

## Surface Mount

# Coaxial-Ceramic Resonator Filters and Multiplexers

50Ω      DC to 6 GHz

## The Big Deal

- Low insertion loss with excellent power handling
- Passbands up to 6 GHz
- Fractional bandwidth from <1 to 25%
- Low profile designs with min. height of 0.120"
- Excellent temperature stability
- Rugged construction to handle demanding environmental conditions



## Product Overview

Mini-Circuits' *Coaxial-Ceramic Resonator filters* offer low insertion loss in very small form factors, using ceramic material with high dielectric constant and superior Q factor. Bandpass and bandstop filters, diplexer and multiplexer designs can be constructed using this technology. Low insertion loss combined with excellent power handling makes these filters well suited for transmitter and receiver signal chains. Advanced filter design and construction can achieve stopband width greater than 3x the center frequency as high as 20 GHz.

All our coaxial-ceramic resonator filters are built with rugged construction, qualified to withstand multiple demanding reflow cycles. Excellent repeatability across units is achieved through precise tuning and process control.

## Key Features

Feature	Advantages
Low insertion loss	Low signal loss results in better SNR in signal chain
Fast roll-off	Higher selectivity results in better adjacent channel rejection and dynamic range
Wide stop band	Wide spur-free stopband results in better receiver sensitivity
Excellent power handling	Well suited for transmitter applications
Rugged Construction	These filter assemblies have been qualified over a wide range of thermal, mechanical and environmental conditions including withstanding the stress of extensive solder reflow cycles
Small Size	Very well suited for high performance applications where size is a constraint.
Temperature stability	Very minimal change in electrical performance across temperature makes these filters suitable for a wide range of operating conditions.

### Notes

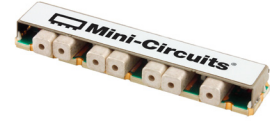
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# Surface Mount Bandpass Filter

## CBP-1773AF+

50Ω 1678 to 1868 MHz



Generic photo used for illustration purposes only

### Features

- High rejection of 55 dB.
- High selectivity
- Miniature shielded package

### Applications

- Space operation and research
- Radar/Satellite
- Defense/Military

CASE STYLE: SV2484

### Electrical Specifications <sup>(1)</sup> at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit	
<b>Pass Band</b>	Center Frequency	-	-	1773	-	MHz	
	Insertion Loss	F1-F2	1678-1868	-	3.0	3.5	dB
	VSWR	F1-F2	1678-1868	-	1.78	2.0	:1
<b>Stop Band, Lower</b>	Insertion Loss	DC-F3	DC-1400	55	-	dB	
	VSWR	DC-F3	DC-1400	-	20	-	:1
<b>Stop Band, Upper</b>	Insertion Loss	F4-F5	2150-2700	55	60	-	dB
		F5-F6	2700-3300	40	50	-	dB
	VSWR	F4-F6	2150-3300	-	20	-	:1

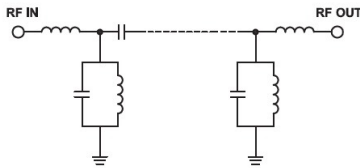
(1) Measured on Mini-Circuits Characterization Test Board TB-1069+.

### Maximum Ratings

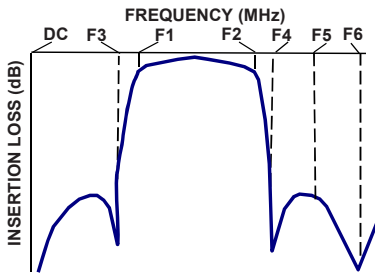
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	5W Max.

