Coaxial

Bandpass Filter

ZFBP-70HR-S+

50Ω 69 to 71 MHz

Generic photo used for illustration purposes only

CASE STYLE: H16

Connectors	Model
SMA-F	ZFBP-70HR-S+
BRACKET (OPTION "B")	

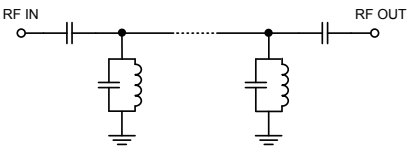
Features

- Good VSWR, 1.2:1 Typ @ Passband
- Excellent Rejection in the Stopband
- Connectorized package

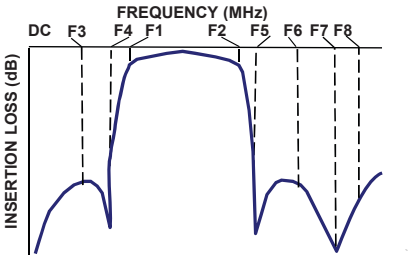
Applications

- IF Signal Processing
- High Rejection Application
- Wire-Line Broadband Access
- Lab Use

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

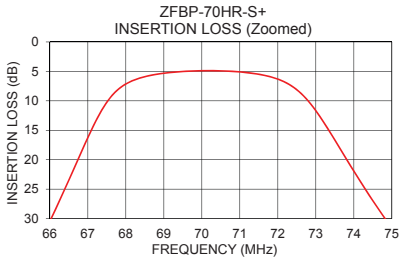
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	-	70	-	MHz
	Insertion Loss	F1-F2	69 - 71	-	5.5	7.0	dB
	VSWR	F1-F2	69 - 71	-	1.2	1.35	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 50	75	85	-	dB
		F3-F4	50 - 66	20	30	-	dB
	VSWR	DC-F4	DC - 66	-	18	-	:1
Stop Band, Upper	Insertion Loss	F5-F6	75 - 100	20	30	-	dB
		F6-F7	100 - 700	60	70	-	dB
		F7-F8	700 - 1000	50	60	-	dB
	VSWR	F5-F8	75 - 1000	-	18	-	:1

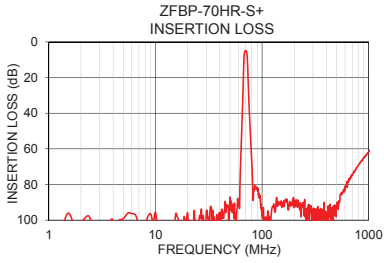
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	1 W at 25°C

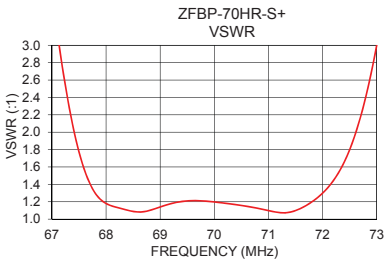
Permanent damage may occur if any of these limits are exceeded.

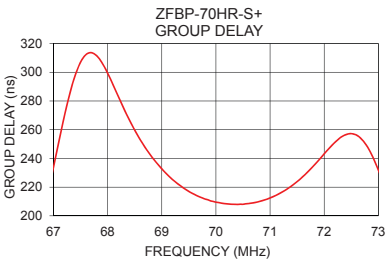
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (ns)
1.0	102.69	17007.26	69.0	232.76
10.0	95.63	7623.21	69.1	228.80
30.0	94.91	2561.53	69.2	225.24
50.0	87.17	521.91	69.3	222.15
64.0	54.64	31.49	69.4	219.43
66.0	30.47	10.34	69.5	217.03
66.7	20.57	5.31	69.6	215.02
67.0	16.25	3.62	69.7	213.21
68.0	7.14	1.18	69.8	211.71
69.0	5.31	1.14	69.9	210.45
70.0	4.89	1.20	70.0	209.54
71.0	5.08	1.10	70.1	208.88
74.0	21.94	7.65	70.2	208.41
75.0	31.62	13.83	70.3	208.09
80.0	67.41	56.77	70.4	207.97
90.0	81.62	163.24	70.5	208.06
100.0	96.57	248.57	70.6	208.55
505.0	89.99	88.51	70.7	209.11
700.0	74.48	73.71	70.8	210.00
1000.0	61.62	62.49	71.0	212.43









