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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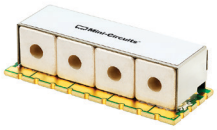
Surface Mount

Bandpass Filter

50Ω 1027 to 1033 MHz

CBP12-1030BE+



Generic photo used for illustration purposes only
CASE STYLE: UP2912

Features

- Excellent roll-off
- Excellent rejection
- Good passband IL
- Cavity filter standard specs in compact profile

Applications

- Traffic Alert and Collision Avoidance System (TCAS)
- Military IFF

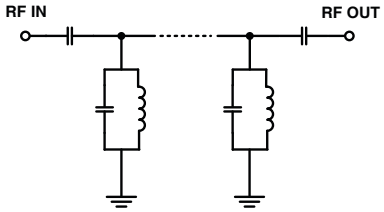
Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	-	1030	-	MHz
	Insertion Loss	F1-F2	1027 - 1033	-	1.75	2.5	dB
	VSWR	F1-F2	1027 - 1033	-	1.5	1.92	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 950	70	80	-	dB
		F3-F4	950 - 1008	20	30	-	dB
Stop Band, Upper	Insertion Loss	F5-F6	1052 - 1100	20	30	-	dB
		F6-F7	1100 - 1800	60	67	-	dB
		F7-F8	1800 - 2000	-	40	-	dB

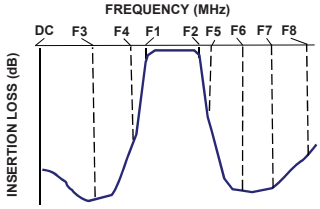
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	10 W max. at 25°C

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

Functional Schematic



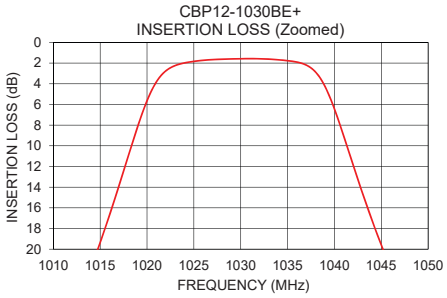
Typical Frequency Response

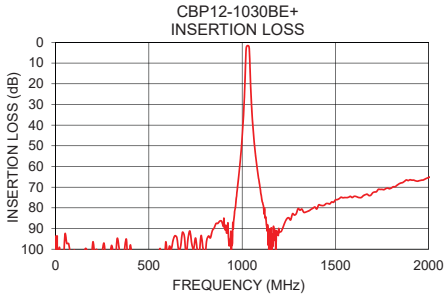


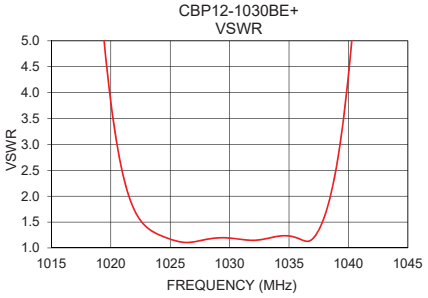
+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

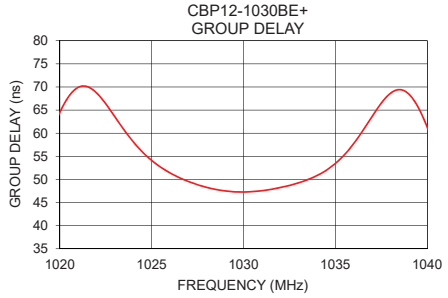
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (ns)
1	107.75	169.12	1020	64.52
10	108.16	287.78	1021	69.93
100	100.39	386.63	1022	68.72
950	87.28	267.91	1023	63.53
1000	46.05	86.67	1024	58.11
1008	34.15	52.19	1025	54.11
1014	21.86	25.67	1026	51.41
1027	1.67	1.12	1027	49.55
1029	1.60	1.19	1028	48.28
1030	1.58	1.19	1029	47.52
1032	1.58	1.15	1030	47.28
1033	1.62	1.18	1031	47.56
1038	2.88	1.62	1032	48.25
1046	21.86	32.63	1033	49.27
1052	32.91	75.15	1034	50.86
1100	72.91	388.69	1035	53.46
1200	91.70	370.21	1036	57.79
1500	76.17	261.41	1037	63.65
1800	70.39	203.10	1038	68.65
2000	65.32	149.47	1039	68.45









