Preliminary Specifications

## FUNCTIONAL BLOCKS

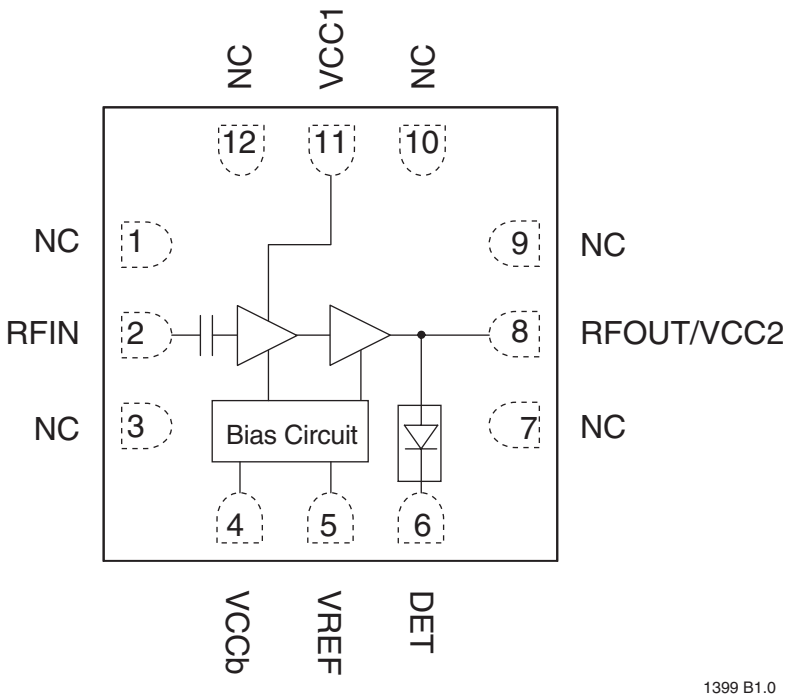



**FIGURE 1: Functional Block Diagram 12-Contact XQFN (QXB)**

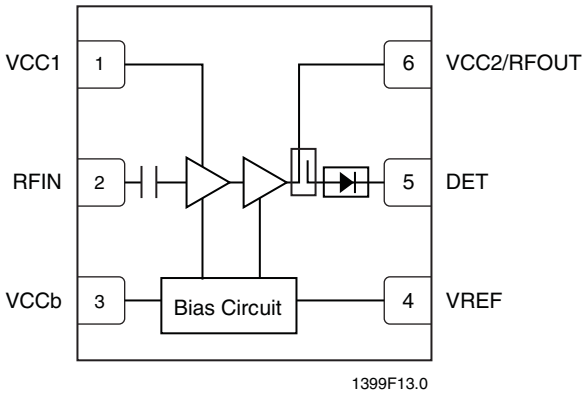
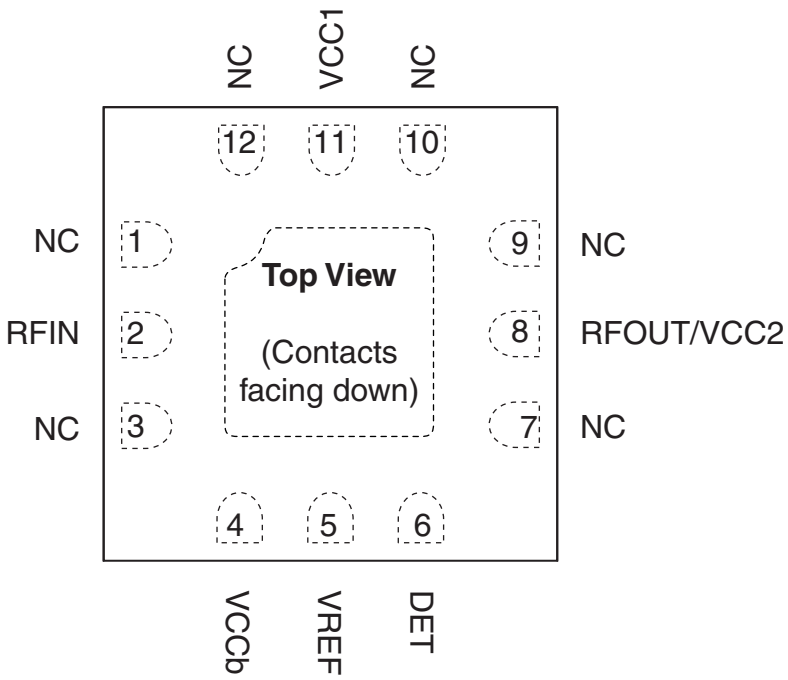
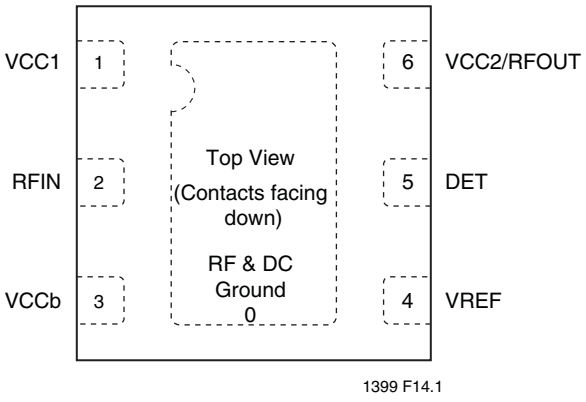



**FIGURE 2: Functional Block Diagram 6-Contact XSON (QX6)**

## PIN ASSIGNMENTS




**12-Contact XQFN**




**6-Contact XSON**

**FIGURE 3: Pin Assignments**

Preliminary Specifications

## PIN DESCRIPTIONS

**TABLE 1: Pin Description for12-Contact XQFN (QXB)**

| Symbol | Pin No. | Pin Name | Type[1] | Function |
|---|---|---|---|---|
| GND | 0 | Ground | | Low-inductance GND pad |
| NC | 1 | No Connection | | Unconnected pin |
| RFIN | 2 | | I | RF input, DC decoupled |
| NC | 3 | No Connection | | Unconnected pin |
| VCCb | 4 | Power Supply | PWR | Supply voltage for bias circuit |
| VREF | 5 | | PWR | 1st and 2nd stage idle current control |
| DET | 6 | | O | On-chip power detector |
| NC | 7 | No Connection | | Unconnected pin |
| VCC2/RFOUT | 8 | Power Supply | PWR/O | Power Supply, 2nd stage / RF output |
| NC | 9 | No Connection | | Unconnected pin |
| NC | 10 | No Connection | | Unconnected pin |
| VCC1 | 11 | Power Supply | PWR | Power supply, 1st stage |
| NC | 12 | No Connection | | Unconnected pin |

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1. I=Input, O=Output

**TABLE 2: Pin Description, 6-contact XSON (QX6)**

| Symbol | Pin No. | Pin Name | Type[1] | Function |
|---|---|---|---|---|
| GND | 0 | Ground | | Low inductance GND pad |
| $V_{CC1}$ | 1 | Power Supply | PWR | Power supply, 1st stage |
| $RF_{IN}$ | 2 | | I | RF input, DC decoupled |
| $V_{CCb}$ | 3 | Power Supply | PWR | Supply voltage for bias circuit |
| VREF | 4 | | PWR | 1st and 2nd stage idle current control |
| Det | 5 | | O | On-chip power detector |
| $V_{CC2}$/ RFOUT | 6 | Power Supply | PWR/O | Power supply, 2nd stage/ RF Output |

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1. I=Input, O=Output

## ELECTRICAL SPECIFICATIONS

The AC and DC specifications for the power amplifier interface signals. Refer to Table 3 for the DC voltage and current specifications. Refer to Figures 4 through 11 for the RF performance.

