Surface Mount

Bandpass Filter

CBP-1490A+

50Ω 1465 to 1515 MHz

Generic photo used for illustration purposes only
CASE STYLE: KV1514

The Big Deal

- High selectivity
- Good Return loss
- Miniature shielded package

Product Overview

CBP-1490A+ is a ceramic-coaxial-resonator based bandpass filter in a shielded package fabricated using SMT technology. This filter offers outstanding close in rejection and power handling for use in aeronautical, test and measurement applications.

Key Features

Feature	Advantages
High Selectivity	The CBP-1490A+ filter incorporates High-Q ceramic resonators that enables sharp rejection near passband.
Low Passband VSWR	This filter maintains typical VSWR over a passband frequency range making this filter easier to integrate into receiver and transmitter RF chains with less concerns for in band frequency ripple.
Rugged construction	The CBP-1490A+ has been qualified over wide range of thermal, mechanical and environmental conditions including withstanding the stress of extensive solder reflow cycles.

Notes
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B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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/MCLStore/terms.jsp

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CASE STYLE: KV1514

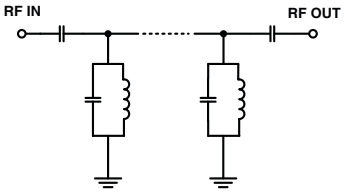
Features

- High selectivity
- Good return loss
- Miniature shielded package

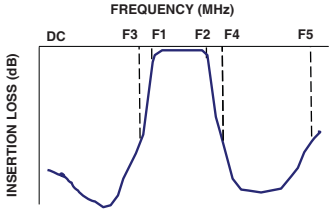
Applications

- Aeronautical
- Digital audio broadcasting
- Test and measurement

Functional Schematic



Typical Frequency Response



+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	-	1490	-	MHz
	Insertion Loss	F1-F2	1465-1515	-	3.0	4.5	dB
	VSWR	F1-F2	1465-1515	-	1.3	2.3	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC-1430	20.0	30.0	-	dB
	VSWR	DC-F3	DC-1430	-	20.0	-	:1
Stop Band, Upper	Insertion Loss	F4-F5	1550-3300	20.0	29.5	-	dB
	VSWR	F4-F5	1550-3300	-	20.0	-	:1

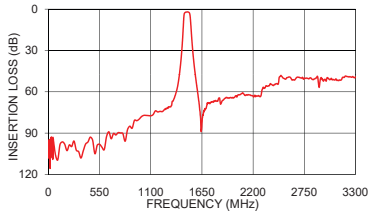
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	4 W max.

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

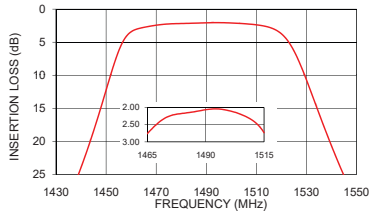
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	107.36	356.22	1465	23.75
50	93.32	405.86	1468	21.52
350	108.05	474.84	1470	20.51
750	89.67	298.94	1473	19.45
1100	77.42	168.32	1475	18.89
1430	33.06	24.76	1477	18.40
1433	30.54	22.25	1480	17.77
1443	20.72	13.12	1483	17.32
1460	3.42	1.16	1485	17.12
1465	2.76	1.30	1487	17.01
1490	2.06	1.22	1490	16.97
1515	2.73	1.36	1492	17.00
1518	3.20	1.51	1495	17.10
1540	20.69	15.42	1498	17.27
1550	29.34	26.88	1500	17.43
1551	30.12	28.00	1502	17.64
1555	33.12	32.77	1505	18.11
2000	64.03	100.47	1508	18.83
2800	50.60	56.83	1510	19.48
3300	49.31	32.57	1515	21.75

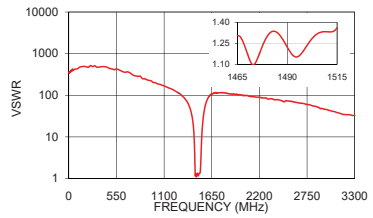
CBP-1490A+
INSERTION LOSS (Full band)



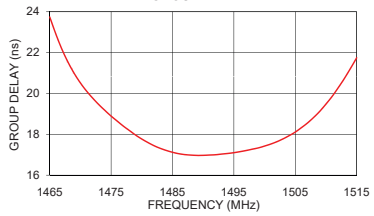
CBP-1490A+
INSERTION LOSS (Pass band)



