FAIRCHILD SEMICONDUCTOR®

May 2005

FMPA2151
2.4–2.5 GHz and 4.9–5.9 GHz Dual Band Linear Power Amplifier Module (Preliminary)

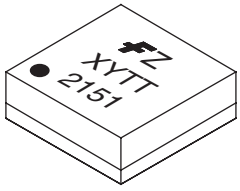
Features

- 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 Characteristics[1] 802.11g (2.4-2.5 GHz) OFDM Modulation

(with 176 µs burst time, 100 µs 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, 50¾ 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 Characteristics[1] 802.11a OFDM Modulation

(with 176 µs burst time, 100 µs 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 Ratings[4]

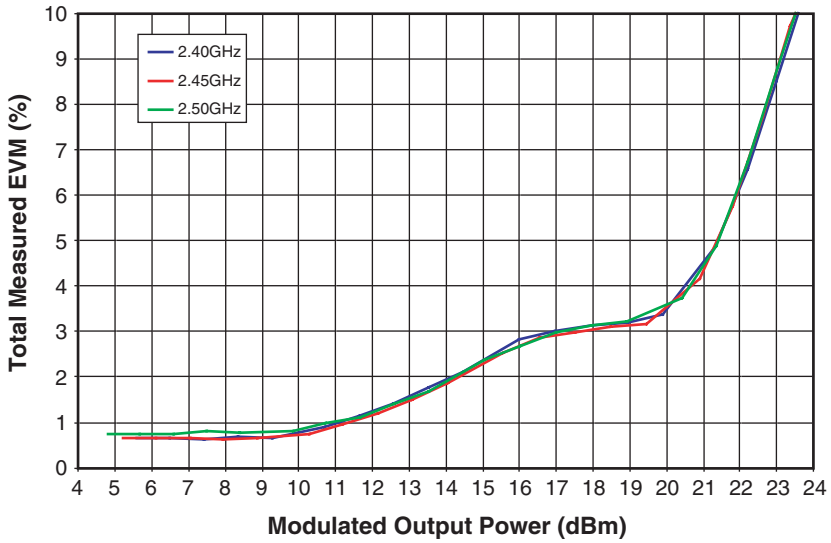
Symbol	Parameter	Ratings	Units
VCC	Positive Supply Voltage	6	V
ICC	Supply Current	500	mA
PA ON	Positive Bias Voltage	4	V
Pin	RF Input Power	0	dBm
Tcase	Case Operating Temperature	-40 to +85	°C
Tstg	Storage Temperature	-55 to +150	°C

Notes:

1. VCC=3.3V, PA ON 5.5=3.3V, T_A=25°C, PA is constantly biased, 50¾ 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

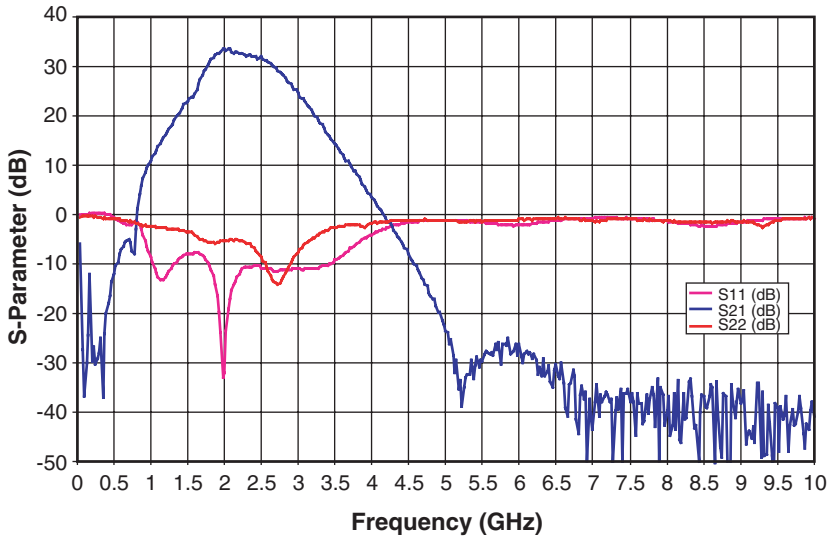
FFPA2151 EVM vs Modulated Output Power 802.11b/g Band