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

### Functional Schematic



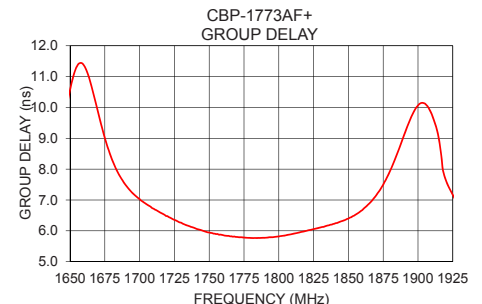
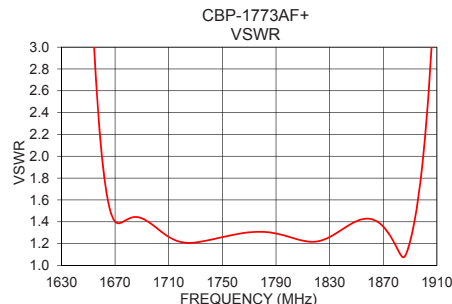
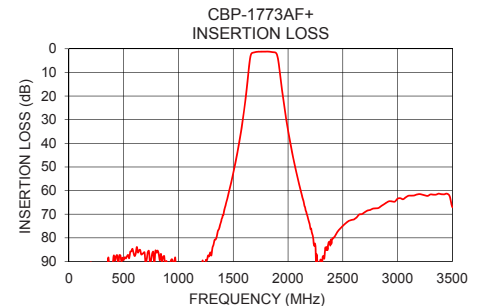
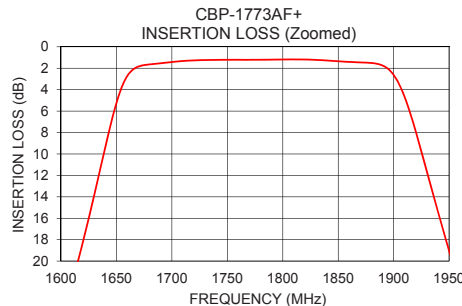
### Typical Frequency Response



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

### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (ns)
1	111.75	2622.04	1678	8.59
10	112.75	798.62	1680	8.34
500	89.34	127.41	1690	7.49
1000	92.48	127.67	1700	7.03
1400	71.46	71.17	1710	6.72
1500	52.54	55.12	1720	6.48
1585	30.77	35.43	1730	6.26
1615	20.15	23.86	1740	6.08
1638	10.25	10.11	1750	5.95
1655	3.72	2.86	1760	5.86
1678	1.66	1.41	1770	5.80
1773	1.21	1.31	1773	5.79
1868	1.45	1.38	1779	5.77
1905	3.50	2.80	1800	5.82
1926	10.15	11.11	1810	5.90
1956	21.11	29.90	1820	6.00
1986	30.55	40.15	1830	6.11
2150	66.48	52.08	1840	6.23
2700	69.16	52.29	1860	6.67
3300	61.63	48.64	1868	7.04



### Notes

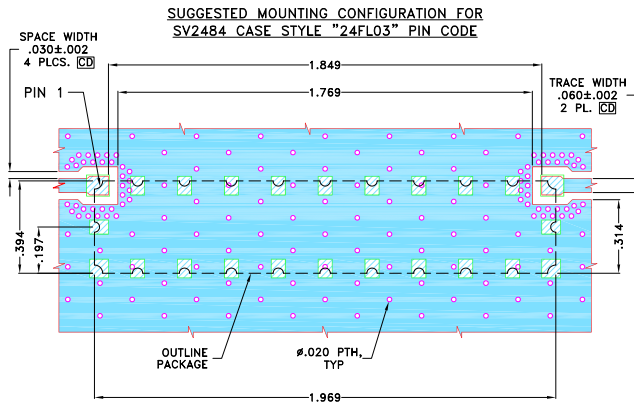
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## Pad Connections

