

FMPA2151

2.4–2.5 GHz and 4.9–5.9 GHz Dual Band Linear Power Amplifier Module (Preliminary)

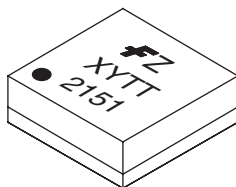
Features

- Dual band operation in a single package design
- Integrated bias bypass
- >30 dB modulated gain 2.4 to 2.5 GHz band
- >30 dB modulated gain 4.9 to 5.9 GHz band
- 27 dBm output power @ 1 dB compression for both frequency bands
- 3.5 % EVM at 20 dBm modulated power out (2.4 GHz)
- 3.5 % EVM at 20 dBm modulated power out (5.5 GHz)
- 3.3 V positive supply operation
- Separate integrated power detectors with 20 dB dynamic range
- 16 pin 4 x 4 x 1.4 mm leadless package
- Internally matched to 50 ohms and DC blocked RF input/output
- Optimized for use in 802.11a/b/g applications

General Description

The FMPA2151 is a dual frequency band power amplifier module designed for high performance WLAN applications in the 2.4-2.5 GHz and the 4.90-5.9 GHz frequency bands. The 16 pin 4 x 4 x 1.4 mm package with internal matching on both input and output to 50 Ohms minimizes next level PCB space and allows for simplified integration. Only two external bias bypass capacitors are required. The two on-chip detectors provide power sensing capability. The PA's low power consumption and excellent linearity are achieved using our InGaP Heterojunction Bipolar Transistor (HBT) technology.

Device (4 x 4 x 1.4mm)



Electrical Characteristics¹ 802.11g (2.4-2.5 GHz) OFDM Modulation (with 176 μ s burst time, 100 μ s idle time) 54 Mbps Data Rate, 16.7 MHz Bandwidth

| Parameter | Min | Typ | Max | Units |
|--|-----|-----|-----|-------|
| Frequency | 2.4 | | 2.5 | GHz |
| Collector Supply Voltage | 3.0 | 3.3 | 3.6 | V |
| Mirror Supply Voltage (PA ON 2.4) | 2.6 | 3.0 | 3.6 | V |
| Mirror Supply Current (PA ON 2.4) | | 0.1 | | mA |
| Gain | | 31 | | dB |
| Average Packet Current @ +20dBm Pout | | 170 | | mA |
| EVM @ +20dBm Pout ² | | 3.5 | | % |
| Detector Output @ +20dBm Pout | | 850 | | mV |
| Detector Output @ +5dBm Pout | | 230 | | mV |
| POUT Spectral Mask Compliance ³ | | +20 | | dBm |

Notes:

1. VCC=3.3V, PA ON 2.4=3.3V, T_A=25°C, PA is constantly biased, 50% system.
2. Percentage includes system noise floor of EVM=0.8%.
3. Measured at PIN at which Spectral Mask Compliance is satisfied. Two-sample windowing length applied.

Electrical Characteristics¹ 802.11a OFDM Modulation

(with 176 μ s burst time, 100 μ s idle time) 54 Mbps Data Rate, 16.7 MHz Bandwidth

| Parameter | Min | Typ | Max | Units |
|---|-----|-----|-----|-------|
| Frequency | 4.9 | | 5.9 | GHz |
| Collector Supply Voltage | 3.0 | 3.3 | 3.6 | V |
| Mirror Supply Voltage (PA ON 5.5) | 2.6 | 3.0 | 3.6 | V |
| Mirror Supply Current (PA ON 5.5) | | 0.1 | | mA |
| Gain | | 32 | | dB |
| Average Packet Current @ +20dBm Pout | | 295 | | mA |
| EVM @ +18dBm Pout ² (4.9 to 5.35GHz) | | 3.5 | | % |
| EVM @ +20dBm Pout ² (5.35 to 5.9GHz) | | 3.5 | | % |
| Detector Output @ +20dBm Pout | | 820 | | mV |
| Detector Output @ +5dBm Pout | | 195 | | mV |
| POUT Spectral Mask Compliance ³ | | +20 | | dBm |

