

Surface Mount Bandpass Filter

50Ω 238 to 242 MHz

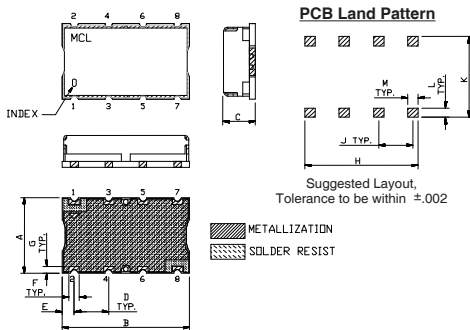
Maximum Ratings

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

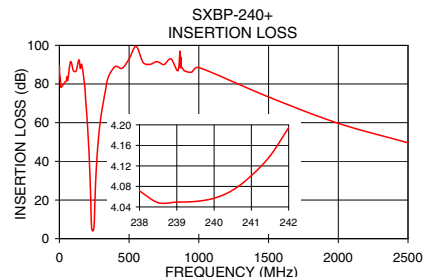
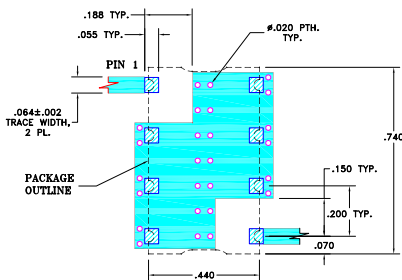


Outline Dimensions (inch mm)

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)



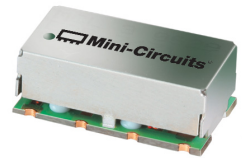
Features

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

Applications

- receivers / transmitters
- wire-line broadband access
- cable system (video & data)

SXBP-240+



Generic photo used for illustration purposes only
CASE STYLE: HF1139

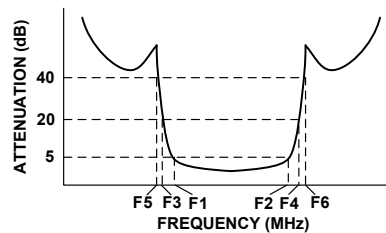
+RoHS Compliant

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

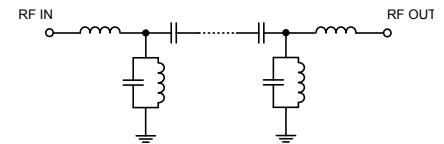
Bandpass Filter Electrical Specifications (T_{AMB} = 25°C)

CENTER FREQ. (MHz)	PASSBAND (MHz) (Loss < 5dB)	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.
240	238 - 242	220	260	210	275 - 2500	1.3	1.8	18

Typical Frequency Response

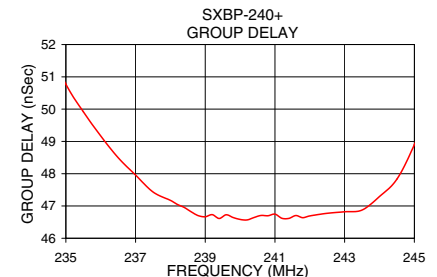
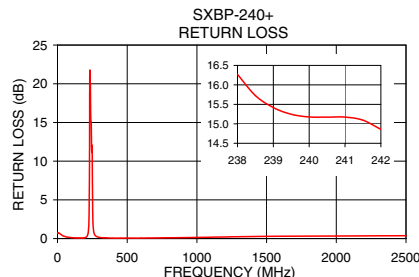


