Surface Mount

Bandpass Filter

CBP-670F+

50Ω 645 to 695 MHz

Generic photo used for illustration purposes only

CASE STYLE: KV1710

The Big Deal

- Sharp roll-off
- Low passband Insertion Loss
- Miniature shielded package

Product Overview

CBP-670F+ 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 for use in digital television, point-to-point radio and test and measurements.

Key Features

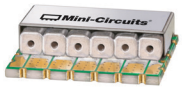
Feature	Advantages
High Selectivity	The CBP-670F+ filter incorporates High-Q ceramic resonators that enables sharp rejection near passband.
Low Passband VSWR	This filter maintains typical VSWR over a wide passband frequency range making this filter easier to integrate into receiver and transmitter RF chains with less concerns for in band frequency ripple.
Rugged construction	The CBP-670F+ 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-670F+

50Ω 645 to 695 MHz



Generic photo used for illustration purposes only
CASE STYLE: KV1710

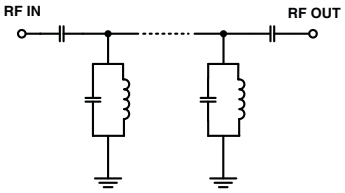
Features

- Sharp roll-off
- Low Passband Insertion loss
- Miniature shielded package

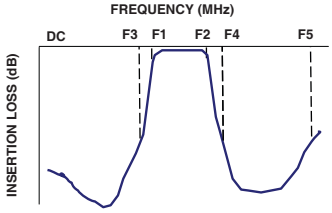
Applications

- Digital television
- Wireless microphones
- Test and measurement
- Point-to-point radio

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

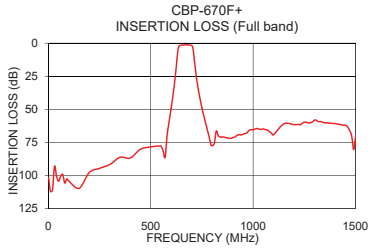
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	-	670	-	MHz
	Insertion Loss	F1-F2	645-695	-	1.9	3.0	dB
	VSWR	F1-F2	645-695	-	1.5	1.9	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC-613	20.0	31.6	-	dB
	VSWR	DC-F3	DC-613	-	20.0	-	:1
Stop Band, Upper	Insertion Loss	F4-F5	728-1500	20.0	29.1	-	dB
	VSWR	F4-F5	728-1500	-	20.0	-	:1

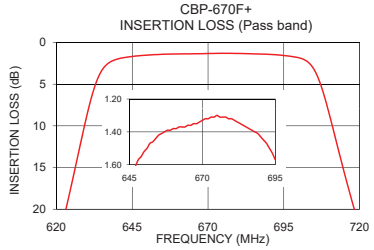
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	5 W max.

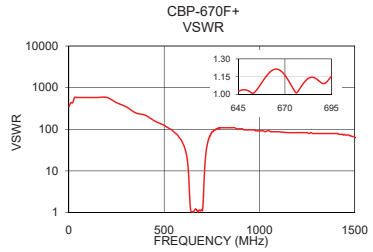
Permanent damage may occur if any of these limits are exceeded.

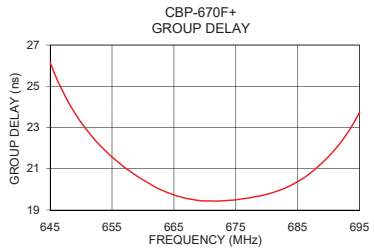
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	101.59	347.44	645	26.16
30	93.10	579.06	647	24.78
100	104.24	579.06	649	23.70
350	86.32	248.17	650	23.25
500	78.50	124.09	652	22.48
613	34.15	29.46	654	21.85
616	30.30	25.56	656	21.32
623	20.20	16.11	658	20.86
635	3.34	1.84	670	19.44
645	1.68	1.03	672	19.43
670	1.33	1.16	674	19.47
695	1.57	1.15	676	19.54
705	3.25	1.98	678	19.64
719	20.93	26.33	680	19.76
728	30.92	46.96	682	19.95
900	71.47	102.19	684	20.21
1000	65.50	91.43	686	20.56
1100	69.33	86.86	688	21.03
1450	62.18	72.39	691	21.93
1500	71.49	64.35	695	23.74







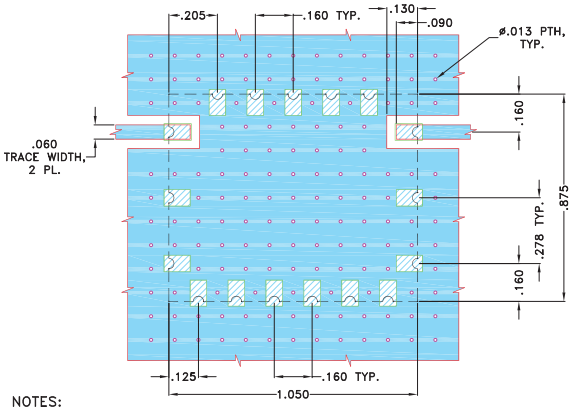


Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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	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)



