

Coaxial Low Pass Filter

ZFLP-450-S+

50Ω DC to 450 MHz



Generic photo used for illustration purposes only
CASE STYLE: H16

The Big Deal

- Wide stopband Rejection
- Good VSWR, 1.2:1 typical in passband
- High Rejection

Product Overview

ZFLP-450-S+ is a 50Ω lowpass filter built into a rugged connectorized package (size :1.25" x 1.25" x 0.75") case. The model has high rejection, wide stopband rejection with well matched input and output ports. This is designed to handle high power (1W)

Key Features

Feature	Advantages
Wide stopband (More than 1 decade of cutoff frequency)	Suitable for application which needs far-frequency attenuation, for e.g. Defense Communications.
Good VSWR, 1.2:1 typical in passband	The model has good matching when used with other devices.
High Rejection	This enables the filter to attenuate harmonics and spurious signals.

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



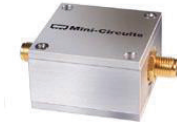
www.minicircuits.com P.O. Box 35166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

Low Pass Filter

50Ω

DC to 450 MHz

ZFLP-450-S+



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CASE STYLE: H16

Connectors Model

SMA-FEMALE ZFLP-450-S+

BRACKET (OPTION "B")

Features

- High Rejection
- Wide stopband rejection
- Good VSWR, 1.2:1 typical in passband
- Rugged connectorized package

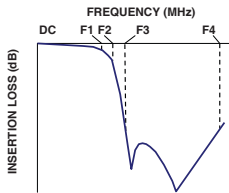
Applications

- Harmonic rejection
- Defense Communications
- Receivers / Transmitters
- Lab Use

Functional Schematic



Typical Frequency Response



Electrical Specifications at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC-F1	DC-450	—	0.5	dB
	Freq. Cut-Off	F2	505	—	4.0	dB
	VSWR	DC-F1	DC-450	—	1.2	:1
Stop Band	Rejection Loss	F3-F4	640-5000	20	26	dB
	VSWR	F3-F4	640-5000	—	21	:1

Maximum Ratings

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

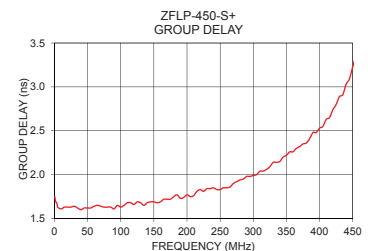
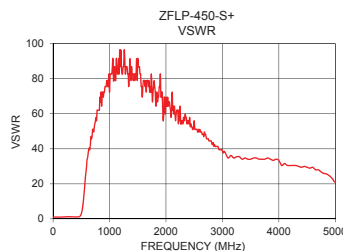
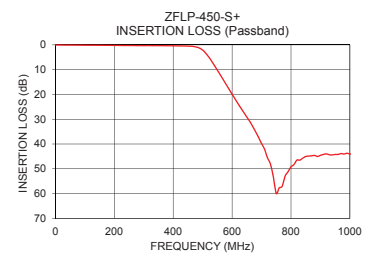
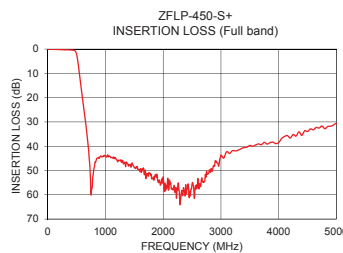
Permanent damage may occur if any of these limits are exceeded.

Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
0.5	0.02	1.00	0.5	1.75
3.5	0.02	1.01	5.0	1.63
20.0	0.05	1.02	165.0	1.72
50.0	0.08	1.03	195.0	1.74
80.0	0.10	1.03	240.0	1.85
205.0	0.22	1.14	280.0	1.94
405.0	0.39	1.11	290.0	1.98
450.0	0.48	1.10	305.0	2.00
480.0	0.88	1.65	325.0	2.09
500.0	2.10	2.91	335.0	2.14
505.0	2.60	3.45	360.0	2.26
530.0	6.44	8.35	375.0	2.35
570.0	14.03	23.18	385.0	2.41
640.0	27.28	40.41	390.0	2.48
730.0	48.04	52.65	400.0	2.53
1000.0	44.04	72.39	405.0	2.55
1500.0	48.71	91.43	415.0	2.65
2000.0	52.62	69.49	425.0	2.80
3000.0	43.66	38.61	440.0	3.03
5000.0	30.58	20.95	450.0	3.23