Functional Schematic



Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)	Frequency (MHz)	Group Delay (nSec)
	$\bar{x}$	σ			
1.0	87.75	3.29	0.69	235.0	50.77
10.0	78.24	1.27	0.71	235.5	49.92
100.0	86.90	2.12	0.12	236.0	49.17
210.0	48.10	0.27	0.26	236.5	48.50
220.0	31.25	0.50	0.74	237.0	47.96
226.0	16.64	0.88	2.63	237.5	47.43
229.0	8.88	0.72	8.14	238.0	47.18
238.0	4.07	0.04	16.27	238.4	46.95
240.0	4.06	0.02	15.18	239.0	46.67
242.0	4.19	0.04	14.86	239.4	46.61
250.0	8.24	0.57	8.62	240.0	46.58
253.0	14.85	0.71	2.99	240.6	46.71
260.0	29.15	0.51	0.89	241.0	46.75
275.0	47.42	0.36	0.33	242.0	46.69
300.0	64.20	0.50	0.16	243.0	46.82
500.0	92.94	5.40	0.07	244.0	47.29
1500.0	73.28	0.76	0.29	244.5	47.83
2500.0	49.59	1.01	0.37	245.0	48.90



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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Surface Mount Band Pass Filter

SXBP-240+

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
5	85.47	93.02	87.79	0.57	0.73	0.88	0.55	0.71	0.87
10	82.38	86.33	83.60	0.55	0.70	0.83	0.54	0.69	0.82
50	79.66	77.04	81.24	0.25	0.29	0.32	0.23	0.27	0.31
100	85.62	83.41	85.39	0.08	0.12	0.15	0.08	0.12	0.15
210	48.64	47.05	46.75	0.18	0.29	0.35	0.18	0.31	0.36
226	17.04	14.28	13.64	1.96	3.27	4.34	1.83	3.47	3.91
229	8.35	7.32	7.40	7.22	10.59	12.63	6.36	11.28	10.70
238	3.57	4.35	4.81	20.29	18.73	19.71	20.88	19.57	21.48
240	3.54	4.39	4.91	19.27	18.55	19.60	21.15	21.65	20.92
242	3.60	4.57	5.18	18.96	17.08	16.64	24.69	20.62	17.49
250	7.88	11.44	13.56	8.29	5.67	4.74	7.08	4.87	4.27
253	14.92	18.45	20.40	2.82	2.47	2.32	2.53	2.21	2.13
260	29.41	31.67	33.08	0.84	0.91	0.95	0.76	0.85	0.89
275	47.62	48.80	49.75	0.28	0.35	0.40	0.25	0.34	0.38
280	51.83	52.84	53.72	0.23	0.29	0.33	0.20	0.30	0.32
290	59.03	60.15	60.76	0.16	0.22	0.26	0.14	0.23	0.25
300	64.11	65.51	65.82	0.11	0.18	0.21	0.10	0.18	0.21
400	88.34	87.02	87.80	0.02	0.08	0.11	0.03	0.12	0.13
500	108.33	94.69	88.74	0.00	0.08	0.11	0.03	0.14	0.15
600	89.63	87.52	83.44	0.00	0.09	0.13	0.05	0.17	0.17
700	96.82	97.31	88.09	0.01	0.11	0.16	0.06	0.20	0.20
800	83.84	85.73	92.75	0.01	0.12	0.17	0.09	0.26	0.25
900	80.45	87.45	84.04	0.02	0.15	0.20	0.09	0.27	0.27
1000	80.25	86.45	84.35	0.02	0.16	0.22	0.11	0.30	0.30
1100	89.08	83.61	81.41	0.03	0.18	0.24	0.13	0.32	0.33
1200	73.07	79.43	85.26	0.04	0.20	0.27	0.15	0.36	0.36
1300	78.12	90.19	75.70	0.05	0.21	0.29	0.16	0.37	0.39
1400	66.34	74.70	71.23	0.04	0.22	0.30	0.16	0.39	0.41
1500	76.98	72.54	73.05	0.05	0.23	0.32	0.16	0.40	0.43
1600	83.79	76.62	100.12	0.06	0.24	0.35	0.15	0.41	0.45
1700	66.32	72.75	67.71	0.09	0.27	0.37	0.15	0.40	0.47
1800	80.96	66.53	83.60	0.08	0.28	0.38	0.14	0.40	0.45
1900	61.28	60.48	65.39	0.09	0.29	0.40	0.12	0.38	0.45
2000	67.14	74.33	67.96	0.09	0.29	0.40	0.09	0.36	0.45
2100	54.86	58.26	59.35	0.12	0.32	0.43	0.06	0.35	0.45
2200	65.65	57.60	63.96	0.10	0.32	0.44	0.01	0.31	0.42
2300	52.47	53.98	50.90	0.13	0.34	0.47	0.02	0.29	0.42
2400	55.35	51.88	55.22	0.12	0.33	0.49	0.06	0.27	0.39
2500	55.61	54.99	56.69	0.08	0.34	0.48	0.11	0.23	0.37
2600	52.72	47.81	50.52	0.13	0.35	0.52	0.10	0.24	0.38
2700	50.11	52.74	47.66	0.14	0.35	0.54	0.11	0.20	0.42
2800	42.42	43.70	43.79	0.22	0.53	0.73	0.06	0.44	0.64
2900	46.37	45.32	47.82	0.38	0.51	0.64	0.15	0.19	0.34
3000	45.20	46.79	44.81	0.10	0.38	0.56	0.24	0.08	0.33
3100	43.03	43.05	42.33	0.16	0.43	0.60	0.23	0.10	0.28
3200	41.09	37.26	39.04	0.18	0.52	0.64	0.32	0.05	0.22
3300	40.27	48.86	42.18	0.22	0.46	0.72	0.30	0.02	0.24
3400	45.59	37.47	41.72	0.22	0.51	0.76	0.30	0.11	0.26
3500	32.72	32.91	34.16	0.25	0.73	0.82	0.02	0.15	0.42
3600	31.31	33.18	31.95	0.35	0.94	1.11	0.28	0.11	0.29
3700	40.04	34.24	37.81	0.27	0.65	0.91	0.20	0.15	0.36
3800	37.09	36.11	35.19	0.34	0.87	1.09	0.09	0.26	0.62
3900	52.63	34.91	41.90	0.59	1.02	1.35	0.18	0.49	0.71
4000	33.76	28.68	36.83	0.75	1.44	1.88	0.40	1.00	1.26

