

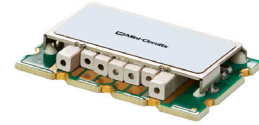


50Ω

1030 to 1090 MHz

### THE BIG DEAL

- Good Insertion Loss, 1.9 dB Typ.
- Excellent Rejection, 62 dB Typ.
- Good Return Loss, 14 dB Typ.
- Miniature Shielded Package

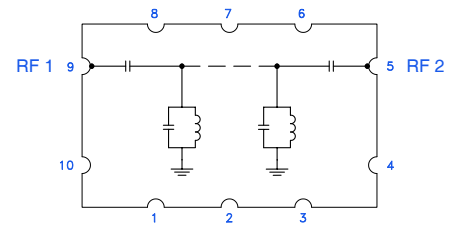


Generic photo used for illustration purposes only

### APPLICATIONS

- Aerospace
- Defense and Government

### FUNCTIONAL DIAGRAM



### PRODUCT OVERVIEW

All our coaxial-ceramic resonator filters are built with rugged construction, qualified to withstand multiple demanding reflow cycles. Excellent repeatability across units is achieved through precise tuning and process control.

### ELECTRICAL SPECIFICATIONS<sup>1,2</sup> AT +25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Units	
Passband	Center Frequency	—	—	1060	—	MHz	
	Insertion Loss	F1-F2	1030 - 1090	—	1.9	2.4	dB
	Return Loss	F1-F2	1030 - 1090	10	14	—	dB
Stopband, Lower	Rejection	DC-F3	DC - 700	50	62	—	dB
		F3-F4	700 - 910	20	30	—	dB
Stopband, Upper	Rejection	F5-F6	1230 - 1360	20	30	—	dB
		F6-F7	1360 - 2000	45	55	—	dB
		F7-F8	2000 - 4800	—	40	—	dB

1. Tested in Evaluation Board P/N TB-CBP2-1060+.

2. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

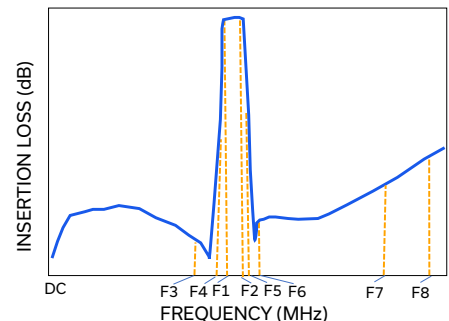
### ABSOLUTE MAXIMUM RATINGS<sup>3</sup>

Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power <sup>4</sup>	6 W at +25°C

