36.0V, 3.1A Monolithic Buck(Step-down) Switching Regulator

PRELIMINARY DATASHEET

Description

FH56003 is a monolithic 36.0V, 3.1A buck(step-down) switching converter. FH56003 integrates a 36.0V/79.0mΩ provide 3.1A high side and a 36.0V, 62.0mohm low side MOSFETs to continuous load current over a 6.5V to 36.0V wide operating input voltage with 33.0V input over voltage protection.

Peak current mode control provides fast transient responses and cycle-by-cycle current limiting.

Programmable soft-start prevents inrush current at power-up.

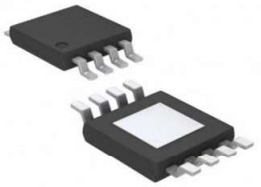
Device Information

Part Number	Package	Body Size(NOM)	Top Marking
FH56003	ESOP-8L	4.90mm x 3.90mm	FH56003 YY MM LL

Note: For all available packages, see the orderable addendum at the end of the datasheet.

Features

- 3.1A continuous output current capability
- 6.5V to 36.0V wide operating input range with input Over Voltage Protection (OVP)
- Integrated 36.0V, 79mΩ high side and 36.0V, 62mΩ low side power MOSFET switches
- Up to 95% efficiency
- Programmable Soft-Start limits the inrush current at turn-on
- Stable with Low ESR Ceramic Output Capacitors
- Fixed 300KHz Switching Frequency
- Input Under-Voltage Lockout
- Input over-voltage protection to protect device from working in high voltage and high current condition
- Output Over-Voltage Protection
- Output short protection with both high side current limit and low side current limit to protect the device in hard short
- Over-Temperature Protection (OTP)
- Thermally Enhanced ESOP-8L Package

(Physical Drawing)  ESOP-8L

Applications

- Televisions
- OLPC, Netbook
- USB car charger
- General purpose
- Portable charging device
- Set-Top-Box (STB)
- DVD, LCD Displays
- Datacom, XDSL modems
- Distributed Power Systems

Typical Application Schematic

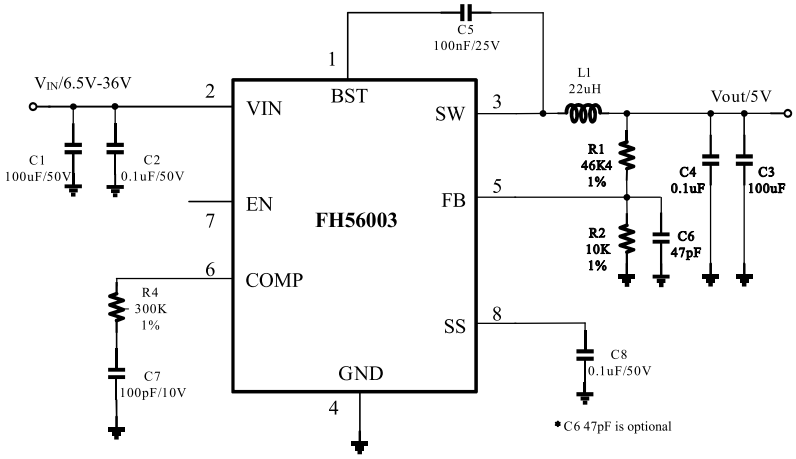


Fig 1. FH56003 Schematic

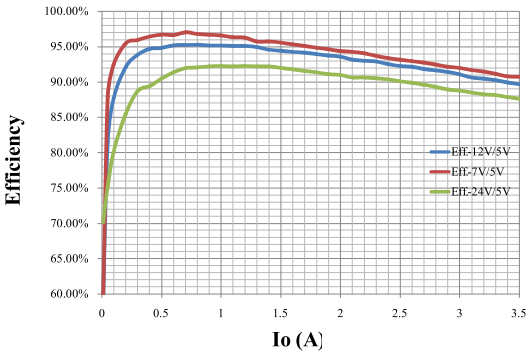
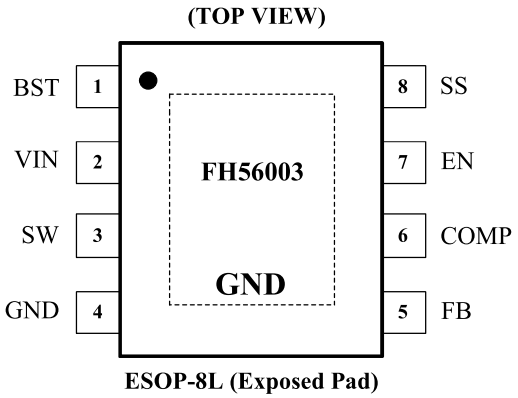


