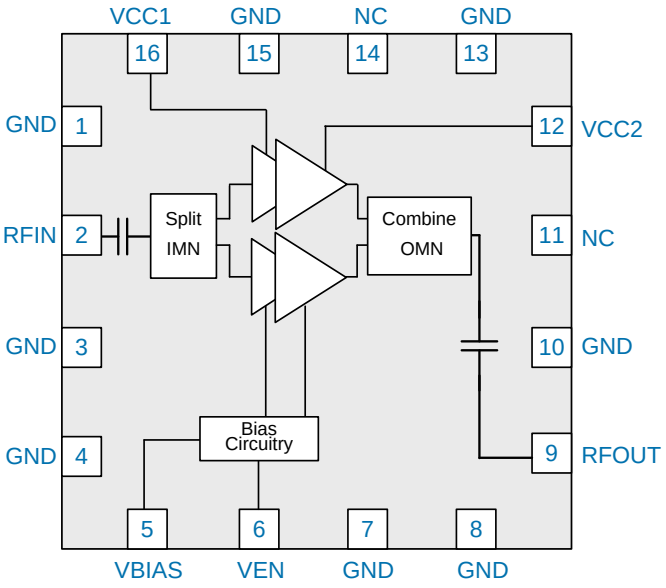
RFMD + TriQuint = Qorvo

RFPA0875

Integrated Power Amplifier Module
869MHz to 894MHz

Package: Module, 16-pin,
5.0mm x 5.0mm x 1.175mm

The RFPA0875 is a two-stage power amplifier (PA) designed for Small Cell Base Stations. Its broadband quadrature design supports usage in multiple bands with excellent output return loss and load tolerance. When used with DPD, the RFPA0875 delivers up to 28dBm LTE Downlink (CFR 8dB) with ACLR -50dBc



Functional Block Diagram

Features

- P_{OUT} = 28dBm, 26% PAE, with 5V, 20MHz LTE DL, CFR 8dB
- ACLR -50dBc with DPD
- 29dB Gain
- Integrated Matching to 50Ω
- Integrated DC Block Capacitors
- Broadband Quadrature Design
- Excellent Output Return Loss
- Covers 3GPP Downlink in Band 5
- VSWR Tolerant, Load Insensitive

Applications

- Small Cell Base Stations
- Data Cards with Terminals
- Customer Premise Equipment

Ordering Information

RFPA0875SQ	Sample bag with 25 pieces
RFPA0875SR	7" Reel with 100 pieces
RFPA0875TR13	13" Reel with 2500 pieces
RFPA0875PCK-410	869MHz to 894MHz PCBA with 5-piece sample bag

Absolute Maximum Ratings

Parameter	Rating	Unit
DC Supply Voltage, V_{CC} (P_{OUT} <28dBm, VSWR < 6:1)	6	V
Enable Control Logic, V_{EN}	+3.3	V
Maximum Average RF Input Power into 50Ω Load (V_{CC} = 5.25V)	30	dBm
Modulated (LTE-20MHz) Input Power 6:1 Output VSWR (V_{CC} = 5.25V)	-4	dBm
Operating Case Temperature	-40 to +85	°C
Storage Temperature Range	-40 to +150	°C
Moisture Sensitivity Level (260° JEDEC J-STD-020)	MSL 3	
ESD Rating, All Pins, HBM, JEDEC JS-001	1000	V
ESD Rating, All Pins, CDM, JEDEC JS-002	1000	V

Caution! ESD sensitive device.

