PWM/PFM controlled DC-DC buck regulators

Description

- The JW5211 is a CMOS step-down DC/DC regulator consisting of a reference voltage source, an oscillator, a comparator, and a PWM/PFM control circuit.
- It utilizes PWM/PFM auto-switching control circuit to achieve adjustable duty cycle and features low ripple, high efficiency and high output current over the full input voltage range (1.8-5.5V).
- The JW5211 has a built-in power MOSFET, which is protected by a number of protection circuits such as over-voltage, over-current, over-temperature, and short-circuit, and is automatically disconnected when it exceeds the control value in order to protect the chip.
- This product combines the features of miniature package and low current consumption, and is most suitable for use inside the power supply of mobile devices.

Feature

- High efficiency Up to 95% efficiency
- Large output current 800mA
- Very low quiescent current 40μA typical
- Very Low Output Ripple <±0.4%
- Low voltage operation Up to 100% duty cycle
- PWM/PFM automatic switching Duty cycle automatically adjustable to maintain high efficiency and low ripple over a wide load range

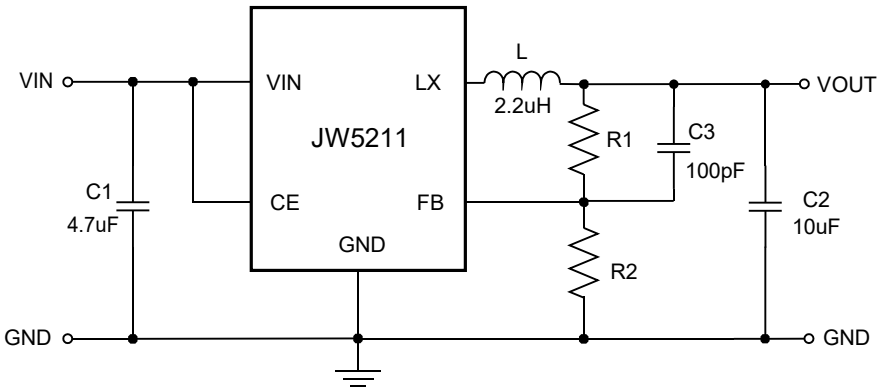
Package

- SOT-23-5L

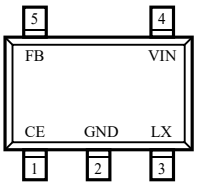
Application

- Power supplies for mobile devices such as digital cameras, digital organizers, PDAs, etc.
- Power supplies for audio devices such as CD players and MDs.
- Regulated power supplies for cameras, video equipment, and communication equipment
- Power supplies for microcomputers

Typical application circuit



Pinout



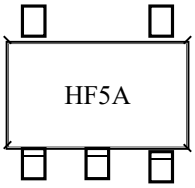
SOT-23-5L

Pin assignment

Pin NO.	Pin Name	Description
1	CE	Chip Enable
2	GND	Ground
3	L_X	Internal power switch output port
4	V_{IN}	Power input
5	F_B	Output voltage feedback terminal

