

# Surface Mount Bandpass Filter

## SXBP-350+

50Ω 330 to 375 MHz

### Maximum Ratings

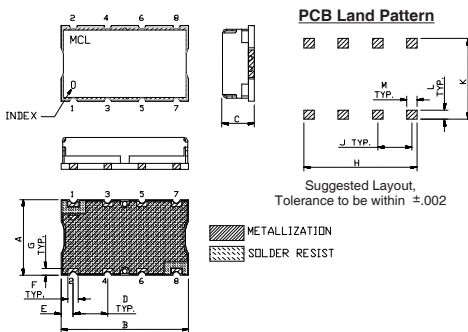
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.5W Max.

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

### Pin Connections

INPUT	1
OUTPUT	8
GROUND	2, 3, 4, 5, 6, 7

### Outline Drawing

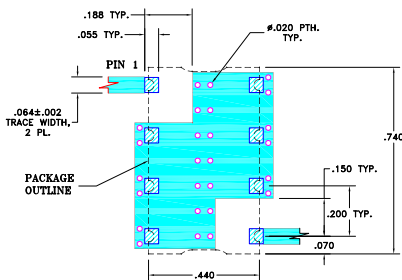


### Outline Dimensions (inch/mm)

A	B	C	D	E	F	
.44	.74	.27	.200	.07	.060	
11.18	18.80	6.86	5.08	1.78	1.52	
G	H	J	K	L	M	wt.
.040	.660	.200	.470	.055	.060	grams
1.02	16.76	5.08	11.94	1.40	1.52	3.0

Note: Please refer to case style drawing for details

### Demo Board MCL P/N: TB-368 Suggested PCB Layout (PL-230)



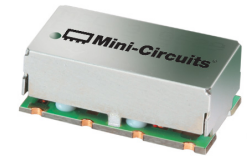
- NOTE:
- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS: .025"±.002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
  - DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Features

- high rejection
- Flat group delay @ passband
- good VSWR, 1.2:1 typ @ passband
- shielded case
- aqueous washable

### Applications

- radio link
- receivers / transmitters
- harmonic rejection



Generic photo used for illustration purposes only  
CASE STYLE: HF1139

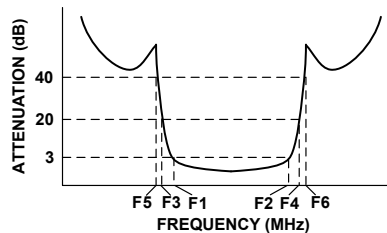
### +RoHS Compliant

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

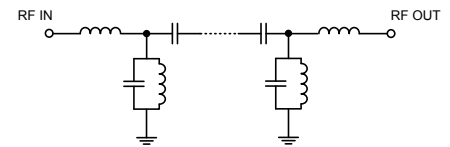
### Bandpass Filter Electrical Specifications (T<sub>AMB</sub> = 25°C)

CENTER FREQ. (MHz)	PASSBAND (MHz) (Loss < 3dB)	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.
350	330 - 375	280	435	245	520 - 2000	1.2	1.5	20

### Typical Frequency Response

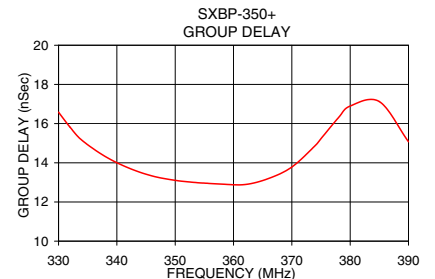
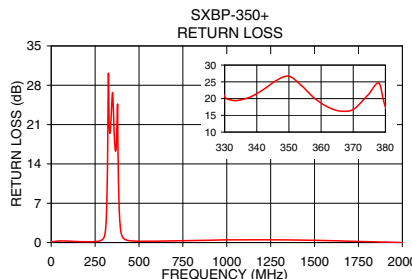
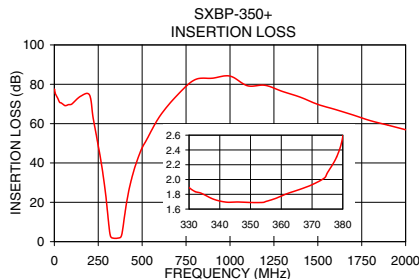


