

SW8510QE

100MHz To 1000MHz Power Amplifier

Description

The SW8510QE is a linear, high power, high efficiency amplifier designed to use as a final stage/driver in linear or saturated transmit applications. The device is manufactured on an advanced HBT process and is provided in a 16-pin leadless chip carrier with backside ground. External matching allows for use in standard bands from 100MHz to 1000MHz.

The SW8510QE is available in a small lead-free, RoHS-Compliant, 3.0mm x 3.0mm x 0.55mm 16-pin QFN package.

Features

- Operation Frequency: 100MHz ~ 1000MHz
- Power Supply : 3.3V ~ 5V
- Max Output Power: 34.2dBm
- OP1dB : 33dBm
- $\geq 40\%$ Efficiency.

Applications

- CDMA/GSM/EDGE Repeater Final Amplifier
- 200MHz , 410MHz to 470MHz and 840MHz to 960MHz ISM Band Amplifier
- General Purpose High Power Amplifier
- TETRA Handheld/Walkie-Talkie Final Amplifier

Pin Configuration and Marking

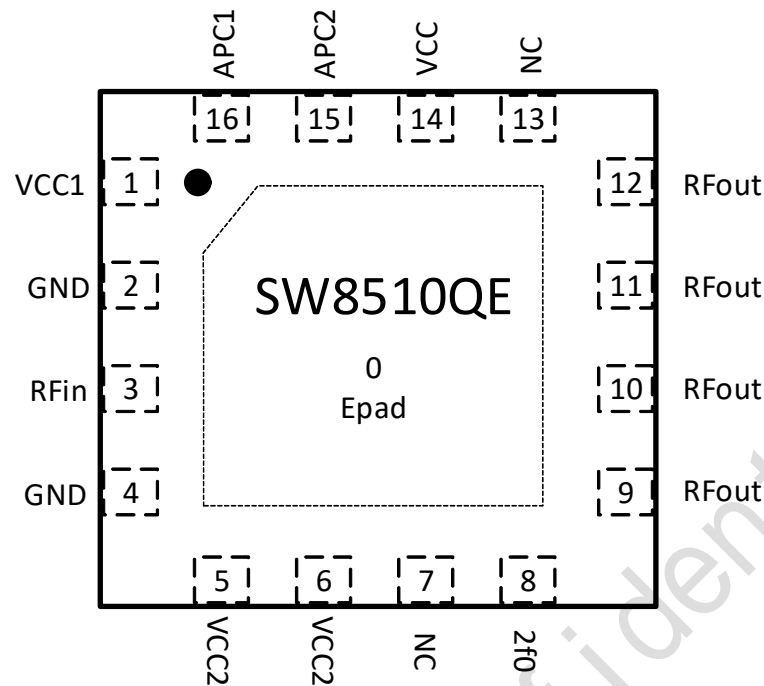


Figure 1. SW8510QE Pin Configuration and Marking

Pin Description

Pin#	Name	Description	Pin#	Name	Description
0	EPAD	Ground	9	RFout	Output and bias for the output stage. The power supply for the output transistor needs to be supplied to this pin. This can be done through an RF inductor that supports the required DC currents.
1	VCC1	Power supply	10	RFout	
2	GND	Ground	11	RFout	
3	RFin	RF Input. An external blocking capacitor is required if this pin is connected to DC path.	12	RFout	
4	GND	Ground	13	NC	Not connected.
5	VCC2	Power supply	14	VCC	Power supply
6	VCC2	Power supply	15	APC2	This pin requires a regulated supply to set output stage DC bias
7	NC	Not connected.	16	APC1	Same as APC2
8	2f0	With the bonding wire together with an external capacitor form a series resonator for second harmonic.			

Order Information

Table 1. Order Information

Part Number	Temperature	Package	RoHS	Mark	SPQ
SW8510QE	-40℃ ~ 85℃	3.0mm*3.0mm QFN-16L	Yes	SW8510QE	Tape and Reel 3000 pcs/Reel

