

Bandpass Filter

50Ω 268 to 282 MHz

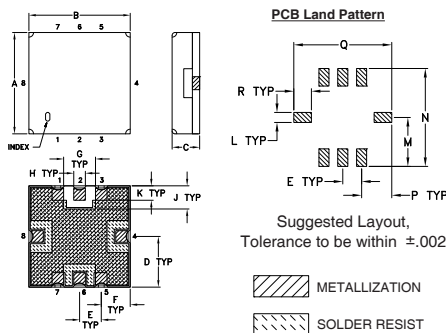
Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.5W at 25°C
Permanent damage may occur if any of these limits are exceeded.	

Pin Connections

RF IN	2
RF OUT	6
GROUND	1,3,4,5,7,8

Outline Drawing

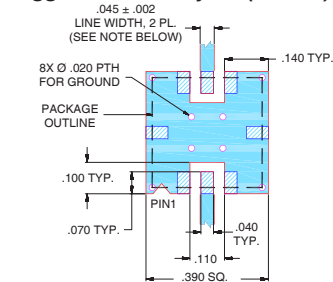


Outline Dimensions (inch/mm)

	A	B	C	D	E	F	G	H	J
	.350	.350	.100	.175	.075	.100	.110	.040	.080
	8.89	8.89	2.54	4.45	1.91	2.54	2.79	1.02	2.03
	K	L	M	N	P	Q	R		wt
	.050	.040	.195	.390	.120	.390	.070		grams
	1.27	1.02	4.95	9.91	3.05	9.91	1.78		0.25

Note: Please refer to case style drawing for details

Demo Board MCL P/N: TB-332 Suggested PCB Layout (PL-176)

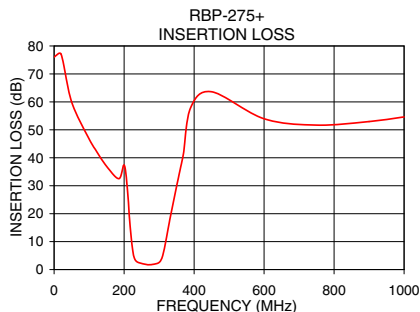


1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .025" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

3. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

4. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK



Notes

- A. 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.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits 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-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

Features

- linear phase, up to ±8deg typ. @ Fc ±30MHz
- good VSWR, 1.2:1 typ. @ passband
- small size 0.35" x 0.35"
- shielded case
- aqueous washable

Applications

- harmonic rejection
- transmitters / receivers



Generic photo used for illustration purposes only
CASE STYLE: GP731

+RoHS Compliant

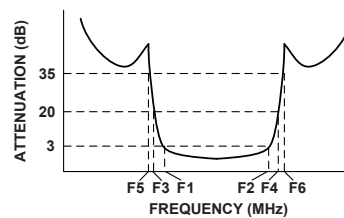
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Reel Size	Devices/Reel
7"	10, 20, 50, 100, 200
13"	500, 1000

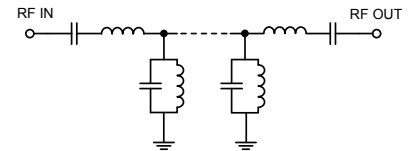
Bandpass Filter Electrical Specifications (T_{AMB} = 25°C)

CENTER FREQ. (MHz)	PASSBAND (MHz) (Loss < 3dB)	STOPBANDS (MHz)				MAXIMUM DEVIATION FROM LINEAR PHASE (deg.)	VSWR (:1)	
		Loss > 20dB	Loss > 35dB				Passband	Stopband
Fc	F1 - F2	F3	F4	F5	F6	Fc ± 30MHz	Max.	Typ.
275	268 - 282	209	350	120	370-1000	±15	1.7	18

