

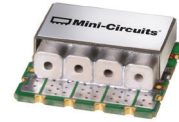
# Surface Mount Bandpass Filter

## CBP-1090C+

50Ω 1060 to 1120 MHz

### The Big Deal

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



Generic photo used for illustration purposes only  
CASE STYLE: MP1766

### Product Overview

CBP-1090C+ 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, mobile radio, broadband and fixed wireless.

### Key Features

Feature	Advantages
High Selectivity	The CBP-1090C+ filter incorporates High-Q ceramic resonators that enables sharp rejection near passband.
Low Passband VSWR	This filter maintains typical VSWR over a narrow 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-1090C+ has been qualified over wide range of thermal, mechanical and environmental conditions including withstanding the stress of extensive solder reflow cycles.

#### Notes

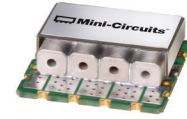
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# Surface Mount Bandpass Filter

## CBP-1090C+

50Ω 1060 to 1120 MHz



Generic photo used for illustration purposes only  
CASE STYLE: MP1766

### Features

- Low Insertion loss
- High selectivity
- Miniature shielded package

### Applications

- Traffic collision avoidance system (TCAS)
- Aeronautical radio navigation
- Fixed satellite
- Radio astronomy
- Radar and navigation system

### Electrical Specifications at 25°C

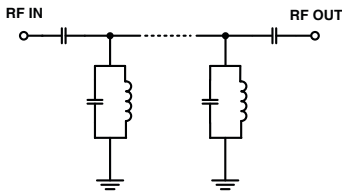
Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit	
Pass Band	Center Frequency	—	—	1090	—	MHz	
	Insertion Loss	F1-F2	1060-1120	—	1.0	2	dB
	VSWR	F1-F2	1060-1120	—	1.2	—	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC-955	20	30	—	dB
	VSWR	DC-F3	DC-955	—	20	—	:1
Stop Band, Upper	Insertion Loss	F4-F5	1255-2200	20	30	—	dB
	VSWR	F4-F5	1255-2200	—	20	—	:1

### Maximum Ratings

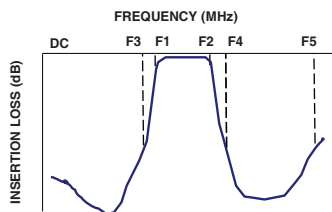
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	5W

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

### Functional Schematic



### Typical Frequency Response

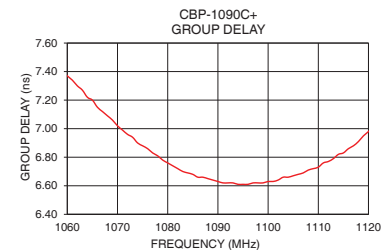
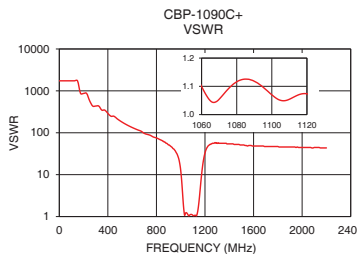
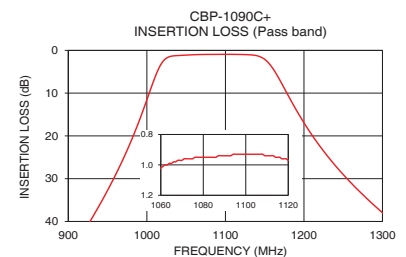
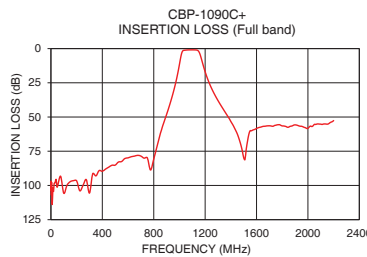


### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	103.40	1737.18	1060	7.37
885	52.26	56.04	1064	7.22
955	30.97	36.97	1069	7.06
995	14.13	16.26	1072	6.96
1010	6.46	5.93	1076	6.86
1020	2.70	2.28	1078	6.81
1032	1.33	1.07	1080	6.76
1060	1.02	1.10	1082	6.72
1080	0.95	1.12	1086	6.66
1090	0.94	1.12	1088	6.65
1105	0.93	1.05	1090	6.63
1120	0.97	1.07	1092	6.62
1150	2.10	2.21	1095	6.61
1163	4.97	5.47	1097	6.62
1180	10.58	15.96	1100	6.63
1215	21.07	43.44	1103	6.66
1255	30.04	54.29	1106	6.68
1440	60.22	52.65	1110	6.73
1800	56.51	46.96	1115	6.83
2200	52.62	43.44	1120	6.98

