



## 300KHz PFM Control Step-Up DC/DC Converter

### ● Features

- Low voltage operation: Startup at 0.9 V @  $I_{OUT} = 1$  mA
- Working frequency: 300KHz
- External parts: Coil, capacitor, diode
- Accuracy of  $\pm 2\%$
- High efficiency 87%typ.
- Shutdown function
- Low ripple, Low noise

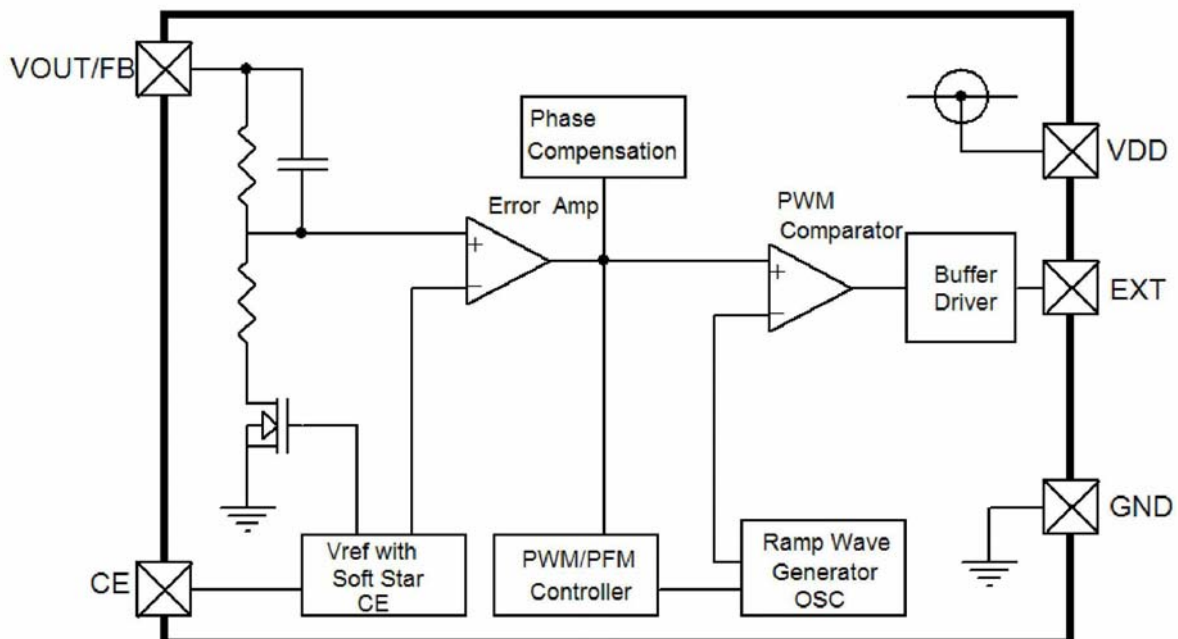
### ● Applications

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

### ● INTRODUCTION

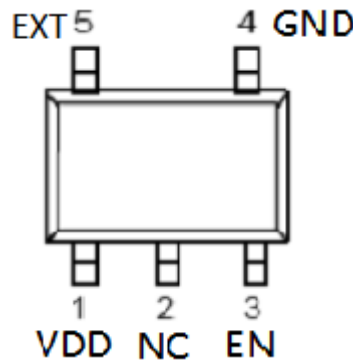
The FS1502 is a CMOS PFM-control step-up switching DC/DC converter. The PFM controller allows the duty ratio to be automatically switched according to the load, enabling products with a low ripple over a wide range, high efficiency, and high output current. With the FS1502, a step-up switching DC/DC converter can be configured by using an external coil, capacitor, and diode.

