+12 to +30dBm

Limiter

VLM-33-S+

50Ω Broadband 30 to 3000 MHz

CASE STYLE: FF704

Connectors	Model
SMA	VLM-33-S+

+RoHS Compliant

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

Maximum Ratings

Operating Temperature	-55°C to 100°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 3000 MHz
- low insertion loss 0.23 dB typ.
- fast recovery time, 10nsec typ.
- excellent VSWR 1.05:1 typ.
- low leakage power, 11.5 dBm typ.

Applications

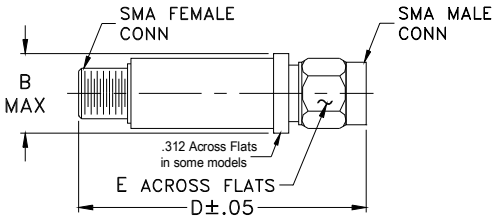
- protects low noise amplifiers and other devices from ESD or input power damage
- military, hi-rel applications

Coaxial Connections*

INPUT	SMA FEMALE
OUTPUT	SMA MALE

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

Outline Drawing



Outline Dimensions (inch / mm)

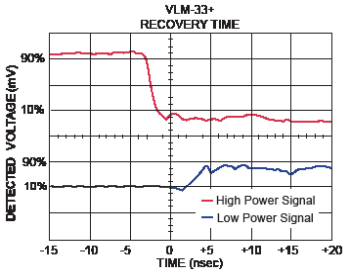
B	D	E	wt
.410	1.43	.312	grams
10.41	36.32	7.92	10.0

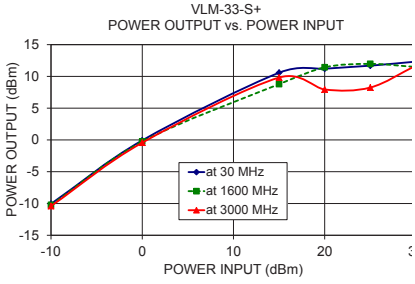
Electrical Specifications

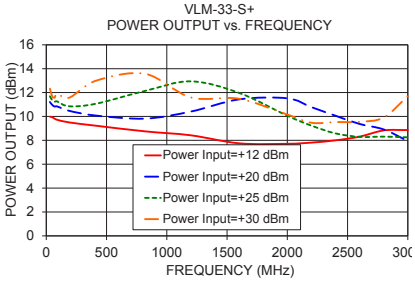
Parameter	Condition	Min.	Typ.	Max.	Units
Frequency Range		30		3000	MHz
Insertion Loss in Linear Range	<+5 dBm Input	—	0.23	0.7	dB
VSWR	<+5 dBm Input		1.05	1.5	:1
Input Power Limiting Range		+12	—	+30	dBm
Output Power	In limiting range	—	+11.5	—	dBm
Recovery Time	1 watt pulse 50 µsec pw 1kHz duty cycle recovery to within 90% of final value.	—	10	—	nsec
Response Time	-30 to +30 dBm input 50 µsec, BW 1 kHz duty cycle	—	2	—	nsec
Limiting Δ Output/1dB Δ Input	Input Power Range (dBm) 12 to 20 20 to 25 25 to 30	 — — —	 0.2 0.2 0.2	 — — —	dB/dB