INPUT	1
OUTPUT	11
GROUND	2 - 10, 12 - 24

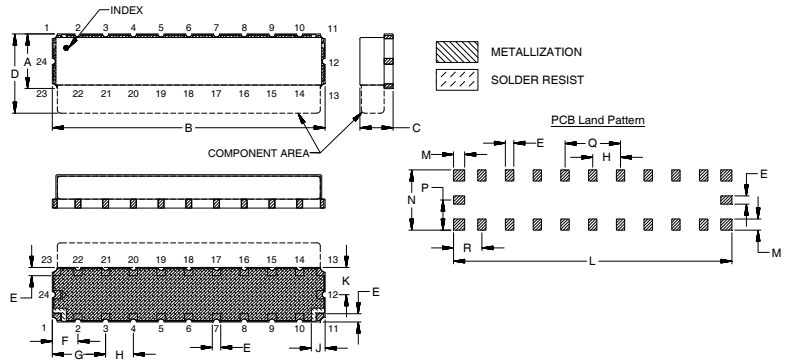
## Demo Board MCL P/N: TB-1069+ Suggested PCB Layout (PL-604)



### NOTES:

- TRACE WIDTH IS SHOWN FOR REOGERS (RO4350B), WITH DIELECTRIC THICKNESS .030"±.002". 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 mm )

A	B	C	D	E	F	G	H	J	K
.394	1.969	.240	.492	.060	.184	.384	.200	.100	.197
10.00	50.00	6.10	12.50	1.52	4.68	9.76	5.08	2.54	5.00
L	M	N	P	Q	R				Wt.
2.009	.080	.434	.217	.400	.204				grams
51.02	2.03	11.02	5.51	10.16	5.19				7.0

