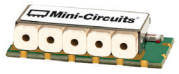
Surface Mount

Bandpass Filter

CBP-1300A+

50Ω 1200 to 1400 MHz



Generic photo used for illustration purposes only
CASE STYLE: KV1514

The Big Deal

- Excellent Rejection till 3.1GHz
- Excellent Return loss
- Low passband Insertion Loss
- Miniature shielded package

Product Overview

CBP-1300A+ is a ceramic-coaxial-resonator based bandpass filter in a shielded package fabricated using SMT technology. This filter offers outstanding close in rejection, low insertion loss and high power handling for use in aviation, military and defense applications.

Key Features

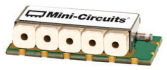
Feature	Advantages
High Selectivity	The CBP-1300A+ filter incorporates High-Q ceramic resonators that enables sharp rejection near passband.
Far stopband rejection	CBP-1300A+ offers far stopband rejection due to proprietary design techniques.
Low Passband VSWR	This filter maintains typical VSWR over a wide 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-1300A+ has been qualified over wide range of thermal, mechanical and environmental conditions including withstanding the stress of extensive solder reflow cycles.

Surface Mount

Bandpass Filter

CBP-1300A+

50Ω 1200 to 1400 MHz



Generic photo used for illustration purposes only

CASE STYLE: KV1514

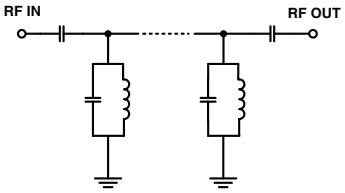
Features

- Low Insertion loss
- High selectivity
- Miniature shielded package
- Excellent return loss

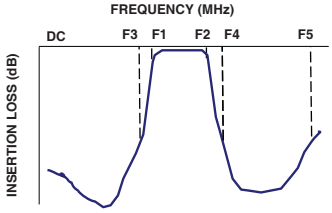
Applications

- Aviation
- Defence
- Military Radar

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	-	-	-	1300	-	MHz
	Insertion Loss	F1-F2	1200-1400	-	1.1	2.0	dB
	VSWR	F1-F2	1200-1400	-	1.2	1.7	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC-1040	20.0	30.0	-	dB
	VSWR	DC-F3	DC-1040	-	20.0	-	:1
Stop Band, Upper	Insertion Loss	F4-F5	1640-3100	20.0	29.0	-	dB
	VSWR	F4-F5	1640-3100	-	20.0	-	:1

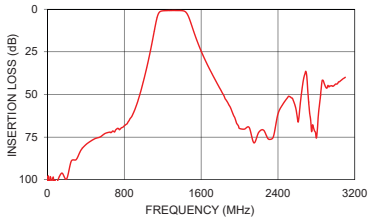
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	2 W max.

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

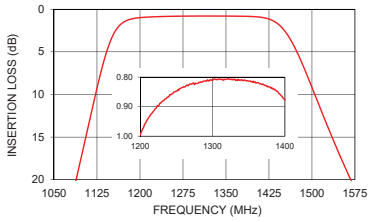
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	113.82	340.29	1200	5.10
30	98.21	351.65	1215	4.67
100	101.71	257.74	1230	4.36
250	89.00	92.58	1245	4.14
400	79.48	47.93	1260	3.98
650	72.09	30.51	1275	3.85
800	68.43	30.39	1290	3.75
1040	32.92	32.71	1300	3.69
1050	30.41	31.78	1310	3.67
1090	19.57	23.21	1320	3.64
1150	3.49	3.23	1330	3.62
1200	1.00	1.13	1340	3.61
1300	0.81	1.08	1350	3.63
1400	0.88	1.11	1360	3.65
1570	20.34	16.66	1365	3.68
1640	29.55	18.80	1370	3.70
1650	30.74	18.92	1380	3.76
2500	51.83	2.39	1390	3.88
2850	46.36	11.14	1395	3.92
3100	39.96	16.31	1400	3.99

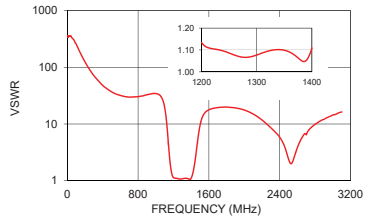
CBP-1300A+
INSERTION LOSS (Full band)



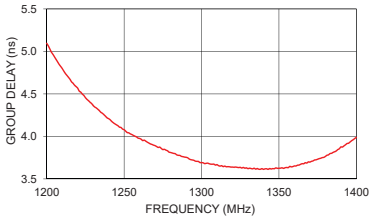
CBP-1300A+
INSERTION LOSS (Pass band)



