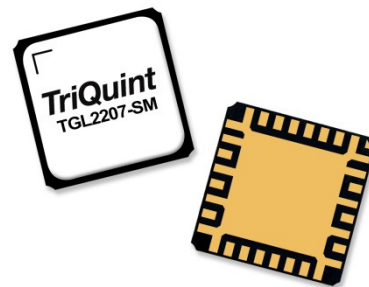


### Applications

- Receive Chain Protection
- Commercial and Military Radar

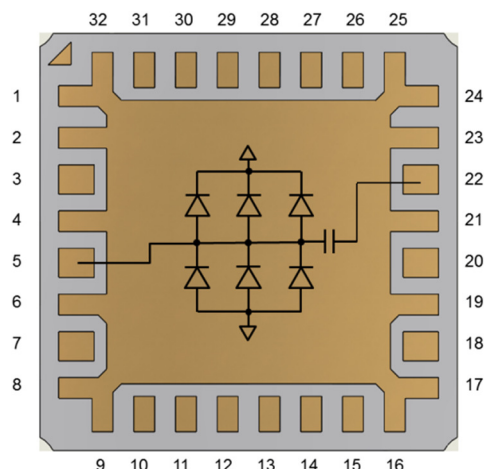


5 mm x 5 mm QFN Package

### Product Features

- Frequency Range: 2.0 to 6.5 GHz
- Insertion Loss: < 1.0 dB
- Peak Power Handling: 100 W (pulsed)
- Flat Leakage: < 15.5 dBm
- Passive (no DC bias required)
- Integrated DC Block on output
- Spike Leakage < 16.0 dBm
- Recovery time < 115 ns
- Package Dimensions: 5.0 mm x 5.0 mm x 1.45 mm

### Functional Block Diagram



### General Description

The TriQuint TGL2207-SM is a high power, wideband GaAs VPIN limiter capable of protecting sensitive receive channel components against high power incident signals. The TGL2207-SM 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-SM operates from 2.0 to 6.5 GHz with low insertion loss of less than 1.0 dB. It can limit up to 100 W incident pulsed-power with a low flat leakage of less than 15.5 dBm.

The TGL2207-SM is offered in a 5x5 mm air-cavity QFN packaged limiter comprised of an aluminum-nitride base with a plastic epoxy-sealed lid. It is well suited for both commercial and defense related applications.

Lead-free and RoHS compliant.

Evaluation boards available on request.

### Pad Configuration

| Pad Number                                       | Symbol        |
|--|---------------|
| 5  | RF Input      |
| 22   | RF Output     |
| 1, 2, 4, 6, 8, 9, 16, 17, 19, 21, 23, 24, 25, 32 | GND           |
| 3, 7, 10-15, 18, 20, 26-31                       | No connection |

NOTE: the RF Input and Output ports are not interchangeable.

### Ordering Information

| Part       | ECCN  | Description                   |
|------------|-------|-------------------------------|
| TGL2207-SM | EAR99 | 2.0-6.5 GHz 100W VPIN Limiter |

### Absolute Maximum Ratings

| Parameter   | Value                         |
|---|-------------------------------|
| Incident Power, CW or Pulsed, 50 $\Omega$ , 25 $^{\circ}\text{C}$ | 100W                          |
| Incident Power, CW or Pulsed, 50 $\Omega$ , 85 $^{\circ}\text{C}$ | 70W                           |
| Mounting Temperature (30 Seconds)                                 | 320 $^{\circ}\text{C}$        |
| Storage Temperature   | -40 to 150 $^{\circ}\text{C}$ |

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         | Value |
|-------------------|-------|
| Passive – No bias |       |

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

### Electrical Specifications

Test conditions unless otherwise noted: 25 C, Tuned EVB Results

| Parameter                               | Min | Typical | Max | Units                  |
|---|-----|---------|-----|------------------------|
| Operational Frequency Range             | 2.0 |         | 6.5 | GHz                    |
| Insertion Loss                          |     | < 1.0   |     | dB                     |
| Input Return Loss                       |     | 15      |     | dB                     |
| Output Return Loss                      |     | 15      |     | dB                     |
| Flat Leakage Power at $P_{IN} > 30$ dBm |     | < 15.5  |     | dBm                    |
| Pulse Recovery Time                     |     | < 115   |     | ns                     |
| Spike Leakage                           |     | < 16.0  |     | dBm                    |
| Insertion Loss Temperature Coefficient  |     | 0.003   |     | dB/ $^{\circ}\text{C}$ |

