

Surface Mount Bandpass Filter

CBP-897G+

50Ω 887 to 907 MHz



Generic photo used for illustration purposes only
CASE STYLE: NC1916

The Big Deal

- Good Rejection
- Low passband Insertion Loss
- Miniature shielded package
- Narrow band 2.2% BW

Product Overview

CBP-897G+ is a ceramic-coaxial-resonator based bandpass filter in a shielded package fabricated using SMT technology. This filter offers outstanding close in rejection and low insertion loss for use in aviation, private and public land mobile.

Key Features

Feature	Advantages
High Selectivity	The CBP-897G+ 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-897G+ has been qualified over wide range of thermal, mechanical and environmental conditions including withstanding the stress of extensive solder reflow cycles.

Notes

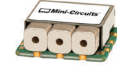
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B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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Features

- Good rejection
- Low Passband Insertion loss
- Miniature shielded package
- Narrow band

Applications

- Aviation/Aeronautical
- Specialized Mobile Radio service
- Private and Public Land Mobile
- Public Safety Communication

Electrical Specifications at 25°C

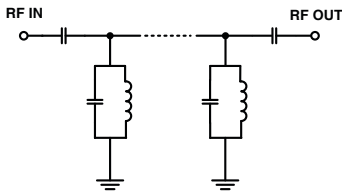
Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit	
Pass Band	Center Frequency	—	—	897	—	MHz	
	Insertion Loss	F1-F2	887-907	—	1.8	2.8	dB
	VSWR	F1-F2	887-907	—	1.4	2.3	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC-850	20	25.9	—	dB
	VSWR	DC-F3	DC-850	—	20	—	:1
Stop Band, Upper	Insertion Loss	F4-F5	945-2000	20	24.9	—	dB
	VSWR	F4-F5	945-2000	—	20	—	:1

Maximum Ratings

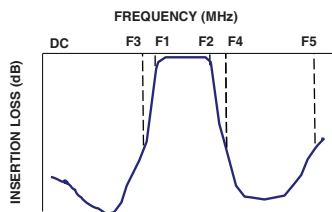
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	10W

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

Functional Schematic



Typical Frequency Response

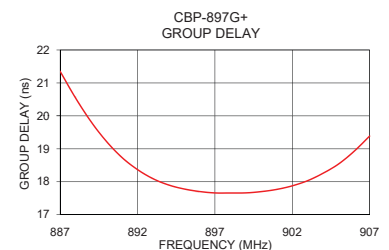
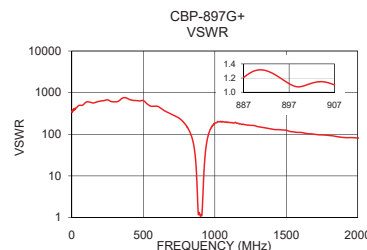
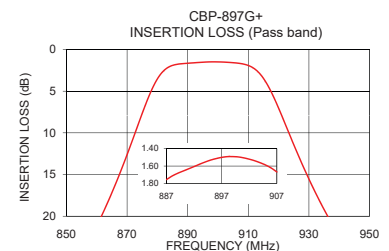
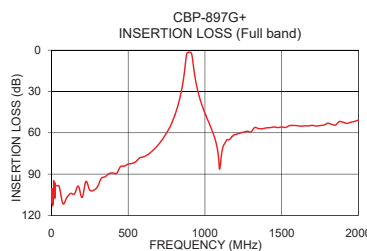


Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	105.04	337.26	887	21.35
50	98.84	492.53	888	20.54
250	101.61	672.38	889	19.82
550	80.95	477.03	890	19.22
840	33.26	82.99	891	18.74
845	30.68	72.35	892	18.37
850	27.84	60.52	893	18.10
861	20.42	34.68	894	17.91
880	3.53	2.42	895	17.78
887	1.76	1.21	896	17.71
897	1.50	1.12	897	17.66
907	1.67	1.10	898	17.66
915	3.47	2.51	899	17.66
937	20.54	44.96	900	17.70
945	25.30	68.48	901	17.77
955	30.23	96.95	902	17.88
960	32.39	110.55	903	18.04
1250	59.59	163.77	904	18.26
1700	54.60	99.73	905	18.54
2000	50.75	81.17	907	19.39

+RoHS Compliant

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



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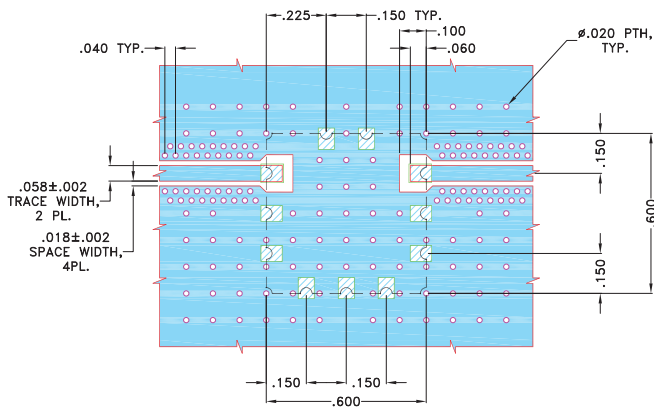
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REV.A
M174392
CBP-897G+
EDU2068/3
URJ
200806
Page 2 of 3

