

Bandpass Filter

JCBP-290+

50Ω 100 to 480 MHz

Maximum Ratings

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

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

Pin Connections

INPUT	2
OUTPUT	9
GROUND	1,3,4,5,6,7,8,10,11,12,13,14



CASE STYLE: BG291

+RoHS Compliant

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

Features

- High stopband rejection
- Aqueous washable

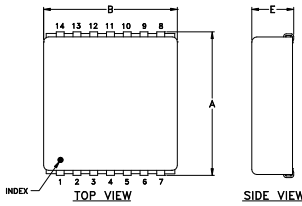
Applications

- Harmonic rejection
- Transmitters/receivers
- Military communications

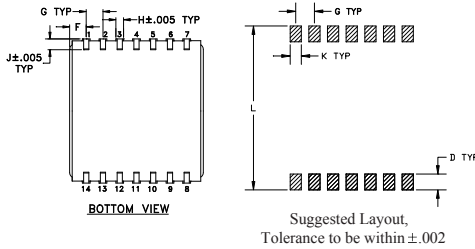
Bandpass Filter Electrical Specifications (T_{AMB} = 25°C)

CENTER FREQ. (MHz)	PASSBAND (MHz) (Loss < 2dB) F1 - F2	STOPBANDS (MHz)		VSWR (:1)	
		Loss > 20dB F3 F4	Loss > 40dB F5 F6	Passband Max.	Stopband Typ.
290	100 - 480	65 630	50 760 - 2000	2.2	20

Outline Drawing



PCB Land Pattern

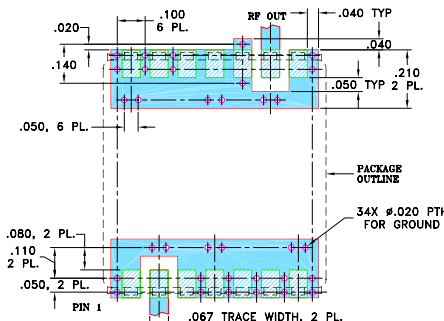


Outline Dimensions (inch/mm)

A	B	C	D	E	F
.870	.800	--	.100	.250	.100
22.09	20.32	--	2.54	6.35	2.54

G	H	J	K	L	wt.
.100	.047	.065	.065	.890	grams
2.54	1.19	1.65	1.65	22.60	4.0

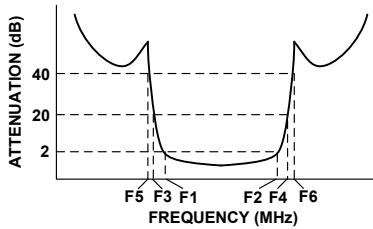
Demo Board MCL P/N: TB-442+ Suggested PCB Layout(PL-269)



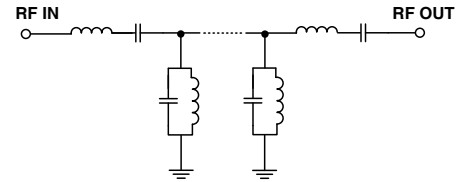
- NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Typical Frequency Response

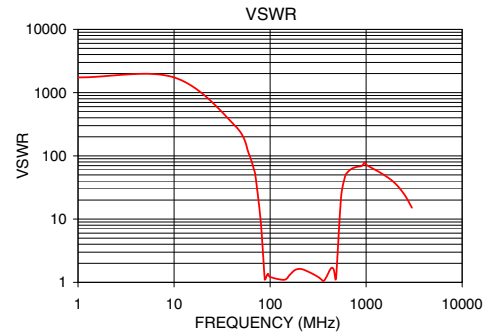
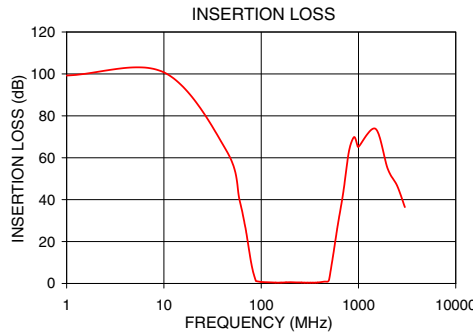


