CERAMIC RESONATOR SURFACE MOUNT

Bandpass Filter

CBP3-1490CB+

50Ω 1442 to 1538 MHz

KEY FEATURES

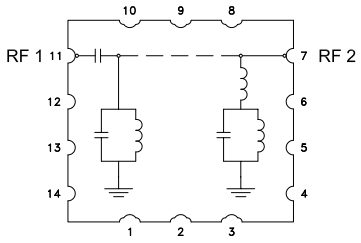
- Good Insertion Loss, 1.0 dB Typ.
- High Rejection, 70 dB Typ.
- Fast Roll-off on the Upper Side

Generic photo used for illustration purposes only

APPLICATIONS

- 5G Base Station

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

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

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

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	—	—	—	1490	—	MHz
	Insertion Loss	F1-F2	1442 - 1538	—	1	1.6	dB
	Return Loss	F1-F2	1442 - 1538	10	14	—	dB
Stop Band, Lower	Rejection	DC-F3	DC - 850	60	70	—	dB
		F3-F4	850 - 1270	20	28	—	
Stop Band, Upper	Rejection	F5-F6	1645 - 1850	20	27	—	dB
		F6-F7	1850 - 2200	35	45	—	

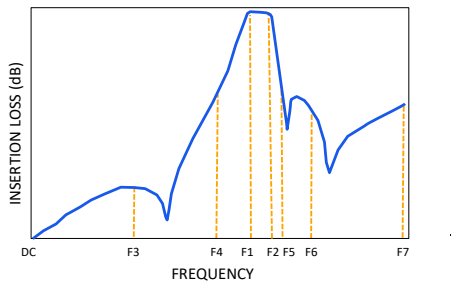
1. Tested in Evaluation Board P/N TB-CBP3-1490CB+.
2. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.
3. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output 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]	12 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-026012
EDU5075
CBP3-1490CB+
URJ
250626

