



## 2.4 GHz High-Power, High-Gain Power Amplifier SST12LP08

Preliminary Specifications

### FUNCTIONAL BLOCKS

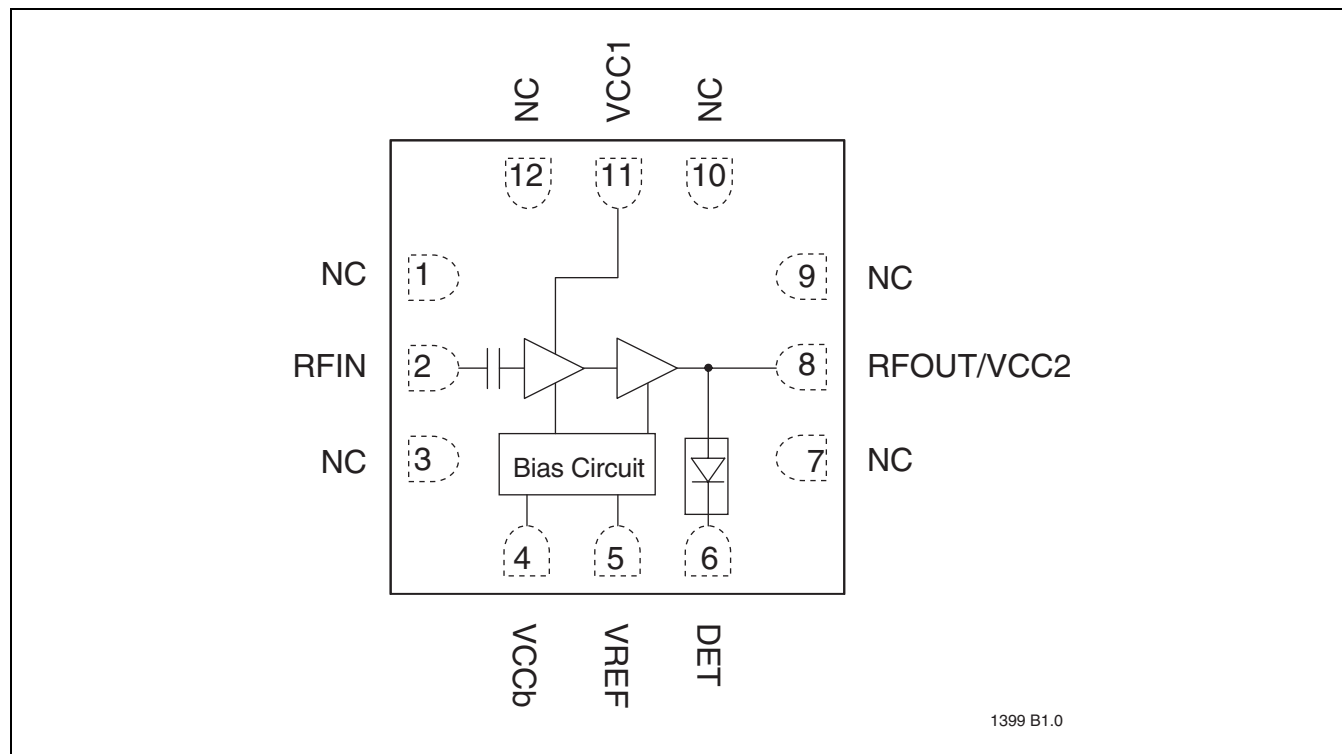


FIGURE 1: Functional Block Diagram 12-Contact XQFN (QXB)

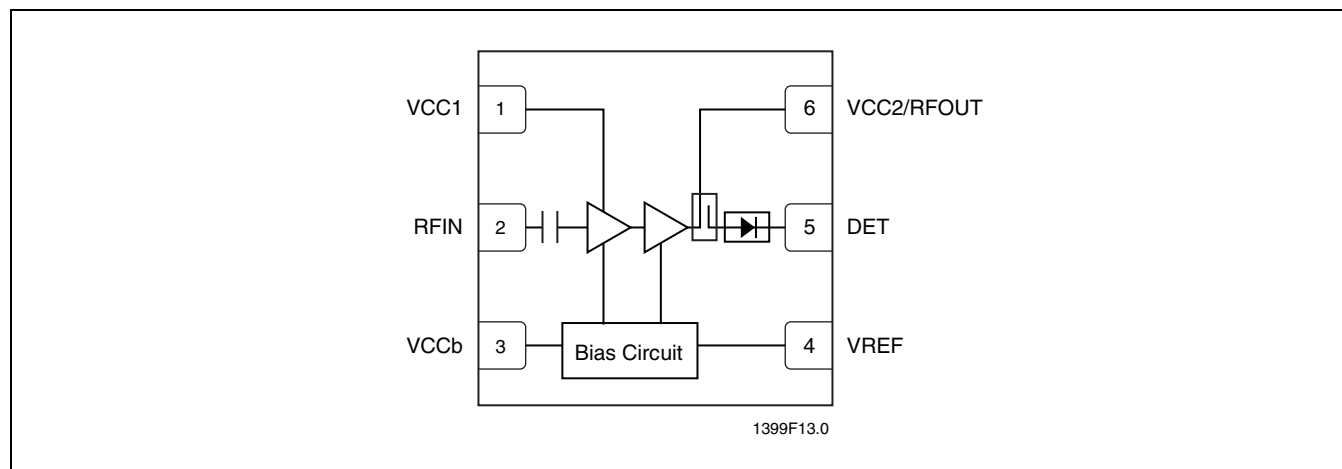
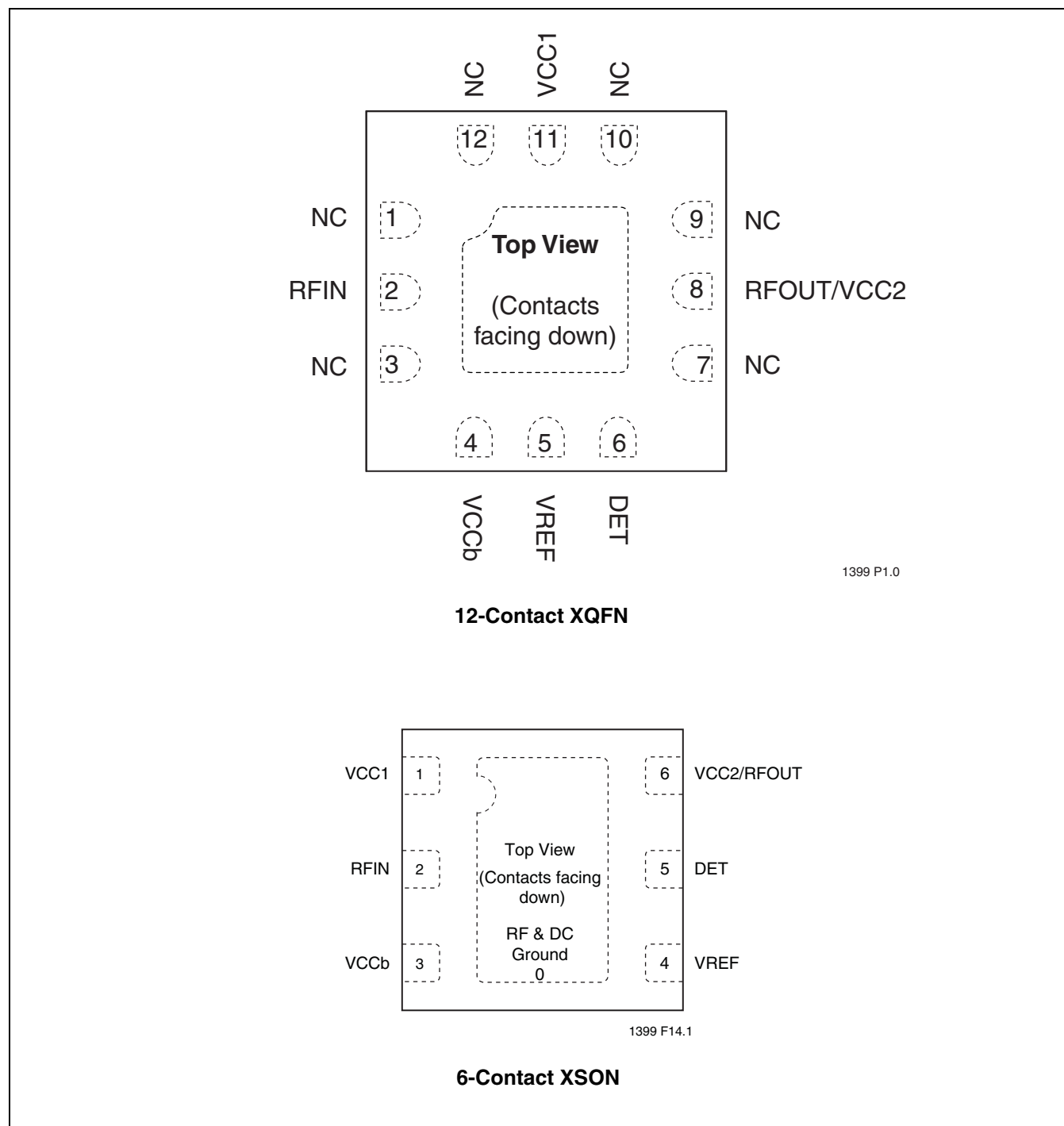


