Product Brief
September 2003

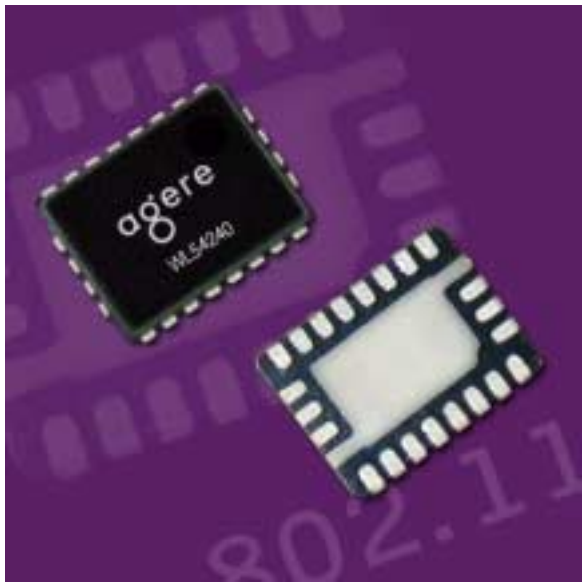
WaveLAN™ WL54240
Dual-Band Power Amplifier

1 Features

- Enhanced 0.25 µm bipolar technology (SiGe).
- Operating frequency:
  — 2.4 GHz ~ 2.5 GHz
  — 5.15 GHz ~ 5.85 GHz
- Dual-band and dual-mode solution.
- Single 3.3 V supply voltage.
- High linear PA for OFDM and DSSS/CCK modes.
- Short TX/RX turnaround times.
- Low EVM for QAM64/54 Mbits/s.
- Standby function.
- Analog power control for both bands.
- Digital band select (2.4 GHz/5 GHz).
- Digital standby mode.
- Tiny mini-VQFN-24/0.5 package.
- Integrated power detector with buffer for control loop.
- Bands:
  — 2.4 GHz: P_{Sat} = 30 dBm.
  — 5 GHz: P_{Sat} = 27 dBm.

2 Wireless LAN Applications

- High data-rate multimode applications.
- Client cards for notebooks, desktop PCs, and PDAs.
- Modules with WLAN functionality.
- Enterprise and home infrastructure devices.
- High-speed bridges and point-to-multipoint systems.
- Home entertainment and multimedia systems.



3 Description

The *WaveLAN* WL54240 is an extremely linear, high-power amplifier for WLAN applications in the 2.4 GHz and 5 GHz bands. It has analog power control for both bands as well as an on-chip power detector to compensate the variability of transmit gain. The WL54240 is designed to form a complete *IEEE*® 802.11a/b/g WLAN chip set in combination with the WL60040 multi-mode MAC, the WL64040 baseband, and the WL54040 transceiver.

The WL54240 is a dual-band and dual-mode power amplifier that combines the functionality of two devices (two frequency bands) in one package. This reduces the total board space required and reduces the total bill of materials to a minimum. Essential internal blocks can be used alternately by both amplifier path, providing optimum product synergy.

