

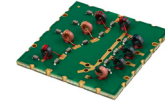
NON-CATALOG

Surface Mount

Diplexer

DPB4254-75+

**75 Ω DC to 1220 MHz
(DC-42, 54-1220 MHz)**



CASE STYLE: PA2002

The Big Deal

- Low insertion loss, 0.8dB Typ.
- High rejection, > 45dB
- Very good return loss, 22dB Typ.
- 75 Ω Impedance
- Used in DOCSIS 3.1 standard

Product Overview

DPB4254-75+ is a high performance diplexer with the lowpass port at DC-42 MHz and highpass port at 54-1220 MHz. Excellent return loss combined with high out of channel rejection makes it a ideal component in cable TV and multiband radio systems.

Key Features

Feature	Advantages
Low passband insertion loss	Passband insertion loss 1dB ensures low signal loss through both the channels.
Excellent Stopband rejection	Co-channel rejection of 45dB ensures unwanted spurious are eliminated.
Excellent return loss at DC-42 and 54-1220 MHz	This makes signal transmission with very less reflection and well-matched with the adjacent component used in the system.

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



Surface Mount Diplexer

NON-CATALOG

DPB4254-75+

75Ω DC to 1220 MHz (DC-42, 54-1220 MHz)

Maximum Ratings

Operating Temperature -40° to 85°C

Storage Temperature -55°C to 100°C

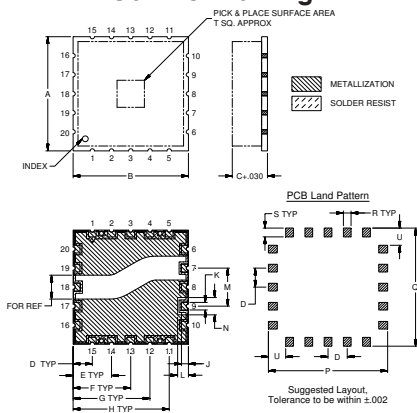
RF Power Input 27dBm Max.

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

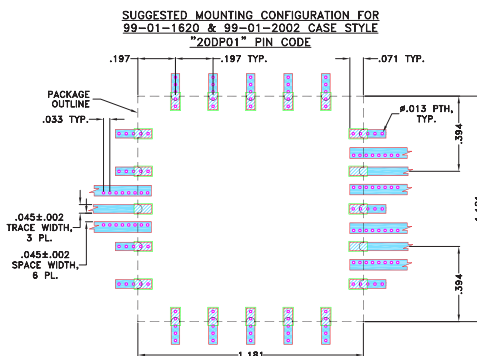
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K
1.181	1.181	.300	.197	.394	.591	.787	.984	.071	.079
30.00	30.00	7.62	5.00	10.00	15.00	20.00	25.00	1.80	2.00
L	M	N	P	Q	R	S	T	U	Wt.
.111	.394	.179	1.221	1.221	.079	.091	.280	.178	grams
2.82	10.00	4.54	31.01	31.01	2.01	2.31	7.11	4.52	3.8

Demo Board MCL P/N: TB-786+ Suggested PCB Layout (PL-435)



- TRACE WIDTH IS SHOWN FOR OAK-602 WITH DIELECTRIC THICKNESS .031"±.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
- Excellent return loss
- High rejection

Applications

- Cable TV systems (DOCSIS 3.1 standard)
- Multiband radio systems

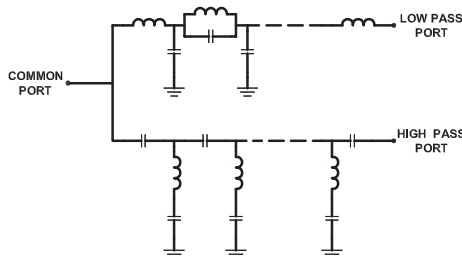
Electrical Specifications at 25°C

Parameter	Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass	DC-42	-	0.8	1.5
	High Pass	54-1220	-	0.8	1.5	dB
	Return Loss	Low Pass	DC-42	18	22	-
		High Pass	54-1220	17	22	-
		Common	DC-42	18	22	-
Stop Band Isolation		54-700	45	50	-	dB
		700-1220	43	45	-	
		DC-42	45	50	-	

