

2.4 GHz High-Power and High-Gain Power Amplifier

SST12LP15A



Data Sheet

FEATURES:

- **High Gain:**
 - Typically 32 dB gain across 2.4–2.5 GHz over temperature 0°C to +85°C
- **High linear output power:**
 - >29 dBm P1dB
 - Please refer to "Absolute Maximum Stress Ratings" on page 4
 - Meets 802.11g OFDM ACPR requirement up to 25 dBm
 - Added EVM~4% up to 23 dBm for 54 Mbps 802.11g signal
 - Meets 802.11b ACPR requirement up to 25 dBm
- **High power-added efficiency/Low operating current for both 802.11g/b applications**
 - ~26%/300 mA @ $P_{OUT} = 24$ dBm for 802.11g
 - ~27%/350 mA @ $P_{OUT} = 25$ dBm for 802.11b
- **Built-in Ultra-low I_{REF} power-up/down control**
 - $I_{REF} \sim 2$ mA
- **Low idle current**
 - ~80 mA I_{CQ}

- **High-speed power-up/down**
 - Turn on/off time (10%-90%) <100 ns
 - Typical power-up/down delay with driver delay included <200 ns
- **High temperature stability**
 - ~1 dB gain/power variation between 0°C to +85°C
 - ~1 dB detector variation over 0°C to +85°C
- **Low shut-down current (~1 μ A)**
- **On-chip power detection**
- **25 dB dynamic range on-chip power detection**
- **Simple input/output matching**
- **Packages available**
 - 16-contact VQFN (3mm x 3mm)
- **All non-Pb (lead-free) devices are RoHS compliant**

APPLICATIONS:

- **WLAN (IEEE 802.11g/b)**
- **Home RF**
- **Cordless phones**
- **2.4 GHz ISM wireless equipment**

PRODUCT DESCRIPTION

The SST12LP15A is a high-power and high-gain power amplifier based on the highly-reliable InGaP/GaAs HBT technology.

The SST12LP15A can be easily configured for high-power applications with superb power-added efficiency while operating over the 2.4-2.5 GHz frequency band. It typically provides 32 dB gain with 26% power-added efficiency @ $P_{OUT} = 24$ dBm for 802.11g and 27% power-added efficiency @ $P_{OUT} = 25$ dBm for 802.11b.

The SST12LP15A has excellent linearity, typically ~4% added EVM at 23 dBm output power which is essential for 54 Mbps 802.11g operation while meeting 802.11g spectrum mask at 25 dBm. SST12LP15A also has wide-range (>25 dB), temperature-stable (~1 dB over 85°C), single-ended/differential power detectors which lower users' cost on power control.

The power amplifier IC also features easy board-level usage along with high-speed power-up/down control. Ultra-low reference current (total $I_{REF} \sim 2$ mA) makes the SST12LP15A controllable by an on/off switching signal directly from the baseband chip. These features coupled with low operating current make the SST12LP15A ideal for the final stage power amplification in battery-powered 802.11g/b WLAN transmitter applications.

The SST12LP15A is offered in 16-contact VQFN package. See Figure 2 for pin assignments and Table 1 for pin descriptions.

Data Sheet

FUNCTIONAL BLOCKS

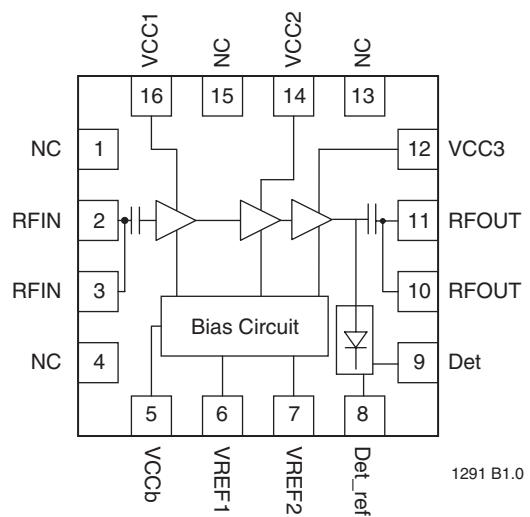


FIGURE 1: Functional Block Diagram

PIN ASSIGNMENTS

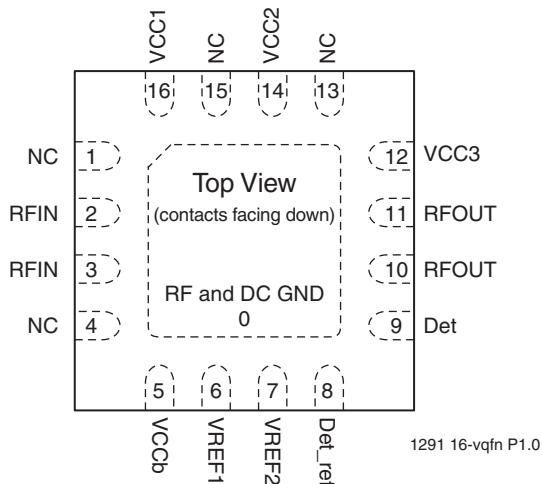


FIGURE 2: Pin Assignments for 16-contact VQFN

PIN DESCRIPTIONS

TABLE 1: Pin Description

Symbol	Pin No.	Pin Name	Type ¹	Function
GND	0	Ground		The center pad should be connected to RF ground with several low inductance, low resistance vias.
NC	1	No Connection		Unconnected pins.
RFIN	2		I	RF input, DC decoupled
RFIN	3		I	RF input, DC decoupled
NC	4	No Connection		Unconnected pins.
VCCb	5	Power Supply	PWR	Supply voltage for bias circuit
VREF1	6		PWR	1st and 2nd stage idle current control
VREF2	7		PWR	3rd stage idle current control
Det_ref	8		O	On-chip power detector reference
Det	9		O	On-chip power detector
RFOUT	10		O	RF output
RFOUT	11		O	RF output
VCC3	12	Power Supply	PWR	Power supply, 3rd stage
NC	13	No Connection		Unconnected pins.
VCC2	14	Power Supply	PWR	Power supply, 2nd stage
NC	15	No Connection		Unconnected pins.
VCC1	16	Power Supply	PWR	Power supply, 1st stage

