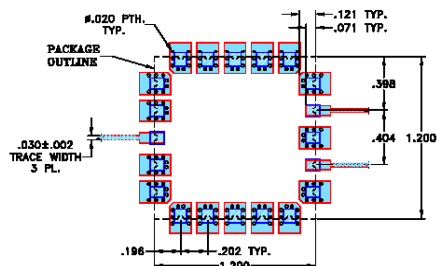
Outline Drawing



Outline Dimensions (inch/mm)

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

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



- NOTES:
1. TRACE WIDTH IS SHOWN FOR OAK-502 WITH DIELECTRIC THICKNESS .002±.002". 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.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Features

- Low Insertion Loss 0.5dB typ.
- High Isolation 60dB typ.
- 75 Ω Impedance

Applications

- CATV
- MMDS
- Set-Top Box



CASE STYLE: HR1176

+RoHS Compliant

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

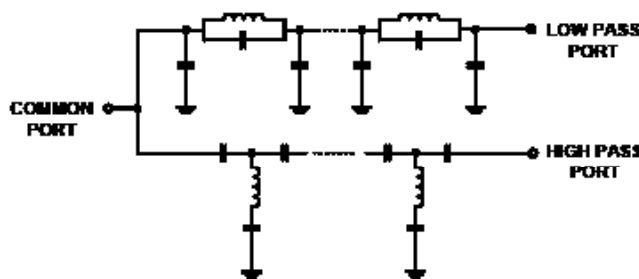
Electrical Specifications (T_{AMB} = 25°C)

Insertion Loss, dB PASSBAND MHz				Isolation, dB STOPBAND MHz				Cross Over Isolation (dB)		Return Loss (dB)							
5-42		88-1000		88-1000		5-42				Low Pass Port		High Pass Port		Common Port			
5-42 MHz		88-1000 MHz		88-1000 MHz		5-42 MHz				5-42 MHz		88-1000 MHz		5-42 MHz		88-1000 MHz	
Typ.	Max.	Typ.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.		
0.5	1	0.5	1	60	38	60	50	60	45	25	17	20	13	25	17	20	13

Typical Performance Data (T_{AMB} = 25°C)

