CERAMIC RESONATOR SURFACE MOUNT

Bandpass Filter

CBP2-1090C+

50Ω 980 to 1200 MHz

KEY FEATURES

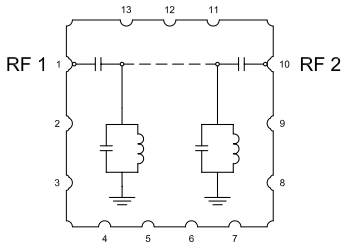
- Low Insertion Loss 1.4 dB Typ.
- High Rejection, 60 dB Typ.
- Miniature Shielded Package
- High Selectivity

Generic photo used for illustration purposes only

APPLICATIONS

- Aviation/Aeronautical

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

All our Surface Mount 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.

ELECTRICAL SPECIFICATIONS[1,2,3] AT +25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	—	—	—	1090	—	MHz
	Insertion Loss	F1-F2	980 - 1200	—	1.4	2	dB
	Return Loss	F1-F2	980 - 1200	10	15	—	dB
Stopband, Lower	Rejection	DC-F3	DC - 800	50	60	—	dB
		F3-F4	800 - 900	20	30	—	
Stopband, Upper	Rejection	F5-F6	1330 - 1500	20	30	—	dB
		F6-F7	1500 - 2100	40	50	—	

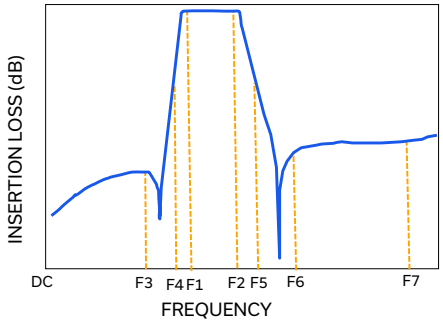
1. Tested in Evaluation Board P/N TB-CBP2-1090C+.
2. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.
3. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

ABSOLUTE MAXIMUM RATINGS[4]

Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power[5]	8 W at +25°C

4. Permanent damage may occur if any of these limits are exceeded.
5. Power rating applies only to signals within the passband. Power rating above +25°C operating temperature decreases linearly to 2 W at +85°C.

TYPICAL FREQUENCY RESPONSE AT +25°C



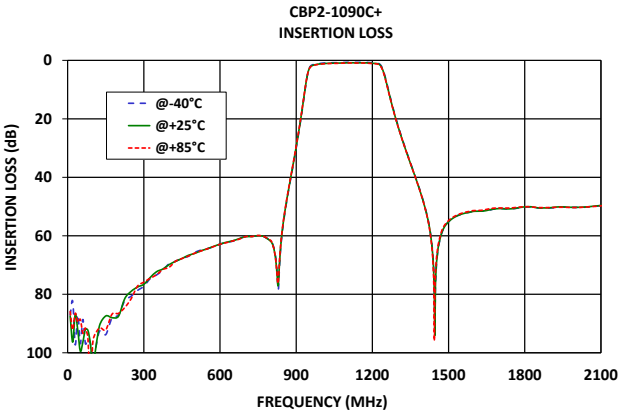
REV. OR
ECO-023691
CBP2-1090C+
EDU4749
URJ
241120

