

# Bandpass Filter

# BPF-A122+

50Ω 119 to 125 MHz

### Maximum Ratings

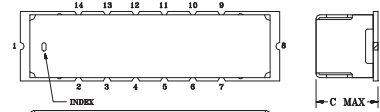
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input*	0.5W at 25°C

\*Passband rating, derate linearly to 0.25W at 100°C ambient. Permanent damage may occur if any of these limits are exceeded.

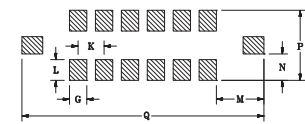
### Pin Connections

RF IN	1
RF OUT	8
GROUND	2,3,4,5,6,7,9,10,11,12,13,14

### Outline Drawing



### PCB Land Pattern



Suggested Layout  
Tolerance to be within ±.002

- METALLIZATION
- SOLDER RESIST

### Outline Dimensions (inch/mm)

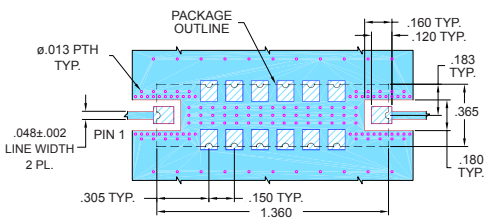
A	B	C	D	E	F	G	H
.365	1.360	.35	.100	.180	.140	.100	.100
9.27	34.54	8.89	2.54	4.57	3.56	2.54	2.54

J	K	L	M	N	P	Q	Wt.
.305	.150	.120	.275	.152	.405	1.400	grams
7.75	3.81	3.05	6.99	3.86	10.29	35.56	4.0

Note: Please refer to case style drawing for details

### Demo Board MCL P/N: TB-363+ Suggested PCB Layout(PL-227)



- NOTES:
- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS: .025" ± .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 SOLDER MASK

### Features

- Good VSWR, 1.3:1 typ @ passband
- High stop band rejection

### Application

- Harmonic rejection
- Transmitters/receivers



Generic photo used for illustration purposes only  
CASE STYLE: HQ1157

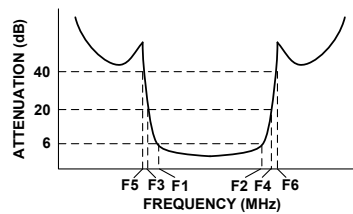
### +RoHS Compliant

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

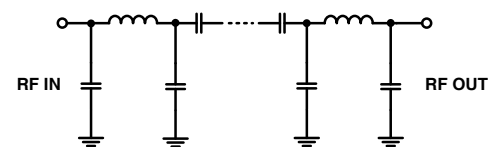
### Bandpass Filter Electrical Specifications (T<sub>AMB</sub> = 25°C)

CENTER FREQ. (MHz)	PASSBAND (MHz) (Loss < 6dB) F1 - F2	STOPBANDS (MHz)		VSWR (:1)	
		Loss > 20dB F3 F4	Loss > 40dB F5 F6	Passband Max.	Stopband Typ.
122	119 - 125	111 132	105 137 - 500	1.6	20

### Typical Frequency Response

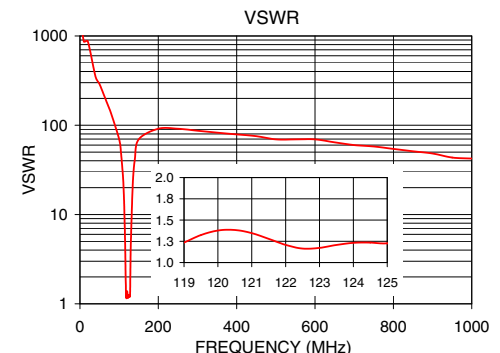
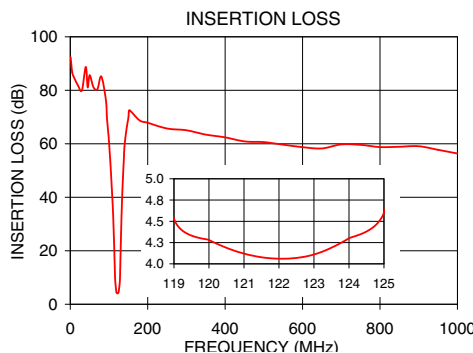


