(LUMPED LC) SURFACE MOUNT

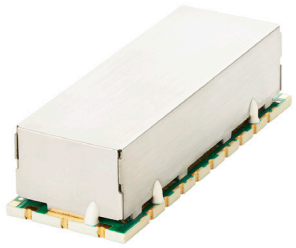
Low Pass Filter

LPF-BV11R5-10W+

50Ω DC to 11.5 MHz

KEY FEATURES

- Good Insertion Loss 0.3dB Typ. with Excellent Power Handling
- Good Return Loss 17dB Typ.
- Wide Stop Band up to 2GHz
- Shielded Package



Generic photo used for illustration purposes only

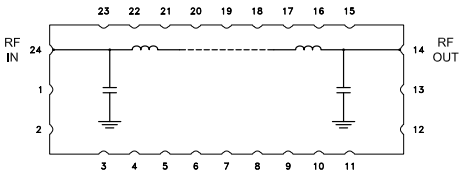
APPLICATIONS

- Test Equipment
- Lab Use
- Transmitters/Receivers

PRODUCT OVERVIEW

Mini-Circuits' LPF-BV11R5-10W+ is a Lumped LC filter that offers a good insertion loss and high rejection. This low pass filter covers from DC to 11.5 MHz and the stop band up to 2 GHz. This filter has high Q capacitors and inductors to achieve a low insertion loss. It has repeatable performance across production lots.

FUNCTIONAL DIAGRAM



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

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Pass Band	Insertion Loss	DC-F1	DC - 11.5	—	0.3	1	dB
	Return Loss	DC-F1	DC - 11.5	—	17	12	dB
Stop Band	Rejection	F2-F3	20 - 25	20	31	—	dB
		F3-F4	25 - 2000	40	49	—	

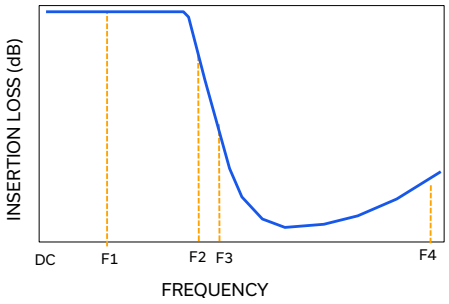
1. Tested in Evaluation Board P/N TB-LPFBV11R510W+
2. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.
3. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

ABSOLUTE MAXIMUM RATINGS[5]

Parameter	Ratings
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-55 °C to +100 °C
Input Power[6]	10 W

5. Permanent damage may occur if any of these limits are exceeded.
6. Power rating applies only to signals within the passband.

TYPICAL FREQUENCY RESPONSE



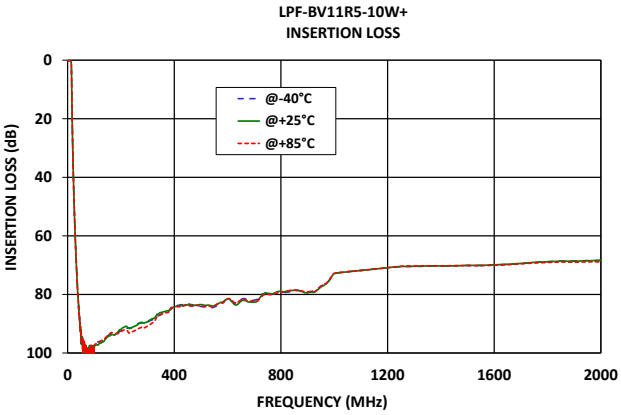
REV. OR
ECO-022059
LPF-BV11R5-10W+
EDU4748
URJ
240611