+RoHS Compliant

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



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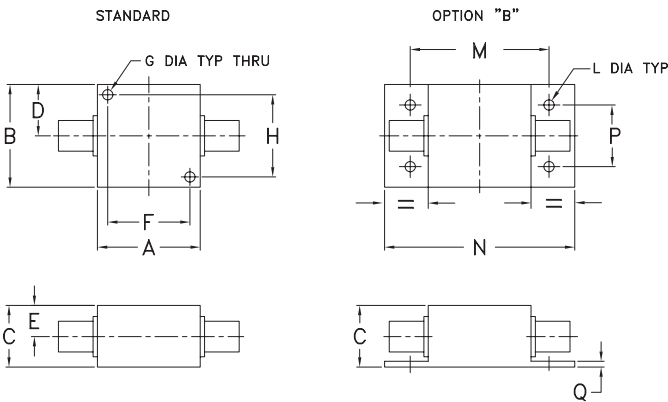


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Coaxial Connections

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

Outline Drawing



Outline Dimensions (inch)

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

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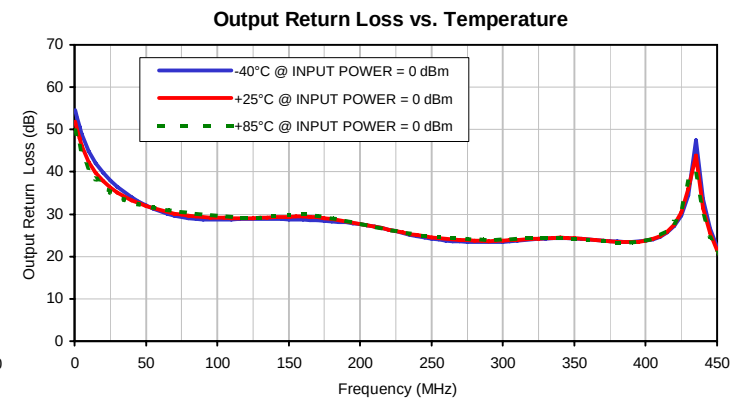
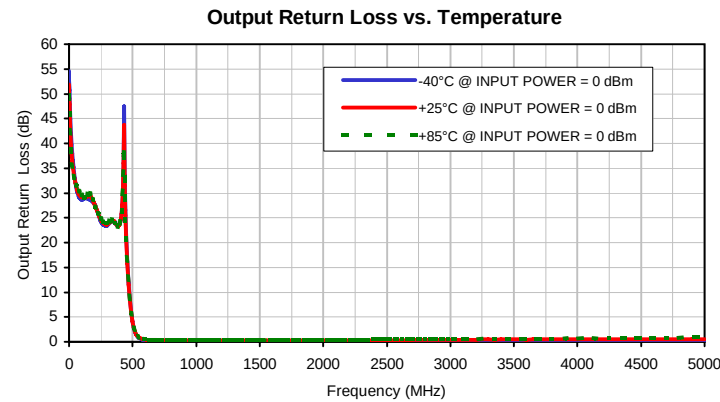
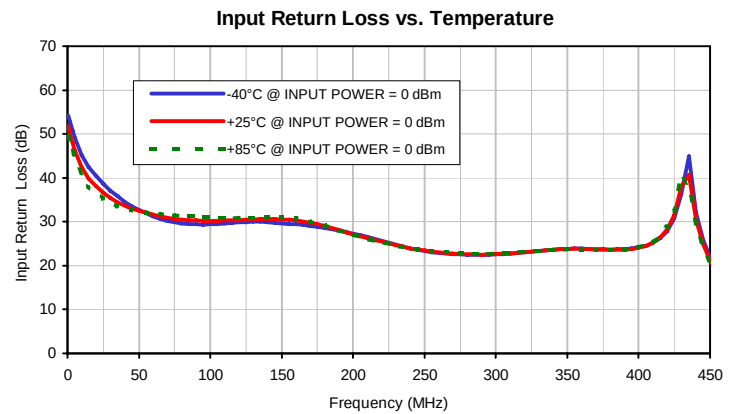
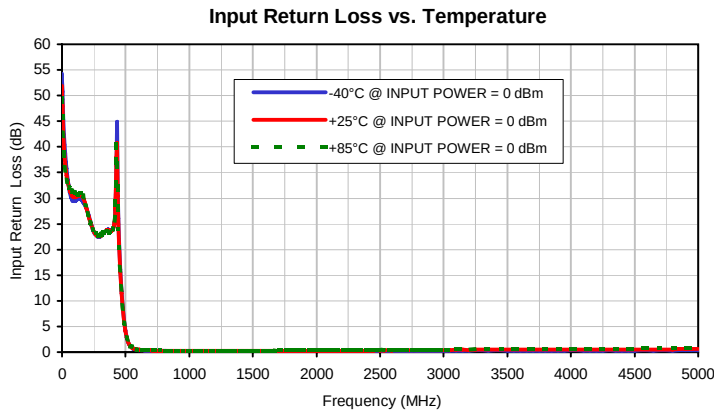
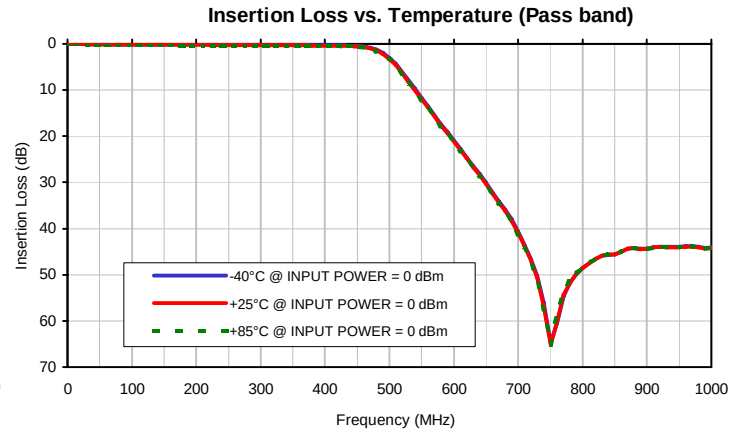
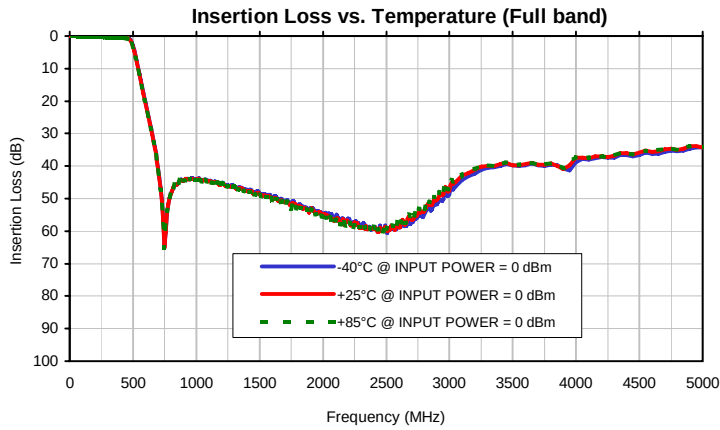
Typical Performance Data