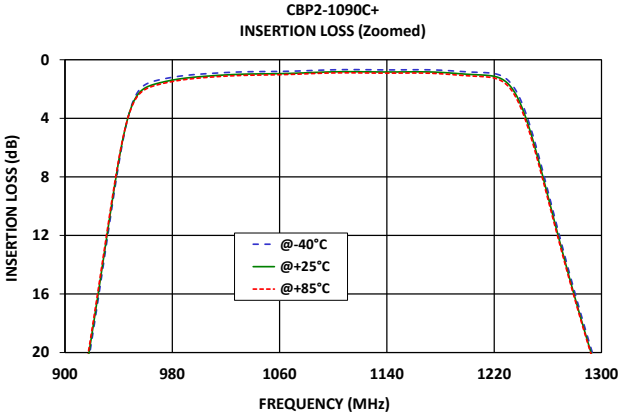
Bandpass Filter

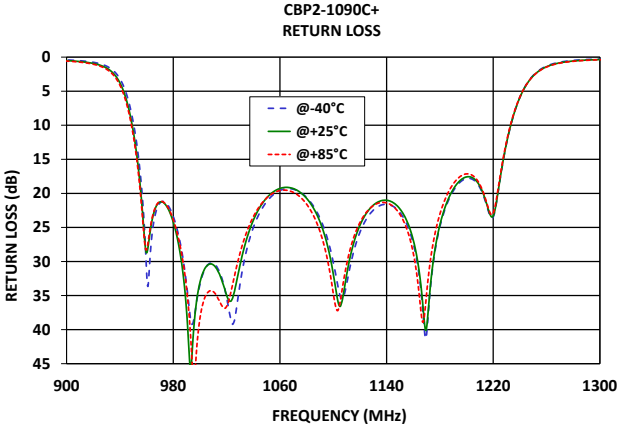
CBP2-1090C+

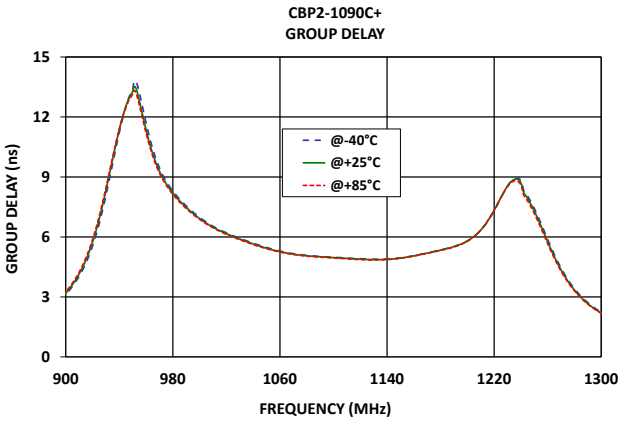
50Ω 980 to 1200 MHz

TYPICAL PERFORMANCE GRAPHS









Bandpass Filter

CBP2-1090C+

50Ω 980 to 1200 MHz

FUNCTIONAL DIAGRAM

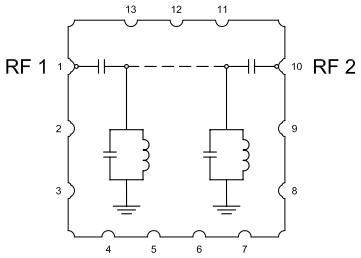
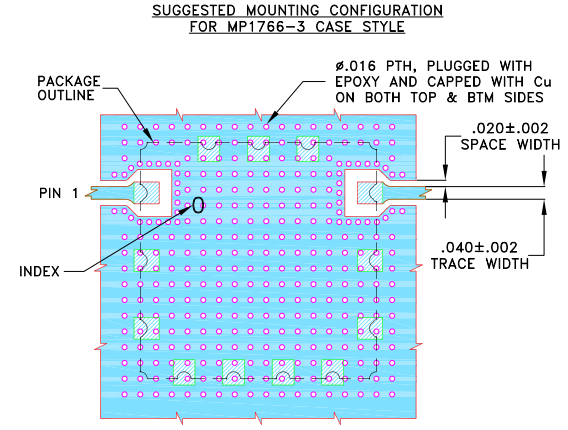


Figure 1. CBP2-1090C+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
RF1[2]	1	Connects to RF Input Port
RF2[2]	10	Connects to RF Output Port
GROUND	2-9,11-13	Connects to Ground on PCB, (See drawing PL-791)
NC	—	No connection, not used internally. See drawing PL-791 for connection to PCB

SUGGESTED PCB LAYOUT (PL-791)



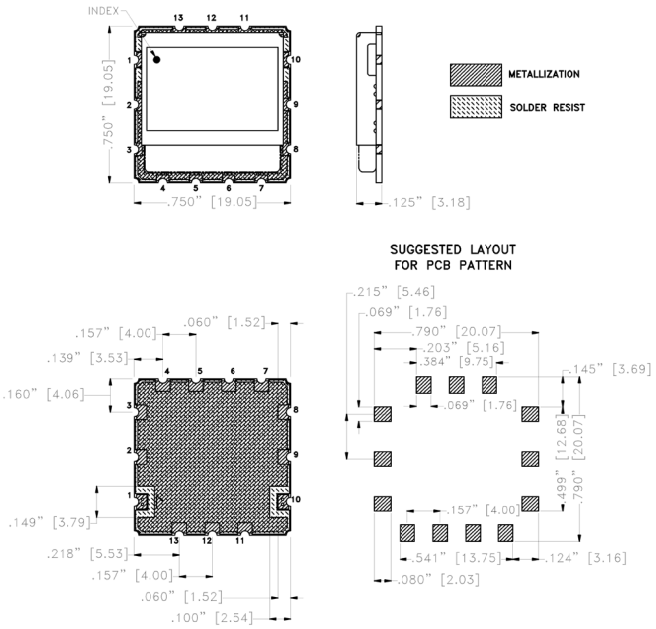
NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .020±.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 PATTERN WITH SMOBC (SOLDER MASK OVER BARE COPPER)
DENOTES PCB COPPER PATTERN FREE OF SOLDERMASK

Figure 2. Suggested PCB Layout PL-791

CASE STYLE DRAWING



Weight: 2.3 gram
Dimensions are in inches (mm). Tolerances: 2Pl. ± .010; 3Pl. ± .005

PRODUCT MARKING*: CBP2-1090C

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

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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD. CLICK HERE

Performance Data and Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	MP1766-3 Lead Finish: Electroless Nickel Immersion Gold
RoHS Status	Compliant
Tape and Reel	TR-F012
Suggested Layout for PCB Design	PL-791
Evaluation Board	TB-CBP2-1090C+
	Gerber File
Environmental Rating	ENV54