T1.0 1291

1. I=Input, O=Output



2.4 GHz High-Power and High-Gain Power Amplifier

SST12LP15A

Data Sheet

ELECTRICAL SPECIFICATIONS

The AC and DC specifications for the power amplifier interface signals. Refer to Table 2 for the DC voltage and current specifications. Refer to Figures 3 through 10 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 pins 2 and 3 (P_{IN})	+5 dBm
Average output power (P_{OUT}) ¹	+28 dBm
Supply Voltage at pins 5, 12, 14, 16 (V_{CC})	-0.3V to +4.6V
Reference voltage to pins 6 (V_{REF1}) and pin 7 (V_{REF2})	-0.3V to +3.6V
DC supply current (I_{CC})	500 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.

Operating Range

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

TABLE 2: DC Electrical Characteristics at 25°C

Symbol	Parameter	Min.	Typ	Max.	Unit
V_{CC}	Supply Voltage at pins 5, 12, 14, 16	3.0	3.3	4.2	V
I_{CC}	Supply Current for 802.11g, 24 dBm for 802.11b, 25 dBm		300 350		mA mA
I_{CQ}	Idle current for 802.11g to meet EVM<4% @ 23dBm		80		mA
I_{OFF}	Shut down current		1		µA
V_{REG1}	Reference Voltage for 1st and 2nd Stage, with 270Ω resistor	2.85	2.90	2.95	V
V_{REG2}	Reference Voltage for 3rd Stage, with 100Ω resistor	2.85	2.90	2.95	V

T2.1 1291

2.4 GHz High-Power and High-Gain Power Amplifier

SST12LP15A

Data Sheet

TABLE 3: AC Electrical Characteristics for Configuration at 25°C

Symbol	Parameter	Min.	Typ	Max.	Unit
F _{L-U}	Frequency range in 802.11b/g applications (see Figure 11)	2400		2485	MHz
P _{OUT}	Output power @ PIN = -10 dBm 11b signals @ PIN = -10 dBm 11g signals		23 23		dBM dBM
G	Small signal gain	31	32		dB
G _{VAR1}	Gain variation over each band (2400-2485 MHz)			±0.5	dB
G _{VAR2}	Gain ripple over channel (Gain variation over 20 MHz)		0.2		dB
ACPR	Meet 11b spectrum mask Meet 11g OFDM 54 MBPS spectrum mask	24 24	25 25		dBM dBM
Added EVM	@ 23 dBm output with 11g OFDM 54 MBPS signal		3.5		%
2f, 3f, 4f, 5f	Harmonics at 22 dBm, without trapping capacitors			-40	dBc