Pad Connections

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

Demo Board MCL P/N: TB-764+
Suggested PCB Layout (PL-403)



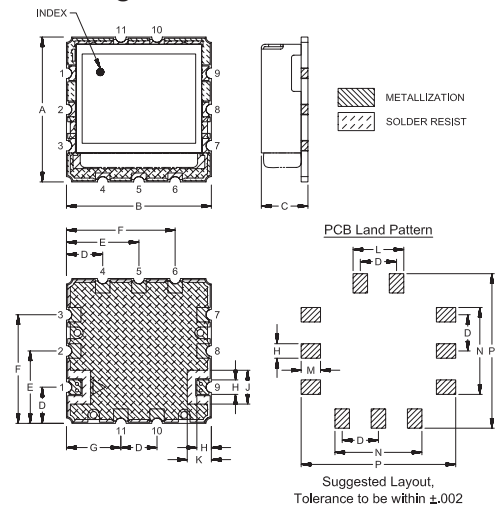
NOTES:

- TRACE WIDTH IS SHOWN FOR OAK (OAK-602) WITH DIELECTRIC THICKNESS $.022 \pm .0015"$. 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



Outline Dimensions (inch mm)

A	B	C	D	E	F	G	H
.600	.600	.210	.150	.300	.450	.225	.060
15.24	15.24	5.33	3.81	7.62	11.43	5.72	1.52
J	K	L	M	N	P	WT.GRAMS	
.140	.100	.210	.080	.360	.640	2.6	
3.56	2.54	5.33	2.03	9.14	16.26		