FIGURE 2: Functional Block Diagram 6-Contact XSON (QX6)

## PIN ASSIGNMENTS



**FIGURE 3: Pin Assignments**



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### PIN DESCRIPTIONS

**TABLE 1: Pin Description for 12-Contact XQFN (QXB)**

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

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1. I=Input, O=Output



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### 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 ( $P_{OUT}$ ) <sup>1</sup>	+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 ( $I_{CC}$ ) <sup>2</sup>	400 mA
Operating Temperature ( $T_A$ )	-40°C to +85°C
Storage Temperature ( $T_{STG}$ )	-40°C to +120°C
Maximum Junction Temperature ( $T_J$ )	+150°C
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



## 2.4 GHz High-Power, High-Gain Power Amplifier SST12LP08

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

Symbol	Parameter	Min.	Typ	Max.	Unit	Test Conditions
V <sub>CC</sub>	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 <sub>CQ</sub>	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 <sub>CC</sub> (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 <sub>CC</sub> (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 <sub>REG</sub>	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 <sub>L-U</sub>	Frequency range	2412		2484	MHz
G	Small signal gain	29	30		dB
G <sub>VAR1</sub>	Gain variation over band (2412–2484 MHz)			±0.5	dB
G <sub>VAR2</sub>	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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## 2.4 GHz High-Power, High-Gain Power Amplifier SST12LP08



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### TYPICAL PERFORMANCE CHARACTERISTICS

Test Conditions:  $V_{CC} = 3.3V$ ,  $T_A = 25^\circ C$ , unless otherwise specified

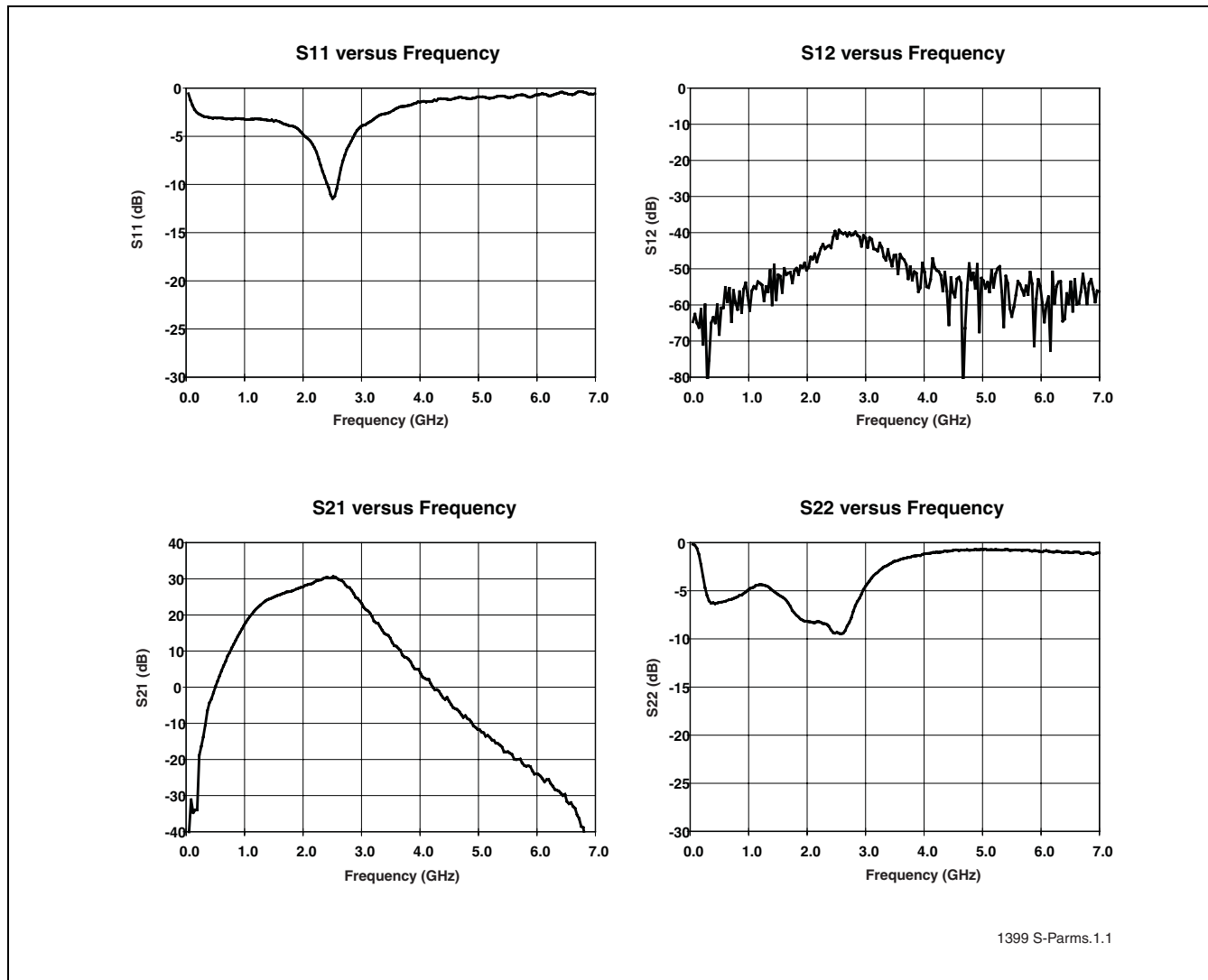


FIGURE 4: S-Parameters



## 2.4 GHz High-Power, High-Gain Power Amplifier SST12LP08

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### TYPICAL PERFORMANCE CHARACTERISTICS

