

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. Custom integrated assembly with LNA in greatly simplifying system integration. They can be realized in small form factors with high-quality, precise machining for applications where size is critical. 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
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



Bandpass Filter

50Ω 1395 to 1427 MHz

CBP12-1411AK+



Features

- Low insertion loss, 0.65 dB typ.
- High selectivity
- High performance
- Shielded package

Applications

- Radio Astronomy
- Earth exploration Satellite(passive)

Generic photo used for illustration purposes only

CASE STYLE: UR2632

Electrical Specifications⁽¹⁾ at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	1411	-	MHz
	Insertion Loss	F1-F2	-	0.65	1.0	dB
	VSWR	F1-F2	-	1.4	1.92	:1
Stop Band, Lower	Insertion Loss	DC-F3	60	83	-	dB
		F3-F4	40	54	-	dB
		F4-F5	20	34	-	dB
Stop Band, Upper	Insertion Loss	F6-F7	20	34	-	dB
		F7-F8	40	47	-	dB
		F8-F9	-	30	-	dB

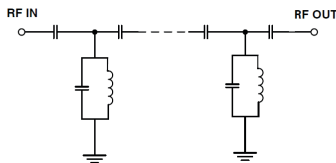
(1) Measured on Mini-Circuits Characterization Test Board TB-1065+.

Maximum Ratings

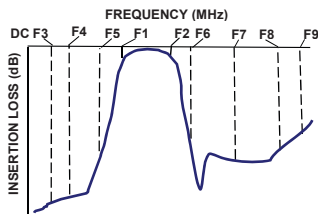
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	15W at 25°C

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

Functional Schematic



Typical Frequency Response

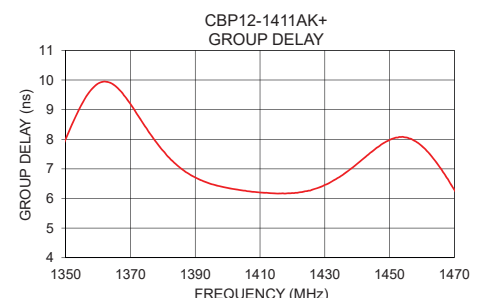
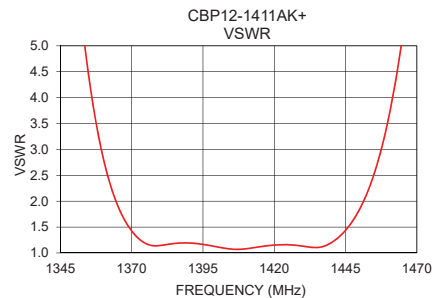
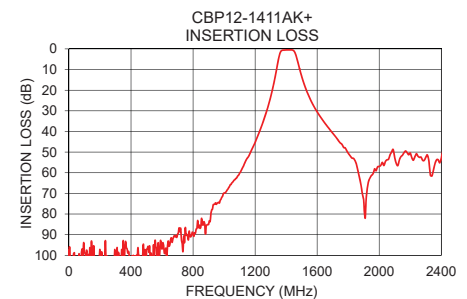
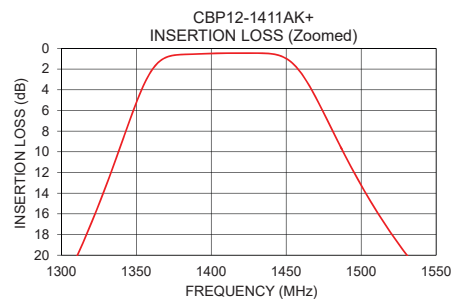


Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (ns)
1	112.85	116.70	1395	6.48
10	102.01	69.57	1396	6.46
100	98.59	101.77	1397	6.43
800	89.34	176.49	1398	6.40
1150	52.87	143.48	1399	6.38
1255	34.61	102.11	1400	6.36
1310	20.26	53.68	1401	6.33
1356	3.23	4.01	1402	6.32
1395	0.52	1.17	1403	6.30
1400	0.49	1.12	1404	6.28
1411	0.46	1.09	1411	6.19
1420	0.46	1.15	1412	6.19
1427	0.46	1.15	1413	6.18
1465	3.50	5.19	1414	6.18
1500	13.24	46.37	1415	6.17
1550	23.49	169.09	1416	6.17
1650	36.01	239.47	1417	6.17
1850	55.14	214.65	1418	6.17
2200	50.45	110.35	1420	6.18
2400	53.00	50.12	1427	6.33