### Functional Schematic



### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)	Frequency (MHz)	Group Delay (nSec)
	$\bar{x}$	$\sigma$			
0.5	77.48	2.27	0.24	330.0	16.58
245.0	51.21	0.45	0.22	332.0	15.81
280.0	32.44	0.51	0.29	334.0	15.15
300.0	17.62	0.71	1.01	338.0	14.32
310.0	8.62	0.78	3.07	342.0	13.74
315.0	4.82	0.59	6.57	346.0	13.33
320.0	2.74	0.32	15.40	350.0	13.10
330.0	1.89	0.19	17.22	354.0	12.98
342.0	1.69	0.20	22.55	355.0	12.96
350.0	1.69	0.19	26.48	358.0	12.91
366.0	1.87	0.19	19.67	362.0	12.89
375.0	2.09	0.18	23.06	366.0	13.20
385.0	4.07	0.24	11.76	370.0	13.78
392.0	7.99	0.31	5.74	375.0	15.23
405.0	16.28	0.29	2.56	378.0	16.30
435.0	30.23	0.18	1.21	380.0	16.90
520.0	50.91	0.07	0.55	385.0	17.12
2000.0	56.91	0.26	0.35	390.0	15.07



### 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.
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REV. C  
ECO-005139  
EDR-8868AU  
SXBP-350+  
URJ/RAV  
201202  
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# Surface Mount Band Pass Filter

# SXBP-350+

## Typical Performance Data

FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@ -40° C	@ +25° C	@ +85° C	@ -40° C	@ +25° C	@ +85° C	@ -40° C	@ +25° C	@ +85° C
1	100.62	98.12	91.59	0.07	0.09	0.12	0.08	0.12	0.14
10	94.93	91.31	88.69	0.12	0.14	0.17	0.12	0.15	0.18
100	77.34	77.38	79.63	0.20	0.25	0.29	0.19	0.25	0.28
200	75.20	74.89	73.34	0.10	0.15	0.19	0.11	0.17	0.19
245	51.55	52.29	52.10	0.10	0.17	0.20	0.11	0.17	0.21
260	44.06	43.67	43.44	0.12	0.20	0.24	0.12	0.20	0.25
270	38.43	38.03	37.77	0.15	0.25	0.29	0.15	0.25	0.30
280	32.33	31.86	31.55	0.22	0.32	0.37	0.21	0.33	0.39
300	17.43	16.77	16.34	0.68	0.97	1.14	0.70	1.03	1.18
310	8.13	7.83	7.51	2.45	3.56	4.16	2.50	3.72	4.27
320	2.15	2.59	2.67	15.04	16.18	17.13	16.06	19.02	19.20
330	1.46	1.78	1.94	17.98	18.74	18.55	18.31	19.28	18.97
342	1.29	1.60	1.77	23.63	23.53	23.25	23.92	23.92	23.40
350	1.28	1.61	1.79	24.01	22.80	21.96	23.88	22.74	21.81
366	1.50	1.85	2.05	15.08	16.19	16.76	14.98	15.87	16.33
375	1.63	2.16	2.49	24.95	23.15	21.31	20.89	18.87	17.94
392	8.16	9.41	10.28	2.52	2.64	2.53	2.44	2.55	2.44
435	30.52	31.14	31.64	0.33	0.44	0.49	0.31	0.43	0.48
520	51.14	51.47	51.85	0.11	0.21	0.25	0.09	0.20	0.24
600	62.59	63.02	63.32	0.05	0.16	0.20	0.06	0.16	0.20
700	72.56	73.72	74.73	0.04	0.14	0.18	0.04	0.14	0.19
800	85.01	87.04	79.62	0.01	0.14	0.18	0.02	0.14	0.19
900	81.30	90.03	86.41	0.01	0.15	0.20	0.01	0.15	0.20
1000	91.77	89.45	88.09	0.02	0.16	0.21	0.00	0.16	0.21
1100	88.31	87.44	91.41	0.02	0.17	0.23	0.01	0.17	0.24
1200	87.37	92.25	86.91	0.02	0.19	0.25	0.01	0.18	0.25
1300	81.49	89.16	80.22	0.03	0.20	0.27	0.02	0.19	0.27
1400	93.64	89.81	92.89	0.04	0.21	0.28	0.02	0.21	0.28
1500	80.96	83.96	73.16	0.04	0.23	0.31	0.02	0.22	0.30
1600	77.70	82.79	76.90	0.05	0.24	0.32	0.04	0.23	0.32
1700	66.71	72.96	75.93	0.08	0.25	0.35	0.07	0.26	0.36
1800	72.73	69.93	74.75	0.09	0.27	0.37	0.06	0.26	0.36
1900	68.72	69.32	71.40	0.06	0.27	0.39	0.04	0.26	0.37
2000	69.79	70.45	79.18	0.10	0.29	0.39	0.06	0.29	0.39
2100	61.75	65.32	65.04	0.09	0.29	0.40	0.05	0.27	0.38
2200	41.64	49.05	52.01	0.16	0.32	0.44	0.12	0.32	0.43
2300	51.52	54.54	52.37	0.11	0.34	0.46	0.08	0.32	0.45
2400	56.05	59.08	55.96	0.10	0.32	0.44	0.05	0.30	0.43
2500	61.26	59.61	55.06	0.10	0.33	0.47	0.08	0.32	0.46
2600	55.45	56.16	51.09	0.10	0.33	0.47	0.07	0.31	0.48
2700	46.83	50.92	49.83	0.12	0.35	0.49	0.13	0.34	0.50
2800	46.95	47.69	47.88	0.15	0.37	0.49	0.09	0.37	0.51
2900	47.57	46.69	48.56	0.09	0.39	0.56	0.05	0.36	0.51
3000	43.99	45.26	46.12	0.12	0.43	0.61	0.08	0.38	0.54
3100	42.70	44.84	47.07	0.14	0.42	0.59	0.17	0.40	0.55
3200	44.82	44.00	44.21	0.15	0.42	0.60	0.09	0.43	0.59
3300	38.31	41.12	39.30	0.16	0.47	0.66	0.06	0.46	0.65
3400	42.03	38.47	36.81	0.20	0.51	0.70	0.17	0.49	0.70
3500	33.82	36.63	35.37	0.19	0.54	0.73	0.17	0.50	0.70
3600	39.72	37.02	35.75	0.22	0.58	0.75	0.19	0.57	0.76
3700	39.11	37.48	35.44	0.23	0.61	0.82	0.15	0.62	0.88
3800	39.27	34.38	35.92	0.24	0.66	0.86	0.26	0.65	0.90
3900	34.60	32.25	32.88	0.24	0.69	0.93	0.25	0.69	0.88
4000	32.10	30.53	31.55	0.33	0.73	0.98	0.36	0.70	0.95

