2A High Efficiency Boost **DC/DC** Voltage Regulator

ÿ Product Overview

The HX3608 is a tiny, high-efficiency, step-up DC/DC regulator.

The circuit consists of current mode PWM control loop, error amplifier, ramp compensation circuit,

Comparator and power switch and other modules. The chip can be used in a wide load range

Efficient and stable work, built-in a 4A power switch and soft-start protection

road. Up to 93% conversion efficiency can effectively extend battery life. can pass

The output voltage is set by adjusting two external resistors.

ÿ Purpose

ÿ Portable mobile devices

ÿ Wireless communication equipment

ÿ Battery backup power

ÿ Product Features

ÿ Efficiency up to 92%

ÿ The output voltage can be raised to 28V

ÿ Input voltage range 2-24V

ÿ 1.2MHz fixed switching frequency

ÿ Automatic PWM/PFM switching mode

ÿ Power path supports short circuit protection

ÿ Package

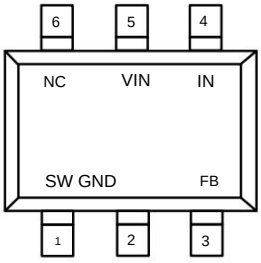
ÿ SOT23-6L

ÿ Ordering Information

HX3608ÿÿ

number bullet		describe
ÿ	A	External feedback, feedback voltage 0.6V
ÿ	R	Tape direction is positive
	L	Reverse tape direction

ÿ Pin Configuration

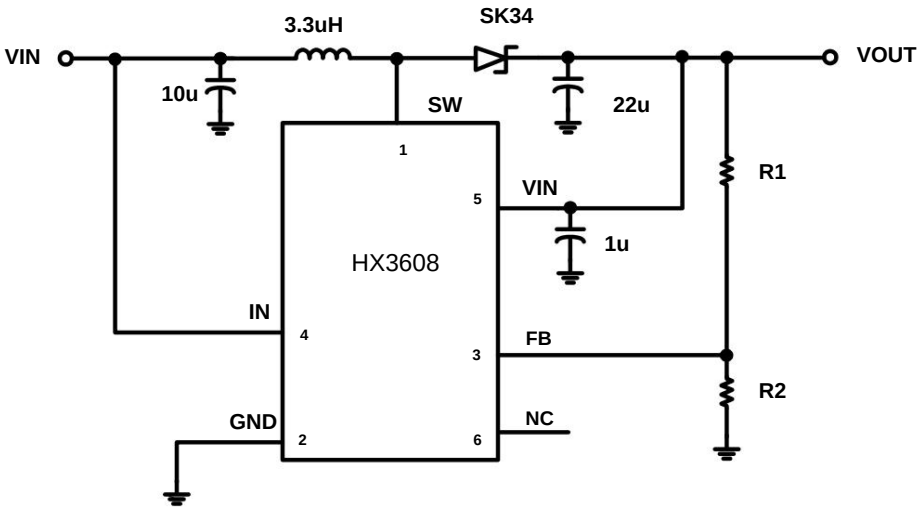


SOT-23-6L
(Top View)

ÿ Pin Description

pin order	pin name	Function description
5	VIN	input
3	FB	Feedback
2	GND	ground terminal
1	SW	switch pin
4	IN	Enable terminal, high effective
6	NC	dangling

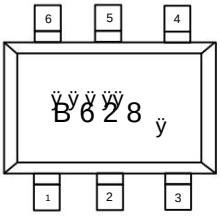
ÿ Typical application circuit



$$VOUT = VFB \times \left(1 + \frac{R1}{R2}\right)$$

Note: The VIN terminal of pin 5 of the chip can be connected to VOUT or VIN. When VIN<5V, it is recommended to connect VOUT to enhance the driving capability.