### ● Typical Block Diagram





● Pin Configurations



● Pin Description

Pin Name	Pin Description	
<b>FS1502A</b>		
1	VDD / V <sub>OUT</sub>	Output voltage pin/ Feedback Pin
2	NC	NC
3	CE	Shutdown pin; "H": Normal operation; "L": Step-up stopped
4	GND	GND pin
5	EXT	External transistor connection pin

● Ordering Information

FS1502-①②③④⑤

DESIGNATOR	SYMBOL	DESCRIPTION
①		A or B
②③	Integer	Output Voltage e.g.: 3.0V=②:3; ③:0 ADJ=②:A; ③:D
④⑤	SK	Package: SOT-23-5

● Absolute Maximum Ratings (Unless otherwise specified, T<sub>a</sub>= 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>	1500	mA
Power,dissipation	P <sub>D</sub>	600	mW
Operating temperature	T <sub>opr</sub>	-20 ~+85	°C
Storage temperature	T <sub>stg</sub>	-40 ~+125	°C
Soldering Temperature & Time	T <sub>solder</sub>	260°C, 10s	

● Electrical Characteristics(Unless otherwise specified, T<sub>a</sub>=25°C)



PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output voltage	$V_{OUT}$	—	$V_{OUT(S)} \times 0.98$	$V_{OUT}$	$V_{OUT(S)} \times 1.02$	V
Input voltage	$V_{IN}$	—	—	—	6	V
Operation start voltage	$V_{ST}$	$I_{OUT} = 1 \text{ mA}$	—	—	0.9	V
Hold voltage	$V_{HOLD}$	$I_{OUT} = 1 \text{ mA}$	0.8	—	—	V
Current consumption	$I_{SS}$	$V_{OUT} = V_{OUT(S)} + 0.5 \text{ V}$	—	7	—	$\mu\text{A}$
Current consumption during shutdown	$I_{SSS}$	$V_{EN} = 0 \text{ V}$ , No load	—	—	1.0	$\mu\text{A}$
Maximum Oscillation frequency	$F_{max}$	$V_{OUT} = 0.95 \times V_{OUT}$ measure waveform at LX pin	—	300	—	KHz
Duty ratio	Duty		—	75	—	%
Efficiency	EFFI		—	87	—	%
Current limit	$I_{LIMIT}$		—	1000	—	mA
Shutdown pin input voltage	$V_{SH}$		1.5	—	—	V
	$V_{SL}$		—	—	0.3	V
Shutdown pin input current	$I_{SH}$		—	—	0.1	$\mu\text{A}$
	$I_{SL}$		-0.1	—	—	$\mu\text{A}$

Remark  $V_{IN} = V_{OUT(S)} \times 0.6$  applied,  $I_{OUT} = V_{OUT(S)} / 250$

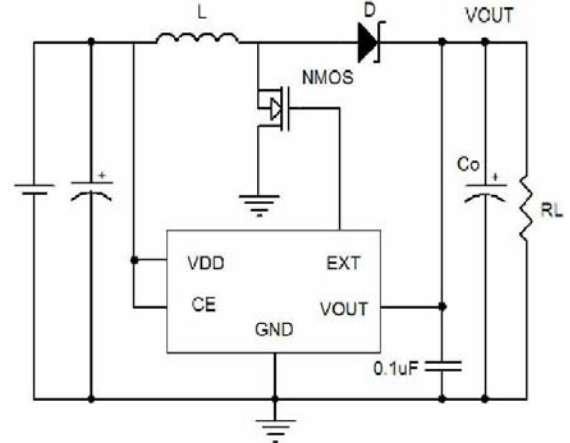
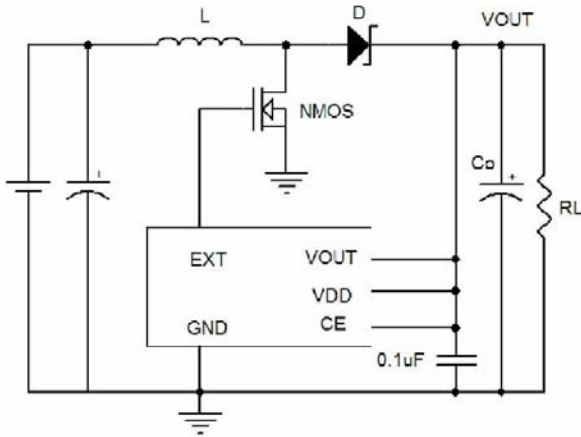
$V_{OUT(S)}$  specified above is the set output voltage value, and  $V_{OUT}$  is the typical value of the actual output voltage.



## ● STANDARD CIRCUITS

**Component:** Inductor 22uH(Sumida),Capacitor47uF/10V(Tantalum),DiodeIN5817/IN5819,NMOS FS2102 FS4468

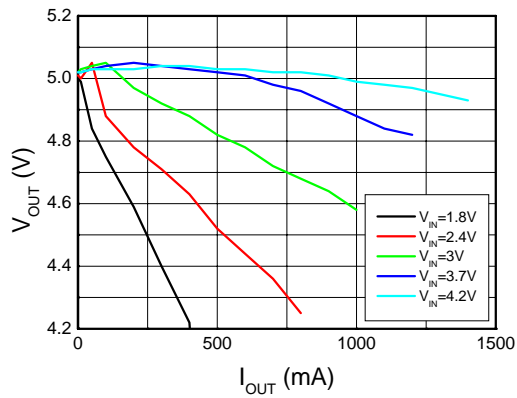
1、 Fixed output voltage



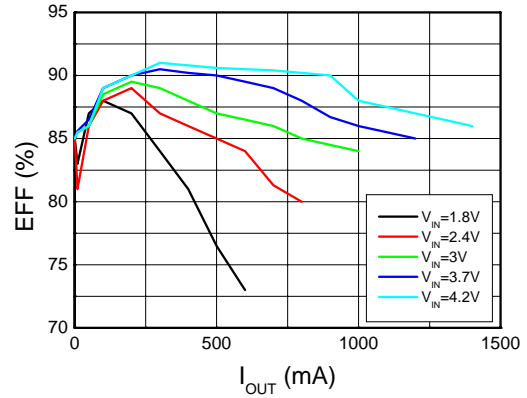
## ● PERFORMANCE CHARACTERISTICS

FS1502-50SK

$V_{OUT}$  VS.  $I_{OUT}$



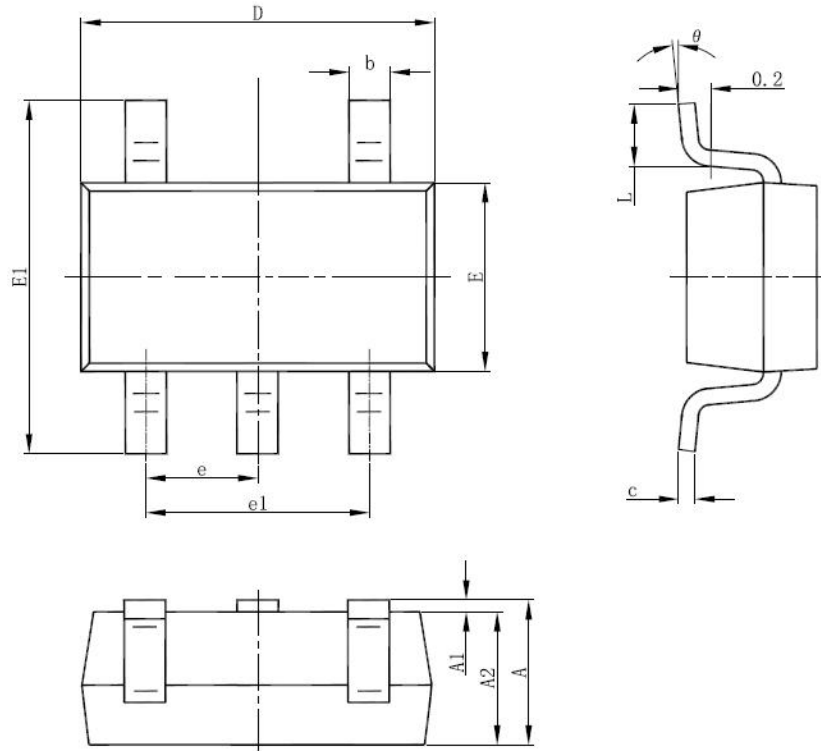
EFFICIENCY VS.  $I_{OUT}$





● PACKAGE INFORMATION

SOT-23-5



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°