Coaxial

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%
- 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

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
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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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Ceramic Resonator

Bandpass Filter

ZX75BP-942-S+

50Ω 875 to 1010 MHz

Generic photo used for illustration purposes only

CASE STYLE: HY1238

SMA Connectors		Model
IN	OUT	
MALE	FEM	ZX75BP-942-S+

+RoHS Compliant

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

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input*	10W max. at 25°C

* Derate linearly to 5W at 100°C ambient.
Permanent damage may occur if any of these limits are exceeded.

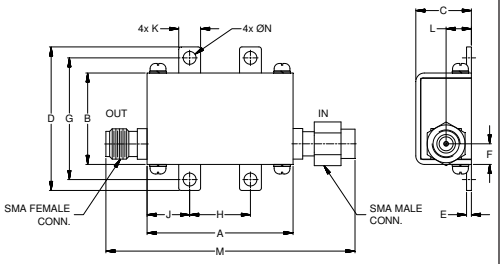
Features

- Low Insertion loss, 1.1 dB typ.
- Minimal Insertion loss variation over temperature, ±0.2 dB
- Sharp stop band rejection
- Protected by US Patent 6,790,049

Applications

- Harmonic & Sub-harmonic filtering
- Image rejection
- Receivers/Transmitters
- Test Lab
- GSM

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
1.20	**.75**	**.46**	**1.18**	**.04**	**.17**	**1.00**
30.48	19.05	11.68	29.97	1.02	4.32	25.40

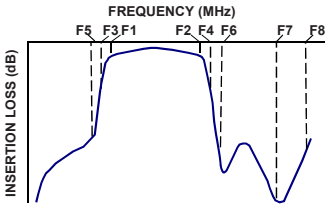
H	J	K	L	M	N	Wt.
.50	**.35**	**.18**	**.21**	**2.05**	**.106**	grams
12.70	8.89	4.57	5.28	52.07	2.69	35.0

Note: Please refer to case style drawing for details

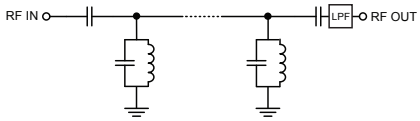
Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency			—	942	—	MHz
	Insertion Loss	F1-F2	875-1010	—	1.1	2.5	dB
	VSWR	F1-F2	875-1010	—	—	1.9	:1
Stop Band, Lower	Insertion Loss	DC-F5	0.3-690	40	—	—	dB
		F5-F3	690-750	20	—	—	dB
	VSWR	DC-F3	0.3-750	—	30	—	:1
Stop Band, Upper	Insertion Loss	F4-F6	1160-1250	20	—	—	dB
		F6-F7	1250-1300	40	—	—	dB
		F7-F8	1300-6800	—	20	—	dB
	VSWR	F4-F8	1160-6800	—	10	—	:1

