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.

Coaxial

Bandpass Filter

ZX75BP-1170-S+

50Ω 1110 to 1230 MHz

Generic photo used for illustration purposes only

CASE STYLE: HY1238

Connectors	Model
SMA-M\F	ZX75BP-1170-S+

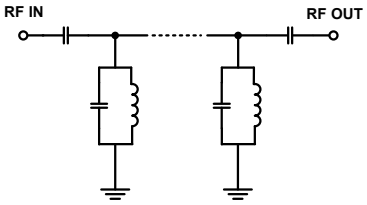
Features

- Low Insertion loss
- High selectivity
- Good VSWR
- Connectorized package

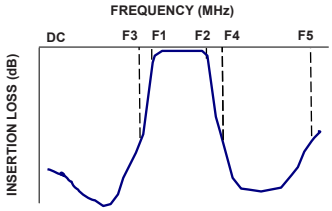
Applications

- Traffic collision avoidance system (TCAS)
- Aeronautical radio navigation
- Fixed satellite
- Radio astronomy
- Radar and navigation system

Functional Schematic



Typical Frequency Response



+RoHS Compliant

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

Electrical Specifications at 25°C

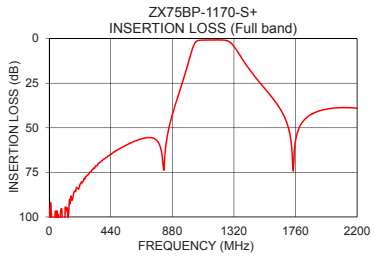
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	-	1170	-	MHz
	Insertion Loss	F1-F2	1110-1230	-	0.8	2	dB
	VSWR	F1-F2	1110-1230	-	1.3	-	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 900	20	35	-	dB
	VSWR	DC-F3	DC - 900	-	20	-	:1
Stop Band, Upper	Insertion Loss	F4-F5	1560-2200	20	29	-	dB
	VSWR	F4-F5	1560-2200	-	20	-	:1

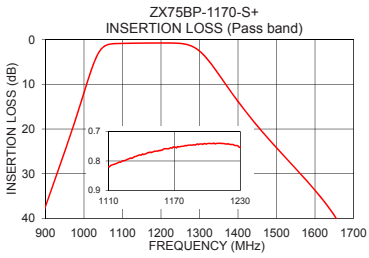
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input*	5 W max.

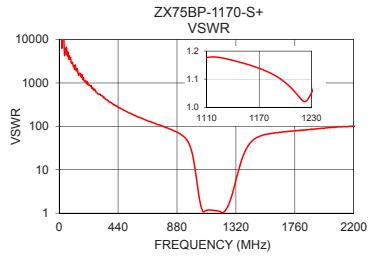
* Passband rating, derate linearly to 3.5W at 85.°C ambient.
Permanent damage may occur if any of these limits are exceeded.

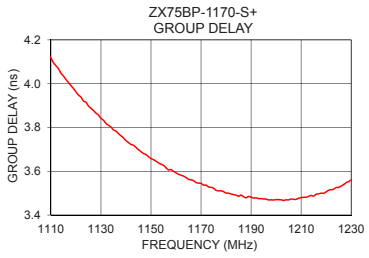
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	98.92	24640.82	1110	4.12
500	61.95	221.22	1115	4.03
900	37.37	67.84	1120	3.96
930	29.98	57.93	1125	3.90
969	20.23	40.38	1130	3.84
1000	11.89	19.34	1135	3.79
1032	3.94	4.39	1140	3.74
1110	0.82	1.18	1145	3.70
1170	0.75	1.14	1150	3.66
1230	0.75	1.05	1155	3.63
1310	3.34	4.35	1160	3.59
1400	13.83	31.31	1165	3.56
1465	20.80	52.74	1170	3.54
1500	24.20	59.60	1175	3.52
1560	29.83	66.69	1180	3.50
1565	30.29	67.25	1185	3.49
1600	33.72	69.75	1190	3.48
1750	64.59	78.42	1200	3.47
2000	39.30	92.44	1210	3.48
2200	39.04	100.37	1230	3.56