Functional Schematic



Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
5.0	100.66	1737.18
50.0	54.53	193.02
65.0	32.31	75.53
70.0	24.77	51.10
78.0	11.82	14.87
82.0	5.50	5.03
85.0	2.40	2.08
88.0	1.27	1.10
100.0	0.72	1.22
290.0	0.39	1.31
480.0	0.85	1.11
498.0	1.71	2.00
510.0	3.51	3.92
526.0	7.30	9.33
554.0	14.72	25.56
630.0	31.11	54.29
760.0	54.49	64.35
1500.0	73.77	51.10
2000.0	54.74	36.97



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-Circuits' 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



Surface Mount Band Pass Filter

JCBP-290+

Typical Performance Data

FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURNLOSS (dB)		
	@ -40° C	@ +25° C	@ +85° C	@ -40° C	@ +25° C	@ +85° C	@ -40° C	@ +25° C	@ +85° C
0.5	95.93	96.77	95.38	0.00	0.01	0.00	0.00	0.01	0.01
10	95.26	90.55	92.17	0.01	0.00	0.00	0.00	0.00	0.01
20	81.70	81.73	85.15	0.00	0.00	0.02	0.00	0.00	0.02
30	83.16	80.48	80.95	0.01	0.02	0.02	0.01	0.02	0.03
40	69.80	69.00	69.36	0.03	0.03	0.04	0.01	0.04	0.05
50	56.21	56.13	55.62	0.06	0.07	0.08	0.03	0.08	0.10
60	41.47	41.41	41.18	0.12	0.14	0.18	0.08	0.12	0.17
70	26.97	26.80	26.66	0.26	0.31	0.36	0.20	0.26	0.32
80	10.89	10.73	10.61	1.27	1.45	1.63	1.08	1.25	1.39
90	1.13	1.31	1.45	20.06	19.29	18.63	14.83	14.36	14.04
100	0.87	0.98	1.08	13.25	13.45	13.72	12.94	13.08	13.23
110	0.53	0.62	0.71	30.68	31.67	31.90	24.28	23.78	23.41
120	0.50	0.59	0.67	18.46	18.22	18.15	18.27	18.04	17.94
130	0.48	0.57	0.63	16.79	16.82	16.79	17.19	17.29	17.35
140	0.41	0.49	0.55	18.29	18.37	18.43	19.49	19.85	20.17
150	0.37	0.45	0.52	19.52	19.48	19.46	21.52	21.91	22.22
160	0.38	0.45	0.52	17.93	17.77	17.62	19.11	19.11	19.06
170	0.40	0.47	0.54	15.77	15.62	15.52	16.32	16.24	16.17
180	0.46	0.55	0.61	14.31	14.21	14.08	14.57	14.49	14.40
190	0.50	0.58	0.64	13.50	13.39	13.30	13.60	13.53	13.43
200	0.48	0.56	0.64	13.20	13.06	13.00	13.24	13.13	13.04
210	0.48	0.56	0.64	13.35	13.14	13.04	13.32	13.14	13.06
220	0.47	0.56	0.63	13.76	13.51	13.34	13.70	13.46	13.29
230	0.44	0.53	0.61	14.41	14.09	13.88	14.30	14.02	13.78
240	0.40	0.49	0.57	15.26	14.91	14.68	15.14	14.81	14.56
250	0.38	0.47	0.55	16.35	15.93	15.71	16.21	15.80	15.55
260	0.37	0.47	0.54	17.65	17.20	16.92	17.47	17.03	16.70
270	0.36	0.44	0.52	19.08	18.70	18.37	18.90	18.54	18.15
280	0.32	0.41	0.48	20.90	20.60	20.26	20.73	20.41	20.03
290	0.32	0.40	0.47	23.36	23.00	22.85	23.05	22.74	22.52
300	0.32	0.40	0.47	26.74	26.47	26.46	26.34	26.02	25.89
310	0.31	0.39	0.46	32.17	32.47	32.48	31.43	31.44	31.29
320	0.31	0.40	0.47	50.66	65.44	60.64	42.49	41.45	40.34
330	0.31	0.41	0.48	33.94	32.13	31.50	33.77	32.00	31.37
340	0.33	0.43	0.50	26.95	25.88	25.31	27.03	26.01	25.43
350	0.35	0.45	0.53	23.06	22.18	21.71	23.14	22.32	21.85
400	0.59	0.74	0.83	13.93	13.63	13.46	13.97	13.69	13.53
450	0.66	0.79	0.92	15.89	16.42	16.86	15.92	16.49	16.97
480	1.03	1.31	1.56	12.67	11.71	11.10	12.91	11.99	11.40
500	3.47	3.94	4.32	4.13	3.94	3.86	4.17	4.04	3.97
550	15.38	15.81	16.14	0.59	0.65	0.72	0.56	0.69	0.79
600	26.36	26.71	26.98	0.33	0.38	0.44	0.29	0.41	0.49
630	32.19	32.51	32.78	0.27	0.32	0.38	0.22	0.34	0.42
650	36.39	36.65	36.96	0.24	0.29	0.35	0.21	0.32	0.40
700	46.58	46.98	47.34	0.20	0.25	0.31	0.16	0.27	0.36
750	60.61	62.13	61.09	0.17	0.22	0.28	0.12	0.25	0.34
760	64.38	66.92	65.36	0.18	0.22	0.28	0.12	0.24	0.33
800	65.27	65.80	64.92	0.15	0.20	0.27	0.11	0.23	0.32
850	59.46	59.01	59.45	0.16	0.20	0.26	0.11	0.25	0.33
900	58.31	58.76	58.40	0.14	0.18	0.23	0.08	0.23	0.31
1000	59.52	59.28	60.31	0.16	0.21	0.27	0.14	0.29	0.37
1500	76.65	81.43	79.77	0.18	0.23	0.29	0.14	0.31	0.41
1800	66.52	73.18	65.90	0.22	0.28	0.34	0.16	0.33	0.46
1900	66.62	63.59	67.08	0.23	0.28	0.33	0.18	0.36	0.47
2000	61.60	62.42	62.18	0.24	0.29	0.34	0.13	0.34	0.48