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

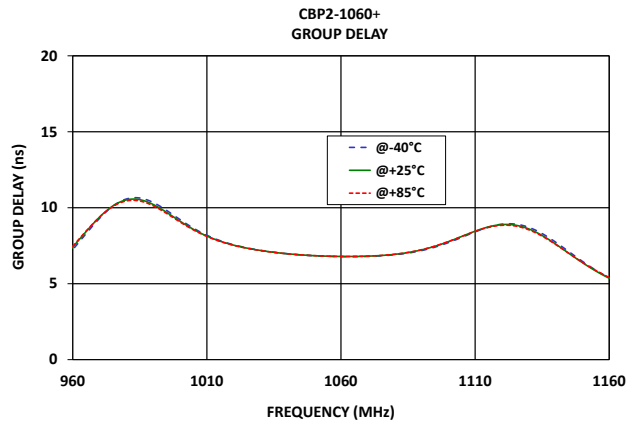
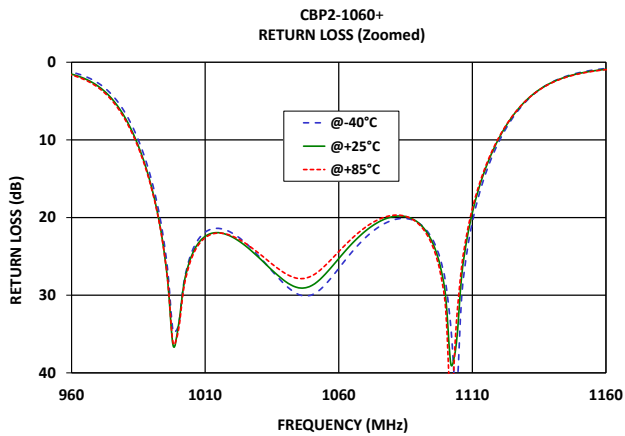
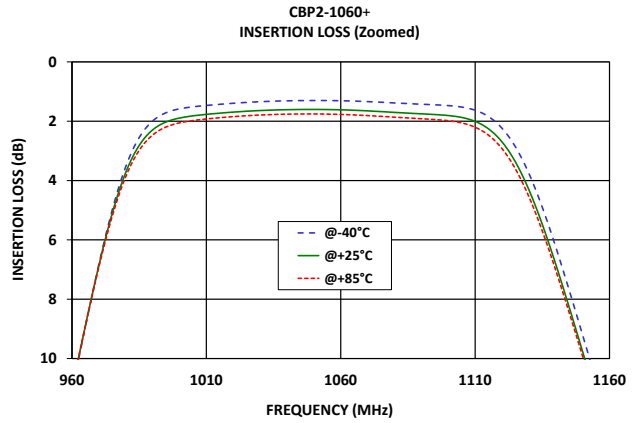
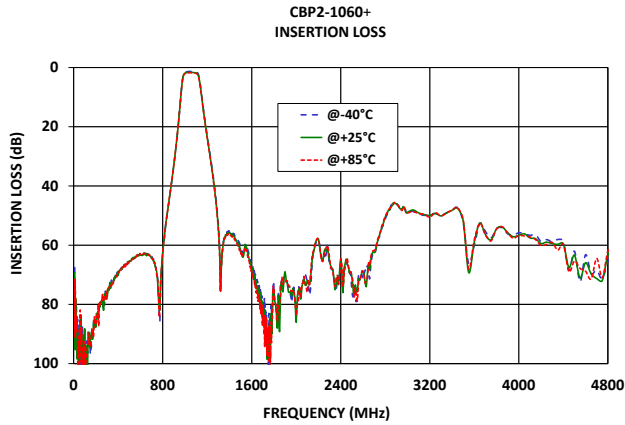
4. Power rating applies only to signals within the passband. Power rating above +25°C operating temperature decreases linearly to 1 W at +85°C.

### TYPICAL FREQUENCY RESPONSE





### TYPICAL PERFORMANCE GRAPHS





### FUNCTIONAL DIAGRAM

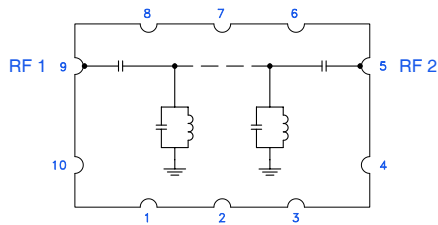


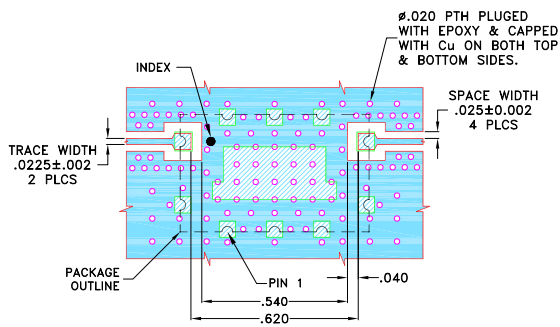
Figure 1. CBP2-1060+ Functional Diagram

### PAD DESCRIPTION

Function	Pad Number	Description
RF1	9	Connects to RF Input Port
RF2	5	Connects to RF Output Port
GROUND	1-4, 6-8,10	Connects to Ground on PCB, (See drawing PL-863)

