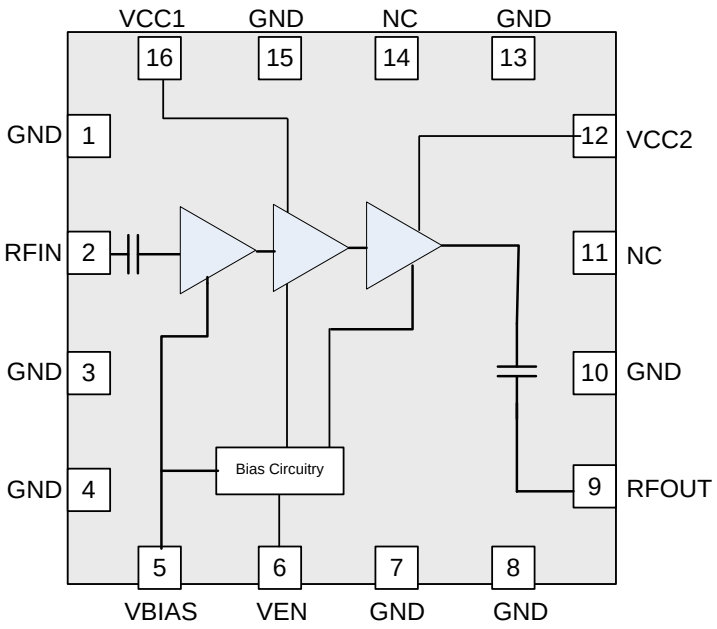
RFMD + TriQuint = Qorvo

RFPA2625

Integrated Power Amplifier Module
2496MHz to 2690MHz

The RFPA2625 is a broadband three stage power amplifier (PA) designed to operate in Band 41 Small Cell Base Stations. When used with DPD, the RFPA2625 delivers up to 28dBm LTE Downlink (CFR 8dB) with ACLR < -50dBc



Functional Block Diagram

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

Features

- P_{OUT} = 28dBm, 20% PAE, with 5.25V, 20MHz LTE DL, CFR 8dB
- ACLR < -50dBc with DPD
- 33 dB Gain
- Integrated Matching to 50Ω
- Integrated DC Block Capacitors
- Broadband Design
- Covers 3GPP Downlink in Band 41

Applications

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

Ordering Information

RFPA2625SQ	Sample bag with 25 pieces
RFPA2625SR	7" Reel with 100 pieces
RFPA2625TR13	13" Reel with 2500 pieces
RFPA2625PCK-410	2496MHz to 2690MHz 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} <5.5V)	+5	dBm
Modulated (LTE-20MHz) Input Power 4.5:1 Output VSWR (VCC = 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)	MSL3	-
ESD Rating, All Pins, HBM, JS-001	1000	V
ESD Rating, All Pins, CDM, 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

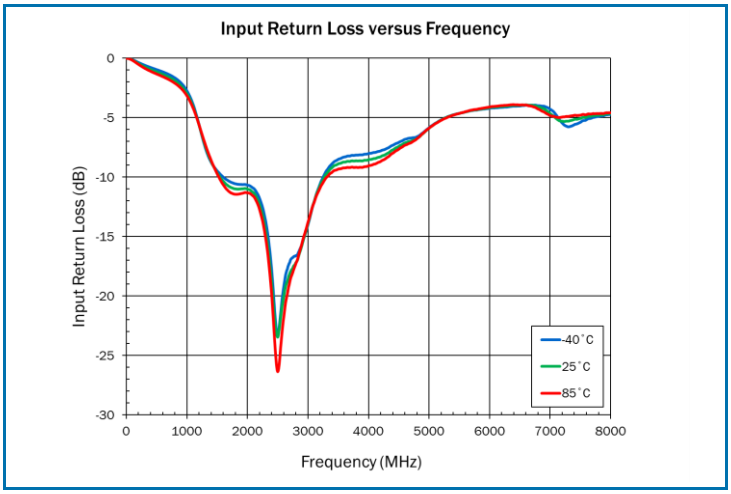
Parameter	Specification			Unit
	Min	Typ	Max	
Operating Temperature Range	-40		+85	°C
Operating Junction Temperature			175	°C
Power Supply V_{CC1}, V_{CC2}, V_{BIAS},	5	5.25	5.5	V