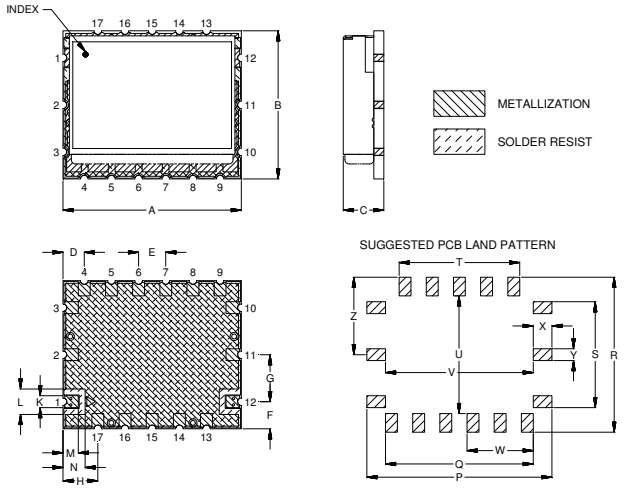
NOTES:

1. 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.
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 SOLDERMASK

Outline Drawing



Outline Dimensions (inch / mm)

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

Band Pass Filter CBP-670F+

Typical Performance Data

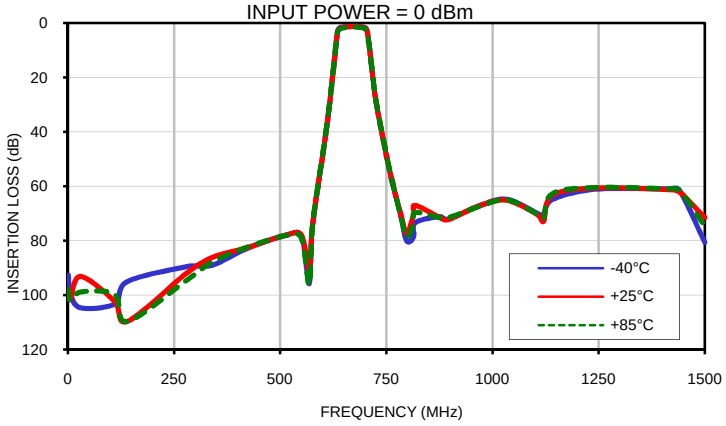
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	92.58	101.59	97.90	0.05	0.05	0.05	0.05	0.05	0.05
6	99.31	101.55	101.87	0.05	0.04	0.05	0.04	0.04	0.04
30	104.57	93.10	98.84	0.04	0.04	0.04	0.03	0.03	0.03
110	103.19	102.25	99.69	0.03	0.03	0.04	0.02	0.03	0.03
140	94.98	109.68	109.71	0.03	0.04	0.04	0.02	0.03	0.03
280	89.49	91.90	94.51	0.04	0.06	0.07	0.03	0.05	0.06
340	88.97	86.15	87.87	0.06	0.08	0.09	0.04	0.06	0.07
425	82.54	82.46	82.28	0.09	0.11	0.13	0.07	0.09	0.11
512	78.05	78.00	78.09	0.14	0.18	0.20	0.12	0.15	0.17
550	78.20	77.92	79.03	0.19	0.23	0.25	0.16	0.20	0.22
568	95.78	90.66	96.21	0.23	0.27	0.30	0.19	0.24	0.26
574	78.28	78.44	78.56	0.24	0.29	0.32	0.21	0.25	0.28
578	72.23	71.92	71.91	0.25	0.30	0.33	0.22	0.27	0.30
588	61.02	60.93	60.74	0.29	0.34	0.38	0.26	0.31	0.34
601	47.82	47.70	47.60	0.38	0.44	0.49	0.34	0.41	0.45
613	34.23	34.15	34.07	0.54	0.63	0.70	0.50	0.59	0.66
616	30.37	30.30	30.21	0.62	0.72	0.80	0.58	0.68	0.76
621	23.32	23.26	23.19	0.82	0.96	1.07	0.79	0.92	1.03
622	21.80	21.75	21.68	0.89	1.04	1.15	0.85	0.99	1.11
623	20.25	20.20	20.14	0.97	1.13	1.26	0.93	1.08	1.21
624	18.66	18.62	18.56	1.07	1.24	1.39	1.03	1.20	1.34
635	3.07	3.34	3.57	9.92	10.59	11.00	9.90	10.59	11.08
638	2.01	2.29	2.52	18.72	19.56	19.62	18.74	19.77	20.15
643	1.53	1.78	1.97	34.18	34.97	32.21	34.97	38.99	35.65
645	1.45	1.68	1.87	34.25	34.97	31.81	34.82	37.19	33.45
647	1.38	1.61	1.78	32.88	33.37	30.62	33.12	34.50	31.72