### Thermal and Reliability Information

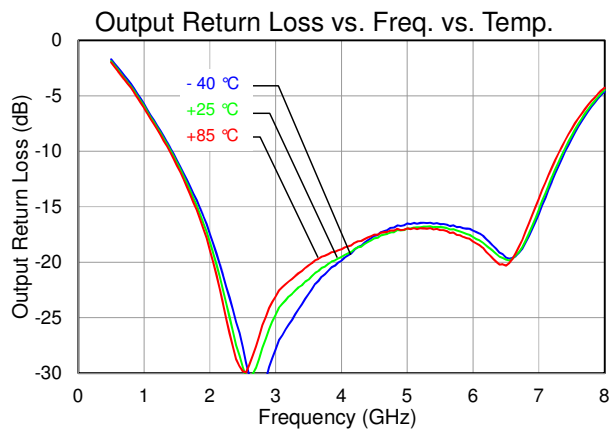
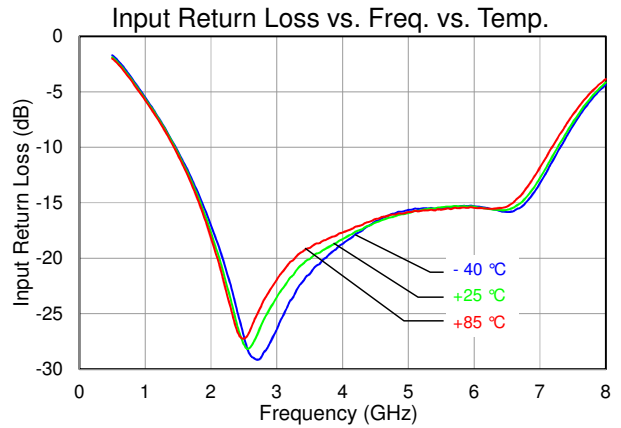
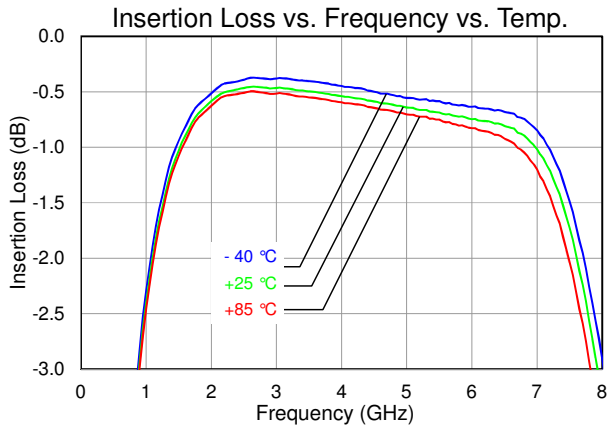
| Parameter  | Test Conditions  | Value | Units |
|--|--|-------|-------|
| Incident Power<br>(168 Hours RF Operational Life Test <sup>(1)</sup> ) | Frequency = 4.5 GHz, CW, 50 $\Omega$ , 25 $^{\circ}\text{C}$                                   | 31    | W     |
|  | Frequency = 4.5 GHz, Pulsed, PW=10 $\mu\text{s}$ , DC=10%, 50 $\Omega$ , 25 $^{\circ}\text{C}$ | 100   | W     |

Notes:

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

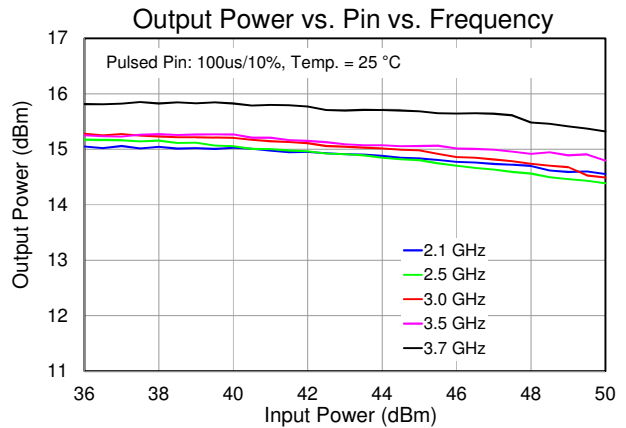
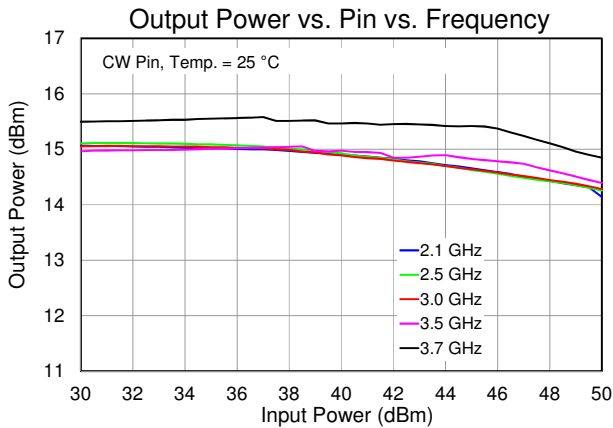
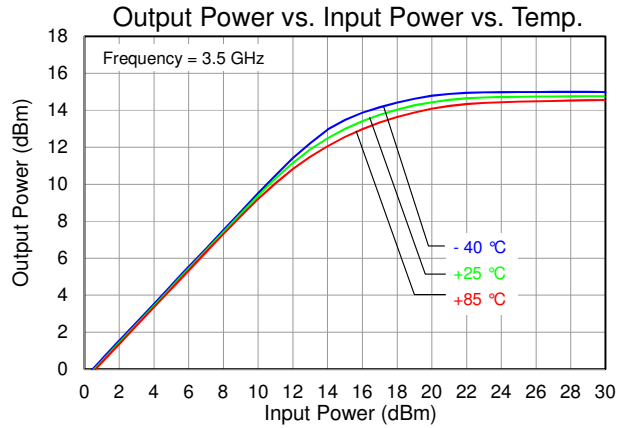
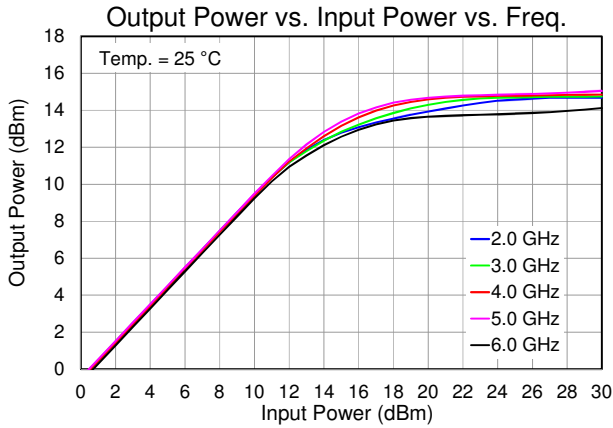
**Typical Performance – Tuned EVB Performance**

Test conditions unless otherwise noted: 25 °C

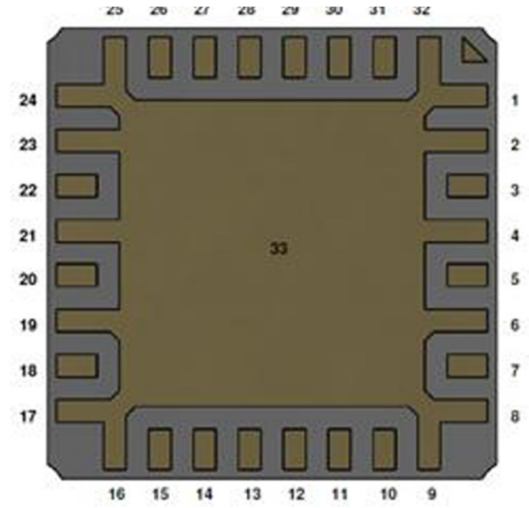
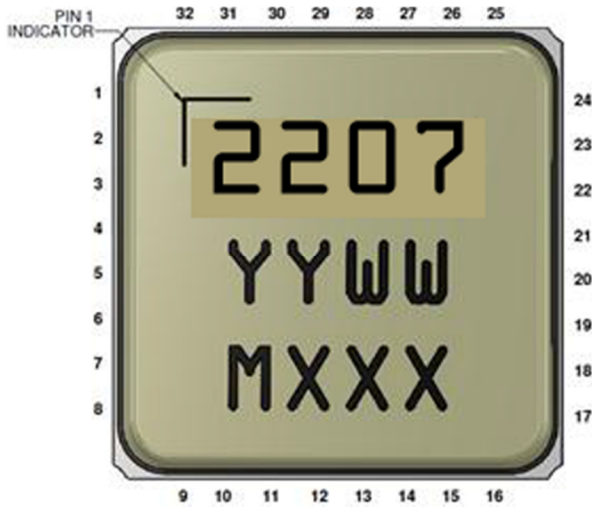