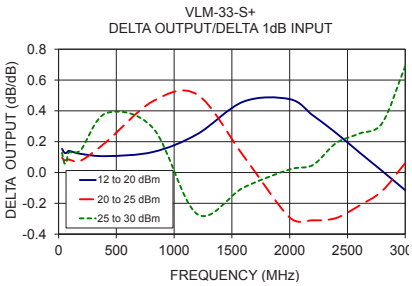
Typical Performance Data

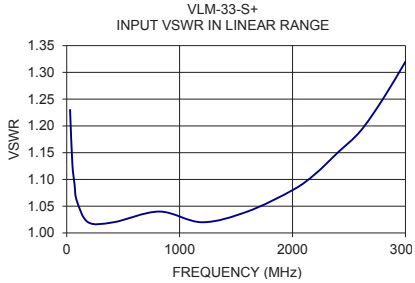
Freq. (MHz)	I. Loss in Linear Range (dB)	VSWR in Linear Range (:1)	Power Output (dBm) +12dBm Input	+20dBm Input	+25 dBm Input	+30dBm Input	Δ Output 1dB Δ Input +12 to +20dBm Input	+20 to +25 dBm Input	+25 to +30 dBm Input
30.00	0.06	1.23	9.98	11.21	11.69	12.33	0.15	0.10	0.13
50.00	0.04	1.13	9.93	10.96	11.36	11.66	0.13	0.08	0.06
70.00	0.04	1.09	9.81	10.83	11.24	11.58	0.13	0.08	0.07
90.00	0.04	1.06	9.72	10.84	11.26	11.91	0.14	0.08	0.13
190.00	0.06	1.02	9.50	10.47	10.85	11.57	0.12	0.08	0.14
415.00	0.10	1.02	9.22	10.07	11.07	13.00	0.11	0.20	0.39
820.00	0.21	1.04	8.75	9.82	12.14	13.57	0.13	0.46	0.29
1200.00	0.19	1.02	8.42	10.41	12.94	11.59	0.25	0.51	-0.27
1600.00	0.23	1.04	7.75	11.43	11.97	11.48	0.46	0.11	-0.10
2000.00	0.26	1.08	7.71	11.52	10.06	10.16	0.48	-0.29	0.02
2200.00	0.28	1.11	7.81	10.78	9.23	9.47	0.37	-0.31	0.05
2400.00	0.30	1.15	8.00	10.06	8.58	9.53	0.26	-0.30	0.19
2600.00	0.32	1.19	8.31	9.37	8.29	9.55	0.13	-0.22	0.25
2800.00	0.35	1.25	8.83	8.91	8.31	9.91	0.01	-0.12	0.32
3000.00	0.40	1.32	8.86	7.94	8.25	11.70	-0.12	0.06	0.69

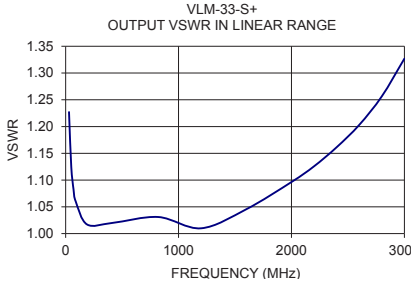












Notes

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

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)	+12 dBm INPUT	+20 dBm INPUT	+25 dBm INPUT	+30 dBm INPUT	+12 to +20 dBm INPUT	+20 to +25 dBm INPUT	+25 to +30 dBm INPUT
30	0.06	1.23	1.23	9.98	11.21	11.69	12.33	0.15	0.10	0.13
50	0.04	1.13	1.12	9.93	10.96	11.36	11.66	0.13	0.08	0.06
70	0.04	1.09	1.08	9.81	10.83	11.24	11.58	0.13	0.08	0.07
90	0.04	1.06	1.06	9.72	10.84	11.26	11.91	0.14	0.08	0.13
190	0.06	1.02	1.02	9.50	10.47	10.85	11.57	0.12	0.08	0.14
415	0.10	1.02	1.02	9.22	10.07	11.07	13.00	0.11	0.20	0.39
820	0.21	1.04	1.03	8.75	9.82	12.14	13.57	0.13	0.46	0.29
1200	0.19	1.02	1.01	8.42	10.41	12.94	11.59	0.25	0.51	-0.27
1600	0.23	1.04	1.05	7.75	11.43	11.97	11.48	0.46	0.11	-0.10
2000	0.26	1.08	1.10	7.71	11.52	10.06	10.16	0.48	-0.29	0.02
2200	0.28	1.11	1.13	7.81	10.78	9.23	9.47	0.37	-0.31	0.05
2400	0.30	1.15	1.16	8.00	10.06	8.58	9.53	0.26	-0.30	0.19
2600	0.32	1.19	1.20	8.31	9.37	8.29	9.55	0.13	-0.22	0.25
2800	0.35	1.25	1.26	8.83	8.91	8.31	9.91	0.01	-0.12	0.32
3000	0.40	1.32	1.33	8.86	7.94	8.25	11.70	-0.12	0.06	0.69

