

# Bandpass Filter

## BPF-A127+

50Ω 118 to 137 MHz

### Maximum Ratings

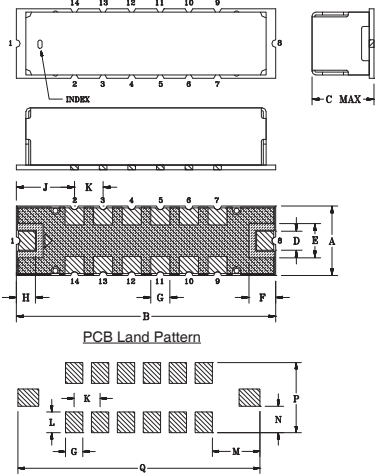
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input*	0.5W at 25°C

\*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



Suggested Layout  
Tolerance to be within ±.002

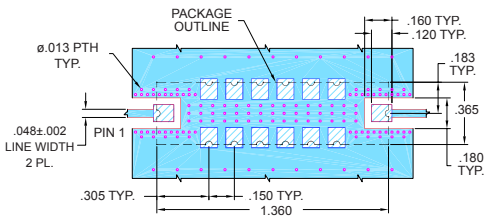
- METALLIZATION
- SOLDER RESIST

### 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

#### 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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### Features

- High rejection
- Good VSWR, 1.3:1 typ @ passband
- Shielded case
- Aqueous washable

### Applications

- Military communications
- Harmonic rejection
- Transmitters/receivers



Generic photo used for illustration purposes only

CASE STYLE: HQ1157

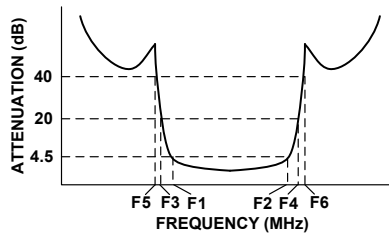
### +RoHS Compliant

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

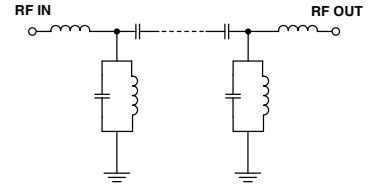
### Bandpass Filter Electrical Specifications (T<sub>AMB</sub> = 25°C)

CENTER FREQ. (MHz)	PASSBAND (MHz) (Loss < 4.5dB)	STOPBANDS (MHz)				VSWR (:1)		
		Loss > 20dB		Loss > 40dB		Passband		Stopband
F <sub>c</sub>	F <sub>1</sub> - F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	F <sub>5</sub>	F <sub>6</sub>	Typ.	Max.	Typ.
127	118 - 137	105	155	95	180 - 2200	1.3	1.7	20

### Typical Frequency Response

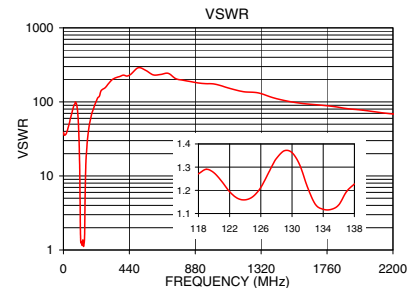


### Functional Schematic



### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1	80.41	38.14
95	55.33	73.96
105	32.61	26.93
110	17.37	8.08
113	8.51	2.15
115	4.29	1.38
118	2.95	1.27
123	2.43	1.17
127	2.40	1.28
130	2.39	1.36
137	2.75	1.19
140	3.38	1.34
142	6.66	1.74
145	11.58	5.39
155	30.62	22.13
180	54.67	57.07
700	92.48	243.05
2200	55.19	68.65