Typical Frequency Response

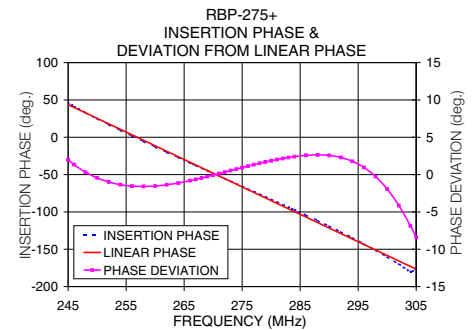
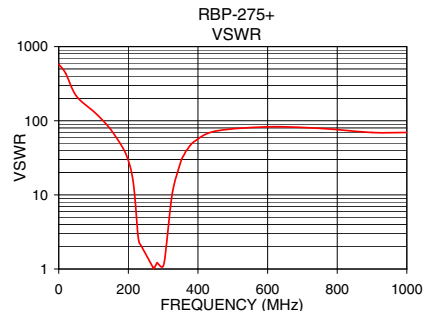


Functional Schematic



Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Deviation from Linear Phase (deg.)
0.3	76.04	579.06	245.0	1.98
120.0	42.54	108.58	248.0	0.32
209.0	29.34	20.22	250.0	-0.44
220.0	11.85	7.94	254.0	-1.35
225.0	6.57	3.95	258.0	-1.58
245.0	2.29	1.77	260.0	-1.54
268.0	1.73	1.11	262.0	-1.36
270.0	1.73	1.07	268.0	-0.45
275.0	1.75	1.04	270.0	-0.07
280.0	1.82	1.16	275.0	0.94
282.0	1.85	1.21	280.0	1.86
305.0	3.31	1.38	282.0	2.16
320.0	10.72	6.32	286.0	2.58
330.0	17.48	12.99	290.0	2.57
350.0	29.80	27.59	294.0	1.78
370.0	41.72	41.37	296.0	0.95
450.0	63.62	72.39	300.0	-1.94
1000.0	54.60	69.49	305.0	-8.40