T3.2 1291



2.4 GHz High-Power and High-Gain Power Amplifier SST12LP15A

Data Sheet

TYPICAL PERFORMANCE CHARACTERISTICS

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

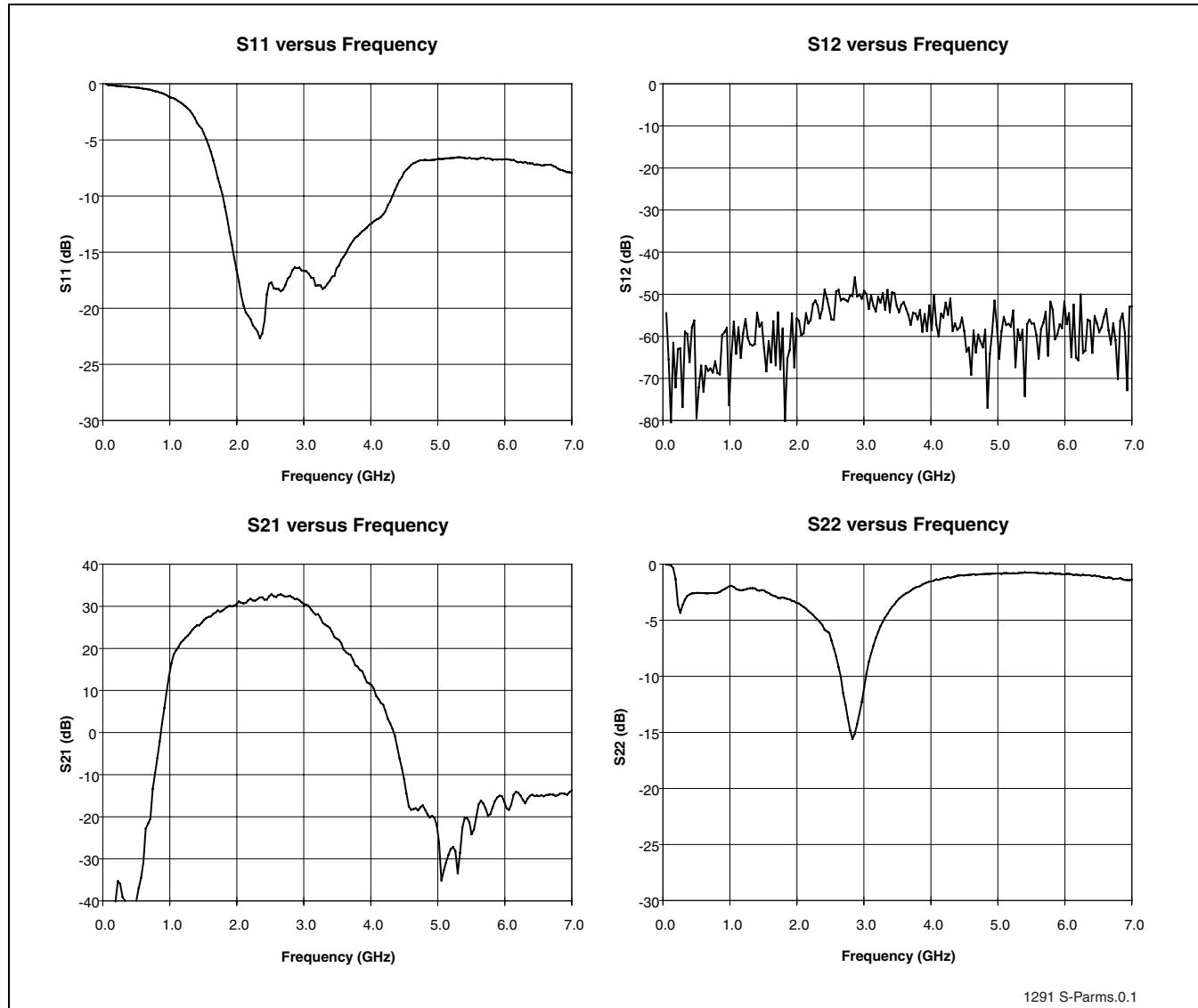


FIGURE 3: S-Parameters

TYPICAL PERFORMANCE CHARACTERISTICS

