

Applications

- W-CDMA / LTE
- Macrocell Base Station Driver
- Microcell Base Station
- Small Cell Final Stage
- Active Antenna
- General Purpose Applications

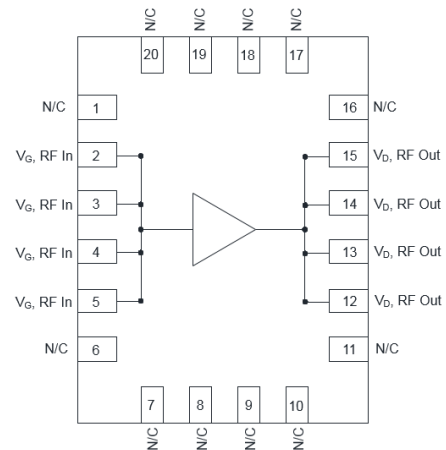


20 Pin 3x4mm QFN

Product Features

- Operating Frequency Range: DC to 4 GHz
- Operating Drain Voltage: 48 V
- Maximum Output Power (P_{SAT}): 49 W
- Maximum Drain Efficiency: 72.5%
- Efficiency-Tuned P3dB Gain: 21.7 dB
- Surface Mount Plastic Overmold package

Functional Block Diagram



General Description

The QPD0030 is a wide band over-molded QFN discrete power amplifier. The device is a single stage unmatched power amplifier transistor.

The QPD0030 can be used in Doherty architecture for the final stage of a base station power amplifier for small cell, microcell, and active antenna systems. The QPD0030 can also be used as a driver in a macrocell base station power amplifier.

The wide bandwidth of the QPD0030 makes it suitable for many different applications from DC to 4 GHz. QPD0030 can deliver P_{SAT} of 49 W at 48 V operation.

Lead-free and ROHS compliant.

Pin Configuration

Pin No.	Label
2, 3, 4, 5	RF IN, V_G
12, 13, 14, 15	RF OUT, V_D
1, 6-11, 16-20	N/C
Backside Paddle	RF/DC Ground

Ordering Information

Part No.	ECCN	Description
QPD0030	EAR99	45W DC to 4 GHz

Absolute Maximum Ratings

Parameter	Rating
Gate Voltage (V_G)	-10 V
Drain Voltage (V_D)	+55 V
Maximum RF Input Power	33 dBm
VSWR Mismatch, P1dB Pulse (20% 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)		-2.5		V
Drain Voltage (V_D)		48		V
Quiescent Current (I_{CQ})		90		mA
T_{CH} for $>10^6$ hours MTF			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, $I_{DQ} = 85$ mA, $T = 25^\circ\text{C}$, pulsed CW (10% duty cycle, 100 μs width), and fixed second harmonic for optimal efficiency.

Frequency (MHz)	Source Impedance	Load Impedance	2 nd Harmonic Load Impedance	Gain @ P3dB (dB)	P3dB (dBm)	Drain Efficiency (%)
1800	22.34 - j5.34	9.30 + j4.15	24.43 + j43.11	21.66	46.90	60.28
2000	26.00 + j1.18	7.55 + j5.63	24.43 + j43.11	21.26	46.51	62.51
2200	18.40 + j2.92	7.04 + j4.47	10.09 + j26.02	19.52	46.88	56.35
2500	19.94 + j0.77	6.62 + j3.94	6.85 + j18.79	18.41	46.78	59.38
2600	18.47 - j0.83	5.26 + j2.94	5.89 + j15.91	17.60	46.83	55.53

RF Characterization – Efficiency-Tuned Load Pull Performance

Test conditions unless otherwise noted: $V_D = 48$ V, $I_{DQ} = 85$ mA, $T = 25^\circ\text{C}$, pulsed CW (10% duty cycle, 100 μs width), and fixed second harmonic for optimal efficiency.

Frequency (MHz)	Source Impedance	Load Impedance	2 nd Harmonic Load Impedance	Gain @ P3dB (dB)	P3dB (dBm)	Drain Efficiency (%)
1800	22.34 - j5.34	8.37 + j12.72	24.43 + j43.11	23.85	45.29	72.53
2000	26.00 + j1.18	7.47 + j10.34	24.43 + j43.11	22.72	45.37	70.46
2200	18.40 + j2.92	5.05 + j10.28	10.09 + j26.02	22.07	45.17	71.92
2500	19.94 + j0.77	4.22 + j8.18	6.85 + j18.79	20.07	45.21	71.35
2600	18.47 - j0.83	4.22 + j8.17	5.89 + j15.91	19.81	44.99	71.84

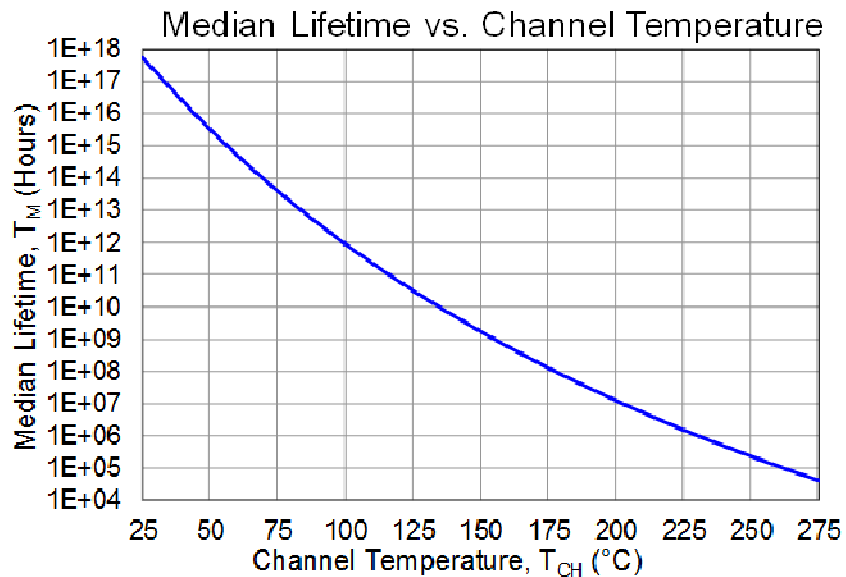
Thermal Information

Parameter	Conditions	Value	Units
Thermal Resistance at Average Power (θ_{JC})	$T_{CASE} = 105^{\circ}C, T_{CH} = 150^{\circ}C$ CW: $P_{DISS} = 11.4 W, P_{OUT} = 2.5 W$	3.9	$^{\circ}C/W$
Thermal Resistance at Peak Power (θ_{JC})	$T_{CASE} = 105^{\circ}C, T_{CH} = 225^{\circ}C$ CW: $P_{DISS} = 26.5 W, P_{OUT} = 39.8 W$	4.5	$^{\circ}C/W$

Notes:

1. Thermal resistance measured to package backside.

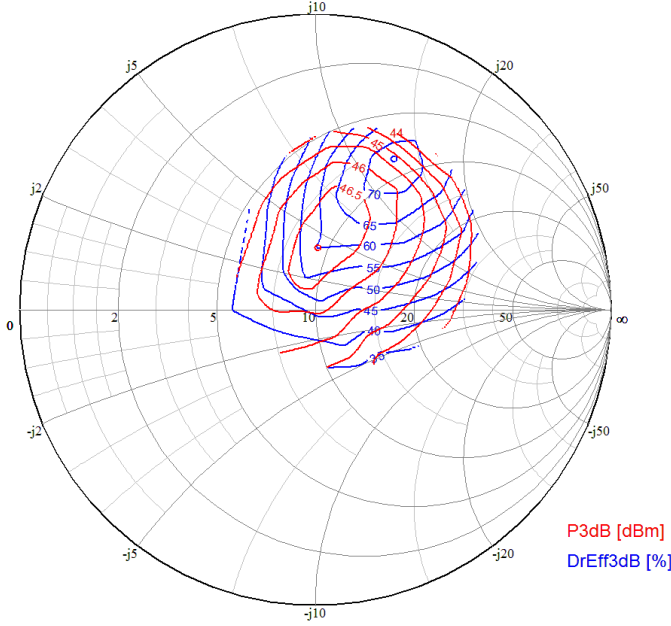
Median Lifetime



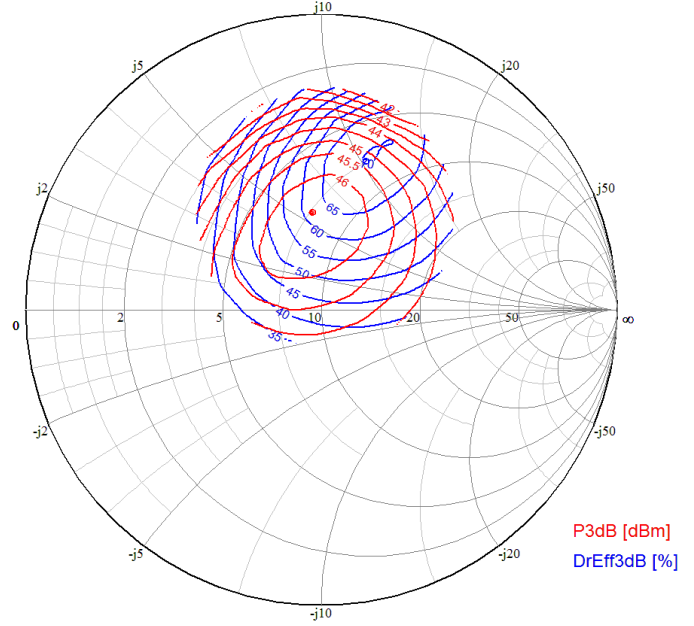
Load Pull Plots

Test conditions unless otherwise noted: $V_D = 48\text{ V}$, $I_{CQ} = 85\text{ mA}$, $T = 25^\circ\text{C}$, pulsed CW (10% duty cycle, 100 μs width), and fixed second harmonic for optimal efficiency.

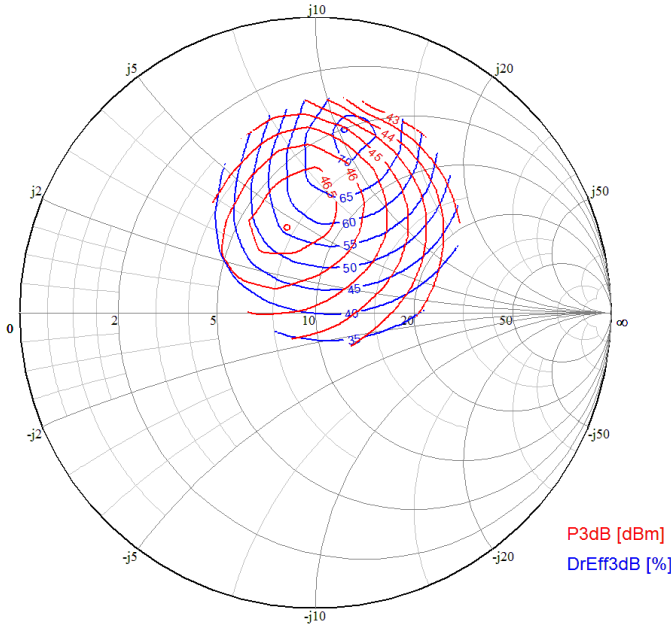
Load Pull at 1.8 GHz



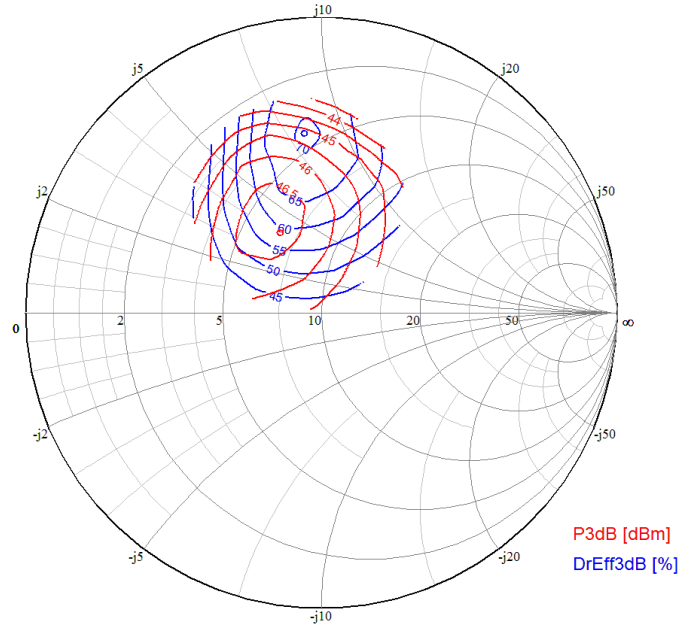
Load Pull at 2 GHz



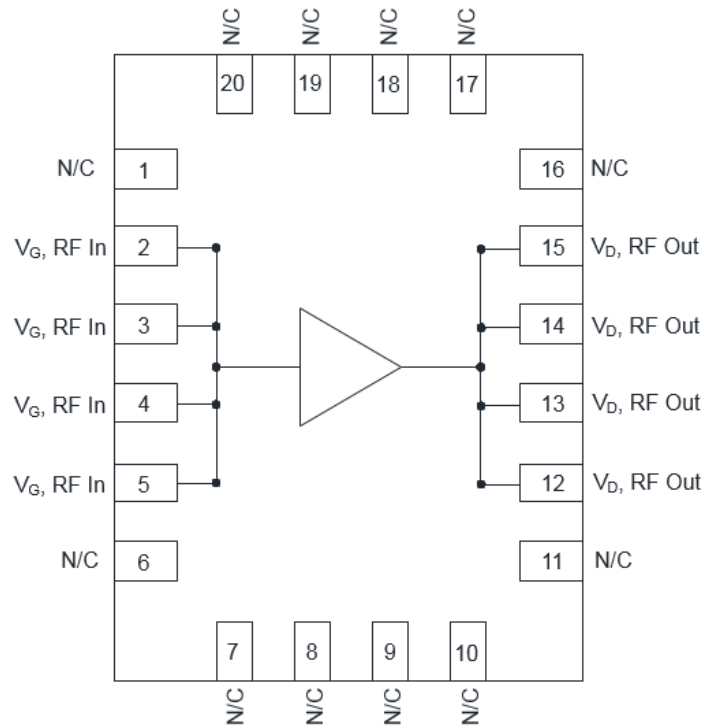
Load Pull at 2.2 GHz



Load Pull at 2.5 GHz



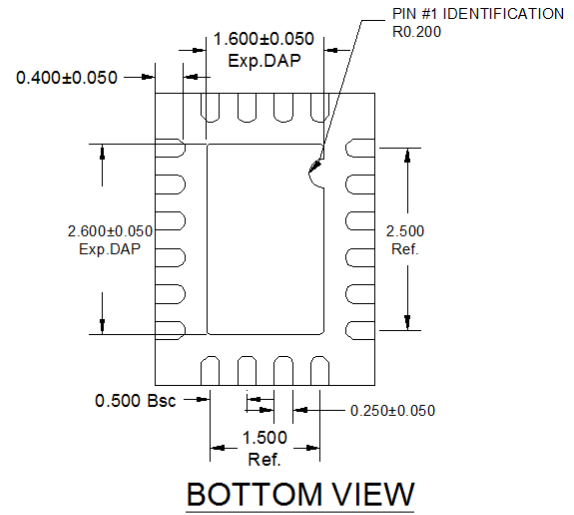
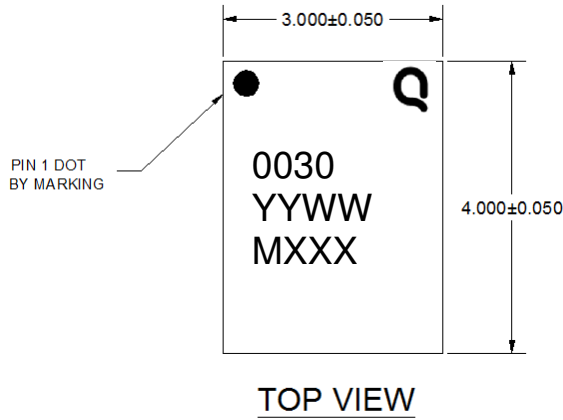
Pin Configuration and Description



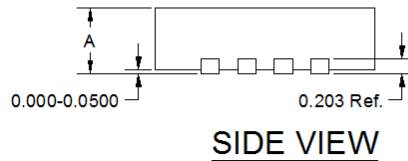
Pin No.	Label	Description
2, 3, 4, 5	RF IN, V _G	RF Input, Gate Bias
1, 6, 7, 8, 9, 10, 11, 16, 17, 18, 19, 20	N/C	No Connection
12, 13, 14, 15	RF OUT, V _D	RF Output, Drain Bias
Backside Paddle	RF/DC GND	RF/DC Ground

Package Marking and Dimensions

Marking: Product Name – 0030
 Year, Work Week Assembly Code – YYWW
 Assembly Number – MXXX



A	MAX.	QFN 0.900
	NOM.	0.850
	MIN.	0.800



- 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: Level 3

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 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 (C₁₅H₁₂Br₄O₂) Free
- PFOS Free
- SVHC Free

Contact Information

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

Web: www.triquint.com

Tel: 877-800-8584

Email: customer.support@qorvo.com

For information about the merger of RFMD and TriQuint as Qorvo:

Web: www.qorvo.com

For technical questions and application information:

Email: btsapplications@tqs.com

Important Notice

The information contained herein is believed to be reliable. TriQuint makes no warranties regarding the information contained herein. TriQuint assumes no responsibility or liability whatsoever for any of the information contained herein. TriQuint assumes no responsibility or liability whatsoever for the use of the information contained herein. The information contained herein is provided "AS IS, WHERE IS" and with all faults, and the entire risk associated with such information is entirely with the user. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for TriQuint products. The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information.

TriQuint products are not warranted or authorized for use as critical components in medical, life-saving, or life-sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.