TGL2203

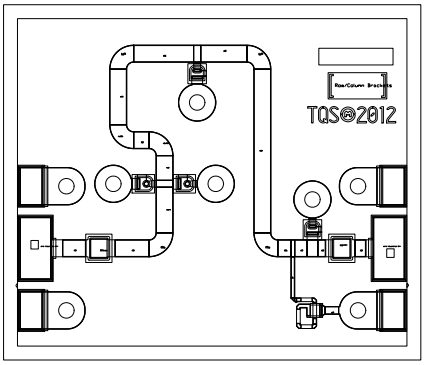
Ka-Band 1 W VPIN Limiter

Product Description

Qorvo's 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.

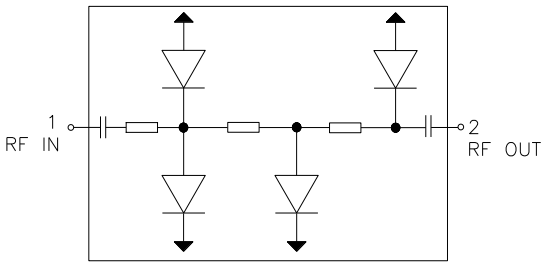


Product Features

- Frequency Range: 30 – 38 GHz
- Insertion Loss: < 1 dB
- Peak Power Handling: 1 W
- Flat Leakage: ≤ 20 dBm
- Spike Leakage: ≤ 20 dBm
- Return Loss: > 12 dB
- Passive (no DC bias required)
- Integrated DC Block on the output
- Recovery Time: < 40 nS
- Die Size: 1.35 x 1.35 x 0.10 mm

Performance is typical across frequency. Please reference electrical specification table and data plots for more details.

Block Diagram



Applications

- Receive Chain Protection
- Commercial and Military Radar

Ordering Information

Part No.	Description
TGL2203	Ka-Band 1 W VPIN Limiter, Waffle Pack, 100 pieces
TGL2203 EVB	Evaluation Board

Absolute Maximum Ratings

Parameter	Rating
Incident Power, CW or Pulsed, 50 Ω, 25 °C	2 W
Mounting Temperature (30 seconds)	320 °C
Storage Temperature	-55 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
Operating Temperature Range	-40	+25	+85	°C
Passive – No Bias				

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

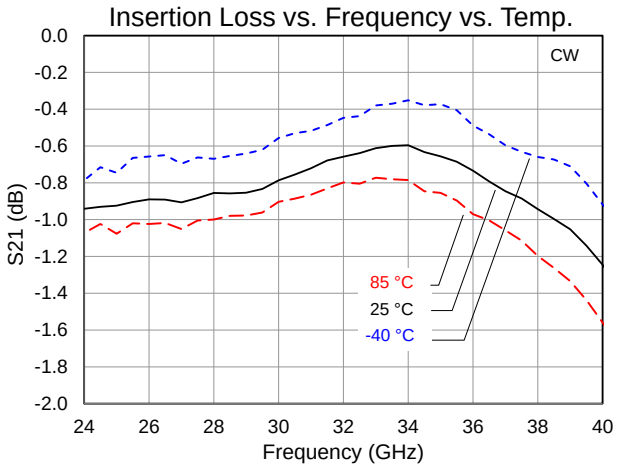
Electrical Specifications

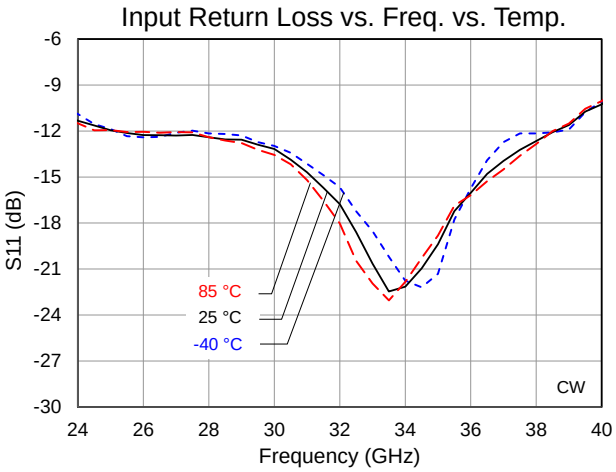
Test conditions unless otherwise noted: T = 25°C