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

Surface mount Band Pass Filter CBP2-1090C+

Typical Performance Data

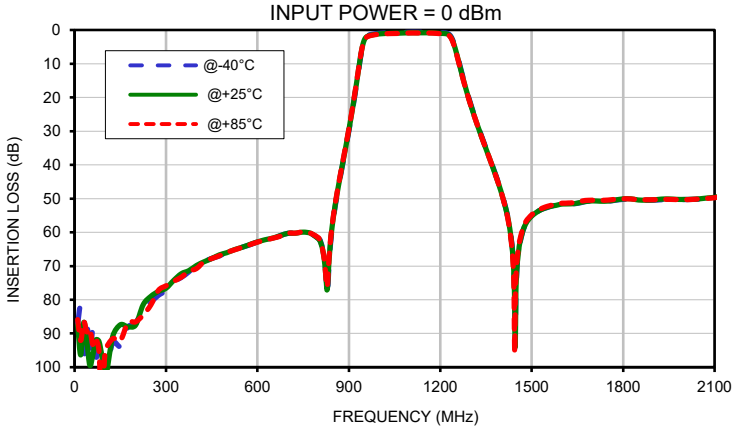
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
10	87.12	87.45	85.88	0.04	0.04	0.03	0.04	0.03	0.03
20	82.44	96.37	92.10	0.03	0.03	0.03	0.04	0.04	0.04
30	97.25	86.74	86.49	0.03	0.03	0.03	0.03	0.04	0.03
50	96.92	99.46	88.58	0.03	0.03	0.02	0.02	0.03	0.03
60	88.60	96.33	93.35	0.03	0.03	0.02	0.03	0.03	0.03
70	96.88	91.92	91.57	0.03	0.03	0.03	0.03	0.03	0.03
100	102.66	103.71	95.82	0.03	0.04	0.03	0.03	0.03	0.04
200	87.14	87.54	86.55	0.03	0.04	0.05	0.02	0.03	0.04
300	77.27	76.58	75.85	0.04	0.06	0.06	0.02	0.04	0.05
400	69.54	69.84	70.75	0.04	0.07	0.08	0.03	0.05	0.07
500	65.71	66.03	65.94	0.05	0.09	0.09	0.04	0.07	0.09
600	62.85	62.85	62.91	0.07	0.11	0.12	0.06	0.10	0.12
700	60.31	60.29	60.28	0.10	0.14	0.15	0.09	0.13	0.16
800	61.84	61.91	61.60	0.15	0.20	0.22	0.15	0.19	0.23
840	63.22	62.53	62.01	0.19	0.25	0.28	0.19	0.25	0.29
850	55.45	54.93	54.59	0.21	0.27	0.30	0.21	0.27	0.32
860	49.61	49.24	48.90	0.23	0.30	0.33	0.23	0.30	0.34
870	44.48	44.17	43.85	0.26	0.33	0.37	0.26	0.33	0.38
800	61.84	61.91	61.60	0.15	0.20	0.22	0.15	0.19	0.23
900	29.93	29.59	29.30	0.41	0.51	0.58	0.41	0.51	0.58
910	24.74	24.38	24.09	0.53	0.65	0.74	0.52	0.65	0.73
918	20.31	19.94	19.65	0.70	0.85	0.96	0.68	0.84	0.95
930	13.17	12.80	12.56	1.33	1.60	1.79	1.28	1.56	1.73
940	7.19	6.95	6.84	3.18	3.77	4.12	3.06	3.66	3.98
980	1.20	1.39	1.49	23.39	24.21	23.85	22.87	22.94	23.14
990	1.07	1.25	1.35	33.42	37.27	33.96	31.83	30.74	30.09
1000	0.99	1.16	1.25	33.38	33.10	38.38	32.91	31.93	33.13
1025	0.85	1.01	1.10	39.11	35.05	32.95	53.41	40.39	36.29
1050	0.81	0.96	1.04	21.24	20.68	20.69	21.20	20.54	20.89
1090	0.71	0.85	0.92	23.62	24.13	25.55	23.68	24.04	25.84
1100	0.69	0.83	0.90	30.09	31.79	34.64	30.91	32.67	38.12
1125	0.68	0.82	0.90	23.73	22.88	22.74	24.05	23.26	22.92
1150	0.69	0.83	0.91	22.81	22.29	23.09	22.87	22.41	23.07
1175	0.70	0.84	0.93	30.25	29.97	27.23	29.61	28.84	26.48
1200	0.83	0.99	1.09	17.82	17.59	17.15	18.00	17.69	17.28
1225	1.08	1.29	1.42	18.13	18.04	17.66	20.30	20.04	19.42
1242	3.25	3.56	3.79	5.04	5.06	5.02	5.20	5.21	5.16
1290	19.04	19.34	19.45	0.35	0.43	0.47	0.38	0.46	0.51
1330	30.09	30.32	30.36	0.18	0.25	0.27	0.20	0.26	0.31
1400	47.95	48.15	48.21	0.11	0.17	0.19	0.13	0.18	0.22
1410	51.14	51.35	51.40	0.11	0.17	0.19	0.12	0.18	0.22
1500	55.18	55.19	54.79	0.09	0.15	0.18	0.11	0.17	0.21
1520	53.79	53.83	53.49	0.09	0.15	0.17	0.10	0.16	0.20
1580	51.96	52.00	51.68	0.08	0.14	0.17	0.09	0.16	0.20
1600	51.62	51.62	51.37	0.08	0.14	0.17	0.09	0.15	0.20
1650	51.41	51.34	50.95	0.07	0.14	0.17	0.09	0.15	0.20
1700	50.68	50.68	50.47	0.07	0.14	0.17	0.09	0.16	0.20
1725	50.79	50.78	50.52	0.07	0.14	0.18	0.09	0.16	0.21
1750	50.78	50.74	50.44	0.07	0.15	0.18	0.09	0.16	0.21
1800	50.23	50.09	50.07	0.07	0.15	0.18	0.09	0.16	0.21
1825	50.12	50.07	50.11	0.07	0.15	0.19	0.09	0.16	0.21
1850	50.46	50.42	50.33	0.07	0.15	0.19	0.09	0.16	0.21
1875	50.48	50.46	50.35	0.07	0.15	0.19	0.08	0.16	0.21
1900	50.47	50.40	50.33	0.07	0.15	0.20	0.08	0.16	0.22
1925	50.35	50.15	50.25	0.06	0.15	0.19	0.08	0.17	0.22
1950	50.14	50.11	50.23	0.07	0.15	0.20	0.08	0.17	0.22
1975	50.27	50.23	50.29	0.07	0.16	0.20	0.08	0.17	0.22
2000	50.28	50.25	50.34	0.07	0.16	0.21	0.09	0.17	0.23
2050	50.15	50.07	50.10	0.07	0.17	0.00	0.09	0.18	0.24
2100	49.65	49.62	49.74	0.08	0.18	0.23	0.09	0.18	0.25

