

High Efficiency, synchronous PFM Step-up(boost) DC-DC converter

PRELIMINARY DATASHEET

General Description

The FH4003 series is a CMOS PFM-control step-up(boost) switching regulator that mainly consists of a reference voltage source, an oscillator, and a comparator, enabling products with a low ripple over a wide range, high efficiency, and high output current. With the FH4003 series, a step-up switching regulator can be configured by using an external coil and capacitor. A protection circuit turns off the built-in MOSFET when the voltage at the CONT pin exceeds the limit to prevent it from being damaged. This feature, along with the mini package and low current consumption, makes the FH4003 series ideal for applications such as the power supply unit of portable equipment.

The FH4003 is available in 3pin and 5pin SOT packages.

Datasheet Brief

Features

- High efficiency: 94% (typ.)
- Maximum frequency: 300kHz (typ.)
- Low Quiescent Current: 15uA
- Input Voltage: 0.9V ~ 5.0V
- Output Voltage Range: 1.8V to 5.0V
- High Accuracy: $\pm 2\%$
- Low ripple and Low noise
- Package: SOT-23, SOT-23-3L, SOT-23-5L

Typical Application

- One to Three Cell Battery Operated Devices
- Medical Instruments
- Bluetooth Headsets
- Flash-Based MP3 Players
- Noise Canceling Headphones

Typical Application Circuit

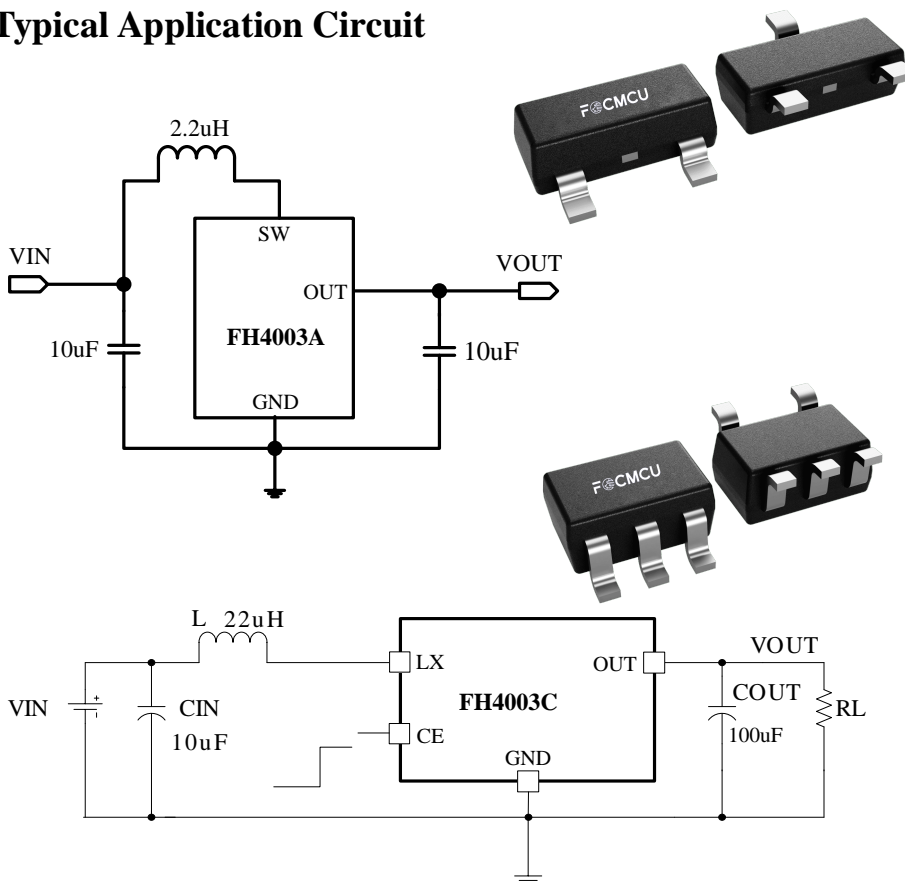
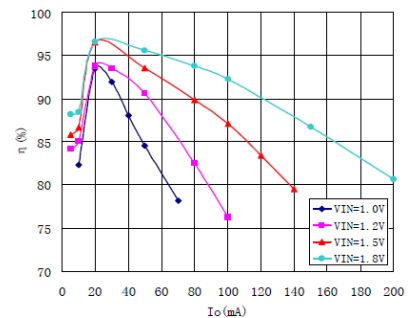