+RoHS Compliant

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



Notes

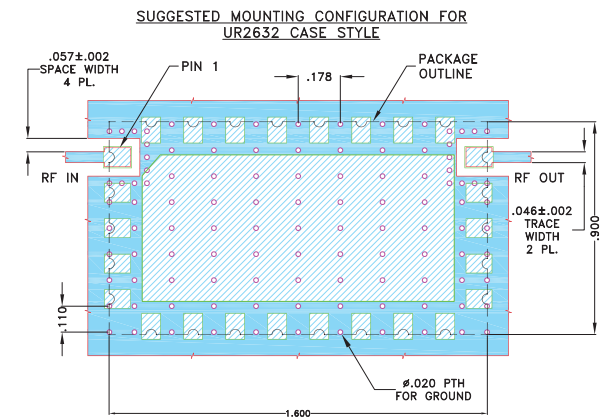
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Pad Connections

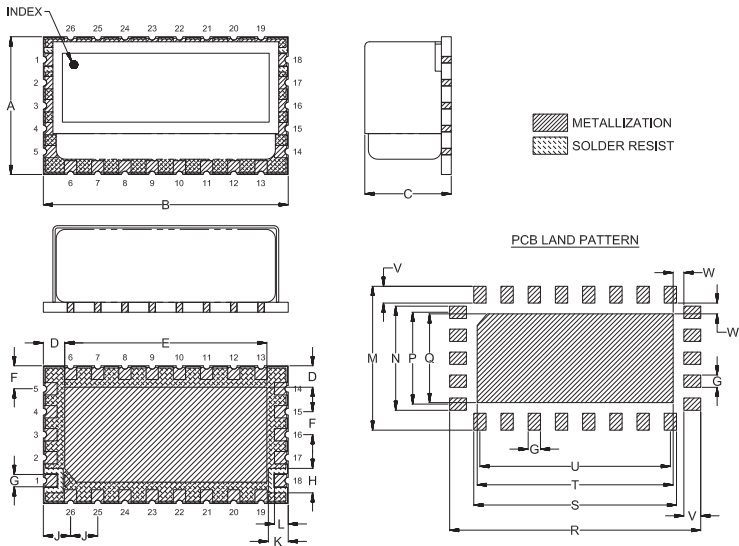
INPUT	1
OUTPUT	18
GROUND	2-17, 19-26

Demo Board MCL P/N: TB-1065+
Suggested PCB Layout (PL-687)



- NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS (R04350B) WITH DIELECTRIC THICKNESS .020"±.015". 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)

A	B	C	D	E	F	G	H	J	K	L	M	N
.900	1.600	.580	.140	1.320	.150	.080	.160	.178	.130	.090	.940	.680
22.86	40.64	14.73	3.56	33.53	3.81	2.03	4.06	4.52	3.30	2.29	23.88	17.27
P	Q	R	S	T	U	V	W	Wt.				
.600	.580	1.640	1.324	1.280	1.244	.110	.070	grams				
15.24	14.73	41.66	33.64	32.51	31.61	2.79	1.78	22.2				