REV. X2

SXBP-350+

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# Surface Mount Band Pass Filter

# SXBP-350+

## Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
210	3.12	1.60	2.30
220	1.13	1.21	0.65
230	1.58	1.73	1.78
240	1.88	1.73	0.52
250	1.99	1.44	1.13
260	2.35	2.29	2.18
270	2.83	3.00	3.04
280	3.71	3.87	3.92
290	5.08	5.35	5.62
300	8.19	8.75	9.19
310	16.37	17.13	17.82
320	21.93	21.34	20.88
330	16.30	15.99	15.76
332	15.58	15.34	15.17
334	15.02	14.84	14.70
336	14.59	14.44	14.35
338	14.24	14.12	14.05
340	13.97	13.86	13.81
342	13.74	13.67	13.61
344	13.54	13.48	13.46
346	13.38	13.34	13.31
348	13.24	13.22	13.19
350	13.13	13.11	13.1
352	13.04	13.02	13.04
354	12.97	12.96	12.98
356	12.91	12.91	12.96
358	12.91	12.93	12.99
360	12.91	12.96	13.05
362	12.98	13.05	13.18
364	13.05	13.21	13.37
366	13.26	13.47	13.69
368	13.54	13.82	14.12
370	13.94	14.33	14.67
372	14.46	14.93	15.33
374	15.05	15.53	15.94
375	15.7	16.2	16.59
380	17.69	17.67	17.59
390	14.9	13.77	12.92
400	8.04	7.5	7.09
420	3.44	3.38	3.29
430	2.61	2.55	2.5
440	1.98	1.89	1.89
450	1.54	1.52	1.51
460	1.42	1.48	1.42
470	1.4	1.28	1.32
480	1.21	1.16	1.12
500	0.72	0.76	0.87
520	1.03	0.8	0.84
530	0.85	0.43	0.57
540	0.55	0.58	0.58
550	0.8	0.38	0.47
560	0.58	0.53	0.51
570	0.52	0.49	0.22
580	0.18	0.38	0.49
600	0.65	0.47	0.24