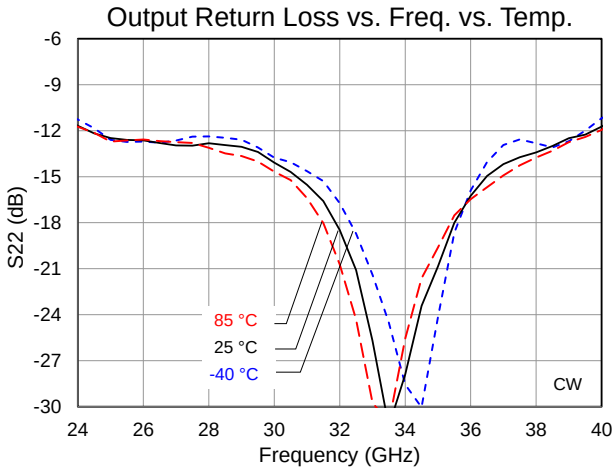
Parameter	Conditions	Min	Typ	Max	Units
Operational Frequency Range		30		38	GHz
Insertion Loss			< 1		dB
Input Return Loss			12		dB
Output Return Loss			12		dB
Flat Leakage Power	P_{IN} < 30 dBm		≤ 20		dBm
Spike Leakage	33 GHz, Pulsed, PW = 1 µs, 10% DC		≤ 20		dBm
Recovery Time			< 40		ns
Insertion Loss Temperature Coefficient			0.004		dB/°C