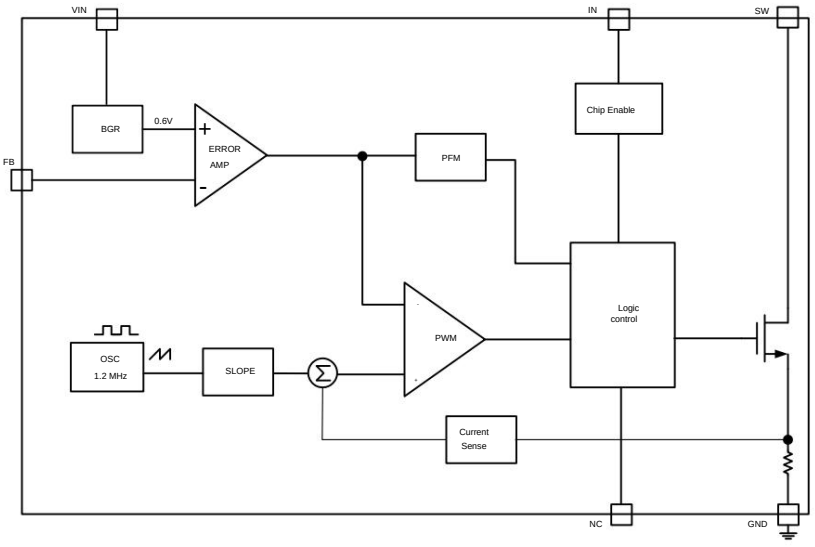
ÿ Printing information



SOT-23-6L

Note: ÿÿÿÿÿÿ code point is the product quality information code

ÿ Functional block diagram



ÿ Absolute Maximum Ratings

project	symbol	Absolute Maximum Ratings	unit
Input voltage	VIN	Vss-0.3ÿVss+24	IN
The output voltage	VOUT	Vss-0.3ÿVss+28	
	VSW	Vss-0.3ÿVss+28	
SW terminal switch current	ISW	3.5	A
Allowable power consumption	PD	250	mW
Working temperature	Topr	-40ÿÿ80	ÿ
storage temperature	Tstg	-40ÿÿ125	

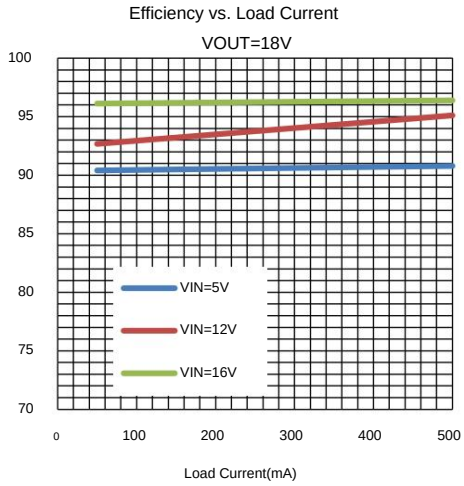
ÿ Electrical characteristic parameters

(VIN=5V, Ta=25ÿ, unless otherwise specified)

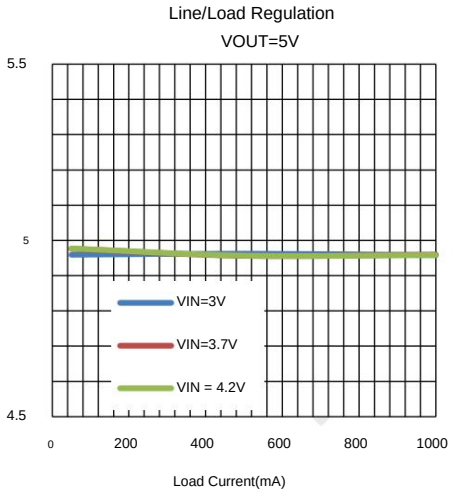
project	symbol	condition	Min	Typ	Max	Units
The output voltage	VOUT	·	2.5		28	IN
Input voltage	VIN	·	2	·	24	
Input undervoltage protection	UVLO_F -		1.7	·	2	IN
Undervoltage protection hysteresis	UVLO_HYS -		·	110	·	mV
off current	IOFF	VEN <VENL	·	·	1	µA
no load current	IC	VIN=4.2VÿVOUT=5V	·	90	·	ÿA
Feedback reference voltage	VR	VOUT=5V	588	600	612 mV	
On-off level	FS	IOUT=1A	·	1.2	·	MHz
maximum duty cycle	DMAX	VFB=0V	·	90	·	%
Power tube internal resistance	RDSON	VIN=5V	·	80	150 mÿ	
switch current	ISW	VIN=5V	3.5	·	·	A
Linear adjustment	ÿVLINE	IOUT=1.2A, VIN=3V to 4.2V	·	0.38	·	%
Load regulation ÿVLOAD	VIN=3.6V, IOUT=10mA to 1.2A		·	0.41	·	%
EN high level	VENH	VIN=3.6V	1.2	·	·	IN
EN low level	VENL	VIN=3.6V	·	·	0.5	IN
SW leakage current	ISW_L	VSW=20V	·	·	1	uA
Thermal shutdown temperature	TSHD	VIN=3.6VÿIOUT=10mA	·	160	·	ÿ

