

Applications

- DSSS 2.4 GHz WLAN (IEEE802.11b)
- OFDM 2.4 GHz WLAN (IEEE802.11g)
- Access Points, PCMCIA, PC cards

Features

- Single 3.3 V Supply Operation
- Integrated matching: Input, Interstage and Output
- Integrated power amplifier enable pin (VEN)
- Buffered, temperature compensated power detector
- 17.5 dBm, EVM = 3 %, 802.11g, OFDM 54 Mbps
- Low quiescent current of 48 mA
- 30 dB Gain
- Lead Free and RoHS compliant package
- 16 pin 3 mm x 3 mm x 0.9 mm QFN

Ordering Information

| Part Number | Package | Remark |
|-------------|----------------|---------------|
| SE2582L | 16 Pin QFN | Samples |
| SE2582L-R | 16 Pin QFN | Tape and Reel |
| SE2582L-EK1 | Evaluation Kit | Standard |

Product Description

The SE2582L is a 2.4 GHz power amplifier designed for use in the 2.4 GHz ISM band for wireless LAN applications.

The SE2582L is completely integrated including all RF matching (input, output and interstage) as well as a high performance power detector for closed loop monitoring of the output power.

The SE2582L includes a digital enable control for device on/off control. This functionality allows for a seamless interface with CMOS transceivers, without the use of external logic or reference voltages.

The SE2582L temperature compensated power detector has is highly immune to mismatch at its output with less than 1.5 dB of variation with a 2:1 mismatch.

The part operates at a low quiescent current making it ideal for low power applications such as mobile phone and PDA devices.

