LUMPED LC SURFACE MOUNT

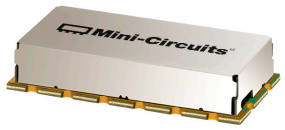
Bandpass Filter

BPF-BV435+

50Ω 420 to 450 MHz

KEY FEATURES

- Low Insertion Loss, 1.7 dB Typ.
- High Rejection, 60 dB Typ.
- Wide Stopband Rejection, Up to 4 GHz
- Miniature Shielded Package

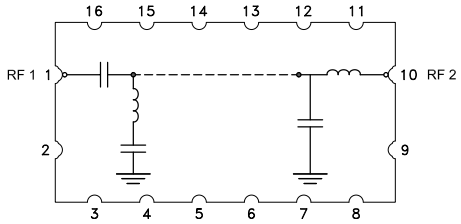


Generic photo used for illustration purposes only

APPLICATIONS

- Amateur Radio
- Transmitter/Receivers
- Military and Federal Applications
- Industrial Applications

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' Model-BPF-BV435+ is a Lumped LC filter that offer a good insertion loss and high rejection. This bandpass filter covers from 420 to 450 MHz. This filter has high Q capacitors and inductors to achieve a low insertion loss. It has repeatable performance across production lots.

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

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	Fc	—	—	435	—	MHz
	Insertion Loss	F1-F2	420 - 450	—	1.7	2.5	dB
	Return Loss	F1-F2	420 - 450	10	16	—	dB
Stopband, Lower	Rejection	DC-F3	DC - 100	30	37	—	dB
		F3-F4	100 - 390	20	26	—	
Stopband, Upper	Rejection	F5-F6	490 - 1000	20	28	—	dB
		F6-F7	1000 - 2000	45	60	—	
		F7-F8	2000 - 4000	30	40	—	

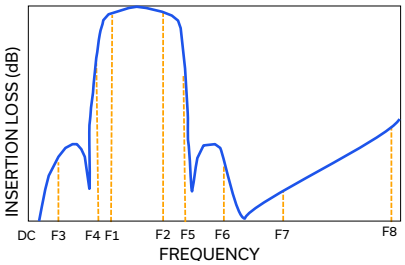
1. Tested in Evaluation Board P/N TB-BPF-BV435+.
2. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.
3. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output 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]	1 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 0.5 W at +85°C.

TYPICAL FREQUENCY RESPONSE AT +25°C



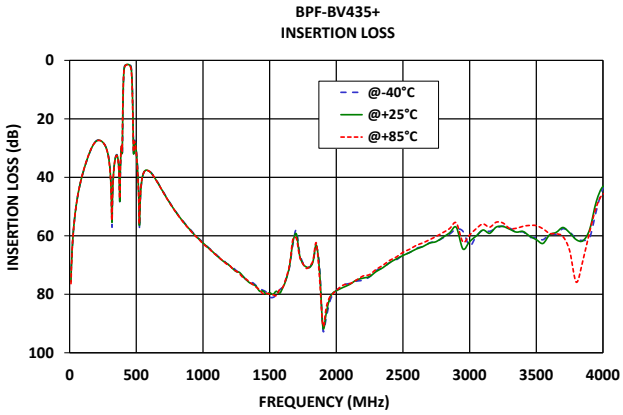
REV. OR
ECO-023691
BPF-BV435+
EDU4869
URJ
241120

