

RFPA5201E

WiFi Power Amplifier
5.0V, 2.4GHz to 2.5GHz

The RFPA5201E is an integrated Power Amplifier (PA) designed for high performance WiFi systems requiring up to +29dBm linear output power. The PA is manufactured on an advanced RFMD InGaP Heterojunction Bipolar Transistor (HBT) process for optimal efficiency and linearity (EVM).

The RFPA5201E integrates the power detector, biasing and input/output match which reduces the number of external components and manufacturability cost. The device is mounted on a 14-pin, 7 x 7mm LGA laminate package and meets the RF specifications for 802.11b/g/n systems.



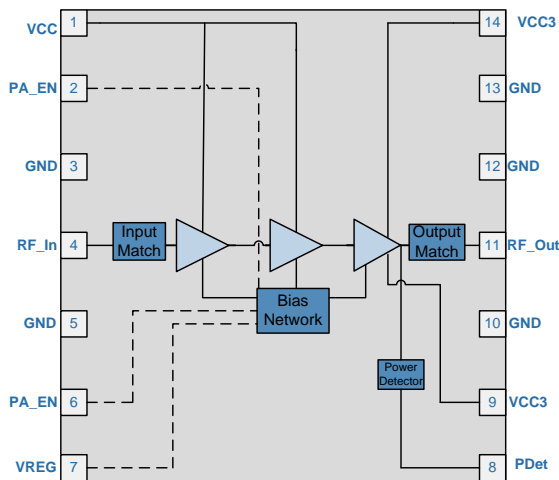
Package: Laminate, 14-pin,
7.0mm x 7.0mm x 1.0mm

Features

- $P_{OUT} = 29\text{dBm}$; EVM = -30dB
11n MCS7
- Input and Output Matched
to 50Ω
- High Gain: 33dB
- Integrated Power Detector
- High Impedance Enable Pin
- High PAE Design

Applications

- IEEE 802.11b/g/n WiFi Systems
- Customer Premise Equipment (CPE)
- Wireless Access Points, Gateways & Routers
- Microcells



Functional Block Diagram

Ordering Information

| | |
|------------------|--|
| RFPA5201ESB | Standard 5 piece bag |
| RFPA5201ESQ | Standard 25 piece bag |
| RFPA5201ESR | Standard 100 piece reel |
| RFPA5201ETR13 | Standard 2500 piece reel |
| RFPA5201EPCK-410 | Fully assembled evaluation board w/5 piece bag |

Absolute Maximum Ratings

| Parameter | Rating | Unit |
|-------------------------------------|--------------|------|
| Supply Voltage (RF Applied) | -0.5 to +5.5 | V |
| Supply Voltage (No RF Applied) | -0.5 to +6.0 | V |
| DC Supply Current | 1800 | mA |
| Input RF Power with 50W Output Load | 10 | dBm |
| Maximum VSWR with no damage | 10:1 | |
| Operating Ambient Temperature | -40 to +85 | °C |
| Storage Temperature | -40 to +150 | °C |
| Moisture Sensitivity Level | MSL3 | |



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.