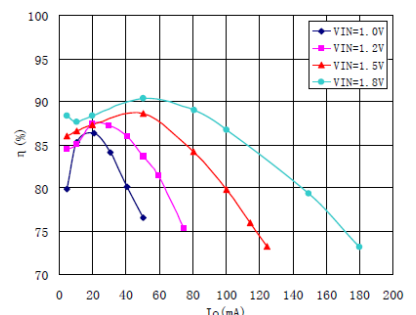
Figure 1. FH4003A/FH4003C Application Circuit

Figure 2. Type Efficiency

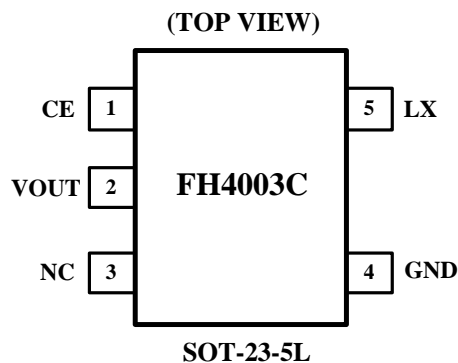
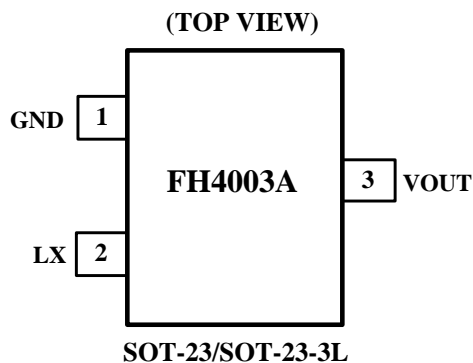
1. η vs. I_o ($V_o=2.8V$)



2. η vs. I_o ($V_o=3.0V$)



Pin Configuration



Pin Assignment

FH4003A**

Pin Number	Pin Name	Description
SOT-23/SOT-23-3L		
1	GND	Ground
3	VOUT	Voltage output
2	LX	Switch pin

