

Surface Mount Bandpass Filter

SXBP-615+

50Ω 565 to 670 MHz

Maximum Ratings

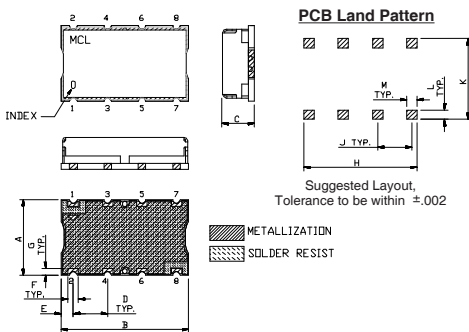
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.5W Max.

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

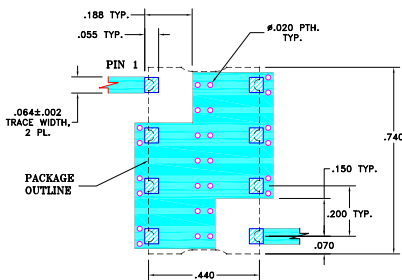


Outline Dimensions (inch/mm)

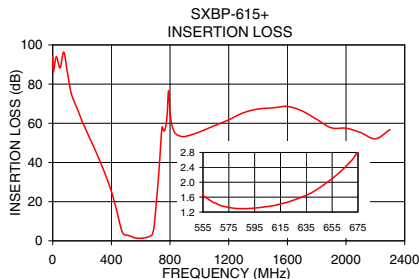
A	B	C	D	E	F						
.44	.74	.27	.200	.07	.060						
11.18	18.80	6.86	5.08	1.78	1.52						
G	H	J	K	L	M	wt.					
.040	.660	.200	.470	.055	.060	grams					
1.02	16.76	5.08	11.94	1.40	1.52	3.0					

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

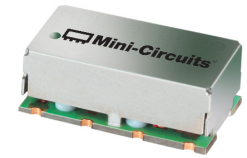


Features

- high rejection
- flat group delay @ passband
- good VSWR, 1.3:1 typ @ passband
- shielded case
- aqueous washable

Applications

- mobile TV
- receivers / transmitters
- harmonic rejection



Generic photo used for illustration purposes only

CASE STYLE: HF1139

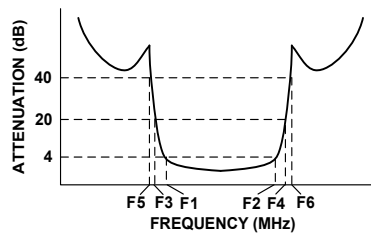
+RoHS Compliant

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

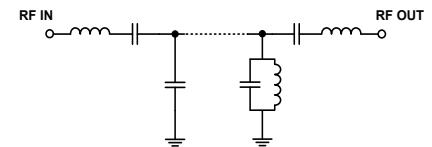
Bandpass Filter Electrical Specifications (T_{AMB} = 25°C)

CENTER FREQ. (MHz)	PASSBAND (MHz) (Loss < 4dB)	STOPBANDS (MHz)				VSWR (:1)		
		Loss > 20dB		Loss > 40dB		Passband		Stopband
F _c	F ₁ - F ₂	F ₃	F ₄	F ₅	F ₆	Typ.	Max.	Typ.
615	565 - 670	380	720	250	740 - 2300	1.3	1.9	20

Typical Frequency Response

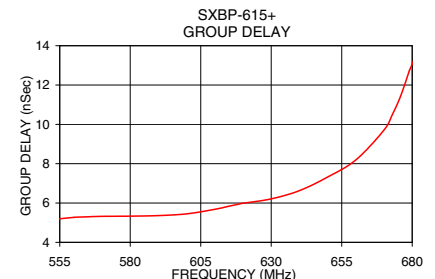
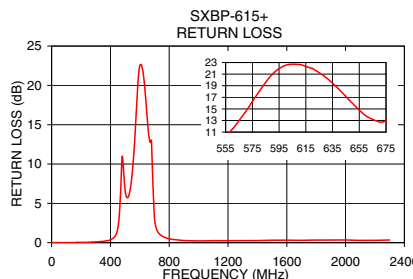