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	0.04	76.19	46.46	47.21	0.02
10.0	0.10	58.76	31.99	34.11	0.03
40.0	0.55	68.16	28.57	26.99	0.58
42.0	0.73	77.07	26.13	24.80	0.70
44.5	1.37	51.98	16.71	17.61	0.89
45.5	2.57	40.72	9.25	8.78	1.01
46.0	3.86	33.91	6.59	5.82	1.09
47.0	8.60	19.25	3.73	2.37	1.45
47.5	12.18	13.40	3.49	1.57	1.93
48.0	16.74	8.74	4.15	1.12	2.96
49.5	34.02	2.28	13.39	0.65	12.04
50.0	37.91	1.73	18.70	0.59	16.67
54.0	70.61	0.78	30.05	0.40	27.62
55.0	72.01	0.71	30.35	0.38	27.25
60.0	64.95	0.51	28.76	0.34	25.46
100.0	68.36	0.29	32.99	0.27	32.67
250.0	64.30	0.28	28.44	0.17	28.74
300.0	62.66	0.29	26.35	0.16	26.71
500.0	57.58	0.35	21.76	0.15	22.03
700.0	55.33	0.42	19.69	0.19	20.30
1000.0	50.67	0.49	20.87	0.32	22.66
1220.0	48.51	0.67	26.83	0.44	31.42

Functional Schematic



Notes

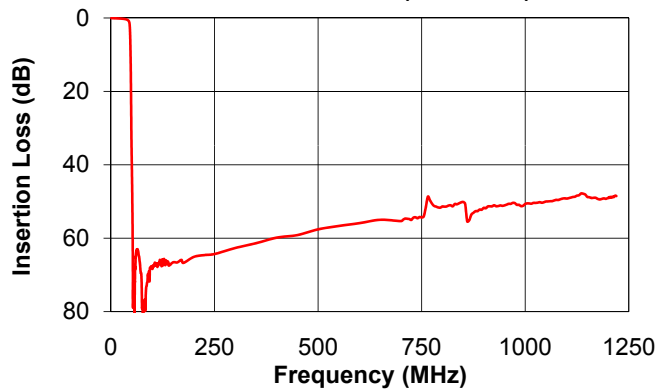
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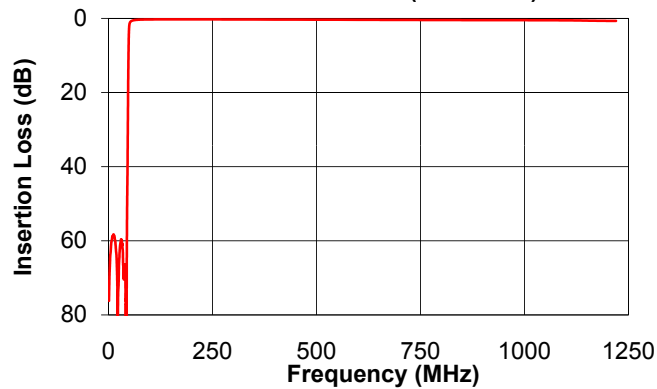
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DPB4254-75+
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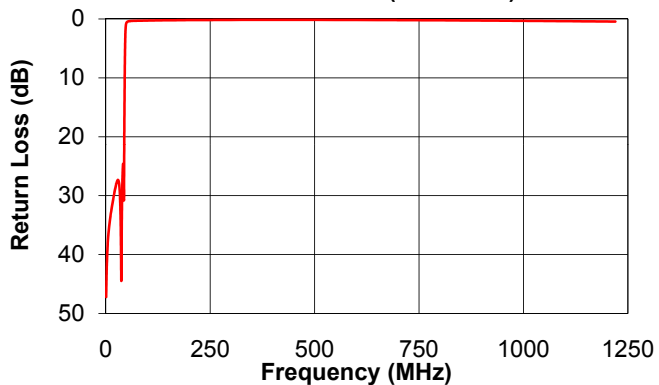
**DPB4254-75+ LOW PASS PORT
INSERTION LOSS ($P_{in}=0\text{dBm}$)**



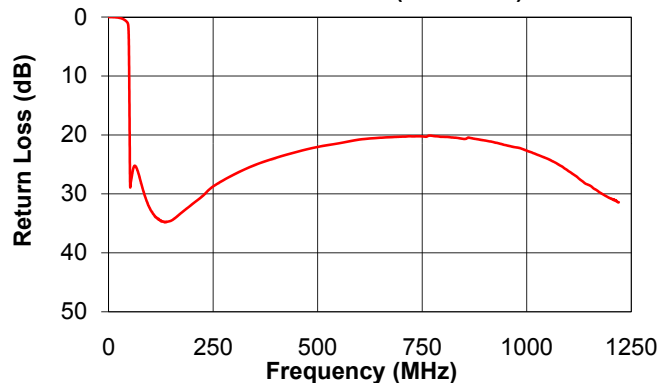
**DPB4254-75+ HIGH PASS PORT
INSERTION LOSS ($P_{in}=0\text{dBm}$)**