CBP-1490A+
VSWR



CBP-1490A+
GROUP DELAY



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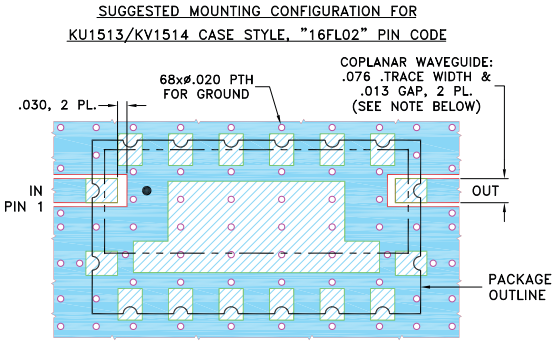
Pad Connections

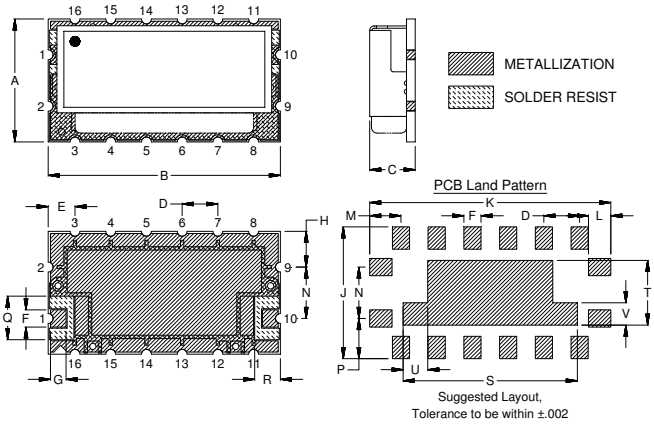
INPUT	1
OUTPUT	10
GROUND	2,3,4,5,6,7,8,9,11,12,13,14,15,16

Demo Board MCL P/N: TB-578+
Suggested PCB Layout (PL-331)



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

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K	L
.550	**1.040**	**.225**	**.160**	**.120**	**.077**	**.070**	**.160**	**.590**	**1.080**	**.100**
13.97	26.24	5.72	4.06	3.05	1.96	1.78	4.06	14.99	27.43	2.54

M	N	P	Q	R	S	T	U	V		Wt.
.140	**.230**	**.180**	**.195**	**.115**	**.780**	**.290**	**.110**	**.100**		grams
3.56	5.84	4.57	4.95	2.92	19.81	7.37	2.79	2.54		4.8

Note: Please refer to case style drawing for details.