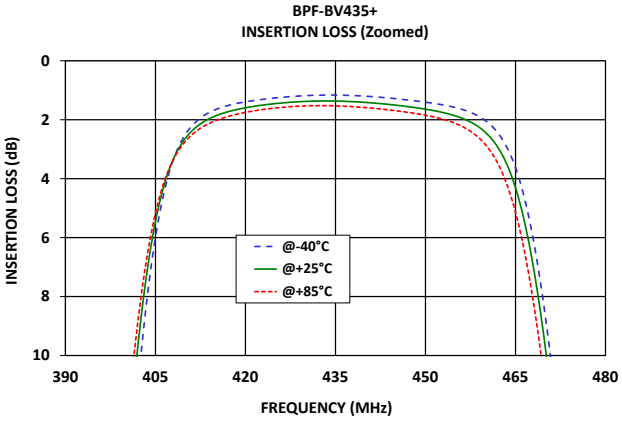
Bandpass Filter

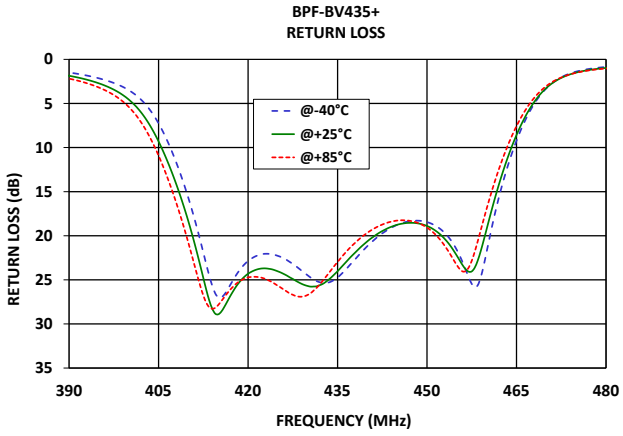
BPF-BV435+

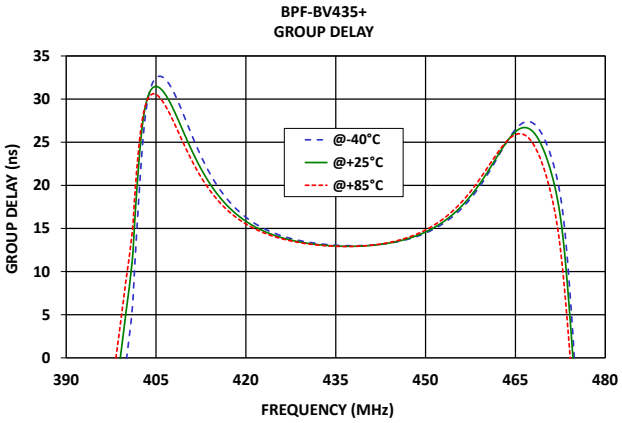
50Ω 420 to 450 MHz

TYPICAL PERFORMANCE GRAPHS









LUMPED LC SURFACE MOUNT

Bandpass Filter

BPF-BV435+

50Ω 420 to 450 MHz

FUNCTIONAL DIAGRAM

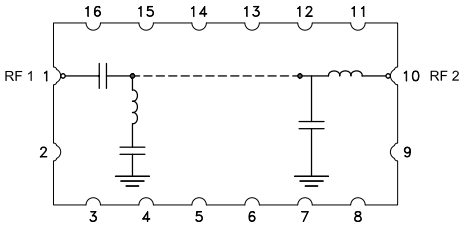


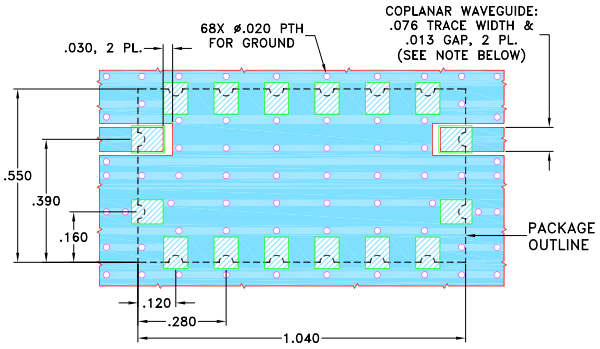
Figure 1. BPF-BV435+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
RF1	1	Connects to RF Input Port
RF2	10	Connects to RF Output Port
GROUND	2-9,11-16	Connects to Ground on PCB, (See drawing PL-507)
NC	—	No connection, not used internally. See drawing PL-507 for connection to PCB

SUGGESTED PCB LAYOUT (PL-507)

SUGGESTED MOUNTING CONFIGURATION FOR KV1974 CASE STYLE, "16FL02" PIN CODE



NOTE:

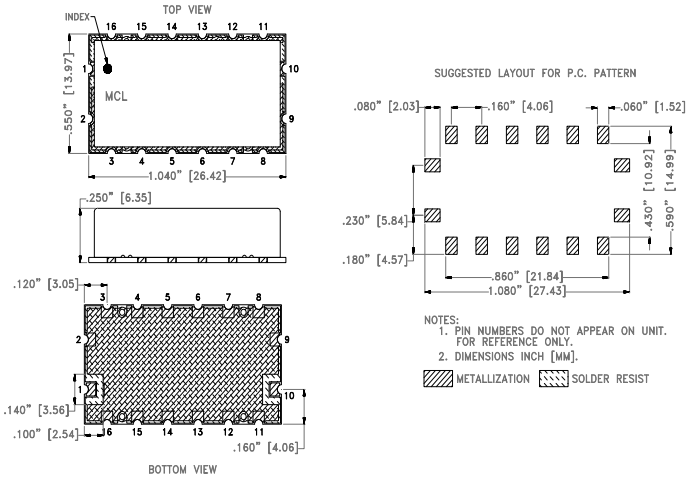
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .060" ± .004"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Figure 2. Suggested PCB Layout PL-507