REV. X1

JCBP-290+

090326

Page 1 of 2



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Surface Mount Band Pass Filter

JCBP-290+

Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
100	15.83	15.88	15.78
101	15.52	15.46	15.46
102	15.18	15.14	15.14
103	14.83	14.82	14.67
104	14.46	14.46	14.44
105	14.10	14.03	14.04
106	13.62	13.63	13.67
107	13.48	13.38	13.40
108	13.09	13.13	13.17
109	12.81	12.66	12.72
110	11.96	11.93	11.89
120	10.57	10.52	10.53
130	8.83	8.81	8.78
140	7.65	7.64	7.63
150	6.82	6.81	6.80
160	6.15	6.14	6.13
170	5.61	5.61	5.60
180	5.16	5.16	5.15
190	4.77	4.77	4.76
200	4.51	4.51	4.50
210	4.31	4.30	4.29
220	4.12	4.11	4.10
230	3.98	3.97	3.97
240	3.90	3.88	3.88
250	3.80	3.80	3.79
260	3.70	3.70	3.69
270	3.64	3.65	3.63
280	3.62	3.62	3.62
290	3.57	3.57	3.57
300	3.53	3.54	3.54
310	3.52	3.52	3.52
320	3.51	3.52	3.53
330	3.51	3.52	3.52
340	3.51	3.52	3.52
350	3.53	3.54	3.54
360	3.56	3.56	3.57
370	3.57	3.58	3.58
380	3.61	3.61	3.61
390	3.65	3.64	3.64
400	3.68	3.68	3.68
410	3.74	3.75	3.75
420	3.85	3.87	3.88
430	3.98	4.00	4.02
440	4.17	4.20	4.24
450	4.40	4.48	4.41
460	5.06	5.13	5.22
470	5.71	5.77	5.83
480	6.34	6.45	6.44

