Coaxial

Limiter

ZFLM-43-5W+

50Ω Broadband 20 to 4000 MHz

The Big Deal

- Wideband, 20 to 4000 MHz
- Wide limiting range, +10 to +37 dBm
- Low output power leakage, +12 dBm
- Fast recovery time, 33ns typ.



CASE STYLE: H16

Product Overview

Mini-Circuits' ZFLM-43-5W+ is a coaxial RF limiter ideal for protecting sensitive receiver circuitry from high-power signals, while allowing low-scattered signals to be received. Providing input limiting range from +10 to +37 dBm and +12 dBm output power, this model is suitable for many situations where unwanted signals prevail such as manufacturing sites, train tunnels, radar transceivers and more. The unit comes housed in a rugged, aluminum alloy case (1.25" x 1.25 x 0.75") with SMA connectors.

Key Features

Feature	Advantages
Wideband, from 20 to 4000 MHz	Ideal for a variety of applications requiring protection of sensitive receiver circuitry from unwanted signals, ESD and power surges on the network.
Wide limiting range from +10 to +37 dBm	Prevents a wide range of high input signal levels from passing through the network and damaging sensitive electronic components.
Low Δoutput / 1 dB ΔΔ input • 0.3 dB, +10 to +20 dBm input range • 0.1 dB, +20 to +37 dBm input range	Low delta output per 1 dB delta input maintains signal stability in the presence of volatile input signal conditions.
Rapid recovery, 33ns	Minimal downtime after unwanted signals are removed with very quick restoration of standard operating levels.
Low insertion loss, 0.36 dB	Preserves the strength of low-power signals in the receive path.
Low-output power, +12 dBm	Low output power prevents saturation of receiver circuitry and provides extra protection for sensitive components.

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

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ZFLM-43-5W+

50Ω Broadband 20 to 4000 MHz



Generic photo used for illustration purposes only

CASE STYLE: H16

Connectors	Model
SMA	ZFLM-43-5W+

+RoHS Compliant

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

Maximum Ratings

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

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

Coaxial Connections

INPUT	SMA female
OUTPUT	SMA male

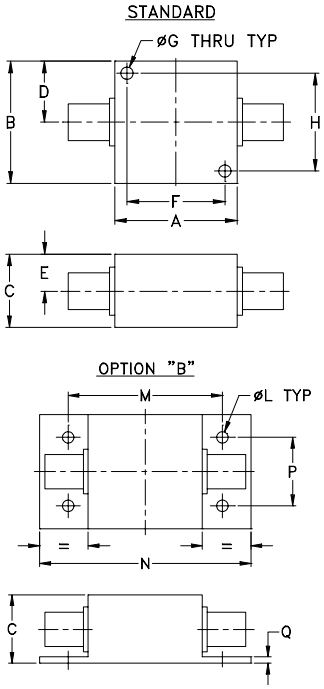
Features

- wideband, 20 to 4000 MHz
- low insertion loss 0.36 dB typ.
- fast recovery time, 33nsec typ.
- excellent VSWR 1.2:1 typ.
- low output power, 12 dBm typ.

Applications

- military, hi-rel applications
- stabilizing generator outputs
- reducing amplitude variations
- protects low noise amplifiers and other devices from ESD or input power damage

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

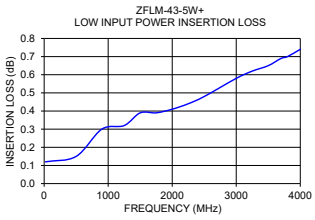
J	K	L	M	N	P	Q	wt
--	--	.125	1.688	2.18	.750	.06	grams
--	--	3.18	42.88	55.37	19.05	1.52	70.0