Fig 2. Efficiency curve

PIN CONFIGURATION



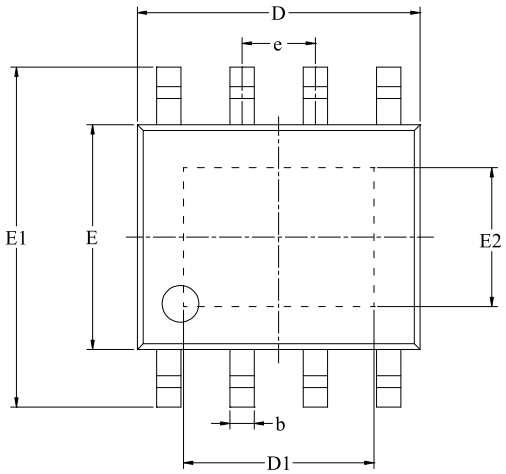
PIN DESCRIPTION

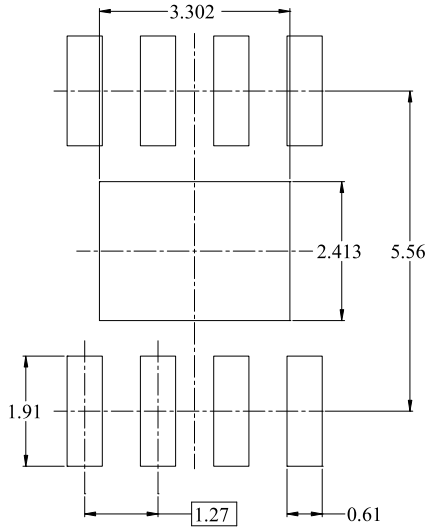
Pin - Functions

Pin		Description
Number	Name	
1	BST	**Boot-Strap pin.** Connect a 0.1uF or greater capacitor between SW and BST to power the high side gate driver. Minimize BST and SW loop to reduce EMI.
2	VIN	**Power Input.** VIN supplies the power to the IC. Supply VIN with a 6.5V to 36.0V power source. Bypass VIN to GND with a large capacitor and at least another 0.1uF ceramic capacitor to eliminate noise on the input to the IC. Put the capacitors, especially 0.1uF ceramic capacitor as close as possible to VIN and GND pins. Minimize 0.1uF capacitor, VIN pin, GND pin loop to reduce EMI and voltage spike on high side power device.
3	SW	**Power Switching pin.** Connect this pin to the switching node of inductor.
4	GND	**Ground.**
5	FB	**Feedback Input.** FB senses the output voltage. Connect FB with a resistor divider connected between the output and ground. FB is a sensitive node. Keep FB away from SW and BST pin. It is better to connect a 47.0pF capacitor on FB pin to filter out possible coupling from other noisy node such as SW, BST, and VIN.
6	COMP	Connect compensation network to make the converter work stably.
7	EN	**Enable Input.** EN is a digital input that turns the regulator on or off. Drive EN high to turn on the regulator; low to turn it off. EN pin is pulled to VIN internally by a larger resistor. No external resistor is needed to enable the part.
8	SS	This pin is used to program soft-start time, connect a cap to program soft-start time.
9	EPAD	Power ground and EPAD, for full load operation EPAD must been connected to PCB gnd.

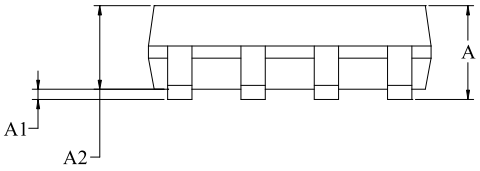
Packaging Information

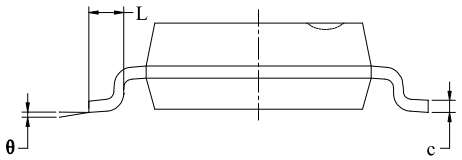
ESOP-8L (Exposed Pad)





RECOMMENDED LAND PATTERN (Unit: mm)





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A		1.700		0.067
A1	0.0 00	0.100	0.000	0.004
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.00 7	0.010
D	4.700	5.100	0.185	0.20 1
D1	3.202	3.402	0.126	0.134
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.24 4
E2	2.313	2.513	0.091	0.099
e	1.27 BSC		0.050 BSC	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

ORDERING INFORMATION

Part Number	Voltage Range	Features	Operating Temperature	Package Type	Top Mark	SPQ
FH56003S8	6.5V ~ 36.0V	● DC-DC buck(Step-down) ● Output current: 3.1A ● Efficiency: 95% ● CV/CC Mode Control ● Switch Frequency: 300KHz ● Feedback Voltage: 0.9V	-40°C to 125°C	ESOP-8L	FH56003 YY MM LL	4000PCS/Reel

Note:

- **FH56003** 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.
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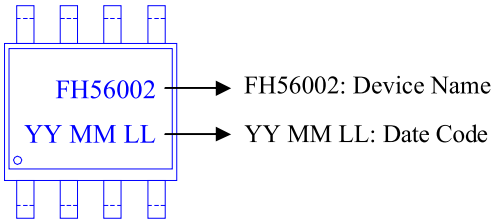
Device Name: ESOP-8L



ESD SENSITIVITY CAUTION

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

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▲ Update by Jun.2020