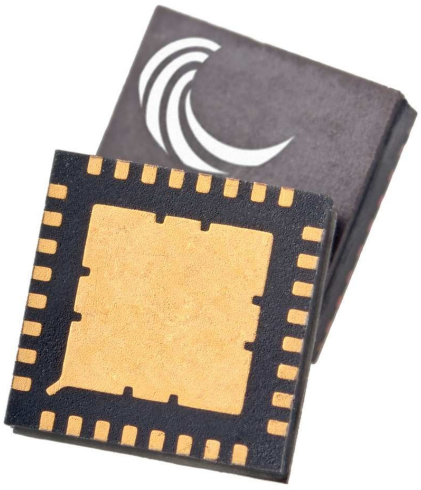
Linwave QFN Dual Stage PIN Limiter

LW48-700133



Features

- 20-2000MHz Passive, high isolation limiter
- Low loss Typically < 0.6dB
- Return Loss > 20dB
- Flat Leakage < +18dBm
- Input Power CW Survivability >10W
- Integrated DC Block on both input and output
- QFN dimensions 5.0 x 5.0 x 1.6 mm, 32 lead

Typical Applications

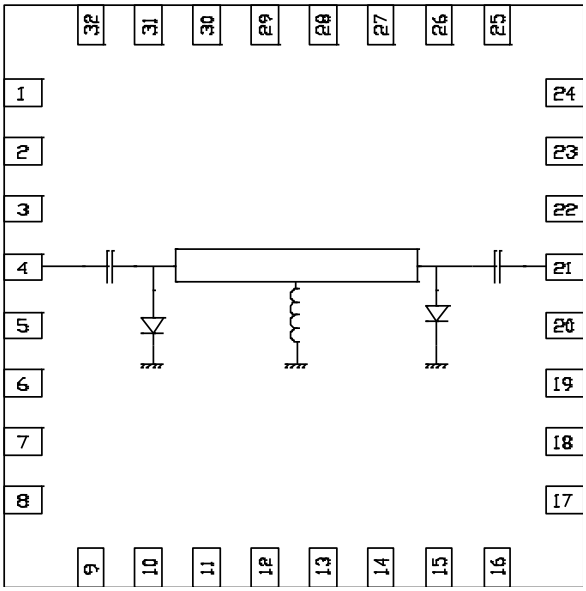
- LNA receiver chain protection
- Radar receiver protection

General Description

The LW48-700133 is an ultra-wideband two stage PIN diode limiter packaged in a leadless 5x5 mm surface mount package which operates between 20 and 2000 MHz. The limiter provides flat leakage of <+18dBm, return loss of >20dB with typical insertion loss of 0.5dB
The LW48-700133 limiter input and output are internally matched to 50 Ohms and are internally DC blocked.

Pin Designations	
Pin No.	FUNCTION
Pin 4	RF IN
Pin 21	RF OUT
Pins 1-3, 5-20	GROUND
Pins 22-32	GROUND