RFMD Green: RoHS status based on EU Directive 2011/65/EU (at time of this document revision), halogen free per IEC 61249-2-21, < 1000ppm each of antimony trioxide in polymeric materials and red phosphorus as a flame retardant, and <2% antimony in solder.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

Recommended Operating Condition

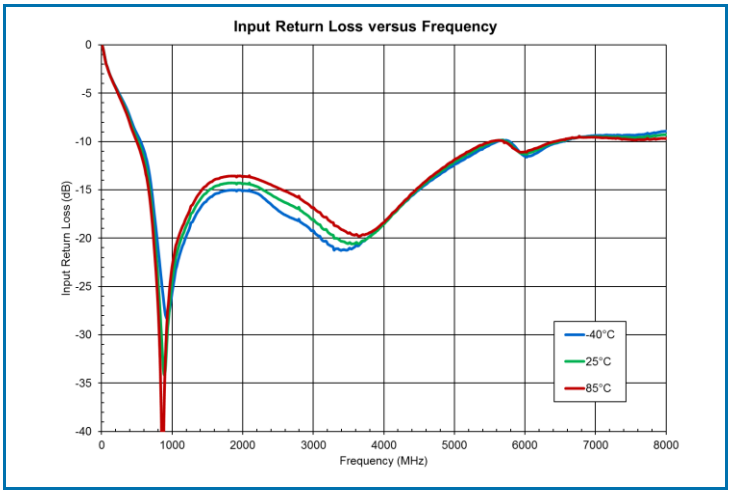
Parameter	Specification			Unit
	Min	Typ	Max	
Operating Temperature Range	-40		+85	°C
Operating Junction Temperature			180	°C
Power Supply V_{CC1}, V_{CC2}, V_{BIAS}	4.75	5	5.25	V

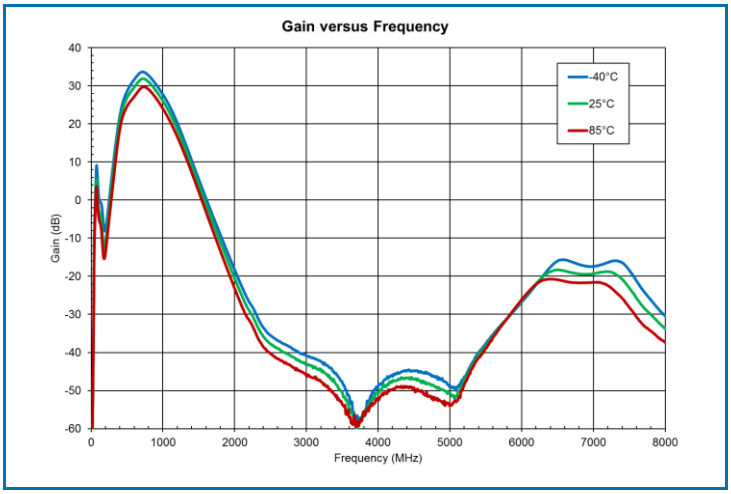
Nominal Operating Parameters

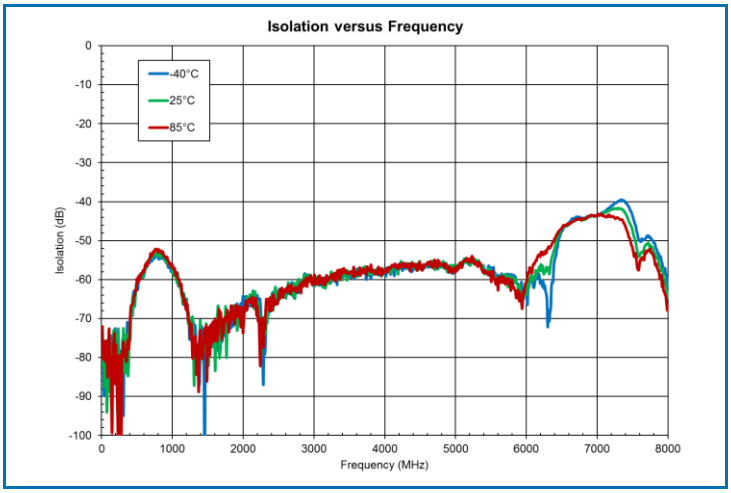
Parameter	Specification			Unit	Condition
	Min	Typ	Max		
General Performance					
Operating Frequency Range	869		894	MHz	
V_{EN} Range (Logic Low)	0		0.4	V	
V_{EN} Range (Logic High)	1.4		3.0	V	
V_{EN} Enable Current			0.2	mA	V_{EN} = 1.8V
Total Idle Current (I_{CQ})		110		mA	DC only, V_{CC1} = V_{CC2} = V_{BIAS} = 5V, V_{EN} = 1.8V
V_{BIAS} Current		3		mA	DC only, V_{EN} = 1.8V
DC Enable Time			7	µs	DC only, time from V_{EN} = high to stable idle current (90% of steady state value)
RF Rise / Fall Time			2	µs	P_{OUT} ≤ 28dBm, 90% of target, DC settled prior to RF
Thermal Resistance (R_{TH})		31		°C/W	Junction-to-backside of IC

