

+12 to +32dBm

# Limiters

## VLM-83-2W-S+

50Ω Broadband 30 to 8200 MHz



Generic photo used for illustration purposes only  
CASE STYLE: FF704

### The Big Deal

- Ultra wide frequency range, 30 MHz to 8.2 GHz
- High CW input power, +32 dBm
- Fast recovery time, 10 nsec typ.

### Product Overview

The VLM-83-2W-S+ protects against ESD and input RF power surges, up to 1.6 W, across a very wide frequency range. These units are rugged unibody enclosure (1.43" x 0.410") specifically designed to function in tough environments such as manufacturing sites, train tunnels, ECM & ECCM, or anywhere sensitive components, such as low noise amplifiers, need protection.

### Key Features

Feature	Advantages
Limiting abilities from +12 to +32 dBm	Protects against very strong undesired signals to help prevent burn out of amplifiers and other highly sensitive components
Ultra wideband, 30 MHz to 8.2 GHz	Protects against many different types of unwanted signals.
Response time 2 nsec	Reacts almost instantaneously to limit unwanted high level signals
Recovery time 8 nsec	Minimal downtime after unwanted signals are removed, with very quick restoration of standard operating levels
Low insertion loss and VSWR	Provides minimal degradation to system performance, especially low noise amplifiers where input loss is critical

#### 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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# +12 to +32dBm Limiter

# VLM-83-2W-S+

50Ω Broadband 30 to 8200 MHz



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CASE STYLE: FF704  
Connectors Model  
SMA VLM-83-2W-S+

## Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Input Power	2W

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

## Features

- Wideband, 30 to 8200 MHz
- Low insertion loss 1 dB typ.
- Fast recovery time, 10nsec typ.
- Low output power, 11.5 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

**+RoHS Compliant**

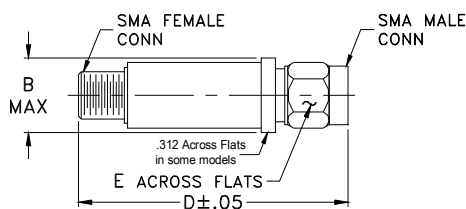
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

## Coaxial Connections\*

PORT - 1	SMA FEMALE
PORT - 2	SMA MALE

\*Suggested Connections. For reverse connections, consult Mini-Circuits.

## Outline Drawing



## Outline Dimensions (inch/mm)

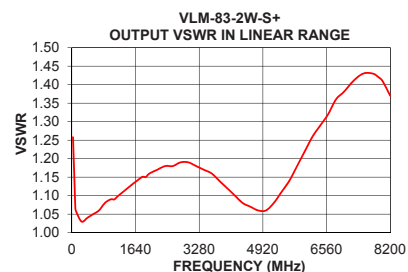
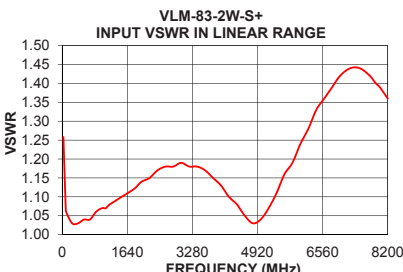
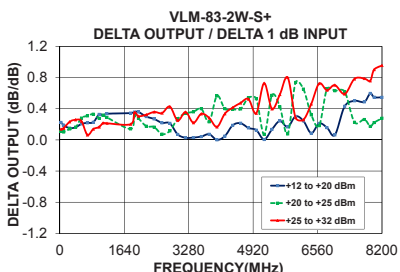
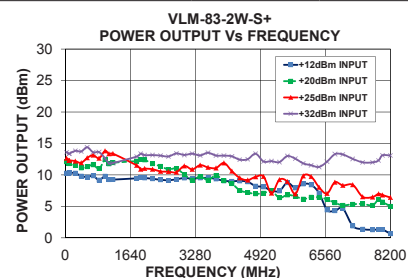
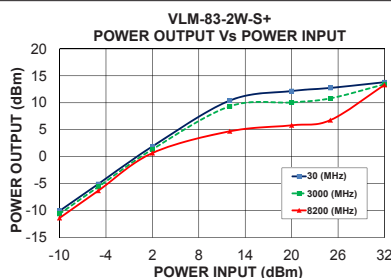
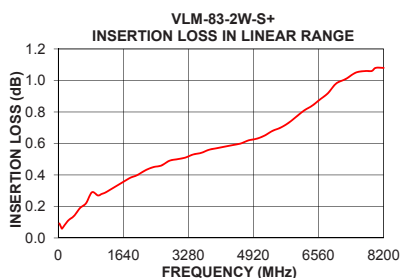
B	D	E	wt
.410	1.43	.312	grams
10.41	36.32	7.92	10.0