Typical Performance Data

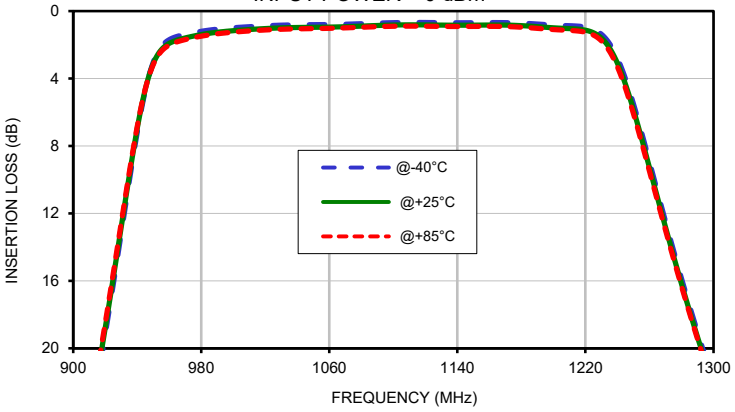
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
980	8.30	8.20	8.13
985	7.90	7.81	7.75
990	7.55	7.48	7.42
995	7.25	7.18	7.13
1000	6.98	6.92	6.88
1005	6.74	6.69	6.65
1010	6.54	6.49	6.46
1015	6.36	6.32	6.28
1020	6.20	6.16	6.13
1025	6.06	6.02	5.99
1030	5.93	5.89	5.86
1040	5.69	5.65	5.62
1050	5.47	5.44	5.41
1060	5.29	5.26	5.24
1070	5.16	5.14	5.12
1080	5.08	5.06	5.04
1090	5.02	5.01	4.99
1100	4.98	4.97	4.95
1105	4.97	4.95	4.92
1110	4.95	4.93	4.91
1115	4.92	4.91	4.88
1120	4.91	4.89	4.87
1125	4.89	4.87	4.85
1130	4.89	4.87	4.85
1135	4.89	4.87	4.85
1140	4.90	4.88	4.87
1145	4.92	4.90	4.89
1150	4.96	4.94	4.93
1155	5.00	4.99	4.98
1160	5.06	5.05	5.04
1165	5.13	5.12	5.11
1170	5.20	5.19	5.18
1175	5.27	5.27	5.25
1180	5.35	5.34	5.32
1185	5.43	5.42	5.40
1186	5.45	5.44	5.42
1187	5.46	5.46	5.44
1188	5.48	5.48	5.45
1190	5.52	5.52	5.50
1195	5.64	5.63	5.62
1200	5.80	5.80	5.78