Functional Schematic



Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)	Frequency (MHz)	Group Delay (nSec)
	\bar{x}	σ			
0.5	93.98	3.00	0.01	555.0	5.20
250.0	52.72	0.29	0.05	560.0	5.27
380.0	29.65	0.41	0.25	565.0	5.30
430.0	17.34	0.64	0.80	570.0	5.32
450.0	11.22	0.78	1.85	580.0	5.33
470.0	5.30	0.60	6.58	590.0	5.36
565.0	1.43	0.04	12.98	600.0	5.45
580.0	1.30	0.02	17.97	610.0	5.68
615.0	1.42	0.05	22.32	615.0	5.84
640.0	1.74	0.08	18.33	620.0	5.99
670.0	2.58	0.08	12.75	630.0	6.21
690.0	6.56	1.62	7.05	640.0	6.63
700.0	13.84	2.34	3.07	650.0	7.32
710.0	22.42	2.46	1.95	660.0	8.19
720.0	31.31	2.80	1.46	670.0	9.71
740.0	53.80	3.72	1.01	673.0	10.51
1000.0	55.59	0.27	0.23	676.0	11.48
2300.0	56.85	0.49	0.34	680.0	13.06



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. C
ECO-005139
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SXBP-615+
URJ/RAV
201202
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Surface Mount Band Pass Filter

SXBP-615+

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	98.70	95.30	102.34	0.01	0.01	0.00	0.00	0.01	0.00
10	100.52	94.94	98.50	0.01	0.00	0.01	0.00	0.01	0.00
50	99.93	93.15	89.63	0.00	0.00	0.02	0.01	0.00	0.01
100	78.94	80.83	81.04	0.01	0.02	0.04	0.01	0.02	0.03
200	61.41	61.08	61.16	0.00	0.05	0.06	0.02	0.06	0.09
250	52.85	53.05	52.98	0.01	0.06	0.09	0.03	0.08	0.11
300	44.58	44.62	44.60	0.03	0.10	0.13	0.07	0.13	0.17
380	29.81	29.71	29.54	0.10	0.20	0.26	0.22	0.32	0.38
400	25.24	25.12	24.93	0.15	0.26	0.33	0.29	0.43	0.51
430	17.43	17.26	17.02	0.35	0.50	0.60	0.66	0.87	1.03
450	11.03	10.88	10.65	0.87	1.09	1.26	1.59	1.99	2.32
470	4.84	4.94	4.94	3.19	3.54	3.81	6.03	7.12	8.12
500	2.67	2.95	3.14	5.52	5.73	5.86	6.69	6.86	6.93
565	1.14	1.44	1.63	16.60	16.64	16.54	14.06	14.19	14.26
580	1.05	1.35	1.55	19.59	19.43	19.23	18.44	18.92	19.18
600	1.12	1.42	1.62	16.56	17.84	18.92	18.12	20.53	22.93
615	1.22	1.54	1.75	16.23	18.15	20.02	17.47	20.02	22.67
640	1.50	1.91	2.22	16.92	18.12	18.58	16.57	17.38	17.69
670	2.20	2.86	3.38	22.70	22.88	23.50	18.40	17.69	17.04
690	8.70	10.66	12.39	4.14	4.16	4.01	4.33	4.31	4.16
720	36.26	38.40	40.37	1.02	1.26	1.36	1.05	1.29	1.41
740	55.22	55.82	55.95	0.68	0.89	0.98	0.69	0.89	0.99
800	59.43	60.09	60.50	0.28	0.45	0.53	0.30	0.44	0.54
900	52.31	53.14	53.61	0.11	0.26	0.32	0.16	0.30	0.38
1000	55.42	56.06	56.70	0.07	0.22	0.28	0.14	0.28	0.35
1200	62.14	61.98	63.54	0.03	0.19	0.25	0.16	0.30	0.38
1300	64.46	65.85	66.08	0.02	0.18	0.26	0.17	0.33	0.41
1400	66.23	67.28	70.88	0.03	0.21	0.29	0.19	0.34	0.43
1500	73.09	71.69	69.84	0.02	0.19	0.27	0.18	0.36	0.45
1600	68.12	72.34	70.08	0.04	0.22	0.31	0.18	0.37	0.46
1700	65.32	66.94	65.36	0.03	0.21	0.31	0.19	0.39	0.49
1800	55.08	54.56	54.55	0.05	0.23	0.33	0.22	0.44	0.55
2000	65.53	68.23	66.45	0.06	0.25	0.35	0.12	0.37	0.49
2200	52.67	57.58	62.83	0.08	0.28	0.40	0.09	0.35	0.49
2300	65.29	61.59	63.35	0.08	0.28	0.40	0.05	0.32	0.47
2400	66.85	60.36	59.52	0.08	0.28	0.42	0.01	0.29	0.43
2500	58.49	55.27	51.96	0.07	0.29	0.44	0.03	0.29	0.45
2600	54.50	54.02	53.26	0.12	0.31	0.45	0.09	0.23	0.39
2800	46.52	48.55	47.37	0.11	0.33	0.49	0.13	0.21	0.37
3000	45.49	48.41	46.39	0.10	0.33	0.48	0.29	0.09	0.24
3200	40.98	43.68	38.80	0.16	0.39	0.59	0.23	0.04	0.22
3300	44.58	42.97	44.47	0.12	0.38	0.54	0.28	0.03	0.20
3400	37.54	39.69	40.75	0.14	0.43	0.58	0.37	0.01	0.17
3500	36.89	39.02	36.70	0.18	0.45	0.66	0.32	0.05	0.17
3600	34.91	39.20	38.37	0.11	0.44	0.57	0.27	0.03	0.20
3800	35.82	35.03	35.38	0.13	0.53	0.65	0.32	0.01	0.16
4000	29.17	32.78	35.05	0.28	0.61	0.80	0.01	0.11	0.32
4200	29.49	32.49	28.26	0.42	0.72	1.08	0.25	0.19	0.58
4300	29.61	29.39	29.42	0.35	0.83	1.06	0.24	0.25	0.46
4400	25.43	27.72	30.47	0.57	1.04	1.39	0.54	0.45	0.80
4500	25.50	25.67	24.51	0.60	1.24	1.43	0.82	0.67	1.10
4600	27.31	27.39	29.77	0.79	1.17	1.44	1.27	1.07	1.12
4800	21.61	22.92	21.67	1.05	1.55	1.84	1.06	1.22	1.49
5000	20.88	21.62	26.53	1.51	1.89	1.79	0.49	1.19	1.27