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

Single Tone

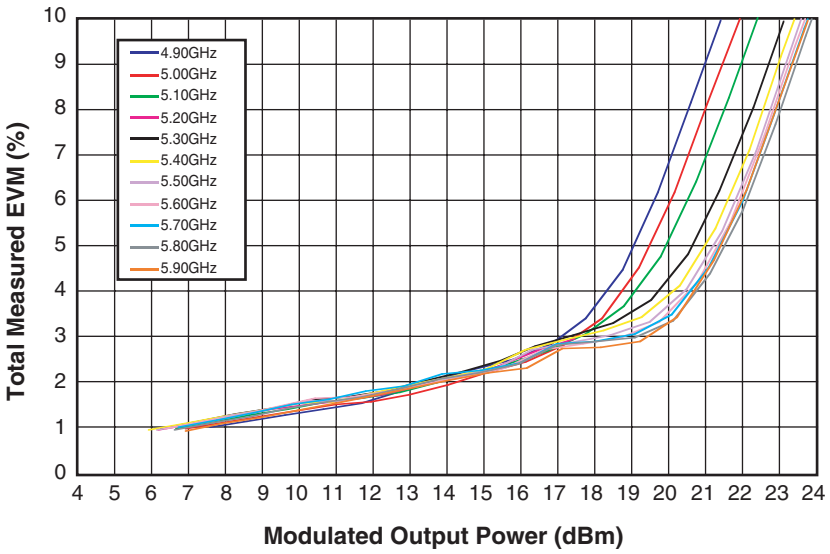
FFPA2151 S-Parameters 802.11b/g Band



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



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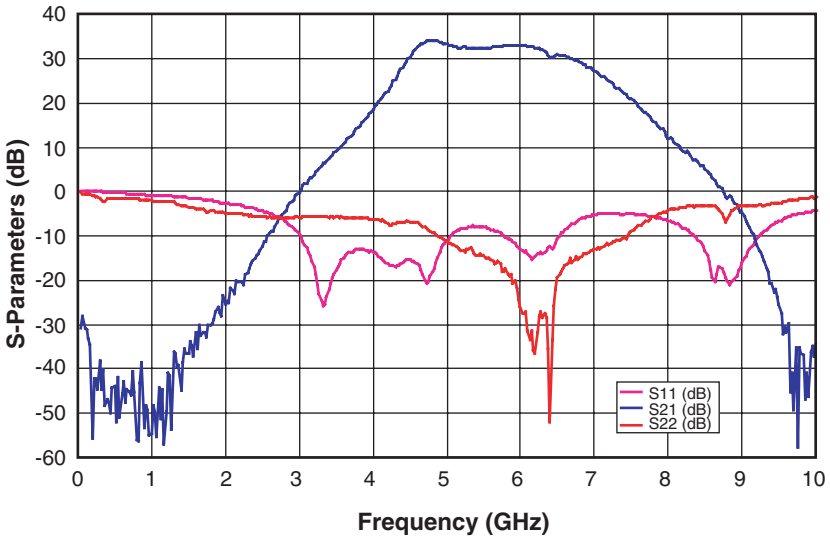
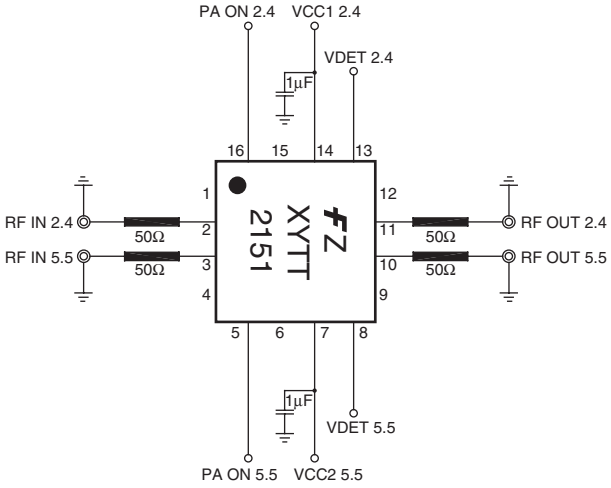
FFPA2151 S-Parameters 802.11a Band

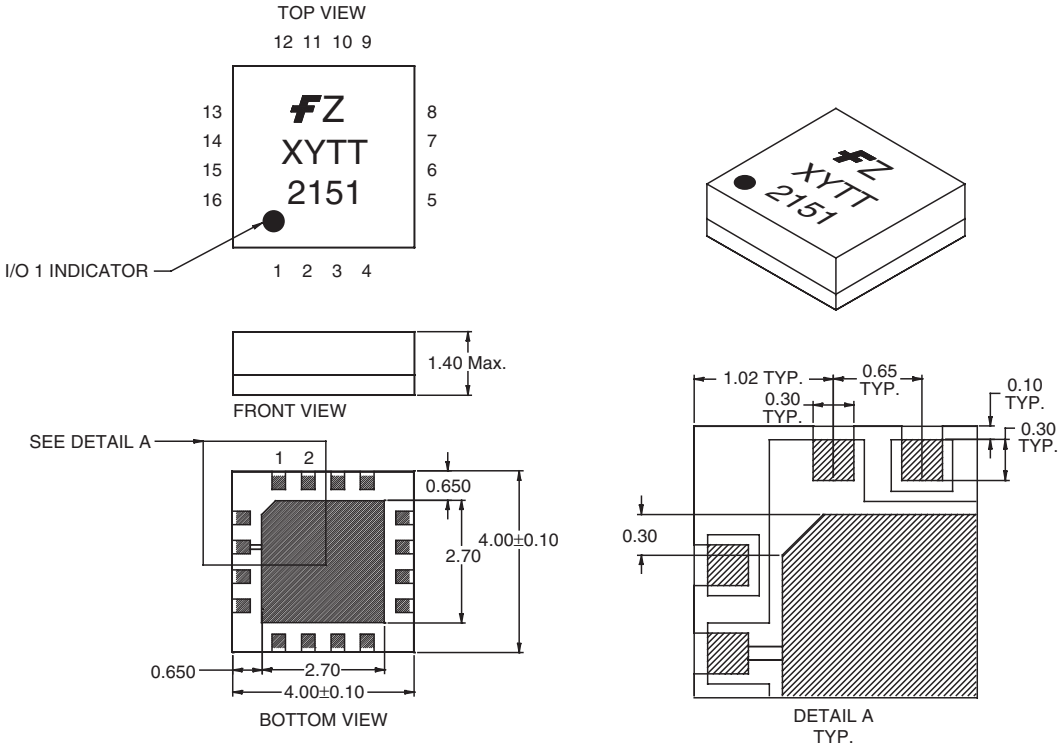


Schematic



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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FACT Quiet Series™		OCXPro™	RapidConnect™	UHC™
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