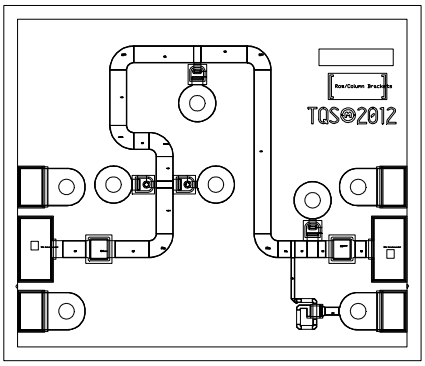
TGL2203

Ka-Band 1 W VPIN Limiter

Applications

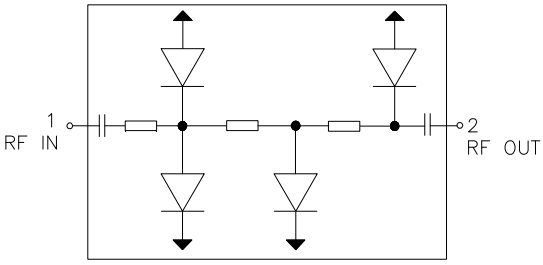
- Receive Chain Protection
- Commercial and Military Radar



Product Features

- Frequency Range: 30 - 38 GHz
- Insertion Loss: < 1 dB
- Peak Power Handling: 1 W
- Flat Leakage: ≤ 20 dBm at P_{IN} < 30 dBm
- Spike Leakage: ≤ 20 dBm at P_{IN} < 30 dBm
- Return Loss: > 12 dB
- Passive (no DC bias required)
- Integrated DC Block on input and output
- Chip Dimensions: 1.35 x 1.15 x 0.1 mm

Functional Block Diagram



General Description

The TriQuint TGL2203 is a wideband MMIC GaAs VPIN limiter capable of protecting sensitive receive channel components against high power incident signals. The TGL2203 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 TGL2203 operates from 30 to 38 GHz and achieves low insertion loss of 1 dB and a return loss of >12 dB; it can limit up to 1 W incident power with a low flat leakage of 20 dBm. The TGL2203 is ideally suited to support both commercial and defense related applications.

Lead-free and RoHS compliant.

Pin Configuration

Pin No.	Symbol
1	RF_{IN}
2	RF_{OUT}

Notes:
1. RF input and output ports are not interchangeable.

Ordering Information

Part	ECCN	Description
TGL2203	EAR99	Ka-Band 1 W VPIN Limiter

Absolute Maximum Ratings

Parameter	Value
Incident Power, CW or Pulsed, 50 Ω, 25 ℃	2 W
Mounting Temperature (30 Seconds)	320 ℃
Storage Temperature	–40 to 150 ℃

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.

