

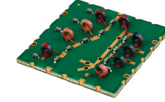
# NON-CATALOG

Surface Mount

## Diplexer

DPB4254-75+

75Ω 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.
- 75Ω 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.  
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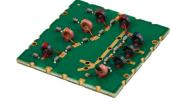


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## DPB4254-75+

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



CASE STYLE: PA2002

### Maximum Ratings

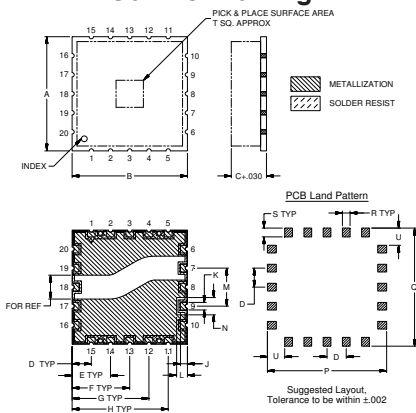
Operating Temperature	-40° to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	27dBm Max.

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

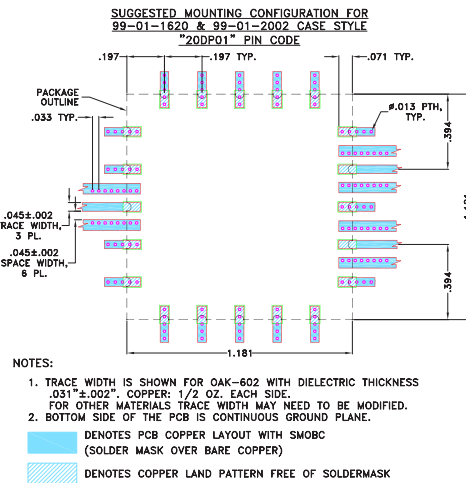
### Outline Drawing



### 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)



### Features

- Low insertion loss