### SUGGESTED PCB LAYOUT

#### SUGGESTED MOUNTING CONFIGURATION FOR WA3176 CASE STYLE



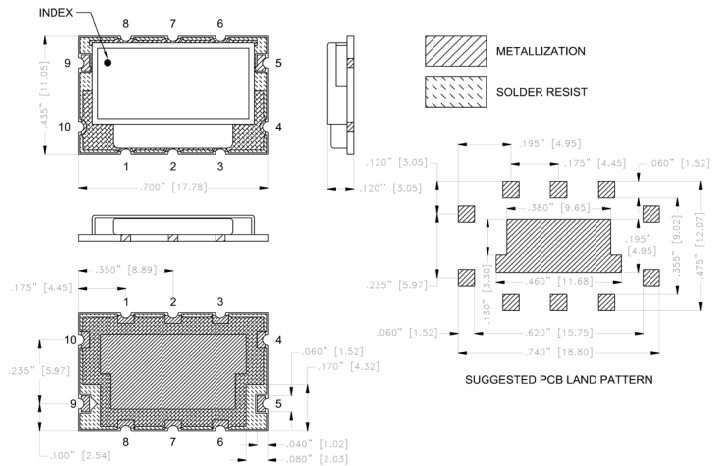
NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .010±.0015. COPPER: 1/2 Oz. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP 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 SOLDERMASK

Figure 2. Suggested PCB Layout

### CASE STYLE DRAWING



Weight: 1.1 gram  
Dimensions are in inches (mm) Tolerances: 2Pl ± .03; 3Pl ± .015

### PRODUCT MARKING\*: CBP2-1060

\*Marking may contain other features or characters for internal lot control.



# Band Pass Filter

## CBP2-1060+

50Ω

1030 to 1090 MHz

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD

[CLICK HERE](#)

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	WA3176 Lead Finish: Gold over Nickel Plate
RoHS/REACH Status	Compliant
Tape and Reel	F122
Suggested Layout for PCB Design	PL-863
Evaluation Board	TB-CBP2-1060+ Gerber File
Environmental Rating	ENV54
MSL Level	MSL1

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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)