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Band Pass Filter CBP-1490A+

Typical Performance Data

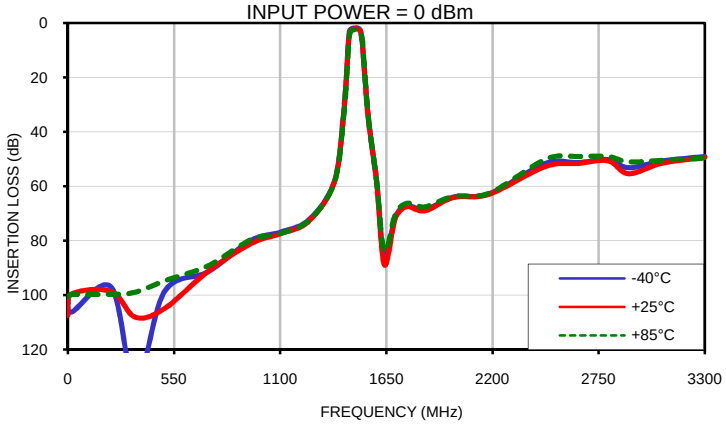
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	101.48	107.36	100.46	0.05	0.05	0.05	0.05	0.05	0.05
20	106.16	99.57	99.79	0.04	0.05	0.04	0.05	0.05	0.05
225	97.07	98.56	99.75	0.02	0.03	0.03	0.02	0.04	0.04
350	132.85	108.05	98.93	0.01	0.03	0.03	0.01	0.04	0.04
500	98.76	104.94	94.81	0.01	0.03	0.04	0.00	0.04	0.04
725	91.39	91.33	89.28	0.01	0.05	0.06	0.01	0.05	0.07
950	79.85	80.98	79.59	0.02	0.07	0.08	0.02	0.08	0.10
1100	76.86	77.42	77.38	0.03	0.09	0.11	0.04	0.10	0.13
1250	72.22	72.69	72.52	0.07	0.14	0.16	0.07	0.15	0.18
1382	57.86	58.14	58.37	0.20	0.29	0.34	0.19	0.29	0.34
1430	32.42	33.06	33.99	0.54	0.72	0.83	0.54	0.70	0.78
1433	29.84	30.54	31.57	0.61	0.80	0.92	0.61	0.78	0.86
1434	28.93	29.67	30.73	0.63	0.83	0.95	0.64	0.81	0.90
1442	20.77	21.82	23.25	1.01	1.25	1.37	1.04	1.23	1.30
1443	19.62	20.72	22.21	1.09	1.33	1.46	1.13	1.33	1.38
1445	17.20	18.43	20.05	1.32	1.56	1.66	1.37	1.55	1.58
1452	8.03	9.72	11.83	3.96	3.72	3.29	4.21	3.81	3.23
1458	3.17	4.15	5.58	15.96	13.13	9.18	20.29	14.29	9.42
1459	2.93	3.72	4.92	17.05	16.12	11.19	21.66	18.31	11.64
1460	2.77	3.42	4.39	16.38	18.85	13.64	18.93	22.63	14.47
1461	2.66	3.20	3.98	15.30	19.88	16.57	16.69	23.30	18.15
1463	2.51	2.93	3.44	14.06	18.32	22.97	14.72	19.07	28.27
1465	2.37	2.76	3.14	14.25	17.48	24.20	14.80	17.58	24.26
1471	1.98	2.38	2.68	21.78	24.27	28.53	26.31	23.91	22.48
1476	1.87	2.22	2.47	18.70	22.35	28.45	19.48	21.86	23.55
1479	1.88	2.18	2.41	15.84	18.88	23.20	15.89	18.29	21.32
1480	1.88	2.17	2.39	15.32	18.28	22.41	15.28	17.64	20.77
1481	1.88	2.17	2.37	14.98	17.90	21.93	14.86	17.20	20.36
1482	1.88	2.15	2.36	14.81	17.72	21.74	14.63	16.93	20.10
1490	1.77	2.06	2.27	18.79	23.37	31.08	18.11	19.97	21.52
1492	1.74	2.05	2.26	21.89	28.22	33.20	20.84	21.76	21.52
1496	1.71	2.05	2.27	30.42	28.37	23.31	26.97	22.55	19.71
1497	1.72	2.05	2.28	28.31	25.72	21.90	25.99	21.87	19.17
1502	1.81	2.13	2.35	19.09	19.32	18.36	18.58	18.31	17.41
1507	1.99	2.26	2.43	15.81	17.70	18.47	15.62	16.97	17.79
1508	2.03	2.29	2.45	15.39	17.61	18.83	15.30	16.91	18.09
1510	2.15	2.37	2.51	14.60	17.47	19.81	14.77	16.92	18.88
1514	2.50	2.63	2.69	12.63	16.39	21.88	13.41	16.67	20.59
1515	2.63	2.73	2.76	11.97	15.77	21.90	12.84	16.30	20.81
1517	3.00	3.01	2.95	10.47	14.08	20.46	11.33	14.90	20.28
1525	6.81	6.31	5.50	4.32	5.75	7.85	4.39	5.89	8.14
1529	10.29	9.73	8.69	2.62	3.38	4.32	2.53	3.35	4.41
1533	14.22	13.74	12.74	1.71	2.16	2.59	1.57	2.07	2.61
1538	19.12	18.76	17.94	1.12	1.41	1.62	0.98	1.31	1.60
1539	20.06	19.73	18.94	1.04	1.31	1.50	0.90	1.21	1.47
1550	29.49	29.34	28.84	0.55	0.72	0.81	0.45	0.65	0.77
1565	39.87	39.83	39.52	0.30	0.43	0.49	0.24	0.39	0.47
1600	58.34	58.42	58.25	0.13	0.23	0.27	0.11	0.22	0.27
1640	86.64	88.79	83.82	0.09	0.17	0.20	0.07	0.17	0.21
1696	71.33	71.89	70.47	0.07	0.14	0.17	0.07	0.15	0.19
1755	67.09	67.44	66.22	0.07	0.14	0.17	0.07	0.15	0.19
1850	68.62	68.96	67.53	0.08	0.15	0.18	0.08	0.16	0.19
1995	63.99	64.09	63.68	0.09	0.16	0.19	0.09	0.17	0.20
2185	62.66	62.79	62.44	0.11	0.19	0.22	0.12	0.19	0.23
2475	51.52	52.69	50.01	0.16	0.25	0.29	0.15	0.25	0.28
2645	51.26	51.53	49.03	0.17	0.28	0.33	0.15	0.26	0.31
2800	50.16	50.60	49.05	0.20	0.34	0.42	0.16	0.31	0.38
2905	53.17	55.32	50.98	0.23	0.40	0.50	0.20	0.37	0.44
3080	50.66	51.45	50.38	0.28	0.49	0.62	0.22	0.44	0.56
3300	48.99	49.31	49.57	0.30	0.54	0.67	0.28	0.53	0.68