REV. X2

SXBP-240+

101118

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Surface Mount Band Pass Filter

SXBP-240+

Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
200.0	1.90	1.97	4.59
210.0	3.77	3.64	4.32
212.0	4.86	5.24	5.70
214.0	5.88	6.87	7.49
215.0	6.15	7.34	8.04
216.0	7.04	8.56	8.94
218.0	8.70	10.24	11.09
220.0	10.98	13.25	14.68
222.0	14.49	18.05	20.15
224.0	20.49	26.32	29.70
225.0	25.31	32.66	36.57
226.0	31.81	40.45	44.57
228.0	49.83	56.49	58.43
230.0	63.69	63.14	62.07
232.0	63.85	58.61	56.55
234.0	55.48	51.89	51.09
235.0	52.35	50.03	49.64
236.0	49.46	48.31	48.09
238.0	47.69	46.82	46.97
238.5	47.29	46.53	46.91
239.0	47.01	46.55	46.97
239.5	46.73	46.44	46.96
240.0	46.59	46.63	47.17
240.5	46.56	46.69	47.31
241.0	46.70	46.98	47.58
241.5	46.69	47.14	47.85
242.0	46.95	47.52	48.37
244.0	48.50	50.18	52.01
245.0	50.92	53.47	55.26
246.0	53.13	55.44	56.36
248.0	58.04	56.46	54.18
250.0	56.52	49.47	44.40
252.0	45.31	36.44	31.58
254.0	31.00	24.93	21.92
255.0	25.24	20.76	18.44
256.0	20.78	17.48	15.85
258.0	14.90	13.03	12.00
260.0	11.16	10.04	9.53
262.0	8.88	8.06	7.72
264.0	7.08	6.79	6.31
265.0	6.50	6.00	5.75
266.0	5.76	5.79	5.66
268.0	5.06	4.74	4.76
270.0	4.44	4.18	3.96
272.0	3.76	3.46	3.70
274.0	3.60	3.45	3.08
275.0	2.83	2.95	3.43
276.0	2.68	3.13	2.66
278.0	2.90	3.37	2.87
280.0	3.17	3.37	2.27
285.0	2.43	2.48	2.45
290.0	1.76	3.23	2.40
295.0	1.99	1.52	2.30
300.0	1.48	1.63	1.53