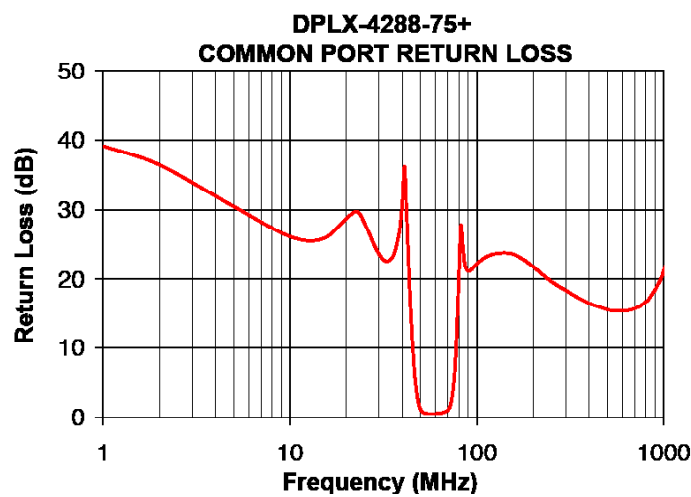
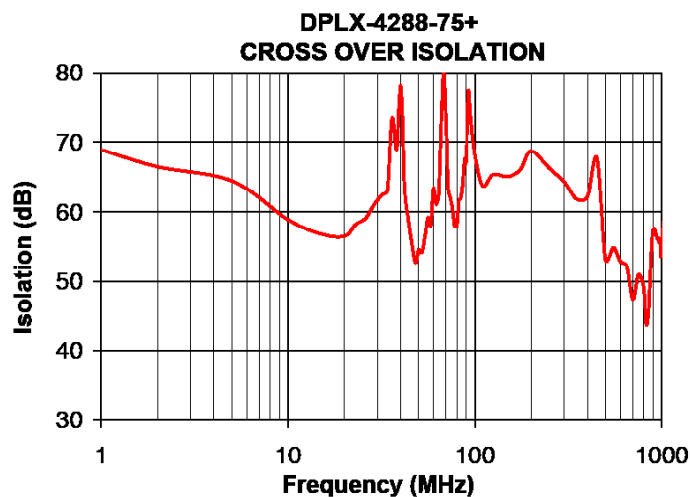
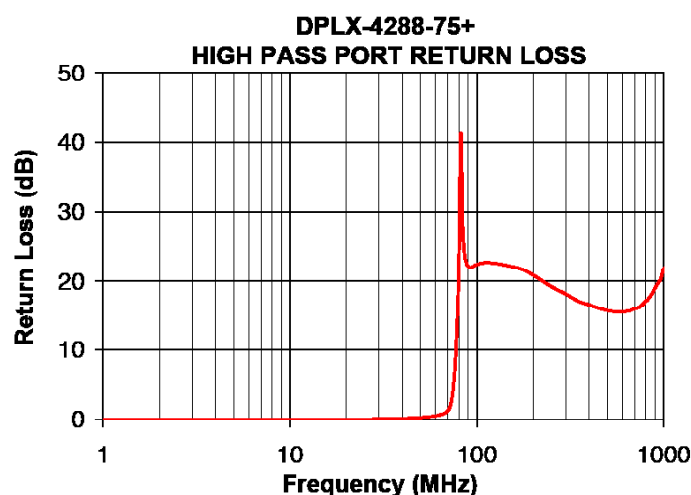
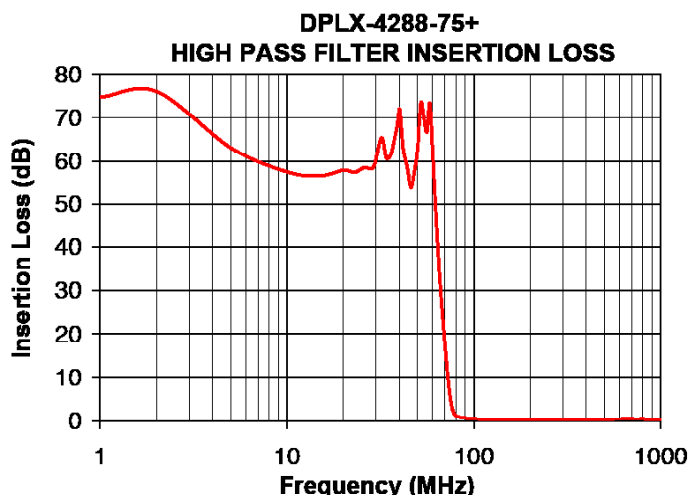
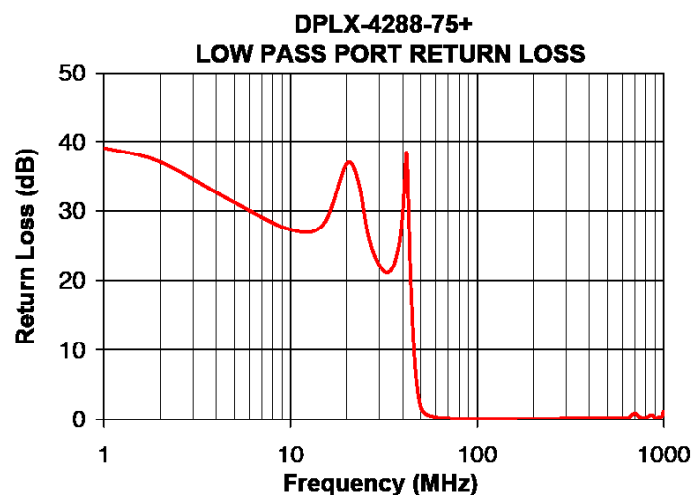
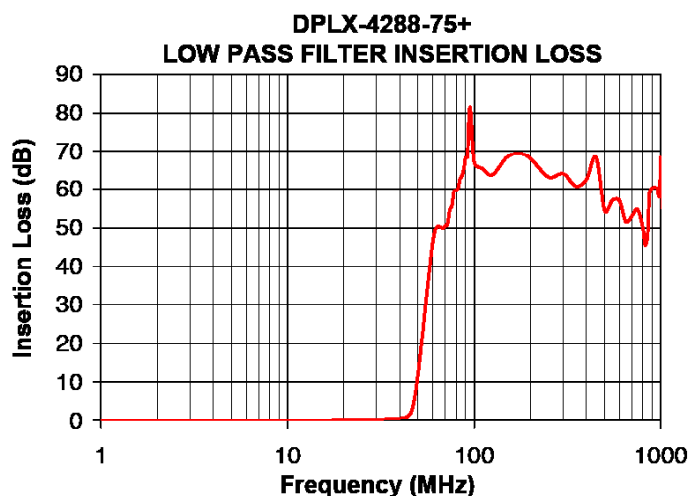
FREQUENCY (MHz)	INSERTION LOSS (dB)		CROSS OVER ISOLATION (dB) (between LPF and HPF)	RETURN LOSS (dB)		
	Low Pass Port	High Pass Port		Common Port	Low Pass Port	High Pass Port
5	0.12	63.06	64.43	30.46	31.21	0.02
20	0.23	57.91	56.51	28.74	36.81	0.02
36	0.48	61.55	73.35	23.62	22.42	0.09
40	0.64	72.06	78.01	31.32	30.16	0.12
42	0.77	62.35	63.33	30.11	38.02	0.15
46	2.26	54.06	55.35	7.73	9.52	0.18
50	12.15	62.88	54.58	1.10	1.71	0.26
60	46.10	63.48	63.36	0.54	0.37	0.51
70	50.47	17.56	72.98	1.07	0.22	1.26
80	59.51	1.25	58.05	19.96	0.18	21.25
86	63.50	0.77	63.99	22.32	0.16	23.80
88	65.42	0.71	67.51	21.45	0.16	22.59
90	68.36	0.66	67.56	21.18	0.15	22.13
100	67.01	0.48	68.09	22.21	0.15	22.41
200	68.13	0.24	68.73	21.81	0.19	20.89
400	62.57	0.30	62.20	16.53	0.23	16.59
600	56.95	0.44	52.89	15.46	0.25	15.63
800	50.16	0.45	49.20	16.73	0.31	17.10
900	60.23	0.36	57.46	18.50	0.34	19.05
1000	68.06	0.33	56.10	21.22	1.17	21.84