REV. X2
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Surface Mount Band Pass Filter

SXBP-615+

Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
210	0.82	0.29	0.38
220	0.75	0.27	0.39
230	0.43	0.33	0.58
240	0.60	0.50	0.48
250	0.56	0.36	0.23
260	0.45	0.45	0.50
270	0.70	0.59	0.72
280	0.61	0.67	0.72
290	0.73	0.64	0.64
300	0.55	0.55	0.58
310	0.57	0.61	0.69
320	0.73	0.74	0.80
330	0.85	0.84	0.79
340	0.88	0.92	0.95
350	0.90	0.90	0.95
360	0.93	0.94	0.97
370	0.98	0.95	0.99
380	1.11	1.15	1.18
390	1.33	1.37	1.41
400	1.57	1.58	1.66
410	1.71	1.76	1.84
420	1.95	2.02	2.12
430	2.43	2.54	2.66
440	3.25	3.38	3.53
450	4.37	4.54	4.72
460	5.85	6.01	6.16
470	7.38	7.40	7.44
480	8.02	7.88	7.76
490	7.35	7.15	6.99
500	6.14	6.02	5.93
510	5.31	5.27	5.26
520	4.89	4.91	4.92
530	4.77	4.79	4.83
540	4.86	4.88	4.92
550	5.07	5.08	5.11
560	5.22	5.22	5.24
570	5.29	5.29	5.30
580	5.31	5.32	5.36
590	5.33	5.37	5.41
600	5.40	5.47	5.55
610	5.58	5.66	5.77
620	5.87	5.98	6.09
630	6.27	6.39	6.51
640	6.78	6.90	7.05
650	7.49	7.65	7.83
660	8.79	9.06	9.35
670	10.77	11.25	11.77
690	14.43	13.43	12.50
720	2.49	1.83	0.76

