



Product Description

The RF3025 is a high isolation single-pole double-throw (SPDT) absorptive switch designed for general purpose switching applications requiring moderate insertion loss and power handling capability. It features single-bit control with operation as low as 3V. This GaAs pHEMT switch is housed in a compact 3mm, 16-pin, leadless QFN package.

Features

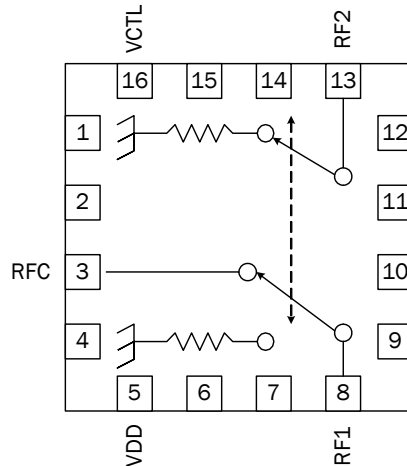
- 10MHz to 6GHz Operation
- 0.5dB Insertion Loss at 1GHz
- 1.1dB Insertion Loss at 6GHz
- Terminated Off State
- 58dB Isolation at 1GHz
- 39dBm Isolation at 6GHz
- 3V Minimum Voltage
- 50dBm IP3 at 5V

Applications

- Cellular Handset Applications
- Antenna Tuning Applications
- IEEE802.11b/g WLAN Applications
- Cellular Infrastructure Applications

Optimum Technology Matching® Applied

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



| Parameter | Specification | | | Unit | Condition |
|----------------------------------|---------------|------|------|------|---|
| | Min. | Typ. | Max. | | |
| Insertion Loss | | 0.45 | | dB | Freq=10MHz to 1.0GHz |
| | | 0.5 | 0.8 | dB | Freq=1.0GHz to 2.0GHz |
| | | 0.55 | | dB | Freq=2.0GHz to 3.0GHz |
| | | 0.8 | | dB | Freq=3.0GHz to 5.0GHz |
| | | 1.1 | | dB | Freq=5.0GHz to 6.0GHz |
| Return Loss | | 18 | | dB | Freq=10MHz to 1.0GHz, Freq=1.0GHz to 3.0GHz |
| | | 13 | | dB | Freq=3.0GHz to 6.0GHz |
| Return Loss into Off Port | | 14 | | dB | Freq=0.5GHz to 0.8GHz |
| | | 16 | | dB | Freq=0.8GHz to 1.0GHz |
| | | 17 | | dB | Freq=1.0GHz to 3.0GHz |
| | | 12 | | dB | Freq=3.0GHz to 6.0GHz |
| Isolation | | 58 | | dB | Freq=0.5GHz to 1.0GHz |
| | 50 | 52 | | dB | Freq=1.0GHz to 2.0GHz |
| | | 48 | | dB | Freq=2.0GHz to 3.0GHz |
| | | 42 | | dB | Freq=3.0GHz to 5.0GHz |
| | | 39 | | dB | Freq=5.0GHz to 6.0GHz |
| PO.1dB* | | 30 | | dBm | Freq=1.8GHz |
| IP3* | | 50 | | dBm | Freq=0.5GHz to 2.5GHz, 1MHz spacing, 10dBm/tone |
| I _{DD} , Supply Current | | 200 | 300 | uA | |
| I _C , Control Current | | 20 | | uA | |
| TON, TOFF | | 120 | | nS | 50% of VCTRL to 10/90% of RF |
| TRISE, TFALL | | 35 | | nS | 10/90% RF |

Test Conditions: V_{DD}=5V, 25 °C, 50Ω, with application circuit with 100pF DC blocking capacitors.
 *Note: Performance degrades below 50MHz.

Absolute Maximum Ratings

| Parameter | Rating | Unit |
|----------------------------------|-------------|------|
| Supply Voltage V_{DD} | 5.5 | V |
| Control Voltage (V_C) | 5.5 | V |
| RF Input Power (on state) | 32 | dBm |
| RF Input Power (terminated port) | 24 | dBm |
| Operating Temp Range (T_L) | -40 to +85 | °C |
| Storage Temp | -55 to +150 | °C |
| ESD Rating (HBM) | Class 0 | |
| Moisture Sensitivity Level | MSL2 | |



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.

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RFMD Green: RoHS compliant per EU Directive 2002/95/EC, 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.

