

+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

### 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.

### 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.  
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+12 to +32 dBm

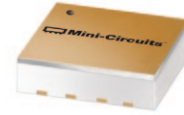
# Limiter

## 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  
 PRICE: \$19.95 ea. QTY. (10)

### +RoHS Compliant

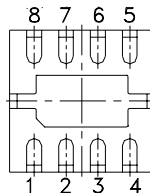
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

### 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

### 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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REV. OR  
 M138104  
 CLM-83-2W+  
 DJ/CP/AM  
 120920  
 Page 2



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   |
| Δ Output/ Δ 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 μsec PW, 1kHz duty cycle, recovery to within 90% of final value | —    | 10    | —    | nsec  |
| Response Time         | 30 dBm input, 50 μsec PW, 1 kHz duty cycle                                       | —    | 2     | —    | nsec  |

Absolute Maximum Ratings

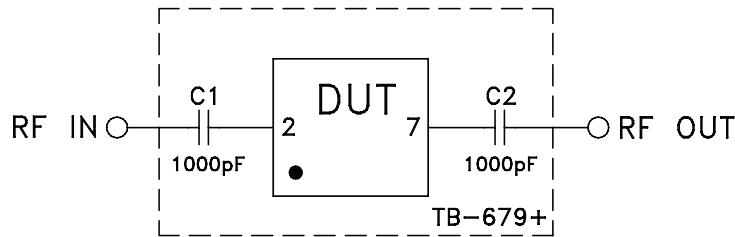
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Input Power        | 2W             |

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

Notes

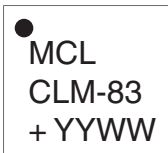
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### Characterization Test Circuit



**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



| <b>Additional Detailed Technical Information</b>  |  |
|---|--|
| <i>additional information is available on our dash board. To access this information <a href="#">click here</a></i> |  |
| <b>Performance Data</b>   | Data Table   |
|   | Swept Graphs   |
| <b>Case Style</b>   | DL1721 <i>Ceramic package, exposed paddle, Terminal finish: Ni,Pd,Au</i> |
| <b>Tap &amp; Reel</b><br>Standard quantities available on reel  | F66<br><i>7" reels with 10, 20, 50, 100, 200, 500 or 1K devices.</i>     |
| <b>Suggested Layout for PCB Design</b>  | PL-377   |
| <b>Evaluation Board</b>   | TB-679+  |
| <b>Environmental Ratings</b>  | 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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