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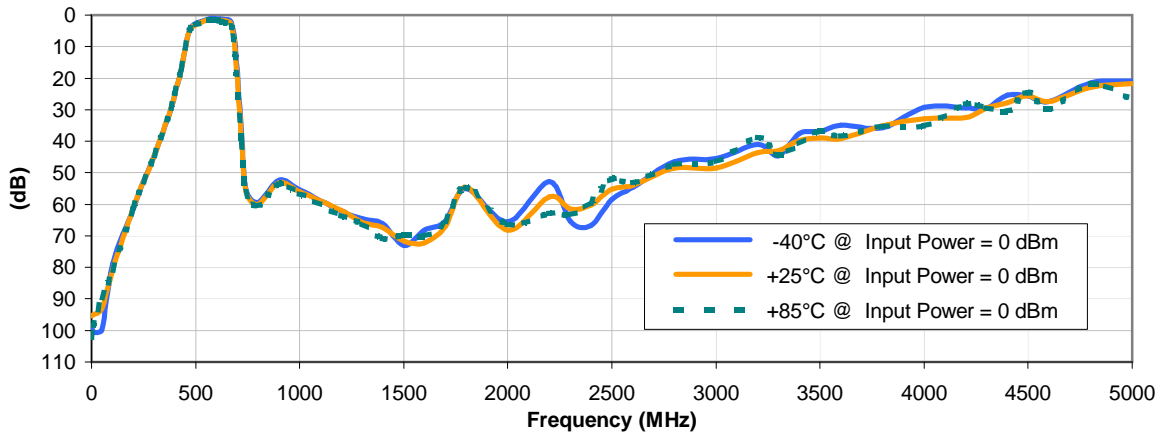


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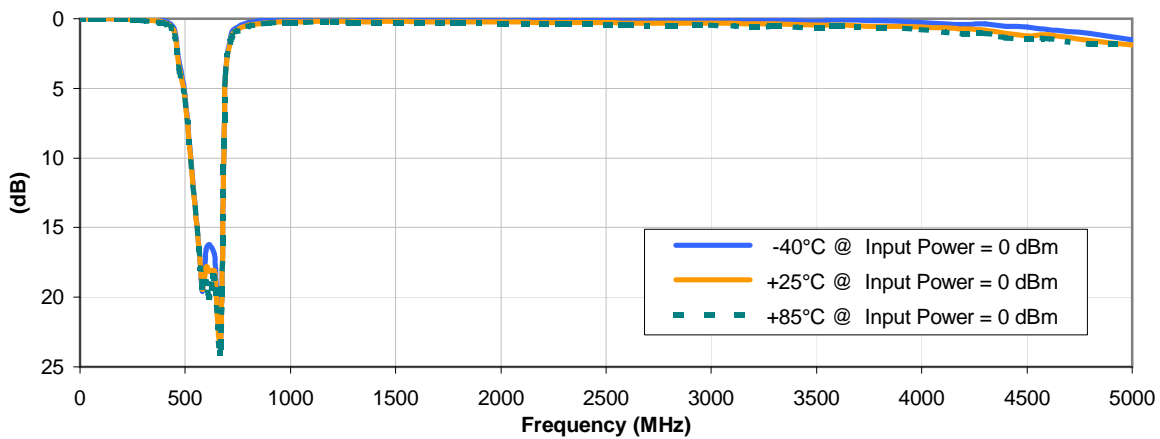