Metal Shield Band Pass Filter

RBP-275+

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
0.5	87.10	94.30	92.21	0.01	0.02	0.02	0.00	0.00	0.00
50	60.51	60.58	60.37	0.07	0.09	0.10	0.01	0.01	0.03
100	46.95	47.01	47.04	0.12	0.14	0.16	0.00	0.04	0.06
120	42.87	42.88	42.91	0.15	0.17	0.19	0.02	0.06	0.08
130	40.92	40.94	40.97	0.17	0.19	0.21	0.03	0.07	0.09
140	39.05	39.07	39.06	0.18	0.21	0.23	0.04	0.09	0.12
150	37.23	37.23	37.20	0.20	0.24	0.25	0.06	0.12	0.15
160	35.48	35.46	35.44	0.23	0.27	0.29	0.08	0.15	0.19
170	33.79	33.81	33.78	0.26	0.31	0.33	0.12	0.20	0.24
180	32.34	32.37	32.37	0.31	0.36	0.39	0.18	0.27	0.32
190	31.41	31.50	31.56	0.37	0.44	0.48	0.27	0.38	0.44
200	32.12	32.37	32.58	0.46	0.55	0.62	0.43	0.57	0.63
209	38.94	38.60	38.07	0.62	0.75	0.84	0.70	0.89	0.98
220	20.35	19.54	18.94	1.13	1.39	1.59	1.58	1.97	2.21
225	13.04	12.51	12.09	1.90	2.35	2.71	2.76	3.46	3.93
245	2.14	2.45	2.63	12.82	12.97	13.08	16.70	17.10	17.26
268	1.69	1.95	2.11	14.28	15.17	15.89	14.60	15.36	15.86
270	1.67	1.94	2.10	14.93	15.96	16.83	14.75	15.46	15.98
275	1.63	1.92	2.09	17.38	18.93	20.50	15.54	16.12	16.64
280	1.62	1.92	2.10	21.53	24.04	27.31	16.77	17.07	17.46
282	1.62	1.93	2.12	23.76	26.50	29.84	17.28	17.42	17.72
305	2.45	2.97	3.35	19.94	17.75	16.24	18.09	17.45	16.43
320	8.44	9.28	9.93	3.34	3.34	3.27	3.00	3.17	3.22
330	15.28	16.03	16.62	1.42	1.51	1.54	1.25	1.48	1.59
350	28.42	29.01	29.52	0.58	0.64	0.68	0.51	0.69	0.78
370	42.00	42.61	43.19	0.35	0.41	0.43	0.32	0.48	0.55
400	55.74	55.47	55.37	0.24	0.27	0.30	0.19	0.34	0.41
450	53.37	53.61	53.63	0.16	0.20	0.21	0.11	0.26	0.33
500	62.01	62.15	62.06	0.14	0.17	0.19	0.07	0.23	0.30
600	59.81	60.22	60.17	0.12	0.16	0.18	0.04	0.22	0.29
700	54.90	55.33	55.53	0.11	0.16	0.18	0.04	0.23	0.31
800	54.12	54.49	54.64	0.11	0.16	0.19	0.03	0.25	0.33
900	54.49	55.03	55.40	0.11	0.17	0.21	0.04	0.26	0.35
1000	56.38	56.55	57.29	0.11	0.19	0.23	0.05	0.29	0.37
1200	68.58	72.85	73.53	0.12	0.23	0.28	0.06	0.32	0.42
1400	54.51	54.02	53.75	0.17	0.33	0.40	0.08	0.35	0.46
1500	48.86	48.48	48.49	0.27	0.46	0.56	0.08	0.36	0.48
1800	38.96	39.77	40.51	1.97	2.21	2.28	0.10	0.39	0.55
2000	57.87	63.03	62.53	0.30	0.52	0.61	0.11	0.41	0.59
2200	51.18	49.82	48.45	0.22	0.45	0.56	0.10	0.43	0.63
2400	43.54	42.74	42.44	0.23	0.49	0.61	0.10	0.44	0.65
2500	41.63	41.22	40.88	0.30	0.57	0.71	0.10	0.45	0.66
2800	37.71	37.30	37.35	0.26	0.56	0.75	0.13	0.50	0.68
3000	34.50	34.67	34.65	0.29	0.62	0.85	0.10	0.53	0.65
3200	32.69	32.71	33.10	0.37	0.72	0.98	0.10	0.57	0.66
3400	31.19	31.05	31.41	0.54	0.88	1.15	0.10	0.61	0.74
3500	30.77	30.46	30.68	0.55	0.91	1.20	0.11	0.64	0.76
3800	28.89	28.56	28.55	2.20	2.68	3.04	0.18	0.73	1.01
4000	27.70	27.29	26.82	0.92	1.32	1.60	0.20	0.77	1.14
4200	25.81	25.51	25.04	0.61	1.08	1.41	0.28	0.93	1.44
4400	23.84	22.73	22.50	0.63	1.18	1.54	1.50	1.45	1.85
4500	21.44	21.81	21.51	0.68	1.27	1.68	0.59	1.04	1.47
4800	18.88	19.31	19.64	1.02	1.79	2.32	0.42	1.02	1.27
5000	16.81	17.43	18.19	1.62	2.60	3.18	0.48	1.16	1.34

REV. X2

RBP-275+

101011

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Metal Shield Band Pass Filter

RBP-275+

Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
268	9.77	9.75	9.74
269	9.75	9.73	9.71
270	9.72	9.70	9.69
272	9.69	9.68	9.68
273	9.69	9.69	9.69
274	9.68	9.69	9.69
275	9.70	9.70	9.71
276	9.72	9.71	9.72
277	9.73	9.73	9.75
278	9.76	9.77	9.78
279	9.79	9.80	9.80
280	9.83	9.83	9.84
282	9.92	9.92	9.94
283	9.97	9.98	10.00
284	10.03	10.04	10.06
285	10.09	10.09	10.11
286	10.15	10.15	10.19
287	10.21	10.23	10.26
288	10.30	10.32	10.35
289	10.38	10.41	10.45
290	10.48	10.52	10.56
292	10.72	10.77	10.82
293	10.87	10.93	10.99
294	11.02	11.09	11.16
295	11.19	11.27	11.36
296	11.39	11.48	11.57
297	11.60	11.70	11.81
298	11.83	11.95	12.06
300	12.38	12.49	12.61
302	13.00	13.12	13.23
303	13.34	13.43	13.53
304	13.68	13.75	13.81
305	14.02	14.05	14.08
306	14.35	14.34	14.33
307	14.64	14.58	14.53
308	14.91	14.78	14.67
310	15.25	14.98	14.75
312	15.28	14.87	14.51
314	14.94	14.41	13.96
315	14.64	14.07	13.58
316	14.27	13.66	13.15
317	13.81	13.20	12.68
318	13.25	12.63	12.12
320	11.69	11.13	10.68
325	9.79	9.34	8.98
330	7.77	7.46	7.20
335	6.01	5.81	5.63
340	4.74	4.60	4.48
345	3.82	3.71	3.60
350	3.11	3.02	2.92
355	2.55	2.43	2.33
360	2.03	1.90	1.82
365	1.50	1.36	1.15
370	0.75	0.43	0.28

