

Surface Mount Bandpass Filter

CBP-1400F+

50Ω 1300 to 1500 MHz



Generic photo used for illustration purposes only
CASE STYLE: KV1710

The Big Deal

- Excellent Rejection
- Low passband Insertion Loss
- Miniature shielded package

Product Overview

CBP-1400F+ 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 broadband, wireless medical telemetry, fixed wireless and radio astronomy.

Key Features

Feature	Advantages
High Selectivity	The CBP-1400F+ filter incorporates High-Q ceramic resonators that enables sharp rejection near passband.
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-1400F+ has been qualified over wide range of thermal, mechanical and environmental conditions including withstanding the stress of extensive solder reflow cycles.

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



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CBP-1400F+

50Ω 1300 to 1500 MHz



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CASE STYLE: KV1710

Features

- Low Insertion loss
- High selectivity
- Miniature shielded package

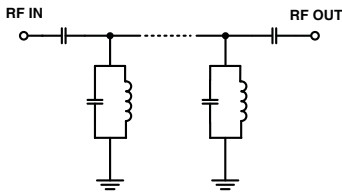
Electrical Specifications at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	1400	-	MHz
	Insertion Loss	F1-F2	1300-1500	0.8	2.0	dB
	VSWR	F1-F2	1300-1500	1.4	1.92	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC-1090	20.0	30.0	dB
	VSWR	DC-F3	DC-1090	20.0	-	:1
Stop Band, Upper	Insertion Loss	F4-F5	1740-2450	20.0	30.0	dB
	VSWR	F4-F5	1740-2450	20.0	-	:1

Applications

- Wimax
- Defense systems
- Radio astronomy
- Space operation / Space research
- Aviation and aeronautical
- Wireless medical telemetry

Functional Schematic



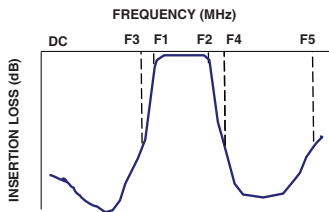
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	10 W max.

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

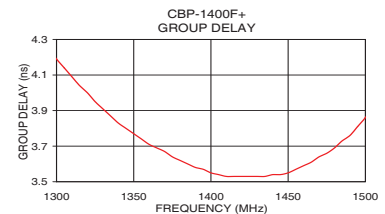
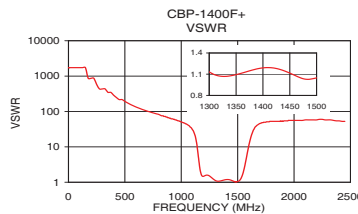
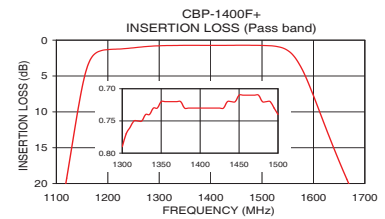
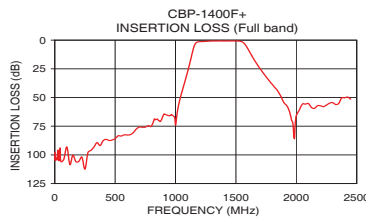
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	97.53	1737.18	1300	4.19
400	87.78	217.15	1310	4.09
1000	73.92	41.37	1320	4.00
1090	31.38	31.60	1330	3.91
1115	21.38	23.81	1340	3.83
1130	14.90	16.11	1350	3.77
1150	6.59	5.79	1360	3.71
1160	3.75	3.15	1370	3.67
1190	1.41	1.47	1380	3.62
1300	0.79	1.14	1390	3.58
1400	0.73	1.17	1400	3.55
1500	0.74	1.03	1410	3.53
1550	1.44	1.92	1420	3.53
1570	3.04	3.65	1430	3.53
1600	7.73	10.56	1440	3.54
1635	14.23	22.87	1450	3.55
1670	20.21	30.49	1460	3.59
1740	30.54	36.20	1470	3.64
1980	84.33	45.72	1480	3.69
2450	51.46	52.65	1500	3.86

Typical Frequency Response



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



Notes

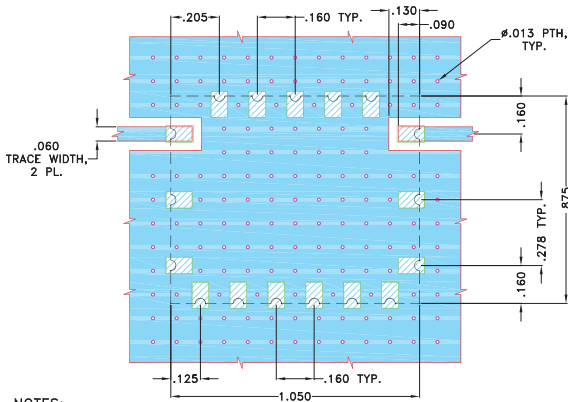
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Pad Connections

INPUT	1
OUTPUT	12
GROUND	2,3,4,5,6,7,8,9,10,11,13,14,15,16,17

Demo Board MCL P/N: TB-693+ Suggested PCB Layout (PL-378)