CASE STYLE DRAWING



Unit Weight: 2.5gram

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

PRODUCT MARKING*: BPF-BV435

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

Bandpass Filter

BPF-BV435+

50Ω 420 to 450 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	KV1974-1 Lead Finish: Gold over Nickel Plate
RoHS Status	Compliant
Tape and Reel	TR-F106
Suggested Layout for PCB Design	PL-507
Evaluation Board	TB-BPF-BV435+
	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 BPF-BV435+

Typical Performance Data

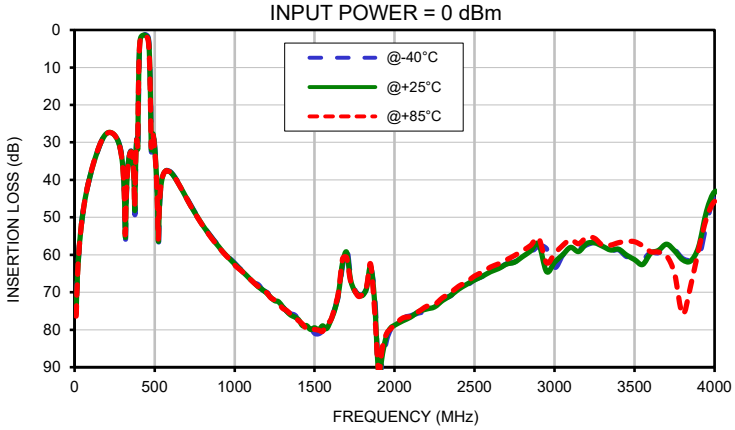
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
10	71.38	75.70	76.38	0.15	0.17	0.19	0.04	0.03	0.04
14	68.72	69.77	70.14	0.17	0.19	0.21	0.04	0.05	0.05
20	64.01	63.96	63.82	0.19	0.22	0.24	0.04	0.04	0.04
22	62.88	62.36	62.14	0.20	0.23	0.25	0.04	0.04	0.04
20	64.01	63.96	63.82	0.19	0.22	0.24	0.04	0.04	0.04
26	59.84	59.76	60.01	0.21	0.24	0.26	0.03	0.04	0.04
30	57.46	57.48	57.35	0.22	0.25	0.28	0.03	0.03	0.03
36	54.69	54.62	54.79	0.23	0.26	0.28	0.03	0.02	0.03
40	53.02	52.93	52.94	0.23	0.26	0.28	0.02	0.02	0.02
46	50.69	50.78	50.78	0.23	0.26	0.28	0.02	0.02	0.02
50	49.35	49.41	49.44	0.23	0.26	0.28	0.02	0.02	0.02
52	48.72	48.76	48.78	0.23	0.25	0.28	0.02	0.02	0.02
54	48.28	48.24	48.25	0.22	0.25	0.28	0.02	0.02	0.02
60	46.47	46.54	46.48	0.22	0.24	0.27	0.01	0.02	0.02
64	45.53	45.49	45.41	0.21	0.24	0.26	0.01	0.02	0.02
70	44.09	44.11	44.09	0.20	0.23	0.25	0.01	0.02	0.02
80	42.03	42.00	41.93	0.19	0.22	0.24	0.01	0.02	0.02
90	40.21	40.12	40.06	0.17	0.20	0.23	0.01	0.02	0.02
100	38.54	38.43	38.33	0.16	0.19	0.22	0.01	0.01	0.02
120	35.53	35.41	35.25	0.14	0.18	0.21	0.00	0.01	0.02
140	32.86	32.74	32.59	0.16	0.21	0.24	0.01	0.02	0.03
160	30.48	30.46	30.36	0.22	0.27	0.31	0.01	0.02	0.03
200	27.52	27.62	27.68	0.40	0.45	0.49	0.03	0.05	0.06
240	27.65	27.68	27.67	0.39	0.47	0.53	0.05	0.08	0.09
260	28.61	28.68	28.65	0.38	0.47	0.54	0.07	0.09	0.11
300	35.51	35.91	36.26	0.52	0.62	0.70	0.11	0.14	0.16
340	34.08	34.12	34.15	0.68	0.81	0.89	0.21	0.25	0.28
390	28.99	29.21	29.33	1.49	1.86	2.18	0.82	1.01	1.16
400	16.47	14.30	12.99	3.49	4.55	5.39	1.94	2.58	3.20
408	3.35	3.33	3.35	11.75	14.22	16.33	10.40	12.37	14.57
420	1.39	1.60	1.75	22.86	24.31	24.72	23.32	24.93	25.75
424	1.28	1.48	1.62	22.09	23.81	25.25	22.97	25.43	28.16
426	1.24	1.43	1.58	22.57	24.34	26.11	23.99	26.96	31.37
430	1.18	1.38	1.53	24.49	25.70	26.70	27.94	31.16	33.63
432	1.17	1.37	1.52	25.27	25.61	25.52	29.58	30.21	28.71
435	1.16	1.37	1.53	24.74	24.03	22.98	27.46	25.99	23.98
440	1.20	1.41	1.59	21.17	20.63	19.66	21.84	21.22	19.99
442	1.23	1.45	1.63	19.98	19.66	18.88	20.48	20.18	19.22
444	1.27	1.48	1.67	19.10	18.99	18.40	19.56	19.54	18.82
446	1.31	1.53	1.72	18.52	18.61	18.24	19.00	19.24	18.77
450	1.41	1.64	1.85	18.45	18.89	19.08	19.02	19.78	19.87
460	2.03	2.43	2.85	21.78	19.22	16.91	24.54	23.62	20.58
470	8.71	9.77	11.17	3.28	3.24	3.02	5.06	5.32	5.31
480	32.60	32.06	31.26	0.86	0.97	1.03	1.87	2.09	2.26
800	51.94	52.07	52.15	0.01	0.05	0.08	0.14	0.21	0.24
1000	62.21	62.44	62.73	0.03	0.03	0.05	0.17	0.23	0.27
2000	78.77	78.81	78.70	0.04	0.03	0.07	0.17	0.27	0.34
2200	75.16	74.48	73.75	0.04	0.04	0.08	0.17	0.28	0.35
2400	69.20	69.19	68.41	0.02	0.06	0.10	0.20	0.31	0.37
2600	64.28	64.52	63.27	0.00	0.08	0.12	0.24	0.35	0.41
2800	60.72	60.49	58.88	0.01	0.10	0.14	0.34	0.46	0.53
3000	63.40	61.96	59.72	0.04	0.14	0.18	0.89	0.81	0.93
3100	58.08	58.02	55.94	0.04	0.15	0.19	0.38	0.49	0.59
3200	57.34	57.00	55.34	0.06	0.17	0.21	0.35	0.48	0.58
3400	58.65	58.51	56.76	0.07	0.19	0.24	0.34	0.49	0.60
3600	59.41	59.64	59.17	0.09	0.22	0.27	0.36	0.52	0.63
3700	57.58	57.16	60.27	0.10	0.23	0.28	0.42	0.58	0.69
3800	60.99	61.32	75.87	0.13	0.26	0.31	0.55	0.74	0.84
3900	60.74	57.89	58.64	0.14	0.28	0.18	1.22	1.73	1.80
4000	43.78	43.17	45.75	0.16	0.29	0.35	5.86	5.11	5.73

