

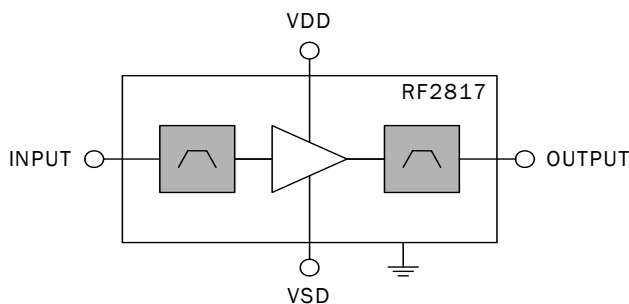


Features

- Low Noise Figure: 1.80dB (Typ)
- High Gain: 13.8dB (Typ)
- High IIP3: +4.5dBm (Typ)
- Excellent Out-of-Band Rejection:
Cell: 86dBc
PCS: 82dBc
- Operable Over Wide Supply Voltage Range: 1V to 3.6V
- CMOS Compatible Shutdown Function (<0.1uA)
- Adjustable Bias Using External Resistor
- No External DC-Blocking Capacitor Required - Lowest BOM Cost and Small Solution Size
- 1kV HBM On All Pins
- Compact Footprint: 4.5mmx2.2mmx0.975mm

Applications

- Cellular and Non-Cellular GPS Receivers



Functional Block Diagram

Product Description

The RF2817 is a GPS Low Noise Amplifier with an integrated SAW filters at the input and output. Low noise figure, along with high gain, achieved by the RF2817 makes it ideal for GPS receivers requiring high sensitivity. This module builds upon RFMD's leading edge pHEMT process and integrates input matching and low loss high rejection SAW filters at both the input and output. This results in high performance and a reduced solution size. The ease of implementation simplifies the receiver design.

The RF2817 is packaged in a compact 4.5mmx2.2mmx0.975mm package with low external component count required to achieve the best-in-class performance.

Ordering Information

| | |
|----------------|--|
| RF2817 | GPS Low Noise Amplifier with Integrated Input/Output SAW Filters |
| RF2817PCBA-410 | Fully Assembled Evaluation Board |

Optimum Technology Matching® Applied

- | | | | |
|--------------------------------------|--------------------------------------|--|-----------------------------------|
| <input type="checkbox"/> GaAs HBT | <input type="checkbox"/> SiGe BiCMOS | <input checked="" type="checkbox"/> GaAs pHEMT | <input type="checkbox"/> GaN HEMT |
| <input type="checkbox"/> GaAs MESFET | <input type="checkbox"/> Si BiCMOS | <input type="checkbox"/> Si CMOS | <input type="checkbox"/> RF MEMS |
| <input type="checkbox"/> InGaP HBT | <input type="checkbox"/> SiGe HBT | <input type="checkbox"/> Si BJT | <input type="checkbox"/> LDMS |

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Absolute Maximum Ratings

| Parameter | Rating | Unit |
|---|-------------|------|
| V _{DD} | 3.6 | V |
| I _{DD} | 20 | mA |
| Maximum Input Power - CW, V _{DD} =2.85V, I _{DD} =9mA | +15 | dBm |
| P _{Diss} | 72 | mW |
| Max Voltage on RF Output (Pin 8) | +5 | V |
| T _j (Junction Temperature) | 150 | °C |
| Storage Temperature | -65 to +150 | °C |
| Operating Temperature | -40 to +85 | °C |



Caution! ESD sensitive device.

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.

RoHS status based on EUDirective2002/95/EC (at time of this document revision).

