

# 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. 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.  
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# Coaxial Bandpass Filter

## ZX75BP-1450-S+

50Ω 1320 to 1580 MHz



Generic photo used for illustration purposes only

CASE STYLE: HY1238  
Connectors SMA-MF Model ZX75BP-1450-S+

### Features

- Low insertion loss
- High selectivity
- Connectorized package

### Applications

- Aeronautical navigation
- Radio astronomy
- Wireless medical telemetry
- Defense systems.

### Electrical Specifications at 25°C

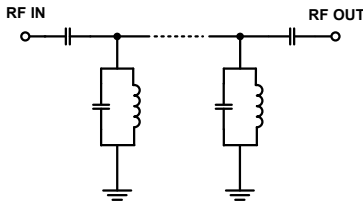
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	F1-F2	-	-	1450	-	MHz
	Insertion Loss	F1-F2	1320-1580	-	1.1	2.0	dB
Stop Band, Lower	VSWR	F1-F2	1320-1580	-	1.6	1.92	:1
	Insertion Loss	DC-F3	DC-1000	60	70	-	dB
Stop Band, Lower	VSWR	F3-F4	1000-1100	40	46	-	dB
	Insertion Loss	DC-F4	DC - 1100	-	20	-	:1
Stop Band, Upper	Insertion Loss	F5-F6	2000-2150	40	54	-	dB
	VSWR	F6-F7	2150-2500	60	75	-	dB
Stop Band, Upper	Insertion Loss	F5-F7	2000-2500	-	20	-	:1

### Maximum Ratings

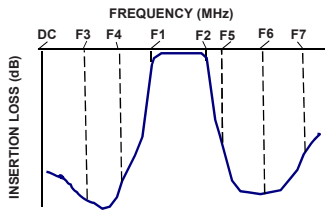
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input*	5 W max.

\* Passband rating, derate linearly to 3.5W at 85°C ambient. Permanent damage may occur if any of these limits are exceeded.

### Functional Schematic



### Typical Frequency Response

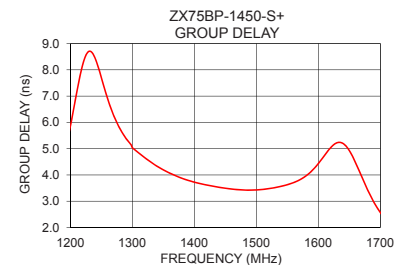
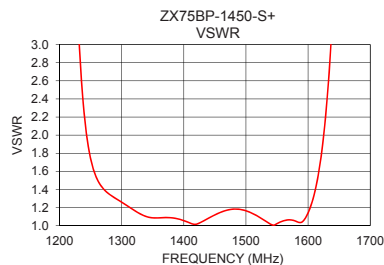
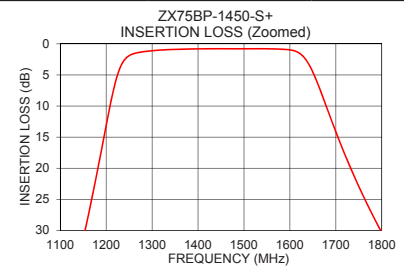
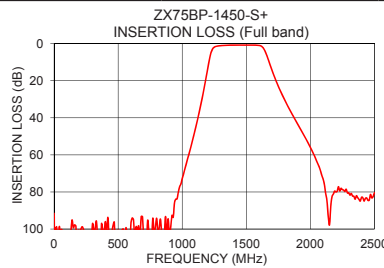


### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	93.37	29644.67	1320	4.66
100	102.03	2935.22	1335	4.40
150	99.31	2206.70	1350	4.19
210	99.86	1129.66	1365	4.02
400	96.01	370.93	1380	3.87
600	96.77	172.86	1395	3.76
610	94.03	166.40	1410	3.67
1000	72.86	63.20	1425	3.59
1100	46.78	44.80	1440	3.53
1150	31.42	32.35	1450	3.49
1182	20.05	21.35	1470	3.44
1320	0.99	1.17	1485	3.42
1450	0.78	1.12	1500	3.43
1580	0.86	1.05	1515	3.46
1600	0.97	1.14	1530	3.52
1640	3.13	3.39	1545	3.60
1740	21.31	38.27	1560	3.71
2000	55.90	60.60	1565	3.76
2150	97.76	67.26	1570	3.81
2500	80.62	78.28	1580	3.96