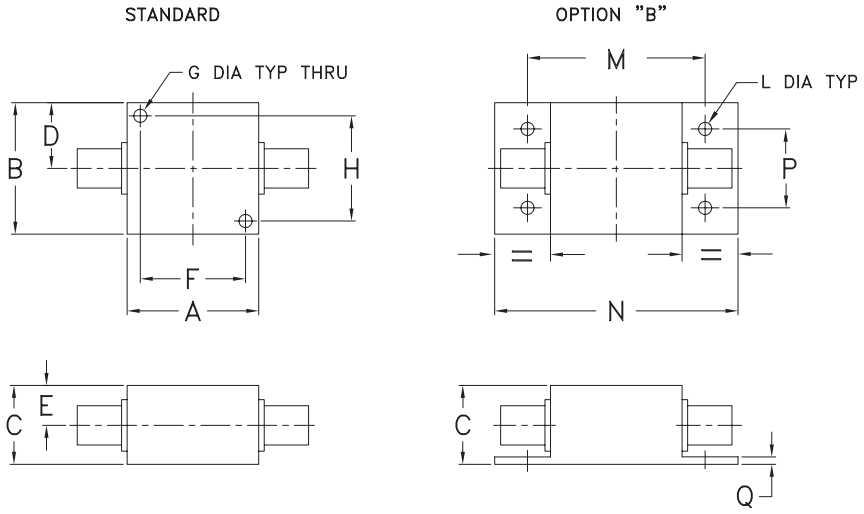
Notes

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

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

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H
1.25	1.25	.75	.63	.38	1.000	.125	1.000
31.75	31.75	19.05	16.00	9.65	25.40	3.18	25.40

J	K	L	M	N	P	Q	wt
--	--	.125	1.688	2.18	.750	.06	grams
--	--	3.18	42.88	55.37	19.05	1.52	70.0