## Electrical Specifications at 25°C

Parameter	Condition	Min.	Typ.	Max.	Units
Frequency Range		30		8200	MHz
Max input power in Linear Range	< 0.1 dB compression	—	—	2.0	dBm
Insertion Loss in Linear Range	<+2 dBm Input power	—	1.0	2.3	dB
VSWR	<+2 dBm Input power	—	1.5	—	:1
Input Power Limiting Range	>1dB compression filtered signal frequency	+12	—	+32	dBm
Output Power Limiting Range	>1dB compression filtered signal frequency	—	+11.5	—	dBm
Recovery Time	1 watt pulse 50 usec PW, 1kHz duty cycle, recovery to within 90% of final value.	—	10	—	nsec
Response Time	+30 dBm input, 50 usec, PW 1 kHz duty cycle	—	2	—	nsec
Limiting Δ Output/1dB Δ Input	Input Power Range (dBm)				
	12 to 20	—	0.4	—	dB/dB
	20 to 25	—	0.2	—	
	25 to 32	—	0.8	—	

## Typical Performance Data

Freq. (MHz)	I. Loss in Linear Range (dB)	VSWR in Linear Range (:1)	Power Output (dBm)				Δ Output 1dB Δ Input		
			+12dBm Input	+20dBm Input	+25 dBm Input	+32dBm Input	+12 to +20dBm Input	+20 to +25 dBm Input	+25 to +32 dBm Input
30	0.09	1.26	10.29	12.08	12.64	13.60	0.22	0.11	0.14
100	0.06	1.06	10.33	11.79	12.31	13.36	0.18	0.10	0.15
550	0.19	1.04	9.67	11.31	12.71	14.40	0.21	0.28	0.24
700	0.22	1.04	9.66	11.61	13.15	13.60	0.22	0.31	0.06
1200	0.29	1.08	9.26	11.94	13.38	11.89	0.34	0.29	0.21
1800	0.38	1.12	9.46	12.21	11.51	12.92	0.34	0.14	0.20
2000	0.40	1.14	9.52	12.39	11.01	13.14	0.36	0.28	0.30
3000	0.50	1.19	9.51	10.07	11.43	13.17	0.07	0.27	0.25
4000	0.57	1.13	9.07	9.08	11.90	13.07	0.00	0.56	0.17
4400	0.59	1.08	9.05	7.55	9.52	12.42	0.19	0.39	0.41
5000	0.63	1.04	8.10	7.10	9.74	12.13	0.13	0.53	0.34
5600	0.70	1.16	8.76	6.82	8.94	13.01	0.24	0.42	0.58
6000	0.77	1.24	8.57	6.16	9.84	11.84	0.30	0.74	0.29
7000	0.98	1.42	4.67	5.18	8.33	13.25	0.06	0.63	0.70
8200	1.08	1.36	0.65	5.02	6.41	13.09	0.55	0.28	0.95



