

## 160KHz 60V 0.5A Switching Current Dual Channel Buck DC/DC Converter

### Features

- Wide 24V to 60V Input Voltage Range
- Fixed 12V Channel and 5V Channel
- Fixed 160KHz Switching Frequency
- Maximum 0.5A Switching Current
- Excellent line and load regulation
- Internal Optimize HV Transient
- Built in Frequency Compensation
- Built in Soft-Start Function
- Built in Thermal Shutdown Function
- Built in Current Limit Function
- Available in SOP8L-EP package

### Applications

- Ebike Power Manager Solution
- Portable Electronic Equipment

### General Description

The GS60125 regulator is a wide input range, voltage mode, dual channel DC/DC converter. The GS60125 built in high voltage power transient.

The GS60125 regulator is special design for EBIKE power solution and portable electronic equipment power supply.

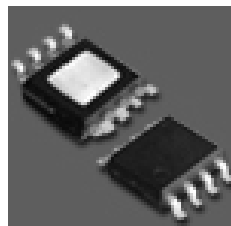


Figure1. Package Type of GS60125

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**Pin Configurations**

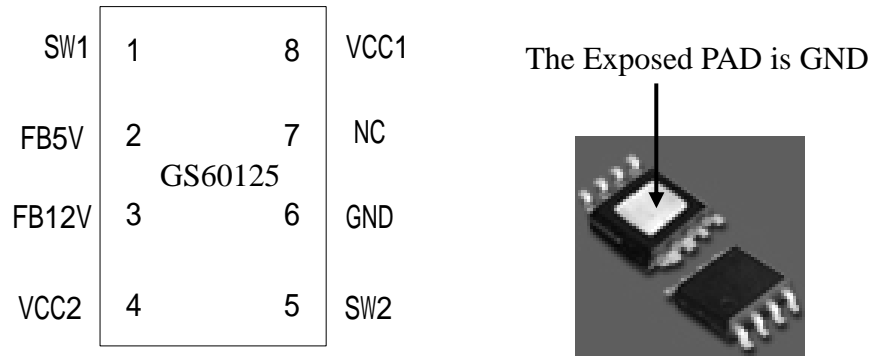


Figure2. Pin Configuration of GS60125 (Top View)

Table 1 Pin Description

Pin Number	Pin Name	Description
1	SW1	Channel1 Power Switch Output Pin (SW1).
2	FB5V	Channel2 Feedback Pin (FB5V). The feedback threshold voltage is 5V.
3	FB12V	Channel1 Feedback Pin (FB12V). The feedback threshold voltage is 12V.
4	VCC2	Channel2 Supply Voltage Input Pin.
5	SW2	Channel2 Power Switch Output Pin (SW2).
6	GND	Ground Pin.
7	NC	No Connected.
8	VCC1	Channel1 and Whole Chip Supply Voltage Input Pin.

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Function Block

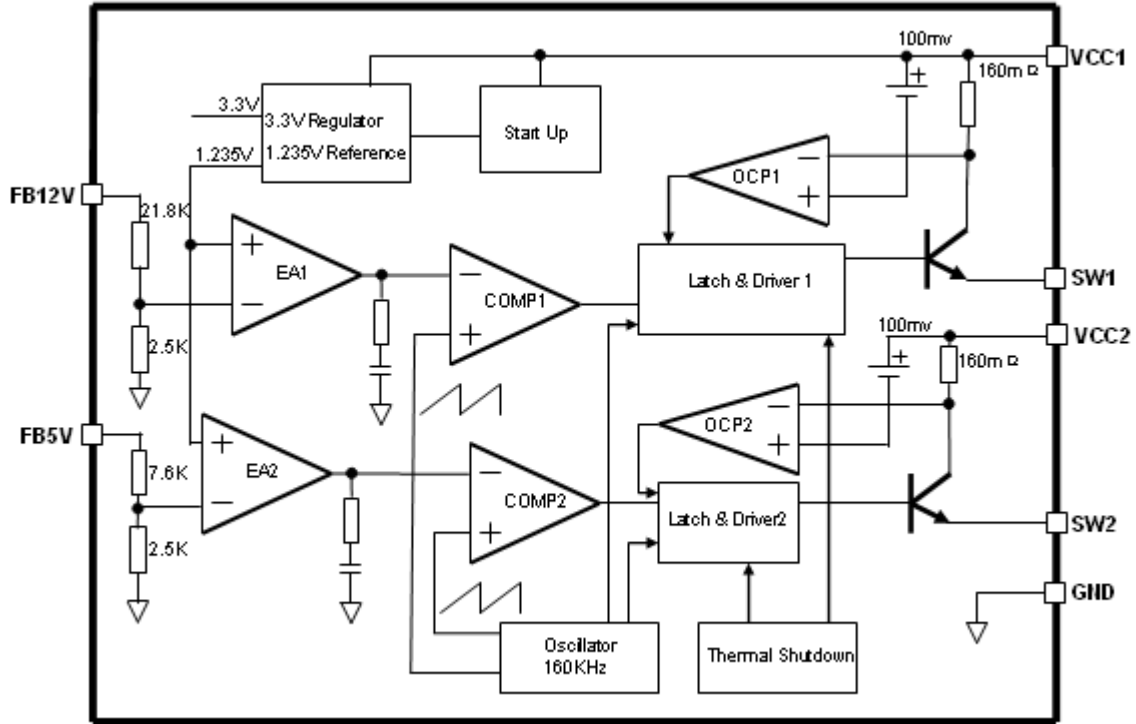


Figure3. Function Block Diagram of GS60125

Ordering Information

Package	Temperature Range	Part Number	Marking ID	Packing Type
		Lead Free	Lead Free	
		GS60125Z	GS60125ZT	Tube
		GS60125Z	GS60125ZT	Tape & Reel

ZGSEMI Pb-free products, as designated with "ZT" suffix in the par number, are RoHS compliant.

Absolute Maximum Ratings (Note1)

Parameter	Symbol	Value	Unit
Input Voltage	VCC1	-0.3 to 70	V
Feedback Pin Voltage	V <sub>FB</sub>	-0.3 to V <sub>in</sub>	V
Output Switch Pin Voltage	V <sub>SW</sub>	-0.3 to V <sub>in</sub>	V
Power Dissipation	P <sub>D</sub>	Internally limited	mW
Thermal Resistance (SOP8L-EP) (Junction to Ambient, No Heatsink, Free Air)	R <sub>JA</sub>	60	°C/W
Operating Junction Temperature	T <sub>J</sub>	-40 to 125	°C
Storage Temperature	T <sub>STG</sub>	-65 to 150	°C
Lead Temperature (Soldering, 10 sec)	T <sub>LEAD</sub>	260	°C
ESD (HBM)		2000	V

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**Note1:** Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

**GS60125 Electrical Characteristics**

$T_a = 25$  ; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<i>System parameters test circuit figure4</i>						
VFB5V	Channel2 FB5V	VCC1 = 24V to 48V, VOUT2=5V Iload=0.2A	4.9	5	5.1	V
VFB12V	Channel1 FB12V	VCC1 = 24V to 48V, VOUT1=12V Iload=0.2A	11.52	12	12.48	V

**Electrical Characteristics (DC Parameters)**

VCC1 = 24V, GND=0V, Vin & GND parallel connect a 47uf/50V capacitor; Iout=0.2A,  $T_a = 25$  ; the others floating unless otherwise specified.