- 75Ω Impedance
- Excellent return loss
- High rejection

### Applications

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

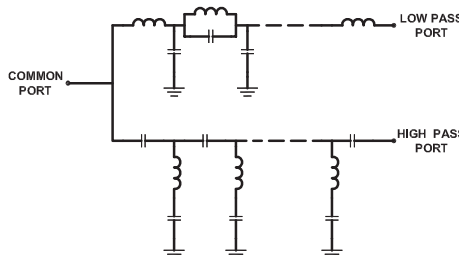
### Electrical Specifications at 25°C

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

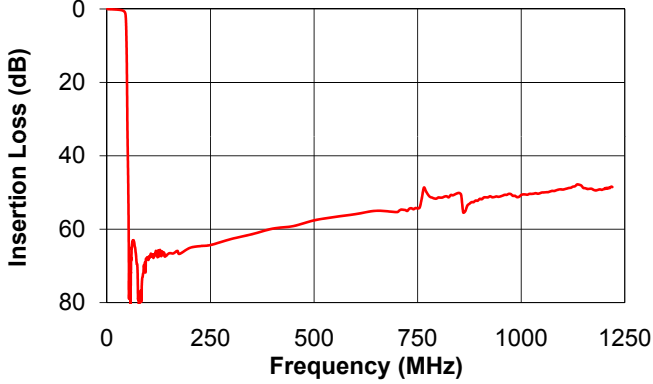


### Notes

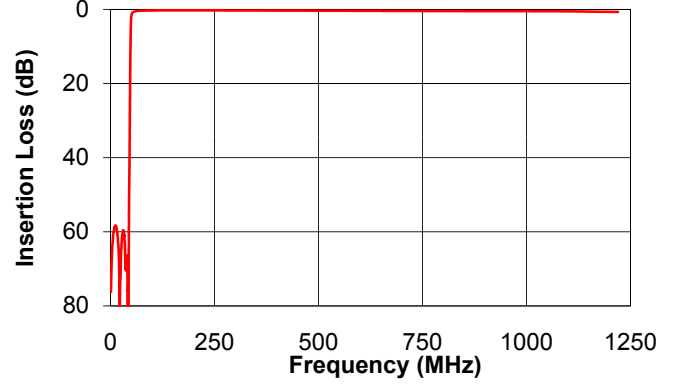
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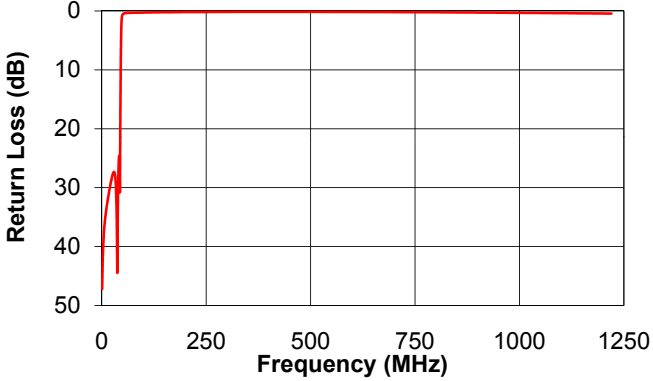
**DPB4254-75+ LOW PASS PORT  
INSERTION LOSS (P<sub>in</sub>=0dBm)**



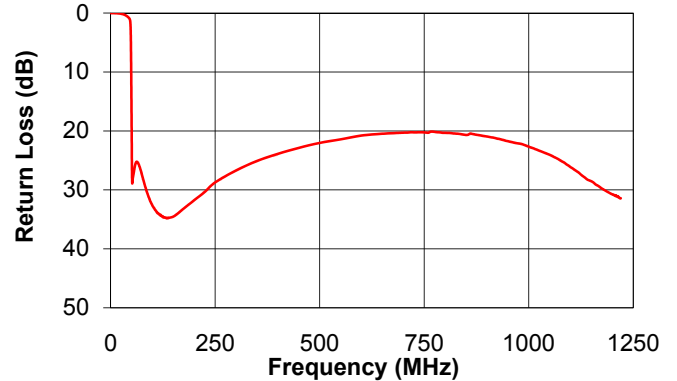
**DPB4254-75+ HIGH PASS PORT  
INSERTION LOSS (P<sub>in</sub>=0dBm)**



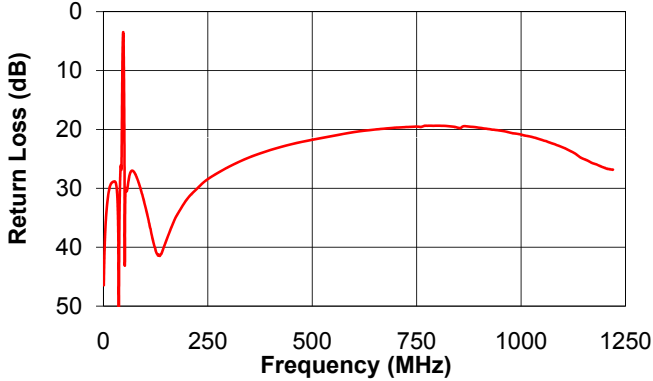
**DPB4254-75+ LOW PASS PORT  
RETURN LOSS (P<sub>in</sub>=0dBm)**