REV. X2
SXBP-240+
101118
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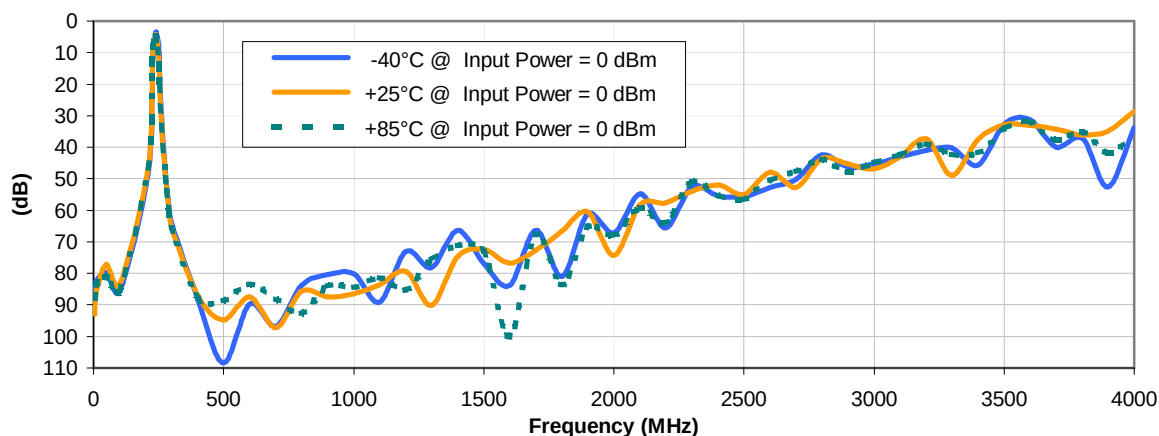
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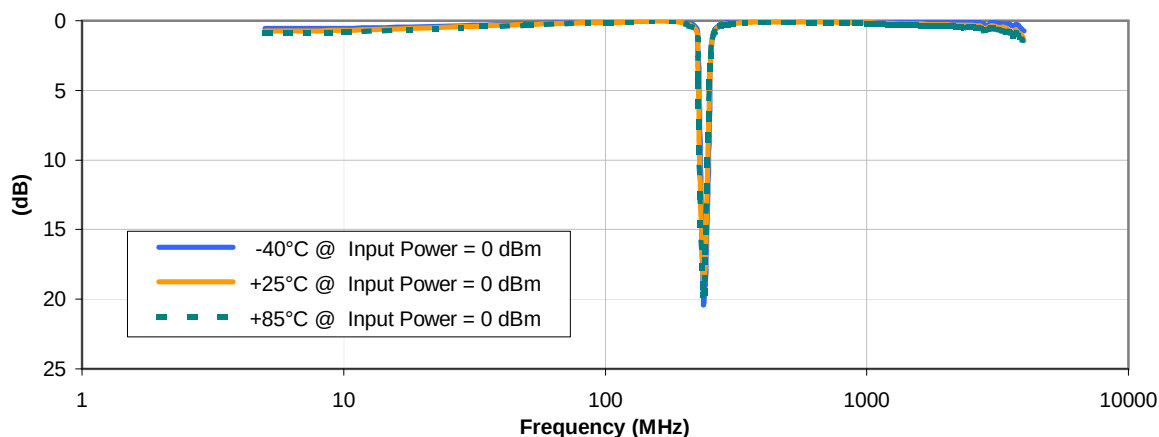