REV. X2  
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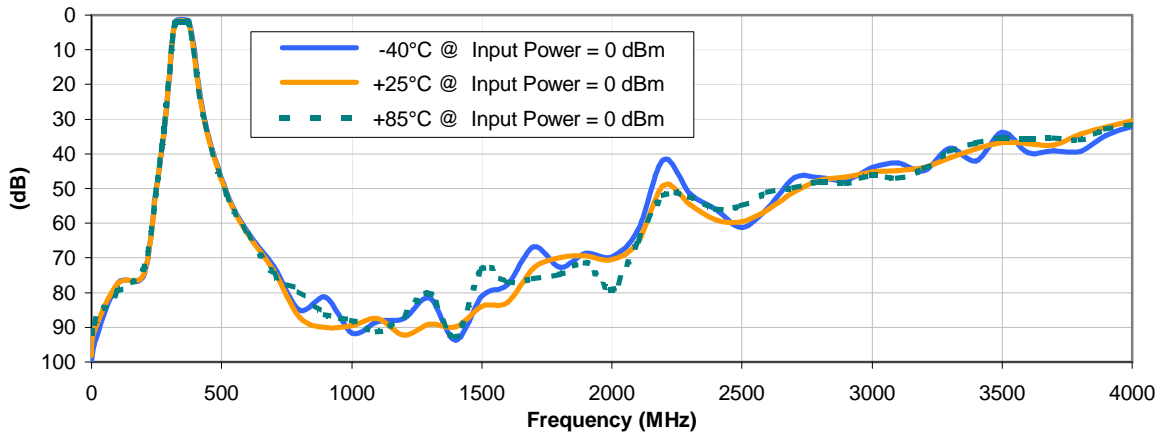


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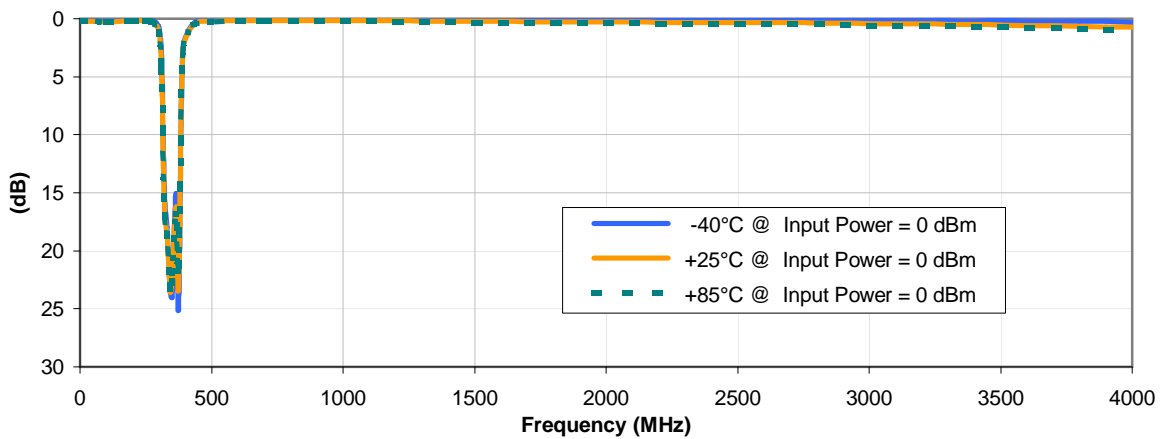