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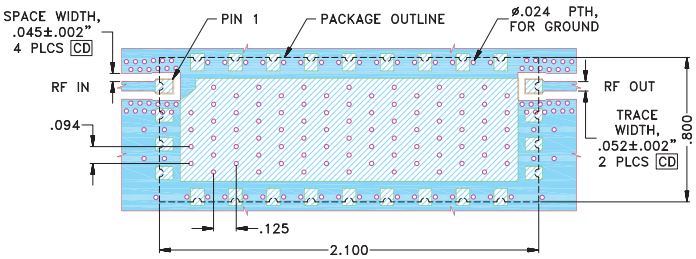
Pad Connections

INPUT	1
OUTPUT	17
GROUND	2-16, 18-26

Demo Board MCL P/N: TB-1137+
Suggested PCB Layout (PL-686)

SUGGESTED MOUNTING CONFIGURATION
FOR UP2912 CASE STYLE



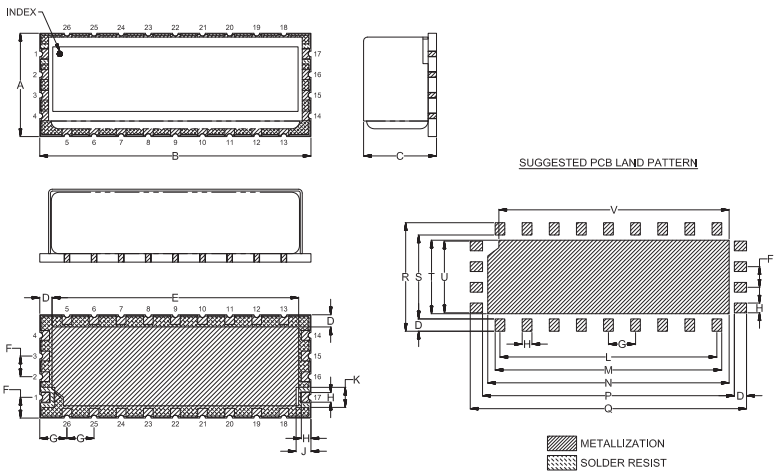
NOTES:

1. COPLANAR WAVEGUIDE PARAMETER ARE SHOWN FOR ROGERS(RO4350B), WITH DIELECTRIC THICKNESS .023"±.002". 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
.800	**2.100**	**.580**	**.095**	**1.910**	**.160**	**.210**	**.075**	**.115**	**.155**	**1.680**
20.32	53.34	14.73	2.41	48.51	4.06	5.33	1.91	2.92	**3**.94	42.67

M	N	P	Q	R	S	T	U	V		Wt.
1.755	**1.870**	**1.950**	**2.140**	**.840**	**.650**	**.570**	**.555**	**1.783**		grams
44.58	47.50	49.53	54.36	21.34	16.51	14.48	14.10	45.29		40

Note: Please refer to case style drawing for details

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Surface mount Band Pass Filter CBP12-1030BE+