Typical Performance Data

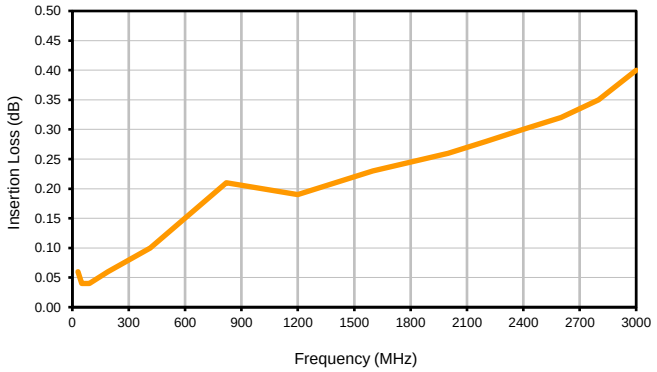
POWER INPUT	POWER OUTPUT
@ 30 MHz	
(dBm)	
-10.0	-10.06
0.0	-0.07
10.0	9.94
15.0	10.58
20.0	11.21
25.0	11.69
30.0	12.33

POWER INPUT	POWER OUTPUT
@ 1600 MHz	
(dBm)	
-10.0	-10.23
0.0	-0.25
10.0	9.76
15.0	8.78
20.0	11.43
25.0	11.97
30.0	11.48

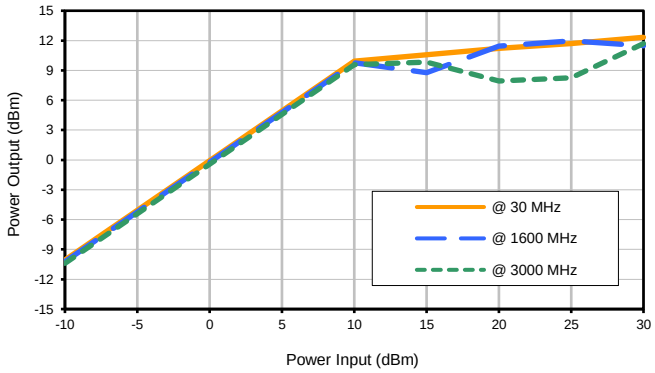
POWER INPUT	POWER OUTPUT
@ 3000 MHz	
(dBm)	
-10.0	-10.4
0.0	-0.43
10.0	9.59
15.0	9.82
20.0	7.94
25.0	8.25
30.0	11.70