CBP-1300A+
VSWR



CBP-1300A+
GROUP DELAY



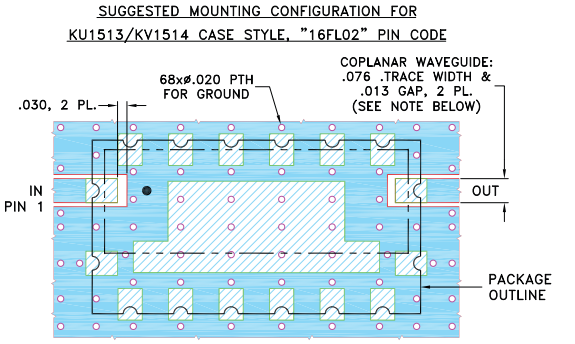
Notes

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-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

Pad Connections

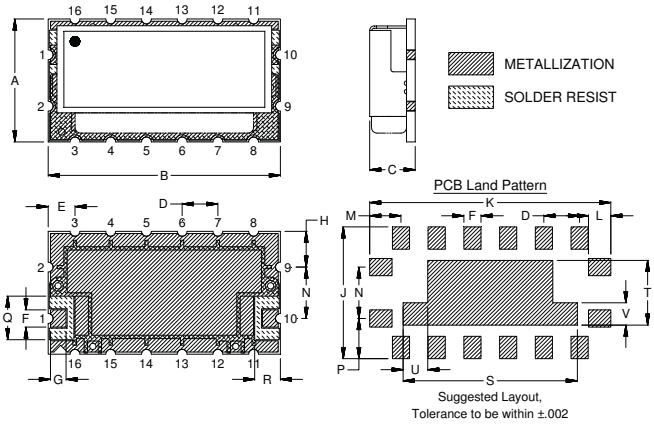
INPUT	1
OUTPUT	10
GROUND	2,3,4,5,6,7,8,9,11,12,13,14,15,16

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

Band Pass Filter CBP-1300A+

Typical Performance Data

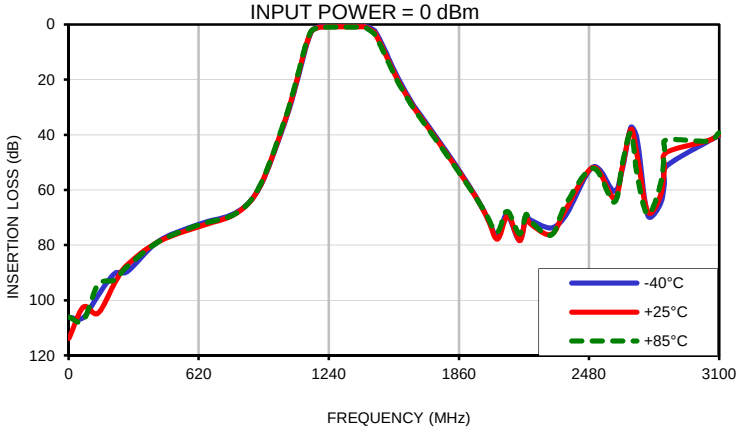
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	106.17	113.82	106.11	0.05	0.05	0.05	0.05	0.05	0.05
70	106.25	102.47	107.26	0.05	0.05	0.05	0.05	0.06	0.06
140	98.24	104.69	94.38	0.04	0.06	0.06	0.07	0.09	0.10
220	90.21	93.72	92.59	0.05	0.07	0.07	0.13	0.16	0.18
280	89.55	87.05	87.67	0.06	0.08	0.09	0.18	0.22	0.25
430	78.56	78.64	78.71	0.08	0.12	0.13	0.32	0.40	0.43
620	72.43	73.31	72.68	0.13	0.18	0.19	0.46	0.55	0.61
800	68.08	68.43	68.39	0.16	0.22	0.23	0.47	0.57	0.64
915	58.35	58.24	57.91	0.18	0.24	0.26	0.41	0.52	0.59
1040	33.49	32.92	32.40	0.21	0.30	0.34	0.40	0.53	0.60
1050	31.02	30.41	29.88	0.22	0.32	0.36	0.42	0.55	0.62
1090	20.28	19.57	18.94	0.34	0.49	0.57	0.57	0.75	0.86
1130	8.52	7.88	7.30	1.36	1.82	2.21	1.73	2.22	2.63
1154	3.13	2.92	2.70	4.88	6.05	7.14	5.42	6.65	7.82
1163	2.05	2.01	1.93	7.37	8.88	10.31	8.01	9.63	11.20
1166	1.80	1.80	1.75	8.33	9.96	11.51	9.00	10.78	12.49
1190	0.92	1.08	1.16	16.80	19.62	22.41	17.59	20.94	24.22
1193	0.89	1.05	1.14	17.78	20.80	23.79	18.51	22.04	25.45
1200	0.82	1.00	1.09	19.88	23.37	26.89	20.29	24.05	27.36
1230	0.70	0.88	0.99	24.73	29.99	36.29	23.16	26.34	28.80
1235	0.69	0.87	0.98	25.05	30.53	37.10	23.36	26.57	29.22
1253	0.66	0.85	0.95	25.97	32.03	36.84	24.29	27.97	31.54
1263	0.65	0.83	0.93	26.40	32.39	34.73	24.93	28.96	32.61
1295	0.63	0.81	0.92	26.79	30.35	29.52	26.16	29.08	29.05
1300	0.62	0.81	0.92	26.64	29.90	29.15	26.08	28.60	28.34
1338	0.62	0.81	0.92	25.21	28.42	29.91	24.77	26.32	26.66
1365	0.63	0.82	0.93	25.03	30.11	35.75	25.18	27.99	29.55
1374	0.64	0.83	0.95	25.81	32.59	41.78	26.29	29.95	31.30
1380	0.64	0.83	0.95	26.86	35.72	39.10	27.60	31.74	31.47
1390	0.64	0.85	0.98	30.50	36.05	29.15	31.99	31.82	27.64
1395	0.65	0.86	1.00	33.61	30.81	25.67	35.78	28.98	25.02
1400	0.65	0.88	1.02	34.54	26.46	22.68	35.91	25.77	22.48
1417	0.72	1.02	1.21	20.48	16.76	14.94	20.80	17.00	15.29
1455	2.06	2.78	3.26	6.18	5.25	4.72	6.77	5.90	5.46
1465	3.00	3.85	4.42	4.27	3.66	3.32	4.88	4.35	4.10
1500	8.12	9.18	9.85	1.13	1.09	1.06	1.76	1.84	1.89
1570	19.46	20.34	20.90	0.24	0.32	0.35	0.83	1.04	1.17
1640	28.80	29.55	30.00	0.17	0.24	0.27	0.73	0.93	1.04
1645	29.40	30.14	30.59	0.16	0.24	0.26	0.73	0.92	1.04
1860	52.69	53.24	53.56	0.12	0.18	0.20	0.74	0.89	1.00
1980	67.60	67.70	67.45	0.10	0.16	0.17	0.82	0.96	1.07
2040	76.74	77.80	75.40	0.08	0.15	0.17	0.89	1.04	1.16
2080	69.44	70.87	68.22	0.07	0.14	0.16	0.95	1.12	1.24
2100	69.99	69.34	68.30	0.07	0.13	0.16	0.98	1.16	1.29
2150	78.23	78.38	75.93	0.06	0.13	0.15	1.08	1.29	1.45
2180	69.60	69.92	68.90	0.05	0.12	0.15	1.16	1.40	1.57
2200	70.83	72.20	71.18	0.05	0.12	0.15	1.22	1.48	1.67
2300	73.74	76.13	76.34	0.04	0.12	0.14	1.66	2.04	2.31
2370	69.16	66.95	65.09	0.02	0.11	0.14	2.18	2.63	2.98
2500	51.66	51.83	52.13	0.03	0.13	0.17	6.05	7.73	9.22
2600	60.46	63.00	64.39	0.19	0.35	0.44	4.54	4.61	4.66
2640	52.08	51.50	50.13	0.90	1.36	1.82	3.15	3.29	3.39
2680	37.29	38.04	39.30	5.22	5.07	4.28	2.43	2.61	2.74
2710	41.58	47.65	54.69	1.05	1.10	1.02	2.44	2.48	2.54
2760	69.12	67.86	68.84	0.24	0.37	0.43	1.81	1.98	2.09
2820	65.10	62.26	58.11	0.25	0.52	0.94	1.50	1.68	1.79
2840	57.38	52.22	45.90	0.62	1.41	4.41	1.42	1.60	1.71
2850	51.39	46.36	41.84	1.33	3.68	12.32	1.38	1.56	1.68
3050	42.28	42.06	42.26	0.10	0.26	0.34	0.95	1.13	1.27
3100	40.30	39.96	39.29	0.16	0.35	0.47	0.88	1.07	1.20

Typical Performance Data

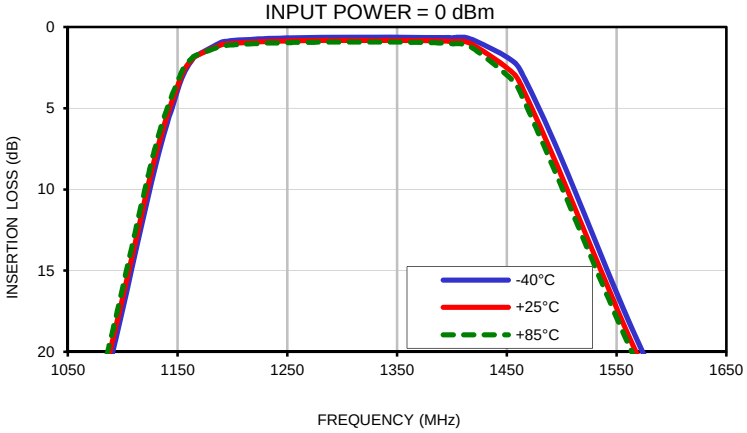
FREQ.	GROUP DELAY		
	(nsec)		
(MHz)	@-40°C	@+25°C	@+85°C
1200	5.21	5.10	5.00
1210	4.89	4.80	4.73
1220	4.63	4.57	4.51
1230	4.41	4.36	4.32
1240	4.25	4.21	4.18
1250	4.11	4.08	4.04
1260	4.01	3.98	3.95
1270	3.92	3.89	3.87
1280	3.84	3.81	3.80
1290	3.77	3.75	3.74
1300	3.71	3.69	3.68
1305	3.68	3.68	3.67
1310	3.67	3.67	3.66
1315	3.65	3.65	3.64
1320	3.64	3.64	3.63
1325	3.64	3.64	3.63
1330	3.62	3.62	3.62
1335	3.62	3.62	3.62
1340	3.60	3.61	3.62
1345	3.60	3.62	3.62
1350	3.61	3.63	3.64
1355	3.61	3.63	3.65
1360	3.63	3.65	3.67
1361	3.62	3.65	3.67
1364	3.64	3.67	3.69
1365	3.64	3.68	3.70
1366	3.64	3.68	3.70
1367	3.66	3.69	3.71
1368	3.65	3.69	3.71
1369	3.66	3.70	3.72
1370	3.66	3.70	3.72
1371	3.67	3.71	3.74
1372	3.68	3.71	3.74
1373	3.68	3.72	3.75
1374	3.68	3.72	3.76
1375	3.69	3.73	3.76
1376	3.70	3.74	3.77
1377	3.71	3.74	3.78
1378	3.71	3.75	3.78
1379	3.71	3.75	3.79
1380	3.71	3.76	3.80
1381	3.73	3.78	3.81
1382	3.73	3.78	3.82
1383	3.74	3.80	3.83
1384	3.74	3.80	3.83
1385	3.76	3.81	3.85
1386	3.76	3.82	3.86
1387	3.77	3.83	3.87
1388	3.78	3.84	3.88
1389	3.79	3.85	3.90
1390	3.81	3.88	3.92
1391	3.81	3.87	3.92
1392	3.83	3.89	3.94
1393	3.83	3.90	3.95
1394	3.84	3.92	3.96
1395	3.85	3.92	3.97
1396	3.86	3.94	3.98
1398	3.89	3.96	4.02
1399	3.90	3.98	4.03
1400	3.92	3.99	4.04

Typical Performance Curves

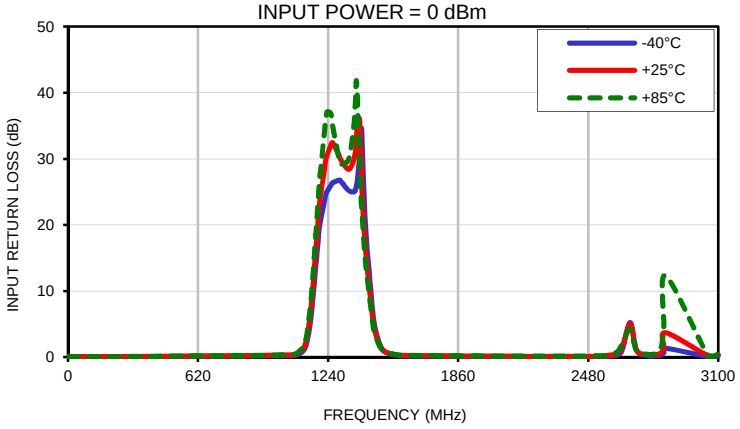
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



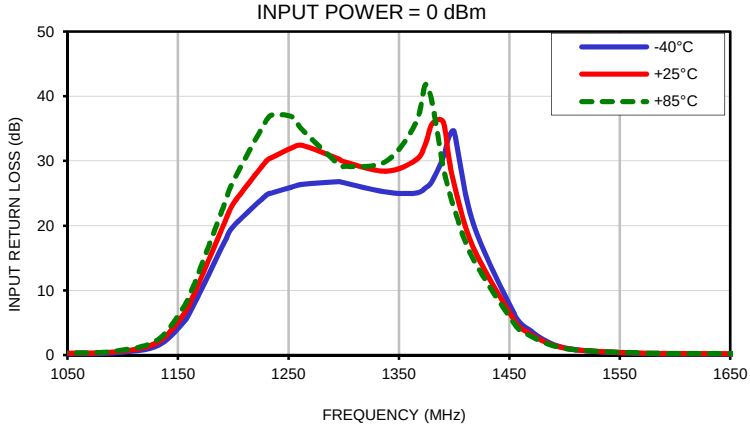
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



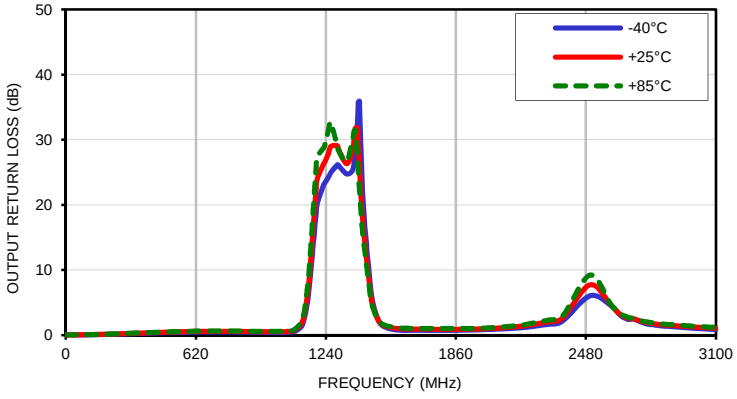
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



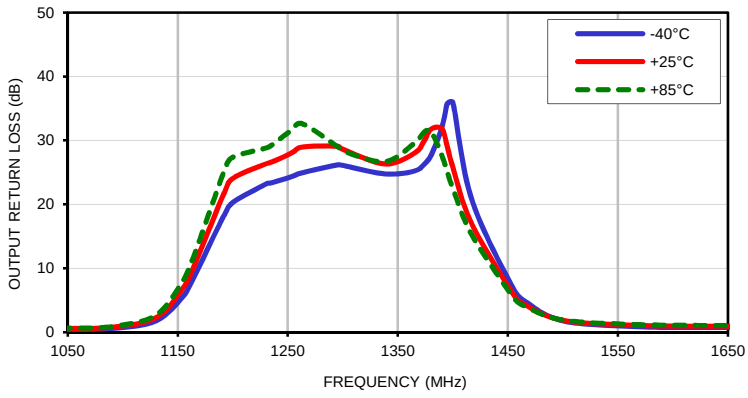
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



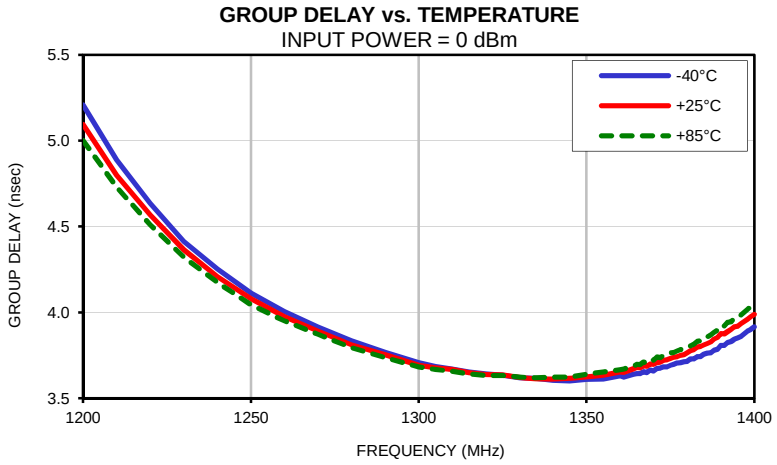
OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



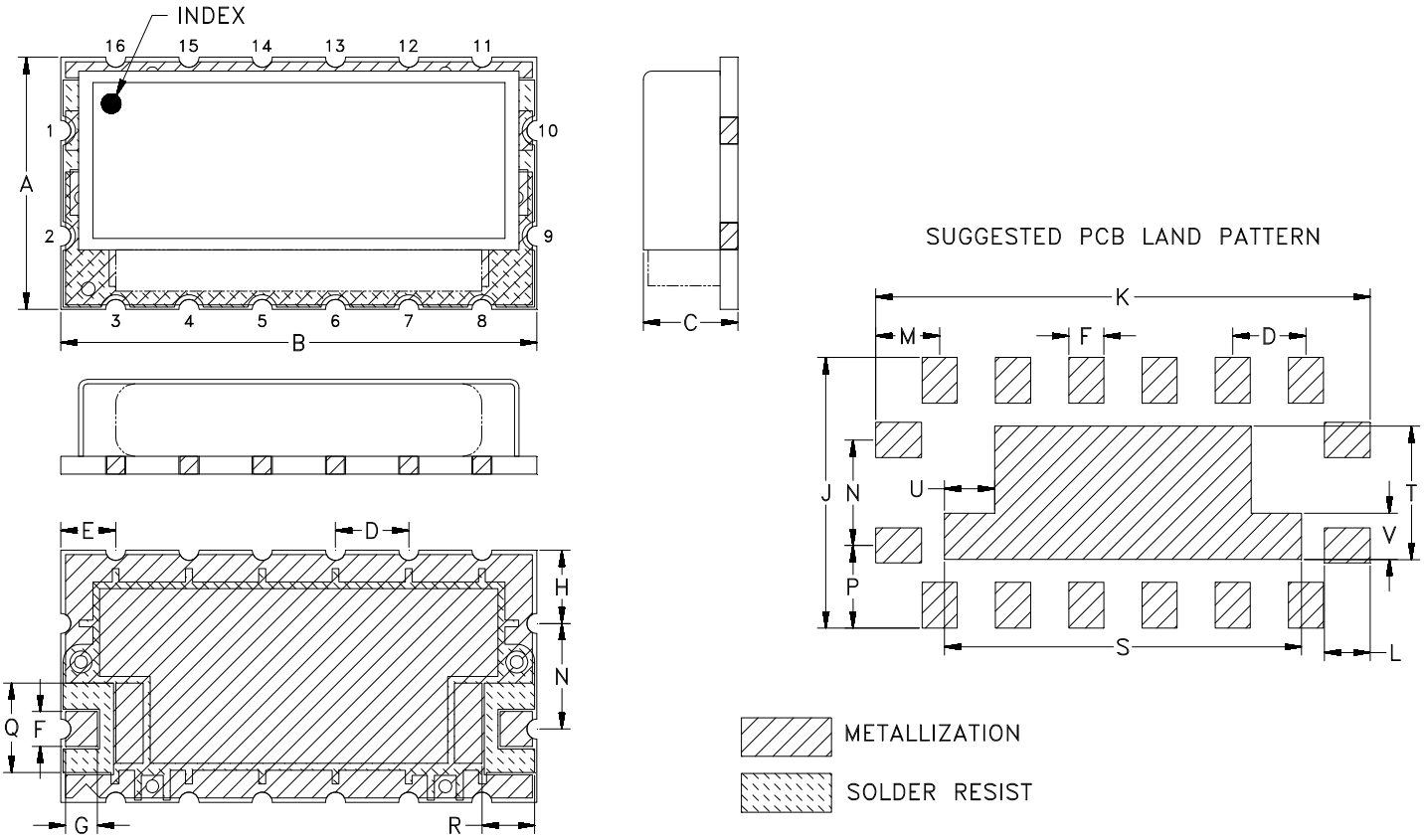
Typical Performance Curves



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

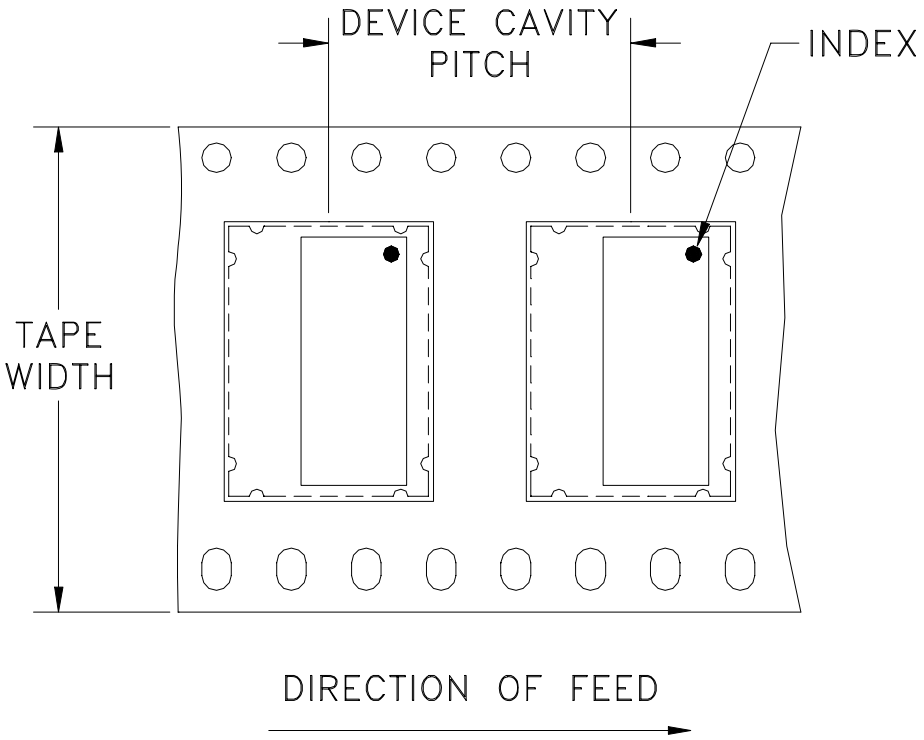
Notes:

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.

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

Mini-Circuits®
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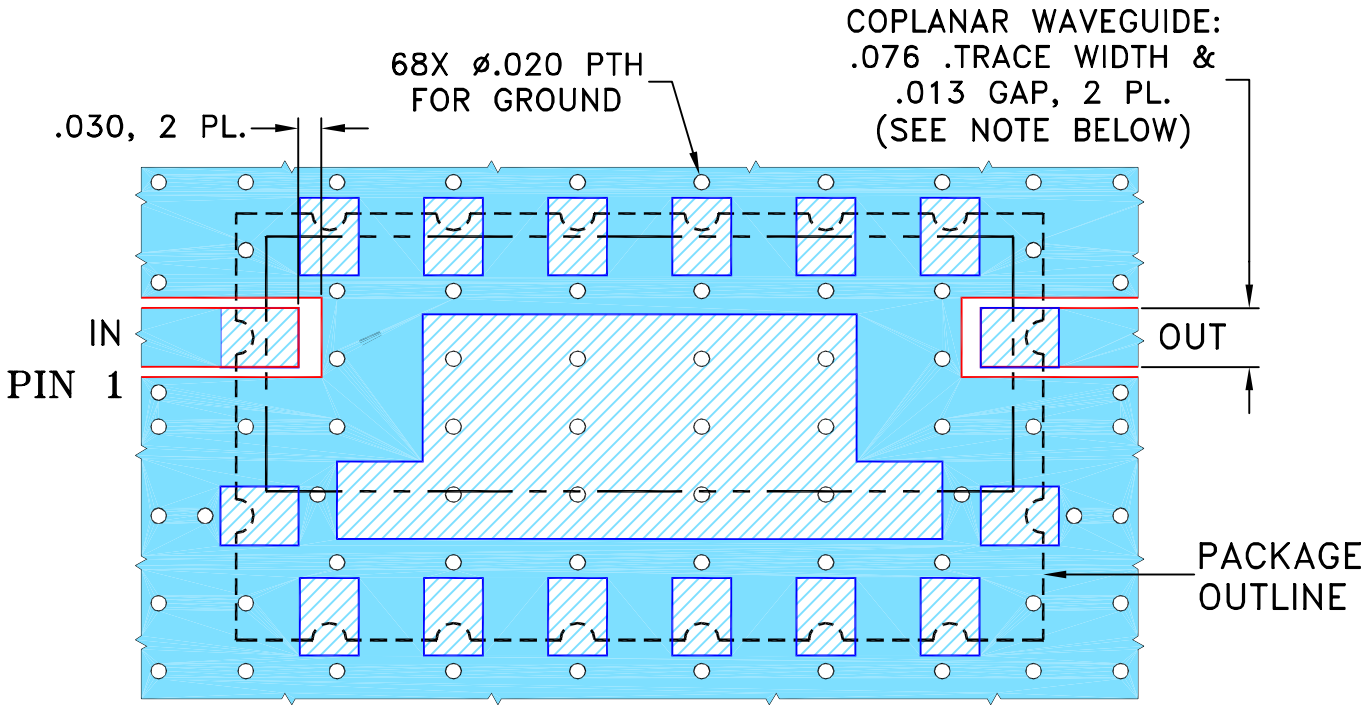
THIRD ANGLE PROJECTION

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 ±			

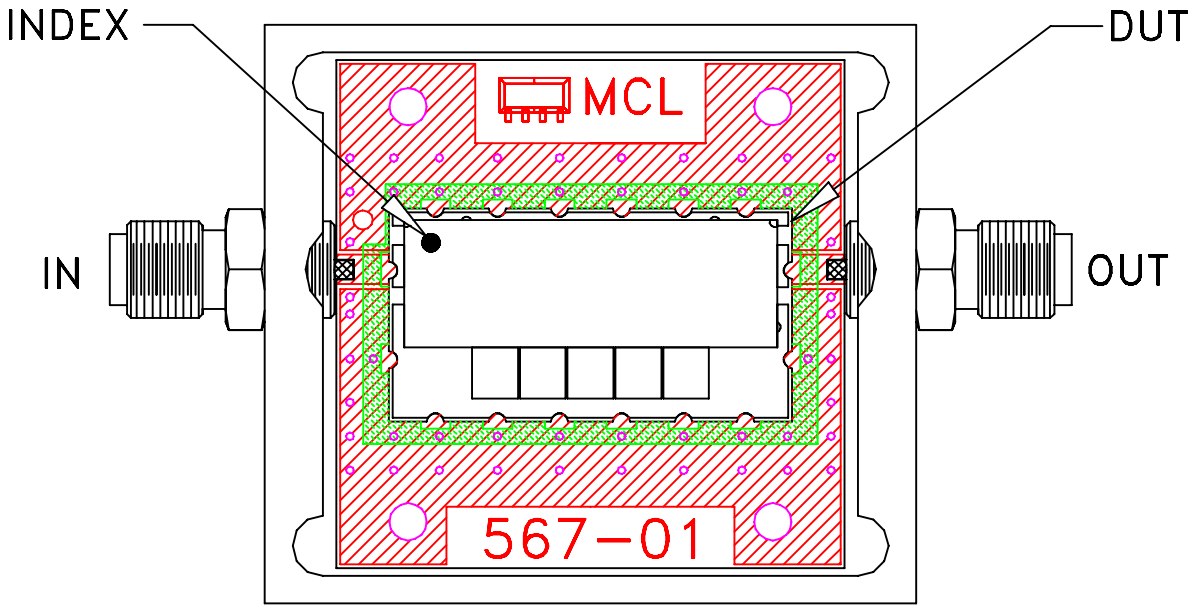
ASHEETA1.DWG REV:A DATE:01/12/95

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

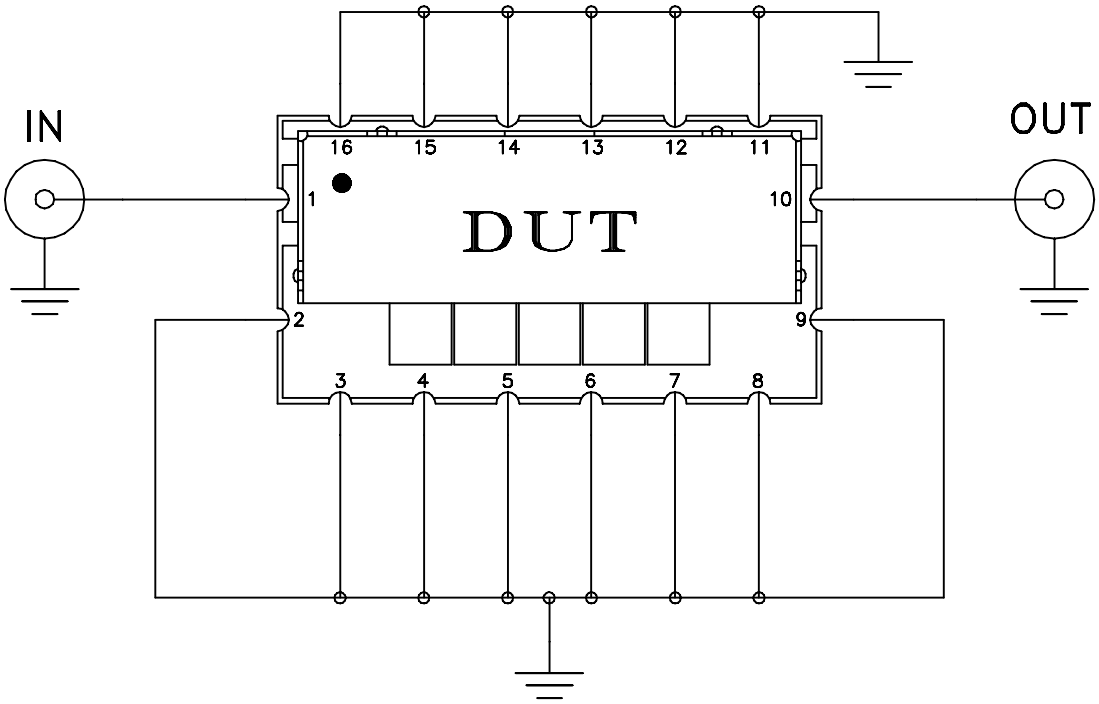
PL, 16FL02, KU1513/KV1514, TB-578+

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