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
0.50	0.01	0.02	0.02	54.26	51.84	49.56	54.53	51.89	49.73
2.00	0.03	0.03	0.03	52.86	49.87	48.10	52.69	49.87	48.04
10.00	0.03	0.04	0.05	45.28	42.43	40.78	44.84	42.26	40.74
50.00	0.06	0.09	0.09	32.64	32.50	32.36	32.00	31.95	31.91
100.00	0.10	0.12	0.14	29.42	30.24	31.02	28.68	29.14	29.56
150.00	0.12	0.16	0.18	29.64	30.53	31.04	28.77	29.39	29.78
200.00	0.14	0.19	0.23	27.34	27.17	27.01	27.68	27.65	27.67
250.00	0.19	0.24	0.28	23.35	23.43	23.55	24.19	24.49	24.76
300.00	0.21	0.28	0.32	22.54	22.60	22.74	23.47	23.73	23.98
350.00	0.23	0.31	0.37	23.83	23.80	23.70	24.26	24.33	24.22
400.00	0.31	0.40	0.45	24.17	24.12	24.15	23.73	23.74	23.75
410.00	0.31	0.40	0.46	25.17	25.28	25.43	24.70	24.82	24.97
420.00	0.32	0.42	0.48	27.87	28.24	28.73	27.16	27.56	27.99
430.00	0.34	0.44	0.50	36.32	38.04	40.57	34.44	36.04	37.59
440.00	0.36	0.46	0.54	32.10	30.45	29.02	33.51	31.46	29.87
450.00	0.41	0.53	0.61	21.94	21.16	20.43	22.23	21.43	20.67
460.00	0.54	0.68	0.78	16.12	15.59	15.09	16.20	15.69	15.18
470.00	0.79	0.95	1.08	11.88	11.49	11.13	11.89	11.54	11.18
480.00	1.23	1.44	1.60	8.59	8.33	8.08	8.59	8.36	8.11
490.00	1.97	2.22	2.43	6.08	5.91	5.75	6.04	5.91	5.75
500.00	2.99	3.27	3.51	4.21	4.13	4.03	4.16	4.12	4.03
510.00	4.33	4.64	4.92	2.89	2.87	2.83	2.83	2.85	2.82
520.00	6.04	6.36	6.65	2.01	2.02	2.02	1.95	2.01	2.02
530.00	7.92	8.25	8.54	1.44	1.48	1.51	1.37	1.46	1.49
540.00	9.76	10.08	10.37	1.07	1.13	1.16	1.00	1.10	1.15
550.00	11.58	11.89	12.18	0.83	0.90	0.94	0.76	0.88	0.93
560.00	13.49	13.78	14.07	0.68	0.74	0.79	0.61	0.72	0.78
570.00	15.45	15.73	16.00	0.57	0.64	0.69	0.50	0.62	0.67
580.00	17.36	17.66	17.92	0.50	0.57	0.61	0.43	0.55	0.60
590.00	19.17	19.47	19.71	0.45	0.52	0.56	0.37	0.50	0.55
600.00	20.93	21.21	21.42	0.41	0.48	0.52	0.34	0.46	0.52
610.00	22.75	23.01	23.22	0.38	0.44	0.49	0.32	0.43	0.50
620.00	24.63	24.88	25.13	0.36	0.42	0.47	0.29	0.40	0.47
630.00	26.44	26.70	26.94	0.34	0.40	0.46	0.28	0.39	0.45
640.00	28.17	28.45	28.68	0.33	0.39	0.44	0.26	0.37	0.43
650.00	30.09	30.35	30.60	0.31	0.37	0.42	0.24	0.36	0.42
660.00	32.13	32.41	32.64	0.29	0.36	0.40	0.24	0.35	0.41
670.00	34.10	34.38	34.66	0.29	0.35	0.40	0.22	0.34	0.40
680.00	35.92	36.22	36.50	0.28	0.35	0.39	0.22	0.33	0.40
690.00	38.04	38.33	38.62	0.27	0.33	0.38	0.21	0.33	0.39
700.00	40.63	40.89	41.27	0.26	0.32	0.37	0.20	0.32	0.38
750.00	64.79	65.19	65.25	0.23	0.29	0.34	0.16	0.28	0.36
800.00	48.51	48.57	48.53	0.20	0.27	0.31	0.14	0.26	0.33
900.00	44.40	44.41	44.47	0.16	0.23	0.28	0.10	0.23	0.31
1000.00	44.06	44.23	44.26	0.14	0.22	0.27	0.07	0.21	0.30
1100.00	44.58	44.69	44.80	0.12	0.21	0.27	0.06	0.21	0.30
1200.00	45.25	45.56	45.57	0.11	0.20	0.26	0.04	0.21	0.30
1300.00	46.07	46.36	46.53	0.09	0.20	0.26	0.02	0.21	0.31
1400.00	47.29	47.66	47.92	0.09	0.19	0.27	0.02	0.22	0.31
1500.00	48.33	48.82	48.72	0.10	0.21	0.29	0.02	0.22	0.33
2000.00	54.94	55.08	56.02	0.13	0.26	0.36	0.02	0.26	0.40
2500.00	59.62	59.22	59.85	0.15	0.31	0.41	0.01	0.30	0.46
3000.00	48.77	47.54	46.70	0.23	0.41	0.53	0.08	0.39	0.57
3500.00	39.85	39.71	39.61	0.30	0.48	0.61	0.12	0.46	0.67
4000.00	38.87	37.33	37.15	0.32	0.51	0.65	0.16	0.51	0.70
4500.00	36.58	35.82	35.69	0.31	0.52	0.67	0.11	0.51	0.76
5000.00	34.18	34.17	34.08	0.39	0.58	0.75	0.14	0.57	0.88

