

DATA SHEET
SE5516A: Dual-Band 802.11a/g/n/ac Wireless LAN Front-End
Preliminary

Applications

- IEEE802.11b DSSS WLAN
- IEEE802.11g OFDM WLAN
- IEEE802.11a OFDM WLAN
- IEEE802.11n WLAN
- IEEE802.11ac WLAN
- Access Points, PCMCIA, PC cards

Features

- All RF ports matched to 50 Ω
- Integrated 2.4 GHz PA, 5 GHz PA, TX Filter, T/R switches and diplexers
- Integrated Power Detector for each TX Chain
- 21 dBm Power, 802.11b, 11 mbps
- 18 dBm @ 3.0 % EVM, 802.11n, 64QAM, 2G
- 16 dBm @ 3.0 % EVM, 802.11n, 64QAM, 5G
- 16 dBm @ 1.8 % EVM, 802.11ac, 256QAM, 2G
- 13 dBm @ 1.8 % EVM, 802.11ac, 256QAM, 5G
- Single supply voltage: 3.3 V ± 10 %
- Lead free, Halogen free, RoHS compliant, MSL3/240°C
- 4mm x 4mm x 1.0mm, LGA Package

Product Description

The SE5516A is a complete 802.11a/b/g/n/ac WLAN RF front-end module providing all the functionality of the power amplifiers, filtering, power detector, T/R switch, diplexers and associated matching. The SE5516A provides a complete 2.4 GHz and 5 GHz WLAN RF solution from the output of the transceiver to the antenna in an ultra compact form factor. Design to meet stringent linearity conditions of 802.11ac standard, the SE5516A delivers < 2% EVM at rated AC power.

Designed for ease of use, all RF ports are matched to 50 Ω to simplify PCB layout and the interface to the transceiver RFIC. The SE5516A also includes a transmitter power detector with 20 dB of dynamic range for each transmit chain. Each power amplifier has a separate digital enable control for transmitter on/off control. The PA Enable rise/fall time is less than 0.4 μsec.

The device also provides a notch filter from 3.260-3.267 GHz and 3.28-3.89 GHz prior to the input of each 2.4 GHz and 5 GHz power amplifiers, respectively.

The SE5516A packaged in 4mm x 4mm x 1.0mm, Halogen free, Lead free, ROHS compliant, MSL 3 LGA package.

Ordering Information

| Part No. | Package | Remark |
|-------------|------------|----------------|
| SE5516A | 24 pin LGA | Samples |
| SE5516A-R | 24 pin LGA | Tape & Reel |
| SE5516A-EK1 | N/A | Evaluation kit |