652	1.26	1.47	1.64	39.93	37.35	33.53	38.89	42.25	39.37
653	1.25	1.46	1.62	42.97	38.03	34.42	41.03	45.79	49.78
661	1.18	1.38	1.53	21.51	21.74	21.58	21.72	21.98	21.85
664	1.18	1.37	1.52	19.86	20.16	19.96	20.16	20.43	20.19
670	1.14	1.33	1.48	21.19	21.59	21.31	22.15	22.49	21.95
672	1.13	1.32	1.46	23.06	23.53	23.27	24.86	25.28	24.51
675	1.11	1.30	1.45	26.89	27.60	27.83	33.67	35.36	33.50
682	1.15	1.34	1.48	23.89	24.26	24.65	23.85	24.31	24.82
691	1.24	1.45	1.60	47.69	43.72	38.55	26.46	27.12	27.85
693	1.28	1.50	1.66	28.60	29.08	30.02	24.62	25.22	26.14
695	1.34	1.57	1.73	23.71	24.19	24.80	22.36	22.89	23.50
701	1.68	1.95	2.13	25.05	24.50	25.32	27.81	26.61	25.68
703	2.06	2.36	2.52	15.90	15.99	17.17	16.34	16.43	17.28
706	3.68	3.97	4.02	6.99	7.32	8.05	7.03	7.38	8.05
710	8.44	8.59	8.43	2.34	2.60	2.95	2.33	2.60	2.93
718	19.69	19.67	19.41	0.61	0.74	0.85	0.60	0.72	0.83
719	20.97	20.93	20.67	0.56	0.67	0.78	0.54	0.66	0.76
728	31.01	30.92	30.67	0.30	0.39	0.45	0.29	0.37	0.43
758	54.43	54.31	54.12	0.16	0.21	0.25	0.14	0.19	0.22
784	70.78	70.16	70.87	0.14	0.19	0.22	0.12	0.16	0.19
798	80.02	77.35	78.67	0.14	0.19	0.22	0.12	0.16	0.19
814	78.54	70.44	73.83	0.14	0.19	0.22	0.12	0.16	0.19
818	73.33	67.02	69.60	0.14	0.19	0.22	0.12	0.16	0.19
875	71.06	71.41	71.48	0.15	0.20	0.23	0.13	0.17	0.19
895	72.02	72.28	71.61	0.16	0.20	0.23	0.13	0.17	0.20
975	66.75	66.82	67.06	0.18	0.22	0.25	0.15	0.19	0.21
1035	64.74	65.19	64.96	0.19	0.24	0.26	0.16	0.19	0.22
1105	69.78	70.33	70.16	0.20	0.24	0.27	0.17	0.20	0.23
1120	70.50	72.90	71.74	0.20	0.24	0.27	0.17	0.21	0.23
1140	64.92	63.43	62.78	0.21	0.25	0.28	0.17	0.21	0.24
1240	61.04	60.64	60.44	0.21	0.25	0.29	0.17	0.21	0.24
1410	60.92	61.20	60.88	0.21	0.26	0.31	0.17	0.22	0.26
1440	61.36	62.10	61.44	0.21	0.27	0.32	0.18	0.24	0.28
1500	80.55	71.49	74.56	0.24	0.31	0.37	0.20	0.27	0.32