Typical Performance Data

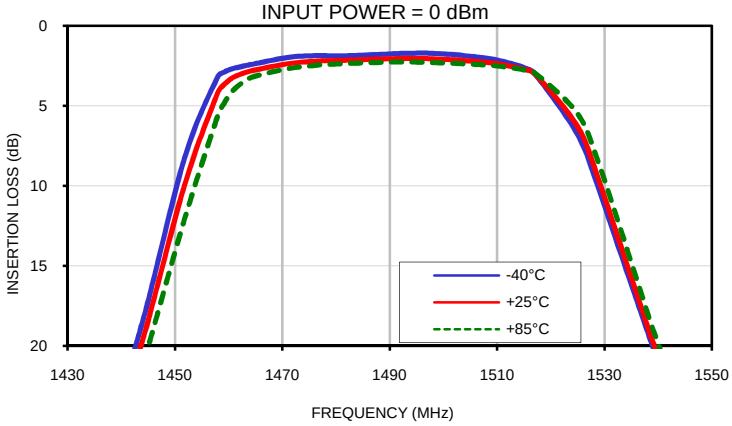
FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-40°C	@+25°C	@+85°C
1465	22.84	23.75	25.01
1466	22.09	22.91	24.20
1467	21.46	22.16	23.38
1468	20.96	21.52	22.63
1469	20.54	20.98	21.94
1470	20.19	20.51	21.33
1471	19.88	20.12	20.80
1472	19.59	19.77	20.34
1473	19.32	19.45	19.94
1474	19.05	19.17	19.58
1475	18.79	18.89	19.26
1476	18.53	18.65	18.98
1477	18.27	18.40	18.72
1478	18.04	18.18	18.48
1479	17.80	17.96	18.26
1480	17.59	17.77	18.06
1481	17.41	17.60	17.89
1482	17.25	17.44	17.72
1483	17.13	17.32	17.59
1484	17.03	17.21	17.47
1485	16.96	17.12	17.36
1486	16.91	17.05	17.27
1487	16.89	17.01	17.19
1488	16.89	16.98	17.14
1489	16.91	16.97	17.09
1490	16.95	16.97	17.06
1491	17.01	16.99	17.03
1492	17.06	17.00	17.01
1493	17.13	17.03	17.01
1494	17.19	17.06	17.00
1495	17.26	17.10	17.00
1496	17.34	17.15	17.02
1497	17.42	17.21	17.05
1498	17.50	17.27	17.09
1499	17.59	17.34	17.14
1500	17.69	17.43	17.21
1501	17.80	17.52	17.29
1502	17.92	17.64	17.38
1503	18.07	17.78	17.51
1504	18.23	17.94	17.64
1505	18.42	18.11	17.81
1506	18.65	18.33	18.00
1507	18.89	18.56	18.20
1508	19.17	18.83	18.44
1509	19.49	19.13	18.72
1510	19.85	19.48	19.03
1511	20.23	19.86	19.36
1512	20.67	20.28	19.75
1513	21.12	20.74	20.17
1514	21.60	21.23	20.64
1515	22.08	21.75	21.15

Typical Performance Curves

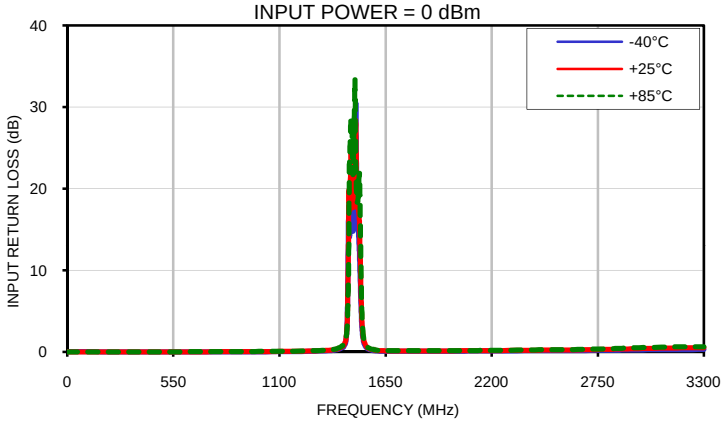
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



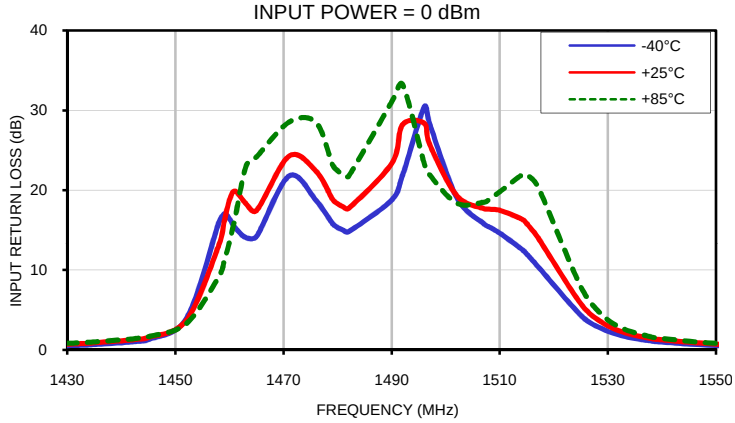
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