Note: Please refer to case style drawing for details

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Typical Performance Data

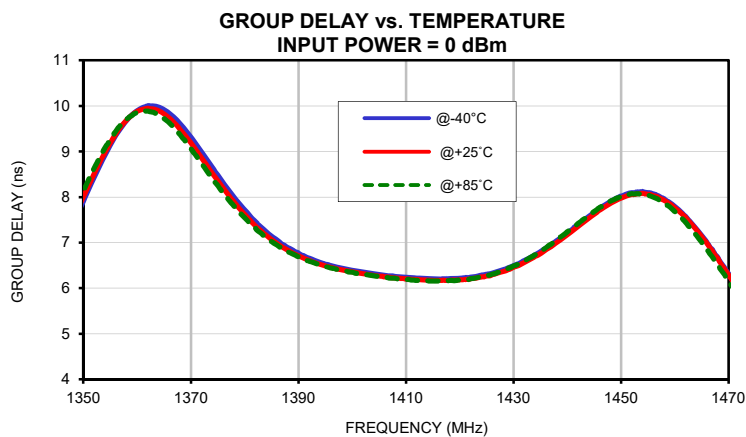
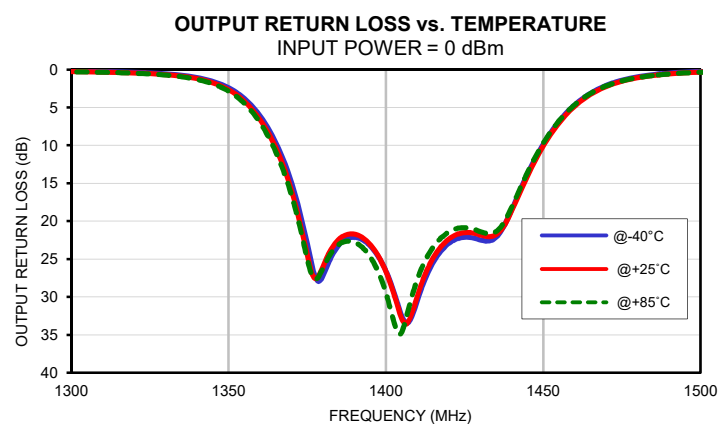
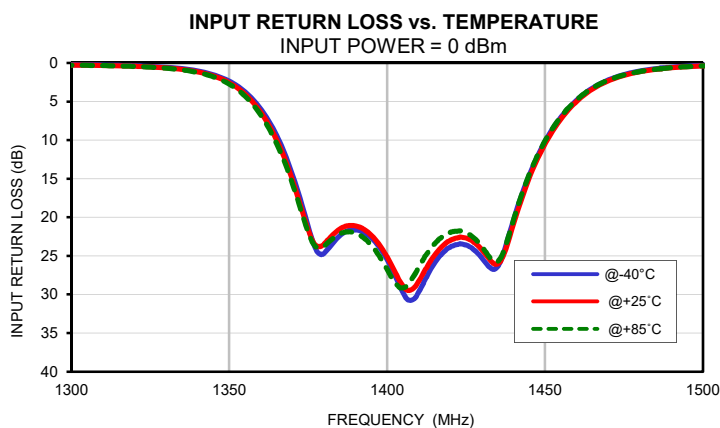
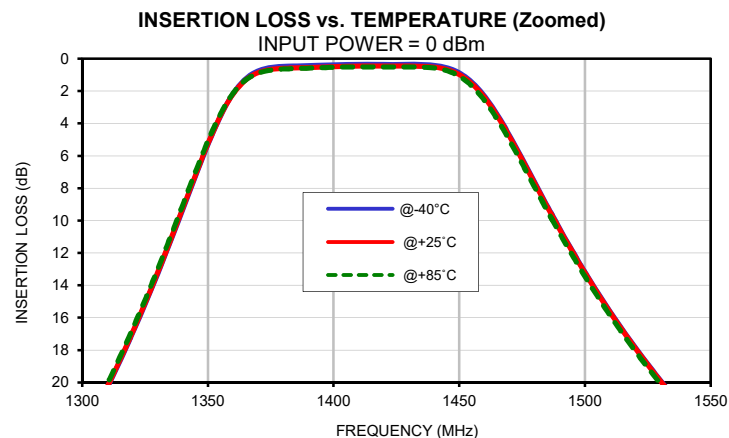
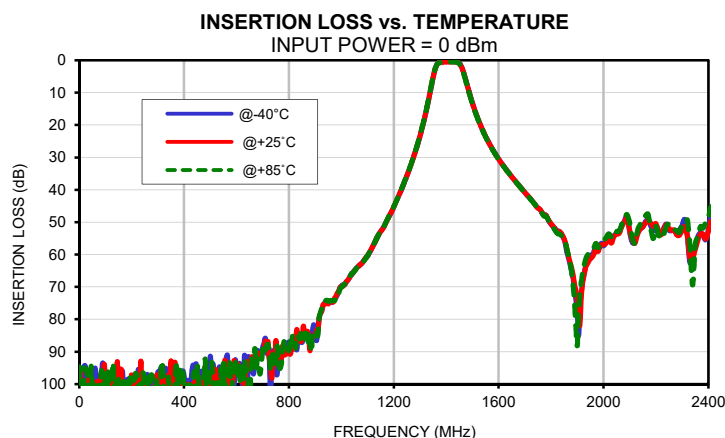
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	105.09	112.85	108.29	0.15	0.15	0.15	0.06	0.06	0.06
10	108.77	102.01	105.30	0.25	0.25	0.25	0.06	0.06	0.06
20	94.37	101.60	95.04	0.23	0.23	0.23	0.06	0.06	0.06
50	99.87	120.70	100.51	0.20	0.20	0.20	0.06	0.06	0.06
100	100.34	98.59	97.15	0.16	0.17	0.17	0.05	0.06	0.06
150	110.67	103.29	98.54	0.14	0.15	0.15	0.05	0.06	0.06
200	99.07	97.34	107.06	0.13	0.14	0.14	0.04	0.06	0.06
250	113.76	105.50	107.30	0.11	0.13	0.13	0.04	0.06	0.06
300	96.29	102.80	114.19	0.10	0.12	0.12	0.04	0.06	0.06
350	101.45	92.89	100.96	0.09	0.11	0.11	0.03	0.06	0.06
400	97.37	108.87	102.90	0.09	0.11	0.11	0.03	0.06	0.06
500	91.43	97.27	94.66	0.08	0.10	0.10	0.03	0.06	0.06
800	87.02	89.34	89.69	0.06	0.10	0.10	0.03	0.08	0.08
1000	69.83	69.83	70.17	0.07	0.10	0.11	0.03	0.09	0.10
1050	64.89	64.95	65.19	0.07	0.11	0.12	0.04	0.09	0.10
1070	63.15	63.32	63.47	0.08	0.11	0.12	0.04	0.10	0.10
1150	52.89	52.87	52.86	0.08	0.12	0.13	0.05	0.11	0.12
1255	34.64	34.61	34.53	0.13	0.17	0.18	0.11	0.17	0.19
1300	23.39	23.35	23.20	0.22	0.27	0.28	0.21	0.28	0.30
1310	20.33	20.26	20.09	0.27	0.32	0.34	0.26	0.34	0.36
1355	3.55	3.53	3.42	3.74	4.03	4.29	3.81	4.16	4.46
1395	0.41	0.52	0.56	22.65	22.30	23.59	23.27	23.09	24.72
1400	0.38	0.49	0.53	25.45	25.12	26.74	26.55	26.64	29.45
1405	0.36	0.47	0.51	29.70	28.85	29.14	32.45	32.83	34.67
1411	0.35	0.46	0.51	28.92	27.59	25.76	29.22	28.59	26.53
1415	0.35	0.46	0.51	25.93	24.92	23.44	25.45	24.85	23.43