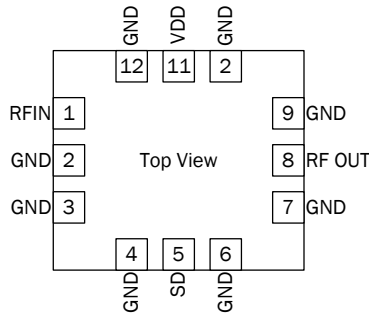
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| Parameter | Specification | | | Unit | Condition |
|--|---------------|------|------|------|---|
| | Min. | Typ. | Max. | | |
| High Current Mode | | | | | V _{DD} = V _{SD} = 2.7V, I _{DD} = 8mA, R2 = 3.3kΩ. Nominal Operating Conditions (unless otherwise specified) |
| Gain (G) | 12 | 13.8 | | dB | |
| Noise Figure (NF)* | | 1.80 | 2.3 | dB | |
| Input P1dB Compressed Power (P1dB) | | -4.0 | | dBm | |
| Input 3rd Order Intercept Point (2-tone at fc ± 2.5Hz) | | 4.5 | | dBm | |
| Input Return Loss (S11) | | -8 | | dB | |
| Output Return Loss (S22) | | -16 | | dB | |
| Reverse Isolation (S12) | | -24 | | dB | |
| Cell Band Rejection (Relative to 1575GHz at 827.5Hz) | 70 | 86 | | dBc | |
| PCS Band Rejection (Relative to 1575GHz at 1885MHz) | 70 | 82 | | dBc | |
| Supply DC Current at Shutdown (SD) Voltage VSD = 2.6V (I _{DD}) | | 8 | 15 | mA | |
| ISH (Shutdown Current) | | 0.1 | | uA | |
| Low Current Mode | | | | | V _{DD} = V _{SD} = 1.8V, I _{DD} = 4mA, R2 = 3.9kΩ. Nominal Operating Conditions (unless otherwise specified) |
| Gain (G) | | 12.8 | | dB | |
| Noise Figure (NF)* | | 1.90 | | dB | |
| Input P1dB Compressed Power (P1dB) | | -7 | | dBm | |
| Input 3rd Order Intercept Point (2-tone @ fc ± 2.5Hz) | | 0 | | dBm | |
| Input Return Loss (S11) | | -8 | | dB | |
| Output Return Loss (S22) | | -14 | | dB | |
| Reverse Isolation (S12) | | -22 | | dB | |
| Cell Band Rejection (Relative to 1575GHz at 827.5Hz) | | 86 | | dBc | |
| PCS Band Rejection (Relative to 1575GHz at 1885MHz) | | 82 | | dBc | |

| Parameter | Specification | | | Unit | Condition |
|--|---------------|------|------|---------------|---|
| | Min. | Typ. | Max. | | |
| Low Current Mode (cont.) | | | | | $V_{DD}=V_{SD}=1.8V$, $I_{DD}=4\text{ mA}$, $R2=3.9\text{ k}\Omega$. Nominal Operating Conditions (unless otherwise specified) |
| Supply DC Current at Shutdown (SD) Voltage $V_{SD}=1.67V$ (I_{DD}) | | 4 | | mA | |
| ISH (Shutdown Current) | | 0.1 | | μA | |

| Pin | Function | Description |
|-----|----------|-------------------|
| 1 | RF IN | RF input |
| 2 | GND | Ground |
| 3 | GND | Ground |
| 4 | GND | Ground |
| 5 | SD | Shutdown |
| 6 | GND | Ground |
| 7 | GND | Ground |
| 8 | RF OUT | RF output |
| 9 | GND | Ground |
| 10 | GND | Ground |
| 11 | VDD | DC Voltage Supply |
| 12 | GND | Ground |