# Surface Mount Band Pass Filter

# BPF-A127+

## 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	102.66	90.99	94.19	0.32	0.41	0.51	0.31	0.42	0.50
1	91.70	92.75	97.54	0.31	0.42	0.51	0.32	0.42	0.52
5	97.71	94.80	94.75	0.35	0.45	0.53	0.35	0.45	0.54
10	92.26	92.18	94.01	0.37	0.48	0.56	0.36	0.46	0.56
20	81.96	81.20	91.61	0.38	0.46	0.51	0.38	0.46	0.52
30	90.47	91.73	87.37	0.34	0.40	0.45	0.33	0.39	0.44
40	91.34	92.68	87.66	0.29	0.34	0.37	0.29	0.34	0.37
50	94.45	94.48	92.09	0.25	0.29	0.31	0.24	0.27	0.31
60	90.80	86.02	94.15	0.20	0.24	0.27	0.20	0.24	0.28
70	85.34	111.02	84.71	0.18	0.21	0.24	0.15	0.20	0.23
80	81.38	79.48	78.27	0.17	0.20	0.23	0.13	0.18	0.22
90	64.11	63.49	63.79	0.18	0.23	0.26	0.15	0.21	0.26
95	55.08	54.40	53.94	0.21	0.28	0.30	0.19	0.26	0.31
100	44.53	43.92	43.51	0.29	0.39	0.43	0.29	0.37	0.44
105	32.03	31.32	30.90	0.53	0.72	0.78	0.54	0.68	0.79
110	15.98	15.32	14.87	1.70	2.25	2.55	1.76	2.20	2.56
113	5.99	6.01	5.98	7.34	8.90	10.22	7.65	9.28	10.77
115	3.24	3.63	3.84	21.50	22.99	25.43	26.36	35.04	36.17
118	2.41	2.80	3.03	25.40	24.73	24.13	20.98	19.18	19.14
120	2.26	2.61	2.84	17.36	17.81	17.68	16.62	16.62	16.57
123	2.09	2.41	2.63	16.18	17.75	17.67	16.82	18.43	18.48
127	1.96	2.31	2.54	20.20	20.16	19.88	26.54	22.67	22.56
130	2.03	2.38	2.61	15.85	16.44	16.63	16.72	17.05	17.19
137	2.38	2.86	3.20	20.88	24.93	22.96	22.70	24.92	23.10
140	3.61	4.47	5.07	12.12	11.34	10.50	11.24	10.57	9.89
142	6.22	7.47	8.20	5.97	5.58	5.44	5.59	5.31	5.17
145	12.54	13.90	14.54	2.44	2.49	2.58	2.31	2.39	2.49
150	22.78	23.86	24.29	1.10	1.24	1.32	1.07	1.20	1.30
155	30.82	31.66	31.93	0.73	0.84	0.91	0.70	0.82	0.90
180	54.51	54.91	54.77	0.29	0.37	0.41	0.27	0.36	0.41
200	64.81	65.65	65.13	0.20	0.27	0.32	0.17	0.27	0.32
300	98.61	84.04	86.79	0.10	0.19	0.21	0.07	0.16	0.22
400	90.70	97.75	90.51	0.08	0.21	0.22	0.05	0.17	0.22
500	97.97	89.81	105.18	0.07	0.24	0.25	0.04	0.18	0.25
600	86.64	91.62	97.19	0.08	0.27	0.28	0.04	0.20	0.27
700	93.57	83.43	89.30	0.09	0.34	0.31	0.07	0.25	0.33
800	85.03	85.24	90.25	0.10	0.37	0.34	0.07	0.26	0.35
900	84.11	85.11	81.22	0.11	0.41	0.38	0.08	0.28	0.36
1000	86.93	85.88	87.18	0.11	0.44	0.40	0.08	0.29	0.40
1050	94.93	80.54	99.03	0.13	0.46	0.42	0.06	0.31	0.41
1100	84.77	89.32	85.58	0.13	0.46	0.43	0.07	0.31	0.41
1200	83.36	84.49	86.56	0.14	0.47	0.45	0.07	0.32	0.44
1250	83.54	85.71	96.35	0.15	0.50	0.47	0.06	0.32	0.43
1300	81.82	79.73	74.77	0.17	0.52	0.49	0.08	0.33	0.46
1400	76.33	77.12	77.05	0.19	0.54	0.51	0.09	0.35	0.48
1450	81.34	77.27	91.62	0.19	0.56	0.50	0.08	0.33	0.45
1500	79.07	79.38	75.47	0.19	0.57	0.51	0.09	0.35	0.48
1600	70.02	71.92	81.83	0.20	0.57	0.52	0.09	0.36	0.50
1650	72.96	73.74	71.71	0.19	0.59	0.52	0.08	0.33	0.47
1700	72.59	71.07	72.03	0.20	0.60	0.53	0.07	0.37	0.52
1800	75.25	73.07	67.96	0.19	0.59	0.55	0.08	0.36	0.53
1900	67.19	67.61	67.84	0.20	0.61	0.56	0.09	0.39	0.56
2000	69.44	69.93	72.98	0.20	0.60	0.57	0.10	0.39	0.56
2100	60.70	61.09	60.53	0.20	0.61	0.57	0.10	0.37	0.56
2200	66.92	65.38	61.49	0.19	0.62	0.58	0.10	0.41	0.59