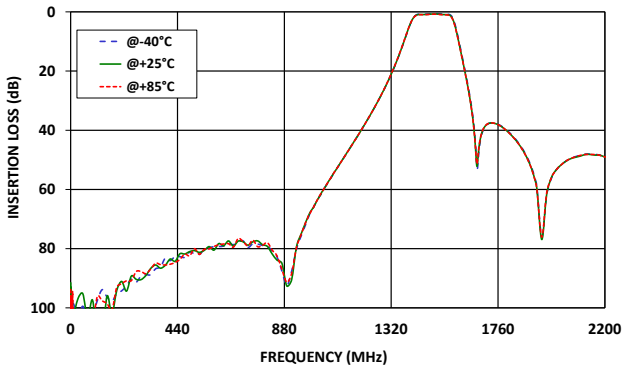
Bandpass Filter

CBP3-1490CB+

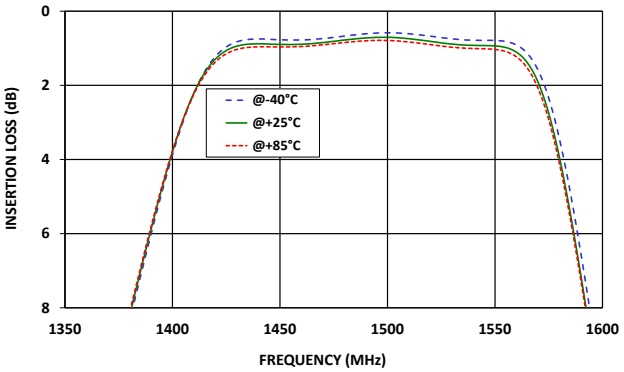
50Ω 1442 to 1538 MHz

TYPICAL PERFORMANCE GRAPHS

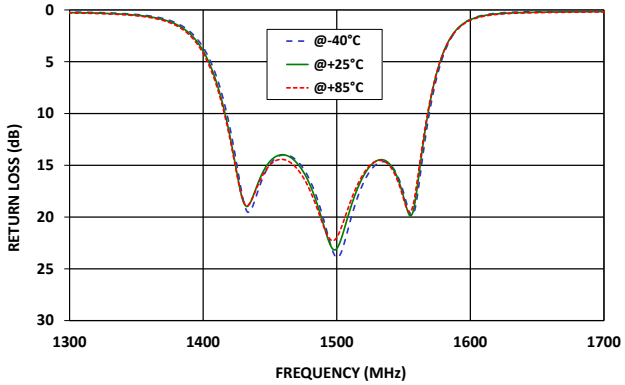
CBP3-1490CB+
INSERTION LOSS



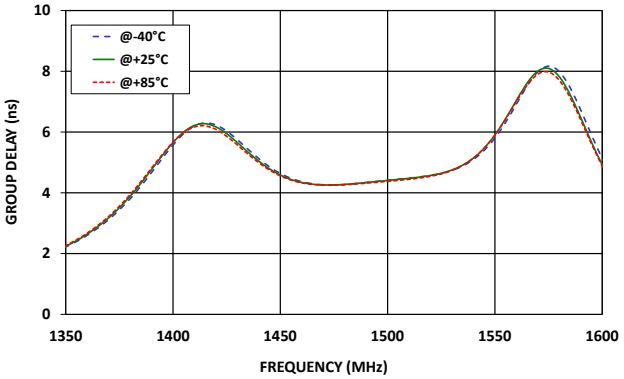
CBP3-1490CB+
INSERTION LOSS (Zoomed)



CBP3-1490CB+
RETURN LOSS (Zoomed)



CBP3-1490CB+
GROUP DELAY



Bandpass Filter

CBP3-1490CB+

50Ω 1442 to 1538 MHz

FUNCTIONAL DIAGRAM

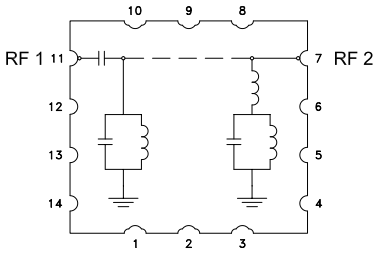


Figure 1. CBP3-1490CB+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
RF1[2]	11	Connects to RF Input Port
RF2[2]	7	Connects to RF Output Port
GROUND	1-6, 8-10,12-14	Connects to Ground on PCB, (See drawing PL-818)
NC	-	No connection, not used internally. See drawing PL-818 for connection to PCB

SUGGESTED PCB LAYOUT (PL-818)

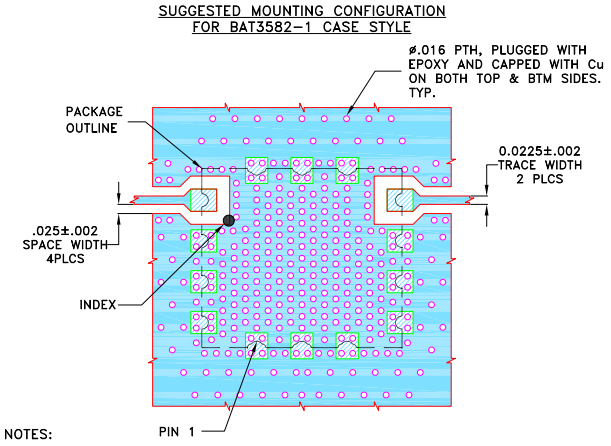
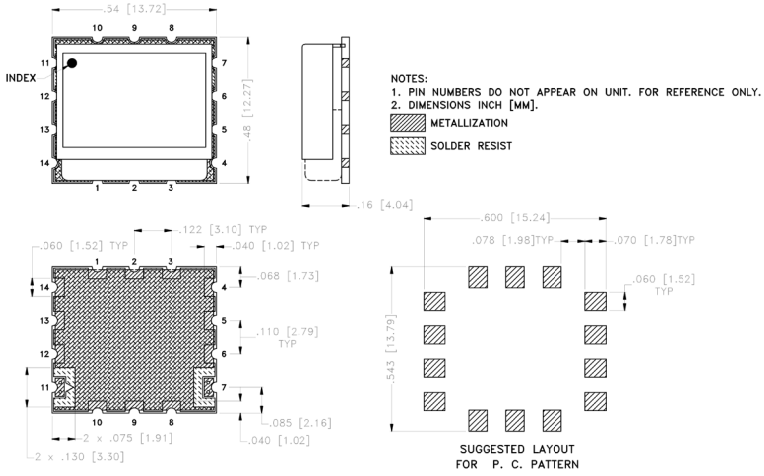


Figure 2. Suggested PCB Layout PL-818

CASE STYLE DRAWING



Weight: 1.5 grams
Dimensions are in inches (mm). Tolerances: 2Pl. ± .015; 3Pl. ± .003

PRODUCT MARKING*: CBP3-1490CB

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

Bandpass Filter

CBP3-1490CB+

50Ω 1442 to 1538 MHz

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	BAT3582-1 Lead Finish: Gold over Nickel Plate
RoHS Status	Compliant
Tape and Reel	TR-F014
Suggested Layout for PCB Design	PL-818
Evaluation Board	TB-CBP3-1490CB+
	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 Bandpass Filter CBP3-1490CB+

