

## Applications

- W-CDMA / LTE
- Macrocell Base Station
- Active Antenna
- General Purpose Applications

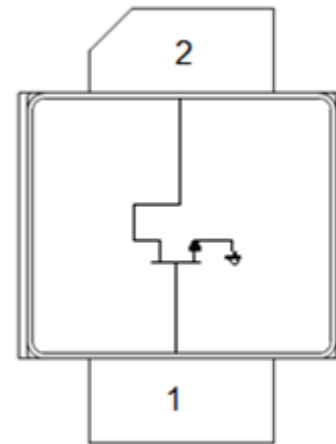


2 Lead NI400 Package

## Product Features

- Operating Frequency Range: 2.5 – 2.7 GHz
- Operating Drain Voltage: 48 V
- Maximum Output Power ( $P_{SAT}$ ): 200 W
- Maximum Drain Efficiency: 72%
- Efficiency-Tuned P3dB Gain: 20 dB
- 2-lead, earless, ceramic flange NI400 package

## Functional Block Diagram



## General Description

The QPD2796 is a discrete GaN on SiC HEMT which operates from 2.5–2.7 GHz. The device is a single stage matched power amplifier transistor.

The QPD2796 can be used in Doherty architecture for the final stage of a base station power amplifier for macrocell high efficiency systems.

QPD2796 can deliver  $P_{SAT}$  of 200 W at 48 V operation.

Lead-free and ROHS compliant.

## Pin Configuration

Pin No.	Label
1	RF IN, $V_G$
2	RF OUT, $V_D$
Backside Paddle	RF/DC Ground

## Ordering Information

Part No.	ECCN	Description
QPD2796	EAR99	200 W, 2.5-2.7 GHz, GaN RF Power Transistor

### Absolute Maximum Ratings

Parameter	Rating
Gate Voltage ( $V_G$ )	-10 V
Drain Voltage ( $V_D$ )	+55 V
Peak RF Input Power	40 dBm
VSWR Mismatch, P1dB Pulse (20% duty cycle, 100 $\mu$ width), $T = 25^\circ\text{C}$	10:1
Storage Temperature	-65 to +150 $^\circ\text{C}$

Operation of this device outside the parameter ranges given above may cause permanent damage.

### Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
Operating Temperature	-40			$^\circ\text{C}$
Gate Voltage ( $V_G$ )		-2.7		V
Drain Voltage ( $V_D$ )		48		V
Quiescent Current ( $I_{CQ}$ )		360		mA
$T_{CH}$ for $>10^6$ hours MTTF			225	$^\circ\text{C}$

Electrical performance is measured under conditions noted in the electrical specifications table. Specifications are not guaranteed over all recommended operating conditions.

### RF Characterization – Power-Tuned Load Pull Performance

Test conditions unless otherwise noted:  $V_D = 48$  V,  $I_{DQ} = 360$  mA,  $T = 25^\circ\text{C}$ , Pulsed (10% duty cycle, 100  $\mu\text{s}$  width)

Frequency (MHz)	Source Impedance	Load Impedance	Gain @ P3dB (dB)	P3dB (dBm)	Drain Efficiency (%)
2500	4.19 - j7.30	15.21 + j3.95	18.07	52.99	57.79
2600	7.50 - j10.00	13.14 + j3.66	18.30	53.08	60.41
2700	8.00 - j8.00	10.89 + j5.55	18.62	52.93	60.78

### RF Characterization – Efficiency-Tuned Load Pull Performance

Test conditions unless otherwise noted:  $V_D = 48$  V,  $I_{DQ} = 360$  mA,  $T = 25^\circ\text{C}$ , Pulsed (10% duty cycle, 100  $\mu\text{s}$  width)

Frequency (MHz)	Source Impedance	Load Impedance	Gain @ P3dB (dB)	P3dB (dBm)	Drain Efficiency (%)
2500	4.19 - j7.30	12.03 - j9.90	19.92	51.45	72.09
2600	7.50 - j10.00	12.39 - j11.45	20.27	50.49	72.77
2700	8.00 - j8.00	14.88 - j2.48	19.96	51.67	71.66