Functional Block Diagram

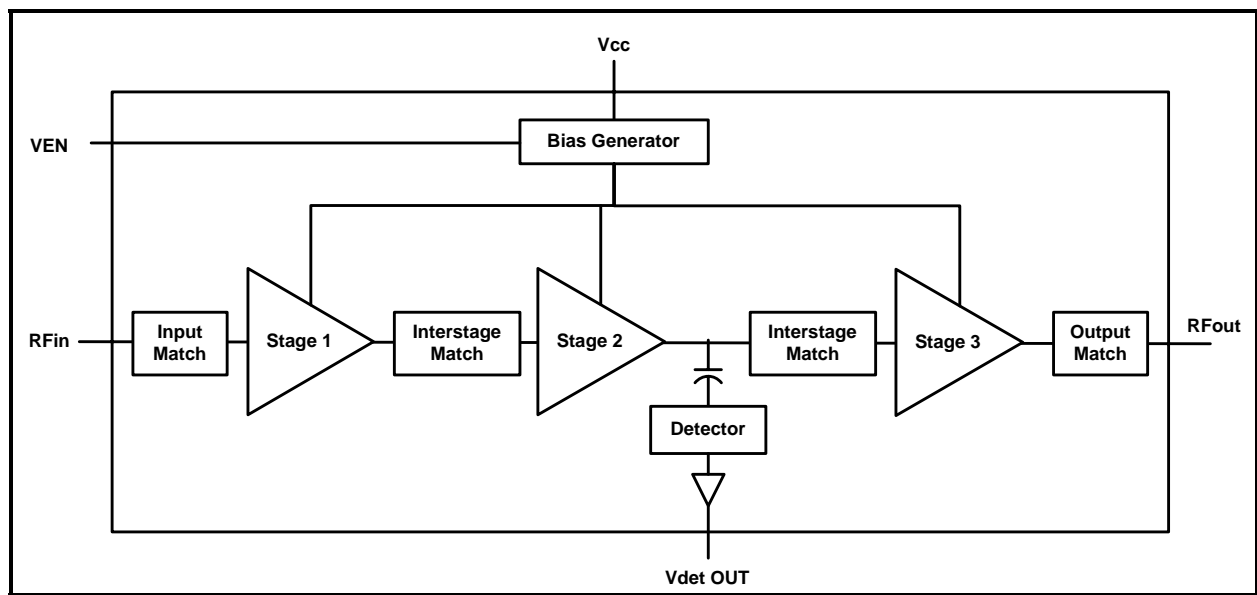


Figure 1: Functional Block Diagram

Pin Out Diagram

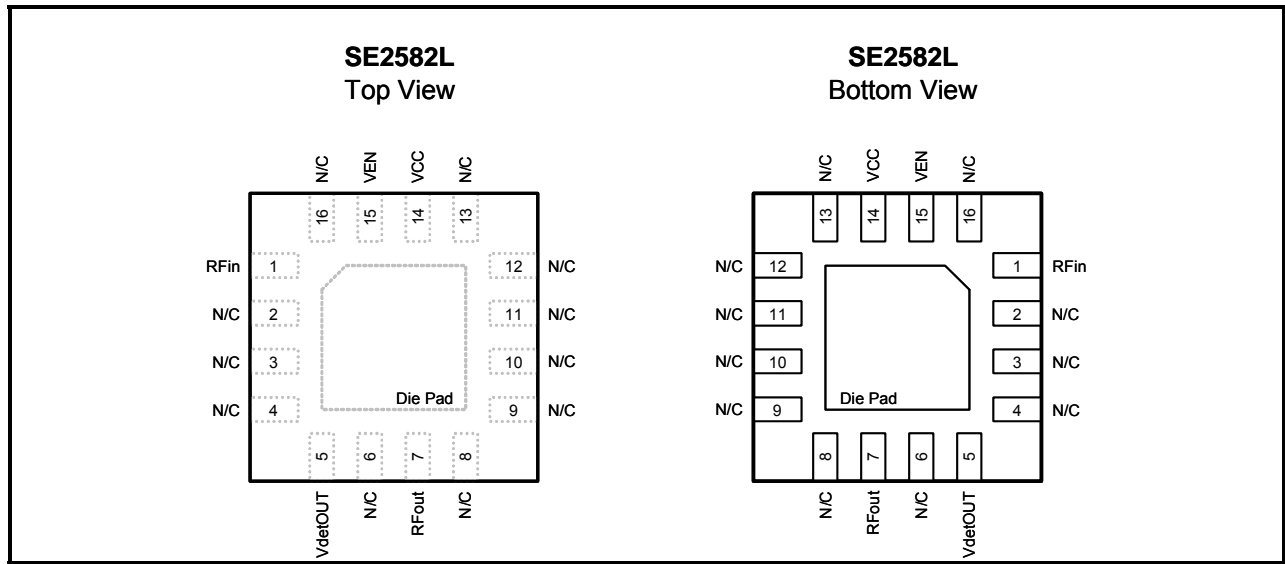


Figure 2: SE2582L Pin-Out Diagram

Pin Out Description

| Pin No. | Name | Description |
|---------|----------|--|
| 1 | RFin | Power Amplifier RF input, DC block required |
| 2 | N/C | No Connect |
| 3 | N/C | No Connect |
| 4 | N/C | No Connect |
| 5 | Vdet OUT | Analog Power Detector Output |
| 6 | N/C | No Connect |
| 7 | RFout | Power Amplifier RF Output, DC block required |
| 8 | N/C | No Connect |
| 9 | N/C | No Connect |
| 10 | N/C | No Connect |
| 11 | N/C | No Connect |
| 12 | N/C | No Connect |
| 13 | N/C | No Connect |
| 14 | Vcc | Supply Voltage |
| 15 | VEN | Digital pin used to power up and power down the IC |
| 16 | N/C | No Connect |

Absolute Maximum Ratings

These are stress ratings only. Exposure to stresses beyond these maximum ratings for a long period of time 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 |
|------------------|---|------|------|------|
| V _{CC} | Supply Voltage on pin V _{CC} | -0.3 | 4 | V |
| V _{EN} | Power Amplifier Enable | -0.3 | 4 | V |
| RF _{IN} | RF Input Power, RF _{OUT} terminated in 50Ω match | - | 10 | dBm |
| T _{STG} | Storage Temperature Range | -40 | 150 | °C |
| T _J | Maximum Junction Temperature | - | 150 | °C |

Recommended Operating Conditions

| Symbol | Parameter | Min. | Max. | Unit |
|-----------------|---------------------|------|------|------|
| V _{CC} | Supply Voltage | 2.9 | 3.6 | V |
| T _A | Ambient Temperature | -10 | 85 | °C |

