TGL2207

S-Band 100 W VPIN Limiter

Product Overview

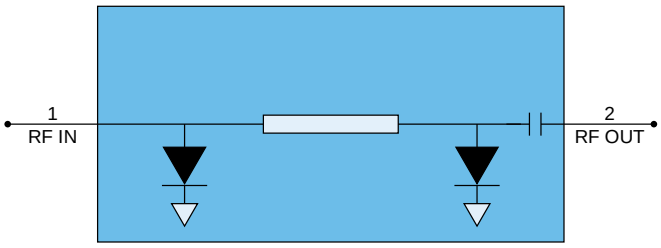
The Qorvo TGL2207 is a high power, wideband MMIC GaAs VPIN limiter capable of protecting sensitive receive channel components against high power incident signals. The TGL2207 does not require DC bias and achieves a low insertion loss all in a small form factor. These features allow for simple integration with minimal impact to system performance.

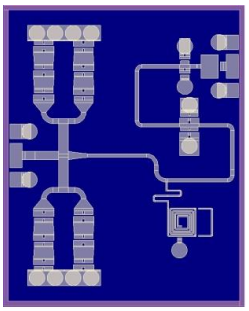
The TGL2207 operates from 2 to 5 GHz and achieves low insertion loss of 0.5 dB and return loss of 15 dB. It can limit up to 100 W incident pulsed-power with a low flat leakage of 16 dBm.

The TGL2207 has a protective surface passivation layer providing environmental robustness and is ideally suited to support both commercial and defense related applications.

Lead-free and RoHS compliant.

Functional Block Diagram





Key Features

- Frequency Range: 2 to 5 GHz
- Insertion Loss: < 0.5 dB
- Peak Power Handling: 100 W (pulsed)
- Flat Leakage: 16 dBm
- Return Loss: 15 dB
- Recovery Time: < 115 ns
- Passive (no DC bias required)
- Integrated DC Block on output
- Chip Dimensions: 2.0 x 2.5 x 0.1 mm

Applications

- Receive Chain Protection
- Commercial and Military Radar

Ordering Information

Part No.	Description
TGL2207	S-Band 100 W VPIN Limiter

Absolute Maximum Ratings

Parameter	Value
Incident Power, CW or Pulsed, 50 Ω, 25 °C	100 W
Incident Power, CW or Pulsed, 50 Ω, 85 °C	70 W
Mounting Temperature (30 Seconds)	320 °C
Storage Temperature	-40 to 150 °C

Operation of this device outside the parameter ranges given above may cause permanent damage. These are stress ratings only, and functional operation of the device at these conditions is not implied

Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
Passive – no bias				
Temperature Range	-40	+25	+85	°C

Electrical specifications are measured at specified test conditions. Specifications are not guaranteed over all recommended operating conditions.

Electrical Specifications

Test conditions unless otherwise noted: T = 25 °C

Parameter	Min	Typical	Max	Units
Operational Frequency Range	2		5	GHz
Insertion Loss		0.5		dB
Input Return Loss		15		dB
Output Return Loss		15		dB
Flat Leakage Power @ Pin >30 dBm		16		dBm
Insertion Loss Temperature Coefficient		0.003		dB/°C

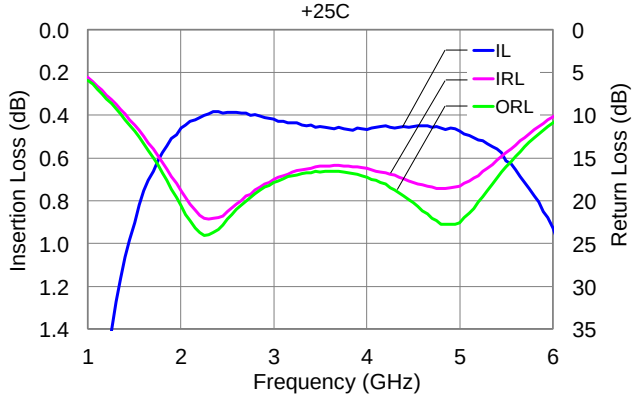
Thermal and Reliability Information

Parameter	Test Conditions	Value	Units
Incident Power (RF Operational Life Test 168 Hours [1])	Frequency = 4.5 GHz, CW, 50 Ω, 25 °C	31	W
	Frequency = 4.5 GHz, Pulsed, PW = 10 us, DC = 10%, 50 Ω, 25 °C	100	W

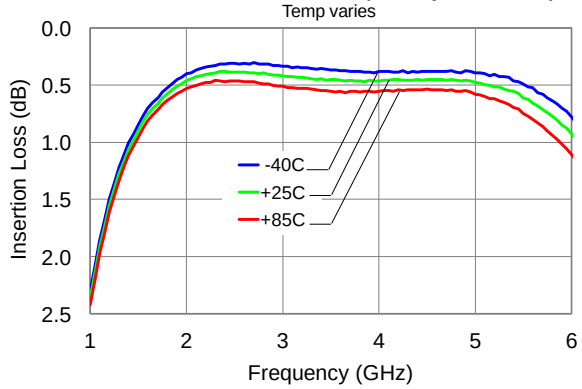
Notes:
1. Test was terminated at 168 Hours. Insertion Loss remained ≤ 1 dB for device under test.