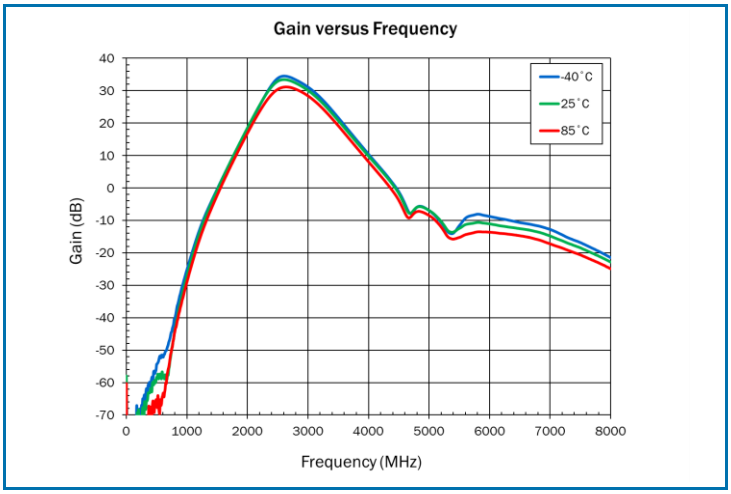
Nominal Operating Parameters

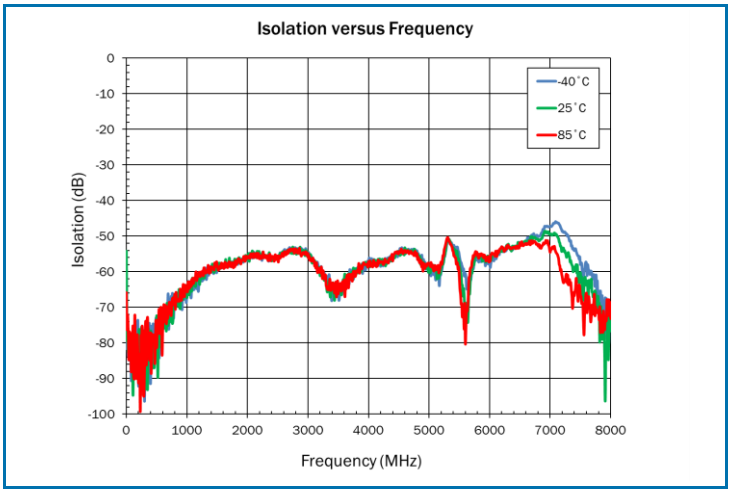
Parameter	Specification			Unit	Condition
	Min	Typ	Max		
General Performance					
Operating Frequency Range	2496		2690	MHz	
V_{EN} Range (Logic Low)	0		0.4	V	
V_{EN} Range (Logic High)	1.4		3.0	V	
V_{EN} Enable Current			0.2	mA	V_{EN} = 1.8V
Total Idle Current (I_{CQ})		175		mA	DC only, V_{CC1} = V_{CC2} = V_{BIAS} = 5.25V, V_{EN} = 1.8V
V_{BIAS} Current		30		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} ≤ 27dBm, 90% of target, DC settled prior to RF
Thermal Resistance (R_{TH})		23		°C/W	Junction-to-backside of IC