1420	0.35	0.46	0.51	23.86	22.99	21.97	22.91	22.34	21.40
1423	0.35	0.46	0.51	23.44	22.58	21.75	22.26	21.67	20.92
1425	0.35	0.46	0.51	23.59	22.70	21.99	22.11	21.50	20.85
1427	0.35	0.46	0.51	24.03	23.08	22.49	22.15	21.52	20.96
1465	3.42	3.50	3.72	3.25	3.39	3.25	3.13	3.29	3.17
1520	17.85	17.89	18.07	0.13	0.18	0.19	0.07	0.15	0.17
1540	21.73	21.76	21.91	0.07	0.12	0.12	0.02	0.09	0.11
1560	25.05	25.09	25.21	0.04	0.10	0.10	0.01	0.07	0.08
1580	27.94	27.97	28.07	0.03	0.08	0.09	0.01	0.06	0.07
1600	30.51	30.53	30.61	0.02	0.07	0.08	0.02	0.05	0.06
1620	32.80	32.81	32.89	0.03	0.07	0.08	0.03	0.04	0.06
1650	35.98	36.01	36.07	0.02	0.07	0.08	0.02	0.04	0.06
1660	36.98	36.99	37.03	0.02	0.07	0.07	0.02	0.04	0.06
1680	38.92	38.92	38.94	0.02	0.07	0.07	0.02	0.04	0.06
1700	40.84	40.82	40.84	0.02	0.07	0.07	0.02	0.04	0.06
1720	42.73	42.67	42.73	0.03	0.07	0.08	0.02	0.04	0.06
1740	44.74	44.75	44.71	0.03	0.07	0.08	0.02	0.04	0.06
1760	46.38	46.26	46.51	0.03	0.07	0.08	0.02	0.04	0.06
1780	47.80	47.90	48.18	0.03	0.08	0.09	0.03	0.04	0.06
1800	50.69	50.48	50.73	0.03	0.08	0.09	0.02	0.04	0.06
1820	52.51	52.56	53.03	0.03	0.08	0.09	0.02	0.04	0.06
1850	55.42	55.14	55.59	0.03	0.08	0.09	0.03	0.04	0.05
1860	59.14	58.14	58.07	0.03	0.08	0.09	0.03	0.04	0.05
1880	66.11	64.89	66.36	0.03	0.08	0.09	0.02	0.04	0.06
1900	77.97	73.37	88.15	0.04	0.09	0.09	0.03	0.04	0.06
1920	68.75	69.46	65.68	0.04	0.09	0.10	0.03	0.04	0.06
2000	57.32	56.95	55.64	0.04	0.10	0.11	0.02	0.05	0.07
2050	53.47	53.75	52.94	0.03	0.10	0.11	0.03	0.04	0.06
2100	52.98	52.72	50.42	0.08	0.14	0.17	0.02	0.06	0.09
2150	51.41	51.51	49.52	0.06	0.14	0.16	0.01	0.07	0.10
2200	51.75	50.45	51.35	0.08	0.16	0.19	0.00	0.09	0.13
2250	52.49	52.01	50.59	0.10	0.18	0.23	0.04	0.13	0.17
2300	50.95	52.54	50.75	0.14	0.23	0.27	0.05	0.15	0.20
2400	52.26	53.00	48.84	0.24	0.35	0.41	0.15	0.27	0.36