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## Typical Performance Data

Freq.	LOW INPUT POWER		POWER OUTPUT (dBm)				DELTA OUTPUT/1dB DELTA INPUT (dB/dB)			
	INSERTION LOSS	VSWR		+12dBm	+20dBm	+25dBm	+32dBm	+12 to +20dBm	+20 to +25dBm	+25 to +32dBm
(MHz)	(dB)	INPUT	OUTPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT
		(:1)								
30	0.09	1.26	1.26	10.29	12.08	12.64	13.60	0.22	0.11	0.14
90	0.06	1.07	1.07	10.30	11.82	12.34	13.37	0.19	0.10	0.15
100	0.06	1.06	1.06	10.33	11.79	12.31	13.36	0.18	0.10	0.15
250	0.11	1.03	1.03	10.29	11.50	12.20	13.83	0.15	0.14	0.23
400	0.14	1.03	1.04	9.82	11.11	11.92	13.73	0.16	0.16	0.26
550	0.19	1.04	1.05	9.67	11.31	12.71	14.40	0.21	0.28	0.24
700	0.22	1.04	1.06	9.86	11.61	13.15	13.60	0.22	0.31	0.06
850	0.29	1.06	1.08	9.19	11.00	12.65	13.62	0.23	0.33	0.14
1000	0.27	1.07	1.09	9.81	12.43	13.82	12.66	0.33	0.28	0.17
1100	0.28	1.07	1.09	9.25	11.76	13.35	11.83	0.31	0.32	0.22
1200	0.29	1.08	1.10	9.26	11.94	13.38	11.89	0.34	0.29	0.21
1800	0.38	1.12	1.15	9.46	12.21	11.51	12.92	0.34	0.14	0.20
1900	0.39	1.13	1.15	9.59	12.45	10.90	13.37	0.36	0.31	0.35
2000	0.40	1.14	1.16	9.52	12.39	11.01	13.14	0.36	0.28	0.30
2200	0.43	1.15	1.17	9.39	11.78	10.90	13.16	0.30	0.18	0.32
2400	0.45	1.17	1.18	9.23	11.38	10.56	13.07	0.27	0.16	0.36
2600	0.46	1.18	1.18	9.14	10.89	10.52	12.93	0.22	0.07	0.34
2800	0.49	1.18	1.19	9.31	11.01	10.43	13.42	0.21	0.12	0.43
3000	0.50	1.19	1.19	9.51	10.07	11.43	13.17	0.07	0.27	0.25
3200	0.51	1.18	1.18	9.40	9.18	10.88	13.38	0.03	0.34	0.36
3400	0.53	1.18	1.17	9.52	9.76	11.56	13.10	0.03	0.36	0.22
3600	0.54	1.17	1.16	9.53	9.19	11.19	13.53	0.04	0.40	0.33
3800	0.56	1.15	1.14	9.36	9.94	11.10	13.08	0.07	0.23	0.28
4000	0.57	1.13	1.12	9.07	9.08	11.90	13.07	0.00	0.56	0.17
4200	0.58	1.10	1.10	9.00	8.61	10.61	12.96	0.05	0.40	0.34
4400	0.59	1.08	1.08	9.05	7.55	9.52	12.42	0.19	0.39	0.41
4600	0.60	1.05	1.07	8.91	7.20	9.18	12.50	0.21	0.40	0.47
4800	0.62	1.03	1.06	8.23	7.00	9.70	13.37	0.15	0.54	0.52
5000	0.63	1.04	1.06	8.10	7.10	9.74	12.13	0.13	0.53	0.34
5200	0.65	1.07	1.08	7.50	7.46	7.10	12.19	0.01	0.07	0.73
5400	0.68	1.11	1.11	7.46	6.38	9.24	12.03	0.14	0.57	0.40
5600	0.70	1.16	1.14	8.76	6.82	8.94	13.01	0.24	0.42	0.58
5800	0.73	1.19	1.18	7.93	6.60	6.98	12.58	0.17	0.08	0.80
6000	0.77	1.24	1.22	8.57	6.16	9.84	11.84	0.30	0.74	0.29
6200	0.81	1.28	1.26	8.42	6.47	9.73	11.54	0.24	0.65	0.26
6400	0.84	1.33	1.29	7.12	6.43	8.04	11.27	0.09	0.32	0.46
6600	0.88	1.36	1.32	4.44	6.13	7.04	12.10	0.21	0.18	0.72
6800	0.92	1.39	1.36	4.31	5.57	8.84	13.30	0.16	0.65	0.64
7000	0.98	1.42	1.38	4.67	5.18	8.33	13.25	0.06	0.63	0.70
7250	1.01	1.44	1.41	1.89	5.34	8.43	12.55	0.43	0.62	0.59
7500	1.05	1.44	1.43	1.38	5.39	6.52	12.00	0.50	0.23	0.78
7750	1.06	1.42	1.43	1.28	5.18	6.49	12.00	0.49	0.26	0.79
7900	1.06	1.40	1.42	1.35	6.12	6.99	12.30	0.60	0.17	0.76
8000	1.08	1.39	1.41	1.32	5.70	6.81	13.12	0.55	0.22	0.90
8200	1.08	1.36	1.37	0.65	5.02	6.41	13.09	0.55	0.28	0.95