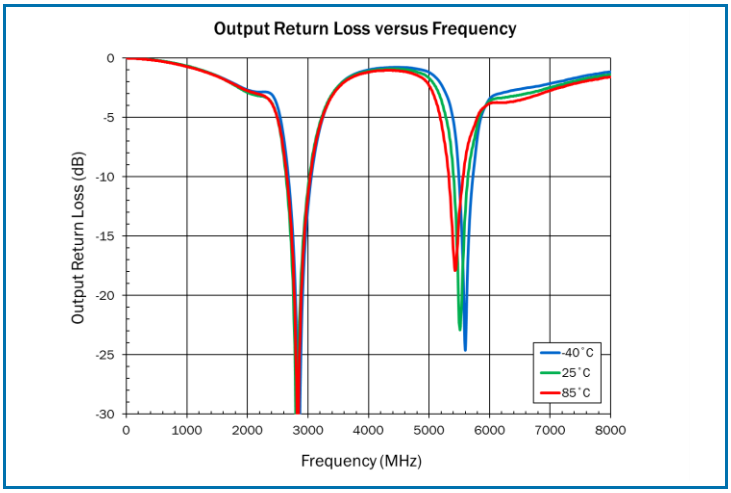
Parameter	Specification			Unit	Condition
	Min	Typ	Max		
Electrical Performance: Band 41					**Unless otherwise specified; Temp = +25°C, V_{CC}, V_{BIAS} = +5.25V, V_{EN} = +1.8V, P_{OUT} = 28dBm, 2496MHz < F < 2690MHz, 50Ω system, 20MHz LTE DL with CFR 8dB**
Gain		33		dB	
ACLR1 – Adjacent Channel		-33		dBc	Without DPD
ACLR2 – Alternate Channel		-47		dBc	Without DPD
ACLR1_DPD		-50		dBc	With DPD
ACLR2_DPD		-51		dBc	With DPD
PA Current Drain		580		mA	With DPD
PAE		20		%	With DPD
Input Return Loss		-19		dB	Small signal S11, no external matching
Output Return Loss		-7		dB	Small signal S22, no external matching
Harmonics 2fo		-21		dBm	
Harmonics 3fo		-34		dBm	
Noise Figure		4.1		dB	Temp = +25ºC, VCC = +5.25V, VEN = +1.8V

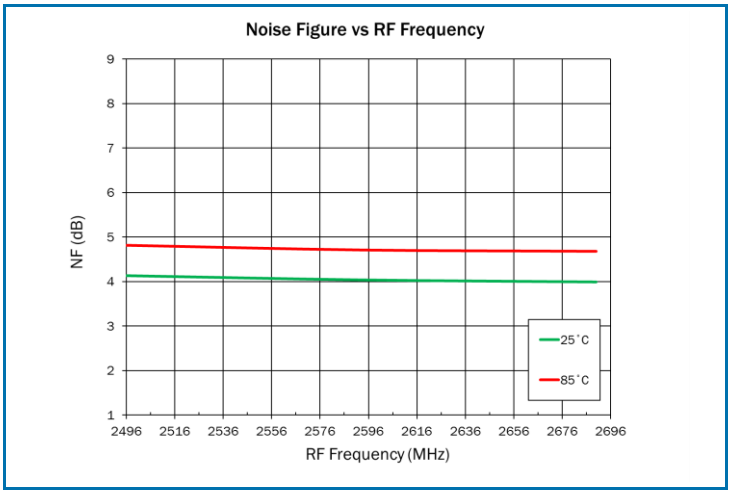
Typical Performance: V_{CC}, V_{BIAS} = 5.25V, V_{EN} = 1.8V, 2496MHz to 2690MHz Application Circuit