Typical Performance Data

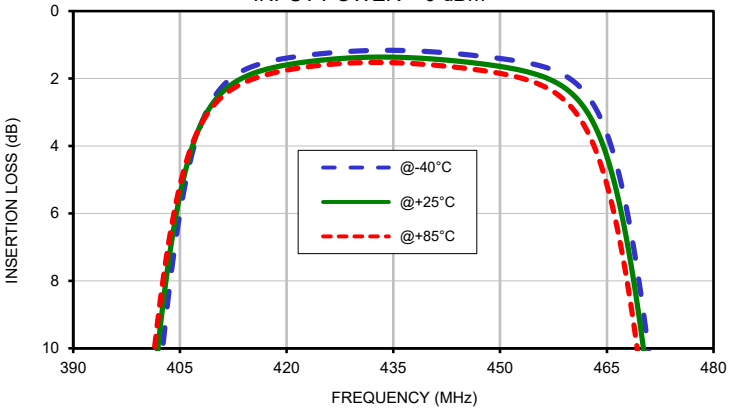
FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-40°C	@+25°C	@+85°C
420	16.30	15.84	15.52
421	15.80	15.40	15.13
422	15.37	15.02	14.79
423	14.99	14.69	14.49
424	14.67	14.40	14.23
425	14.39	14.15	14.00
426	14.14	13.93	13.81
427	13.93	13.74	13.64
428	13.75	13.58	13.49
429	13.59	13.44	13.36
430	13.46	13.32	13.25
431	13.35	13.21	13.16
432	13.25	13.13	13.08
433	13.17	13.06	13.02
434	13.11	13.01	12.97
435	13.06	12.97	12.93
436	13.03	12.94	12.92
437	13.01	12.93	12.91
438	13.00	12.93	12.93
439	13.01	12.95	12.95
440	13.03	12.99	13.00
441	13.07	13.04	13.07
442	13.13	13.11	13.15
443	13.21	13.21	13.26
444	13.31	13.32	13.39
445	13.43	13.46	13.55
446	13.57	13.62	13.73
447	13.74	13.81	13.95
448	13.95	14.04	14.20
449	14.19	14.30	14.50
450	14.47	14.60	14.83