REV. X1
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Page 2 of 2



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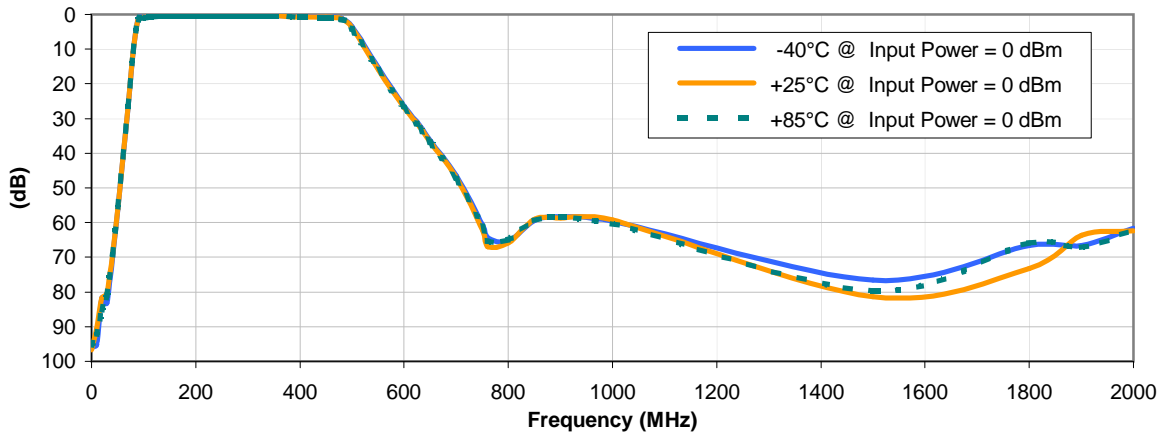


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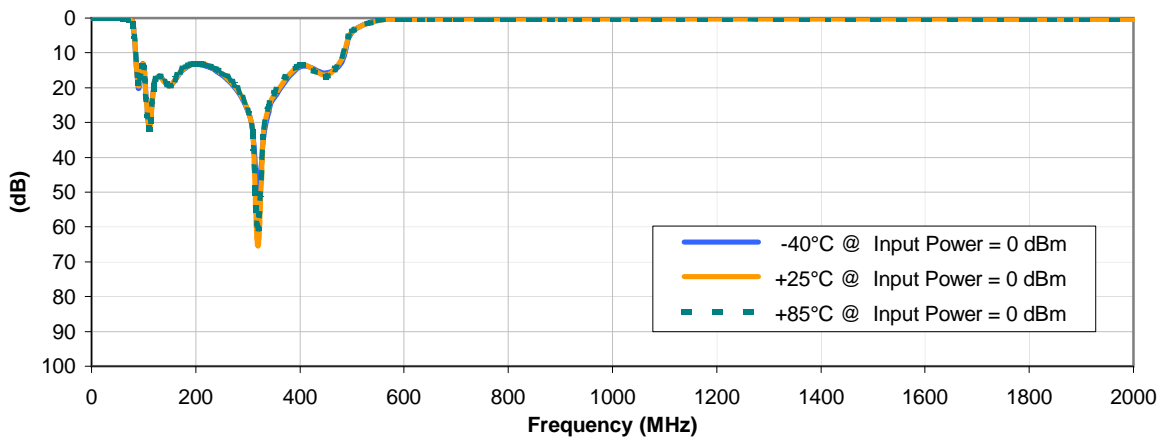