Note: Please refer to case style drawing for details

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## Typical Performance Data

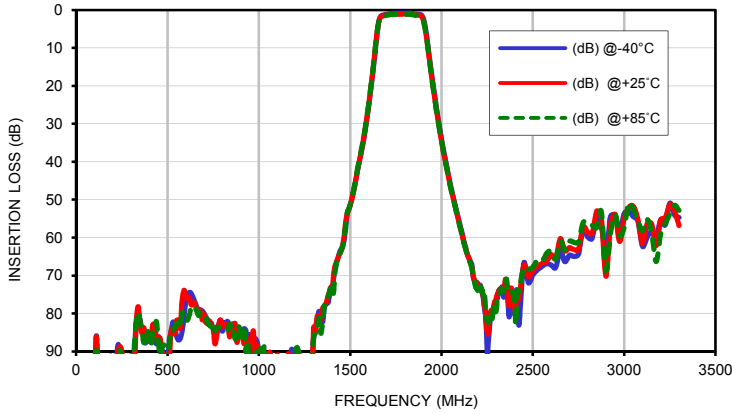
FREQ.  (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	101.07	117.35	107.00	0.05	0.05	0.05	0.05	0.06	0.06
5	111.43	115.60	100.55	0.06	0.06	0.06	0.06	0.07	0.07
10	102.29	102.88	106.17	0.06	0.06	0.06	0.07	0.08	0.08
50	96.83	100.57	97.73	0.07	0.08	0.08	0.09	0.10	0.10
100	123.71	99.41	97.78	0.09	0.09	0.09	0.11	0.12	0.11
160	107.86	96.52	96.49	0.10	0.11	0.10	0.13	0.14	0.13
200	121.00	105.56	97.90	0.10	0.11	0.11	0.13	0.14	0.13
250	90.98	89.89	94.95	0.10	0.11	0.11	0.12	0.14	0.14
300	96.51	91.31	98.30	0.10	0.11	0.11	0.12	0.15	0.15
350	81.59	82.40	82.22	0.09	0.11	0.11	0.11	0.14	0.14
400	85.86	86.71	86.28	0.07	0.10	0.10	0.10	0.14	0.14
450	86.12	87.49	87.27	0.06	0.09	0.10	0.10	0.13	0.14
500	92.72	93.42	92.65	0.06	0.08	0.09	0.08	0.12	0.13
550	86.05	81.85	82.59	0.04	0.08	0.09	0.08	0.12	0.13
600	77.21	74.90	81.91	0.03	0.07	0.07	0.06	0.11	0.11
650	77.03	77.25	78.44	0.02	0.06	0.07	0.05	0.10	0.11
700	80.04	80.24	80.44	0.02	0.05	0.07	0.05	0.09	0.11
750	84.01	84.16	83.64	0.00	0.04	0.05	0.04	0.08	0.10
800	84.68	83.46	84.01	0.01	0.04	0.05	0.03	0.08	0.09
850	83.69	84.05	84.19	0.01	0.04	0.05	0.03	0.08	0.10
900	85.95	84.96	85.33	0.02	0.03	0.04	0.02	0.08	0.09
950	85.68	88.40	99.97	0.02	0.03	0.05	0.02	0.08	0.09
1000	89.79	90.16	92.17	0.02	0.03	0.06	0.03	0.08	0.10
1050	92.19	98.16	96.16	0.02	0.03	0.05	0.03	0.09	0.11
1100	92.90	91.18	104.18	0.02	0.04	0.06	0.04	0.10	0.11
1150	101.67	99.95	94.10	0.02	0.04	0.07	0.04	0.11	0.12
1200	103.75	92.85	89.68	0.01	0.06	0.08	0.06	0.13	0.14
1250	92.47	93.13	98.12	0.01	0.06	0.08	0.07	0.14	0.15
1300	86.35	83.68	86.59	0.01	0.07	0.10	0.09	0.16	0.17
1350	82.17	78.55	81.67	0.03	0.10	0.12	0.12	0.19	0.20
1400	73.65	73.97	74.44	0.05	0.11	0.13	0.14	0.21	0.22
1450	63.19	63.39	63.58	0.07	0.14	0.16	0.17	0.24	0.25
1500	51.46	51.52	51.31	0.11	0.18	0.20	0.22	0.30	0.32
1585	30.84	30.43	30.27	0.27	0.35	0.37	0.41	0.53	0.57
1610	22.20	21.74	21.55	0.42	0.52	0.56	0.61	0.77	0.84
1615	20.28	19.80	19.60	0.48	0.59	0.63	0.68	0.86	0.94
1657	3.08	3.01	3.07	6.74	7.84	8.04	8.22	10.10	10.50
1678	1.36	1.57	1.64	15.00	14.68	14.92	17.36	16.85	17.31
1773	0.89	1.07	1.14	17.29	17.50	17.64	17.56	17.62	17.72
1868	1.10	1.32	1.41	15.59	16.13	16.11	16.18	16.33	16.29
1986	30.02	30.58	30.62	0.14	0.24	0.30	0.45	0.59	0.64
2001	34.22	34.77	34.81	0.12	0.22	0.26	0.38	0.51	0.55
2046	45.45	45.89	45.87	0.10	0.19	0.21	0.27	0.38	0.41
2051	46.58	47.02	47.01	0.10	0.19	0.21	0.26	0.37	0.40
2101	56.62	56.98	57.12	0.07	0.15	0.18	0.21	0.30	0.32
2150	65.47	65.43	65.77	0.06	0.14	0.16	0.18	0.27	0.28
2231	77.02	76.23	76.54	0.06	0.13	0.14	0.15	0.24	0.25
2386	75.84	73.95	73.94	0.04	0.11	0.12	0.13	0.21	0.24
2391	77.89	74.55	74.91	0.05	0.11	0.12	0.13	0.21	0.24
2396	79.46	76.27	75.30	0.04	0.11	0.12	0.13	0.22	0.24
2401	80.16	78.99	76.97	0.04	0.11	0.12	0.13	0.21	0.24
2406	75.33	78.82	83.07	0.04	0.11	0.12	0.13	0.21	0.24
2500	69.86	68.74	67.74	0.03	0.10	0.11	0.12	0.21	0.24
2550	67.63	66.81	66.33	0.03	0.09	0.11	0.12	0.22	0.26
2600	67.23	64.50	63.58	0.02	0.10	0.10	0.11	0.22	0.25
2650	63.36	60.28	60.99	0.02	0.09	0.10	0.11	0.23	0.26
2700	64.64	62.65	60.97	0.02	0.09	0.11	0.13	0.24	0.29
2750	64.35	63.17	61.18	0.00	0.08	0.09	0.14	0.26	0.31
3000	53.68	54.89	57.34	0.03	0.05	0.08	0.23	0.37	0.41
3300	54.69	56.80	52.82	0.04	0.07	0.11	0.35	0.49	0.56