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

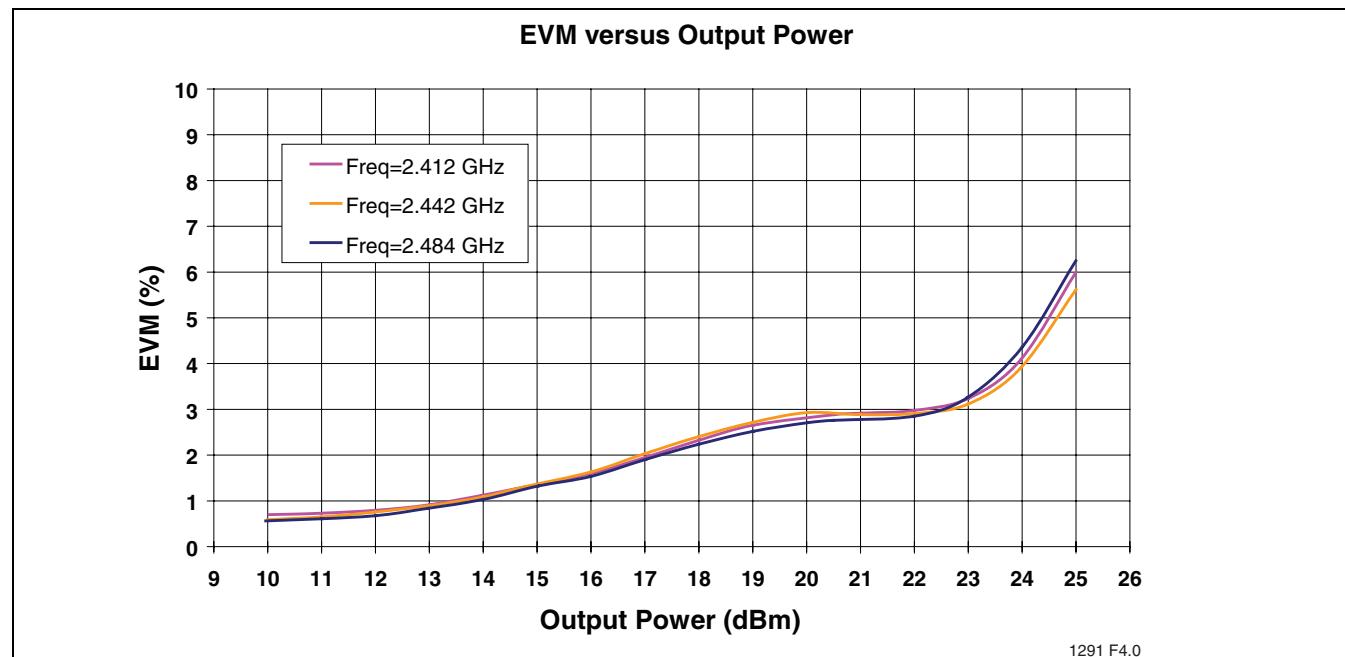


FIGURE 4: EVM versus Output Power

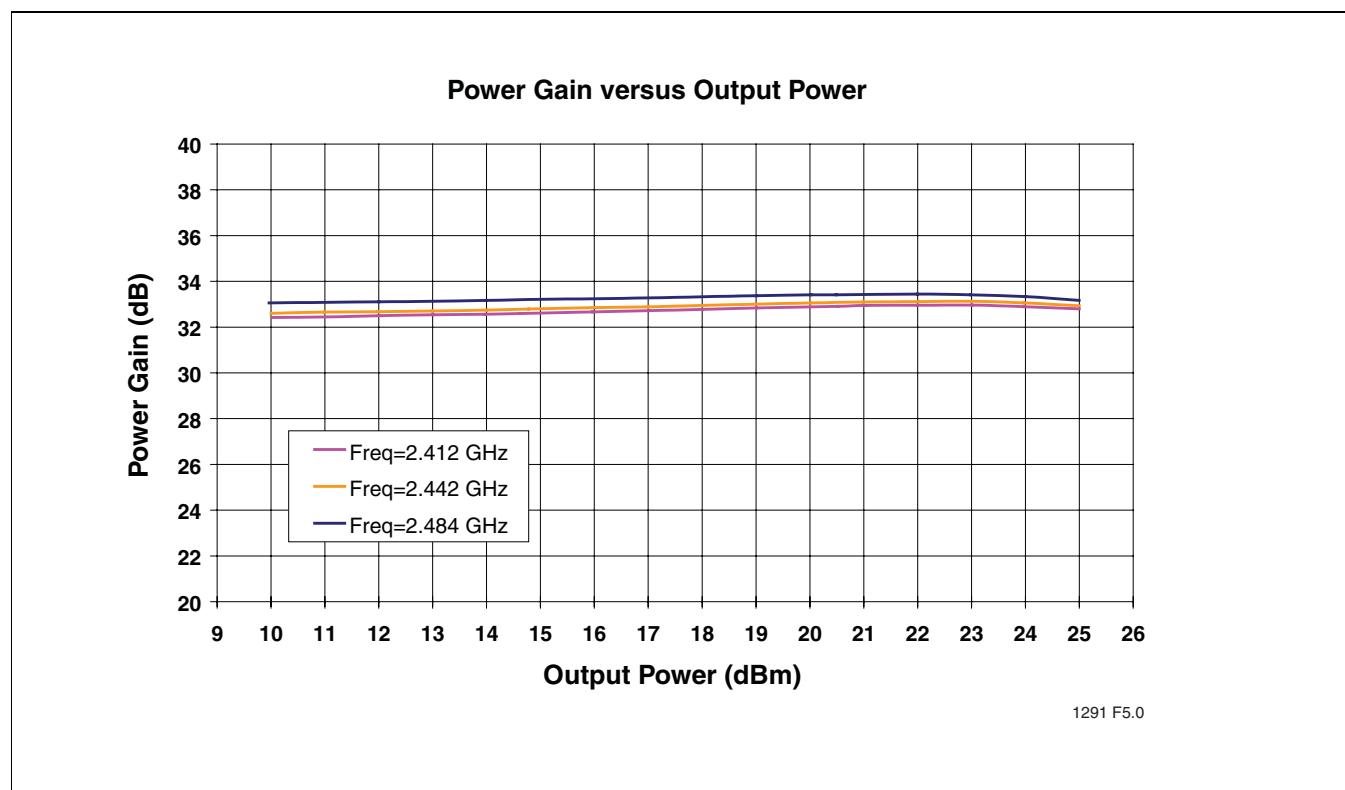
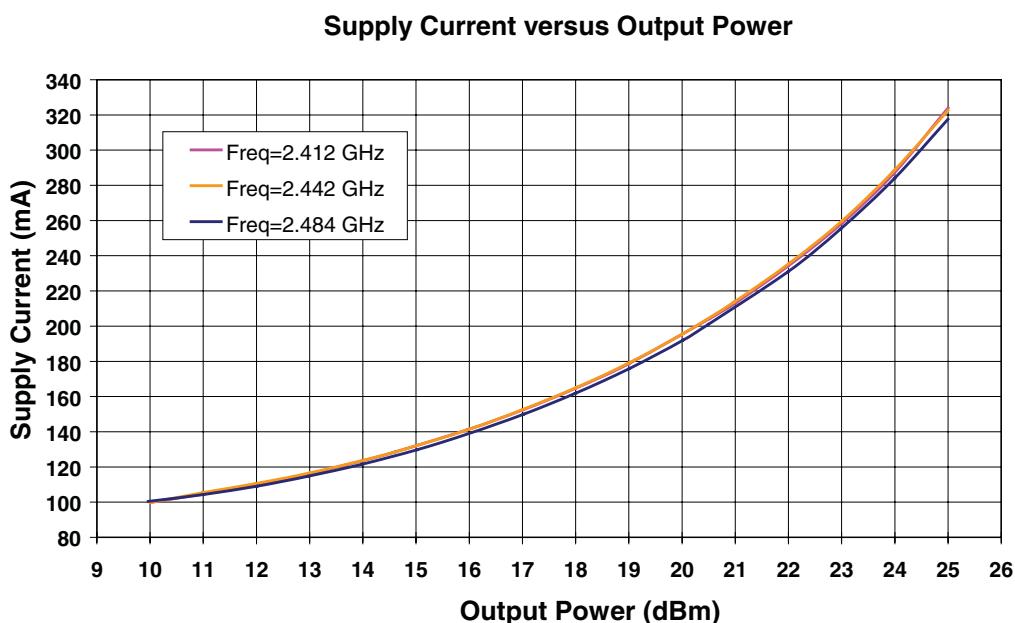


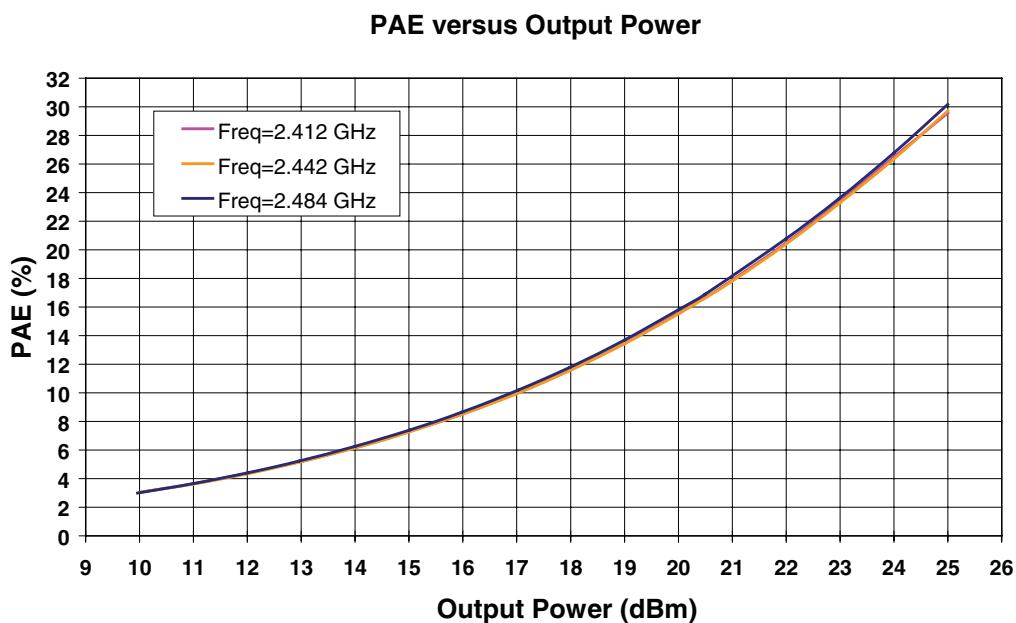
FIGURE 5: Power Gain versus Output Power