Typical Performance Data

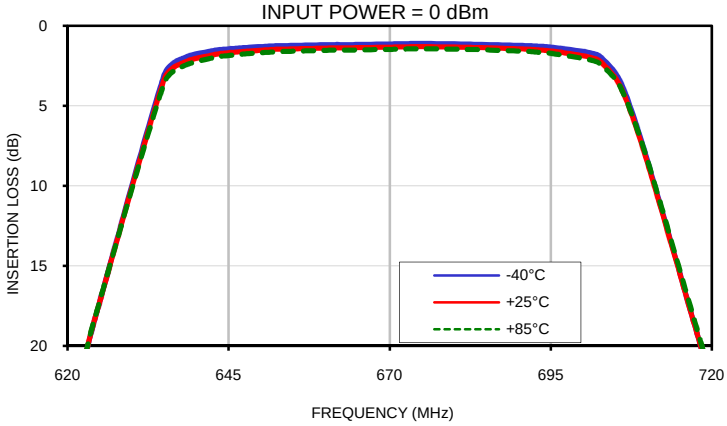
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
645	26.33	26.16	26.01
646	25.57	25.41	25.29
647	24.92	24.78	24.65
648	24.33	24.20	24.09
649	23.82	23.70	23.59
650	23.36	23.25	23.15
651	22.95	22.85	22.75
652	22.57	22.48	22.38
653	22.25	22.15	22.06
654	21.94	21.85	21.77
655	21.66	21.57	21.49
656	21.40	21.32	21.24
657	21.16	21.07	21.00
658	20.94	20.86	20.78
659	20.73	20.65	20.58
660	20.54	20.46	20.38
661	20.36	20.29	20.21
662	20.19	20.11	20.04
663	20.03	19.97	19.89
664	19.91	19.84	19.76
665	19.79	19.73	19.64
666	19.71	19.64	19.56
667	19.62	19.56	19.48
668	19.57	19.51	19.42
669	19.53	19.46	19.38
670	19.50	19.44	19.35
671	19.50	19.44	19.35
672	19.50	19.43	19.35
673	19.51	19.45	19.36
674	19.54	19.47	19.39
675	19.57	19.49	19.41
676	19.61	19.54	19.45
677	19.65	19.58	19.50
678	19.70	19.64	19.55
679	19.77	19.69	19.61
680	19.83	19.76	19.68
681	19.92	19.85	19.76
682	20.02	19.95	19.86
683	20.15	20.07	19.97
684	20.29	20.21	20.11
685	20.45	20.38	20.27
686	20.64	20.56	20.45
687	20.86	20.78	20.66
688	21.11	21.03	20.89
689	21.39	21.30	21.16
690	21.69	21.60	21.45
691	22.02	21.93	21.77
692	22.40	22.30	22.14
693	22.82	22.72	22.54
694	23.30	23.20	23.00
695	23.86	23.74	23.52

Typical Performance Curves

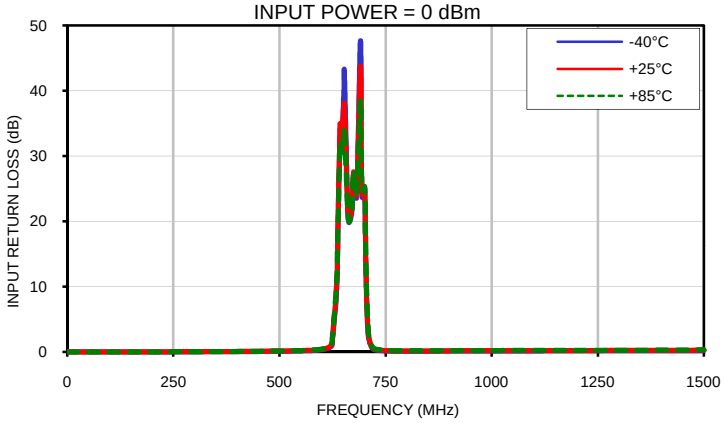
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



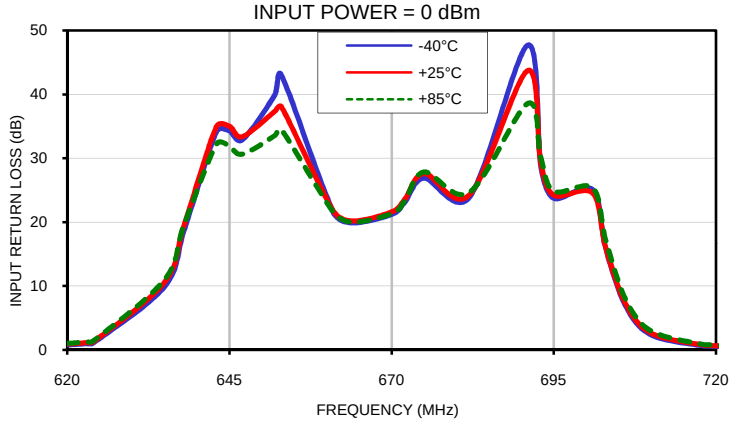
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



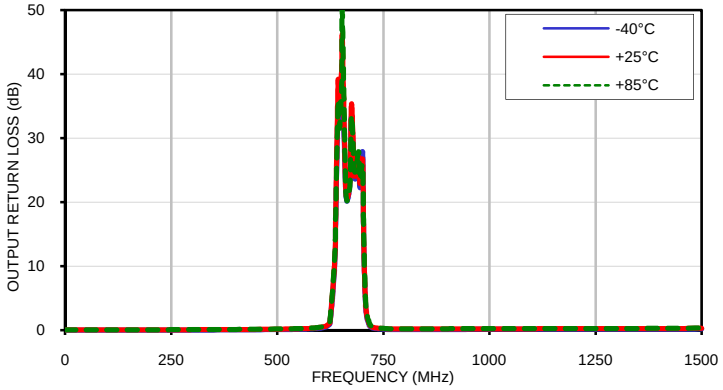
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



