36.0V, 3.1A Monolithic Buck(Step-down) Converter with CC/CV Control

PRELIMINARY DATASHEET

Description

FH56002 integrates a high efficiency synchronous buck (step-down) switching regulator, which includes a 36V, 76mΩ high side and a 36.0V, 52mΩ low side MOFETs to provide 3.10A continuous load current over 6.50V 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.

FH56002 has configurable line drop compensation, configurable charging current limit. CC/CV mode control provides a smooth transition between constant current charging and constant voltage charging stages.

Built-in soft-start prevents inrush current at power-up.

Applications

- Car charger
- Portable charging device
- General purpose USB charger
- General purpose DC-DC conversion

Device Information

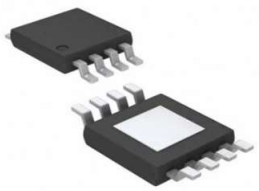
Part Number	Package	Body Size(NOM)	Top Marking
FH56002	ESOP-8L	4.90mm x 3.90mm	FH56002 YY MM LL

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 36V, 76mΩ high side and 36V, 52mΩ low side power MOSFET switches
- Up to 95% efficiency
- CV/CC Mode control (Constant voltage and constant current). Cycle-by-Cycle Current Limiting
- Configurable Line Drop Compensation with resistor
- Configurable Charging Current Limit with resistor
- Internal Soft-Start limits the inrush current at turn-on
- Internal compensation to save external components
- Stable with Low ESR Ceramic Output Capacitors
- Fixed 100KHz Switching Frequency
- Input Under-Voltage Lockout.
  Output Over-Voltage Protection
- Over-Temperature Protection
- Soft start time is program mable using external capacitor
- 33V input voltage protection to protect power MOSFETs from working at high current, high input voltage condition
- Pulse skip mode at light load to improve light load efficiency
- Thermally Enhanced ESOP-8L Package

(Physical Drawing)



ESOP-8L

Typical Application Schematic & Efficiency

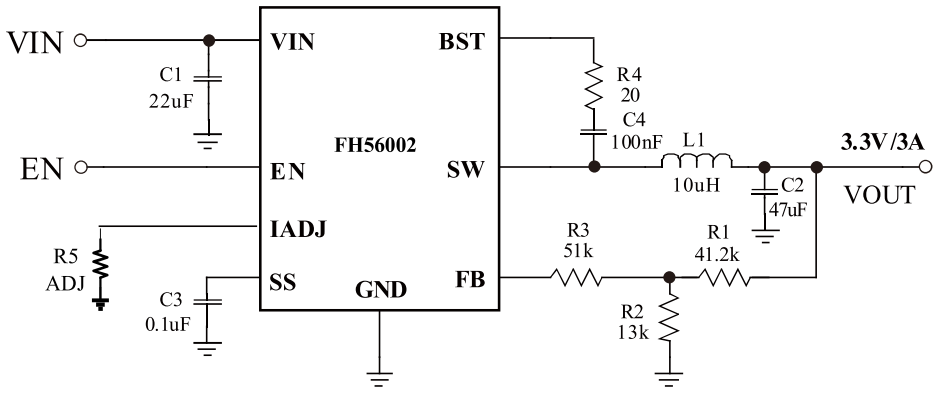


Fig. 1 Schematic

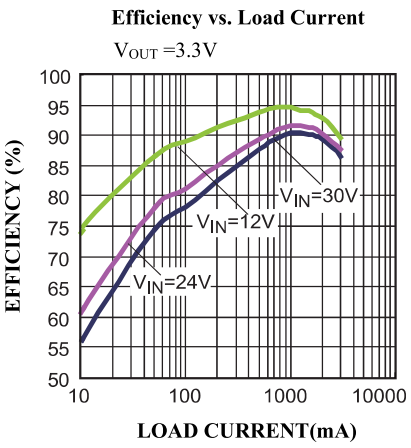
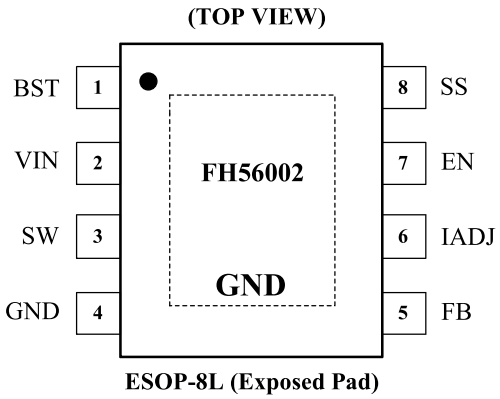