Functional Schematic



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



Notes

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Surface Mount Diplexer

DPLX-4288-75+

Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)		CROSS OVER ISOLATION (dB) Between LPF and HPF	RETURN LOSS (dB)		
	Low Pass Port	High Pass Port		Common Port	Low Pass Port	High Pass Port
1	0.08	74.68	68.91	39.18	39.09	0.01
5	0.12	63.06	64.43	30.46	31.21	0.02
10	0.15	57.54	58.89	26.16	27.30	0.00
15	0.19	56.61	56.83	25.83	28.12	0.02
20	0.22	57.91	56.51	28.74	36.81	0.02
36	0.48	61.55	73.35	23.62	22.42	0.09
38	0.54	66.02	68.91	26.08	24.93	0.11
39	0.59	68.63	74.10	28.12	27.03	0.11
40	0.64	72.06	78.01	31.32	30.16	0.12
41	0.68	67.22	72.97	36.20	35.00	0.14
42	0.77	62.35	63.33	30.11	38.02	0.15
44	1.12	58.63	58.86	16.85	20.36	0.17
46	2.26	54.06	55.35	7.73	9.52	0.18
48	6.05	57.53	52.71	2.90	3.98	0.23
50	12.15	62.88	54.58	1.10	1.71	0.26
54	26.55	69.99	56.45	0.55	0.70	0.35
56	33.80	66.69	59.20	0.53	0.54	0.39
58	40.55	73.29	58.07	0.53	0.44	0.45
60	46.10	63.48	63.36	0.54	0.37	0.51
64	50.38	40.70	62.56	0.62	0.28	0.68
66	50.21	31.75	72.40	0.70	0.24	0.79
68	49.70	24.25	80.11	0.82	0.22	0.95
70	50.47	17.56	72.98	1.07	0.22	1.26
74	54.54	6.79	61.91	3.20	0.18	3.48
76	55.67	3.46	60.18	6.38	0.17	6.70
78	59.33	1.91	57.89	11.99	0.18	12.40
80	59.51	1.25	58.05	19.96	0.18	21.25
84	62.70	0.86	62.06	24.93	0.17	27.89
86	63.50	0.77	63.99	22.32	0.16	23.80
88	65.42	0.71	67.51	21.45	0.16	22.59
89	66.95	0.68	66.78	21.25	0.16	22.29
90	68.36	0.66	67.56	21.18	0.15	22.13
100	67.01	0.48	68.09	22.21	0.15	22.41
150	68.44	0.27	65.07	23.75	0.17	22.18
200	68.13	0.24	68.73	21.81	0.19	20.89
250	63.18	0.23	66.27	19.67	0.20	19.25
300	64.02	0.26	64.33	18.37	0.21	18.15
400	62.57	0.30	62.20	16.53	0.23	16.59
450	68.38	0.33	67.69	16.03	0.22	16.10
500	54.43	0.40	53.12	15.60	0.23	15.78
600	56.95	0.44	52.89	15.46	0.25	15.63
700	53.01	0.46	47.48	15.80	0.93	16.05
800	50.16	0.45	49.20	16.73	0.31	17.10
870	58.79	0.38	51.56	17.92	0.69	18.26
900	60.23	0.36	57.46	18.50	0.34	19.05
950	60.32	0.34	56.00	19.69	0.36	20.05
970	58.63	0.33	55.53	20.18	0.44	20.65
990	58.09	0.32	53.56	20.85	0.92	21.43
1000	68.06	0.33	56.10	21.22	1.17	21.84

REV. X1

DPLX-4288-75+

090426

Page 1 of 1



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Patent Pending

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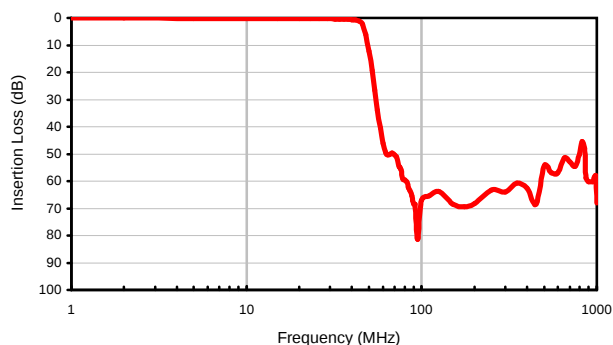