**Absolute Maximum Stress Ratings** (Applied conditions greater than those listed under "Absolute Maximum Stress Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these conditions or conditions greater than those defined in the operational sections of this data sheet is not implied. Exposure to absolute maximum stress rating conditions may affect device reliability.)

Input power to pin 2 ($P_{IN}$) . . . . . +5 dBm
Average output power ($P_{OUT}$)[1] . . . . . +26 dBm
Supply Voltage at pins 4, 8, and 11 ($V_{CC}$) for 12-contact XQFN . . . . . -0.3V to +4.0V
Supply Voltage at pins 1, 3, and 6 ($V_{CC}$) for 6-contact XSON . . . . . -0.3V to +4.0V
Reference voltage to pin 5 ($V_{REF}$) or 12-contact XQFN . . . . . -0.3V to +3.3V
Reference voltage to pin 4 ($V_{REF}$) for 6-contact XSON . . . . . -0.3V to +3.3V
DC supply current ($I_{CC}$)[2] . . . . . 400 mA
Operating Temperature ($T_A$) . . . . . -40ºC to +85ºC
Storage Temperature ($T_{STG}$) . . . . . -40ºC to +120ºC
Maximum Junction Temperature ($T_J$) . . . . . +150ºC
Surface Mount Solder Reflow Temperature . . . . . 260°C for 10 seconds

1. Never measure with CW source. Pulsed single-tone source with <50% duty cycle is recommended. Exceeding the maximum rating of average output power could cause permanent damage to the device.
2. Measured with 100% duty cycle 54 Mbps 802.11g OFDM Signal

### Operating Range

| Range | Ambient Temp | $V_{CC}$ |
|---|---|---|
| Industrial | -40°C to +85°C | 3.3V |

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**TABLE 3: DC Electrical Characteristics at 25°C**

| Symbol | Parameter | Min. | Typ | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage at pins 4, 8, 11 for 12-contact XQFN | 3.0 | 3.3 | 3.6 | V | Figure 12 |
| | Supply Voltage at pins 1, 3, 6 for 6-contact XSON | 3.0 | 3.3 | 3.6 | V | Figures 13 and 14 |
| $I_{CQ}$ | Idle current for 802.11g to meet EVM ~3% @ 20 dBm for 12-contact XQFN | | 85 | | mA | Figure 12 |
| | Idle current for 802.11g to meet EVM ~3% @ 20 dBm for 6-contact XSON | | 65 | | mA | Figure 13 |
| | Idle current for 802.11g to meet EVM ~3% @ 18 dBm for 6-contact XSON | | 48 | | mA | Figure 14 |
| $I_{CC}$ (802.11g) | Current consumption for 802.11g to meet EVM ~3% @ 20 dBm for 12-contact XQFN | | 148 | | mA | Figure 12 |
| | Current consumption for 802.11g to meet EVM ~3% @ 20 dBm for 6-contact XSON | | 140 | | mA | Figure 13 |
| | Current Consumption for 802.11g to meet EVM ~3% @ 18 dBm for 6-contact XSON | | 95 | | mA | Figure 14 |
| $I_{CC}$ (802.11b/g) | Current consumption for 802.11b/g, 23.5 dBm for 12-contact XQFN | | 200 | | mA | Figure 12 |
| | Current consumption for 802.11b/g, 23.5 dBm for 6-contact XSON | | 200 | | mA | Figure 13 |
| | Current Consumption for 802.11b/g, 22 dBm for 6-contact XSON | | 140 | | mA | Figure 14 |
| $V_{REG}$ | Reference Voltage for 12-contact XQFN with 75Ω resistor | 2.75 | 2.85 | 2.95 | V | Figure 12 |
| | Reference Voltage for 6-contact XSON with 180Ω resistor | 2.75 | 2.85 | 2.95 | V | Figure 13 |
| | Reference Voltage for 6-contact XSON with 390Ω resistor | 2.75 | 2.85 | 2.95 | V | Figure 14 |

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**TABLE 4: AC Electrical Characteristics for Configuration at 25°C**

| Symbol | Parameter | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|
| $F_{L-U}$ | Frequency range | 2412 | | 2484 | MHz |
| G | Small signal gain | 29 | 30 | | dB |
| $G_{VAR1}$ | Gain variation over band (2412–2484 MHz) | | | ±0.5 | dB |
| $G_{VAR2}$ | Gain ripple over channel (20 MHz) | | 0.2 | | dB |
| ACPR | Meet 11b spectrum mask | 23 | | | dBm |
| | Meet 11g OFDM 54 Mbps spectrum mask | 23 | | | dBm |
| Added EVM | @ 20 dBm output with 11g OFDM 54 Mbps signal | | 3 | | % |
| 2f, 3f, 4f, 5f | Harmonics at 22 dBm, without external filters | | | -40 | dBc |

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## TYPICAL PERFORMANCE CHARACTERISTICS
## Test Conditions: $V_{CC}$ = 3.3V, $T_A$ = 25°C, unless otherwise specified