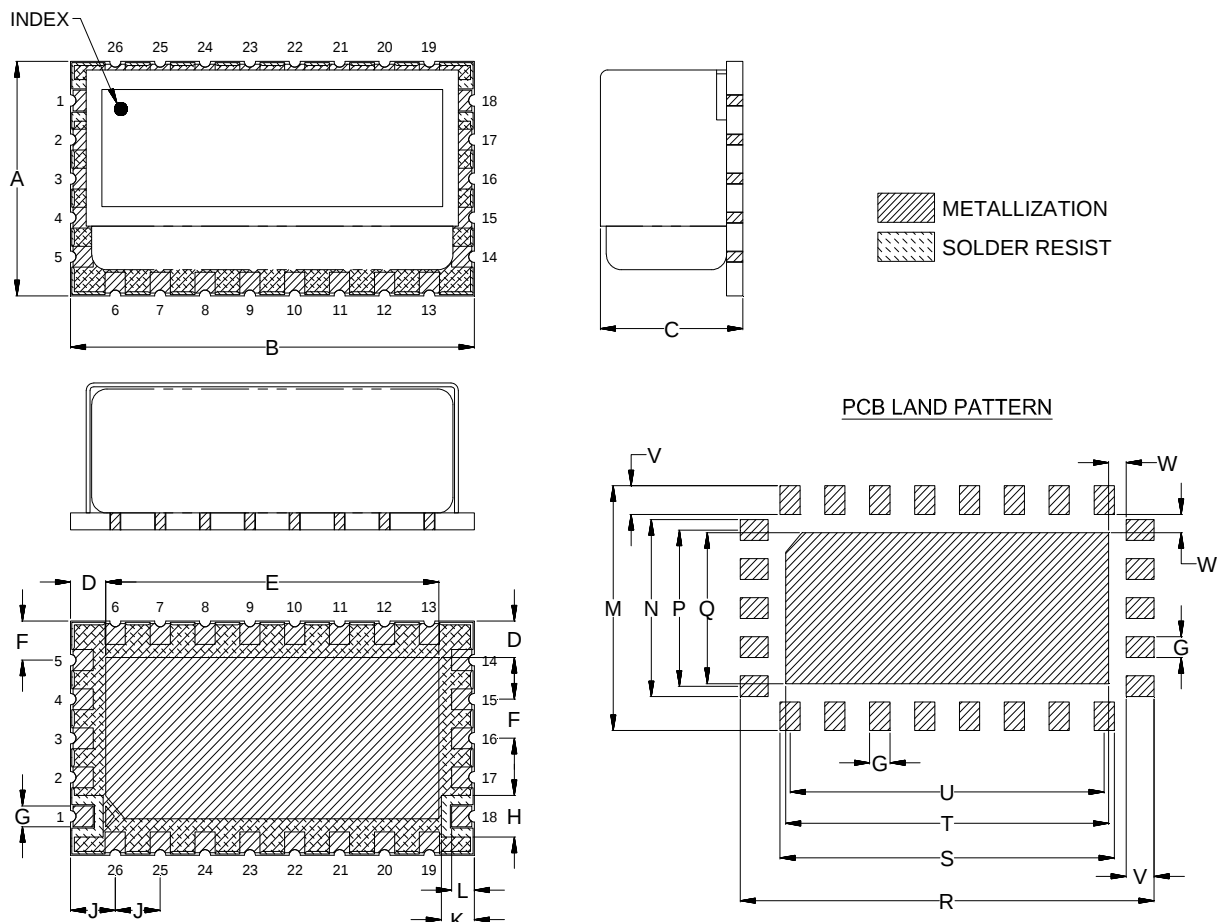
Surface mount Band Pass Filter CBP12-1411AK+