REV. X2

RBP-275+

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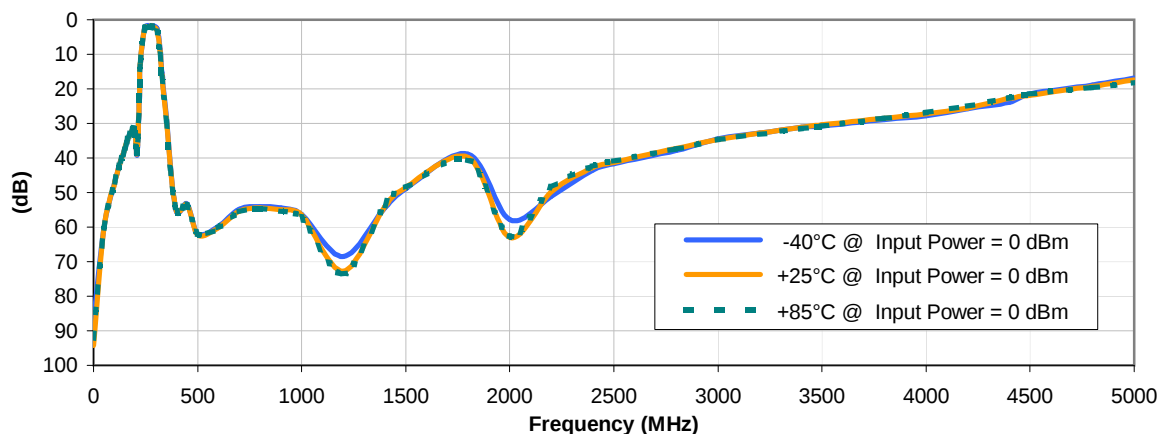


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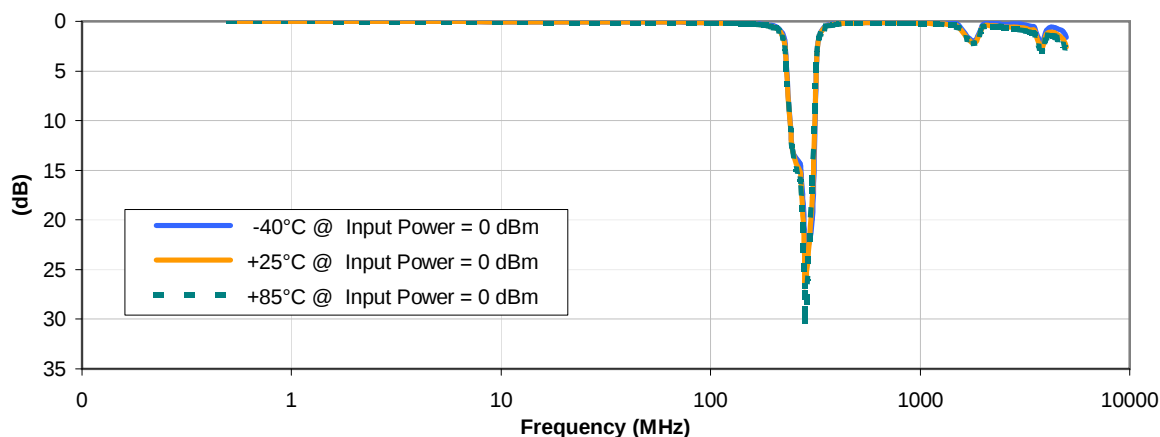