Typical Performance Curves

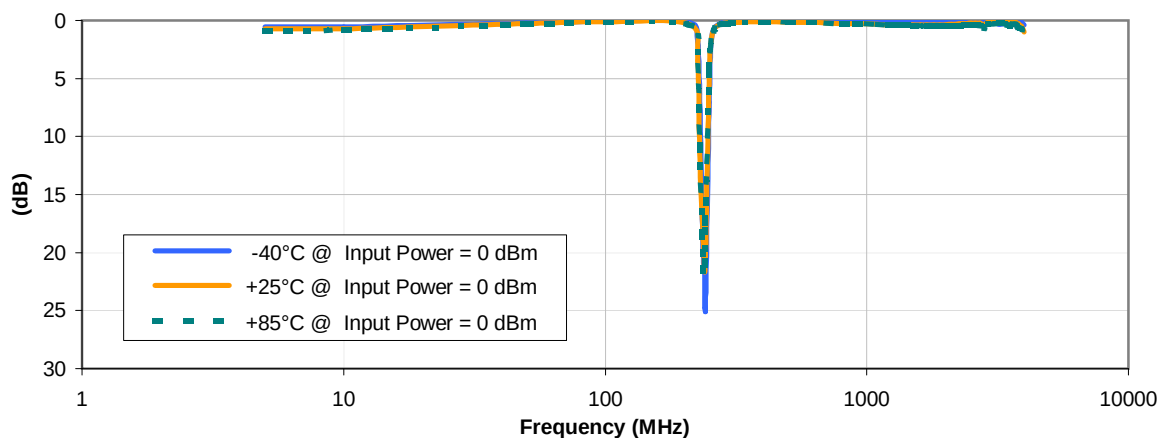
INSERTION LOSS vs. TEMPERATURE



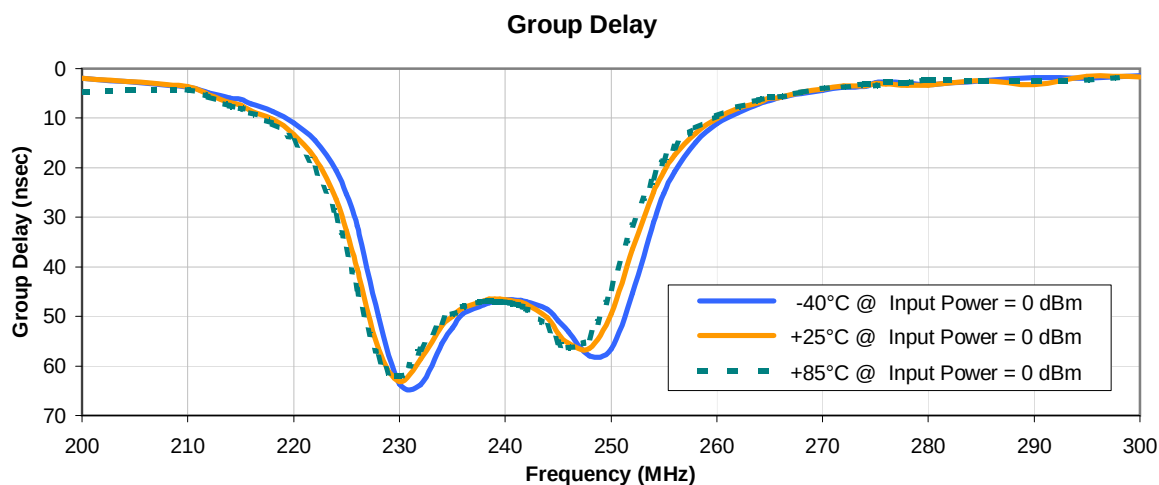
INPUT RETURN LOSS vs. TEMPERATURE



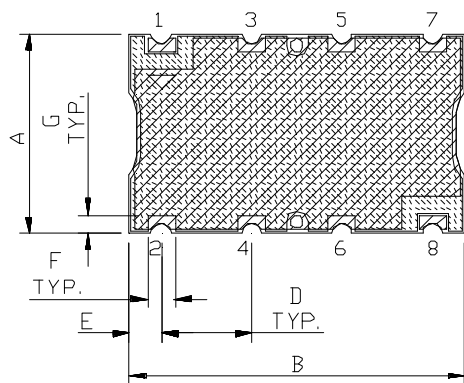
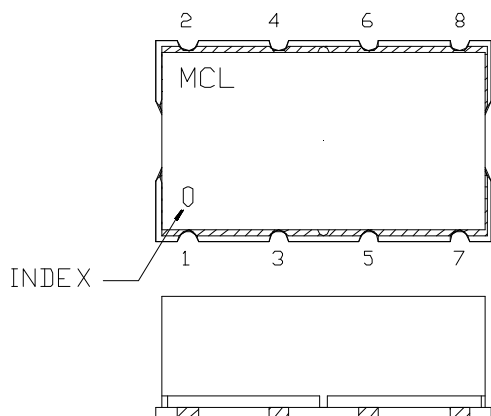
OUTPUT RETURN LOSS vs. TEMPERATURE