Note: Please refer to case style drawing for details

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Typical Performance Data

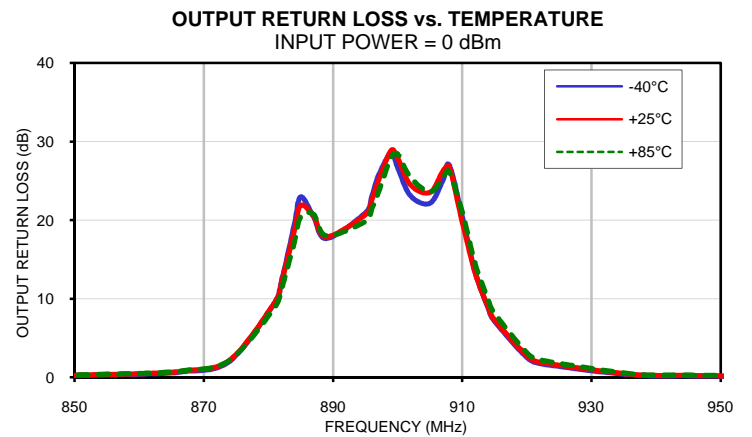
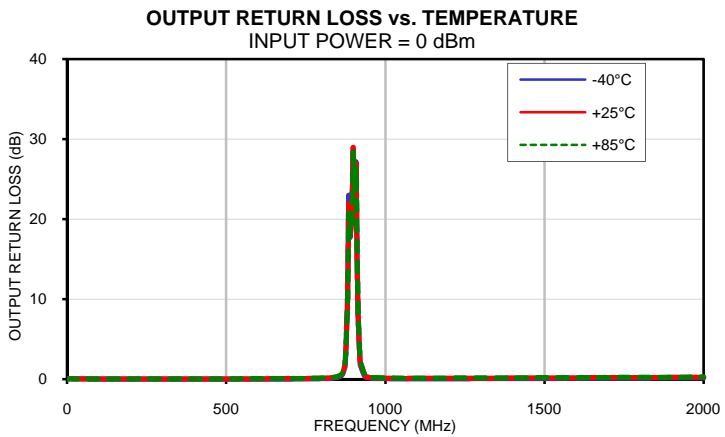
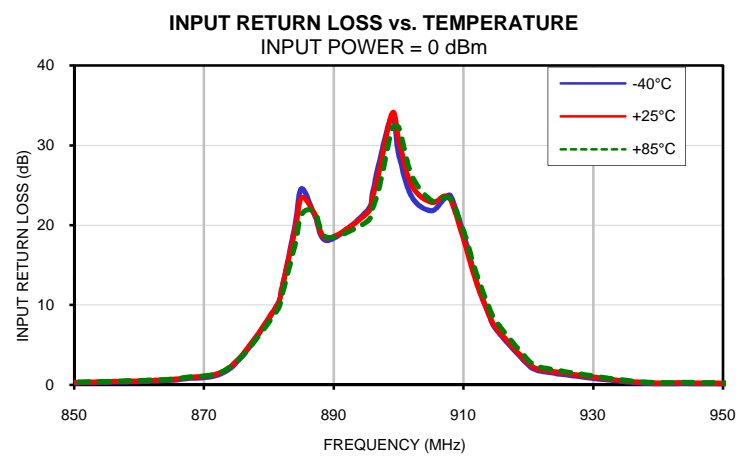
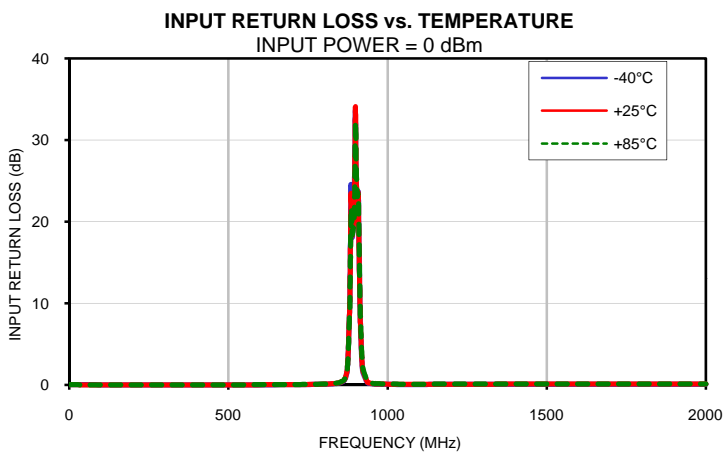
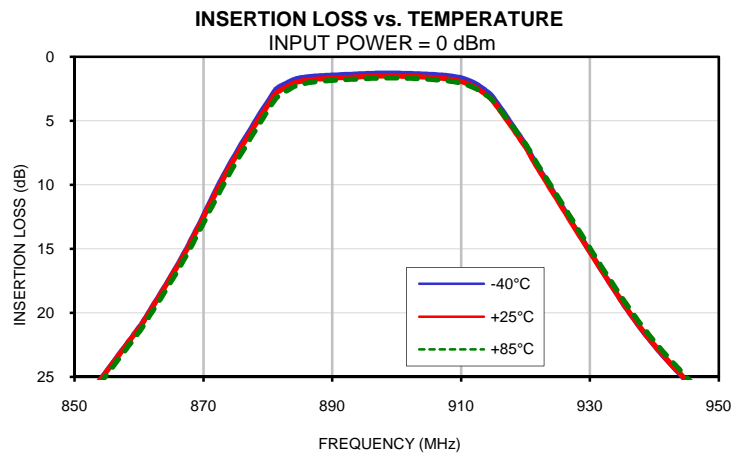
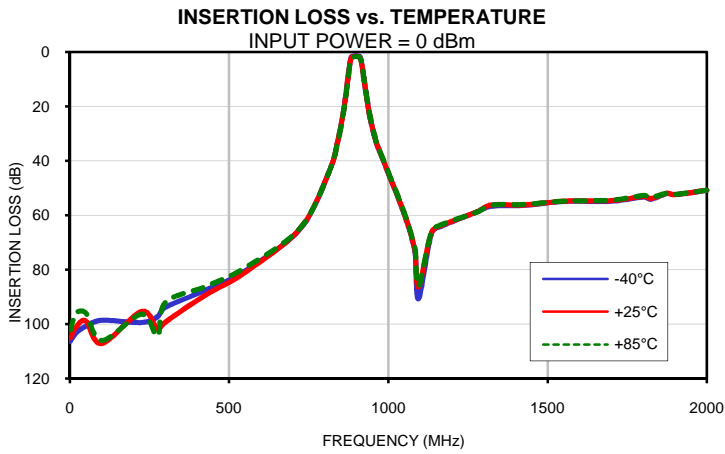
FREQ. (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	106.25	105.04	102.13	0.05	0.05	0.05	0.05	0.05	0.05
20	103.09	100.97	95.84	0.04	0.04	0.05	0.04	0.04	0.04
50	100.68	98.84	95.85	0.04	0.04	0.04	0.03	0.04	0.04
100	98.50	107.14	105.95	0.03	0.03	0.03	0.03	0.03	0.03
225	99.36	95.31	96.29	0.01	0.02	0.02	0.02	0.03	0.03
275	97.21	101.74	104.30	0.01	0.03	0.03	0.02	0.03	0.04
300	93.74	99.21	91.95	0.01	0.03	0.03	0.02	0.03	0.04
425	87.49	89.37	86.16	0.01	0.02	0.03	0.01	0.03	0.04
550	80.34	80.95	79.24	0.02	0.04	0.04	0.01	0.04	0.05
725	64.67	64.50	64.39	0.04	0.07	0.08	0.03	0.06	0.08
816	43.33	43.28	43.38	0.11	0.14	0.16	0.09	0.13	0.16
840	33.28	33.26	33.46	0.18	0.23	0.25	0.16	0.21	0.24
845	30.69	30.68	30.89	0.21	0.26	0.28	0.19	0.24	0.28
850	27.85	27.84	28.08	0.25	0.30	0.33	0.23	0.29	0.32
860	21.14	21.18	21.50	0.42	0.49	0.52	0.39	0.47	0.51
861	20.38	20.42	20.76	0.45	0.52	0.56	0.42	0.50	0.55
867	15.34	15.43	15.84	0.76	0.85	0.89	0.73	0.83	0.88
874	8.47	8.66	9.18	2.07	2.22	2.21	2.04	2.19	2.19
881	2.71	3.00	3.42	9.63	9.66	9.02	9.55	9.55	8.95
882	2.30	2.59	2.96	12.22	12.14	11.25	12.10	11.97	11.14
884	1.80	2.06	2.35	19.98	19.30	17.54	19.35	18.60	17.11
885	1.66	1.91	2.18	24.56	23.42	21.34	22.98	21.89	20.43
887	1.53	1.76	1.98	21.25	21.45	21.66	20.46	20.53	20.77
889	1.47	1.68	1.88	18.07	18.33	18.45	17.68	17.90	18.04
895	1.33	1.53	1.72	21.69	21.39	20.39	20.93	20.70	19.84
896	1.31	1.51	1.70	24.23	23.63	22.23	23.02	22.59	21.44