Typical Performance Data

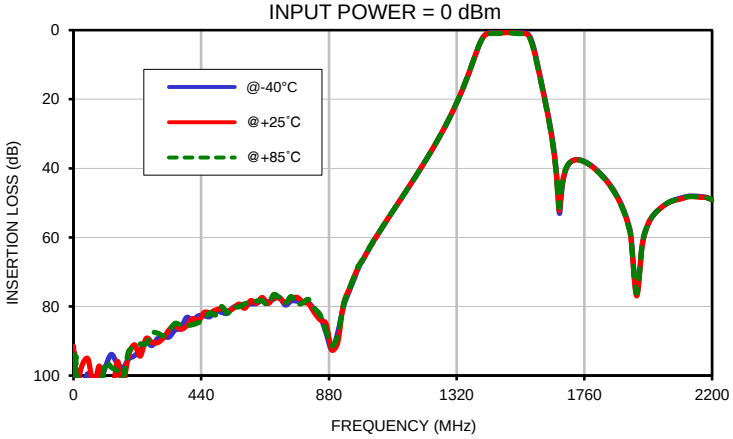
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1.0	102.60	92.98	97.70	0.06	0.06	0.06	0.07	0.07	0.08
3.0	101.75	107.65	107.93	0.06	0.06	0.06	0.07	0.08	0.08
7.0	102.30	97.81	107.28	0.06	0.06	0.06	0.07	0.08	0.09
10.0	98.53	103.46	103.25	0.05	0.05	0.05	0.07	0.08	0.09
30.0	102.66	96.93	111.49	0.05	0.05	0.05	0.09	0.09	0.11
50.0	99.47	95.21	103.37	0.04	0.04	0.04	0.09	0.11	0.12
70.0	103.74	103.48	103.22	0.04	0.04	0.04	0.10	0.12	0.13
90.0	102.65	97.35	105.28	0.04	0.04	0.04	0.11	0.13	0.14
150.0	96.37	96.01	98.56	0.02	0.03	0.04	0.13	0.14	0.16
210.0	94.26	91.07	91.87	0.02	0.03	0.04	0.14	0.16	0.17
250.0	90.30	89.27	90.80	0.01	0.03	0.04	0.15	0.17	0.18
310.0	88.81	89.05	88.46	0.01	0.03	0.04	0.16	0.19	0.20
350.0	86.80	85.53	84.90	0.01	0.03	0.04	0.16	0.19	0.21
410.0	84.03	83.50	85.26	0.01	0.03	0.04	0.16	0.20	0.22
450.0	82.70	81.73	83.64	0.01	0.03	0.04	0.17	0.21	0.23
510.0	81.70	80.66	80.01	0.01	0.04	0.06	0.17	0.21	0.24
550.0	80.28	80.60	80.24	0.01	0.04	0.06	0.17	0.21	0.23
610.0	79.24	78.30	78.72	0.01	0.04	0.06	0.17	0.22	0.24
650.0	78.18	77.39	78.33	0.02	0.05	0.07	0.17	0.22	0.25
710.0	77.36	77.68	77.61	0.03	0.06	0.08	0.17	0.22	0.25
750.0	78.39	77.72	77.11	0.03	0.06	0.08	0.17	0.22	0.26
810.0	78.97	79.24	77.98	0.04	0.08	0.09	0.16	0.22	0.27
850.0	82.79	83.90	82.48	0.04	0.08	0.10	0.16	0.23	0.27
910.0	87.65	90.54	88.45	0.05	0.09	0.11	0.16	0.23	0.28
1000.0	65.99	66.12	66.05	0.08	0.11	0.14	0.16	0.23	0.27
1100.0	52.47	52.39	52.42	0.09	0.13	0.16	0.17	0.25	0.29
1150.0	46.04	46.05	46.03	0.11	0.15	0.17	0.20	0.28	0.32
1210.9	38.03	38.02	38.02	0.12	0.16	0.19	0.25	0.32	0.37
1264.9	30.29	30.26	30.24	0.16	0.20	0.24	0.31	0.38	0.43
1270.0	29.51	29.47	29.45	0.16	0.21	0.24	0.31	0.39	0.43
1324.9	20.22	20.14	20.06	0.27	0.32	0.36	0.47	0.55	0.60
1346.9	15.85	15.74	15.65	0.41	0.47	0.52	0.64	0.73	0.80
1374.9	9.57	9.43	9.33	1.01	1.13	1.22	1.29	1.45	1.58
1402.9	3.33	3.26	3.26	4.28	4.68	4.93	4.72	5.21	5.53
1442.0	0.75	0.88	0.96	17.11	16.44	16.64	19.09	18.33	18.71
1470.9	0.73	0.84	0.90	14.66	14.90	15.44	15.39	15.80	16.58
1480.9	0.67	0.77	0.84	16.74	17.20	17.73	17.68	18.50	19.51
1490.0	0.61	0.72	0.80	20.17	20.70	20.84	21.88	23.42	24.53
1500.9	0.58	0.70	0.79	23.90	22.87	21.77	28.00	27.24	25.68
1510.9	0.61	0.75	0.84	20.01	18.89	18.29	21.46	20.27	19.68
1520.9	0.68	0.82	0.91	16.45	15.83	15.64	17.26	16.63	16.48
1538.0	0.78	0.92	1.00	14.78	14.70	14.85	15.65	15.60	15.87
1600.9	10.63	11.25	11.34	0.86	0.89	0.95	1.28	1.34	1.44
1624.9	20.17	20.78	20.81	0.27	0.33	0.38	0.65	0.75	0.84
1645.0	29.02	29.72	29.76	0.17	0.23	0.27	0.54	0.65	0.74
1701.0	39.55	39.36	39.25	0.10	0.16	0.19	0.46	0.59	0.68
1711.0	38.34	38.26	38.21	0.10	0.15	0.19	0.45	0.58	0.68
1721.0	37.73	37.71	37.68	0.10	0.15	0.18	0.44	0.57	0.67
1731.0	37.50	37.54	37.52	0.10	0.15	0.18	0.43	0.57	0.66
1751.0	37.73	37.81	37.80	0.10	0.15	0.18	0.42	0.56	0.65
1781.0	39.01	39.18	39.19	0.10	0.15	0.18	0.41	0.55	0.64
1801.0	40.35	40.54	40.57	0.10	0.15	0.19	0.40	0.53	0.62
1850.0	44.96	45.22	45.25	0.08	0.14	0.16	0.39	0.52	0.60
1889.5	50.82	51.21	51.30	0.08	0.13	0.16	0.38	0.50	0.58
1904.5	54.13	54.62	54.76	0.08	0.14	0.17	0.38	0.50	0.58
1940.0	76.01	76.92	76.11	0.09	0.15	0.17	0.37	0.48	0.55
1980.0	56.21	55.94	56.00	0.08	0.14	0.17	0.37	0.47	0.54
2000.0	53.37	53.33	53.33	0.07	0.13	0.17	0.37	0.47	0.53
2100.0	48.43	48.70	48.46	0.09	0.14	0.18	0.35	0.44	0.50
2200.0	49.02	49.05	49.01	0.06	0.13	0.18	0.34	0.43	0.50

