

Generic photo used for illustration purposes only

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



50Ω 60 to 90 MHz

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.1W at 25°C

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

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

PCB Land Pattern

Suggested Layout,
Tolerance to be within ± 0.02

LEGEND:
 [Hatched Box] METALLIZATION
 [Cross-hatched Box] SOLDER RESIST

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

Figure 6 is a detailed technical drawing of a package outline, specifically focusing on the location of Pin 1. The drawing includes several key dimensions and labels:

- PIN1**: A label pointing to the first pin on the left side of the package.
- .070 TYP.**: Dimension indicating the typical distance from the bottom edge to the centerline of the pins.
- .100 TYP.**: Dimension indicating the typical distance between the centerlines of adjacent pins.
- 8X Ø .020 PTH FOR GROUND**: Label indicating eight circular through-holes for ground connection.
- PACKAGE OUTLINE**: Label pointing to the overall rectangular boundary of the package.
- LINE WIDTH, 2 PL (SEE NOTE BELOW)**: Label pointing to the width of the conductive traces on two layers.
- .045 ± .002**: Dimension indicating the tolerance for the line width.
- .140 TYP.**: Dimension indicating the typical distance from the right edge to the centerline of the pins.
- .110**: Dimension indicating the distance from the centerline of Pin 1 to the centerline of the next pin.
- .040 TYP.**: Dimension indicating the typical thickness or height of the pin.
- .390 SQ.**: Dimension indicating the square length of the package body.

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 LANE 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. Technical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.

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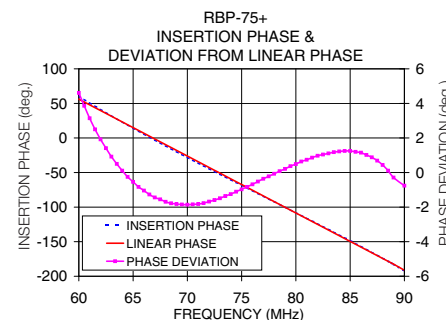
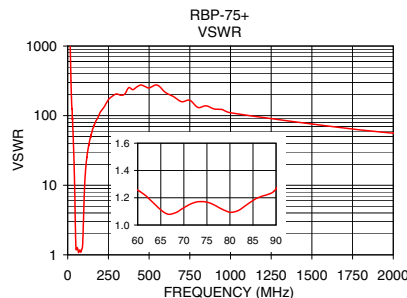
- linear phase, up to ± 4 deg. typ @ $F_c \pm 15$ MHz
- good VSWR, 1.3:1 typ @ passband
- high rejection
- small size 0.35" X 0.35"
- shielded case
- aqueous washable

- military radar
- harmonic rejection
- transmitters/receivers

CENTER FREQ. (MHz)	PASSBAND (MHz) (Loss < 4dB) Fc	STOPBANDS (MHz)				MAXIMUM DEVIATION FROM LINEAR PHASE (deg.) Fc ± 15MHz	VSWR (:1)		
		Loss > 20dB		Loss > 35dB			Passband		Stopband
		F3	F4	F5	F6		Typ.	Max.	Typ.
75	60 - 90	37	122	30	155 - 2000	±8	1.3	1.7	18

The diagram shows a two-port network. On the left, an input port labeled 'RF IN' is connected to a series combination of a capacitor and an inductor. This is followed by a node connected to a parallel LC resonator (a capacitor and an inductor in parallel, both connected to ground). A dashed line indicates a transmission path to a second node, which is also connected to a parallel LC resonator (a capacitor and an inductor in parallel, both connected to ground). This second node is followed by another series combination of an inductor and a capacitor, leading to an output port labeled 'RF OUT'.

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Deviation from Linear Phase (deg.)
0.5	81.04	10825.01	60.0	4.61
28.0	50.32	99.37	62.0	1.92
37.0	29.43	29.94	64.0	0.11
43.0	14.77	8.67	66.0	-1.04
46.5	7.36	2.96	68.0	-1.69
50.0	3.52	1.36	70.0	-1.86
60.0	2.02	1.25	71.0	-1.82
70.0	1.81	1.13	73.0	-1.49
75.0	1.82	1.17	74.0	-1.25
80.0	1.89	1.09	75.0	-0.97
90.0	2.50	1.27	76.0	-0.68
95.0	4.21	2.21	78.0	-0.07
100.0	8.84	5.56	80.0	0.49
105.0	14.58	10.93	82.0	0.97
122.0	29.82	30.01	84.0	1.22
173.0	51.75	83.61	86.0	1.15
500.0	94.19	250.42	88.0	0.44
2000.0	50.37	55.92	90.0	-0.76