897	1.30	1.50	1.68	27.95	26.79	24.75	25.61	24.95	23.48
899	1.29	1.49	1.66	33.62	34.00	32.14	28.60	28.90	28.04
900	1.29	1.49	1.67	28.85	30.61	32.24	26.74	27.91	28.45
902	1.32	1.52	1.69	23.53	24.93	26.22	23.11	24.50	25.46
905	1.38	1.59	1.76	21.80	22.85	23.11	22.17	23.55	23.62
907	1.44	1.67	1.84	23.28	23.63	23.45	25.10	26.24	25.35
908	1.49	1.73	1.89	23.64	23.18	23.27	26.99	26.84	26.18
910	1.67	1.93	2.08	18.88	18.21	19.27	20.52	19.80	21.08
912	2.04	2.31	2.43	12.88	12.72	13.83	13.43	13.32	14.53
914	2.72	3.00	3.04	8.57	8.65	9.57	8.82	8.95	9.91
915	3.21	3.47	3.48	6.95	7.09	7.91	7.14	7.32	8.17
920	6.89	7.05	6.83	2.48	2.67	3.06	2.54	2.76	3.16
922	8.68	8.79	8.52	1.71	1.88	2.17	1.76	1.95	2.25
936	19.92	19.88	19.59	0.32	0.40	0.46	0.33	0.41	0.49
945	25.37	25.30	25.04	0.19	0.24	0.28	0.19	0.25	0.31
955	30.32	30.23	30.00	0.13	0.17	0.20	0.12	0.18	0.22
960	32.48	32.39	32.17	0.11	0.15	0.18	0.11	0.16	0.20
963	33.70	33.61	33.39	0.10	0.14	0.17	0.10	0.15	0.19
1050	59.51	59.36	59.03	0.06	0.09	0.11	0.05	0.09	0.11
1080	71.36	71.04	70.55	0.06	0.10	0.11	0.05	0.09	0.12
1085	75.25	74.34	73.42	0.06	0.10	0.11	0.05	0.09	0.12
1095	90.58	86.26	85.96	0.06	0.10	0.11	0.05	0.09	0.12
1135	66.74	66.48	66.26	0.07	0.10	0.12	0.05	0.09	0.12
1170	63.82	63.59	63.29	0.07	0.11	0.13	0.06	0.10	0.13
1275	58.85	58.87	58.97	0.08	0.11	0.13	0.07	0.11	0.14
1325	56.61	56.15	56.24	0.09	0.12	0.13	0.08	0.12	0.15
1425	56.33	56.23	56.00	0.09	0.13	0.15	0.10	0.13	0.17
1550	54.89	54.80	54.77	0.09	0.13	0.15	0.11	0.15	0.18
1700	54.81	54.60	54.41	0.09	0.13	0.15	0.13	0.17	0.21
1800	53.30	53.06	52.71	0.09	0.13	0.16	0.15	0.19	0.22
1825	54.05	53.81	53.40	0.09	0.13	0.16	0.15	0.19	0.23
1875	51.92	51.88	51.92	0.09	0.13	0.16	0.16	0.20	0.24
1900	52.33	52.38	52.35	0.09	0.13	0.15	0.16	0.21	0.24
2000	50.82	50.75	50.75	0.08	0.12	0.15	0.16	0.21	0.26

