

+5 to +30 dBm

Limiter

RLM-23+

50Ω Broadband 950 to 2050 MHz

The Big Deal

- High CW input power, 1 W
- Very low limiting output power, ≤ 0 dBm typ.
- Very fast response time, 2 nsec



CASE STYLE: CK1246-1

Product Overview

The RLM-23+ protects against damage from unwanted signals over a wide frequency range, 950 to 2050 MHz, at up to 1W power. Construction is on a micro strip low loss dielectric material and cased into a high volume, low cost package for cost efficiencies. Measuring 0.5 x 0.5 x 0.18" high, these tiny units provide excellent protection for IF circuits in satellite receivers, or low noise amplifiers in hostile environments where unwanted signals prevail, such as in manufacturing sites, train tunnels, etc.

Key Features

Feature	Advantages
Limiting abilities from +5 to +30 dBm	Protects against strong undesired signals and prevents burn out of amplifiers and the saturation of sensitive IF circuitry
0 dBm typ. output power	Very low power output prevents saturation of satellite IF circuits, and offers extra protection for expensive, highly sensitive components following the limiter
Very low insertion loss, 0.7 dB typ.	Preserves the strength of low-power signals
Frequency coverage 950 to 2050 MHz	Protection against many sources generating 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
Small surface-mount package	Allows convenient placement in amplifiers incorporating this protective device
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/MCLStore/terms.jsp



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Generic photo used for illustration purposes only

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+RoHS Compliant

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

Maximum Ratings

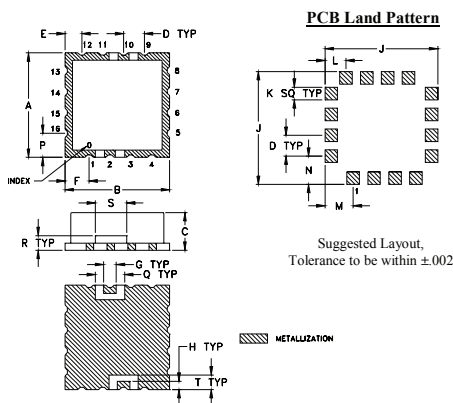
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Input Power	1.5W

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

Pin Connections

INPUT	2
OUTPUT	10
GROUND	all others

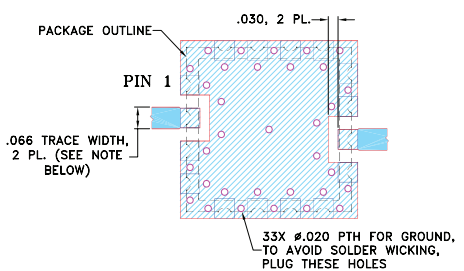
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K
.500	.500	.180	.100	.080	.115	.060	.040	.540	.060
12.70	12.70	4.57	2.54	2.03	2.92	1.52	1.02	13.72	1.52
L	M	N	P	Q	R	S	T	wt.	
.100	.135	.135	.115	.140	.070	.150	.070	grams	
2.54	3.43	3.43	2.92	3.56	1.78	3.81	1.78	1.0	

Demo Board MCL P/N: TB-613+ Suggested PCB Layout (PL-343)



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

■ DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
■ DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

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Features

- low insertion loss, 0.7 dB typ.
- very low output power 0 dBm typ. at 30 dBm input
- low cost
- aqueous washable

Applications

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

Electrical Specifications

Parameter	Condition	Min.	Typ.	Max.	Units
Frequency Range		950		2050	MHz
Linear Range					
Max Input Power	less than 0.1 dB compression	—	—	-10	dBm
Insertion Loss	less than -10 dBm input power	—	0.7	1.3	dB
VSWR	less than -10 dBm input power	—	1.35	1.6	:1
Limiting Range					
Input Power	>1dB compression filtered signal frequency	+5	—	+30	dBm
Output Power		—	0	—	dBm
Δ Output/ Δ 1dB Input	Input Power Range (dBm)				
	5 to 10	—	0.1	—	dB/dB
	10 to 20	—	0.05	—	
	20 to 30	—	0.1	—	
Recovery Time	1 watt pulse 50 μsec PW 1kHz duty cycle recovery to within 90% of final value.	—	8	—	nsec
Response Time	-30 to +30 dBm input 50 μsec PW 1 kHz duty cycle	—	2	—	nsec

Typical Performance Data

Freq. (MHz)	I. Loss (dB) in Linear Range	VSWR (:1) in Linear Range	Power Output (dBm)				Δ Output / Δ 1dB Input			
			at -10 dBm	+5 dBm Input	+10 dBm Input	+20 dBm Input	+30 dBm Input	+5 to +10 dBm Input	+10 to +20 dBm Input	+20 to +30 dBm Input
950.00	0.50	1.35	-0.03	0.33	0.58	-0.68	0.07	0.03	-0.13	
1060.00	0.51	1.34	-0.12	0.41	0.64	-0.59	0.11	0.02	-0.12	
1115.00	0.51	1.33	-0.56	0.11	0.33	0.24	0.13	0.02	-0.01	
1170.00	0.53	1.32	-0.34	0.18	0.38	-0.87	0.10	0.02	-0.13	
1280.00	0.54	1.28	-0.37	-0.06	-0.05	-0.79	0.06	0.00	-0.07	
1390.00	0.54	1.25	-0.41	-0.19	-0.20	-0.50	0.04	0.00	-0.03	
1445.00	0.54	1.23	-0.85	-0.26	-0.41	-0.69	0.12	-0.02	-0.03	
1500.00	0.55	1.21	-0.72	-0.56	-0.66	-1.04	0.03	-0.01	-0.04	
1555.00	0.55	1.20	-1.10	-0.45	-0.68	-1.20	0.13	-0.02	-0.05	
1665.00	0.56	1.18	-1.23	-0.71	-0.99	-1.42	0.10	-0.03	-0.04	
1720.00	0.57	1.18	-1.18	-1.08	-1.26	-1.48	0.02	-0.02	-0.02	
1830.00	0.61	1.19	-1.47	-1.37	-1.48	-1.84	0.02	-0.01	-0.04	
1940.00	0.64	1.22	-1.72	-1.52	-1.71	-2.03	0.04	-0.02	-0.03	
1995.00	0.67	1.24	-1.86	-1.72	-1.90	-2.60	0.03	-0.02	-0.07	
2050.00	0.68	1.26	-2.08	-2.19	-2.36	-3.24	-0.02	-0.02	-0.09	