Typical Performance Data

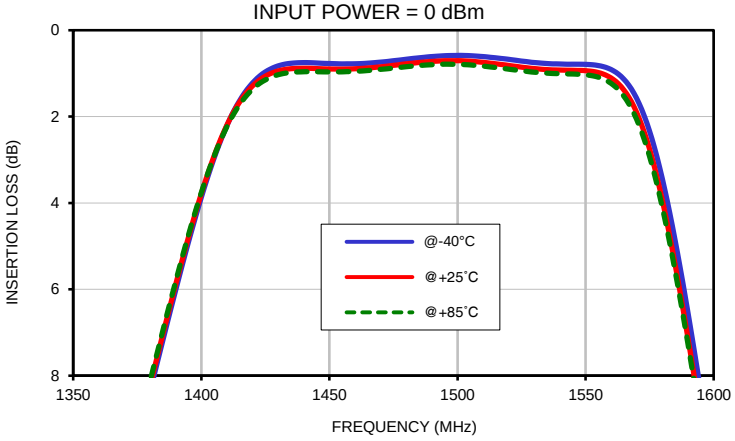
FREQ.	GROUP DELAY		
	(nsec)		
(MHz)	@-40°C	@+25˚C	@+85˚C
1442.0	5.01	4.94	4.89
1446.9	4.77	4.71	4.67
1448.9	4.68	4.62	4.60
1450.9	4.61	4.56	4.53
1454.9	4.48	4.44	4.42
1456.9	4.43	4.40	4.38
1458.9	4.39	4.36	4.34
1460.9	4.35	4.33	4.32
1462.9	4.32	4.31	4.29
1464.9	4.30	4.29	4.27
1468.9	4.27	4.26	4.26
1470.9	4.27	4.26	4.25
1472.9	4.26	4.26	4.25
1476.9	4.26	4.27	4.26
1480.9	4.28	4.28	4.27
1484.9	4.30	4.30	4.29
1486.9	4.32	4.32	4.30
1488.9	4.33	4.33	4.31
1490.0	4.34	4.34	4.32
1500.9	4.42	4.41	4.38
1502.9	4.43	4.43	4.40
1504.9	4.45	4.44	4.41
1510.9	4.49	4.48	4.45
1514.9	4.52	4.52	4.49
1520.9	4.59	4.59	4.56
1524.9	4.64	4.64	4.62
1526.9	4.67	4.68	4.66
1530.9	4.76	4.78	4.76
1538.0	5.00	5.05	5.04