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	102.38	99.84	99.42	0.10	0.10	0.10	0.10	0.10	0.10
10	98.47	103.65	99.76	0.06	0.06	0.06	0.06	0.06	0.06
100	102.17	96.64	94.74	0.04	0.04	0.05	0.04	0.05	0.05
150	97.36	101.78	115.20	0.03	0.04	0.04	0.03	0.04	0.04
200	98.05	103.57	98.03	0.02	0.03	0.04	0.02	0.03	0.04
220	98.26	97.74	94.95	0.02	0.03	0.03	0.02	0.03	0.04
250	105.61	102.22	100.22	0.01	0.03	0.04	0.02	0.03	0.04
300	99.99	94.27	104.74	0.01	0.02	0.03	0.01	0.03	0.03
320	99.41	96.81	103.17	0.01	0.02	0.03	0.01	0.03	0.03
350	106.15	99.89	116.69	0.01	0.02	0.03	0.01	0.02	0.03
400	111.62	98.68	103.31	0.00	0.02	0.03	0.01	0.02	0.03
420	95.65	95.65	113.96	0.00	0.02	0.03	0.01	0.02	0.03
600	99.08	97.99	95.38	0.01	0.02	0.03	0.01	0.02	0.03
700	89.38	88.16	94.18	0.01	0.02	0.04	0.00	0.03	0.04
800	86.28	94.55	91.70	0.00	0.03	0.05	0.00	0.03	0.05
950	76.68	78.06	74.63	0.02	0.06	0.08	0.02	0.06	0.08
990	59.10	58.83	55.55	0.09	0.13	0.16	0.09	0.13	0.17
1000	47.63	47.31	46.33	0.14	0.19	0.23	0.15	0.20	0.24
1008	35.26	34.89	34.42	0.26	0.33	0.37	0.28	0.35	0.40
1014	23.01	22.55	22.21	0.55	0.66	0.74	0.58	0.73	0.83
1018	12.10	11.69	11.38	1.50	1.79	2.01	1.65	2.03	2.32
1020	6.24	6.08	5.93	3.81	4.41	4.90	4.24	5.06	5.75
1021	3.98	4.03	4.02	6.64	7.40	8.08	7.56	8.73	9.81
1027	1.45	1.66	1.81	23.92	25.34	25.67	19.29	19.88	19.85
1028	1.41	1.62	1.77	22.23	22.58	22.31	19.25	19.68	19.53
1029	1.38	1.60	1.74	20.16	20.51	20.34	19.05	19.58	19.46
1030	1.37	1.58	1.73	19.12	19.77	19.78	19.37	20.28	20.34
1031	1.36	1.57	1.72	19.13	20.09	20.29	20.75	22.42	22.87
1032	1.36	1.57	1.72	19.89	20.99	21.27	23.64	27.09	28.78
1033	1.37	1.59	1.75	20.81	21.51	21.61	27.65	32.71	35.28
1038	2.36	2.71	2.98	12.67	12.86	12.77	11.31	11.09	10.81
1039	3.56	3.98	4.30	7.30	7.39	7.36	6.77	6.68	6.55
1040	5.52	6.00	6.37	4.16	4.27	4.30	3.91	3.92	3.88
1043	13.55	14.01	14.37	1.02	1.15	1.21	0.98	1.07	1.12
1046	20.96	21.33	21.64	0.43	0.53	0.58	0.42	0.50	0.54
1050	28.89	29.18	29.44	0.20	0.28	0.32	0.20	0.27	0.30
1052	32.23	32.49	32.73	0.15	0.22	0.26	0.15	0.21	0.25
1100	71.35	71.60	70.29	0.01	0.03	0.06	0.00	0.04	0.06
1120	86.32	84.58	76.02	0.01	0.03	0.06	0.01	0.03	0.05
1140	77.75	79.94	87.20	0.02	0.03	0.05	0.01	0.04	0.06
1160	81.03	83.56	83.61	0.02	0.02	0.05	0.01	0.03	0.05
1180	78.98	79.85	84.70	0.02	0.03	0.05	0.01	0.03	0.05
1200	81.10	80.84	74.80	0.01	0.04	0.06	0.01	0.04	0.06
1240	78.78	78.77	73.29	0.01	0.03	0.06	0.00	0.04	0.06
1260	77.39	76.95	73.20	0.01	0.04	0.06	0.00	0.04	0.06
1280	76.05	77.99	73.47	0.01	0.03	0.06	0.01	0.04	0.06
1300	75.43	78.14	74.44	0.01	0.03	0.06	0.00	0.04	0.06
1320	75.16	77.91	76.16	0.01	0.03	0.06	0.00	0.04	0.06
1340	75.41	78.51	76.34	0.00	0.04	0.07	0.00	0.04	0.07
1360	75.14	77.99	77.66	0.00	0.04	0.07	0.01	0.05	0.07
1380	74.27	74.87	78.10	0.01	0.04	0.07	0.00	0.05	0.07
1400	74.89	74.83	77.24	0.00	0.04	0.07	0.00	0.05	0.07
1500	69.41	70.31	71.76	0.01	0.05	0.08	0.00	0.05	0.07
1550	66.84	67.47	65.07	0.01	0.06	0.09	0.01	0.05	0.08
1600	63.34	63.86	65.81	0.00	0.04	0.07	0.01	0.06	0.08
1650	66.42	66.17	71.98	0.01	0.06	0.09	0.02	0.06	0.09
1800	58.20	58.17	67.65	0.01	0.06	0.10	0.03	0.08	0.10
1900	62.67	65.55	62.60	0.01	0.06	0.09	0.03	0.08	0.10
1950	65.07	66.83	66.46	0.02	0.07	0.11	0.03	0.08	0.11
2000	62.95	64.91	62.52	0.02	0.08	0.11	0.03	0.09	0.13