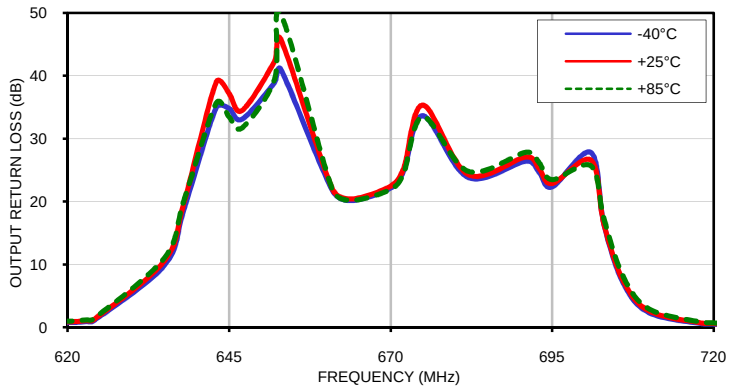
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



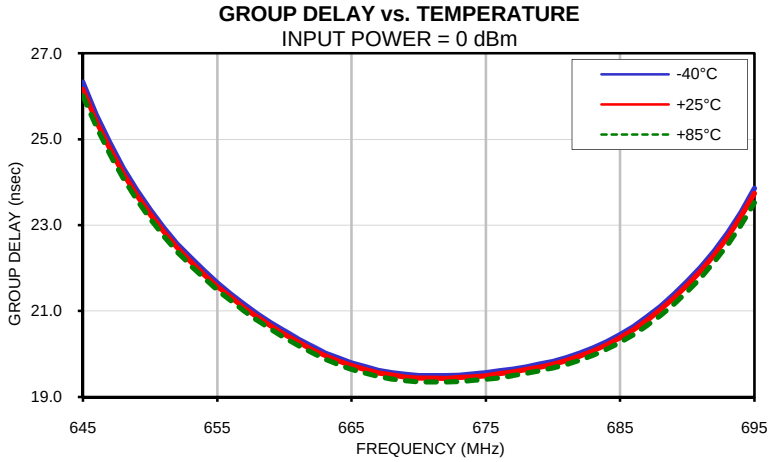
OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



