

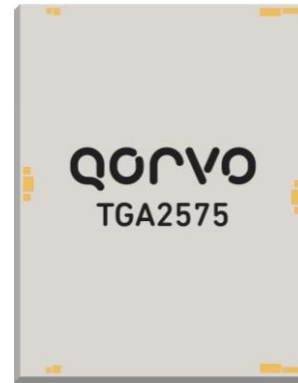
### Product Description

Qorvo's TGA2575 is a wideband power amplifier fabricated on Qorvo's production released 0.15um power pHEMT process. Operating from 32 GHz to 38 GHz, it achieves 35.5 dBm saturated output power, 22% PAE and 19 dB small signal gain over most of the band.

Fully matched to 50 ohms, RoHS compliant and with integrated DC blocking caps on both I/O ports, the TGA2575 is ideally suited to support both commercial and defense related opportunities.

The TGA2575 is 100% DC and RF tested on-wafer to ensure compliance to performance specifications.

Lead-free and RoHS compliant.

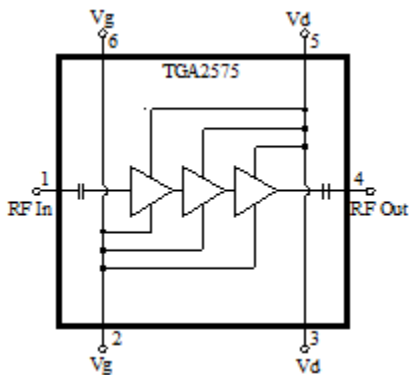


### Product Features

- Frequency Range: 32.0 – 38.0 GHz
- Power: 35.5 dBm P<sub>SAT</sub>
- PAE: 22%
- Gain: 19 dB
- Return Loss: 12 dB
- Bias: V<sub>d</sub> = 6 V, I<sub>d</sub> = 2.1 A, V<sub>g</sub> = -0.60 V Typical
- Dimensions: 5.4 x 4.1 x 0.05 mm

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

### Functional Block Diagram



### Applications

- Military Radar
- Communications

### Ordering Information

Part No.	Description
TGA2575	Ka-band Power Amplifier
TGA2575EVB1	Evaluation Board



### Absolute Maximum Ratings

Parameter	Value / Range
Drain Voltage, Vd	+6.5 V
Gate Voltage, Vg	-5 to 0 V
Drain to Gate Voltage, Vd-Vg	10
Drain Current, Id	4.0 A
Gate Current, Ig	-14 to 4.8 mA
Power Dissipation, P <sub>diss</sub>	21 W
RF Input Power, CW, 50Ω, T = 25°C	23 dBm
Channel Temperature, T <sub>ch</sub>	200 °C
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	Value / Range
Drain Voltage (V <sub>D</sub> )	+6 V
Drain Current (I <sub>DQ</sub> )	2.1 A
Drain Current, under drive (I <sub>D</sub> )	3.3 A
Gate Voltage Range (V <sub>G</sub> )	-0.6 V
Temperature (T <sub>BASE</sub> )	-40 to 85 °C

