



**RF2421**

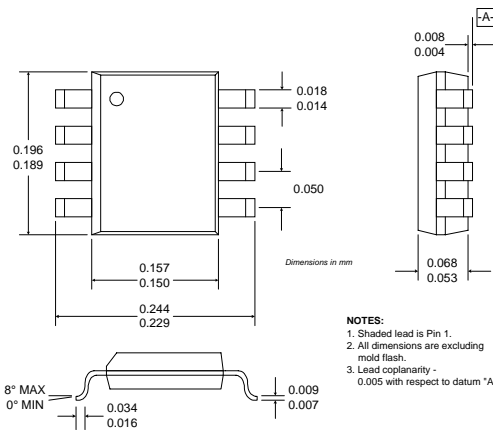
10dB SWITCHED ATTENUATOR

Typical Applications

- Power Control in Communication Systems
- Commercial and Consumer Systems
- CMOS Compatible Programmable Attenuator
- Portable Battery-Powered Equipment

Product Description

The RF2421 is a monolithic switched attenuator. The device is built using a Gallium Arsenide process technology and has a single step attenuation of 10dB. The input and output of the device has a low VSWR 50Ω match. The RF output can drive up to +16dBm. This unit is intended for use in systems that require RF power control by digital means. No negative supply voltages are required, and the current consumption is less than 5μA when the attenuator is off.



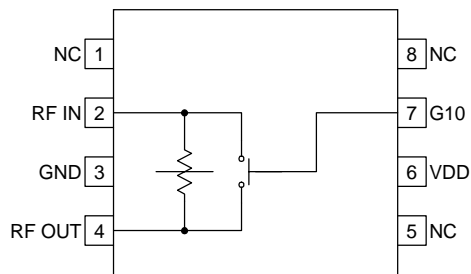
Optimum Technology Matching® Applied

- |                                     |                                   |   |
|-------------------------------------|-----------------------------------|---|
| <input type="checkbox"/> Si BJT     | <input type="checkbox"/> GaAs HBT | <input checked="" type="checkbox"/> GaAs MESFET |
| <input type="checkbox"/> Si Bi-CMOS | <input type="checkbox"/> SiGe HBT | <input type="checkbox"/> Si CMOS                |

Package Style: SOIC-8

Features

- Single 2.7V to 6V Supply
- 10dB Single Step Attenuation
- 1 dB Insertion Loss
- 1-bit Digitally Controlled Attenuation
- Digitally Controlled Power Down Mode
- 500MHz to 3000 MHz Operation



Functional Block Diagram

Ordering Information

- |             |                                  |
|-------------|----------------------------------|
| RF2421      | 10dB Switched Attenuator         |
| RF2421 PCBA | Fully Assembled Evaluation Board |

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# RF2421

## Absolute Maximum Ratings

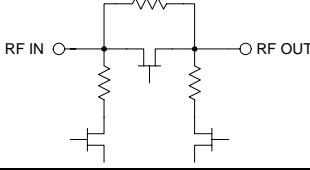
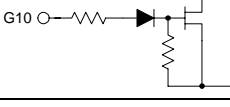
| Parameter                     | Rating       | Unit            |
|-------------------------------|--------------|-----------------|
| Supply Voltage                | -0.5 to +6.0 | V <sub>DC</sub> |
| Control Voltage               | -0.5 to +6.0 | V               |
| Input RF Power                | +20          | dBm             |
| Operating Ambient Temperature | -40 to +85   | °C              |
| Storage Temperature           | -40 to +150  | °C              |



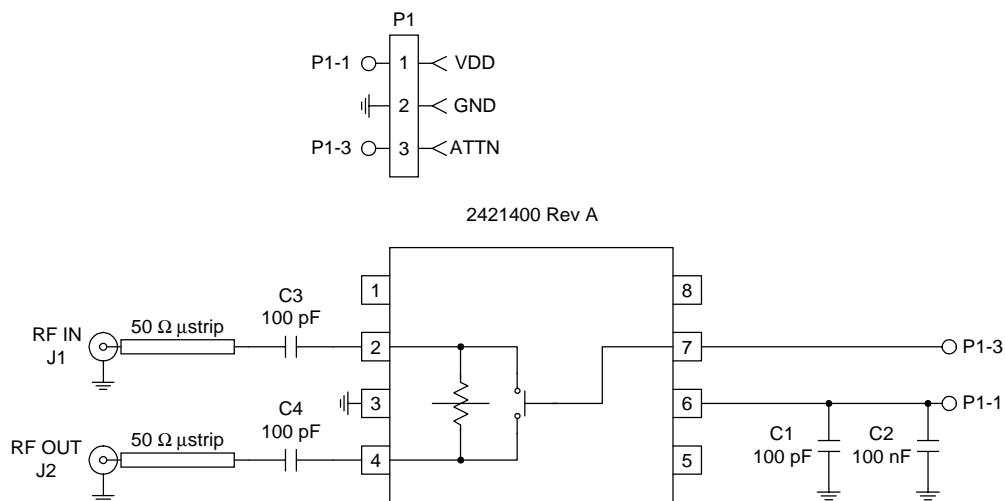
**Caution!** ESD sensitive device.

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| Parameter                  | Specification |                 |       | Unit | Condition   |
|----------------------------|---------------|-----------------|-------|------|---|
|                            | Min.          | Typ.            | Max.  |      |   |
| <b>Overall</b>             |               |                 |       |      | T=25 °C, V <sub>DD</sub> =5.0V, Freq=915MHz             |
| Frequency Range            |               | 500 to 3000     |       | MHz  |   |
| Insertion Loss             |               | 1.0             | 1.5   | dB   | V <sub>G10</sub> =0V <sub>DC</sub>                      |
| Insertion Loss             | 9.5           | 10              | 10.5  | dB   | V <sub>G10</sub> =V <sub>DD</sub>                       |
| Gain Flatness              |               | 0.25            |       | dB   | In any 50MHz band                                       |
| <b>Input</b>               |               |                 |       |      |   |
| Input Impedance            |               | 50              |       | Ω    |   |
| Input VSWR                 |               |                 | 1.3:1 |      |   |
| Input 1 dB Compression     | +17           |                 |       | dBm  |   |
| <b>Attenuation Control</b> |               |                 |       |      |   |
| Attenuation "ON" Voltage   | 2.5           | V <sub>DD</sub> |       | V    | Voltage supplied to input                               |
| Attenuation "OFF" Voltage  |               |                 | 0.3   | V    | Voltage supplied to input                               |
| Current                    |               | 0.4             | 0.5   | mA   | Into control line, V <sub>G10</sub> =5V <sub>DC</sub>   |
| Response Time              |               | <10             |       | ns   |   |
| <b>Output</b>              |               |                 |       |      |   |
| IM <sub>3</sub>            | -60           |                 |       | dBc  | With 0dBm output in each of 2 tones, attenuation "OFF". |
| Harmonic Output            | -40           |                 |       | dBc  | With 0dBm output in each of 2 tones, attenuation "OFF". |
| Output Impedance           |               | 50              |       | Ω    |   |
| Output VSWR                |               |                 | 1.3:1 |      |   |
| <b>Power Supply</b>        |               |                 |       |      |   |
| Voltage                    |               | 5               |       | V    | Specifications  |
|                            | 2.7           | 5               | 6.0   | V    | Operating Limits  |
| Current                    |               |                 | 0.5   | mA   | Attenuation "ON"  |
|                            |               |                 | 5     | μA   | Attenuation "OFF"                                       |

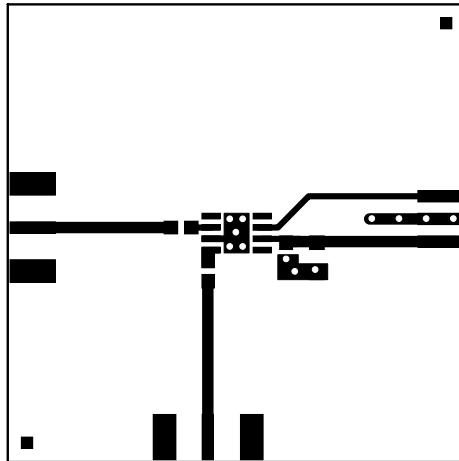
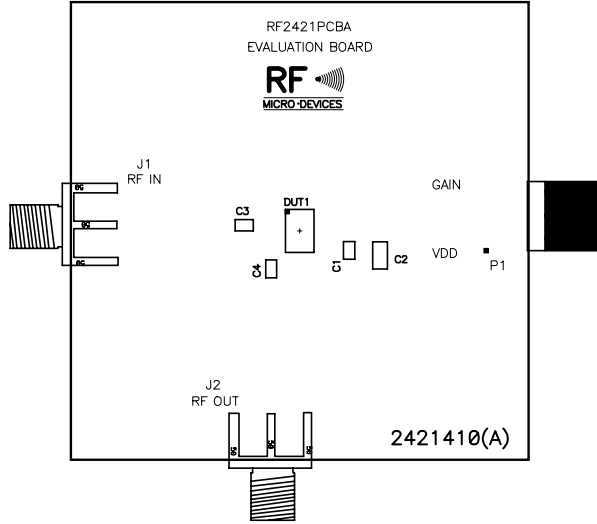
| Pin | Function | Description   | Interface Schematic   |
|-----|----------|---|---|
| 1   | NC       | Not internally connected. This pin can be grounded.   |   |
| 2   | RF IN    | RF Input. This pin is not DC blocked, and an external blocking capacitor is recommended. The value depends on the frequency used.                     |  |
| 3   | GND      | Ground connection. Keep trace physically short and connect immediately to the ground plane for best performance.                                      |   |
| 4   | RF OUT   | RF Output. This pin is not DC blocked, and an external blocking capacitor is recommended. The value depends on the frequency used.                    | See pin 2.  |
| 5   | NC       | Not internally connected. This pin can be grounded.   |   |
| 6   | VDD      | Power supply pin. An external RF bypass capacitor is recommended.   |   |
| 7   | G10      | Control pin for the 10dB attenuator. This pin has an internal pull-down resistor, so when the pin is not connected the attenuator will be turned off. |  |
| 8   | NC       | Not internally connected. This pin can be grounded.   |   |

## Evaluation Board Schematic (Download [Bill of Materials](http://www.rfmd.com) from www.rfmd.com.)



## Evaluation Board Layout

Board Thickness 0.031"; Board Material FR-4



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