Data Sheet



1291 F6.0

FIGURE 6: Total Current Consumption for 802.11g Operation versus Output Power



1291 F7.0

FIGURE 7: PAE versus Output Power

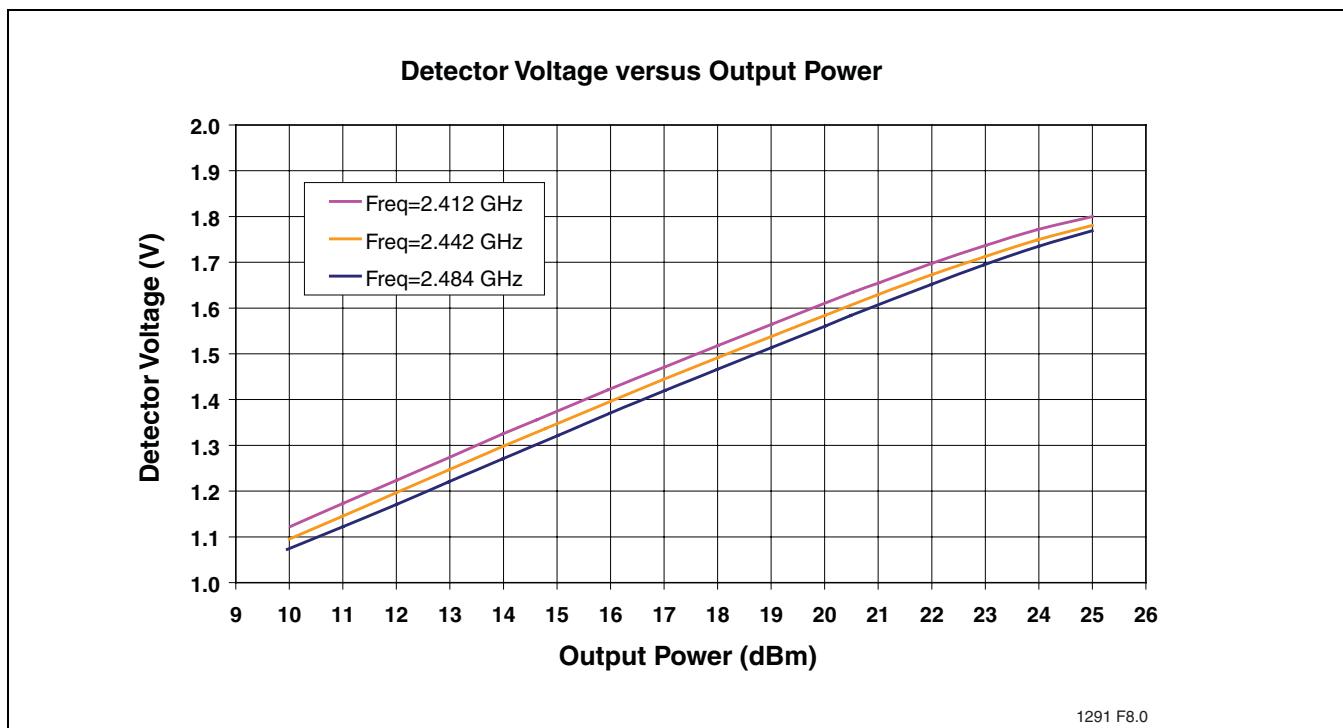


FIGURE 8: Detector Characteristic versus Output Power