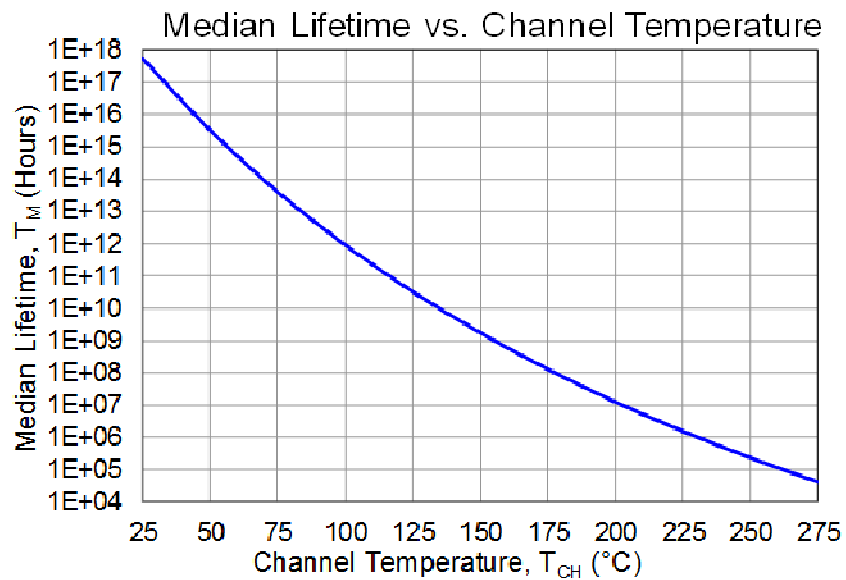
## Thermal Information

Parameter	Conditions	Value	Units
Thermal Resistance at Average Power ( $\theta_{JC}$ )	$T_{CASE} = 85^{\circ}C$ , $T_{CH} = 175^{\circ}C$ CW: $P_{DISS} = 60.9 W$ , $P_{OUT} = 56 W$	1.47	$^{\circ}C/W$

Notes:

1. Thermal resistance measured to package backside.
2. Based on expected carrier amplifier efficiency of Doherty.
3. Pout assumes 20% peaking amplifier contribution of total average Doherty rated power.

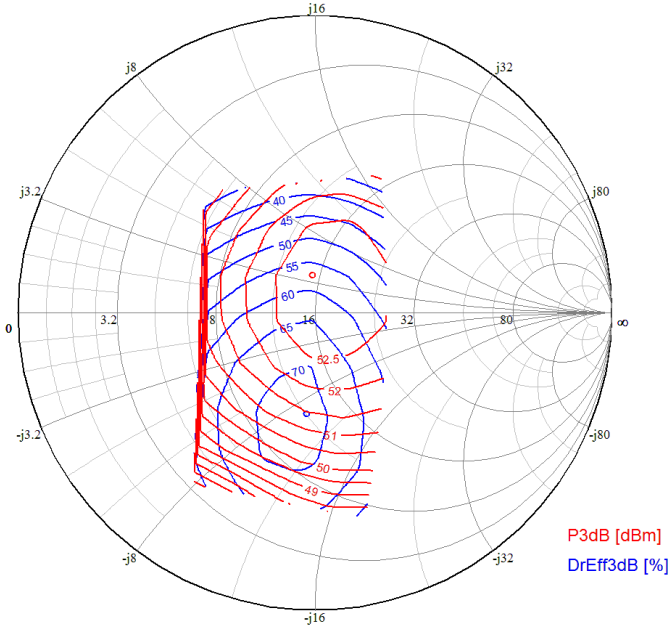
## Median Lifetime



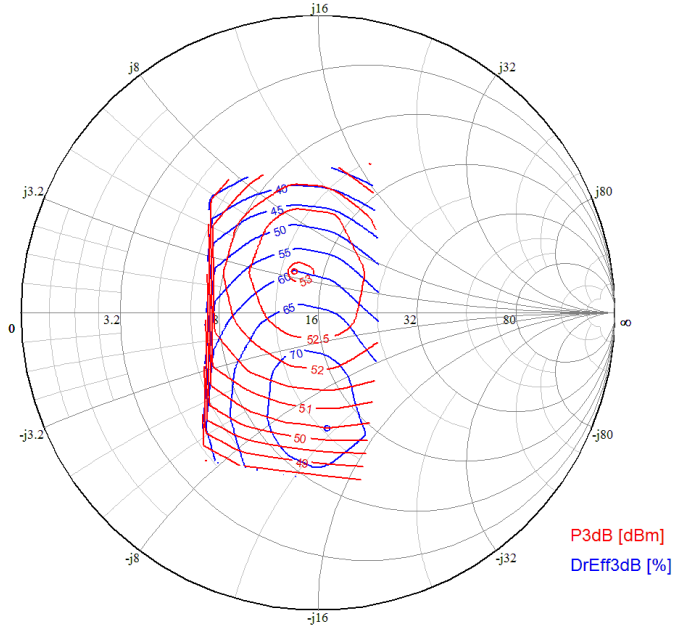
**Load Pull Plots**

Test conditions unless otherwise noted:  $V_D = 48\text{ V}$ ,  $I_{CQ} = 360\text{ mA}$ ,  $T = 25^\circ\text{C}$ , Pulsed (10% duty cycle, 100  $\mu\text{s}$  width)