Absolute Maximum Ratings⁴

| Symbol | Parameter | Ratings | Units |
|--------|----------------------------|-------------|-------|
| VCC | Positive Supply Voltage | 6 | V |
| ICC | Supply Current | 500 | mA |
| PA ON | Positive Bias Voltage | 4 | V |
| Pin | RF Input Power | 0 | dBm |
| Tcase | Case Operating Temperature | -40 to +85 | °C |
| Tstg | Storage Temperature | -55 to +150 | °C |

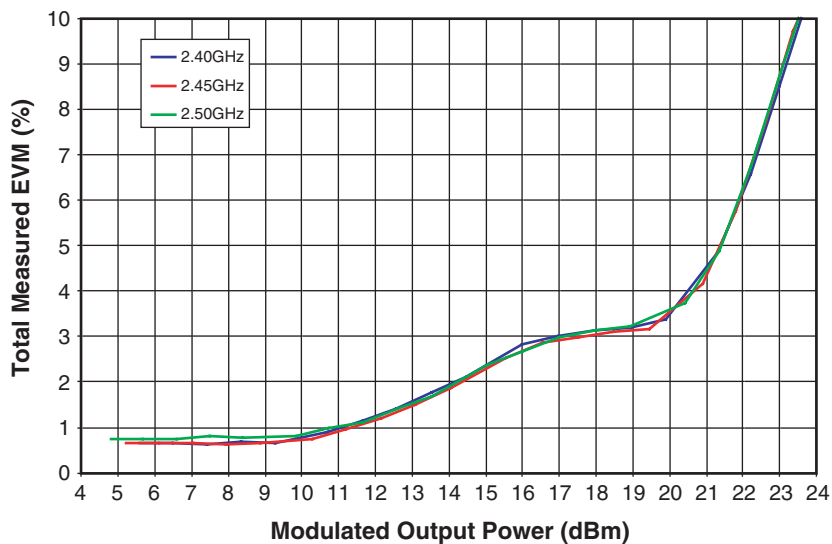
Notes:

1. VCC=3.3V, PA ON 5.5=3.3V, T_A=25°C, PA is constantly biased, 50% system.
2. Percentage includes system noise floor of EVM=0.8%.
3. Measured at PIN at which Spectral Mask Compliance is satisfied. Two-sample windowing length applied.
4. No permanent damage with one parameter set at extreme limit. Other parameters set to typical values.

Performance Data 802.11b/g OFDM Modulation

(with 176 ms burst time, 100 ms idle time) 54 Mbps Data Rate, 16.7 MHz Bandwidth

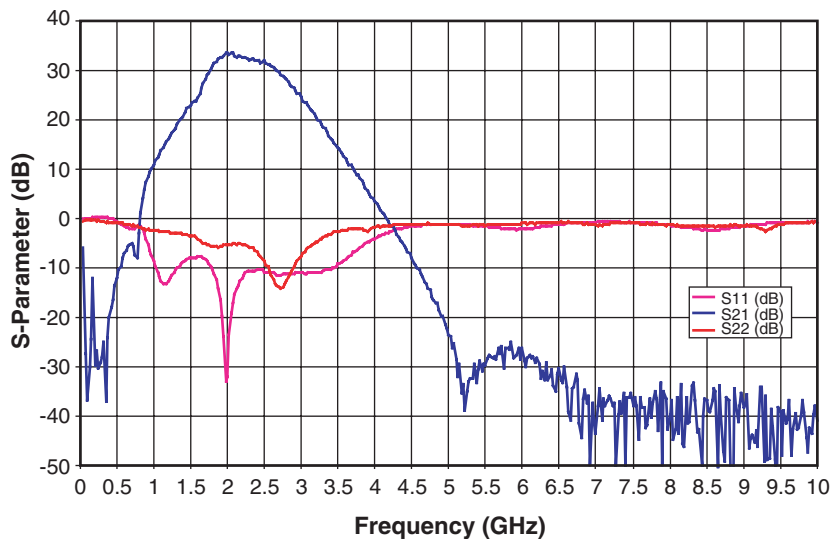
FFPA2151 EVM vs Modulated Output Power 802.11b/g Band



Note: Uncorrected EVM. Source EVM is approximately 0.8%.