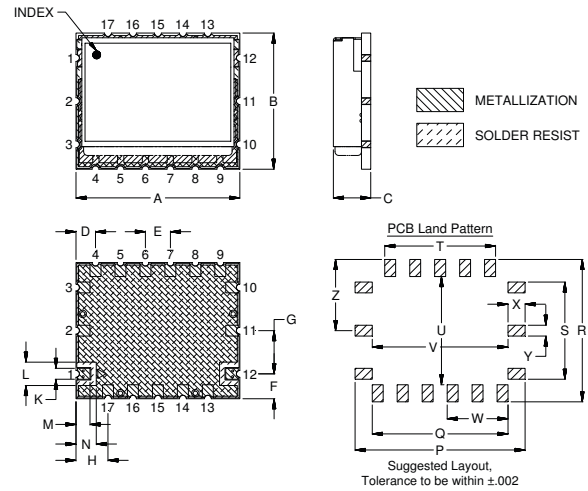


NOTES:

- TRACE WIDTH IS SHOWN FOR OAK (OAK-602) WITH DIELECTRIC THICKNESS .022"±.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- 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 SOLDERMASK

Outline Drawing



Outline Dimensions (inch)

A	B	C	D	E	F	G	H	J	K	L	M	N
1.050	.875	.239	.125	.160	.160	.278	.205	.160	.070	.150	.090	.130
26.67	22.23	6.07	3.18	4.06	4.06	7.06	5.21	4.06	1.78	3.81	2.29	3.30
P	Q	R	S	T	U	V	W	X	Y	Z	Wt.	
1.090	.870	.915	.625	.710	.695	.870	.390	.110	.070	.458	grams	
27.69	22.10	23.24	15.88	18.03	17.65	22.10	9.91	2.79	1.78	11.63	8.5	

Note: Please refer to case style drawing for details

Notes

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Typical Performance Data

FREQ. (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	106.02	97.53	101.08	0.00	0.00	0.00	0.00	0.00	0.00
3	96.25	104.50	102.39	0.00	0.00	0.00	0.00	0.00	0.00
10	109.22	102.53	102.12	0.00	0.00	0.00	0.00	0.00	0.00
25	99.88	95.96	96.61	0.00	0.00	0.00	0.00	0.00	0.00
50	104.60	105.68	105.46	0.00	0.00	0.00	0.00	0.00	0.00
100	100.89	93.06	101.10	0.00	0.01	0.01	0.00	0.01	0.01
175	105.84	105.90	109.05	0.00	0.02	0.02	0.00	0.02	0.02
250	98.30	112.48	103.22	0.01	0.03	0.04	0.02	0.04	0.04
300	93.67	96.05	96.11	0.02	0.04	0.05	0.02	0.05	0.06
500	87.39	85.95	85.27	0.06	0.09	0.11	0.09	0.12	0.13
600	81.09	82.71	81.51	0.09	0.13	0.15	0.14	0.18	0.19
700	74.95	75.80	74.79	0.12	0.17	0.19	0.19	0.23	0.25
825	68.94	68.59	68.79	0.17	0.23	0.25	0.26	0.31	0.33
830	68.84	68.99	68.80	0.17	0.23	0.25	0.27	0.31	0.33
895	67.45	66.29	67.31	0.21	0.27	0.29	0.30	0.35	0.37
990	66.69	66.75	68.18	0.27	0.33	0.37	0.36	0.41	0.44
1000	71.99	73.92	72.44	0.27	0.34	0.38	0.36	0.42	0.45
1005	74.19	71.18	68.73	0.28	0.35	0.39	0.36	0.42	0.45
1015	64.32	62.62	61.18	0.28	0.36	0.40	0.37	0.43	0.46
1035	53.04	52.17	51.29	0.30	0.38	0.43	0.38	0.44	0.49
1065	41.38	40.70	39.89	0.34	0.43	0.50	0.40	0.48	0.54
1090	32.09	31.38	30.52	0.40	0.51	0.60	0.44	0.55	0.63
1105	26.28	25.50	24.59	0.46	0.60	0.72	0.49	0.63	0.75
1120	20.12	19.26	18.31	0.59	0.79	0.96	0.61	0.81	0.99
1135	13.60	12.70	11.81	0.94	1.28	1.61	0.96	1.32	1.66
1150	7.27	6.59	6.04	2.20	2.97	3.69	2.24	3.03	3.78
1165	2.97	2.86	2.81	6.09	7.45	8.51	6.15	7.55	8.61
1180	1.46	1.65	1.80	11.96	12.93	13.42	11.99	12.91	13.37
1195	1.11	1.35	1.52	14.71	14.50	14.32	14.80	14.52	14.33
1250	0.88	1.07	1.19	13.94	13.92	14.20	14.01	13.94	14.17
1300	0.62	0.79	0.90	23.22	24.16	24.15	22.81	23.87	23.83
1315	0.59	0.75	0.87	26.68	28.27	27.72	26.50	28.34	27.76
1325	0.58	0.75	0.86	27.65	29.54	28.85	28.20	30.58	29.65
1350	0.56	0.72	0.84	25.58	27.01	26.75	27.40	29.10	28.47
1385	0.57	0.73	0.84	21.39	22.21	22.65	22.82	23.50	23.88
1400	0.57	0.73	0.83	20.50	21.26	22.07	21.71	22.33	23.17
1475	0.55	0.71	0.83	30.03	35.08	50.78	30.17	34.18	45.98
1500	0.56	0.74	0.86	30.09	32.48	34.17	33.09	37.54	45.62
1550	1.10	1.44	1.73	10.66	9.98	9.25	10.63	10.00	9.27
1570	2.47	3.04	3.55	5.24	4.84	4.45	5.28	4.89	4.51
1595	6.01	6.83	7.50	1.90	1.85	1.79	2.00	1.94	1.87
1625	11.55	12.39	13.02	0.68	0.77	0.82	0.83	0.89	0.93
1670	19.49	20.21	20.70	0.32	0.43	0.49	0.50	0.57	0.62
1695	23.44	24.09	24.52	0.28	0.38	0.44	0.46	0.52	0.56
1740	29.97	30.54	30.88	0.26	0.35	0.40	0.44	0.48	0.51
1800	37.96	38.45	38.75	0.25	0.33	0.37	0.42	0.45	0.48
1815	39.90	40.43	40.73	0.25	0.33	0.37	0.41	0.45	0.47
1905	55.25	55.51	56.47	0.25	0.33	0.36	0.38	0.41	0.43
1955	65.68	66.90	67.57	0.24	0.31	0.35	0.36	0.39	0.41
1975	74.38	76.14	83.52	0.24	0.31	0.35	0.34	0.38	0.40
1985	83.52	85.74	78.06	0.24	0.31	0.35	0.34	0.37	0.40
2000	65.72	65.65	66.44	0.24	0.31	0.35	0.33	0.37	0.39
2050	55.61	55.72	55.61	0.23	0.31	0.35	0.31	0.35	0.38
2100	55.20	55.26	55.39	0.23	0.30	0.34	0.29	0.33	0.36
2125	58.21	58.62	58.41	0.22	0.30	0.34	0.27	0.32	0.35
2175	56.45	57.19	57.03	0.22	0.30	0.35	0.25	0.31	0.35
2250	56.63	56.52	56.52	0.21	0.29	0.35	0.23	0.30	0.34
2325	55.88	56.04	54.48	0.21	0.30	0.37	0.21	0.29	0.35
2375	50.17	50.42	50.30	0.22	0.32	0.39	0.21	0.31	0.37
2450	51.82	51.46	50.83	0.22	0.33	0.41	0.23	0.33	0.41

