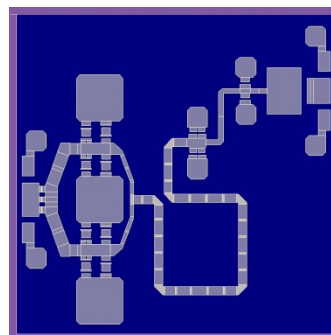


## Applications

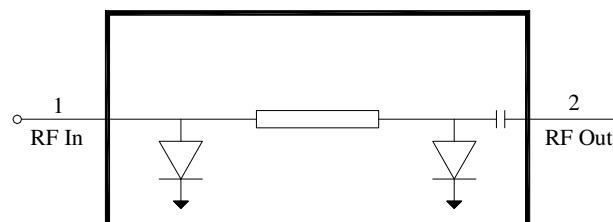
- Receive Chain Protection
- Commercial and Military Radar



## Product Features

- Frequency Range: 1 to 6 GHz
- Insertion Loss: < 0.5 dB
- Peak Power Handling: 100W (pulsed)
- Flat Leakage:  $\leq 16$  dBm
- Return Loss: 12 dB
- Passive (no DC bias required)
- Integrated DC Block on output
- Chip Dimensions: 2.0 x 2.0 x 0.1 mm

## Functional Block Diagram



## General Description

The TriQuint TGL2205 is a high power, wideband MMIC GaAs VPIN limiter capable of protecting sensitive receive channel components against high power incident signals. The TGL2205 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 TGL2205 operates from 1 to 6 GHz and achieves low insertion loss of 0.5 dB and return loss of 12 dB. It can limit up to 100 W incident pulsed-power with a low flat leakage of 16 dBm.

The TGL2205 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.

## Pad Configuration

Pad No.	Symbol
1	RF In
2	RF Out

## Ordering Information

Part	ECCN	Description
TGL2205	EAR99	S and C-Band 100W VPIN Limiter

### Absolute Maximum Ratings

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

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	Value
Passive – No bias	
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	Conditions	Min	Typ	Max	Units
Operational Frequency Range		1		6	GHz
Insertion Loss			< 0.5		dB
Input Return Loss			12		dB
Output Return Loss			12		dB
Flat Leakage Power at P <sub>IN</sub> > 30 dBm			≤ 16		dBm
Insertion Loss Temperature Coefficient			0.003		dB/°C