Functional Diagram



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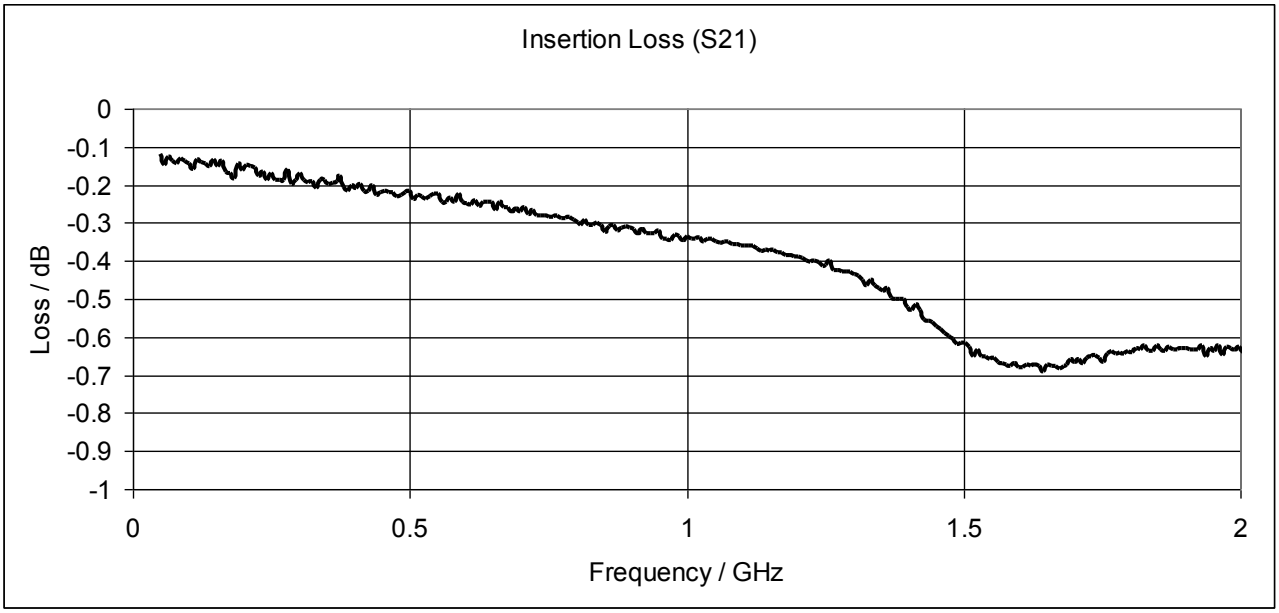