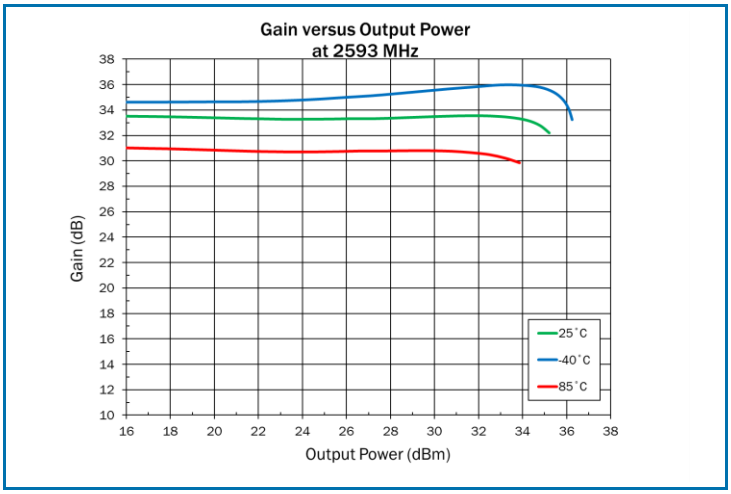




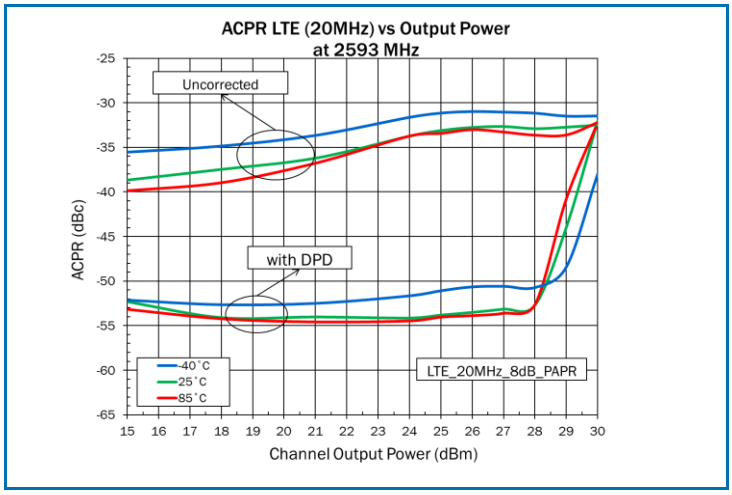


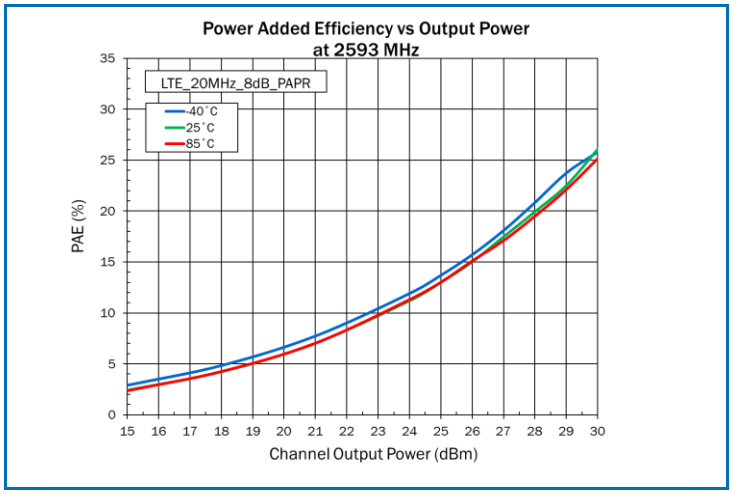


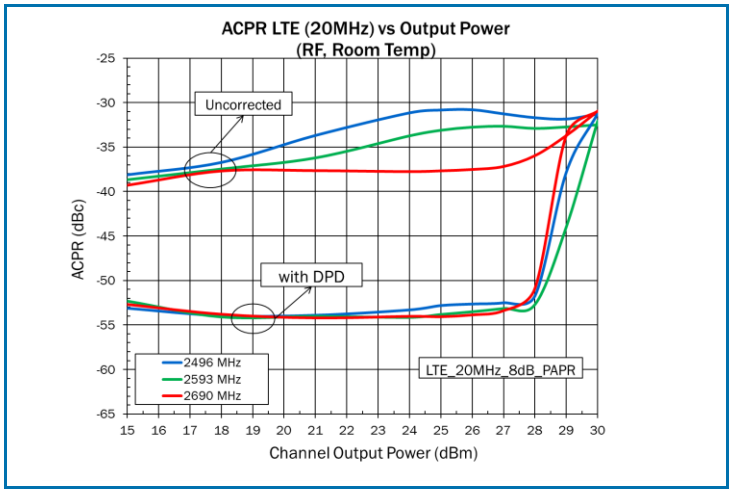


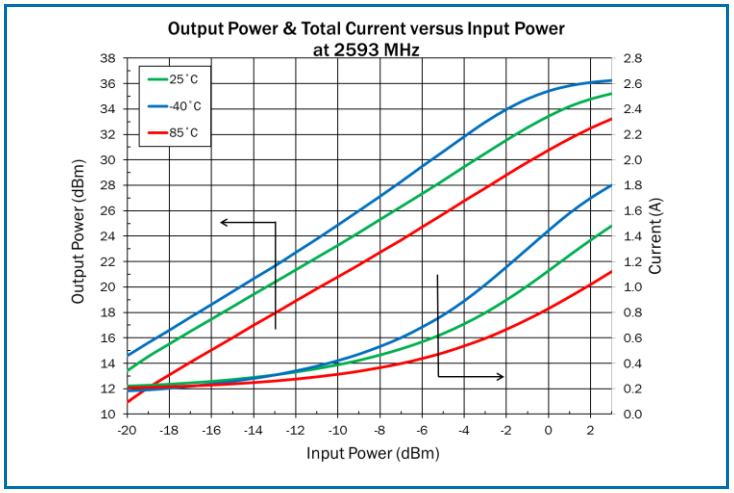


Typical Performance: V_{CC}, V_{BIAS} = 5.25V, V_{EN} = 1.8V, 2496MHz to 2690MHz Application Circuit