## Typical Performance Curves

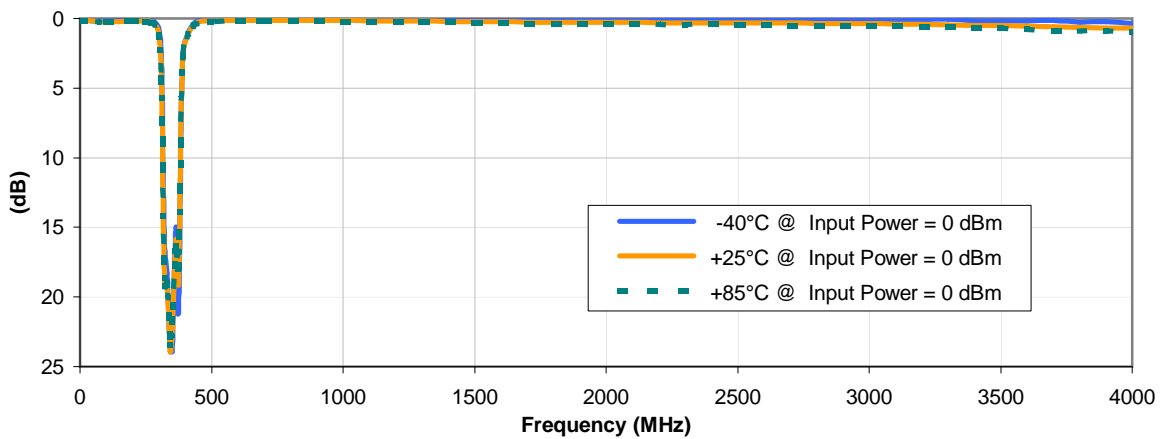
### INSERTION LOSS vs. TEMPERATURE



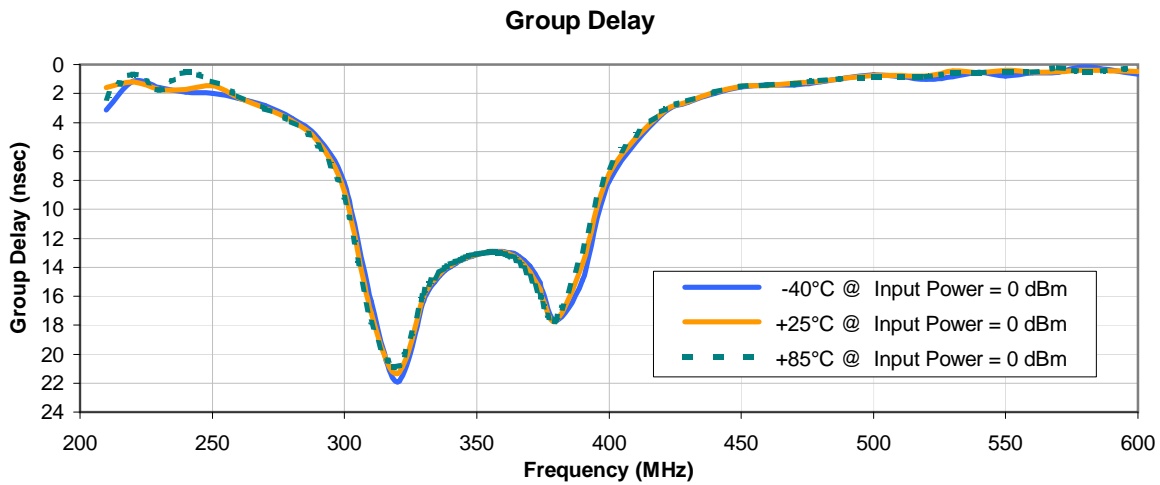
### INPUT RETURN LOSS vs. TEMPERATURE



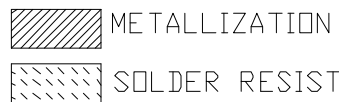
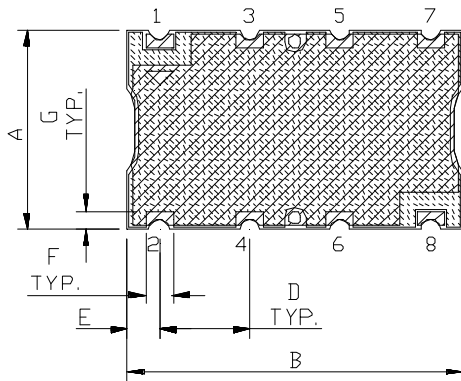
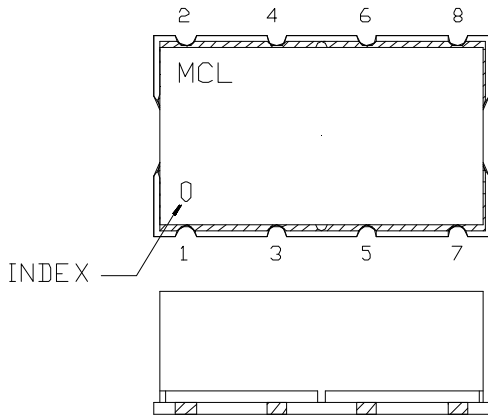
### OUTPUT RETURN LOSS vs. TEMPERATURE