Typical Performance Curves

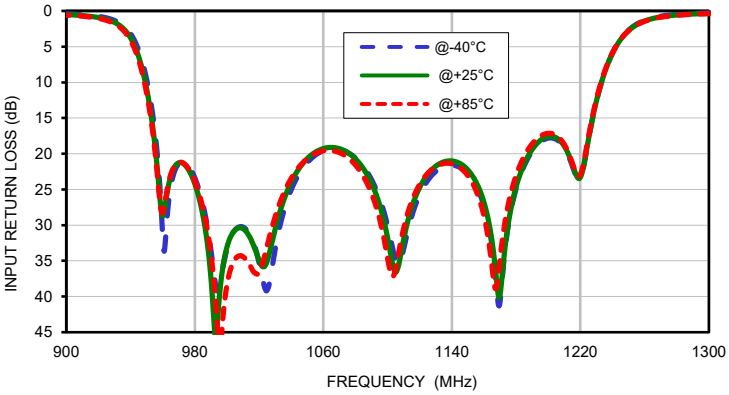
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



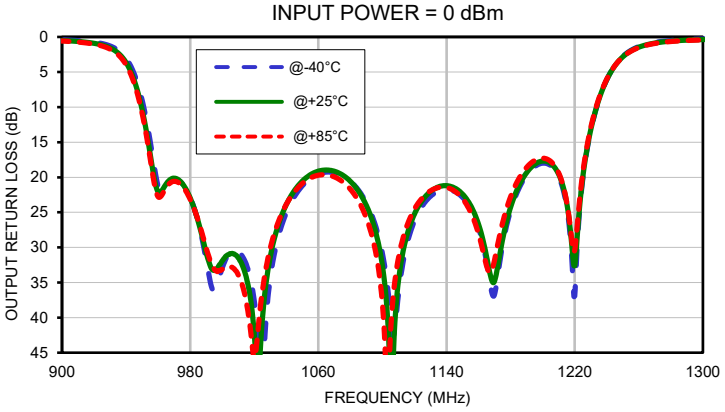
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



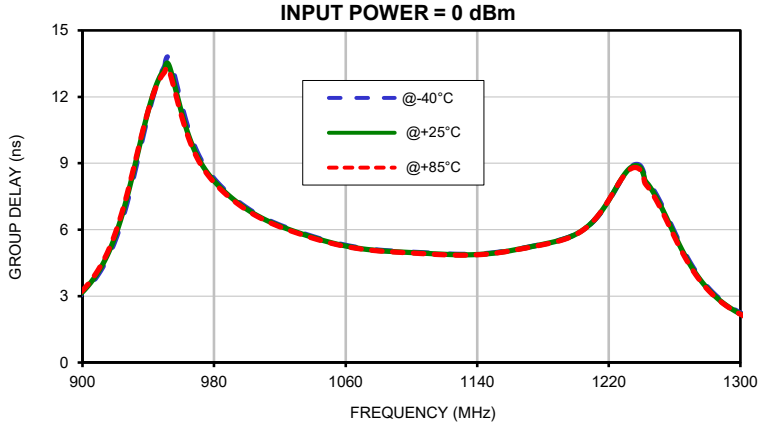
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm

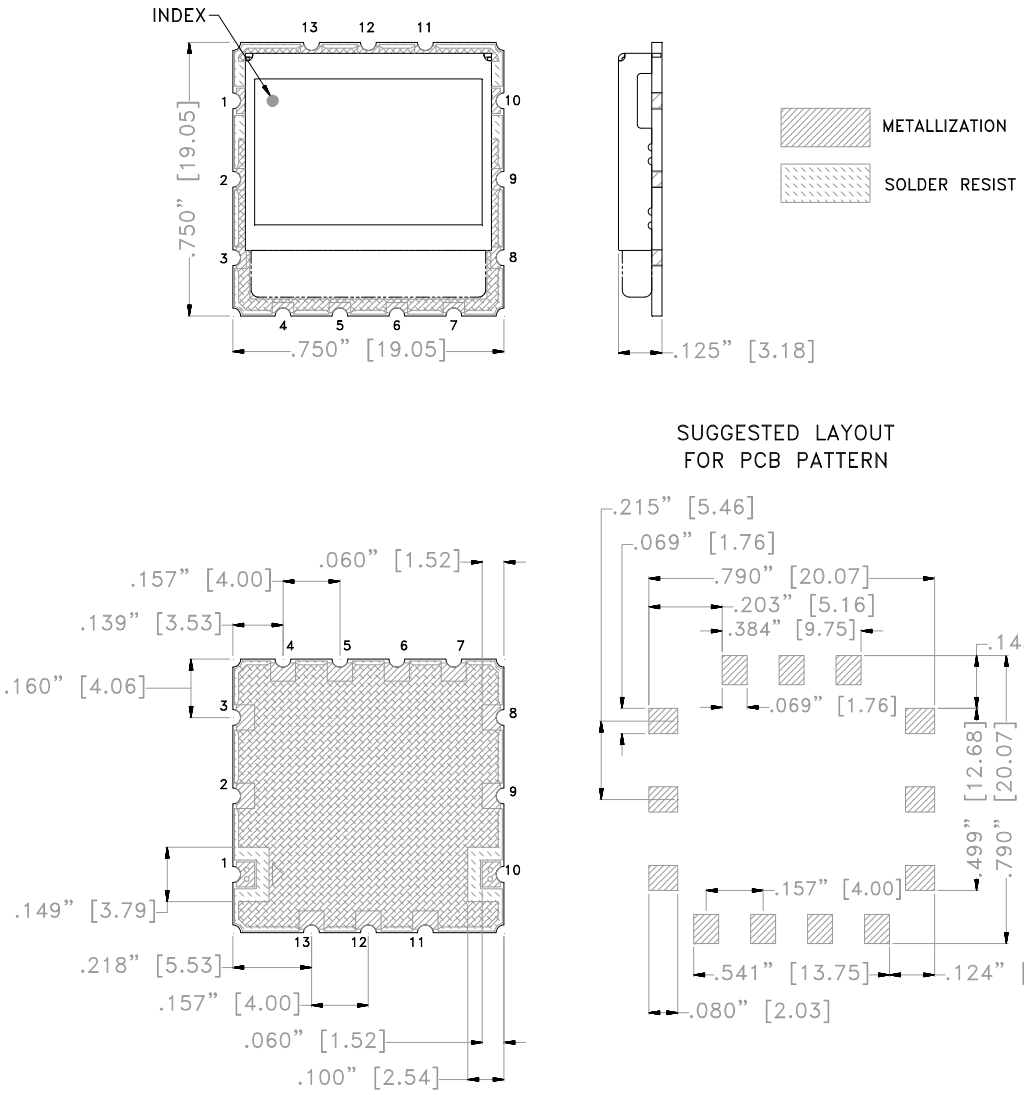


GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style MP

Outline Dimension MP1766-3



Dimensions are in inches (mm). Tolerances: 2Pl. ± .010; 3Pl. ± .005

Notes:

1. Base: Printed wiring laminate.
2. Unit Weight: 2.3 gram

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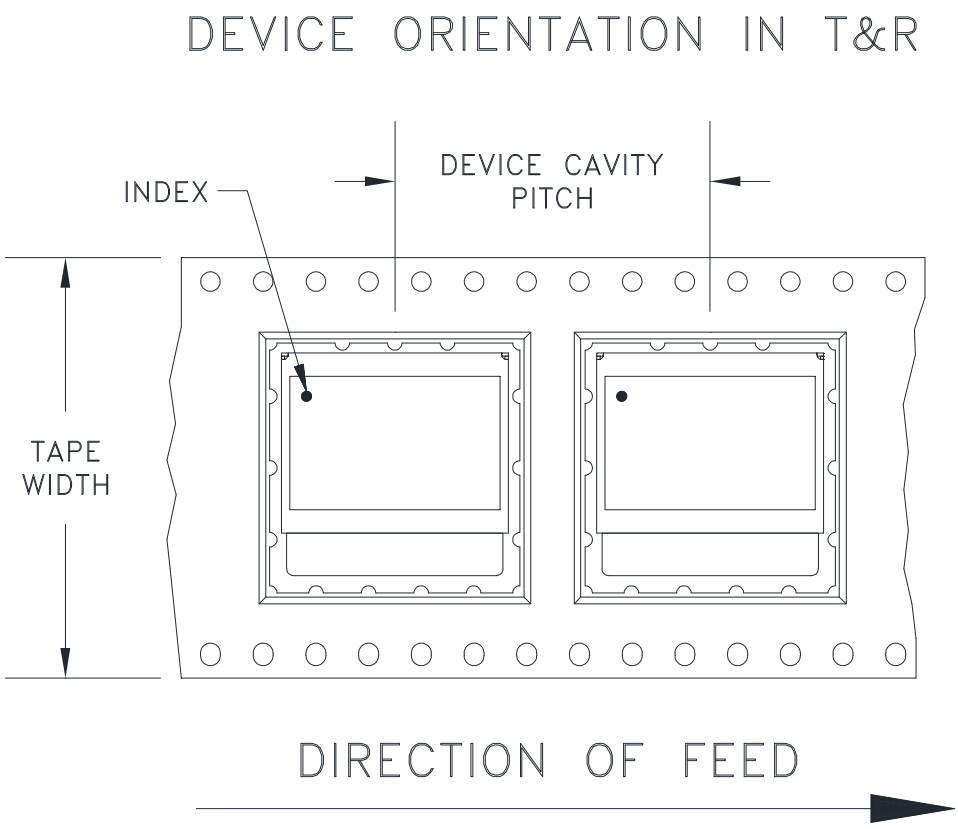
Tape & Reel Packaging TR-F012



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel See note	
32	24	13	Small quantity standards	10
				20
				50
				100
			Standard	400