Note: Please refer to case style drawing for details

Coaxial Band Pass Filter ZFBP-70HR-S+

Typical Performance Data

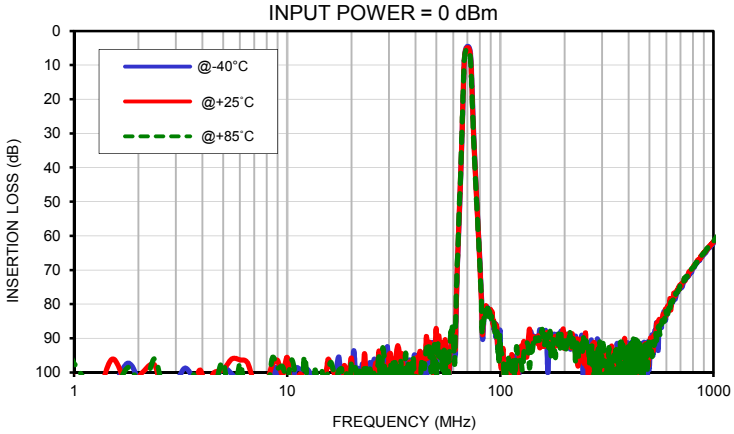
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1.0	102.31	102.69	97.39	0.00	0.00	0.01	0.00	0.00	0.00
5.0	98.80	99.18	97.02	0.00	0.00	0.00	0.00	0.00	0.00
10.0	103.02	95.63	102.27	0.00	0.00	0.01	0.00	0.00	0.01
25.0	110.09	102.69	109.64	0.01	0.00	0.01	0.00	0.00	0.01
30.0	100.19	94.91	97.56	0.00	0.01	0.01	0.01	0.01	0.01
40.0	99.54	107.59	100.31	0.01	0.01	0.02	0.01	0.01	0.02
50.0	106.25	87.17	101.71	0.03	0.03	0.04	0.03	0.03	0.04
55.0	97.59	90.47	106.50	0.06	0.06	0.07	0.05	0.06	0.08
60.0	86.73	89.60	89.33	0.14	0.16	0.18	0.14	0.16	0.18
63.0	67.70	66.22	65.35	0.33	0.38	0.43	0.32	0.37	0.41
64.0	55.83	54.64	53.66	0.48	0.55	0.63	0.45	0.52	0.60
65.0	44.35	43.11	42.08	0.76	0.88	1.01	0.71	0.83	0.95
66.0	31.80	30.47	29.41	1.42	1.68	1.96	1.29	1.54	1.78
66.7	21.87	20.57	19.62	2.71	3.31	3.93	2.42	2.96	3.49
67.0	17.41	16.25	15.48	3.98	4.93	5.86	3.50	4.34	5.14
67.5	10.75	10.23	10.02	9.08	11.10	12.83	7.74	9.44	10.81
67.8	8.12	8.04	8.12	15.50	17.74	19.52	12.54	14.31	15.59
68.0	7.04	7.14	7.31	20.40	21.69	23.23	15.83	17.08	18.07
68.5	5.62	5.89	6.16	25.58	27.45	29.93	20.16	20.45	21.03
69.0	4.99	5.31	5.60	23.62	23.70	24.17	20.65	20.94	21.97
69.2	4.84	5.17	5.46	21.35	21.76	22.48	20.15	20.97	22.58
69.5	4.68	5.02	5.32	19.62	20.46	21.40	20.21	22.00	24.85
69.8	4.58	4.92	5.24	19.42	20.47	21.39	21.87	25.00	30.38
70.0	4.53	4.89	5.21	19.86	20.92	21.70	24.23	28.96	40.29
70.5	4.51	4.90	5.26	21.80	22.74	23.46	40.50	33.61	28.07
71.0	4.64	5.08	5.49	24.50	26.61	29.71	25.81	24.35	23.08
71.5	4.96	5.49	5.97	26.39	26.60	25.80	22.19	22.32	22.13
72.0	5.63	6.31	6.94	19.16	17.73	16.53	24.53	28.42	30.85
73.0	10.21	11.68	12.86	6.70	6.03	5.61	9.57	8.37	7.69
74.0	20.41	21.94	23.10	2.35	2.28	2.24	2.93	2.82	2.76
75.0	30.36	31.62	32.58	1.25	1.26	1.27	1.46	1.47	1.48
80.0	66.40	67.41	68.06	0.29	0.31	0.32	0.31	0.33	0.35
85.0	81.50	81.33	81.46	0.14	0.16	0.17	0.15	0.17	0.18
90.0	83.27	81.62	83.60	0.09	0.11	0.12	0.09	0.11	0.12
95.0	89.55	85.92	88.18	0.07	0.08	0.09	0.07	0.08	0.10
100.0	92.22	96.57	92.33	0.06	0.07	0.08	0.06	0.07	0.08
105.0	105.60	126.98	108.15	0.05	0.06	0.07	0.05	0.06	0.07
119.0	96.01	111.45	92.56	0.05	0.06	0.07	0.04	0.05	0.06
131.0	92.87	94.80	92.07	0.04	0.05	0.06	0.04	0.05	0.06
151.0	90.34	89.24	89.86	0.04	0.06	0.07	0.04	0.06	0.07
161.0	87.97	92.39	92.08	0.05	0.06	0.07	0.04	0.06	0.07
175.0	91.92	94.24	93.22	0.05	0.07	0.08	0.04	0.06	0.07
201.0	92.34	89.35	91.30	0.06	0.08	0.09	0.06	0.07	0.09
221.0	90.59	92.07	91.07	0.07	0.09	0.10	0.07	0.08	0.10
241.0	89.28	90.16	91.15	0.08	0.10	0.11	0.08	0.09	0.10
251.0	96.44	88.60	91.40	0.09	0.11	0.12	0.09	0.10	0.11
261.0	96.21	99.01	97.66	0.10	0.12	0.13	0.09	0.11	0.12
281.0	103.07	94.15	97.29	0.10	0.12	0.13	0.10	0.12	0.13
301.0	94.13	93.74	93.63	0.11	0.13	0.14	0.11	0.13	0.13
321.0	96.23	95.45	96.17	0.12	0.14	0.15	0.12	0.14	0.14
351.0	100.08	95.49	100.62	0.13	0.15	0.16	0.13	0.15	0.16
371.0	106.20	97.87	92.60	0.14	0.16	0.17	0.14	0.16	0.17
381.0	95.51	94.73	93.24	0.14	0.16	0.17	0.14	0.16	0.17
401.0	95.12	103.86	97.40	0.15	0.17	0.18	0.15	0.17	0.18
550.0	93.42	85.88	86.83	0.18	0.21	0.22	0.19	0.22	0.24
600.0	82.87	83.28	82.70	0.19	0.21	0.23	0.20	0.23	0.24
700.0	75.43	74.48	75.10	0.21	0.24	0.25	0.21	0.25	0.27
750.0	72.34	71.94	72.11	0.21	0.24	0.25	0.22	0.26	0.28
800.0	69.70	69.40	69.33	0.21	0.24	0.26	0.22	0.27	0.29
1000.0	62.04	61.62	61.47	0.24	0.28	0.30	0.25	0.30	0.32