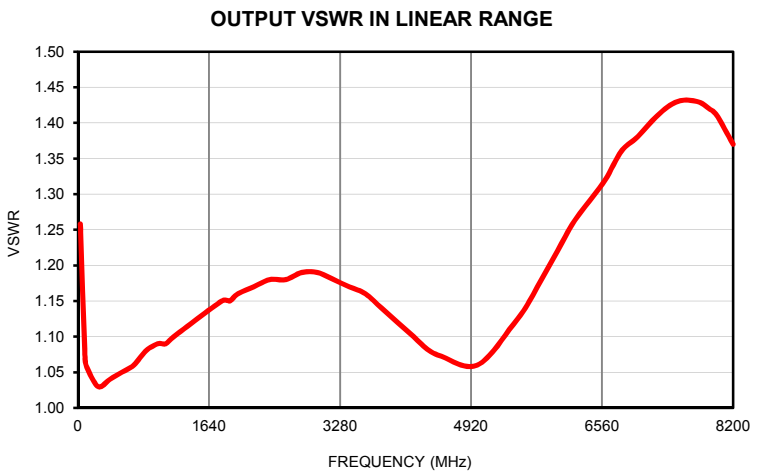
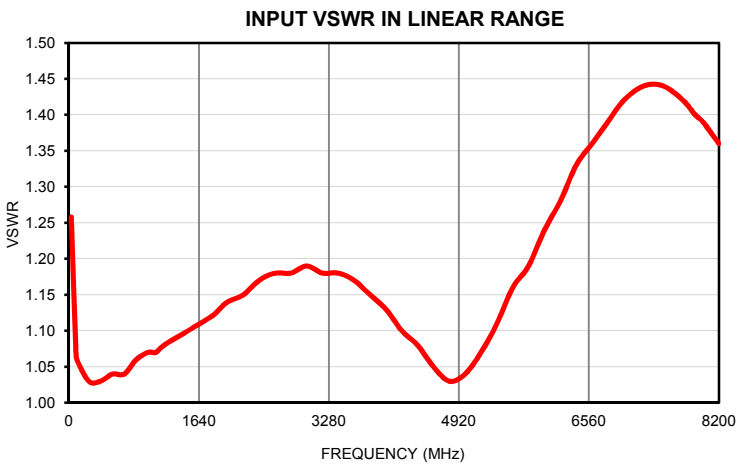
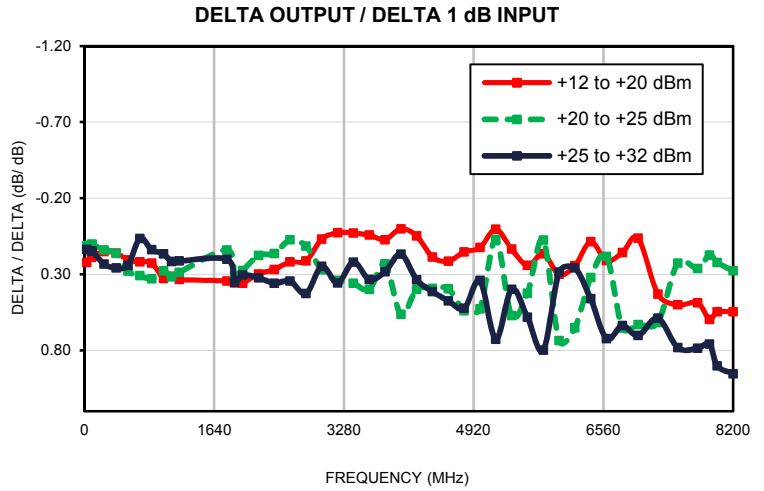