REV. X1

BPF-A127+

091217

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# Surface Mount Band Pass Filter

# BPF-A127+

## Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
118.0	57.30	56.05	55.17
118.5	55.32	54.22	53.47
119.0	53.52	52.49	51.85
119.5	51.92	51.09	50.46
120.0	50.44	49.74	49.25
120.5	49.17	48.55	48.14
121.0	47.97	47.61	47.17
121.5	47.04	46.78	46.38
122.0	46.20	46.05	45.69
122.5	45.55	45.51	45.18
123.0	45.04	45.01	44.66
123.5	44.58	44.45	44.21
124.0	44.06	44.02	43.80
124.5	43.82	43.67	43.44
125.0	43.40	43.30	43.04
125.5	43.11	42.93	42.75
126.0	42.87	42.74	42.53
126.5	42.61	42.34	42.20
127.0	42.26	42.06	42.00
127.5	42.00	41.80	41.71
128.0	41.72	41.61	41.57
128.5	41.45	41.35	41.30
129.0	41.23	41.25	41.21
129.5	41.01	41.10	41.07
130.0	40.98	41.20	41.21
130.5	40.99	41.20	41.22
131.0	41.00	41.34	41.41
131.5	41.16	41.57	41.61
132.0	41.48	41.90	42.00
132.5	41.72	42.17	42.31
133.0	42.07	42.63	42.75
133.5	42.68	43.20	43.38
134.0	43.16	43.75	43.99
134.5	43.76	44.36	44.59
135.0	44.43	45.05	45.37
135.5	45.24	45.95	46.28
136.0	46.07	46.89	47.31
136.5	47.16	48.06	48.50
137.0	48.29	49.34	49.81

REV. X1  
BPF-A127+  
091217  
Page 2 of 2



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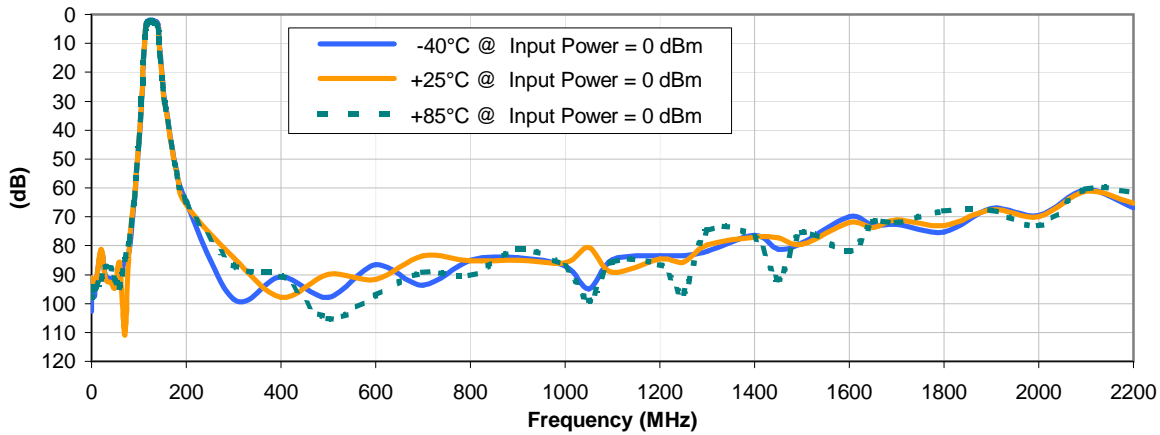