Surface Mount Diplexer

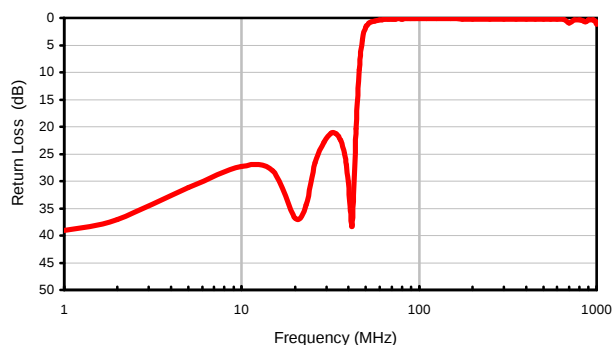
Typical Performance Curves

DPLX-4288-75+

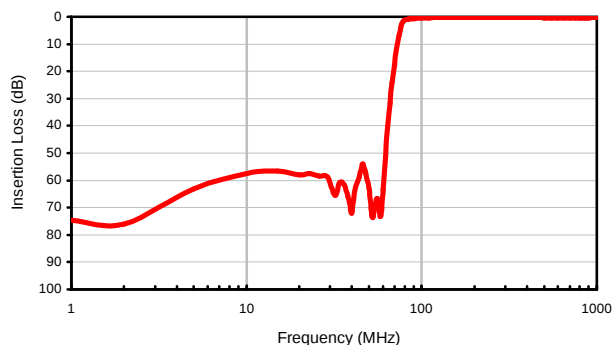
Low Pass Port Insertion Loss



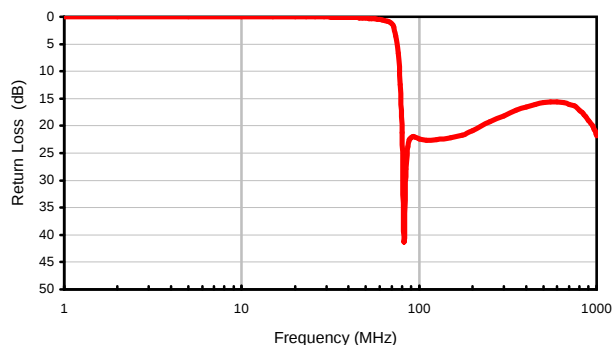
Low Pass Port Return Loss



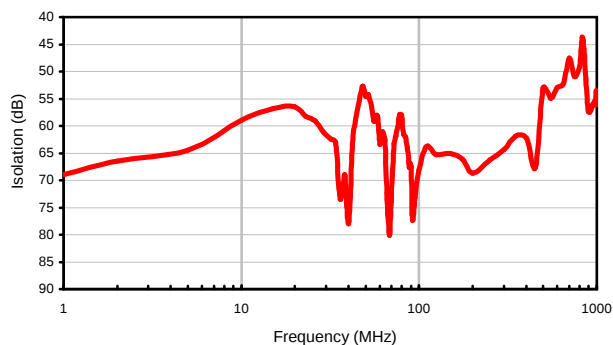
High Pass Port Insertion Loss



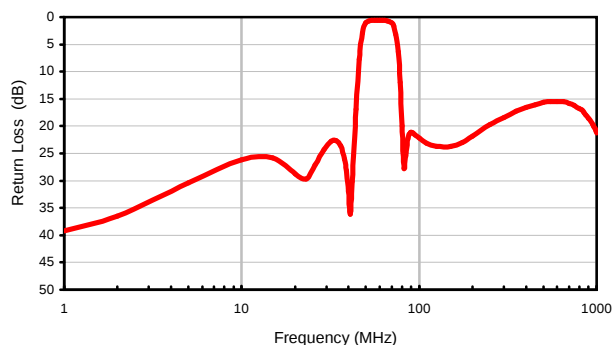
High Pass Port Return Loss



Cross Over Isolation



Common Port Return Loss



REV. X1
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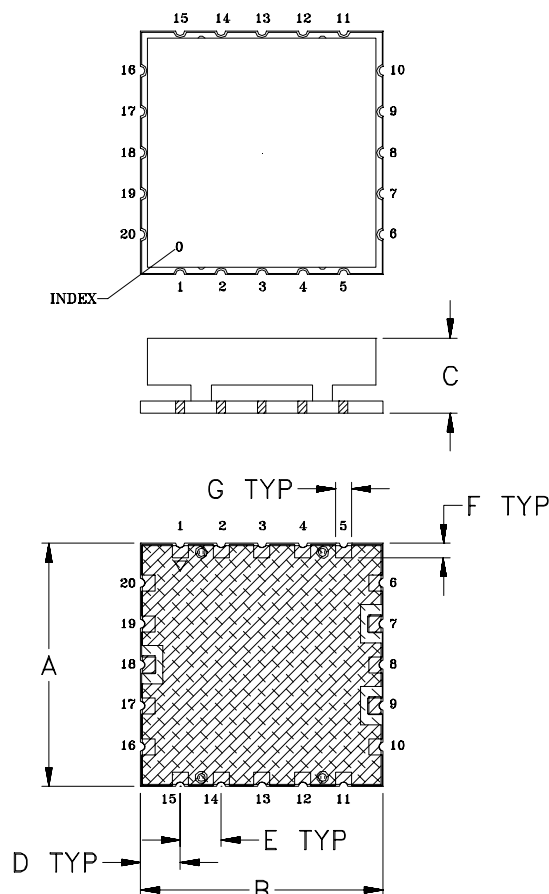