Typical Performance Curves

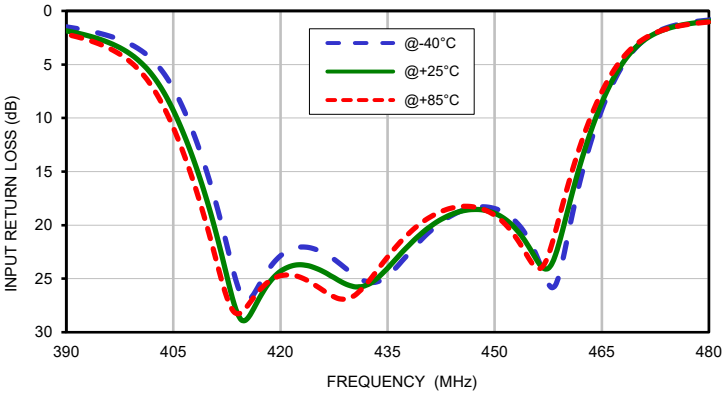
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



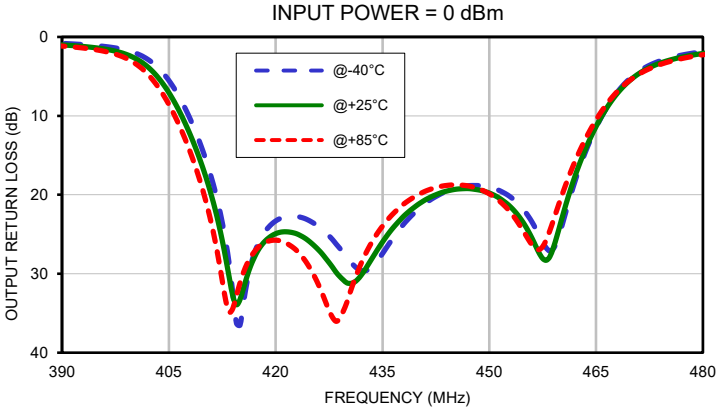
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



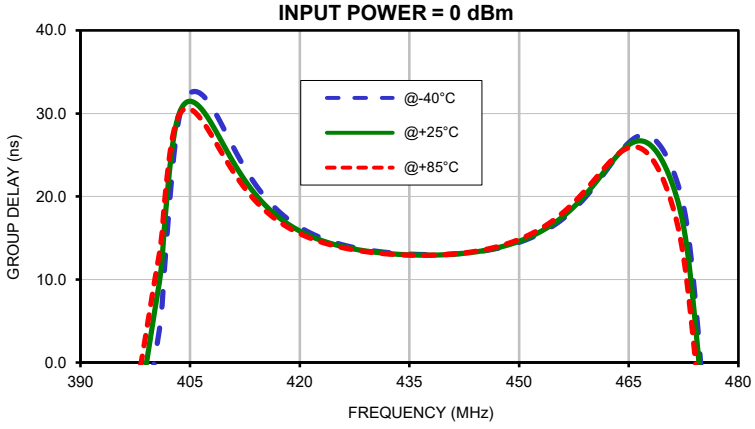
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



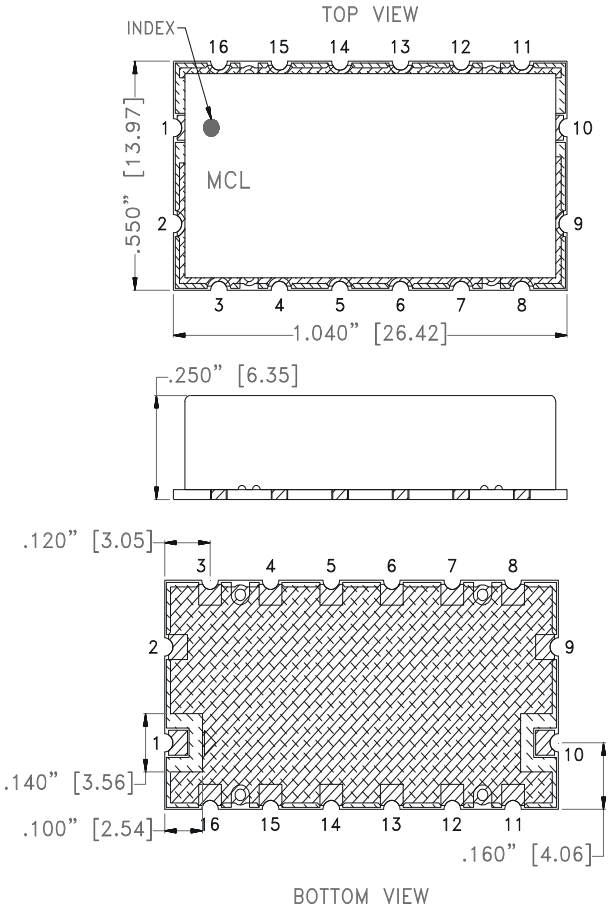
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm

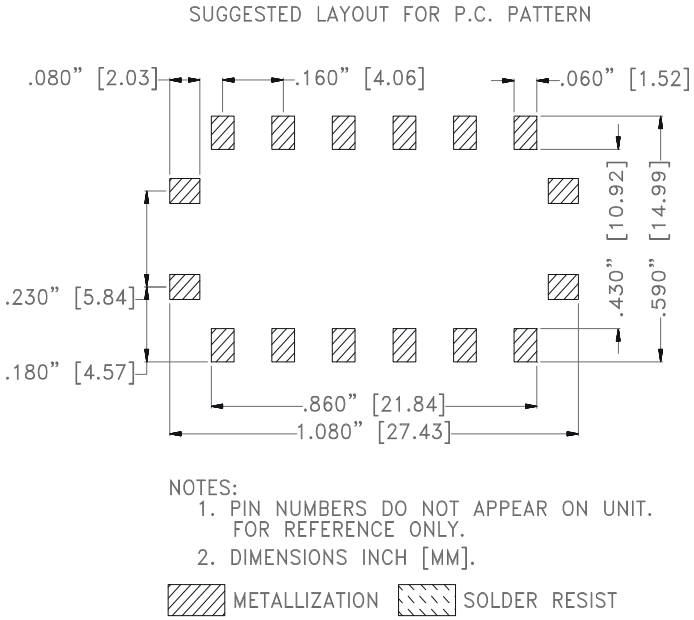


Case Style KV

Outline Dimension

KV1974-1





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

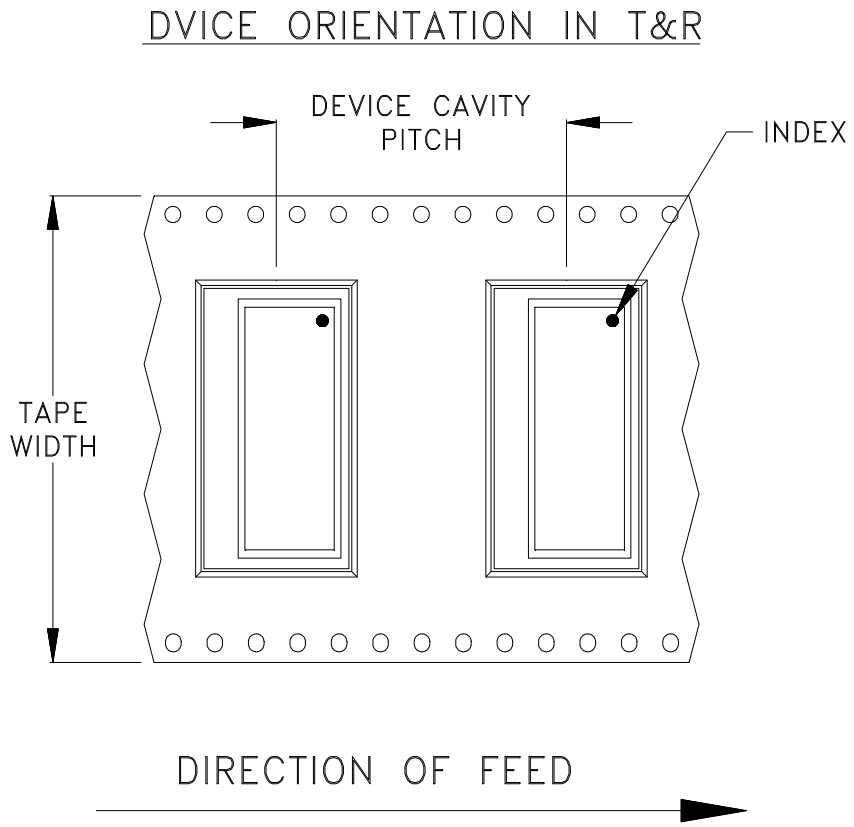
Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Unit Weight: 2.5g
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.

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RF/IF MICROWAVE COMPONENTS

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Tape & Reel Packaging TR-F005