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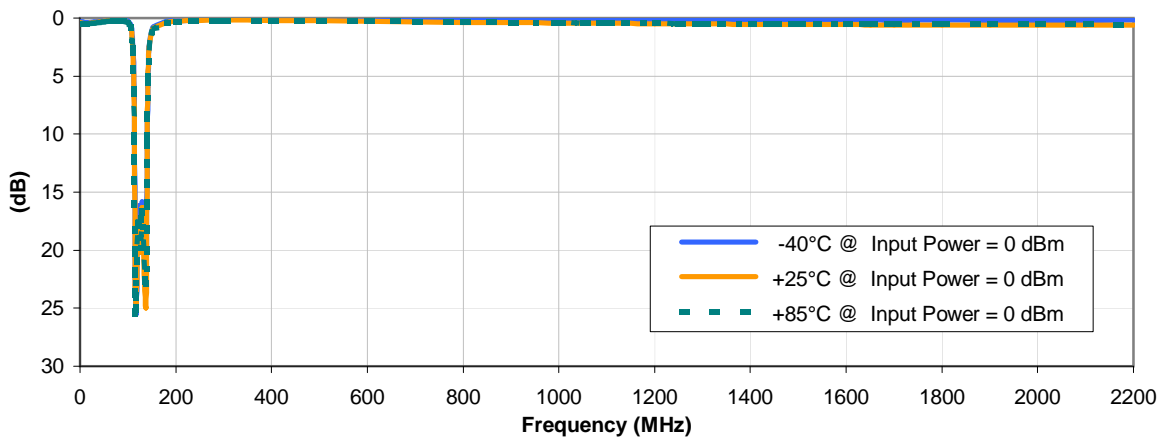