Typical Performance Data

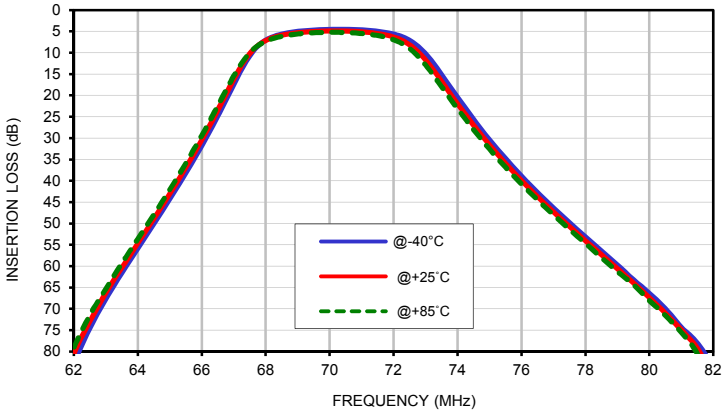
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
68.50	269.56	259.74	252.82
68.55	265.73	256.42	249.93
68.60	261.93	253.14	247.03
68.65	258.46	250.21	244.40
68.70	255.08	247.20	241.80
68.75	251.93	244.56	239.43
68.80	248.82	241.87	237.03
68.85	246.02	239.44	234.78
68.90	243.35	237.14	232.84
68.95	240.73	234.86	230.79
69.00	238.17	232.76	228.83
69.05	235.94	230.72	227.06
69.10	233.66	228.80	225.37
69.20	229.53	225.24	222.24
69.30	225.90	222.15	219.62
69.40	222.68	219.43	217.15
69.50	219.84	217.03	215.12
69.60	217.39	215.02	213.32
69.70	215.19	213.21	211.83
69.80	213.39	211.71	210.56
69.90	211.93	210.45	209.46
70.00	210.74	209.54	208.71
70.10	209.83	208.88	208.17
70.20	209.11	208.41	207.84
70.30	208.67	208.09	207.70
70.40	208.31	207.97	207.75
70.50	208.25	208.06	208.06
70.60	208.44	208.55	208.62
70.70	208.78	209.11	209.48
70.80	209.37	210.00	210.57
70.90	210.20	211.10	211.84
71.00	211.34	212.43	213.47
71.10	212.62	214.11	215.24
71.15	213.41	215.07	216.33
71.20	214.30	216.08	217.46
71.25	215.24	217.17	218.68
71.30	216.25	218.32	219.87
71.35	217.28	219.57	221.22
71.40	218.45	220.92	222.66
71.45	219.75	222.35	224.15
71.50	221.08	223.84	225.76