Functional Block Diagram

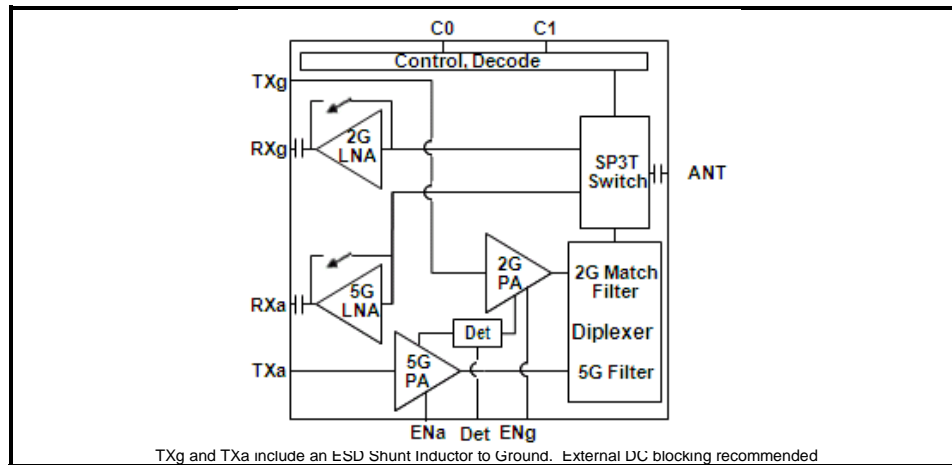


Figure 1: SE5516A Functional Block Diagram

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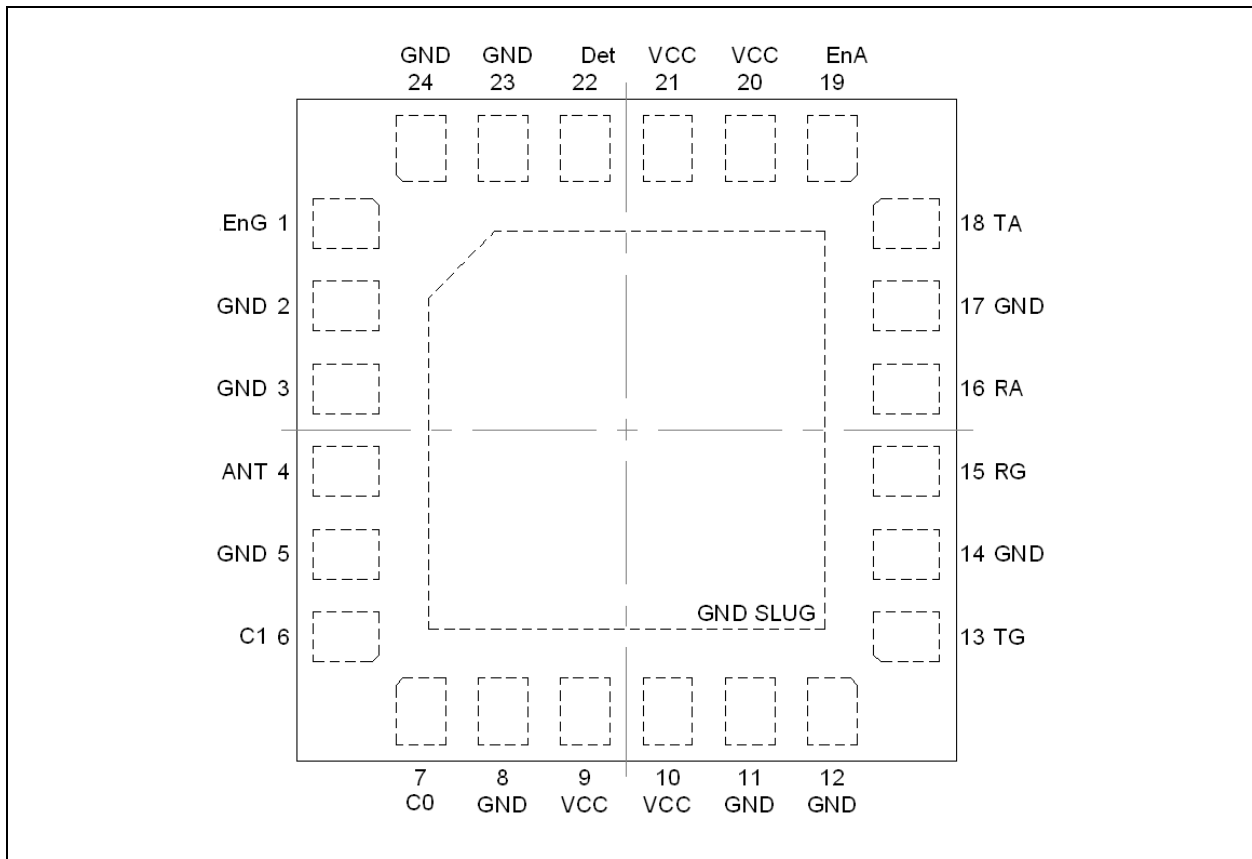


Figure 2: SE5516A Pin Out (Top View Through Package)

Pin Out Description

| Pin No. | Name | Description |
|---------|------|--------------------------------|
| 1 | ENg | 2.4 GHz Power Amplifier Enable |
| 2 | GND | Ground |
| 3 | GND | Ground |
| 4 | Ant | Antenna |
| 5 | GND | Ground |
| 6 | C1 | Switch Control |
| 7 | C0 | Switch Control |
| 8 | GND | Ground |
| 9 | VCC | Supply Voltage |
| 10 | VCC | Supply Voltage |
| 11 | GND | Ground |
| 12 | GND | Ground |

| Pin No. | Name | Description |
|---------|------|------------------------------|
| 13 | Tg | 2GHz Transmit RF Input |
| 14 | GND | Ground |
| 15 | Rg | 2GHz Receive RF Output |
| 16 | Ra | 5GHz Receive RF Output |
| 17 | GND | Ground |
| 18 | Ta | 5GHz Transmit RF Input |
| 19 | ENa | 5GHz Power Amplifier Enable |
| 20 | VCC | Supply Voltage |
| 21 | VCC | Supply Voltage |
| 22 | DET | 2/5GHz Power Detector Output |
| 23 | GND | Ground |
| 24 | GND | Ground |

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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 |
|--------------------|--|------|------|------|
| V _{CC} | Supply Voltage | -0.3 | 3.6 | V |
| PU | PA Enable pins: ENa, ENg | -0.3 | 3.6 | V |
| TX _{RF} | Max power input to Ta, Tg, with ANT terminated in 6:1 load or better | - | 12.0 | dBm |
| T _A | Operating Temperature Range | -40 | 85 | °C |
| T _{STG} | Storage Temperature Range | -40 | 150 | °C |
| ESD _{ANT} | JEDEC JESD22-A114 ANT pin zap to ground (With 220pF blocking capacitor on the ANT trace) | | 1.5 | KV |
| ESD _{HBM} | JEDEC JESD22-A114 all pins | - | 1.0 | KV |

Recommended Operating Conditions

| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|-----------------|---------------------|------|------|------|------|
| V _{CC} | Supply Voltage | 3.0 | 3.3 | 3.6 | V |
| T _A | Ambient Temperature | -40 | 25 | 85 | °C |

DC Electrical Characteristics

Conditions: V_{CC} = 3.3 V, T_A = 25 °C, as measured on Skyworks' SE5516A-EK1 evaluation board, all unused ports terminated with 50 ohms, unless otherwise noted

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------------------|---|---|------|------|------|------|
| I _{CQ-A} | Total 802.11a Transmit Supply Current | No RF | - | 175 | - | mA |
| I _{CQ-G} | Total 802.11g Transmit Supply Current | No RF | - | 135 | - | mA |
| I _{CC-G} | Total 802.11g Transmit Supply Current | P _{OUT} = 18 dBm, 54 Mbps OFDM signal, 64 QAM | - | 185 | 200 | mA |
| I _{CC-B} | Total 802.11b Transmit Supply Current | P _{OUT} = 21 dBm, 11 Mbps CCK signal, BT = 0.45, | - | 205 | 220 | mA |
| I _{CC-A} | Total 802.11a Transmit Supply Current | P _{OUT} = 16 dBm, 54 Mbps OFDM signal, 64 QAM, | - | 220 | 250 | mA |
| I _{CC-AC2G} | Total 802.11ac Transmit Supply Current 2G | P _{OUT} = 16 dBm, 256 QAM, MCS9, 40Mhz | - | 155 | 165 | mA |
| I _{CC-AC5G} | Total 802.11ac Transmit Supply Current 5G | P _{OUT} = 13 dBm, 256 QAM, MCS9, 80Mhz | - | 190 | 210 | mA |
| I _{CC-RX2} | Total Receive Supply Current 2G | Eng=Ena=0V, LNA on Switch condition 1 | - | - | 12 | mA |
| I _{CC-RX5} | Total Receive Supply Current 5G | Eng=Ena=0V, LNA on Switch condition 4 | - | - | 12 | mA |
| I _{CC_OFF} | Total Supply Current | No RF, ENG = ENa = 0 V Switch condition 3 or 6 | - | 65 | 200 | µA |

