PRELIMINARY

FAIRCHILD
SEMICONDUCTOR®

August 2006

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

Features

- Dual band operation in a single package design
- Integrated bias bypass
- >33dB modulated gain 2.4 to 2.5GHz band
- >33dB modulated gain 4.9 to 5.9GHz band
- 3.0% EVM at 19dBm modulated power out (2.4GHz)
- 3.5% EVM at 19dBm modulated power out (5.5GHz)
- 3.3V positive supply operation
- Separate integrated power detectors with 20dB dynamic range
- 16 pin 4 x 4 x 1.4mm leadless package
- Internally matched to 50Ω 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 to 2.5GHz and the 4.90 to 5.9GHz frequency bands. The 16 pin 4 x 4 x 1.4 mm package with internal matching on both input and output to 50Ω 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.

Complimentary pin out available with part number FMPA2153 for MIMO applications.

Device (4 x 4 x 1.4mm)
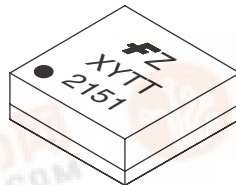
Electrical Characteristics[1] 802.11g (2.4-2.5 GHz) OFDM Modulation
(with 176 µs burst time, 100 µs idle time) 54 Mbps Data Rate, 16.7 MHz Bandwidth

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 @ +19dBm Pout		140		mA
EVM @ +19dBm Pout[2]		3.0		%
Detector Output @ +19dBm Pout		600		mV
Detector Output @ +7dBm Pout		280		mV
POUT Spectral Mask Compliance[3]		+20		dBm

Notes:
1. V_{CC} = 3.3V, PA ON 2.4 = 3.3V, T_A = 25°C, PA is constantly biased, 50Ω 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		33		dB
Average Packet Current @ +19dBm Pout		240		mA
EVM @ +19dBm Pout[2] (4.9 to 5.9GHz)		3.5		%
Detector Output @ +19dBm Pout		600		mV
Detector Output @ +7dBm Pout		375		mV
POUT Spectral Mask Compliance[3]		+20		dBm

Absolute Maximum Ratings[4]

Symbol	Parameter	Ratings	Units
V_{CC}	Positive Supply Voltage	6	V
I_{CC}	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. V_{CC} = 3.3V, PA ON 5.5 = 3.3V, T_A = 25°C, PA is constantly biased, 50Ω 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.
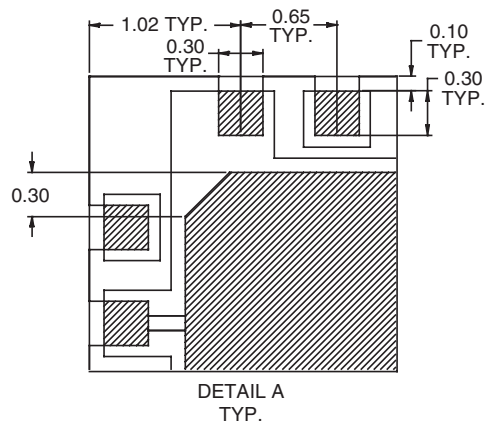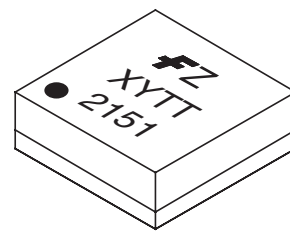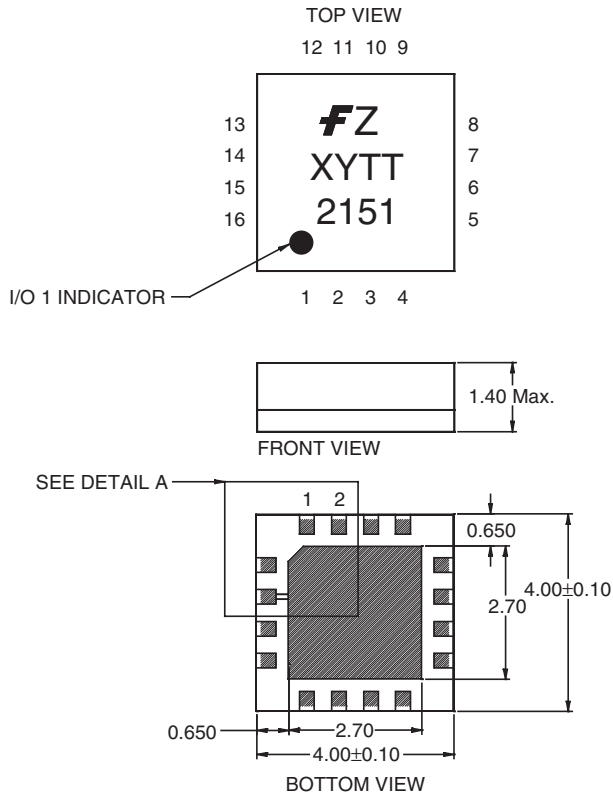
FMPA2151 2.4–2.5GHz and 4.9–5.9GHz Dual Band Linear Power Amplifier Module