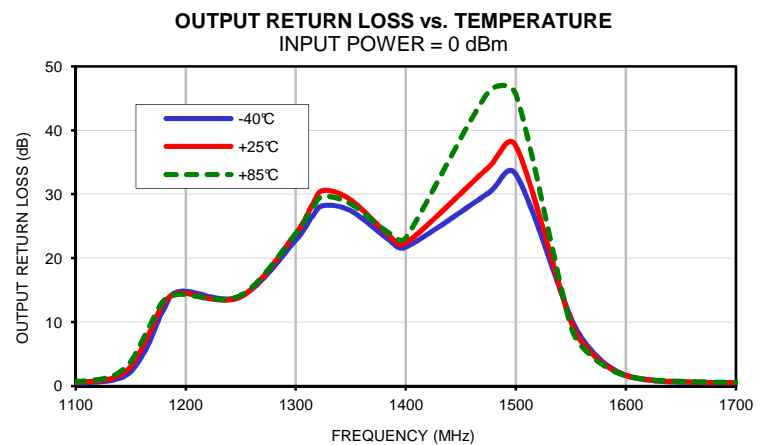
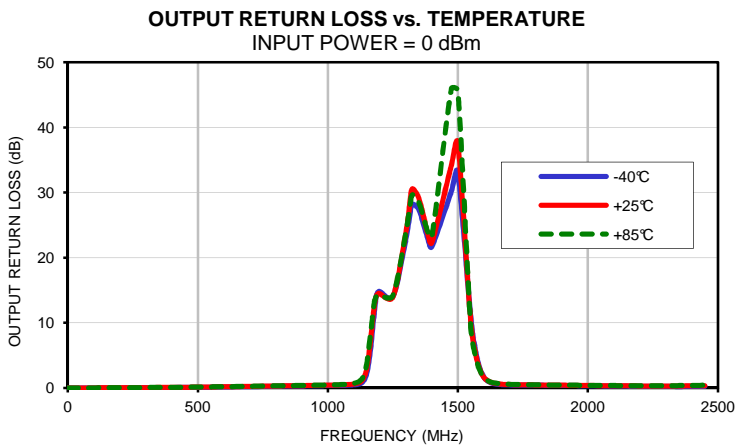
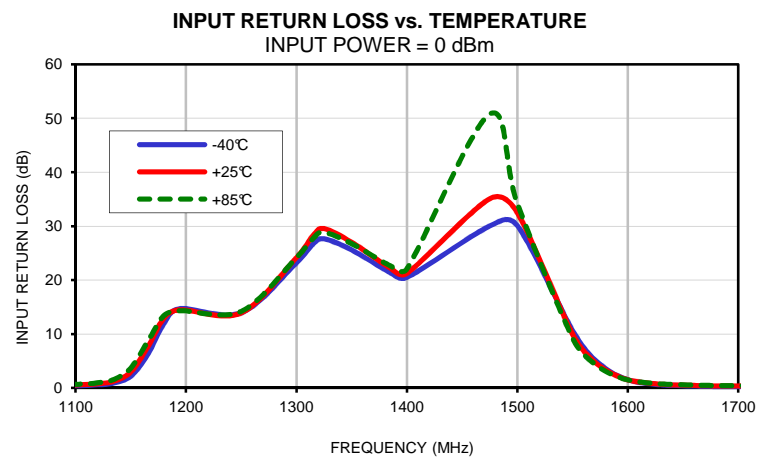
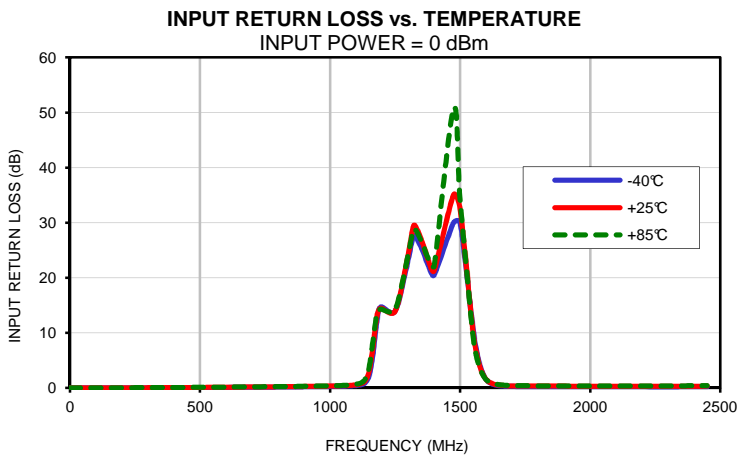
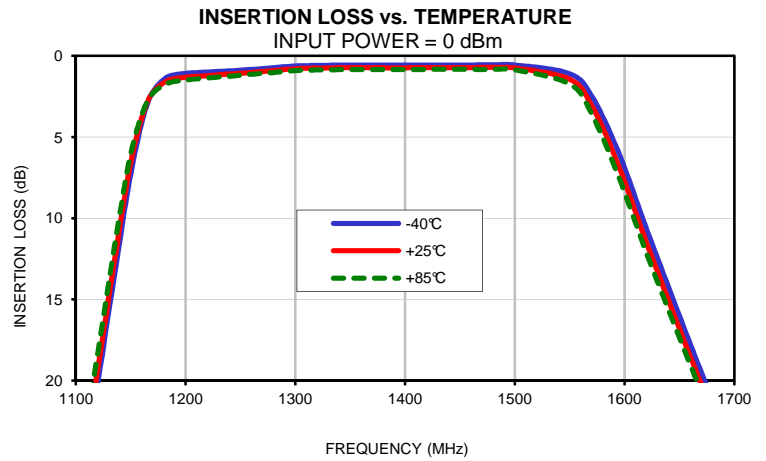
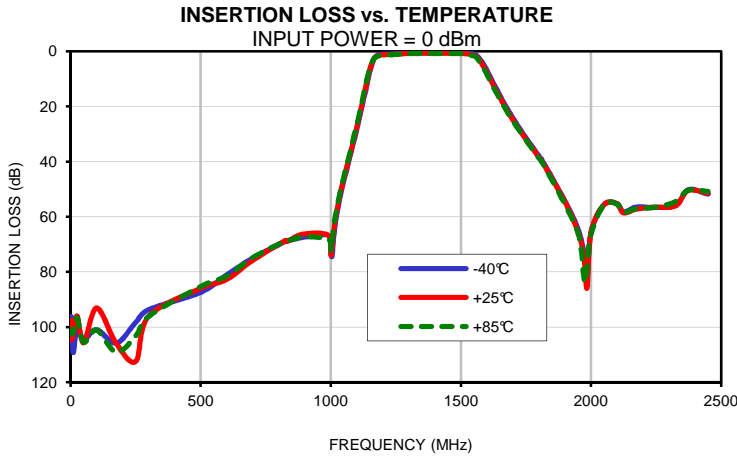
Typical Performance Data

FREQ. (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
1300	4.22	4.19	4.16
1305	4.17	4.14	4.11
1310	4.12	4.09	4.06
1315	4.07	4.04	4.01
1320	4.02	4.00	3.97
1325	3.98	3.95	3.93
1330	3.94	3.91	3.89
1335	3.89	3.87	3.85
1340	3.85	3.83	3.82
1345	3.81	3.80	3.78
1350	3.78	3.77	3.75
1355	3.75	3.74	3.72
1360	3.73	3.71	3.70
1365	3.70	3.69	3.67
1370	3.68	3.67	3.65
1375	3.66	3.64	3.63
1380	3.64	3.62	3.61
1385	3.61	3.60	3.59
1390	3.60	3.58	3.57
1395	3.58	3.57	3.56
1400	3.56	3.55	3.54
1405	3.55	3.54	3.53
1410	3.54	3.53	3.53
1415	3.53	3.53	3.52
1420	3.53	3.53	3.53
1425	3.53	3.53	3.53
1430	3.53	3.53	3.53
1440	3.53	3.54	3.54
1445	3.54	3.54	3.55
1450	3.55	3.55	3.56
1455	3.56	3.57	3.58
1460	3.58	3.59	3.59
1465	3.60	3.61	3.62
1470	3.62	3.64	3.64
1475	3.65	3.66	3.67
1480	3.68	3.69	3.71
1485	3.71	3.73	3.74
1490	3.74	3.76	3.78
1495	3.78	3.81	3.83
1500	3.83	3.86	3.89

Band Pass Filter

CBP-1400F+

Typical Performance Curves



ISO 9001 ISO 14001 AS 9100 CERTIFIED

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The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

IF/RF MICROWAVE COMPONENTS

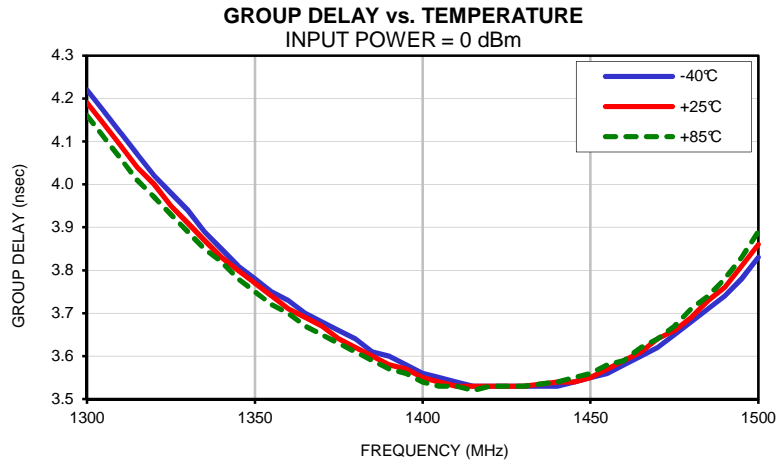


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CBP-1400F+
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Page 1 of 2

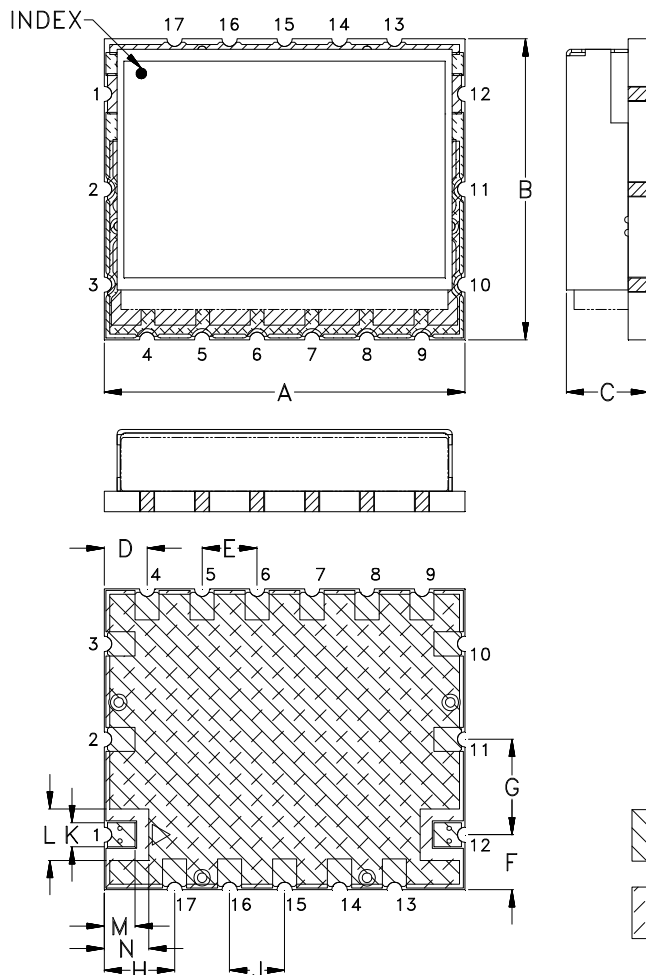
Band Pass Filter

CBP-1400F+

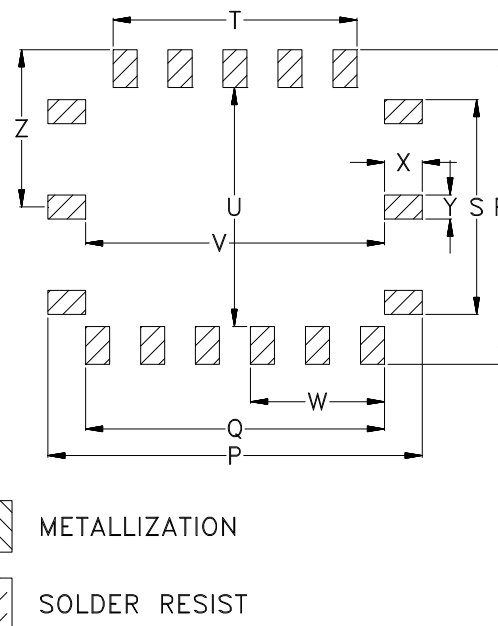
Typical Performance Curves



Outline Dimensions



SUGGESTED PCB LAND PATTERN



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
KV1710	1.050 (26.67)	.875 (22.23)	.239 (6.07)	.125 (3.18)	.160 (4.06)	.160 (4.06)	.278 (7.06)	.205 (5.21)	.160 (4.06)	.070 (1.78)	.150 (3.81)	.090 (2.29)	.130 (3.30)

CASE#	P	Q	R	S	T	U	V	W	X	Y	Z	WT, GRAMS
KV1710	1.090 (27.69)	.870 (22.10)	.915 (23.24)	.625 (15.88)	.710 (18.03)	.695 (17.65)	.870 (22.10)	.390 (9.91)	.110 (2.79)	.070 (1.78)	.458 (11.63)	8.5

Dimensions are in inches (mm). Tolerances: 2PL. $\pm .03$; 3PL. $\pm .015$

Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- 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.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site

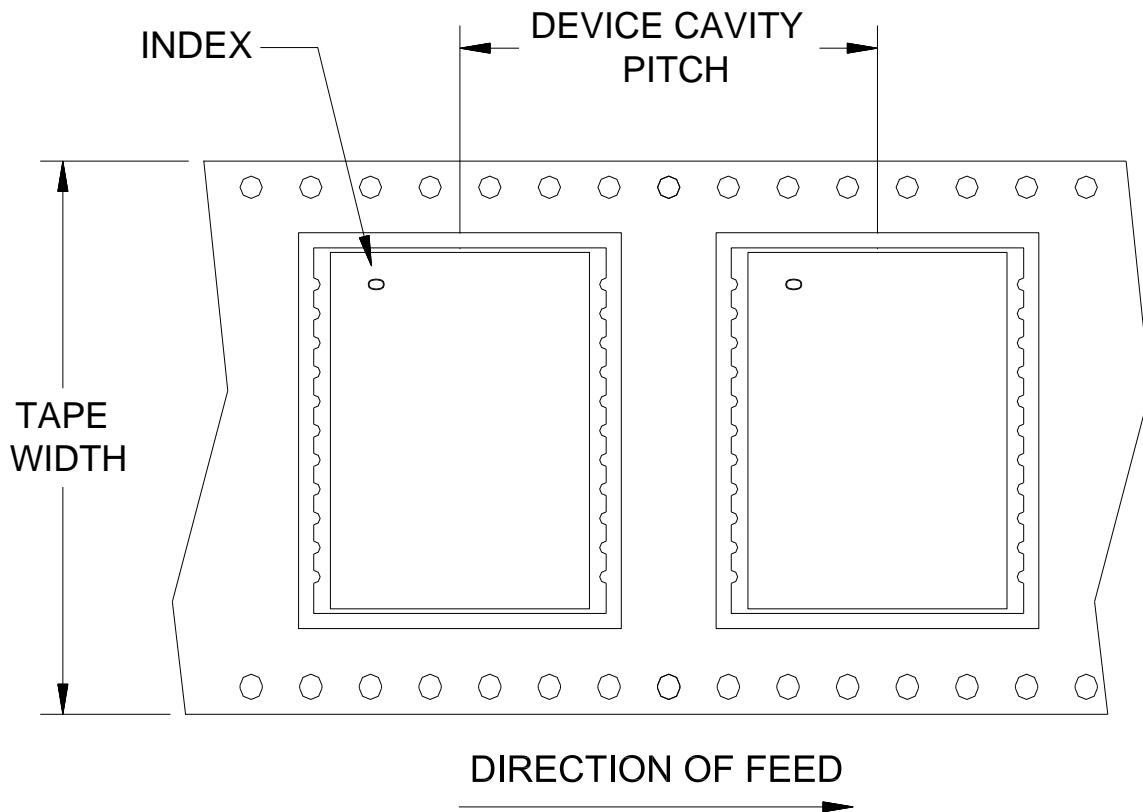


The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F97

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
44	32	13	Small quantity standards (see note)	20
				50
				100
			Standard	200

Note: Please consult individual model data sheet to determine device per reel availability.

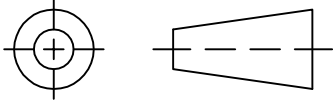
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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



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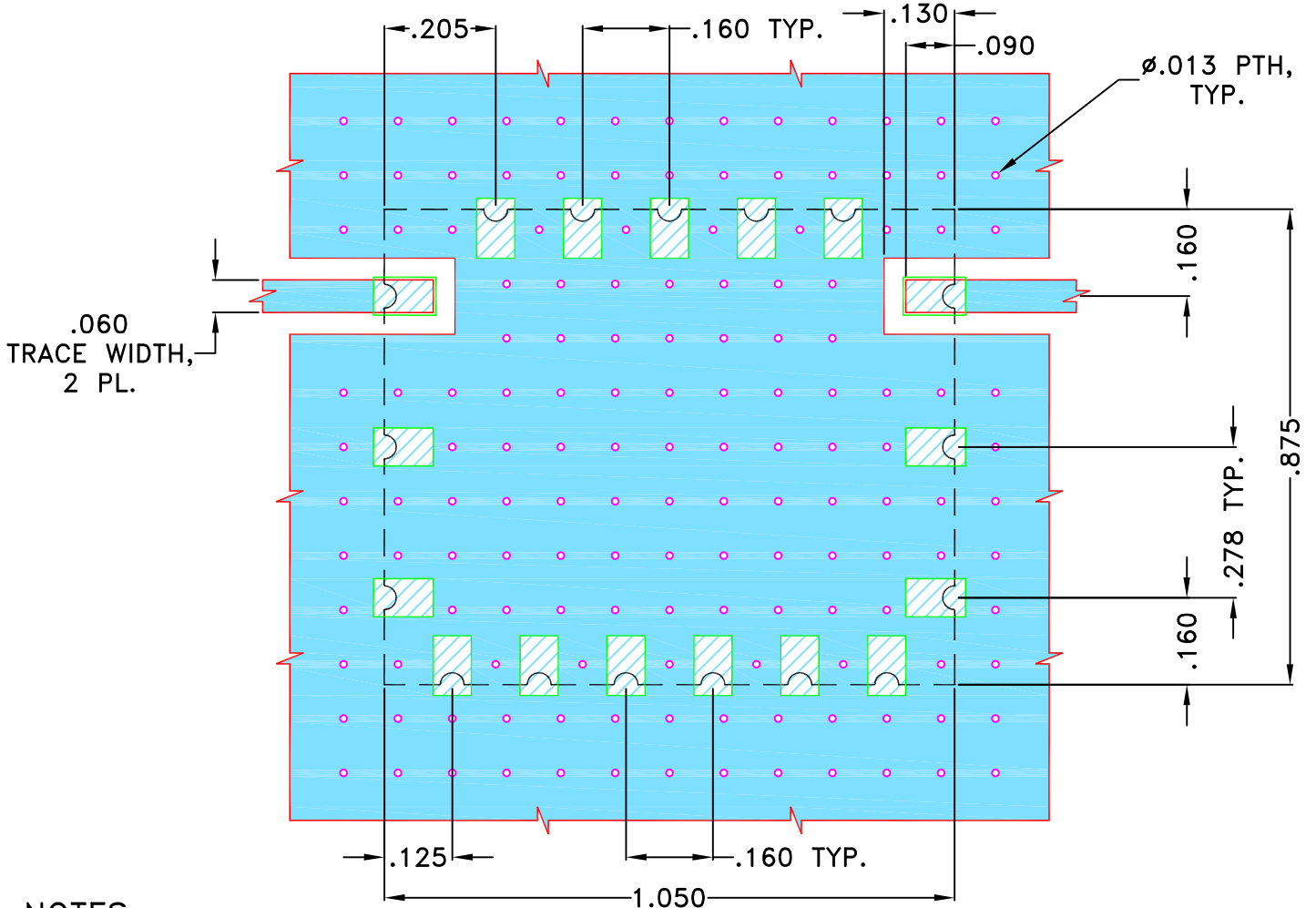
THIRD ANGLE PROJECTION



REVISIONS

REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M138032	NEW RELEASE	JUL 12	DDR	KG

SUGGESTED MOUNTING CONFIGURATION FOR KV1710 CASE STYLE "17FL01" PIN CODE



NOTES:

- TRACE WIDTH IS SHOWN FOR OAK (OAK-602) WITH DIELECTRIC THICKNESS .022"±.0015". COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- 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 SOLDERMASK

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN: DDR	17 JUL 12
TOLERANCES ON:	CHECKED: DDR	17 JUL 12
2 PL DECIMALS ±	APPROVED: GM	17 JUL 12
3 PL DECIMALS ± .005"		
ANGLES ±		
FRACTIONS ±		