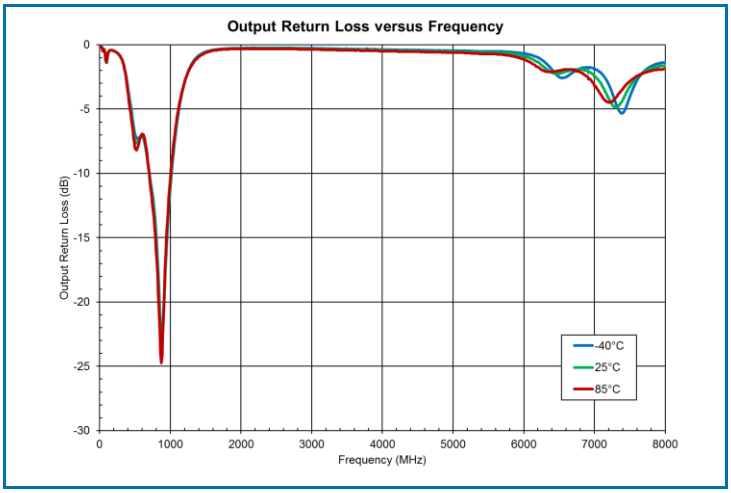
Parameter	Specification			Unit	Condition
	Min	Typ	Max		
Electrical Performance: Band 5					**Unless Otherwise Specified; Temp = +25°C, V_{CC} = +5.0V, V_{EN} = +1.8V, P_{OUT} = 28dBm, 869MHz < F < 894MHz, 50Ω system, 20MHz LTE DL with CFR 8dB**
Gain		29		dB	
ACLR1 – Adjacent Channel		-33		dBc	Without DPD
ACLR2 – Alternate Channel		-46		dBc	Without DPD
ACLR1_DPD		-50		dBc	With DPD
ACLR2_DPD		-56		dBc	With DPD
PA Current Drain		480		mA	With DPD
PAE		26		%	With DPD
Input Return Loss		-25		dB	Small signal S11, no external matching
Output Return Loss		-22		dB	Small signal S22, no external matching
Harmonics 2fo		-27		dBm	
Harmonics 3fo		-50		dBm	
Noise Figure		5.7		dB	Temp = +25°C, V_{CC} = +5V, V_{EN} = +1.8V

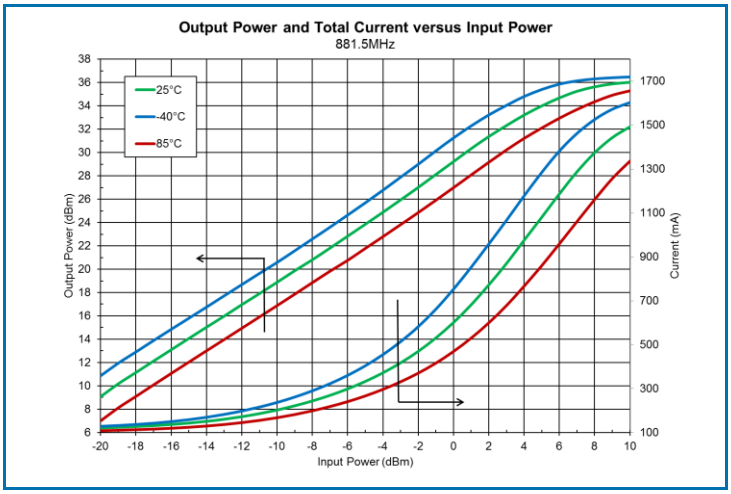
Typical Performance: V_{CC} = V_{BIAS} = 5V, V_{EN} = 1.8V unless otherwise noted