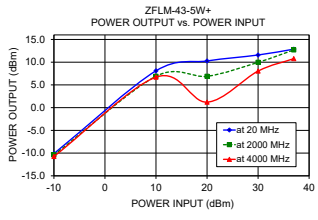
Electrical Specifications

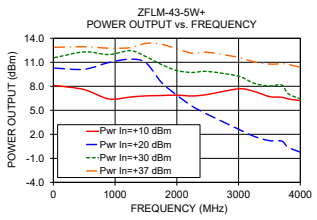
Parameter	Condition	Min.	Typ.	Max.	Units
Frequency Range		20	—	4000	MHz
Linear Range					
Max Input Power	<0.1 dB compression	—	5	—	dBm
Insertion Loss	<-10 dBm	—	0.5	1.2	dB
VSWR	<-10 dBm	—	1.3	1.80	:1
Limiting Range					
Input Power	>1dB compression filtered signal frequency	+10	—	+37	dBm
Output Power		—	+13	—	dBm
Δ Output/1dB Δ Input	Input Power Range (dBm)				
	10 to 20	—	0.3	—	
	20 to 30	—	0.1	—	dB/dB
	30 to 37	—	0.1	—	
Recovery Time	2 watt pulse 50 µsec pw 1kHz duty cycle recovery to within 90% of final value @ -5 dBm	—	33	—	nsec
Response Time	-30 to +33 dBm input 50 µsec PW 1 kHz duty cycle	—	21	—	nsec

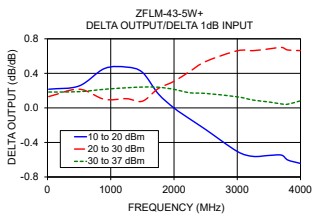
Typical Performance Data

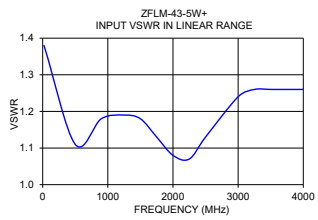
Freq. (MHz)	I. Loss in Linear Range (dB)	VSWR in Linear Range (:1)	Power Output (dBm) +10 dBm Input	+20 dBm Input	+30 dBm Input	+37 dBm Input	Δ Output / 1dB Δ Input +10 to +20 dBm Input	+20 to +30 dBm Input	+30 to +37 dBm Input
20	0.12	1.38	8.11	10.27	11.58	12.87	0.22	0.13	0.18
500	0.15	1.11	7.59	10.13	12.30	12.94	0.25	0.22	0.09
900	0.30	1.18	6.42	10.98	11.97	12.76	0.46	0.10	0.11
1250	0.32	1.19	6.67	11.39	12.46	12.83	0.47	0.11	0.05
1500	0.39	1.18	6.80	10.93	11.70	13.36	0.41	0.08	0.24
1750	0.39	1.13	6.85	8.49	10.72	13.25	0.16	0.22	0.36
2000	0.41	1.08	6.90	6.89	9.97	12.69	0.00	0.31	0.39
2250	0.44	1.07	6.79	5.51	9.73	12.13	-0.13	0.42	0.34
2500	0.48	1.13	6.98	4.48	9.85	12.25	-0.25	0.54	0.34
3000	0.58	1.24	7.68	2.64	9.26	11.60	-0.50	0.66	0.34
3250	0.62	1.26	7.36	1.75	8.38	11.05	-0.56	0.66	0.38
3500	0.65	1.26	6.72	1.21	8.04	10.78	-0.55	0.68	0.39
3700	0.69	1.26	6.63	1.16	8.16	10.81	-0.55	0.70	0.38
3800	0.70	1.26	6.43	0.39	7.09	10.75	-0.60	0.67	0.52
4000	0.74	1.26	6.21	-0.23	6.41	10.37	-0.64	0.66	0.57

