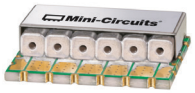
Surface Mount

Bandpass Filter

CBP-1820F+

50Ω 1680 to 1960 MHz



Generic photo used for illustration purposes only
CASE STYLE: KV1710

The Big Deal

- High Q
- Good selectivity
- Low VSWR
- Small shielded package

Product Overview

CBP-1820F+ is a coaxial-ceramic-resonator based bandpass filter in a shielded package fabricated using SMT technology. This filter has low insertion loss with high rejection and low VSWR for use in L-band application, International mobile telecommunications (IMT) and public cellular network.

Key Features

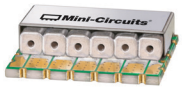
Feature	Advantages
High Q	The CBP-1820F+ filter incorporates High-Q ceramic resonators that enables low insertion loss.
Good selectivity	This filter designed with six pole. So this providing good selectivity in the stopband performance.
Low VSWR	This filter maintains typical VSWR over a passband frequency range.
Rugged construction	The CBP-1820F+ 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-1820F+

50Ω 1680 to 1960 MHz



Generic photo used for illustration purposes only

CASE STYLE: KV1710

Features

- High Q
- Good selectivity
- Low VSWR
- Small shielded package

Applications

- L-band application
- International mobile telecommunications (IMT)
- Public cellular network

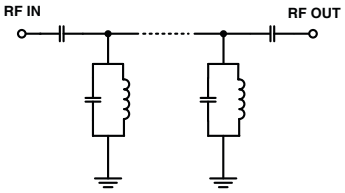
Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	-	1820	-	MHz
	Insertion Loss	F1-F2	1680-1960	-	1.4	2.5	dB
	VSWR	F1-F2	1680-1960	-	1.5	2.3	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC-1510	20	33	-	dB
	VSWR	DC-F3	DC-1510	-	20	-	:1
Stop Band, Upper	Insertion Loss	F4-F5	2170-3000	20	29.5	-	dB
	VSWR	F4-F5	2170-3000	-	20	-	:1

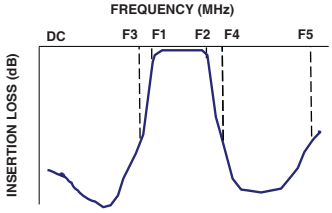
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	1 W max.

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

Functional Schematic



Typical Frequency Response



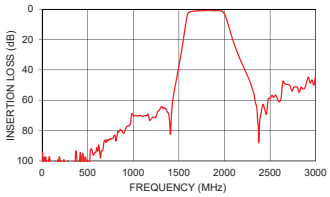
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	99.58	358.95	1680	4.62
100	116.68	353.06	1690	4.45
500	99.80	228.78	1700	4.31
1000	70.32	105.13	1720	4.04
1510	34.24	31.25	1740	3.80
1520	30.83	28.54	1760	3.64
1550	19.74	17.39	1780	3.56
1580	7.58	4.99	1800	3.52
1598	3.03	1.80	1820	3.49
1680	1.18	1.28	1840	3.44
1820	0.85	1.05	1860	3.40
1960	1.15	1.40	1870	3.40
2000	3.16	3.35	1880	3.42
2040	10.12	14.27	1890	3.45
2090	20.03	38.88	1900	3.50
2155	30.65	60.85	1910	3.59
2170	32.86	63.47	1920	3.69
2600	61.14	107.56	1930	3.82
2800	51.54	111.64	1940	3.97
3000	43.97	84.15	1960	4.41

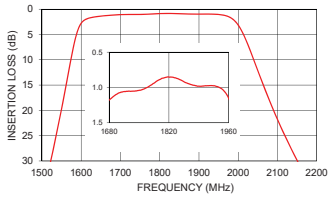
+RoHS Compliant

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

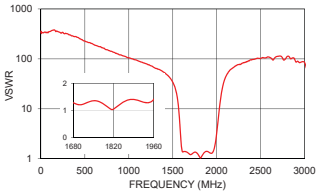
CBP-1820F+
INSERTION LOSS (Full band)



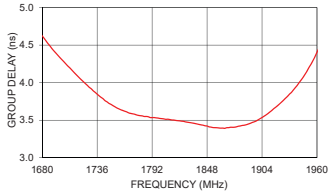
CBP-1820F+
INSERTION LOSS (Pass band)



CBP-1820F+
VSWR



CBP-1820F+
GROUP DELAY



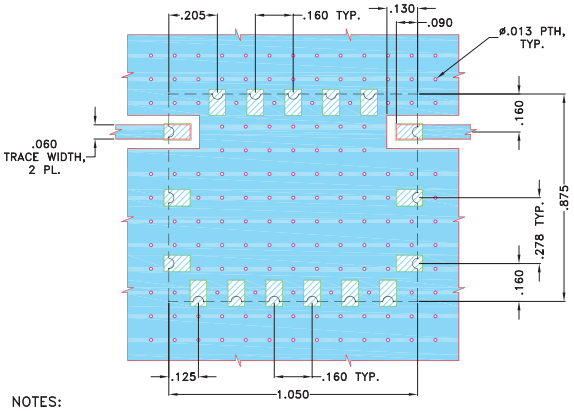
Notes

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	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)