Typical Performance

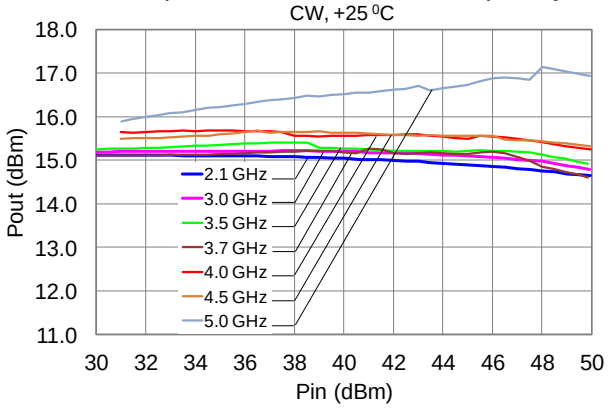
S-Parameters vs. Frequency
+25C



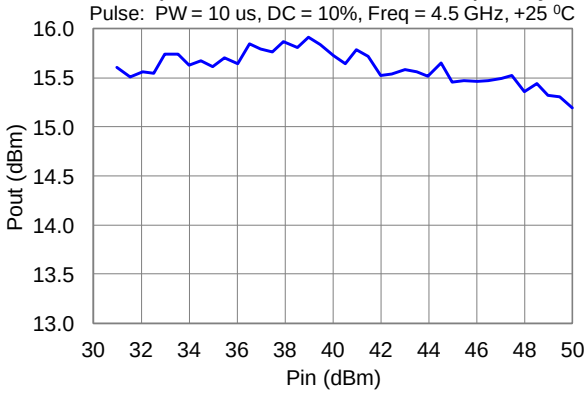
Insertion Loss vs. Frequency vs. Temp
Temp varies



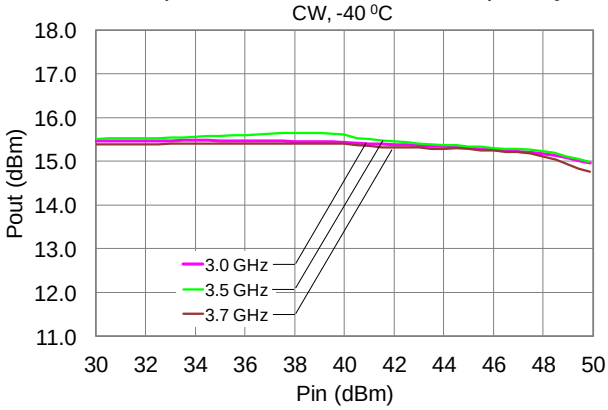
Output Power vs. Pin vs. Frequency
CW, +25 °C



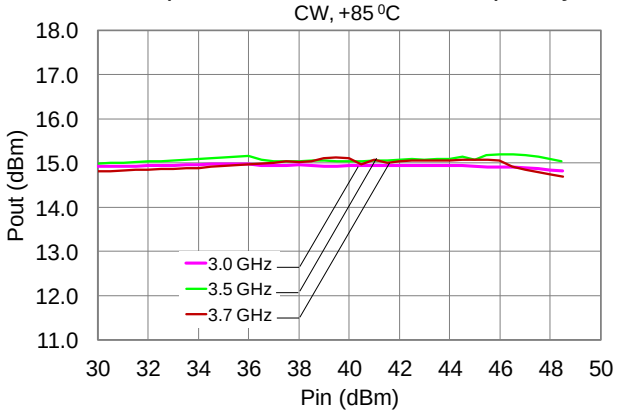
Output Power vs. Pin vs. Frequency
Pulse: PW = 10 us, DC = 10%, Freq = 4.5 GHz, +25 °C



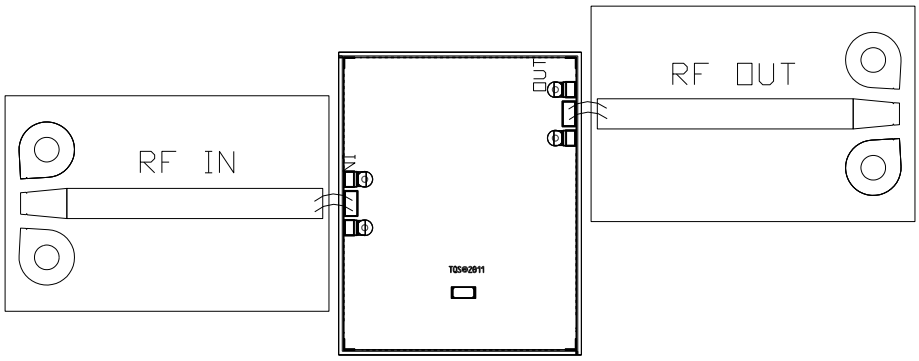
Output Power vs. Pin vs. Frequency
CW, -40 °C