ÿ Typical characteristic curve

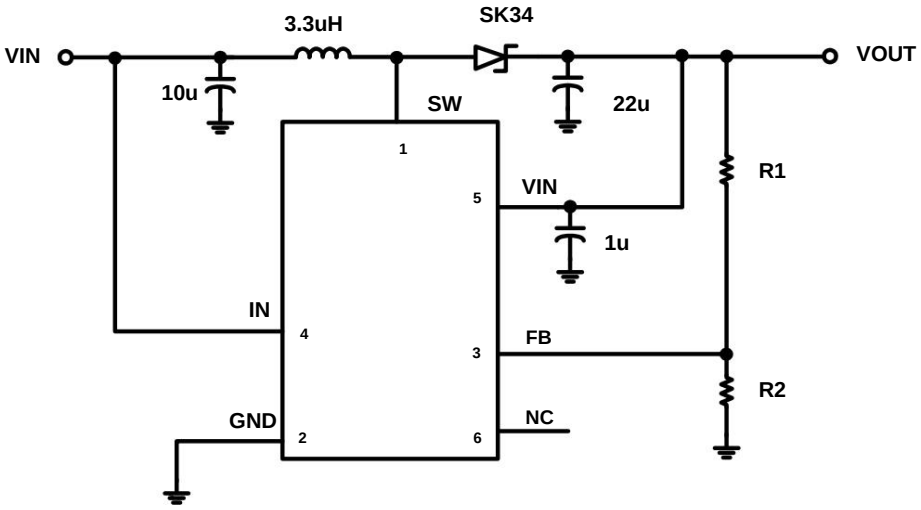
ÿ Efficiency



Line Regulation and Load Regulation



ÿ Application Information



ÿ Output voltage setting

By dividing the voltage by the external resistor of FB, the output voltage value can be calculated according to the following formula:

$$VOUT = VFB \times \left(1 + \frac{R1}{R2}\right)$$

, R1 takes a hundred K-class resistance

ÿ Inductor selection

The recommended inductance range is 3.3uH to 22uH. Inductor selection mainly considers smaller DCR resistance to ensure higher efficiency.

ÿ Input and output capacitance

The capacitance value of the input capacitor and output capacitor is recommended to be above 22uF. In order to obtain a smaller output ripple, it is recommended to use a ceramic capacitor for the output.

The 5-pin terminal needs a 1uF capacitor for voltage regulation. It is recommended to use a ceramic capacitor.

ÿ Diode

ÿ For the freewheeling diode, please use a fast-response Schottky diode. The lower the forward voltage drop, the higher the load efficiency. For different output voltages, pay attention to the reverse direction of the freewheeling diode

The withstand voltage selection should be high enough (>VOUT+5V) to prevent reverse leakage or breakdown.