# Surface Mount Bandpass Filter

# CBP2-1060+

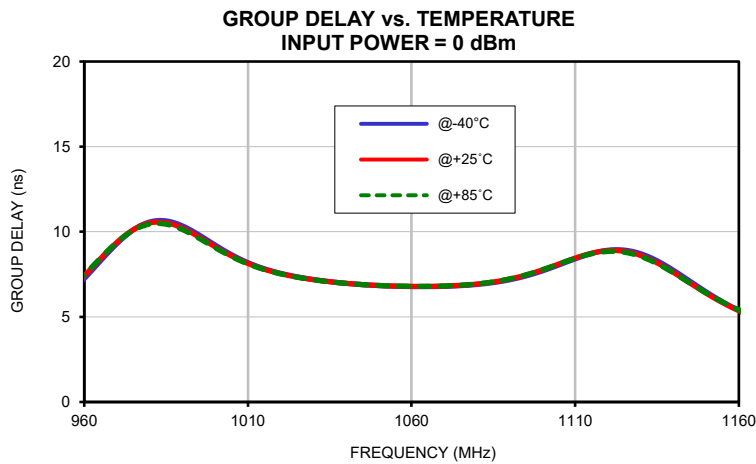
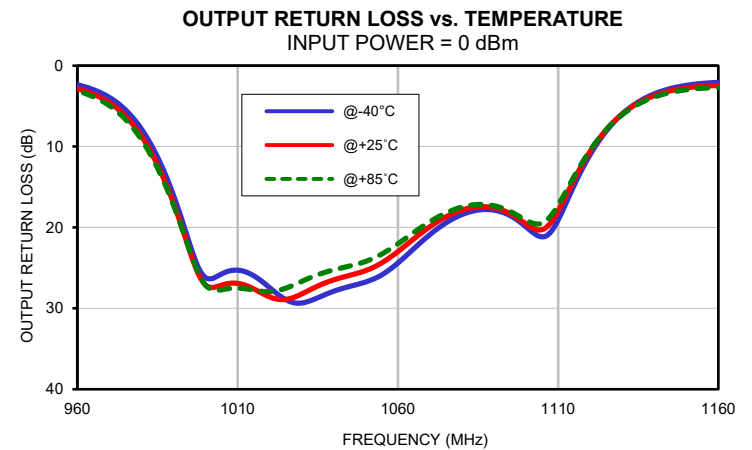
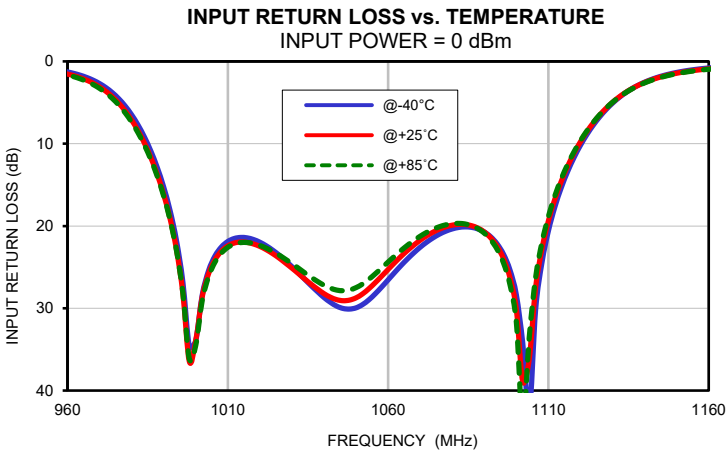
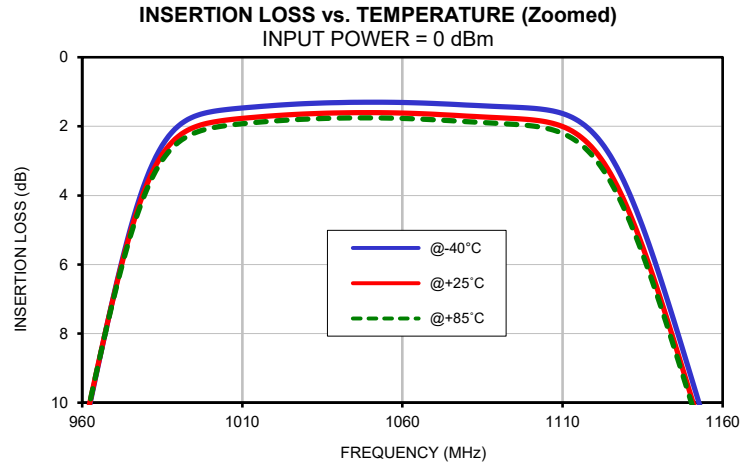
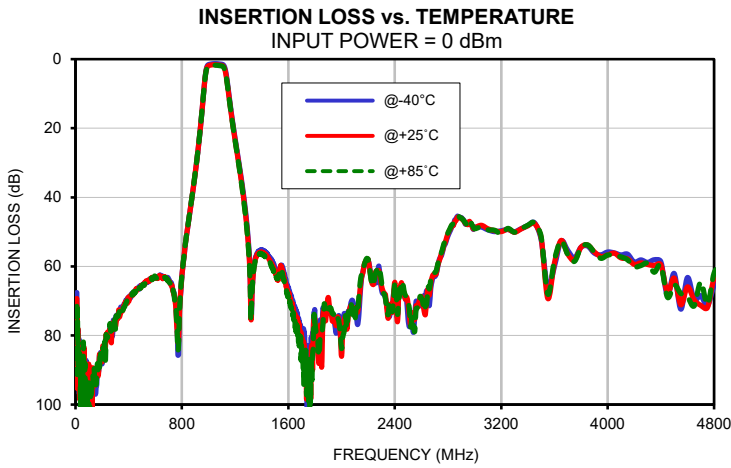
## Typical Performance Data