Pin Out

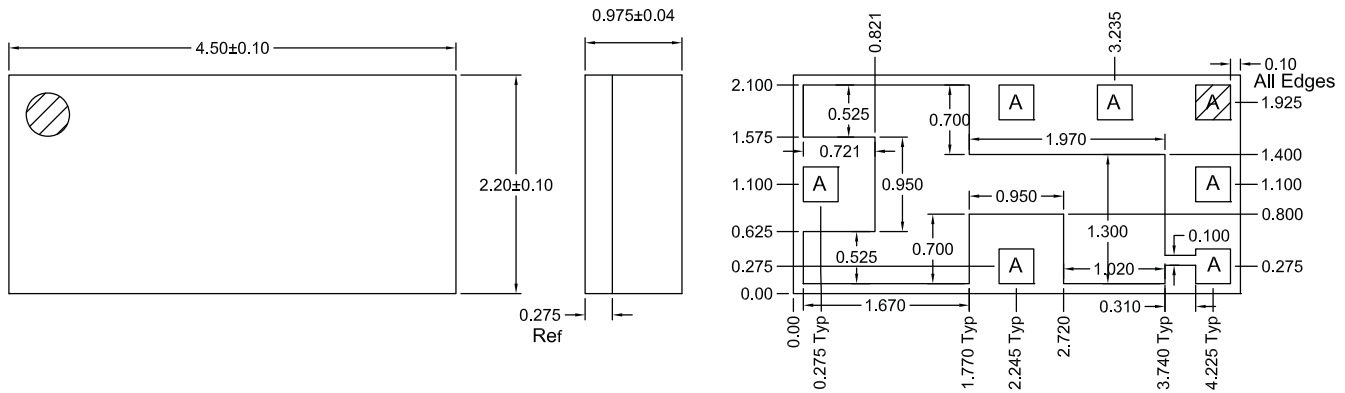


Package Outline Drawing

Top View

Side View

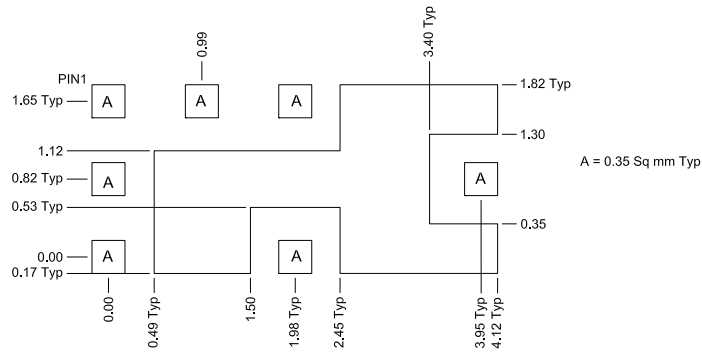
Bottom View



Notes:

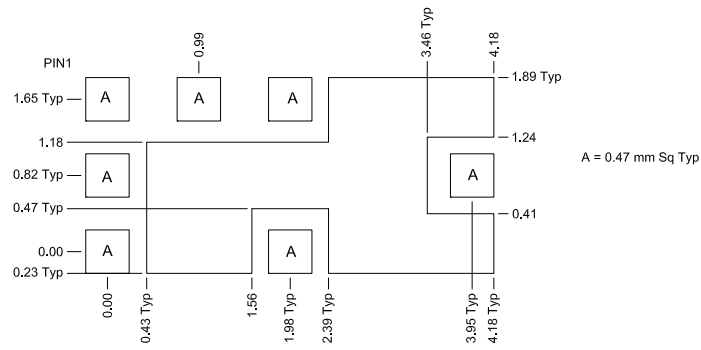
1. Shaded area represents Pin 1 location
2. Defining I/O Pad Center:
To define center of the I/O pad opening, draw a right triangle in one corner of the I/O pad
Then take the center of the hypotenuse to determine center of I/O pad

