

+12 to +32 dBm

# Limiter

**CLM-83-2W+**

50Ω Broadband 30 to 8200 MHz

## The Big Deal

- Ultra wide frequency range, 30 MHz to 8.2 GHz
- High CW input power, +32 dBm
- Ultra reliable ceramic hermetic package
- Low profile case, 0.045" high



CASE STYLE: DL1721

MIL Screening Available  
Please consult Applications Dept.

## Product Overview

The CLM-83-2W+ protects against ESD and input RF power surges, up to 1.6 W, across a very wide frequency range. Internal diodes are bonded to a multilayer integrated LTCC substrate, and then hermetically sealed under a controlled nitrogen atmosphere with gold-plated covers and eutectic AuSn solder. These rugged, tiny limiters, only 0.12 x 0.12 x 0.045" high, provide excellent protection for low noise amplifiers and other sensitive equipment, especially in hostile environments where unwanted signals prevail, such as manufacturing sites, train tunnels, ECM & ECCM, etc. This limiter is capable of meeting MIL requirements for gross leak, fine leak, thermal shock, vibration, acceleration, mechanical shock, and HTOL. The testing can be done if requested.

## 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.
Tiny surface mount package	Useful in crowded PCB boards where space is at a premium
Ceramic, hermetic, nitrogen filled construction	Protects against moisture, for long term reliability
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
Low cost	Practical, low cost solution to protect expensive amplifiers or other sensitive applications from burning out

### 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/MCStore/terms.jsp](http://www.minicircuits.com/MCStore/terms.jsp)



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# Limiter

CLM-83-2W+

50Ω Broadband 30 to 8200 MHz

## Product Features

- wideband, 30 to 8200 MHz
- low insertion loss 0.5 dB typ.
- fast recovery time, 10nsec typ.
- excellent VSWR 1.2:1 typ.
- low output power, 11.5 dBm typ.
- ceramic, hermetic, Nitrogen filled



CASE STYLE: DL1721

### +RoHS Compliant

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

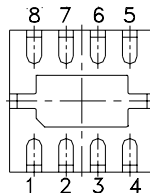
## Typical Applications

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

MIL Screening Available  
Please consult Applications Dept.

## General Description

The CLM-83-2W+ is an RoHS-compliant limiter utilizing PIN diodes on an LTCC substrate, all hermetically sealed under a controlled nitrogen atmosphere. Terminal finish on the tiny, low-profile case is Ni-Pd-Au, delivering excellent electrical performance across a very wide bandwidth, with low insertion loss, excellent return loss, and low output power.



## Pad Description

Function	Pad Number	Description
RF IN	2	RF input pad
RF-OUT	7	RF output pad
GND	1,3,4,5,6,8, Bottom Center Paddle	Connected to ground.

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## Electrical Specifications at 25°C

Parameter	Condition	Min.	Typ.	Max.	Units
Frequency Range		30		8200	MHz
<b>Linear Range</b>					
Max Input Power	less than 0.1 dB compression	—	—	2	dBm
Insertion Loss	less than +2 dBm input power	—	0.5	1.3	dB
VSWR	less than +2 dBm input power	—	1.2	1.6	:1
<b>Limiting Range</b>					
Input Power	>1dB compression filtered signal frequency	+12	—	+32	dBm
Output Power		—	+11.5	—	dBm
$\Delta$ Output/ $\Delta$ 1dB Input	Input Power Range (dBm)				
	12 to 20	—	0.4	—	dB/dB
	20 to 25	—	0.2	—	
	25 to 32	—	0.8	—	
Recovery Time	1 watt pulse, 50 $\mu$ sec PW, 1kHz duty cycle, recovery to within 90% of final value	—	10	—	nsec
Response Time	30 dBm input, 50 $\mu$ sec PW, 1 kHz duty cycle	—	2	—	nsec

## Absolute Maximum Ratings

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

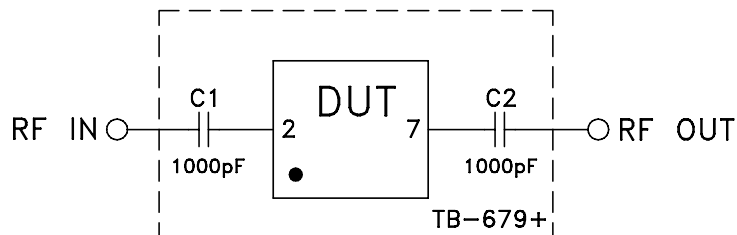
Permanent damage may occur if any of these limits are exceeded.

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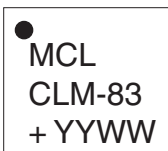


## Characterization Test Circuit



**Fig. 1.** Block Diagram of Test Circuit used for characterization. Mini-Circuits test board TB-679+.  
Insertion loss, return loss, and VSWR measured using Agilent N5230A network analyzer.  
Performance at frequencies below 30 MHz may be improved by increasing capacitance at C1 and C2.  
Depending on application requirements, this device may be effective at frequencies up to 10 GHz.  
Conditions:  
1. Frequency range tested: 1 to 10000 MHz  
2. RF input power tested: -12 to +33 dBm

## Product Marking



## Additional Detailed Technical Information

additional information is available on our dash board. To access this information [click here](#)

Performance Data	Data Table
	Swept Graphs
Case Style	DL1721 Ceramic package, exposed paddle, Terminal finish: Ni,Pd,Au
Tape & Reel	F66-1
Standard quantities available on reel	7" reels with 10, 20, 50, 100, 200, 500 or 1K, 2K devices.
Suggested Layout for PCB Design	PL-377
Evaluation Board	TB-679+
Environmental Ratings	ENV-67

## ESD Rating

Human Body Model (HBM): Class 3B (>8000V) in accordance with JESD22-A114

Machine Model (MM): Class C (>400) in accordance with JESD22-A115

## MSL Rating

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020D

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