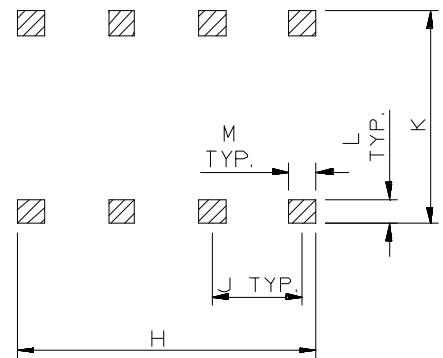
## Typical Performance Curves



### Outline Dimensions



### PCB Land Pattern



CASE #	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAMS
HF1139	.44 (11.18)	.74 (18.80)	.27 (6.86)	.200 (5.08)	.07 (1.78)	.060 (1.52)	.040 (1.02)	.660 (16.76)	.200 (5.08)	.470 (11.94)	.055 (1.40)	.060 (1.52)	3.0

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm 0.015$ "; 3 Pl.  $\pm 0.01$ "

#### Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:
  - For RoHS Case Styles: 2-5  $\mu$  inch (.05-.13 microns) Gold over 120-240  $\mu$  inch (3.05-6.10 microns) Nickel plate.
  - For RoHS-5 Case Styles: Tin-Lead plate.



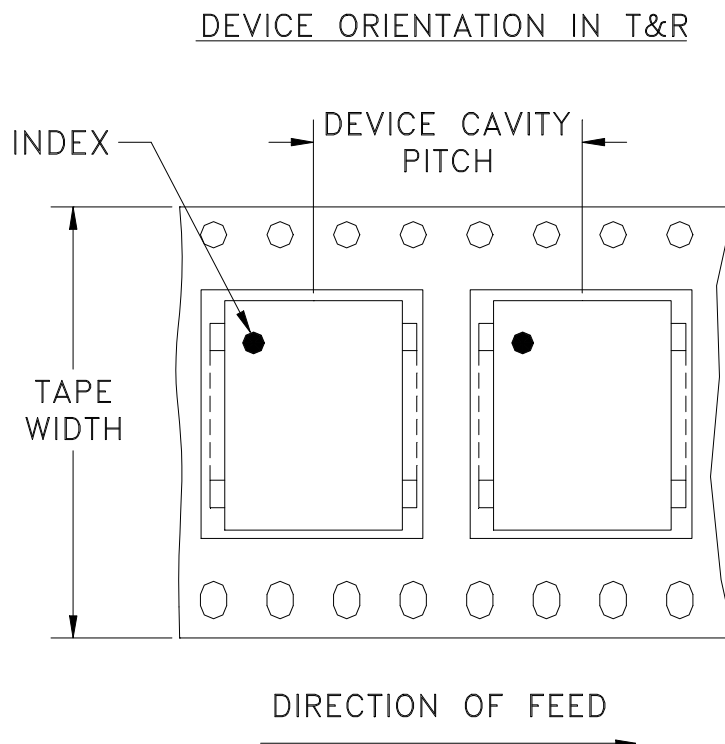
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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F5