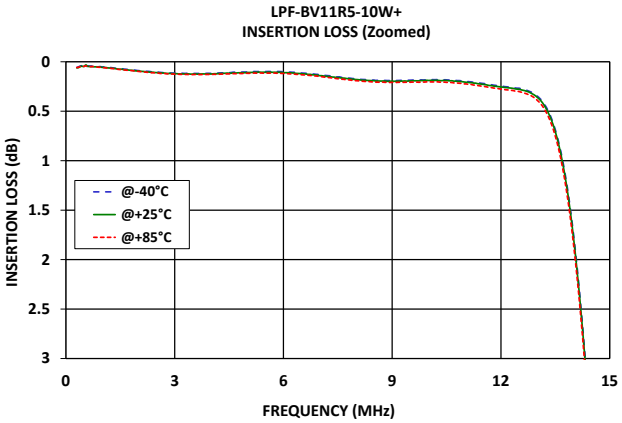
Low Pass Filter

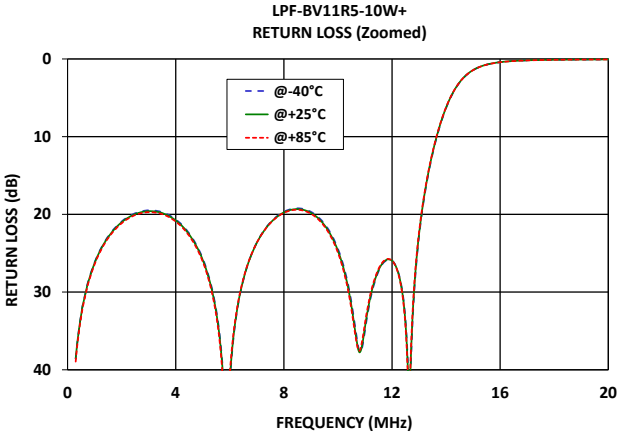
LPF-BV11R5-10W+

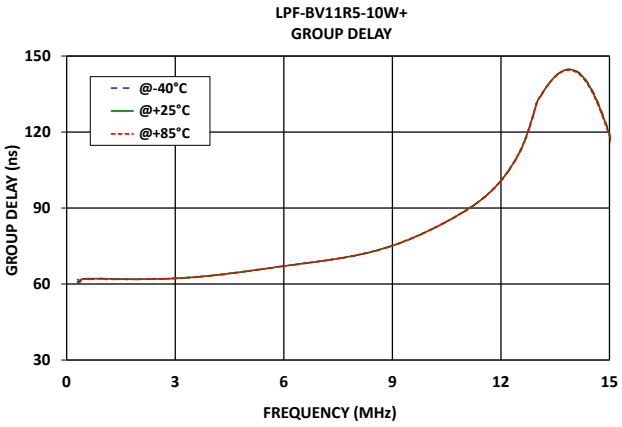
50Ω DC to 11.5 MHz

TYPICAL PERFORMANCE GRAPHS









Low Pass Filter

LPF-BV11R5-10W+

50Ω DC to 11.5 MHz

FUNCTIONAL DIAGRAM

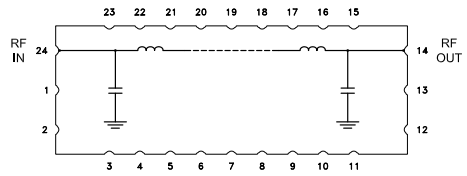


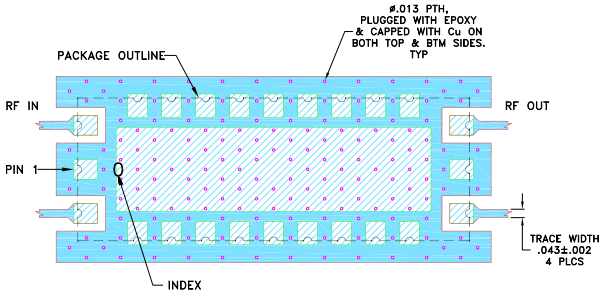
Figure 1. LPF-BV11R5-10W+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
RF1[2]	24	Connects to RF Input Port
RF2[2]	14	Connects to RF Output Port
GROUND	All others	Connects to Ground on PCB, (See drawing PL-774)
NC	2 & 12	No connection, not used internally. See drawing PL-774 for connection to PCB

SUGGESTED PCB LAYOUT (PL-774)

SUGGESTED MOUNTING CONFIGURATION
FOR ZW1825-1 CASE STYLE



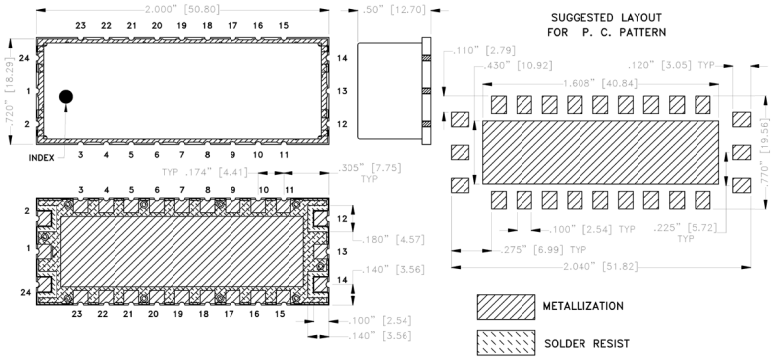
NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .020±.0015. COPPER: 1/2 Oz. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES PCB COPPER PATTERN FREE OF SOLDERMASK