**DPB4254-75+ HIGH PASS PORT  
RETURN LOSS (P<sub>in</sub>=0dBm)**



**DPB4254-75+ COMMON PORT  
RETURN LOSS (P<sub>in</sub>=0dBm)**



**Notes**

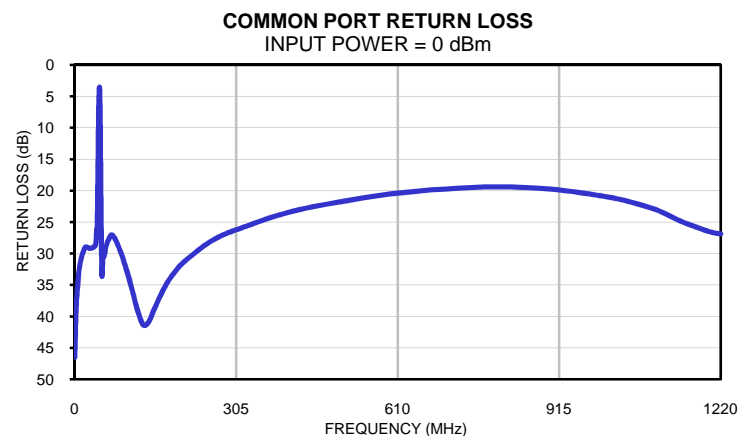
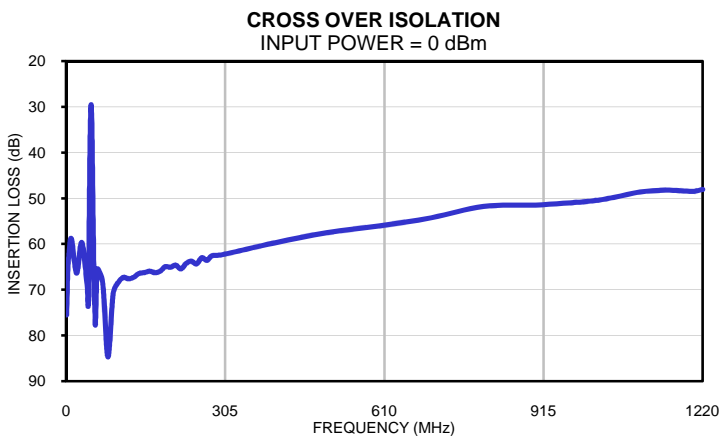