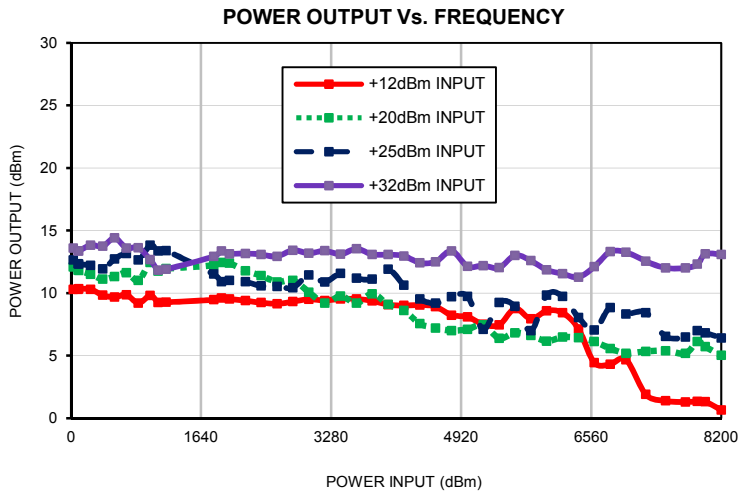
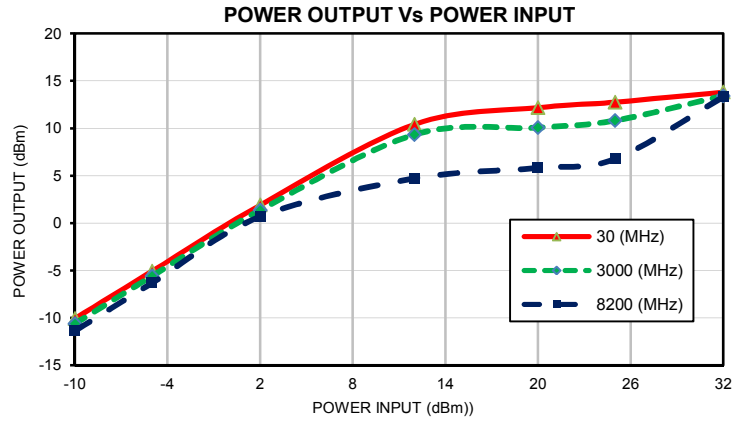
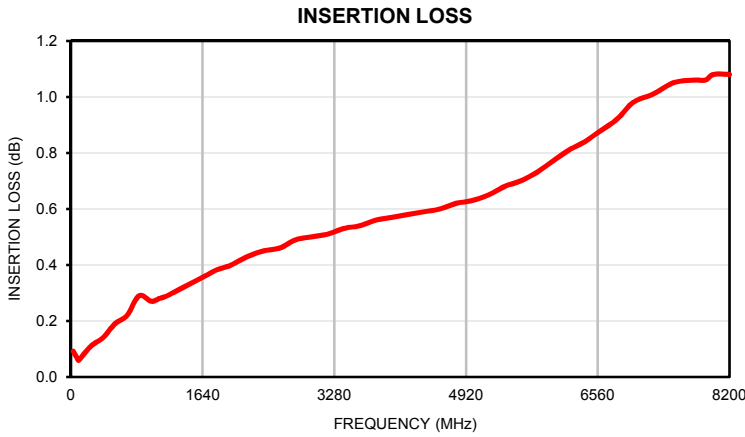
## Typical Performance Data