PCB Metal Land Pattern



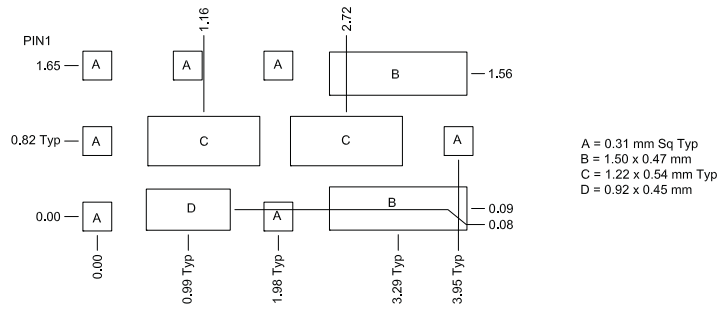
PCB METAL LAND PATTERN

PCB Solder Mask Pattern



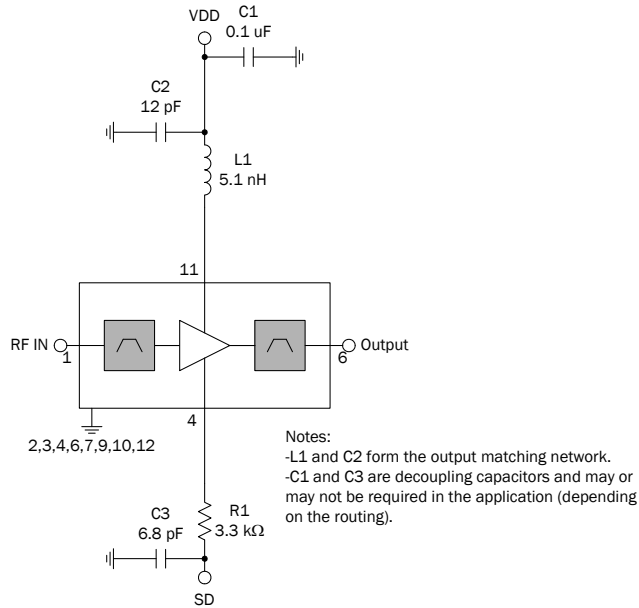
PCB SOLDER MASK LAND PATTERN

PCB Stencil Pattern

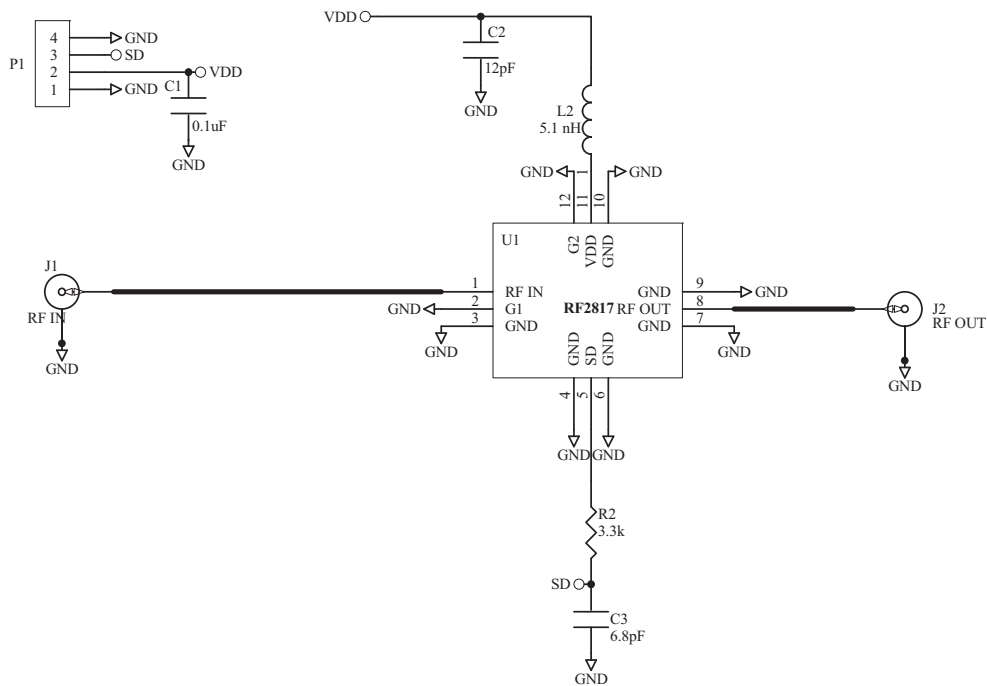


PCB STENCIL LAND PATTERN

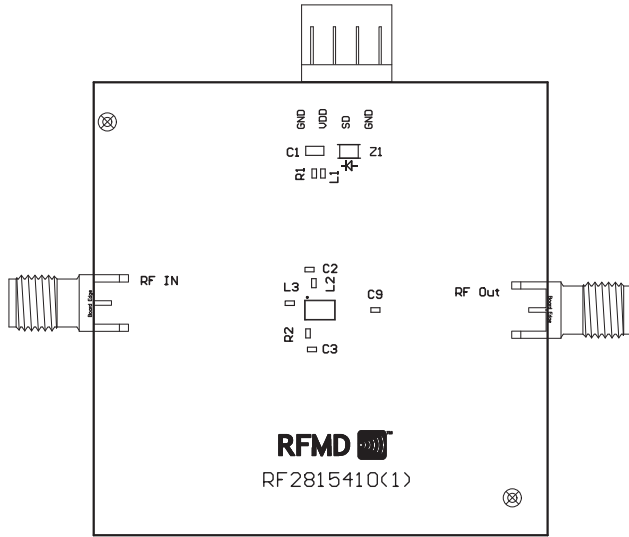