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input operation voltage	VCC1		24		60	V
Quiescent Supply Current	$I_q$	$V_{FB12V}=12.4V,$ $V_{FB5V}=5.2V,$ $VCC1=VCC2=24V$		2	4	mA
Oscillator Frequency	Fosc		136	160	184	Khz
Max. Duty Cycle	$D_{MAX}$	$V_{FB12V}=V_{FB5V}=0$		85		%
Switch Current Limit	$I_{L\_channel1}$	$V_{FB12V}= 0$		0.6		A
Switch Current Limit	$I_{L\_channel2}$	$V_{FB5V}= 0$		0.6		A

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Typical System Application – EBIKE Power Supply Solution

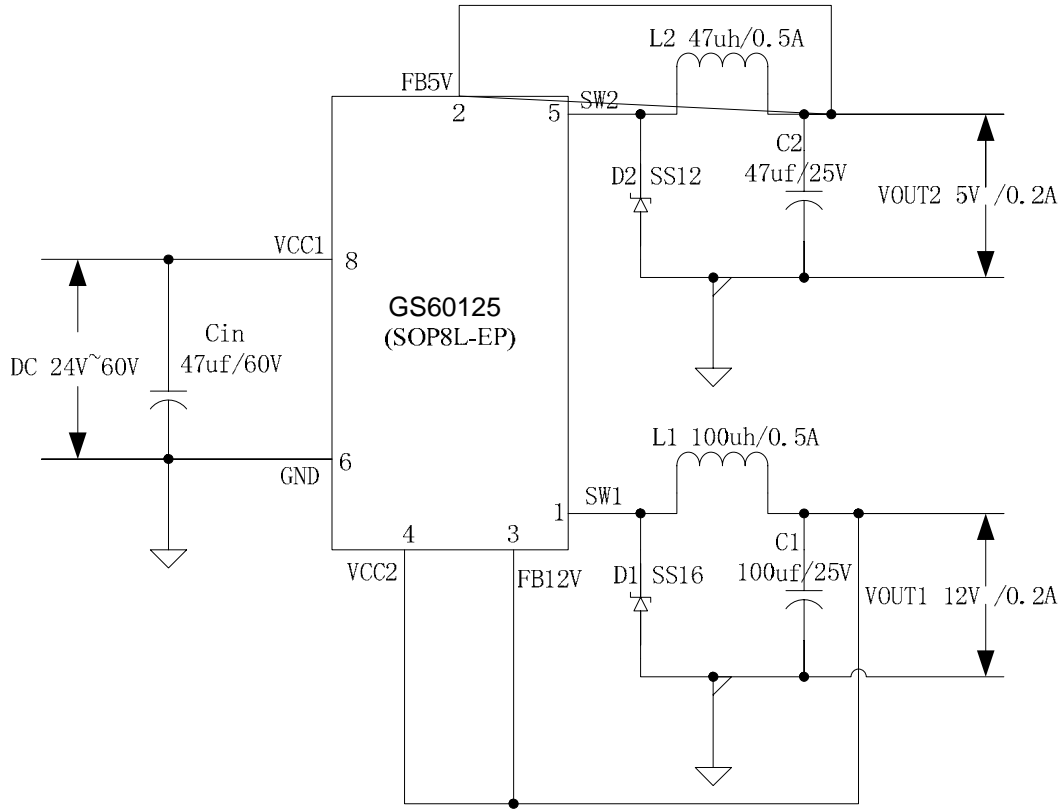


Figure4. GS60125 Typical System Application (EBIKE Controller Power Supply Solution)

Schottky Diode Selection Table

Current	Surface Mount	Through Hole	VR (The same as system maximum input voltage)				
			20V	30V	40V	50V	60V
1A			SS12	SS13	SS14	SS15	SS16
			1N5817	1N5818	1N5819		

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Typical System Application – Single Channel1 Application