Test Conditions:  $V_{CC} = 3.3V$ ,  $T_A = 25^\circ C$ , 54 Mbps 802.11g OFDM Signal

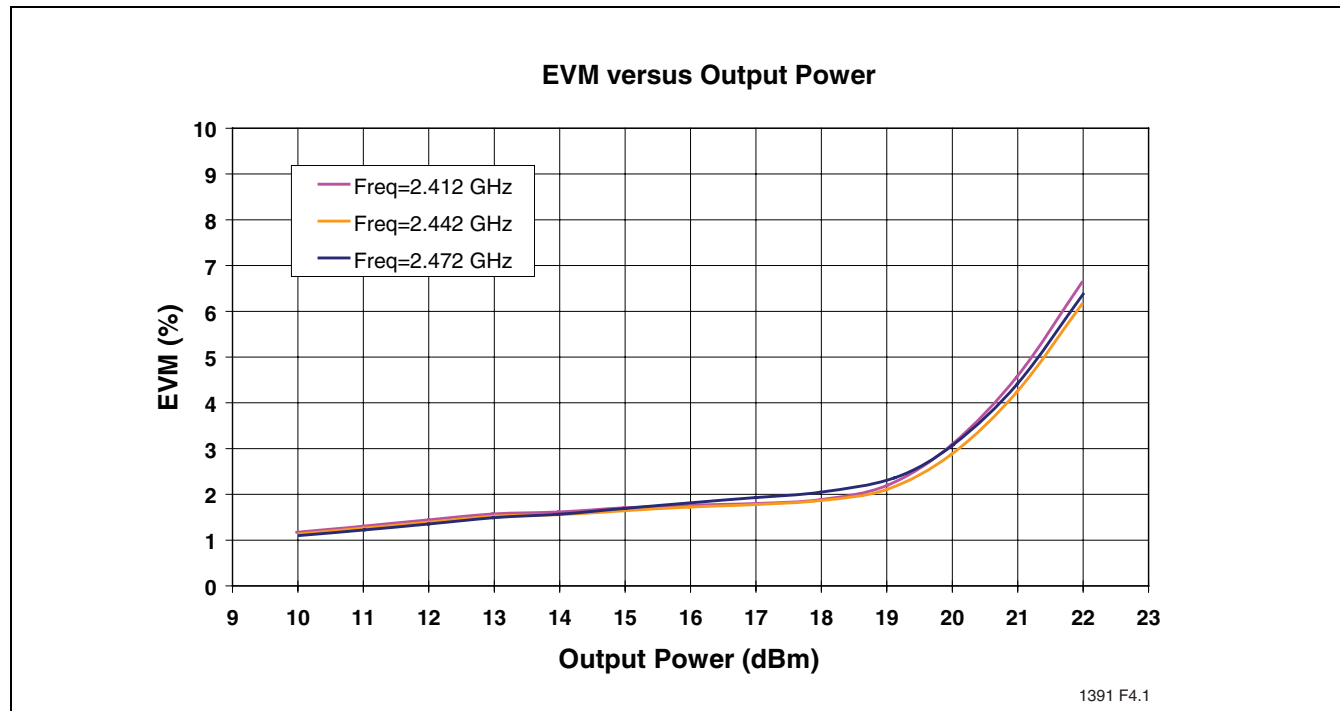