Typical Performance Curves

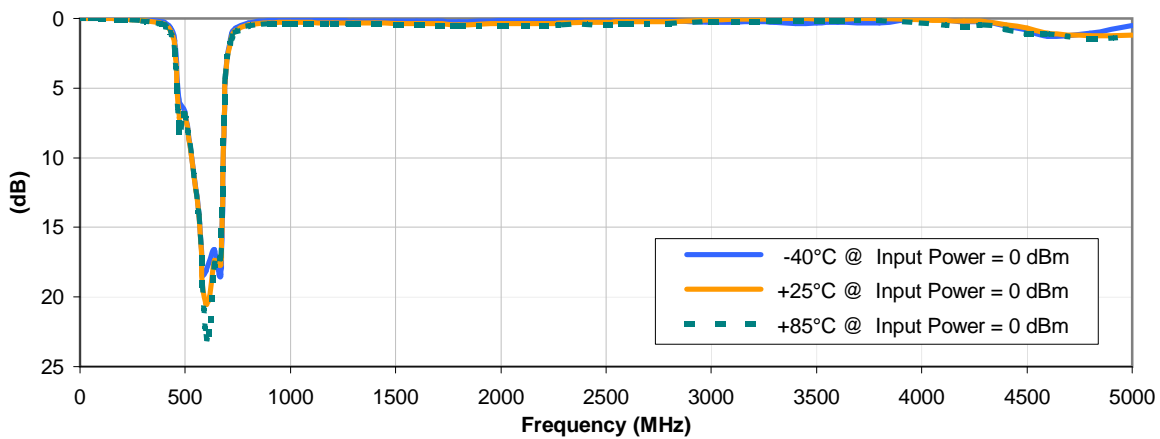
INSERTION LOSS vs. TEMPERATURE



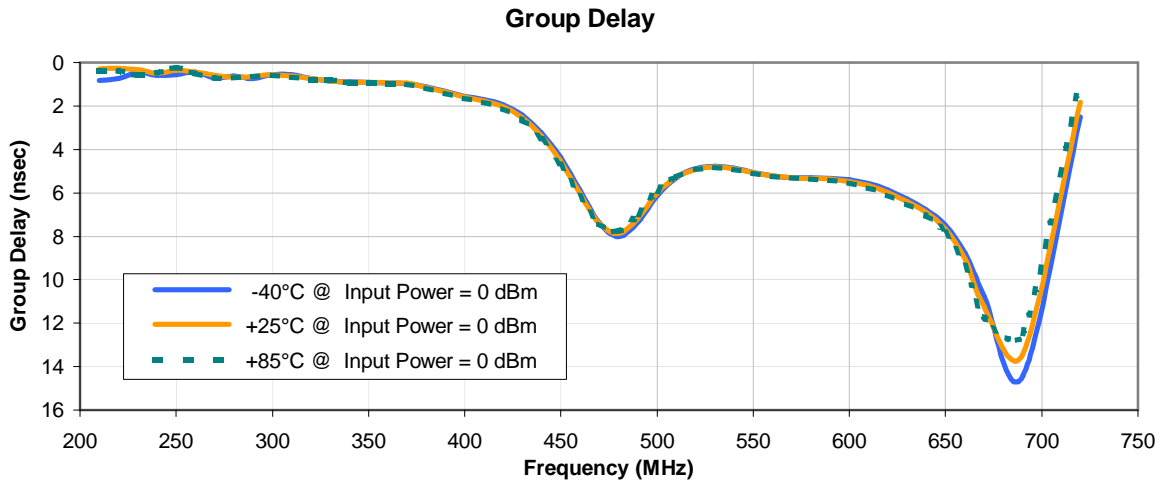
INPUT RETURN LOSS vs. TEMPERATURE



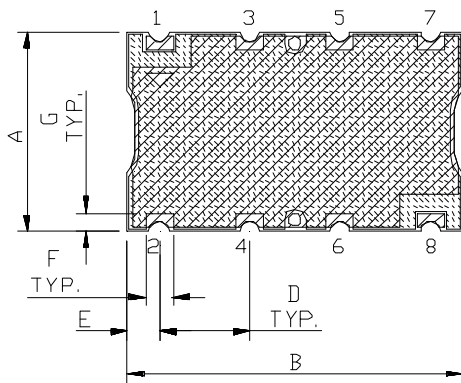
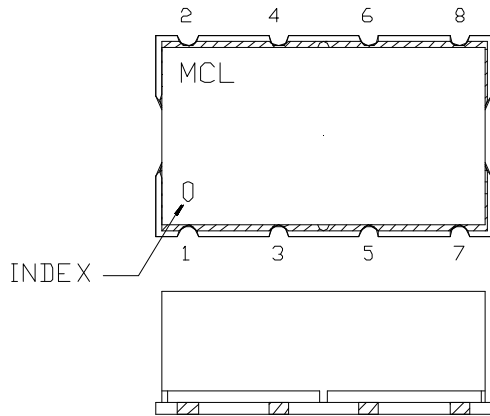
OUTPUT RETURN LOSS vs. TEMPERATURE



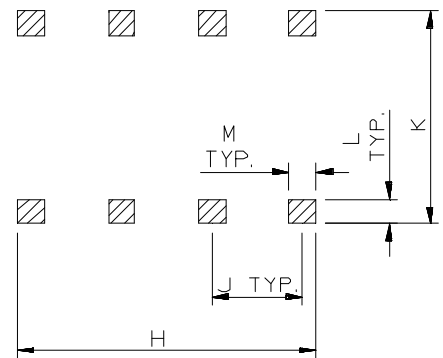
Typical Performance Curves



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. ± 0.015 "; 3 Pl. ± 0.01 "

Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:
 - For RoHS Case Styles: 2-5 μ inch (.05-.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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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