## Typical Performance Curves

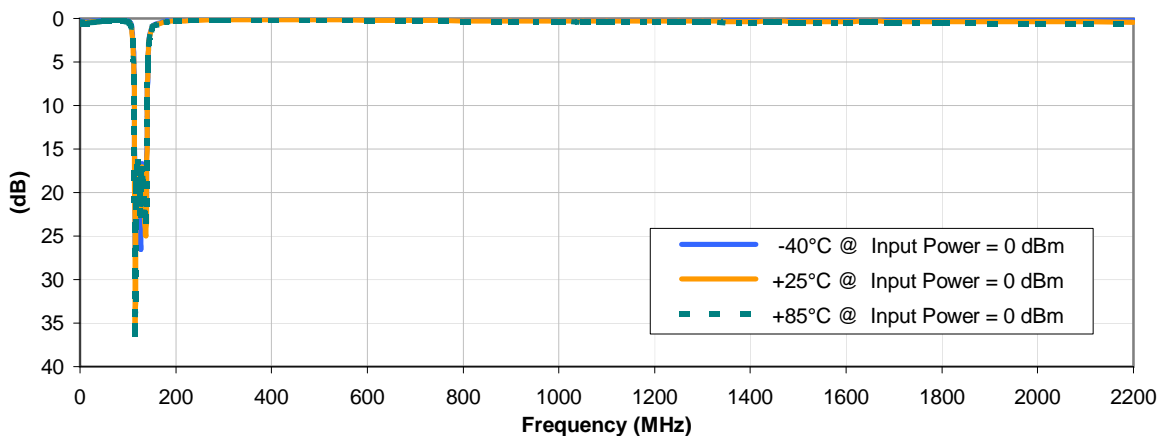
### INSERTION LOSS vs. TEMPERATURE



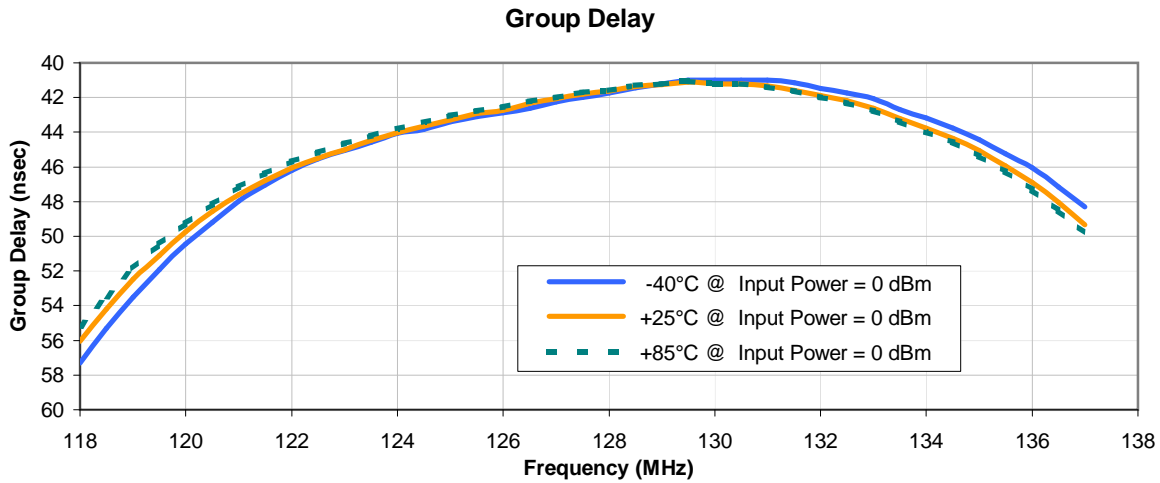
### INPUT RETURN LOSS vs. TEMPERATURE



### 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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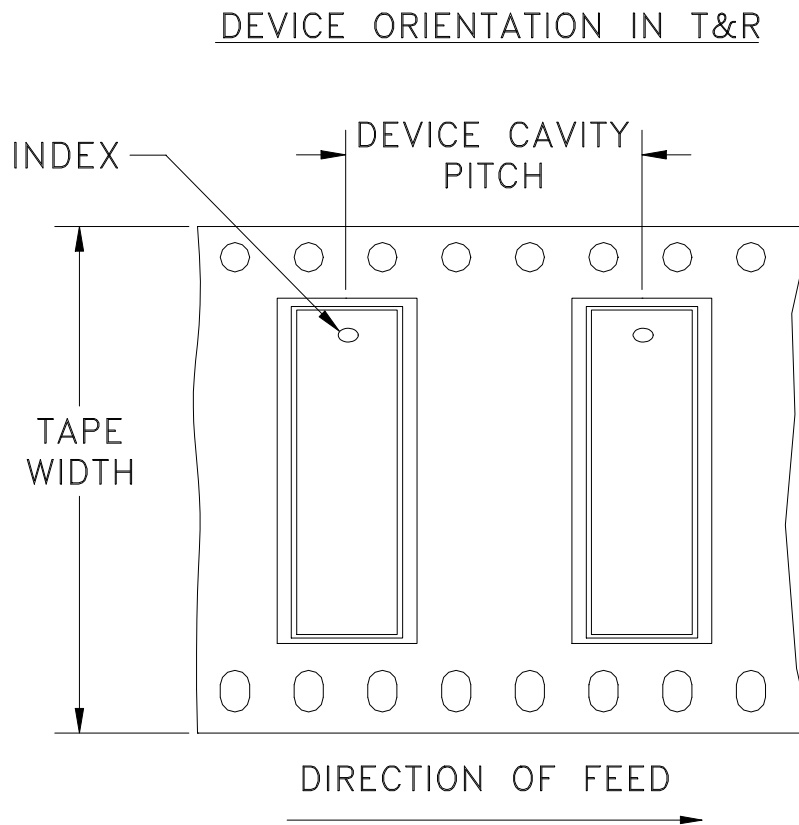
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# Tape & Reel Packaging TR-F83



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
56	16	13	100

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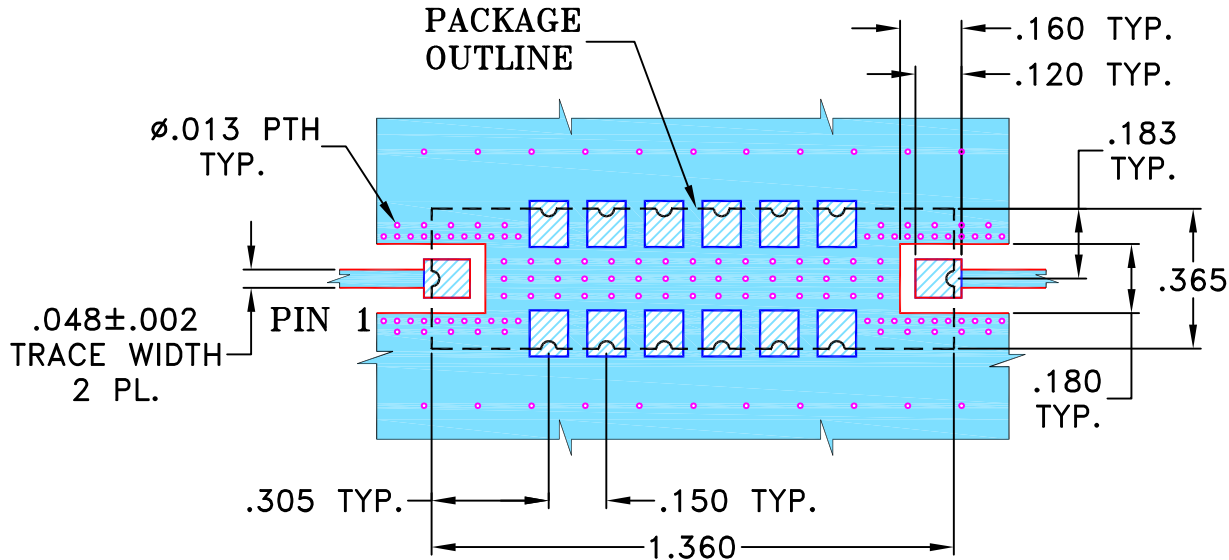
THIRD ANGLE PROJECTION