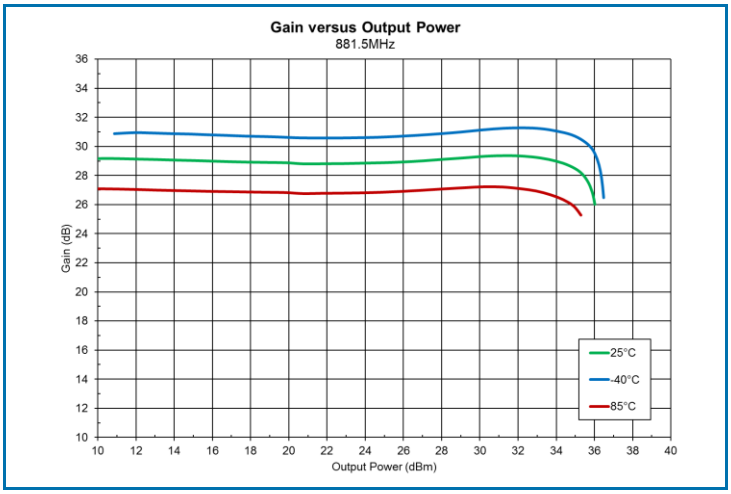




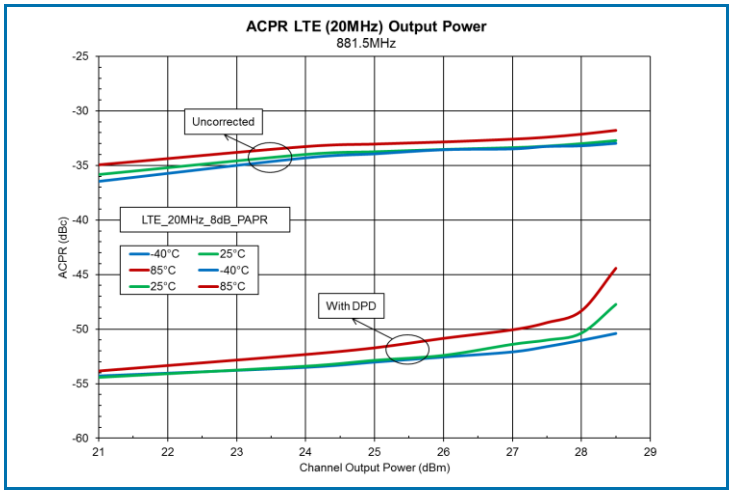


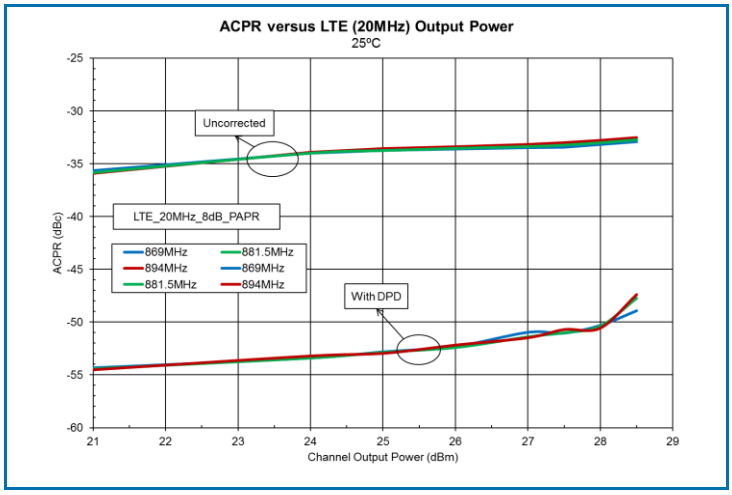