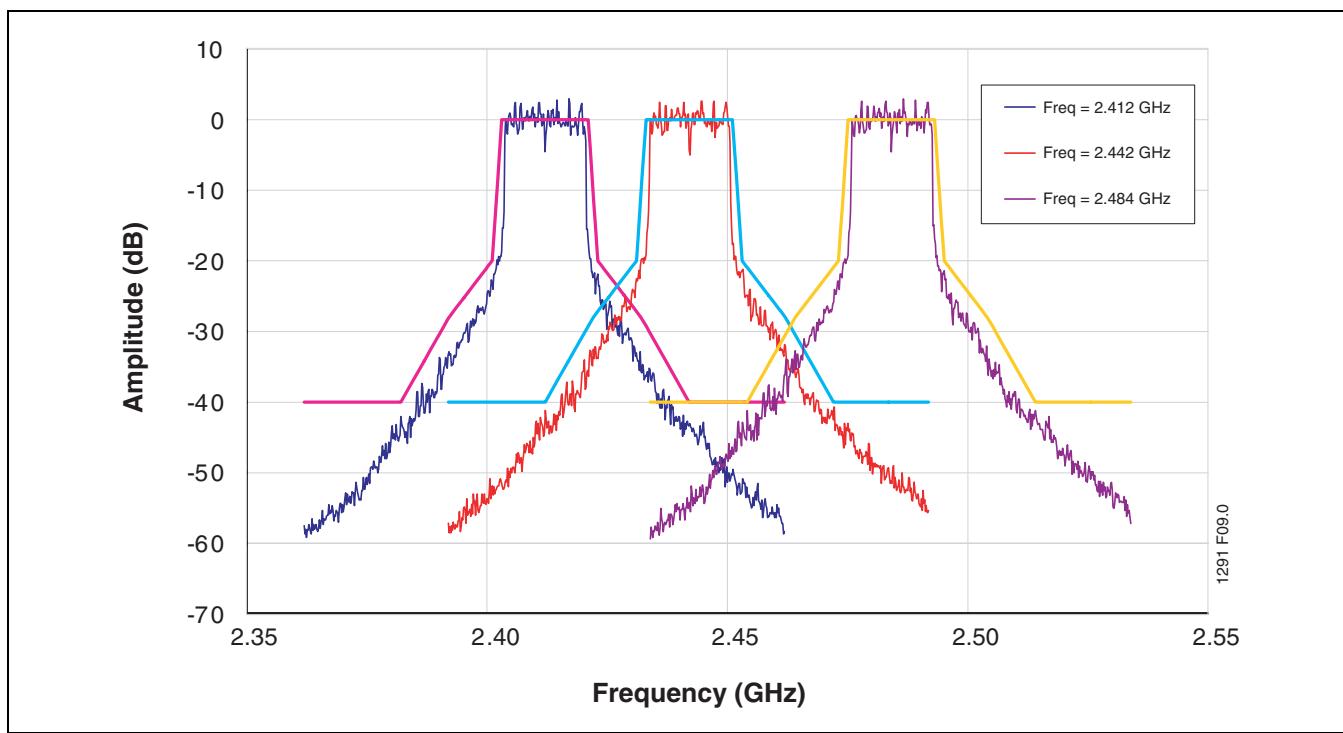


FIGURE 9: 802.11g Spectrum Mask at 24 dBm, Total current 300 mA

Data Sheet

TYPICAL PERFORMANCE CHARACTERISTICS

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

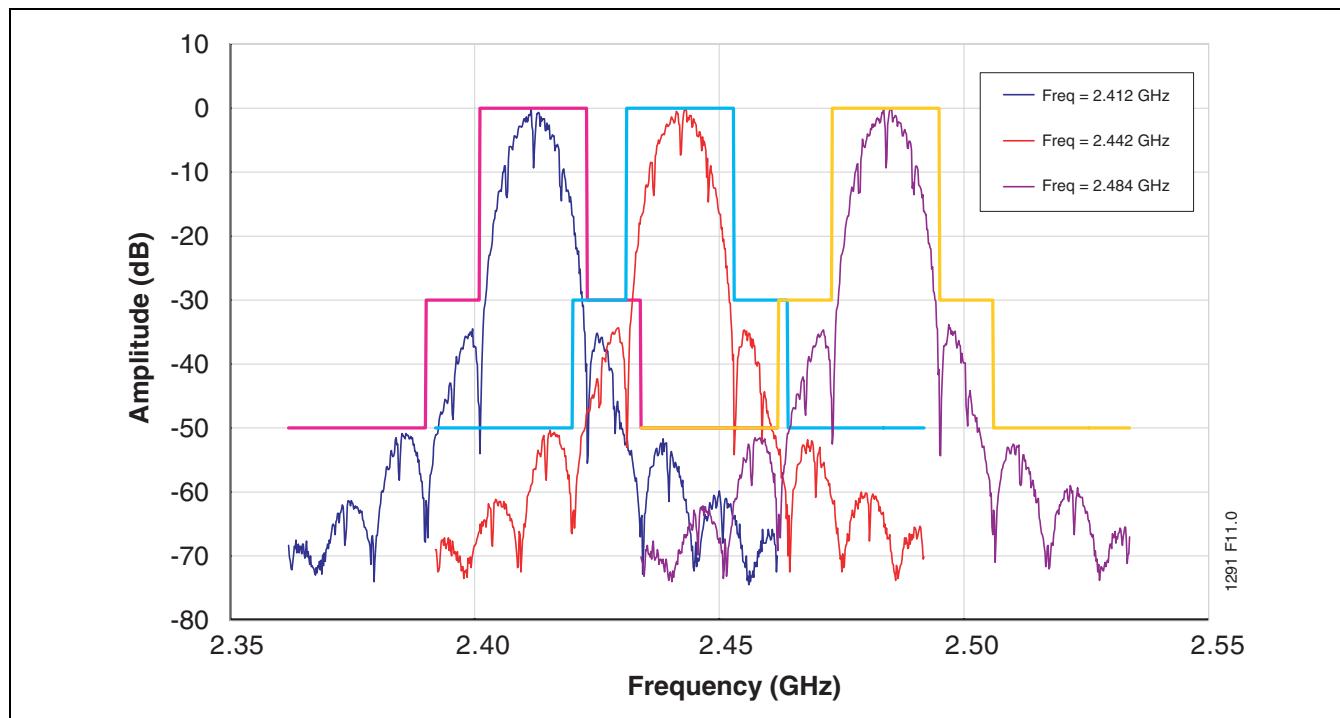