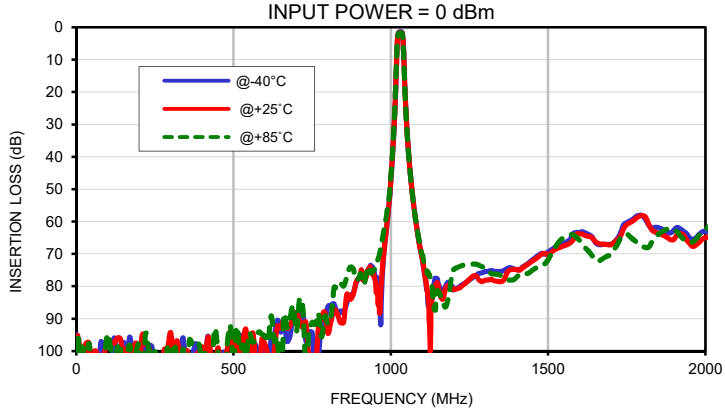
Surface mount Band Pass Filter CBP12-1030BE+

Typical Performance Data

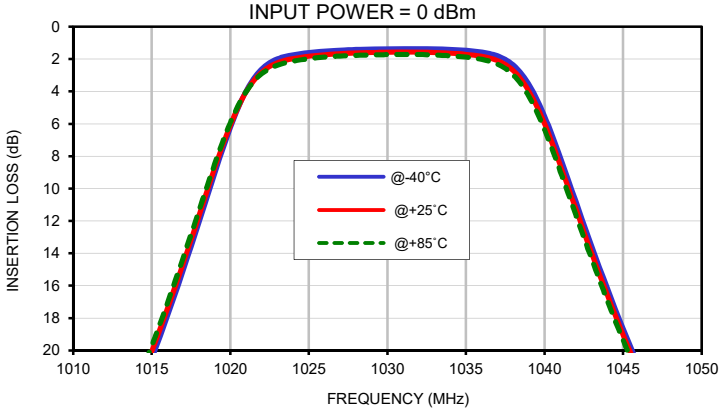
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
1022.0	72.62	70.43	69.25
1022.3	71.69	69.39	68.10
1022.5	70.42	68.12	66.80
1022.8	68.88	66.66	65.35
1023.0	67.23	65.11	63.85
1023.3	65.50	63.54	62.33
1023.5	63.75	61.97	60.85
1023.8	62.05	60.45	59.43
1024.0	60.47	59.06	58.15
1024.3	58.98	57.75	56.94
1024.5	57.65	56.60	55.88
1024.8	56.44	55.51	54.88
1025.0	55.37	54.55	54.00
1025.3	54.42	53.69	53.20
1025.5	53.59	52.93	52.51
1025.8	52.83	52.24	51.88
1026.0	52.19	51.64	51.32
1026.3	51.59	51.08	50.78
1026.5	51.05	50.57	50.30
1026.8	50.58	50.11	49.87
1027.0	50.15	49.72	49.48
1027.3	49.77	49.35	49.12
1027.5	49.40	49.00	48.79
1027.8	49.05	48.70	48.48
1028.0	48.76	48.41	48.20
1028.3	48.47	48.14	47.95
1028.5	48.23	47.90	47.73
1028.8	48.02	47.75	47.57
1029.0	47.83	47.57	47.40
1029.3	47.69	47.43	47.31
1029.5	47.53	47.31	47.21
1029.8	47.45	47.24	47.14
1030.0	47.38	47.20	47.13
1030.3	47.35	47.19	47.13
1030.5	47.35	47.22	47.20
1030.8	47.37	47.28	47.24
1031.0	47.42	47.34	47.34
1031.3	47.53	47.46	47.48
1031.5	47.67	47.61	47.61
1031.8	47.82	47.79	47.83
1032.0	48.02	47.98	48.03
1032.3	48.22	48.18	48.24
1032.5	48.45	48.44	48.50
1032.8	48.73	48.73	48.78
1033.0	49.06	49.04	49.11
1033.3	49.40	49.38	49.47
1033.5	49.78	49.76	49.84
1033.8	50.20	50.18	50.28
1034.0	50.66	50.63	50.74
1034.3	51.19	51.19	51.30
1034.5	51.78	51.79	51.91