Typical Performance Curves

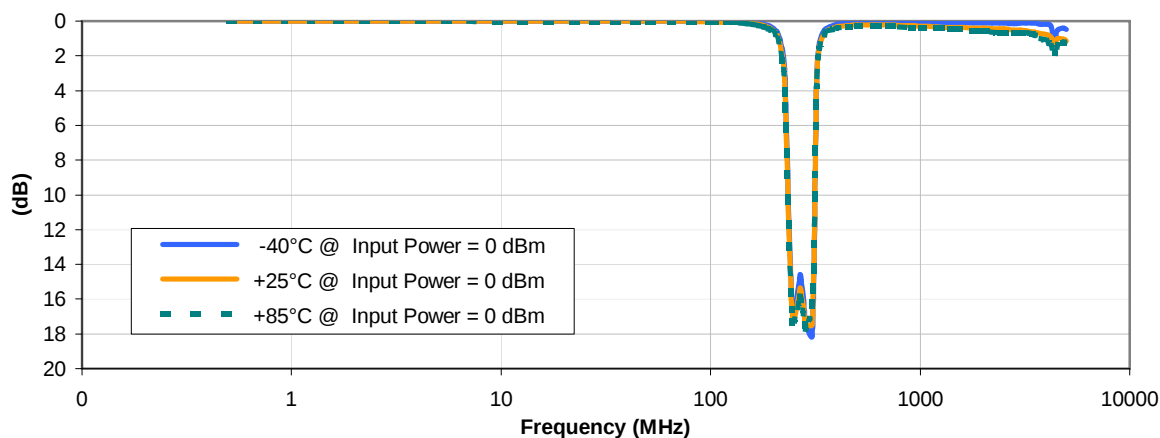
INSERTION LOSS vs. TEMPERATURE



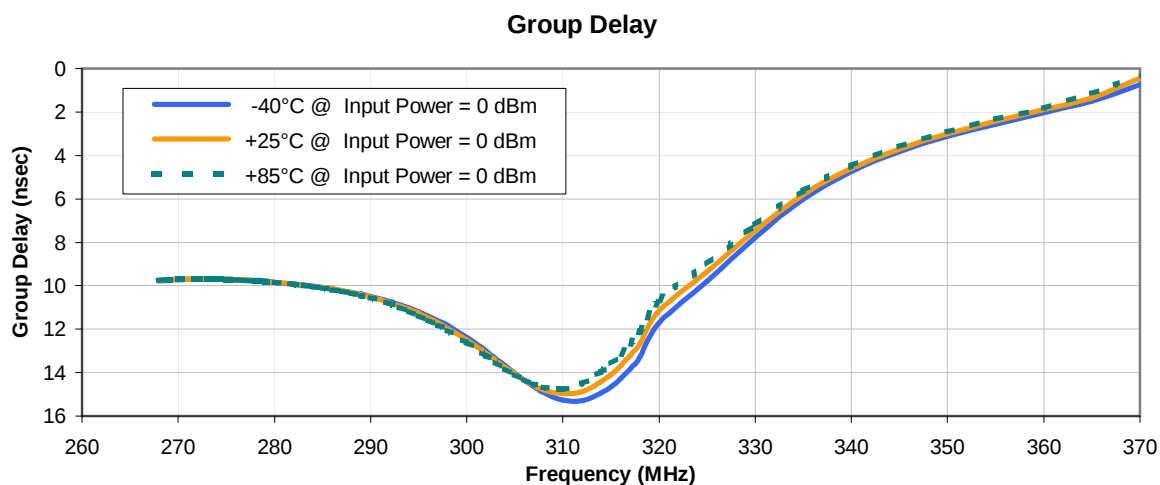
INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE

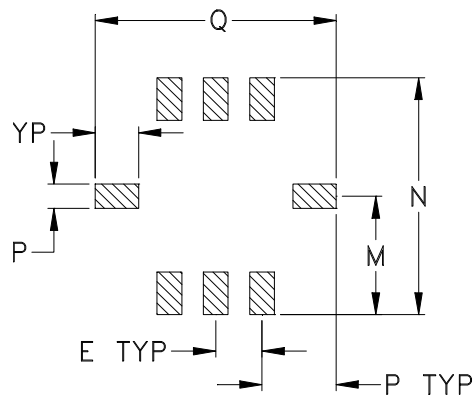
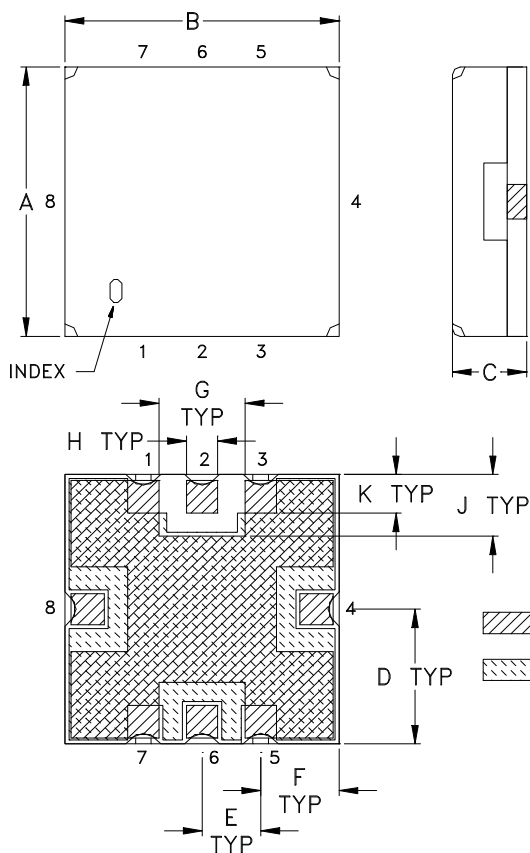


Typical Performance Curves



Outline Dimensions

GP731



CASE #	A	B	C	D	E	F	G	H	J	K	L	M
GP731	.350 (8.89)	.350 (8.89)	.100 (2.54)	.175 (4.45)	.075 (1.91)	.100 (2.54)	.110 (2.79)	.040 (1.02)	.080 (2.03)	.050 (1.27)	.040 (1.02)	.195 (4.95)

CASE #	N	P	Q	R	WT. GRAM
GP731	.390 (9.91)	.120 (3.05)	.390 (9.91)	.070 (1.78)	.4 +0.3 -0.0

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

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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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F78



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note
16	12	7	10
			20
			50
			100
			200
		13	500, 1000

Note: Please consult individual model data sheet to determine device per reel availability.

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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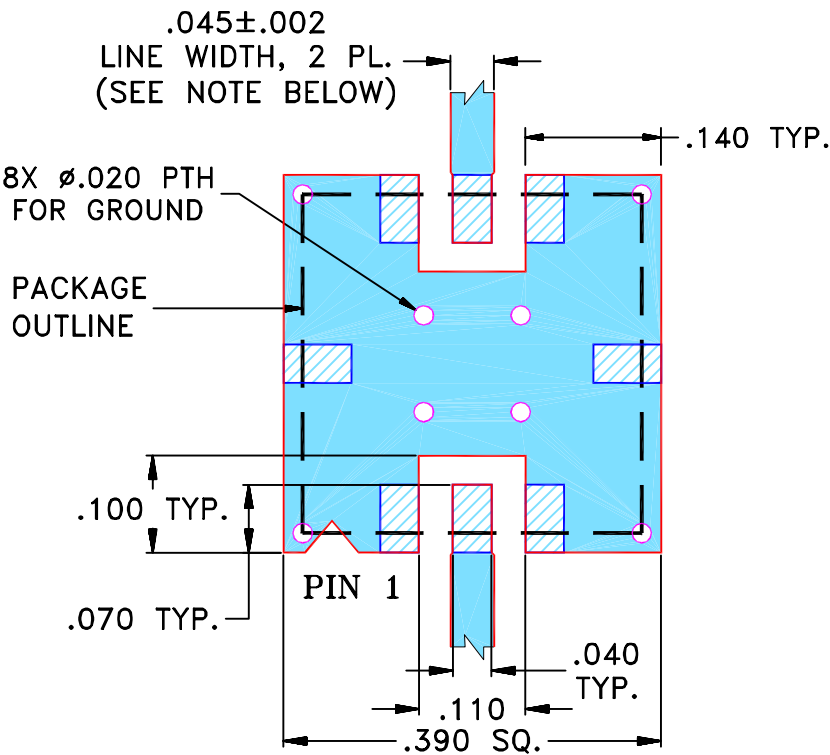
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THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	R59289	NEW RELEASE (FROM RAVON)	02/05	DK	HH
A	M101151	ADDED "RBP" & CORRECTED PIN	10/10/05	MMG	DJ
		CONNECTION TO DESCRIPTION OF PL-DWG.			
B	M102713	UPDATED NOTES, ADDED "...WITH SMOBC"	01/20/06	GT	IL