Typical Frequency Response

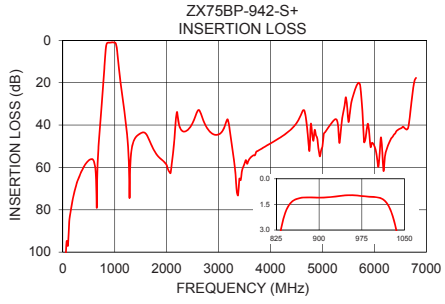


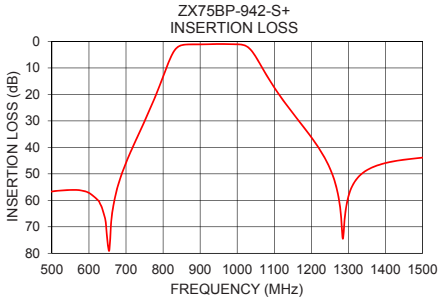
Functional Schematic

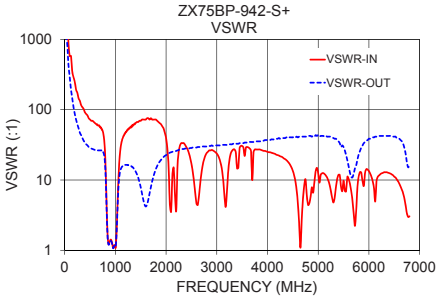


Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR-IN (:1)	VSWR-OUT (:1)
0.3	104.61	1737.18	1737.18
100.0	96.86	579.06	289.53
500.0	56.65	72.39	28.49
690.0	49.47	57.91	26.33
750.0	30.16	49.64	25.56
830.0	3.57	3.64	3.34
875.0	1.09	1.23	1.21
900.0	1.10	1.40	1.34
920.0	1.07	1.39	1.34
945.0	0.97	1.17	1.15
980.0	1.02	1.18	1.18
1010.0	1.16	1.16	1.21
1040.0	3.74	3.90	3.53
1160.0	28.88	42.38	16.11
1210.0	38.15	48.26	16.41
1230.0	42.47	51.10	16.41
1250.0	47.87	52.65	16.41
1900.0	56.26	62.05	19.32
5000.0	49.93	12.44	43.44
6800.0	17.75	3.04	16.72







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Coaxial Band Pass Filter ZX75BP-942-S+