Figure 2. Suggested PCB Layout PL-774

CASE STYLE DRAWING



Unit Weight: 14 grams

Dimensions are in inches [mm]. Tolerances: 2 Pl ±.03[.76]; 3 Pl ±.015[.38]

PRODUCT MARKING*: LPF-BV11R5-10W

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

Low Pass Filter

LPF-BV11R5-10W+

50 Ω DC to 11.5 MHz

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD. CLICK HERE

Performance Data and Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	ZW1825-1 Lead Finish: Gold over Nickel
RoHS Status	Compliant
Tape and Reel	-
Suggested Layout for PCB Design	PL-774
Evaluation Board	TB-LPFBV11R510W+
	Gerber File
Environmental Rating	ENV02T1

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 LPF-BV11R5-10W+

Typical Performance Data

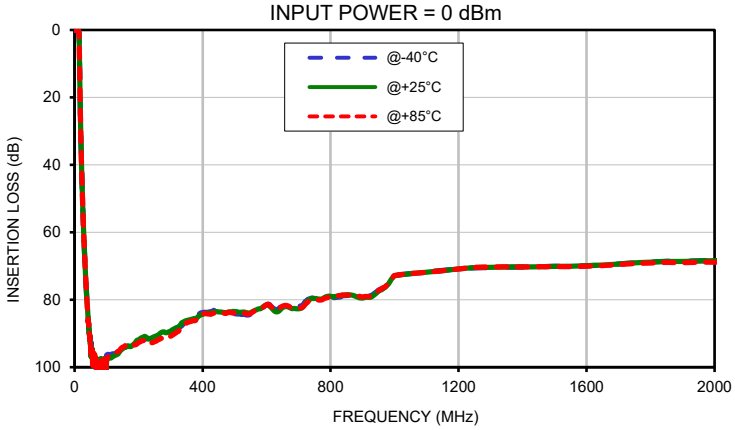
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
0.3	0.06	0.06	0.06	38.58	38.59	38.95	37.17	37.21	37.48
1.0	0.05	0.06	0.06	26.18	26.27	26.43	25.93	26.02	26.16
5.0	0.10	0.11	0.12	25.70	25.88	26.11	25.91	26.07	26.28
11.5	0.22	0.23	0.25	27.35	27.19	27.03	27.56	27.39	27.22
15.0	6.79	6.84	6.92	1.44	1.43	1.44	1.42	1.41	1.42
20.0	33.63	33.66	33.70	0.05	0.06	0.06	0.06	0.06	0.07
25.0	50.89	50.93	50.93	0.03	0.03	0.03	0.03	0.03	0.04
30.0	63.93	63.95	64.00	0.02	0.02	0.03	0.03	0.03	0.04
50.0	92.53	93.72	93.82	0.02	0.03	0.03	0.05	0.04	0.05
100.0	96.45	97.82	97.39	0.03	0.03	0.04	0.06	0.07	0.07
120.0	96.03	96.66	96.29	0.03	0.04	0.04	0.08	0.08	0.08
140.0	95.21	95.48	95.04	0.04	0.04	0.05	0.08	0.08	0.09
160.0	93.40	94.12	93.32	0.04	0.04	0.05	0.09	0.09	0.10
180.0	93.73	93.58	93.42	0.05	0.05	0.05	0.09	0.10	0.10
200.0	92.47	91.97	92.63	0.05	0.05	0.06	0.10	0.11	0.11
220.0	91.61	90.85	92.15	0.05	0.06	0.06	0.10	0.11	0.11
240.0	91.38	91.37	92.79	0.05	0.06	0.06	0.10	0.11	0.12
260.0	90.40	90.50	91.94	0.06	0.06	0.06	0.10	0.11	0.12
280.0	89.80	89.53	91.03	0.06	0.06	0.07	0.11	0.12	0.12
300.0	89.42	89.31	90.83	0.06	0.07	0.07	0.11	0.12	0.13
320.0	88.44	88.21	89.56	0.06	0.07	0.08	0.11	0.13	0.14
340.0	87.26	86.65	87.37	0.06	0.07	0.08	0.12	0.13	0.14