*Typical Performance Data*

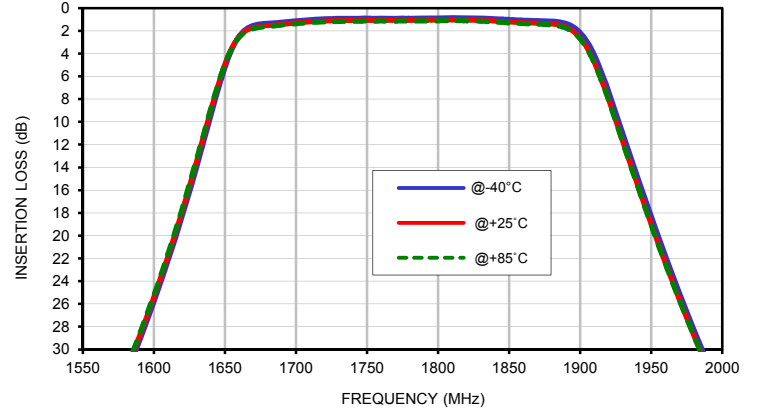
FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
1678.0	8.44	8.23	8.18
1682.0	7.93	7.76	7.72
1686.0	7.54	7.42	7.40
1690.0	7.24	7.15	7.12
1694.0	7.02	6.94	6.93
1698.0	6.86	6.81	6.78
1702.0	6.72	6.67	6.64
1706.0	6.60	6.53	6.51
1710.0	6.47	6.43	6.39
1714.0	6.36	6.33	6.28
1718.0	6.27	6.23	6.19
1722.0	6.16	6.12	6.08
1726.0	6.08	6.03	6.01
1730.0	6.00	5.97	5.93
1734.0	5.93	5.88	5.86
1738.0	5.85	5.82	5.80
1742.0	5.80	5.76	5.75
1746.0	5.73	5.70	5.69
1750.0	5.67	5.65	5.63
1754.0	5.65	5.61	5.61
1758.0	5.60	5.58	5.57
1762.0	5.58	5.55	5.54
1766.0	5.53	5.52	5.51
1770.0	5.54	5.52	5.51
1773.0	5.51	5.50	5.50
1778.0	5.50	5.49	5.47
1782.0	5.50	5.49	5.47
1786.0	5.51	5.50	5.48
1790.0	5.50	5.49	5.49
1794.0	5.49	5.50	5.48
1798.0	5.52	5.52	5.50
1802.0	5.55	5.53	5.54
1806.0	5.57	5.57	5.57
1810.0	5.62	5.63	5.61
1814.0	5.68	5.68	5.67
1818.0	5.71	5.71	5.70
1822.0	5.74	5.75	5.74
1826.0	5.80	5.81	5.80
1830.0	5.84	5.83	5.83
1834.0	5.90	5.90	5.87
1838.0	5.94	5.96	5.93
1842.0	5.99	6.00	5.99
1846.0	6.05	6.06	6.04
1850.0	6.10	6.13	6.11
1854.0	6.20	6.22	6.21
1858.0	6.33	6.35	6.33
1862.0	6.46	6.51	6.48
1866.0	6.64	6.72	6.69
1870.0	6.85	6.93	6.92
1874.0	7.11	7.21	7.18
1878.0	7.43	7.55	7.52