FIGURE 10: 802.11b Spectrum Mask at 25 dBm, Total current 350 mA

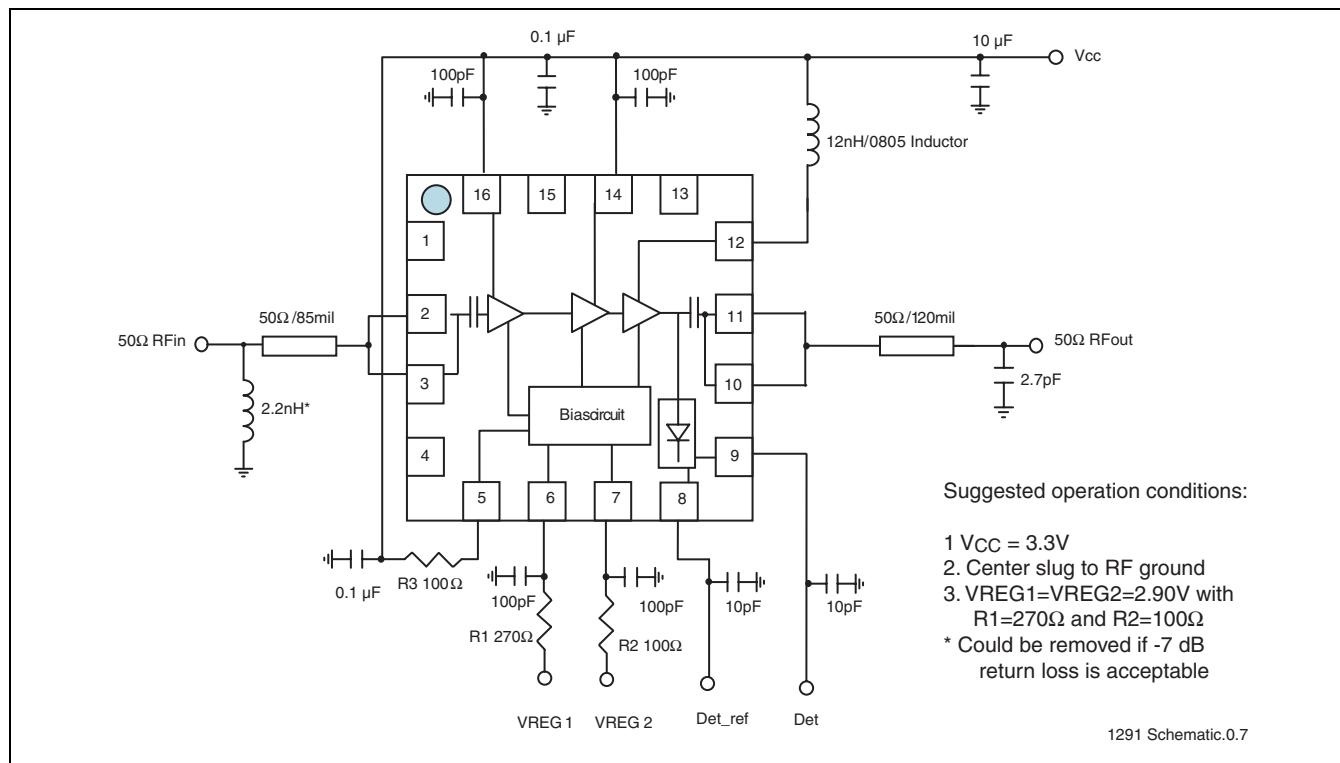
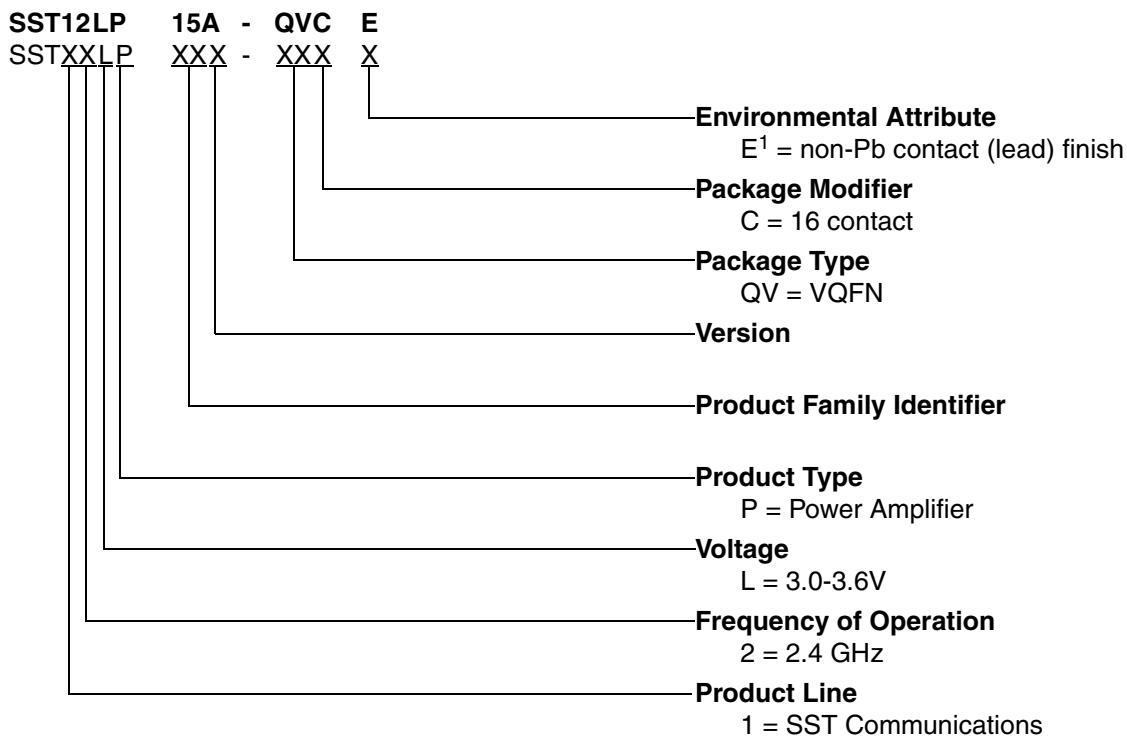


FIGURE 11: Typical Schematic for High-Power, High-Efficiency 802.11b/g Applications