Typical Application

840MHz-960MHz

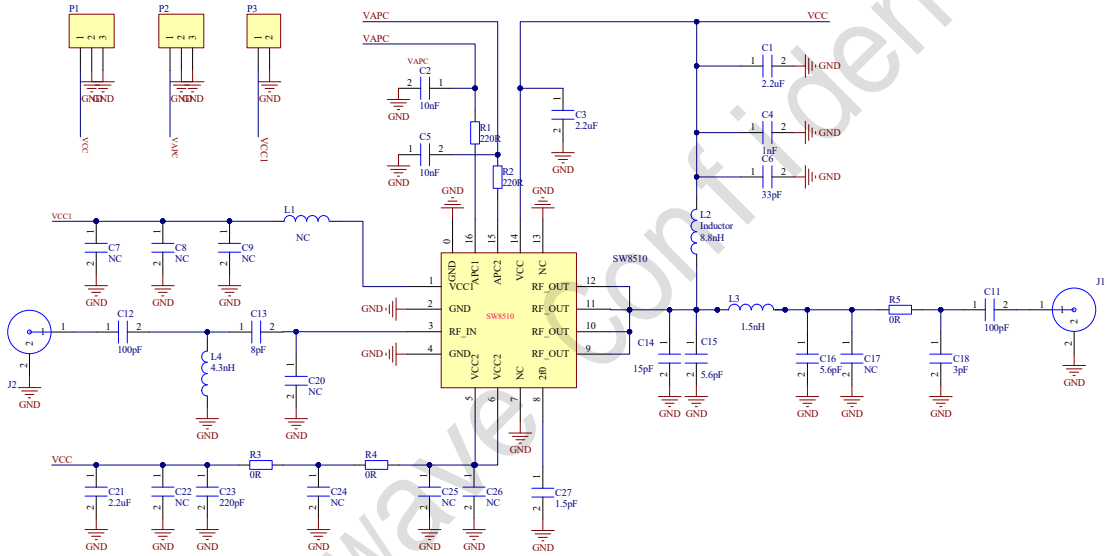


Figure 2. Typical Application Circuit

Absolute Maximum Ratings

Table 2. Limiting Values

Parameter	Rating	Units
Maximum Supply Current	3100	mA
Device Voltage (VD)	7.4	V
Power Dissipation	5	W
Operating Lead Temperature (TAMBIENT)	-40 to +85	℃
Max RF Input 50 Output Load	12	dBm
Max RF Output 50 Load	38	dBm

Output Load VSWR	5.0:1	
Storage Temperature Range	-40 to +150	°C
Operating Junction Temperature (T _J)	150	°C
ESD Rating - Human Body Model (HBM)	Class 1A	V
Moisture Sensitivity Level (MSL)	MSL3	

Electrical Characteristics

Table 3. Electrical Characteristics for 840MHz to 960 MHz

Parameter	Conditions	Min.	Typ.	Max.	Units
See 865MHz to 955MHz Evaluation Board Schematic.					
Operating Frequency	VCC=4.0V APC1=APC2=3.0V	840	900	960	MHz
OP1dB	VCC=4.0V APC1=APC2=3.0V		33		dBm
Small Signal Gain	Frequency = 900MHz	34.0	36.0		dB
Saturated Output Power (PSAT)	VCC=5.0V APC1=APC2=3.0V		34.2		dBm
Saturated Efficiency			40		%
Saturated Output Power (PSAT)	VCC=4.0V APC1=APC2=3.0V		33.2		dBm
Saturated Efficiency			40		%
Saturated Output Power (PSAT)	VCC=3.3V APC1=APC2=3.0V I _{CQ} total=180mA		32.1		dBm
Saturated Efficiency			41		%
Quiescent Current (I _{CQ})	VCC=4.0V APC1=APC2=3.0V		214		mA
Leakage Current	VCC=4.0V APC1=APC2=0V		5	10	uA
Current at APC1 and APC2 (I _{REG1} and I _{REG2})	VCC=3.3V APC1=APC2=3.0V APC1/2 supplied through 220Ω bias resistance (see evaluation board schematic).		3		mA
Thermal Resistance, R _{TH}			11		°C/W
Ruggedness Load VSWR	P _{out} =35.2 dBm@4.0V		5.0:1		