### +RoHS Compliant

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



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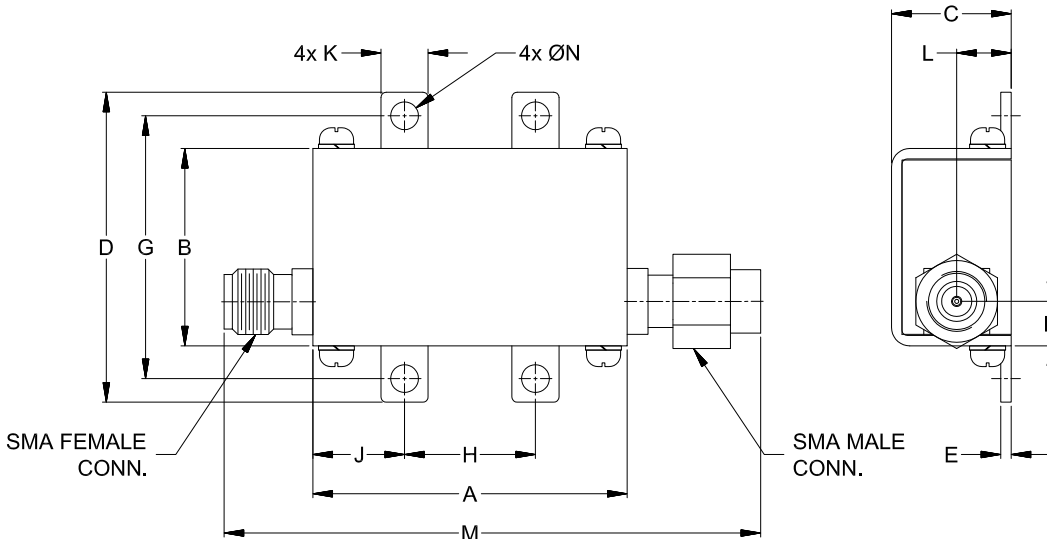
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## Coaxial Connections