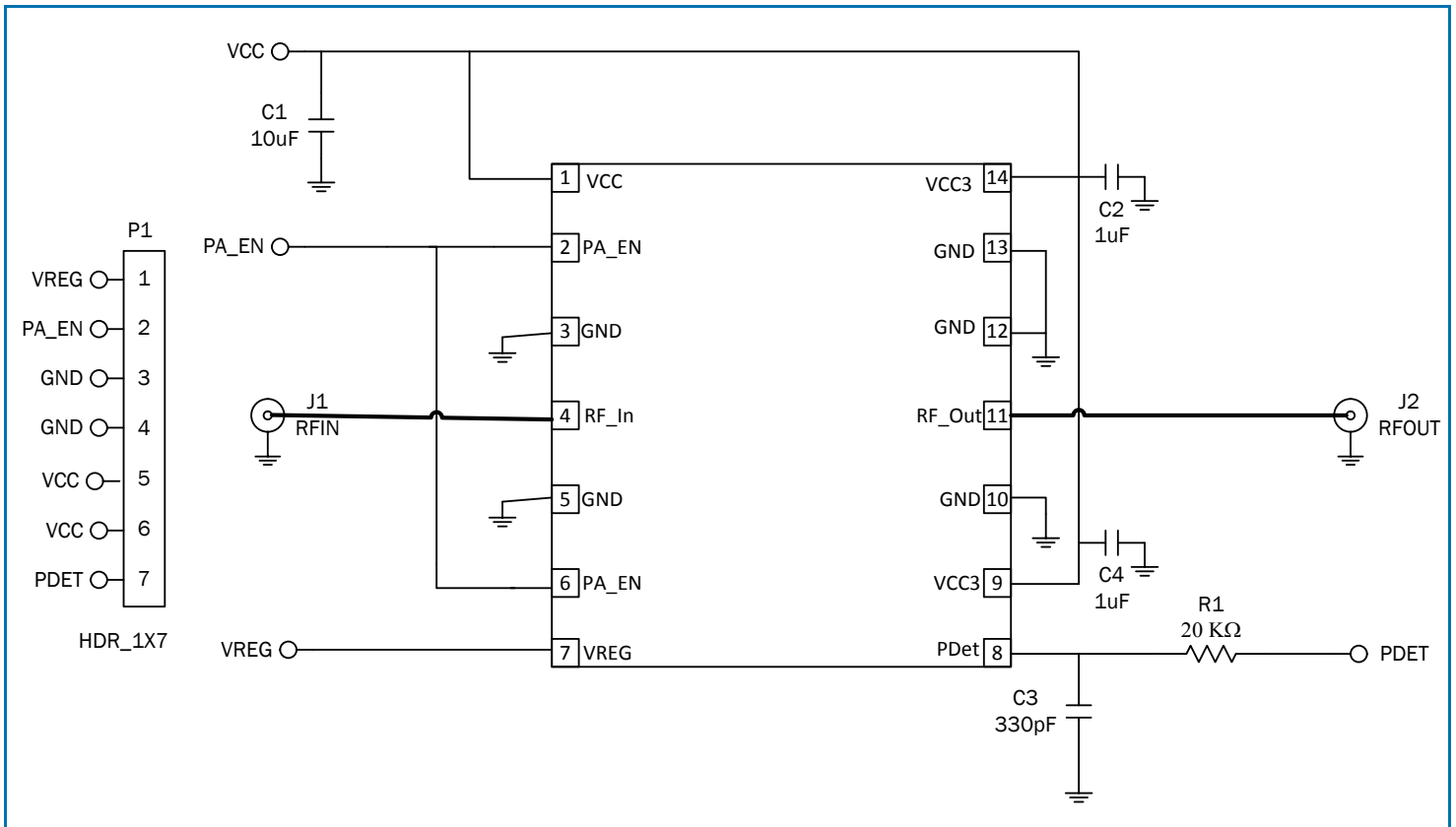
Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute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