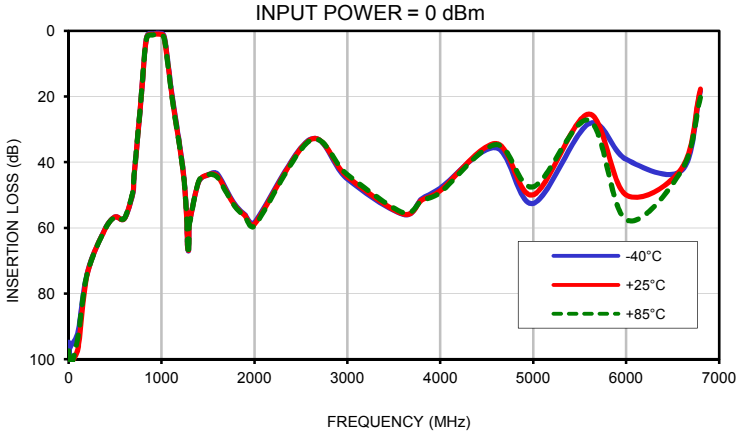
Typical Performance Data

FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C
0	109.69	104.61	97.47	0.00	0.01	0.00	0.00	0.00	0.00
1	94.93	105.40	112.55	0.00	0.00	0.00	0.00	0.00	0.00
5	102.21	102.07	101.56	0.00	0.00	0.00	0.00	0.00	0.00
10	96.83	101.60	103.78	0.00	0.00	0.00	0.00	0.00	0.00
100	91.83	96.86	93.31	0.02	0.03	0.04	0.02	0.06	0.08
200	73.79	74.14	73.88	0.05	0.07	0.09	0.13	0.20	0.23
400	59.82	59.95	59.99	0.17	0.19	0.21	0.38	0.51	0.57
500	56.64	56.65	56.67	0.22	0.24	0.27	0.44	0.61	0.70
600	57.17	57.18	57.08	0.25	0.27	0.31	0.46	0.65	0.78
690	49.66	49.47	49.18	0.26	0.30	0.34	0.45	0.66	0.81
700	45.95	45.82	45.53	0.27	0.31	0.35	0.45	0.66	0.80
720	39.48	39.35	39.11	0.27	0.32	0.37	0.44	0.66	0.81
740	33.38	33.22	33.01	0.28	0.34	0.39	0.45	0.67	0.81
750	30.31	30.16	29.96	0.29	0.35	0.41	0.46	0.68	0.82
760	27.17	27.04	26.84	0.31	0.37	0.44	0.47	0.70	0.83
780	20.57	20.45	20.27	0.38	0.47	0.56	0.55	0.78	0.92
790	17.06	16.94	16.79	0.47	0.59	0.69	0.66	0.90	1.03
800	13.41	13.30	13.17	0.66	0.82	0.96	0.87	1.14	1.28
810	9.71	9.63	9.52	1.11	1.34	1.53	1.35	1.67	1.85
820	6.22	6.20	6.17	2.15	2.50	2.80	2.44	2.87	3.13
830	3.47	3.57	3.62	4.36	4.90	5.35	4.76	5.36	5.74
840	1.87	2.06	2.18	8.16	8.89	9.51	8.74	9.51	10.04
850	1.18	1.42	1.58	13.16	14.00	14.71	13.89	14.75	15.51
860	0.94	1.19	1.35	18.09	18.77	19.30	18.55	19.32	20.45
870	0.86	1.10	1.27	20.23	20.30	20.64	20.23	20.83	22.27
875	0.85	1.09	1.25	19.74	19.65	20.03	19.81	20.42	21.85
890	0.86	1.09	1.24	16.75	16.78	17.24	17.20	17.95	19.02
900	0.87	1.10	1.25	15.43	15.60	16.05	15.98	16.77	17.64
920	0.85	1.07	1.22	15.33	15.70	16.17	15.94	16.80	17.41
940	0.76	0.99	1.14	19.21	20.04	20.64	20.01	21.11	21.43
945	0.74	0.97	1.13	21.08	22.21	22.89	22.02	23.32	23.53
950	0.72	0.96	1.12	23.41	25.01	25.75	24.53	26.17	26.23
960	0.72	0.96	1.13	26.91	28.61	28.49	27.68	29.39	29.64
970	0.74	0.99	1.16	23.94	24.09	23.78	23.78	24.57	25.26
980	0.78	1.02	1.20	21.43	21.48	21.32	21.05	21.86	22.66
990	0.80	1.05	1.22	21.41	21.75	21.79	20.62	21.73	22.92
1000	0.81	1.07	1.25	24.74	26.37	28.17	22.19	23.83	27.11