Typical Performance Curves

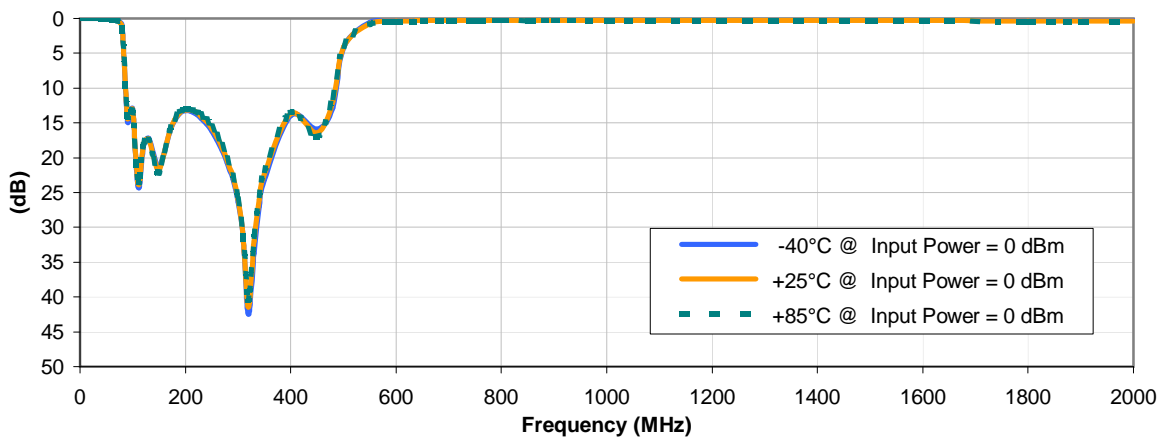
INSERTION LOSS vs. TEMPERATURE



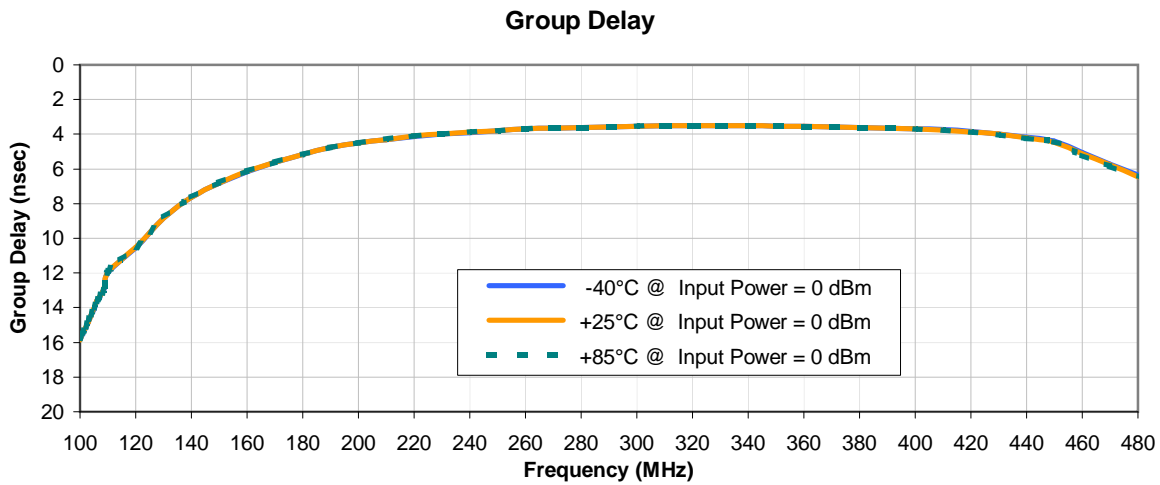
INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE

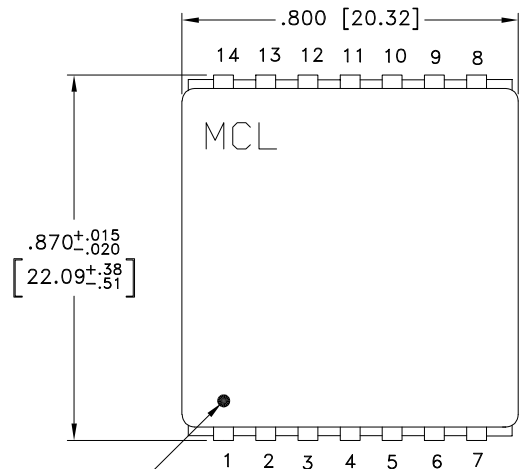


Typical Performance Curves

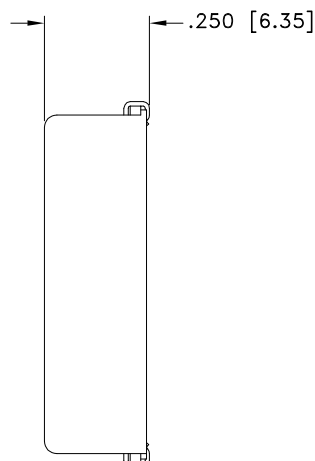


Outline Dimensions

BG291



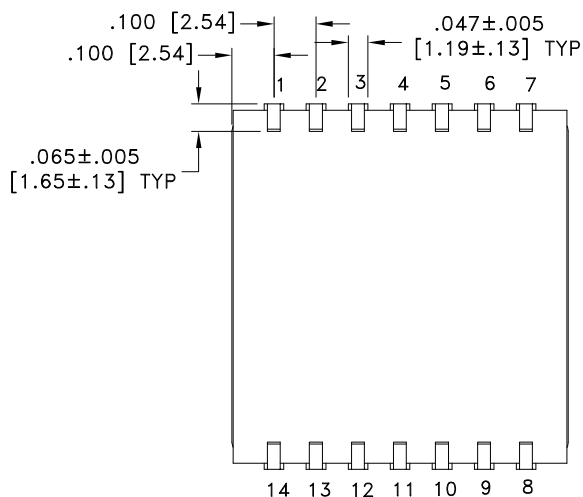
TOP VIEW



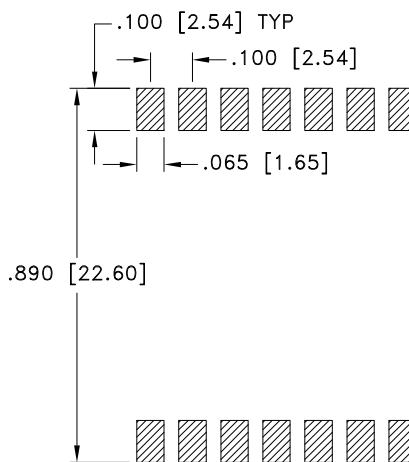
SIDE VIEW



SIDE VIEW



BOTTOM VIEW



SUGGESTED LAYOUT FOR PCB LAND PATTERN (TOL ± 0.002)

 DENOTES METALLIZATION

Weight: 4 gram

Dimensions are in inches[mm]. Tolerances: 2PL±0.03[0.76]; 3 PL± 0.015 [0.381] inches[mm], unless otherwise specified

Notes:

1. Case material: Copper-Nickel alloy.
2. Base material: Printed wiring laminate.
3. Termination finish:

For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
 For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



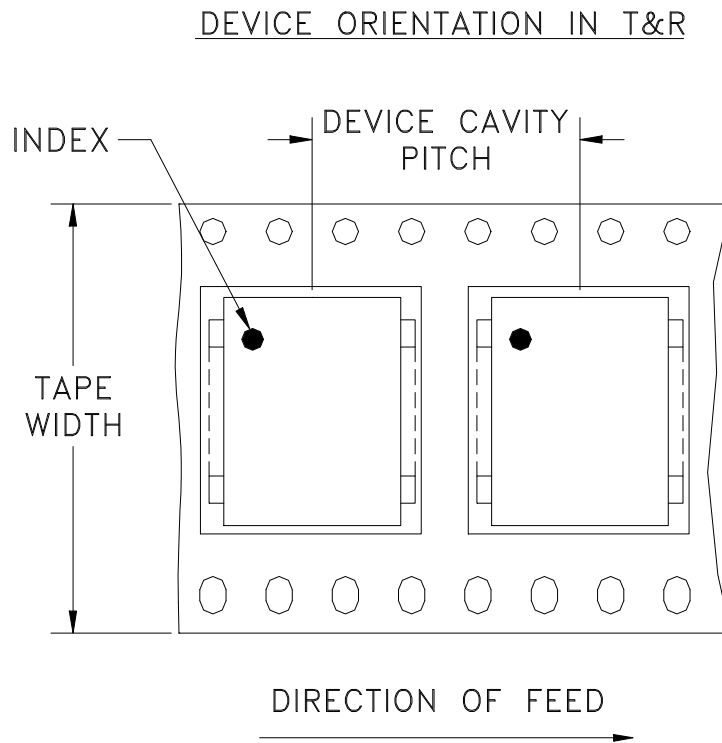
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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F21