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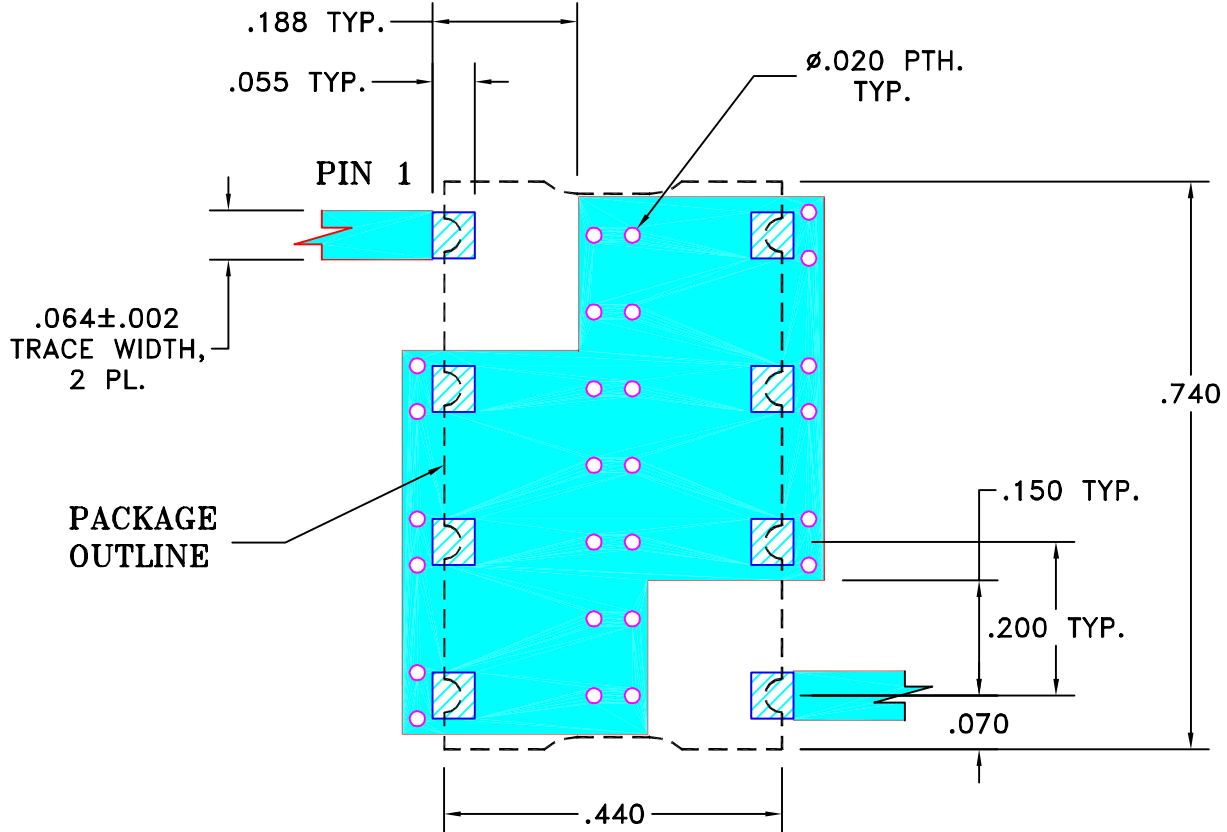
THIRD ANGLE PROJECTION



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.**

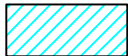


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- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



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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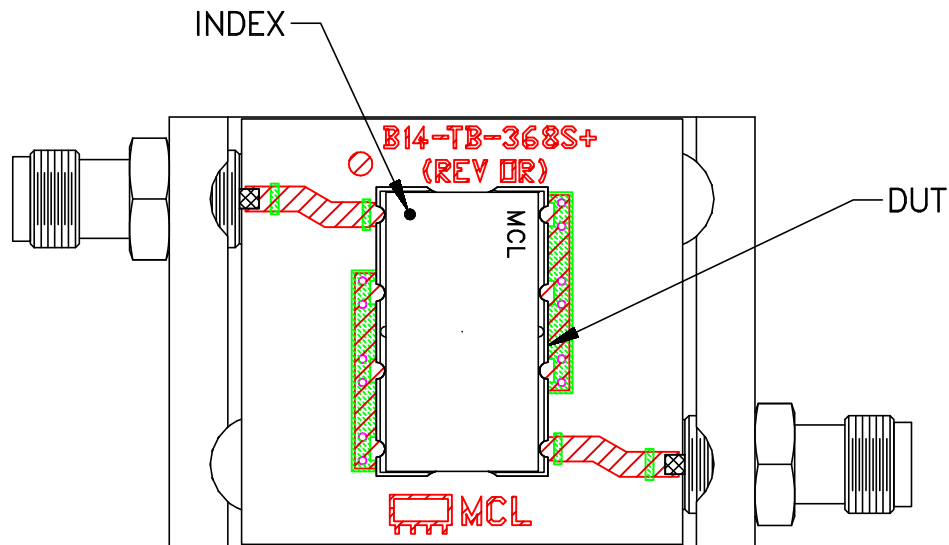
13 Neptune Avenue
Brooklyn NY 11235