Nominal Operating Parameters

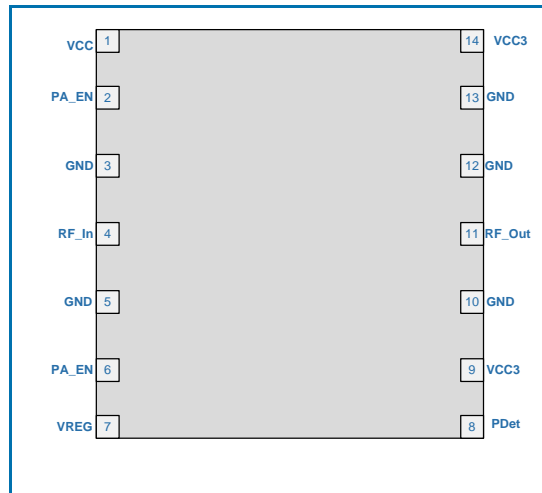
| Parameter | Specification | | | Unit | Condition |
|-------------------------------|---------------|--------|------|---------|--|
| | Min | Typ | Max | | |
| Compliance | | | | | 802.11b/g/n |
| Operating Frequency | 2412 | | 2484 | MHz | |
| Supply Voltage | 4.75 | 5 | 5.25 | V | 802.11n HT20 and HT40 MCS7 |
| PA_EN Voltage High | 1.75 | 2.9 | 5 | V | Can be tied to Vreg when using 2.85v min and sources 12mA typ. |
| PA_EN Voltage Low | | 0 | 0.2 | V | Turns PA OFF |
| V _{REG} Voltage High | 2.85 | 2.9 | 3 | V | Can be tied to PA_EN. Requires 12mA typ and 2.85V min |
| V _{REG} Voltage Low | | 0 | 0.2 | V | |
| Typical Conditions | | | | | V_{CC} = 5.0V, V_{REG} = 2.9V, PA_EN = 2.9V; 11n MCS7 HT20 and HT40, temperature = 25°C, unless otherwise noted |
| Output Power | | 29 | | dBm | 802.11n HT20 and HT40 MCS7 |
| 11n Dynamic EVM | | 2.5 | 3 | % | |
| Second Harmonic | | -38 | -36 | dBm/MHz | At rated P _{OUT} |
| Third Harmonic | | -48 | -45 | dBm/MHz | |
| Gain | 31.5 | 33.5 | | dB | |
| Gain Variation | | +/-1 | | dB | Over 40MHz channel |
| | | +/-2.5 | | dB | Over temperature of -40°C to +85°C |
| Power Detect Range | 0.1 | | 2.2 | V | P _{OUT} = 0dBm to 30dBm |
| Power Detect Voltage | 1.8 | 1.9 | 2.0 | V | At rated P _{OUT} |
| Input Return Loss | | -15 | -12 | dB | In specified frequency band |
| Output Return Loss | | -10 | -8 | dB | |
| Operating Current | | 875 | 1000 | mA | At rated P _{OUT} |
| Quiescent Current | | 350 | 425 | mA | V _{CC} = 5.0, V _{REG} = PA_EN = 2.9V and RF = OFF |
| PAE (Power Added Efficiency) | | 18.5 | | % | At rated P _{OUT} (PA only) |
| Power Down Current | | 16 | | mA | PA_EN = 0V, V _{CC} = 5V, V _{REG} = 2.9V |
| I _{REG} | | 12 | 15 | mA | V _{CC} =5V, PA_EN = 2.9V, V _{REG} = 2.9V |
| Leakage Current | | 0.5 | 0.7 | mA | V _{CC} =5V, V _{REG} = 0V, PA_EN=0V |

| Parameter | Specification | | | Unit | Condition |
|---|---------------|-----|-----|------|---|
| | Min | Typ | Max | | |
| Typical Conditions (continued) | | | | | V_{CC} = 5.0V, V_{REG} = 2.9V, PA_EN = 2.9V; 11n MCS7 HT20 and HT40, temperature = 25°C, unless otherwise noted |
| Turn-on time from setting of V _{REGS} | | | 1 | μsec | Output stable to within 90% of final gain |
| Turn-off time from setting of V _{REGS} | | | 1 | μsec | |
| Stability | -25 | | 33 | dBm | No spurs above -47dBm into 4:1 VSWR |
| Output P1dB | | 35 | | dBm | CW signal |
| Spectral Mask Margin to 802.11n limits | | 2 | | dB | P _{OUT} = 31dBm; MCS0 HT20 |
| General Performance | | | | | |
| ESD | | | | | |
| Human Body Model | 500 | | | V | EIA/JESD22-114A all pins |
| Charge Device Model | 1000 | | | V | JESD22-C101C all pins |
| Thermal Resistance | | | | | |
| Theta _{jc} | | 13 | | °C/W | P _{OUT} - 29dBm; duty cycle - 90%; V _{CC} = 5V; V _{REG} = 2.90V; junction to bottom of laminate package; T _{REF} = 85°C |
| Theta _{j-ref} | | 18 | | °C/W | P _{OUT} - 29dBm; duty cycle - 90%; V _{CC} = 5V; V _{REG} = 2.90V; junction to bottom of PCB; T _{REF} = 85°C |
| Junction Temperature for Long Term Reliability (T _{jmax}) | | 175 | | °C | P _{OUT} - 29dBm; V _{CC} = 5V; V _{REG} = 2.90V; T _{REF} = 85°C |