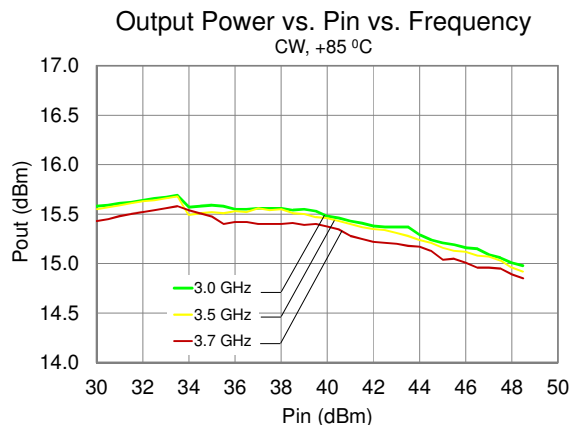
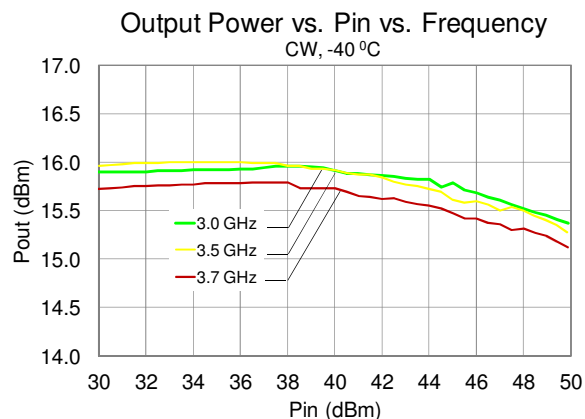
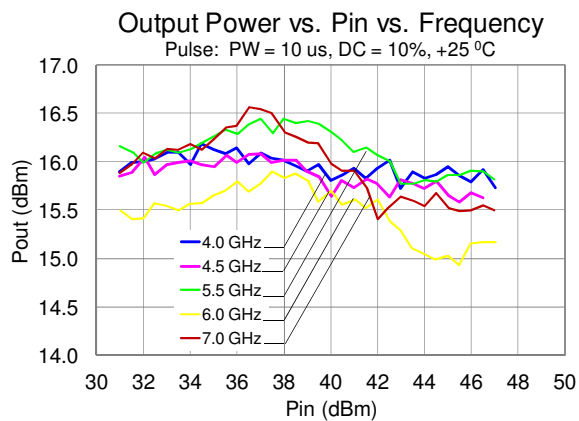
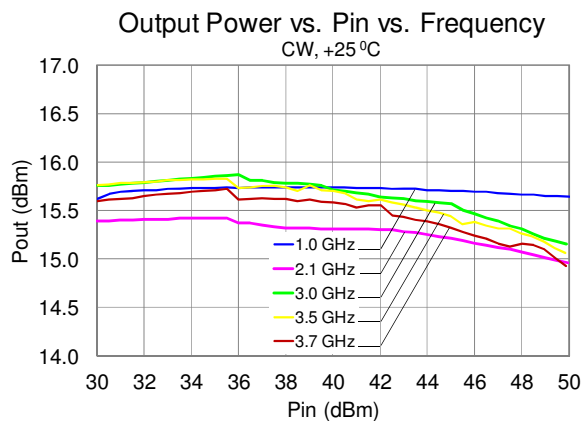
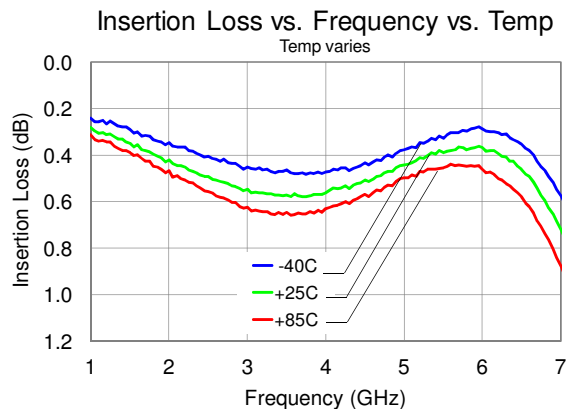
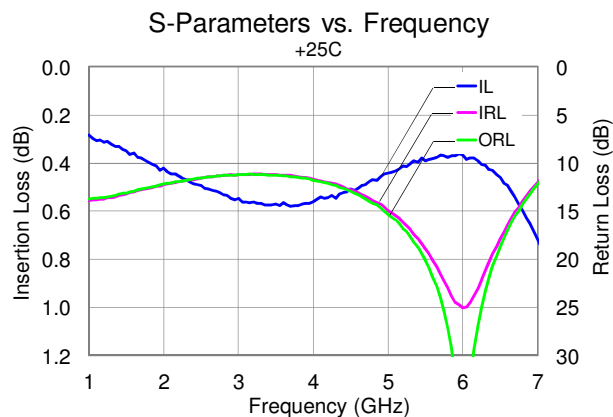
### Thermal and Reliability Information

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

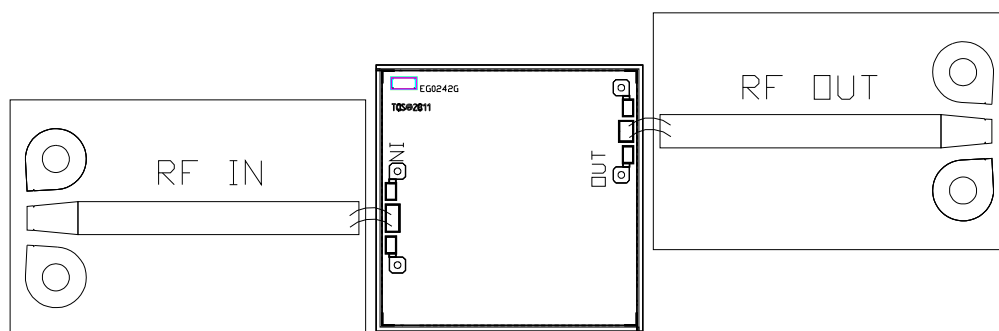
Notes:

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

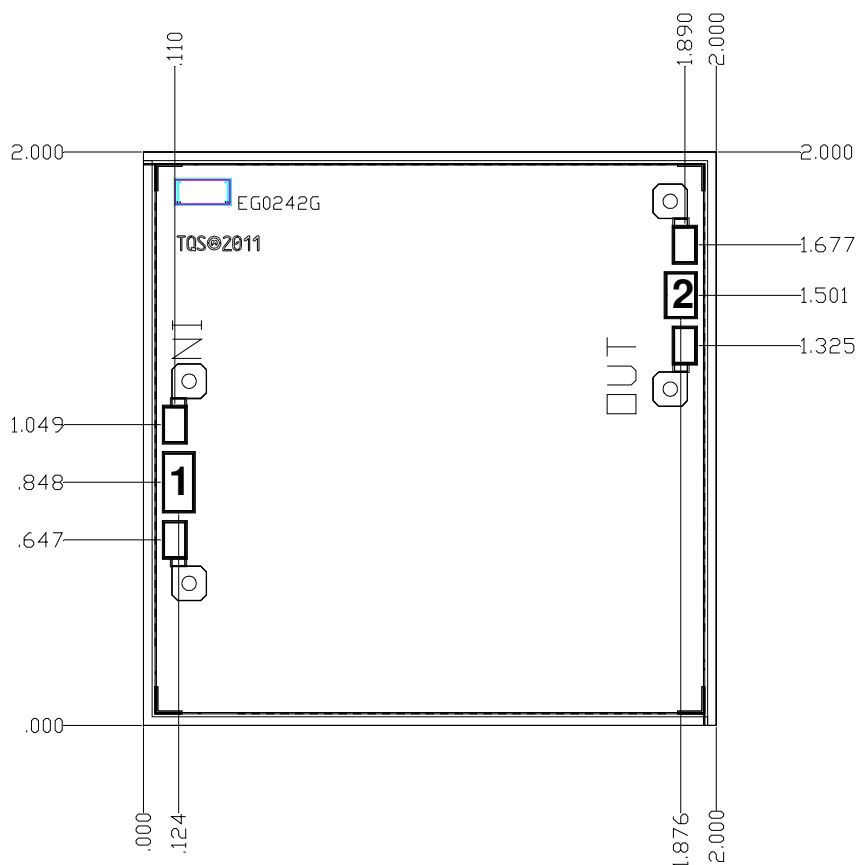
### Typical Performance



## Assembly Drawing



## Mechanical Information and Pad Description



Unit: millimeters

Thickness: 0.10

Die x, y size tolerance:  $\pm 0.050$

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 $\Omega$ .	0.100 x 0.200
2	RF Out	Output; matched to 50 $\Omega$ .	0.100 x 0.150

## 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 TGL2205.
- 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 to 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.

Organic adhesive attachment assembly notes:

- The organics such as epoxy or polyimide can be used.
- Epoxies cure at temperatures of 100 to 200°C.

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.

## Product Compliance Information

### ESD Sensitivity Ratings



Caution! ESD-Sensitive Device

ESD Rating: TBD  
Value: TBD  
Test: Human Body Model (HBM)  
Standard: JEDEC Standard JESD22-A114

### Solderability

This part is compliant with EU 2002/95/EC RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

This product also has the following attributes:

- Lead Free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C<sub>15</sub>H<sub>12</sub>Br<sub>4</sub>O<sub>2</sub>) Free
- PFOS Free
- SVHC Free

### ECCN

US Department of Commerce: EAR99

## Contact Information

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

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