FREQ. (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
10	67.56	69.28	71.56	0.02	0.00	0.01	0.02	0.01	0.01
75	90.81	94.83	101.82	0.04	0.02	0.03	0.04	0.00	0.00
100	93.67	97.61	99.01	0.05	0.02	0.03	0.04	0.01	0.01
200	88.23	87.63	86.80	0.10	0.05	0.06	0.05	0.17	0.16
150	97.01	92.79	93.36	0.07	0.03	0.04	0.03	0.06	0.05
300	75.15	77.42	78.17	0.11	0.05	0.06	0.32	0.46	0.50
700	63.63	64.35	64.36	0.01	0.07	0.08	0.59	0.82	0.88
908	30.59	30.50	30.41	0.28	0.40	0.42	0.90	1.15	1.28
910	29.96	29.88	29.78	0.29	0.40	0.43	0.91	1.17	1.31
938	20.25	20.13	20.05	0.50	0.65	0.69	1.31	1.65	1.83
962	10.23	10.16	10.15	1.46	1.74	1.86	2.56	3.07	3.37
974	5.33	5.42	5.51	3.81	4.30	4.51	5.08	5.83	6.22
982	3.08	3.31	3.46	7.74	8.43	8.68	9.06	9.98	10.39
1000	1.58	1.89	2.06	33.93	33.90	34.50	26.20	27.11	27.12
1030	1.34	1.64	1.79	24.94	25.13	24.58	29.34	28.22	26.67
1036	1.32	1.62	1.77	27.26	27.08	26.24	28.53	27.07	25.71
1040	1.31	1.61	1.76	28.70	28.22	27.21	27.88	26.48	25.24
1046	1.30	1.60	1.76	30.03	29.08	27.87	27.18	25.81	24.66
1050	1.30	1.60	1.76	29.95	28.73	27.49	26.74	25.32	24.19
1056	1.30	1.61	1.76	28.24	26.88	25.81	25.61	24.12	23.06
1060	1.31	1.62	1.77	26.55	25.28	24.38	24.40	22.99	22.03
1066	1.32	1.63	1.79	24.02	22.99	22.36	22.26	21.09	20.34
1070	1.34	1.65	1.81	22.58	21.73	21.25	20.89	19.91	19.29
1080	1.38	1.70	1.86	20.36	19.90	19.72	18.41	17.85	17.48
1090	1.43	1.75	1.92	20.73	20.73	20.87	17.86	17.57	17.32
1100	1.47	1.81	1.98	28.39	30.16	31.71	19.92	19.57	19.10
1110	1.63	2.01	2.20	20.58	19.37	18.84	19.09	17.97	17.26
1120	2.24	2.70	2.92	10.19	9.76	9.63	11.00	10.60	10.46
1140	6.24	6.82	7.02	2.53	2.57	2.61	3.49	3.70	3.88
1160	12.25	12.76	12.89	0.80	0.91	0.95	2.06	2.44	2.71
1180	17.92	18.37	18.48	0.39	0.50	0.52	2.10	2.61	2.98
1200	23.05	23.51	23.65	0.25	0.35	0.37	2.53	3.17	3.66
1240	32.94	33.58	33.89	0.16	0.25	0.26	3.47	4.23	4.78
1260	38.37	39.17	39.55	0.13	0.22	0.23	3.62	4.29	4.72
1280	44.71	45.59	46.09	0.11	0.20	0.21	3.48	4.03	4.37
1300	53.06	54.17	54.79	0.09	0.18	0.19	3.20	3.69	3.98
1320	73.82	75.49	74.73	0.07	0.17	0.18	2.95	3.41	3.69
1350	57.90	58.20	58.65	0.05	0.15	0.16	2.72	3.18	3.50
1400	55.34	55.86	56.42	0.04	0.14	0.14	2.78	3.34	3.80
1450	56.88	57.56	58.20	0.04	0.14	0.14	3.23	3.90	4.39
1500	60.40	61.61	62.09	0.04	0.14	0.15	3.29	3.85	4.11
1550	59.72	60.35	61.77	0.04	0.15	0.15	2.61	2.94	3.03
1600	66.31	67.77	68.94	0.04	0.15	0.15	1.80	2.04	2.10
1650	71.97	74.89	76.06	0.01	0.13	0.14	1.23	1.45	1.50
1700	79.19	81.43	84.01	0.01	0.13	0.13	0.88	1.08	1.12
1750	101.71	90.90	87.07	0.01	0.12	0.12	0.66	0.86	0.89
1800	75.14	77.85	76.52	0.01	0.12	0.13	0.50	0.69	0.71
1850	81.85	89.21	79.50	0.01	0.12	0.13	0.37	0.56	0.57
1900	70.75	68.97	72.70	0.02	0.15	0.17	0.27	0.46	0.46
1950	77.03	75.75	75.22	0.06	0.21	0.23	0.22	0.40	0.40
2000	81.11	86.04	83.81	0.16	0.32	0.35	0.19	0.36	0.37
2200	58.26	58.01	57.97	16.27	23.43	20.29	0.05	0.23	0.22
2500	75.38	70.87	70.47	0.21	0.36	0.41	0.01	0.21	0.20
3000	48.70	48.87	49.11	0.74	0.94	1.00	0.01	0.23	0.25
3400	48.16	48.25	48.08	0.66	0.89	0.95	0.04	0.29	0.32
3800	54.45	54.45	54.52	0.79	0.79	0.76	0.00	0.26	0.28
4000	55.83	56.67	56.71	0.10	0.25	0.26	0.04	0.28	0.30
4200	58.76	59.43	60.11	0.03	0.20	0.21	0.01	0.25	0.25
4400	58.64	59.51	59.73	0.11	0.29	0.31	0.03	0.27	0.26
4800	65.60	63.37	61.93	0.05	0.26	0.32	0.02	0.26	0.24