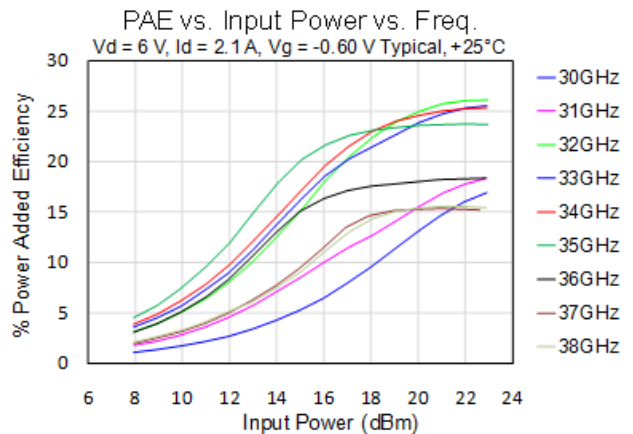
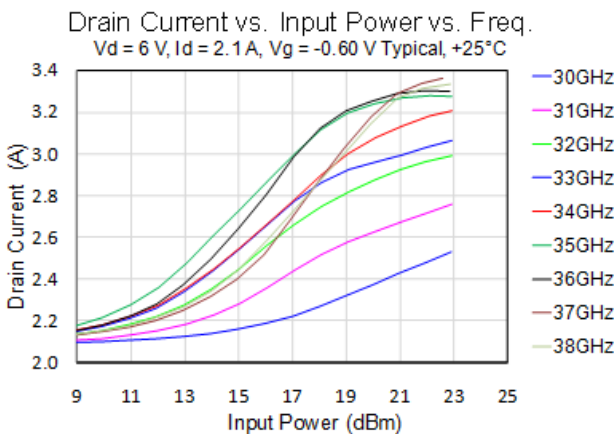
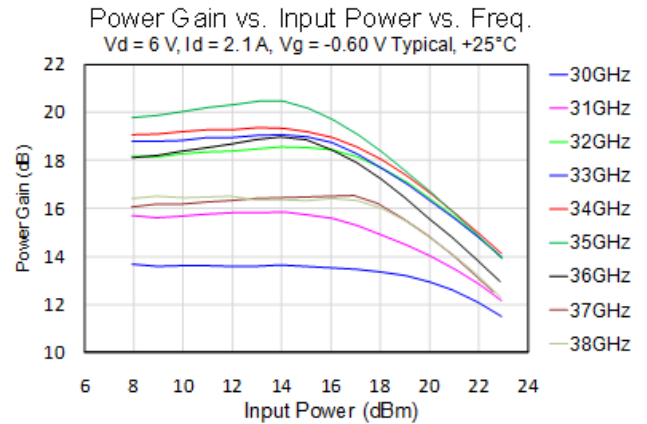
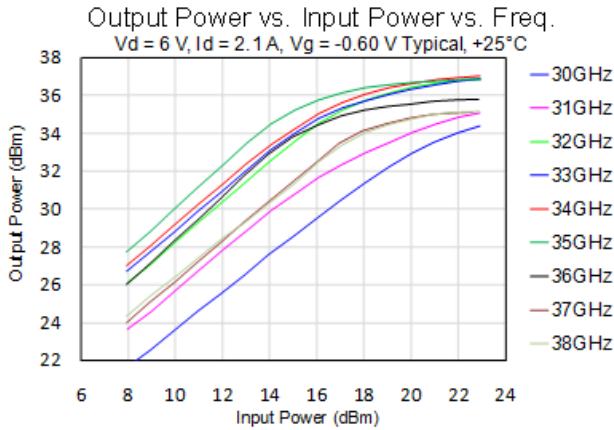
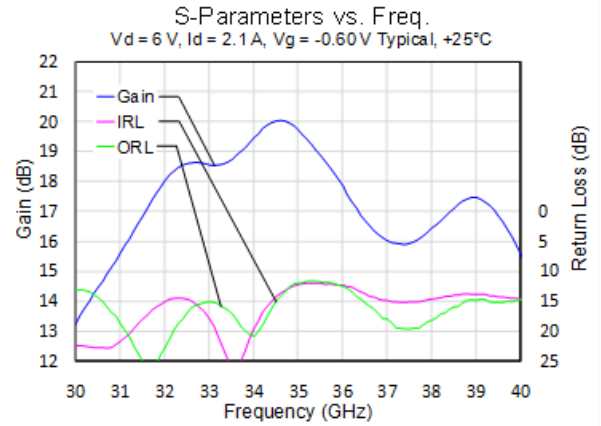
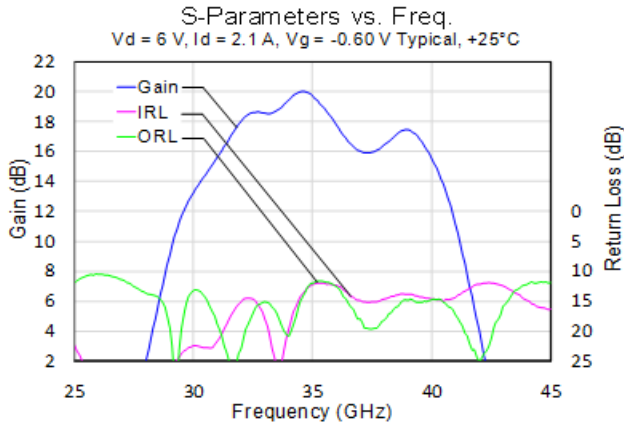
Electrical specifications are measured at specified test conditions. Specifications are not guaranteed over all recommended operating conditions.