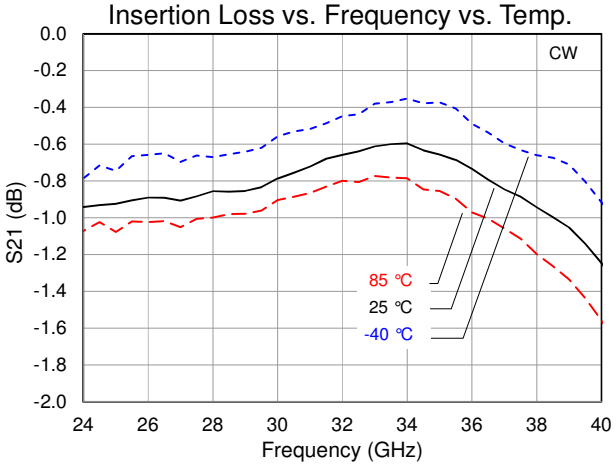
Electrical Specifications

Test conditions unless otherwise noted: T = 25℃

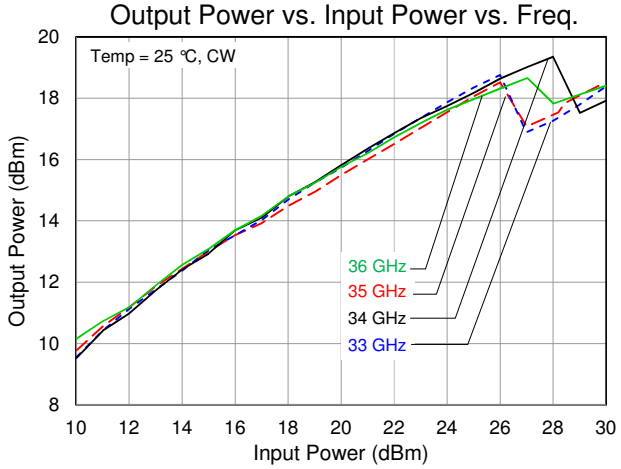
Parameter	Conditions	Min	Typ	Max	Units
Operational Frequency Range		30		38	GHz
Insertion Loss			< 1		dB
Input Return Loss			12		dB
Output Return Loss			12		dB
Flat Leakage Power	P_{IN} < 30 dBm		≤ 20		dBm
Spike Leakage	33 GHz, Pulsed, PW = 1 µs, 10% DC		≤ 20		dBm
Insertion Loss Temperature Coefficient			0.004		dB/℃

Typical Performance

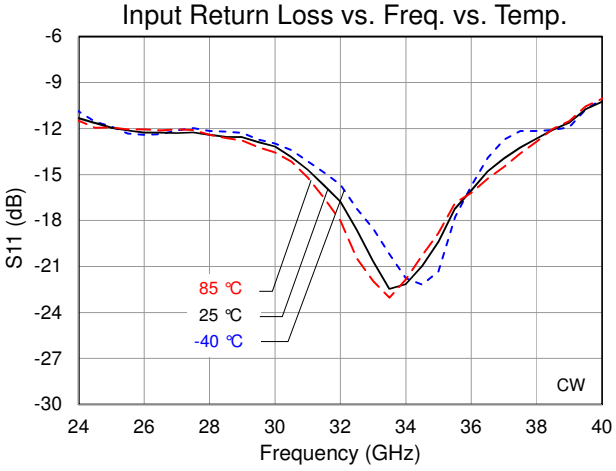
Insertion Loss vs. Frequency vs. Temp.



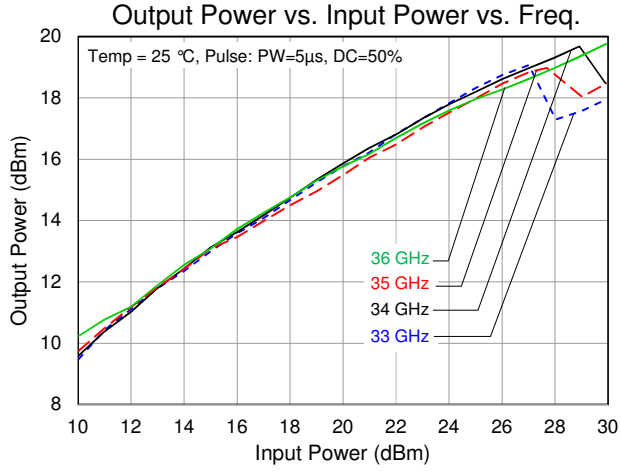
Output Power vs. Input Power vs. Freq.



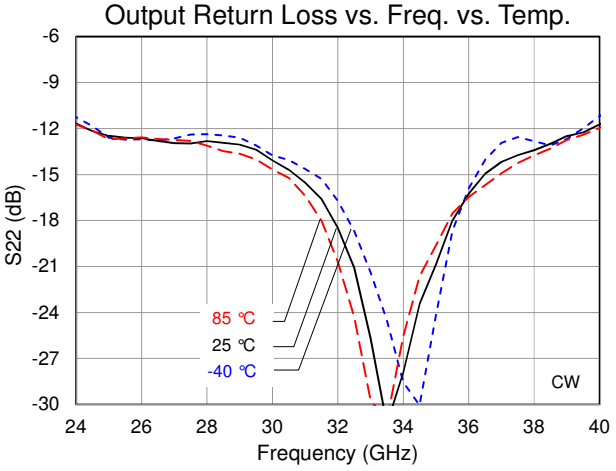
Input Return Loss vs. Freq. vs. Temp.



Output Power vs. Input Power vs. Freq.



Output Return Loss vs. Freq. vs. Temp.