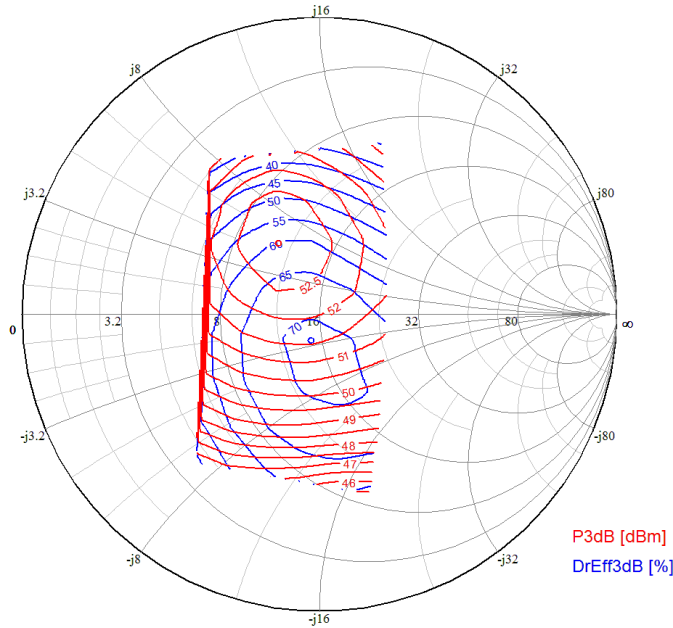
Load Pull at 2.5 GHz



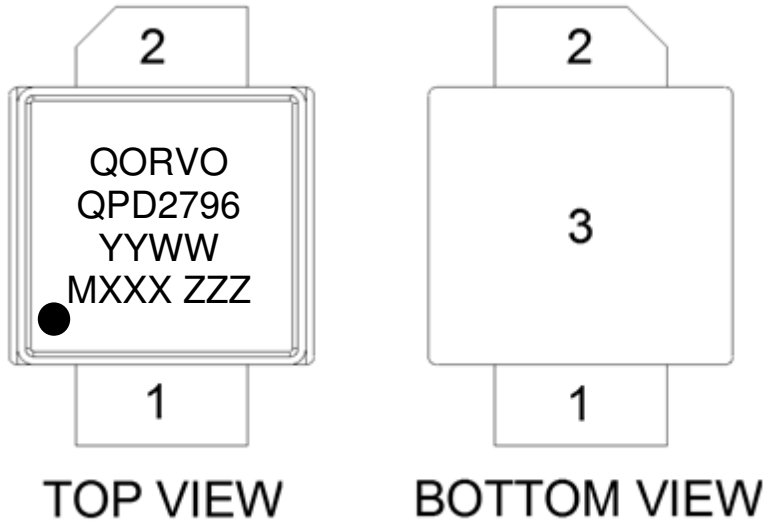
Load Pull at 2.6 GHz



Load Pull at 2.7 GHz



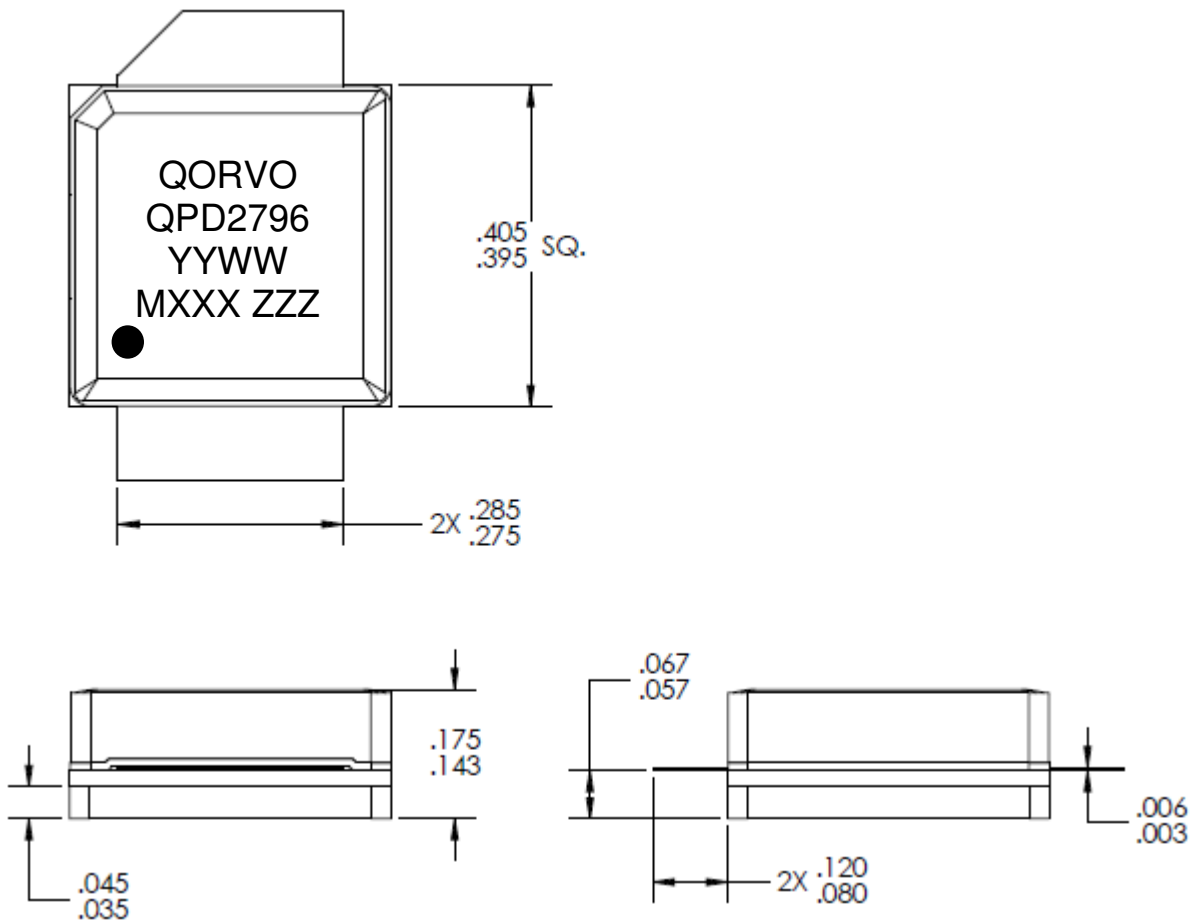
Pin Configuration and Description



Pin No.	Label	Description
1	RF IN, $V_G$	RF Input, Gate Bias
2	RF OUT, $V_D$	RF Output, Drain Bias
3 (Backside Paddle)	RF/DC GND	RF/DC Ground

**Package Marking and Dimensions**

Marking: Product Name – QPD2796  
 Year/Week Code– YYWW  
 Production Lot Number – MXXX  
 Serial Number – ZZZ



- Notes:
1. All dimensions are in inches. Angles are in degrees.
  2. Exposed metallization is NiAu plated.

**Product Compliance Information**

**ESD Sensitivity Ratings**



Caution! ESD-Sensitive Device

ESD Class: TBD  
 Volt. Range: TBD  
 Test: Human Body Model (HBM)  
 Standard: JEDEC Standard JS-001-2012

ESD Class: TBD  
 Range: TBD  
 Test: Charged Device Model (CDM)  
 Standard: JEDEC Standard JESD22-C101F

**MSL Rating**

MSL Rating: TBD  
 Test: 260 °C convection reflow  
 Standard: JEDEC Standard IPC/JEDEC J-STD-020

**ECCN**

US Department of Commerce EAR99

**Solderability**

Compatible with both lead-free (260 °C maximum reflow temperature) and tin/lead (245 °C maximum reflow temperature) soldering processes.

Contact plating: NiAu

**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
- 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.triquint.com](http://www.triquint.com) **Tel:** 877-800-8584  
**Email:** [customer.support@qorvo.com](mailto:customer.support@qorvo.com)

For information about the merger of RFMD and TriQuint as Qorvo: **Web:** [www.qorvo.com](http://www.qorvo.com)

For technical questions and application information: **Email:** [btsapplications@tqs.com](mailto:btsapplications@tqs.com)

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