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

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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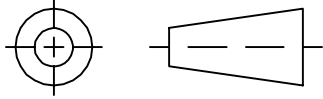
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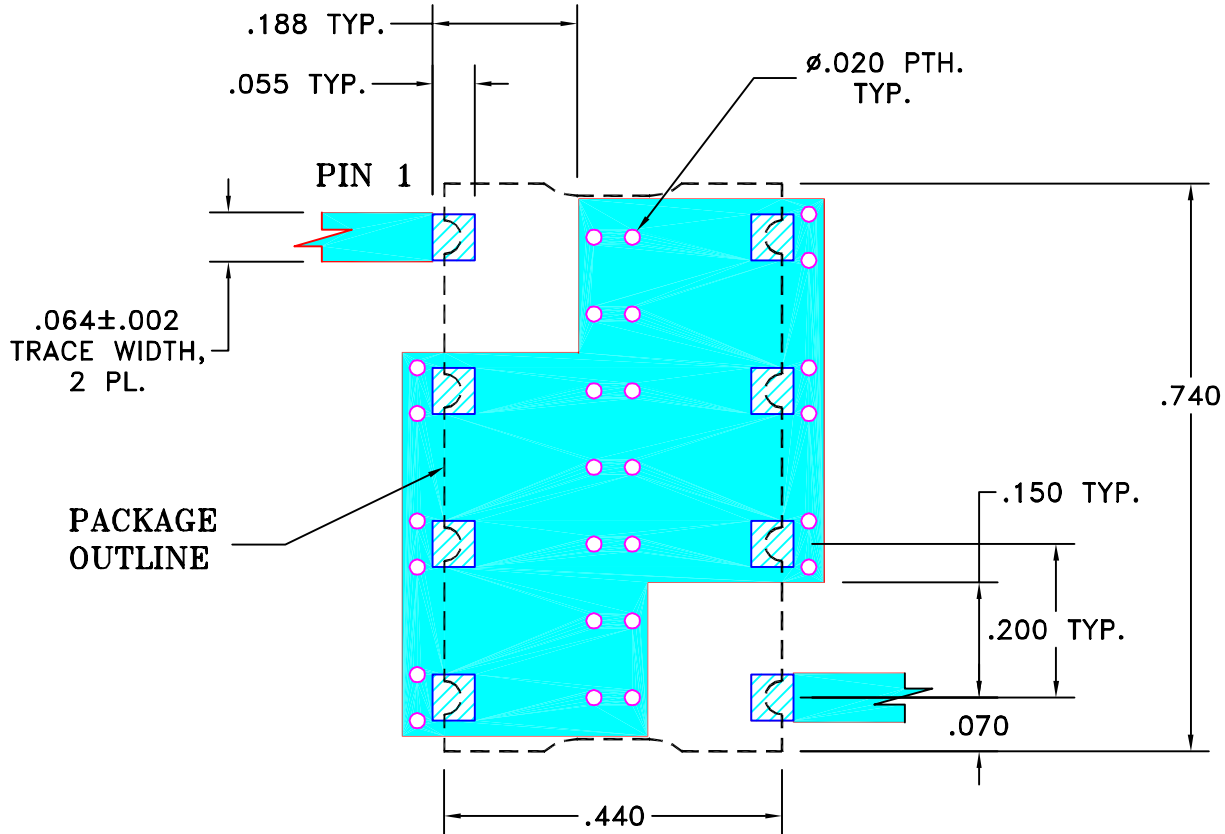
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M101757	NEW RELEASE (FROM RAVON)	11/05	DK	HH
OR	R62293	NEW RELEASE (FROM RAVON)	11/05	DK	HH

**SUGGESTED MOUNTING CONFIGURATION  
FOR HF1139 CASE STYLE, cr PIN CONNECTION, 50 OHM.**

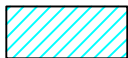


NOTE:

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 SOLDER MASK

UNLESS OTHERWISE SPECIFIED	INITIALS		DATE
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ±	DRAWN	DK (RAVON)	29 NOV 05
	CHECKED	RZ (RAVON)	29 NOV 05
	APPROVED	HH (RAVON)	29 NOV 05



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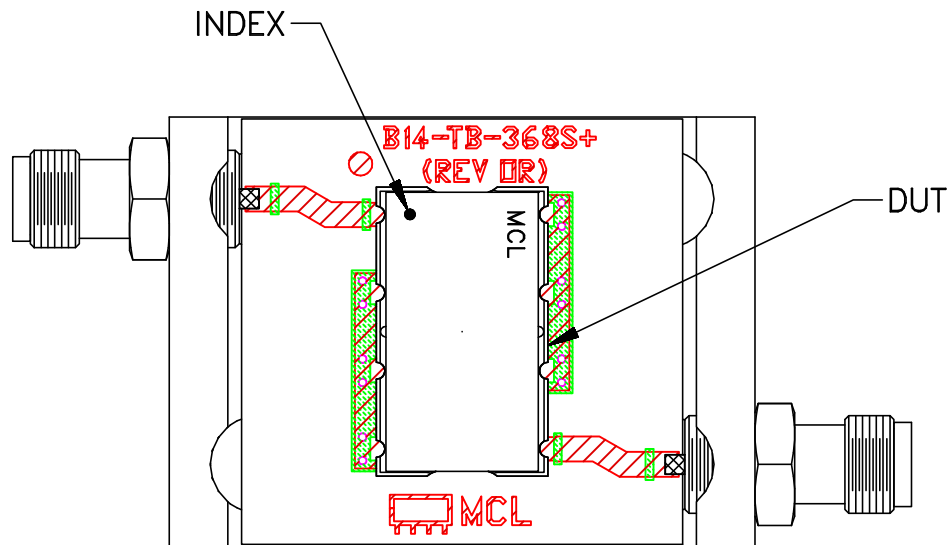
PL, cr, HF1139, SCLF, TB-368