Typical Performance Curves

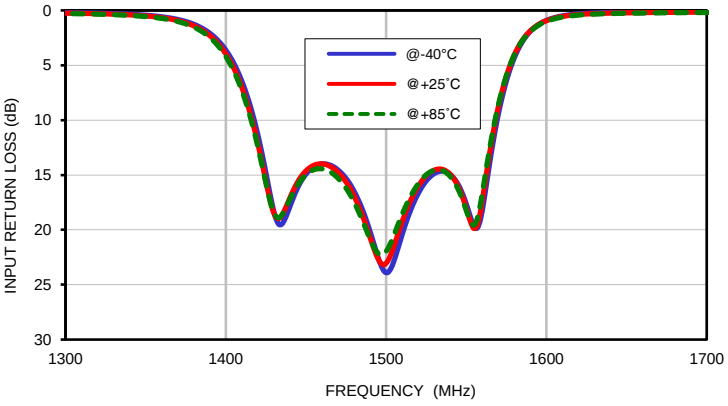
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



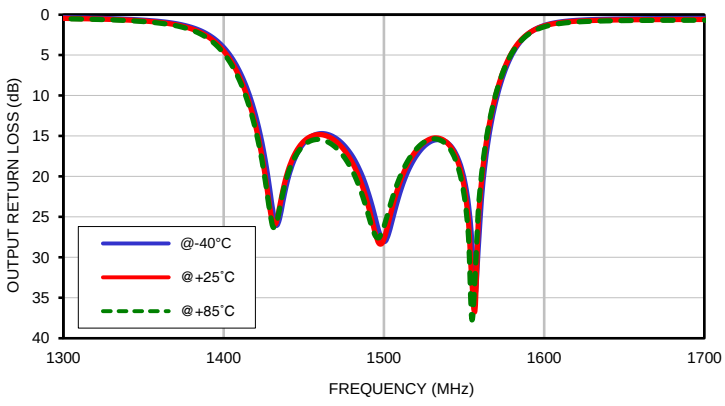
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



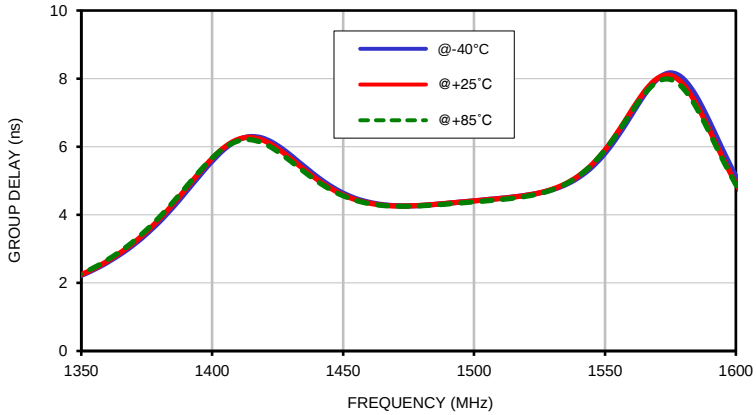
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