### +RoHS Compliant

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



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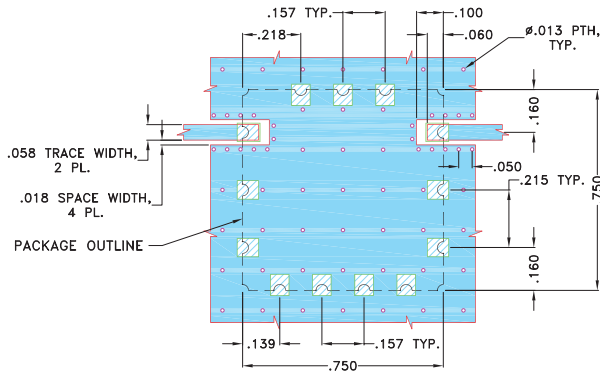
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REV. B  
M174392  
CBP-1090C+  
EDU1780  
URJ  
200806  
Page 2 of 3

## Pad Connections

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

**Demo Board MCL P/N: TB-684+**  
**Suggested PCB Layout (PL-373)**

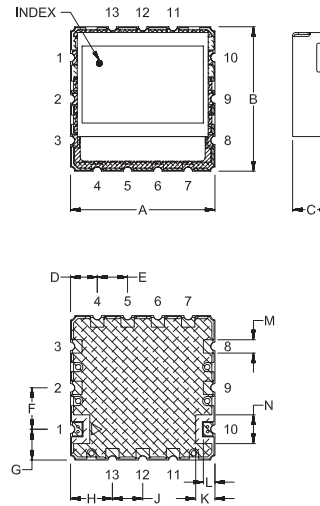


### NOTES:

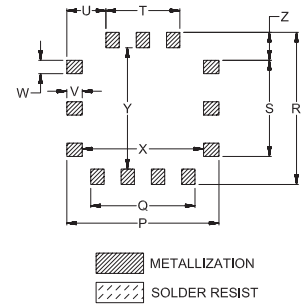
- TRACE WIDTH IS SHOWN FOR OAK (OAK-602) WITH DIELECTRIC THICKNESS .022"±.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

## Outline Drawing



## PCB Land Pattern



## Outline Dimensions (inch)

A	B	C	D	E	F	G	H	J	K	L	M	N
.750	.750	.210	.139	.157	.215	.160	.218	.157	.100	.060	.069	.149
19.05	19.05	5.33	3.53	3.99	5.46	4.06	5.54	3.99	2.54	1.52	1.75	3.78
P	Q	R	S	T	U	V	W	X	Y	Z	wt.	
.790	.541	.790	.499	.384	.203	.080	.069	.630	.630	.145	grams	
20.07	13.74	20.07	12.67	9.75	5.16	2.03	1.75	16.00	16.00	3.68	4.6	