FIGURE 5: EVM versus Output Power

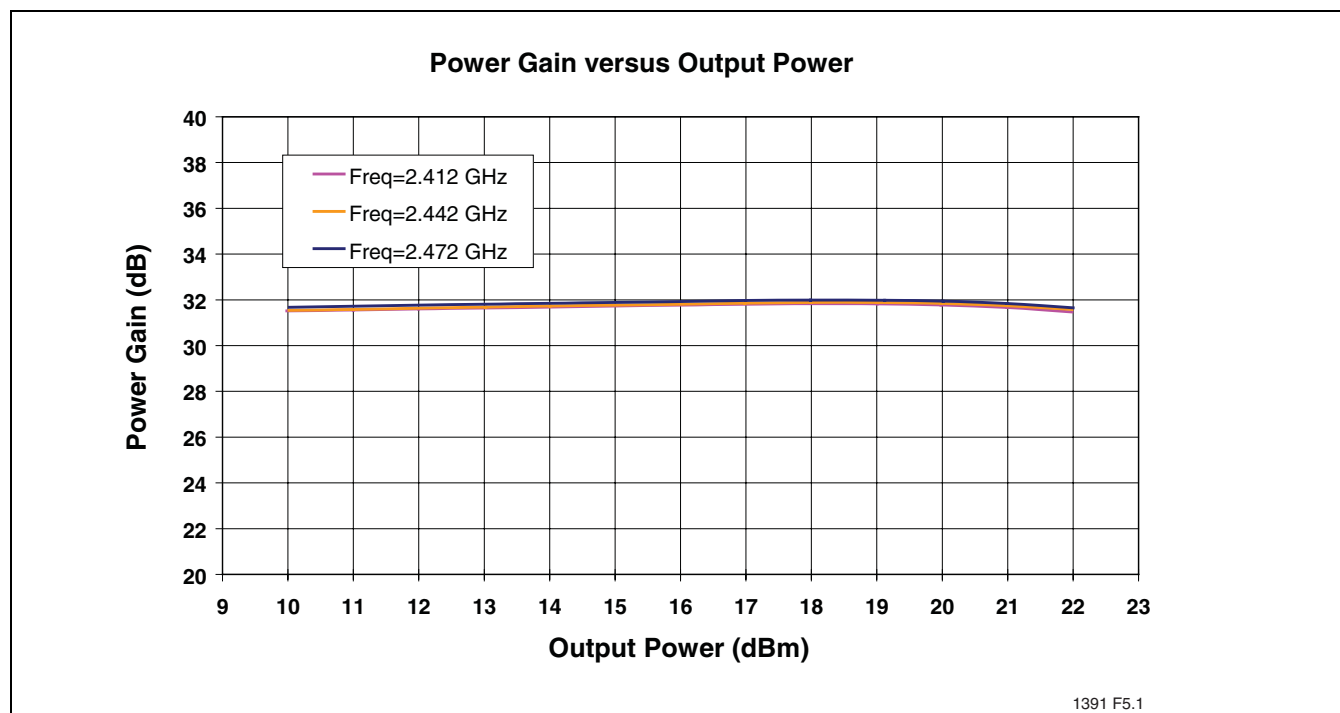
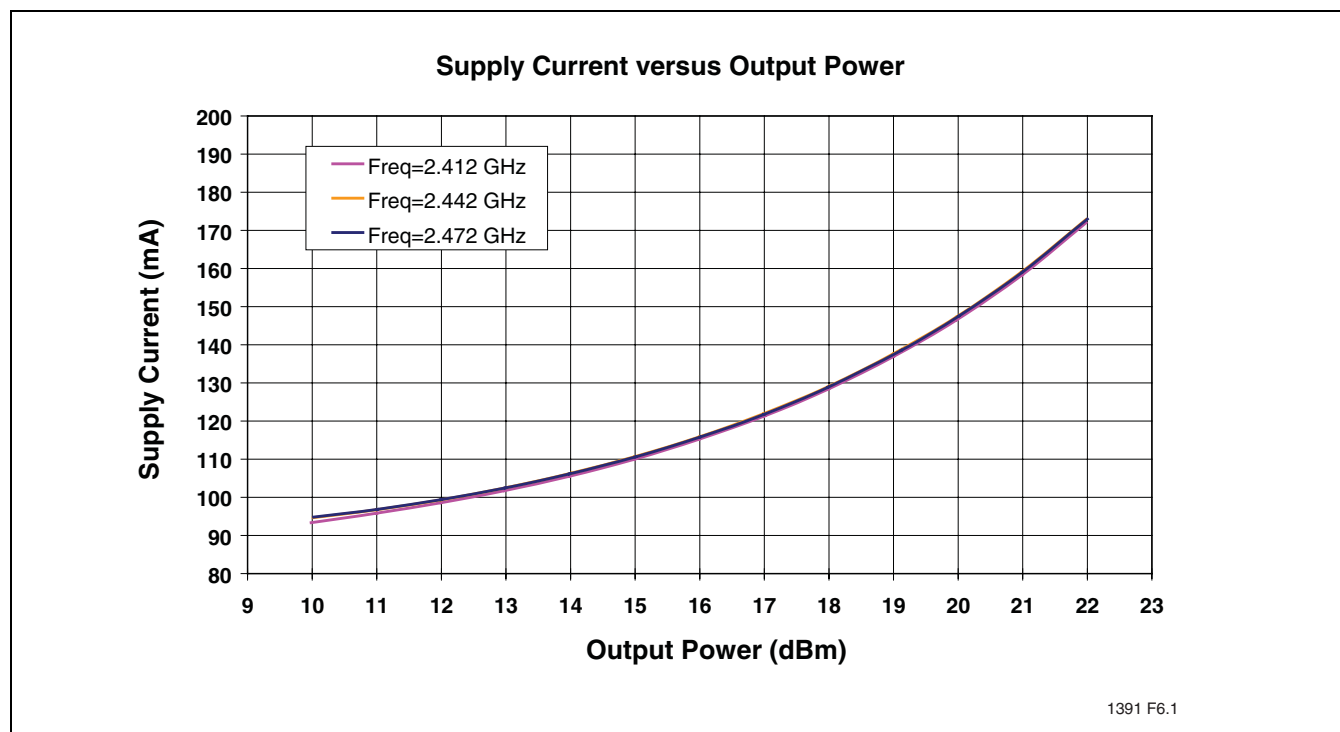
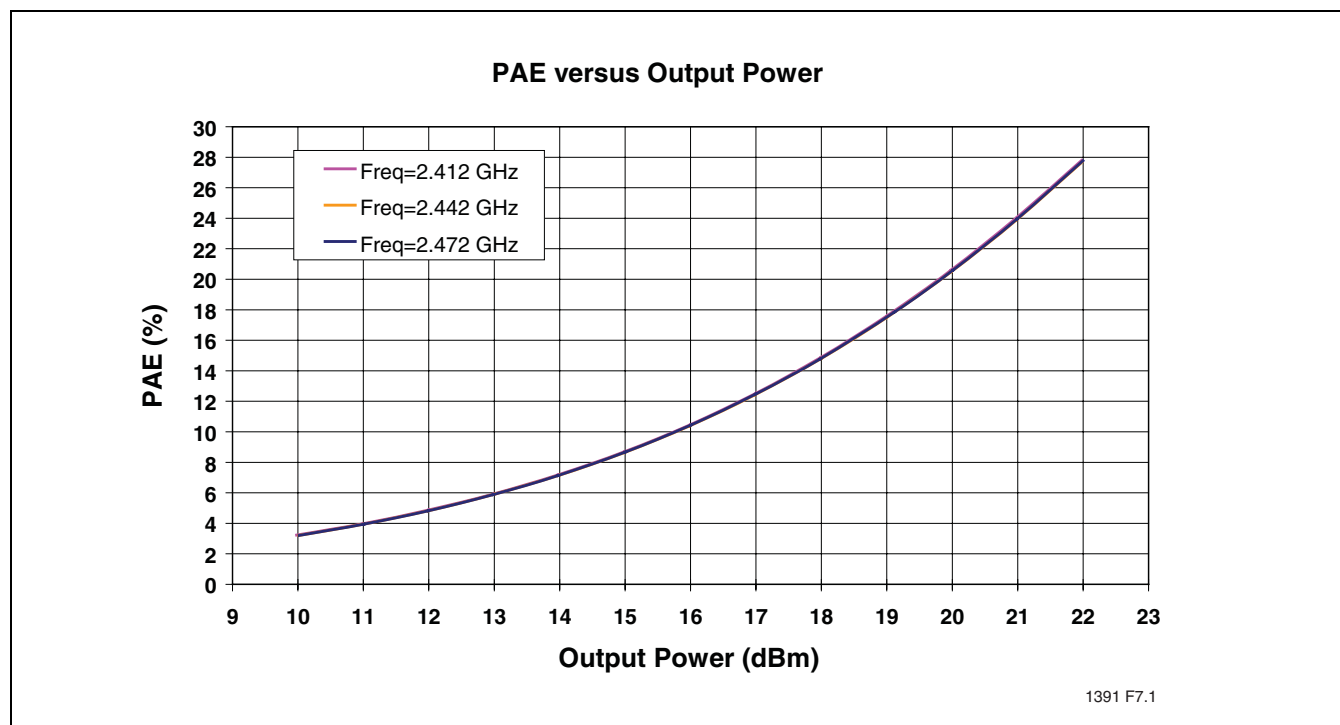