PORT - 1	SMA-MALE
PORT - 2	SMA-FEMALE

## Outline Drawing



## Outline Dimensions ( $\frac{\text{inch}}{\text{mm}}$ )

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

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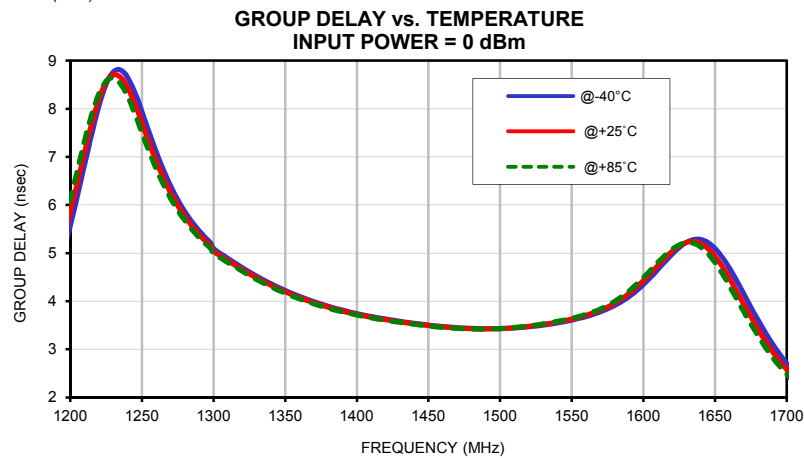
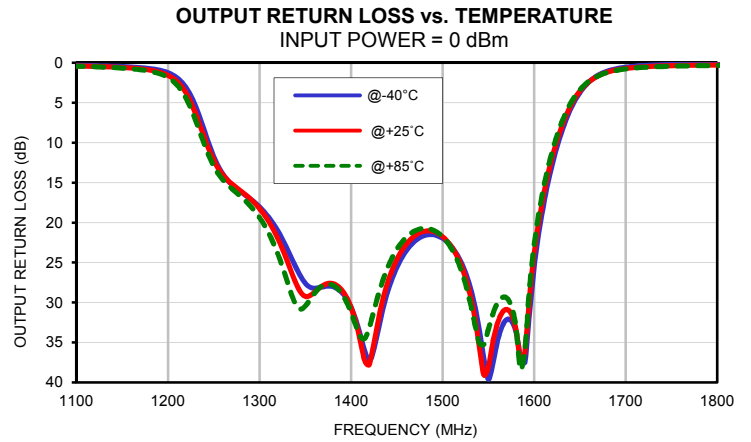
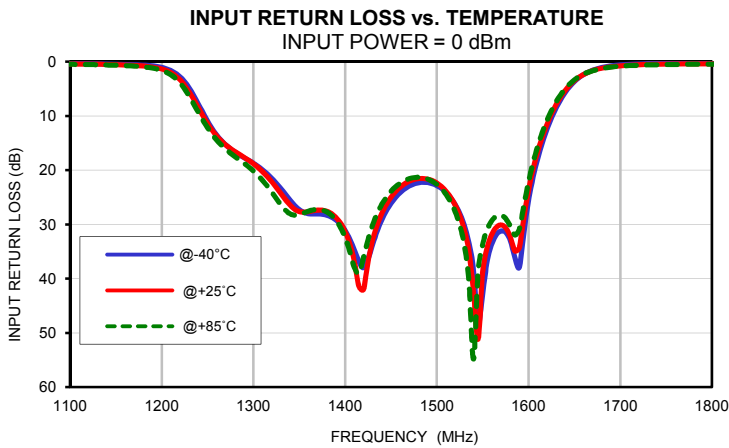
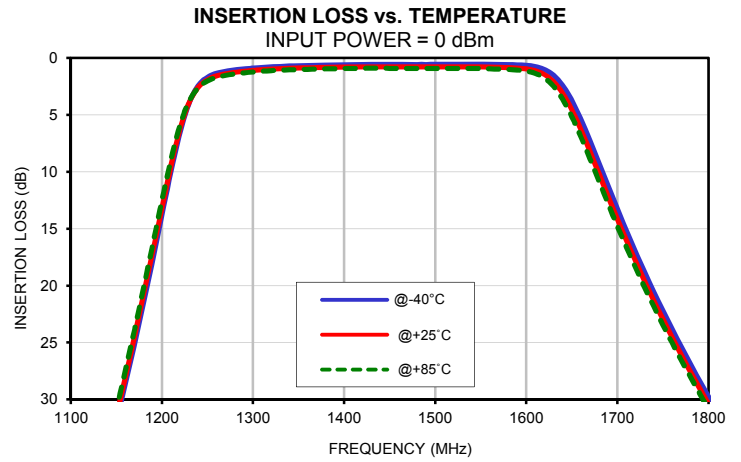
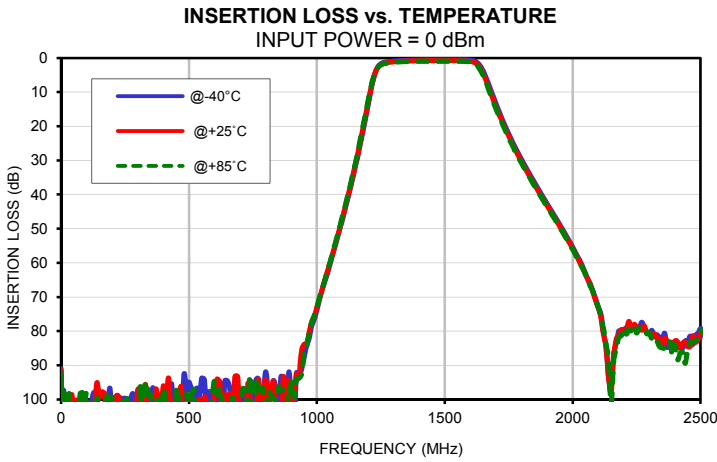
*Typical Performance Data*