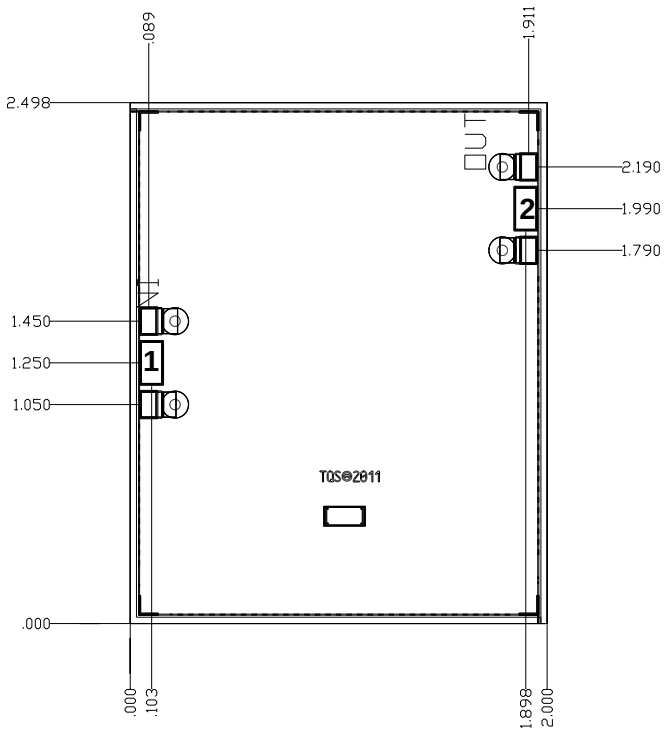
Output Power vs. Pin vs. Frequency
CW, +85 °C



Assembly Drawing



Mechanical Drawing



Unit: millimeters
Thickness: 0.10
Die x, y size tolerance: ± 0.050
Chip edge to bond pad dimensions are shown to center of pad
Ground is backside of die

Pad Number	Symbol	Description	Pad Size
1	RF In	Input; matched to 50 Ω.	0.100 x 0.200
2	RF Out	Output; matched to 50 Ω.	0.100 x 0.200

Assembly Notes

Component placement and adhesive attachment assembly notes:

- Vacuum pencils and/or vacuum collets are the preferred method of pick up.
- Air bridges must be avoided during placement.
- The force impact is critical during auto placement.
- Solder or Organic Adhesive attachment can be used for TGL2207.
- Curing should be done in a convection oven; proper exhaust is a safety concern.

Solder attachment reflow process assembly notes:

- Use AuSn (80/20) solder and limit exposure to temperatures above 300 °C to 3-4 minutes, maximum.
- An alloy station or conveyor furnace with reducing atmosphere should be used.
- Do not use any kind of flux.
- Coefficient of thermal expansion matching is critical for long-term reliability.
- Devices must be stored in a dry nitrogen atmosphere.

Interconnect process assembly notes:

- Thermosonic ball bonding is the preferred interconnect technique.
- Force, time, and ultrasonics are critical parameters.
- Aluminum wire should not be used.
- Devices with small pad sizes should be bonded with 0.0007-inch wire.

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	TBD	ANSI/ESD/JEDEC JS-001

Caution!

ESD-Sensitive Device

Solderability

Use only AuSn (80/20) solder, and limit exposure to temperatures above 300 °C to 3 – 4 minutes, maximum.

RoHS Compliance

This part is compliant with 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment) as amended by Directive 2015/863/EU.

This product also has the following attributes:

- Lead Free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C15H12Br402) Free
- PFOS Free
- SVHC Free

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

Web: www.qorvo.com

Tel: 1-844-890-8163

Email: customer.support@qorvo.com

Important Notice

The information contained herein is believed to be reliable; however, Qorvo makes no warranties regarding the information contained herein and assumes no responsibility or liability whatsoever for the use of the information contained herein. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for Qorvo products. The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information. **THIS INFORMATION DOES NOT CONSTITUTE A WARRANTY WITH RESPECT TO THE PRODUCTS DESCRIBED HEREIN, AND QORVO HEREBY DISCLAIMS ANY AND ALL WARRANTIES WITH RESPECT TO SUCH PRODUCTS WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE**.

Without limiting the generality of the foregoing, Qorvo products are not warranted or authorized for use as critical components in medical, life-saving, or life-sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.