1010	0.88	1.16	1.34	22.15	22.60	24.46	20.22	20.50	22.63
1020	1.15	1.48	1.68	13.41	13.25	13.54	13.29	13.20	13.81
1030	1.88	2.28	2.51	7.92	7.82	7.93	8.13	8.18	8.52
1040	3.27	3.74	4.00	4.57	4.56	4.65	4.87	5.06	5.34
1050	5.25	5.78	6.06	2.67	2.72	2.81	3.00	3.28	3.54
1060	7.58	8.12	8.42	1.65	1.73	1.82	1.99	2.32	2.57
1080	12.38	12.91	13.21	0.81	0.91	0.98	1.17	1.52	1.76
1100	16.85	17.37	17.66	0.54	0.63	0.70	0.92	1.26	1.47
1120	20.93	21.45	21.72	0.44	0.51	0.58	0.83	1.16	1.34
1130	22.85	23.37	23.64	0.41	0.48	0.54	0.81	1.13	1.30
1160	28.36	28.88	29.11	0.35	0.41	0.47	0.79	1.08	1.24
1190	33.83	34.31	34.47	0.32	0.38	0.43	0.78	1.06	1.21
1200	35.73	36.19	36.34	0.31	0.37	0.42	0.78	1.06	1.20
1210	37.71	38.15	38.26	0.30	0.36	0.42	0.78	1.06	1.20
1230	42.03	42.47	42.50	0.29	0.34	0.40	0.79	1.06	1.20
1250	47.47	47.87	47.79	0.27	0.33	0.38	0.80	1.06	1.21
1270	56.01	56.56	56.17	0.26	0.32	0.37	0.82	1.07	1.22
1280	65.57	65.72	64.62	0.26	0.32	0.37	0.83	1.08	1.23
1290	67.01	66.81	68.04	0.26	0.31	0.37	0.83	1.08	1.25
1295	61.90	61.67	62.45	0.25	0.31	0.36	0.83	1.09	1.26
1300	58.56	58.57	59.02	0.25	0.31	0.36	0.83	1.09	1.26
1400	45.97	45.90	45.77	0.21	0.27	0.33	0.97	1.32	1.62
1500	43.86	43.87	43.78	0.18	0.25	0.31	1.62	2.22	2.79
1600	43.52	44.11	44.57	0.17	0.24	0.31	3.58	4.22	4.55
1700	48.59	49.06	49.36	0.16	0.23	0.32	1.86	2.21	2.49
1800	53.29	53.65	53.84	0.16	0.24	0.34	0.91	1.21	1.47
1900	56.08	56.26	56.63	0.17	0.28	0.39	0.60	0.90	1.12
2000	58.38	58.91	59.37	0.30	0.44	0.59	0.46	0.77	0.97
2600	33.05	33.15	33.40	2.88	3.83	4.60	0.18	0.60	0.85
3000	45.15	44.45	43.79	0.47	0.73	0.97	0.13	0.56	0.93
3600	55.89	55.79	55.35	0.39	0.59	0.76	0.15	0.51	0.77
3800	51.14	51.53	51.66	0.40	0.64	0.80	0.12	0.49	0.68
4000	47.90	48.67	49.22	0.41	0.69	0.87	0.08	0.47	0.63
4600	35.60	34.33	34.65	1.52	3.83	8.72	0.05	0.43	0.62
5000	52.55	49.93	47.48	0.75	1.40	1.94	0.05	0.40	0.78
5600	28.28	25.34	27.23	1.05	1.68	2.01	0.18	1.11	2.05
6000	39.13	49.98	57.52	0.82	1.30	1.67	0.18	0.45	0.78
6600	42.49	41.82	42.37	0.99	1.97	3.07	0.20	0.45	0.56
6800	18.32	17.75	20.28	4.65	5.93	7.93	0.45	1.04	0.81