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	100.76	93.37	105.20	0.00	0.00	0.00	0.00	0.00	0.00
10	97.40	104.95	113.49	0.00	0.00	0.00	0.00	0.00	0.00
50	115.81	103.32	103.77	0.00	0.00	0.01	0.00	0.00	0.01
90	100.08	102.34	102.59	0.00	0.00	0.01	0.00	0.00	0.01
130	98.14	102.48	111.01	0.00	0.01	0.02	0.00	0.01	0.01
170	101.11	98.47	107.76	0.00	0.01	0.02	0.01	0.01	0.02
210	104.33	99.86	100.00	0.00	0.02	0.03	0.01	0.01	0.02
250	99.74	101.76	101.32	0.00	0.02	0.03	0.01	0.01	0.02
290	100.56	107.47	110.00	0.00	0.03	0.04	0.01	0.02	0.03
330	99.63	95.68	95.17	0.01	0.03	0.05	0.01	0.02	0.03
370	116.32	97.30	99.18	0.01	0.04	0.06	0.00	0.02	0.04
410	104.98	101.09	101.05	0.02	0.05	0.07	0.00	0.03	0.04
450	100.85	101.97	97.59	0.02	0.06	0.08	0.00	0.03	0.05
490	97.34	112.25	98.42	0.03	0.07	0.09	0.00	0.04	0.05
530	96.87	100.65	107.01	0.04	0.08	0.10	0.01	0.04	0.06
570	105.39	102.03	116.60	0.05	0.09	0.12	0.01	0.05	0.07
610	108.60	94.03	98.52	0.06	0.10	0.14	0.02	0.06	0.08
650	94.57	100.79	106.73	0.07	0.12	0.15	0.03	0.07	0.09
690	98.15	93.41	106.69	0.08	0.13	0.17	0.04	0.08	0.10
730	103.43	95.53	101.69	0.09	0.15	0.18	0.04	0.09	0.11
770	93.94	94.41	94.53	0.10	0.16	0.20	0.06	0.10	0.12
810	97.98	100.47	97.72	0.12	0.18	0.22	0.07	0.12	0.14
850	103.35	103.88	96.43	0.13	0.19	0.24	0.08	0.13	0.15
890	92.18	94.49	101.59	0.15	0.21	0.26	0.10	0.15	0.17
930	92.47	93.65	93.81	0.17	0.23	0.28	0.12	0.17	0.20
970	82.05	80.05	80.32	0.19	0.26	0.31	0.14	0.20	0.22
1000	73.92	72.86	73.11	0.21	0.27	0.33	0.16	0.22	0.25
1050	60.75	60.33	60.10	0.25	0.32	0.38	0.22	0.28	0.31
1100	47.21	46.78	46.33	0.31	0.39	0.46	0.30	0.37	0.42
1130	38.36	37.86	37.34	0.37	0.46	0.54	0.38	0.47	0.53
1170	25.10	24.48	23.84	0.53	0.67	0.80	0.59	0.75	0.86
1210	9.97	9.44	8.91	1.60	2.00	2.40	1.85	2.33	2.77
1234	3.23	3.26	3.22	5.93	6.66	7.48	6.59	7.50	8.40
1290	0.97	1.18	1.32	17.69	17.64	18.74	17.02	17.02	17.90
1320	0.79	0.99	1.12	21.48	22.11	24.04	21.05	21.99	23.92
1370	0.65	0.85	0.99	28.09	27.36	27.23	28.02	27.83	27.83
1410	0.60	0.80	0.93	34.66	36.76	37.93	34.01	34.78	34.24
1450	0.57	0.78	0.92	26.09	24.98	23.91	25.57	24.61	23.35
1490	0.58	0.80	0.93	22.28	21.64	21.63	21.51	21.12	20.94
1580	0.59	0.86	1.02	32.89	32.20	30.27	33.63	33.33	32.97
1570	0.58	0.83	0.99	31.20	30.09	28.32	32.13	30.87	29.43
1610	0.77	1.13	1.36	17.81	16.55	15.58	17.89	16.68	15.79
1640	2.42	3.13	3.63	5.65	5.27	4.97	5.71	5.33	5.01
1690	11.29	12.20	12.85	0.76	0.91	0.98	0.73	0.87	0.93
1735	19.70	20.47	21.01	0.33	0.47	0.56	0.25	0.40	0.47
1740	20.55	21.31	21.84	0.31	0.45	0.54	0.23	0.38	0.45
1810	31.14	31.76	32.17	0.24	0.35	0.42	0.14	0.25	0.31
1850	36.44	37.02	37.38	0.23	0.32	0.40	0.13	0.23	0.29
1890	41.48	42.01	42.32	0.21	0.31	0.38	0.13	0.22	0.27
1930	46.44	46.94	47.19	0.21	0.30	0.37	0.13	0.22	0.26
2000	55.47	55.90	56.08	0.20	0.29	0.35	0.13	0.21	0.25
2010	56.86	57.24	57.51	0.19	0.28	0.35	0.13	0.22	0.25
2050	63.12	63.48	63.32	0.19	0.27	0.34	0.14	0.21	0.25
2150	96.91	97.76	101.26	0.17	0.26	0.33	0.15	0.22	0.25
2130	84.16	84.66	83.51	0.17	0.26	0.33	0.14	0.22	0.25
2170	83.80	82.44	85.38	0.16	0.25	0.32	0.15	0.22	0.25
2300	80.72	80.44	80.48	0.14	0.23	0.31	0.16	0.23	0.26
2250	78.72	78.73	80.54	0.15	0.24	0.31	0.16	0.23	0.26
2290	80.15	80.55	80.79	0.14	0.23	0.31	0.16	0.23	0.26
2500	79.25	80.62	79.82	0.12	0.22	0.30	0.19	0.26	0.30