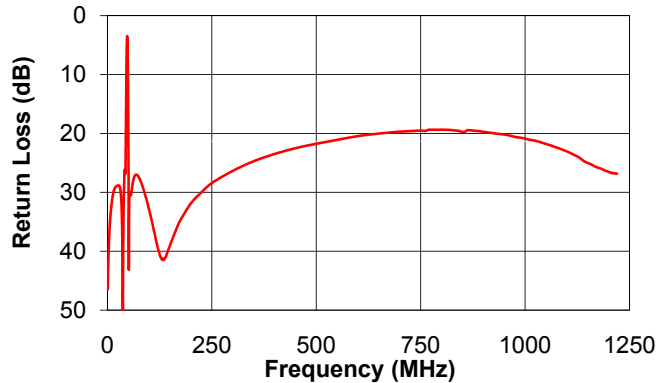
**DPB4254-75+ LOW PASS PORT
RETURN LOSS ($P_{in}=0\text{dBm}$)**



**DPB4254-75+ HIGH PASS PORT
RETURN LOSS ($P_{in}=0\text{dBm}$)**



**DPB4254-75+ COMMON PORT
RETURN LOSS ($P_{in}=0\text{dBm}$)**

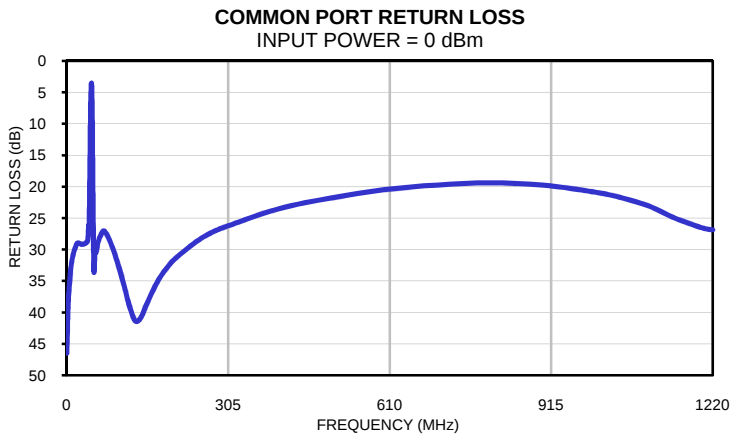
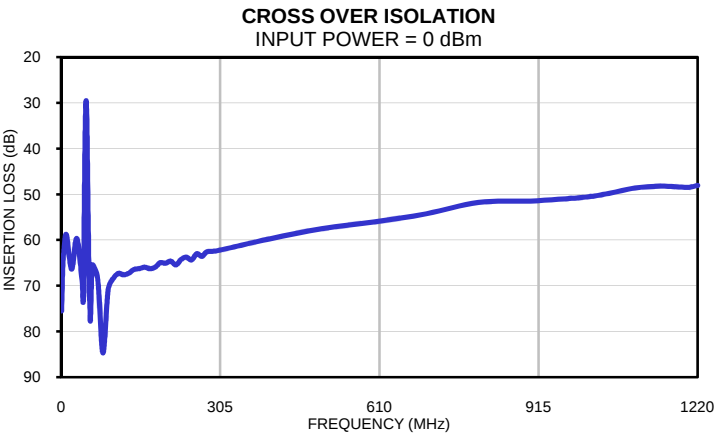
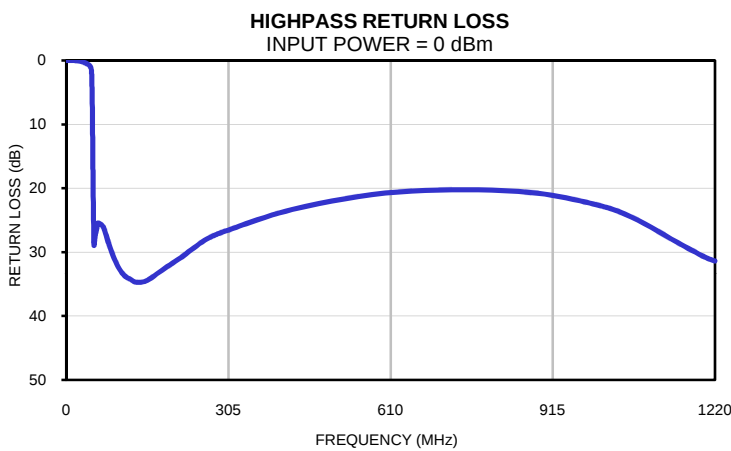
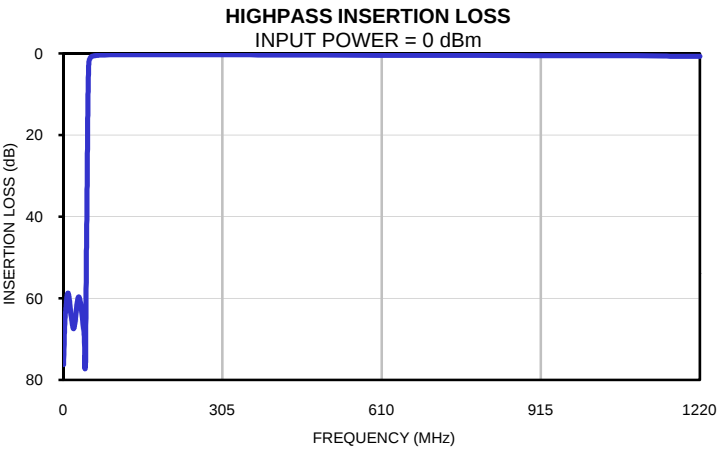
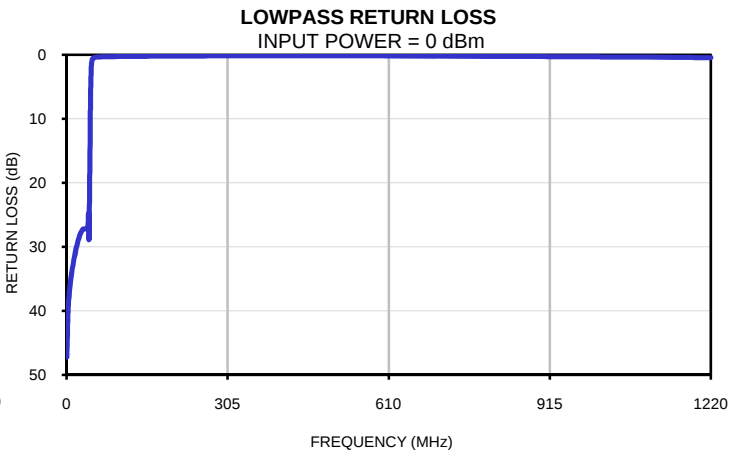
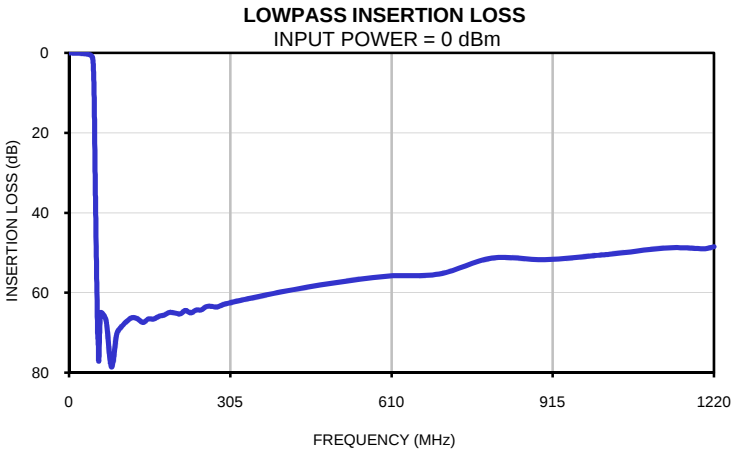