PRODUCT ORDERING INFORMATION



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

Valid combinations for SST12LP15A

SST12LP15A-QVCE

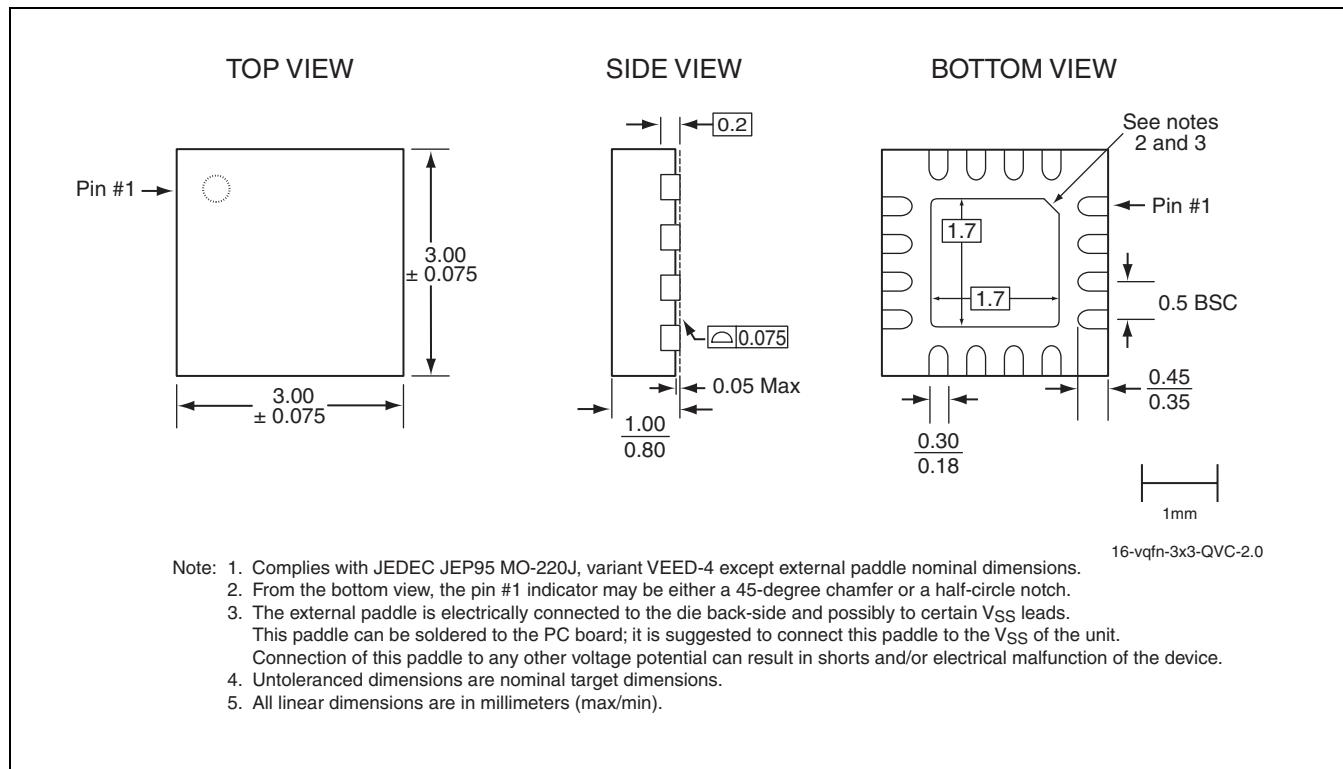
SST12LP15A Evaluation Kits

SST12LP15A-QVCE-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.

Data Sheet

PACKAGING DIAGRAMS



**FIGURE 12: 16-contact Very-thin Quad Flat No-lead (VQFN)
SST Package Code: QVC**

TABLE 4: Revision History

Revision	Description	Date
00	<ul style="list-style-type: none"> Initial release of data sheet 	Mar 2005
01	<ul style="list-style-type: none"> Updated values for gain and efficiency on page 1 Updated values for VREG1 and VREG2 in Table 2 on page 4 Removed stability parameter from Table 3 on page 5 Updated the typical application schematic on page 10 Updated QVC package drawing. Updated “Absolute Maximum Stress Ratings” on page 4 	Mar 2006
02	<ul style="list-style-type: none"> Added information for 2.3-2.4 and 2.5-2.6 applications Removed leaded part numbers 	Jul 2006
03	<ul style="list-style-type: none"> Updated “Features:” and “Product Description” on page 1 Revised Table 2 on page 4 and Table 3 on page 5 Updated values in Figure 11 on page 10. Removed two schematics Updated Figures 3 - 8 	Sep 2008
04	<ul style="list-style-type: none"> Updated “Contact Information” on page 13. 	Feb 2009



2.4 GHz High-Power and High-Gain Power Amplifier SST12LP15A

Data Sheet

CONTACT INFORMATION

Marketing

SST Communications Corp.
5340 Alla Road, Ste. 210
Los Angeles, CA 90066
Tel: 310-577-3600
Fax: 310-577-3605

Sales and Marketing Offices

NORTH AMERICA

Silicon Storage Technology, Inc.
1171 Sonora Court
Sunnyvale, CA 94086-5308
Tel: 408-735-9110
Fax: 408-735-9036

EUROPE

Silicon Storage Technology Ltd.
Mark House
9-11 Queens Road
Hersham, Surrey
KT12 5LU UK
Tel: 44 (0) 1932-238133
Fax: 44 (0) 1932-230567

JAPAN

SST Japan
NOF Tameike Bldg, 9F
1-1-14 Akasaka, Minato-ku
Tokyo, Japan 107-0052
Tel: 81-3-5575-5515
Fax: 81-3-5575-5516

ASIA PACIFIC NORTH

SST Macao
Room N, 6th Floor,
Macao Finance Center, No. 202A-246,
Rua de Pequim, Macau
Tel: 853-2870-6022
Fax: 853-2870-6023

ASIA PACIFIC SOUTH

SST Communications Co.
16F-6, No. 75, Sec.1, Sintai 5th Rd
Sijih City, Taipei County 22101
Taiwan, R.O.C.
Tel: 886-2-8698-1198
Fax: 886-2-8698-1190

KOREA

SST Korea
6F, Heungkuk Life Insurance Bldg 6-7
Sunae-Dong, Bundang-Gu, Sungnam-Si
Kyungki-Do, Korea, 463-020
Tel: 82-31-715-9138
Fax: 82-31-715-9137

ООО "ЛайфЭлектроникс"

"LifeElectronics" LLC

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибуторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибуторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помочь разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru