SKYWORKS®

DATA SHEET
SE2574BL-R: 2.4 GHz 802.11b/g/n Power Amplifier

Applications

- IEEE802.11b DSSS WLAN
- IEEE802.11g,n OFDM WLAN
- Embedded, SiP modules

Features

- Dual Mode IEEE802.11b & IEEE802.11g
- Integrated PA, digital bias control, 50Ω input and output match, 3.2GHz TX Filter.
- Integrated harmonic filter.
- Integrated load insensitive Power Detector, with <1dB error at 2:1 mismatch
- 21 dBm Output Power, 802.11b, 11 Mbps
- 18.5dBm @ 3.0 % EVM, 802.11g, 54 Mbps
- 2.3 V to 4.8 V direct to battery supply
- Lead free, Halogen free, ROHS compliant , 2 x2x0.9 mm QFN package, MSL 1

Product Description

The SE2574BL-R is a complete 802.11 b/g WLAN discrete power amplifier. The device provides all the functionality of the power amplifier, power detector, filter, associated input, inter-stage and output matching in an ultra compact 2mm x 2mm x 0.9mm form factor.

The SE2574BL-R is designed for ease of use, with all the critical input and output matching integrated. The SE2574BL-R includes a transmitter power detector with 20 dB of dynamic range and a digital Enable for power on/off control. Harmonic filters and an input 3.2GHz LO rejection filter are integrated on-chip. The power ramp rise/fall time is 0.7 µs typical.

Ordering Information

Part No.	Package	Remark
SE2574BL-R	8 pin QFN	Samples
SE2574BL-R	8 pin QFN	Tape and Reel
SE2574BL-R-EK1	N/A	Evaluation kit

Functional Block Diagram
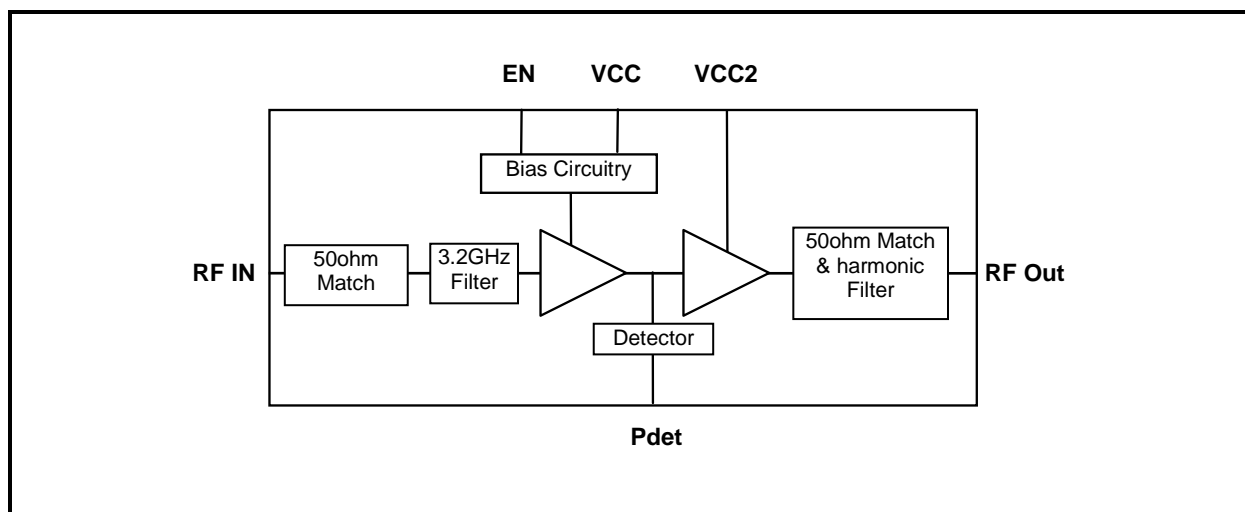
Figure 1: Functional Block Diagram

Pin Out Diagram

Figure 2: SE2574BL-R Pin Out (Top View Through Package)

Pin Out Description

Pin No.	Name	Description
1	RF In	RF Input (No DC voltage on the pin, but DC short to ground)
2	GND	Ground
3	GND	Ground
4	RF Out	RF Output (No DC voltage on the pin, DC open to ground)
5	VCC2	Final Stage Supply Voltage (May attach directly to battery)
6	VCC	First Stage Supply Voltage (May attach directly to battery)
7	DET	Power Detector Output
8	EN	Power Amplifier Enable
Die paddle	GND	Ground

Absolute Maximum Ratings

These are stress ratings only. Exposure to stresses beyond these maximum ratings may cause permanent damage to, or affect the reliability of the device. Avoid operating the device outside the recommended operating conditions defined below. This device is ESD sensitive. Handling and assembly of this device should be at ESD protected workstations.