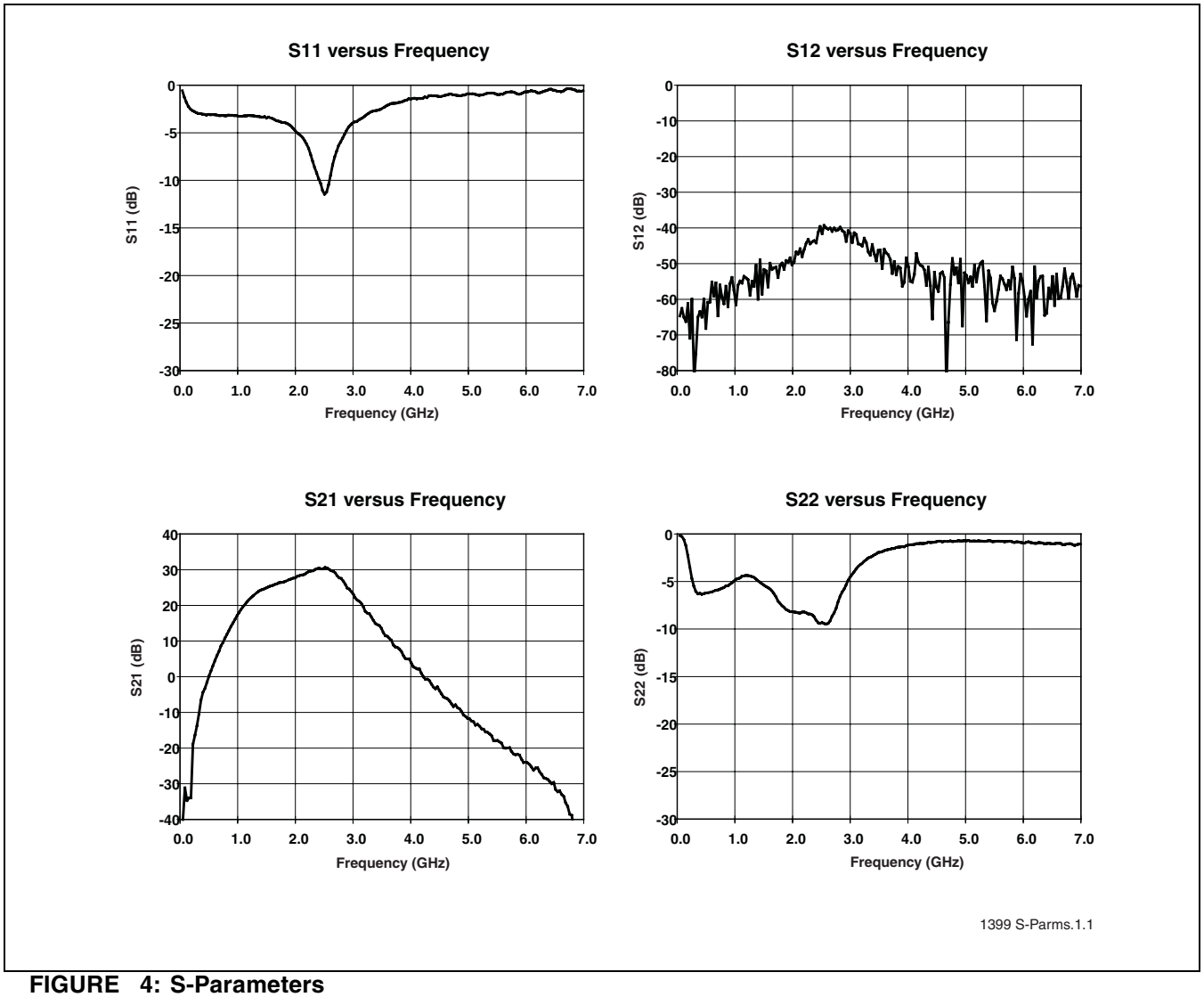



**FIGURE 4: S-Parameters**

## TYPICAL PERFORMANCE CHARACTERISTICS
## Test Conditions: $V_{CC}$ = 3.3V, $T_A$ = 25°C, 54 Mbps 802.11g OFDM Signal

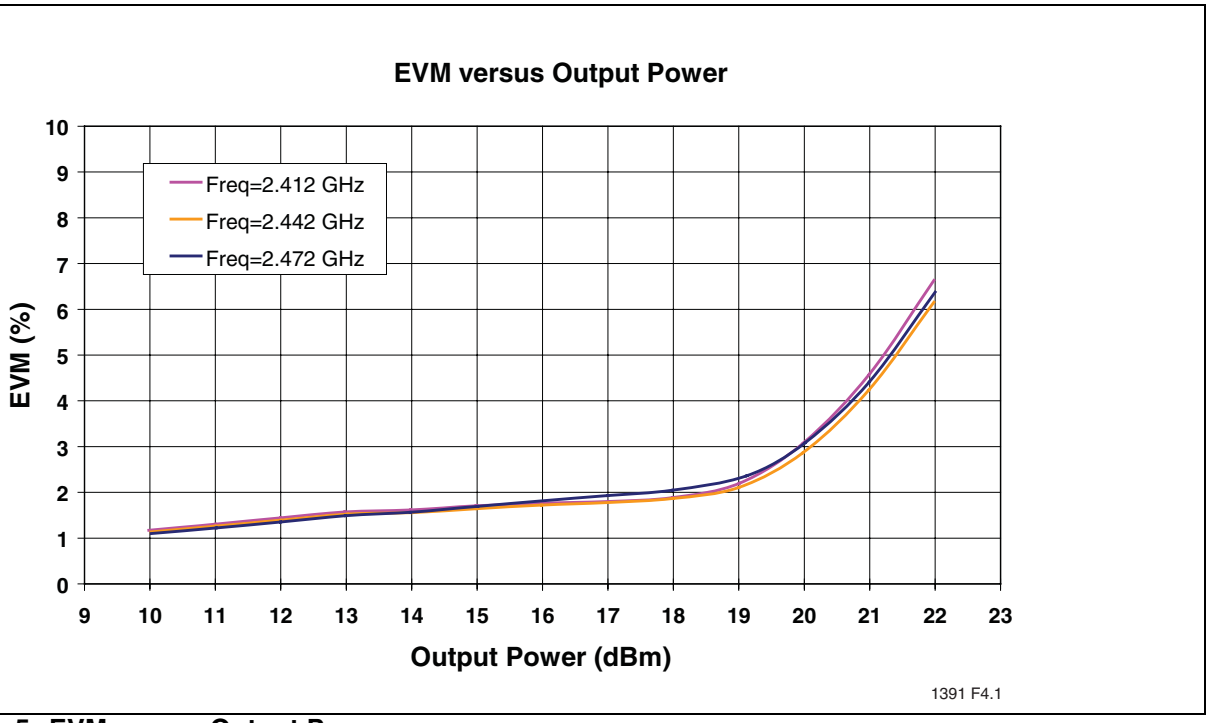



**FIGURE 5: EVM versus Output Power**

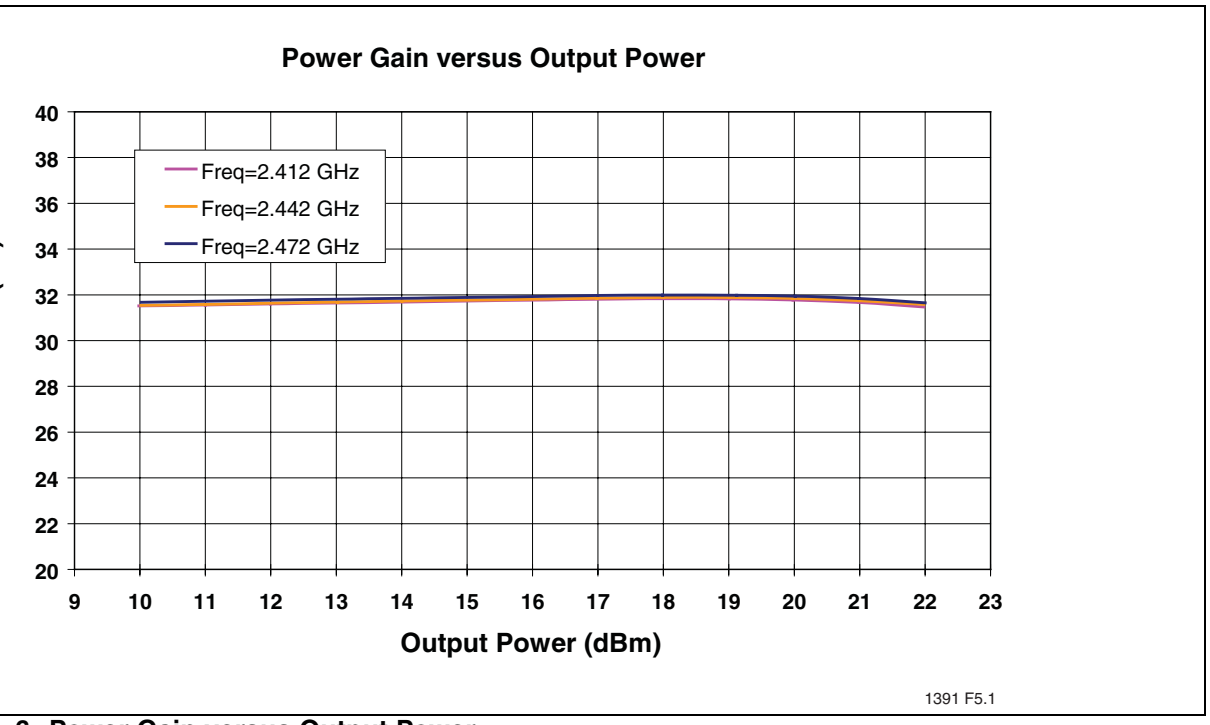



**FIGURE 6: Power Gain versus Output Power**

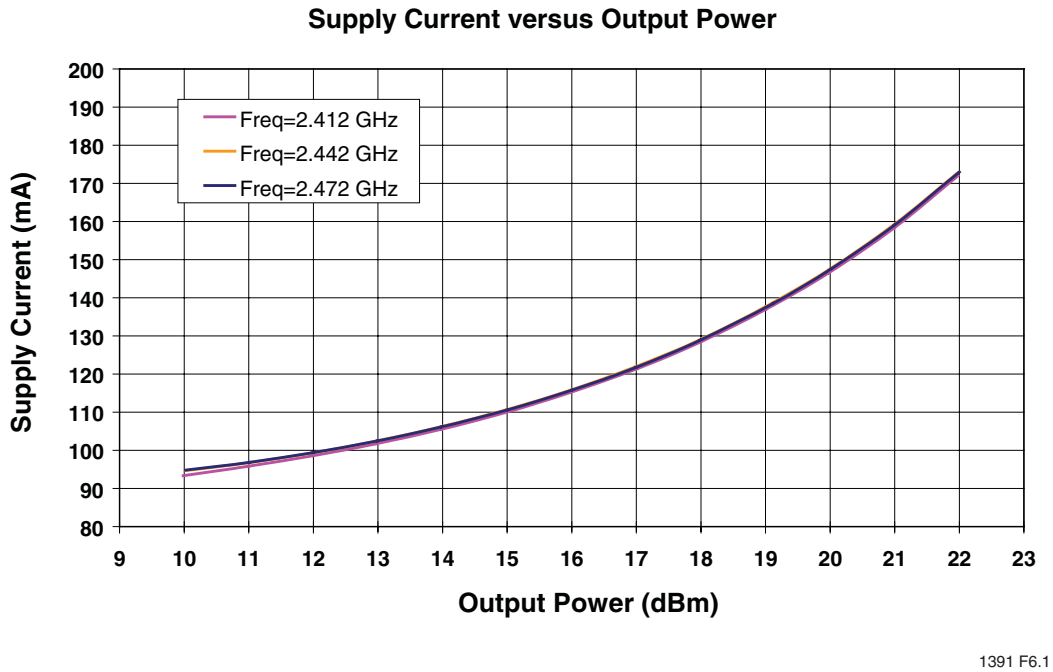