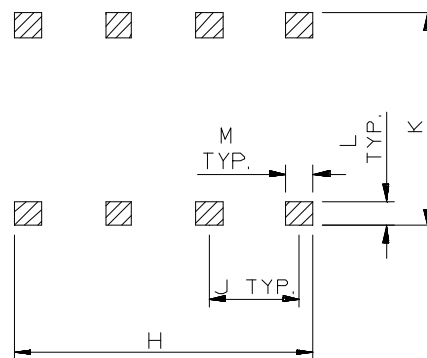
Typical Performance Curves



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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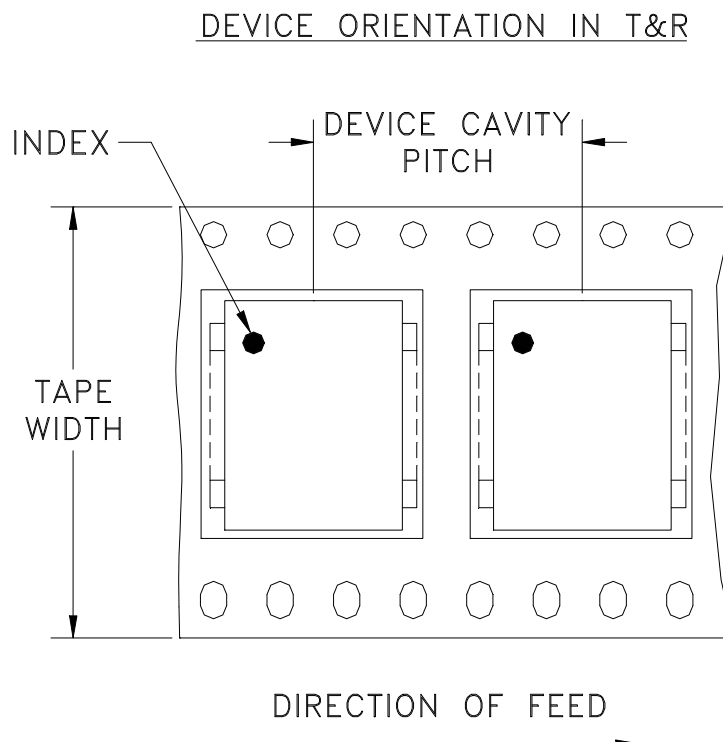