Metal Shield Band Pass Filter

RBP-75+

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	93.86	94.10	96.31	0.00	0.01	0.00	0.01	0.01	0.01
10	101.27	101.38	96.42	0.01	0.01	0.02	0.01	0.01	0.01
20	69.39	69.29	69.90	0.05	0.06	0.08	0.04	0.06	0.07
28	50.29	50.01	49.80	0.14	0.17	0.20	0.12	0.16	0.20
37	29.59	29.34	29.12	0.50	0.61	0.70	0.47	0.58	0.69
43	14.70	14.61	14.53	1.71	2.02	2.29	1.71	2.02	2.30
50	3.14	3.51	3.79	14.52	15.40	16.15	16.31	17.39	18.02
60	1.84	2.11	2.32	17.86	18.05	18.37	16.91	17.15	17.58
70	1.62	1.87	2.08	33.78	32.88	30.96	39.66	46.96	37.83
75	1.66	1.91	2.11	28.73	32.85	40.72	27.14	31.41	42.33
80	1.76	2.02	2.25	34.64	29.91	26.73	28.65	29.24	28.34
90	2.36	2.73	3.04	22.09	20.85	19.76	28.53	27.69	25.68
95	3.94	4.51	4.99	9.62	9.07	8.60	9.89	9.51	9.15
100	8.45	9.09	9.61	3.41	3.43	3.43	3.41	3.51	3.59
105	14.20	14.73	15.15	1.63	1.73	1.80	1.60	1.75	1.87
110	19.50	19.93	20.27	1.02	1.11	1.19	0.99	1.12	1.23
120	28.11	28.43	28.68	0.59	0.66	0.72	0.56	0.66	0.74
122	29.58	29.89	30.11	0.54	0.61	0.67	0.52	0.61	0.68
130	34.81	35.04	35.24	0.41	0.47	0.53	0.39	0.47	0.53
140	40.20	40.38	40.54	0.31	0.37	0.42	0.30	0.37	0.42
150	44.65	44.80	44.89	0.26	0.31	0.35	0.24	0.31	0.36
160	48.38	48.46	48.51	0.21	0.27	0.31	0.20	0.27	0.31
170	51.58	51.61	51.60	0.19	0.23	0.28	0.17	0.23	0.28
173	52.44	52.42	52.45	0.18	0.23	0.27	0.16	0.23	0.27
200	58.54	58.44	58.35	0.13	0.18	0.22	0.11	0.18	0.23
300	69.59	69.41	69.76	0.07	0.13	0.18	0.04	0.12	0.18
400	75.71	76.44	76.39	0.06	0.13	0.18	0.03	0.13	0.19
500	84.13	84.25	83.06	0.07	0.14	0.20	0.02	0.14	0.21
600	91.01	94.52	99.33	0.07	0.16	0.23	0.02	0.16	0.25
700	90.82	85.99	91.26	0.08	0.18	0.26	0.02	0.18	0.27
800	83.59	84.17	87.74	0.09	0.20	0.29	0.02	0.20	0.30
900	83.33	84.82	84.76	0.10	0.22	0.32	0.03	0.22	0.33
1000	84.22	89.26	85.49	0.11	0.24	0.35	0.04	0.24	0.35
1200	84.68	85.59	84.33	0.14	0.29	0.40	0.05	0.27	0.40
1400	75.30	80.58	74.96	0.17	0.32	0.44	0.06	0.29	0.43
1500	67.73	64.73	68.70	0.19	0.34	0.47	0.06	0.30	0.45
1600	69.80	66.51	68.38	0.19	0.35	0.48	0.07	0.32	0.47
1700	67.14	65.21	66.90	0.20	0.36	0.50	0.08	0.33	0.49
1800	60.70	65.47	59.72	0.21	0.37	0.51	0.09	0.34	0.51
2000	64.47	65.52	61.74	0.22	0.39	0.54	0.08	0.35	0.56
2200	61.45	54.83	61.54	0.22	0.42	0.57	0.08	0.38	0.58
2400	54.41	51.96	57.10	0.23	0.43	0.59	0.08	0.39	0.61
2500	49.34	52.69	53.06	0.24	0.44	0.61	0.09	0.40	0.63
2600	48.73	51.52	48.72	0.25	0.46	0.63	0.09	0.42	0.63
2700	48.32	47.90	47.73	0.26	0.47	0.64	0.08	0.42	0.63
2800	46.52	47.35	47.82	0.28	0.50	0.69	0.10	0.44	0.64
3000	44.21	44.31	43.99	0.77	0.74	0.82	0.47	0.76	0.83
3200	40.01	41.11	42.44	0.30	0.57	0.72	0.09	0.53	0.69
3400	38.44	38.90	38.94	0.30	0.60	0.77	0.09	0.52	0.76
3500	38.66	37.53	36.66	0.38	0.66	0.82	0.09	0.54	0.79
3600	37.75	35.95	36.62	0.37	0.68	0.90	0.10	0.57	0.85
3700	36.39	34.30	35.13	0.43	0.75	1.00	0.12	0.63	0.93
3800	32.23	32.65	31.80	0.51	0.87	1.23	0.16	0.66	1.03
4000	28.85	28.84	26.96	1.06	1.87	2.81	0.26	0.82	1.32