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Logic Characteristics

Conditions: $V_{CC} = 3.3\text{ V}$, $T_A = 25\text{ }^\circ\text{C}$, as measured on Skyworks' SE5516A-EK1 evaluation board (de-embedded to device), all unused ports terminated with 50 ohms, unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------|---|------------|------|------|----------|---------------|
| V_{ENH} | Logic High Voltage for ENg, ENa (Module On) | - | 1.8 | - | V_{CC} | V |
| V_{ENL} | Logic Low Voltage ENg, ENa (Module Off) | - | 0 | - | 0.5 | V |
| I_{ENH} | Input Current Logic High Voltage (ENg, ENa) | - | - | 350 | 400 | μA |
| I_{ENL} | Input Current Logic Low Voltage (ENg, ENa) | - | - | 0.2 | - | μA |

Switch Characteristics

Conditions: $V_{CC} = V_{EN} = 3.3\text{ V}$, $T_A = 25\text{ }^\circ\text{C}$, as measured on Skyworks' SE5516A-EK1 evaluation board (de-embedded to device), all unused ports terminated with 50 ohms, unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------------|--|---|------|------|----------|---------------|
| V_{CTL_ON} | Control Voltage (On State) | - | 3.0 | - | 3.6 | V |
| V_{CTL_OFF} | Control Voltage (OFF State) | - | 0.0 | - | 0.2 | V |
| SW_{ON} | Low Loss Switch Control Voltage | High State = $V_{CTL_ON} - V_{CTL_OFF}$ | 2.8 | - | V_{CC} | V |
| SW_{OFF} | High Loss Switch Control Voltage | Low State = $V_{CTL_OFF} - V_{CTL_OFF}$ | 0 | - | 0.3 | V |
| I_{CTL_ON} | Switch Control Bias Current (RF Applied) | On pin (C0, C1) being driven high. RF Applied | - | - | 100 | μA |
| I_{CTL_ON} | Switch Control Bias Current (No RF) | On pin (C0, C1) being driven high. No RF | - | - | 30 | μA |
| C_{CTL} | Control Input Capacitance | - | - | - | 100 | pF |

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Switch Control Logic Table

| Condition | Logic | | | | State | | |
|-----------|-------|----|-----|-----|-------|---------|------------|
| | C0 | C1 | ENa | Eng | SP3T | LNA | Bypass |
| 1 | 0 | 1 | 0 | 0 | RXg | RXg_EN | Open |
| 2 | 0 | 0 | 0 | 1 | TX | RXg_OFF | RXg_Bypass |
| 3 | 0 | 0 | 0 | 0 | RXg | RXg_OFF | RXg_Bypass |
| 4 | 1 | 1 | 0 | 0 | RXa | RXa_EN | Open |
| 5 | 1 | 0 | 1 | 0 | TX | RXa_OFF | RXa_Bypass |
| 6 | 1 | 0 | 0 | 0 | RXa | RXa_OFF | RXa_Bypass |

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2.4 GHz AC Electrical Characteristics

2.4 GHz Transmit Characteristics

Conditions: $V_{CC} = 3.3\text{ V}$, $ENg = C0 = 3.3\text{ V}$, $ENa = C1 = 0\text{ V}$, $T_A = 25\text{ }^\circ\text{C}$, as measured on Skyworks' SE5516A-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 |
| $P_{802.11g}$ | Output power | 54 Mbps OFDM signal, 64QAM, DEVM = 3.0 %, input signal EVM < 1% 802.11g mask compliant | - | 18 | - | dBm |
| $P_{802.11n}$ | Output power | OFDM signal, MCS7, HT40, DEVM = 3% 802.11n mask compliant $\pm 11\text{MHz}$ offset, RBW=100KHz, VBW=30KHz | - | 18 | - | dBm |
| | | DEVM = 2.5% | - | 17 | - | |
| $P_{802.11ac}$ | Output power | 40 MHz 256 QAM, MCS9 DEVM= 1.8% ac mask compliant | - | 16 | - | dBm |
| | | DEVM = 1.4% | - | 15 | - | |
| $P_{802.11b}$ | Output power | 11 Mbps CCK signal, BT = 0.45 ACPR($\pm 11\text{MHz}$ offset) < -35 ACPR($\pm 22\text{MHz}$ offset) < -56 | 21 | 22 | - | dBm |
| P_{1dB} | P1dB | - | 24 | 24.5 | - | dBm |
| S_{21} | Small Signal Gain | - | 25 | - | 30 | dB |
| ΔS_{21} | Small Signal Gain Variation Over Band | - | - | 1.0 | 2.0 | dB |
| $S_{21.6}$ | Gain at $\frac{1}{2}\text{Ref-VCO}$ | 1640.00 to 1942.00 MHz | - | 12 | 20 | dB |
| $S_{213.2}$ | Gain at Ref-VCO | 3216.00 to 3312.00 MHz | - | - | 0 | dB |
| $2f, 3f$ | Harmonics | $P_{out} \leq 21\text{ dBm}$, 1Mbps, CCK | - | - | -45.2 | dBm/MHz |
| | | $P_{out} \leq 18\text{ dBm}$, 802.11gn, all data rates | - | - | -50.0 | |
| t_{dr}, t_{df} | Delay and rise/fall Time | 50 % of V_{EN} edge and 90/10 % of final output power level | - | 0.2 | 0.4 | μs |
| S_{11} | Input Return Loss | - | - | 7 | - | dB |
| S_{22} | Output Return Loss | - | - | 10 | - | dB |
| STAB | Stability | CW, $P_{OUT} = 21\text{ dBm}$ 0.1 GHz – 21 GHz Load VSWR = 6:1 | All non-harmonically related outputs less than -42 dBm/MHz | | | |
| R_u | Ruggedness | $T_g = 12\text{dBm}$, ANT load varies over 6:1 VSWR | No Irreversible damage | | | |