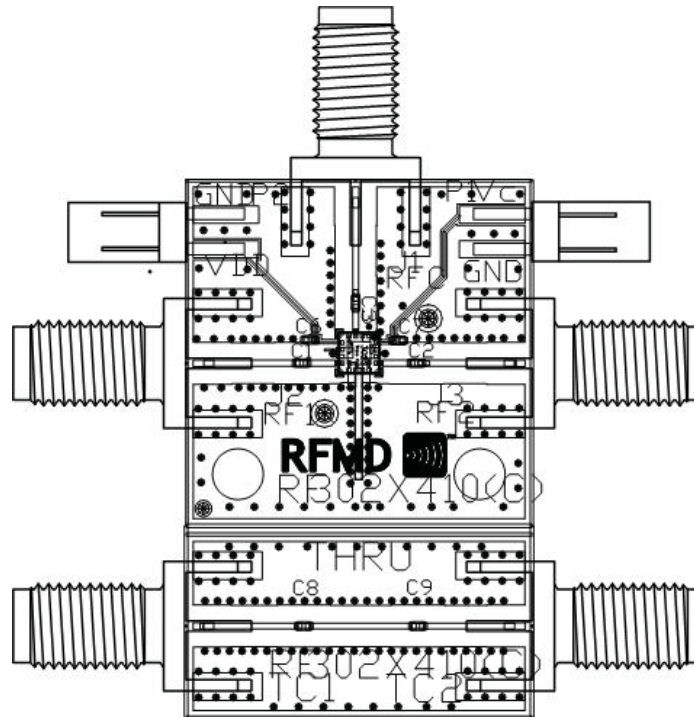
Truth Table

| V_C | RFC-RF1 | RFC-RF2 |
|-------|---------|---------|
| 0 | OFF | ON |
| 1 | ON | OFF |

Logic '0': $0V < V_C \leq 1.0V$

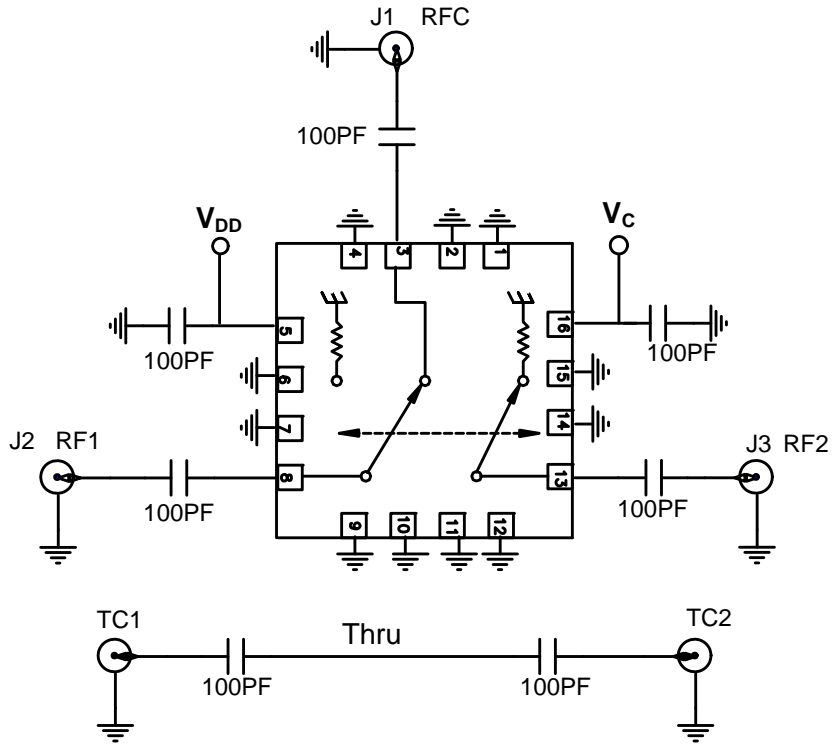
Logic '1': $2V < V_C \leq 5V$

Evaluation Board Layout



All Capacitors are 100pF

Evaluation Board Schematic

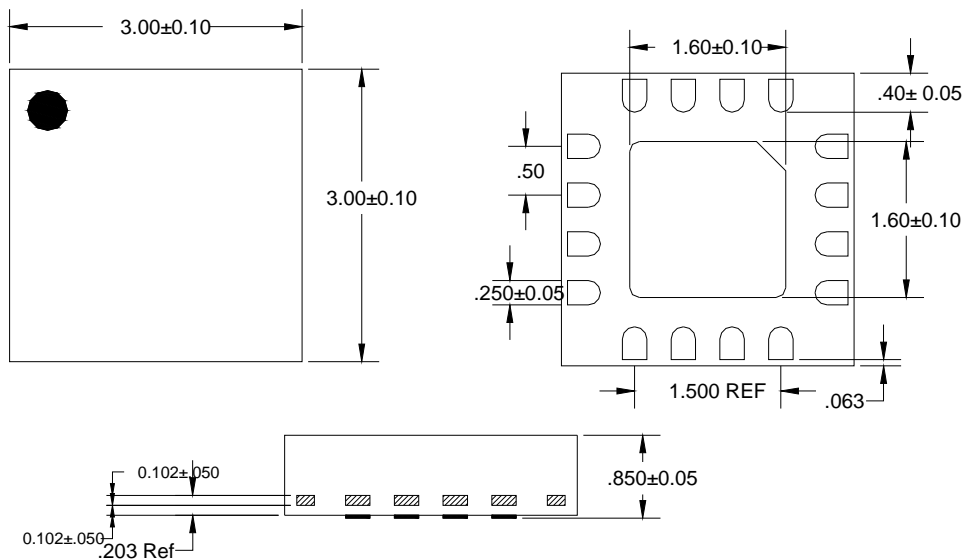


| Pin | Function | Description |
|-----|----------|--|
| 1 | GND | Ground. |
| 2 | GND | Ground. |
| 3 | RFC | RF Common. External DC Block required. |
| 4 | GND | Ground. |
| 5 | VDD | Supply Voltage. |
| 6 | GND | Ground. |
| 7 | GND | Ground. |
| 8 | RF1 | RF Port 1. External DC Block required. |
| 9 | GND | Ground. |
| 10 | GND | Ground. |
| 11 | GND | Ground. |
| 12 | GND | Ground. |
| 13 | RF2 | RF Port 2. External DC Block required. |
| 14 | GND | Ground. |
| 15 | GND | Ground. |
| 16 | VC | Control Voltage. |
| 17 | Paddle | Ground. |

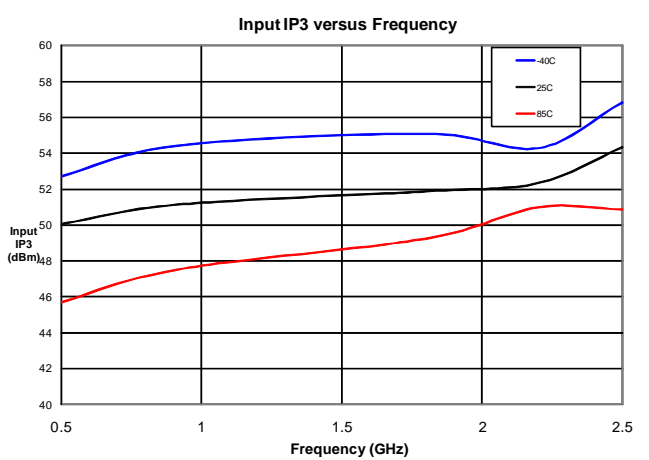
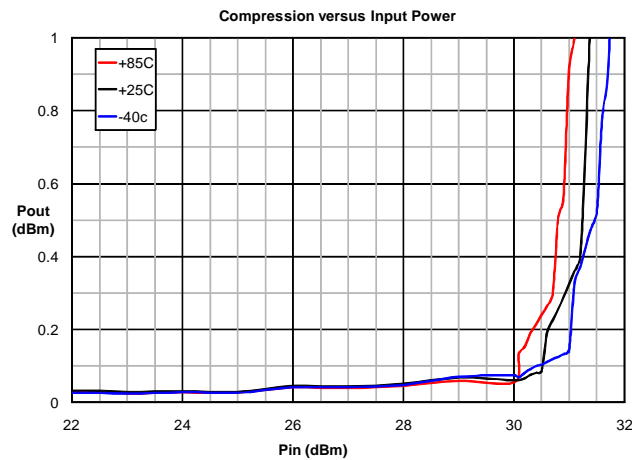
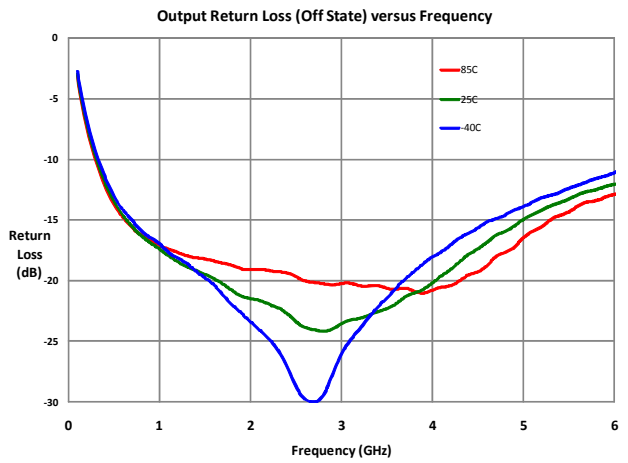
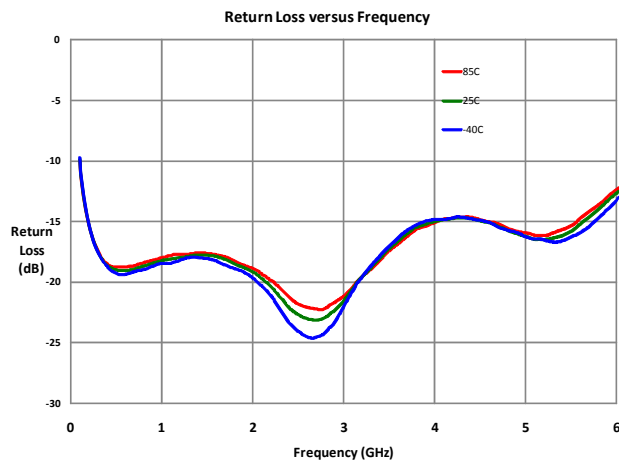
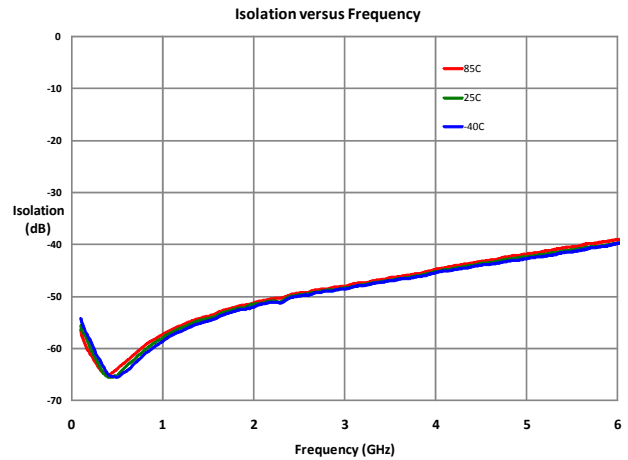
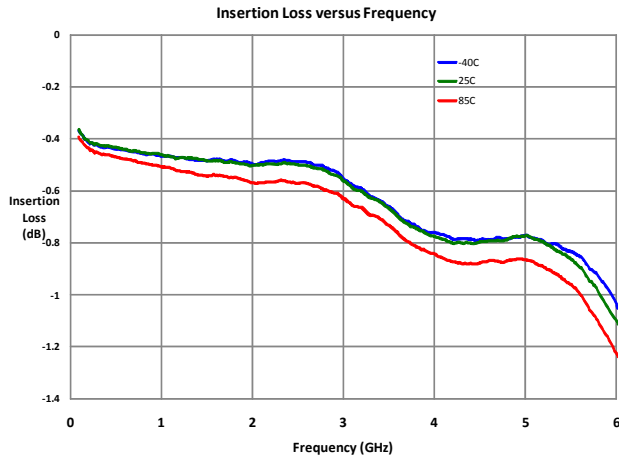
Package Drawing

Dimensions in millimeters

Refer to drawing posted at www.rfmd.com for tolerances.



Typical Performance at 25 °C, V_{DD} = 5V



Ordering Information

| Ordering Code | Description |
|---------------|--|
| RF3025 | Sample bag with 25 pieces |
| RF3025SR | 7" Reel with 100 pieces |
| RF3025TR7 | 7" Reel with 2500 pieces |
| RF3025PCK-410 | 500MHz to 4000MHz PCBA with 5-piece sample bag |