Typical Performance Curves

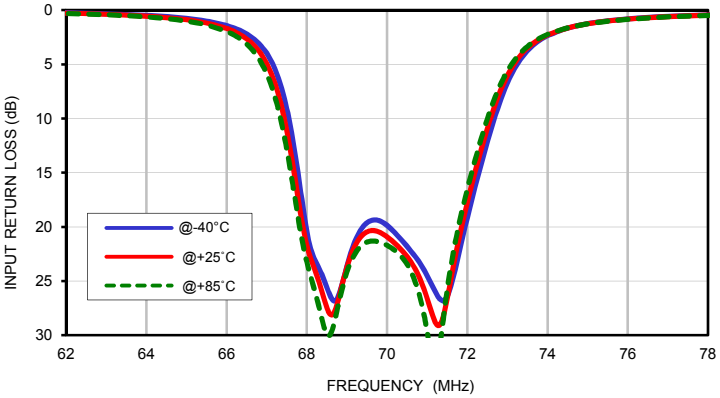
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



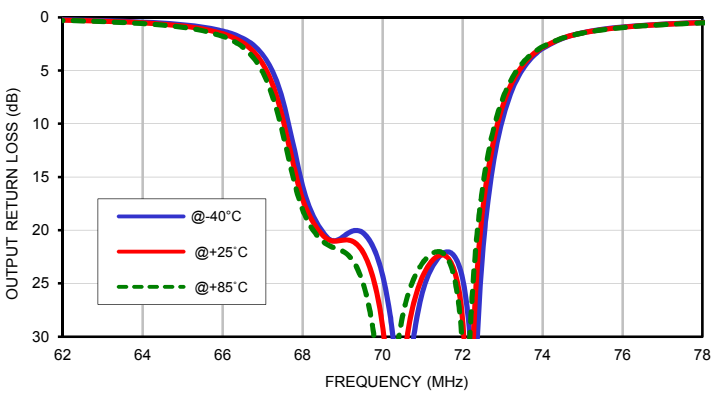
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



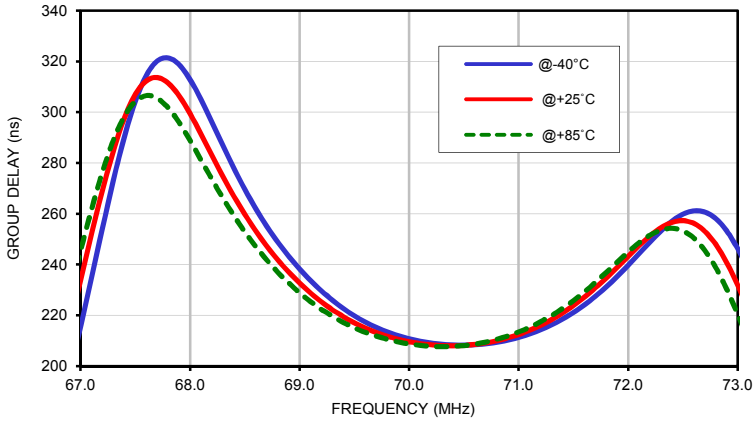
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