FIGURE 6: Power Gain versus Output Power



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



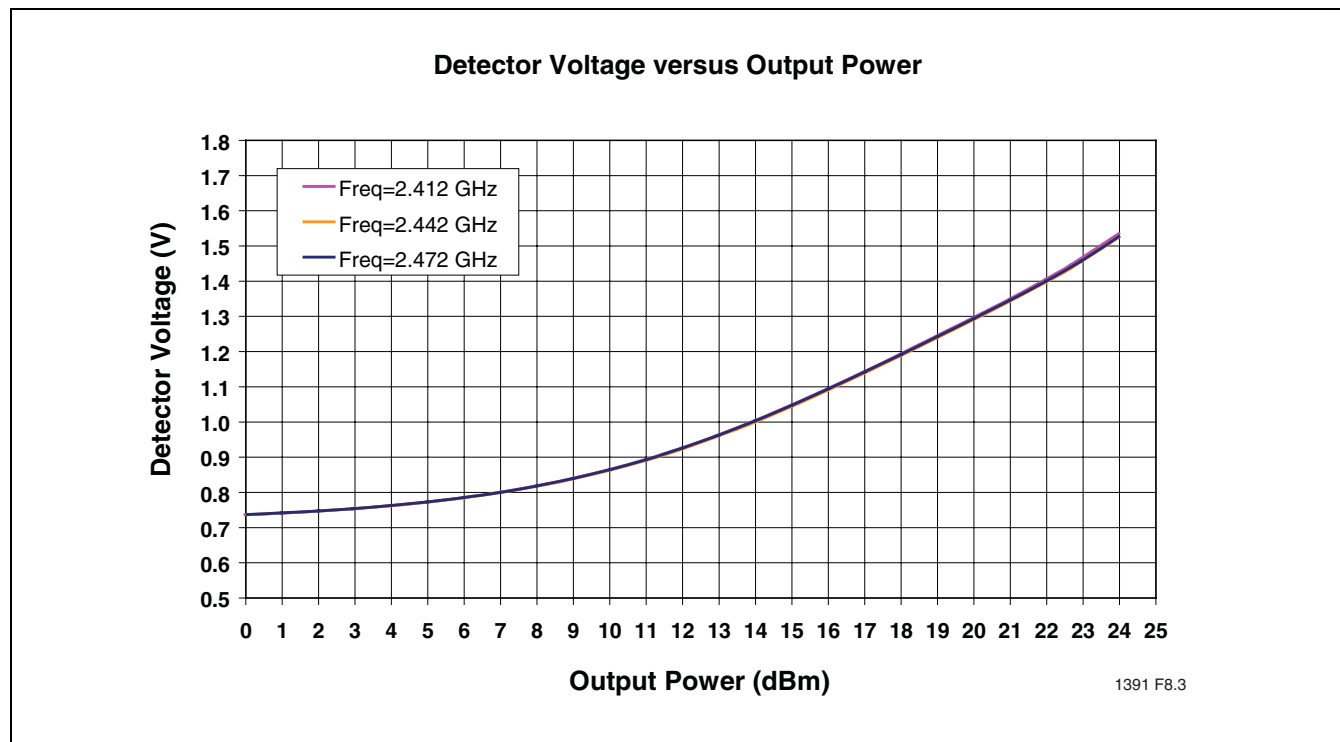
**FIGURE 8: PAE versus Output Power**



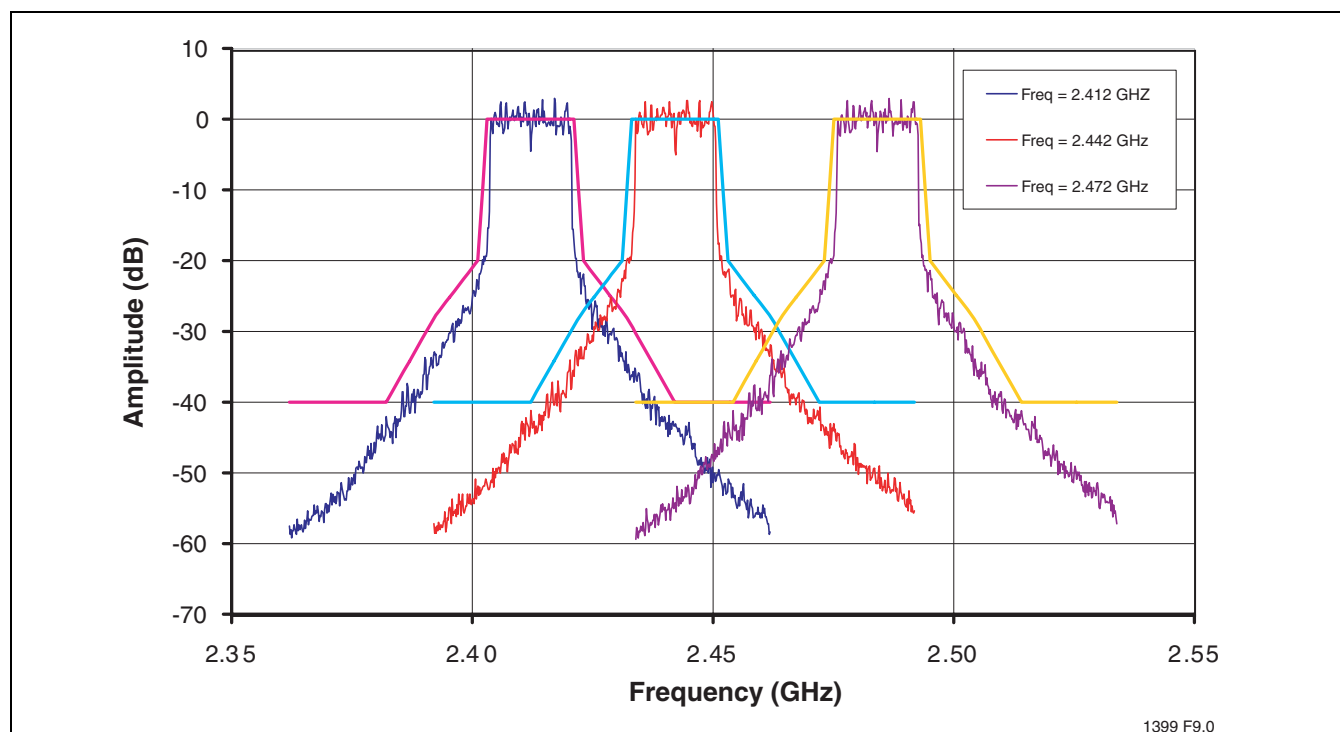


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**FIGURE 9: Detector Characteristics versus Output Power**



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



## 2.4 GHz High-Power, High-Gain Power Amplifier SST12LP08

Preliminary Specifications

### TYPICAL PERFORMANCE CHARACTERISTICS

Test Conditions:  $V_{CC} = 3.3V$ ,  $T_A = 25^\circ C$ , 1 Mbps 802.11b CCK Signal