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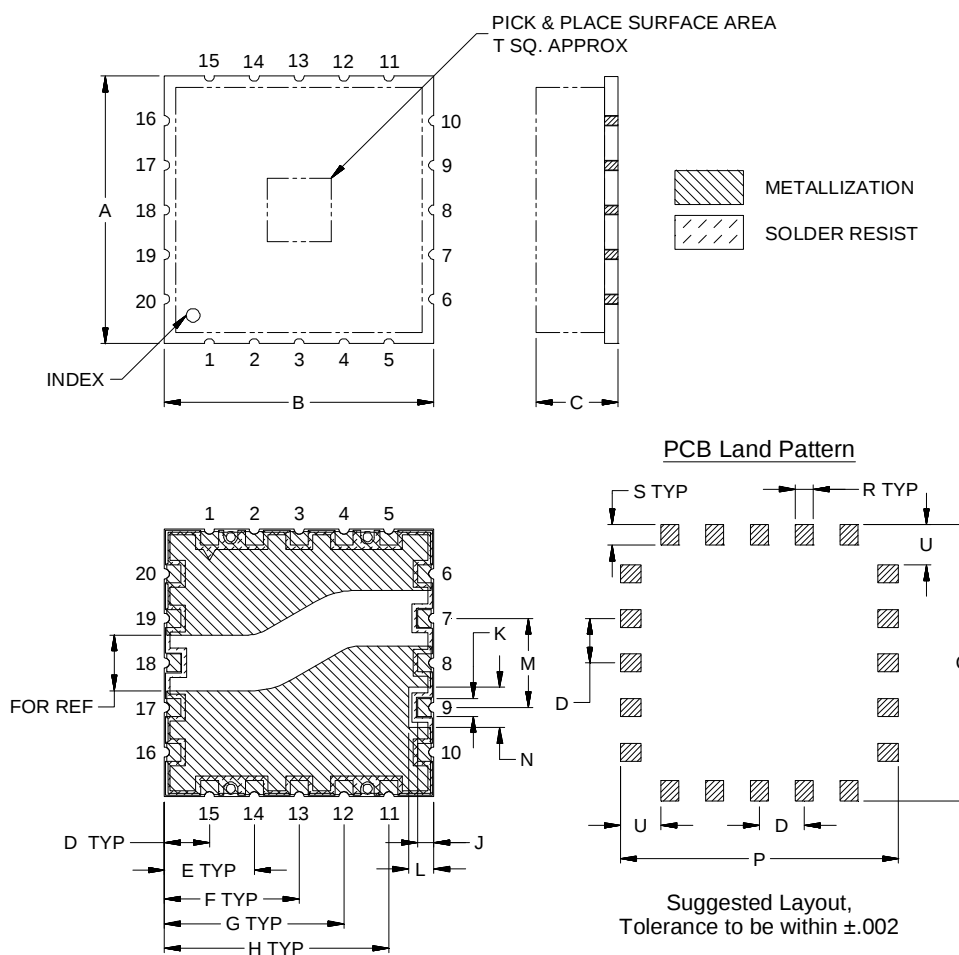
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)		Cross over isolation (dB) (between LPF and HPF)	RETURN LOSS (dB)		
	Lowpass port	Highpass port		Common port	Lowpass port	Highpass port
1	0.04	76.19	75.52	46.46	47.21	0.02
3	0.06	66.88	66.28	39.95	40.75	0.02
5	0.08	62.96	62.68	36.55	37.80	0.02
10	0.10	58.76	58.83	31.99	34.11	0.03
20	0.15	67.38	66.40	29.04	29.74	0.07
30	0.24	59.61	59.68	29.15	27.39	0.21
40	0.55	68.16	68.89	28.57	26.99	0.58
42	0.73	77.07	73.61	26.13	24.80	0.70
42.5	0.79	74.08	73.01	26.55	25.94	0.73
43	0.87	75.98	71.84	26.86	28.59	0.77
44.5	1.37	51.98	51.61	16.71	17.61	0.89
45.5	2.57	40.72	40.35	9.25	8.78	1.01
46	3.86	33.91	36.39	6.59	5.82	1.09
47	8.60	19.25	31.19	3.73	2.37	1.45
47.5	12.18	13.40	29.89	3.49	1.57	1.93
48	16.74	8.74	29.52	4.15	1.12	2.96
49	28.73	3.36	32.23	9.11	0.73	8.03
49.5	34.02	2.28	35.15	13.39	0.65	12.04
50	37.91	1.73	38.60	18.70	0.59	16.67
52	55.45	1.02	56.91	33.27	0.46	28.85
54	70.61	0.78	72.26	30.05	0.40	27.62
55	72.01	0.71	73.61	30.35	0.38	27.25
56	77.12	0.65	77.72	30.44	0.37	26.82
58	69.03	0.57	70.09	29.75	0.35	25.98
60	64.95	0.51	65.44	28.76	0.34	25.46
70	67.02	0.38	68.46	27.01	0.31	26.19
80	78.56	0.33	84.73	28.19	0.29	28.76
90	70.38	0.30	70.89	30.33	0.28	31.00
100	68.36	0.29	68.39	32.99	0.27	32.67
110	67.07	0.28	67.31	36.03	0.25	33.74
120	66.21	0.28	67.64	39.22	0.24	34.25
130	66.61	0.28	67.24	41.32	0.23	34.72
140	67.45	0.27	66.44	40.90	0.22	34.74
150	66.56	0.27	66.27	38.98	0.22	34.53
160	66.59	0.27	65.95	37.11	0.22	34.04
170	65.90	0.27	66.31	35.39	0.21	33.45
180	65.62	0.27	65.98	33.99	0.20	32.85
190	64.93	0.27	64.96	32.85	0.19	32.28
200	65.08	0.27	65.11	31.86	0.18	31.75
210	65.31	0.28	64.63	31.07	0.18	31.17
220	64.44	0.28	65.46	30.37	0.17	30.64
230	65.05	0.28	64.24	29.70	0.18	29.97
240	64.37	0.28	63.76	29.03	0.18	29.37
250	64.30	0.28	64.37	28.44	0.17	28.74
260	63.46	0.28	62.99	27.89	0.17	28.17
270	63.42	0.29	63.58	27.43	0.17	27.72
280	63.59	0.29	62.56	27.02	0.16	27.33
300	62.66	0.29	62.33	26.35	0.16	26.71
400	59.84	0.32	59.74	23.50	0.15	23.89
500	57.58	0.35	57.50	21.76	0.15	22.03
600	55.89	0.39	56.05	20.45	0.17	20.78
700	55.33	0.42	54.26	19.69	0.19	20.30
800	51.35	0.44	51.78	19.36	0.23	20.32
900	51.72	0.47	51.46	19.72	0.27	20.94
1000	50.67	0.49	50.67	20.87	0.32	22.66
1050	50.00	0.50	49.80	21.79	0.34	24.05
1100	49.19	0.53	48.60	23.06	0.37	26.14
1150	48.74	0.61	48.22	25.02	0.40	28.55
1200	49.01	0.67	48.46	26.52	0.43	30.76
1220	48.51	0.67	48.07	26.83	0.44	31.42