Application Schematic



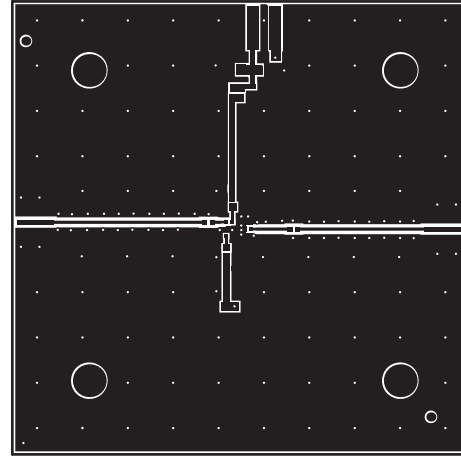
Evaluation Board Schematic



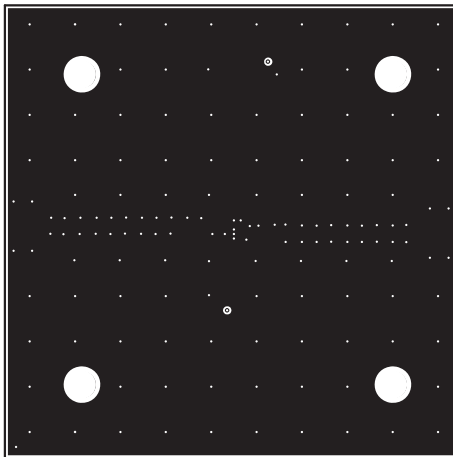
Evaluation Board Layout



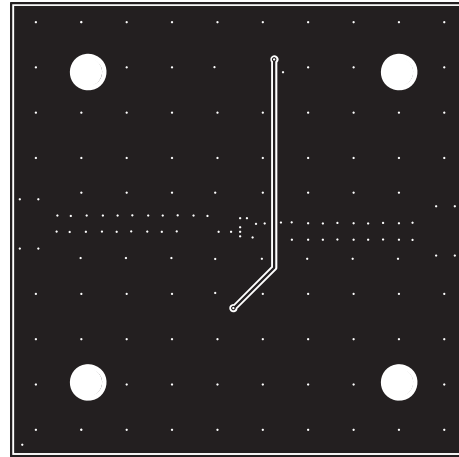
Assembly



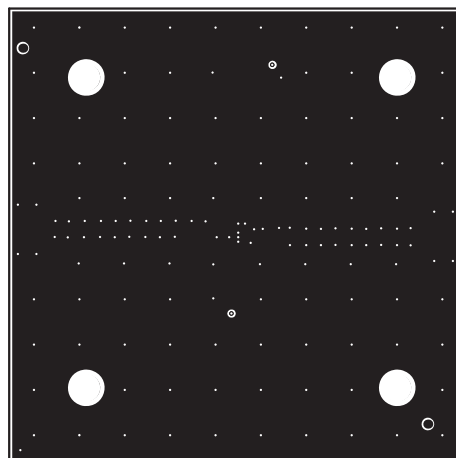
Top



In 1



In 2



Back