### Electrical Specifications

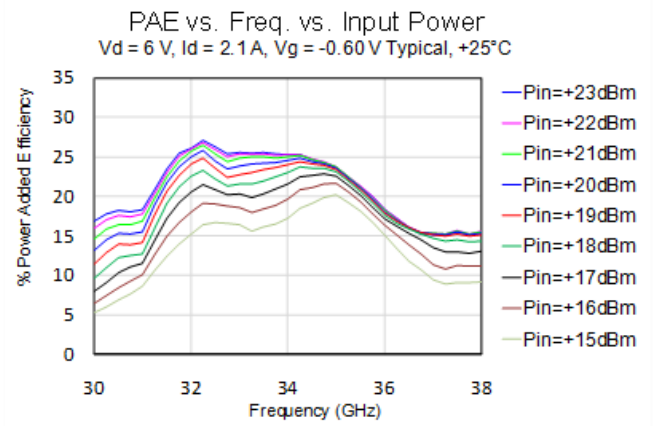
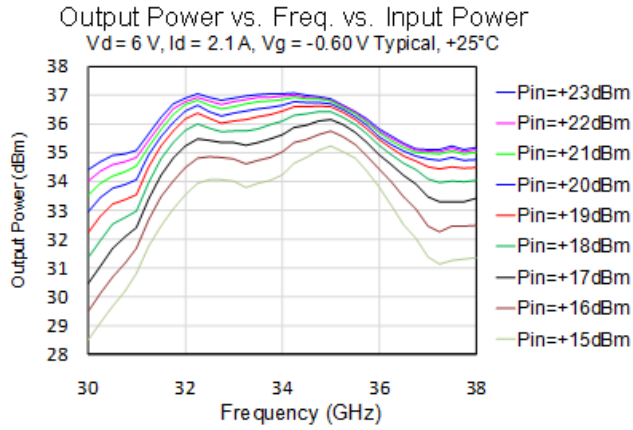
Test conditions unless otherwise noted: 25 °C, V<sub>d</sub> = 6 V, I<sub>d</sub> = 2.1 A, V<sub>g</sub> = -0.60 V Typical.

Parameter	Min	Typ	Max	Units
Operational Frequency Range	32		38	GHz
Gain: 32 – 35 GHz	17	19		dB
Gain: 36 – 85 GHz	15	17		dB
Input Return Loss		12		dB
Output Return Loss		12		dB
Output Power @ Saturation: 32 – 35 GHz	34.5	35.5		dBm
Output Power @ Saturation: 36 – 38 GHz	33	34.5		dBm
PAE @ Saturation		22		%