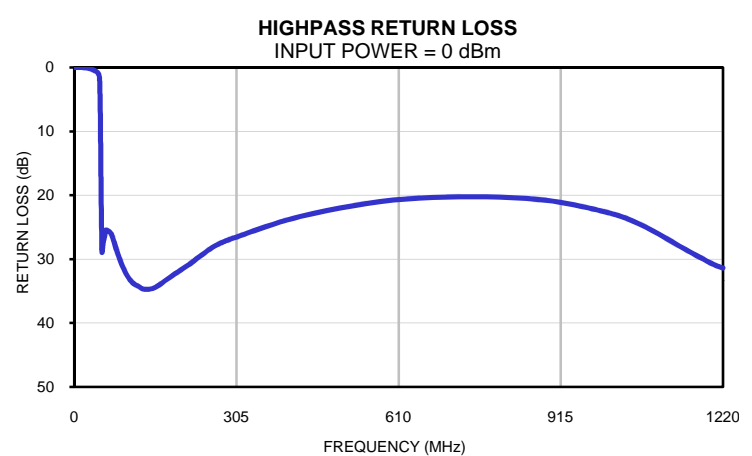
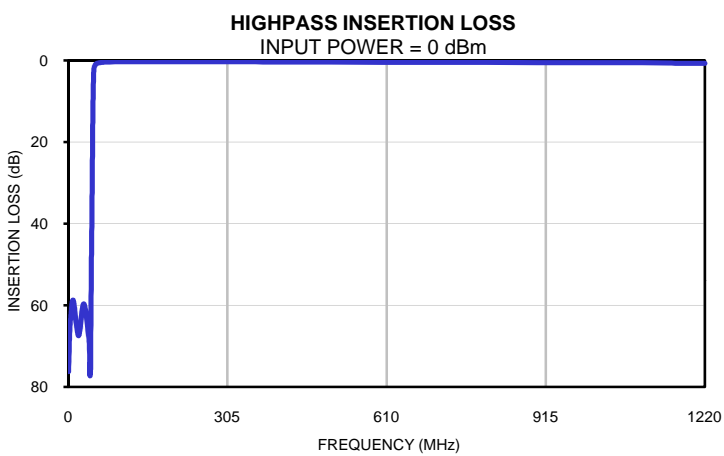
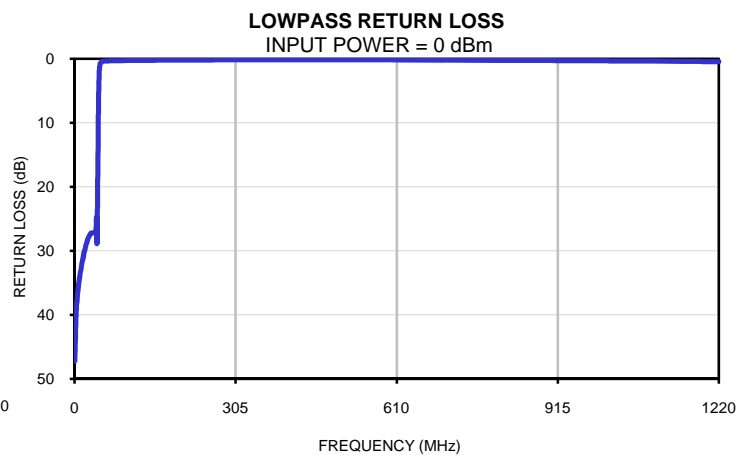
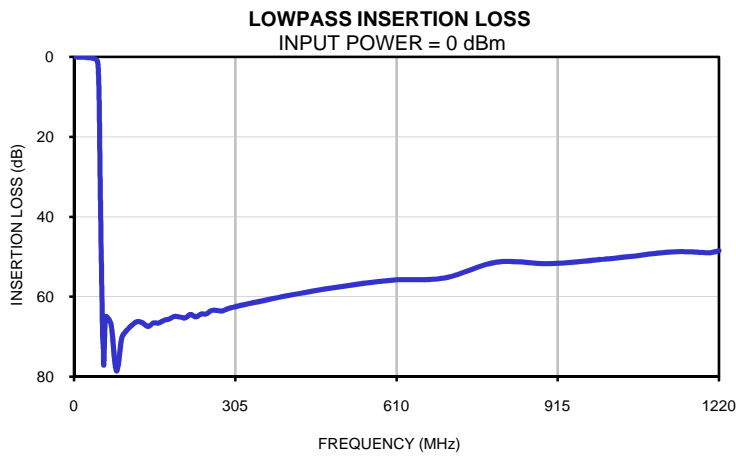
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## Typical Performance Data