Note: Please refer to case style drawing for details

### Notes

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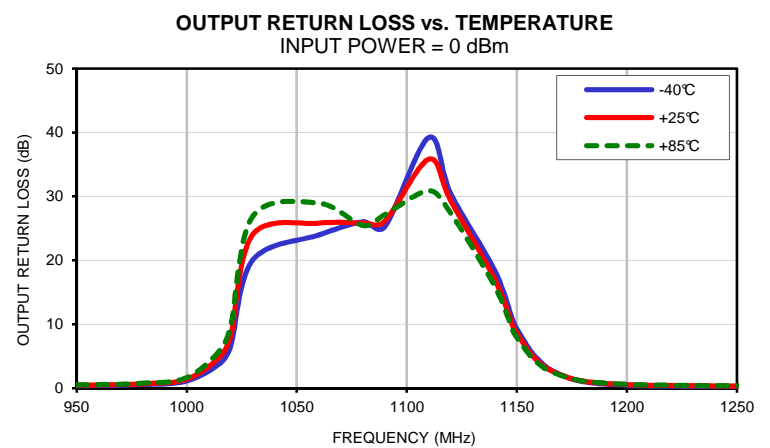
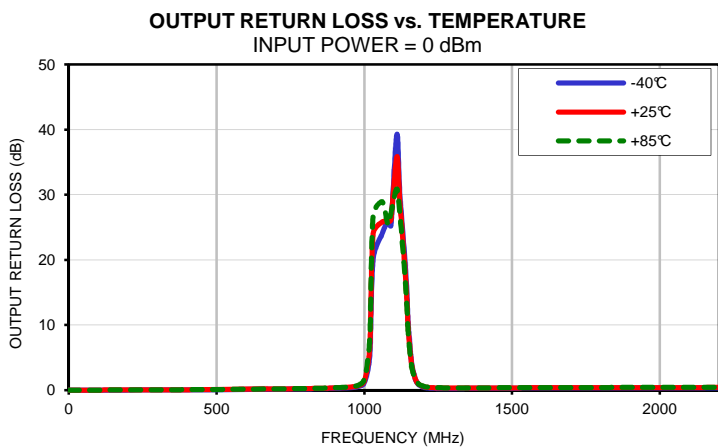
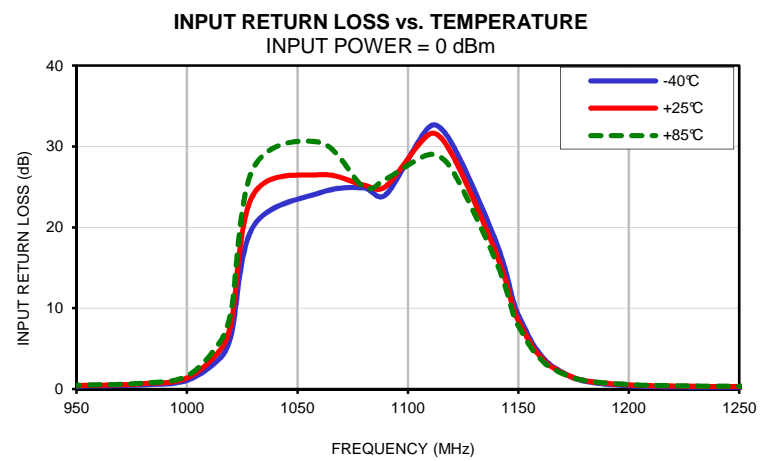
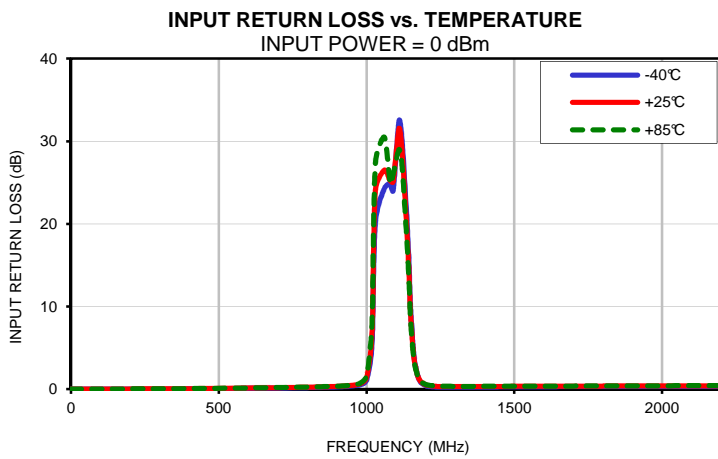
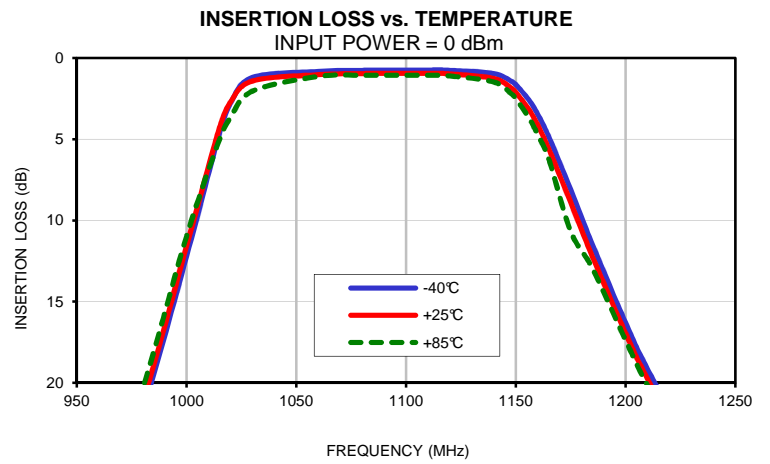
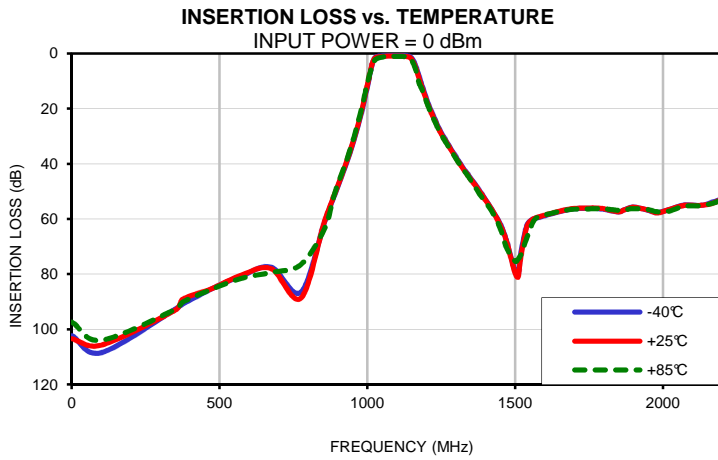
*Typical Performance Data*

