

Applications

- W-CDMA / LTE
- Macrocell Base Station, Band 7
- Active Antenna
- General Purpose Applications

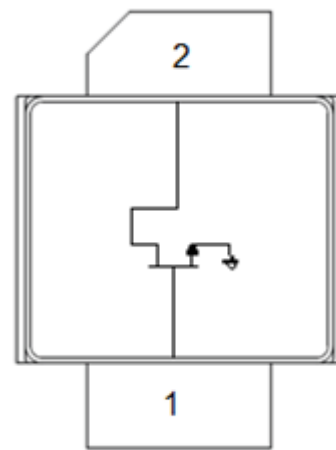


2 Lead NI400 Package

Product Features

- Operating Frequency Range: 2.62-2.69 GHz
- Operating Drain Voltage: 48 V
- Maximum Output Power (P_{SAT}): 200 W
- Maximum Drain Efficiency: 75%
- Efficiency-Tuned P3dB Gain: 19 dB
- 2-lead, earless, ceramic flange NI400 package

Functional Block Diagram



General Description

The QPD2793 is a discrete GaN on SiC HEMT which operates from 2.62-2.69 GHz. The device is a single stage matched power amplifier transistor.

The QPD2793 can be used in Doherty architecture for the final stage of a base station power amplifier for macrocell high efficiency systems.

QPD2793 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
QPD2793	EAR99	200 W, 2.62-2.69 GHz, GaN Discrete

Absolute Maximum Ratings

Parameter	Rating
Gate Voltage (V_G)	-10 V
Drain Voltage (V_D)	+55 V
Peak RF Input Power	43 dBm
VSWR Mismatch, P1dB Pulse (10% duty cycle, 100 μ 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)		-2.9		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: $V_G = -2.9$ V, $V_D = 48$ V, $I_{DQ} = 360$ mA, $T = 25^\circ\text{C}$, Pulsed (10% duty cycle, 100 μs width)

Frequency (MHz)	Source Impedance	Load Impedance	Gain @ P3dB (dB)	P3dB (dBm)	Drain Efficiency (%)
2620	4.260 – j0.510	7.577 – j2.638	16.9	53.0	62.1
2655	4.780 – j0.660	7.569 – j2.653	17.8	53.1	61.6
2690	2.040 – j0.750	7.566 – j2.654	16.9	53.0	60.6

RF Characterization – Efficiency-Tuned Load Pull Performance

Test conditions unless otherwise noted: $V_G = -2.9$ V, $V_D = 48$ V, $I_{DQ} = 360$ mA, $T = 25^\circ\text{C}$, Pulsed (10% duty cycle, 100 μs width)

Frequency (MHz)	Source Impedance	Load Impedance	Gain @ P3dB (dB)	P3dB (dBm)	Drain Efficiency (%)
2620	4.260 – j0.510	3.029 – j4.088	19.1	51.2	74.7
2655	4.780 – j0.660	3.021 – j4.083	20.5	51.1	75.1
2690	2.040 – j0.750	2.498 – j4.489	20.1	50.4	74.1

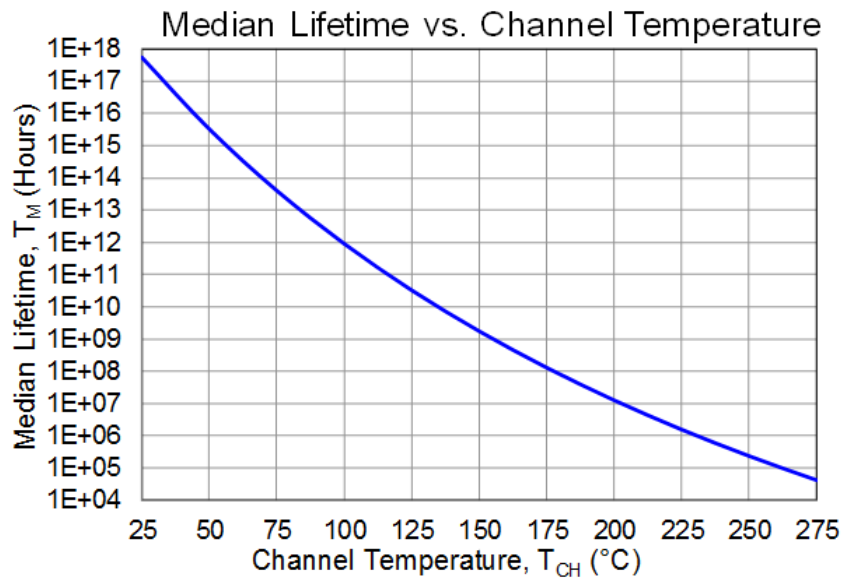
Thermal Information

Parameter	Conditions	Value	Units
Thermal Resistance at Average Power (θ_{JC})	$T_{CASE} = 85^{\circ}C, T_{CH} = 123^{\circ}C$ CW: $P_{DISS} = 29 W, P_{OUT} = 50 W$	1.31	$^{\circ}C/W$

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.

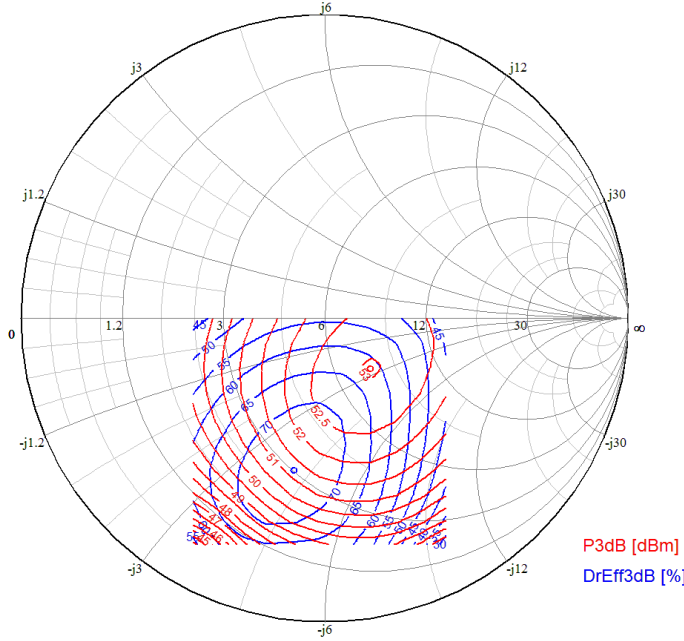
Median Lifetime



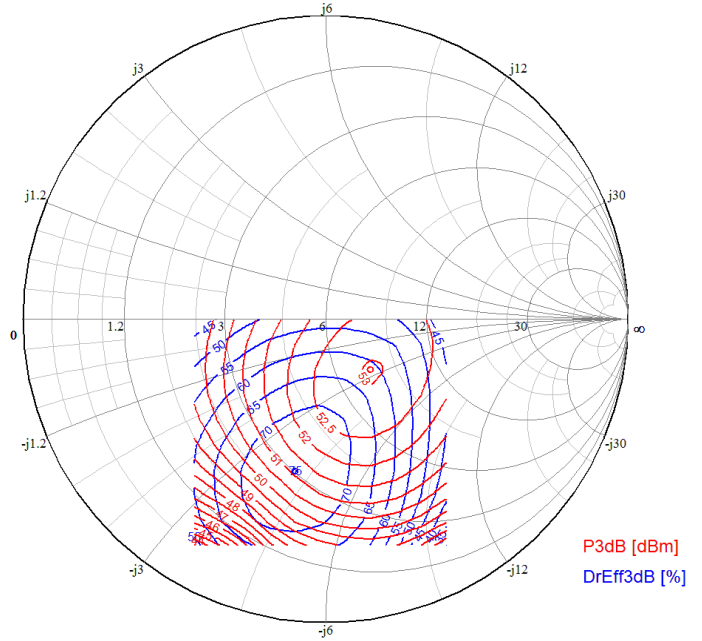
Load Pull Plots

Test conditions unless otherwise noted: $V_{G1} = -2.9\text{ V}$, $V_{D1} = 48\text{ V}$, $I_{CQ1} = 360\text{ mA}$, $T = 25^\circ\text{C}$, Pulsed (10% duty cycle, 100 μs width)

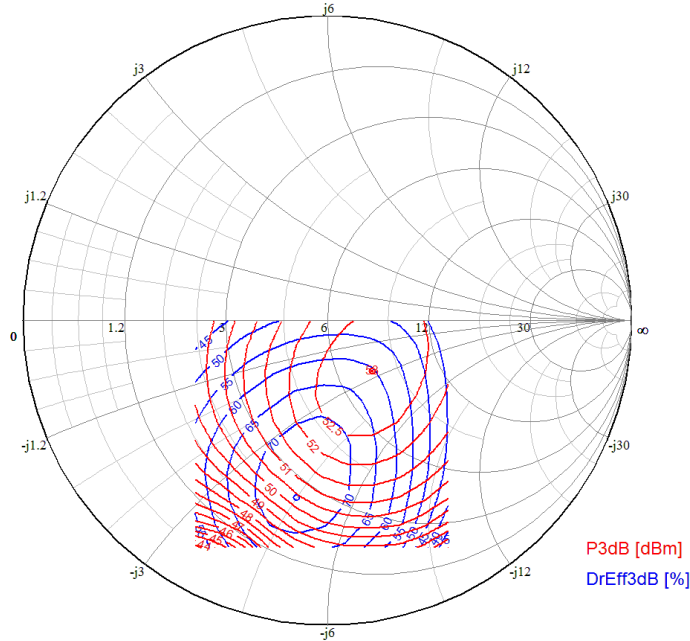
Load Pull at 2.62 GHz



Load Pull at 2.655 GHz



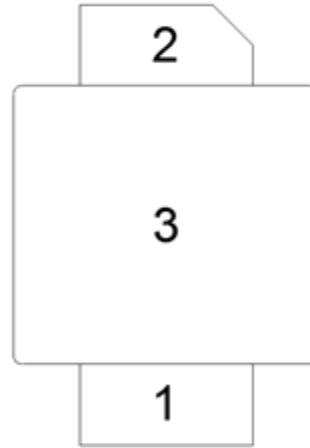
Load Pull at 2.69 GHz



Pin Configuration and Description



TOP VIEW

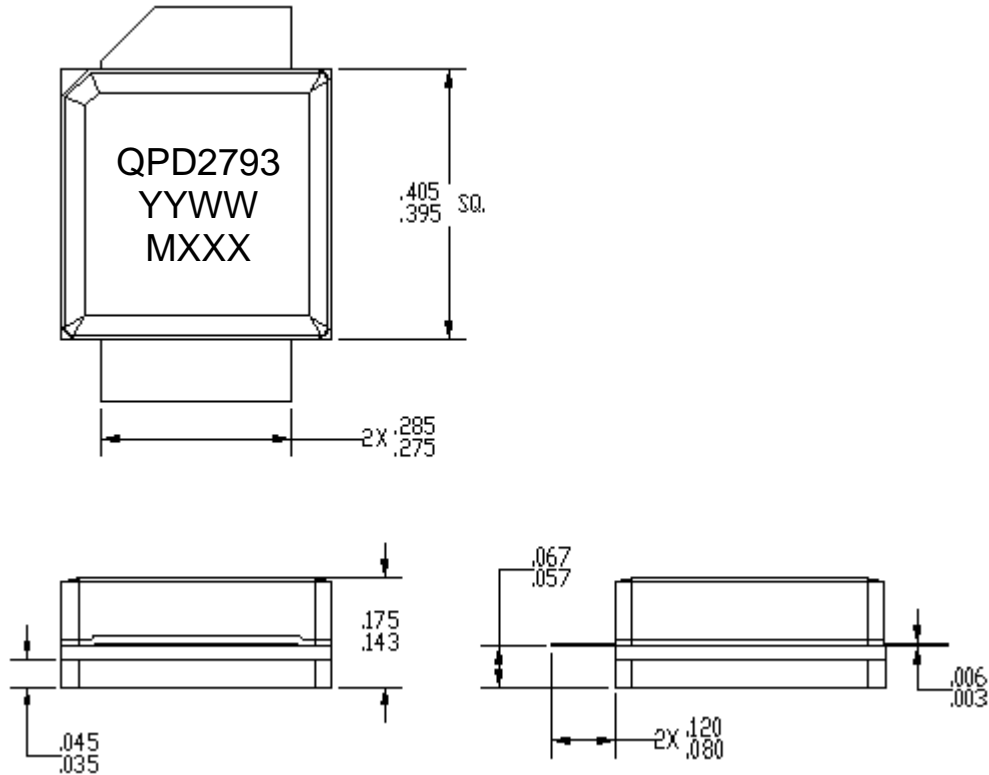


BOTTOM VIEW

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 – QPD2793
Year/Week Code– YYWW
Production Lot Number – MXXX



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