DC Electrical Characteristics

Conditions: V_{CC} = V_{EN} = 3.3 V, T_A = 25 °C, as measured on SiGe Semiconductor's SE2582L-EV1 evaluation board, unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------|--------------------|---|------|------|-----------------|------|
| I _{CC-802.11b} | Supply Current | P _{OUT} = 20 dBm, 11 Mbps CCK signal, BT = 0.45, | - | 134 | - | mA |
| I _{CC-802.11g} | Supply Current | P _{OUT} = 17.5 dBm, 54 Mbps OFDM signal, 64 QAM | - | 105 | - | mA |
| I _{QC} | Quiescent Current | No RF | - | 48 | - | mA |
| I _{OFF} | Supply Current | V _{EN} = 0 V, No RF | - | 0.5 | 10 | μA |
| V _{ENH} | Logic High Voltage | - | 1.3 | - | V _{CC} | V |
| V _{ENL} | Logic Low Voltage | - | 0 | - | 0.5 | V |

AC Electrical Characteristics

802.11b/g AC Electrical Characteristics

Conditions: $V_{CC} = V_{EN} = 3.3\text{ V}$, $f = 2.45\text{ GHz}$, $T_A = 25\text{ }^\circ\text{C}$, as measured on SiGe Semiconductor's SE2582L-EV1 evaluation board, unless otherwise noted

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---------------------------------|--|---|---|------------|------|------|
| f _{L-U} | Frequency Range | - | 2400 | - | 2500 | MHz |
| P _{1dB} | Output 1dB compression point | No modulation | - | 24 | - | dBm |
| S ₂₁ | Small Signal Gain | P _{IN} = -25 dBm | - | 30 | - | dB |
| ΔS ₂₁ | Gain Variation over band | P _{IN} = -25 dBm, f _{IN} = 2400 to 2500 MHz | - | 1 | - | dB |
| ACPR | Adjacent Channel Power Ratio ±11 MHz offsets from carrier ±22 MHz offsets from carrier | P _{OUT} = 20 dBm, 11 Mbps CCK signal, BT = 0.45 | - | -37 -52 | - | dBc |
| 2f | Harmonic | P _{OUT} = 20 dBm, CW | - | -48 | - | dBc |
| 3f | | | - | -50 | - | dBc |
| EVM | Error Vector Magnitude | P _{OUT} = 17.5 dBm, 54 Mbps OFDM signal, 64 QAM | - | 3.0 | - | % |
| t _r , t _f | Rise and Fall Time | - | - | 0.5 | - | us |
| STAB | Stability | P _{OUT} = 17.5 dBm, 54 Mbps OFDM, 64 QAM, VSWR = 6:1, all phases | All non-harmonically related outputs less than -50 dBc/100 kHz | | | |
| VSWR | Tolerance to output load mismatching | P _{OUT} = 17.5 dBm, 54 Mbps OFDM, 64 QAM, VSWR = 3:1, all phases | No damage | | | |

Power Detector

Conditions: $V_{CC} = V_{EN} = 3.3\text{ V}$, $f = 2.45\text{ GHz}$, $T_A = 25\text{ }^\circ\text{C}$, as measured on SiGe Semiconductor's SE2582L-EV1 evaluation board, unless otherwise noted

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---------------------|------------------------|-----------------------------|------|------|-----------|------------|
| PDR | P_{OUT} detect range | - | 0 | - | P_{1dB} | dBm |
| VDET | Detector voltage | $P_{OUT} = 20\text{ dBm}$ | - | 0.8 | - | V |
| VDET | Detector voltage | $P_{OUT} = 17.5\text{ dBm}$ | - | 0.65 | - | V |
| VDET | Detector voltage | $P_{OUT} = \text{NO RF}$ | - | 0.3 | - | V |
| PDZ _{OUT} | Output Impedance | - | 250 | - | 700 | Ω |
| PDZ _{LOAD} | DC load impedance | - | 10 | - | - | k Ω |