### Typical Performance – Tuned EVB Performance

Test conditions unless otherwise noted: 25 °C, CW Input Power



**Pad Description**



| Package Pad                                      | Symbol    | Description  |
|--|-----------|--|
| 1, 2, 4, 6, 8, 9, 16, 17, 19, 21, 23, 24, 25, 32 | GND       | On PCB, multiple vias should be employed under the center pad (33) to minimize inductance and thermal resistance; see page 9 for suggested mounting configuration. |
| 5  | RF Input  | Input, matched to 50 Ohms, not DC blocked  |
| 22   | RF Output | Output, matched to 50 Ohms, DC blocked   |
| 3, 7, 10-15, 18, 20, 26-31                       | NC        | No connection  |

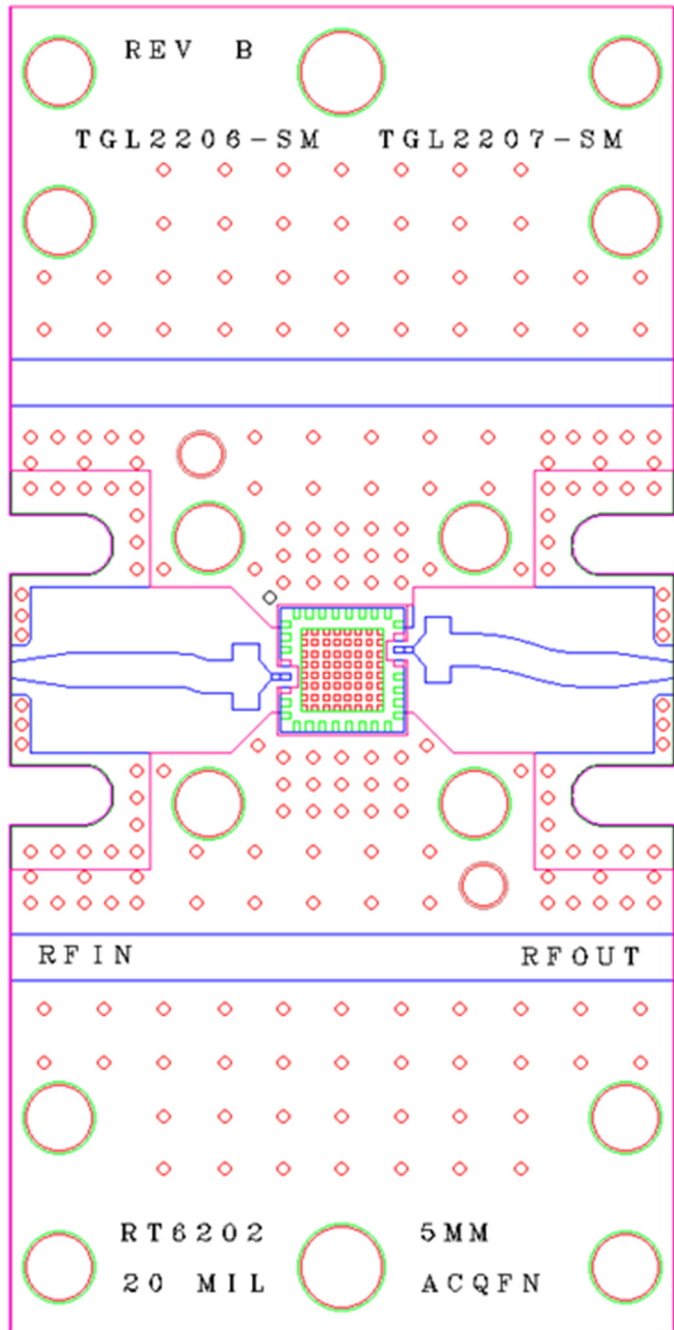
NOTE: The RF Input and Output ports are not interchangeable.