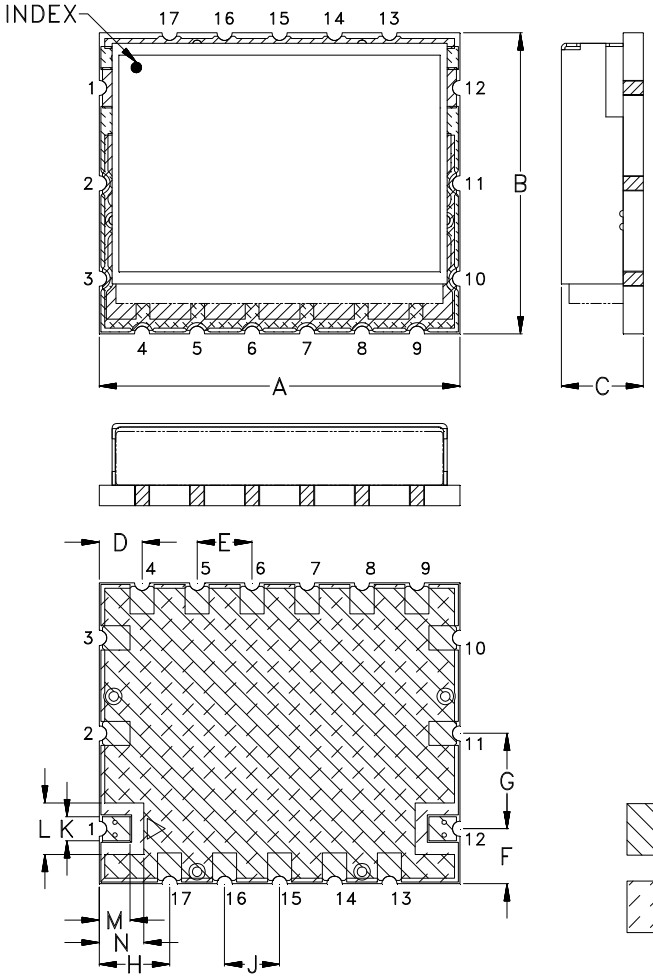
Typical Performance Curves

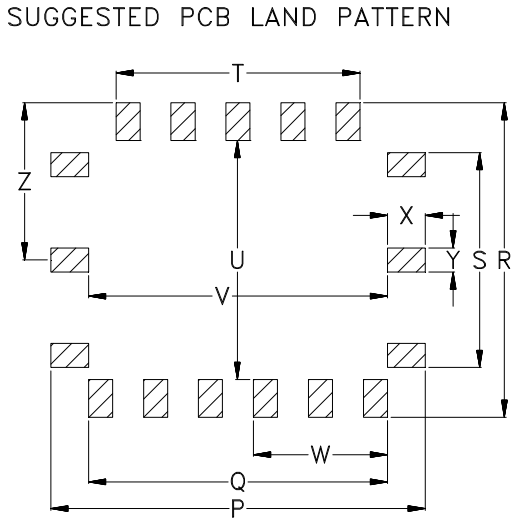


Case Style KV

KV1710

Outline Dimensions





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. ± .03; 3PL. ± .015

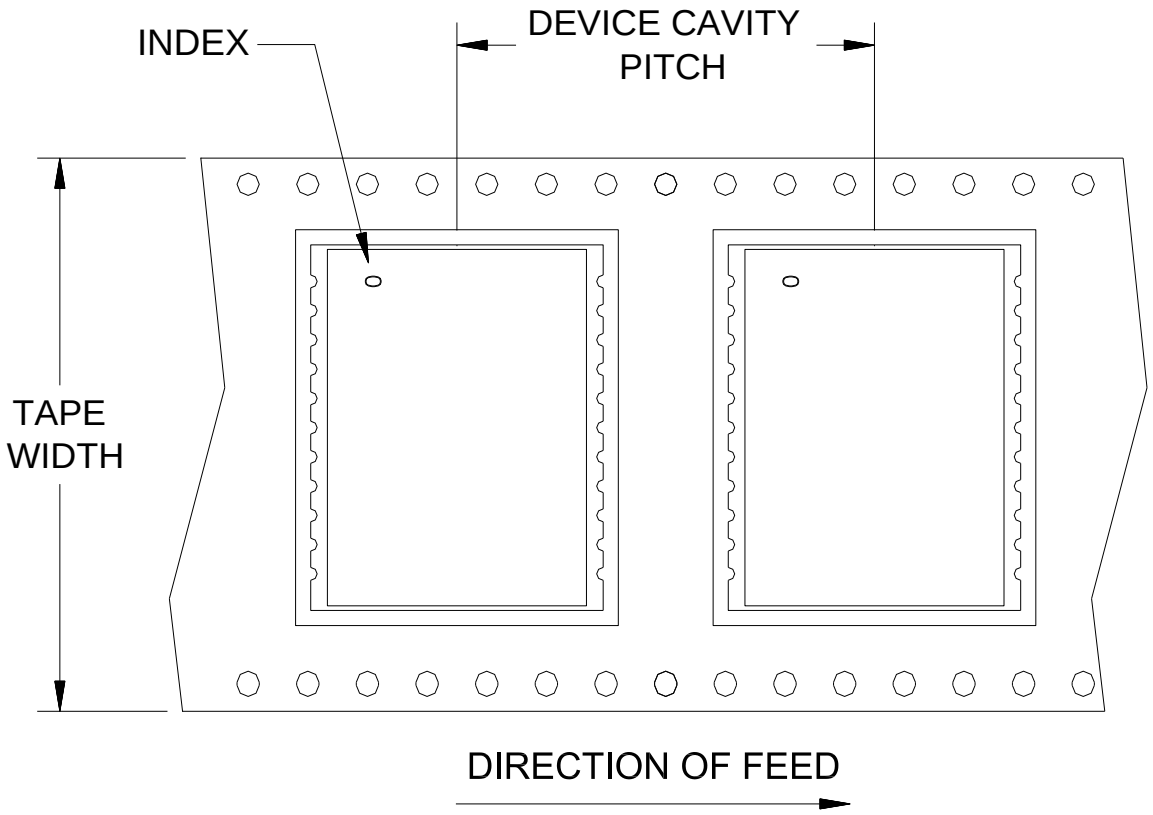
Notes:

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-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

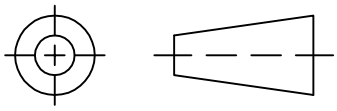
Note: Please consult individual model data sheet to determine device per reel availability.