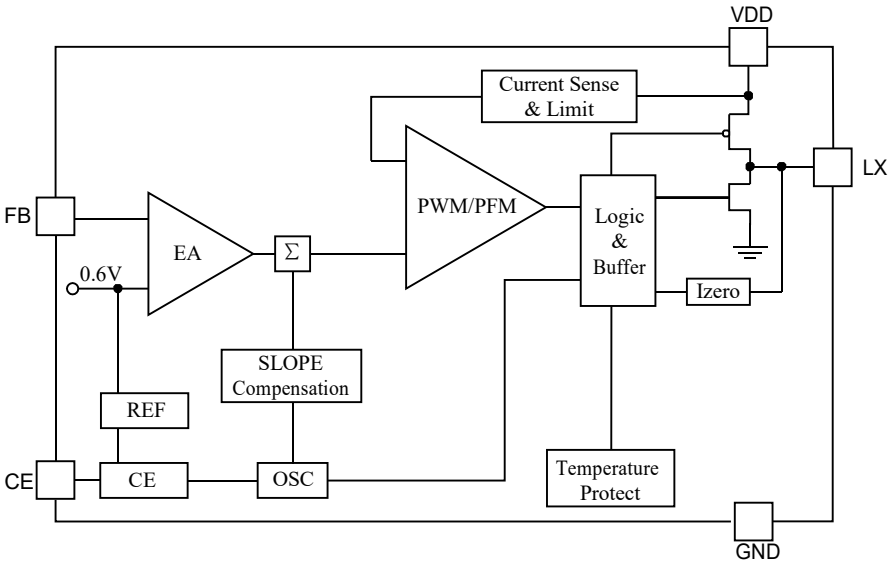
Printing information

- SOT-23-5L



SOT-23-5L
(TOP VIEW)

Functional block diagram



Absolute maximum rating

Parameter	Symbol	Value	Unit
input voltage	V_{IN}	-0.3～6.5	V
output voltage	V_{FB}	-0.3～6.5	
	V_{LX}	-0.3～VIN + 0.3	
CE terminal voltage	V_{CE}	-0.3～VIN + 0.3	
LX terminal current	I_{LX}	±1500	mA
allowable power consumption SOT-23-5L	P_d	250	mW
operating ambient temperature	T_{opr}	-40～＋85	℃
storage temperature	T_{stg}	-55～＋125	

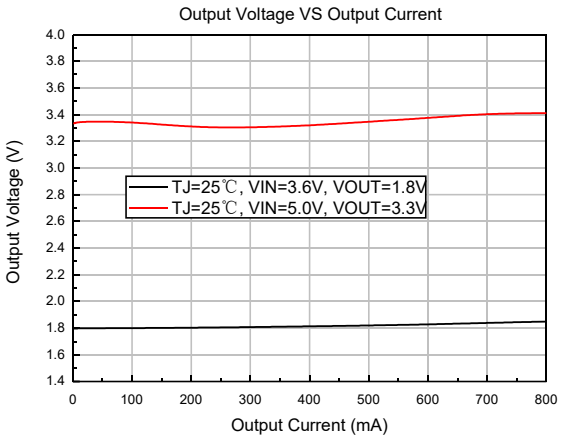
Electrical characteristics

V_{IN}=3.6V, C_{IN}=4.7uF, C_2=10uF, L=2.2uH (T_a=25 ℃unless otherwise specified)

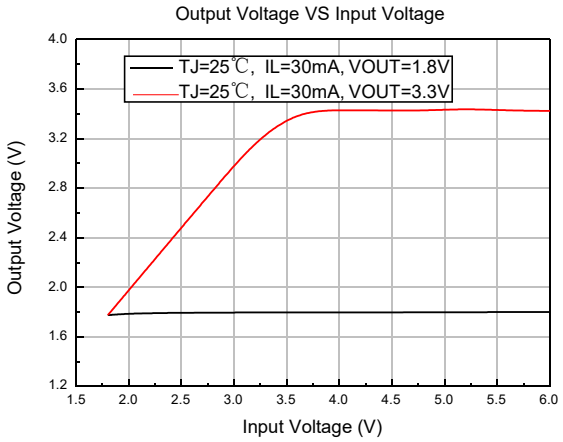
Parameter	Symbol	Condition	Min	Typ	Max	Unit
input voltage	V_{IN}	-	1.8	-	5.5	V
FB feedback voltage	V_{FB}	-	0.59	0.6	0.61	V
load adjustment	V_{OUT}	I_{LMAX}=600mA	-	0.5	-	%
linear adjustment	△ V_{OUT}	V_{IN}=2.5V to 5.5V	-	0.45	-	%
efficiency	E_{FFI}	V_{IN}=2.7V；IL=100mA	—	92	—	%
CE minimum turn-on	V_{CEL}	V_{IN}=5V	1.2			V
CE maximum shutdown	V_{CEH}	V_{IN}=5V			0.9	V
standby current	I_{STB}	V_{CE}=0V、V_{IN}=5V	0	-	1	uA
static current	I_{DD}	V_{FB}=0.5V or V_{OUT}=90%	—	40	-	uA
V_{fb} input current	$I_{\_FB}$	V_{FB}=0.65V	-	-	±50	nA
peak current limit	I_{LIM}	-	-	1000	-	mA
PFM switching point	I_L	V_{IN}=3.6V、V_{OUT}=1.8V		120		mA
oscillation frequency	F_{OSC}	V_{OUT}=100%	-	1.5	-	MHz
maximum duty cycle	MAXDTY	-	100	-	-	%
power-tube resistance_P	R_{DSON_P}	I_{SW}=300mA	-	0.35	0.5	Ω
power-tube internalresistance_N	R_{DSON_N}	I_{SW}=-300mA	-	0.3	0.45	Ω
SW terminal leakage current	I_{LEAK_SW}	C_E=0V，V_{IN}=5V	-	±0.01	±1	uA