## Typical Performance Data

FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
1300	5.10	5.04	5.00
1305	4.99	4.94	4.90
1310	4.89	4.84	4.80
1315	4.79	4.75	4.71
1320	4.70	4.66	4.62
1325	4.60	4.57	4.53
1330	4.52	4.48	4.45
1335	4.44	4.40	4.37
1340	4.36	4.33	4.30
1345	4.29	4.26	4.23
1350	4.22	4.19	4.17
1355	4.16	4.13	4.11
1360	4.10	4.07	4.05
1365	4.05	4.02	3.99
1370	3.99	3.97	3.94
1375	3.94	3.92	3.90
1380	3.90	3.87	3.85
1385	3.85	3.83	3.81
1390	3.81	3.79	3.78
1395	3.78	3.76	3.74
1400	3.74	3.73	3.71
1405	3.71	3.69	3.68
1410	3.68	3.67	3.65
1415	3.65	3.64	3.63
1420	3.63	3.62	3.60
1425	3.60	3.59	3.58
1430	3.58	3.57	3.56
1435	3.56	3.55	3.54
1440	3.54	3.53	3.52
1445	3.52	3.51	3.50
1450	3.50	3.49	3.48
1455	3.49	3.48	3.47
1460	3.47	3.46	3.46
1465	3.46	3.45	3.44
1470	3.45	3.44	3.43
1475	3.44	3.43	3.43
1480	3.43	3.43	3.42
1485	3.43	3.42	3.42
1490	3.42	3.42	3.42
1495	3.43	3.43	3.42
1500	3.43	3.43	3.43
1505	3.44	3.44	3.44
1510	3.44	3.45	3.45
1515	3.45	3.46	3.47
1520	3.47	3.48	3.49
1525	3.49	3.50	3.50
1530	3.50	3.52	3.53
1535	3.53	3.54	3.55
1540	3.55	3.57	3.58
1545	3.58	3.60	3.61
1580	3.91	3.96	4.00