3 Description (continued)

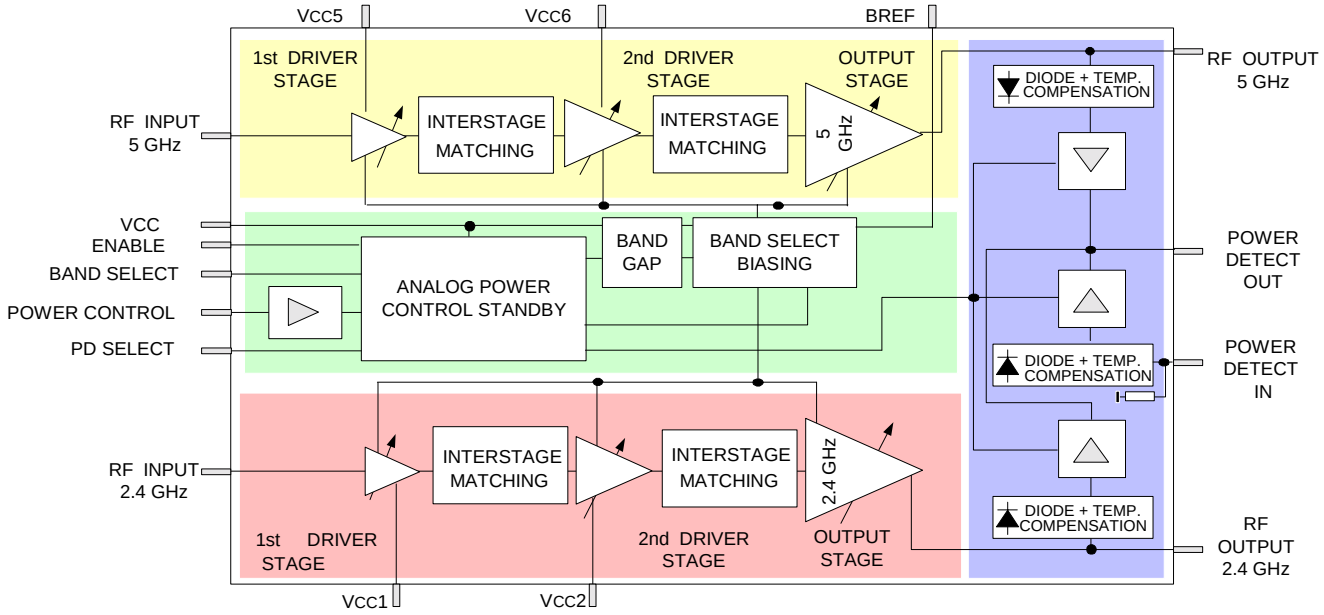


Figure 1. Block Diagram

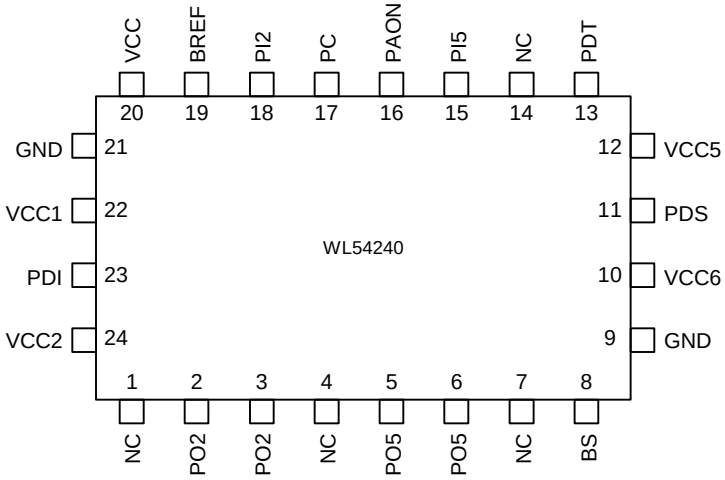


Figure 2. Pin Configuration

3 Description (continued)

Table 1. Pin Definition and Functions

Pin #	Symbol	Pin Type	Function
1	NC	—	Should be connected to ground.
2	PO2	Analog Output	Power output 2.4 GHz (open collector).
3	PO2	Analog Output	Power output 2.4 GHz (open collector).
4	GND	Supply	RF ground emitter (2.4 GHz +5 GHz).
5	PO5	Analog Output	Power output 5 GHz (open collector).
6	PO5	Analog Output	Power output 5 GHz (open collector).
7	NC	—	Should be connected to ground.
8	BS	Digital Input	Band select 2/5 GHz.
9	GND	Supply	Ground.
10	VCC6	Supply	Supply voltage 5 GHz (2 stage).
11	PDS	Digital Input	Power detect select (internal/external).
12	VCC5	Supply	Supply voltage 5 GHz (1 stage).
13	PDT	Analog Output	Power detect output.
14	NC	—	Should be connected to ground.
15	PI5	Analog Input	Power input 5 GHz.
16	PAON	Digital Input	Enable PA logic.
17	PC	Analog Input	Power control.
18	PI2	Analog Input	Power input 2.4 GHz.
19	BREF	Analog Output	Bias reference.
20	VCC	Supply	Supply voltage logic and biasing.
21	GND	Supply	Ground.
22	VCC1	Supply	Supply voltage 2.4 GHz (1 stage).
23	PDI	Analog Input	Power detect input 50 Ω (ext. coupled).
24	VCC2	Supply	Supply voltage 2.4 GHz (2 stage).
—	Heatsink	Supply	Ground.

4 Electrical Characteristics

Table 2. Absolute Maximum Ratings*

Symbol	Parameter	Min	Max	Unit	Symbol	Parameter	Min	Max	Unit
$V_{CC, PDN}$	Supply Voltage in Standby	–0.3	5	V	V_{IN}	Input Voltage	–0.3	4	V
V_{CC}	Supply Voltage	–0.3	4	V	V_{PO}	Output Voltage	–0.3	5	V
V_{LOGIC}	Input Voltage Logic	–0.3	5	V	P_{IN}	RF Input Power	—	12	dBm
V_{BREF}	Input Voltage Reference	–0.3	1.2	V	SWR_{max}	Maximum Output VSWR	—	15:1	—

* Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Table 3. Operating Range

Symbol	Parameter	Min	Max	Unit	Test Conditions
V_{CC}	Supply Voltage Range	3	3.6	V	PAON = H, P_{IN} < 8 dBm
$V_{CC, PDN}$	Supply Voltage Range in PDN	0	4.2	V	PAON = L
T_A	Ambient Temperature	–40	85	°C	—
f_{IN}	Input Frequency	2.4 5.15	2.5 5.850	GHz GHz	BS = L BS = H

4 Electrical Characteristics (continued)

Table 4. ac Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
$f$in = 2.45 GHz, VCC = 3.3 V; Tamb = 25 °C, PAON = H, BS = 0.						
G	Gain	27	31	33	dB	Pin = –20 dBm
PSat	Maximum Output Power	27	30	31.5	dBm	Pin = 3 dBm
EVM2	EVM	—	3	—	%	OFDM for 64 QAM at 20 dBm
$f$in = 5.25 GHz, VCC = 3.3 V, Tamb = 25 °C, PAON = H, BS = 1						
G	Small-Signal-Gain (output matching optimized for fm = 5.25 GHz)	 2 17	 22 19	 24 21	 dB dB	Pin = –20 dBm 5.15—5.35 GHz 5.70—5.85 GHz
PSat	Maximum Output Power	25.5	27	28.5	dBm	Pin = 3 dBm
EVM5	EVM	—	3	—	%	OFDM 64 QAM at 16 dBm

5 Ordering Information

Part Number	Temperature Range (°C)	Package	Packing	MOQ	Comcode
WL54240-D	–40 to +85	Mini-VQFN-24/0.5	TBD	TBD	7000549090

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