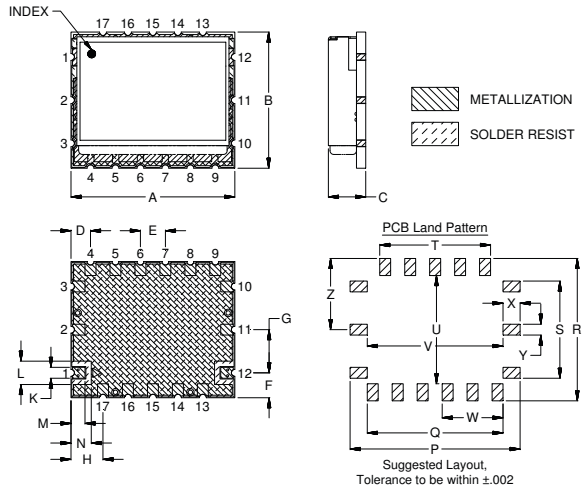
NOTES:

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.

Surface Mount Band Pass Filter CBP-1820F+

Typical Performance Data

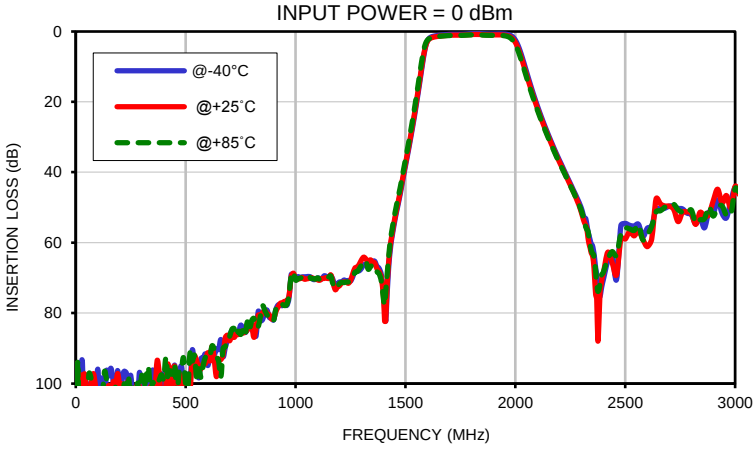
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	107.73	99.58	109.32	0.05	0.05	0.05	0.05	0.05	0.05
10	105.25	103.79	96.21	0.05	0.05	0.06	0.05	0.05	0.05
50	104.82	102.87	105.80	0.05	0.05	0.05	0.05	0.05	0.05
100	95.92	116.68	101.76	0.05	0.05	0.06	0.04	0.05	0.05
500	97.30	99.80	100.41	0.06	0.09	0.10	0.05	0.08	0.08
750	83.43	85.18	86.09	0.09	0.14	0.15	0.07	0.11	0.13
900	81.95	81.64	82.13	0.12	0.17	0.19	0.10	0.14	0.16
950	76.88	76.66	77.87	0.13	0.18	0.20	0.11	0.15	0.17
1000	70.28	70.32	70.63	0.14	0.19	0.21	0.12	0.17	0.18
1200	71.16	72.23	71.58	0.19	0.25	0.27	0.16	0.22	0.23
1300	67.26	64.86	66.38	0.23	0.30	0.32	0.21	0.27	0.28
1400	74.32	75.46	76.23	0.28	0.37	0.40	0.25	0.32	0.35
1500	38.12	37.49	36.34	0.42	0.55	0.60	0.41	0.51	0.58
1510	34.86	34.24	33.02	0.45	0.60	0.65	0.44	0.56	0.63
1520	31.48	30.83	29.56	0.49	0.65	0.71	0.48	0.61	0.70
1530	27.98	27.31	25.98	0.54	0.72	0.79	0.54	0.69	0.81
1540	24.33	23.63	22.21	0.61	0.82	0.92	0.63	0.81	0.96
1550	20.46	19.74	18.24	0.73	0.97	1.12	0.78	1.00	1.22
1560	16.47	15.68	14.09	0.94	1.25	1.50	1.04	1.34	1.69
1570	12.28	11.55	9.94	1.33	1.78	2.29	1.54	2.02	2.69
1580	8.14	7.58	6.21	2.24	2.96	4.07	2.68	3.53	4.95
1590	4.71	4.50	3.66	4.31	5.42	7.50	5.27	6.75	9.66
1600	2.67	2.79	2.46	7.85	9.12	11.88	9.96	12.06	16.76
1610	1.82	2.08	2.00	11.45	12.38	14.83	14.51	15.98	18.42
1620	1.49	1.77	1.77	13.52	14.22	16.36	15.25	15.89	17.10
1630	1.32	1.60	1.62	14.66	15.36	17.72	15.00	15.56	17.02
1640	1.21	1.47	1.51	15.47	16.17	18.88	15.04	15.63	17.50
1650	1.12	1.38	1.42	15.98	16.62	19.48	15.23	15.88	18.10