Performance Plots - Small Signal

Test conditions unless otherwise noted: Temp. = 25 °C

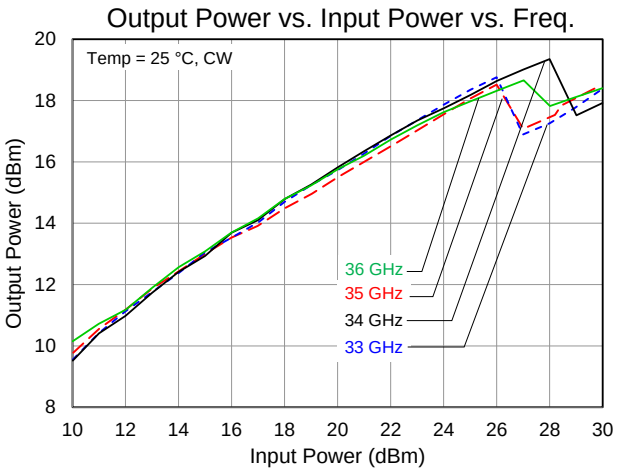


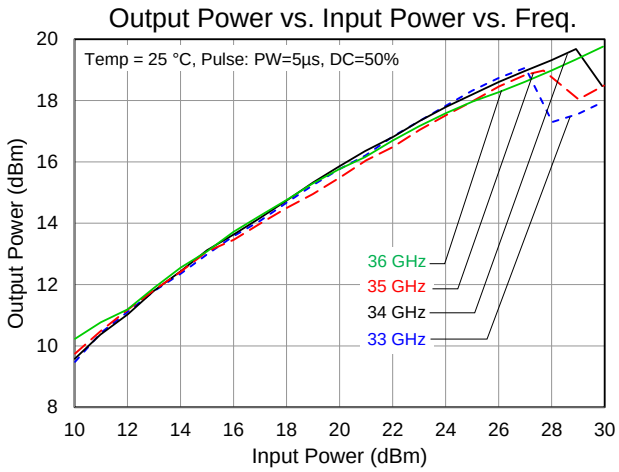


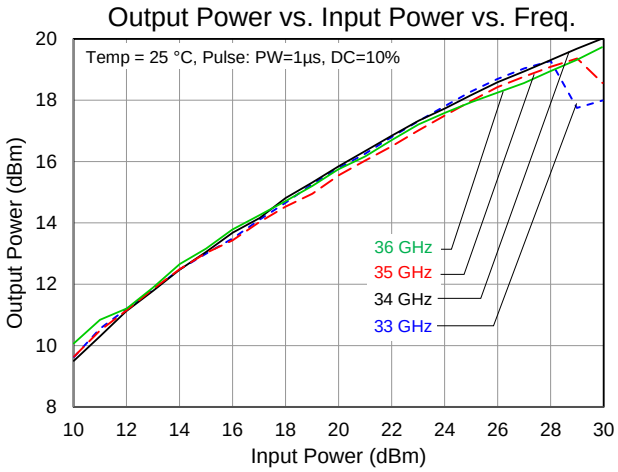


Performance Plots - Large Signal

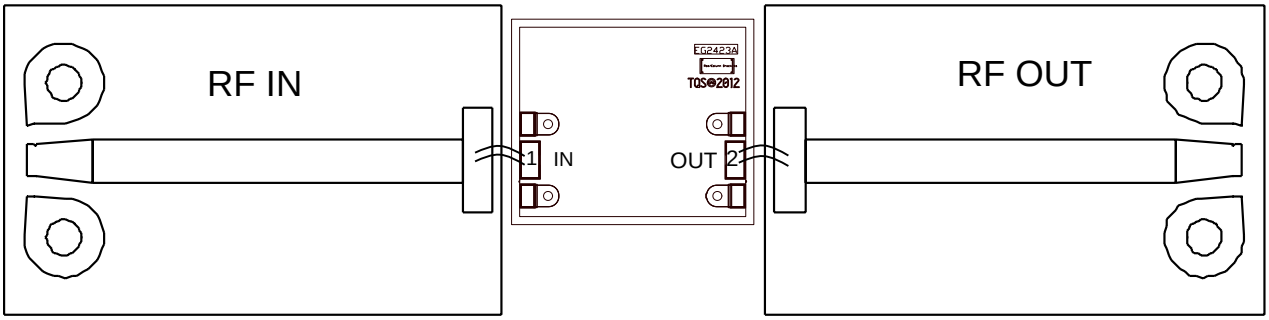
Test conditions unless otherwise noted: Temp. = 25 °C





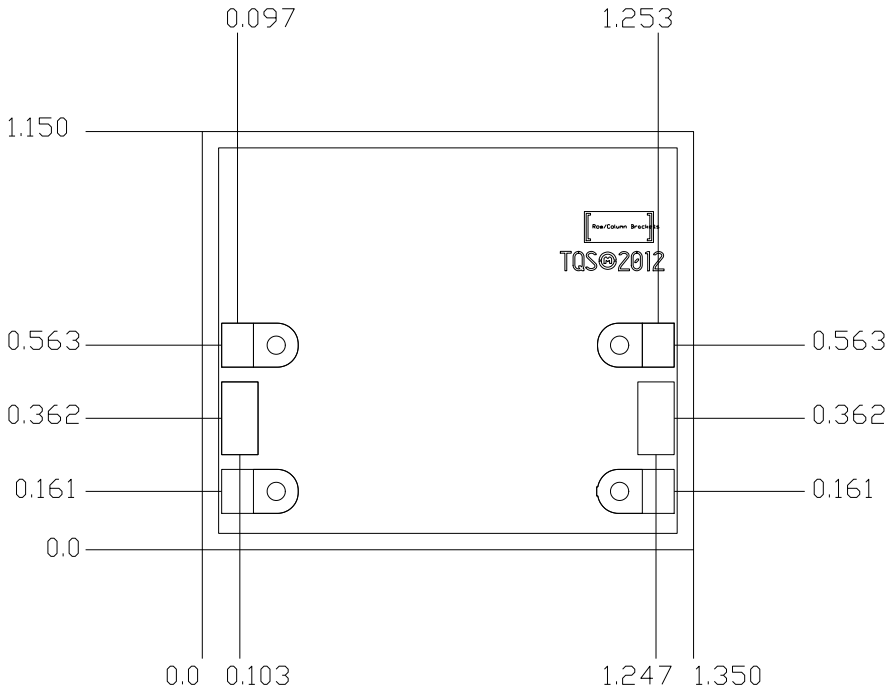


Assembly Drawing



Note: RF Input and RF Output ports are not interchangeable.

Mechanical Drawing and Bond 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 No.	Symbol	Description	Pad Size (mm x mm)
1	RF Input	RF Input, 50 Ω, DC Blocked	0.100 x 0.200
2	RF Output	RF Output, 50 Ω, DC Blocked.	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.

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 ultrasonic 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	ESDA / JEDEC JS-001-2012

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 product is compliant with the 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 ($C_{15}H_{12}Br_4O_2$) Free
- PFOS Free
- SVHC Free

Contact Information

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

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