Symbol	Definition	Min.	Max.	Unit
VCC	Supply Voltage on VCC	-0.3	5.5	V
EN	DC input on EN	-0.3	4.0	V
TX	RF Input Power. ANT terminated in 50Ω match	-	12.0	dBm
T_A	Operating Temperature Range	-40	85	°C
T_{STG}	Storage Temperature Range	-40	150	°C
ESD_{HBM}	JEDEC JESD22-A114, all pins		1000	V

Recommended Operating Conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit
T_A	Ambient temperature	-40	25	85	°C
VCC	Supply voltage, nominal operation	2.7	3.3	5.0	V
	Supply voltage, output power reduced by 2dB typ	2.3	2.7		

DC Electrical Characteristics

Conditions: VCC = 3.3V , EN = 3.3V, T_A = 25 °C, as measured on Skyworks SE2574BL-R-EK1 evaluation board, all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_{CC-G}	Total Supply Current	54 Mbps OFDM signal, 64QAM 18dBm, VCC = 3.3V	-	140	-	mA
I_{CC-B}	Total Supply Current	11 Mbps CCK signal, BT = 0.45 20dBm, VCC = 3.3V	-	165	-	mA
I_{CQ}	Total Supply Current	No RF VCC = 3.3V	-	110	-	mA
I_{CC_OFF}	Total Supply Current	EN = 0 V, No RF Applied	-	1	10	µA

Logic Characteristics

Conditions: VCC = 3.3V , EN = 3.3V, T$_A$ = 25 °C, as measured on Skyworks SE2574BL-R-EK1 evaluation board, all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V$_{ENH}$	Logic High Voltage (Module On)	-	1.8	-	3.6	V
V$_{ENL}$	Logic Low Voltage (Module Off)	-	0	-	0.4	V
I$_{ENH}$	Input Current Logic High Voltage	-	-	160	180	µA
I$_{ENL}$	Input Current Logic Low Voltage	-	-	20	25	µA

AC Electrical Characteristics

802.11g/n Transmit Characteristics

Conditions: VCC = 3.3V , EN = 3.3V, T$_A$ = 25 °C, as measured on Skyworks SE2574BL-R-EK1 evaluation board, all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Condition		Min.	Typ.	Max.	Unit
F$_{IN}$	Frequency Range	-		2400	-	2500	MHz
Pout	Output Power, 3.3V	54 Mbps OFDM , 64 QAM, EVM=3%		-	18.5	-	dBm
		11Mbps, CCK, BT=0.45, Mask			21		
P$_{1dB}$	P1dB	VCC = 3.3V		-	25.0	-	dBm
S$_{21}$	Small Signal Gain	-		25	27	29	dB
ΔS$_{21}$	Small Signal Gain Variation	Gain variation over single 20MHz channel		-	0.5	-	dB
		Gain Variation over band		-	-	1.1	
2f	Harmonics	1 Mbps, BPSK,	20dBm, 3.3V	-	-40	-35	dBm/MHz
3f			20dBm, 3.3V	-	-40	-35	dBm/MHz
t$_{dr}$, t$_{df}$	Delay & rise/fall Time	50 % of V$_{EN}$ edge and 90/10 % of final output power level		-	0.7	-	µs
S$_{11}$	Input Return Loss	-		10	15	-	dB
STAB	Stability	CW, P$_{OUT}$ = 20 dBm, VCC = 3.3V 0.1 GHz – 20 GHz Load VSWR = 10:1		All non-harmonically related outputs less than -42 dBm/MHz			
RU	Ruggedness	P$_{IN}$ = 12dBm, VCC = 3.3V Load VSWR = 10:1		No permanent damage			