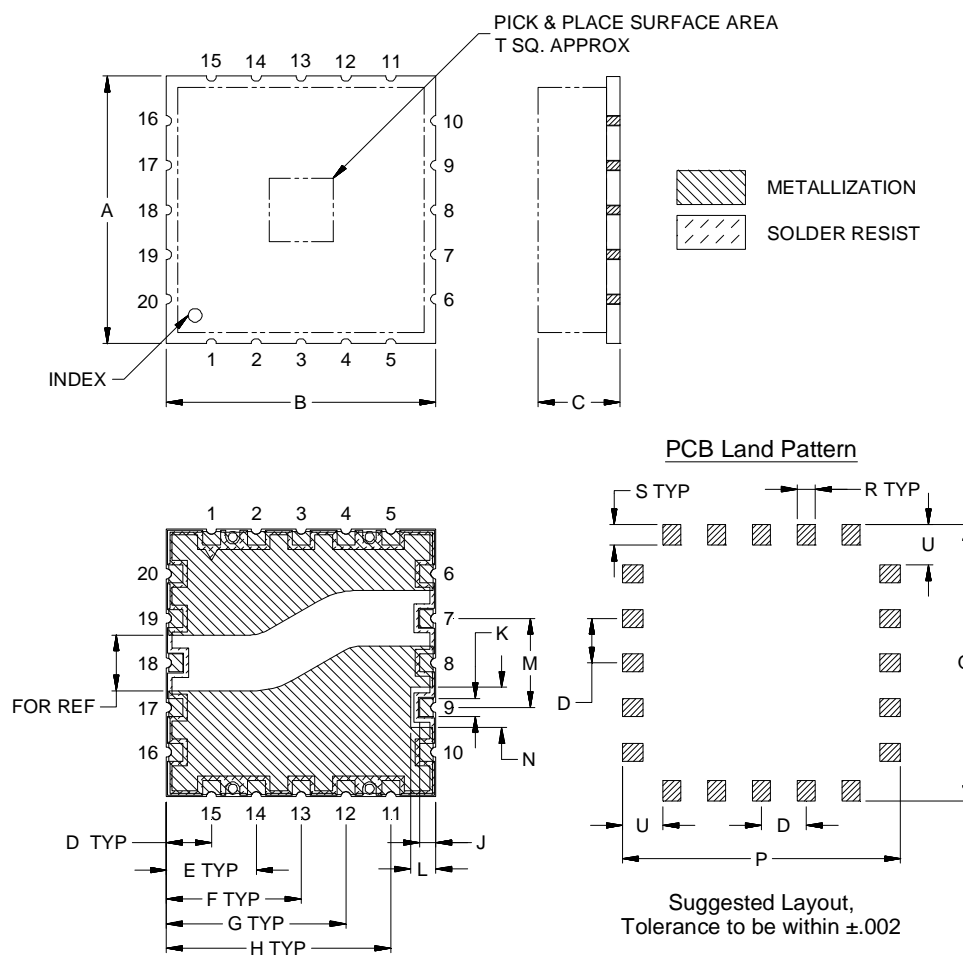
FREQUENCY (MHz)	INSERTION LOSS (dB)		Cross over isolation (dB) (between LPF and HPF)	RETURN LOSS (dB)		
	Lowpass port	Highpass port		Common port	Lowpass port	Highpass port
1	0.04	76.19	75.52	46.46	47.21	0.02
3	0.06	66.88	66.28	39.95	40.75	0.02
5	0.08	62.96	62.68	36.55	37.80	0.02
10	0.10	58.76	58.83	31.99	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