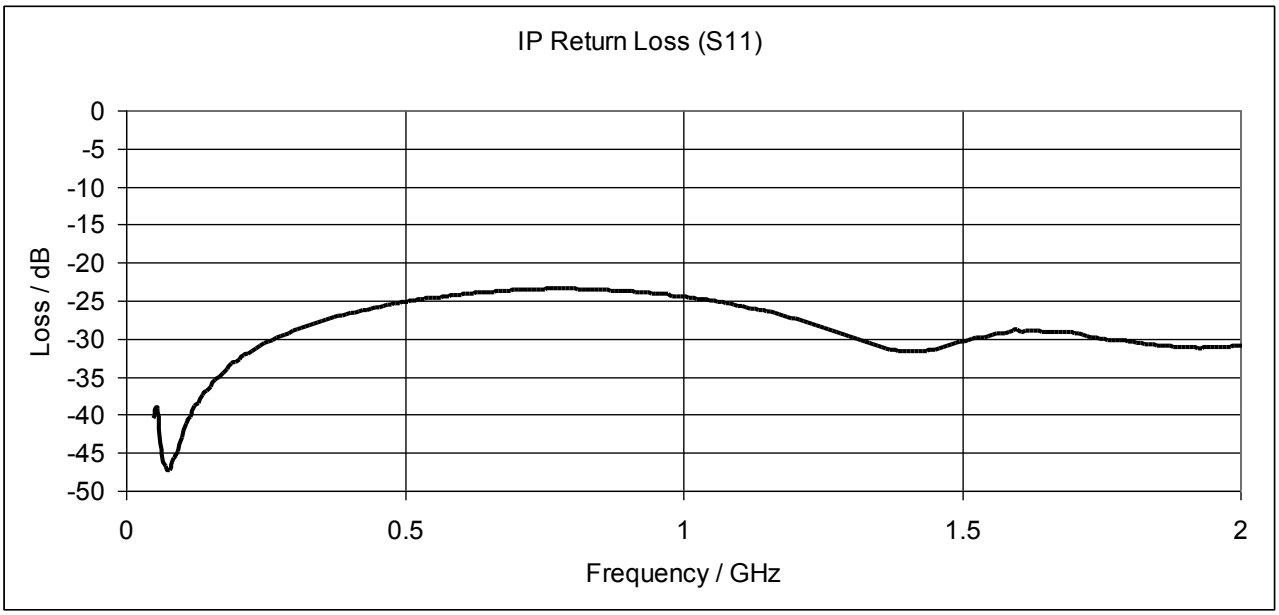
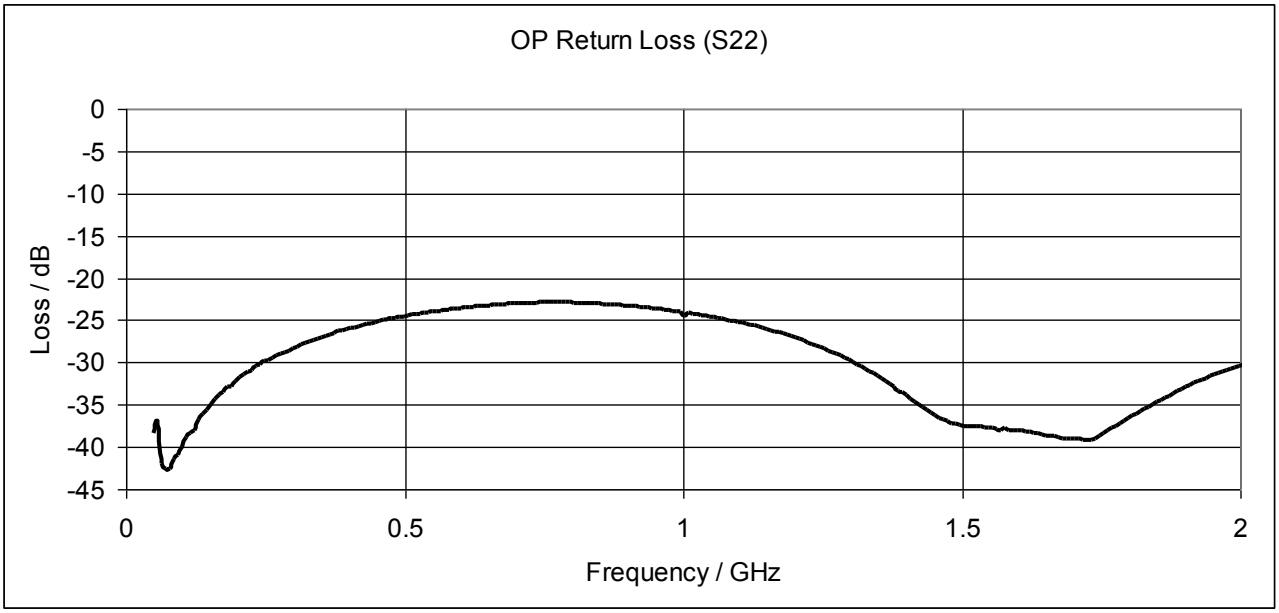
Insertion Loss