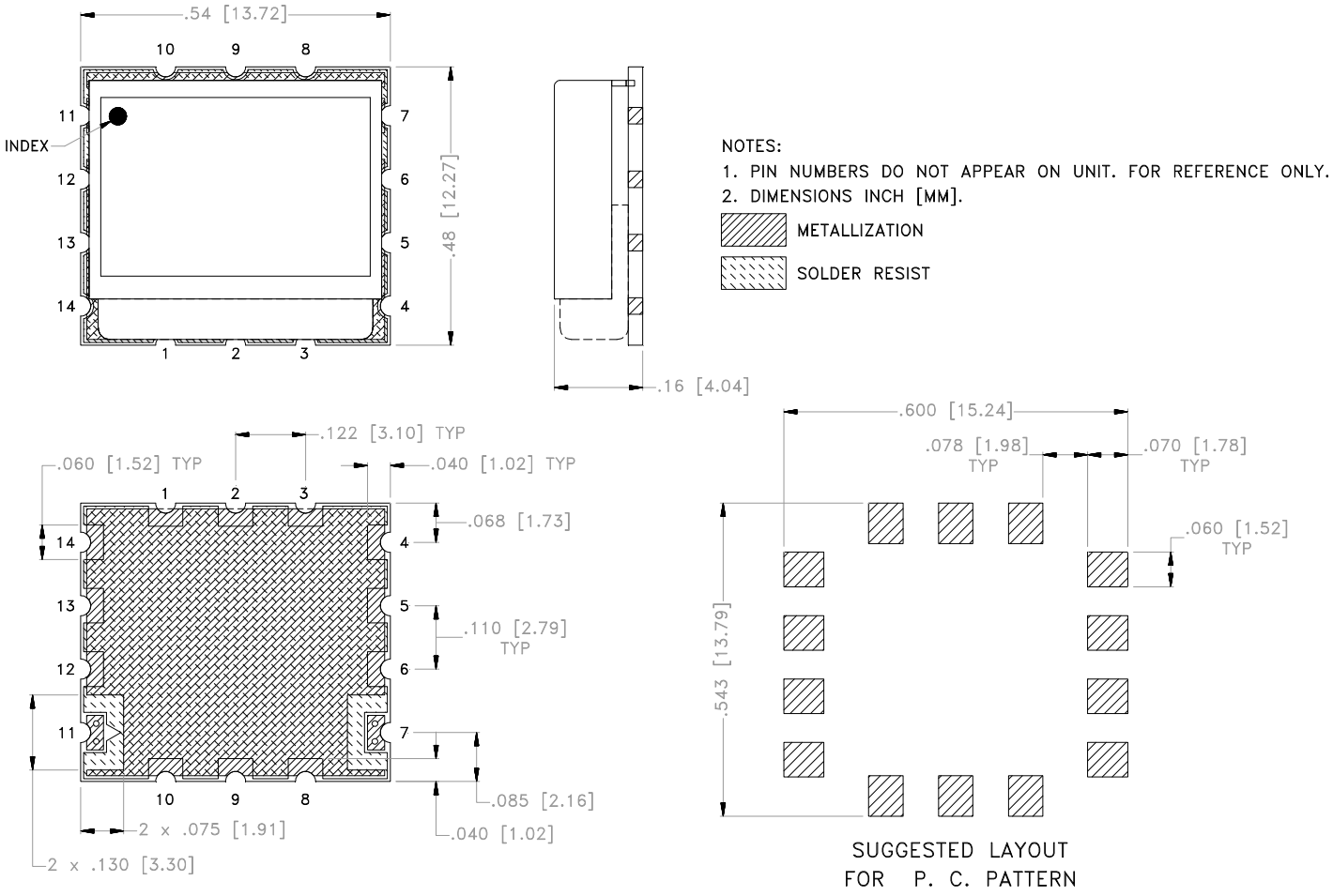
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style BAT

Outline Dimension

BAT3582-1

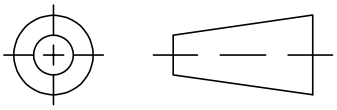


Dimensions are in inches [mm]. Tolerances: 2 Pl ± .015; 3 Pl ± .003

Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Unit Weight: 1.5grams
4. Termination finish:
   For RoHS Case Styles: 2-5 µ inch (.05-.13 microns) Gold over 120-240 µ inch (3.05-6.10 microns) Nickel plate.
   All models, (+) suffix.