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RF/IF MICROWAVE COMPONENTS



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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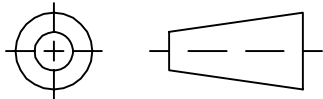
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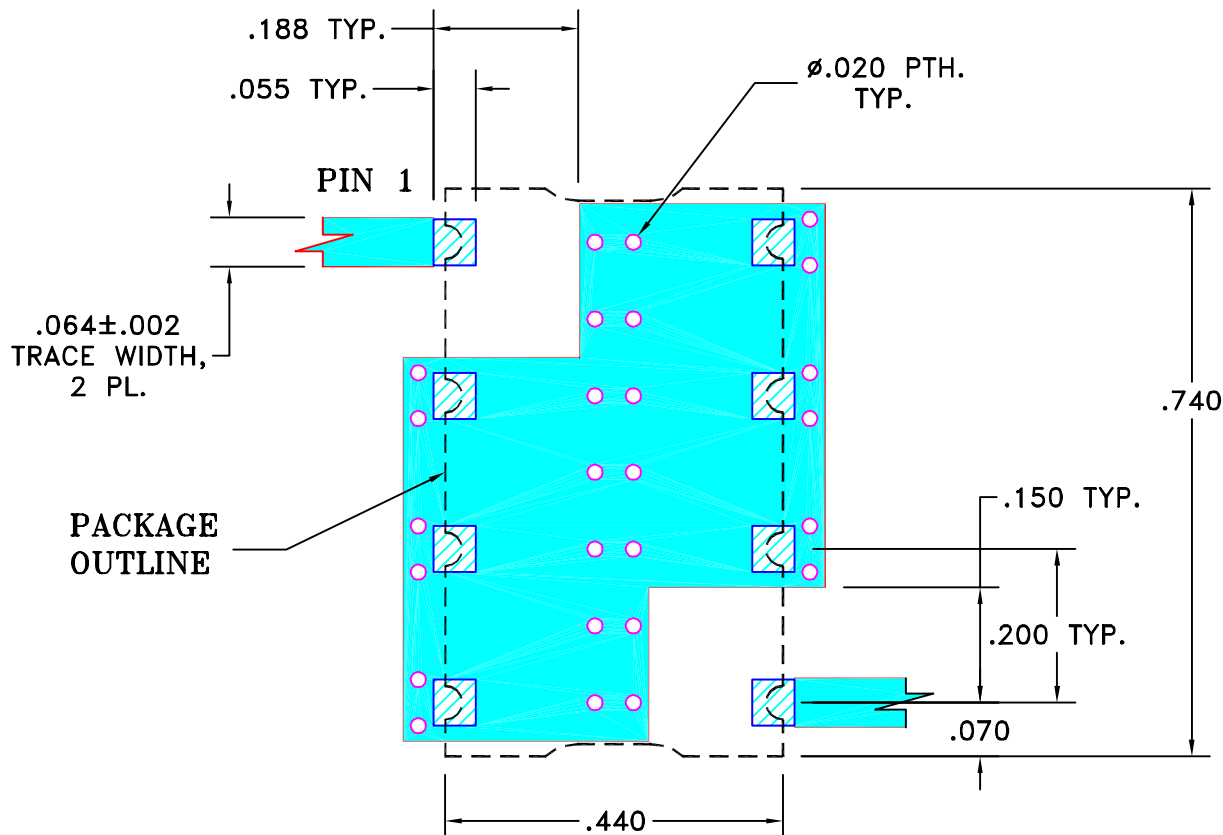
THIRD ANGLE PROJECTION



REVISIONS

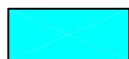
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OR	R62293	NEW RELEASE (FROM RAVON)	11/05	DK	HH

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



NOTE:

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

DRAWN

DK (RAVON)

29 NOV 05

TOLERANCES ON:

CHECKED

RZ (RAVON)

29 NOV 05

2 PL DECIMALS $\pm$.005

APPROVED

HH (RAVON)