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
32	32	13	200

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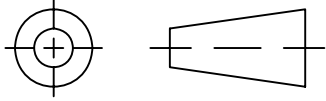
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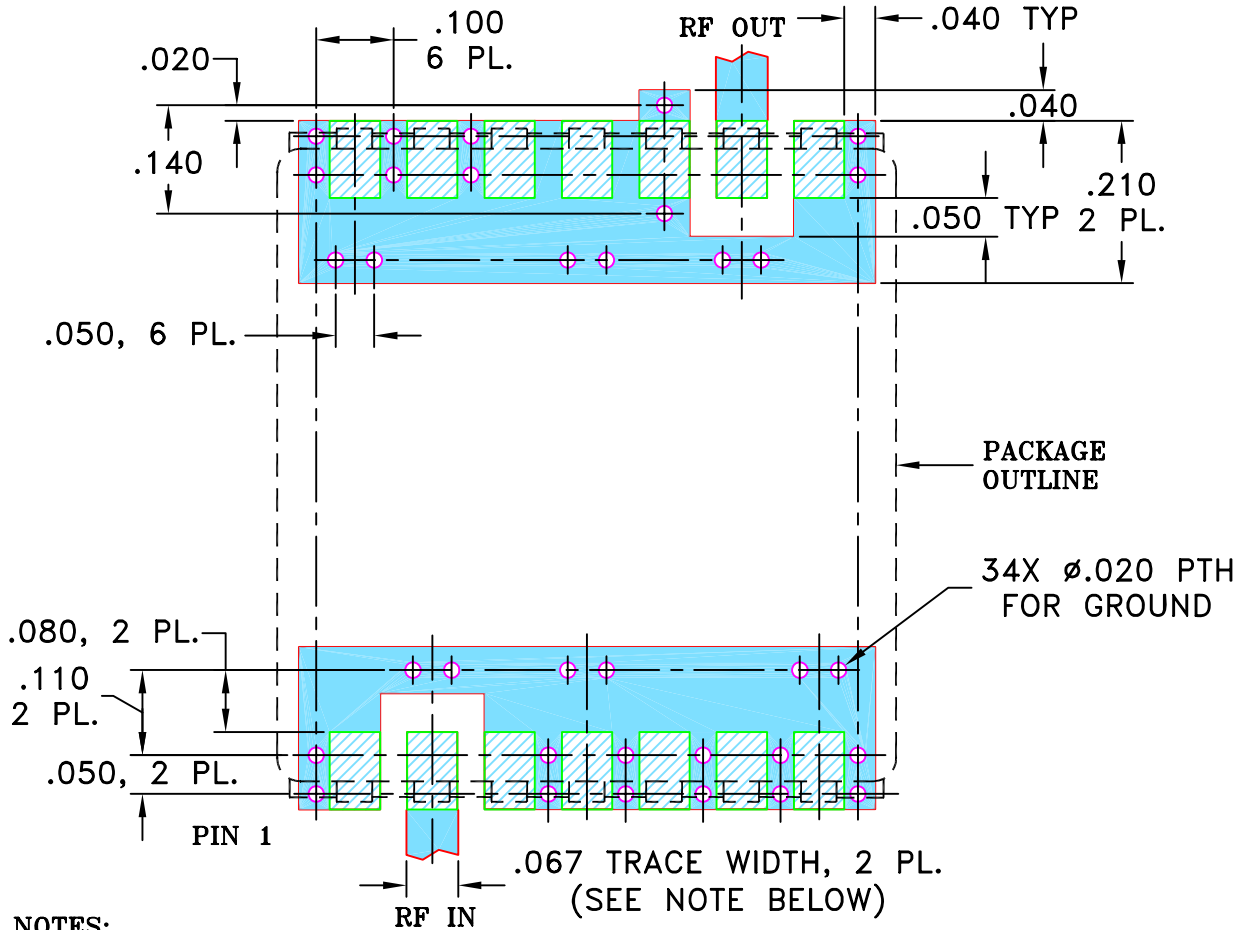
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M110266	NEW RELEASE	03/07	DK	HH
OR	R68010	NEW RELEASE	03/07	DK	HH