## Typical Performance Curves



## 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.



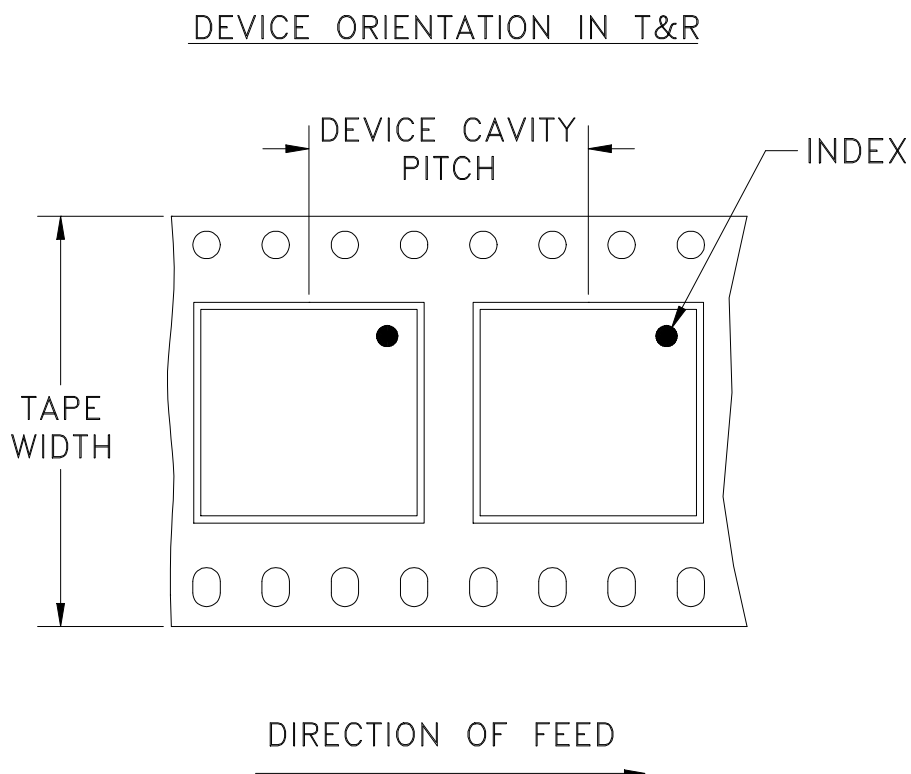
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F80