Input Return Loss



Output Return Loss



Limiting Characteristics

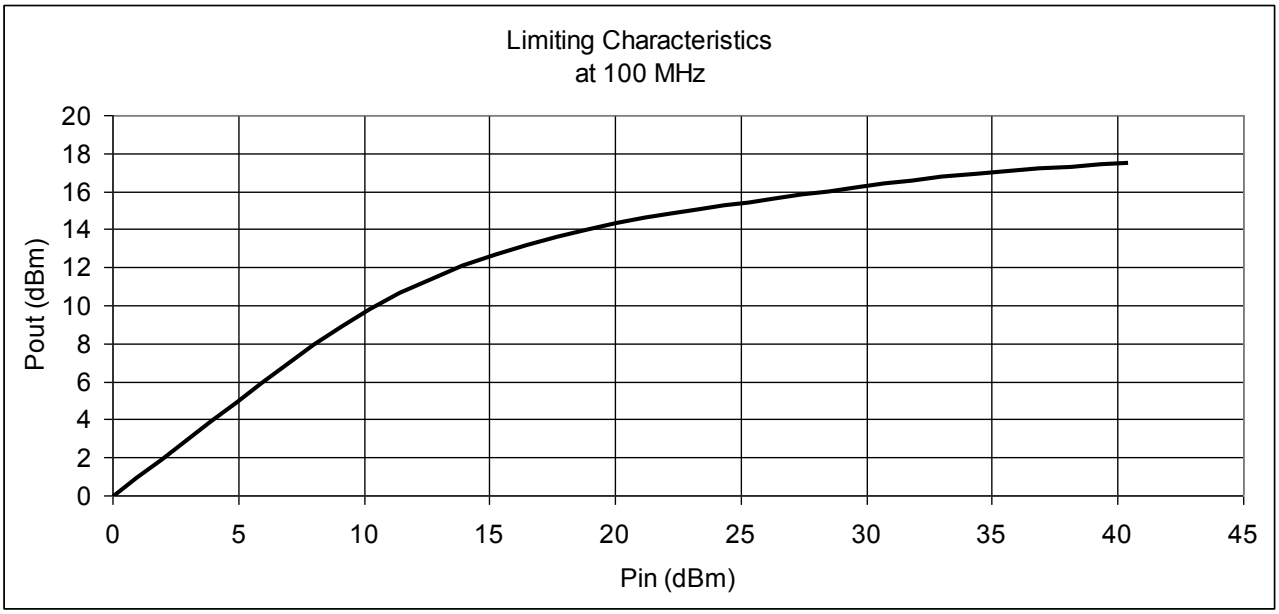


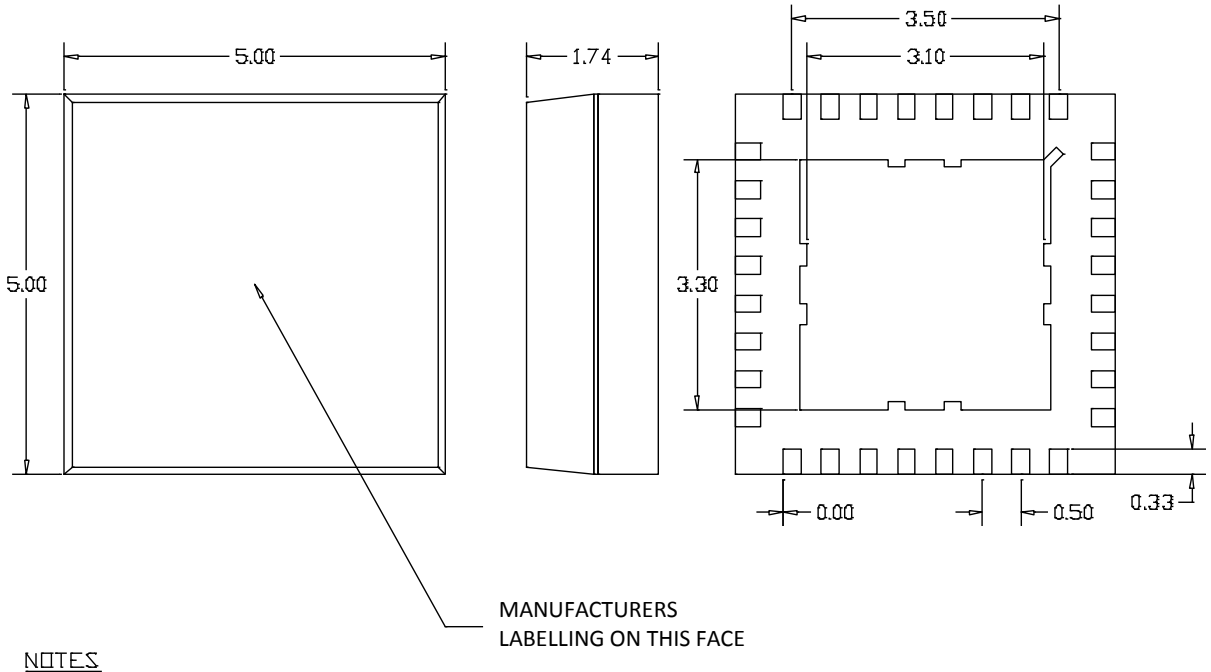
TABLE I
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value
P_{IN}	Input CW Power	+42dBm
T_M	Mounting Temperature (30 secs)	260°C
T_{STG}	Storage Temperature	-55 to +125°C
T_{OP}	Operating Temperature	-40 to +85°C

TABLE II
RF CHARACTERISTICS
(T_A = 25°C)

Symbol	Parameter	Test Condition	Limit			Units
			Min	Typ	Max	
F	Frequency Range	Swept Frequency	20		2000	MHz
IL	Insertion Loss	Swept Frequency		0.5	0.9	dB
IRL	Input Return Loss	Swept Frequency	20			dB
ORL	Output Return Loss	Swept Frequency	20			dB
PWR	Output Power @ Pin = +40dBm	F=100MHz		18		dBm
Pcw	CW Incident Power	Swept Frequency			10	W
Ppulse	Peak Incident Power	1µs pulse width, 10% duty cycle			100	W
P1dB	Threshold Power	Swept Frequency		+11		dBm
Pf	Flat Leakage Power	Swept Frequency, +10dBm CW		+18		dBm
Es	Spike Leakage Energy	+50dBm, 1µs pulse, 10% duty		0.2		ergs
Tr	Recovery Time	+50dBm, 1µs pulse, 10% duty 50% trailing RF Pulse – 1dB IL)			50	
ILtemp	Insertion Loss Rate of Change with Operating Temperature				-0.005	dB/°C

Outline Drawing



NOTES

1) BODY: PLASTIC, SEMICONDUCTOR GRADE
   LID: LCP
2) LEAD FRAME: COPPER, 194 FH
3) LEAD FINISH: FULL GOLD PLATE ON FOOTPRINT
   (1.27µm Au OVER 0.76µm Ni)
   SIDE CONTACTS NON-PLATED
4) FRAME THICKNESS: 0.2030 ±0.0076
5) EXTERNAL DIMENSIONS ± 0.15

Refer to Linwave application note for suggested PC Board Land Pattern.