Typical Performance Data

FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-40°C	@+25°C	@+85°C
1380	7.71	7.62	7.55
1381	7.58	7.49	7.42
1382	7.47	7.37	7.31
1383	7.35	7.27	7.21
1384	7.24	7.16	7.12
1385	7.15	7.07	7.02
1386	7.06	6.98	6.95
1387	6.96	6.90	6.87
1388	6.89	6.83	6.80
1389	6.83	6.77	6.75
1390	6.77	6.71	6.69
1391	6.71	6.66	6.64
1392	6.66	6.61	6.59
1393	6.61	6.57	6.55
1394	6.57	6.52	6.51
1395	6.53	6.48	6.48
1396	6.49	6.46	6.44
1397	6.47	6.43	6.42
1398	6.44	6.40	6.39
1399	6.41	6.38	6.37
1400	6.40	6.36	6.35
1401	6.37	6.33	6.32
1402	6.35	6.32	6.30
1403	6.34	6.30	6.29
1404	6.31	6.28	6.27
1405	6.30	6.26	6.25
1406	6.28	6.25	6.24
1407	6.27	6.24	6.22
1408	6.26	6.22	6.22
1409	6.25	6.21	6.20
1410	6.24	6.20	6.19
1411	6.23	6.19	6.18
1412	6.22	6.19	6.17
1413	6.22	6.18	6.17
1414	6.21	6.18	6.16
1415	6.20	6.17	6.15
1416	6.20	6.17	6.16
1417	6.21	6.17	6.16
1418	6.21	6.17	6.17
1419	6.21	6.18	6.16
1420	6.22	6.18	6.18
1421	6.23	6.19	6.19
1422	6.24	6.21	6.20
1423	6.25	6.22	6.22
1424	6.29	6.25	6.25
1425	6.31	6.27	6.27
1426	6.33	6.29	6.30
1427	6.36	6.33	6.34
1428	6.40	6.36	6.38
1429	6.45	6.40	6.43
1430	6.49	6.46	6.48

Typical Performance Curves





CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
UR2632	.900 (22.86)	1.600 (40.64)	.580 (14.73)	.140 (3.56)	1.320 (33.53)	.150 (3.81)	.080 (2.03)	.160 (4.06)	.178 (4.52)	.130 (3.30)	.090 (2.29)	.940 (23.88)	.680 (17.27)

CASE#	P	Q	R	S	T	U	V	W	WT.GRAM
UR2632	.600 (15.24)	.580 (14.73)	1.640 (41.66)	1.324 (33.64)	1.280 (32.51)	1.244 (31.61)	.110 (2.79)	.070 (1.78)	22.2

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

Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:

For RoHS Case Styles: 2-5 μ inch (.05-.13microns) Gold over 120-240 μ inch (3.05-6.10microns) Nickel plate.
All models, (+) suffix.