SUGGESTED MOUNTING CONFIGURATION

FOR GP731 CASE STYLE, "qf" PIN CONNECTION.



- NOTES:

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

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS ±

3 PL DECIMALS ± .005

ANGLES ±

FRACTIONS ±

INITIALS

DATE

DRAWN DK (RAVON) 10 FEB 05

CHECKED RZ (RAVON) 10 FEB 05

APPROVED HH (RAVON) 10 FEB 05

Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

PL, qf, GP731, RBP, TB-332

SIZE A

CODE IDENT 15542

DRAWING NO: 98-PL-176

REV: B

FILE: 98PL176

SCALE: 5:1

SHEET: 1 OF 1

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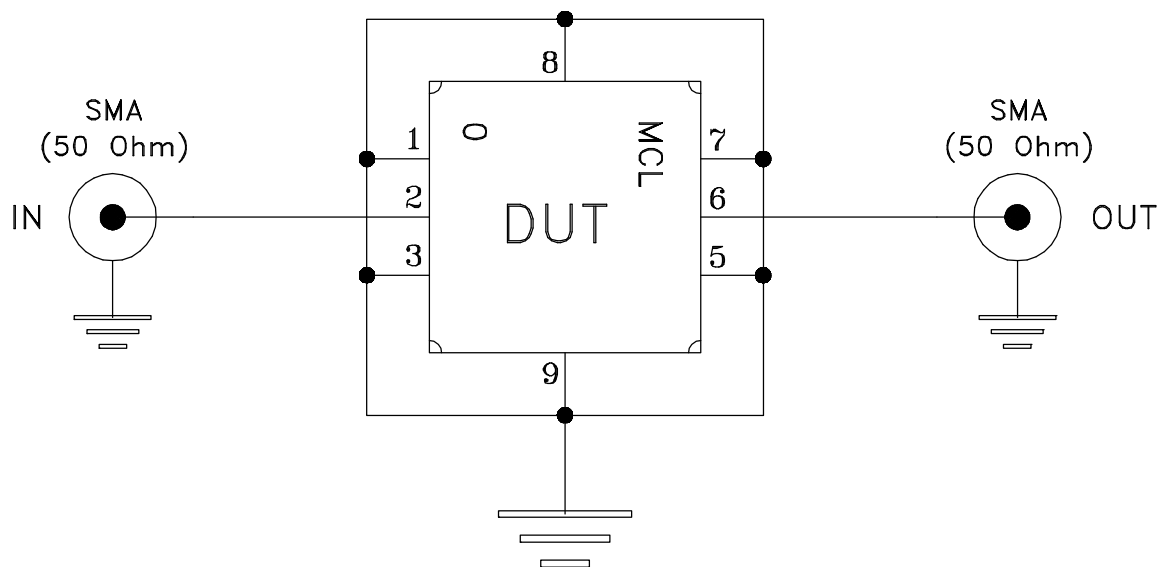
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ASHEETA1.DWG REV:A DATE:01/12/95

Evaluation Board and Circuit



TB-332



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.020 inch.

 **Mini-Circuits®**



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
HAST	130°C, 85% RH, 96 hours	JESD22-A110
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 Eutectic Process: 225°C peak Pb-Free Process, 245°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 20-2000 Hz, 4 times in each of three axes (total 12)	MIL-STD-883, Method 2007.3, Condition A
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