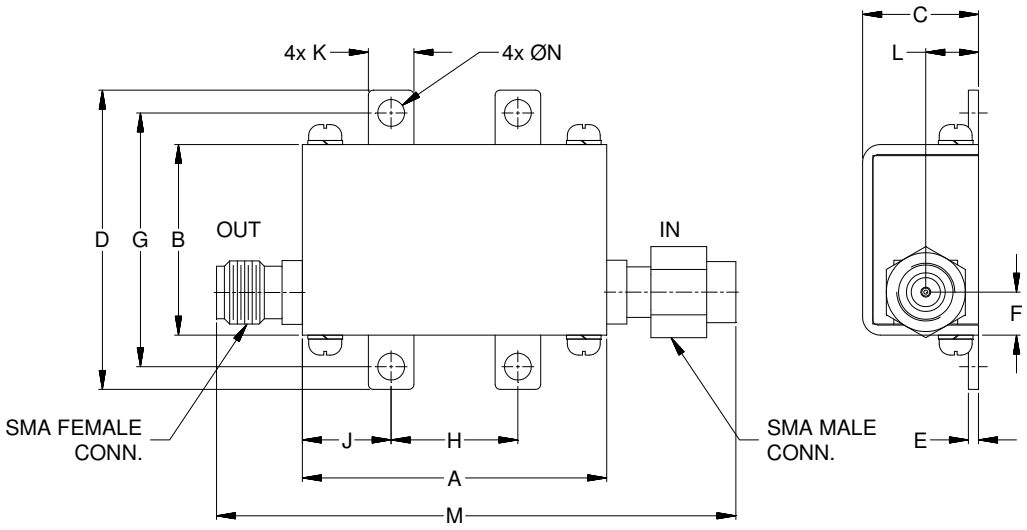
Notes

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

Coaxial Connections

INPUT	SMA-MALE
OUTPUT	SMA-FEMALE

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

Coaxial Band Pass Filter ZX75BP-1170-S+

Typical Performance Data

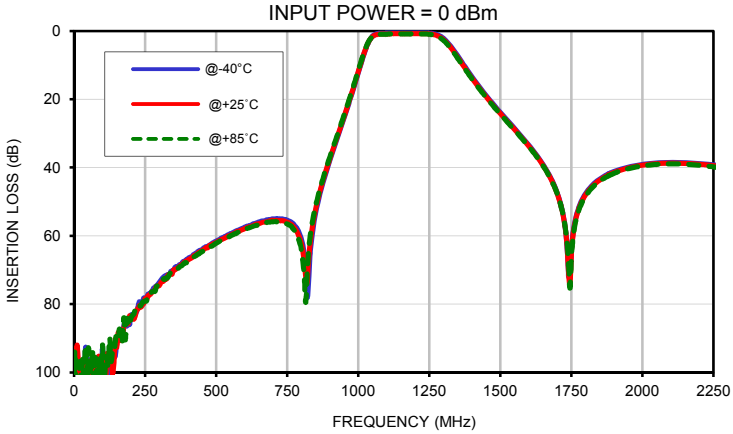
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	96.76	98.92	107.01	0.00	0.00	0.00	0.00	0.00	0.00
10	101.00	92.13	101.42	0.00	0.00	0.00	0.00	0.00	0.00
50	104.78	104.49	92.87	0.00	0.00	0.01	0.00	0.01	0.01
100	93.02	101.96	92.00	0.00	0.01	0.01	0.01	0.02	0.03
150	90.32	92.69	88.27	0.00	0.01	0.02	0.02	0.04	0.05
200	83.22	83.77	84.08	0.00	0.02	0.02	0.04	0.07	0.09
250	78.57	78.39	79.13	0.00	0.02	0.03	0.08	0.11	0.13
300	73.68	74.54	73.91	0.00	0.03	0.04	0.12	0.16	0.18
350	70.15	69.98	70.56	0.01	0.04	0.05	0.17	0.22	0.24
400	66.72	67.15	67.52	0.02	0.05	0.06	0.22	0.28	0.30
450	64.10	64.32	64.64	0.02	0.07	0.08	0.28	0.34	0.37
500	61.55	61.95	62.09	0.03	0.08	0.10	0.33	0.40	0.44
550	59.35	59.77	60.07	0.04	0.09	0.11	0.38	0.47	0.50
600	57.49	57.89	58.16	0.06	0.11	0.13	0.44	0.52	0.57
650	55.95	56.43	56.73	0.07	0.13	0.15	0.48	0.58	0.63
700	55.01	55.52	55.91	0.09	0.14	0.17	0.52	0.63	0.69
750	55.42	55.97	56.53	0.10	0.16	0.18	0.55	0.67	0.74
800	61.12	62.43	64.36	0.12	0.19	0.21	0.56	0.70	0.77
850	53.16	52.14	51.22	0.14	0.21	0.24	0.57	0.71	0.80
900	37.81	37.37	36.89	0.17	0.26	0.27	0.56	0.72	0.80
925	31.58	31.21	30.76	0.19	0.29	0.31	0.56	0.72	0.81
930	30.34	29.98	29.54	0.19	0.30	0.32	0.56	0.72	0.81
965	21.61	21.27	20.84	0.27	0.41	0.43	0.59	0.75	0.85
970	20.31	19.97	19.55	0.29	0.44	0.47	0.60	0.77	0.87
980	17.67	17.34	16.92	0.35	0.52	0.56	0.65	0.83	0.93
1000	12.20	11.89	11.51	0.65	0.90	0.97	0.92	1.15	1.29
1010	9.43	9.16	8.81	1.01	1.34	1.45	1.28	1.56	1.74