PL, cr, HF1139, SCLF, TB-368

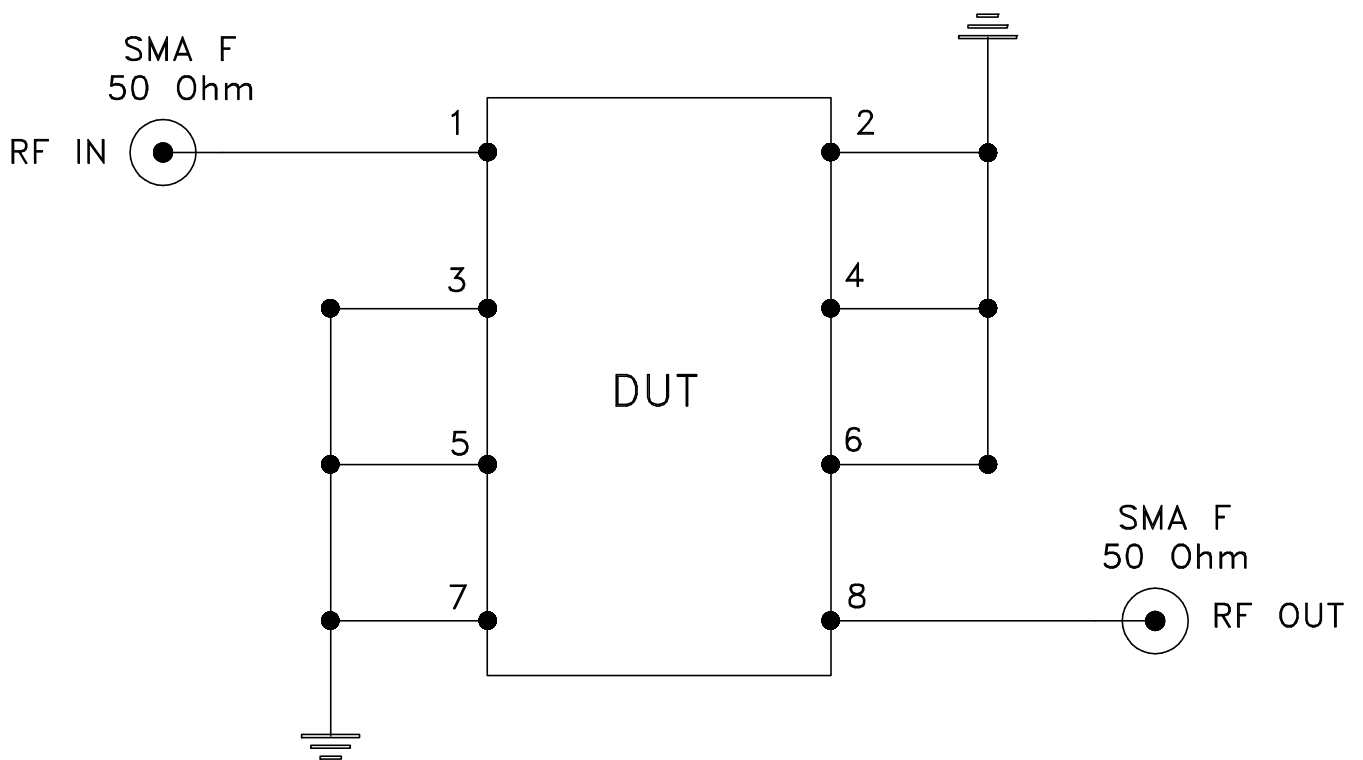
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SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-230	REV: OR
FILE: 98PL230	SCALE: 4:1	SHEET: 1 OF 1	

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