Single Tone

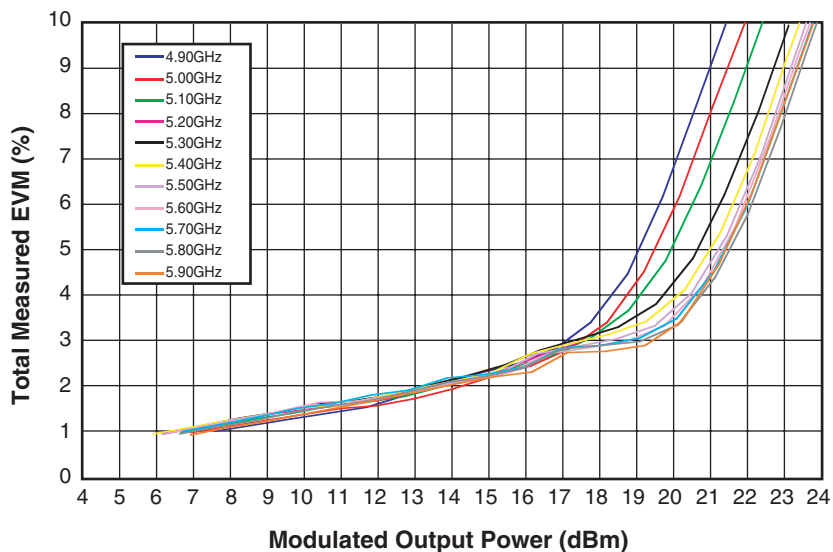
FFPA2151 S-Parameters 802.11b/g Band



Performance Data 802.11a OFDM Modulation

(with 176 ms burst time, 100 ms idle time) 54 Mbps Data Rate, 16.7 MHz Bandwidth

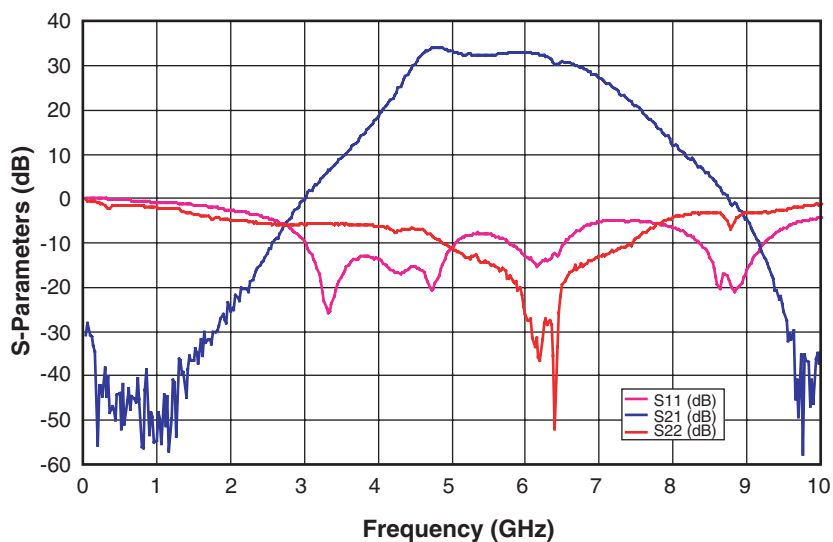
FFPA2151 EVM vs Modulated Output Power 802.11a Band



