

# Surface Mount Bandpass Filter

## CBP-1250C+

50Ω 1215 to 1285 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-1250C+ 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-1250C+ filter incorporates High-Q ceramic resonators that enables sharp rejection near passband.
Low Passband VSWR	This filter maintains typical VSWR over 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-1250C+ has been qualified over wide range of thermal, mechanical and environmental conditions including withstanding the stress of extensive solder reflow cycles.

#### Notes

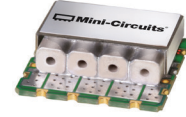
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CASE STYLE: MP1766

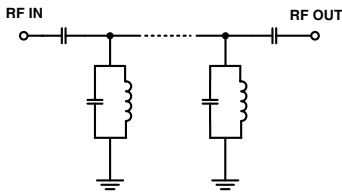
### Features

- Low Insertion loss
- High selectivity
- Miniature shielded package

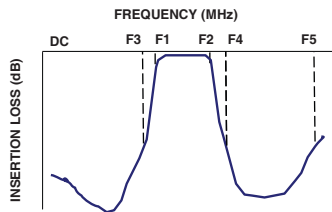
### Applications

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

### Functional Schematic



### Typical Frequency Response



### Electrical Specifications at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	1250	—	MHz
	Insertion Loss	F1-F2	1215-1285	0.8	2	dB
	VSWR	F1-F2	1215-1285	1.2	—	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC-1055	20	30	dB
	VSWR	DC-F3	DC-1055	—	20	:1
Stop Band, Upper	Insertion Loss	F4-F5	1510-2500	20	30	dB
	VSWR	F4-F5	1510-2500	—	20	:1

### Maximum Ratings

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

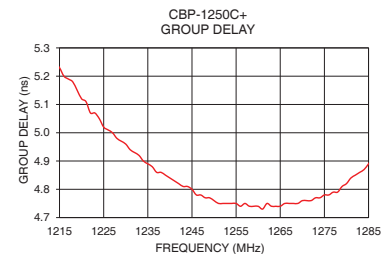
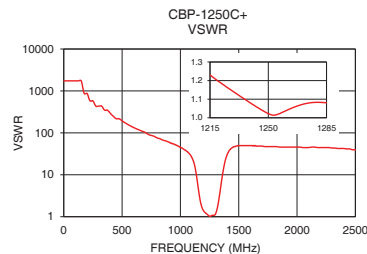
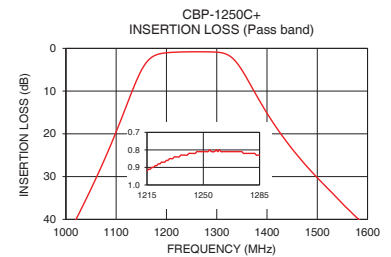
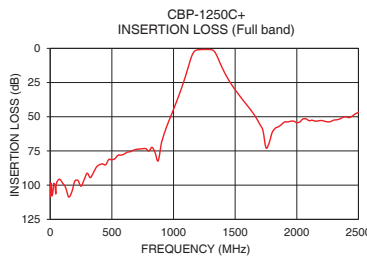
Permanent damage may occur if any of these limits are exceeded.

### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	103.53	1737.18	1215	5.23
970	51.48	49.64	1218	5.18
1055	31.64	36.20	1223	5.07
1115	15.08	19.76	1226	5.01
1136	8.79	10.31	1230	4.96
1150	5.18	5.52	1234	4.90
1168	2.33	2.58	1237	4.86
1187	1.28	1.60	1240	4.84
1215	0.92	1.23	1245	4.80
1226	0.87	1.16	1250	4.76
1250	0.81	1.02	1255	4.75
1275	0.82	1.08	1258	4.74
1285	0.83	1.08	1261	4.73
1331	2.26	2.69	1265	4.74
1350	5.07	6.26	1268	4.75
1390	13.22	24.83	1272	4.76
1510	31.48	49.64	1276	4.78
1725	59.97	46.96	1280	4.82
2100	52.89	44.55	1283	4.86
2500	46.78	39.49	1285	4.89