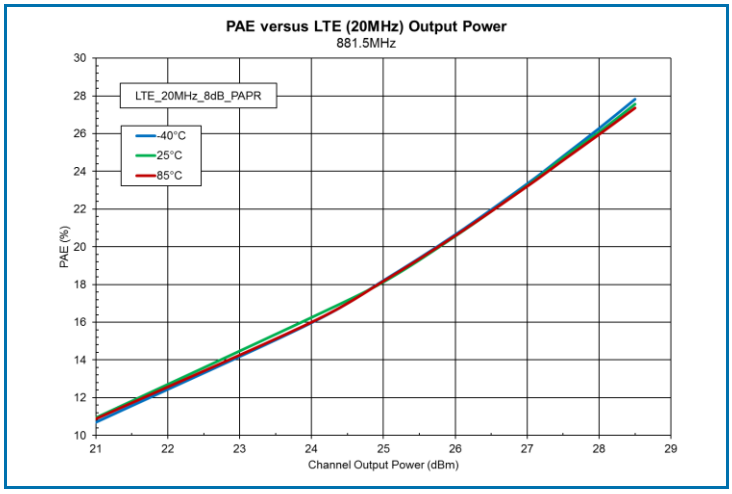


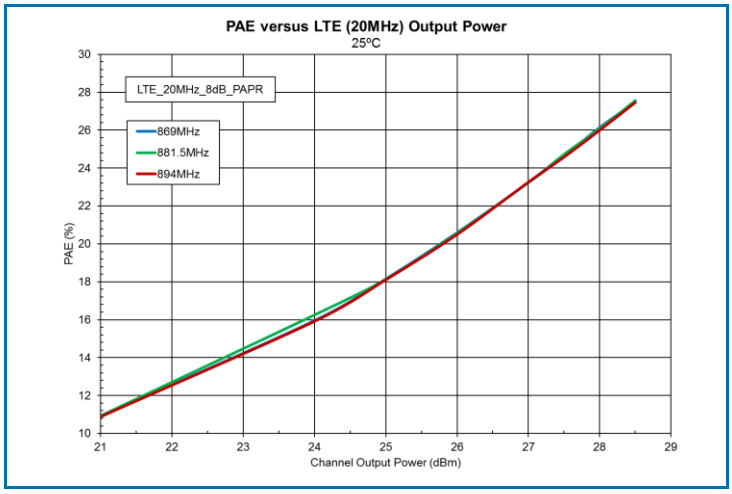


Typical Performance: V_{CC} = V_{BIAS} = 5V, V_{EN} = 1.8V unless otherwise noted