## Typical Performance Curves

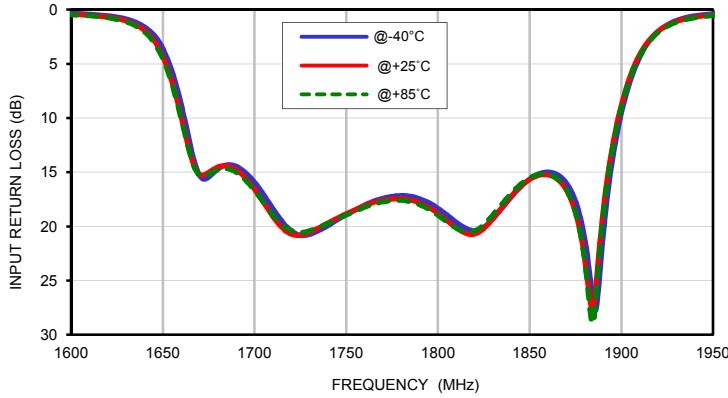
**INSERTION LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



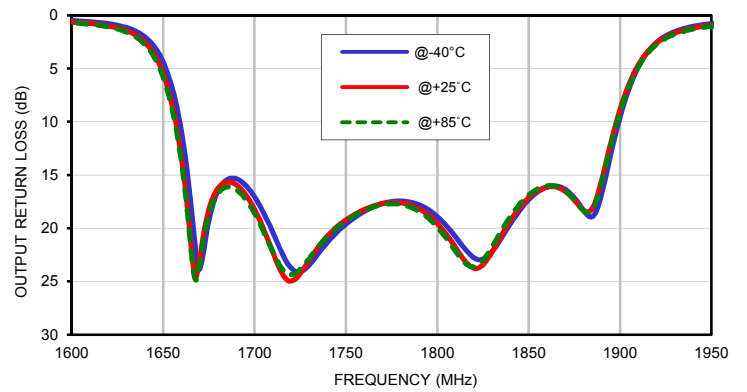
**INSERTION LOSS vs. TEMPERATURE (Zoomed)**  
INPUT POWER = 0 dBm



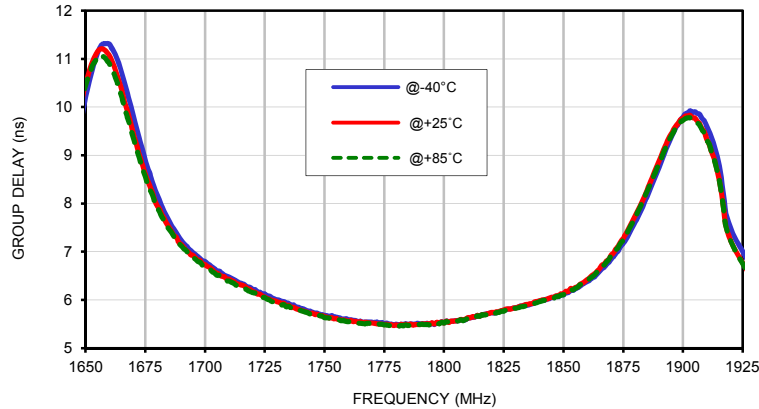
**INPUT RETURN LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