### Performance Plots – Large Signal (CW)

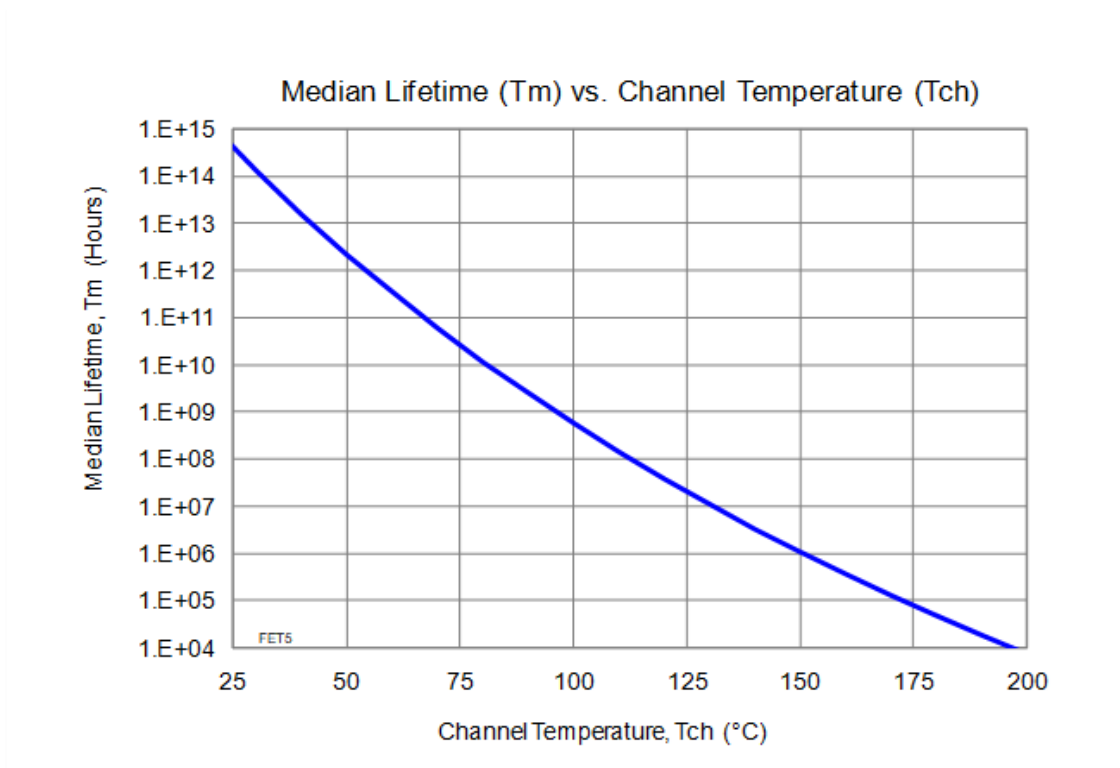


### Performance Plots – Large Signal (CW)

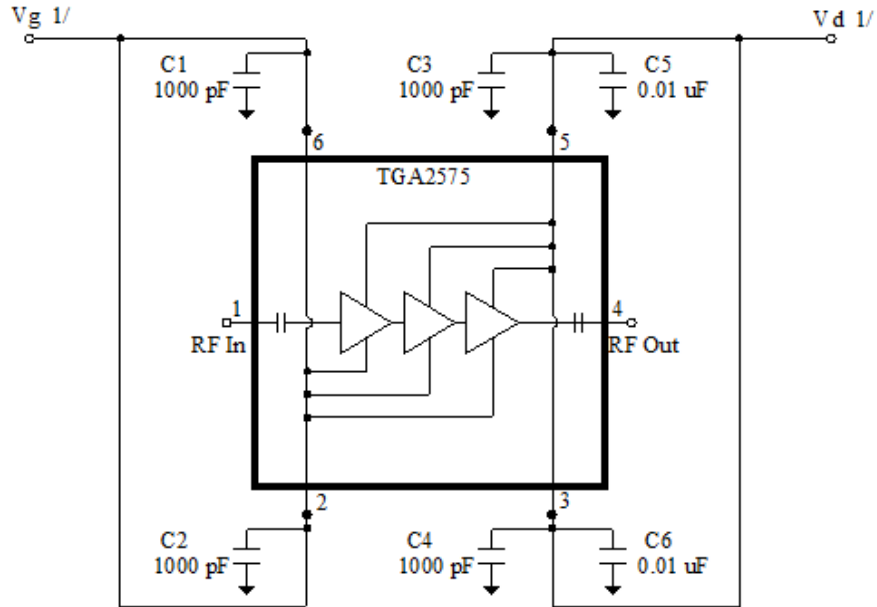


### Thermal and Reliability Information

Parameter	Test Conditions	Value
Thermal Resistance, $\theta_{JC}$ , measured to back of package	$T_{base} = 70\text{ }^{\circ}\text{C}$	$\theta_{JC} = 6.2^{\circ}\text{C/W}$
Channel Temperature ( $T_{ch}$ ), and Median Lifetime ( $T_m$ )	$T_{base} = 70\text{ }^{\circ}\text{C}$ , $V_d = 6\text{ V}$ , $I_d = 2.1\text{ A}$ , $P_{diss} = 12.6\text{ W}$	$T_{ch} = 148^{\circ}\text{C}$ $T_m = 1.3\text{ E}+6\text{ Hours}$
Channel Temperature ( $T_{ch}$ ), and Median Lifetime ( $T_m$ ) Under RF Drive	$T_{base} = 70\text{ }^{\circ}\text{C}$ , $V_d = 6\text{ V}$ , $I_d = 3.3\text{ A}$ , $P_{out} = 36\text{ dBm}$ , $P_{diss} = 15.8\text{ W}$	$T_{ch} = 168^{\circ}\text{C}$ $T_m = 1.5\text{E}+5\text{ Hours}$



### Applications Information and Pad Layout



Vg must be biased from both sides (pins 2 and 6)  
 Vd must be biased from both sides (pins 3 and 5)

1/ Additional bypass capacitors may be required at this location. The presence and value of these capacitors varies by application. Variables include power supply impedance, power supply stability with reactive loads, and the inductance from the power supply to this assembly. 1 to 47 uF tantalum capacitors are commonly used here.

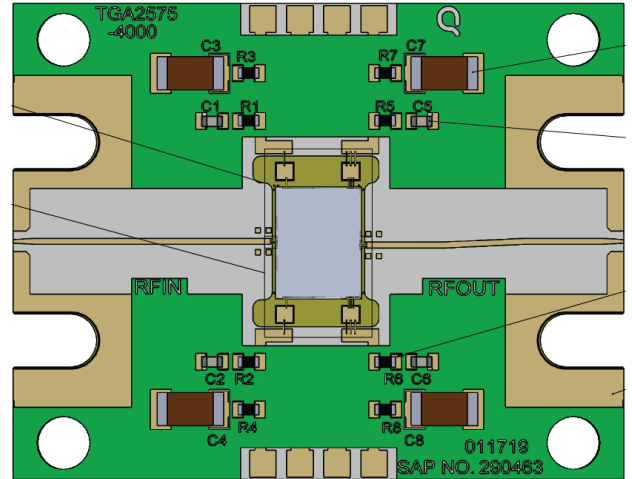
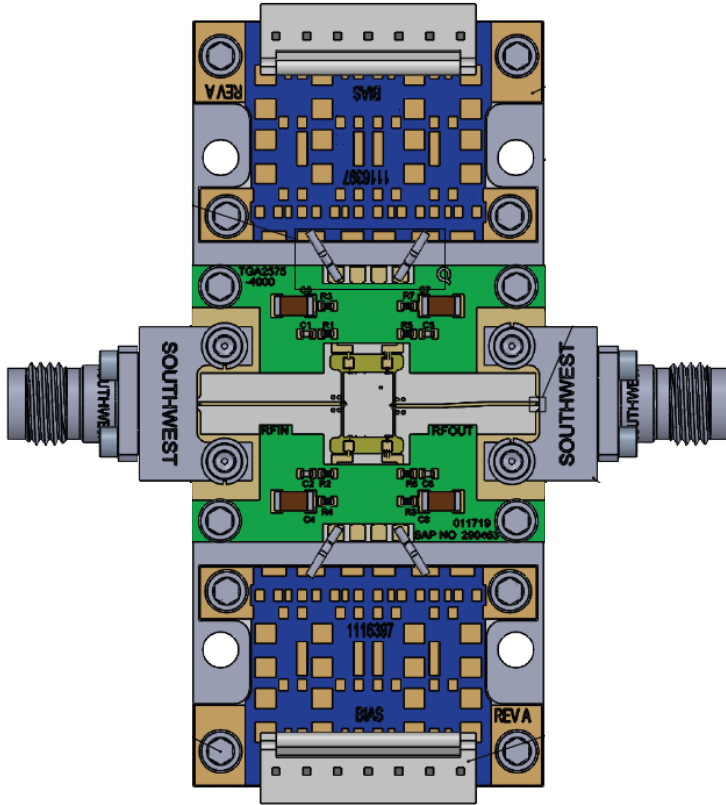
#### Bias Up Procedure