1035	3.43	3.41	3.28	3.97	4.72	5.07	4.29	4.92	5.34
1050	1.50	1.65	1.67	8.76	9.93	10.47	9.28	10.23	10.83
1110	0.61	0.82	0.90	21.38	21.81	21.99	20.61	20.96	20.57
1150	0.57	0.77	0.85	22.08	22.69	23.13	22.51	22.98	22.71
1170	0.56	0.75	0.84	23.09	23.77	24.34	24.53	24.90	24.67
1200	0.54	0.74	0.83	26.69	27.58	28.50	30.89	30.29	30.04
1230	0.55	0.75	0.85	30.79	31.80	30.39	28.68	27.57	25.93
1250	0.63	0.84	0.96	18.87	18.78	18.20	18.33	17.95	17.20
1300	2.19	2.54	2.76	5.45	5.39	5.30	5.82	5.73	5.63
1310	2.95	3.34	3.58	4.08	4.07	4.03	4.51	4.49	4.45
1350	7.31	7.76	8.01	1.28	1.39	1.44	1.80	1.97	2.07
1400	13.43	13.83	14.03	0.43	0.56	0.62	0.97	1.19	1.33
1460	19.95	20.30	20.48	0.23	0.34	0.39	0.75	0.98	1.12
1475	21.45	21.79	21.97	0.21	0.31	0.37	0.73	0.96	1.09
1500	23.87	24.20	24.38	0.19	0.29	0.34	0.70	0.93	1.06
1550	28.58	28.88	29.05	0.17	0.26	0.31	0.67	0.88	1.00
1555	29.05	29.35	29.52	0.17	0.26	0.31	0.67	0.88	1.00
1560	29.52	29.83	29.99	0.17	0.26	0.31	0.67	0.88	0.99
1565	30.00	30.29	30.46	0.17	0.26	0.31	0.66	0.87	0.99
1575	30.96	31.25	31.42	0.17	0.26	0.30	0.66	0.87	0.98
1600	33.44	33.72	33.88	0.16	0.25	0.29	0.65	0.85	0.96
1650	39.10	39.35	39.49	0.15	0.24	0.28	0.65	0.84	0.93
1700	47.48	47.68	47.72	0.14	0.23	0.27	0.66	0.83	0.92
1750	63.78	64.59	65.99	0.13	0.22	0.26	0.68	0.84	0.92
1800	47.57	47.94	48.28	0.13	0.21	0.26	0.71	0.86	0.93
1850	43.35	43.62	43.90	0.12	0.21	0.25	0.75	0.89	0.96
1900	41.17	41.42	41.67	0.11	0.20	0.25	0.80	0.94	1.01
1950	39.86	40.08	40.33	0.10	0.19	0.24	0.85	1.00	1.09
2000	39.08	39.30	39.52	0.09	0.19	0.24	0.91	1.08	1.17
2050	38.66	38.86	39.08	0.08	0.18	0.24	0.97	1.15	1.27
2100	38.50	38.68	38.94	0.07	0.18	0.23	1.02	1.23	1.37
2150	38.59	38.77	39.04	0.06	0.18	0.23	1.07	1.30	1.46
2200	38.85	39.04	39.34	0.05	0.17	0.23	1.10	1.36	1.53