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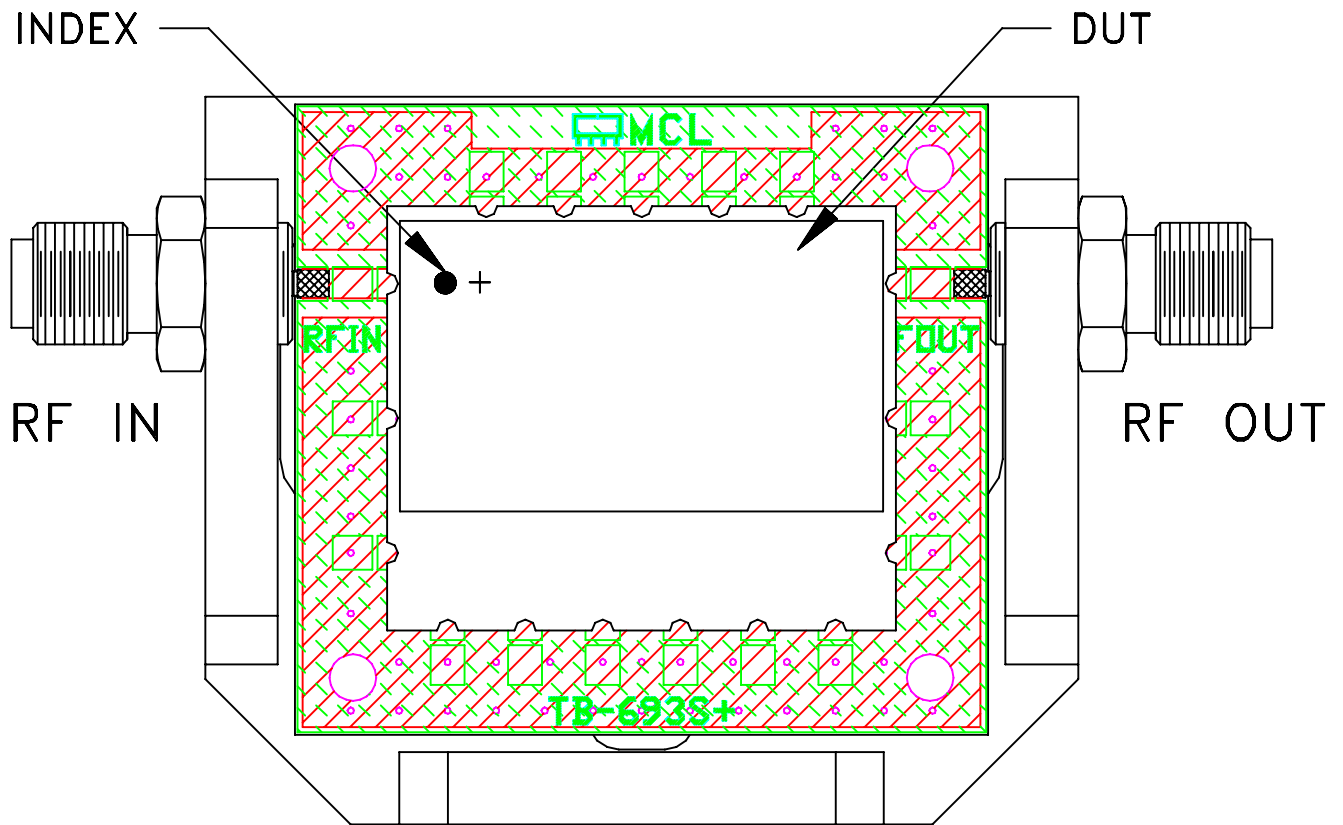
13 Neptune Avenue
Brooklyn NY 11235

**PL, 17FL01, KV1710, CSBP,
TB-693+, 50 Ohm**

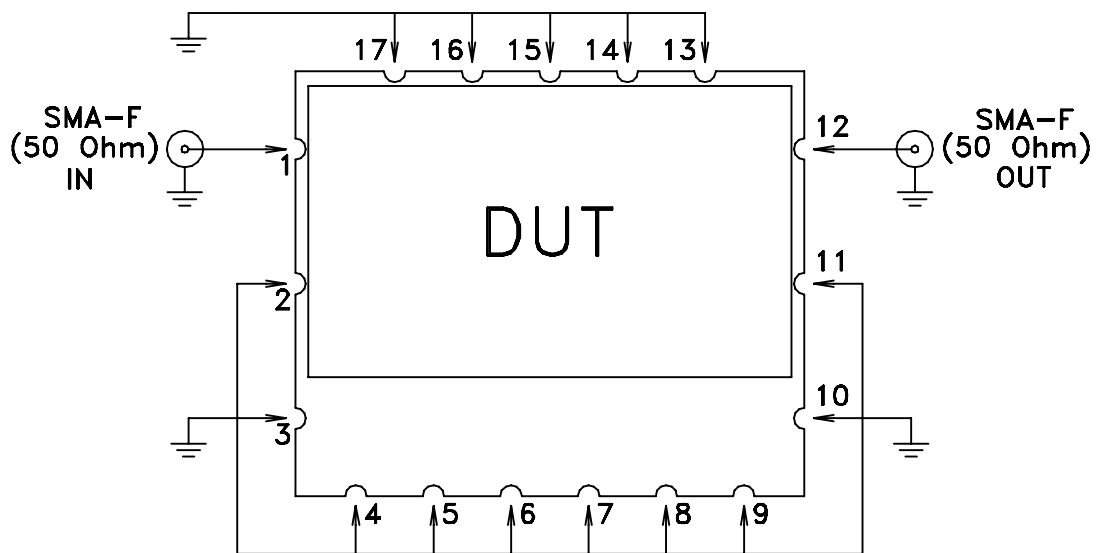
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SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-378	REV: OR
FILE: 98PL378	SCALE: 3:1	SHEET: 1 OF 1	

Evaluation Board and Circuit




TB-693+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: OAK-602 OR Equivalent
Dielectric Constant= 2.50 ± 0.04 , Thickness= $.022$ inch.

 Mini-Circuits®

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