REV. X2

RBP-75+

101006

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Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
60	27.68	27.57	27.46
61	26.91	26.80	26.69
62	26.24	26.14	26.06
63	25.66	25.58	25.49
64	25.20	25.10	25.03
65	24.77	24.67	24.59
66	24.34	24.26	24.16
67	23.97	23.91	23.83
68	23.63	23.57	23.48
69	23.32	23.28	23.21
70	23.04	23.01	22.97
71	22.79	22.78	22.75
72	22.59	22.59	22.58
73	22.40	22.39	22.40
74	22.27	22.28	22.29
75	22.17	22.21	22.22
76	22.14	22.18	22.19
77	22.11	22.15	22.19
78	22.12	22.18	22.20
79	22.19	22.23	22.25
80	22.26	22.29	22.34
81	22.39	22.42	22.47
82	22.53	22.58	22.62
83	22.70	22.77	22.82
84	22.95	23.03	23.10
85	23.25	23.36	23.45
86	23.63	23.78	23.88
87	24.14	24.31	24.44
88	24.79	24.98	25.13
89	25.60	25.79	25.94
90	26.58	26.73	26.83
95	30.34	29.75	29.15
100	23.55	22.74	22.03
110	9.58	9.48	9.40
120	5.21	5.21	5.22
130	3.54	3.52	3.54
140	2.58	2.60	2.67
150	2.13	2.06	2.12
160	1.61	1.91	1.62
170	1.32	1.28	1.59
210	0.88	1.04	0.88
220	0.87	0.88	0.99
230	0.68	0.62	0.87
240	0.73	0.74	0.48
250	0.69	0.88	0.64
260	0.94	0.85	0.46
270	0.45	0.49	0.50
280	0.76	0.23	0.70
290	0.85	0.40	0.91
300	0.66	0.90	0.55
310	0.51	0.96	0.47
320	0.40	0.30	0.65
330	0.24	0.78	0.64

REV. X2

RBP-75+

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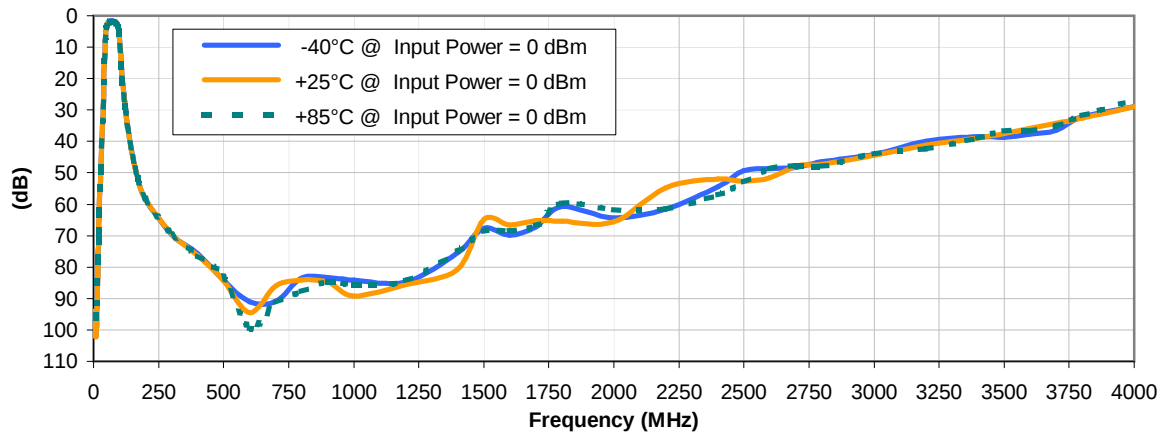