Typical Performance Data

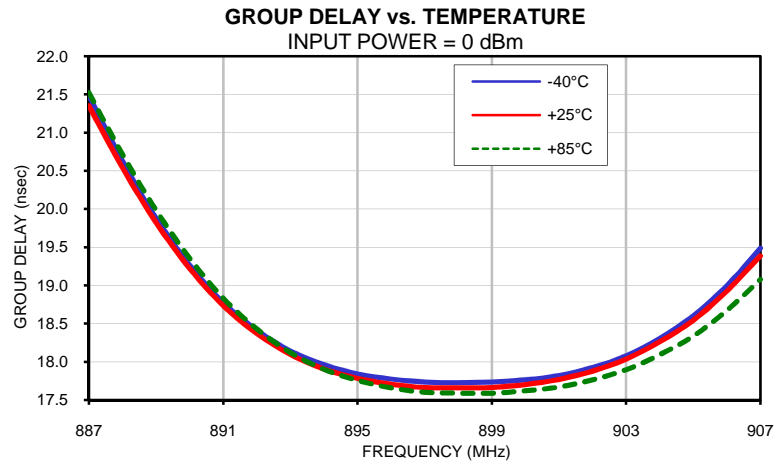
FREQ. (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
887	21.48	21.35	21.52
888	20.63	20.54	20.71
889	19.88	19.82	19.99
890	19.26	19.22	19.36
891	18.78	18.74	18.83
892	18.41	18.37	18.43
893	18.14	18.10	18.12
894	17.96	17.91	17.90
895	17.84	17.78	17.76
896	17.77	17.71	17.66
897	17.73	17.66	17.60
898	17.73	17.66	17.59
899	17.74	17.66	17.59
900	17.76	17.70	17.62
901	17.82	17.77	17.67
902	17.93	17.88	17.77
903	18.08	18.04	17.90
904	18.31	18.26	18.09
905	18.60	18.54	18.34
906	19.00	18.93	18.67
907	19.49	19.39	19.08

945 25.36589 25.29643 25.03994 0.185452 0.242585 0.28262 0.189233 0.253697 0.306713