Fig. 2 Efficiency curve

PIN CONFIGURATION



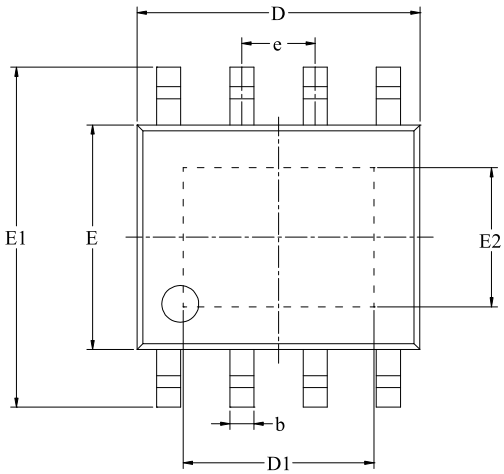
PIN DESCRIPTION

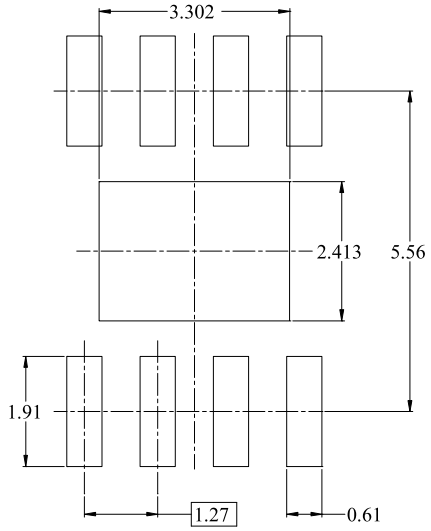
Pin-Functions

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.
2	VIN	**Power Input.** V_{IN} supplies the power to the IC. Supply V_{IN} with a 6.5V to 36.0V power source. Bypass V_{IN} 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 close to V_{IN} and GND pins.
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 47pF ceramic capacitor between FB pin and GND pin.
6	IADJ	Connect a resistor between IADJ and GND to configure load current limit and line drop compensation.
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.
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.

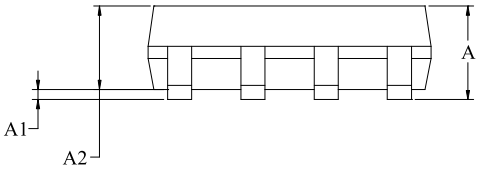
Packaging Information

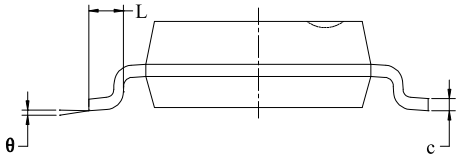
ESOP-8L (Exposed Pad)





RECOMMENDED LAND PATTERN (Unit: mm)





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A		1.700		0.067
A1	0.000	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	0.007	0.010
D	4.700	5.100	0.185	0.201
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	0.244
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
FH56002S8	6.5V ~ 36.0V	● DC-DC buck(Step-down) ● Output current: 3.1A (Typ.) ● Efficiency: 95% ● CV/CC Mode Control ● Switch Frequency: 100KHz ● V_{FB}: 1.2V	-40°C to 125°C	ESOP-8L	FH56002 YY MM LL	4000PCS/Reel

Note:

- **FH56002** 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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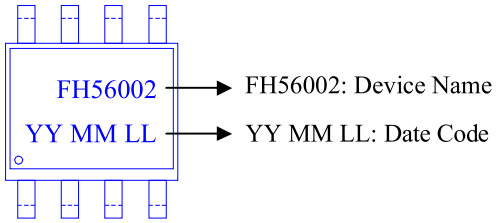
Device Name: ESOP-8L



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