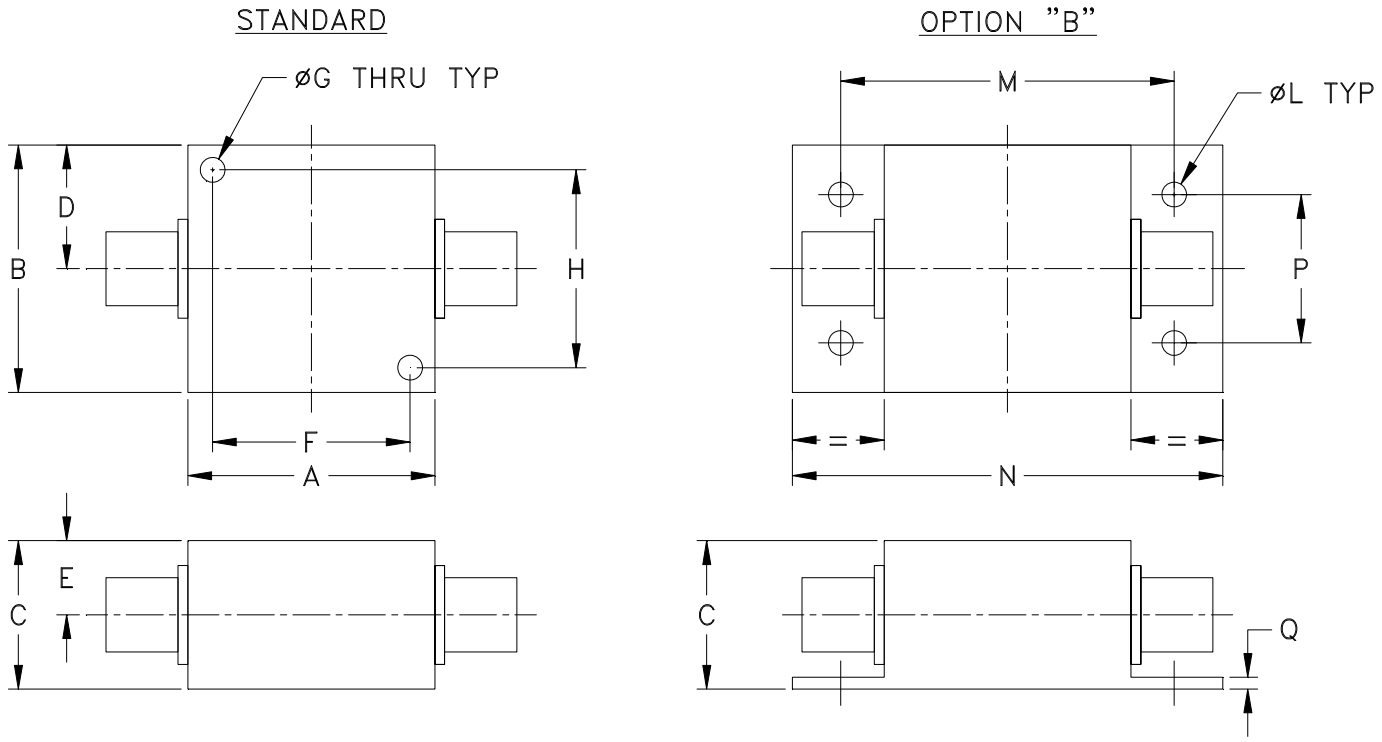
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style H

Outline Dimensions

H16



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
H16	1.25 (31.75)	1.25 (31.75)	.750 (19.05)	.63 (16.00)	.38 (9.65)	1.000 (25.40)	.125 (3.18)	1.000 (25.40)	--	--	.125 (3.18)	1.688 (42.88)	2.18 (55.37)

CASE#	P	Q	WT.GRAMS
H16	.750 (19.05)	.06 (1.52)	70

Dimensions are in inches (mm). Tolerances: 2PL. ± .03; 3PL. ± .015

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
   For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Mounting bracket available on request. Add suffix B to part number.
4. Bracket version, option B, dimension "C" changes from .75 to .94 inches when connectors are type N.
5. Refer to the individual model data sheet for the type of connectors available.

Mini-Circuits

Environmental Specifications **ENV28T5**

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	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
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	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I