Typical Performance Curves

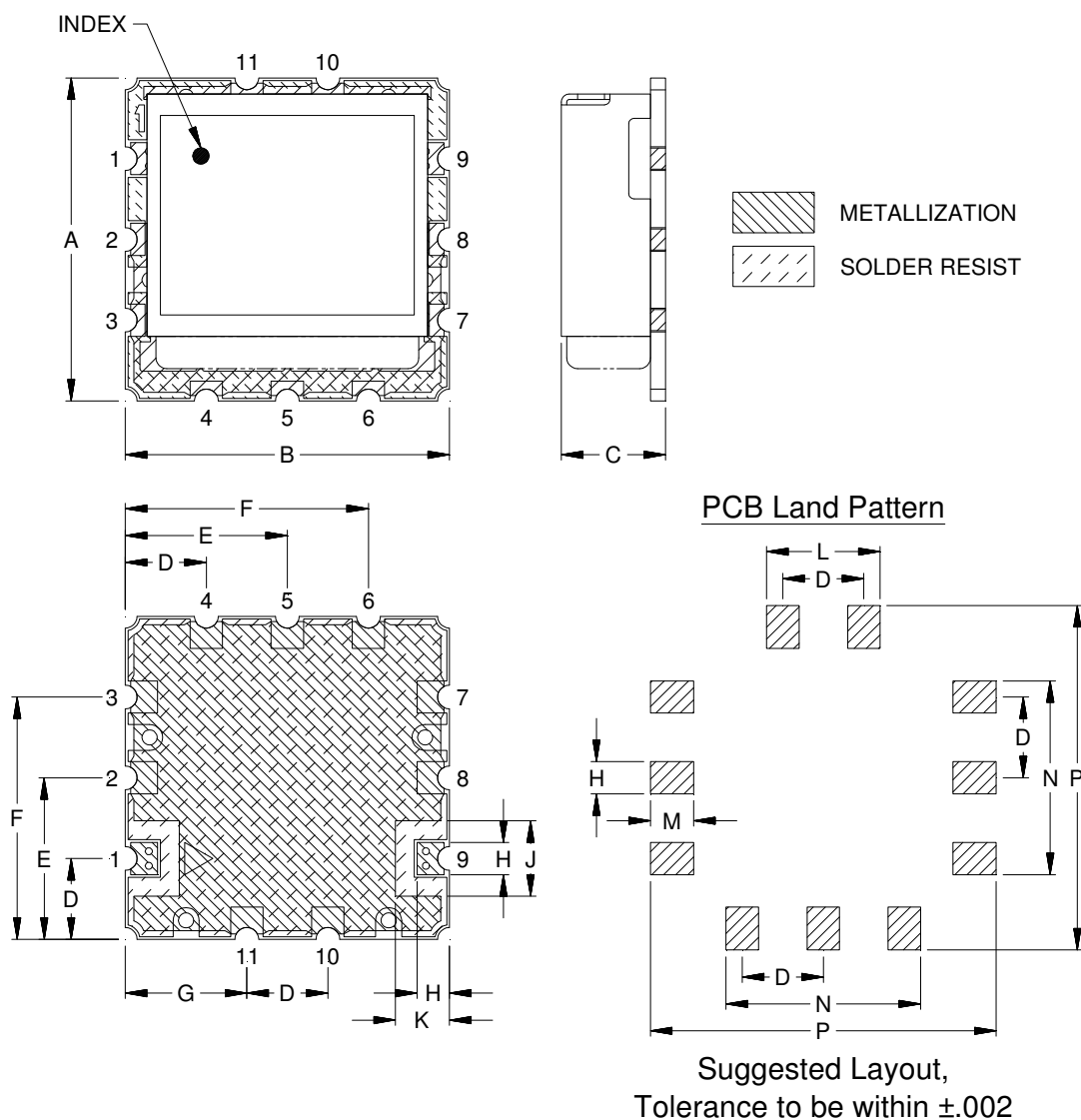


Typical Performance Curves



Outline Dimensions

NC1916



Suggested Layout,
Tolerance to be within $\pm .002$

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT.GRAMS
NC1916	.600 (15.24)	.600 (15.24)	.210 (5.33)	.150 (3.81)	.300 (7.62)	.450 (11.43)	.225 (5.72)	.060 (1.52)	.140 (3.56)	.100 (2.54)	.210 (5.33)	.080 (2.03)	.360 (9.14)	.640 (16.26)	2.6

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: 3-5 μ inch Gold over 120-240 μ 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

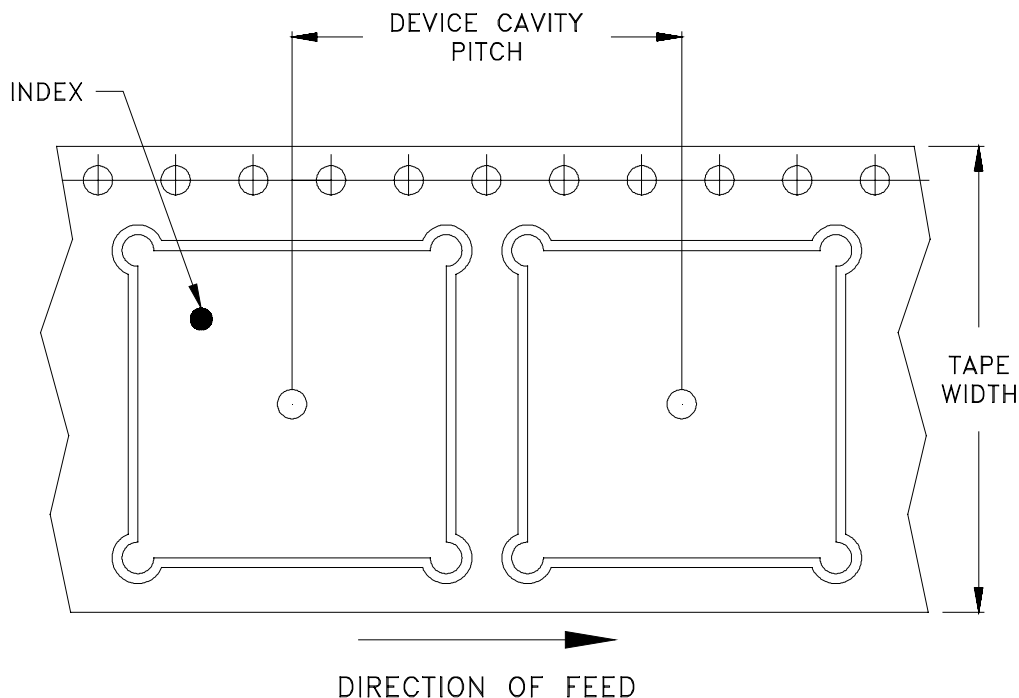


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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F113