Typical Performance Curves

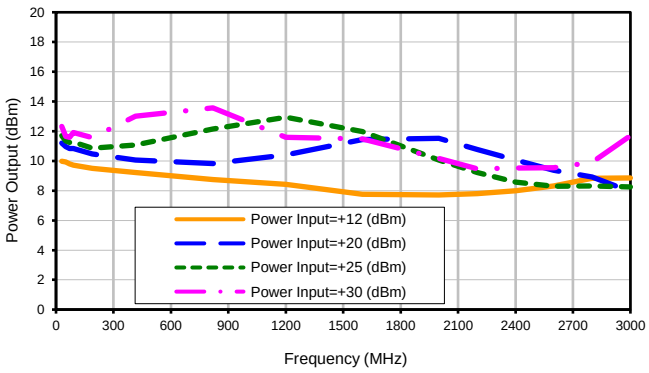
Insertion Loss



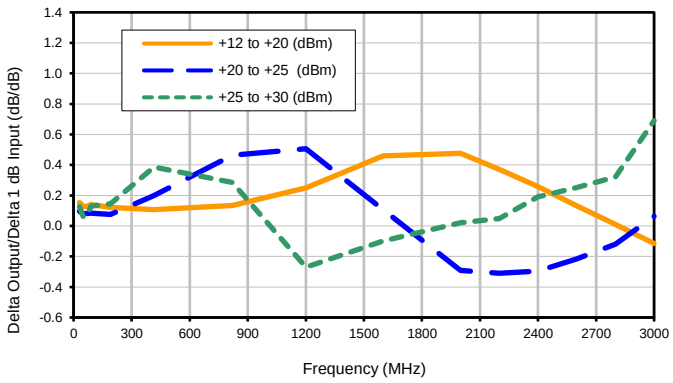
Power Output vs Power Input



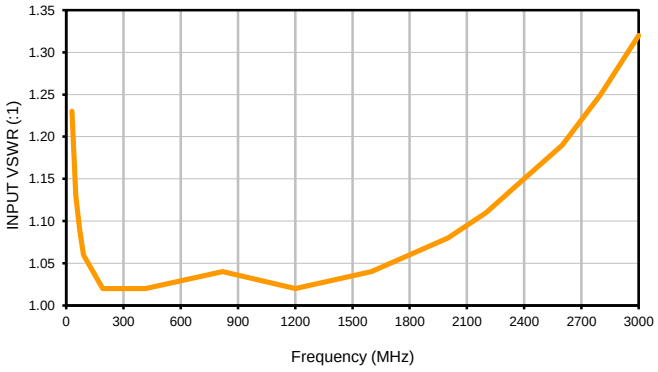
Power Output vs Frequency



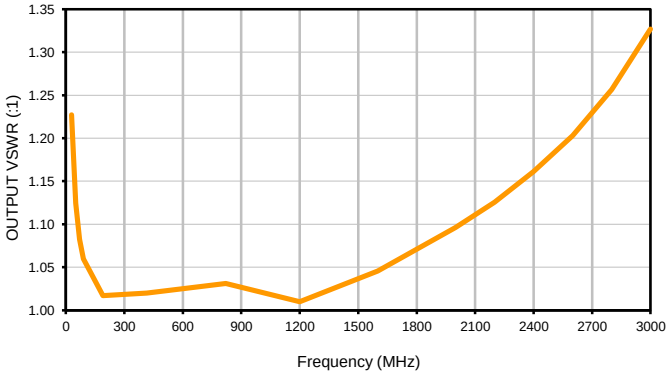
Delta Output / Delta 1dB Input



INPUT VSWR



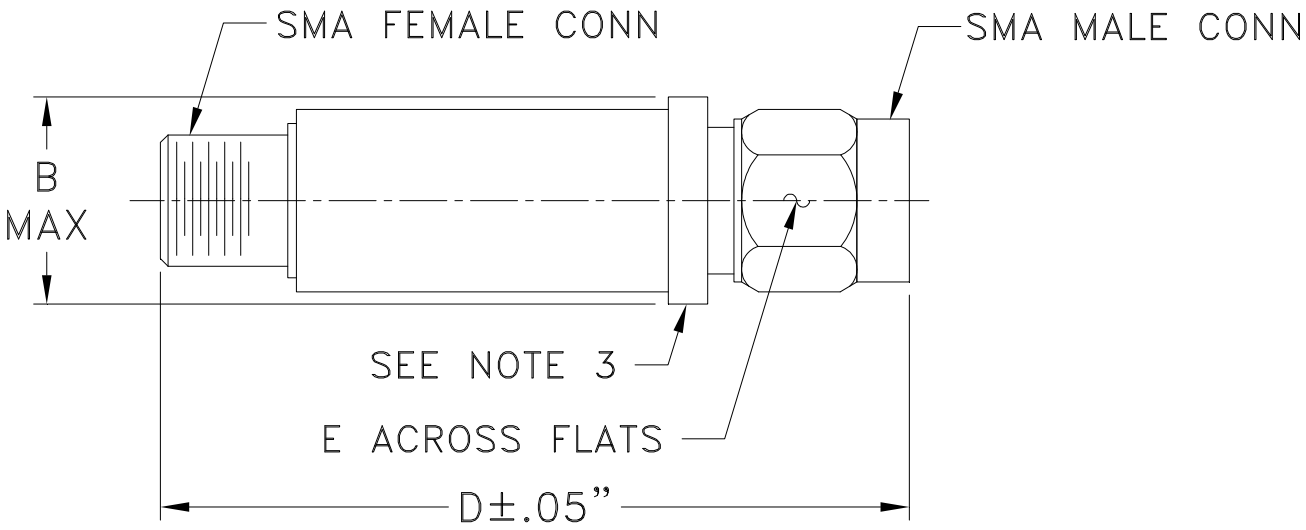
OUTPUT VSWR



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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Mini-Circuits

Environmental Specifications ENV28

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
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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