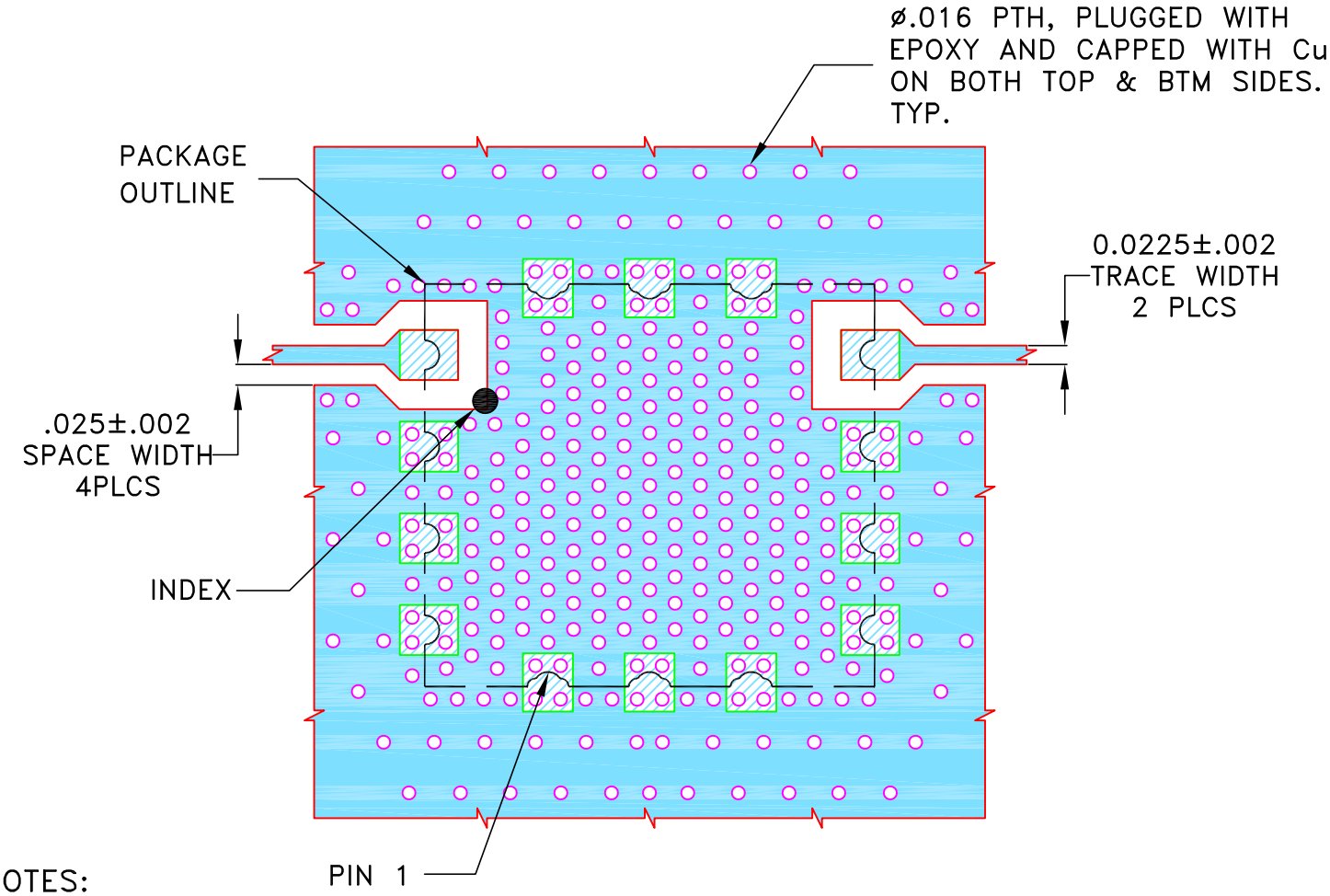
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	NPO-005134	NEW RELEASE	MAR 25	SPM	VR

SUGGESTED MOUNTING CONFIGURATION FOR BAT3582-1 CASE STYLE



NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .010±.001; 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

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	SPM	29 MAR 25
TOLERANCES ON:	CHECKED	LK	31 MAR 25
2 PL DECIMALS ± .002	APPROVED	NK	31 MAR 25
3 PL DECIMALS ±			
ANGLES ±			
FRACTIONS ±			