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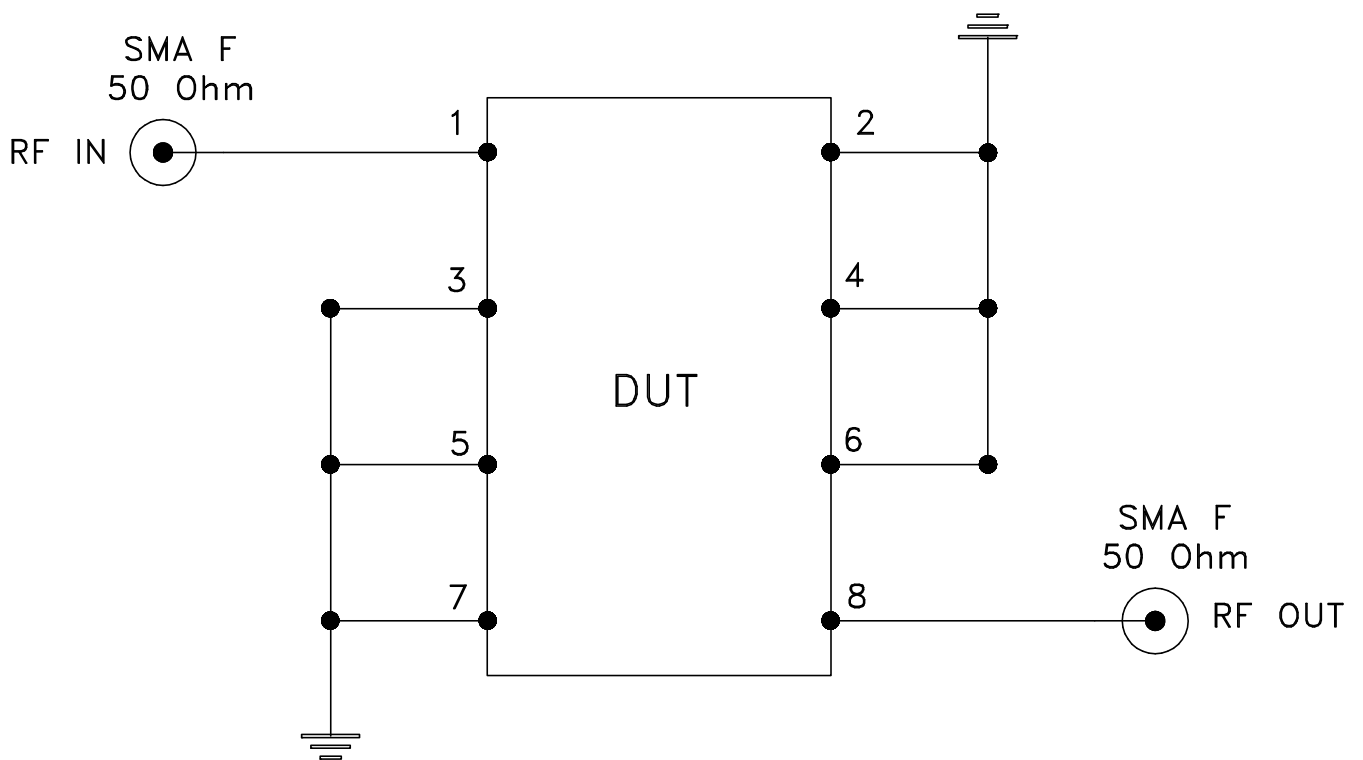
SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-230	REV: OR
FILE: 98PL230	SCALE: 4:1	SHEET: 1 OF 1	



# Evaluation Board and Circuit




TB-368



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: ROGERS R04350B or equivalent, Dielectric Constant=3.5, 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	-55° to 100° C Ambient Environment	Individual Model Data Sheet
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 Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
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
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