## Typical Performance Data

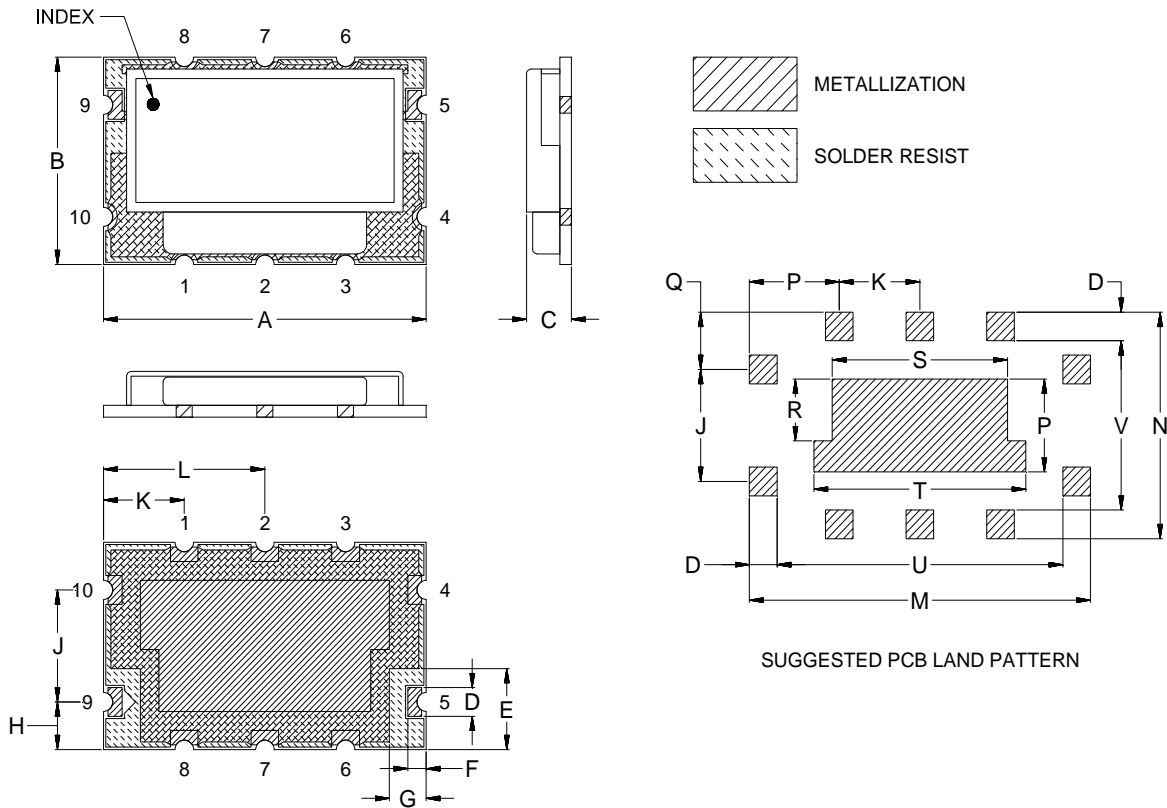
FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
1030	7.20	7.19	7.18
1032	7.14	7.13	7.13
1034	7.09	7.09	7.08
1036	7.05	7.04	7.04
1038	7.01	7.00	7.00
1040	6.97	6.97	6.97
1042	6.94	6.94	6.94
1044	6.91	6.91	6.91
1046	6.88	6.88	6.88
1048	6.86	6.86	6.86
1050	6.84	6.84	6.85
1052	6.82	6.83	6.83
1054	6.81	6.82	6.82
1056	6.80	6.81	6.81
1058	6.79	6.80	6.80
1060	6.78	6.79	6.79
1062	6.78	6.79	6.79
1064	6.78	6.79	6.79
1066	6.78	6.80	6.80
1068	6.79	6.80	6.80
1070	6.80	6.81	6.81
1072	6.81	6.83	6.83
1074	6.83	6.84	6.85
1076	6.85	6.87	6.87
1078	6.87	6.90	6.90
1080	6.91	6.93	6.94
1082	6.94	6.97	6.98
1084	6.99	7.02	7.03
1086	7.04	7.08	7.09
1088	7.11	7.15	7.16
1090	7.18	7.22	7.24