1660	1.05	1.30	1.35	16.32	16.93	19.79	15.56	16.32	18.81
1670	1.00	1.24	1.29	16.72	17.34	20.12	16.16	17.06	19.83
1680	0.94	1.18	1.24	17.38	17.98	20.62	17.09	18.18	21.13
1700	0.84	1.09	1.17	18.68	18.94	20.47	19.27	20.39	22.08
1800	0.66	0.88	0.98	21.82	23.03	24.70	22.56	24.51	28.00
1820	0.61	0.85	0.98	29.61	28.52	23.91	31.37	31.85	25.53
1900	0.75	0.98	1.11	14.95	15.64	16.04	15.05	15.79	16.17
1960	0.82	1.15	1.36	15.98	15.72	15.25	15.77	15.49	15.21
2000	2.47	3.16	3.73	5.81	5.54	5.13	5.66	5.34	4.96
2020	5.29	6.17	6.90	2.54	2.58	2.48	2.46	2.46	2.36
2040	9.23	10.12	10.86	1.12	1.29	1.33	1.08	1.22	1.25
2060	13.43	14.24	14.91	0.58	0.77	0.85	0.56	0.72	0.78
2080	17.44	18.17	18.75	0.36	0.54	0.62	0.35	0.51	0.57
2090	19.34	20.03	20.58	0.31	0.47	0.56	0.29	0.45	0.51
2100	21.17	21.82	22.34	0.27	0.43	0.51	0.25	0.40	0.46
2120	24.62	25.22	25.67	0.22	0.36	0.44	0.21	0.34	0.40
2140	27.86	28.41	28.80	0.19	0.32	0.39	0.18	0.31	0.36
2150	29.39	29.91	30.29	0.18	0.30	0.37	0.17	0.29	0.34
2155	30.15	30.65	31.02	0.17	0.30	0.37	0.16	0.29	0.33
2160	30.89	31.40	31.74	0.17	0.29	0.36	0.16	0.28	0.32
2170	32.37	32.86	33.17	0.17	0.29	0.35	0.15	0.27	0.31
2200	36.57	37.05	37.32	0.15	0.26	0.32	0.14	0.25	0.29
2250	43.24	43.69	43.83	0.14	0.24	0.29	0.13	0.23	0.25
2300	50.22	51.42	50.95	0.12	0.22	0.26	0.11	0.21	0.24
2350	60.75	63.58	63.01	0.12	0.21	0.25	0.10	0.20	0.22
2400	70.52	68.78	68.41	0.11	0.20	0.23	0.08	0.18	0.21
2500	54.55	58.96	55.89	0.08	0.19	0.22	0.07	0.17	0.20
2600	55.88	61.14	57.77	0.06	0.16	0.19	0.06	0.16	0.20
2700	49.62	49.64	49.09	0.05	0.17	0.18	0.05	0.15	0.20
2800	52.01	51.54	50.70	0.02	0.16	0.17	0.05	0.16	0.21
2900	51.97	48.12	52.46	0.03	0.19	0.18	0.08	0.20	0.27
3000	44.25	43.97	44.59	0.06	0.26	0.27	0.08	0.21	0.31