Outline Dimensions

PA2002



CASE#	A	B	C		D	E	F	G	H	J	K	L	M
			Max	Min									
PA2002	1.181 (30.00)	1.181 (30.00)	.280 (7.11)	.205 (5.21)	.197 (5.00)	.394 (10.00)	.591 (15.00)	.787 (20.00)	.984 (25.00)	.071 (1.80)	.079 (2.01)	.111 (2.82)	.394 (10.00)

CASE#	N	P	Q	R	S	T	U	WT.GRAMS
PA2002	.179 (4.54)	1.221 (31.01)	1.221 (31.01)	.079 (2.01)	.091 (2.31)	.280 (7.11)	.178 (4.52)	3.8

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

Notes:

1. Base: Printed wiring laminate.
2. 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.



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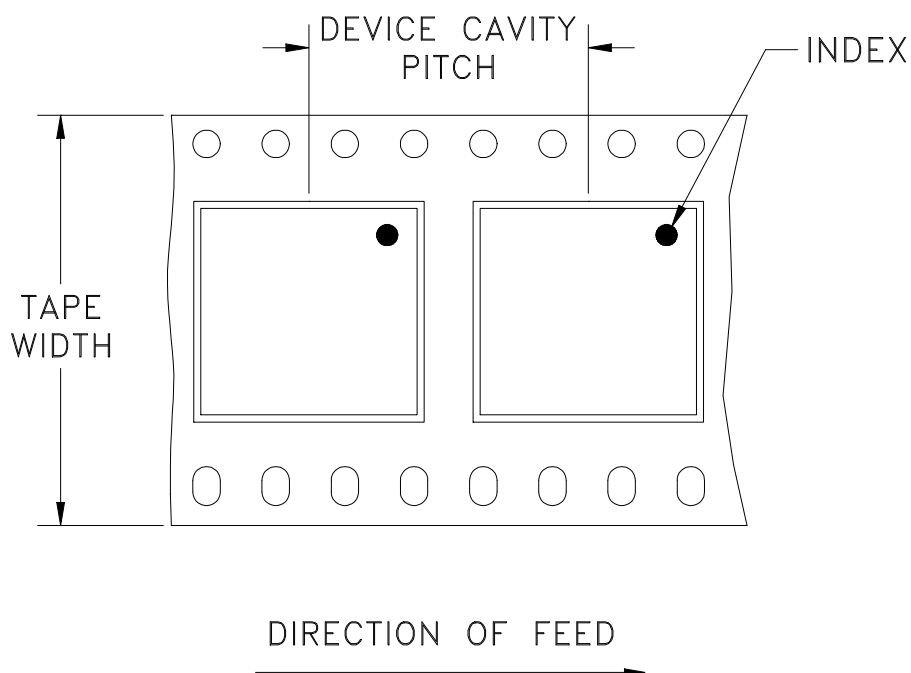