### Functional Schematic



### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1	92.37	1737.18
85	81.88	124.09
100	60.85	69.49
105	49.55	48.26
108	42.04	35.46
111	31.87	21.46
114	18.58	8.72
116	9.21	2.94
119	4.53	1.24
122	4.06	1.16
125	4.60	1.23
127	6.21	1.19
129	13.29	2.69
132	30.67	11.61
134	39.84	19.11
137	50.38	29.96
141	59.83	44.55
500	60.64	69.49



### 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.
- The parts covered by this specification document are subject to Mini-Circuit's 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-Circuit's website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



# Surface Mount Band Pass Filter

# BPF-A122+

## 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	91.81	98.03	88.21	0.01	0.01	0.01	0.01	0.01	0.01
1	95.33	98.28	95.57	0.00	0.00	0.00	0.00	0.00	0.00
10	99.14	97.19	108.30	0.00	0.01	0.01	0.01	0.01	0.01
20	111.30	89.59	94.09	0.01	0.01	0.02	0.00	0.02	0.03
30	95.68	97.66	88.73	0.02	0.03	0.03	0.01	0.03	0.06
40	89.76	95.44	98.62	0.03	0.04	0.05	0.02	0.05	0.08
50	93.91	91.67	94.56	0.04	0.05	0.07	0.04	0.06	0.10
60	94.70	93.86	97.62	0.05	0.06	0.08	0.05	0.07	0.11
70	90.86	100.69	87.92	0.06	0.08	0.10	0.06	0.08	0.12
80	83.54	82.60	80.63	0.08	0.09	0.12	0.07	0.10	0.13
90	73.15	72.53	72.54	0.11	0.13	0.16	0.10	0.13	0.17
100	58.83	58.72	58.47	0.17	0.21	0.25	0.17	0.21	0.26
105	49.16	48.90	48.45	0.26	0.31	0.37	0.27	0.33	0.40
110	35.44	34.90	34.37	0.52	0.63	0.74	0.56	0.69	0.83
111	31.90	31.31	30.73	0.63	0.77	0.92	0.69	0.86	1.03
115	13.35	12.80	12.32	2.80	3.54	4.38	3.30	4.27	5.37
116	8.39	8.27	8.24	5.80	7.21	8.72	7.02	9.04	11.23
117	5.30	5.66	6.00	12.68	14.75	17.07	16.72	21.32	27.09
118	4.09	4.61	5.08	25.31	30.32	35.05	28.35	26.00	23.96
119	3.66	4.20	4.70	24.80	22.28	20.16	20.37	19.24	18.37
120	3.50	4.04	4.53	16.85	16.43	16.12	16.33	16.09	16.02
121	3.43	3.95	4.44	15.21	15.59	16.07	15.50	16.05	16.76
122	3.35	3.89	4.40	17.06	17.82	18.46	18.53	19.91	21.18
123	3.34	3.92	4.48	20.38	19.85	18.99	27.29	25.20	22.42
124	3.46	4.07	4.67	18.43	17.77	17.15	20.40	19.11	17.89
125	3.65	4.31	4.96	17.26	17.61	17.92	17.42	17.51	17.32
126	3.91	4.65	5.39	20.48	21.64	22.66	19.60	20.26	20.00
127	4.38	5.30	6.22	27.32	27.56	27.98	23.53	21.48	19.37
128	5.42	6.71	8.03	32.83	24.14	19.62	16.33	14.03	12.38
129	8.17	10.09	11.92	10.98	9.50	8.49	7.92	6.88	6.23
130	13.56	15.68	17.59	4.64	4.44	4.30	3.53	3.38	3.31
131	19.89	21.79	23.52	2.47	2.54	2.62	1.92	2.00	2.08
132	25.85	27.50	29.03	1.59	1.70	1.82	1.26	1.37	1.49
137	47.92	48.90	49.89	0.50	0.57	0.67	0.43	0.51	0.60
140	57.11	57.82	58.64	0.35	0.40	0.48	0.30	0.37	0.45
150	74.70	74.52	74.95	0.18	0.22	0.27	0.16	0.20	0.27
160	78.80	79.63	79.01	0.14	0.17	0.22	0.11	0.16	0.22
170	79.44	79.30	79.58	0.13	0.15	0.20	0.09	0.14	0.20
180	79.56	78.93	79.84	0.12	0.14	0.19	0.09	0.13	0.19
190	79.93	81.07	80.06	0.12	0.14	0.19	0.08	0.13	0.18
200	78.45	77.52	80.28	0.11	0.14	0.18	0.08	0.12	0.17
210	77.85	77.81	77.87	0.11	0.14	0.18	0.08	0.12	0.17
220	77.10	78.22	76.51	0.12	0.14	0.19	0.08	0.12	0.17
230	76.95	76.74	77.03	0.12	0.14	0.18	0.08	0.12	0.17
240	76.08	77.55	76.19	0.12	0.14	0.19	0.07	0.12	0.17
250	77.29	75.15	76.96	0.12	0.14	0.19	0.08	0.12	0.17
260	75.98	76.22	76.67	0.12	0.15	0.19	0.08	0.13	0.18
270	75.30	76.27	75.67	0.12	0.15	0.19	0.08	0.13	0.18
280	75.57	77.69	75.98	0.12	0.15	0.19	0.07	0.13	0.18
290	76.63	74.97	75.86	0.12	0.15	0.19	0.08	0.13	0.18
300	76.25	74.70	75.30	0.13	0.15	0.20	0.08	0.13	0.18
350	74.26	73.88	74.34	0.13	0.16	0.21	0.08	0.14	0.19
400	72.02	72.74	71.41	0.15	0.17	0.22	0.09	0.14	0.20
450	71.29	70.35	71.21	0.15	0.18	0.22	0.09	0.15	0.21
500	71.47	71.55	72.05	0.15	0.19	0.23	0.09	0.16	0.22