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

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.

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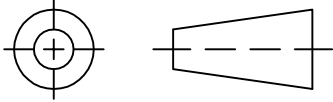
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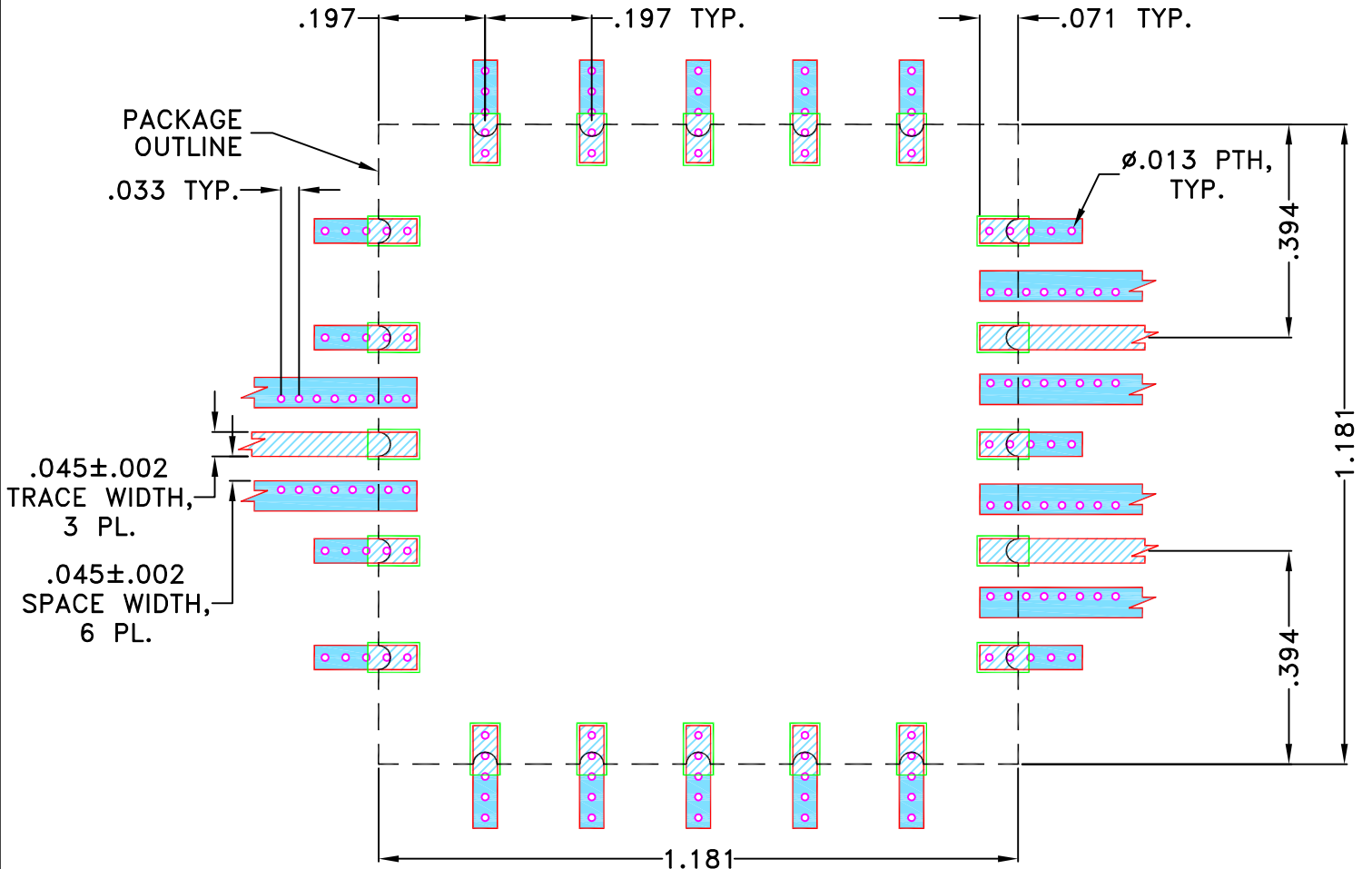
THIRD ANGLE PROJECTION



REVISIONS

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

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



NOTES:

- 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

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN DDR	09 SEP 14
TOLERANCES ON:	CHECKED MD	09 SEP 14
2 PL DECIMALS ±	APPROVED KR	09 SEP 14
3 PL DECIMALS ± .005"		
ANGLES ±		
FRACTIONS ±		



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Brooklyn NY 11235

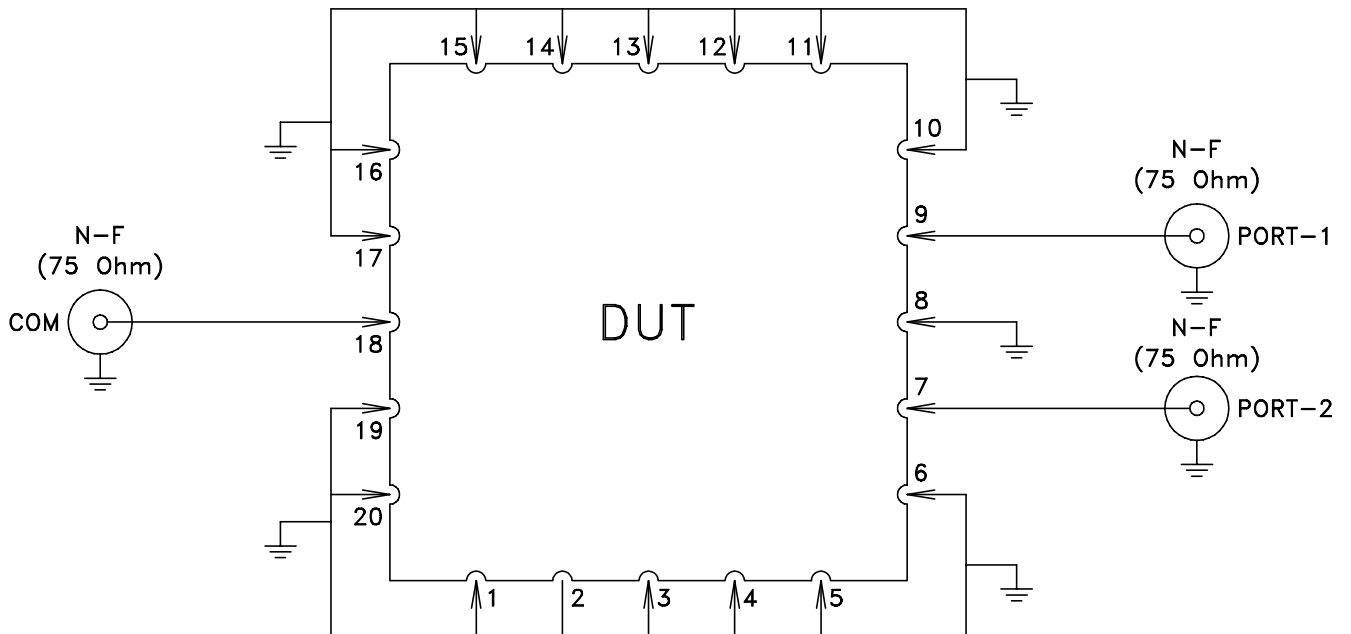
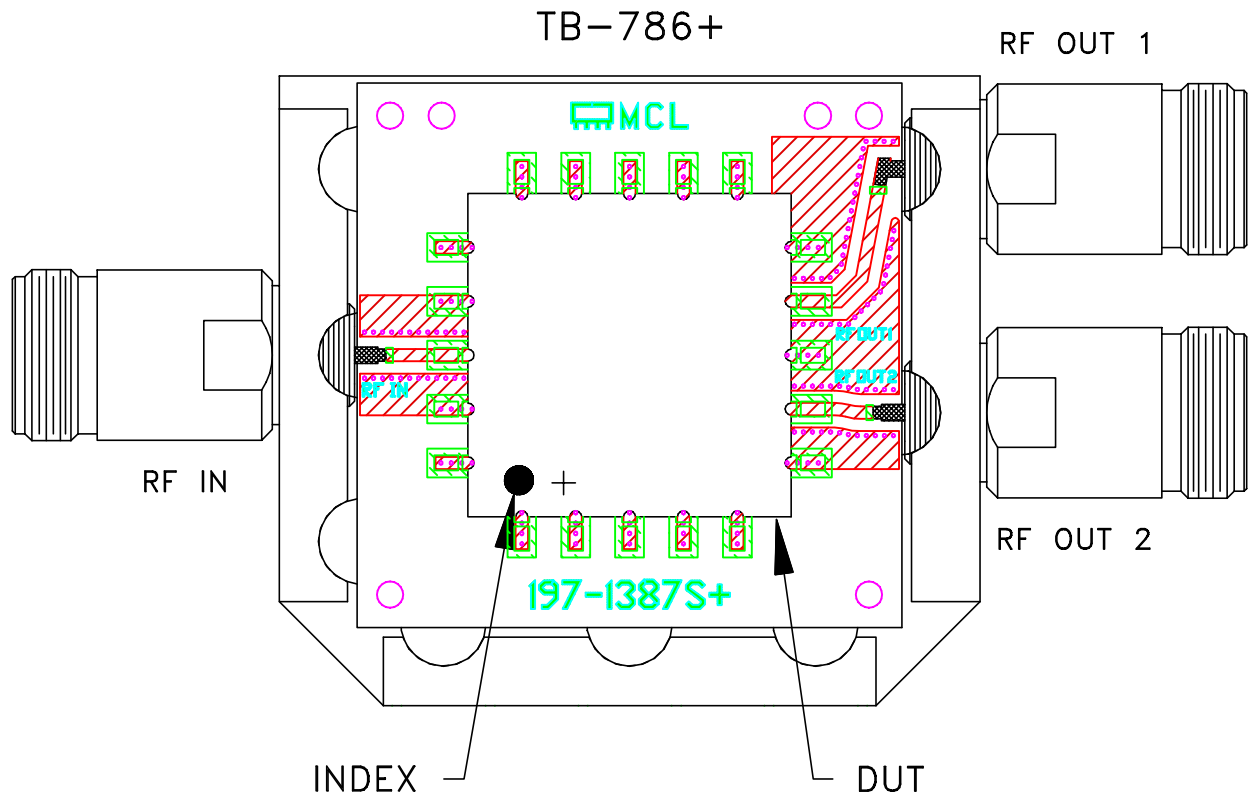
PL, 20DP01, NU1620, NV1998, NZ2001, PA2002, TB-786+, 75 OHM

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-435	REV: OR
FILE: 98PL435	SCALE: 3:1	SHEET: 1 OF 1	

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# Evaluation Board and Circuit



Schematic Diagram

Notes:

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