

## Features

- External parts: Coil, capacitor
- Output voltage: Settable to between 2.1V to 5.5V in 0.1V steps
- Maximum Oscillation frequency :350KHz
- Accuracy of  $\pm 2\%$
- High efficiency :95%
- Package:SOT23-5,SOT89

## Applications

- Digital cameras
- Electronic notebooks and PDAS
- Portable CD/MD players
- Cameras , video equipment
- Communications equipment
- Power supply for microcomputers

## General Description

The HE9118 Series is a Synchronous step-up DC/DC Converter with PFM Control. With the HE9118 Series, a step-up switching DC/DC converter can be configured by using

an external coil 、 capacitor. The built-in MOSFET is turned off by a protection circuit when the voltage at the LX pin exceeds the limit to prevent it from being damaged.

## Selection Table

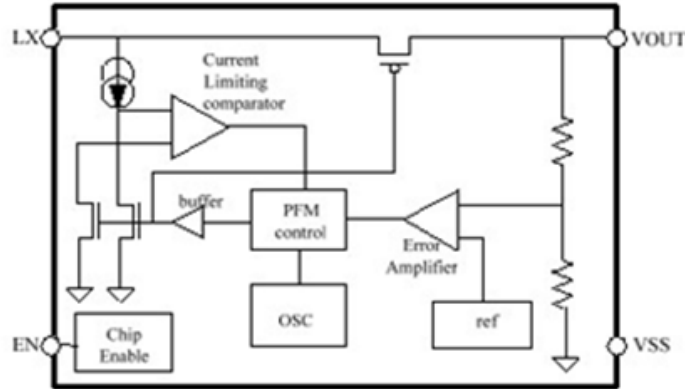
Part No.	Output Voltage	Package	Marking
HE9118Axx	2.7V	SOT23-5	
HE9118Axx	3.0V		
HE9118Axx	3.3V		
HE9118Axx	3.6V	SOT89	
HE9118Axx	5.0V		

## Order Information

HE9118①②③④⑤

Designator	Symbol	Description
①	A	Standard
②③	Integer	Output Voltage (2.1~5.5) e.g:3.0V=②: 3; ③: 0
④	P	Package:SOT89
	M5	Package:SOT23-5
⑤	R	RoHS / Pb Free
	G	Halogen Free

## Block Diagram



## Pin Assignment

SOT23-5(Top view)

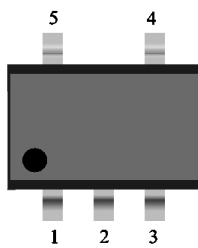


Table2 HE9118 series (SOT23-5 PKG)

PIN NO.	PIN NAME	FUNCTION
1	EN	Shutdown pin "H": Normal operation "L": Step-up stopped
2	VOUT	Output voltage pin
3	NC	(N.C.)
4	GND	GND pin
5	LX	External inductor connection pin

SOT89 (Top view)

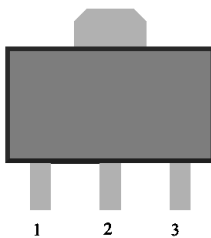


Table3 HE9118 series (SOT89 PKG)

PIN NO.	PIN NAME	FUNCTION
1	GND	GND pin
2	VOUT	Output voltage pin
3	LX	External inductor connection pin

## Absolute Maximum Ratings

(Unless otherwise specified, Ta=25°C)

PARAMETER		SYMBOL	RATINGS	UNITS
VOUT Pin Voltage		V <sub>OUT</sub>	V <sub>SS</sub> -0.3~V <sub>SS</sub> +8	V
EN Pin Voltage		EN	V <sub>SS</sub> -0.3~V <sub>SS</sub> +8	V
LX Pin Voltage		V <sub>LX</sub>	V <sub>SS</sub> -0.3~V <sub>SS</sub> +8	V
LX Pin Current		I <sub>LX</sub>	500	mA
Power Dissipation	SOT23-5	PD	250	mW
	SOT-89-3		500	mW
Operating Temperature		T <sub>OPR</sub>	-40~+85	°C
Storage Temperature		T <sub>STG</sub>	-40~+125	°C
Soldering Temperature & Time		T <sub>SOLDER</sub>	260°C, 10s	

Note: These are stress ratings only. Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