360.0	86.47	85.94	86.52	0.06	0.07	0.08	0.11	0.13	0.14
380.0	85.55	85.52	85.99	0.06	0.07	0.08	0.12	0.13	0.14
400.0	83.82	84.32	84.25	0.06	0.08	0.09	0.11	0.13	0.14
420.0	83.63	84.03	84.22	0.06	0.08	0.09	0.12	0.13	0.15
440.0	83.18	83.56	83.76	0.07	0.08	0.09	0.12	0.14	0.15
460.0	83.42	83.67	83.99	0.07	0.08	0.10	0.12	0.14	0.16
480.0	83.69	83.68	83.73	0.07	0.09	0.10	0.12	0.14	0.16
500.0	84.11	83.49	83.90	0.07	0.09	0.10	0.12	0.15	0.16
520.0	84.32	83.71	84.03	0.07	0.09	0.11	0.13	0.15	0.17
540.0	84.52	83.89	84.27	0.07	0.09	0.11	0.13	0.15	0.17
560.0	83.82	83.33	83.42	0.08	0.10	0.12	0.14	0.16	0.18
580.0	83.03	82.68	82.90	0.09	0.11	0.13	0.16	0.18	0.21
600.0	81.40	81.51	81.51	0.10	0.13	0.15	0.19	0.22	0.25
620.0	82.44	82.89	82.44	0.14	0.18	0.20	0.27	0.31	0.34
640.0	82.44	83.24	82.58	0.34	0.40	0.44	0.60	0.68	0.76
660.0	81.45	82.01	81.69	1.70	1.59	1.51	4.21	4.13	4.04
680.0	81.92	82.65	82.33	0.36	0.38	0.40	1.10	1.12	1.14
700.0	81.96	82.69	82.41	0.18	0.21	0.23	0.41	0.44	0.48
750.0	79.59	79.63	80.04	0.12	0.15	0.17	0.23	0.26	0.29
800.0	79.27	79.00	79.27	0.11	0.14	0.16	0.23	0.26	0.29
850.0	78.74	78.59	78.57	0.13	0.17	0.19	0.35	0.41	0.46
900.0	79.16	79.49	79.14	0.31	0.37	0.43	2.07	2.32	2.57
950.0	77.14	77.47	77.28	0.27	0.30	0.32	1.09	1.13	1.15
1000.0	72.81	72.85	72.81	0.14	0.18	0.21	0.32	0.35	0.38
1050.0	72.24	72.28	72.26	0.14	0.17	0.19	0.21	0.25	0.27
1100.0	71.75	71.83	71.86	0.12	0.16	0.18	0.17	0.21	0.24
1150.0	71.30	71.36	71.39	0.12	0.16	0.19	0.15	0.19	0.22
1200.0	70.87	70.87	70.88	0.11	0.16	0.19	0.14	0.18	0.21
1300.0	70.47	70.39	70.30	0.11	0.16	0.20	0.14	0.19	0.22
1350.0	70.35	70.28	70.23	0.11	0.16	0.21	0.13	0.18	0.22
1400.0	70.29	70.26	70.26	0.11	0.17	0.21	0.14	0.19	0.22
1450.0	70.23	70.23	70.20	0.13	0.19	0.23	0.15	0.20	0.24
1500.0	70.09	70.09	70.16	0.16	0.23	0.27	0.16	0.22	0.26
1600.0	69.91	69.88	70.05	0.84	0.90	0.93	0.25	0.32	0.37
1700.0	69.40	69.41	69.57	0.23	0.33	0.39	0.31	0.38	0.41
1800.0	68.82	68.85	69.11	0.36	0.48	0.53	0.33	0.38	0.42
1900.0	68.59	68.64	69.01	0.52	0.53	0.18	0.39	0.45	0.48
2000.0	68.36	68.41	68.88	0.33	0.38	0.41	0.38	0.42	0.45