Coaxial Band Pass Filter ZX75BP-942-S+

Typical Performance Curves

INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



INSERTION LOSS vs. TEMPERATURE
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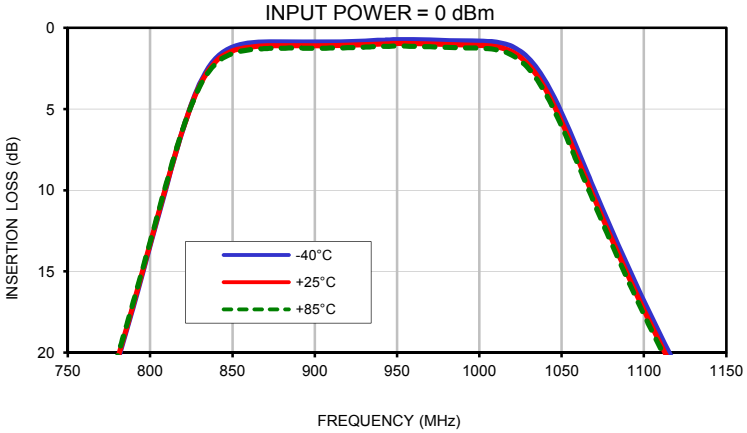
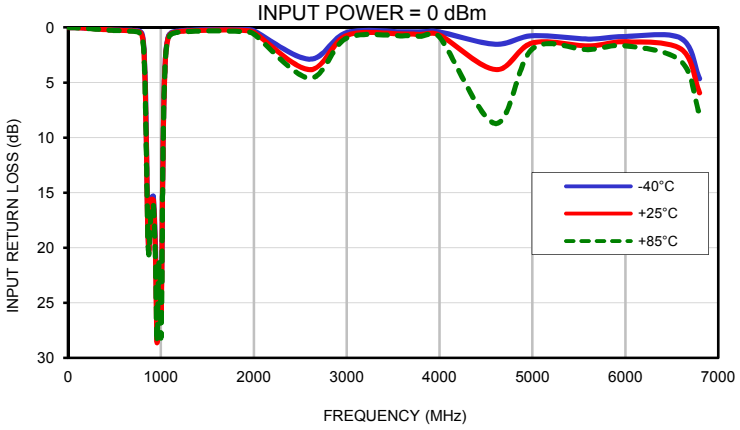
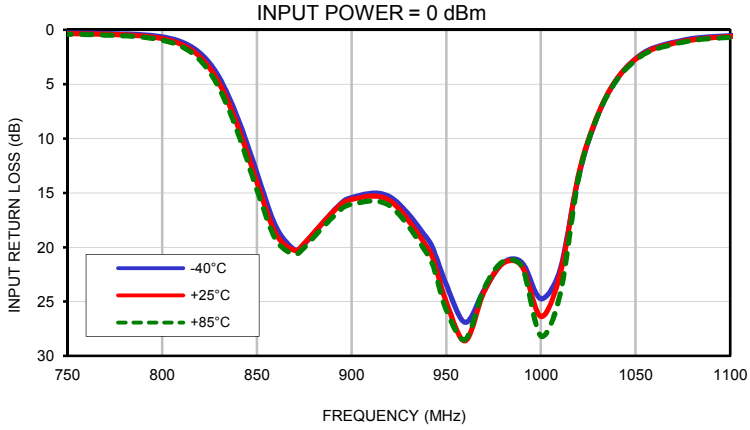