## Electrical Characteristics

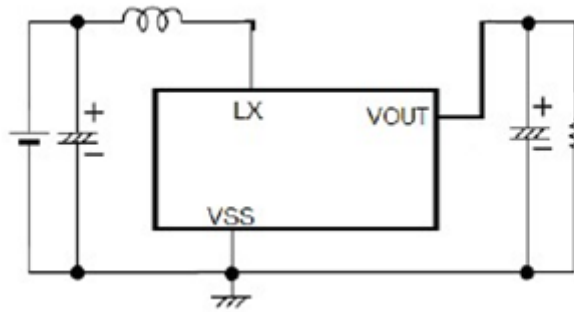
(Unless otherwise specified, Ta = 25°C)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	CONDITION
Output Voltage	V <sub>OUT</sub>	V <sub>OUT(S)</sub> X0.98	V <sub>OUT</sub>	V <sub>OUT(S)</sub> X1.02	V	-
Input Voltage	V <sub>IN</sub>	-	-	7.5	V	-
Operation Start Voltage	V <sub>ST1</sub>	-	-	0.9	V	I <sub>OUT</sub> =1mA, V <sub>OUT</sub> =2.2V~4.2V
Operation Start Voltage	V <sub>ST2</sub>	-	-	1.2	V	I <sub>OUT</sub> =1mA, V <sub>OUT</sub> =4.2V~5.5V
Input Current At No Load	I <sub>SS1</sub>	-	15	-	uA	V <sub>IN</sub> =1.8V, V <sub>OUT</sub> =3.0V
Current Consumption 2	I <sub>SS2</sub>	-	6	10	uA	V <sub>OUT</sub> =V <sub>OUT(S)</sub> +0.5V
Current Consumption During Shutdown	I <sub>SSS</sub>	-	-	1.0	uA	V <sub>EN</sub> =0V
Maximum Oscillation Frequency	fosc		350		KHz	V <sub>OUT</sub> =0.95xV <sub>OUT(S)</sub> , measure Waveform at LX pin
Duty Ratio1	Duty1	70	78	85	%	V <sub>OUT</sub> =0.95xV <sub>OUT(S)</sub>
Efficiency	EFF1		90		%	
Shutdown Pin Input Voltage	V <sub>SH</sub>	0.75	-	-	V	V <sub>OUT</sub> =0.95xV <sub>OUT(S)</sub> , judge Oscillation at LX pin
	V <sub>SL</sub>	-	-	0.3	V	V <sub>OUT</sub> =0.95xV <sub>OUT(S)</sub> , judge stop at LX pin
Shutdown Pin input Current	I <sub>SH</sub>	-0.1	-	0.1	uA	V <sub>EN</sub> =6V
	I <sub>SL</sub>	-0.1	-	0.1	uA	V <sub>EN</sub> =0V

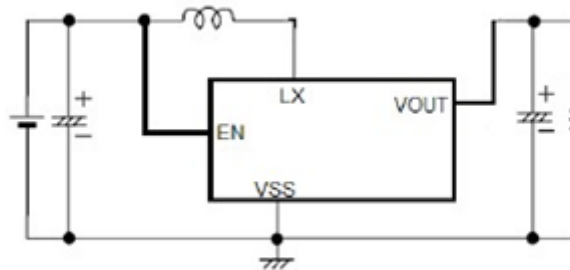
Remark: V<sub>OUT(S)</sub> specified above is the set output voltage value, and V<sub>OUT</sub> is the typical value of the actual output voltage

**Application Circuits**

**1) HE9118 without CE**



**2) HE9118 with CE**

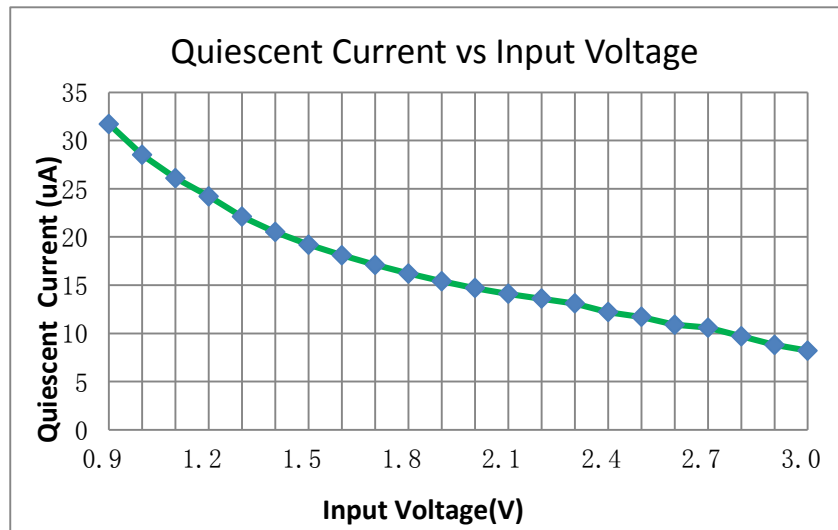
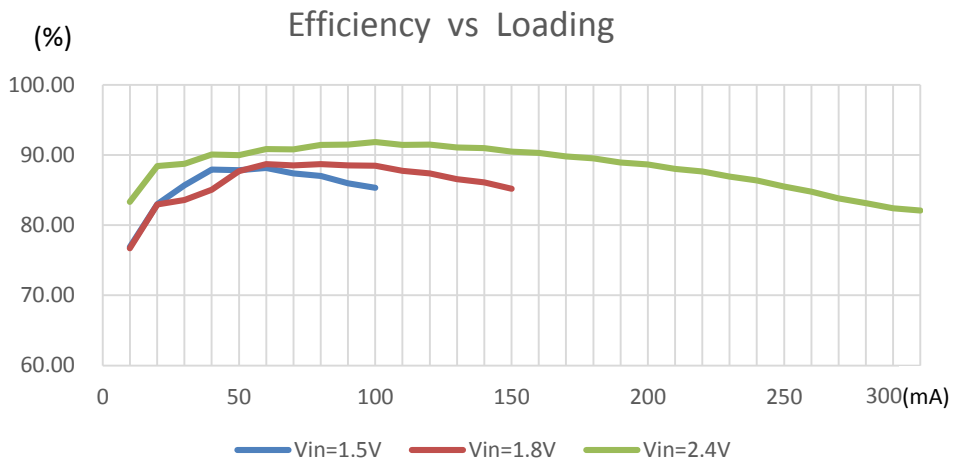
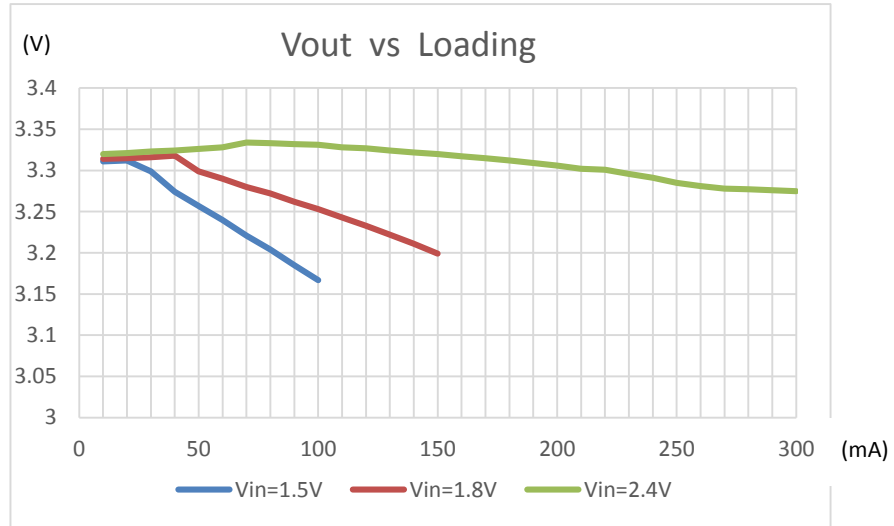


Note: External Component Recommendation:

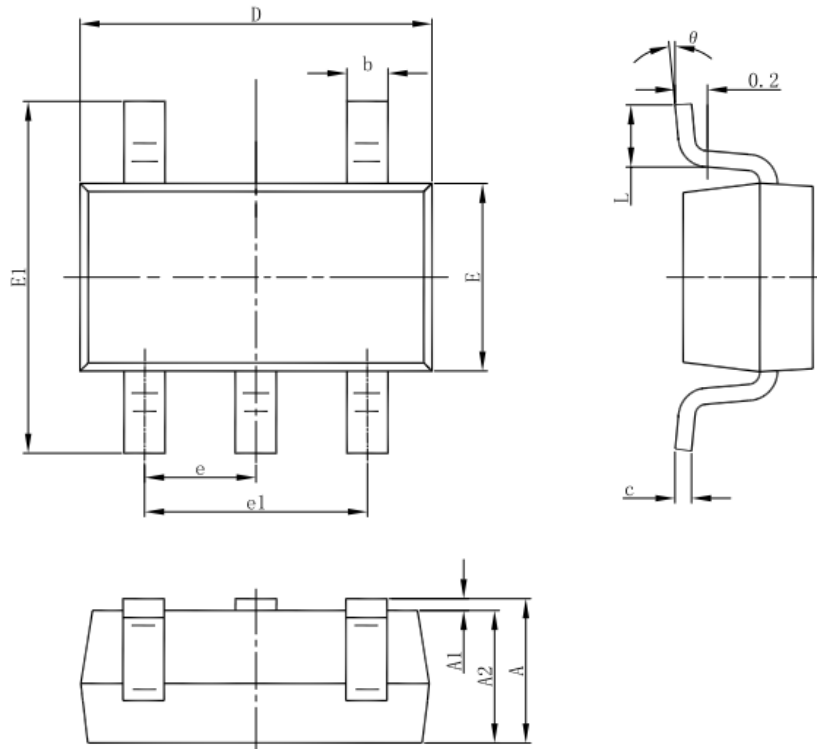
- 1)  $L=47\mu\text{H}$ (Sumida)
- 2)  $C_F=22\mu\text{F}/16\text{V}$ (Tantalum)

**TYPICAL PERFORMANCE CHARACTERISTICS**

(C<sub>in</sub>=C<sub>out</sub>=22uF,L=47uH)

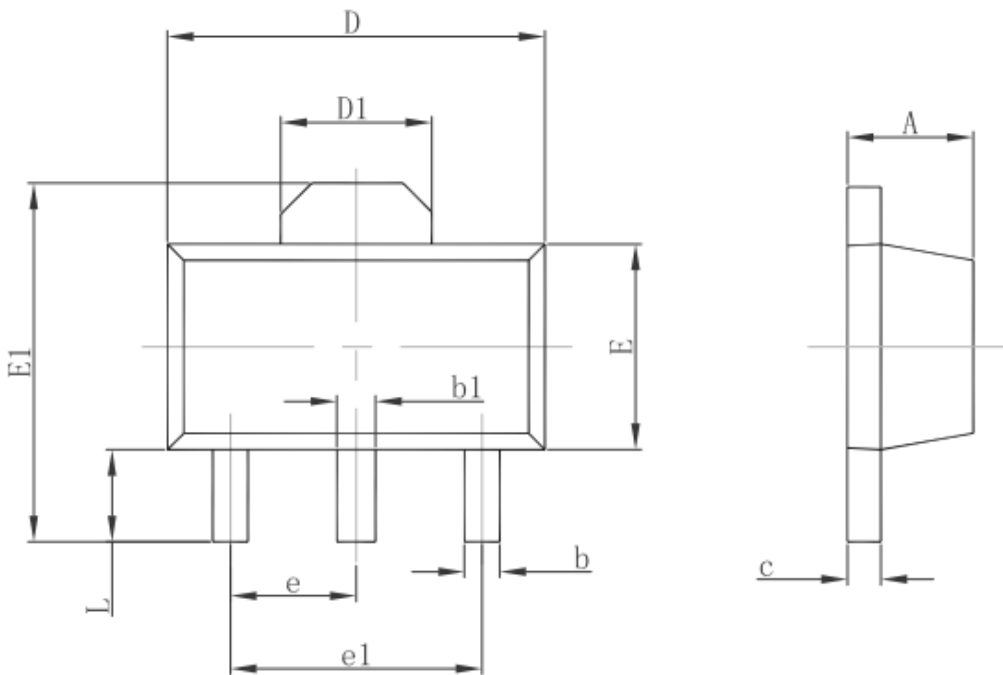


**5-pin SOT23-5L Outline Dimensions**



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
theta	0°	8°	0°	8°

**3-pin SOT89-3 Outline Dimensions**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047