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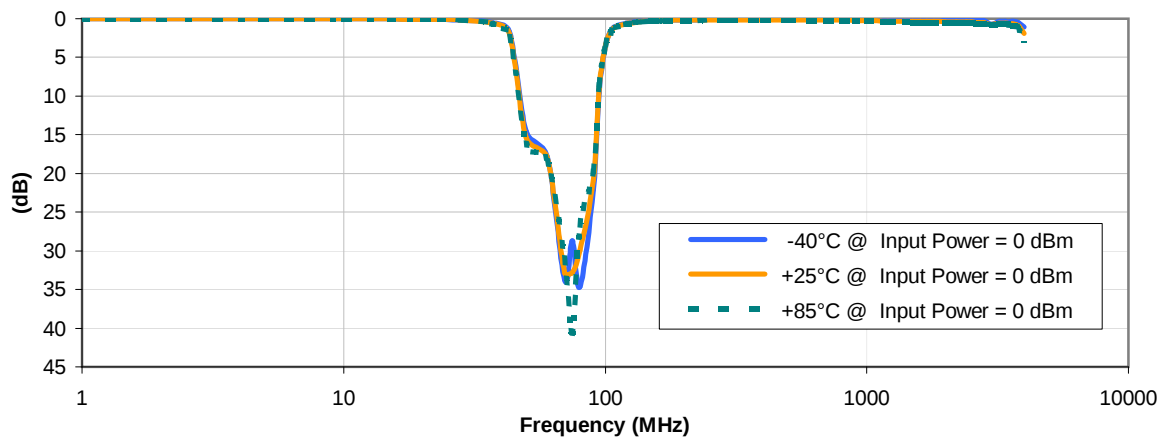


Typical Performance Curves

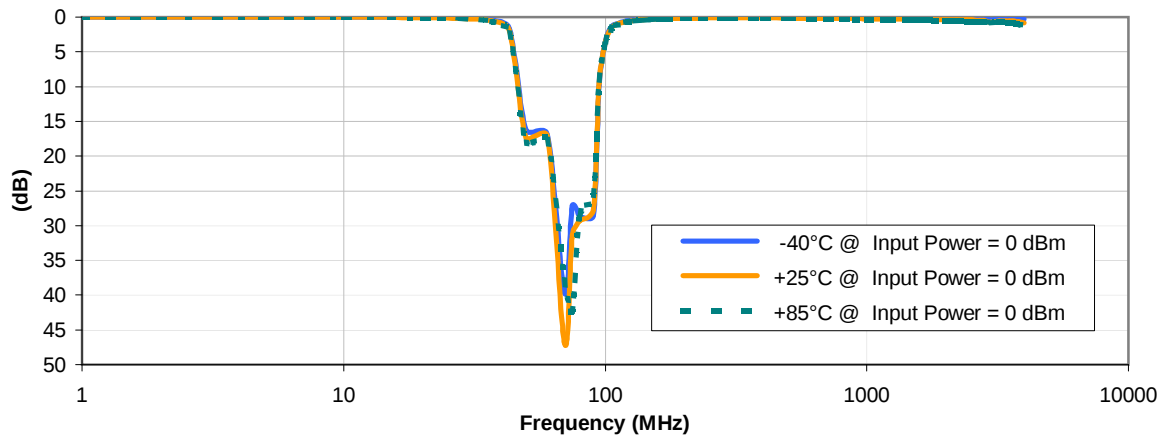
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE



REV. X2

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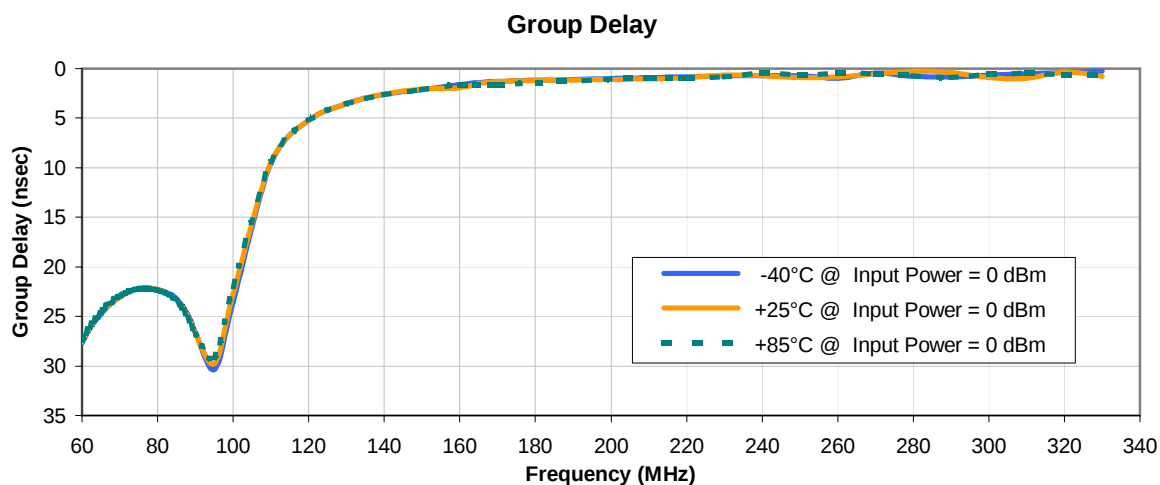
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Typical Performance Curves



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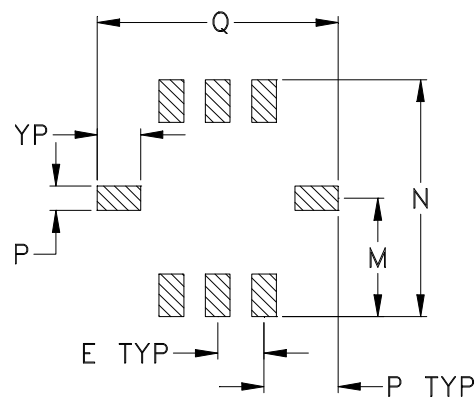
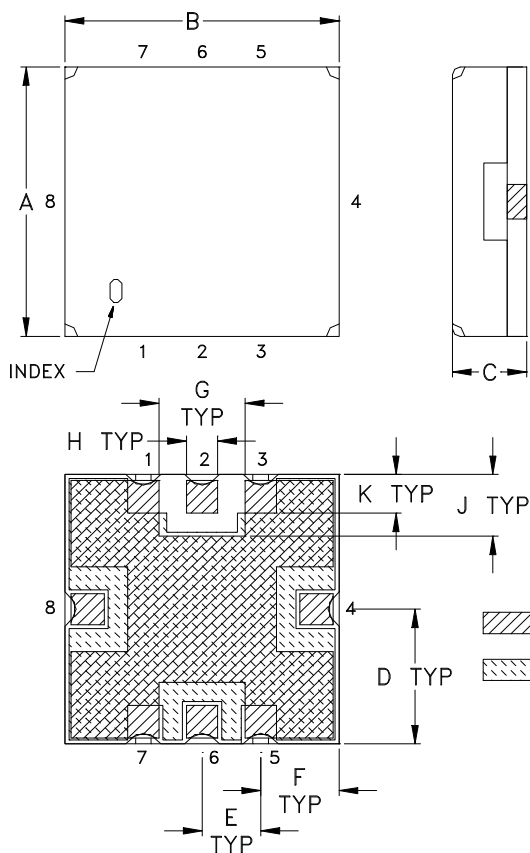