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

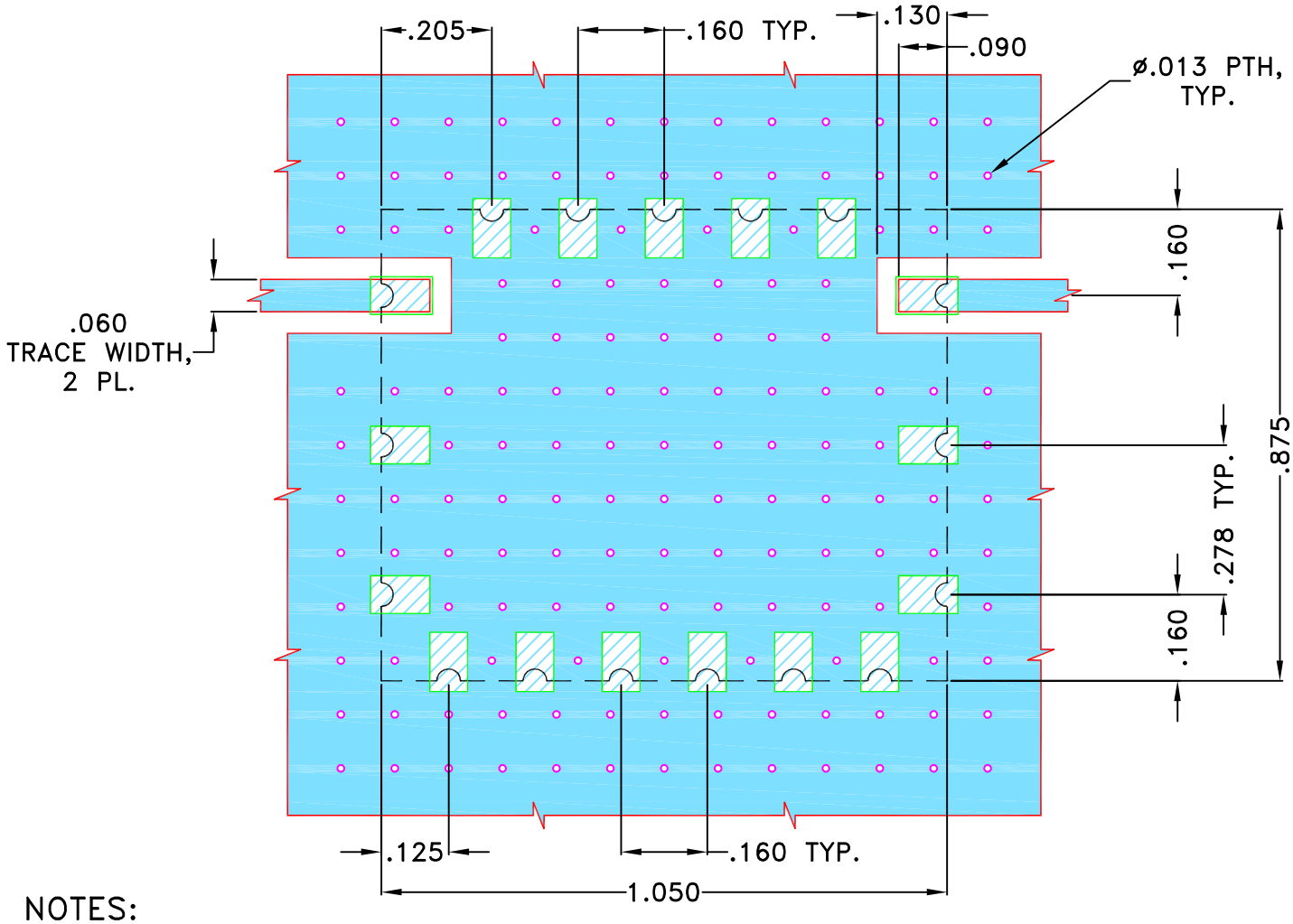
Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

THIRD ANGLE PROJECTION



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

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



NOTES:

1. 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.
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 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 ± .005"	APPROVED	GM	17 JUL 12
3 PL DECIMALS ±			
ANGLES ±			
FRACTIONS ±			