Typical Performance Data

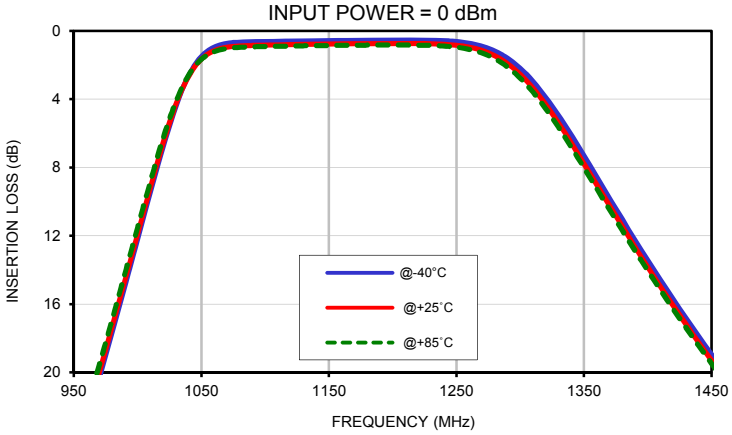
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
1110	4.15	4.12	4.09
1112	4.12	4.08	4.05
1114	4.08	4.05	4.02
1116	4.05	4.02	3.99
1118	4.02	3.99	3.96
1120	3.99	3.96	3.94
1122	3.97	3.94	3.91
1124	3.94	3.92	3.89
1126	3.91	3.89	3.86
1128	3.89	3.87	3.84
1130	3.87	3.84	3.82
1132	3.84	3.82	3.80
1134	3.82	3.80	3.78
1136	3.80	3.78	3.76
1138	3.78	3.76	3.74
1140	3.76	3.74	3.72
1142	3.75	3.72	3.71
1144	3.73	3.71	3.69
1146	3.71	3.69	3.67
1148	3.69	3.68	3.66
1150	3.68	3.66	3.65
1152	3.66	3.65	3.63
1154	3.65	3.63	3.62
1156	3.63	3.62	3.60
1158	3.63	3.61	3.60
1160	3.61	3.59	3.58
1162	3.59	3.58	3.57
1164	3.59	3.57	3.55
1166	3.57	3.56	3.55
1168	3.56	3.55	3.54
1170	3.55	3.54	3.53
1172	3.54	3.54	3.52
1174	3.53	3.53	3.51
1176	3.53	3.51	3.50
1178	3.52	3.51	3.50
1180	3.52	3.50	3.50
1182	3.51	3.50	3.48
1184	3.50	3.49	3.48
1186	3.50	3.49	3.48
1188	3.49	3.48	3.47
1190	3.49	3.48	3.47
1192	3.49	3.48	3.47
1194	3.49	3.47	3.47
1196	3.48	3.47	3.46
1198	3.48	3.47	3.46
1200	3.48	3.47	3.47
1202	3.48	3.47	3.47
1204	3.48	3.47	3.46
1206	3.48	3.47	3.47
1208	3.48	3.47	3.47
1210	3.48	3.48	3.47
1212	3.49	3.48	3.48
1214	3.49	3.49	3.49
1216	3.50	3.49	3.50
1218	3.50	3.50	3.50
1220	3.51	3.51	3.51
1222	3.52	3.52	3.51
1224	3.53	3.53	3.53
1226	3.53	3.53	3.53
1230	3.56	3.56	3.56

Typical Performance Curves

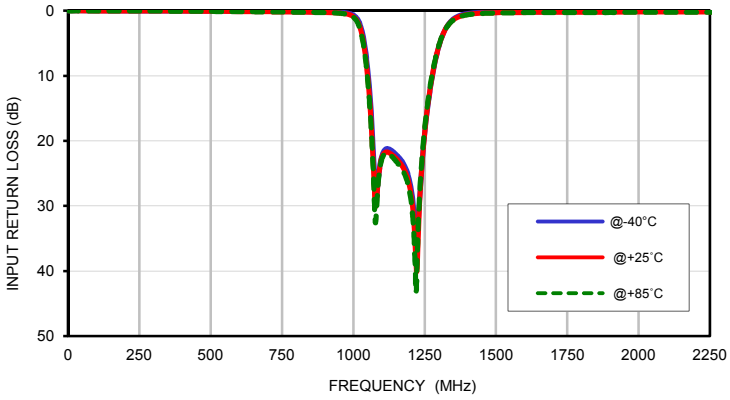
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