Note: Please consult individual model data sheet/dashboard 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.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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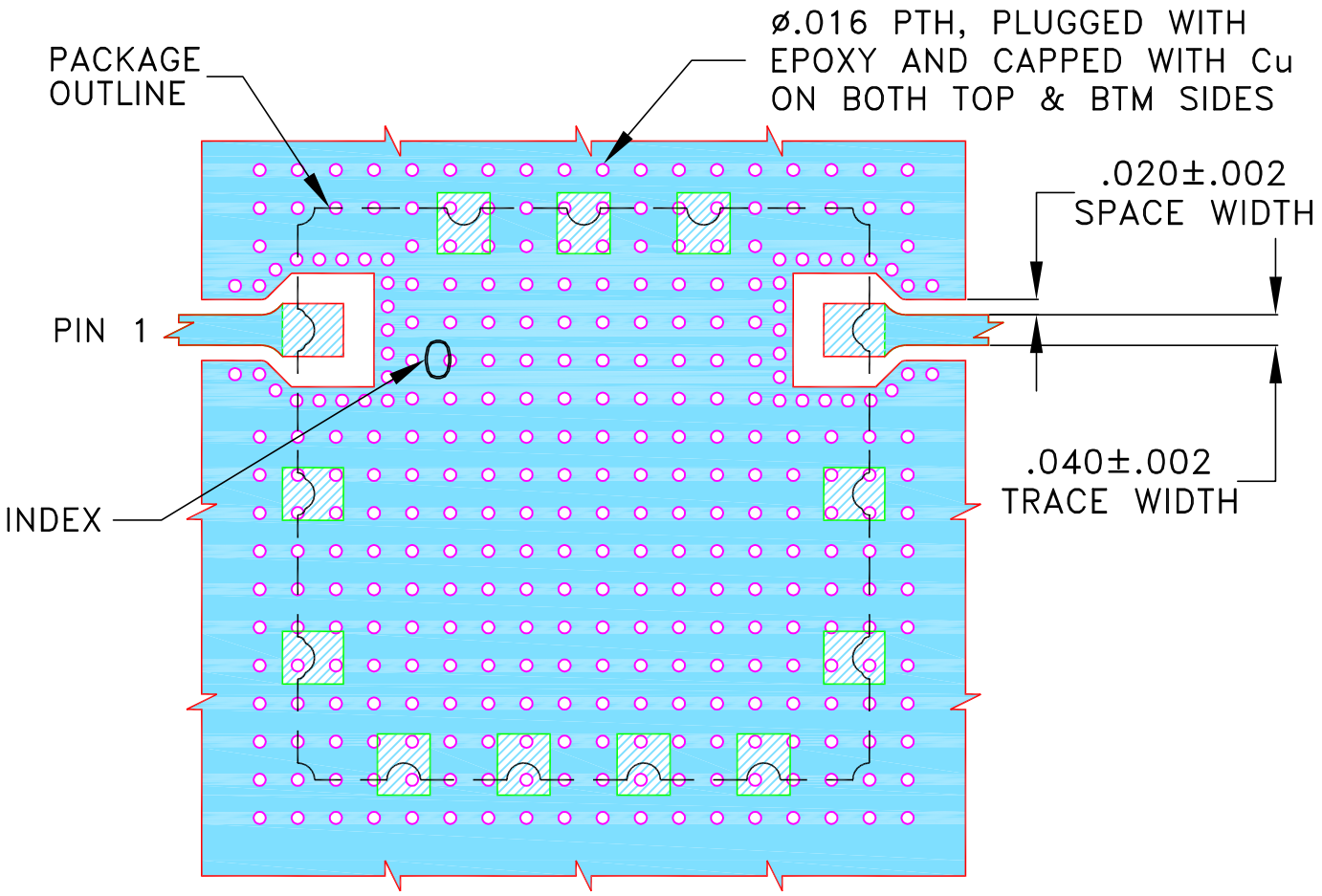
SUGGESTED MOUNTING CONFIGURATION
FOR MP1766-3 CASE STYLE



