

Bandpass Filter

50Ω 170 to 185 MHz

Maximum Ratings

Operating Temperature -40°C to 85°C

Storage Temperature -55°C to 100°C

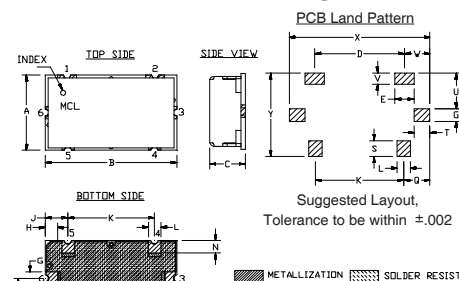
RF Power Input 0.5W Max.

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

Pin Connections

INPUT	1
OUTPUT	2
GROUND	3, 4, 5, 6

Outline Drawing

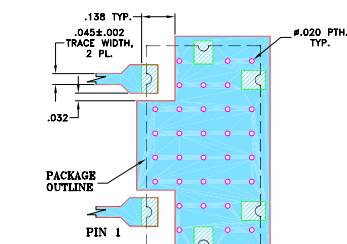


Outline Dimensions (inch mm)

A	B	C	D	E	F	G	H	J	K	L	M
.472"	.826"	.220"	.551"	.118"	.047"	.078"	.076"	.142"	.543"	.078"	.236"
11.99	20.98	5.59	14.00	3.00	1.19	1.98	1.92	3.61	13.79	1.98	5.99
N	P	Q	S	T	U	V	W	X	Y		wt
.079"	.138"	.162"	.098"	.096"	.217"	.067"	.157"	.866"	.512"		grams
2.01	3.51	4.11	2.49	2.44	5.51	1.70	3.99	22.00	13.00		6.0

Note: Please refer to case style drawing for details

Demo Board MCL P/N: TB-400+ Suggested PCB Layout (PL-247)



Features

- Excellent rejection
- Good VSWR, 1.3:1 typ. @ Passband

Applications

- Receivers / Transmitters
- Base station (CDMA 2000)


 Generic photo used for illustration purposes only
 CASE STYLE: HZ1198

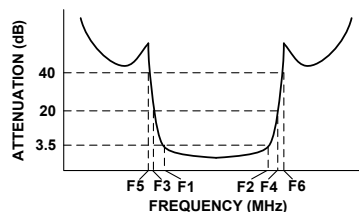
+RoHS Compliant

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

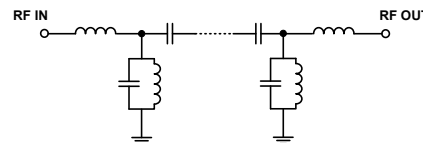
Bandpass Filter Electrical Specifications (T_{AMB} = 25°C)

CENTER FREQ. (MHz)	PASSBAND (MHz) (Loss < 3.5dB) F1 - F2	STOPBANDS (MHz)				VSWR (:1)	
		Loss > 20dB		Loss > 40dB		Passband Max.	Stopband Typ.
177	170 - 185	F3	F4	F5	F6	1.7	30

Typical Frequency Response

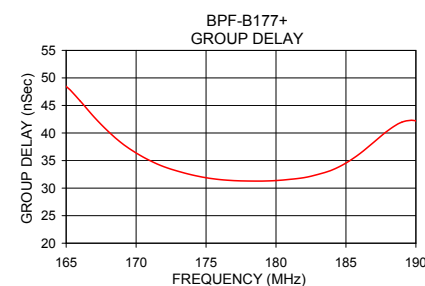
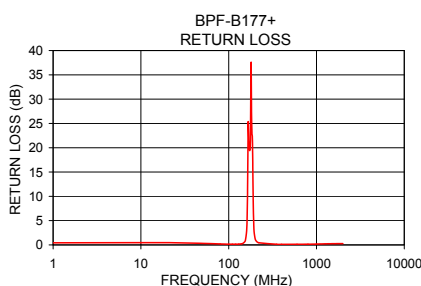
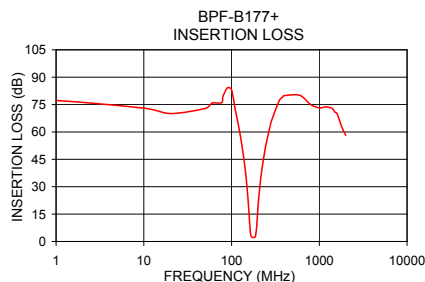


Functional Schematic



Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)	Frequency (MHz)	Group Delay (nsec)
	$\bar{x}$	σ			
1.0	77.26	3.26	0.41	165.0	48.45
135.0	48.61	0.42	0.18	167.0	42.89
150.0	29.67	0.56	0.49	169.0	38.11
159.0	13.44	0.72	2.20	170.0	36.38
163.0	6.08	0.50	7.72	171.0	34.99
170.0	2.42	0.04	20.55	172.0	33.87
177.0	2.17	0.01	21.80	173.0	33.06
185.0	2.46	0.05	22.54	174.0	32.39
191.0	5.06	0.57	7.07	175.0	31.89
194.0	9.27	0.91	3.23	176.0	31.55
199.0	17.13	0.89	1.44	177.0	31.35
210.0	30.18	0.62	0.66	179.0	31.28
240.0	50.00	0.42	0.29	181.0	31.59
400.0	79.86	2.19	0.12	183.0	32.48
900.0	74.08	1.98	0.16	185.0	34.54
1200.0	73.73	1.09	0.21	187.0	38.35
1600.0	69.91	0.85	0.25	188.0	40.44
2000.0	58.16	0.52	0.27	190.0	42.22



Notes

- 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.
- 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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 REV. B
 M174392
 EDR-8063/1BUE1
 BPF-B177+
 URJ/RAV
 190722
 Page 1 of 1

Surface Mount Band Pass Filter

BPF-B177+

Typical Performance Data

FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURNLOSS (dB)		
	@ -40° C	@ +25° C	@ +85° C	@ -40° C	@ +25° C	@ +85° C	@ -40° C	@ +25° C	@ +85° C
0.5	84.39	86.84	87.78	0.32	0.41	0.48	0.30	0.40	0.49
1	85.15	86.44	84.82	0.31	0.40	0.48	0.30	0.40	0.50
3	83.04	90.70	84.38	0.33	0.43	0.51	0.32	0.43	0.52
5	85.80	82.81	81.44	0.34	0.45	0.53	0.34	0.44	0.54
7	77.14	82.41	79.03	0.35	0.45	0.53	0.34	0.45	0.54
10	85.33	74.85	77.21	0.38	0.45	0.54	0.36	0.46	0.55
20	71.10	75.42	74.57	0.40	0.48	0.54	0.38	0.46	0.54
30	73.43	72.91	73.11	0.36	0.43	0.49	0.35	0.42	0.47
40	73.86	73.85	72.25	0.31	0.36	0.39	0.32	0.36	0.41
50	76.06	80.29	75.86	0.28	0.33	0.35	0.27	0.31	0.35
60	76.87	78.32	73.37	0.24	0.27	0.30	0.24	0.28	0.31
70	79.56	79.70	77.18	0.20	0.23	0.25	0.18	0.23	0.26
80	74.49	77.47	77.03	0.18	0.20	0.21	0.15	0.19	0.22
90	84.47	83.27	93.94	0.14	0.17	0.18	0.13	0.16	0.20
100	103.60	89.75	200.00	0.13	0.16	0.18	0.11	0.15	0.18
110	77.13	73.77	75.54	0.12	0.13	0.16	0.11	0.15	0.18
120	63.55	63.81	63.62	0.10	0.14	0.16	0.10	0.14	0.17
130	54.78	54.78	54.28	0.11	0.15	0.18	0.10	0.15	0.18
135	49.46	49.29	49.11	0.13	0.17	0.18	0.13	0.18	0.22
140	44.10	43.80	43.52	0.17	0.21	0.25	0.16	0.22	0.27
150	30.92	30.52	30.15	0.34	0.43	0.51	0.34	0.46	0.55
160	12.65	12.28	11.89	1.78	2.19	2.59	1.93	2.40	2.87
170	2.19	2.54	2.81	42.45	37.13	31.15	22.48	22.00	21.49
177	1.96	2.29	2.55	17.14	17.66	18.15	16.98	17.80	18.57
180	1.96	2.30	2.59	18.38	19.11	19.63	20.86	23.13	25.66
185	2.15	2.56	2.92	18.56	18.96	19.54	24.86	24.22	23.47
190	3.31	4.09	4.83	14.11	12.92	11.79	11.36	10.30	9.46
200	17.52	18.42	19.25	1.37	1.49	1.56	1.22	1.35	1.45
210	29.61	30.19	30.78	0.61	0.70	0.76	0.56	0.67	0.74
220	38.10	38.54	38.98	0.37	0.45	0.49	0.36	0.43	0.50
230	44.68	45.02	45.25	0.27	0.35	0.38	0.27	0.33	0.39
240	50.09	50.25	50.55	0.22	0.28	0.31	0.21	0.28	0.33
250	54.39	54.74	54.84	0.19	0.23	0.27	0.18	0.24	0.29
260	58.53	58.36	58.64	0.17	0.22	0.25	0.14	0.20	0.24
270	61.20	61.54	62.49	0.14	0.19	0.21	0.12	0.18	0.22
300	70.10	70.80	69.88	0.11	0.16	0.18	0.07	0.14	0.18
350	80.43	78.61	80.26	0.09	0.12	0.16	0.05	0.12	0.15
400	78.51	80.27	78.37	0.08	0.12	0.15	0.04	0.11	0.15
450	79.11	86.43	82.96	0.06	0.11	0.13	0.04	0.11	0.16
500	92.82	77.87	80.51	0.07	0.12	0.14	0.03	0.13	0.16
600	86.27	81.37	75.43	0.09	0.15	0.16	0.05	0.14	0.19
700	80.82	86.32	77.71	0.10	0.18	0.20	0.06	0.17	0.22
800	77.19	79.39	81.66	0.12	0.19	0.21	0.09	0.21	0.25
900	76.82	83.11	76.61	0.15	0.20	0.23	0.10	0.22	0.28
1000	80.82	74.08	78.01	0.16	0.23	0.26	0.11	0.23	0.30
1100	76.41	76.73	75.82	0.19	0.26	0.28	0.12	0.26	0.32
1200	75.16	75.37	77.23	0.18	0.26	0.30	0.13	0.27	0.35
1300	79.03	74.24	79.52	0.19	0.27	0.30	0.12	0.27	0.35
1400	79.28	73.41	78.13	0.19	0.27	0.30	0.12	0.28	0.36
1500	79.34	73.67	78.39	0.20	0.28	0.32	0.12	0.29	0.36
1600	68.15	71.83	67.06	0.18	0.27	0.31	0.13	0.29	0.38
1700	66.31	67.75	66.89	0.18	0.28	0.32	0.11	0.30	0.38
1800	72.59	63.44	72.69	0.17	0.27	0.32	0.10	0.30	0.39
1900	49.97	59.19	49.17	0.19	0.27	0.34	0.12	0.29	0.42
2000	57.74	57.00	57.34	0.17	0.27	0.33	0.06	0.28	0.39

REV. X1

BPF-B177+

081217

Page 1 of 2



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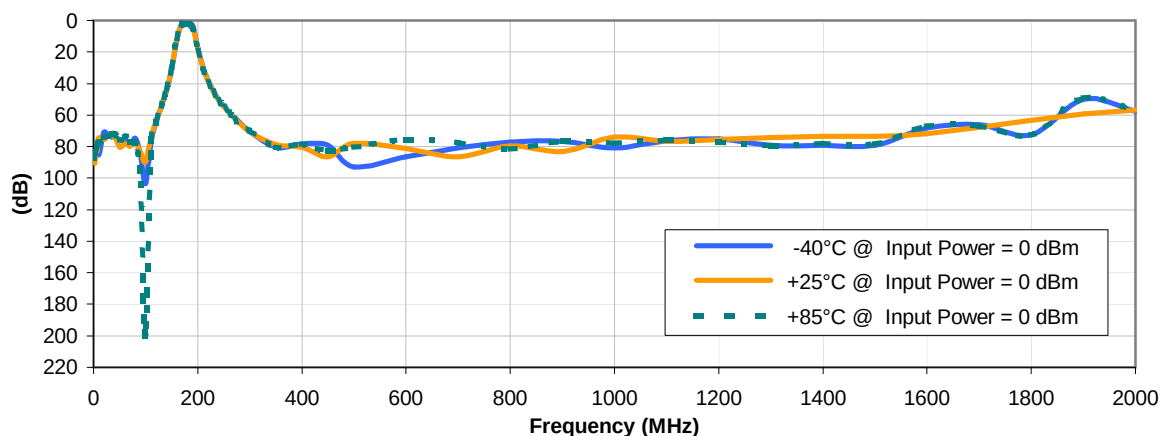


Typical Performance Data

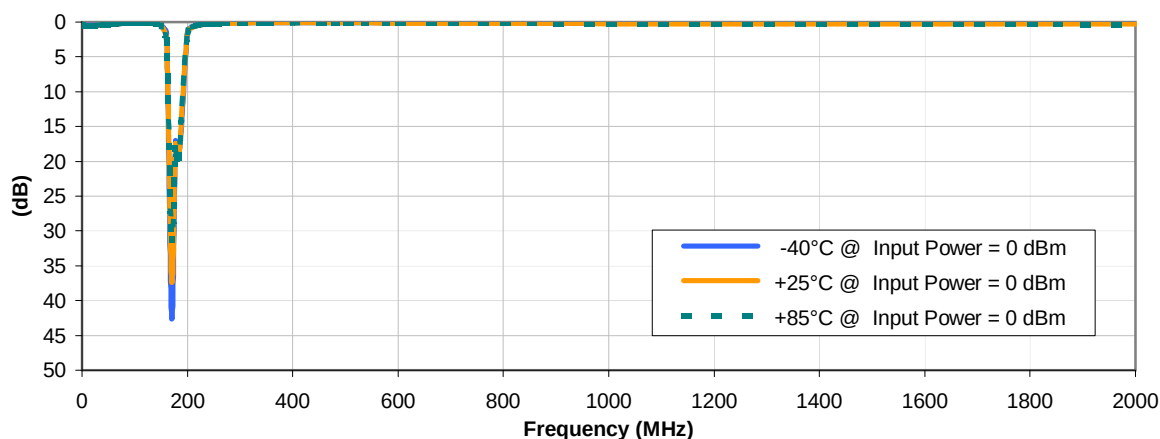
FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
160	30.24	31.99	33.36
162	41.47	42.56	43.60
163	46.67	46.95	47.24
164	50.05	49.56	49.01
165	51.15	49.95	48.77
166	49.61	48.18	46.95
167	47.04	45.52	44.32
168	43.95	42.73	41.86
170	38.88	38.35	37.89
172	35.89	35.46	35.16
174	33.83	33.58	33.48
176	32.59	32.53	32.57
177	32.21	32.31	32.30
178	32.13	32.23	32.31
179	32.05	32.28	32.38
180	32.19	32.40	32.51
181	32.42	32.59	32.77
183	33.14	33.19	33.68
185	34.62	35.16	35.71
187	37.66	38.34	39.11
188	39.67	40.21	40.75
189	41.78	42.03	41.99
190	43.11	42.51	41.77
191	42.91	41.57	40.21
193	38.31	35.88	33.90
195	30.20	28.09	26.31
197	22.65	21.28	20.06
199	17.17	16.35	15.57
200	14.79	14.22	13.53

Typical Performance Curves

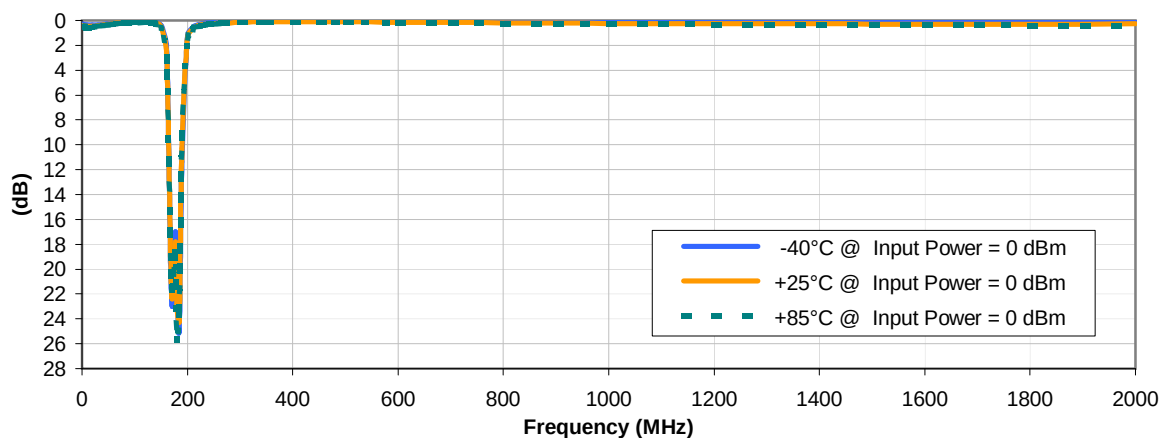
INSERTION LOSS vs. TEMPERATURE



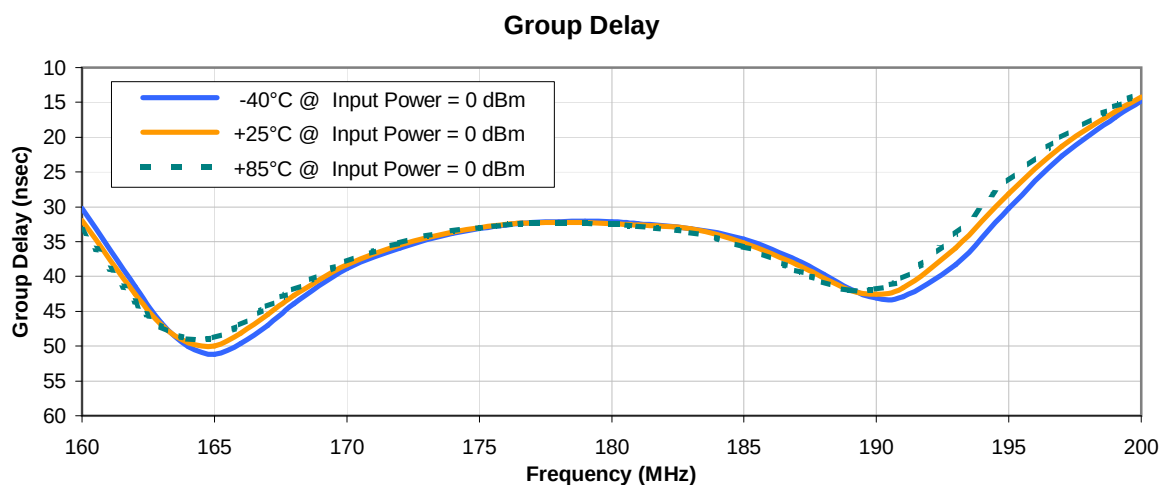
INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE



Typical Performance Curves

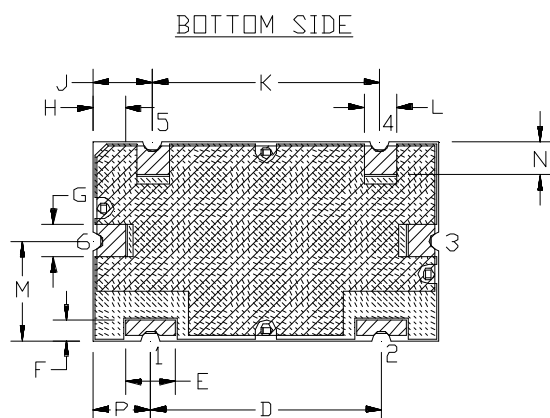
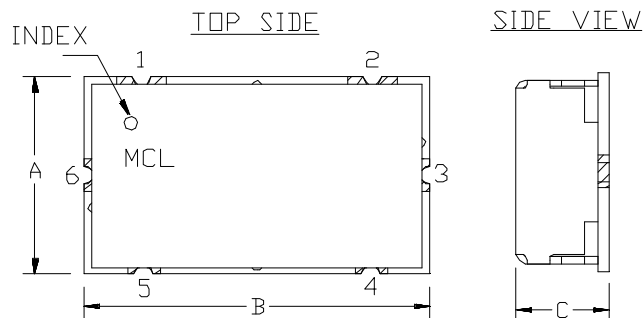


Case Style

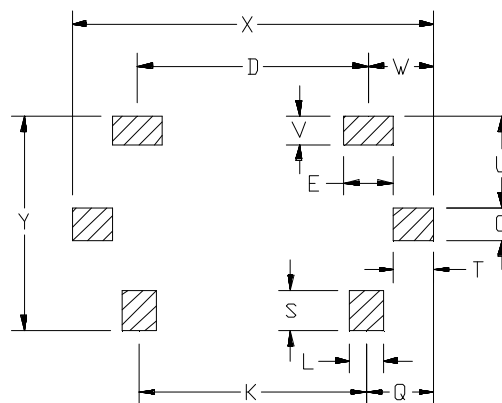
HZ

Outline Dimensions

HZ1198



PCB Land Pattern



 METALLIZATION  SOLDER RESIST

Suggested Layout,
Tolerance to be within $\pm .002$

CASE #	A	B	C	D	E	F	G	H	J	K	L	M
HZ1198	.472" (11.99)	.826" (20.98)	.220" (5.59)	.551" (14.00)	.118" (3.00)	.047" (1.19)	.078" (1.98)	.076" (1.92)	.142" (3.61)	.543" (13.79)	.078" (1.98)	.236" (5.99)

CASE #	N	P	Q	S	T	U	V	W	X	Y	WT GRAMS	NOTES
HZ1198	.079" (2.01)	.138" (3.51)	.162" (4.11)	.098" (2.49)	.096" (2.44)	.217" (5.51)	.067" (1.70)	.157" (3.99)	.866" (22.00)	.512" (13.00)	6.0	A35

Dimensions are in inches (mm). Tolerances: 2PL. +/- .03; 3PL. +/- .015

Notes:

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

For RoHS Case Styles: 3-5 μ inch (.08-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
For RoHS-5 Case Styles: Tin-Lead plate.

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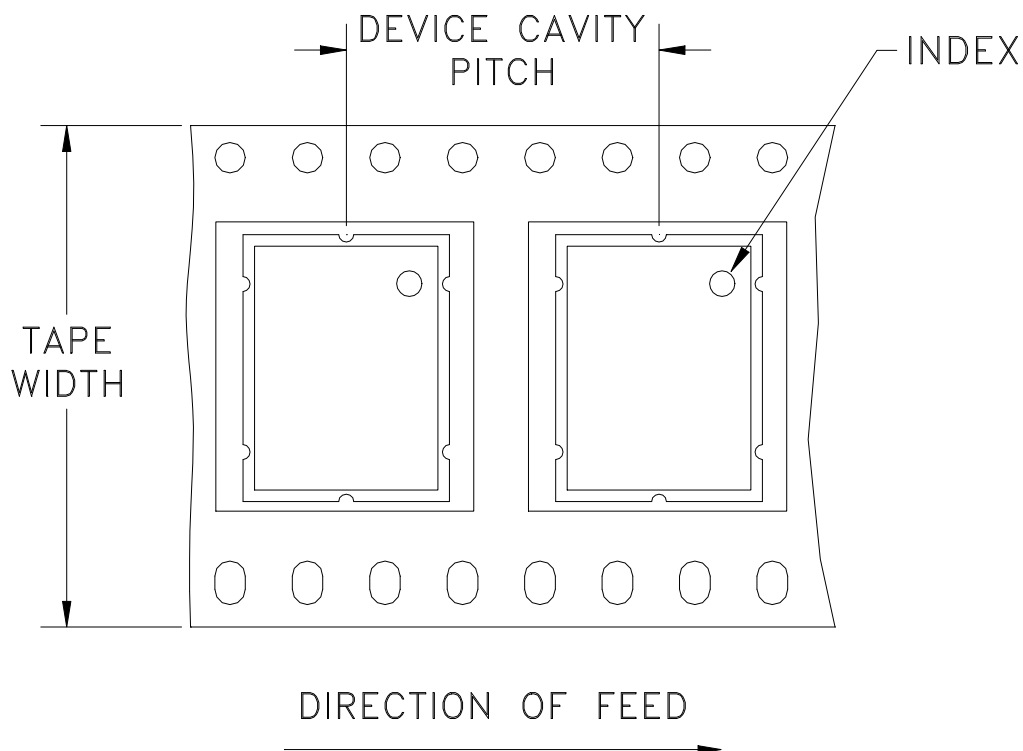


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Tape & Reel Packaging TR-F6

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
32	16	13	500

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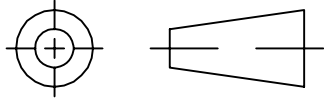
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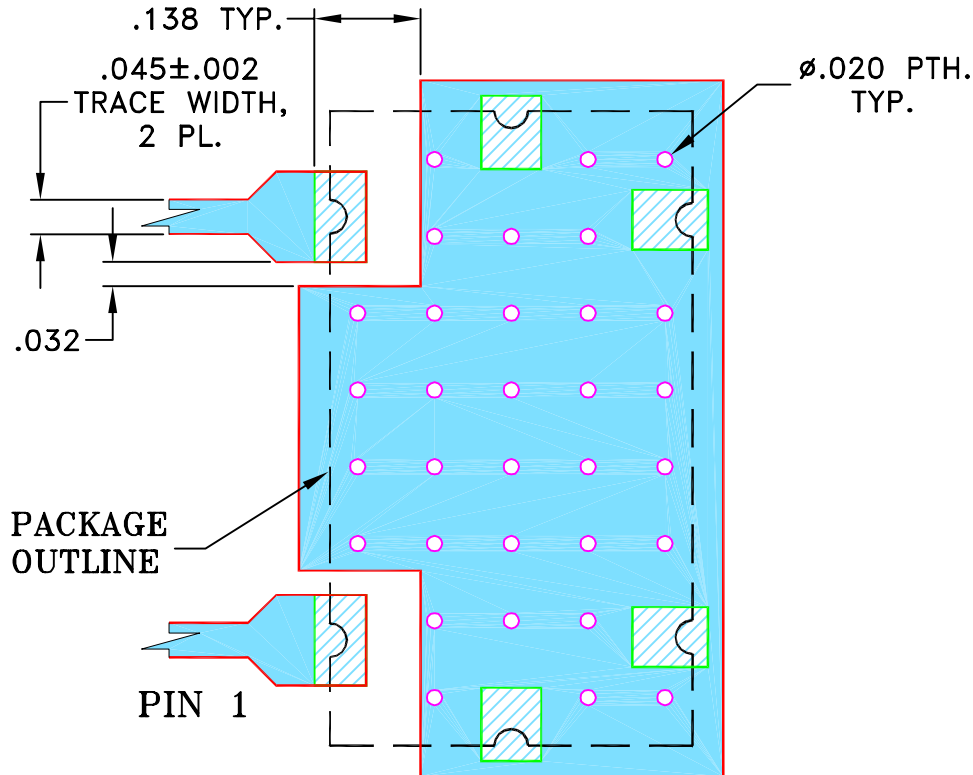
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M107879	NEW RELEASE (FROM RAVON)	11/06	DK	HH
OR	R66100	NEW RELEASE (FROM RAVON)	11/06	DK	HH

**SUGGESTED MOUNTING CONFIGURATION FOR
HZ1198 CASE STYLE, "rg" PIN CONNECTION, 50 Ω**

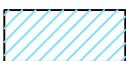


NOTES:

- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS $.025 \pm .002$ ". 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 ±

3 PL DECIMALS ± .005

ANGLES ±

FRACTIONS ±

DRAWN

DK (RAVON)

14 NOV 06

CHECKED

RZ (RAVON)

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APPROVED

HH (RAVON)

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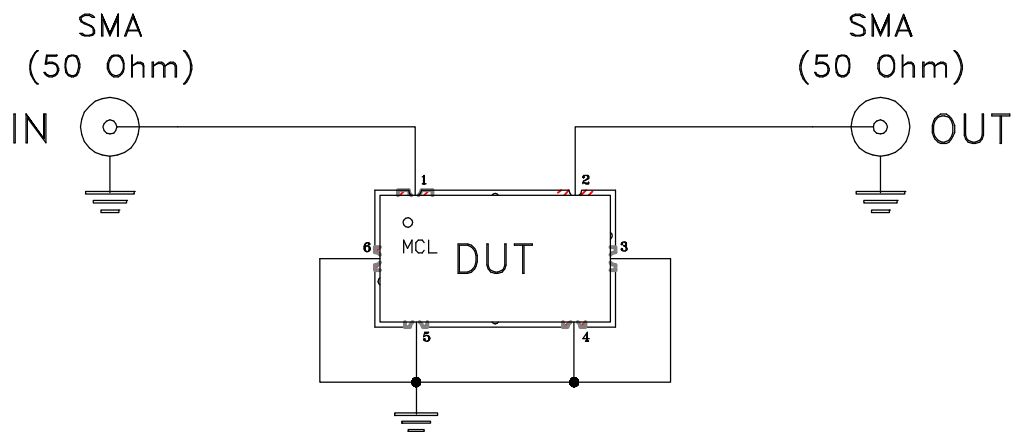
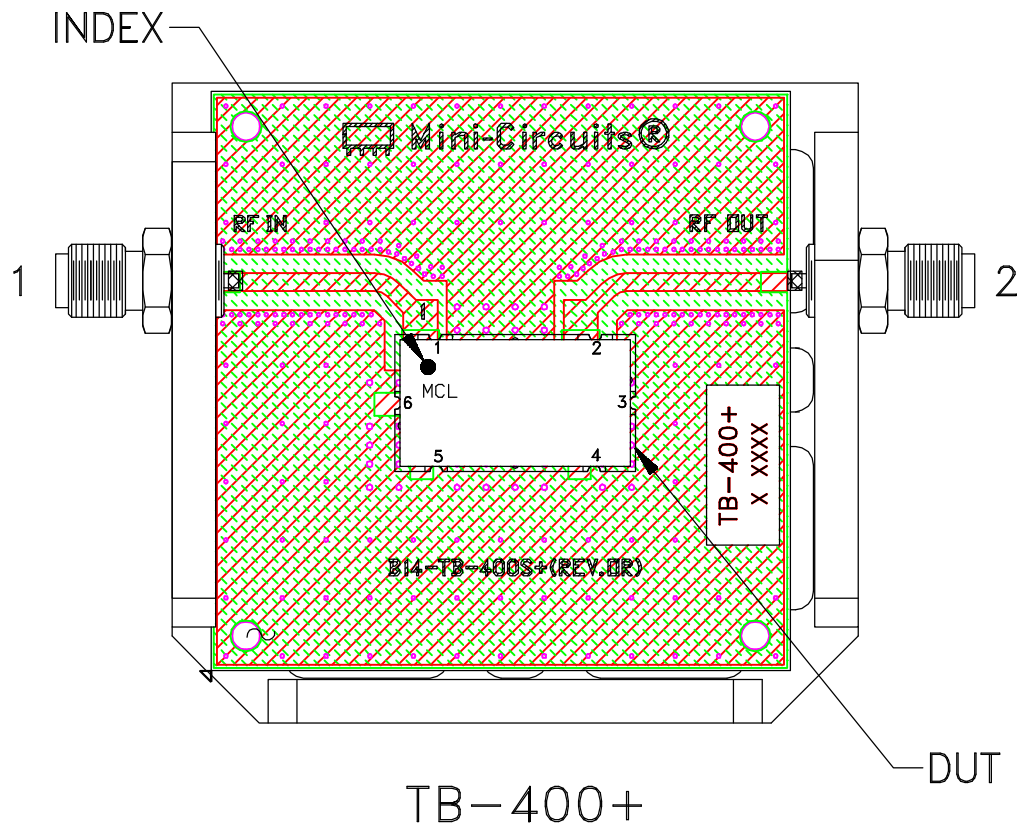
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SHEET:

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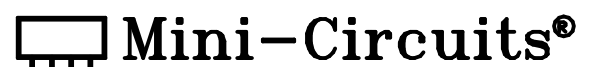
Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350 or equivalent.
Dielectric Constant=3.5, Thickness=.030 inch.





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	-65° to 150° C Ambient Environment	Individual Model Data Sheet
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102-C, Condition C
Temperature Cycling	-65° to 150°C, 100 cycles	JESD22-A104
Temperature Humidity	85°C/ 85% RH, 168 hours	JESD22-113
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 240°C peak (Non-RoHS) or 260°C (RoHS)	J-STD-020
Solderability	10X magnification, 95% coverage	JESD22-B102, Method 1: Dip and Look Test
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
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