**FIGURE 7: Total Current Consumption for 802.11g operation versus Output Power**

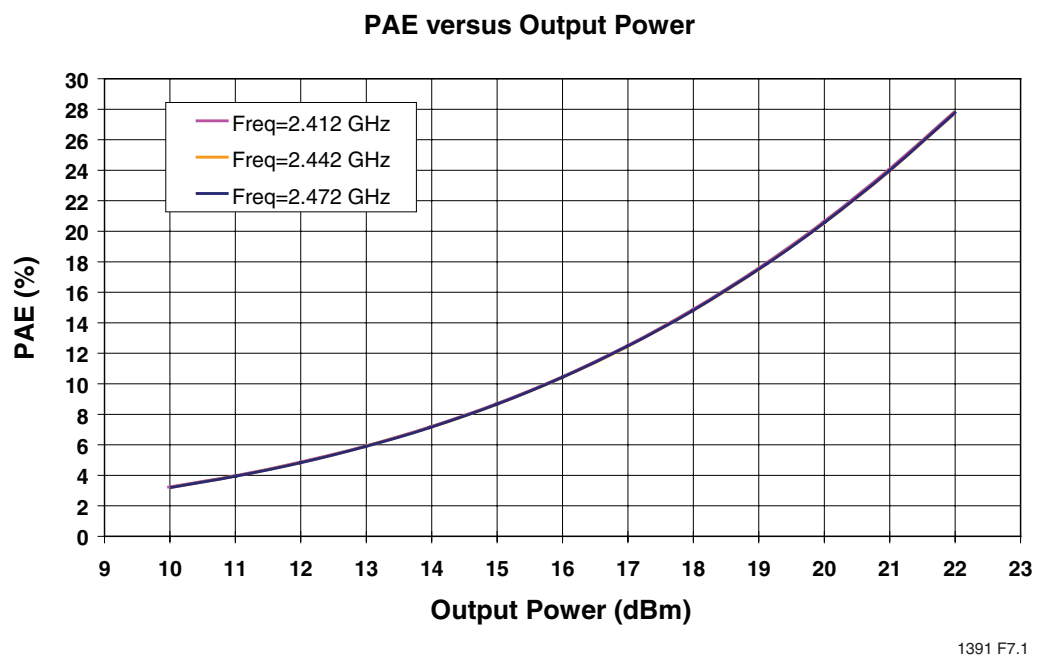



**FIGURE 8: PAE versus Output Power**

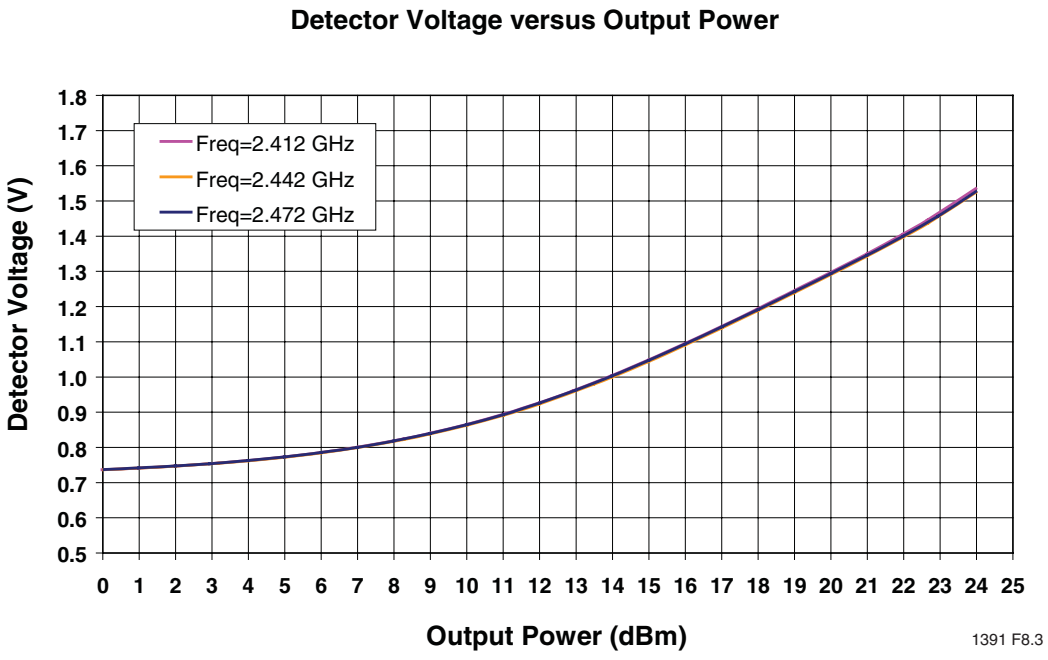



**FIGURE 9: Detector Characteristics versus Output Power**

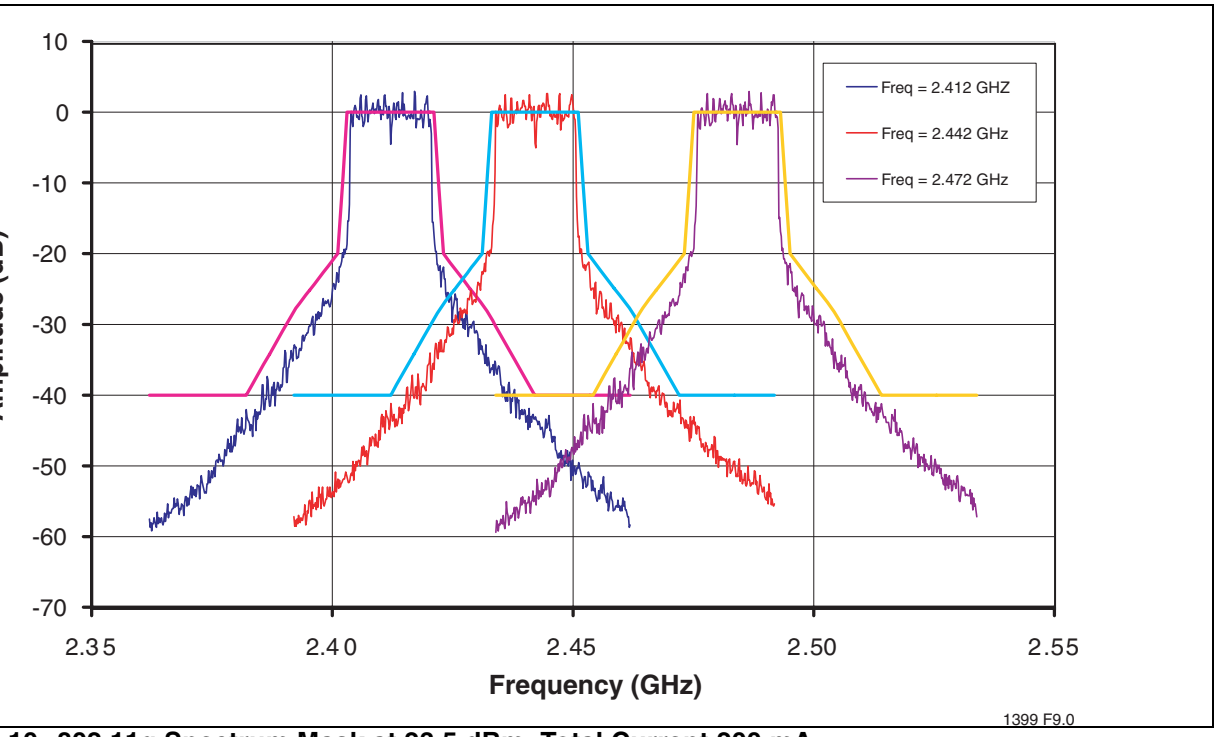



**FIGURE 10: 802.11g Spectrum Mask at 23.5 dBm, Total Current 200 mA**

## TYPICAL