Typical Performance Data

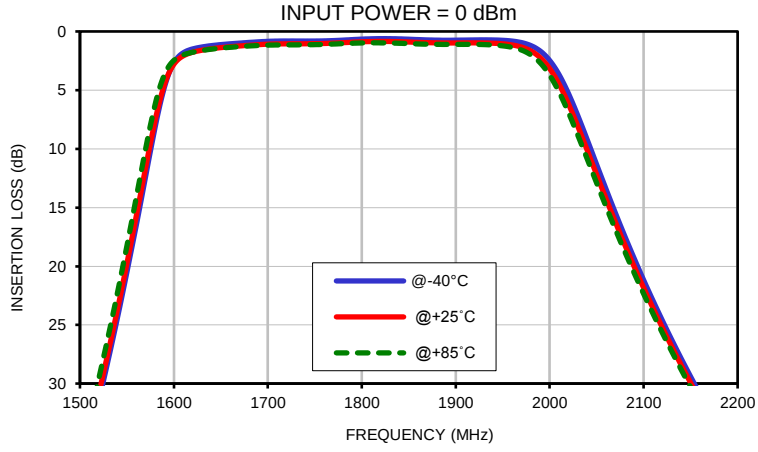
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
1680	4.67	4.62	4.54
1684	4.60	4.55	4.48
1688	4.53	4.49	4.41
1692	4.47	4.42	4.35
1696	4.41	4.36	4.29
1700	4.35	4.31	4.23
1704	4.30	4.25	4.18
1708	4.24	4.20	4.12
1712	4.19	4.14	4.08
1716	4.13	4.09	4.02
1720	4.08	4.04	3.97
1724	4.03	3.99	3.93
1728	3.98	3.94	3.88
1732	3.93	3.89	3.84
1736	3.88	3.85	3.79
1740	3.84	3.80	3.75
1744	3.79	3.76	3.72
1748	3.75	3.72	3.69
1752	3.72	3.69	3.66
1756	3.68	3.66	3.63
1760	3.66	3.64	3.61
1764	3.63	3.62	3.60
1768	3.61	3.60	3.58
1772	3.60	3.59	3.57
1776	3.58	3.57	3.56
1780	3.57	3.56	3.55
1784	3.56	3.55	3.54
1788	3.56	3.55	3.53
1792	3.55	3.53	3.52
1796	3.55	3.53	3.51
1800	3.54	3.52	3.50
1804	3.53	3.52	3.50
1808	3.53	3.51	3.49
1812	3.52	3.50	3.48
1816	3.52	3.50	3.47
1820	3.51	3.49	3.46
1824	3.50	3.48	3.45
1828	3.50	3.47	3.44
1832	3.49	3.46	3.43
1836	3.47	3.45	3.42
1840	3.46	3.44	3.41
1844	3.45	3.43	3.40
1848	3.44	3.42	3.39
1852	3.42	3.41	3.38
1856	3.41	3.40	3.38
1860	3.41	3.40	3.38
1864	3.40	3.40	3.38
1868	3.41	3.40	3.38
1878	3.41	3.41	3.41
1900	3.49	3.50	3.52
1910	3.58	3.59	3.61
1914	3.61	3.63	3.65
1916	3.63	3.65	3.68
1920	3.68	3.69	3.72
1922	3.70	3.72	3.75
1930	3.79	3.82	3.85
1936	3.87	3.90	3.94
1940	3.94	3.97	4.01
1950	4.11	4.16	4.21
1960	4.35	4.41	4.47

Typical Performance Curves

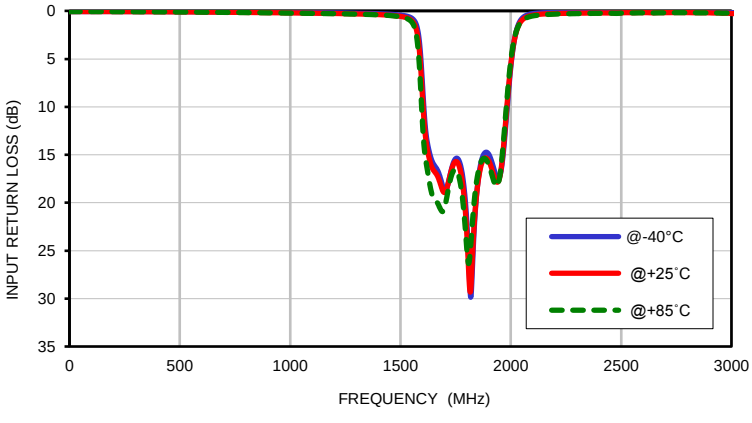
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



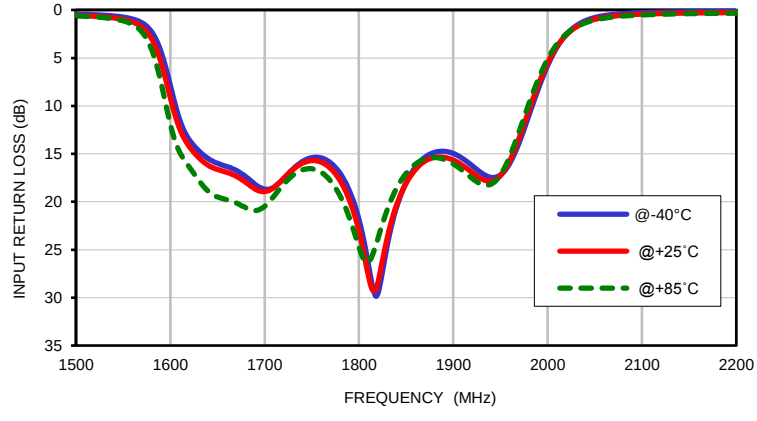
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



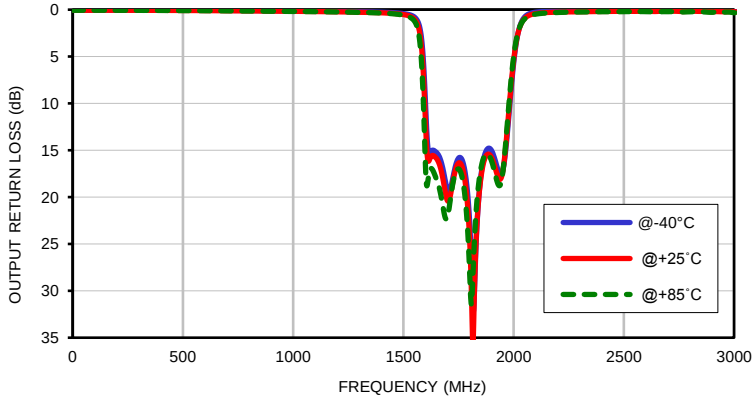
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



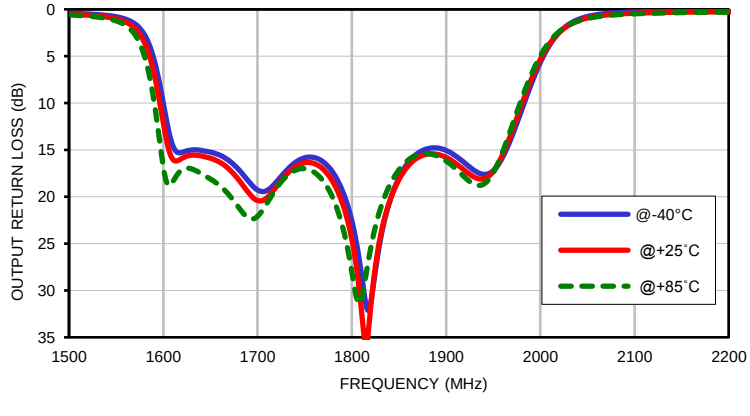
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



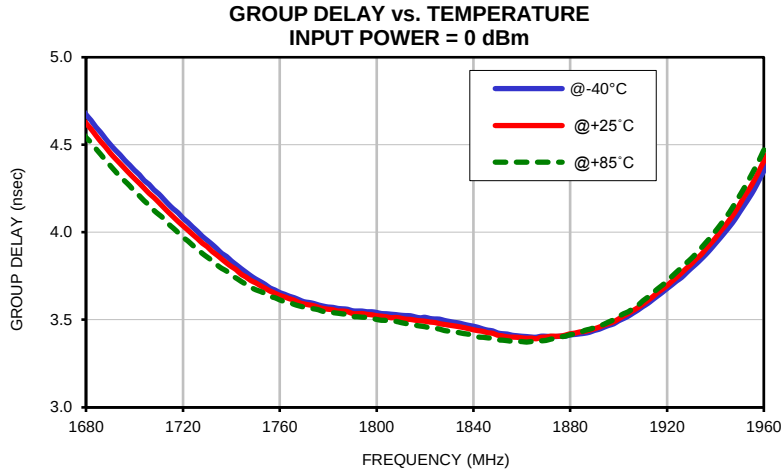
OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