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Outline Dimensions

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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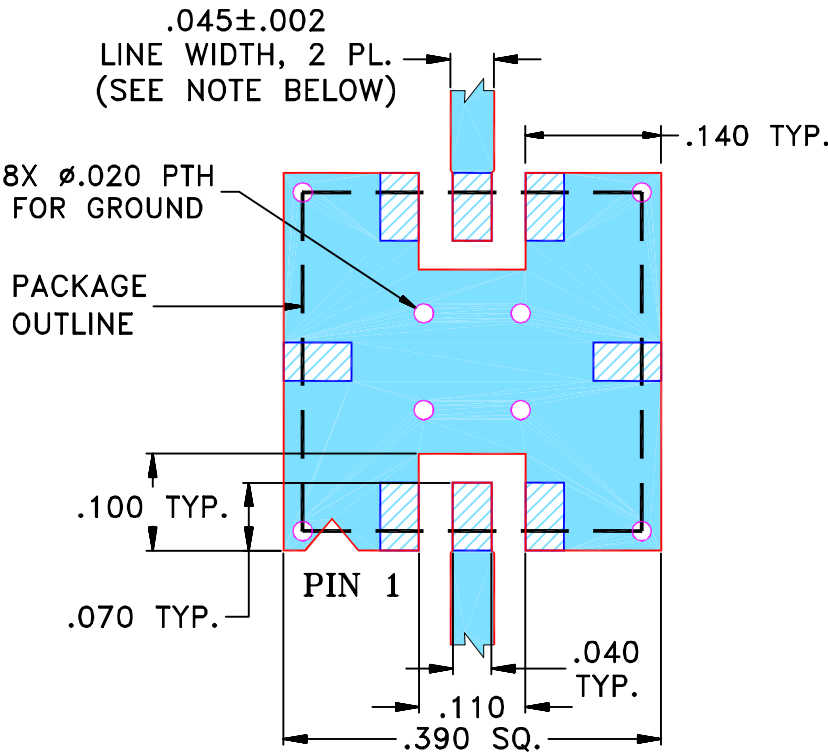
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THIRD ANGLE PROJECTION

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	INITIALS		DATE
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ±	DRAWN	DK (RAVON)	10 FEB 05
	CHECKED	RZ (RAVON)	10 FEB 05
	APPROVED	HH (RAVON)	10 FEB 05



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PL, qf, GP731, RBP, TB-332

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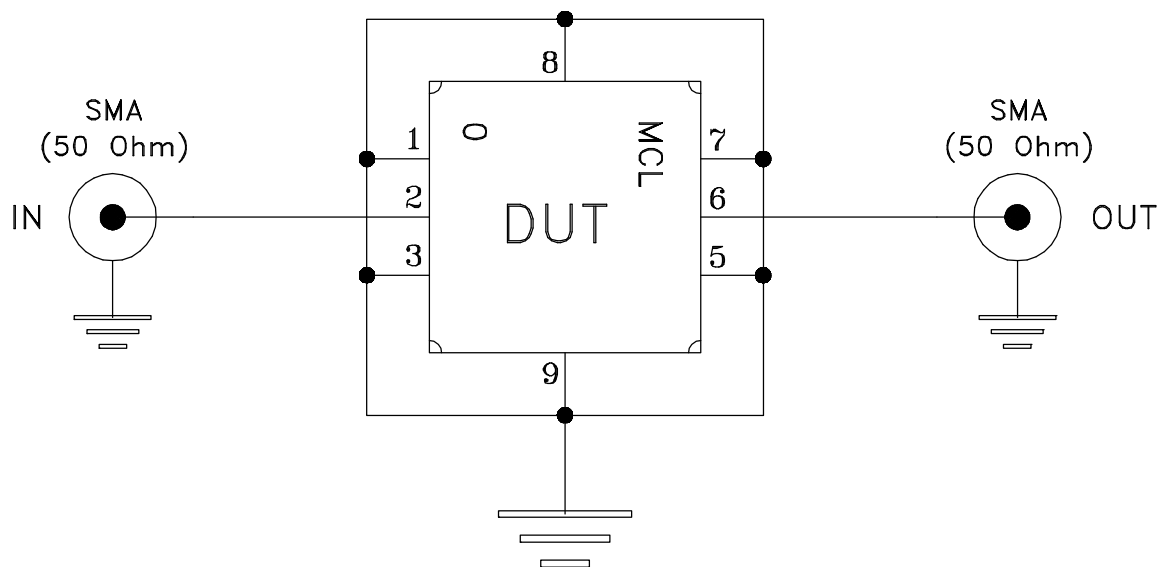
ASHEETA1.DWG REV:A DATE:01/12/95

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-176	B
FILE:	98PL176	SCALE: 5:1	SHEET: 1 OF 1

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