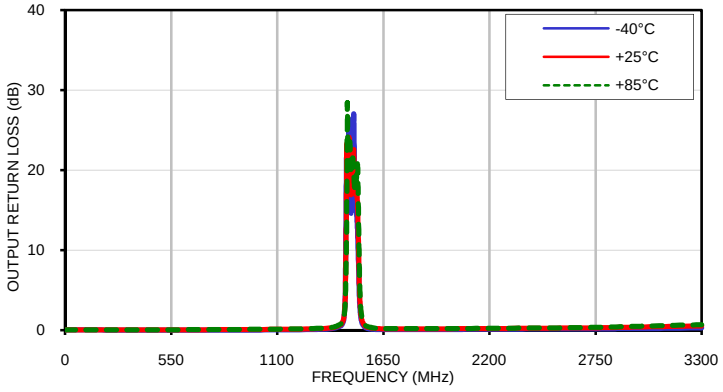
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



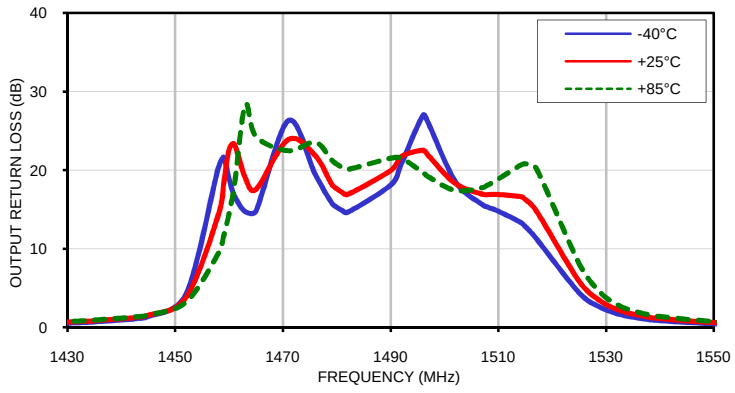
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



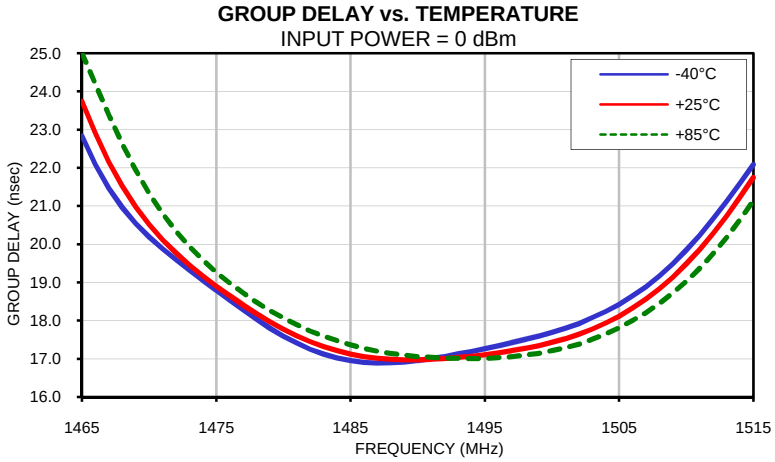
OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