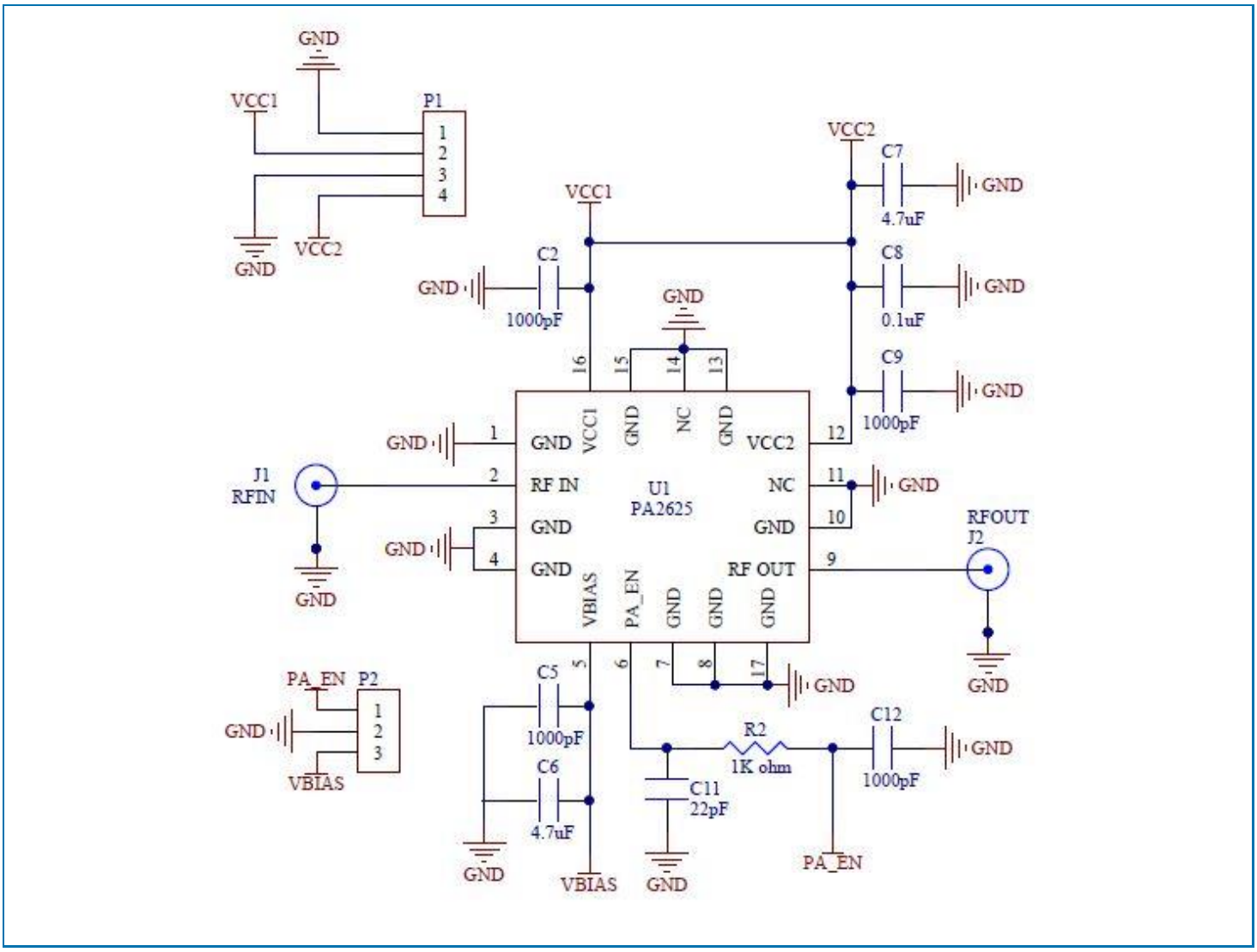








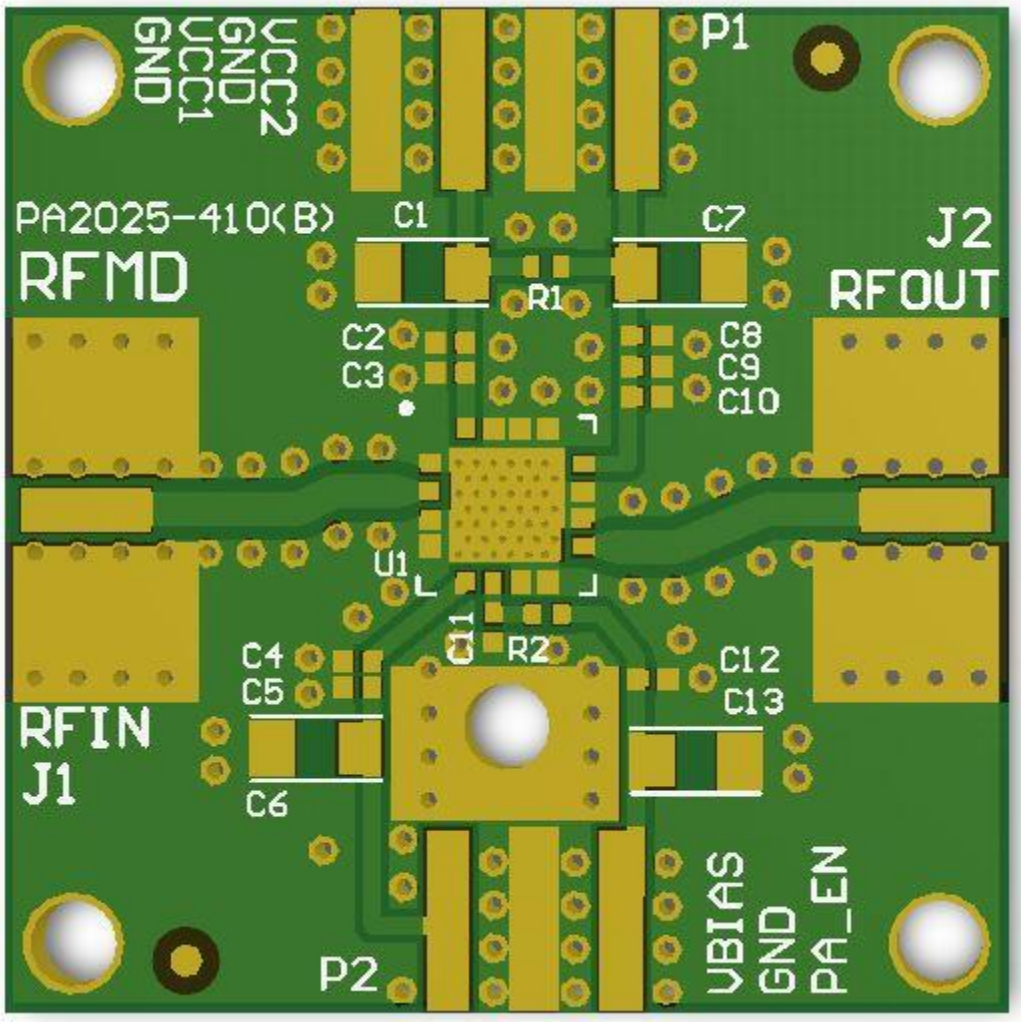
Evaluation Board Schematic: 2496MHz to 2690MHz (Band 41) Application Circuit



Evaluation Board Bill of Materials (BOM)

Description	Reference Designator	Manufacturer	Manufacturer's P/N
RFPA2625 Evaluation Board		Dynamic Details (DDI) Toronto	PA2025-410(B)
2496MHz to 2690MHz Integrated PA Module	U1	RFMD	RFPA2625
CAP, 4.7µF, 20%, 10V, X7R, 1206	C6, C7	Taiyo Yuden Inc	CE LMK316B7475ML-T
CAP, 1000pF, 10%, 50V, X7R, 0402	C2, C5, C9, C12	Murata Electronics	GRM155R71H102KA01D
CAP, 22pF, +/-5%, 50V, COG, 0402	C11	Murata Electronics	GRM1555C1H220JZ01E
CAP, 0.1µF, 10%, 16V, X7R, 0402	C8	Murata Electronics	GRM155R71C104KA88D
RES 1K ohm, ROHS	R2	Kamaya, Inc	RMC1/16S-102JTH
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 and Branding Drawing (Dimensions in millimeters)