29 NOV 05

ANGLES $\pm$ FRACTIONS $\pm$

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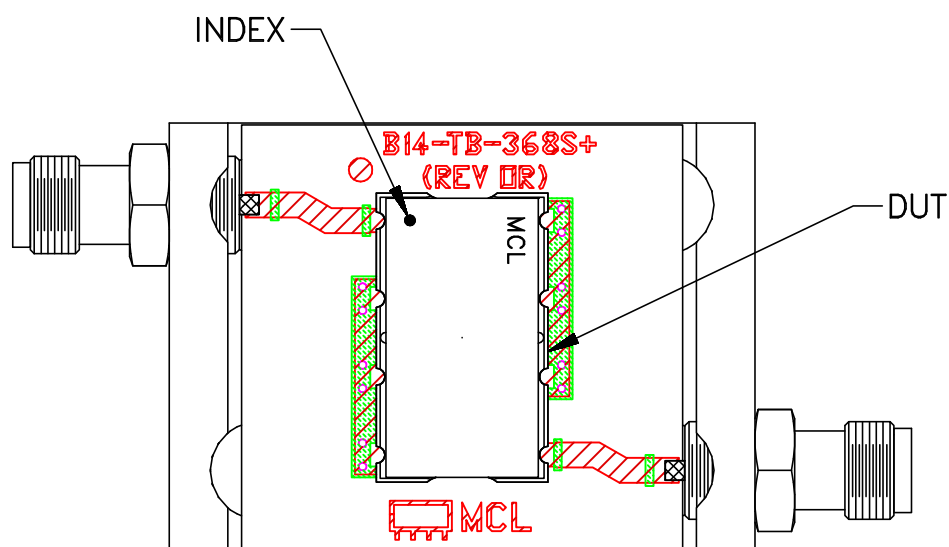
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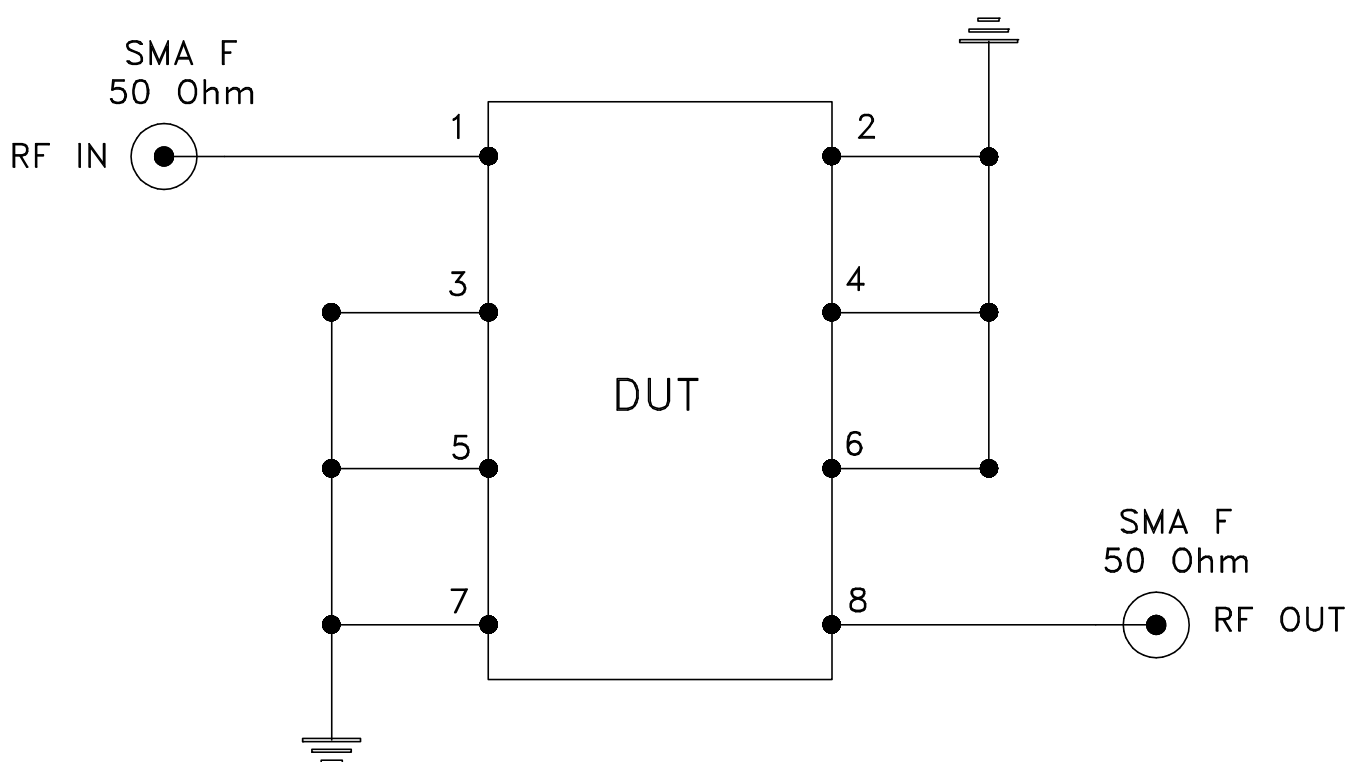
SCALE: 4:1

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