1. Vg set to -1.5 V
2. Vd set to +6 V
3. Adjust Vg more positive until quiescent Id is 2.1 A.  
This will be ~ Vg = -0.60 V
4. Apply RF signal to RF Input

#### Bias Down Procedure

1. Turn off RF supply
2. Reduce Vg to -1.5V. Ensure Id ~ 0 mA
3. Turn Vd to 0 V
4. Turn Vg to 0 V

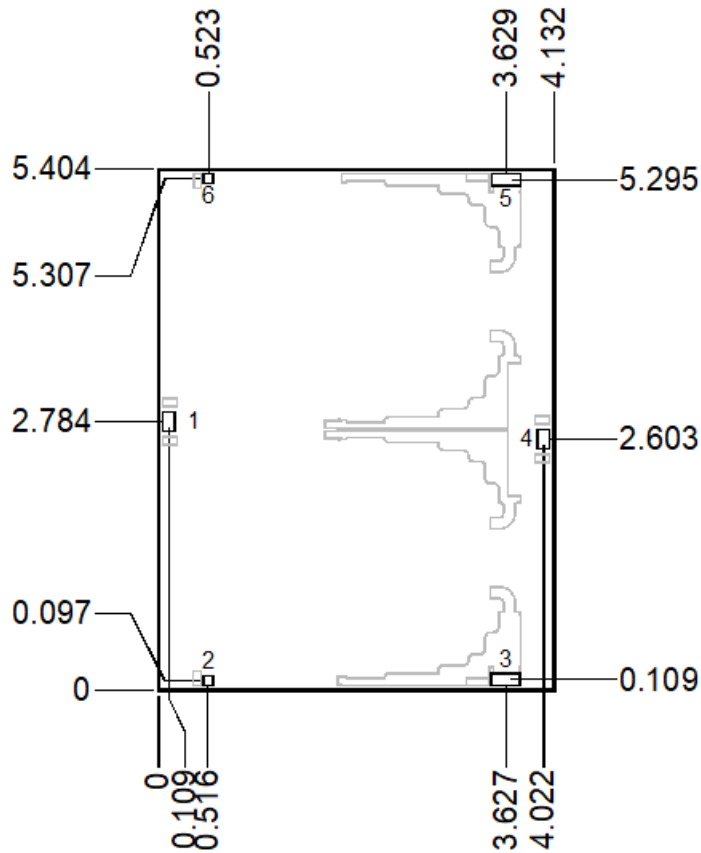
### Evaluation Board (EVB) Layout Assembly



### Bill of Materials

Ref. Des.	Value	Description	Manuf.	Part Number
C1,C2,C5,C6	0.01 uF	CAP, 0.01uF, 10%, 50V, X7R, 0402	Various	
C3,C4,C7,C8	10 uF	CAP, 10uF, 20%, 50V, 20%, X5R, 1206	Various	
C9,C10,C11,C12	1000 pF	CAP, 1000 pF, 10%, 50V, SL, BORDER	Various	
R1,R2,R3,R4,R5,R6,R7,R8	0 Ohm	RES, 0 OHM, JMPR, 0402	Various	
J1, J2	2. 4mm	CONN, 2.4,SSENDW, F, PIN .005, DIEL 0295	SW Microwave	1492-04A-12

**Mechanical Information**



Units: millimeters  
 Thickness: 0.05  
 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

**Bond Pad Description**

Pad No.	Symbol	Pad Size (mm)	Description
1	RF In	0.126 x 0.202	RF Input; matched to 50 $\Omega$ , DC blocked
2,6	VG	0.101 x 0.101	Gate voltage, bias network is required; see Application Circuit on page 6 as an example.
3,5	VD	0.126 x 0.302	Drain voltage, bias network is required; see Application Circuit on page 6 as an example.
4	RF Out	0.126 x 0.202	RF Output; matched to 50 $\Omega$ , DC blocked



## Assembly Notes

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

### Contact Information

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

**Web:** [www.qorvo.com](http://www.qorvo.com)

**Tel:** 1-844-890-8163

**E-mail:** [customer.support@qorvo.com](mailto:customer.support@qorvo.com)

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