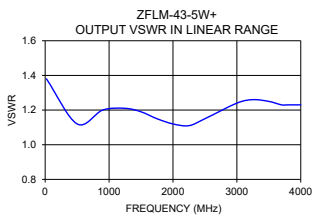












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Typical Performance Data

FREQUENCY	LOW INPUT POWER			POWER OUTPUT (dBm)				DELTA OUTPUT/1dB DELTA INPUT (dB/dB)		
	INSERTION LOSS	VSWR								
(MHz)	(dB)	Input (:1)	Output (:1)	+10 dBm INPUT	+20 dBm INPUT	+30 dBm INPUT	+37 dBm INPUT	+10 to +20 dBm INPUT	+20 to +30 dBm INPUT	+30 to +37 dBm INPUT
20	0.12	1.38	1.38	8.11	10.27	11.58	12.87	0.22	0.13	0.18
40	0.05	1.18	1.38	8.06	10.29	11.55	12.87	0.22	0.13	0.19
60	0.04	1.12	1.24	8.07	10.32	11.64	13.15	0.23	0.13	0.22
80	0.04	1.09	1.18	8.04	10.29	11.67	13.30	0.22	0.14	0.23
100	0.05	1.08	1.14	8.06	10.29	11.80	13.49	0.22	0.15	0.24
200	0.07	1.07	1.12	8.00	10.25	12.51	13.41	0.22	0.23	0.13
300	0.10	1.08	1.11	7.76	10.01	12.59	13.16	0.23	0.26	0.08
400	0.12	1.09	1.10	7.59	9.93	12.23	12.90	0.23	0.23	0.10
500	0.15	1.11	1.12	7.59	10.13	12.30	12.94	0.25	0.22	0.09
600	0.19	1.13	1.08	7.61	10.34	12.18	12.75	0.27	0.18	0.08
700	0.23	1.14	1.08	7.32	10.33	11.88	12.48	0.30	0.15	0.09
800	0.32	1.16	1.07	7.32	10.72	12.09	12.84	0.34	0.14	0.11
850	0.32	1.18	1.07	6.44	10.87	11.97	12.81	0.44	0.11	0.12
900	0.30	1.18	1.20	6.42	10.98	11.97	12.76	0.46	0.10	0.11
950	0.28	1.19	1.08	6.35	10.95	11.88	12.75	0.46	0.09	0.12
1000	0.29	1.19	1.09	6.20	10.93	11.76	12.44	0.47	0.08	0.10
1050	0.29	1.19	1.10	6.13	10.99	11.75	12.39	0.49	0.08	0.09
1100	0.30	1.19	1.11	6.27	11.19	12.32	12.63	0.49	0.11	0.04
1150	0.31	1.19	1.11	6.53	11.49	12.66	12.74	0.50	0.12	0.01
1200	0.32	1.19	1.13	6.80	11.77	12.95	13.39	0.50	0.12	0.06
1250	0.32	1.19	1.21	6.67	11.39	12.46	12.83	0.47	0.11	0.05
1300	0.34	1.19	1.14	6.58	11.35	12.04	12.87	0.48	0.07	0.12
1350	0.35	1.19	1.15	6.39	11.13	11.81	12.81	0.47	0.07	0.14
1400	0.37	1.19	1.16	6.35	11.09	11.62	12.65	0.47	0.05	0.15
1450	0.38	1.19	1.17	6.59	11.10	11.58	13.11	0.45	0.05	0.22
1500	0.39	1.18	1.19	6.80	10.93	11.70	13.36	0.41	0.08	0.24
1550	0.39	1.18	1.20	6.79	10.72	11.57	13.38	0.39	0.08	0.26
1600	0.39	1.17	1.20	6.83	10.57	11.36	13.39	0.37	0.08	0.29
1650	0.39	1.16	1.20	6.75	10.00	10.89	13.23	0.32	0.09	0.33