Typical Performance Data

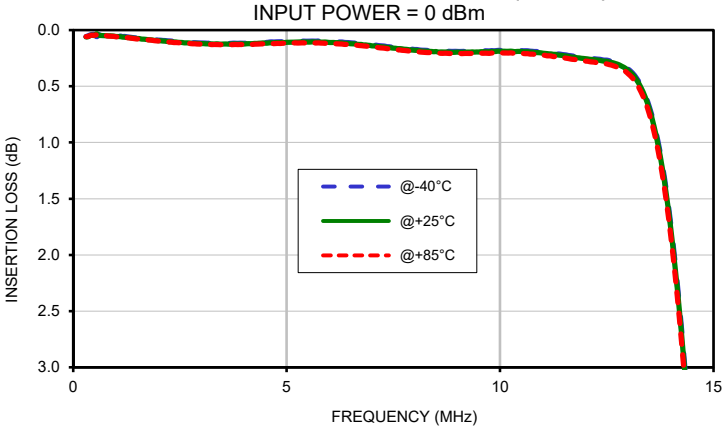
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
0.30	60.63	61.78	60.91
1.00	62.04	62.14	62.10
1.05	61.98	62.10	62.08
1.10	61.82	61.81	61.86
1.75	61.90	61.95	61.95
2.00	61.88	61.91	61.93
2.05	61.87	61.91	61.91
2.10	61.91	61.96	61.93
2.75	62.06	62.05	62.12
3.00	62.22	62.25	62.30
3.50	62.64	62.63	62.71
3.75	62.99	62.98	63.05
4.00	63.33	63.32	63.35
4.50	64.13	64.15	64.19
4.75	64.58	64.60	64.62
5.00	65.10	65.11	65.12
5.50	66.08	66.06	66.10
5.75	66.58	66.60	66.60
6.00	67.11	67.10	67.14
6.50	68.01	68.06	68.07
6.75	68.51	68.50	68.54
7.00	68.98	69.04	69.03
7.50	70.09	70.07	70.11
7.75	70.63	70.66	70.66
8.00	71.31	71.35	71.39
8.50	72.95	73.02	73.04
8.75	73.98	74.03	74.09
9.00	75.11	75.13	75.19
9.50	77.81	77.82	77.88
9.75	79.32	79.38	79.42
10.00	9.50	81.07	81.08
10.05	81.29	81.35	81.43
10.10	81.67	81.75	81.79
10.50	84.64	84.68	84.72
10.80	86.98	87.05	87.10
10.90	87.84	87.87	87.97
11.00	88.70	88.74	88.84
11.05	89.14	89.18	89.26
11.10	89.63	89.71	89.77
11.20	90.52	90.62	90.67
11.50	93.71	93.78	93.86

Typical Performance Curves

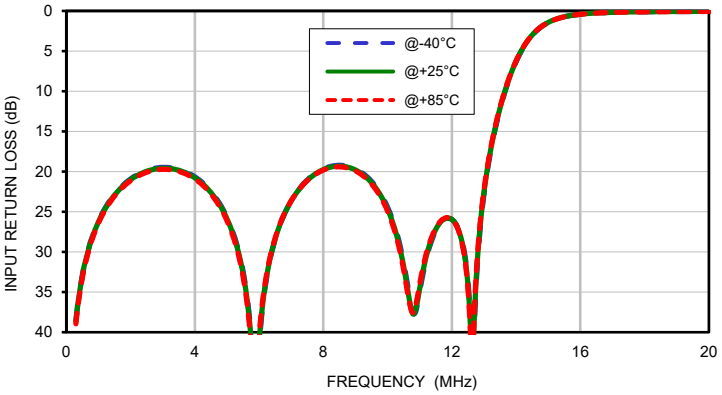
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



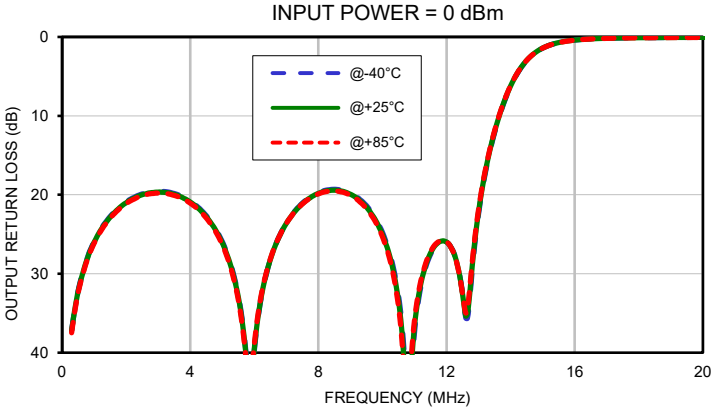
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



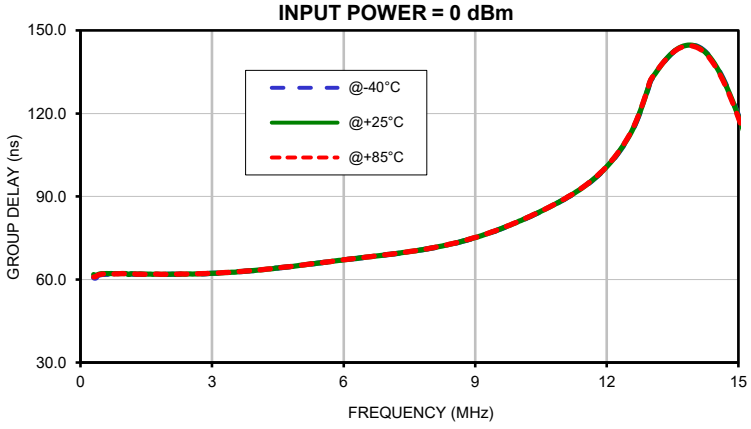
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm

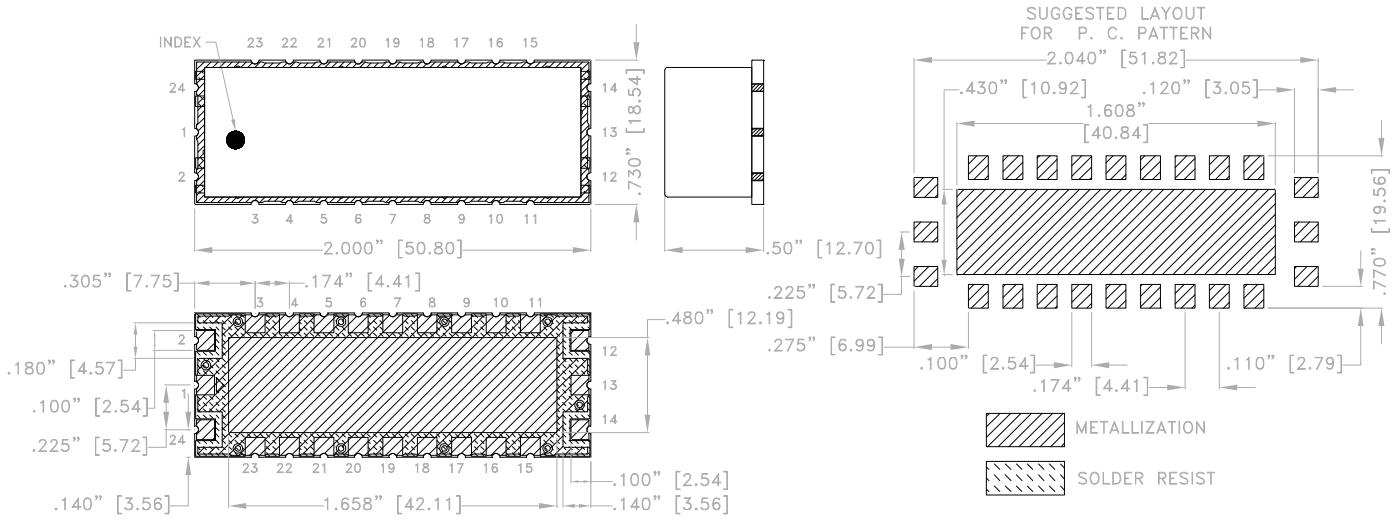


GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style ZW

Outline Dimensions ZW1825-1

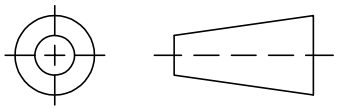


Dimensions are in inches [mm]. Tolerances: 2 Pl. ± .03; 3 Pl. ± .015

Notes:

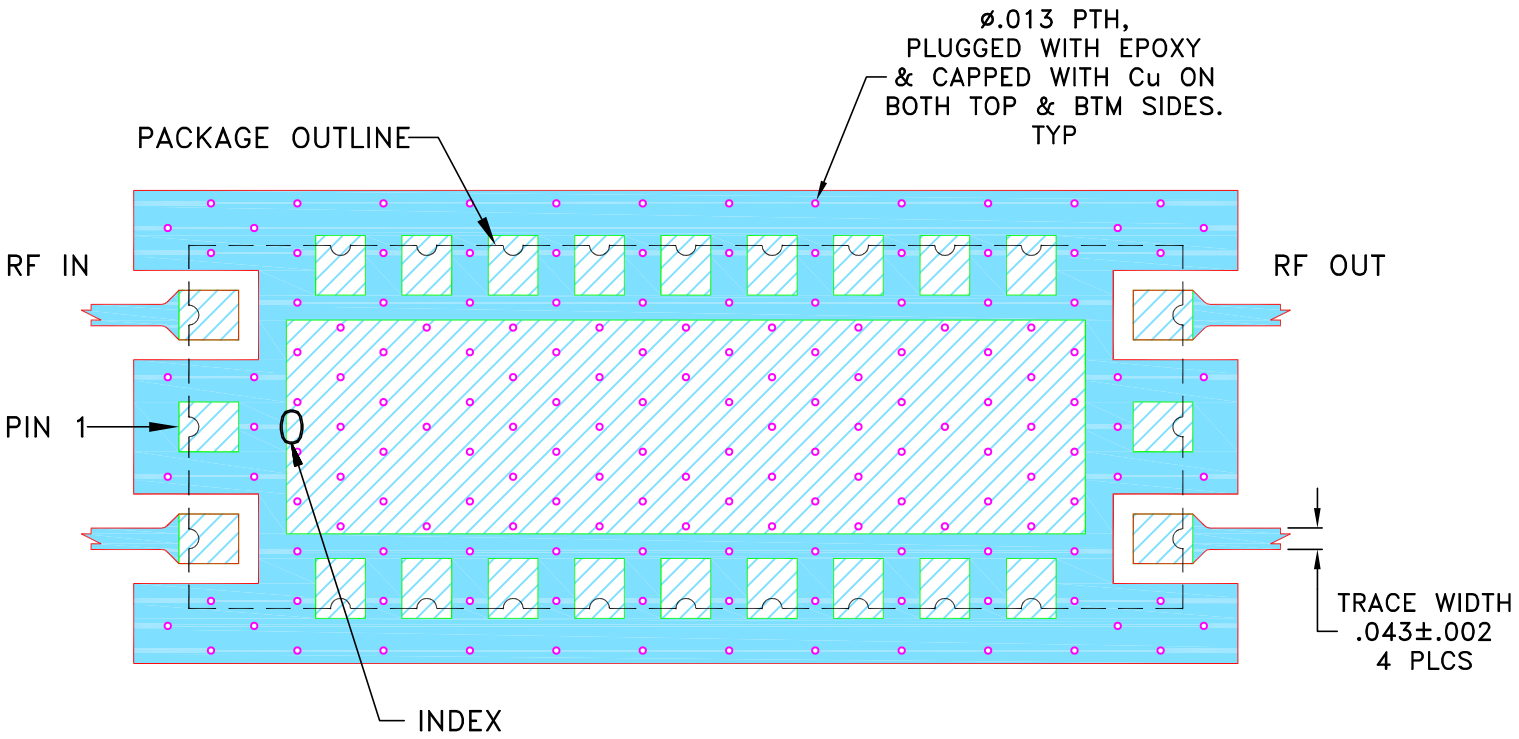
1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Unit Weight: 14 grams
4. Termination finish:
   For RoHS Case Styles: 2-5 µ inch (.05-.13 microns) Gold over 120-240 µ inch (3.05-6.10 microns) Nickel plate.
   All models, (+) suffix.

THIRD ANGLE PROJECTION



REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	NPO-003975	NEW RELEASE	DEC 23	LK	VC

SUGGESTED MOUNTING CONFIGURATION FOR ZW1825-1 CASE STYLE



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .020±.0015. 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 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	LK	06 DEC 23
TOLERANCES ON:	CHECKED	DDR	06 DEC 23
2 PL DECIMALS ±	APPROVED	RR	07 DEC 23
3 PL DECIMALS ±			
ANGLES ±			
FRACTIONS ±			