## Typical Performance Curves

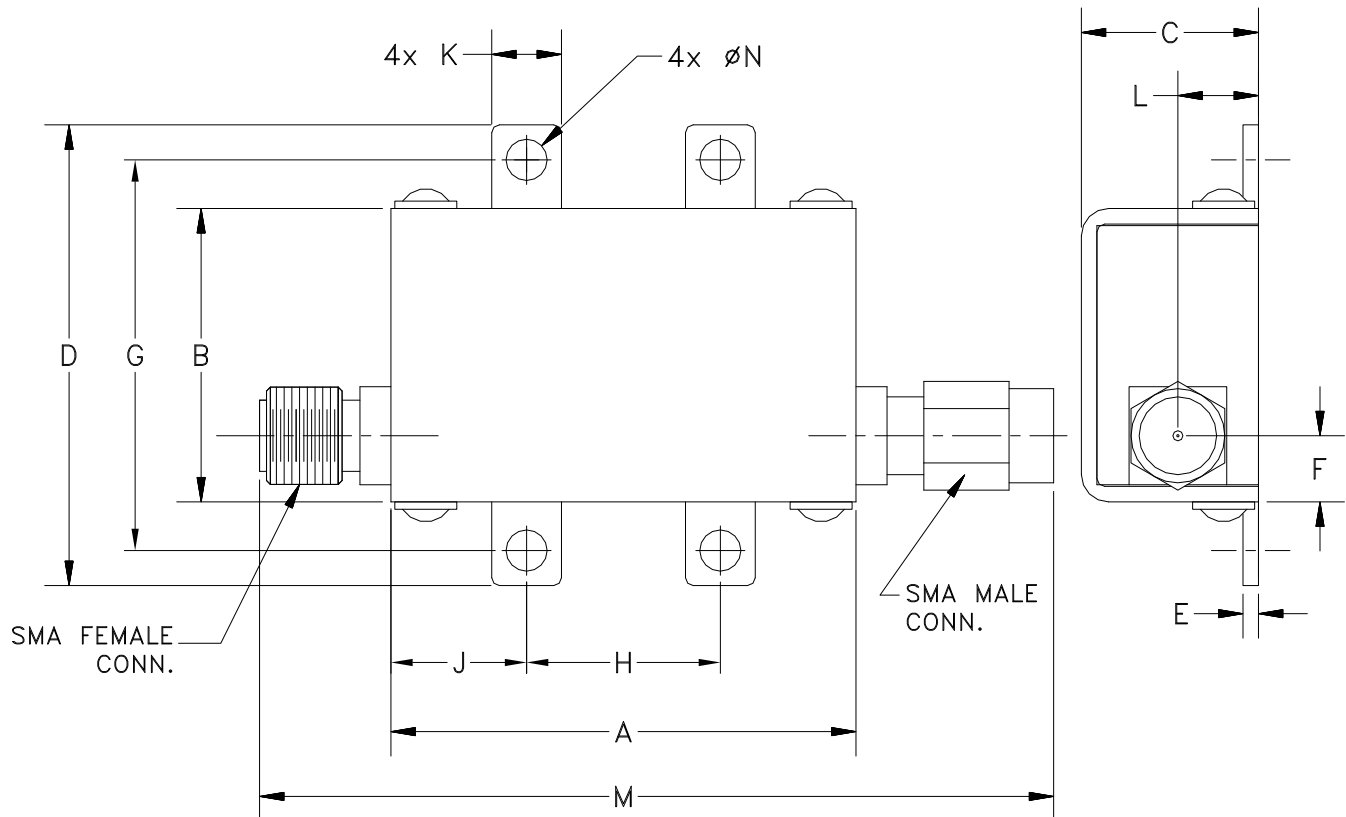


# Case Style

# 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.  $\pm .03$ ; 3Pl.  $\pm .015$   
Tolerance on hole size and interaxes dimensions to be  $\pm .005$ .

### Note:

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

**Mini-Circuits®**

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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, Condition 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