1700	0.39	1.15	1.20	6.78	9.58	10.77	13.27	0.28	0.12	0.36
1750	0.39	1.13	1.15	6.85	8.49	10.72	13.25	0.16	0.22	0.36
1800	0.39	1.12	1.21	7.01	8.45	10.99	13.71	0.14	0.25	0.39
1850	0.40	1.11	1.20	7.16	8.89	10.98	13.61	0.17	0.21	0.38
1900	0.40	1.10	1.20	7.12	8.10	10.98	13.85	0.10	0.29	0.41
1950	0.40	1.09	1.20	6.96	8.03	10.52	13.31	0.11	0.25	0.40
2000	0.41	1.08	1.12	6.90	6.89	9.97	12.69	0.00	0.31	0.39
2050	0.41	1.07	1.19	6.86	6.15	9.96	12.92	-0.07	0.38	0.42
2100	0.42	1.07	1.19	6.92	5.65	9.97	12.80	-0.13	0.43	0.40
2150	0.43	1.07	1.18	6.95	5.51	10.08	12.74	-0.14	0.46	0.38
2200	0.43	1.07	1.18	6.93	5.79	10.13	12.61	-0.11	0.43	0.35
2250	0.44	1.07	1.11	6.79	5.51	9.73	12.13	-0.13	0.42	0.34
2300	0.45	1.08	1.16	7.04	5.24	9.97	12.47	-0.18	0.47	0.36
2350	0.45	1.09	1.15	7.05	5.17	10.06	12.38	-0.19	0.49	0.33
2400	0.46	1.11	1.14	7.09	5.42	9.97	12.57	-0.17	0.45	0.37
2450	0.47	1.12	1.13	7.01	4.70	9.69	12.06	-0.23	0.50	0.34
2500	0.48	1.13	1.15	6.98	4.48	9.85	12.25	-0.25	0.54	0.34
2550	0.49	1.14	1.11	7.83	4.38	9.51	11.88	-0.34	0.51	0.34
2600	0.50	1.16	1.11	7.85	4.15	9.40	11.70	-0.37	0.53	0.33
2650	0.50	1.17	1.10	7.90	3.76	9.22	11.51	-0.41	0.55	0.33
2700	0.51	1.18	1.09	7.81	3.49	9.16	11.56	-0.43	0.57	0.34
2750	0.52	1.19	1.09	7.88	3.36	9.22	11.37	-0.45	0.59	0.31
2800	0.53	1.20	1.09	7.81	3.15	9.30	11.51	-0.47	0.61	0.32
2850	0.54	1.21	1.09	7.67	2.99	9.04	11.28	-0.47	0.61	0.32
2900	0.55	1.22	1.10	7.59	2.65	8.98	11.40	-0.49	0.63	0.35
2950	0.56	1.23	1.10	7.53	2.64	8.94	11.32	-0.49	0.63	0.34
3000	0.58	1.24	1.24	7.68	2.64	9.26	11.60	-0.50	0.66	0.34
3100	0.59	1.26	1.13	7.60	2.75	9.05	11.54	-0.49	0.63	0.36
3200	0.61	1.26	1.15	7.46	2.02	8.65	10.92	-0.54	0.66	0.32
3300	0.62	1.26	1.17	7.55	1.84	8.62	11.19	-0.57	0.68	0.37
3400	0.64	1.26	1.19	7.17	1.53	8.25	11.08	-0.56	0.67	0.40
3500	0.65	1.26	1.25	6.72	1.21	8.04	10.78	-0.55	0.68	0.39
3600	0.67	1.26	1.24	6.77	1.11	7.82	10.94	-0.57	0.67	0.45
3700	0.69	1.26	1.23	6.63	1.16	8.16	10.81	-0.55	0.70	0.38
3800	0.70	1.26	1.23	6.43	0.39	7.09	10.75	-0.60	0.67	0.52
3900	0.72	1.26	1.28	5.69	-0.47	6.32	9.71	-0.62	0.68	0.48
4000	0.74	1.26	1.23	6.21	-0.23	6.41	10.37	-0.64	0.66	0.57