### +RoHS Compliant

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



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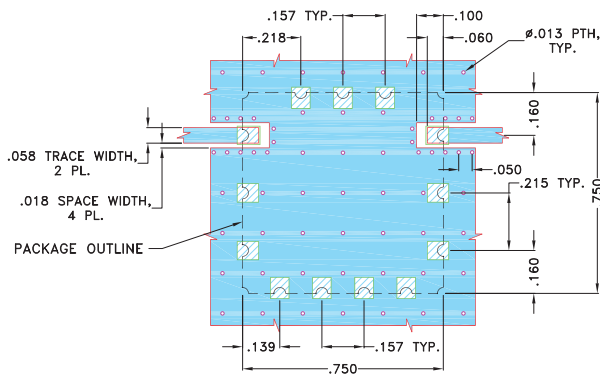
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## Pad Connections

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)**

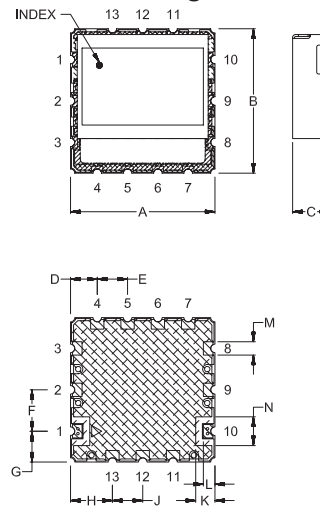


### NOTES:

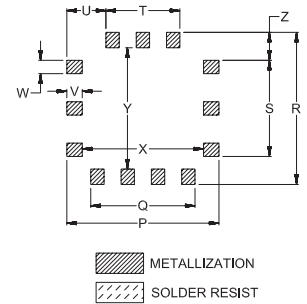
- TRACE WIDTH IS SHOWN FOR OAK (OAK-602) WITH DIELECTRIC THICKNESS .022" ± .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- 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/mm)