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:

1. 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.
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

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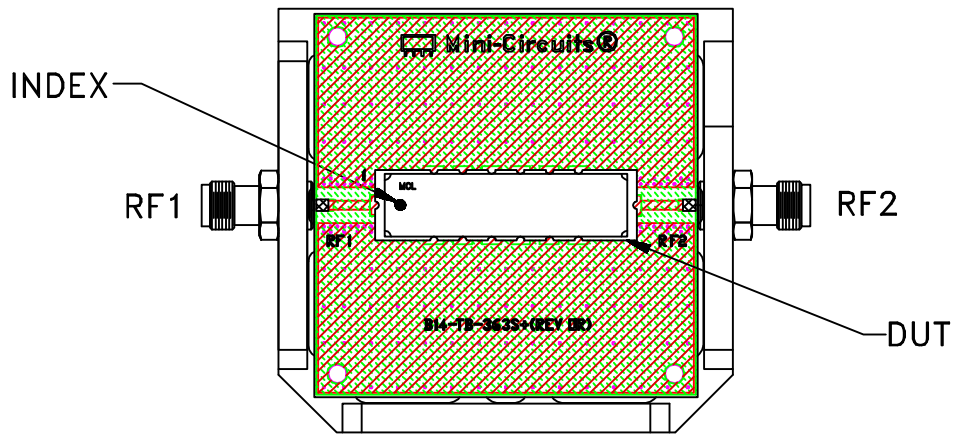
PL, rf, HQ1157, TB-363+, 50 OHM

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

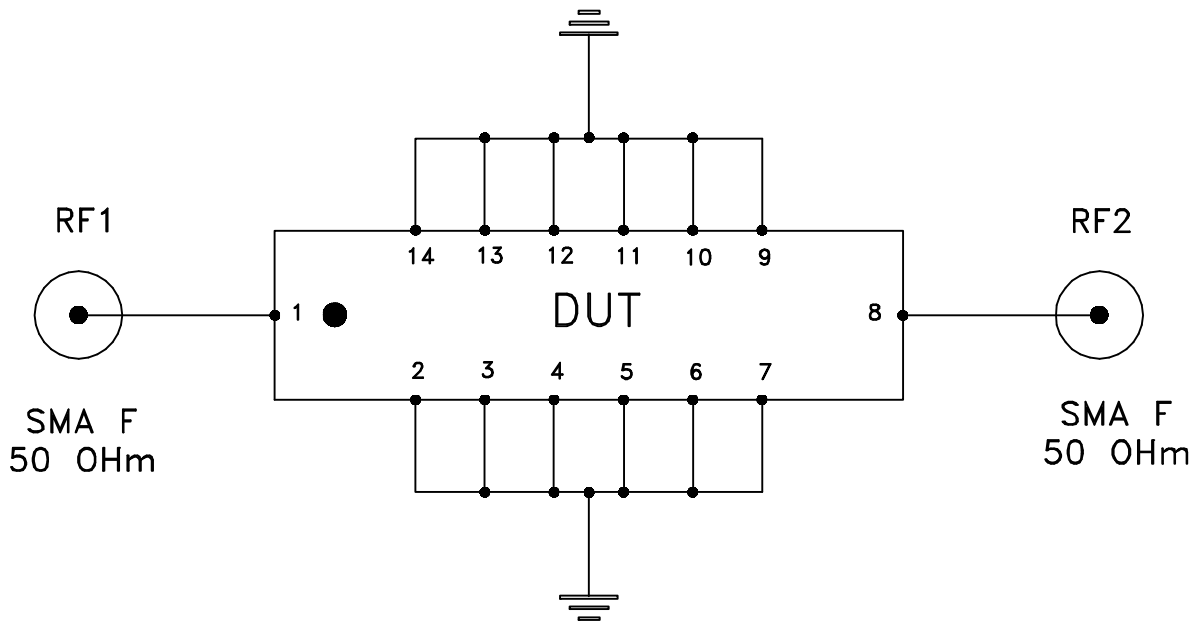
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# Evaluation Board and Circuit



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