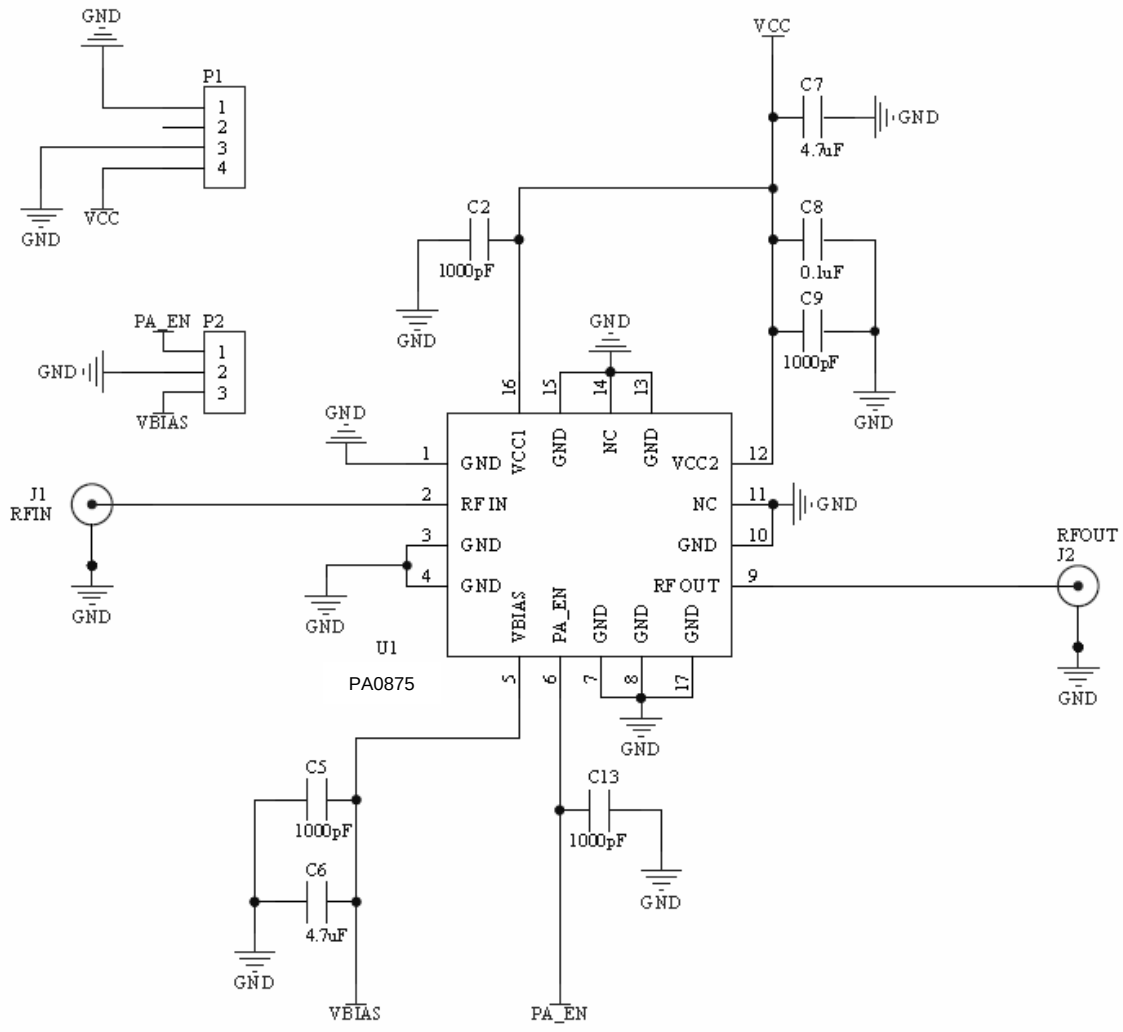








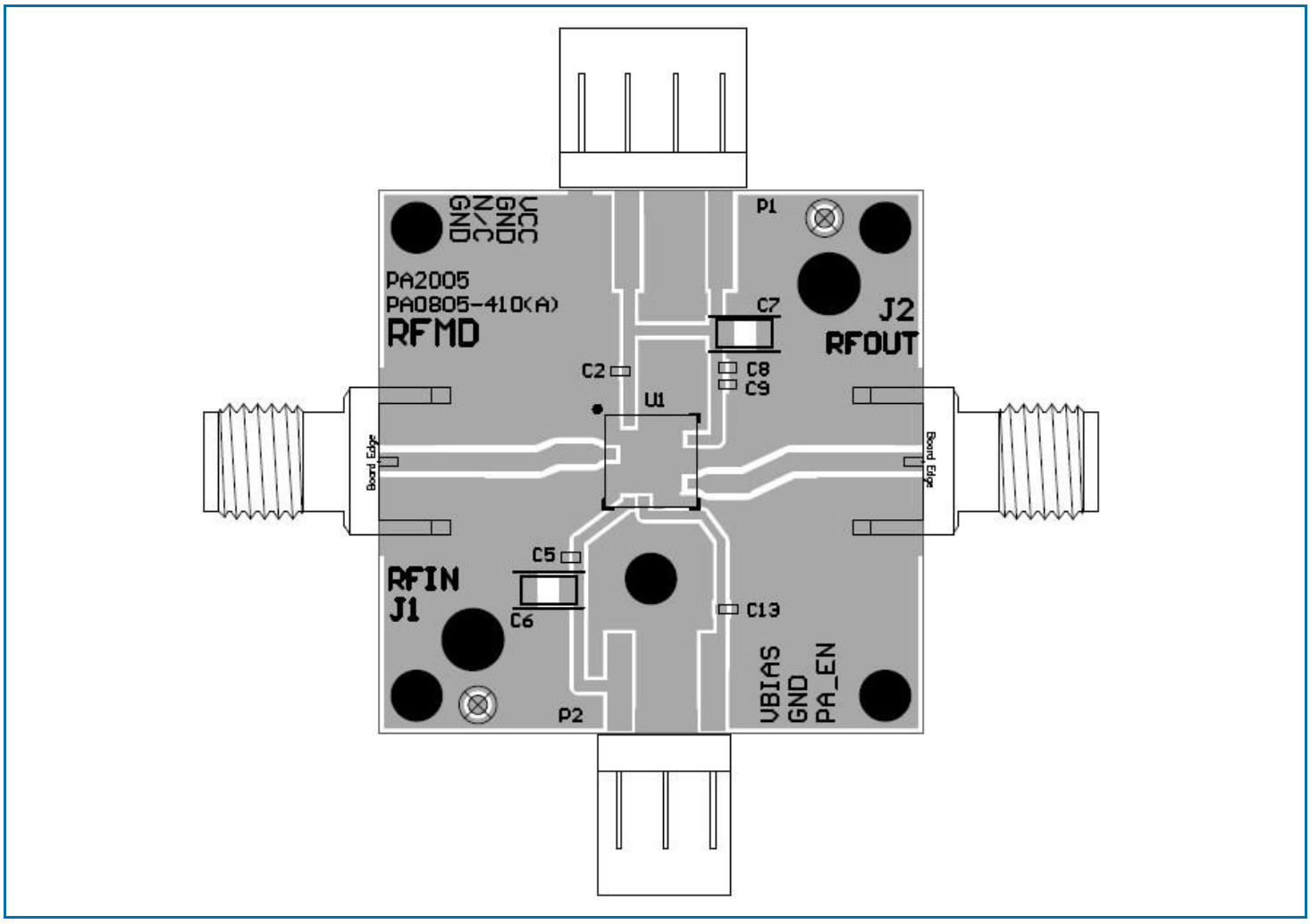
Evaluation Board Schematic: 869MHz to 894MHz (Band 5) Application Circuit