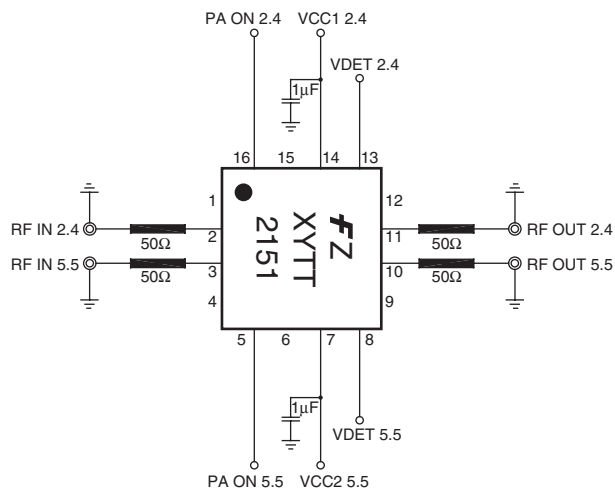
Note: Uncorrected EVM. Source EVM is approximately 0.8%.

Single Tone

FFPA2151 S-Parameters 802.11a Band

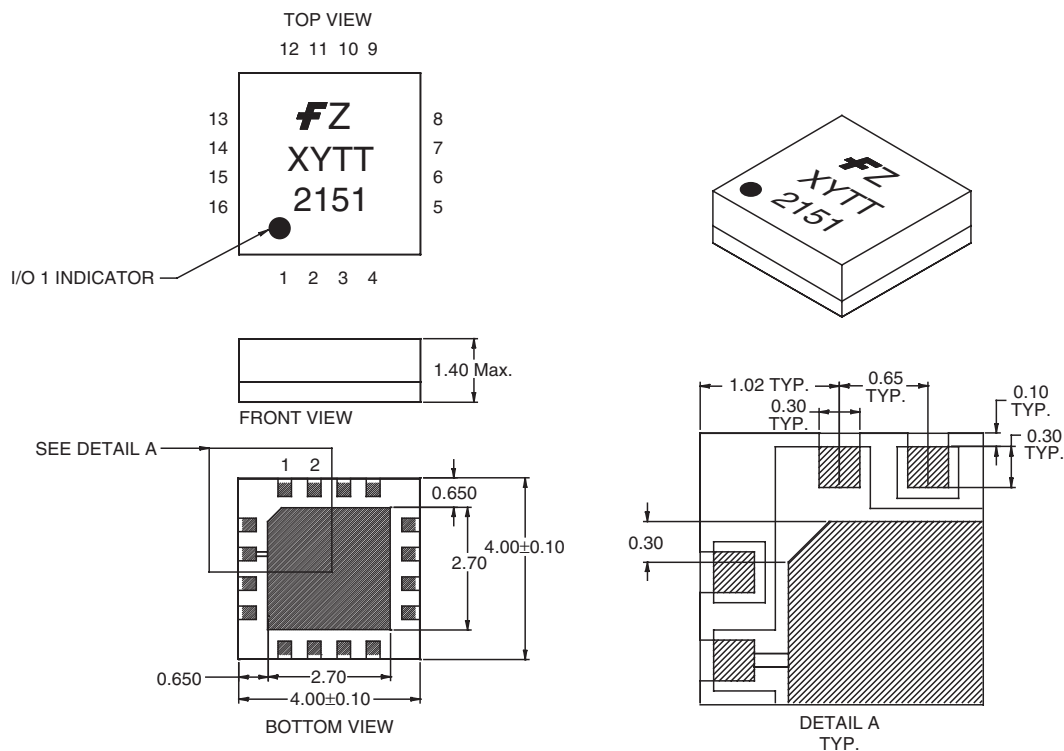


Schematic



| Pin | Description |
|-----|-------------|
| 1 | GND |
| 2 | RF IN 2.4 |
| 3 | RF IN 5.5 |
| 4 | GND |
| 5 | PA ON 5.5 |
| 6 | GND |
| 7 | VCC2 5.5 |
| 8 | VDET 5.5 |
| 9 | GND |
| 10 | RF OUT 5.5 |
| 11 | RF OUT 2.4 |
| 12 | GND |
| 13 | VDET 2.4 |
| 14 | VCC1 2.4 |
| 15 | GND |
| 16 | PA ON 2.4 |
| 17 | CENTER GND |

Package Outline



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|--------------------------|------------------------|---|
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