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
44	28	13	200

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

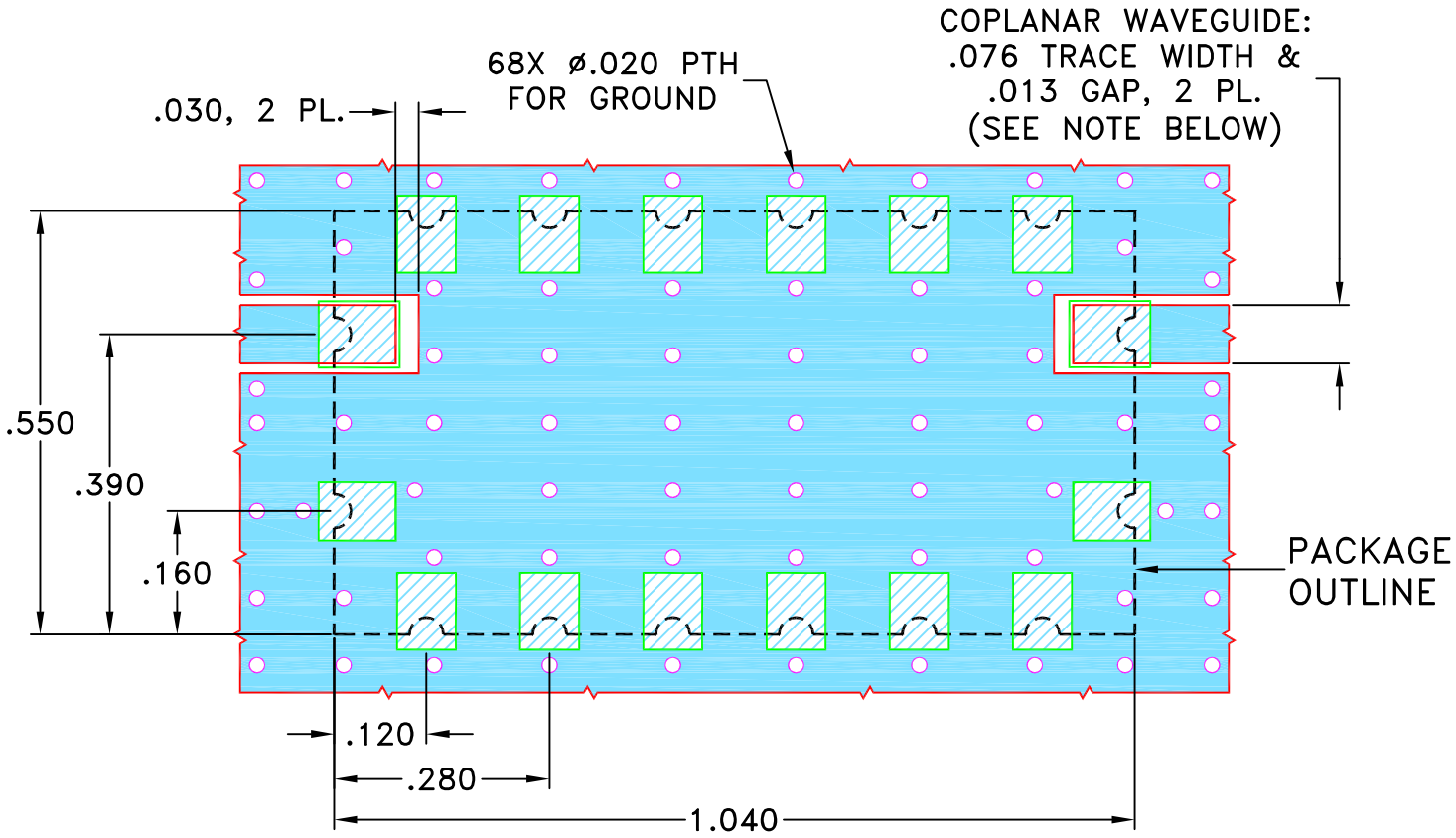
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THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M160945	NEW RELEASE	MAR 17	TM	MD

SUGGESTED MOUNTING CONFIGURATION FOR KV1974 CASE STYLE, "16FL02" PIN CODE



NOTE:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .060" ± .004"; 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	DRAWN	TM	24 MAR 17
TOLERANCES ON:	CHECKED	MD	24 MAR 17
2 PL DECIMALS ±	APPROVED	MD	24 MAR 17
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