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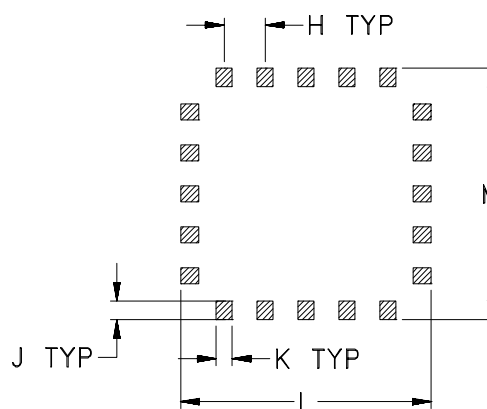


Outline Dimensions

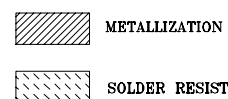
HR1176



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



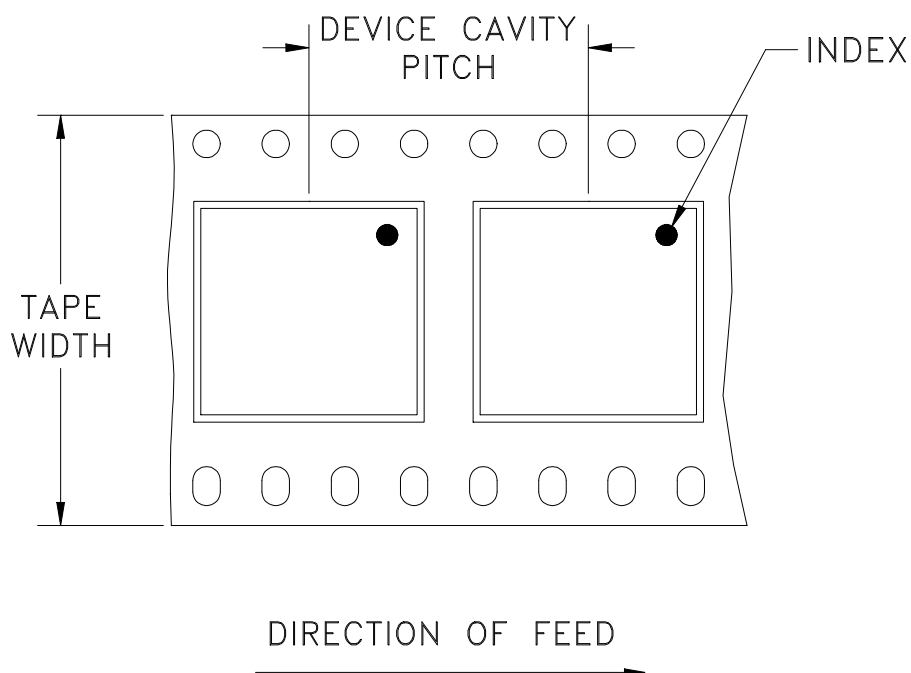
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RF/IF MICROWAVE COMPONENTS