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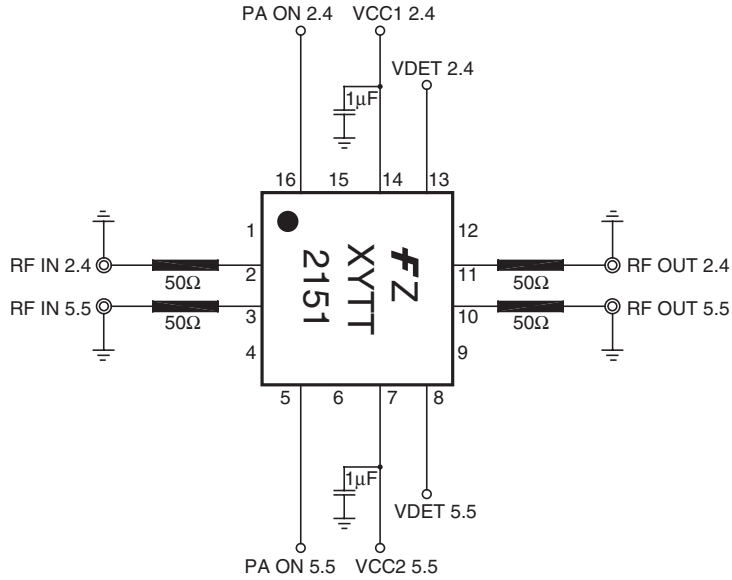
Pin	Description
1	GND
2	RF IN 2.4
3	RF IN 5.5
4	GND
5	PA ON 5.5
6	GND
7	VCC2 5.5
8	VDET 5.5
9	GND
10	RF OUT 5.5
11	RF OUT 2.4
12	GND
13	VDET 2.4
14	VCC1 2.4
15	GND
16	PA ON 2.4
17	CENTER GND

Package Outline

TOP VIEW

I/O 1 INDICATOR

1.40 Max.

FRONT VIEW

SEE DETAIL A

0.650

4.00±0.10

2.70

0.650   2.70

4.00±0.10

BOTTOM VIEW

1.02 TYP.   0.65 TYP.

0.30 TYP.   0.10 TYP.

0.30 TYP.

0.30

DETAIL A
TYP.

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EnSigna™	LittleFET™	PowerTrench®	TCM™	
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FAST®	MicroFET™	QS™	TinyBuck™	
FASTr™	MicroPak™	QT Optoelectronics™	TinyPWM™	
FPS™	MICROWIRE™	Quiet Series™	TinyPower™	
FRFET™	MSX™	RapidConfigure™	TinyLogic®	
	MSXPro™	RapidConnect™	TINYOPTO™	
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The Power Franchise®		ScalarPump™	UHC™	
Programmable Active Droop™				

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