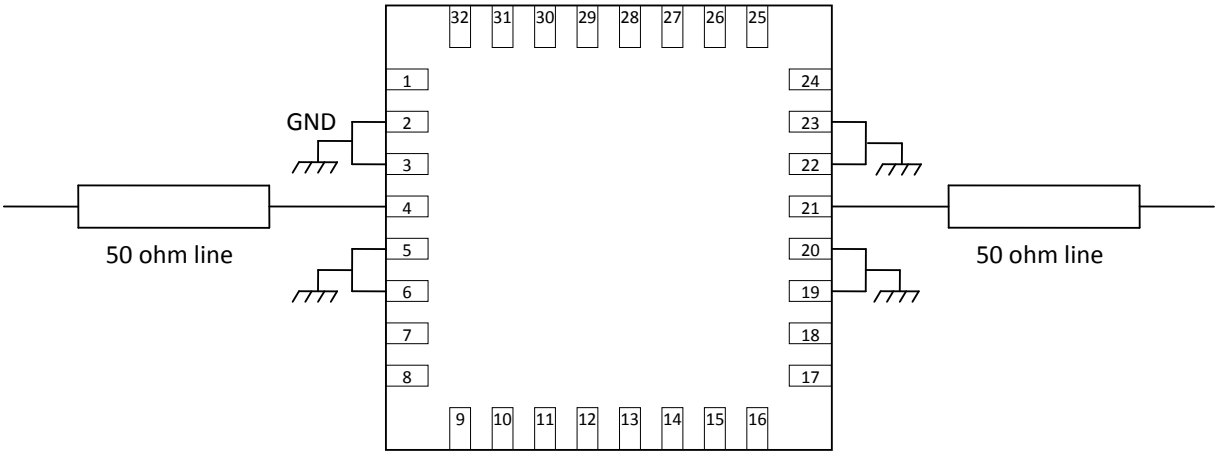
ELECTROSTATIC SENSITIVE DEVICE OBSERVE HANDLING PRECAUTIONS

Pin Descriptions

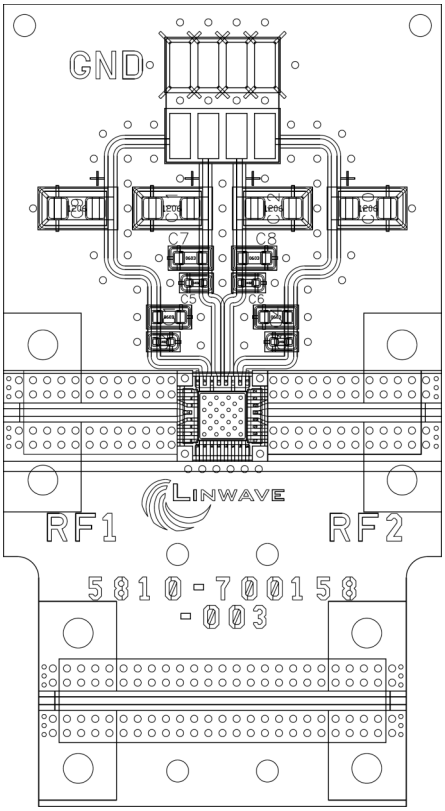
Pin Number	Function	Description
4	RF IN	This pad is AC coupled and matched to 50 ohms
21	RF OUT	This pad is AC coupled and matched to 50 ohms
1,2, 6-19, 23-32	N/C	The pins are not connected internally; however, all data shown was measured with these pins connected to RF/DC ground externally.
3,5,20,22	GROUND	Must be connected to RF/DC ground
Ground paddle	GROUND	Must be connected to RF/DC ground

Application Circuit

Note: Effective heatsinking through the pallet on the underside is essential for high power operation (RF Input >1W)



Evaluation PCB



List of Materials for Evaluation PCB LW54-10133[1]

Item	Description
J1-J2	Southwest Microwave 8100-302230
U1	LW48-700133 Limiter
PCB[2]	5810-700158-003 Evaluation PCB

[1] Reference this number when ordering complete evaluation PCB
[2] Circuit board material: Rogers 4350B on FR4 backing

The circuit board used in the application should use RF circuit design techniques. The signal lines should have 50 ohms impedance and the package ground leads and package bottom should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation circuit board shown is available from Linwave upon request.