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	102.29	103.40	97.38	0.00	0.00	0.00	0.00	0.00	0.00
100	108.46	105.75	103.97	0.00	0.01	0.01	0.00	0.01	0.01
350	92.74	93.08	92.81	0.02	0.05	0.05	0.03	0.05	0.05
375	90.93	89.13	90.19	0.03	0.05	0.06	0.03	0.05	0.06
475	85.27	85.22	85.41	0.05	0.08	0.09	0.05	0.08	0.09
575	80.64	80.32	81.48	0.08	0.12	0.13	0.08	0.12	0.13
675	77.48	78.00	79.39	0.12	0.16	0.18	0.13	0.16	0.17
775	86.58	88.75	76.58	0.16	0.22	0.24	0.18	0.22	0.23
855	61.37	60.98	63.63	0.22	0.28	0.30	0.23	0.28	0.30
890	51.24	50.87	50.56	0.25	0.32	0.34	0.27	0.33	0.35
925	41.21	40.81	40.36	0.31	0.38	0.41	0.32	0.39	0.41
955	31.44	30.97	30.37	0.39	0.47	0.52	0.40	0.48	0.53
980	21.72	21.17	20.36	0.54	0.67	0.75	0.56	0.68	0.76
1000	12.20	11.57	10.96	1.09	1.38	1.63	1.11	1.39	1.64
1015	4.61	4.28	5.00	3.85	4.85	5.85	3.86	4.87	5.87
1020	2.78	2.70	3.65	6.64	8.18	9.71	6.65	8.22	9.76
1030	1.19	1.41	2.03	20.10	24.06	27.31	20.05	24.02	26.88
1060	0.82	1.02	1.13	24.26	26.50	30.51	23.96	25.80	28.94
1080	0.75	0.95	1.06	24.88	25.22	24.99	26.04	25.86	25.47
1090	0.74	0.94	1.05	24.04	25.08	25.98	25.27	26.13	27.15
1110	0.73	0.94	1.06	32.49	31.55	29.01	39.22	35.82	30.89
1120	0.75	0.97	1.10	30.32	29.01	27.11	30.40	29.27	27.33
1140	0.95	1.25	1.47	18.17	16.78	15.72	18.34	16.96	15.89
1148	1.43	1.85	2.20	10.59	9.75	9.03	10.69	9.86	9.14
1150	1.64	2.10	2.49	9.19	8.46	7.82	9.27	8.56	7.91
1156	2.57	3.17	3.68	5.87	5.43	5.02	5.93	5.51	5.09
1160	3.46	4.13	4.71	4.29	4.02	3.74	4.35	4.08	3.79
1165	4.83	5.58	6.20	2.90	2.77	2.61	2.94	2.82	2.66
1175	8.10	8.88	10.66	1.39	1.43	1.41	1.42	1.47	1.44
1185	11.51	12.25	12.97	0.77	0.86	0.88	0.79	0.89	0.91
1200	16.29	16.93	17.37	0.42	0.53	0.57	0.44	0.55	0.59
1210	19.15	19.75	20.15	0.33	0.43	0.48	0.35	0.45	0.49
1235	25.38	25.86	26.20	0.25	0.34	0.38	0.27	0.36	0.39
1255	29.60	30.04	30.34	0.23	0.32	0.35	0.25	0.33	0.36
1315	40.02	40.36	40.58	0.23	0.31	0.33	0.25	0.31	0.34
1345	44.55	44.87	45.09	0.24	0.31	0.33	0.26	0.32	0.34
1380	49.74	50.03	50.97	0.24	0.32	0.34	0.27	0.33	0.35
1420	56.27	56.44	56.98	0.25	0.32	0.34	0.28	0.33	0.35
1450	61.94	62.28	63.44	0.26	0.33	0.35	0.28	0.34	0.36
1470	67.51	67.80	70.15	0.26	0.33	0.35	0.29	0.34	0.36
1500	79.04	79.70	75.30	0.27	0.34	0.35	0.30	0.35	0.37
1510	80.60	81.08	74.54	0.27	0.34	0.36	0.30	0.35	0.37
1520	72.11	73.43	72.98	0.28	0.34	0.36	0.30	0.35	0.37
1540	62.27	62.69	66.82	0.29	0.35	0.37	0.31	0.36	0.38
1560	60.08	60.08	61.34	0.29	0.35	0.37	0.31	0.36	0.38
1580	59.44	59.24	59.20	0.29	0.35	0.37	0.32	0.37	0.38
1680	56.63	56.50	56.69	0.30	0.36	0.37	0.33	0.38	0.39
1750	56.18	56.01	56.36	0.31	0.37	0.39	0.34	0.38	0.40
1790	56.35	56.13	56.21	0.31	0.37	0.39	0.34	0.39	0.40
1810	56.70	56.53	56.42	0.31	0.38	0.39	0.34	0.39	0.40
1850	57.42	57.39	56.89	0.31	0.38	0.40	0.34	0.39	0.41
1870	56.66	56.67	56.77	0.31	0.38	0.39	0.35	0.39	0.41
1900	55.71	55.75	56.23	0.31	0.38	0.40	0.34	0.40	0.41
1950	56.84	56.76	56.60	0.32	0.39	0.40	0.34	0.39	0.41
1980	57.70	57.79	57.37	0.32	0.39	0.41	0.34	0.40	0.41
2020	56.65	56.61	57.17	0.32	0.39	0.41	0.34	0.40	0.42
2070	54.98	55.13	55.41	0.32	0.39	0.42	0.34	0.40	0.42
2130	55.05	55.06	55.19	0.31	0.39	0.43	0.33	0.40	0.43
2170	53.80	54.26	54.22	0.31	0.40	0.43	0.33	0.41	0.44
2200	52.75	52.62	53.17	0.31	0.40	0.44	0.34	0.41	0.44

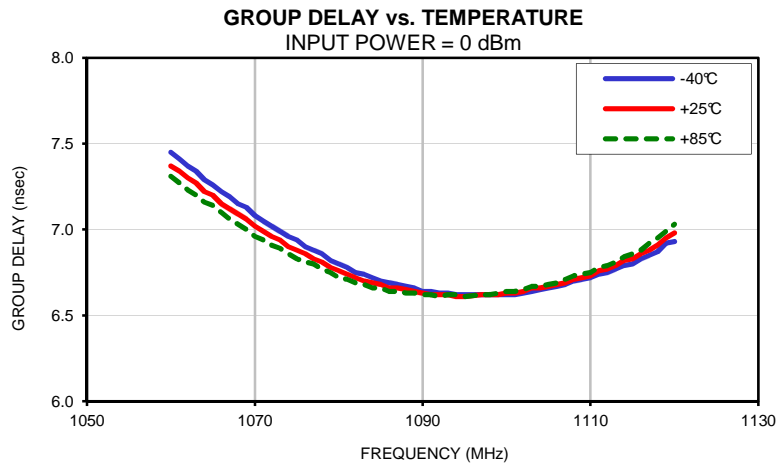
*Typical Performance Data*

FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
1060	7.45	7.37	7.31
1061	7.41	7.34	7.27
1062	7.37	7.30	7.23
1063	7.34	7.27	7.20
1064	7.29	7.22	7.16
1065	7.26	7.20	7.14
1066	7.22	7.15	7.10
1067	7.19	7.12	7.06
1068	7.15	7.09	7.03
1069	7.13	7.06	7.00
1070	7.08	7.02	6.96
1071	7.05	6.99	6.94
1072	7.02	6.96	6.91
1073	6.99	6.94	6.89
1074	6.96	6.90	6.86
1075	6.94	6.88	6.83
1076	6.90	6.86	6.81
1077	6.88	6.83	6.80
1078	6.86	6.81	6.77
1079	6.82	6.78	6.75
1080	6.80	6.76	6.72
1081	6.78	6.74	6.71
1082	6.75	6.72	6.69
1083	6.74	6.70	6.68
1084	6.72	6.69	6.66
1085	6.70	6.68	6.66
1086	6.69	6.66	6.64
1087	6.68	6.66	6.64
1088	6.67	6.65	6.63
1089	6.66	6.64	6.63
1090	6.64	6.63	6.62
1091	6.64	6.62	6.62
1092	6.63	6.62	6.61
1093	6.63	6.62	6.62
1094	6.62	6.61	6.62
1095	6.62	6.61	6.61
1097	6.62	6.62	6.62
1098	6.62	6.62	6.62
1099	6.62	6.62	6.63
1100	6.62	6.63	6.64
1101	6.62	6.63	6.64
1102	6.63	6.64	6.65
1103	6.64	6.66	6.67
1104	6.65	6.66	6.67
1105	6.66	6.67	6.68
1106	6.67	6.68	6.69
1107	6.68	6.69	6.71
1108	6.70	6.71	6.73
1109	6.71	6.72	6.74
1110	6.72	6.73	6.75
1111	6.74	6.76	6.78
1112	6.75	6.77	6.79
1113	6.77	6.79	6.81
1114	6.79	6.82	6.84
1115	6.80	6.83	6.86
1116	6.83	6.86	6.88
1117	6.85	6.88	6.92
1118	6.87	6.91	6.95
1119	6.92	6.95	6.99
1120	6.93	6.98	7.03

## Typical Performance Curves

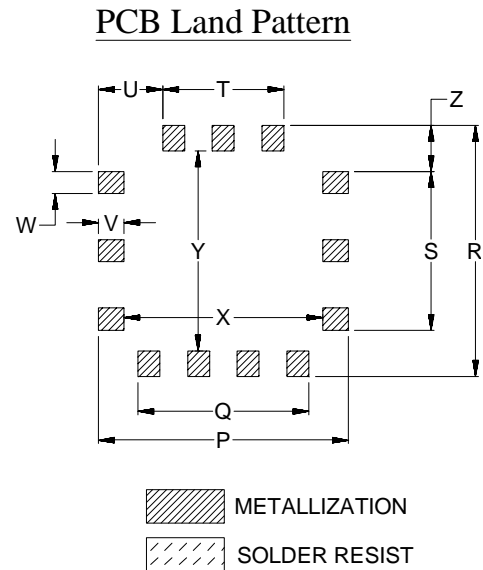


## Typical Performance Curves



## Outline Dimensions

MP1766



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
MP1766	.750 (19.05)	.750 (19.05)	.210 (5.33)	.139 (3.53)	.157 (3.99)	.215 (5.46)	.160 (4.06)	.218 (5.54)	.157 (3.99)	.100 (2.54)	.060 (1.52)	.069 (1.75)	.149 (3.78)

CASE#	P	Q	R	S	T	U	V	W	X	Y	Z	WT.GRAMS
MP1766	.790 (20.07)	.541 (13.74)	.790 (20.07)	.499 (12.67)	.384 (9.75)	.203 (5.16)	.080 (2.03)	.069 (1.75)	.630 (16.00)	.630 (16.00)	.145 (3.68)	4.6

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  $\mu$  inch (.05-.13 microns) Gold over 120-240  $\mu$  inch (3.05-6.10 microns) Nickel plate.  
All models, (+) suffix.

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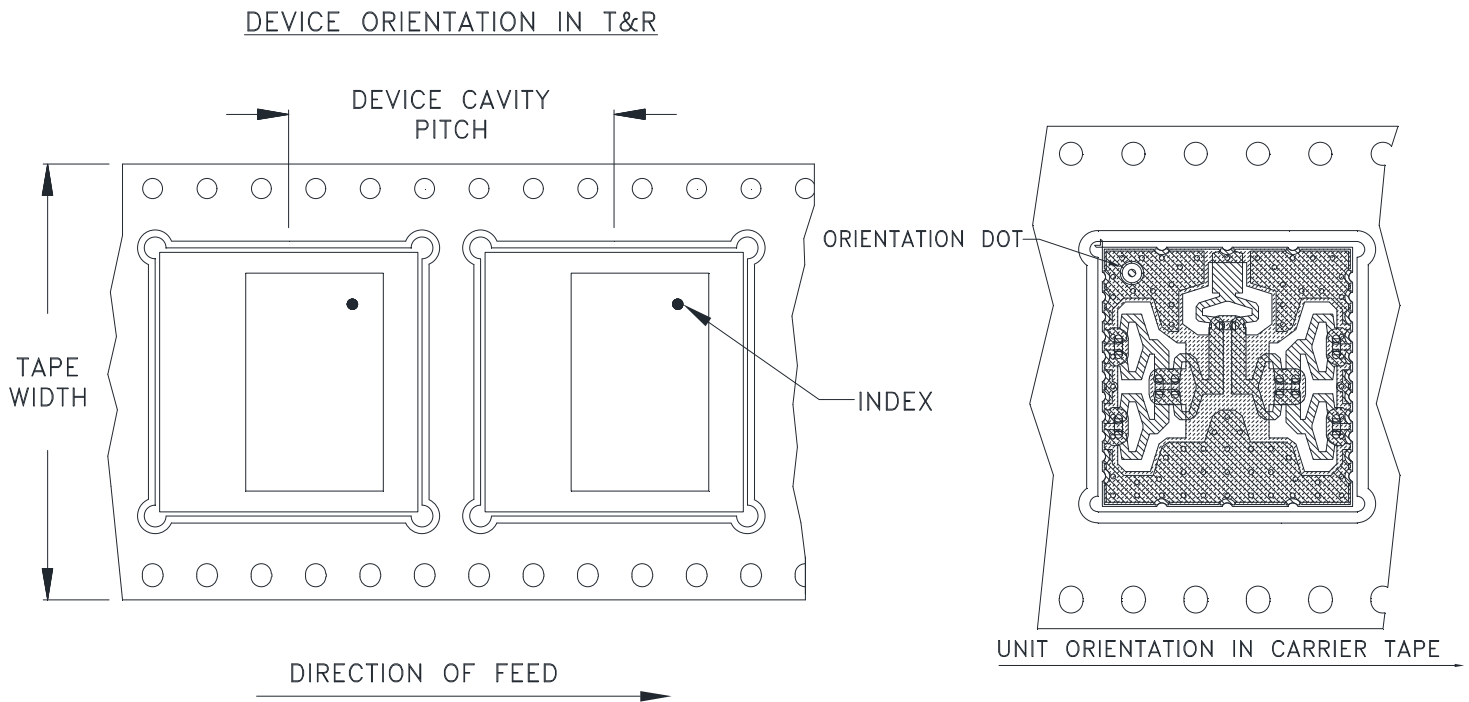


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RF/IF MICROWAVE COMPONENTS



# Tape & Reel Packaging TR-F111



Applicable Case styles:

Applicable Case styles:RS1539

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
32	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](http://www.minicircuits.com/pages/pdfs/tape.pdf)



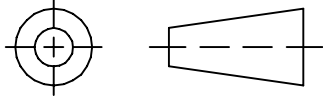
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THIRD ANGLE PROJECTION



REVISIONS

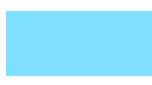
REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M137721	NEW RELEASE	JUN 12	DDR	KG

SUGGESTED MOUNTING CONFIGURATION FOR MP1766 CASE STYLE "13FL01" 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)

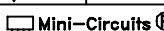
 DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005" ANGLES ± FRACTIONS ±	DRAWN	DDR 22 JUN 12
	CHECKED	MD 22 JUN 12
	APPROVED	GM 22 JUN 12

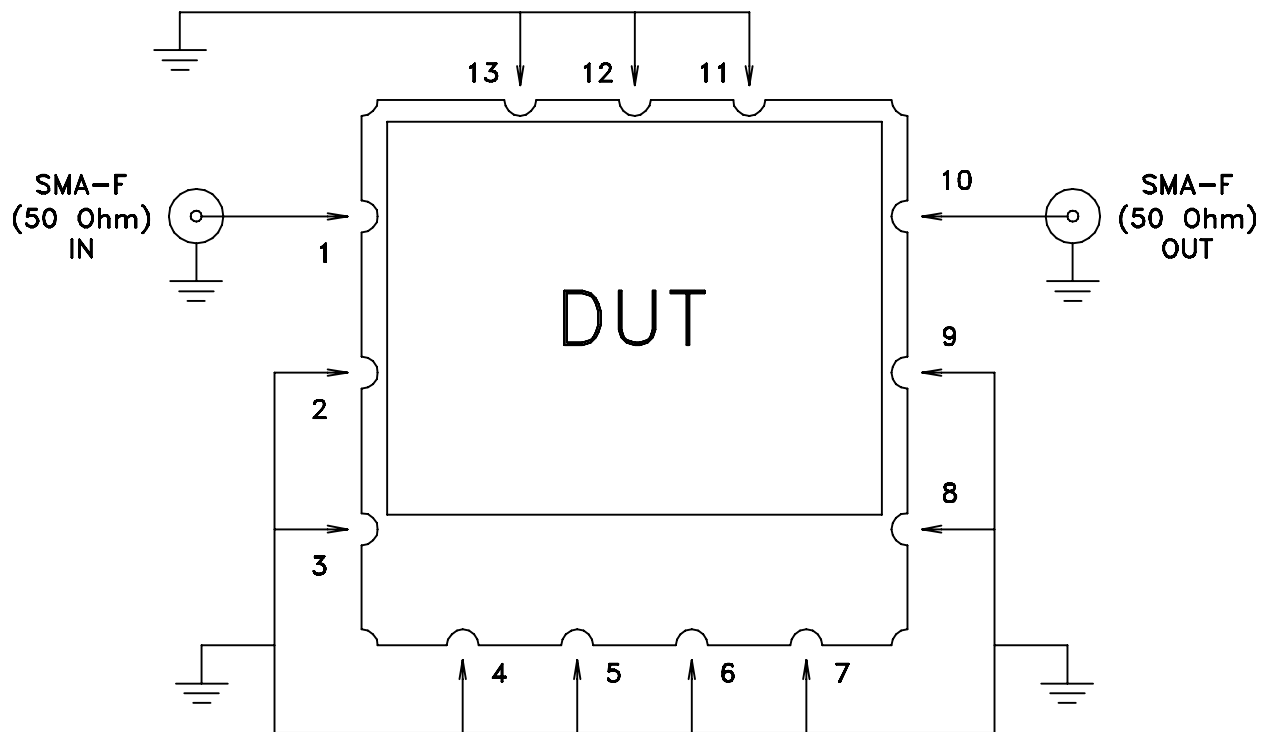
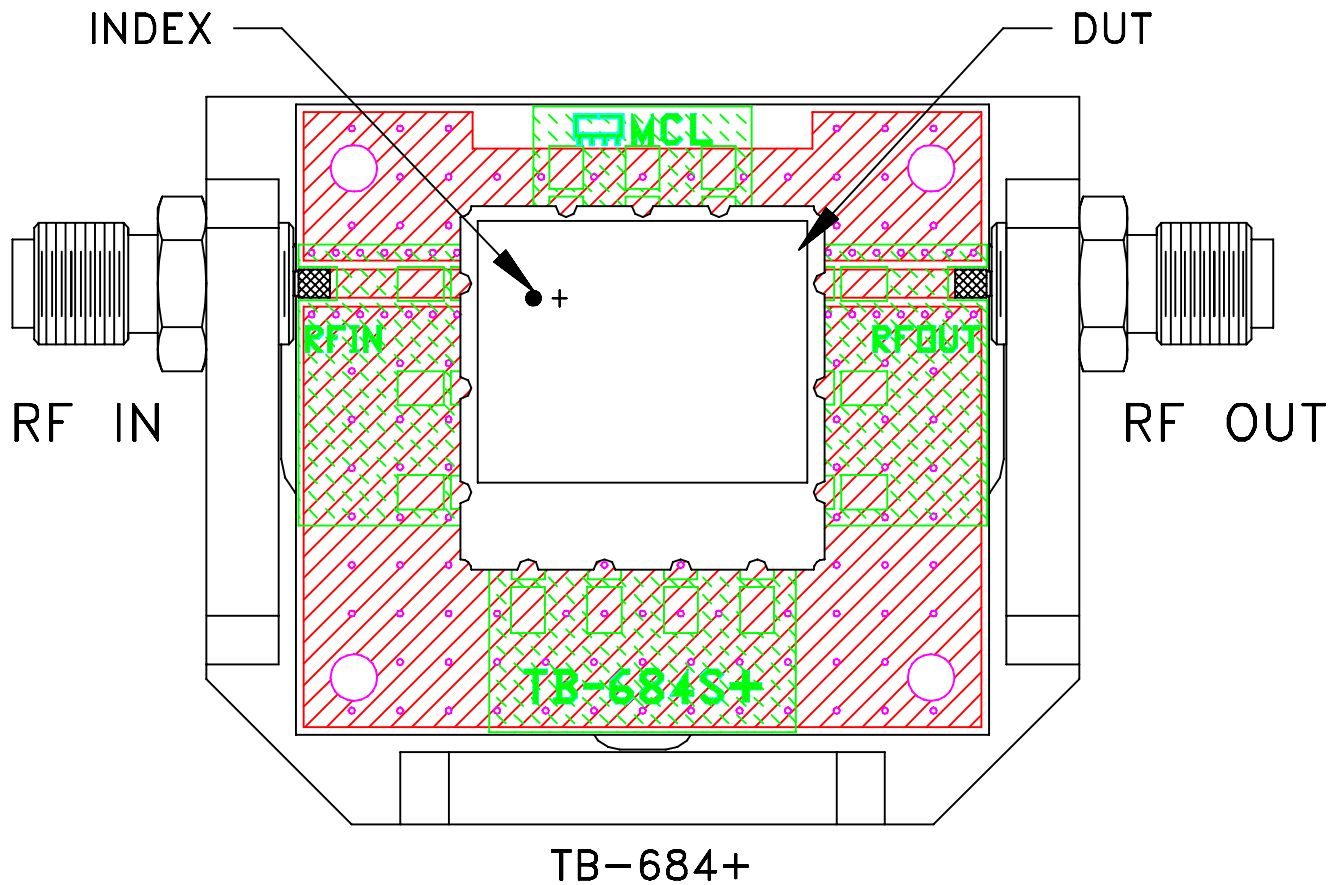
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Brooklyn NY 11235

PL, 13FL01, MP1766, BPF,  
TB-684+, 50 Ohm

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-373	REV: OR
FILE: 98PL373	SCALE: 4:1	SHEET: 1 OF 1	

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# Evaluation Board and Circuit



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®

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