Typical Performance Data

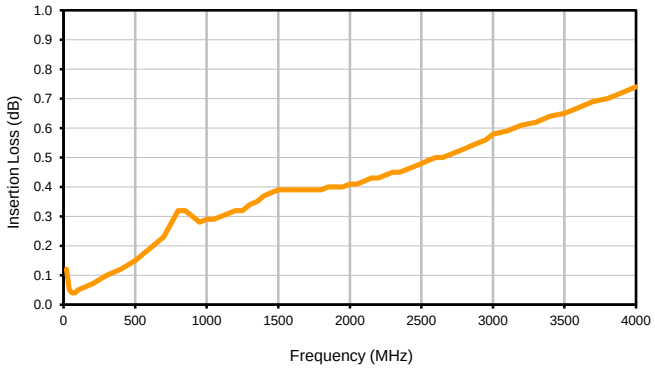
POWER INPUT	POWER OUTPUT
@ 20 MHz	
(dBM)	
-10	-10.12
10	8.11
20	10.27
30	11.58
37	12.87

POWER INPUT	POWER OUTPUT
@ 2000 MHz	
(dBM)	
-10	-10.41
10	6.90
20	6.89
30	9.97
37	12.69

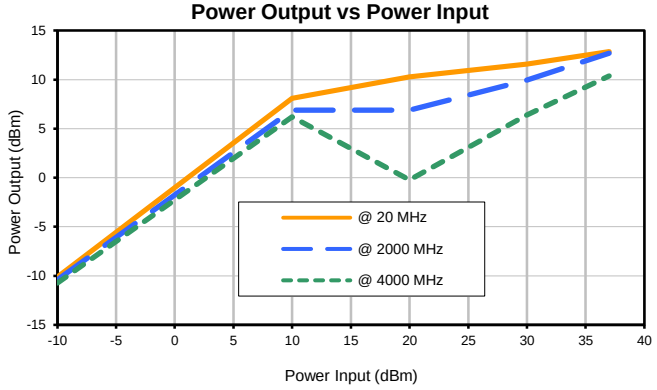
POWER INPUT	POWER OUTPUT
@ 4000 MHz	
(dBM)	
-10	-10.74
10	6.21
20	-0.23
30	6.41
37	10.37