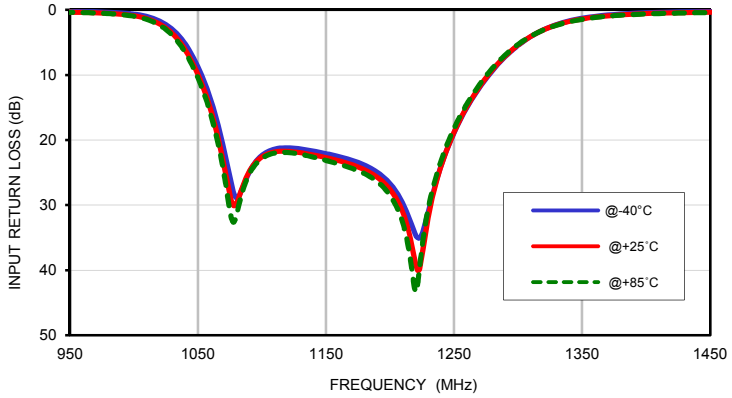
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



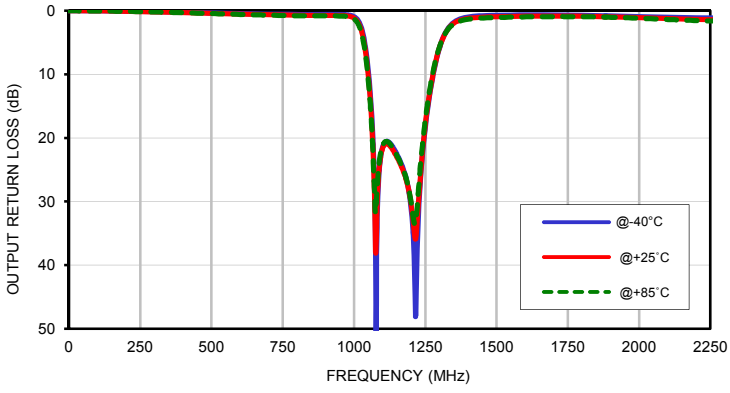
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



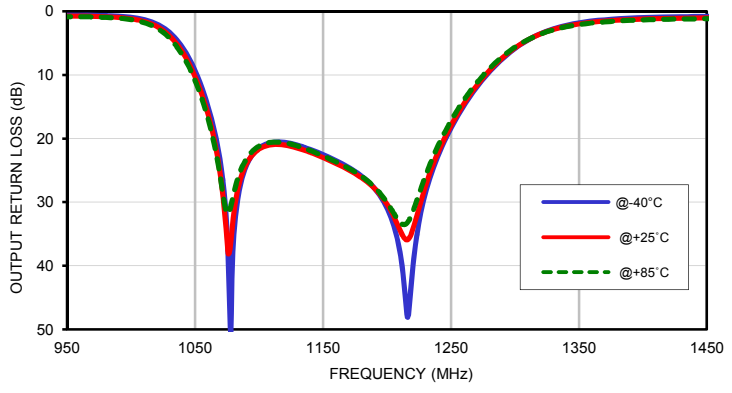
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



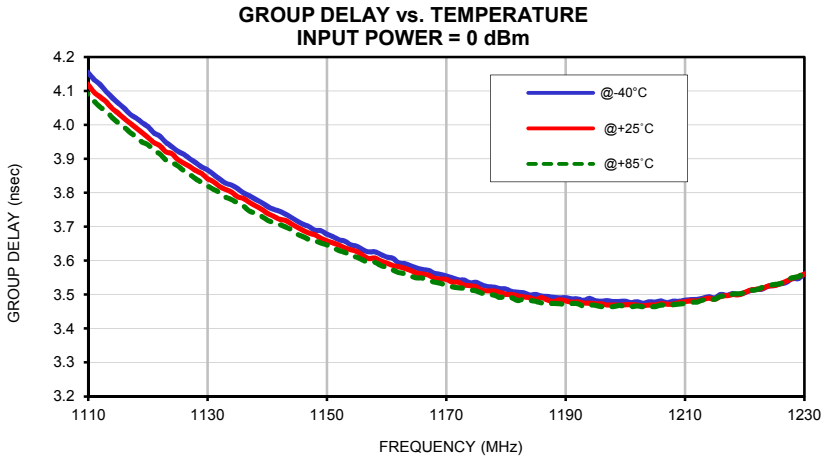
OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