Characteristic curve

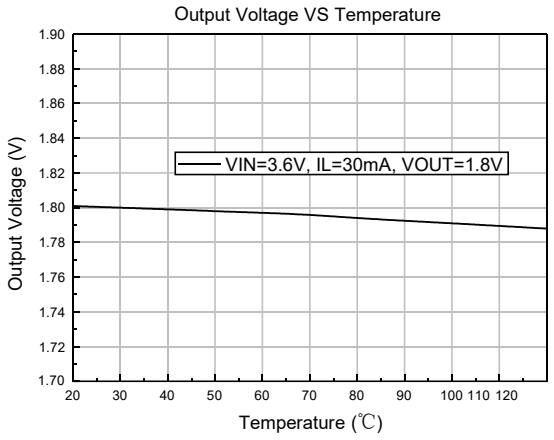
1. input voltage VS output crrent



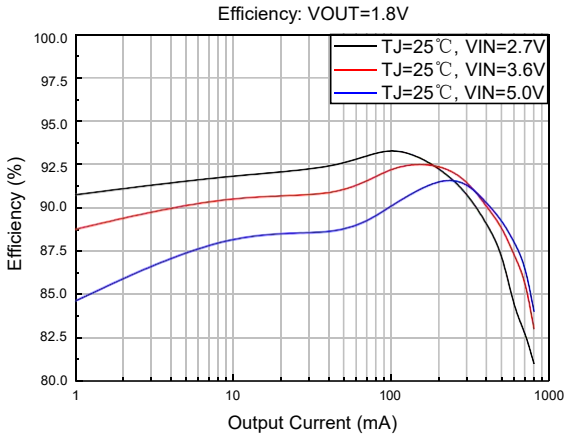
2. input voltage VS output voltage



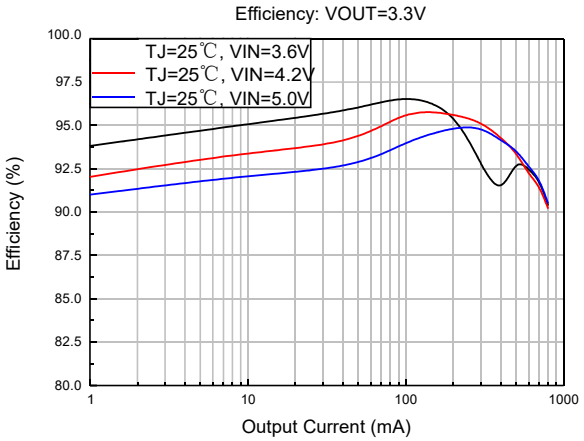
3. Temperature Characteristic



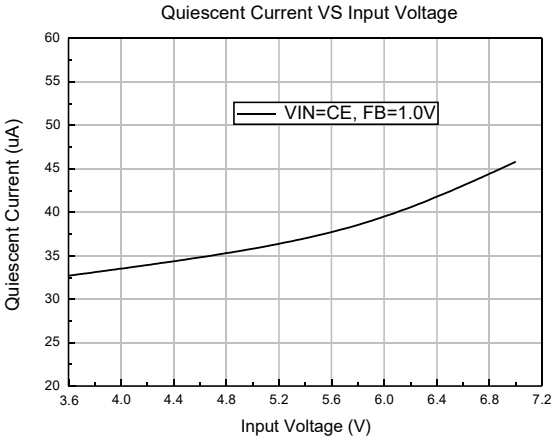