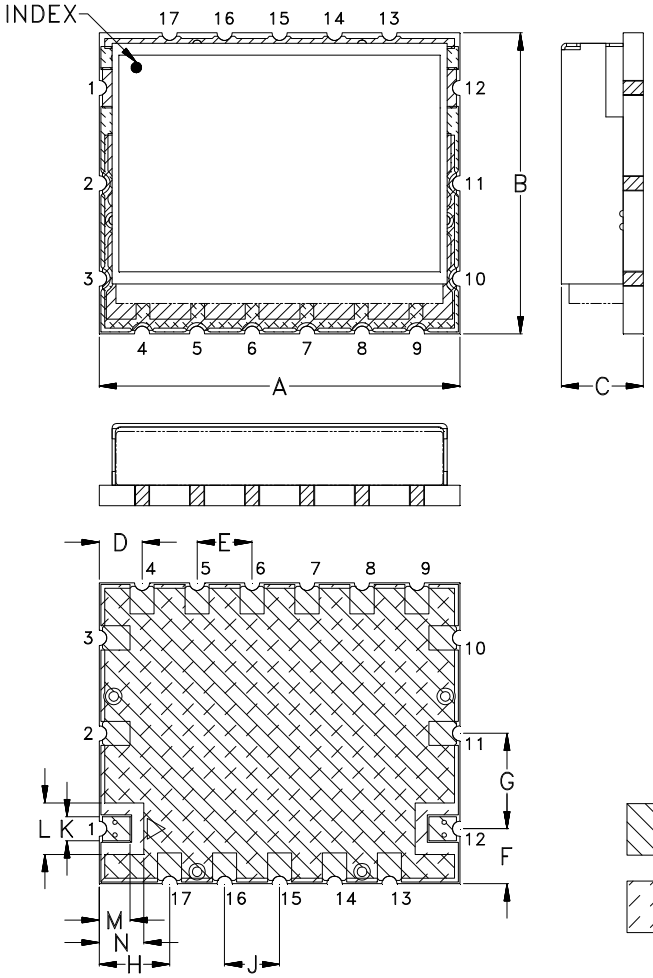
Typical Performance Curves

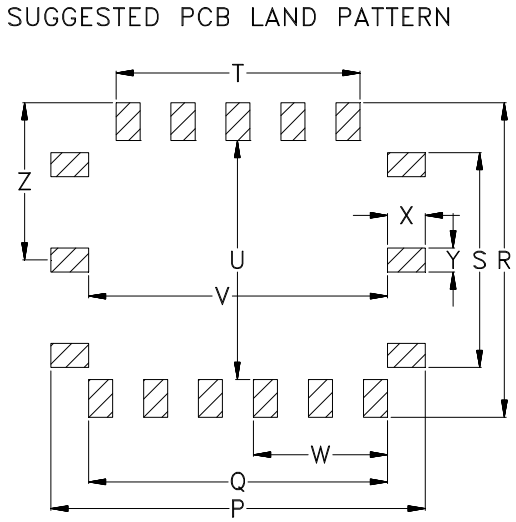


Case Style KV

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

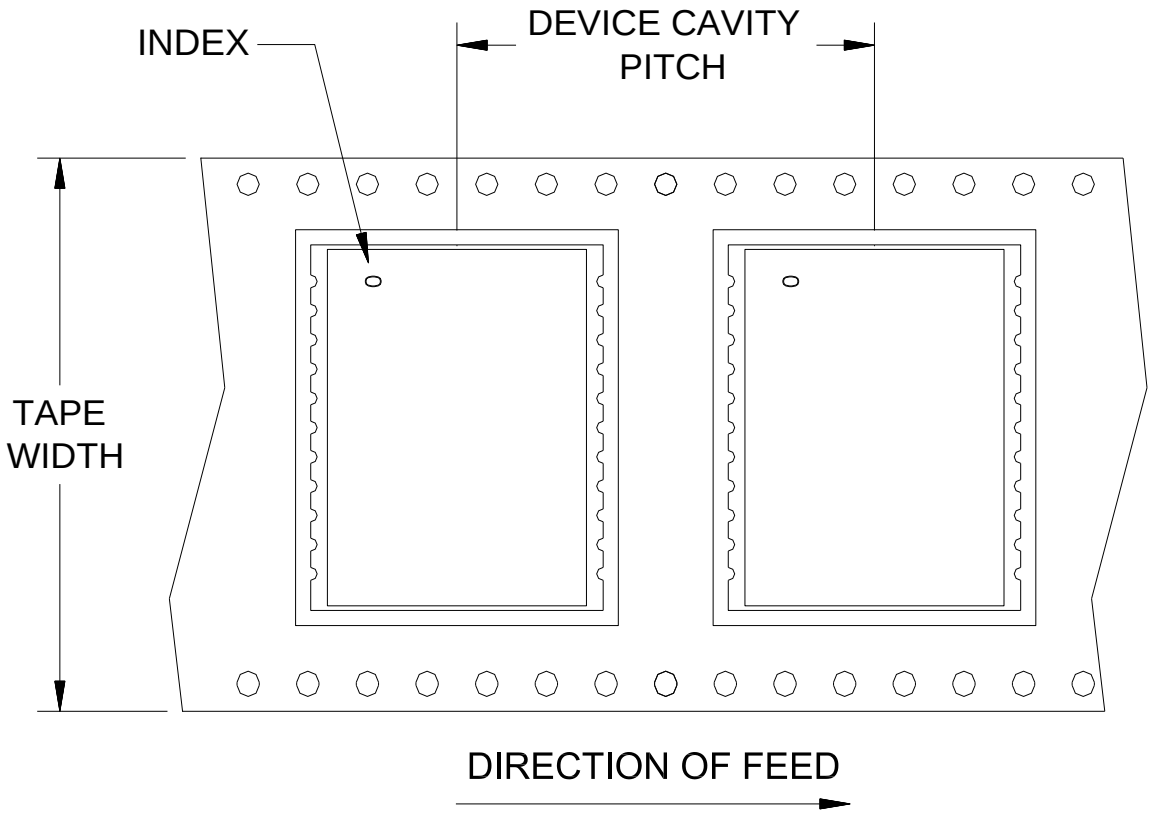
Notes:

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®
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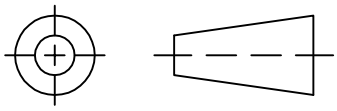
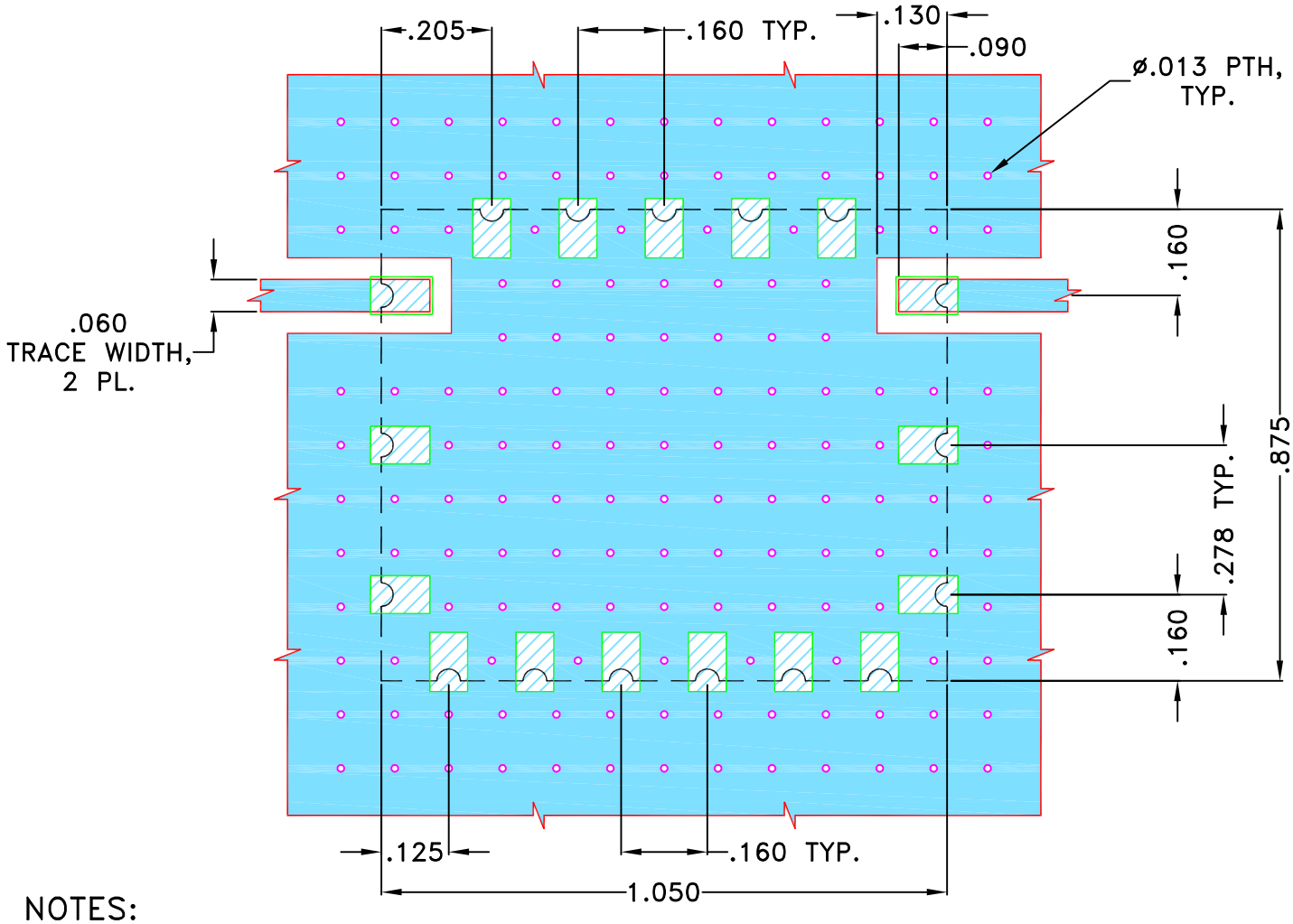
THIRD ANGLE PROJECTION