**Applications Information**

**EVB Layout**

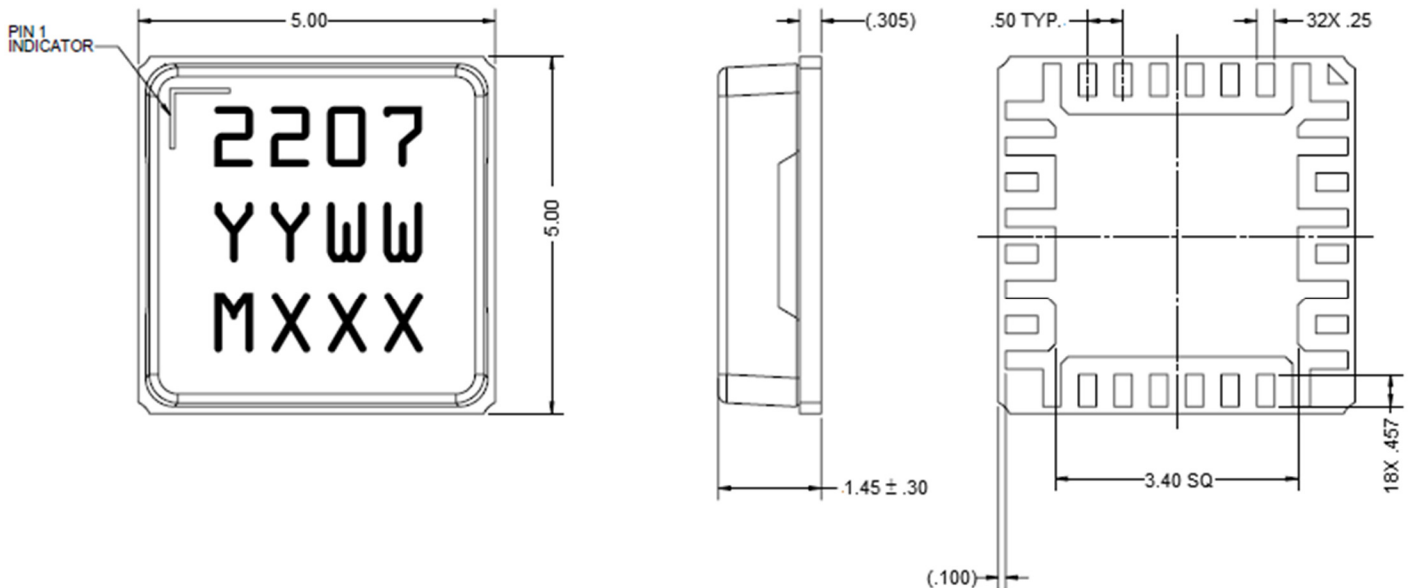
RF layer is 0.020" thick Rogers RO6202,  $\epsilon_r=2.94$ . Metal layers are 1-oz copper. Microstrip 50  $\Omega$  line width is 0.050". The microstrip line taper at the connector interface is optimized for the Southwest Microwave end-launch connector 1092-02A-5.

The pad pattern shown has been developed and tested for optimized assembly at TriQuint Semiconductor. The PCB land pattern has been developed to accommodate lead and package tolerances. Since surface mount processes vary from company to company, careful process development is recommended.