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

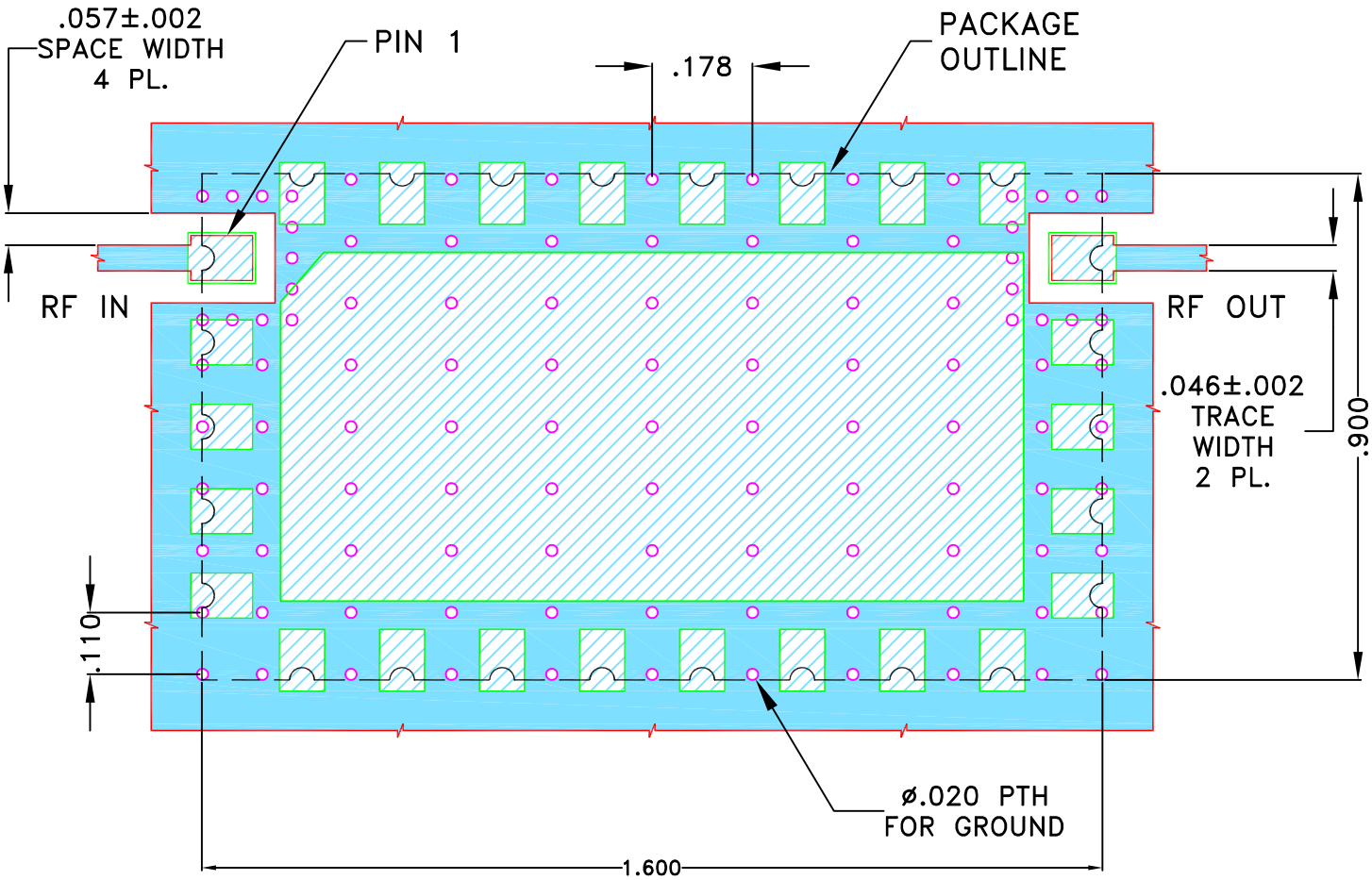


The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

THIRD ANGLE PROJECTION		REVISIONS				
	REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
	OR	NPO-000823	NEW RELEASE	JUL 20	TM	MD

SUGGESTED MOUNTING CONFIGURATION FOR
UR2632 CASE STYLE



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS (R04350B) WITH DIELECTRIC THICKNESS .020"±.015". 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		Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235							
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± .01" 3 PL DECIMALS ± .005" ANGLES ± FRACTIONS ±		DRAWN	TM	04 JUL 20									
		CHECKED	MD	04 JUL 20									
		APPROVED	MD	04 JUL 20									
						PL, UR2632, TB-1065+, 50 Ohm							
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ASHEETA1.DWG REV:A DATE:01/12/95						FILE: 98PL687		SCALE: 4.5:1		SHEET: 1 OF 1			



Environmental Specifications **ENV115**

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
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-020C, 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