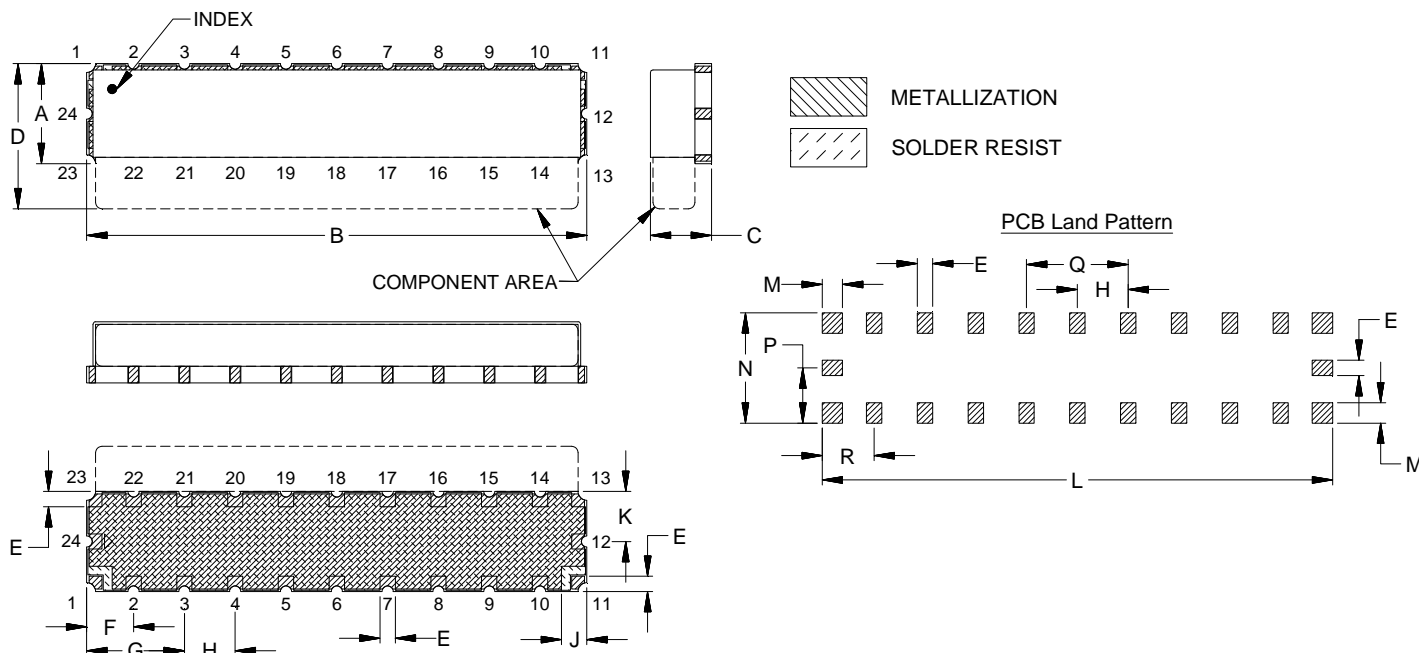
**OUTPUT RETURN LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



**GROUP DELAY vs. TEMPERATURE**  
INPUT POWER = 0 dBm



### Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M
SV2484	.394 (10.00)	1.969 (50.00)	.240 (6.10)	.492 (12.50)	.060 (1.52)	.184 (4.68)	.384 (9.76)	.200 (5.08)	.100 (2.54)	.197 (5.00)	2.009 (51.02)	.080 (2.03)

CASE#	N	P	Q	R	WT. GRAMS
SV2484	.434 (11.02)	.217 (5.51)	.400 (10.16)	.204 (5.19)	7.0

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

#### Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:  
 For RoHS Case Styles: 3-5  $\mu$  inch Gold over 120-240  $\mu$  inch Nickel plate.  
 For RoHS-5 Case Styles: Tin-Lead plate.



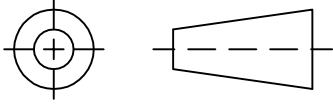
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