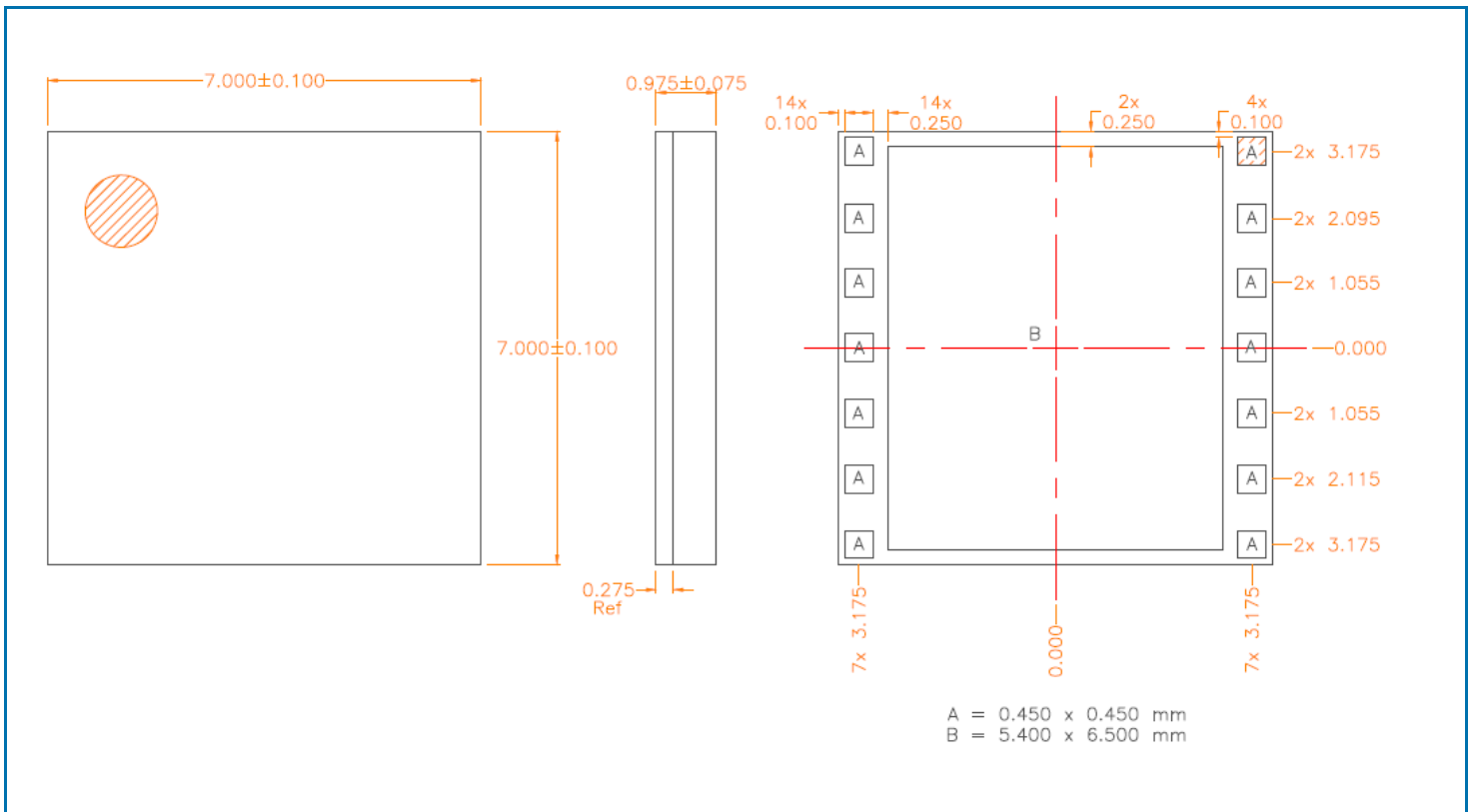
Evaluation Board Schematic



Pin Out

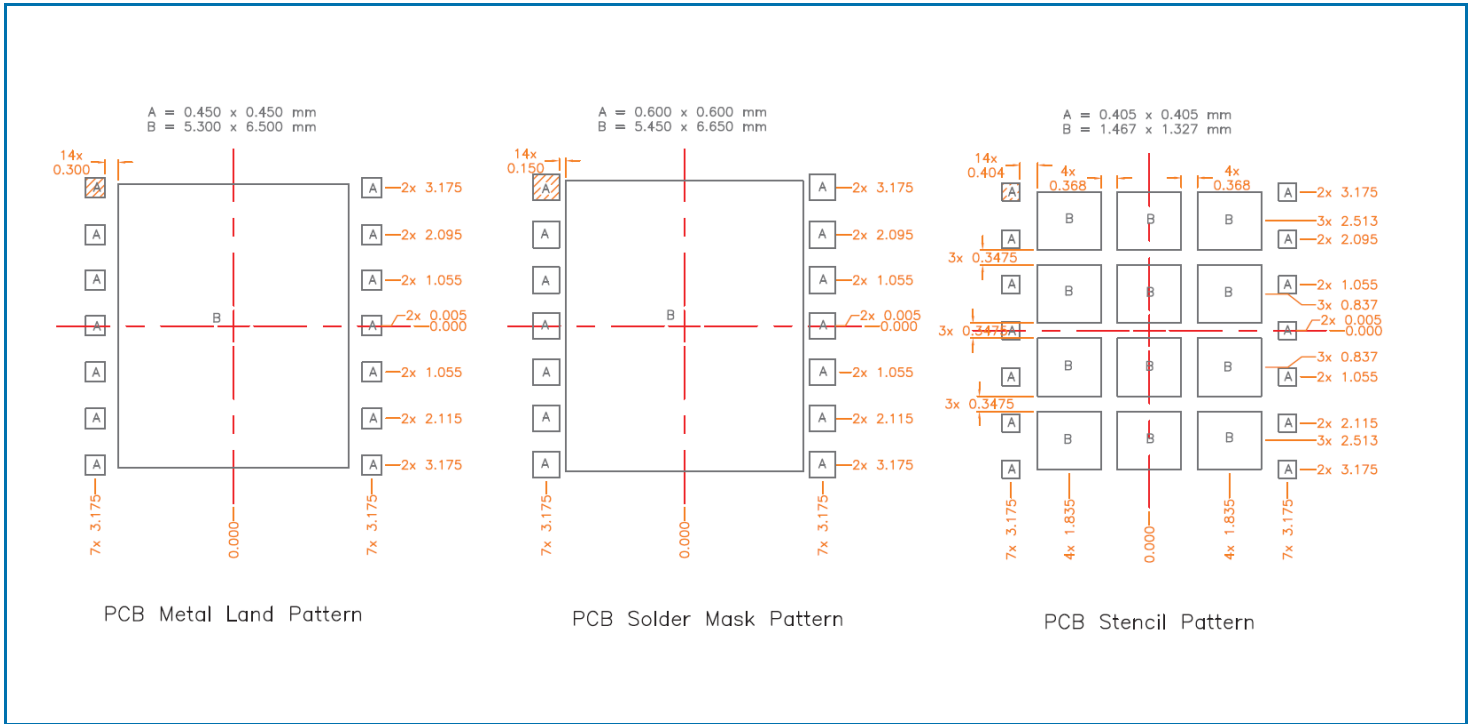


Package Drawing



- Notes
1. Shaded area represents Pin 1 location.
 2. Thermal vias for center slug "B" should be incorporated into the PCB design. The number and size of thermal vias will depend on the application. Example of the number and size of vias can be found on the RFMD evaluation board layout

PCB Pattern



Notes

- 1. Shaded area represents Pin 1 location.

Pin Names and Descriptions

| Pin | Name | Description |
|----------|-------|---|
| 1 | VCC | This pin is connected internally to the collectors of RF device. To achieve specified performance, the layout of the pin should match the Recommended Land Pattern. |
| 2 | PA_EN | High Impedance enable pin, Apply < 0.6VDC to power down the PA. Apply 1.75VDC to 5VDC to enable the PA. |
| 3 | GND | Ground connection. |
| 4 | RF_IN | RF input, is internally matched to 50Ω. DC Blocked |
| 5 | GND | Ground connection. |
| 6 | PA_EN | High Impedance enable pin, Apply < 0.6VDC to power down the PA. Apply 1.75VDC to 5VDC to enable the PA. |
| 7 | VREG | PA bias voltage. This pin requires regulated supply for best performance. |
| 8 | PDET | Power detector provides an output voltage proportional to the RF output power level. |
| 9 | VCC3 | This pin is connected internally to the collectors of RF device. To achieve specified performance, the layout of the pin should match the Recommended Land Pattern |
| 10 | GND | Ground connection. |
| 11 | RFOUT | RF output. Internally matched to 50Ω and DC Blocked |
| 12 | GND | Ground connection. |
| 13 | GND | Ground connection. |
| 14 | VCC3 | This pin is connected internally to the collectors of RF device. To achieve specified performance, the layout of the pin should match the Recommended Land Pattern |
| Pkg Base | GND | Ground connection. The back side of the package should be connected to the ground plane through as short connection as possible, e.g., PCB vias under the device are recommended. |

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9