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RF/IF MICROWAVE COMPONENTS

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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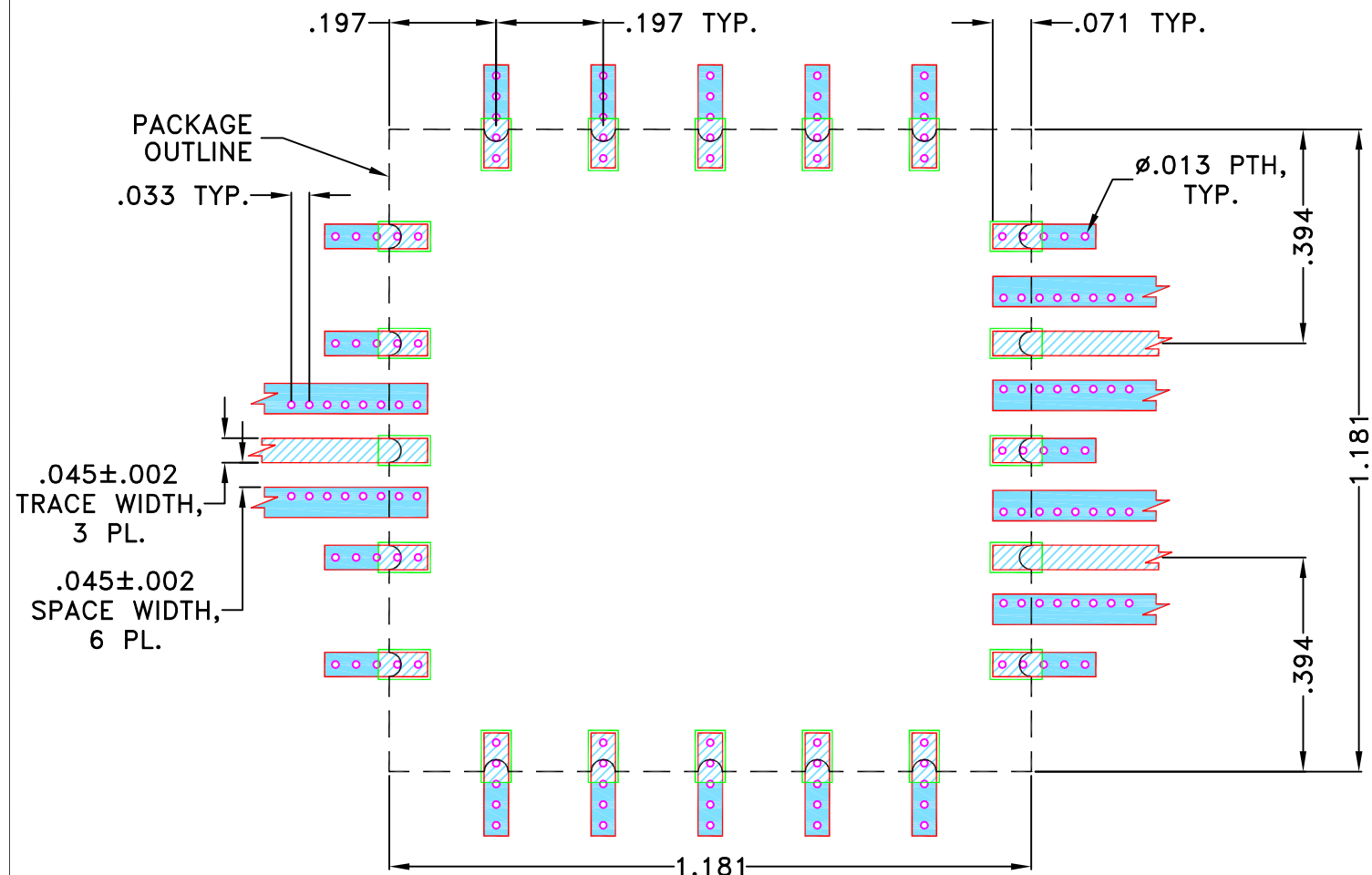
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THIRD ANGLE PROJECTION		REVISIONS				
		REV OR	ECN No. M147697	DESCRIPTION NEW RELEASE	DATE SEP 14	DR DDR
						AUTH MD