Tape & Reel Packaging TR-F80

DEVICE ORIENTATION IN T&R



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

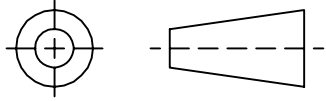
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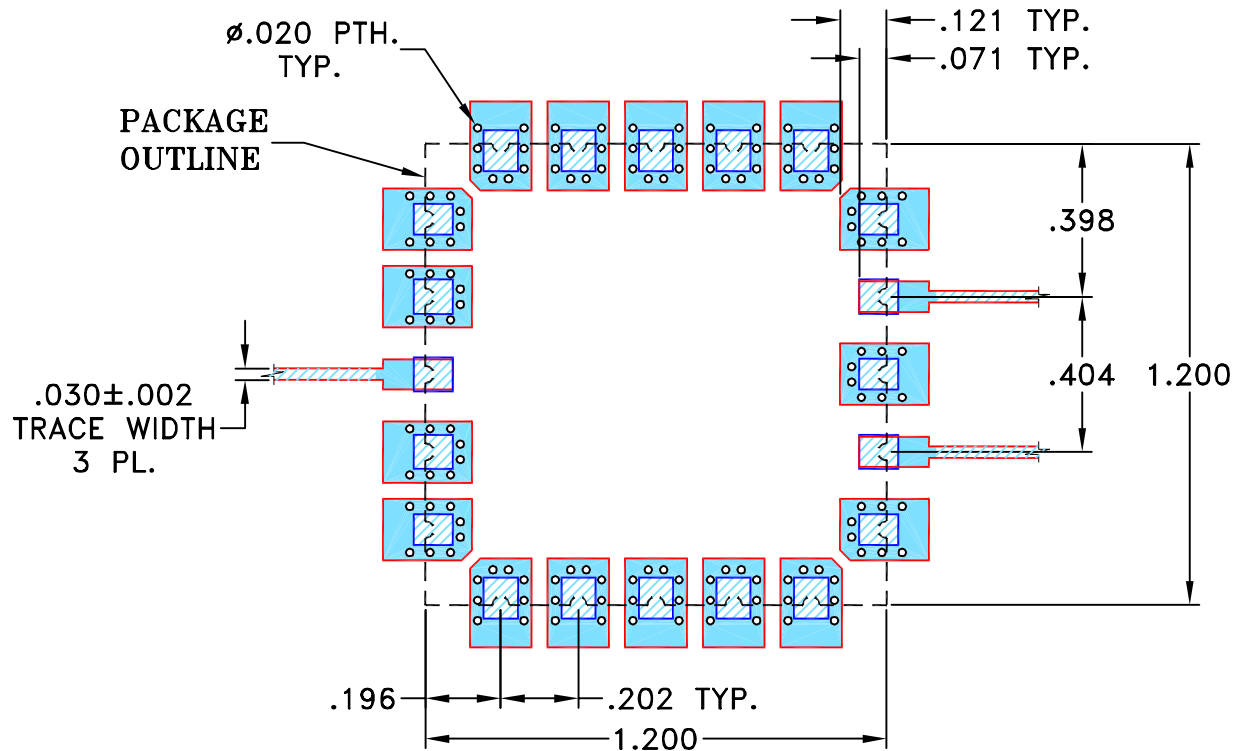
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THIRD ANGLE PROJECTION



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



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PL, rg, HR1176, DPLX,
TB-563+, 75 Ω

SIZE

CODE IDENT

DRAWING NO:

REV:

A

15542

98-PL-228

B

FILE:

98PL228

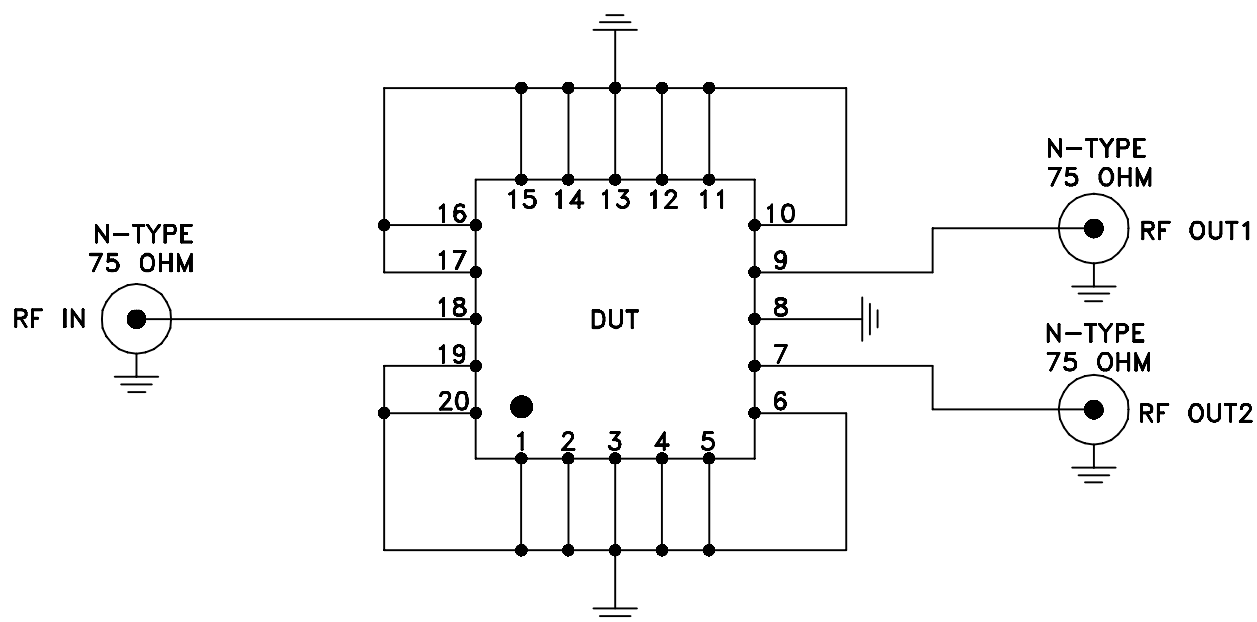
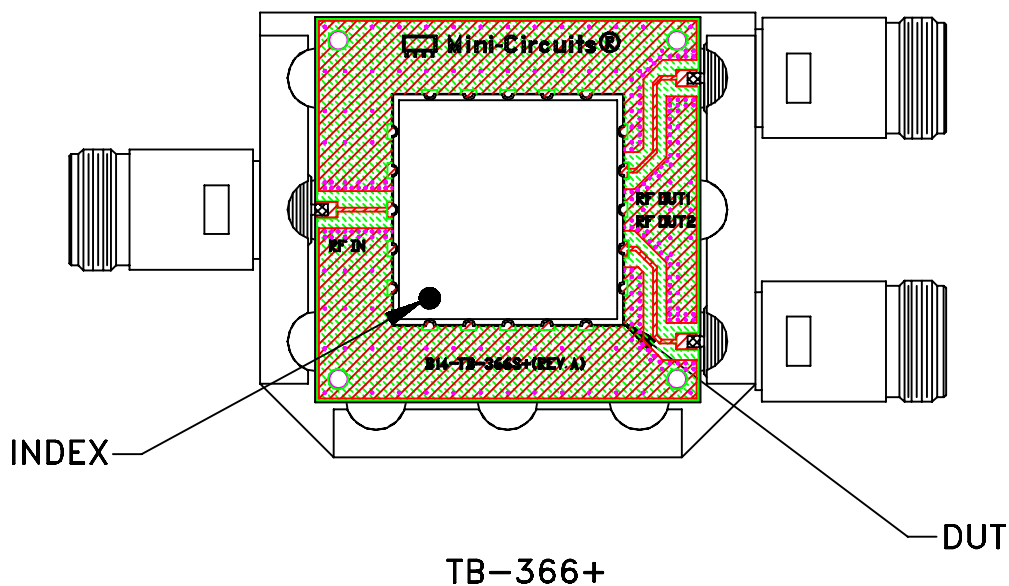
SCALE:

2:1

SHEET:

1 OF 1

Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: ROGERS R04350 or equivalent, Dielectric Constant=3.48, Thickness=.030 inch.

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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	-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