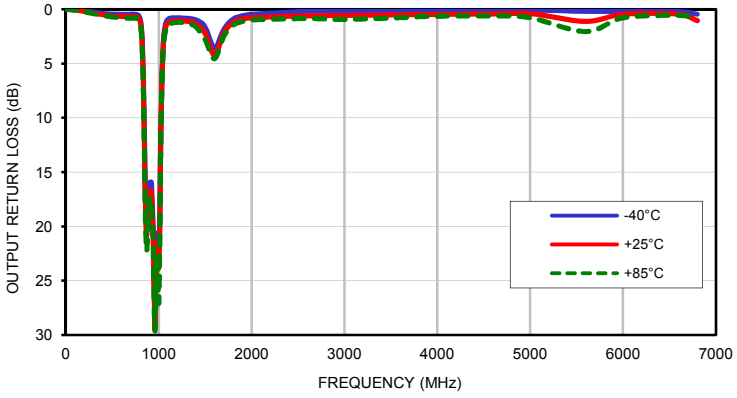
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



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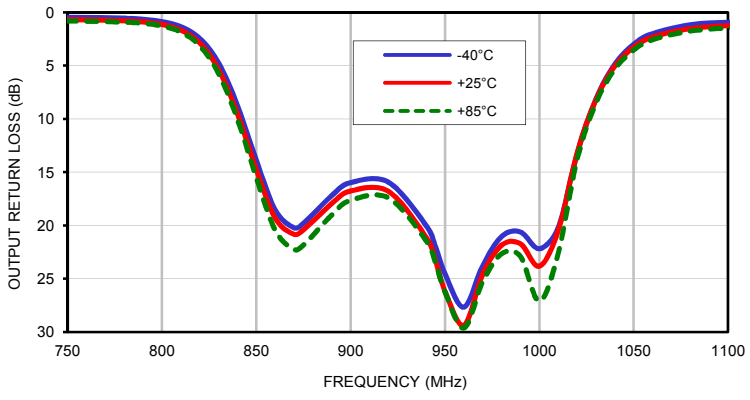
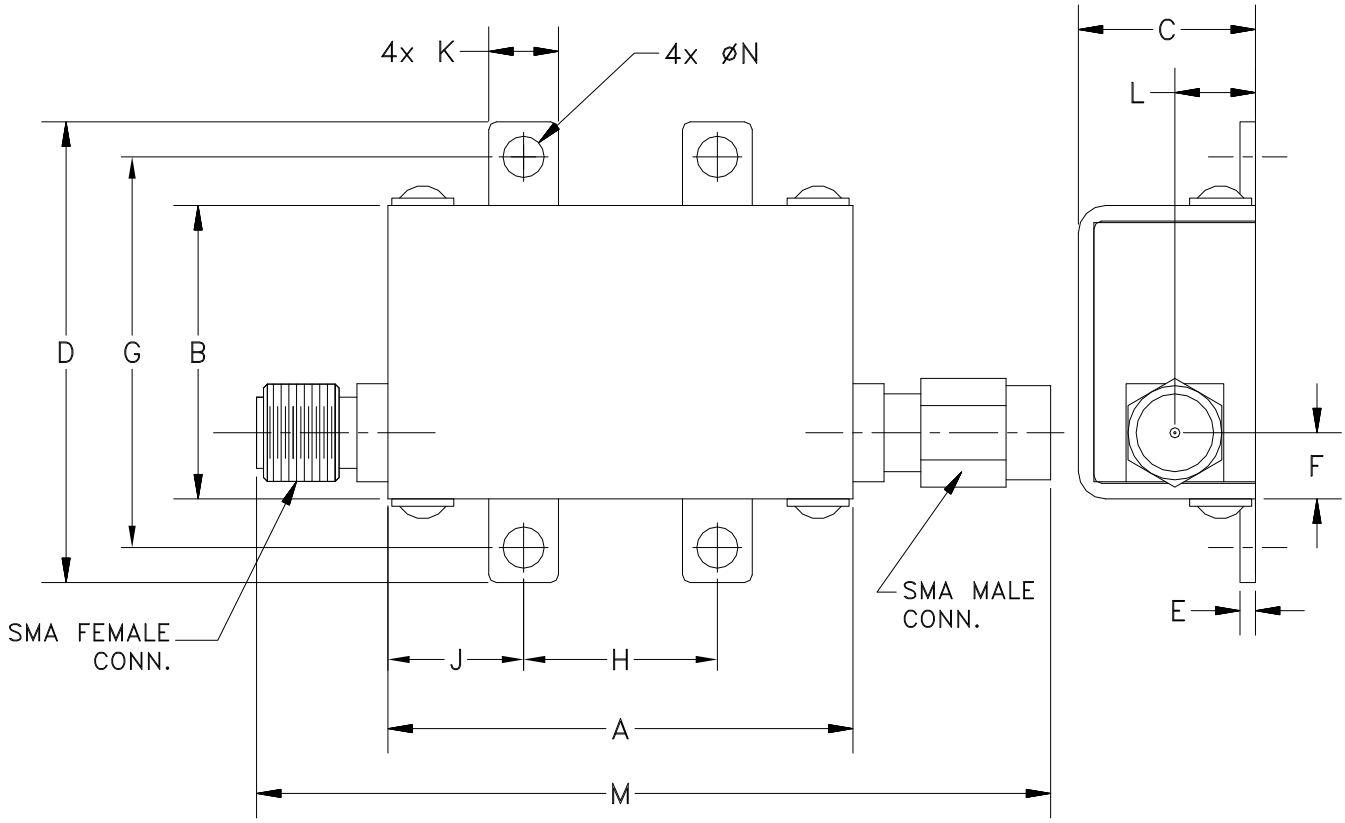


Case Style HY

Outline Dimensions

HY1238



CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N	WT GRAMS
HY1238	1.20 (30.48)	.75 (19.05)	.46 (11.68)	1.18 (29.97)	.04 (1.02)	.17 (4.32)	1.00 (25.40)	.50 (12.70)	.35 (8.89)	.18 (4.57)	.21 (5.28)	2.05 (52.07)	.106 (2.69)	35.0

Dimensions are in inches (mm). Tolerances: 2Pl. ± .03; 3Pl. ± .015
Tolerance on hole size and interaxes dimensions to be ± .005.

Note:

1. Case material: Brass
2. Case finish: Nickel plate

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Mini-Circuits

Environmental Specifications ENV46

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	-55° to 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 40°C, 96 hours; Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103, Condintion B
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11ms half-sine, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition A

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