RF/I/F MICROWAVE COMPONENTS

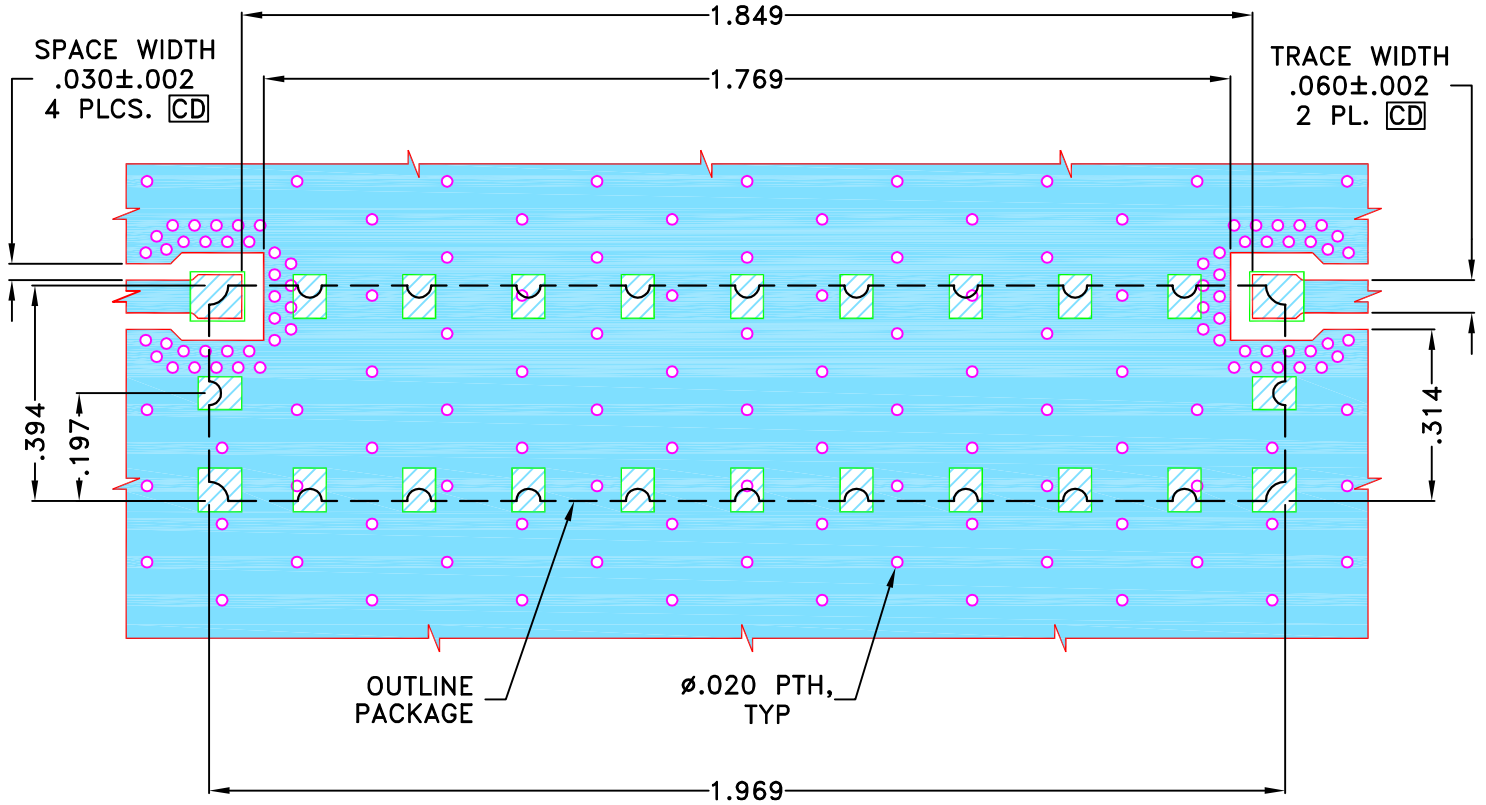
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M169276	NEW RELEASE	AUG 18	TM	MD

SUGGESTED MOUNTING CONFIGURATION FOR SV2484 CASE STYLE "24FL03" PIN CODE



NOTES:

- TRACE WIDTH IS SHOWN FOR REOGERS (R04350B), WITH DIELECTRIC THICKNESS .030"±.002". 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 TM	16 AUG 18
TOLERANCES ON:	CHECKED MD	16 AUG 18
2 PL DECIMALS ±	APPROVED KK	16 AUG 18
3 PL DECIMALS ± .005"		
ANGLES ±		
FRACTIONS ±		

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

PL, 24FL03, SV2484, CBP  
TB-1069+, 50 Ohm

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ASHEETA1.DWG REV:A DATE:01/12/95		FILE: 98PL604	SCALE: 3:1	SHEET: 1 OF 1	



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