PERFORMANCE CHARACTERISTICS
**Test Conditions: $V_{CC}$ = 3.3V, $T_A$ = 25°C, 1 Mbps 802.11b CCK Signal**

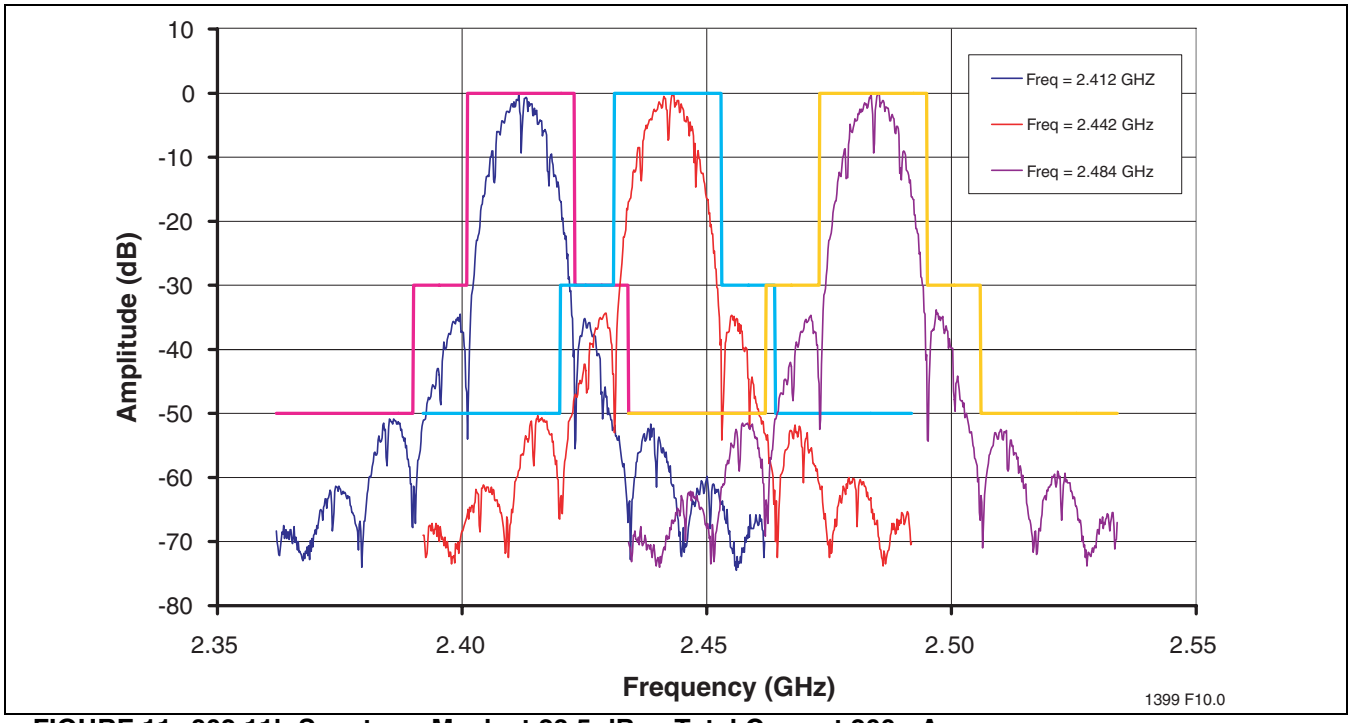



**FIGURE 11: 802.11b Spectrum Mask at 23.5 dBm, Total Current 200mA**

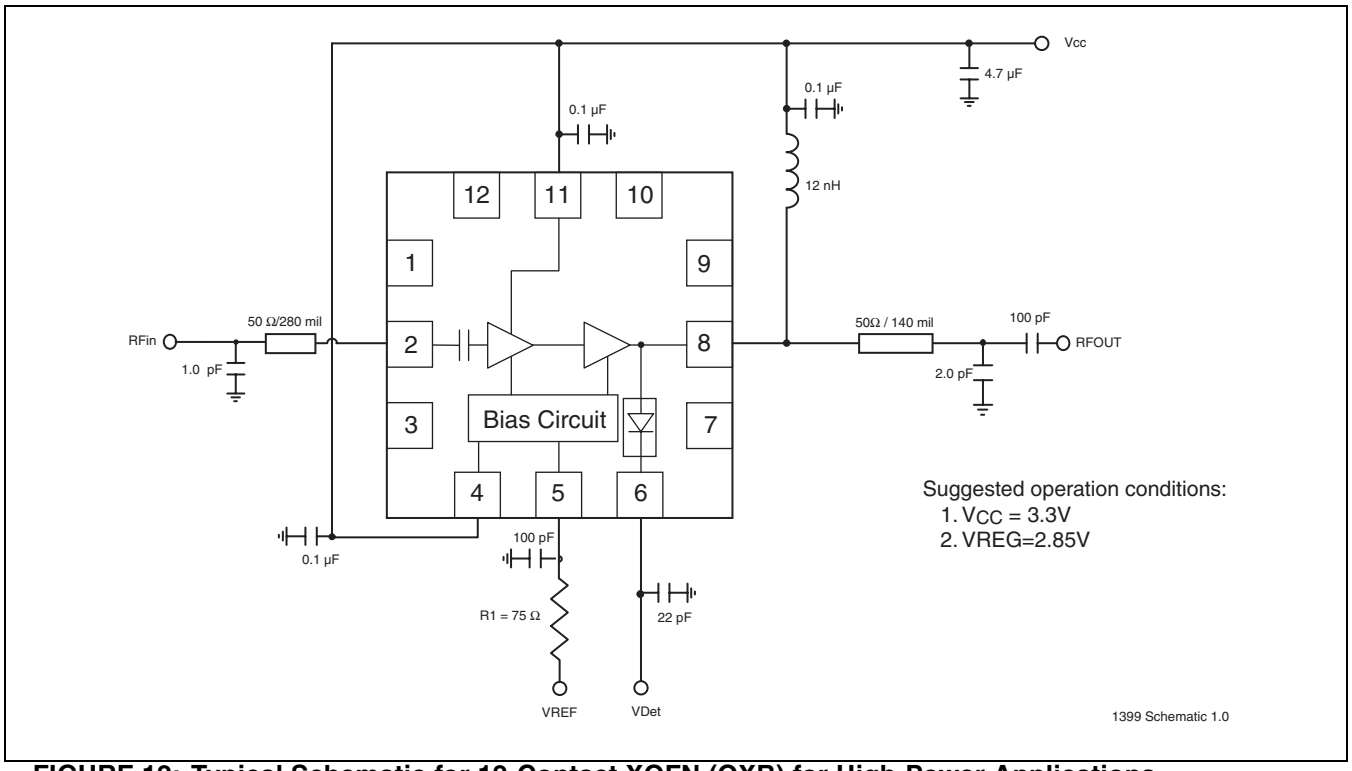



**FIGURE 12: Typical Schematic for 12-Contact XQFN (QXB) for High-Power Applications**

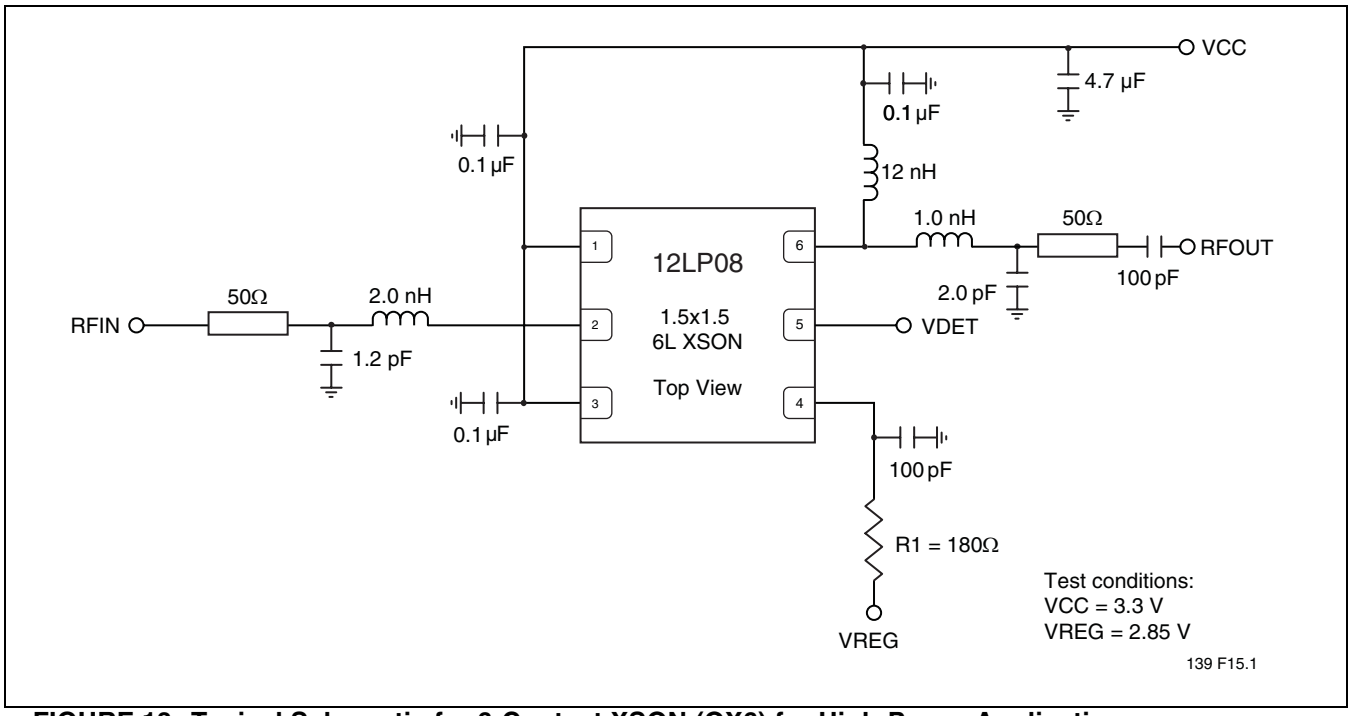



**FIGURE 13: Typical Schematic for 6-Contact XSON (QX6) for High-Power Applications**

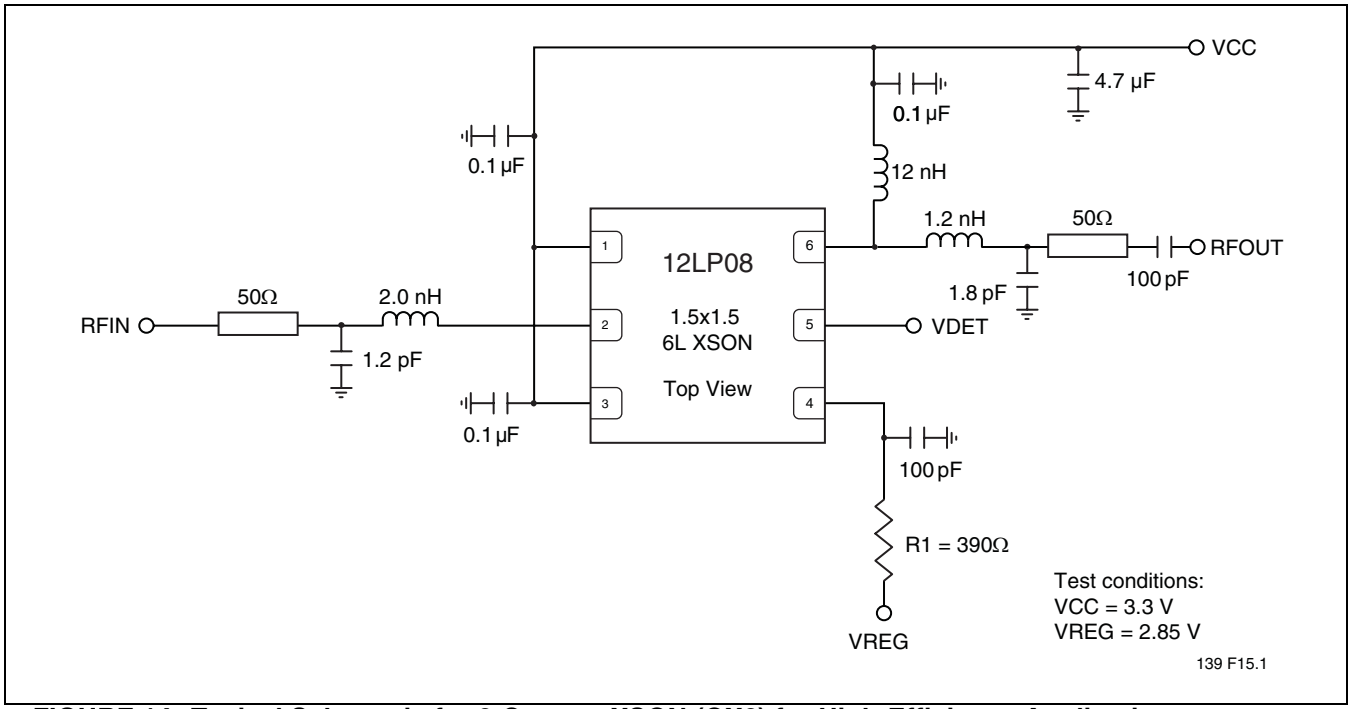
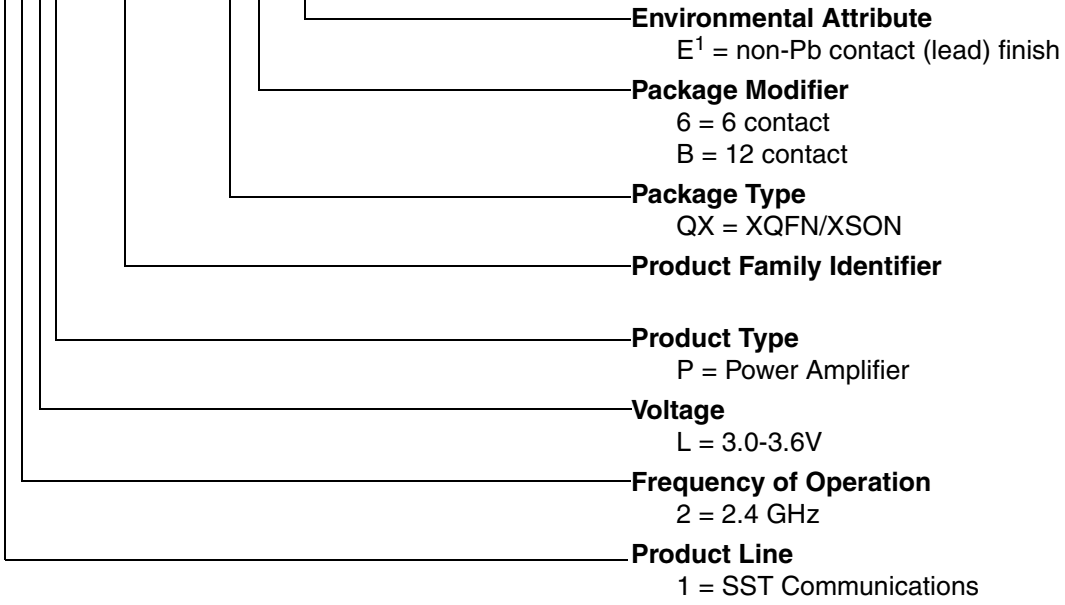



**FIGURE 14: Typical Schematic for 6-Contact XSON (QX6) for High-Efficiency Applications**

## PRODUCT ORDERING INFORMATION

**SST12LP 08 - QXB E**
SSTXXLP XX - XXX X




1. Environmental suffix “E” denotes non-Pb solder.
SST non-Pb solder devices are “RoHS Compliant”.

**Valid combinations for SST12LP08**

SST12LP08-QXBE SST12LP08-QX6E

**SST12LP08 Evaluation Kits**

SST12LP08-QXBE-K SST12LP08-QX6E-K

**Note:** Valid combinations are those products in mass production or will be in mass production. Consult your SST sales representative to confirm availability of valid combinations and to determine availability of new combinations.

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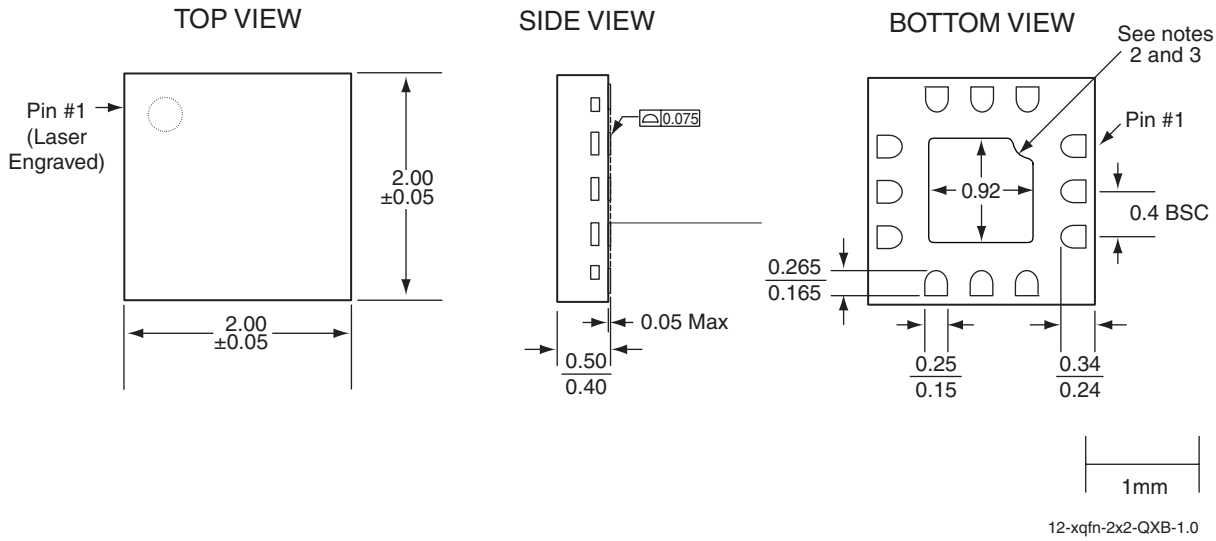
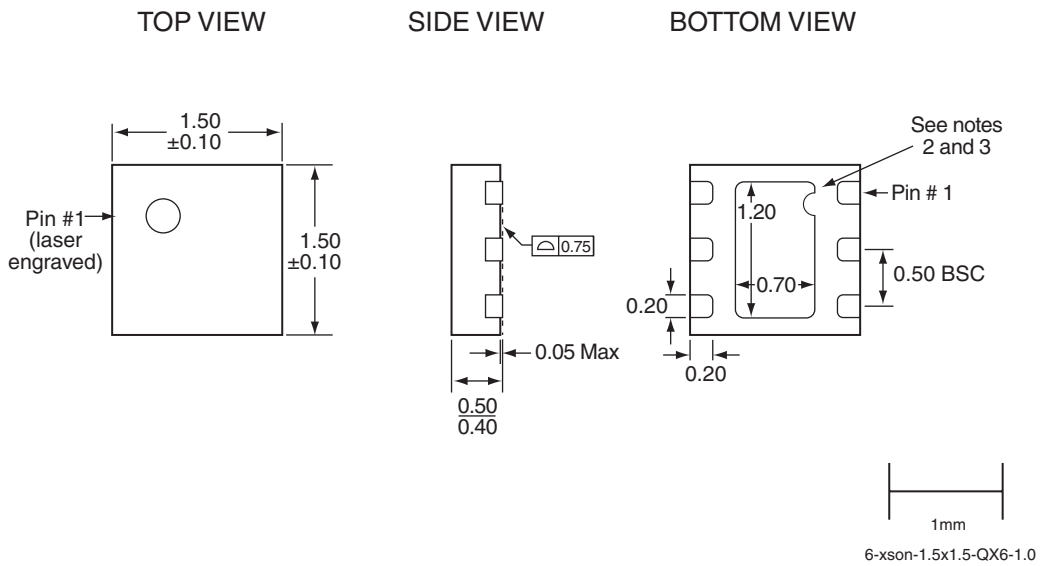
## PACKAGING DIAGRAMS




Note: 1. Complies with JEDEC JEP95 MO-220J, variant VEED-4 except external paddle nominal dimensions and pull-back of terminals from body edge.
2. From the bottom view, the pin #1 indicator may be either a curved indent or a 45-degree chamfer.
3. The external paddle is electrically connected to the die back-side and possibly to certain $V_{SS}$ leads. This paddle **must** be soldered to the PC board; it is required to connect this paddle to the $V_{SS}$ of the unit. Connection of this paddle to any other voltage potential **will** result in shorts and electrical malfunction of the device.
4. Untoleranced dimensions are nominal target dimensions.
5. All linear dimensions are in millimeters (max/min).

**FIGURE 15: 12-Contact Extremely-thin Quad Flat No-lead (XQFN)**
**SST Package Code: QXB**




Note: 1. Similar to JEDEC JEP95 XQFN/XSON variants, though number of contacts and some dimensions are different.
2. From the bottom view, the pin #1 indicator may be either a curved indent or a 45-degree chamfer.
3. The external paddle is electrically connected to the die back-side and to $V_{SS}$.
This paddle **must** be soldered to the PC board; it is required to connect this paddle to the $V_{SS}$ of the unit.
Connection of this paddle to any other voltage potential **will** result in shorts and electrical malfunction of the device.
4. Untoleranced dimensions are nominal target dimensions.
5. All linear dimensions are in millimeters (max/min).

**FIGURE 16: 6-Contact Extremely-thin Quad Small Outline No-lead (XSON)**
**SST Package Code: QX6**

**TABLE 5: Revision History**

| Revision | Description | Date |
|---|---|---|
| 00 | • Initial release of data sheet | Apr 2009 |
| 01 | • Revised Figure 9 on page 10 | May 2009 |
| 02 | • Added information for Qx6 package.<br>• Revised Table 3 | Aug 2009 |

Preliminary Specifications

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