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 ±			

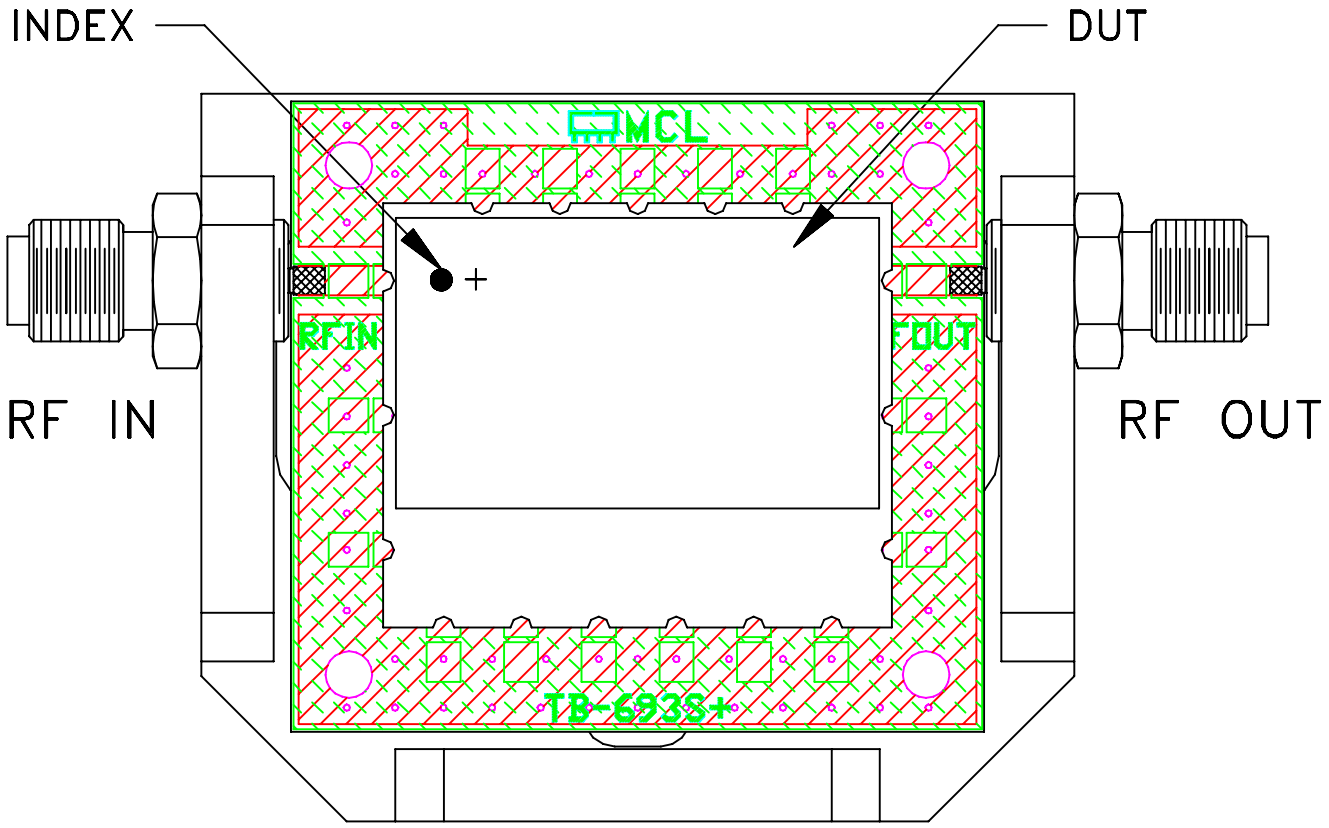
ASHEETA1.DWG REV:A DATE:01/12/95

Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

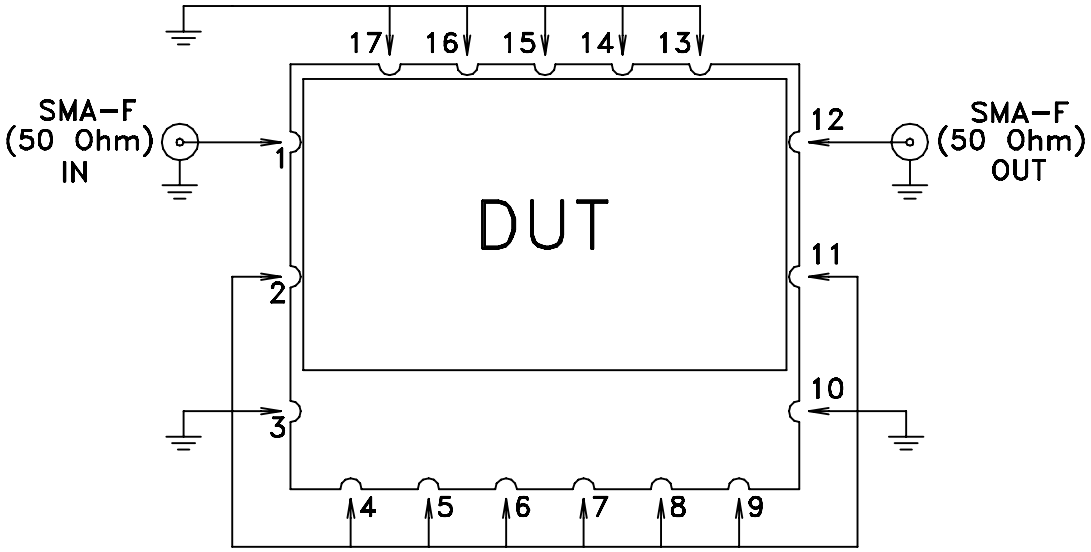
PL, 17FL01, KV1710, CSBP, TB-693+, 50 Ohm

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®

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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