SUGGESTED MOUNTING CONFIGURATION FOR NU1620, NV1998, NZ2001, PA2002 CASE STYLE "20DP01" PIN CODE



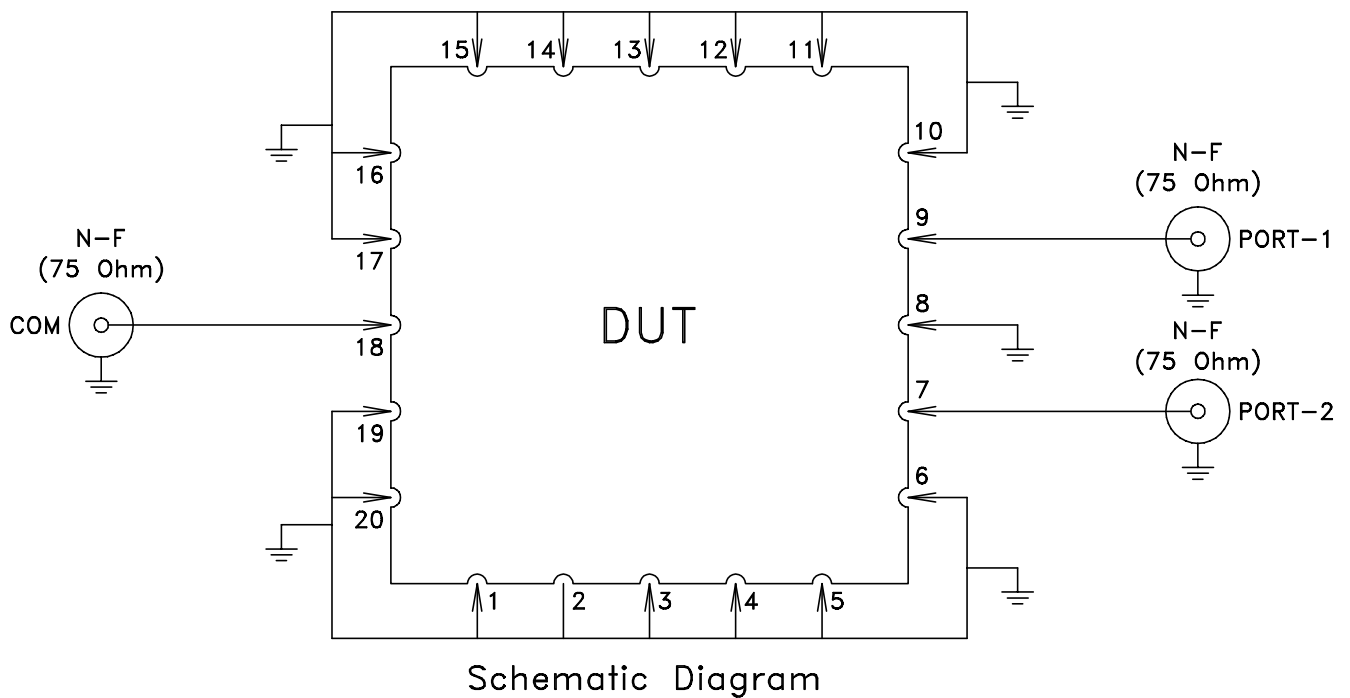
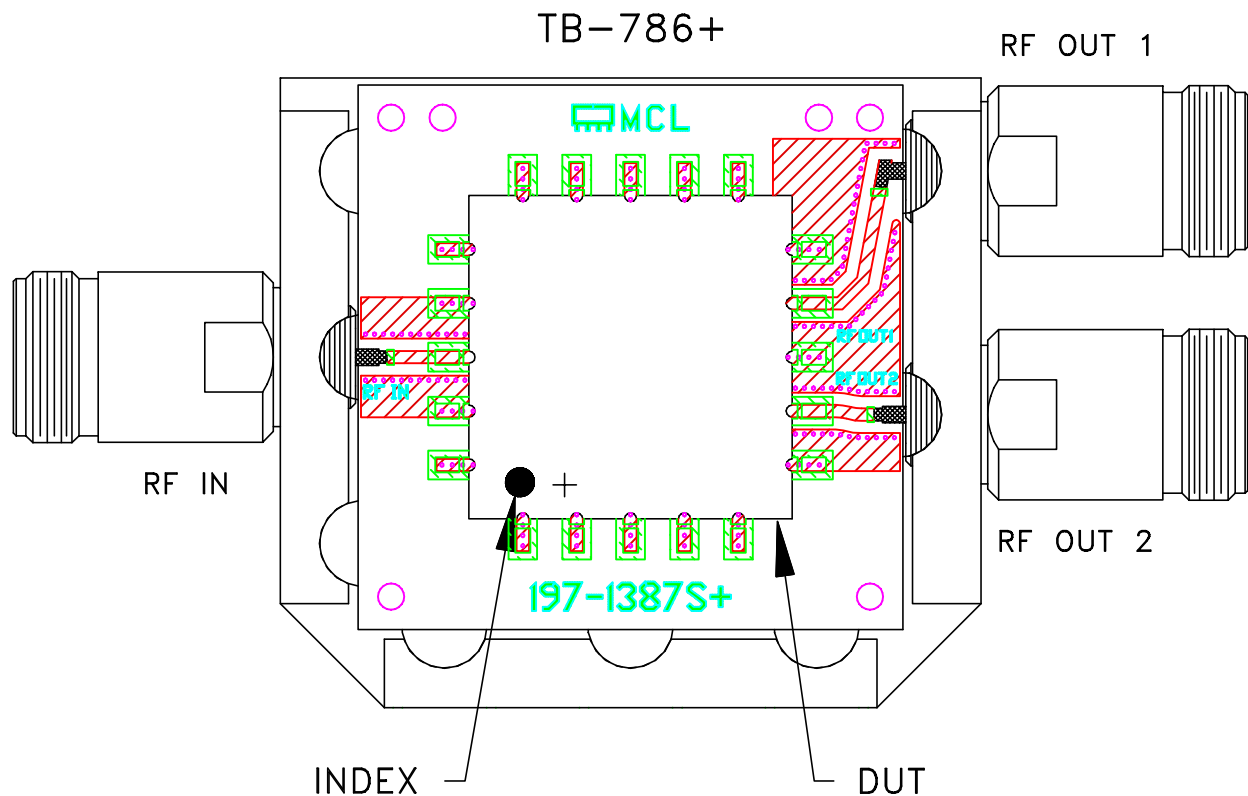
NOTES:

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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

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		CHECKED	MD	09 SEP 14									
		APPROVED	KR	09 SEP 14									
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ASHEETA1.DWG REV:A DATE:01/12/95						FILE: 98PL435		SCALE: 3:1		SHEET: 1 OF 1			

Evaluation Board and Circuit



Notes:

1. 75 Ohm N Female connectors.
2. PCB Material: OAK-602 OR Equivalent
Dielectric Constant=2.50±.04, Thickness=.031 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