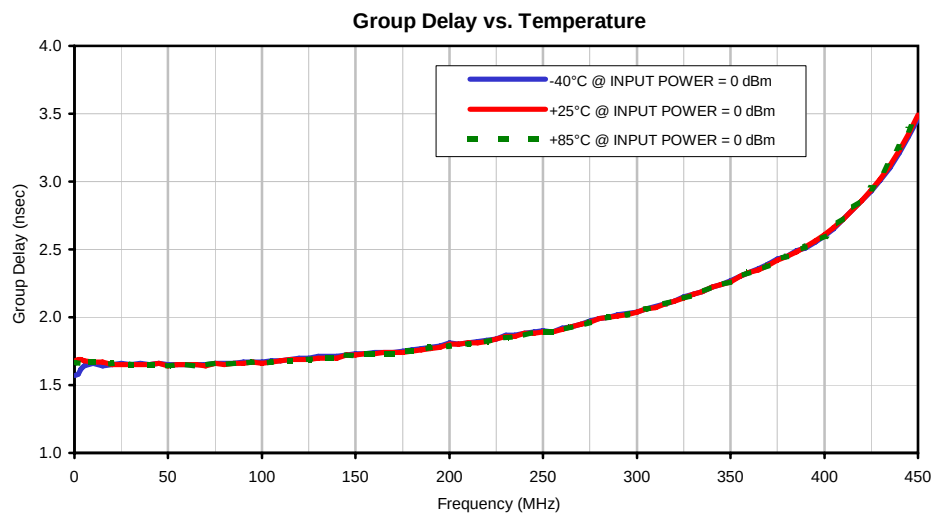
Typical Performance Data

FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-40°C	@+25°C	@+85°C
0.5	1.57	1.68	1.67
2.0	1.58	1.69	1.66
5.0	1.64	1.68	1.67
10.0	1.66	1.67	1.67
20.0	1.65	1.65	1.66
30.0	1.65	1.65	1.65
40.0	1.65	1.65	1.65
50.0	1.65	1.64	1.64
60.0	1.65	1.65	1.65
70.0	1.65	1.64	1.65
80.0	1.66	1.65	1.65
90.0	1.67	1.66	1.66
100.0	1.67	1.66	1.66
110.0	1.68	1.68	1.67
120.0	1.70	1.69	1.68
130.0	1.71	1.70	1.70
140.0	1.71	1.70	1.70
150.0	1.73	1.72	1.71
160.0	1.74	1.73	1.73
170.0	1.74	1.74	1.73
180.0	1.76	1.75	1.75
190.0	1.78	1.77	1.78
200.0	1.81	1.80	1.79
210.0	1.81	1.81	1.80
220.0	1.83	1.82	1.82
230.0	1.87	1.86	1.85
240.0	1.88	1.88	1.87
250.0	1.90	1.89	1.89
260.0	1.92	1.91	1.91
270.0	1.95	1.95	1.94
280.0	1.99	1.99	1.99
290.0	2.02	2.01	2.00
300.0	2.04	2.04	2.04
305.0	2.06	2.06	2.06
310.0	2.08	2.07	2.07
320.0	2.12	2.12	2.12
330.0	2.17	2.17	2.16
340.0	2.22	2.22	2.22
350.0	2.27	2.26	2.26
360.0	2.33	2.33	2.33
370.0	2.39	2.38	2.38
375.0	2.43	2.42	2.43
380.0	2.45	2.45	2.45
385.0	2.49	2.48	2.49
390.0	2.51	2.52	2.52
395.0	2.55	2.56	2.56
400.0	2.60	2.61	2.60
405.0	2.65	2.66	2.67
410.0	2.72	2.72	2.73
415.0	2.79	2.79	2.80
420.0	2.86	2.86	2.87
425.0	2.93	2.94	2.95
430.0	3.01	3.02	3.03
435.0	3.10	3.12	3.14
440.0	3.21	3.23	3.25
445.0	3.33	3.35	3.38
450.0	3.46	3.49	3.51