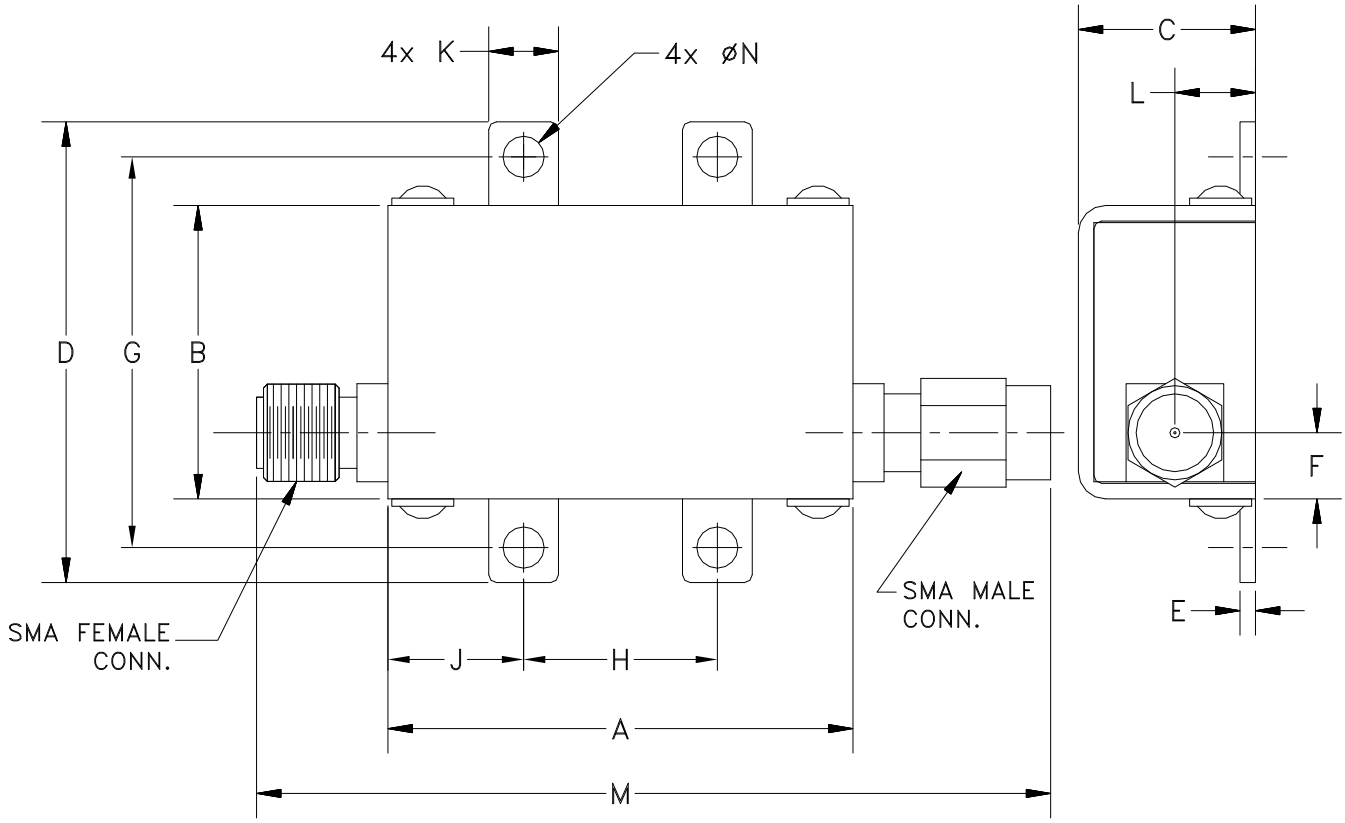
Typical Performance Curves



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. ± .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