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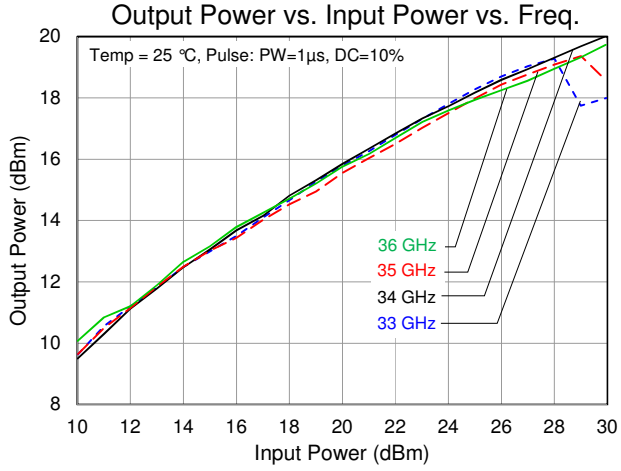
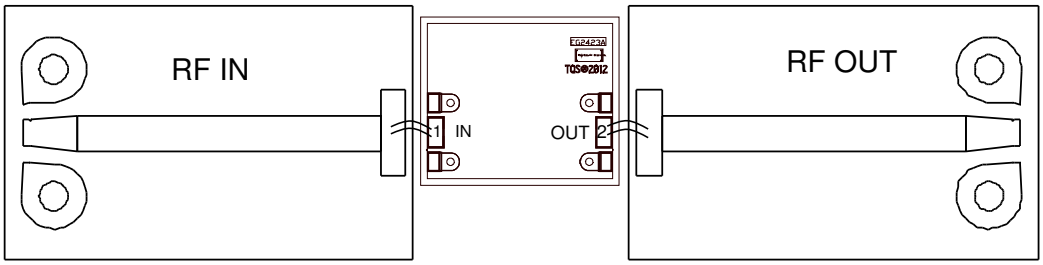
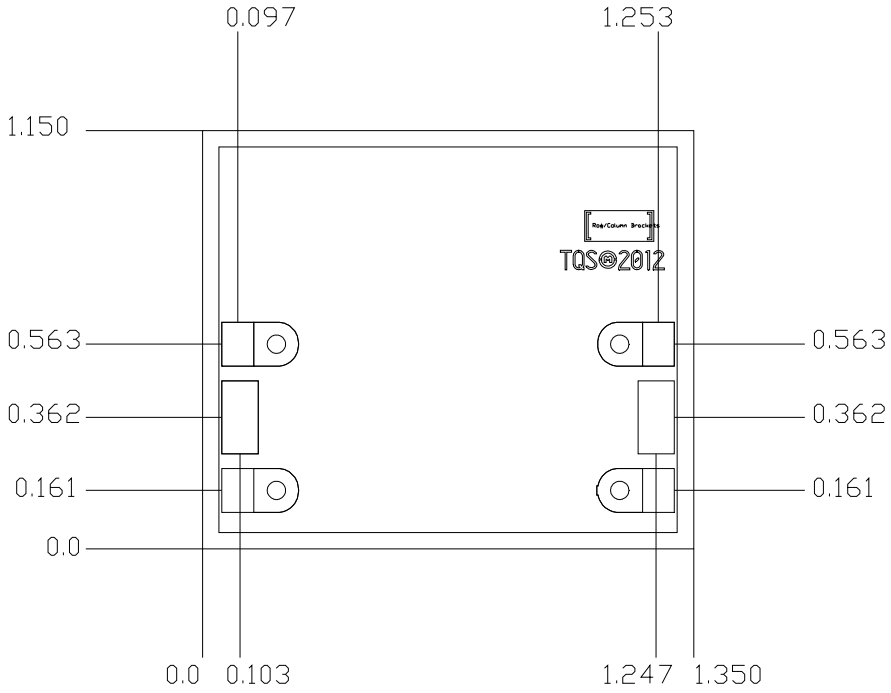


Assembly Drawing



Mechanical Information and Pad Description



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

Notes:
1. RF input and output ports are not interchangeable.

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 TGL2203.
- 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

ECCN

US Department of Commerce: EAR99

Solderability

Compatible with the latest version of J-STD-020 Lead free solder, 260 ℃.

MSL Rating

TBD at 260 ℃ convection reflow
The part is rated Moisture Sensitivity Level TBD
JEDEC standard IPC/JEDEC J-STD-020. Solderability

RoHS Compliance

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 ($C_{15}H_{12}Br_4O_2$) Free
- PFOS Free
- SVHC Free

Contact Information

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