Typical Performance Curves



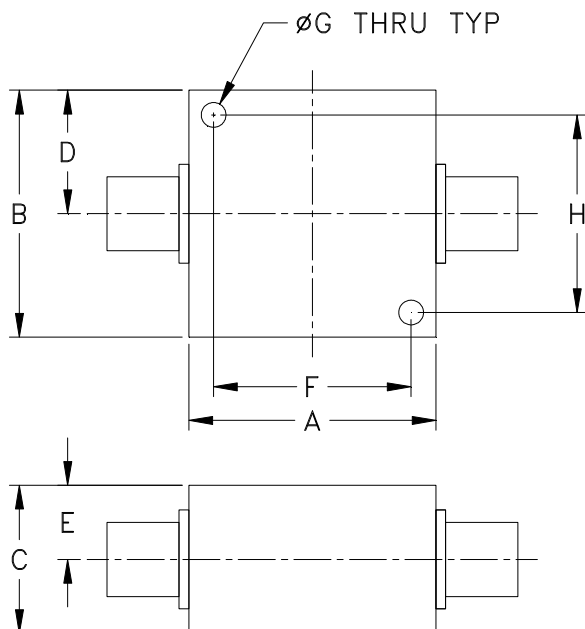
Typical Performance Curves



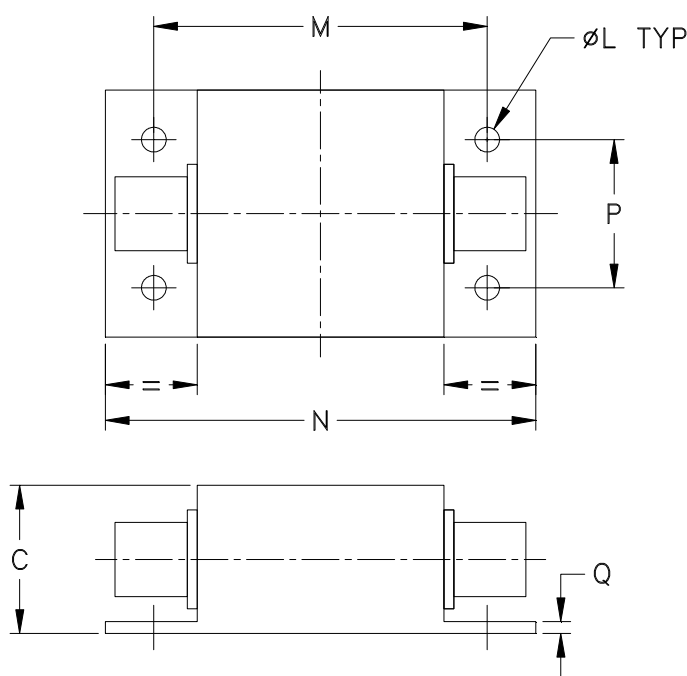
Outline Dimensions

H16

STANDARD



OPTION "B"



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
H16	1.25 (31.75)	1.25 (31.75)	.75 (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. $\pm .03$; 3PL. $\pm .015$

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.



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



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS



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