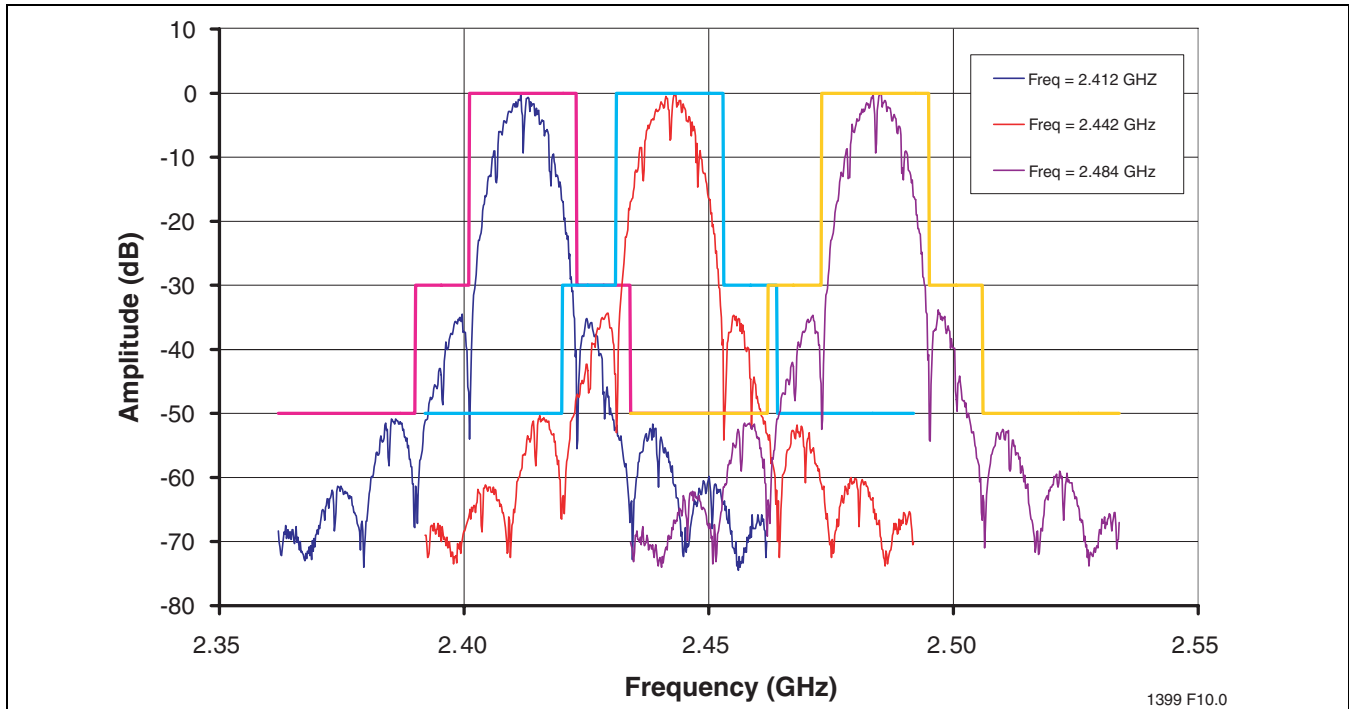


FIGURE 11: 802.11b Spectrum Mask at 23.5 dBm, Total Current 200mA

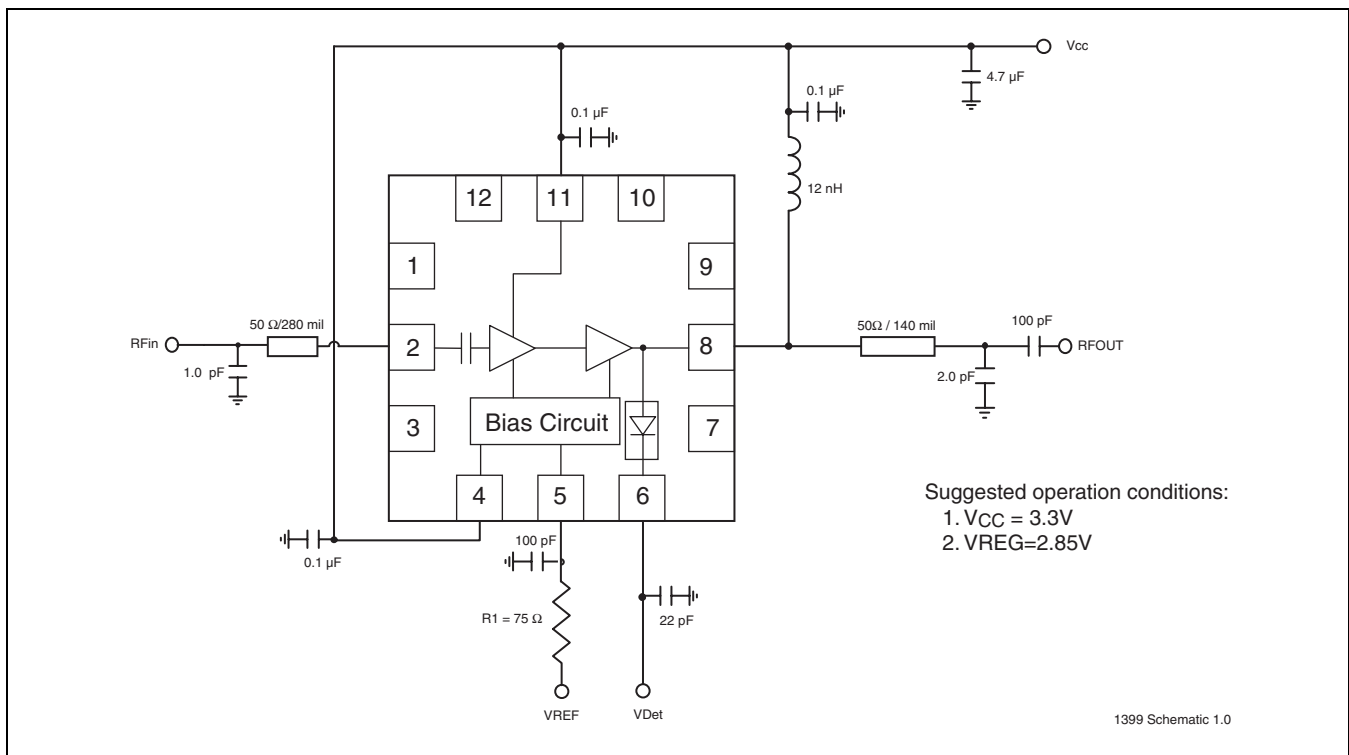


FIGURE 12: Typical Schematic for 12-Contact XQFN (QXB) for High-Power Applications



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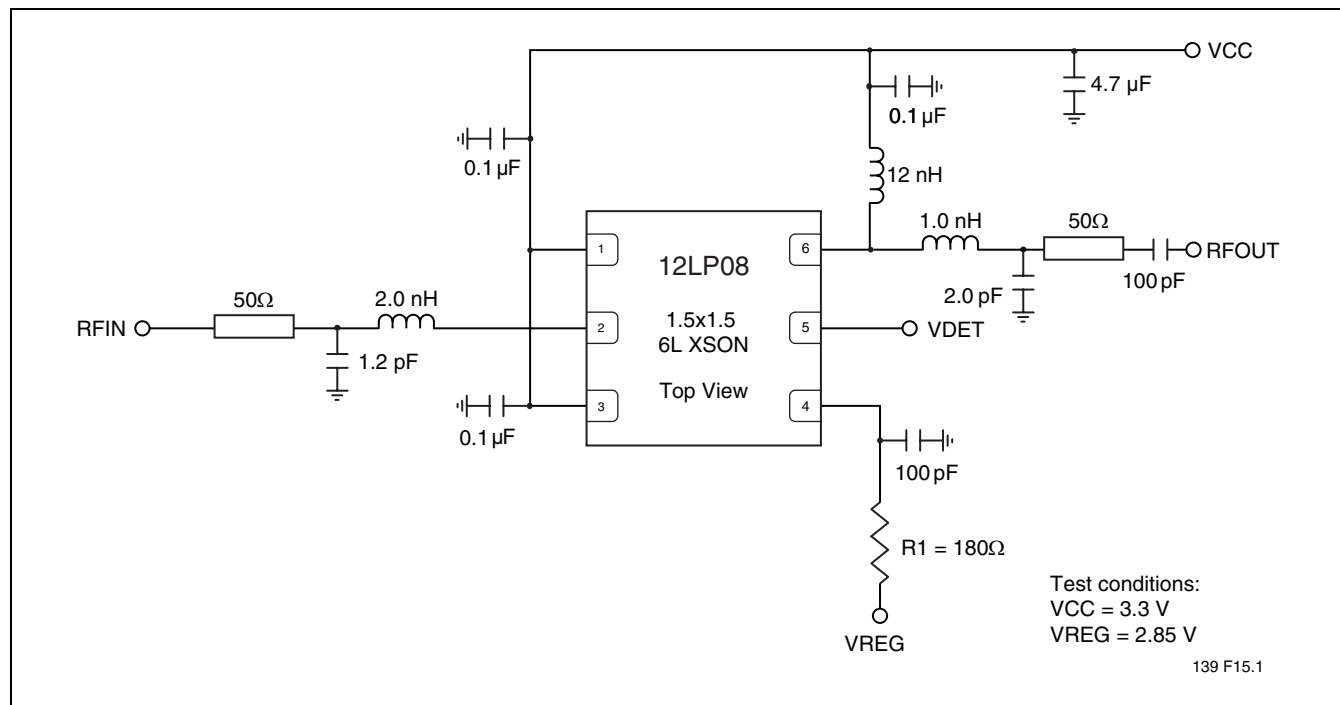