## Typical Performance Curves



## Outline Dimensions

WA3176



CASE#	A	B	C	D	E	F	G	H	J	K	L	M
WA3176	.700 (17.78)	.435 (11.05)	.120 (3.05)	.060 (1.52)	.170 (4.32)	.040 (1.02)	.080 (2.03)	.100 (2.54)	.235 (5.97)	.175 (4.45)	.350 (8.89)	.740 (18.80)

CASE#	N	P	Q	R	S	T	U	V	WT.GRAMS
WA3176	.475 (12.07)	.195 (4.95)	.120 (3.05)	.130 (3.30)	.380 (9.65)	.460 (11.68)	.620 (15.75)	.355 (9.02)	1.1

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

### Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:
  - For RoHS Case Styles: 3-5  $\mu$  inch Gold over 120-240  $\mu$  inch Nickel plate.
  - For RoHS-5 Case Styles: Tin-Lead plate.



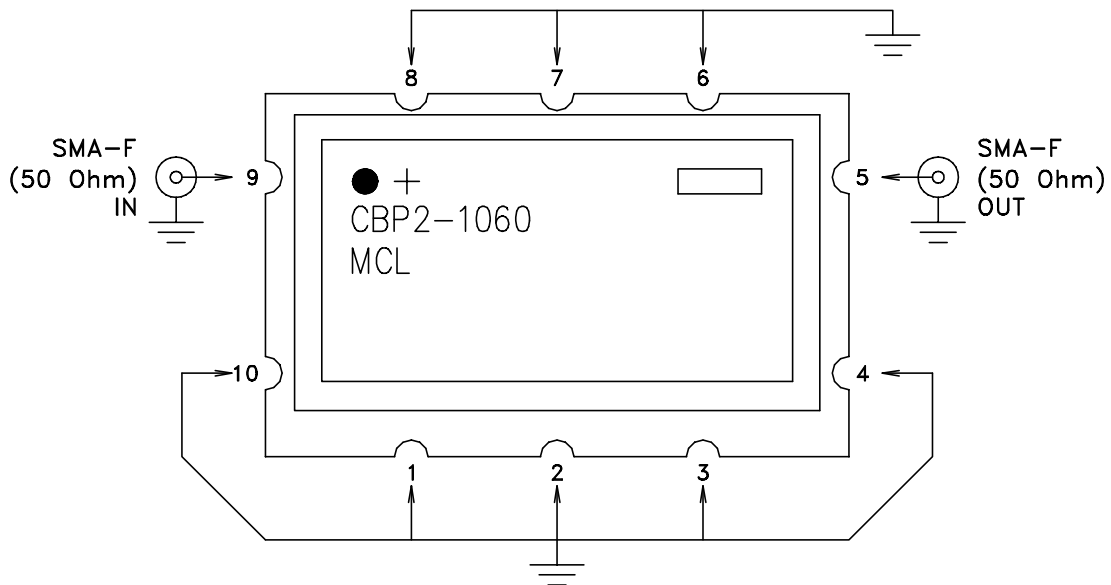