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*

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# Band Pass Filter

# CBP-1250C+

## 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	105.25	103.53	98.10	0.00	0.00	0.00	0.00	0.00	0.00
250	97.73	100.77	99.47	0.01	0.03	0.04	0.01	0.03	0.03
475	82.30	81.27	82.15	0.05	0.08	0.09	0.05	0.08	0.08
650	76.63	75.58	75.74	0.10	0.15	0.16	0.11	0.15	0.15
800	74.86	75.07	74.52	0.17	0.23	0.24	0.18	0.23	0.24
900	71.42	70.13	70.24	0.23	0.29	0.31	0.24	0.30	0.30
915	65.56	65.15	64.94	0.24	0.30	0.32	0.25	0.31	0.31
930	61.29	60.94	60.72	0.25	0.31	0.34	0.26	0.32	0.32
955	55.15	54.76	54.67	0.27	0.33	0.36	0.28	0.34	0.34
975	50.62	50.33	50.15	0.28	0.35	0.38	0.30	0.36	0.36
1000	44.99	44.66	44.48	0.31	0.38	0.41	0.33	0.39	0.40
1020	40.41	40.05	39.86	0.33	0.41	0.44	0.35	0.42	0.43
1055	32.05	31.64	31.42	0.38	0.48	0.51	0.40	0.49	0.50
1060	30.80	30.38	30.16	0.40	0.49	0.52	0.41	0.50	0.51
1080	25.61	25.15	24.90	0.45	0.56	0.60	0.47	0.57	0.59
1095	21.48	20.98	20.71	0.51	0.65	0.69	0.53	0.65	0.69
1100	20.06	19.54	19.26	0.54	0.69	0.74	0.56	0.69	0.73
1115	15.63	15.08	14.78	0.69	0.88	0.95	0.71	0.90	0.96
1120	14.13	13.57	13.27	0.78	0.99	1.07	0.80	1.01	1.08
1125	12.61	12.05	11.75	0.90	1.14	1.24	0.92	1.16	1.25
1138	8.73	8.23	7.96	1.44	1.84	2.00	1.47	1.86	2.02
1150	5.54	5.18	4.99	2.55	3.18	3.44	2.58	3.22	3.50
1155	4.44	4.16	4.01	3.28	4.03	4.34	3.32	4.09	4.41
1162	3.18	3.03	2.94	4.62	5.55	5.92	4.66	5.62	6.03
1170	2.17	2.15	2.12	6.56	7.66	8.10	6.62	7.77	8.25
1200	0.86	1.04	1.09	15.00	16.18	16.59	15.12	16.46	16.97
1215	0.73	0.92	0.97	18.64	19.72	20.10	18.71	20.03	20.56
1230	0.66	0.85	0.91	22.86	23.99	24.39	22.73	24.35	25.09
1250	0.61	0.81	0.87	37.99	39.12	36.20	32.41	38.49	45.32
1275	0.62	0.82	0.88	26.49	28.26	29.21	27.28	29.61	30.87
1285	0.63	0.83	0.89	25.54	28.24	30.09	27.90	32.86	37.04
1300	0.66	0.90	0.98	24.21	23.17	22.25	30.88	26.31	24.04
1308	0.73	1.00	1.10	19.34	17.48	16.55	21.26	18.45	17.18
1329	1.55	2.07	2.29	8.27	7.40	6.99	8.50	7.57	7.13
1338	2.46	3.11	3.38	5.41	4.90	4.65	5.54	5.00	4.73
1344	3.30	4.02	4.32	4.02	3.70	3.53	4.12	3.78	3.59
1385	11.49	12.22	12.51	0.69	0.79	0.81	0.71	0.81	0.82
1405	15.45	16.09	16.34	0.42	0.54	0.57	0.44	0.55	0.57
1430	19.87	20.41	20.63	0.31	0.42	0.45	0.32	0.43	0.45
1500	29.89	30.26	30.42	0.25	0.35	0.38	0.27	0.36	0.37
1510	31.13	31.48	31.63	0.25	0.35	0.38	0.27	0.35	0.37
1585	40.01	40.31	40.44	0.26	0.35	0.38	0.28	0.35	0.36
1630	45.22	45.51	45.59	0.27	0.35	0.38	0.28	0.35	0.36
1670	50.38	50.75	50.88	0.28	0.36	0.38	0.29	0.36	0.36
1700	55.07	55.52	55.80	0.28	0.36	0.38	0.29	0.36	0.37
1725	59.54	59.97	60.45	0.28	0.37	0.39	0.30	0.37	0.37
1750	71.41	72.67	72.82	0.29	0.37	0.39	0.30	0.37	0.37
1775	71.36	69.32	68.84	0.29	0.37	0.39	0.30	0.37	0.37
1825	58.94	58.43	58.05	0.29	0.37	0.39	0.30	0.37	0.37
1875	55.87	55.77	55.63	0.30	0.38	0.39	0.31	0.37	0.38
1975	53.57	53.24	52.98	0.30	0.38	0.40	0.31	0.38	0.38
2000	54.57	54.33	54.22	0.30	0.38	0.40	0.31	0.38	0.38
2050	51.41	51.63	52.00	0.31	0.39	0.40	0.32	0.39	0.39
2175	53.13	53.02	53.24	0.30	0.39	0.40	0.31	0.39	0.39
2225	53.66	53.27	52.73	0.30	0.39	0.40	0.31	0.39	0.40
2300	52.68	52.44	52.22	0.30	0.40	0.41	0.31	0.40	0.41
2350	51.66	51.56	51.15	0.30	0.41	0.41	0.32	0.41	0.42
2400	50.47	50.11	50.06	0.30	0.41	0.43	0.32	0.42	0.43
2450	49.93	49.52	48.68	0.31	0.42	0.44	0.33	0.44	0.46
2500	46.92	46.78	46.58	0.32	0.44	0.46	0.35	0.46	0.48



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REV. OR  
 CBP-1250C+  
 130409  
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# Band Pass Filter

# CBP-1250C+

## Typical Performance Data

FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
1215	5.31	5.23	5.21
1216	5.28	5.20	5.18
1217	5.25	5.19	5.15
1218	5.24	5.18	5.15
1219	5.21	5.15	5.12
1220	5.18	5.12	5.09
1221	5.17	5.11	5.09
1222	5.13	5.07	5.06
1223	5.12	5.07	5.05
1224	5.10	5.05	5.03
1225	5.07	5.02	5.01
1226	5.07	5.01	4.99
1227	5.05	5.00	4.98
1228	5.03	4.98	4.96
1229	5.02	4.97	4.95
1230	5.00	4.96	4.94
1231	4.99	4.94	4.92
1232	4.98	4.93	4.92
1233	4.96	4.92	4.91
1234	4.94	4.90	4.88
1235	4.93	4.89	4.87
1236	4.92	4.88	4.87
1237	4.91	4.86	4.86
1239	4.88	4.85	4.84
1240	4.87	4.84	4.82
1241	4.86	4.83	4.82
1242	4.86	4.82	4.82
1243	4.84	4.81	4.81
1244	4.84	4.81	4.80
1245	4.83	4.80	4.79
1246	4.82	4.78	4.78
1247	4.81	4.78	4.78
1248	4.80	4.77	4.77
1250	4.78	4.76	4.75
1251	4.77	4.75	4.75
1255	4.76	4.75	4.74
1256	4.75	4.74	4.74
1257	4.75	4.75	4.75
1258	4.75	4.74	4.74
1260	4.75	4.74	4.74
1261	4.75	4.73	4.73
1262	4.75	4.75	4.74
1263	4.74	4.74	4.74
1265	4.74	4.74	4.74
1266	4.75	4.75	4.75
1269	4.75	4.75	4.76
1270	4.76	4.76	4.77
1272	4.75	4.76	4.78
1273	4.76	4.77	4.79
1274	4.76	4.77	4.79
1275	4.76	4.78	4.80
1276	4.77	4.78	4.80
1278	4.78	4.79	4.81
1279	4.79	4.81	4.83
1280	4.79	4.82	4.84
1281	4.81	4.84	4.86
1282	4.82	4.85	4.87
1283	4.82	4.86	4.88
1284	4.83	4.87	4.90
1285	4.85	4.89	4.92

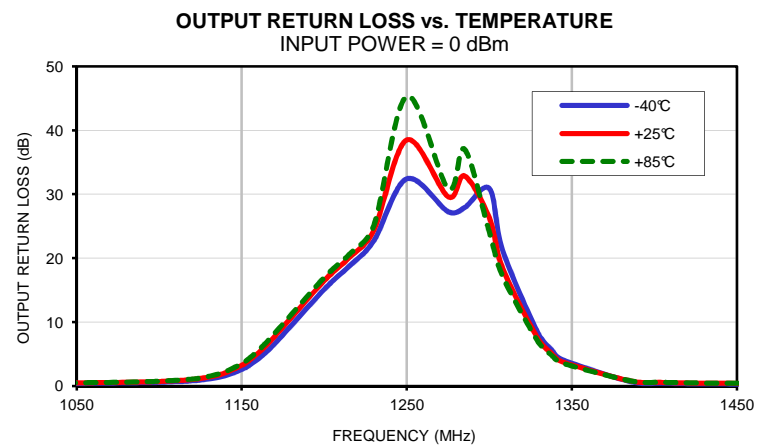
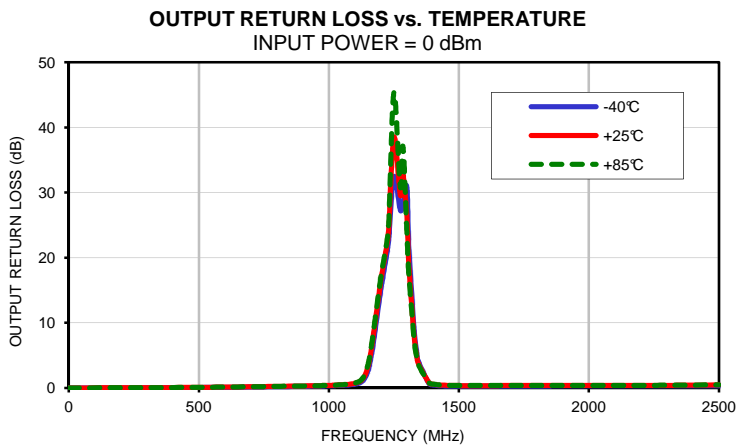
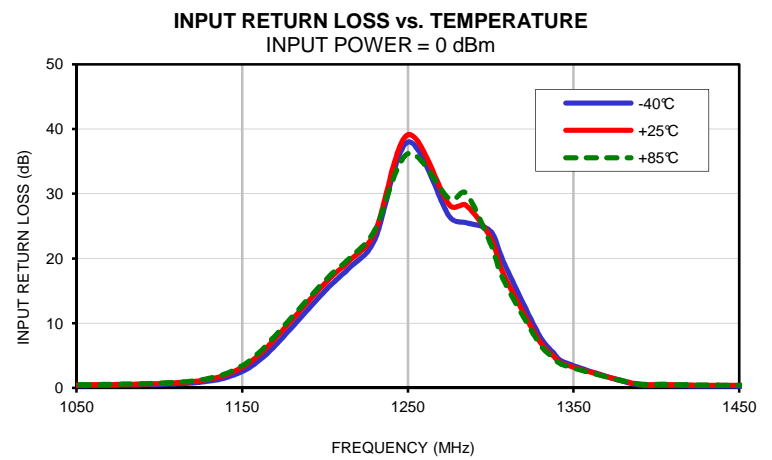
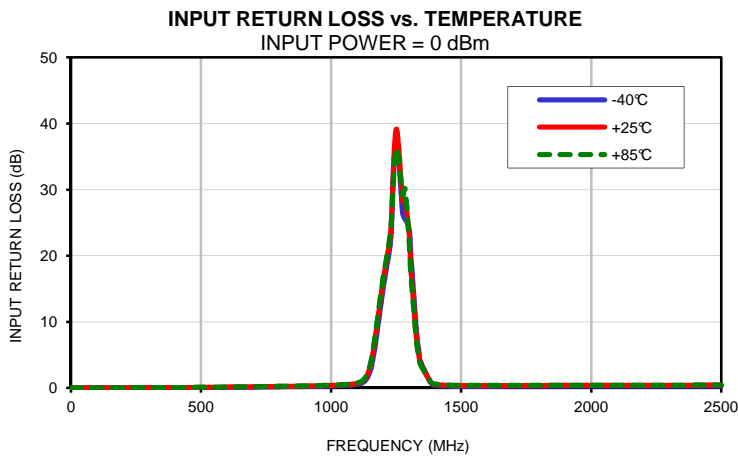
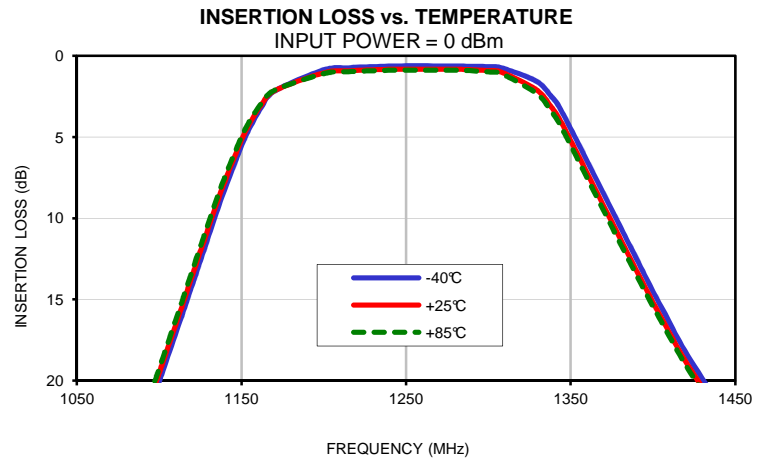
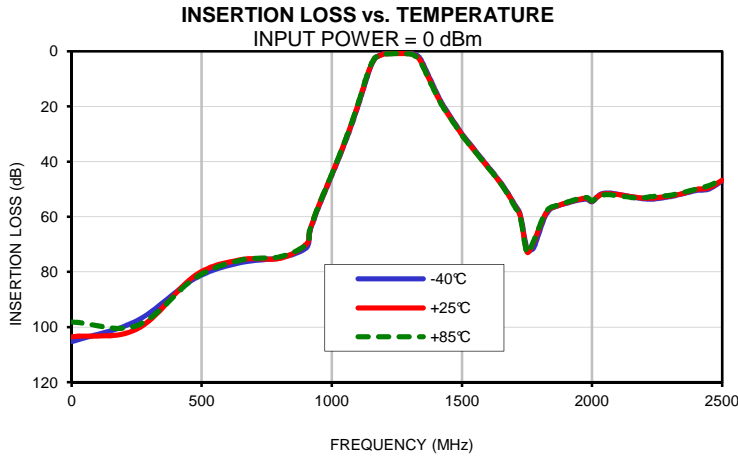


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IF/RF MICROWAVE COMPONENTS

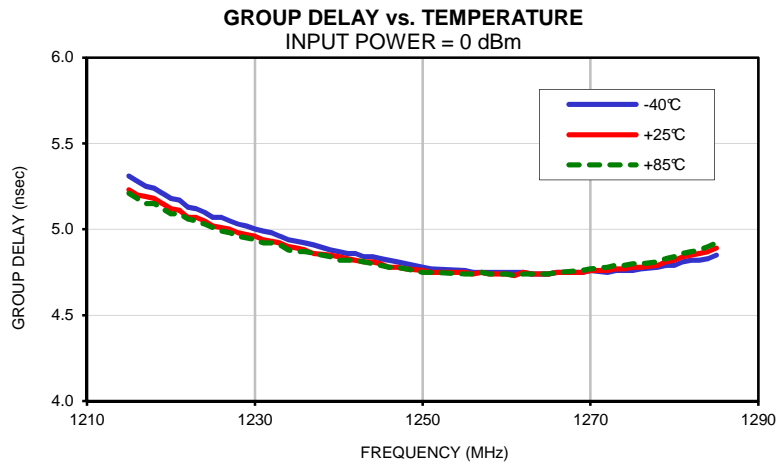
## Typical Performance Curves



# Band Pass Filter

# CBP-1250C+

## Typical Performance Curves

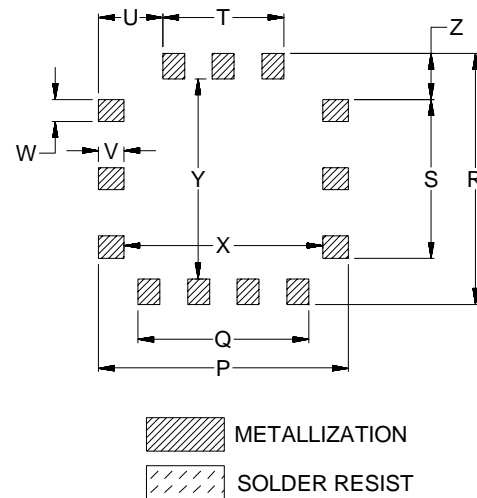


## Outline Dimensions

MP1766



## PCB Land Pattern



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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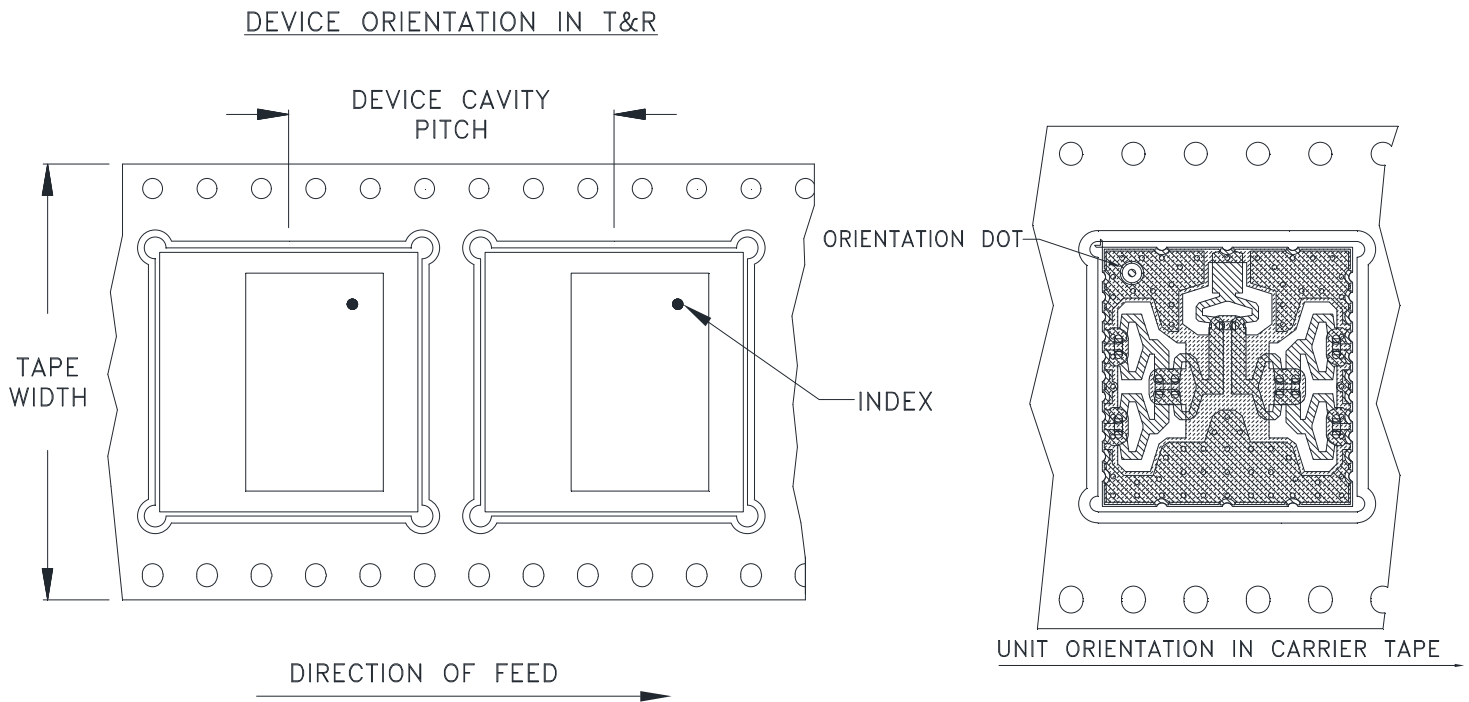


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RF/IF MICROWAVE COMPONENTS



# 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)



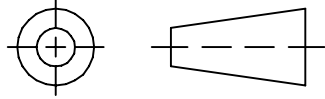
INTERNET <http://www.minicircuits.com>

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

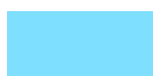
REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M137721	NEW RELEASE	JUN 12	DDR	KG

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)

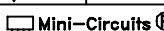
 DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

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

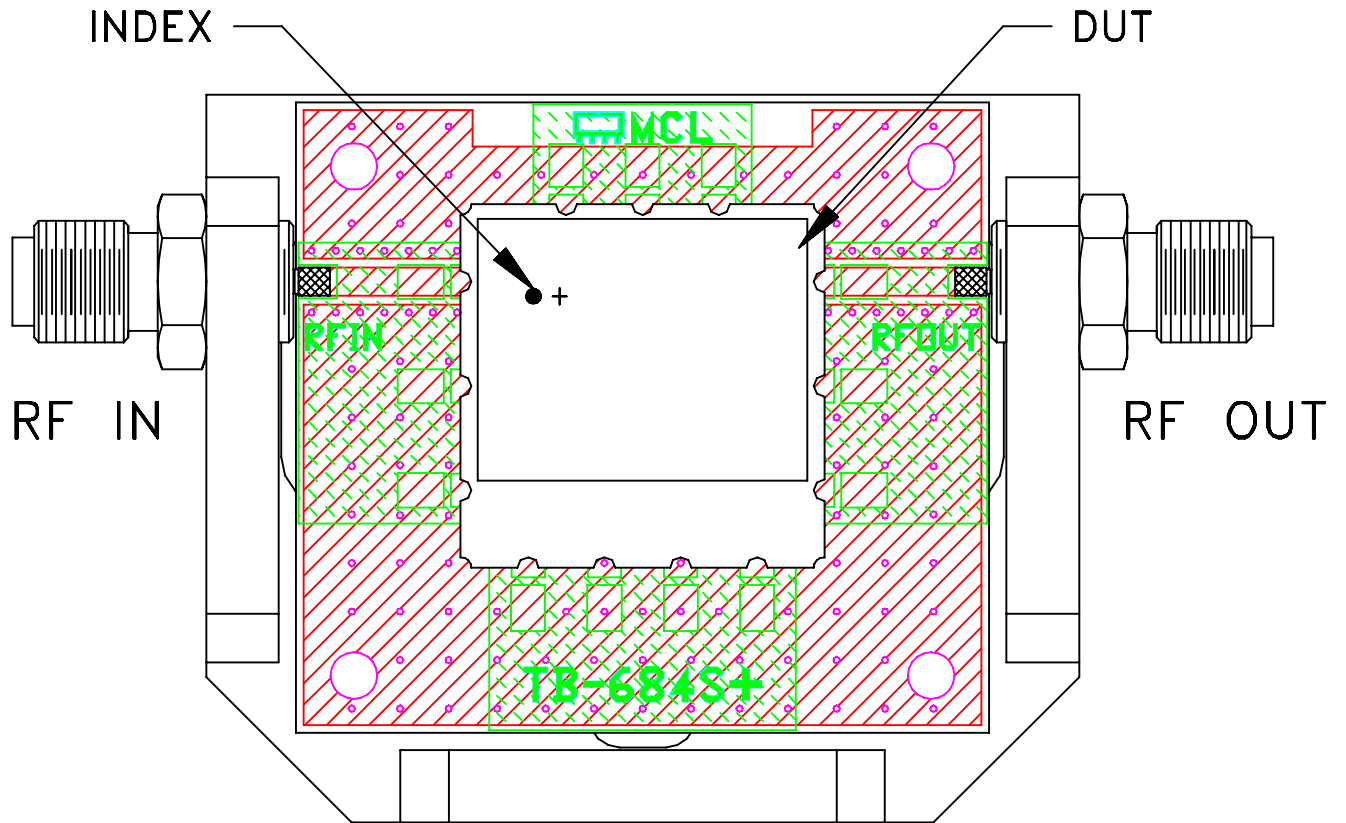
 **Mini-Circuits**® 13 Neptune Avenue  
Brooklyn NY 11235

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

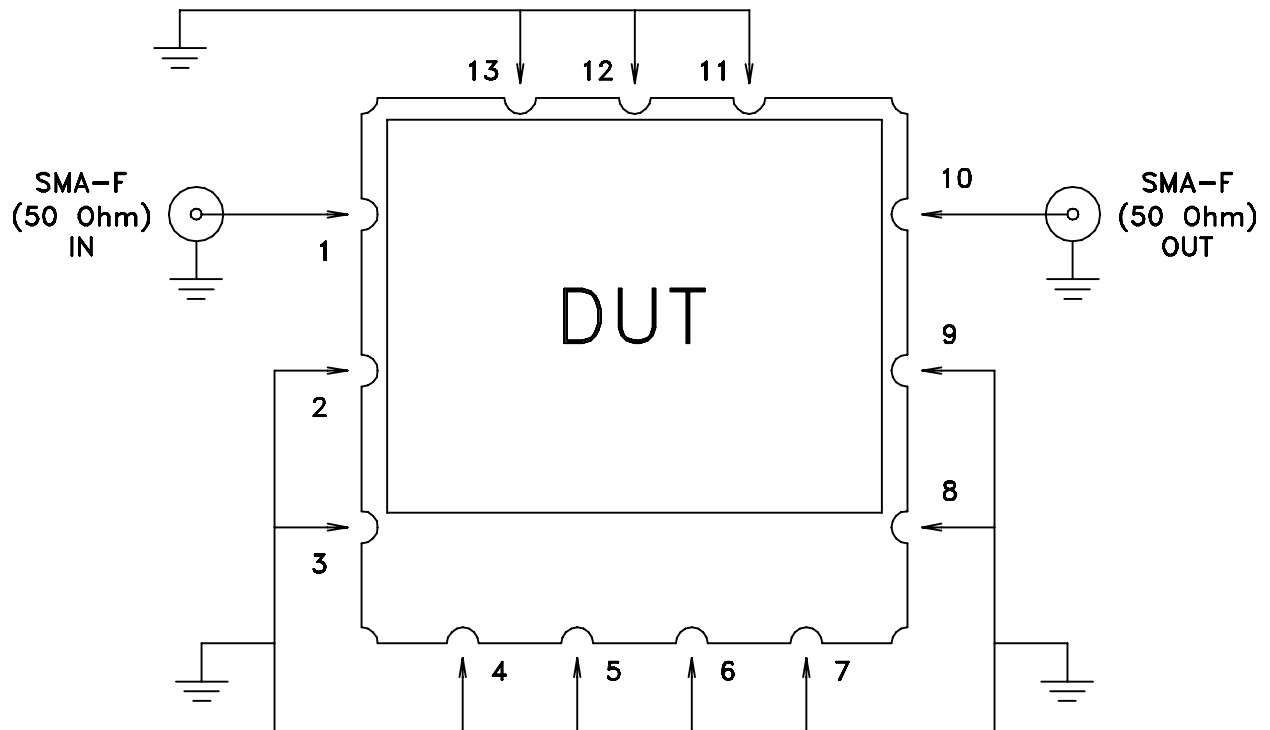
SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-373	REV: OR
FILE: 98PL373	SCALE: 4:1	SHEET: 1 OF 1	

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# Evaluation Board and Circuit




TB-684+



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