Power Detector Characteristics

Conditions: VCC = 3.3V, EN = 3.3V, T_A = 25 °C, as measured on Skyworks SE2574BL-R-EK1 evaluation board, all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Condition	VCC = 3.3V			Unit
			Min.	Typ.	Max.	
F_{OUT}	Frequency Range	-	2400	-	2500	MHz
PDR	Power detect range, CW	Measured at ANT	0	-	23	dBm
PDZ_{src}	DC source impedance on PD_OUT	-	-	1	-	k Ω
PDV_{NoRF}	Output Voltage, P_{OUT} = No RF	Measured into 1MΩ	-	0.10	-	V
PDV_{p16}	Output Voltage, P_{OUT} = 16 dBm CW	Measured into 1MΩ	-	0.50	-	V
PDV_{p19}	Output Voltage, P_{OUT} = 19 dBm CW	Measured into 1MΩ	-	0.70	-	V
PDV_{p22}	Output Voltage, P_{OUT} = 22 dBm CW	Measured into 1MΩ	-	1.0	-	V
LPF_{-3dB}	Power detect low pass filter -3dB corner frequency	Measured into 1MΩ		2.5		MHz
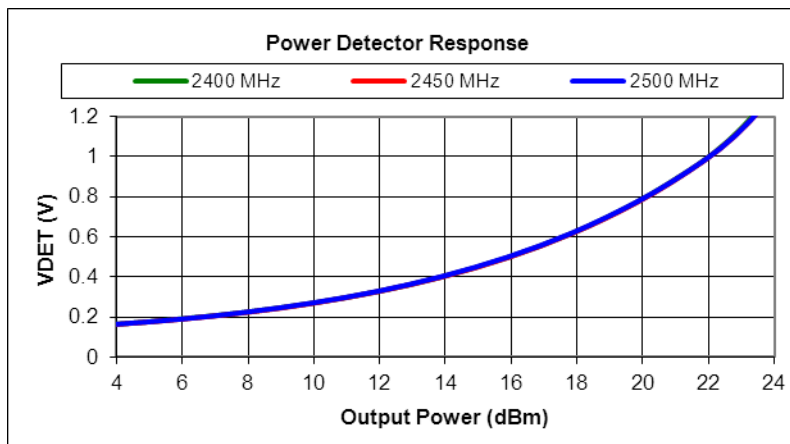
Figure 3: SE2574BL-R Power Detector Characteristics

Package Diagram

This package is Pb free and RoHS compliant. The product is rated MSL1.
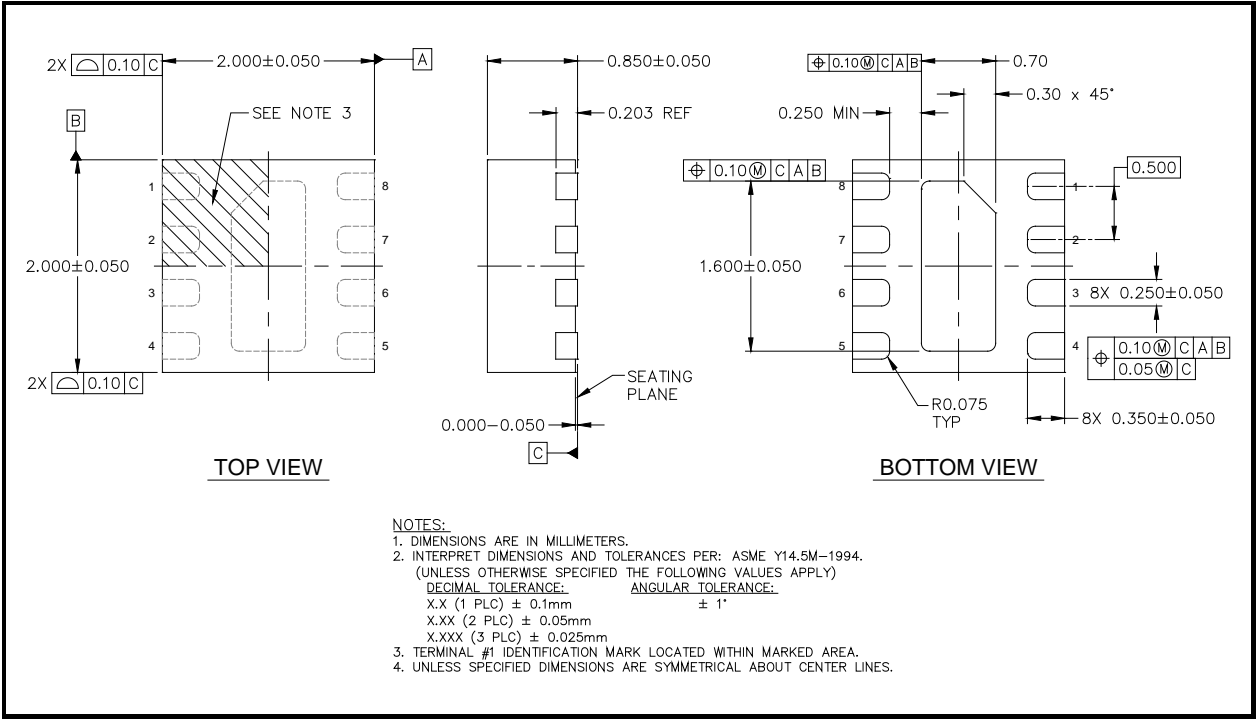
Figure 4: SE2574BL-R Package Diagram