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

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

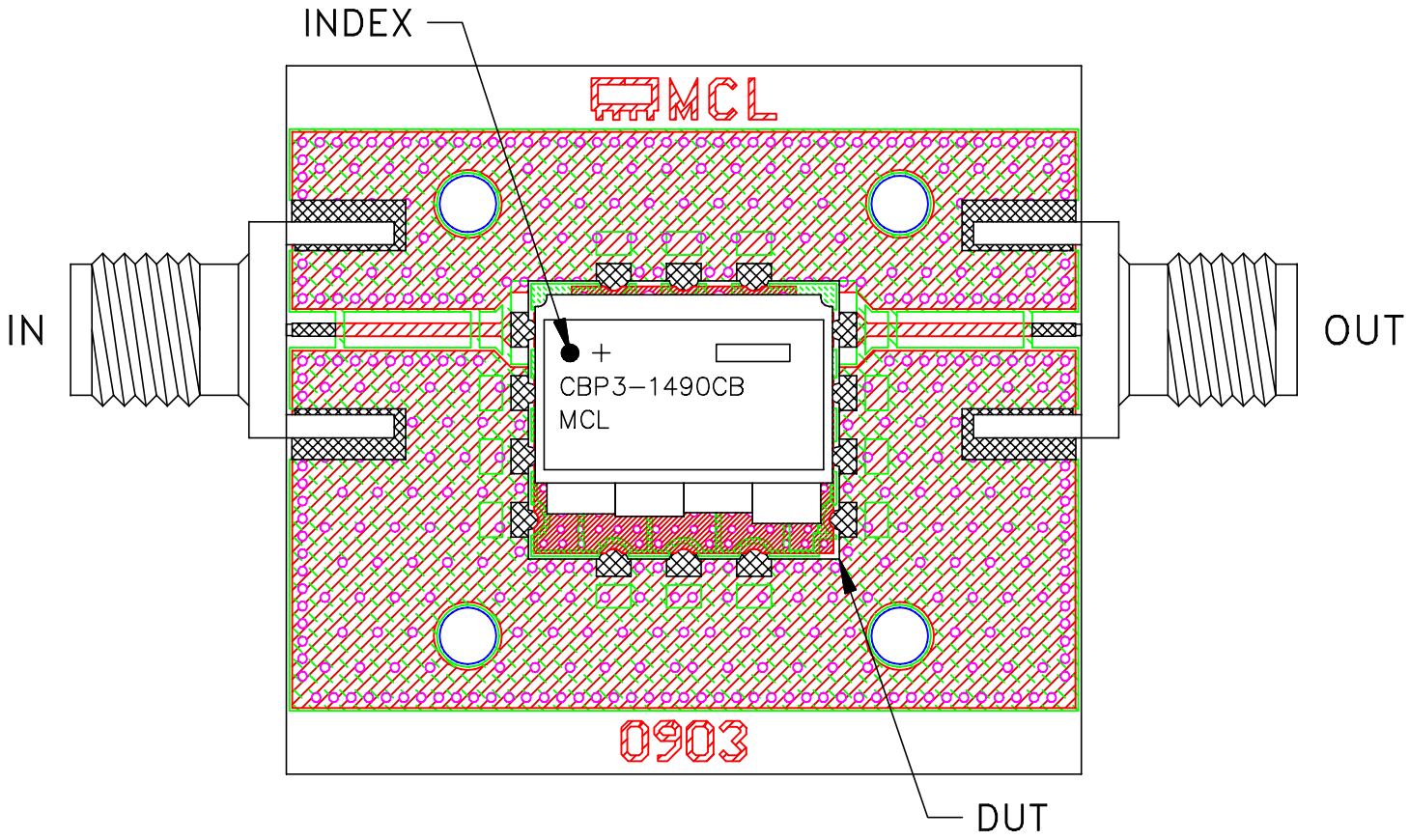
PL, BAT3582-1, TB-1302

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-818	OR

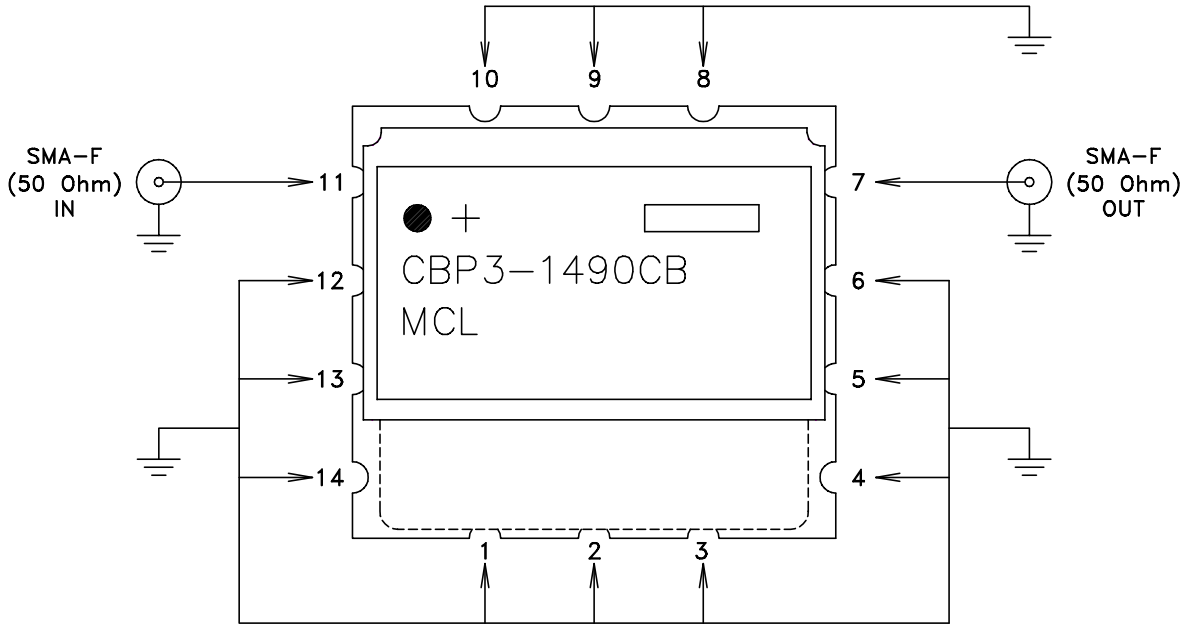
FILE:	SCALE:	SHEET:
98-PL-818	4.5:1	1 OF 1

Evaluation Board and Circuit

TB-CBP3-1490CB+



Schematic diagram



Notes:

1. PCB Material: ROGERS (RO4350B) OR Equivalent, Dielectric Constant=3.48
   Thickness=.010 inch
2. 50 Ohm SMA Female Connector.

Mini-Circuits®

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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