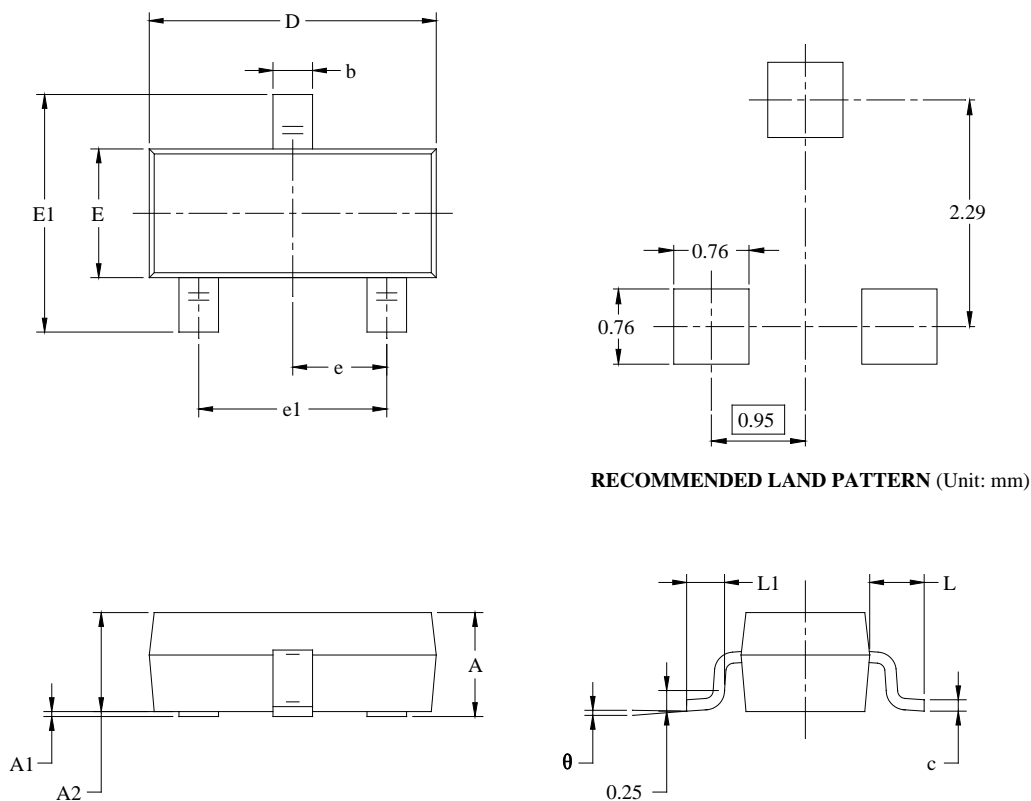
FH4003C**

PIN Number	Pin Name	Description
SOT-23-5L		
1	CE	Chip enable
2	VOUT	Output voltage monitor, IC internal power supply
3	NC	NC
4	GND	Ground
5	LX	Switch

TYPE	POSTFIX	PACKAGE	SWITCHING TRANSISTOR	CE FUNCTION	FEATURES
FH4003A**	M3	SOT-23-3L	Build in Transistor	No	Lx
FH4003C**	M5	SOT-23-5L	Build in Transistor	Yes	LX+CE

PACKAGE OUTLINE DIMENSIONS

Type: SOT-23

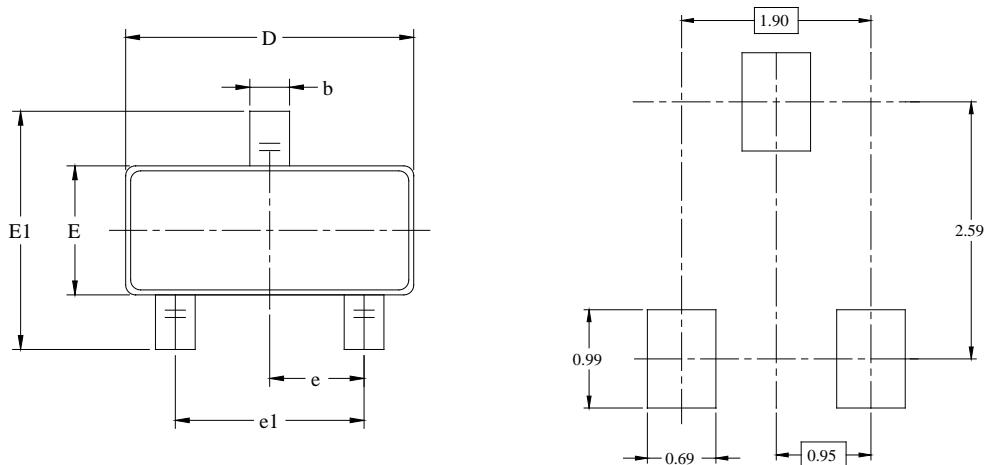


RECOMMENDED LAND PATTERN (Unit: mm)

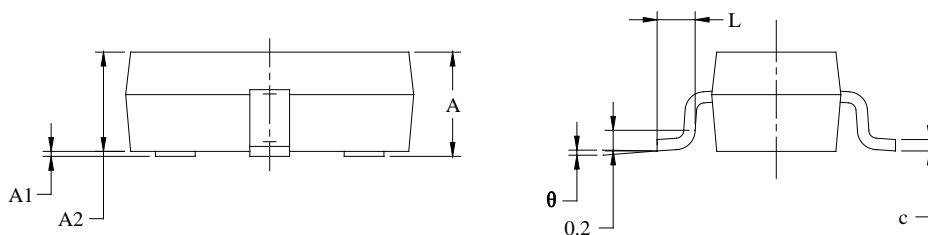
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