**SUGGESTED MOUNTING CONFIGURATION
FOR BG291 CASE STYLE, "sc" PIN CONNECTION.**



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS $.030" \pm .002"$; 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	DK	27 MAR 07
TOLERANCES ON:	HH	27 MAR 07
2 PL DECIMALS \pm	HH	27 MAR 07
3 PL DECIMALS \pm .005		
ANGLES \pm		
FRACTIONS \pm		

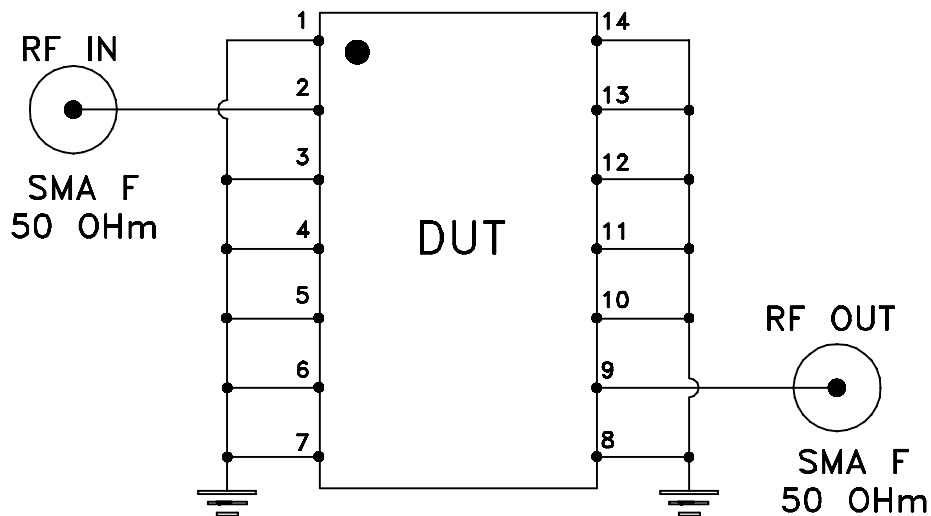
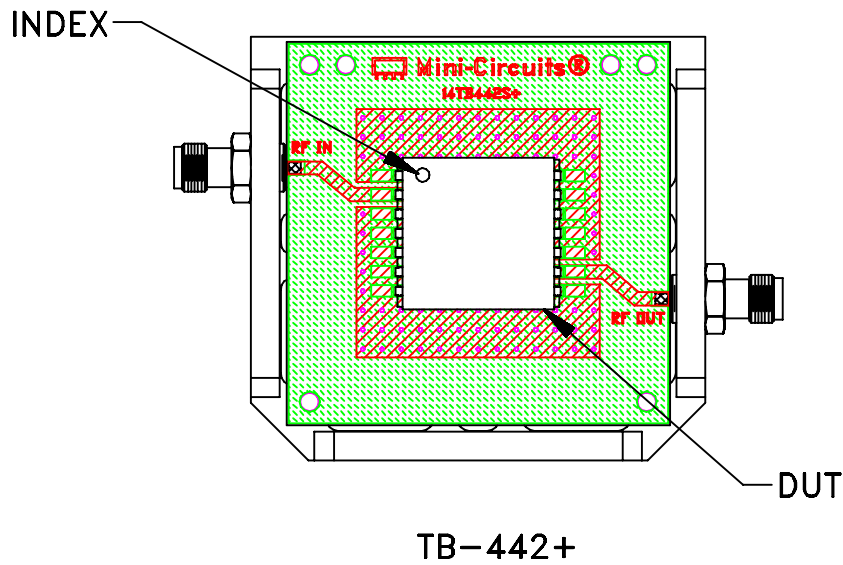
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PL, sc, BG291, JCBP-25, TB-442+

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

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-269	OR
FILE:	98PL269	SCALE: 4:1	SHEET: 1 OF 1


Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: ROGERS R04350 or equivalent, Dielectric Constant=3.48, 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