POWER INPUT	POWER OUTPUT
@ 30 MHz	
(dBm)	
-10	-10.06
-5	-5.07
2	1.9
12	10.41
20	12.17
25	12.75
32	13.81

POWER INPUT	POWER OUTPUT
@ 3000 MHz	
(dBm)	
-10	-10.61
-5	-5.59
2	1.36
12	9.34
20	10.07
25	10.82
32	13.43

POWER INPUT	POWER OUTPUT
@ 8200 MHz	
(dBm)	
-10	-11.37
-5	-6.32
2	0.68
12	4.71
20	5.82
25	6.78
32	13.31

Typical Performance Curves

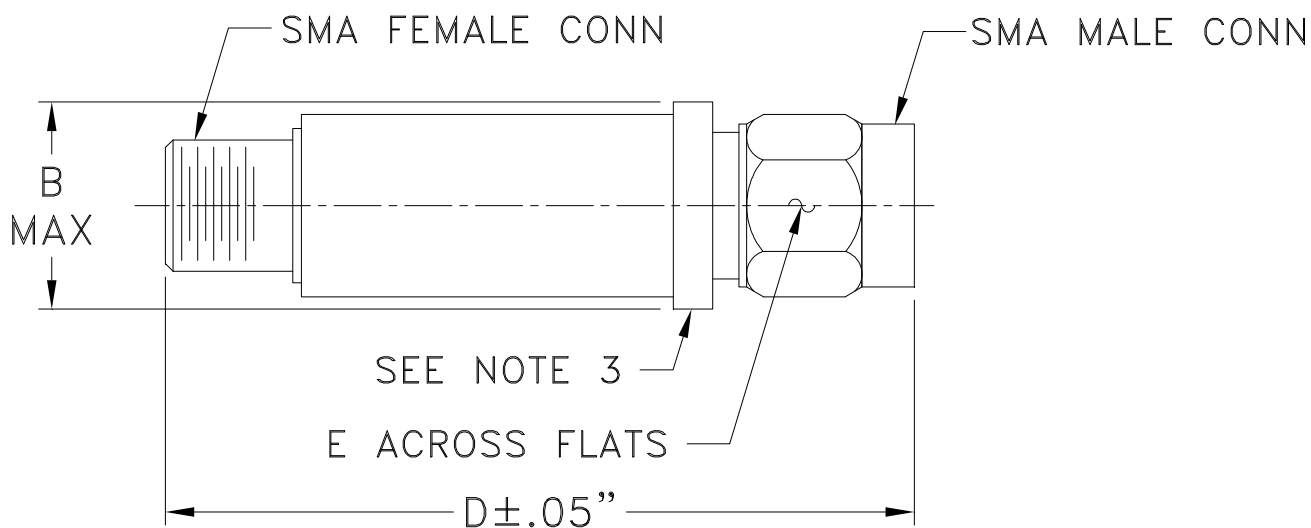


# Case Style

# FF

## FF704

### Outline Dimensions



CASE #.	A	B	C	D	E	WT GRAMS
FF704	--	.410 (10.41)	--	1.43 (36.32)	.312 (7.92)	10.0

Dimensions are in inches (mm). Tolerances: 2Pl. ± .04; 3Pl. ± .030

#### Notes:

1. Case material: Stainless steel.
2. Case finish: Gold plated.
3. Round Flange may have .312 Across Flats in some models.

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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.

<b>Specification</b>	<b>Test/Inspection Condition</b>	<b>Reference/Spec</b>
Operating Temperature	-55° to 100°C Ambient Environment	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