Package Information

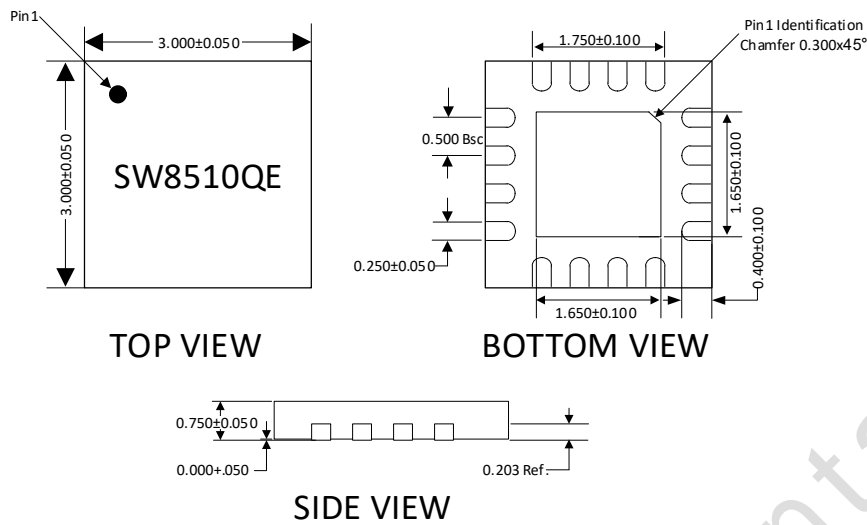
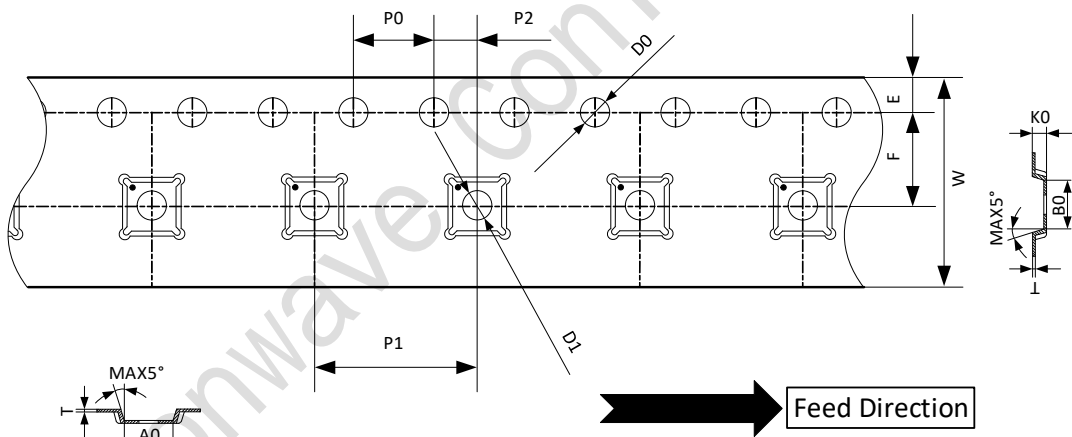


Figure 3. Package Outline

Tape and Reel Dimension



Unit: mm

SYMBOL	A0	B0	K0	P0	P1	P2
SPEC	3.30±0.10	3.30±0.10	1.10±0.10	4.00±0.10	8.00±0.10	2.00±0.05
SYMBOL	T	E	F	D0	D1	W
SPEC	0.25±0.03	1.75±0.10	5.50±0.05	1.50+0.10	1.55±0.10	12.00+0.30 -0.10

Recommended Solder Temperature

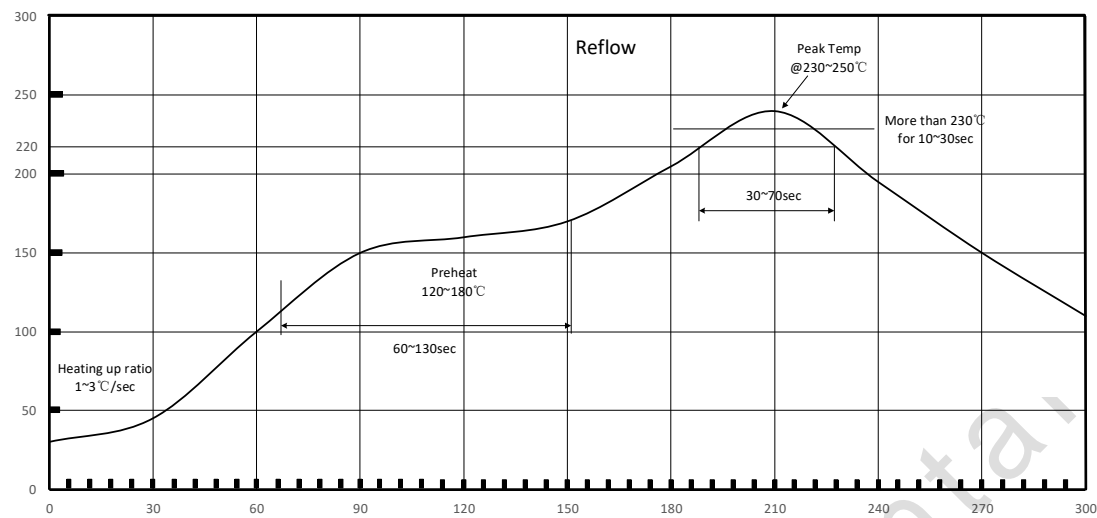


Figure 4. Recommended Solder Temperature

RoHS Compliant

The product does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls(PBB) or polybrominated diphenyl ethers(PBDE), and are therefore considered RoHS compliant.

Revision History

Document ID	Release Date	Change Record
V1.0	2023.7	First Release

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