Evaluation Board Bill of Materials (BOM) 869MHz to 894MHz (Band 5) Application Circuit

Description	Reference Designator	Manufacturer	Manufacturer's P/N
RFPA0875 Evaluation Board		Dynamic Details (DDI) Toronto	RFPA0805-410(A)
869MHz to 894MHz Integrated PA Module	U1	RFMD	RFPA0875
CAP, 4.7µF, 20%, 10V, X7R, 1206	C6-C7	Taiyo Yuden (USA), Inc.	CE LMK316 B7475ML-T
CAP, 1000pF, 10%, 50V, X7R, 0402	C2, C5, C9, C13	Murata Electronics	GRM155R71H102KA01D
CAP, 0.1µF, 10%, 16V, X7R, 0402 MURATA	C8	Murata Electronics	GRM155R71C104KA88D
CONN, SMA, END, LAUNCH, 0.068”	J1-J2	Gigalane Co., LTD.	PA-S05-008
CONN, HDR, ST, PLRZD, 4-PIN, 0.100”	P1	ITW Pancon	MPSS100-4-C
CONN, HDR, ST, PLRZD, 3-PIN, 0.100”	P2	ITW Pancon	MPSS100-3-C

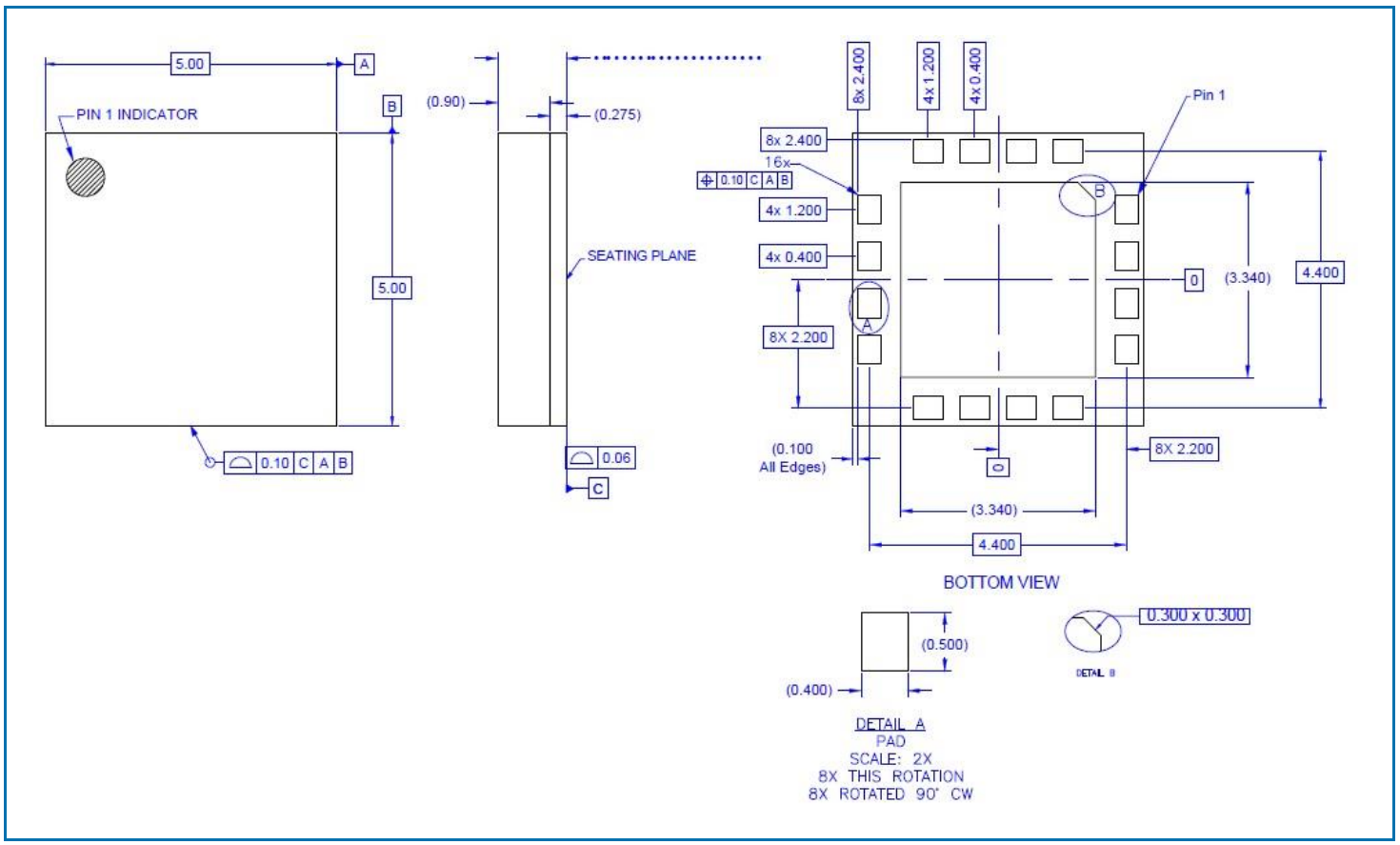
Assembly Drawing



Pin Names and Descriptions

Pin	Name	Description
1	GND	Ground connection
2	RF_{IN}	RF Input; Internally matched to 50Ω
3	GND	Ground connection
4	GND	Ground connection
5	V_{BIAS}	Input Bias Voltage
6	V_{EN}	Enable
7	GND	Ground connection
8	GND	Ground connection
9	RF_{OUT}	RF Output; Internally matched to 50Ω
10	GND	Ground connection
11	NC	Not connected
12	V_{CC2}	Output stage collector supply voltage
13	GND	Ground connection
14	NC	Not connected , OPEN Circuit in the module
15	GND	Ground connection
16	V_{CC1}	Drive stage collector supply voltage
PKG BASE	GND	Ground connection; The back side of the package should be connected to the ground plane though as short of a connection as possible, PCB vias under the device are recommended.

Package Outline (Dimensions in millimeters)



Contact Information

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

Web: **www.rfmd.com** **Tel: 1-844-890-8163**
Email: **customer.support@qorvo.com**

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

Web: **www.qorvo.com**

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