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
24	20	13	400

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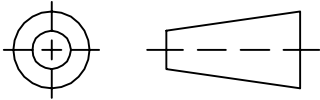
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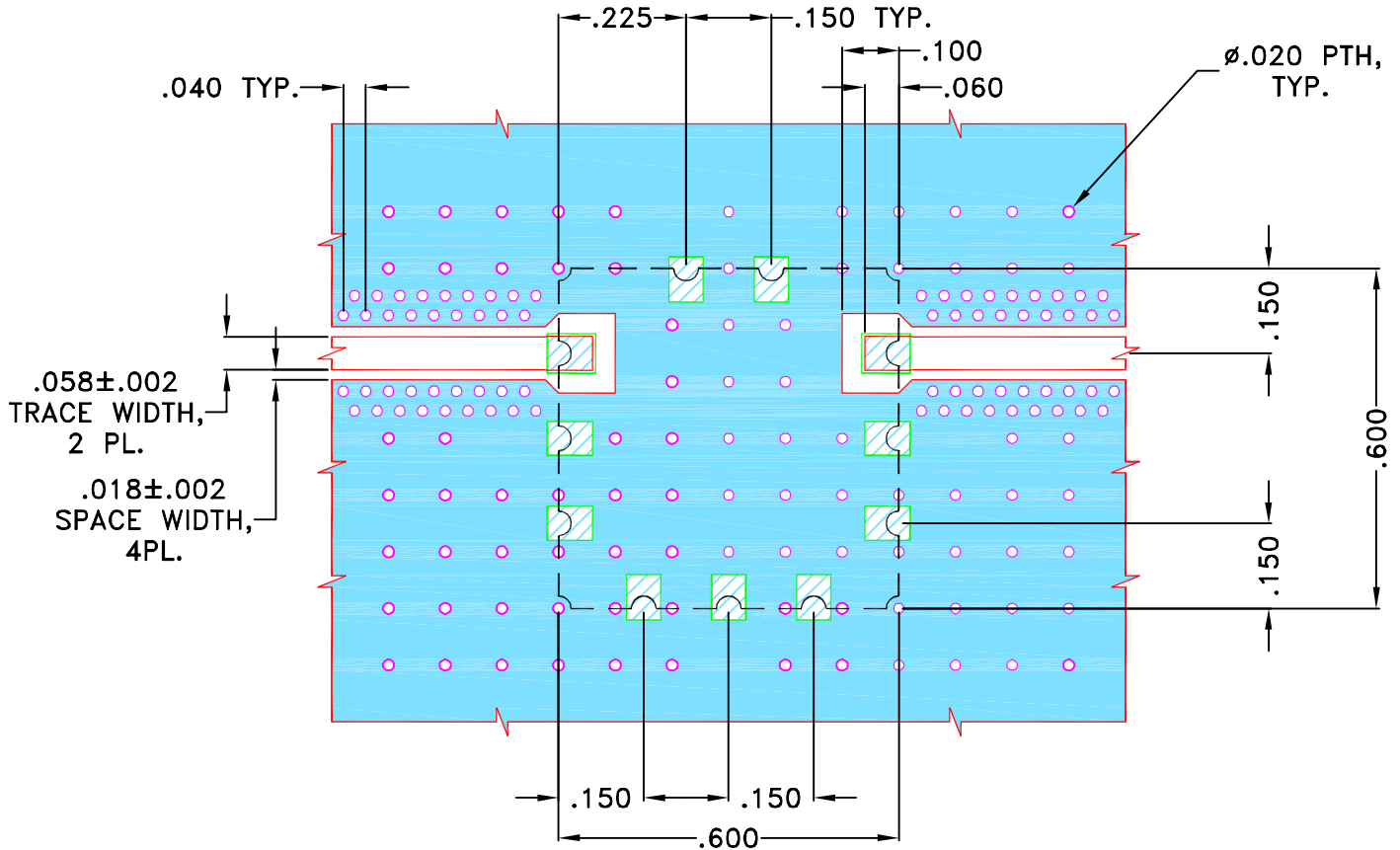
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M144090	NEW RELEASE	NOV 13	DDR	KG

**SUGGESTED MOUNTING CONFIGURATION FOR
NC1916 CASE STYLE "11FL01" 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 26 NOV 13
	CHECKED	MD 26 NOV 13
	APPROVED	ASJ 26 NOV 13