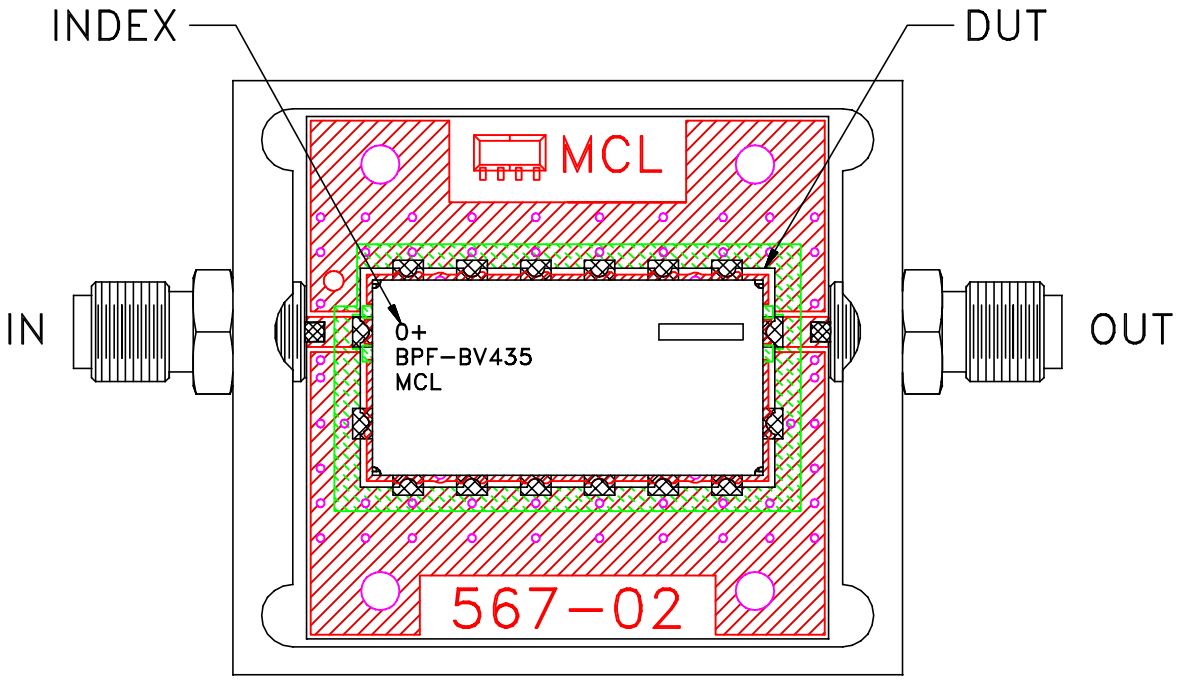
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 16FL02, KV1974, TB-953+

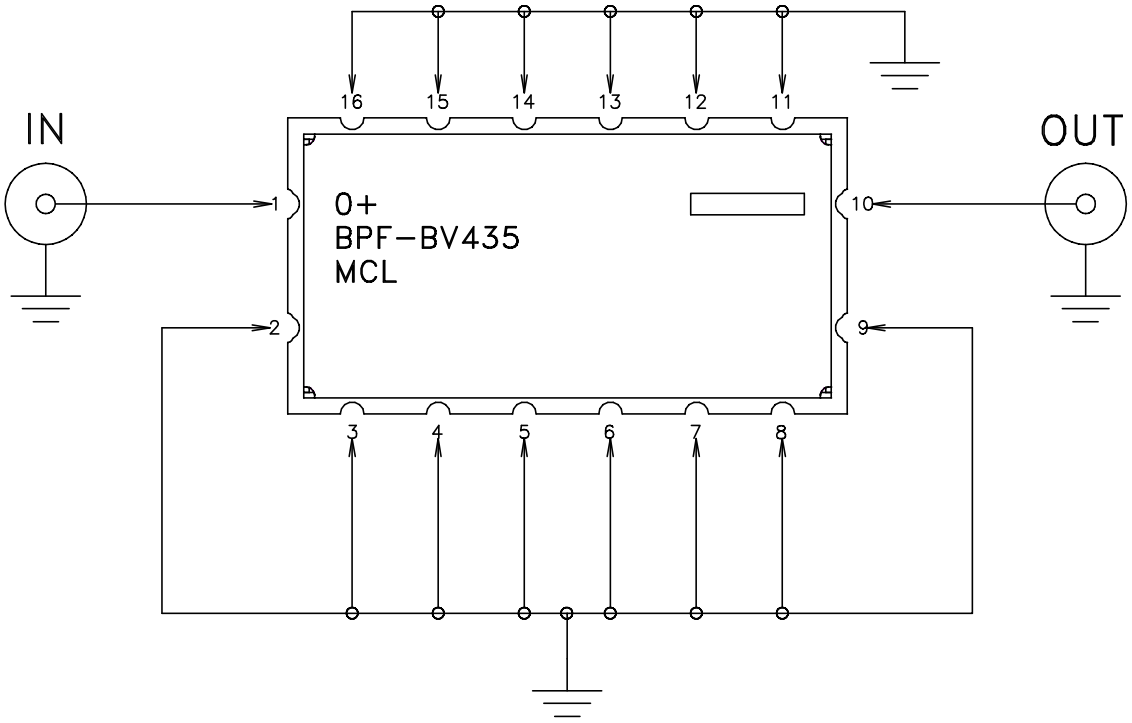
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-507	OR

FILE:	SCALE:	SHEET:
98PL507	4:1	1 OF 1

Evaluation Board and Circuit



TB-BPF-BV435+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: ROGERS (RO4350B) or equivalent, Dielectric Constant=3.5, Thickness=.060 inch.

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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

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