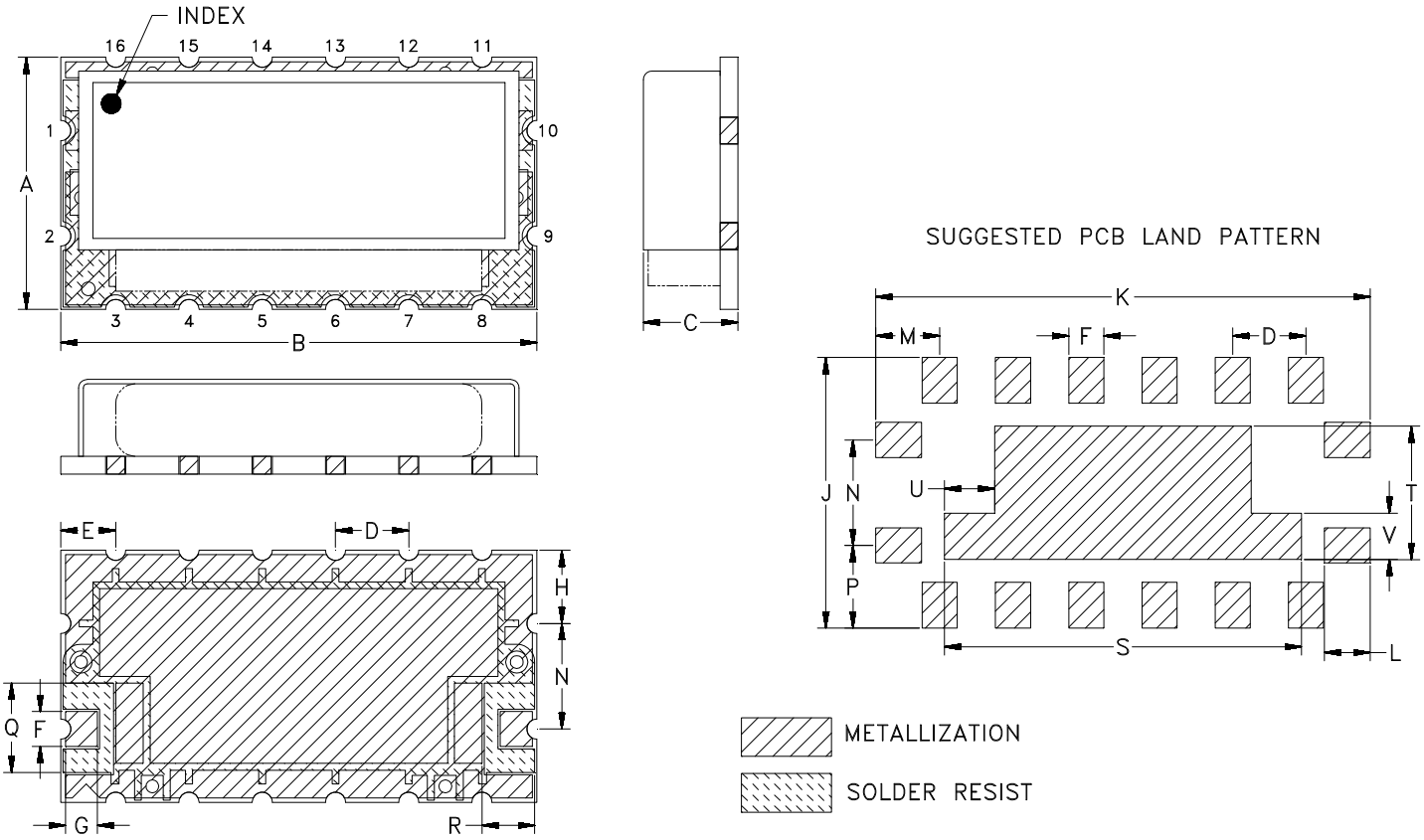
Typical Performance Curves



Case Style KV

KV1514

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M
KV1514	.550 (13.97)	1.040 (26.24)	.225 (5.72)	.160 (4.06)	.120 (3.05)	.077 (1.96)	.070 (1.78)	.160 (4.06)	.590 (14.99)	1.080 (27.43)	.100 (2.54)	.140 (3.56)

CASE#	N	P	Q	R	S	T	U	V	WT, GRAMS
KV1514	.230 (5.84)	.180 (4.57)	.195 (4.95)	.115 (2.92)	.780 (19.81)	.290 (7.37)	.110 (2.79)	.100 (2.54)	4.8

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

Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. 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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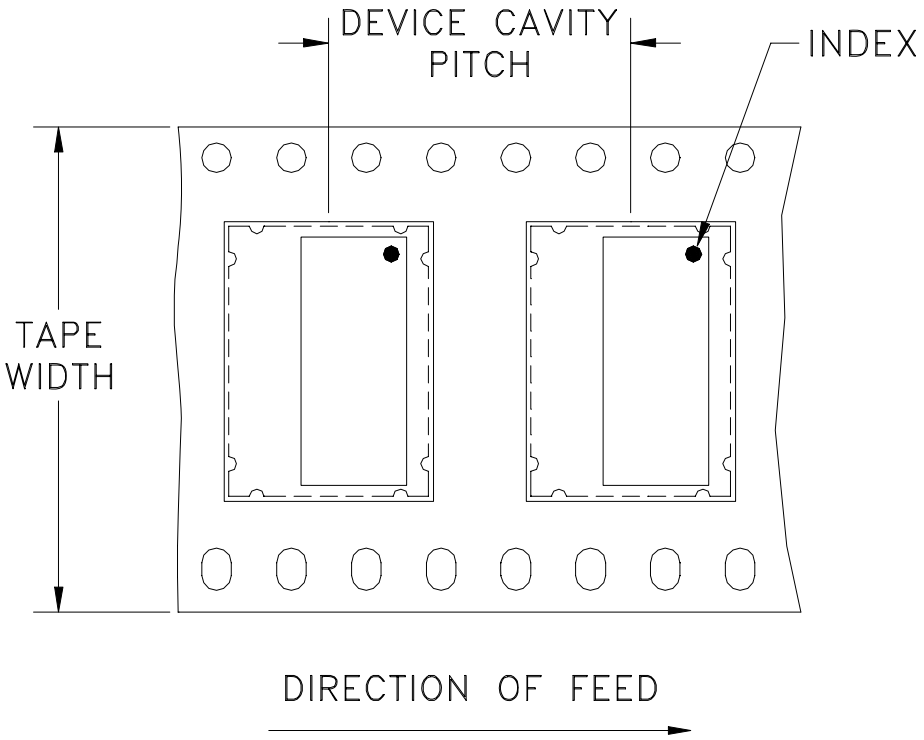
Tape & Reel Packaging TR-F106

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
44	24	13	250

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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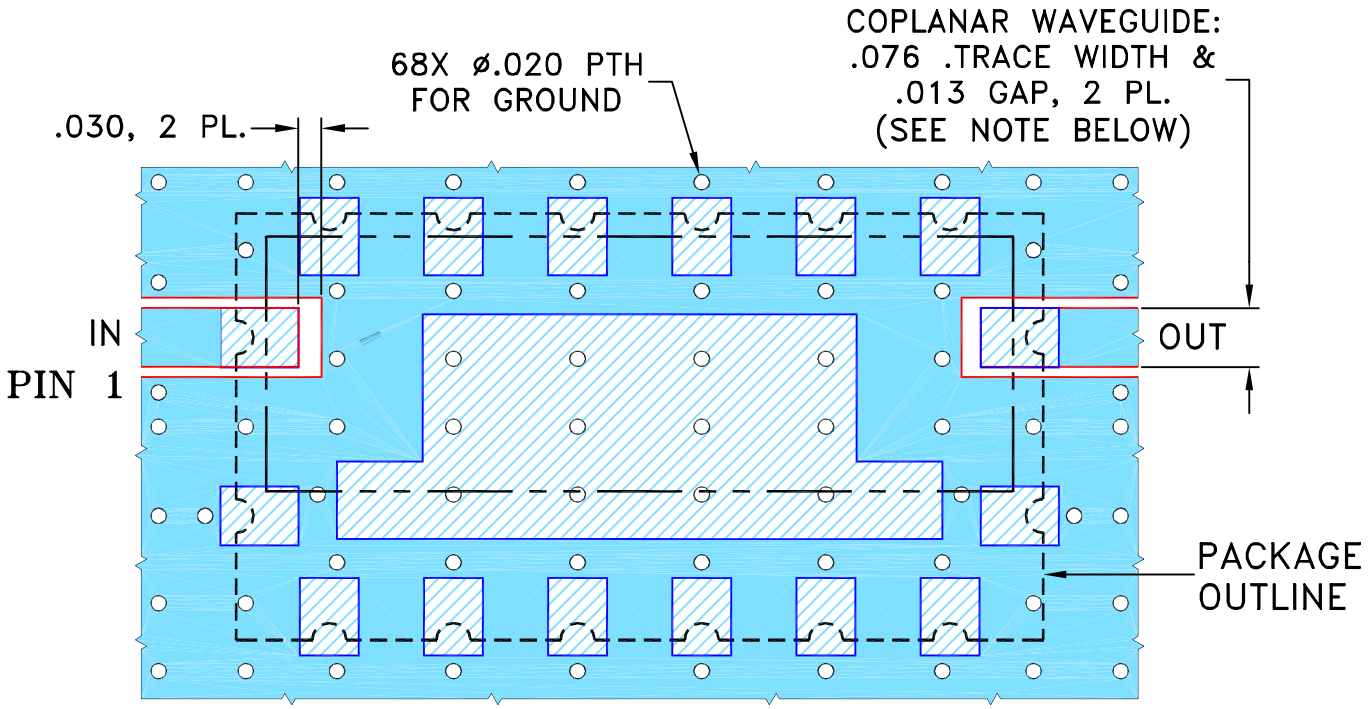
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M126876	NEW RELEASE	04/21/10	MMG	RD

SUGGESTED MOUNTING CONFIGURATION FOR KU1513/KV1514 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	MMG	04/08/10
TOLERANCES ON:	CHECKED	IL	04/21/10
2 PL DECIMALS ±	APPROVED	RD	04/21/10
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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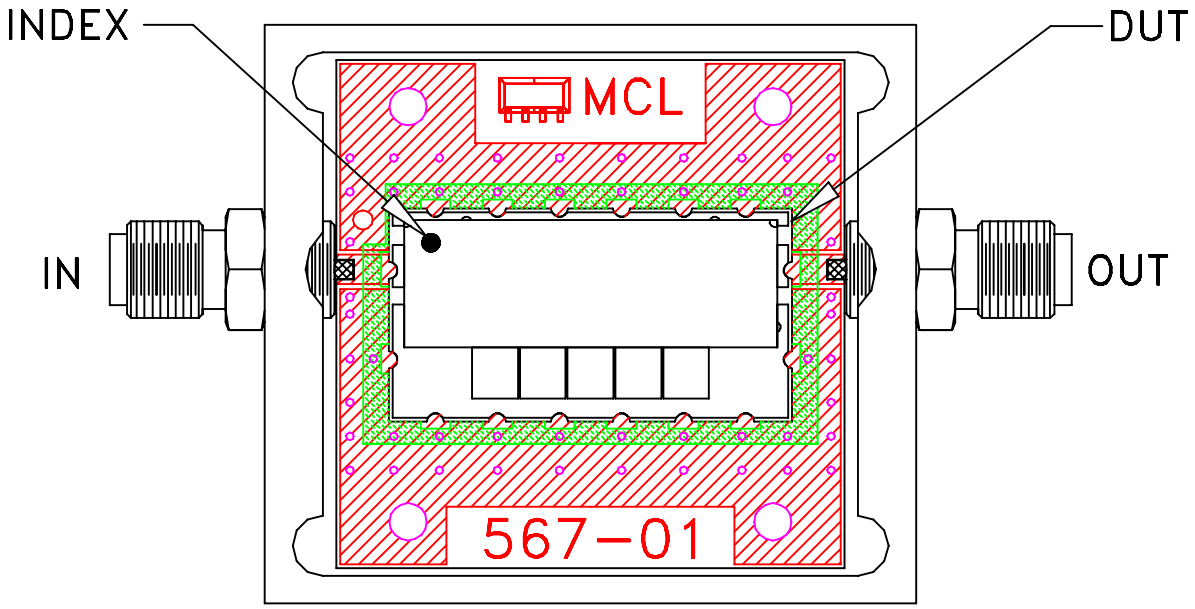
ASHEETA1.DWG REV:A DATE:01/12/95

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

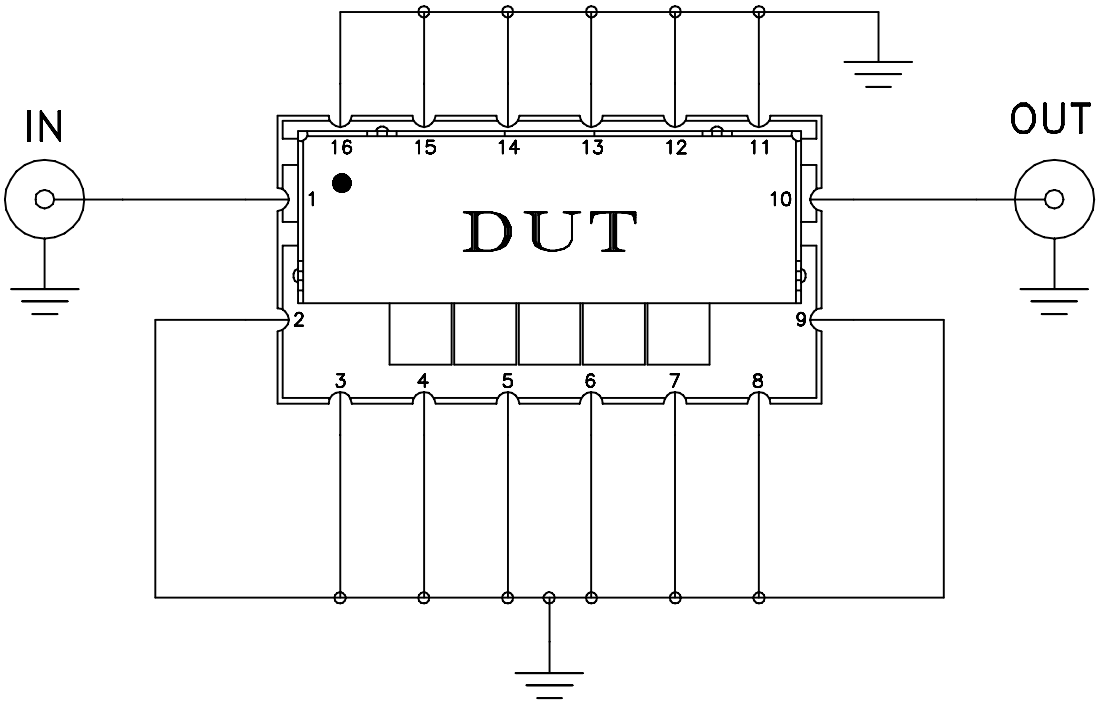
PL, 16FL02, KU1513/KV1514, TB-578+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-331	OR
FILE: 98PL331	SCALE: 4:1	SHEET: 1 OF 1	

Evaluation Board and Circuit



TB-578+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.060 inch.

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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

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