Recommended Land Pattern
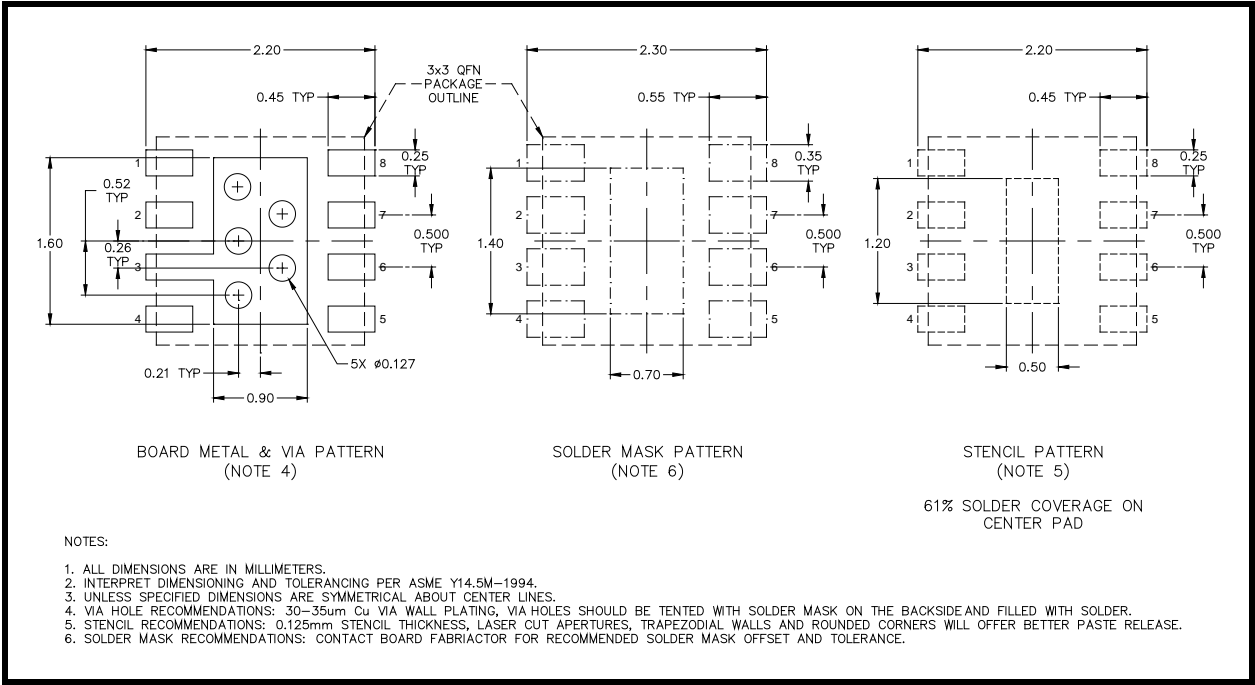
Figure 5: SE2574BL-R Package Diagram

Branding Information
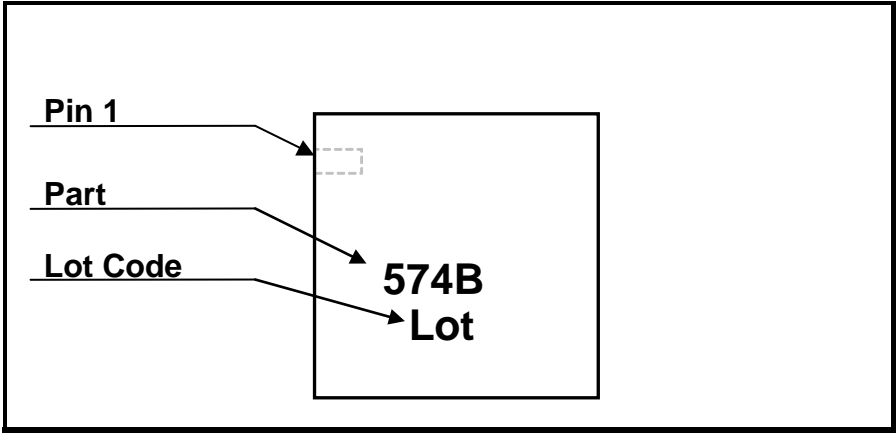
Figure 6: SE2574BL-R Branding and Pin 1 Location (Top View)