FIGURE 13: Typical Schematic for 6-Contact XSON (QX6) for High-Power Applications

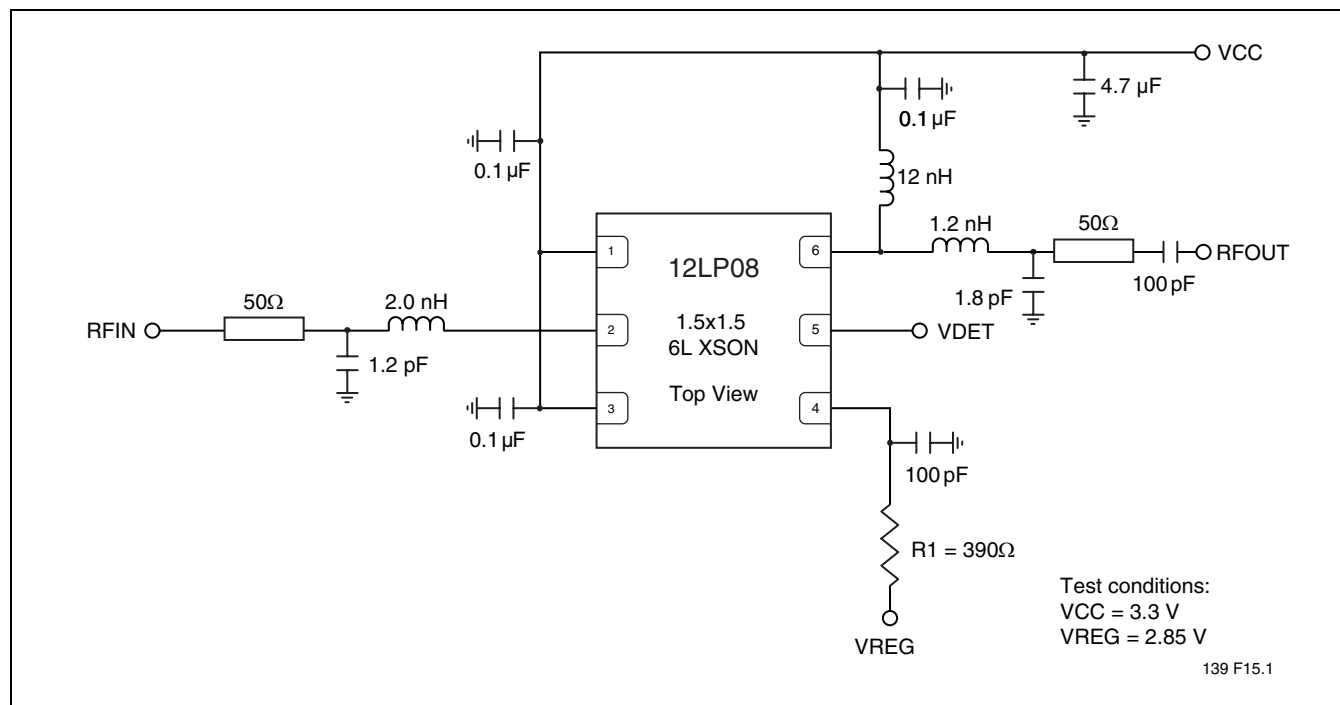


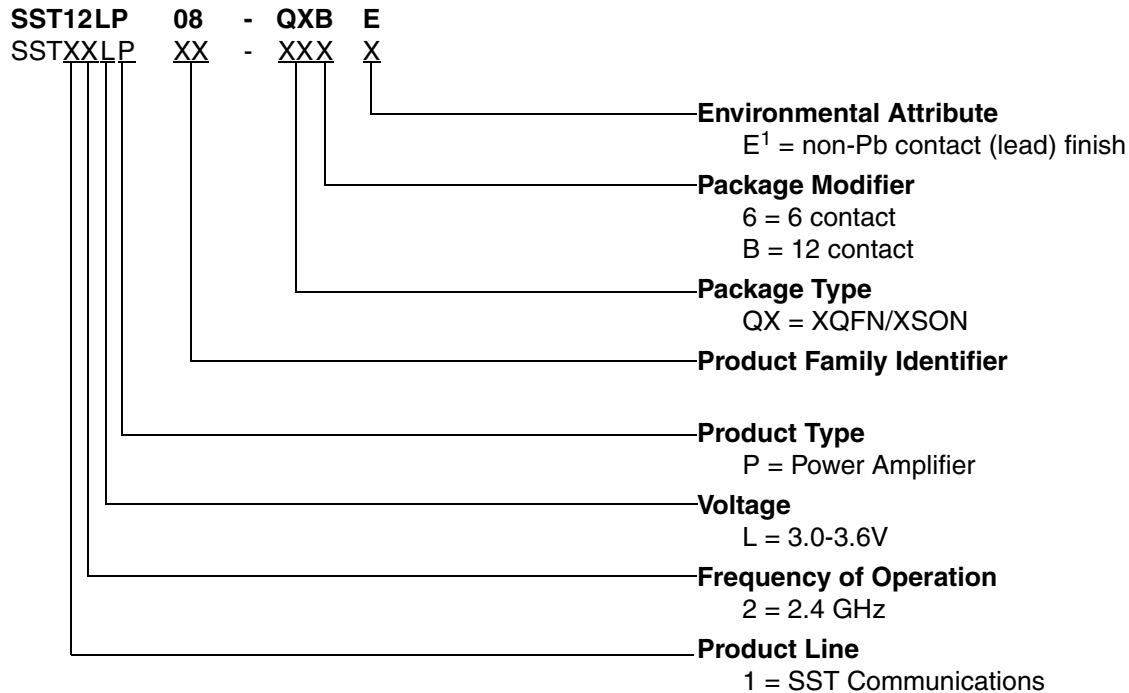
FIGURE 14: Typical Schematic for 6-Contact XSON (QX6) for High-Efficiency Applications

## 2.4 GHz High-Power, High-Gain Power Amplifier SST12LP08



Preliminary Specifications

### PRODUCT ORDERING INFORMATION



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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