PACKAGE OUTLINE DIMENSIONS

Type: SOT-23-3L



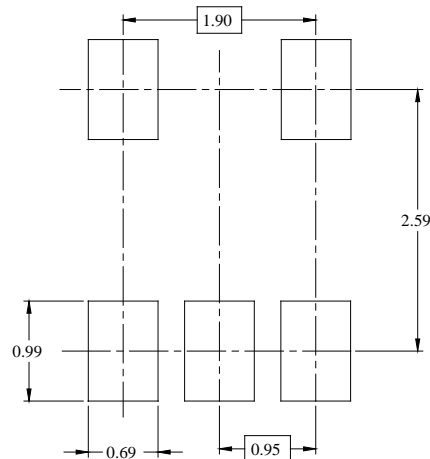
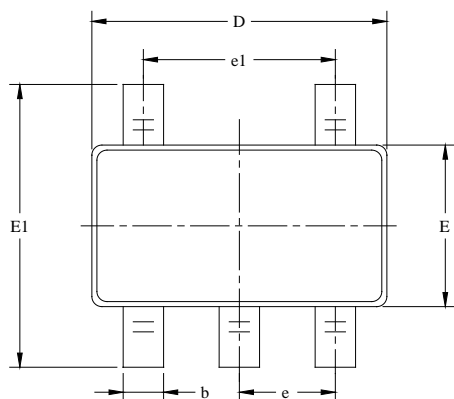
RECOMMENDED LAND PATTERN (Unit: mm)



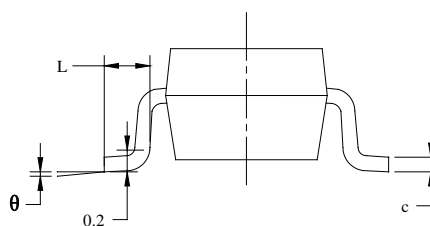
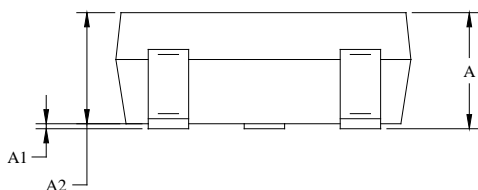
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

PACKAGE OUTLINE DIMENSIONS

Type: SOT-23-5L



RECOMMENDED LAND PATTERN (Unit: mm)



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	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

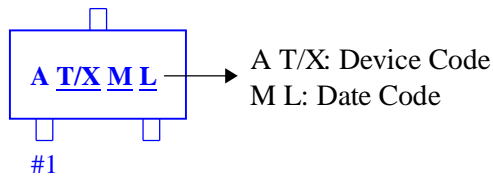
ORDERING INFORMATION

Part Number	Output Voltage	Features	Operating Temperature	Package Type	Top Mark	SPQ
FH4003A25M3/M0	2.5V	<ul style="list-style-type: none"> • Synchronous PFM Boost • Vin Range: ~ 5.0V • Freq.: 300KHz • Flex output: 1.8V ~ 5.0V • Function: LX 	-40°C to +85°C	SOT-23-3L SOT-23	A T/X M L	3000EA/Reel
FH4003A28M3/M0	2.8V		-40°C to +85°C		A T/X M L	3000EA/Reel
FH4003A30M3/M0	3.0V		-40°C to +85°C		A T/X M L	3000EA/Reel
FH4003A33M3/M0	3.3V		-40°C to +85°C		A T/X M L	3000EA/Reel
FH4003A36M3/M0	3.6V		-40°C to +85°C		A T/X M L	3000EA/Reel
FH4003A50M3/M0	5.0V		-40°C to +85°C		A T/X M L	3000EA/Reel
FH4003A25M5	2.5V	<ul style="list-style-type: none"> • Synchronous PFM Boost • Vin Range: ~ 5.0V • Freq.: 300KHz • Flex output: 1.8V ~ 5.0V • Function: LX + CE/EN 	-40°C to +85°C	SOT-23-5L	A T/X M L	3000EA/Reel
FH4003A28M5	2.8V		-40°C to +85°C		A T/X M L	3000EA/Reel
FH4003A30M5	3.0V		-40°C to +85°C		A T/X M L	3000EA/Reel
FH4003A33M5	3.3V		-40°C to +85°C		A T/X M L	3000EA/Reel
FH4003A36M5	3.6V		-40°C to +85°C		A T/X M L	3000EA/Reel
FH4003A50M3	5.0V		-40°C to +85°C		A T/X M L	3000EA/Reel

Note:

- **FH4003A**M3/M0 / FH4003C**M5** devices are Pb-free and RoHs compliant.
- The surface prints of our semiconductor devices are subject to change during the production process and do not involve changes in electrical parameters, and we will not separately state the notice.
- If you have any other custom purchase needs, please contact our sales department.
- ForDevices reserves the right to amend and legally interpret the electrical parameters of this chip device. (<http://www.fordevices.com>)

Device Name: SOT-23-3L/SOT-23



Device Name: SOT-23-5L