Typical Performance Curves

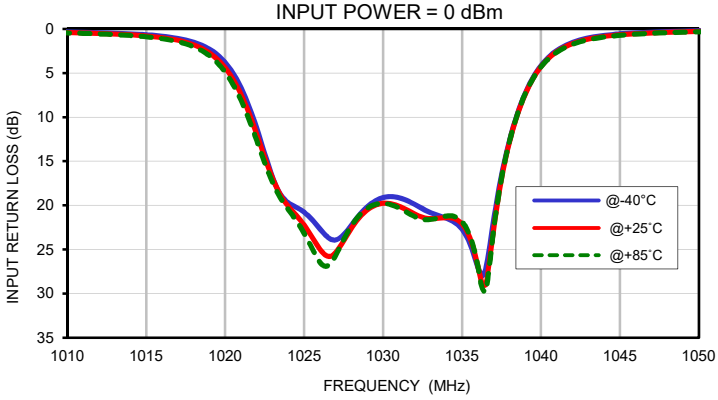
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



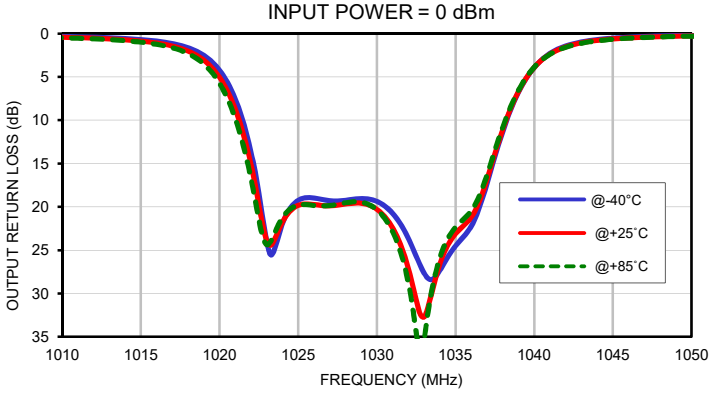
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



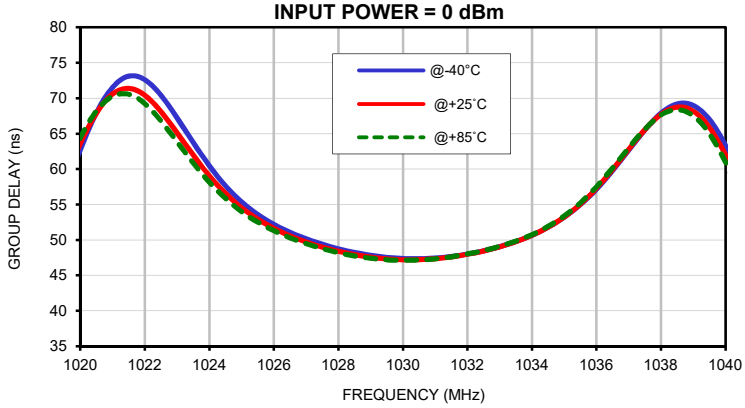
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm

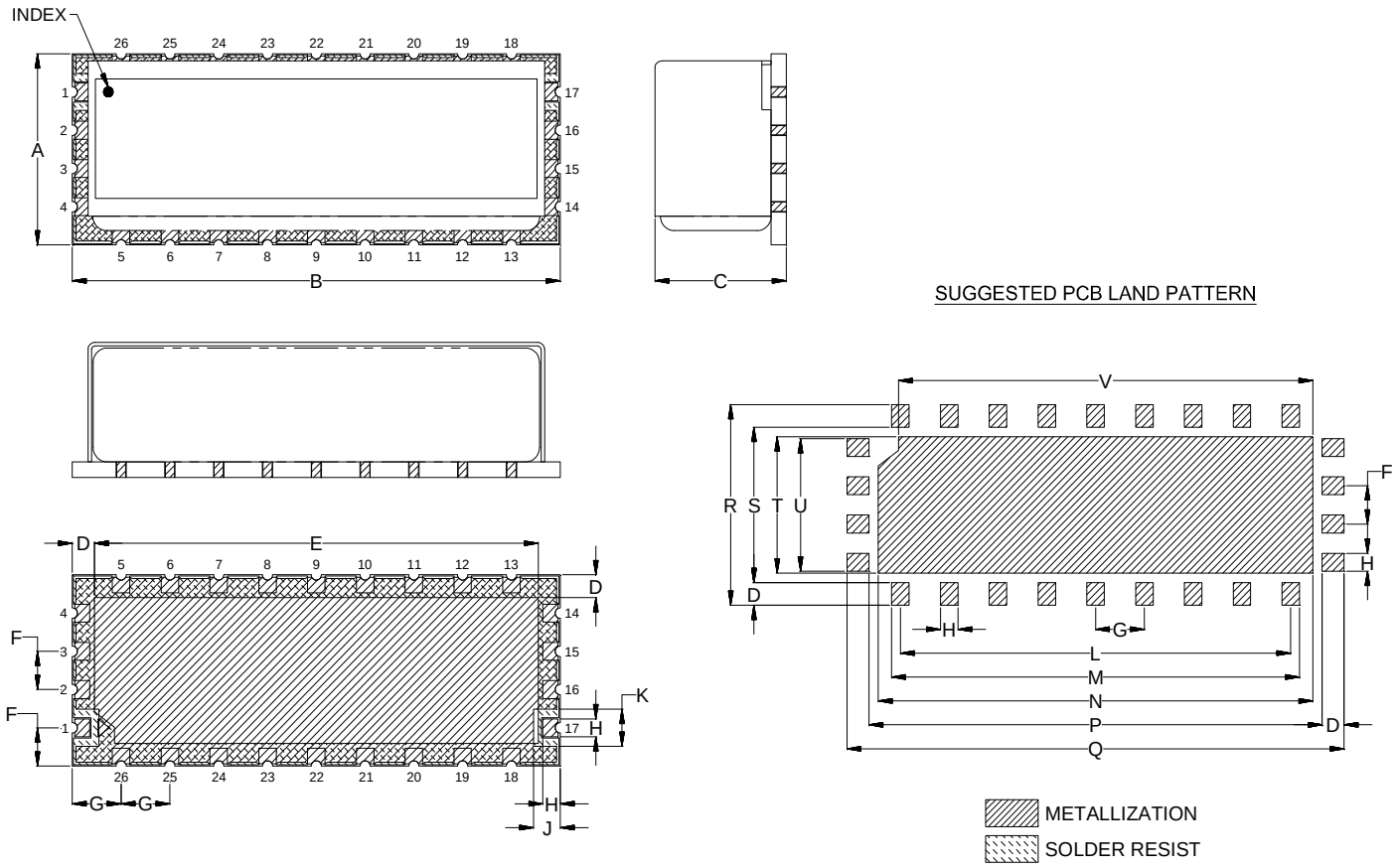


GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style UP

Outline Dimensions UP2912



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
UP2912	.800 (20.32)	2.100 (53.34)	.580 (14.73)	.095 (2.41)	1.910 (48.51)	.160 (4.06)	.210 (5.33)	.075 (1.91)	.115 (2.92)	.155 (3.94)	1.680 (42.67)	1.755 (44.58)	1.870 (47.50)

CASE#	P	Q	R	S	T	U	V	WT.GRAM
UP2912	1.950 (49.53)	2.140 (54.36)	.840 (21.34)	.650 (16.51)	.570 (14.48)	.555 (14.10)	1.783 (45.29)	40

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: 2-5µinch (.05-.13microns) Gold over 120-240µinch (3.05-6.10microns) Nickel plate.
   All models, (+) suffix.