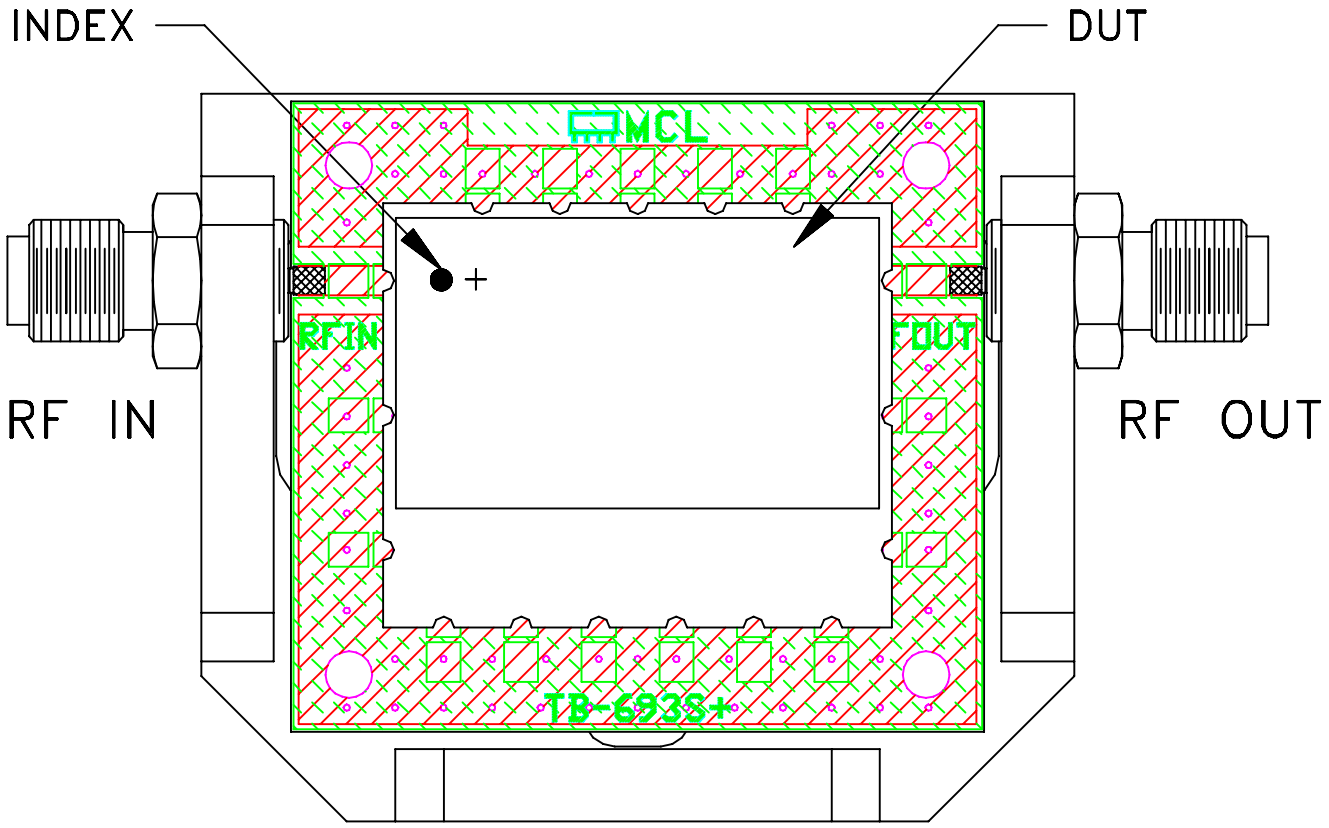
ASHEETA1.DWG REV:A DATE:01/12/95

Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

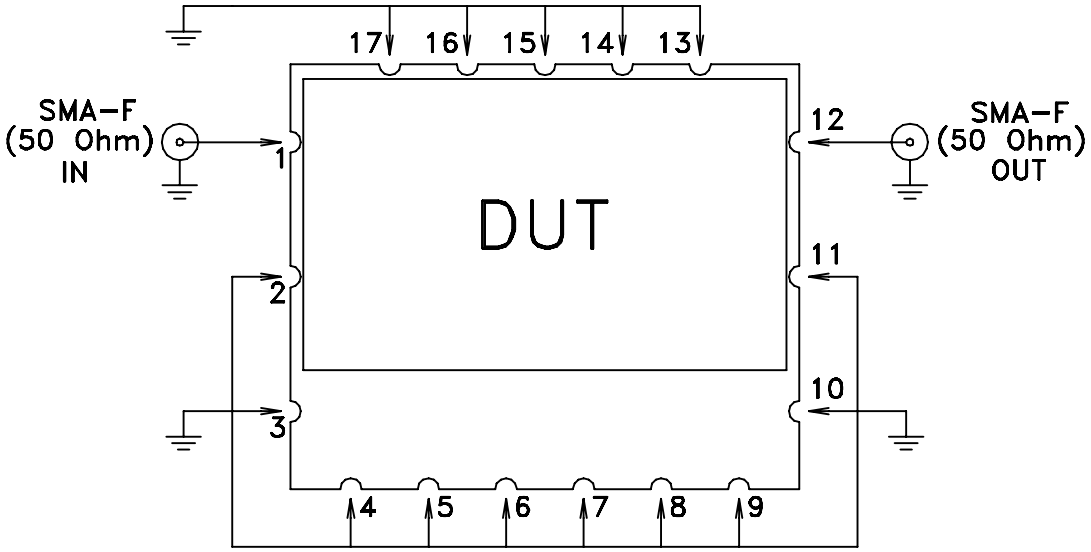
PL, 17FL01, KV1710, CSBP, TB-693+, 50 Ohm

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-378	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±.04, Thickness=.022 inch.

Mini-Circuits®

Mini-Circuits

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