4. 1.8V Efficiency Curve



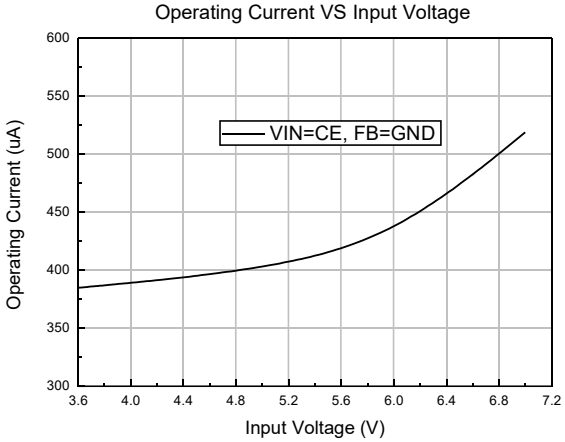
5. 3.3V Efficiency Curve



6. Quiescent Current VS Input Voltage

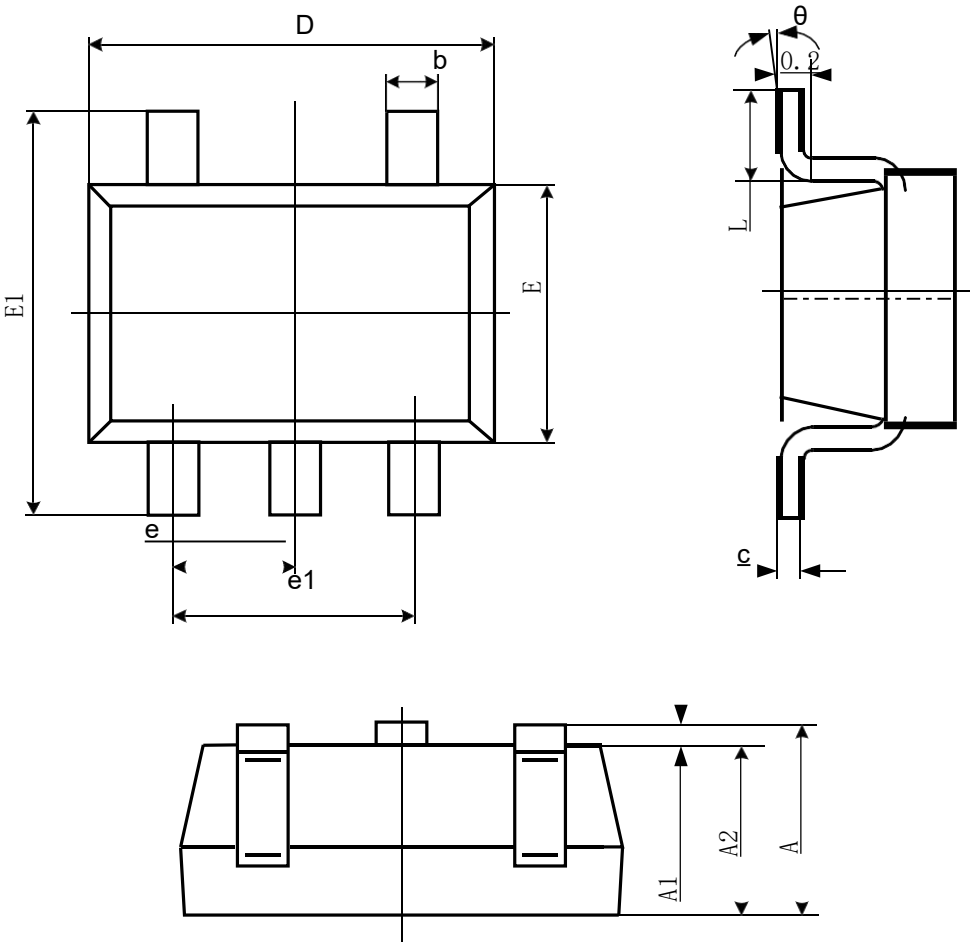


7. Operating Current VS Input Voltage



Package Outline Diagram

- **SOT-23-5L**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°