REV. X1

BPF-A122+

090308

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# Surface Mount Band Pass Filter

# BPF-A122+

## Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
115.0	81.84	88.38	94.28
115.2	92.77	99.14	104.47
115.4	101.62	107.49	111.91
115.5	105.28	110.71	114.57
115.8	116.21	119.82	121.6
116.0	122.78	124.62	124.9
116.2	128.08	128.14	126.8
116.4	131.65	130.05	127.52
116.5	133.12	130.55	127.43
116.8	134.25	129.9	125.63
117.0	133.3	128.21	123.73
117.2	131.17	125.86	121.37
117.4	128.37	123.13	118.88
117.5	126.81	121.66	117.58
117.8	121.85	117.40	113.68
118.0	118.60	114.58	111.31
118.2	115.55	112.10	109.08
118.4	112.82	109.73	107.04
118.5	111.53	108.55	106.03
118.7	109.16	106.64	104.32
118.8	107.98	105.48	103.38
119.0	105.97	103.75	101.82
119.2	104.07	102.11	100.42
119.4	102.32	100.48	99.01
119.5	101.51	99.88	98.41
119.7	99.94	98.51	97.28
119.8	99.17	97.82	96.74
120.0	98.01	96.82	95.86
120.2	96.81	95.81	95.14
120.4	95.76	95.06	94.56
120.5	95.28	94.70	94.29
120.7	94.38	94.13	93.92
120.8	94.09	93.85	93.73
121.0	93.79	93.62	93.64
121.2	93.27	93.33	93.43
121.4	93.20	93.30	93.50
121.5	93.11	93.41	93.54
121.7	93.09	93.37	93.63
121.8	93.16	93.44	93.80
122.0	93.33	93.66	93.97
122.2	93.72	93.89	94.30
122.4	93.83	94.21	94.50
122.8	94.48	94.73	94.93
123.0	94.81	95.05	95.27
123.2	95.02	95.34	95.55
123.4	95.20	95.54	95.78
123.5	95.42	95.77	95.98
123.8	95.76	96.19	96.51
124.0	96.23	96.73	97.22
124.2	96.67	97.29	97.99
124.4	97.13	97.97	98.83
124.5	97.45	98.47	99.37
124.8	98.60	99.82	101.02
125.0	99.58	100.89	102.24

REV. X1  
BPF-A122+  
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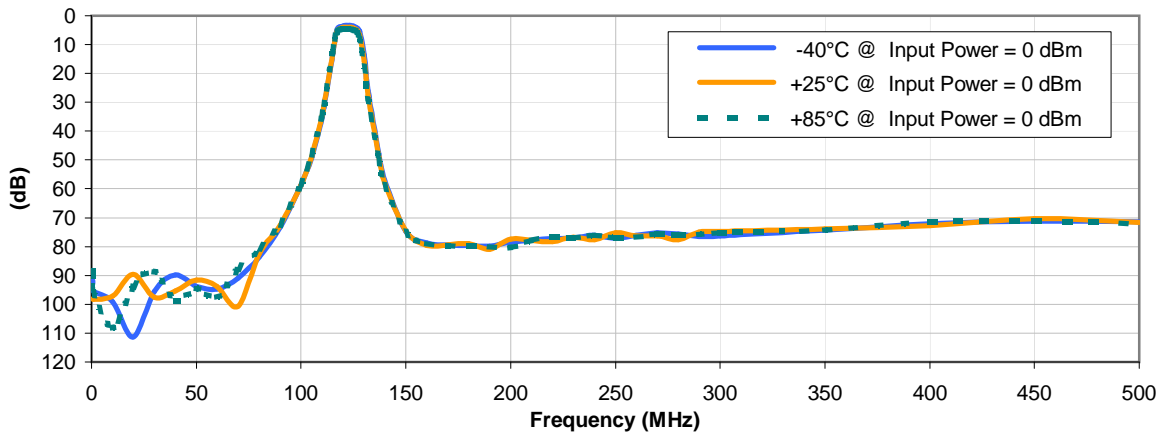


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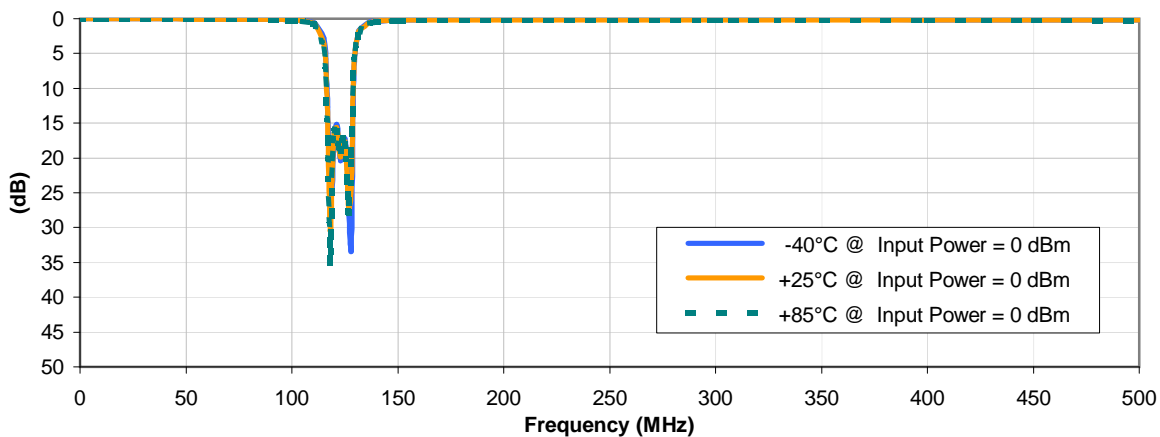


## Typical Performance Curves

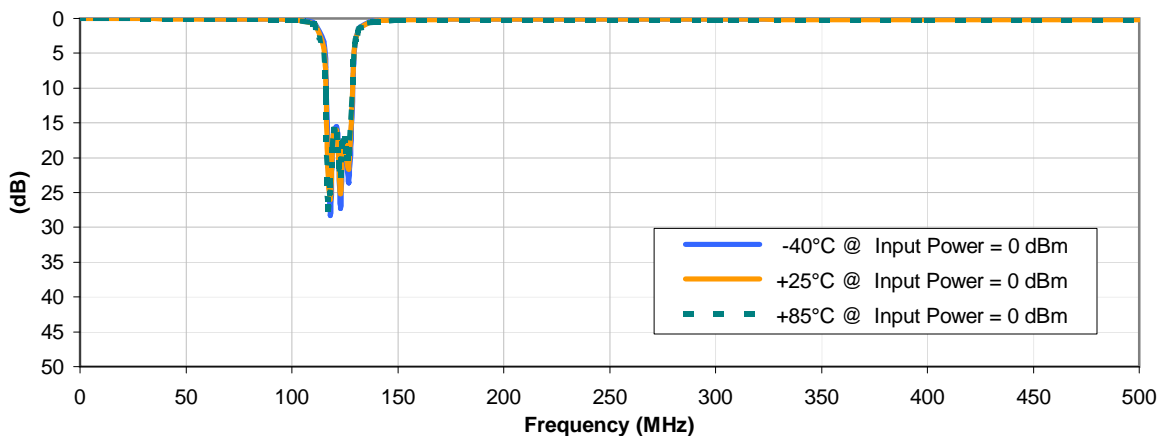
### INSERTION LOSS vs. TEMPERATURE



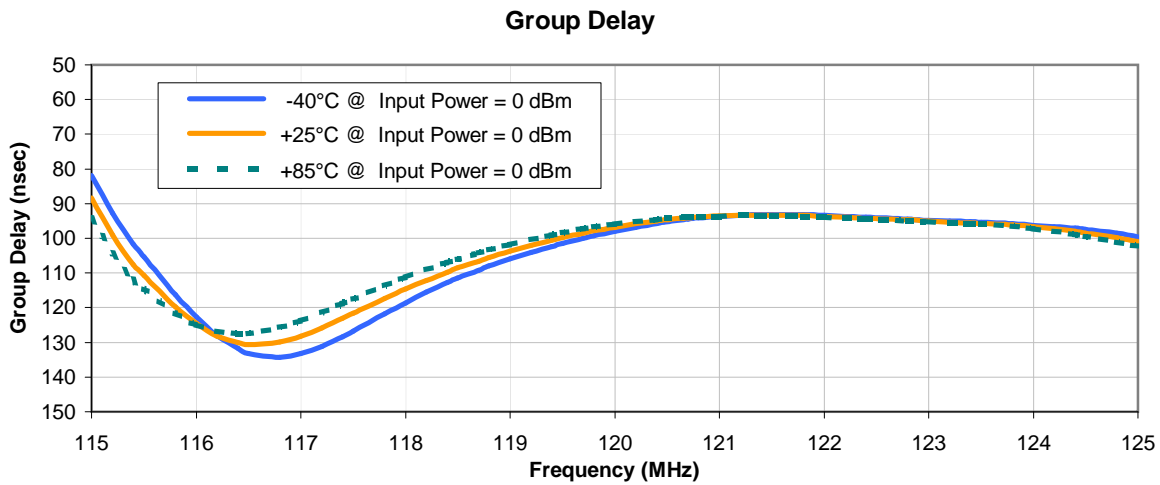
### INPUT RETURN LOSS vs. TEMPERATURE



### OUTPUT RETURN LOSS vs. TEMPERATURE



## Typical Performance Curves



# Case Style

# HQ

## Outline Dimensions

## HQ1157



CASE#	A	B	C	D	E	F	G	H	J	K	L	M
HQ1157	.365 (9.27)	1.360 (34.54)	.350 (8.89)	.100 (2.54)	.180 (4.57)	.140 (3.56)	.100 (2.54)	.100 (2.54)	.305 (7.75)	.150 (3.81)	.120 (3.05)	.275 (6.99)

CASE#	N	P	Q	WT.GRAM
HQ1157	.152 (3.87)	.405 (10.29)	1.400 (35.56)	4.0

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

### Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- 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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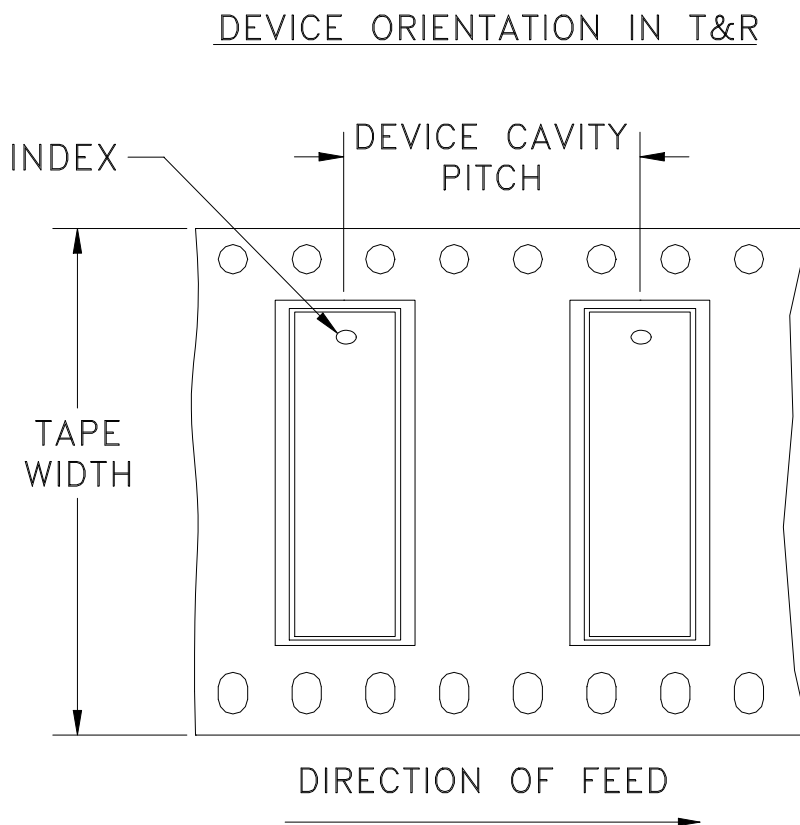
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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F83



<b>Tape Width, mm</b>	<b>Device Cavity Pitch, mm</b>	<b>Reel Size, inches</b>	<b>Devices per Reel</b>
56	16	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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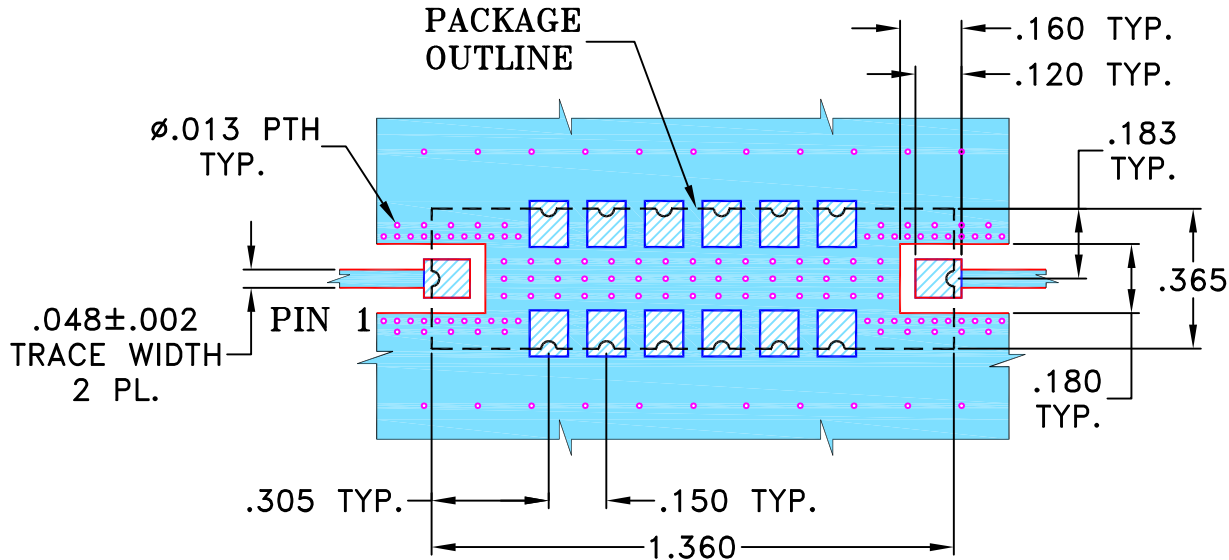
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M101212	NEW RELEASE (FROM RAVON)	11/05	DK	YB
A	M108938	SWITCH HATCHES	12/06	DK	HH
B	M118075	CHANGE LINE PLACES	06/08	HB	HH
C	M173459	CORRECTED CASE STYLE & TB PART#	03/27/19	ITG	IL

**SUGGESTED MOUNTING CONFIGURATION  
FOR HQ1157 CASE STYLE, rf PIN CONNECTION**



**NOTE:**

- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .025" ± .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	HB (RAVON)	12 JUN 2008
	CHECKED	RZ (RAVON)	12 JUN 2008
	APPROVED	HH (RAVON)	12 JUN 2008

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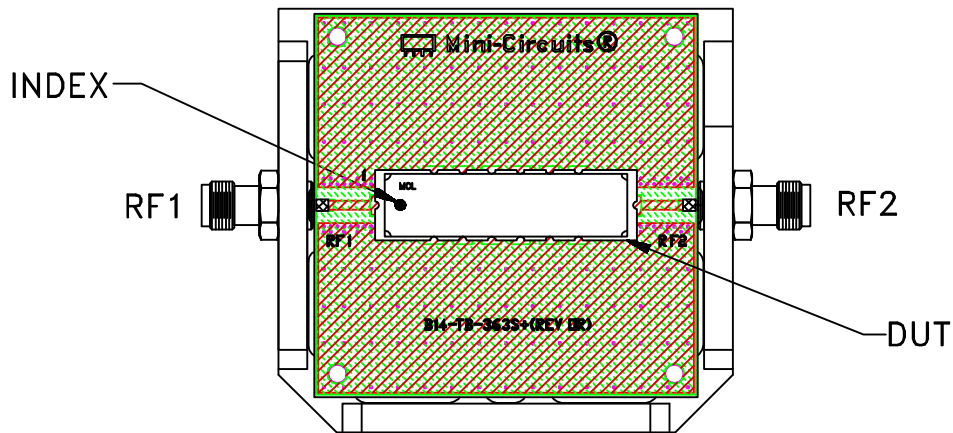
**PL, rf, HQ1157, TB-363+, 50 OHM**

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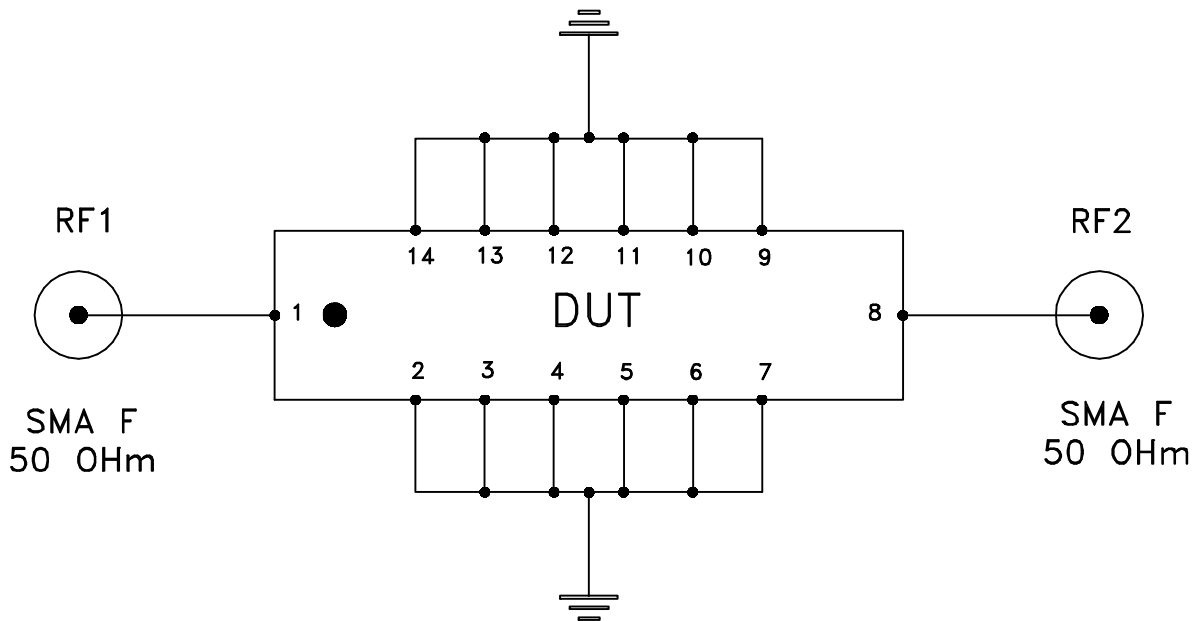
SIZE <b>A</b>	CODE IDENT <b>15542</b>	DRAWING NO: <b>98-PL-227</b>	REV: <b>C</b>
FILE: <b>98PL227</b>	SCALE: <b>2:1</b>	SHEET: <b>1 OF 1</b>	



# Evaluation Board and Circuit



TB-363+



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	-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