Typical Performance Curves

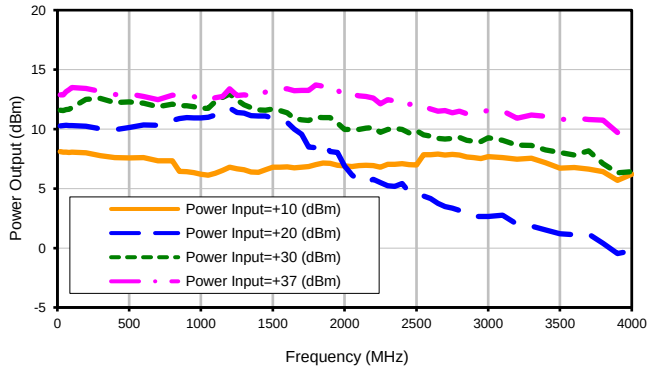
Insertion Loss vs Frequency



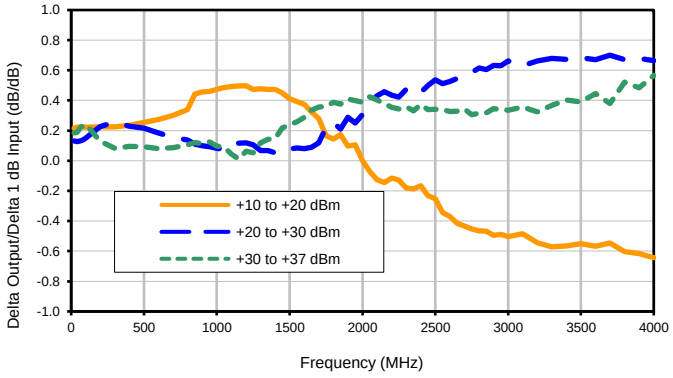
Power Output vs Power Input



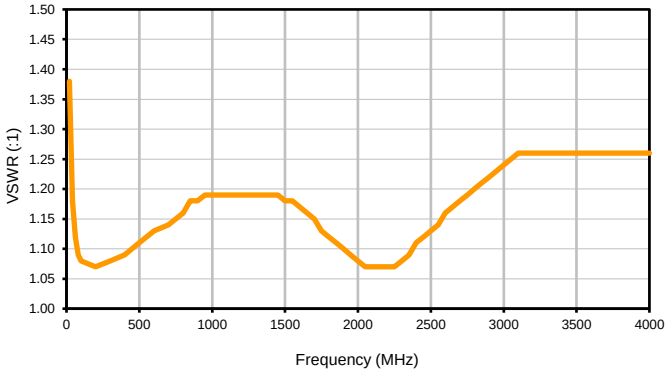
Power Output vs Frequency



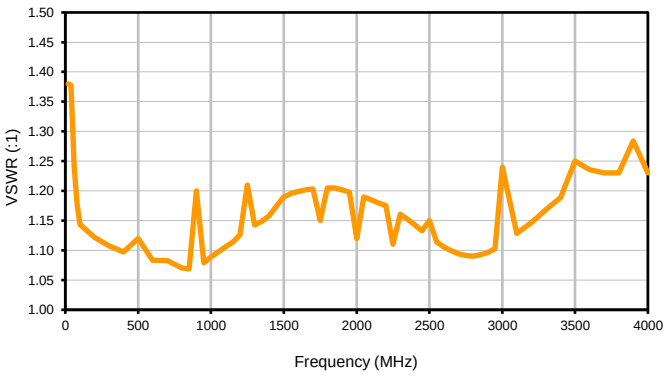
Delta Output / Delta 1dB Input



Input VSWR



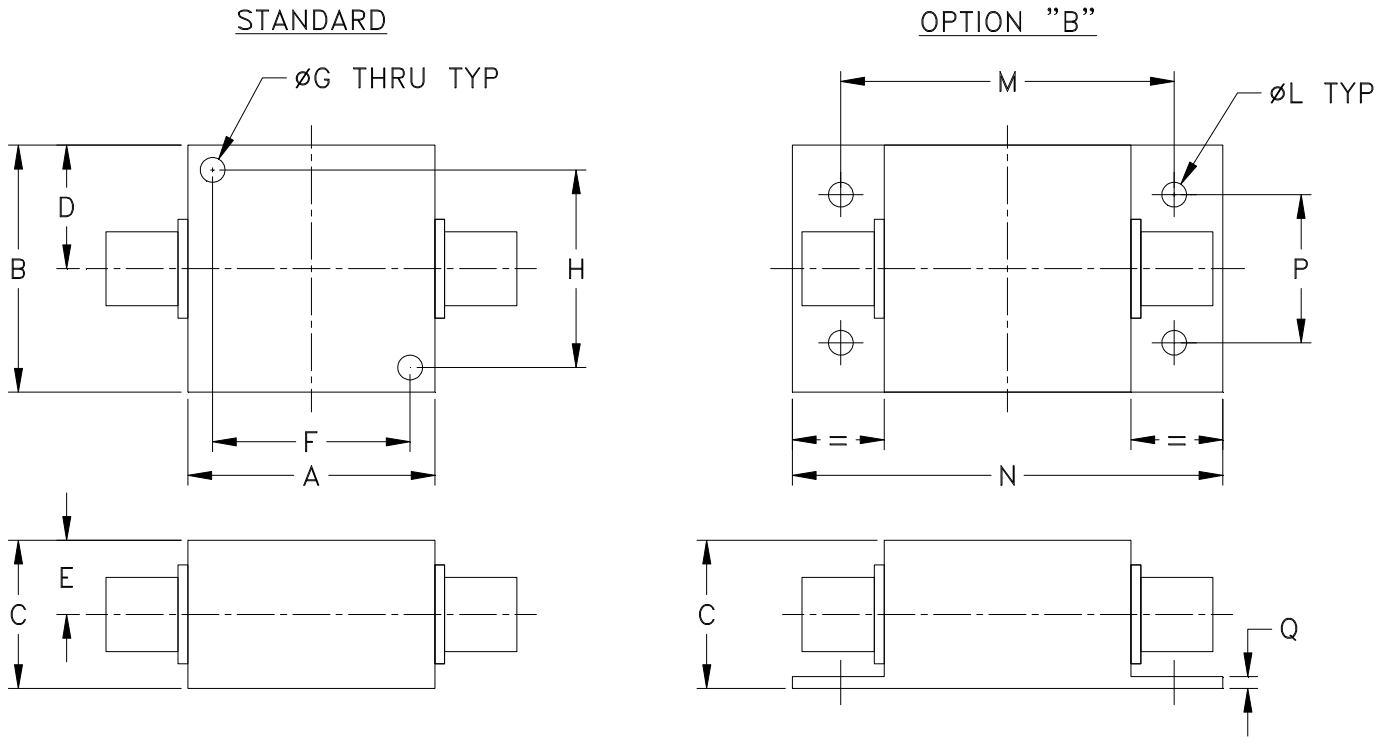
Output VSWR



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)	.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. ± .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.

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RF/IF MICROWAVE COMPONENTS

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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

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