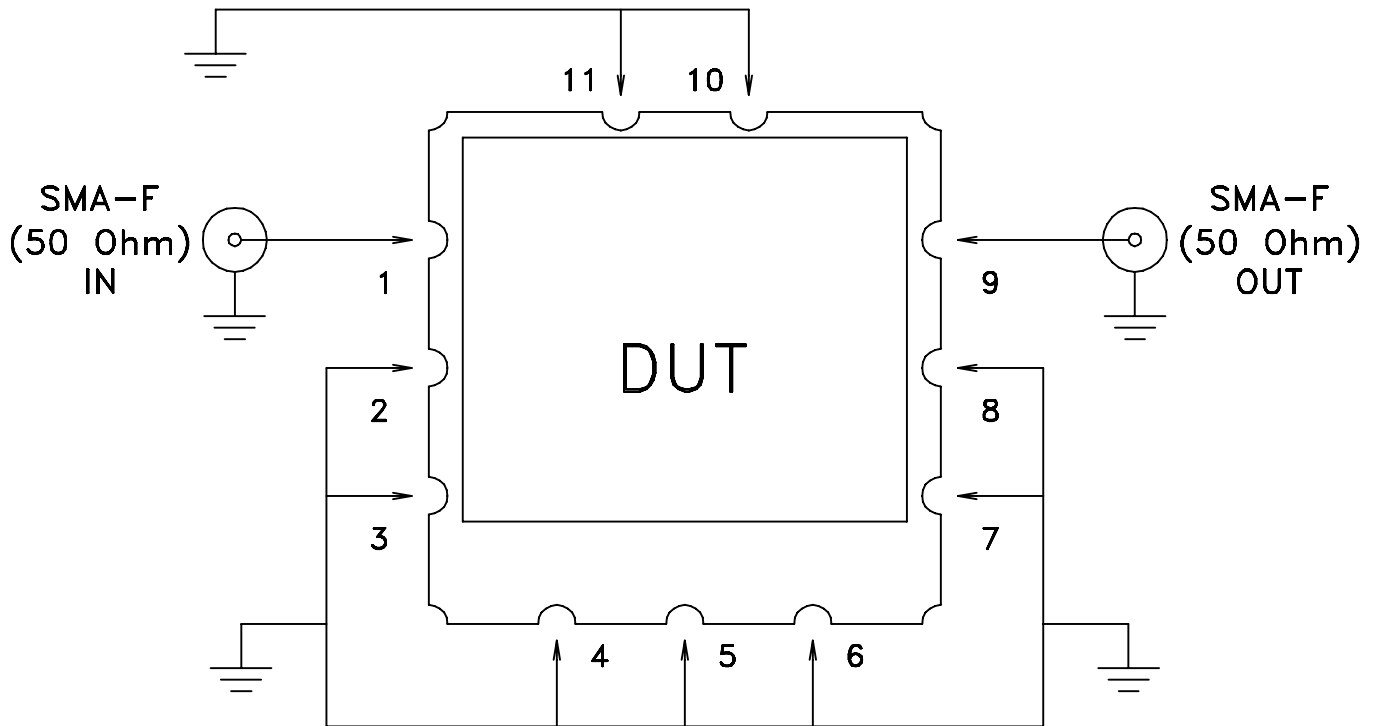
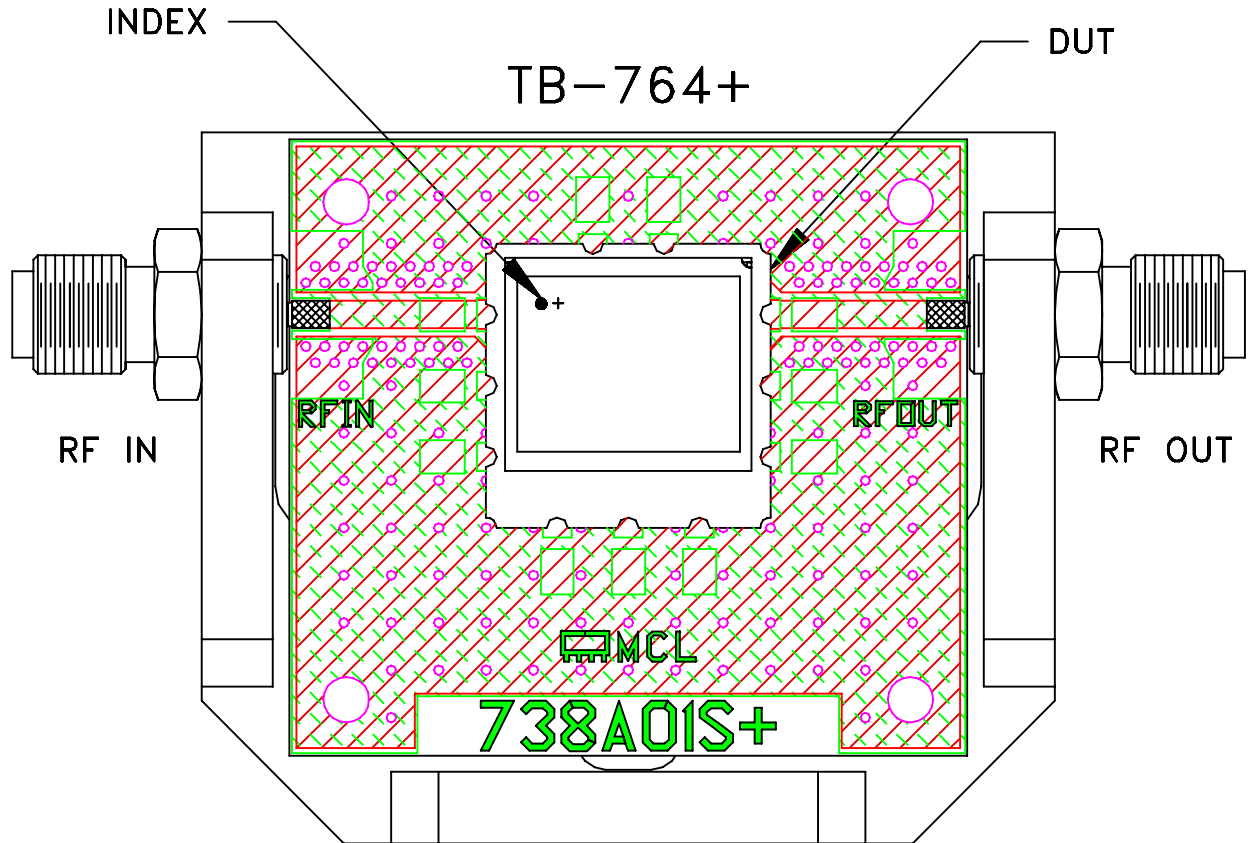
Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

**PL, 11FL01, NC1916, BPF, CBP,
TB-764+, 50 Ohm**

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-403	OR
FILE:	98PL403	SCALE:	3:1
SHEET:		1 OF 1	

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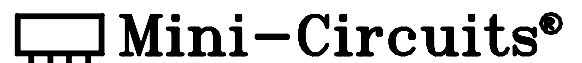
Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: OAK-602 OR Equivalent
Dielectric Constant=2.50±.04, Thickness=.022 inch.



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