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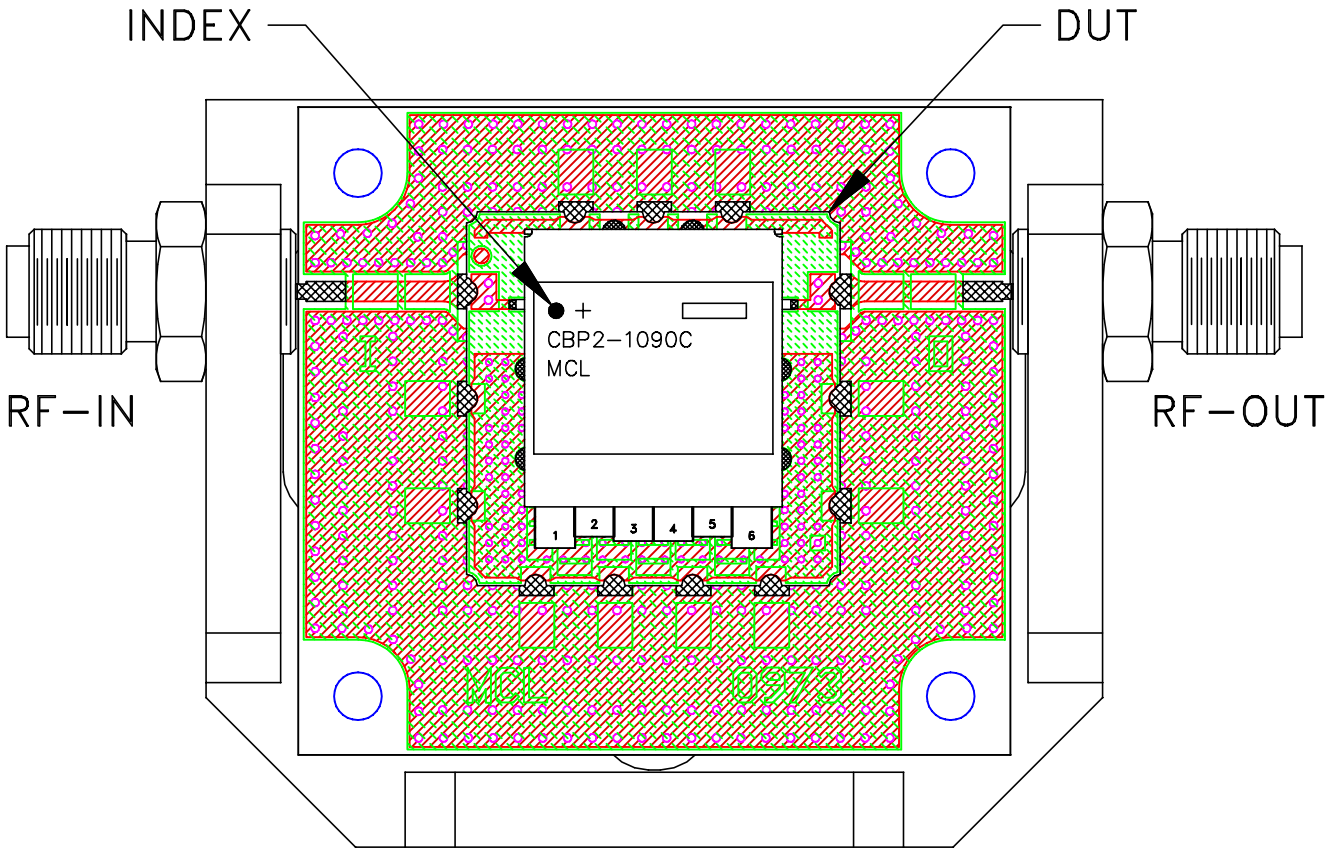
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

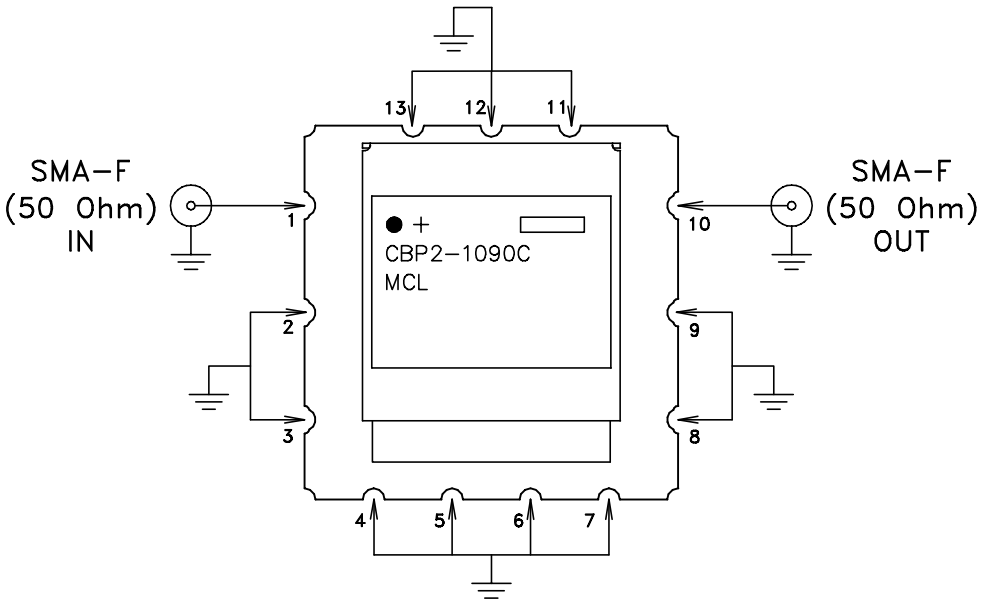
DENOTES PCB COPPER PATTERN WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES PCB COPPER PATTERN FREE OF SOLDERMASK

Evaluation Board and Circuit

TB-CBP2-1090C+





Schematic diagram

Notes:

1. 50 Ohm SMA female connectors.
2. PCB Material: ROGERS (RO4350B) OR Equivalent
Dielectric Constant=3.48, Thickness=.020 inch.

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Mini-Circuits

Environmental Specifications ENV54

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

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