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2.4 GHz Receive Characteristics

Conditions: $V_{CC} = 3.3\text{ V}$, Switch Condition 1, $T_A = 25\text{ }^\circ\text{C}$, as measured on Skyworks' SE5516A-EK1 evaluation board, all unused ports terminated with 50 ohms, unless otherwise noted.

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|-----------------|--|---|--------------|------|------|------|
| F_{OUT} | Frequency Range | - | 2400 | - | 2500 | MHz |
| S_{21} | Receive Gain, LNA Enabled. | 2400 – 2485 MHz Switch Condition 1 | 10 | 13 | 16 | dB |
| | Receive Gain, Bypass mode | LNA bypassed Switch Condition 3 | -9.5 | -8.5 | -7.5 | |
| | High Band Gain @5150-5850MHz | Switch Condition 1 | - | -17 | - | |
| ΔS_{21} | Gain Variation | 2400 – 2485 MHz, Over any 40MHz band | - | 0.25 | 0.5 | dB |
| NF | Noise Figure | De-embedded to device | - | 2.5 | 2.8 | dB |
| S_{11} | Input Return Loss | - | 5 | 10 | - | dB |
| S_{22} | Output Return Loss | - | 8 | 10 | - | dB |
| IP1dB | Input P1dB | LNA enabled Switch Condition 1 | - | -7 | - | dBm |
| IP1dB | Input P1dB | LNA bypassed Switch Condition 3 | - | 8 | - | dBm |
| LB | Loop Back Isolation (ANT – RXg) | Switch Condition 2, $P_{out} = P_{sat}$ | $P_{sat}+10$ | 39 | - | dB |
| T_{EN} | Enable Time | RXg LNA_ON \rightleftharpoons LNA_Bypass | - | - | 0.2 | usec |
| | From C0 = 50% to RX RF power to 90% of transition | TX \rightleftharpoons RXg, RXa \rightleftharpoons RXg | - | 0.6 | 1.0 | |

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5 GHz AC Electrical Characteristics

5 GHz Transmit Characteristics

Conditions: $V_{CC} = 3.3\text{ V}$, $E_{Na} = C0 = 3.3\text{ V}$, $E_{Ng} = C1 = 0\text{ V}$, $T_A = 25\text{ }^\circ\text{C}$, as measured on Skyworks' SE5516A-EK1 evaluation board, all unused ports terminated with 50 ohms, unless otherwise noted.

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|------------------|---|--|--|------|------|---------------|
| F_{IN} | Frequency Range | - | 4900 | - | 5900 | MHz |
| $P_{802.11n}$ | Output Power | OFDM signal, MCS7, HT40, DEVM = 3% 802.11n mask compliant $\pm 11\text{MHz}$ offset, RBW=100KHz, VBW=30KHz | - | 16 | - | dBm |
| | | DEVM = 2.0% | - | 15 | - | |
| $P_{802.11ac}$ | Output Power | 80Mhz , 256 QAM, MCS9 DEVM = 1.8 % Input signal EVM < 0.6% 802.1111ac mask compliant | - | 13 | - | dBm |
| | | DEVM = 1.4% | - | 12 | - | |
| P_{1dB} | P1dB | - | 21 | 22.5 | - | dBm |
| S_{21} | Small Signal Gain | In Band | 25 | - | 31 | dB |
| | | 1.9GHz | - | - | -20 | |
| | | 3.9GHz | - | - | 4 | |
| ΔS_{21} | Small Signal Gain Variation Over 80 MHz Channel | - | -1 | - | 1 | dB |
| | Small Signal Gain Variation Over sub-bands | 4.9 – 5.18 GHz 5.18 – 5.50 GHz 5.50 – 5.90 GHz | - | 2 | 3 | dB |
| S_{12} | - | Switch State 5, 4.9 – 5.9 GHz | - | - | -45 | dB |
| 2f,3f | Harmonics @18dBm, 54Mbps, 802.11a | - | - | - | -50 | dBm/MHz |
| t_{dr}, t_{df} | Delay and rise/fall Time | 50 % of V_{EN} edge and 90/10 % of final output power level | - | 0.2 | 0.4 | μs |
| S_{11} | Input Return Loss | - | - | 10 | - | dB |
| S_{22} | Output Return Loss | - | - | 10 | - | dB |
| STAB | Stability | 64 QAM, $P_{OUT} = 16\text{ dBm}$ 0.1 GHz – 21 GHz Load VSWR = 6:1 | All non-harmonically related outputs less than -42 dBm/MHz | | | |
| R_u | Ruggedness | TXa = 12dBm, ANT load varies over 6:1 VSWR | No Irreversible damage | | | |

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5 GHz Receive Characteristics

Conditions: $V_{CC} = 3.3\text{ V}$, Switch Condition 4, $T_A = 25\text{ }^\circ\text{C}$, as measured on Skyworks' SE5516A-EK1 evaluation board, all unused ports terminated with 50 ohms, unless otherwise noted.

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|-----------------|--|---|------|------|------|------|
| F_{OUT} | Frequency Range | - | 4900 | - | 5850 | MHz |
| S_{21} | Receive Gain | 4900 – 5850 MHz Switch Condition 4 | 10 | 12 | 14 | dB |
| | Receive Gain, Bypass mode | LNA bypassed Switch Condition 6 | -10 | -9 | -8 | |
| | Low Band Gain @2400-2500MHz | Switch Condition 4 | - | -28 | - | |
| ΔS_{21} | Gain Variation | 4900 – 5850 MHz, Over any 80MHz band | -0.5 | - | 0.5 | dB |
| | | Over Entire band | -1 | - | +1 | |
| NF | Noise Figure | De-embedded to device | - | 2.8 | 3.0 | dB |
| S_{11} | Input Return Loss | - | 8 | 10 | - | dB |
| S_{22} | Output Return Loss | - | 6 | 10 | - | dB |
| IP1dB | Input P1dB | LNA enabled Switch Condition 4 | -6 | - | - | dBm |
| IP1dB | Input P1dB | LNA bypassed Switch Condition 6 | 6 | - | - | dBm |
| LB | Loop Back Isolation (TXa – RXa) | Switch Condition 5, Pout = Psat | - | 33 | - | dB |
| T_{EN} | Enable Time From C0 = 50% to RX RF power to 90% of transition | RXa LNA_ON \rightarrow LNA_Bypass | - | - | 0.2 | usec |
| | | TX \rightarrow RXa, RXa \rightarrow RXg | - | 0.6 | 1.0 | |

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2.4 GHz Power Detector Characteristic

Conditions: $V_{CC} = 3.3\text{ V}$, Switch Condition 2, $T_A = 25\text{ }^\circ\text{C}$, as measured on Skyworks' SE5516A-EK1 evaluation board, all unused ports terminated with $50\ \Omega$, unless otherwise noted.

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|---------------|--|------------------------------------|------|------|------|------------|
| F_{OUT} | Frequency Range | - | 2400 | - | 2500 | MHz |
| PDR | Power detect range, peak power | Measured at ANT | 0 | - | 22 | dBm |
| PDZ_{OUT} | DC Output impedance | - | - | 2.3 | - | K Ω |
| PDV_{P21} | Output Voltage, $P_{OUT} = 21\text{ dBm}$ | Measured into 26.5K Ω | - | 0.80 | - | V |
| PDV_{P18} | Output Voltage, $P_{OUT} = 18\text{ dBm}$ | Measured into 26.5K Ω | - | 0.60 | - | V |
| PDV_{pnoRF} | Output Voltage, $P_{OUT} = \text{No RF}$ | Measured into 26.5K Ω | - | 0.20 | - | V |
| LPF_{-3dB} | Power detect low pass filter -3dB corner frequency | Measured into 26.5K Ω | 35 | - | - | MHz |
| $PDet_{acc}$ | Power Detector Accuracy | Measured into 3:1 load at ANT port | -1.5 | - | +1.5 | dB |

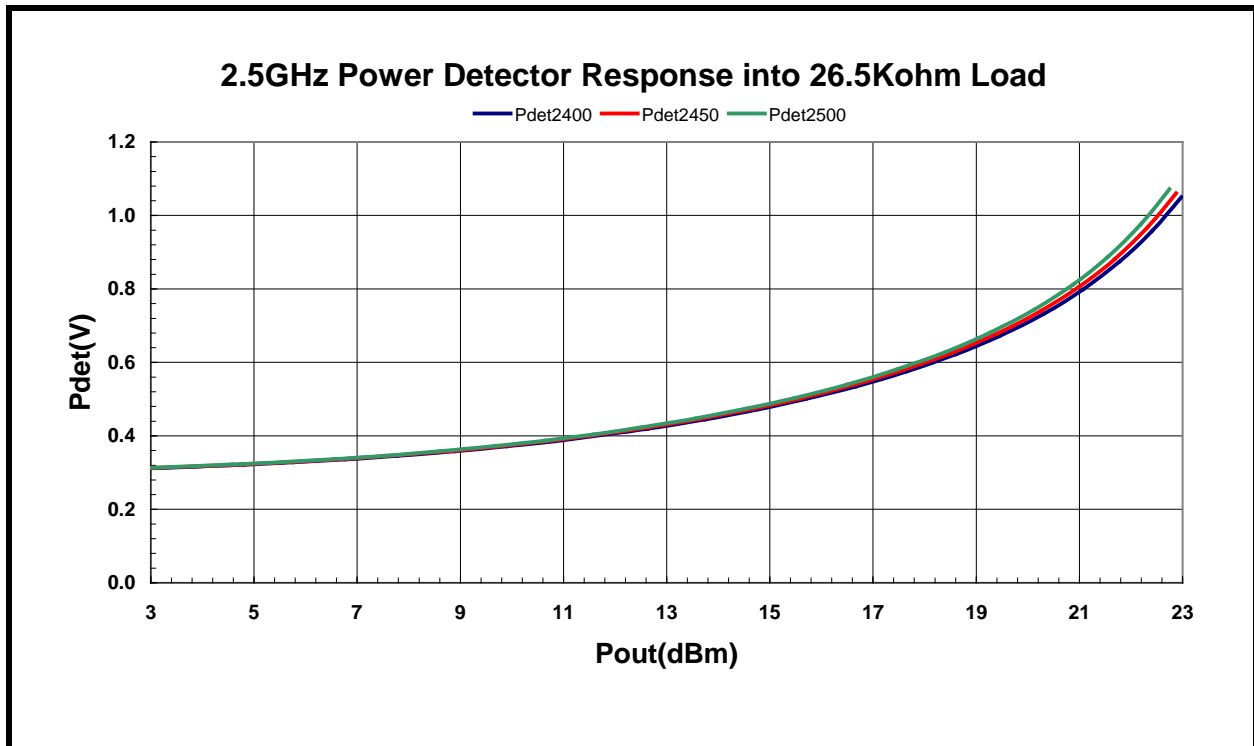


Figure 3: SE5516A Power Detector vs. Output Power over Frequency (CW Signal)

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5 GHz Power Detector Characteristic

Conditions: $V_{CC} = 3.3\text{ V}$, Switch Condition 5, $T_A = 25\text{ }^\circ\text{C}$, as measured on Skyworks' SE5516A-EK1 evaluation board, all unused ports terminated with $50\ \Omega$, unless otherwise noted.

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|---------------------------------|--|------------------------------------|------|------|------|------------|
| F _{OUT} | Frequency Range | - | 4900 | - | 5900 | MHz |
| PDR | Power detect range, peak power | Measured at ANT | 0 | - | 21 | dBm |
| PDZ _{OUT} | DC Output impedance | - | - | 26.5 | - | K Ω |
| PDV _{p18} | Output Voltage, P _{OUT} = 18dBm | Measured into 26.5K Ω | - | 0.70 | - | V |
| PDV _{p16} | Output Voltage, P _{OUT} = 16dBm | Measured into 26.5K Ω | - | 0.6 | - | V |
| PDV _{NoRF} | Output Voltage, P _{OUT} = No RF | Measured into 26.5K Ω | - | 0.20 | - | V |
| LPF _{-3dB} | Power detect low pass filter -3dB corner frequency | Measured into 26.5K Ω | 35 | - | - | MHz |
| PD _{et} _{acc} | Power Detector Accuracy | Measured into 3:1 load at ANT port | -1.5 | - | 1.5 | dB |

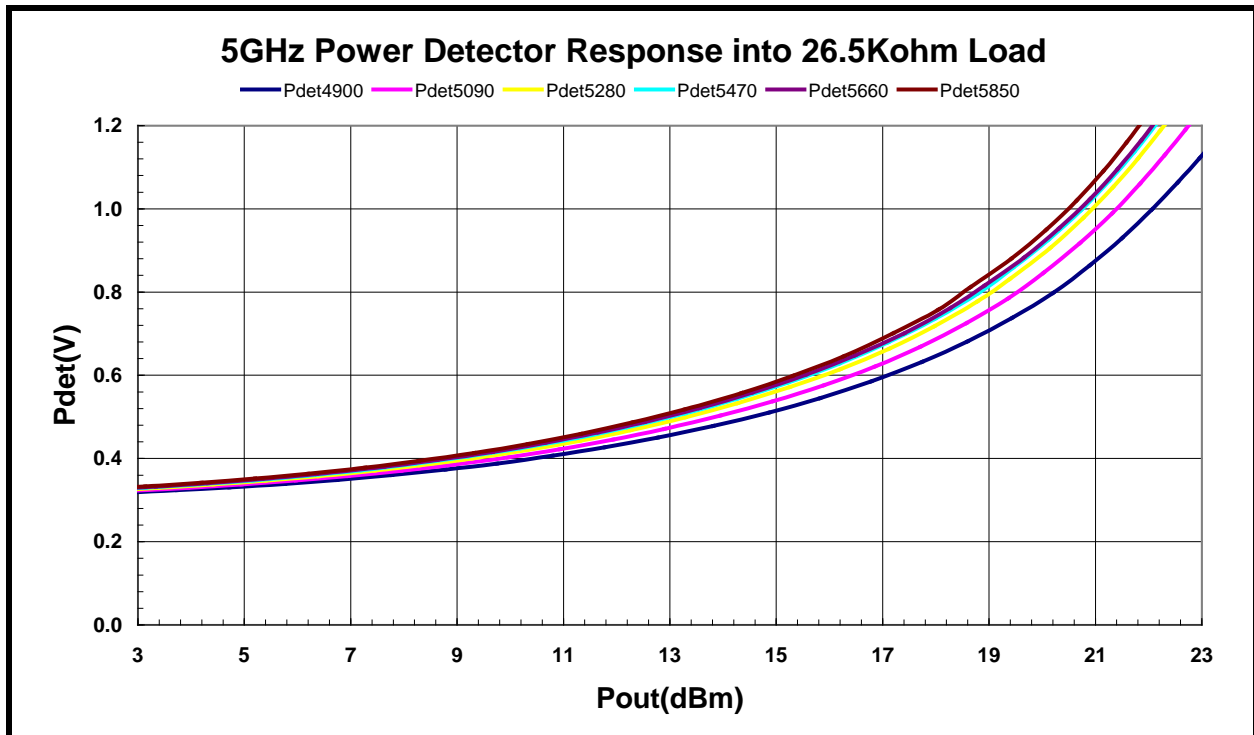


Figure 4: Preliminary SE5516A Power Detector vs. Output Power over Frequency (CW Signal)



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Package Drawing

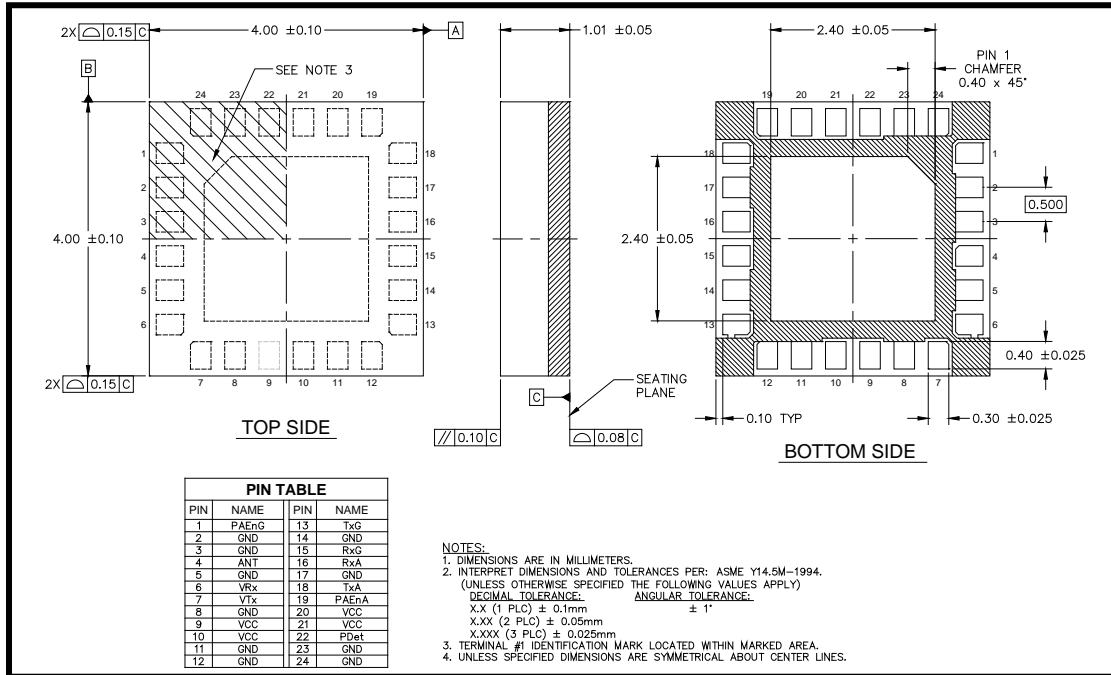


Figure 5: Package Drawing: Topside

Recommended Land and Solder Patterns

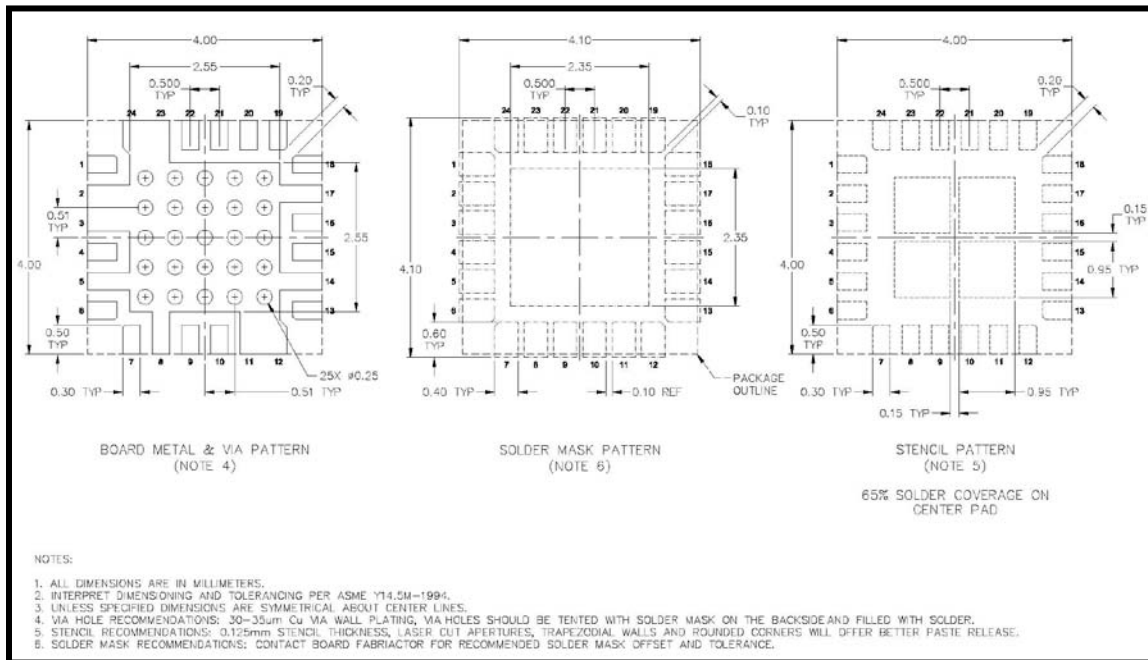


Figure 6: Recommended Land and Solder Patterns

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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 SE5516A 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: "Land Grid Array Module Solder Reflow & Rework Information", *Document Number QAD-00046*.
- Skyworks' Application Note: "Handling, Packing, Shipping and Use of Moisture Sensitive LGA", *Document Number QAD-00047*.



Caution! Class 1C ESD sensitive device

Product Branding

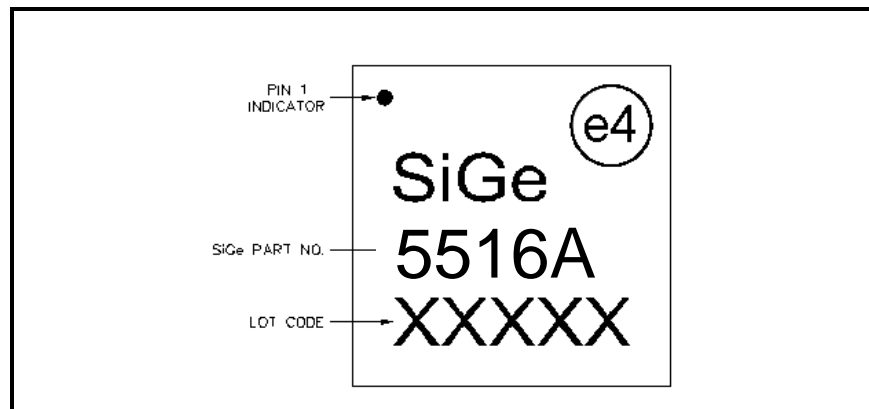


Figure 7: SE5516A Branding Information

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Tape and Reel Information

Production quantities of this product are shipped in a standard tape-and-reel format. Specific tape and reel dimensions and sizing is shown in Table 1 and Figure .

| Parameter | Value |
|------------------|-----------|
| Devices Per Reel | 3000 |
| Reel Diameter | 13 inches |

Table 1: Tape and Reel Dimensions

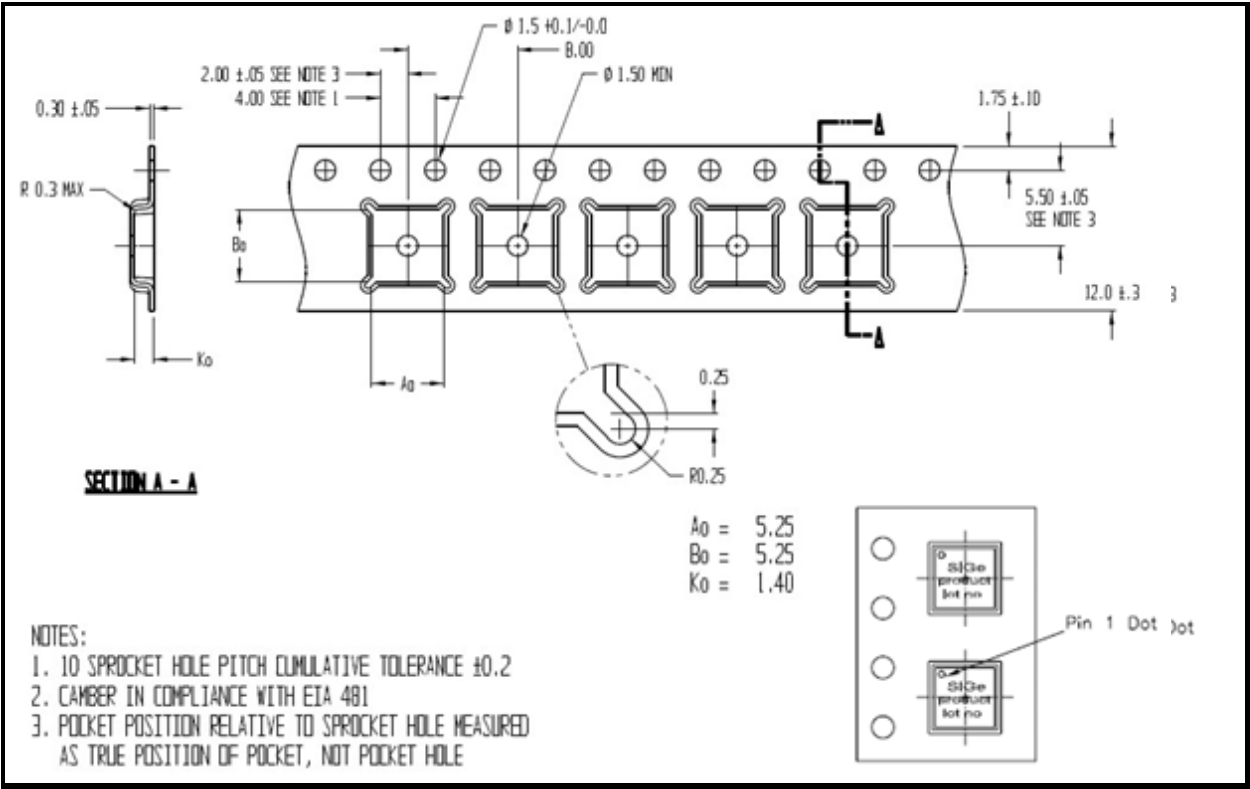


Figure 8: Detailed Tape and Reel Information (All diminsions in Millimeters)



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Document Change History

| Revision | Date | Notes |
|----------|--------------|--|
| 1.0 | Mar-29-2011 | Created |
| 1.1 | Apr-20-2011 | Numerous updates to performance limits |
| 1.2 | Apr-26-2011 | Update RX loop-back limits Update detector bandwidth |
| 1.3 | Apr-30-2011 | Updated RX Gain in Active and Bypass modes, both bands |
| 1.4 | Nov-22-2011 | Update to DEVM Update LNA gain at the opposite band (both bands) Update Harmonics Update loopback mode isolation (both bands) |
| 1.5 | May 15, 2012 | Update to change header and footer to Skyworks. Update current consumption, 2GHz TX gain, 2GHz RX EN time, detector characteristics |
| 1.6 | Jun-7-2012 | Add maximum solder profile temperature to features section |
| 1.7 | Aug-31-2012 | Update gain and return loss specifications. |