ÿ **PCB** layout

ÿ In order to get better use effect, the main precautions for PCB layout are as follows:

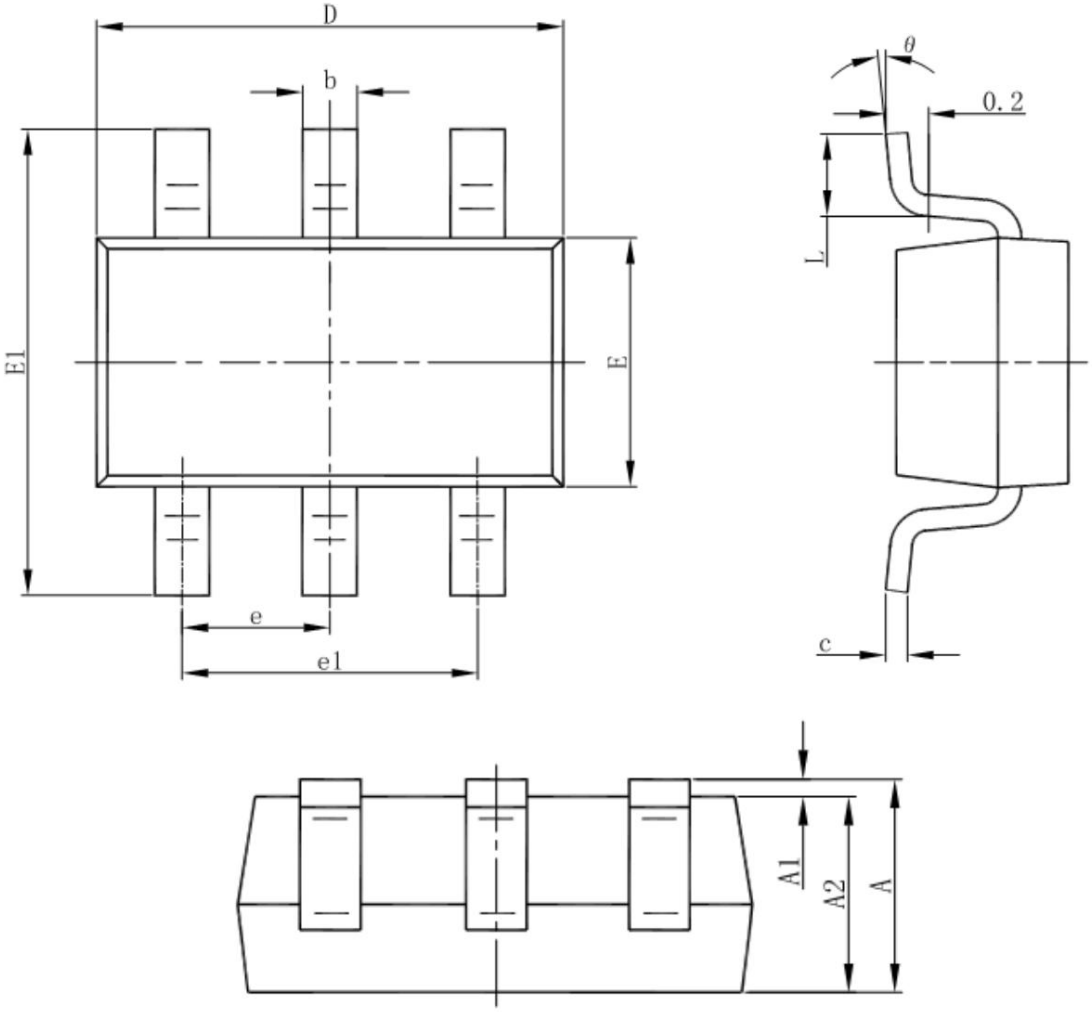
ÿ Input capacitors and output capacitors as close as possible to the chip pins;

ÿ The power path from VIN to inductor L to VOUT should be as short and thick as possible;

ÿ SW pin has high frequency switching signal, pay attention to isolation from other components on the board.

ÿ Package information

ÿ **SOT-23-6L**



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°