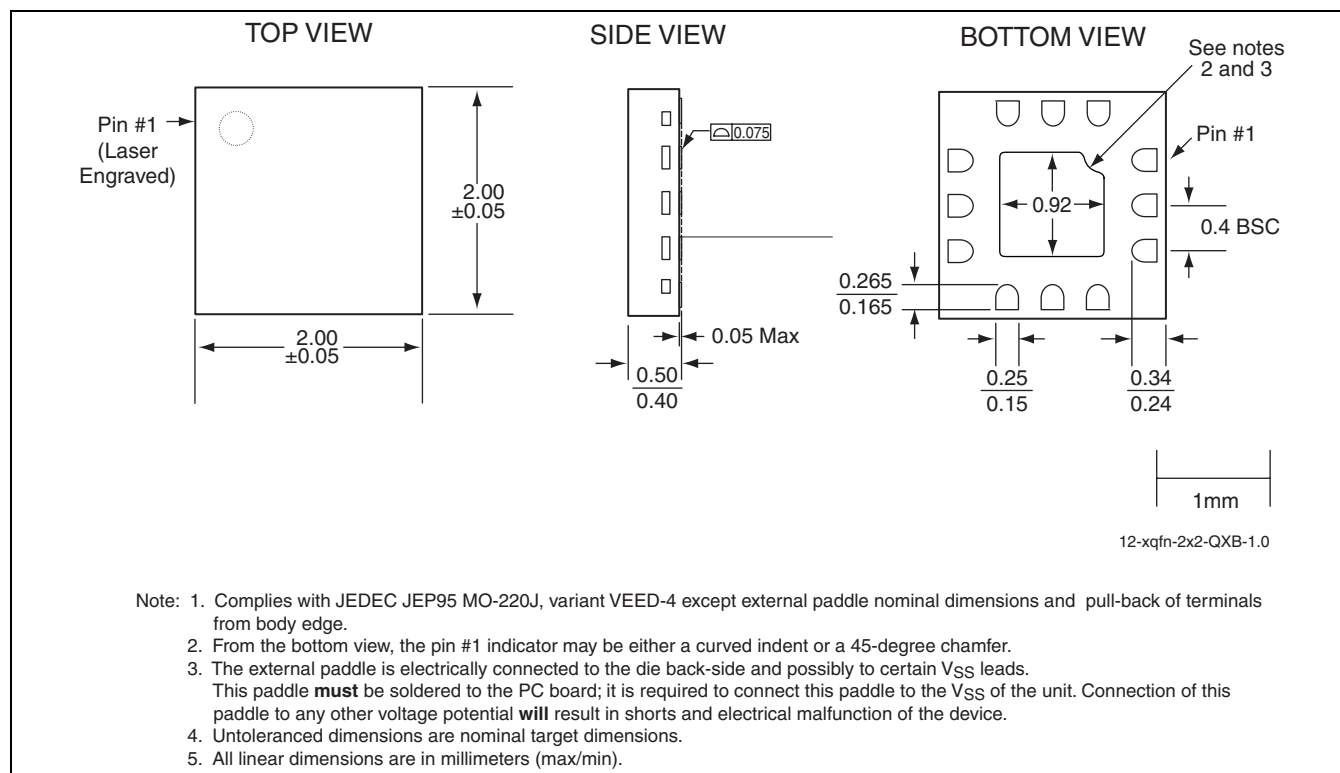
**Note:** Valid combinations are those products in mass production or will be in mass production. Consult your SST sales representative to confirm availability of valid combinations and to determine availability of new combinations.



## 2.4 GHz High-Power, High-Gain Power Amplifier SST12LP08

Preliminary Specifications

### PACKAGING DIAGRAMS

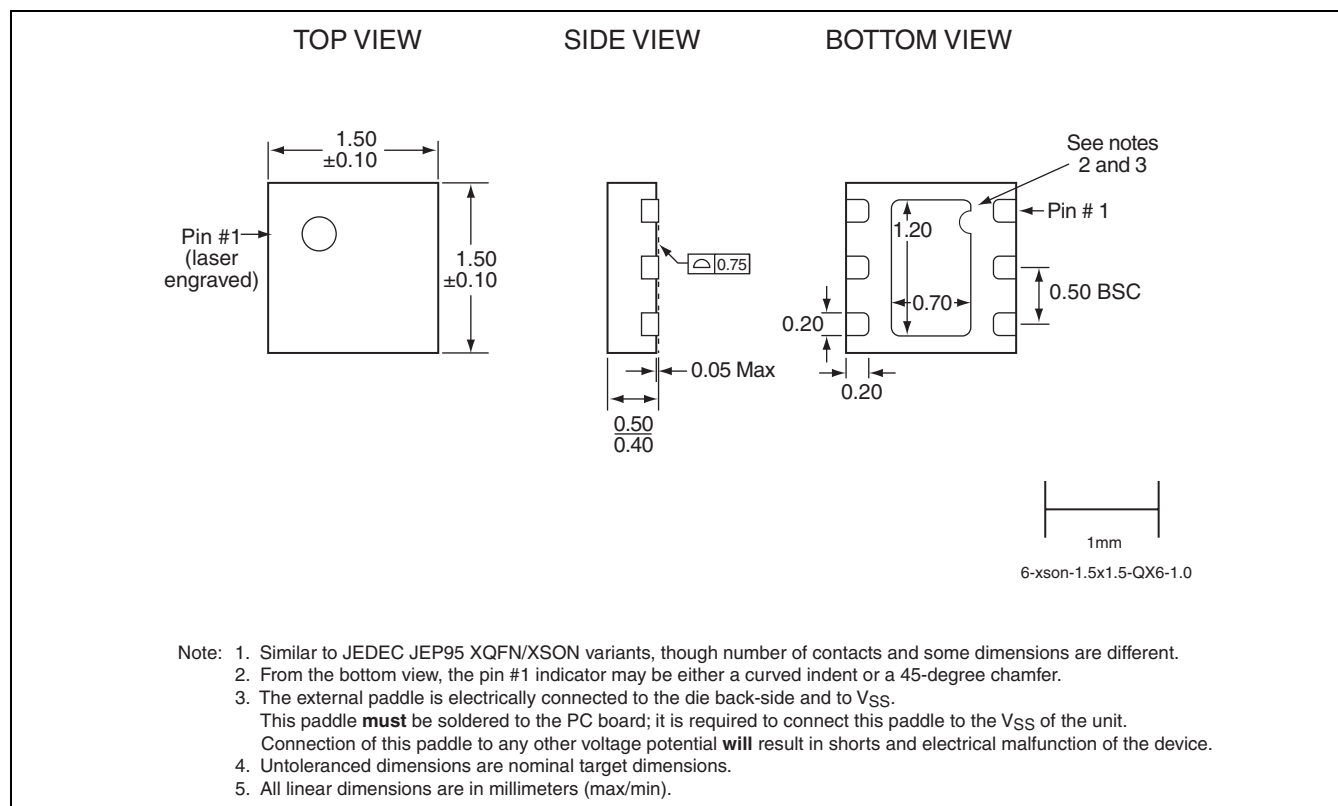


**FIGURE 15: 12-Contact Extremely-thin Quad Flat No-lead (XQFN)**  
**SST Package Code: QXB**

## 2.4 GHz High-Power, High-Gain Power Amplifier

### SST12LP08

Preliminary Specifications



**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. • Revised Table 3	Aug 2009



## 2.4 GHz High-Power, High-Gain Power Amplifier SST12LP08

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