Package Handling Information

Because of its sensitivity to moisture absorption, instructions on the shipping container label must be followed regarding exposure to moisture after the container seal is broken, otherwise, problems related to moisture absorption may occur when the part is subjected to high temperature during solder assembly. The SE2574BL-R is capable of withstanding a Pb free solder reflow. Care must be taken when attaching this product, whether it is done manually or in a production solder reflow environment. If the part is manually attached, precaution should be taken to insure that the device is not subjected to temperatures above its rated peak temperature for an extended period of time. For details on both attachment techniques, precautions, and handling procedures recommended by Skyworks, please refer to:

- Skyworks Application Note: "*QFN solder reflow and rework information application note*", *Document Number QAD-00045*
- Skyworks Application Note: "*Handling, packing, shipping and use of moisture sensitive QFN application note*", *Document Number QAD-00044*

Tape and Reel Information

Parameter	Value
Devices Per Reel	3000
Reel Diameter	7 inches
Tape Width	8 millimeters
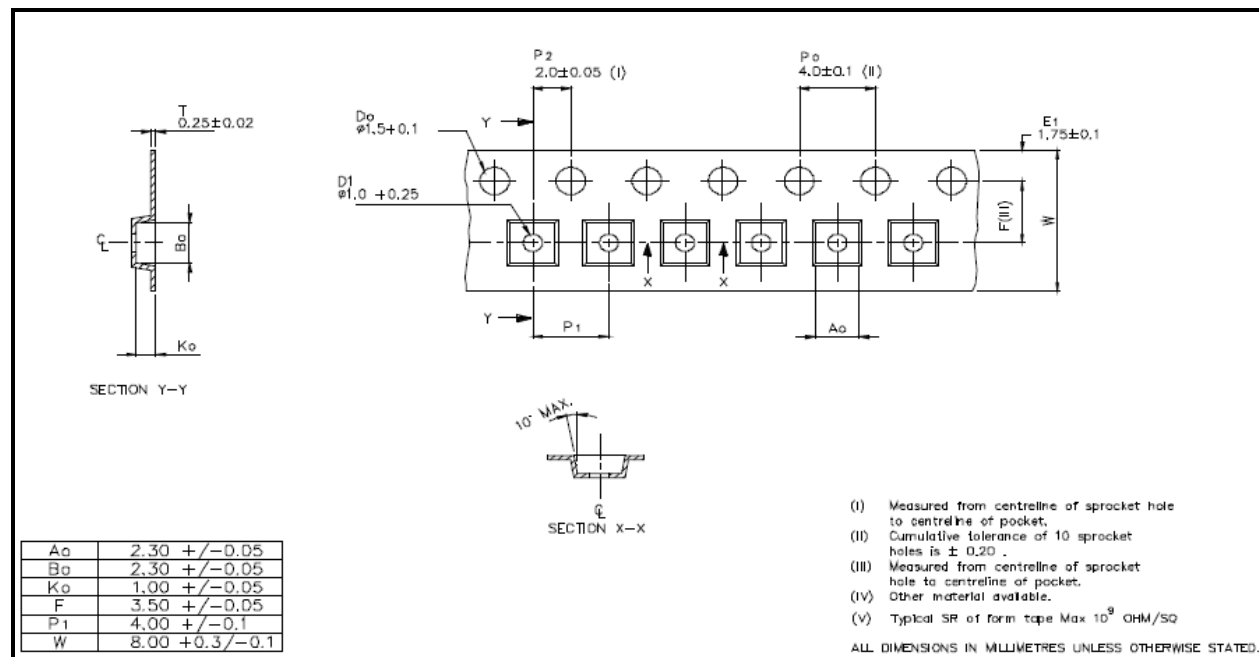
Figure 8: SE2574BL-R Tape and Reel Information

Document Change History

Revision	Date	Notes
1.0	February-10-2011	Created
1.1	February-24-2011	Updated POD
1.2	April-28-2011	Updated Part marking and updated specification
1.3	December-16-2011	Updated specifications
1.4	February-27-2012	Updated Tape and reel information.