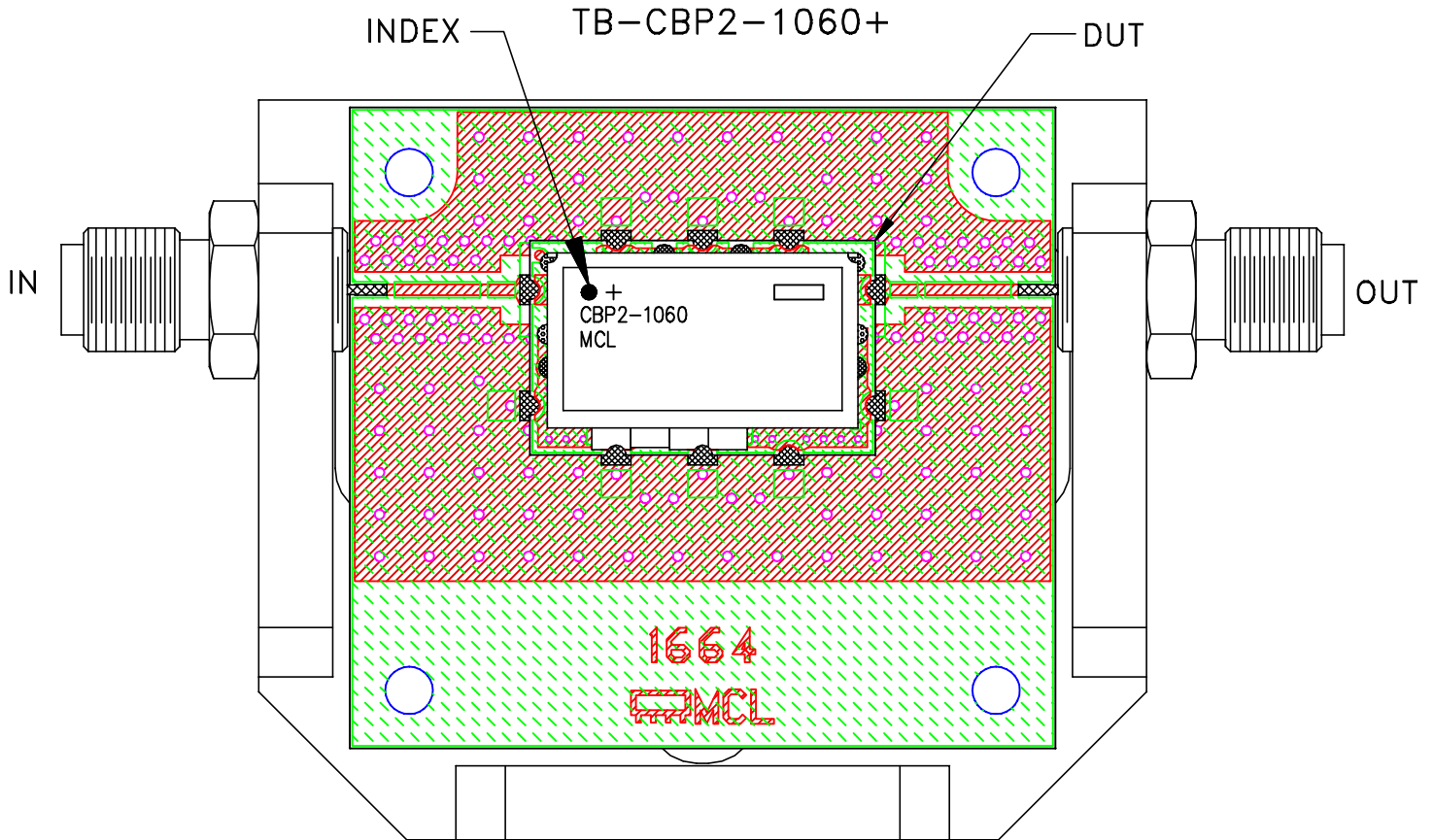
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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RF/IF MICROWAVE COMPONENTS


# Evaluation Board and Circuit



Schematic diagram

## Notes:

1. 50 Ohm SMA female connectors.
2. PCB Material: R04350B OR Equivalent  
Dielectric Constant= $3.48 \pm 0.05$ , Thickness= $.010$  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, 96 hours, 40°C	MIL-STD-202, Method 103B, Condition B, Except 50°C
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, 10-2000 Hz, 4 times in each of three axes (total 12)	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