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

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

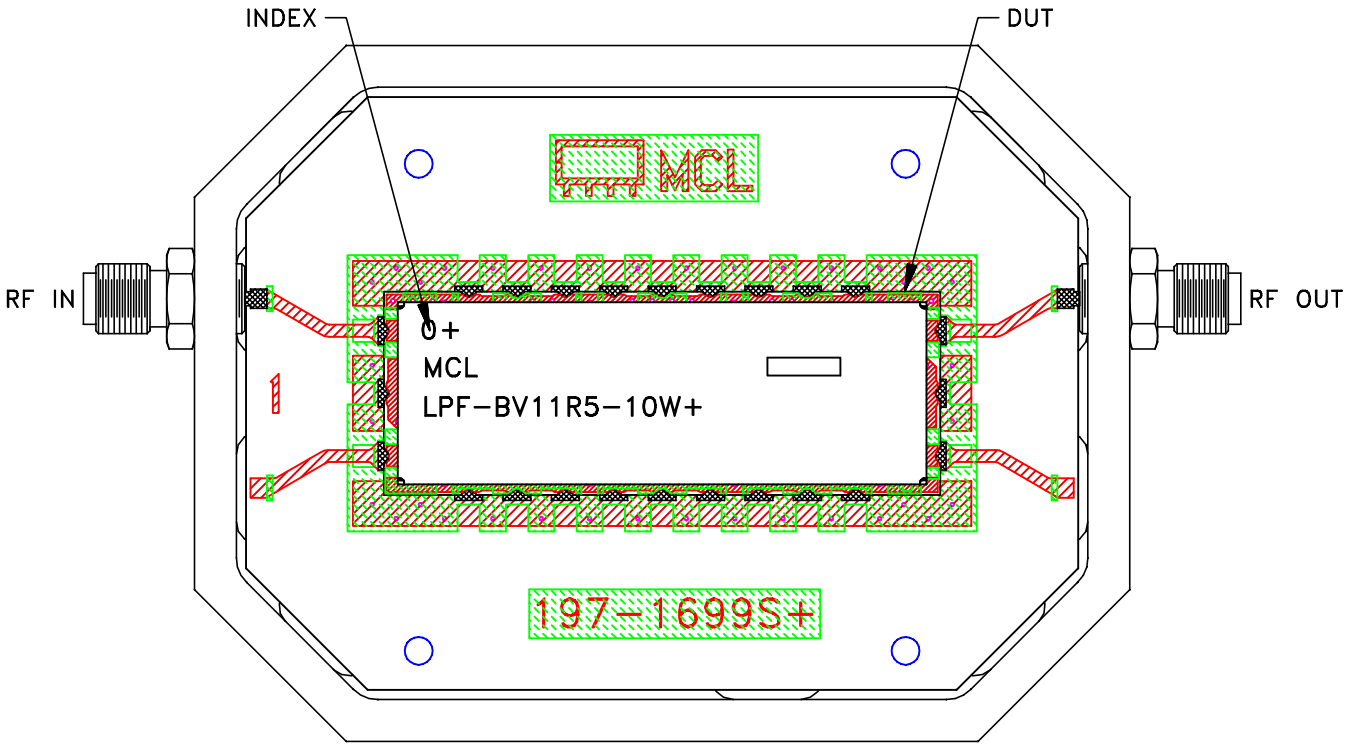
PL, ZW1825-1, TB-1247

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-774	OR

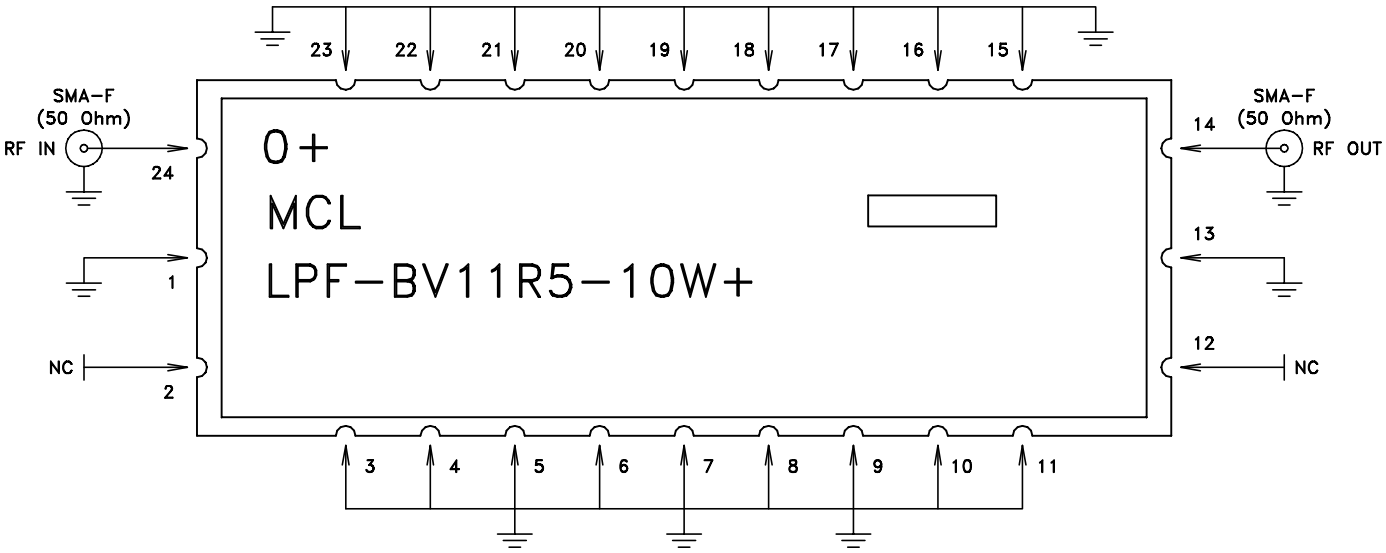
FILE:	SCALE:	SHEET:
98-PL-774	2.5:1	1 OF 1

Evaluation Board and Circuit

TBLPFBV11R510W+



Schematic diagram



Notes:

1. PCB Material: ROGERS (RO4350B) OR Equivalent, Dielectric Constant=3.48±.05
Dielectric Thickness: .020±.0015
2. 50 Ohm SMA Female Connectors.

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV02T1

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