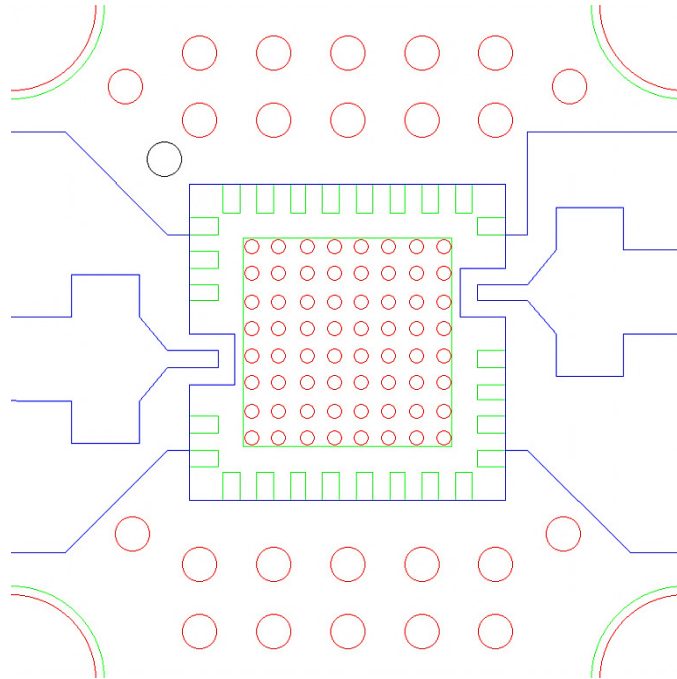
**Mechanical Information**

**Package Information and Dimensions (Units: millimeters)**



The TGL2207-SM will be marked with the “YYWW” designator and a lot code marked below the part designator. The “YY” represents the last two digits of the year the part was manufactured, the “WW” is the work week, and the “MXXX” is an auto-generated number.

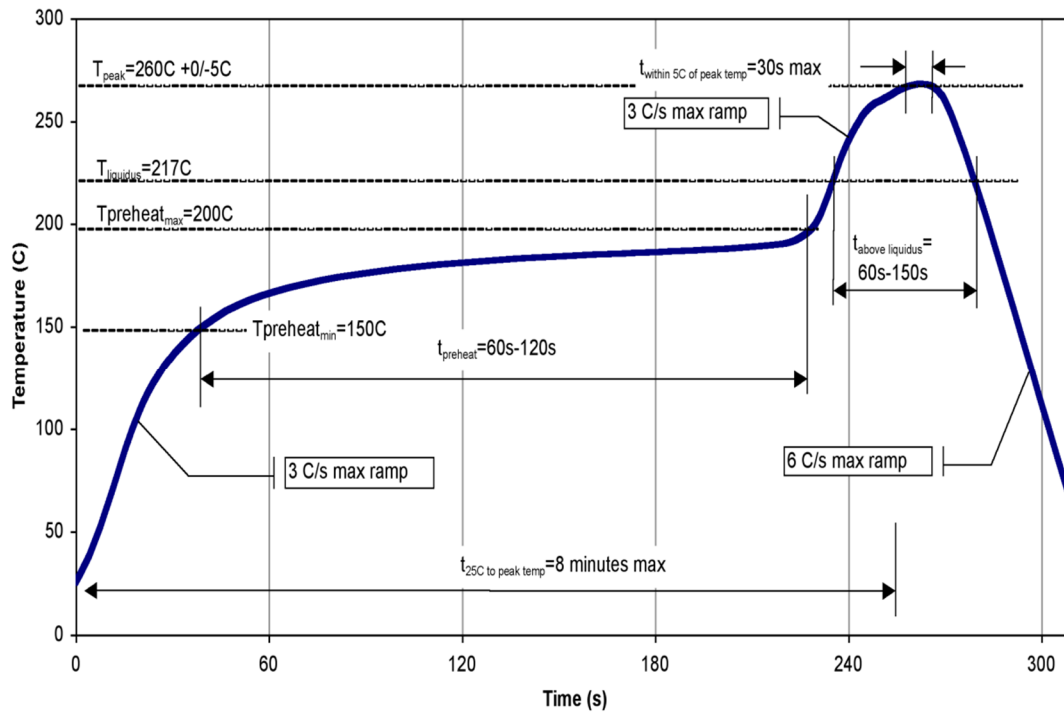
This package is lead-free/RoHS-compliant. The package base is Aluminum Nitride and the plating material on the leads is gold over nickel (Au-Ni). This package is compatible with both lead free and tin-lead soldering processes. The lid is plastic.

**Mechanical Information (continued)****Mounting Configuration****Notes:**

1. Ground / thermal vias under the DUT are critical for the proper performance of this device.
2. The EVB shown herein utilizes copper filled vias (8 mil diameter) under the DUT to maximize heat transfer away from the DUT under large signal conditions.
3. Thermal dissipation is low for normal non-limiting operation.



**Recommended Soldering Temperature Profile**



**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**

U.S. Department of Commerce: EAR99

**Solderability**

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

**MSL Rating**

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

**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<sub>15</sub>H<sub>12</sub>Br<sub>4</sub>O<sub>2</sub>) Free
- PFOS Free
- SVHC Free

## Contact Information

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