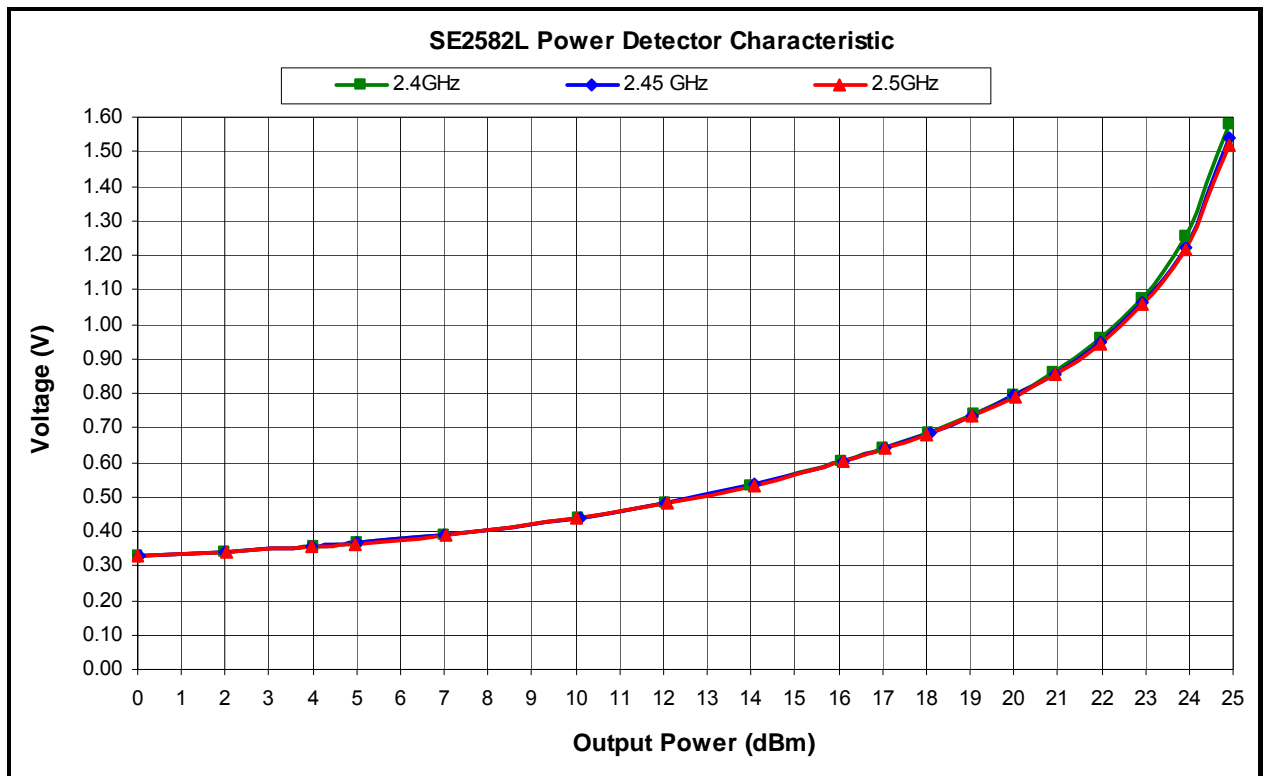


Figure 3: SE2582L Power Detector Characteristic over Frequency

Package Diagram

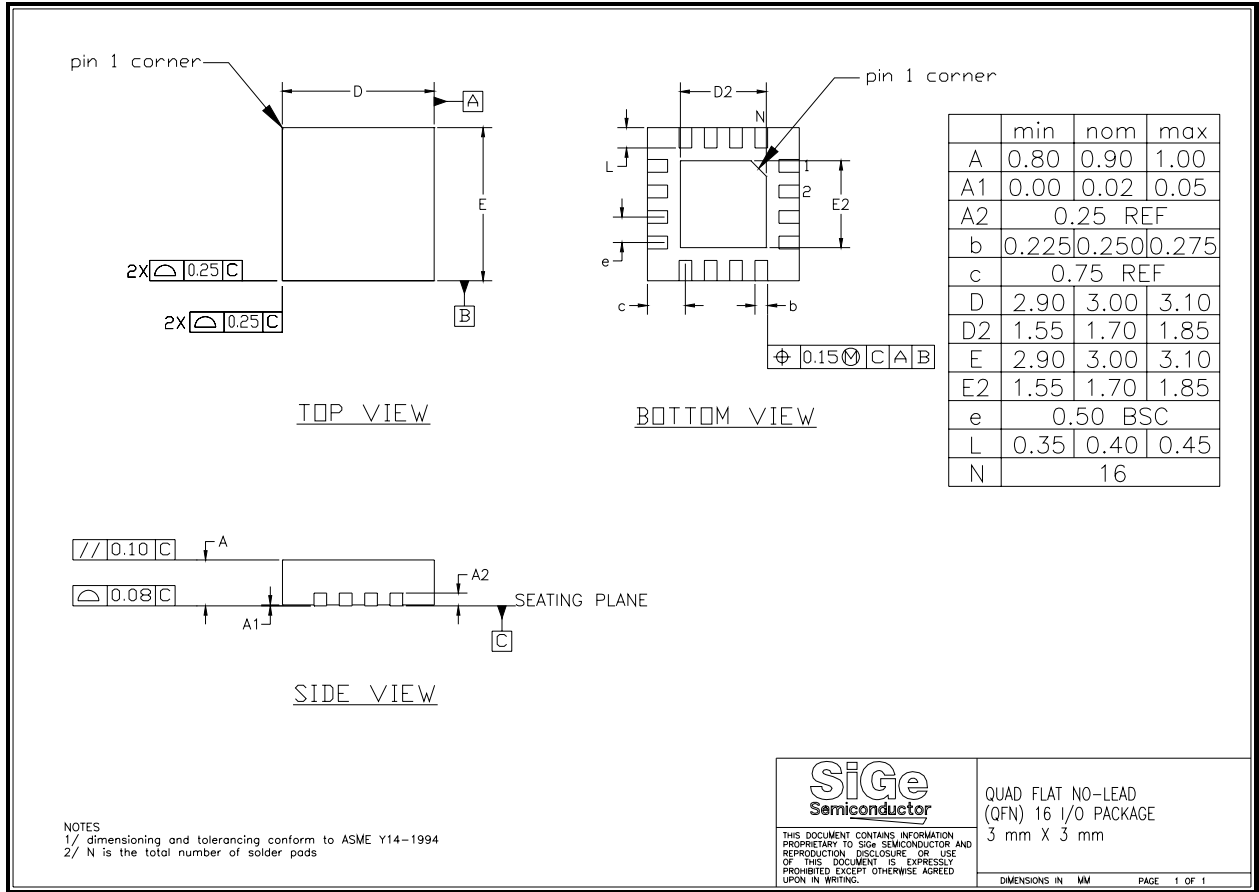


Figure 5: SE2582L Package Diagram

Branding

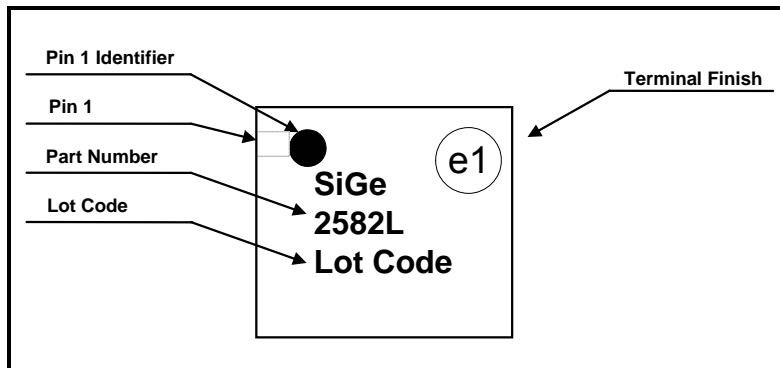


Figure 6: SE2582L Branding

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Product Preview

The datasheet contains information from the product concept specification. SiGe Semiconductor, Inc. reserves the right to change information at any time without notification.

Preliminary Information

The datasheet contains information from the design target specification. SiGe Semiconductor, Inc. reserves the right to change information at any time without notification.

Production testing may not include testing of all parameters.

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