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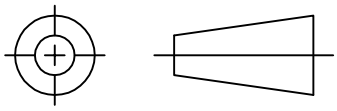
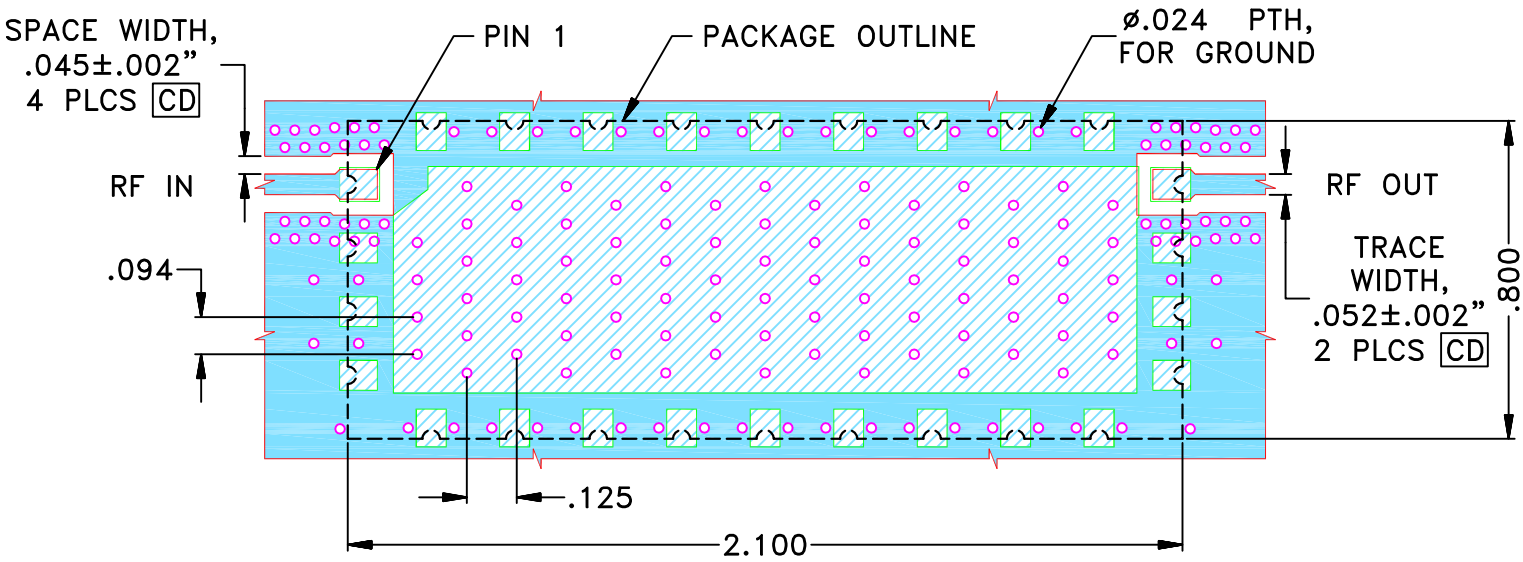
THIRD ANGLE PROJECTION



REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	NPO-000681	NEW RELEASE	JUL 20	AP	VC

SUGGESTED MOUNTING CONFIGURATION FOR UP2912 CASE STYLE



NOTES:

1. COPLANAR WAVEGUIDE PARAMETER ARE SHOWN FOR ROGERS(RO4350B), WITH DIELECTRIC THICKNESS .023"±.002". 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	AP	25 JUL 20
TOLERANCES ON:	CHECKED	MD	25 JUL 20
2 PL DECIMALS ±	APPROVED	KN	25 JUL 20
3 PL DECIMALS ± .005"			
ANGLES ±			
FRACTIONS ±			

Mini-Circuits ®

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

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, UP2912, TB-1137+, 50 Ohm

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-686	OR

FILE:	SCALE:	SHEET:
98PL686	3:1	1 OF 1

Mini-Circuits

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

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