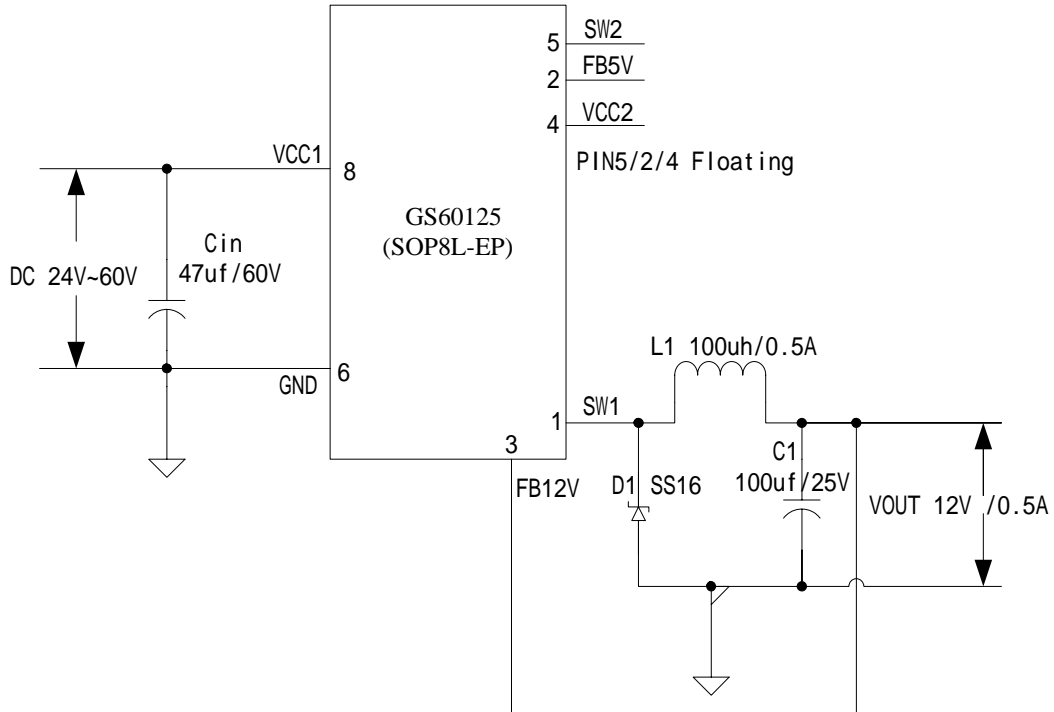


Figure5.GS60125 Single Channel1 Application (VIN=24V~60V, VOUT=12V/0.5A)

Typical System Application – Single Channel2 Application

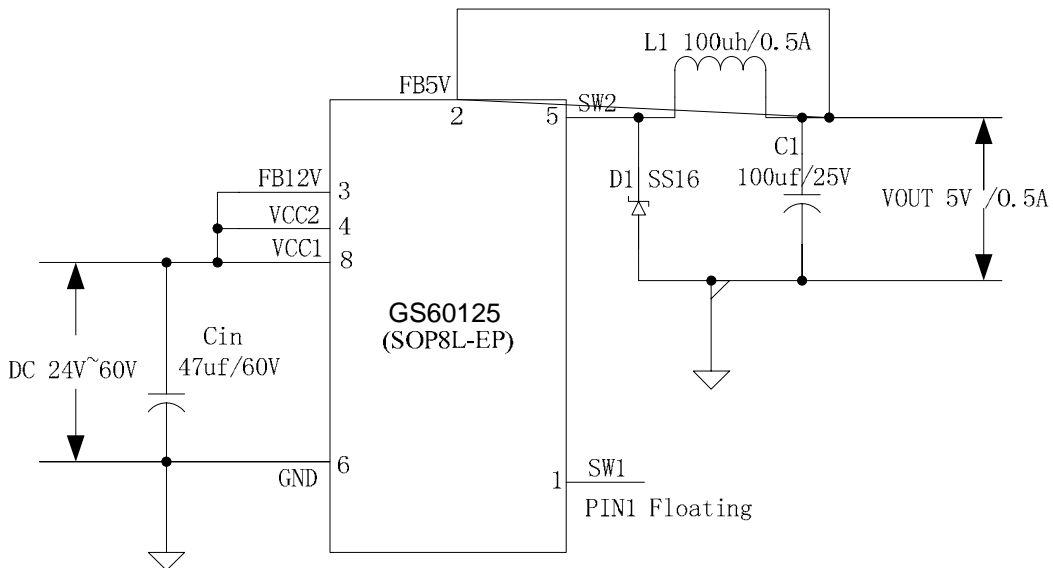
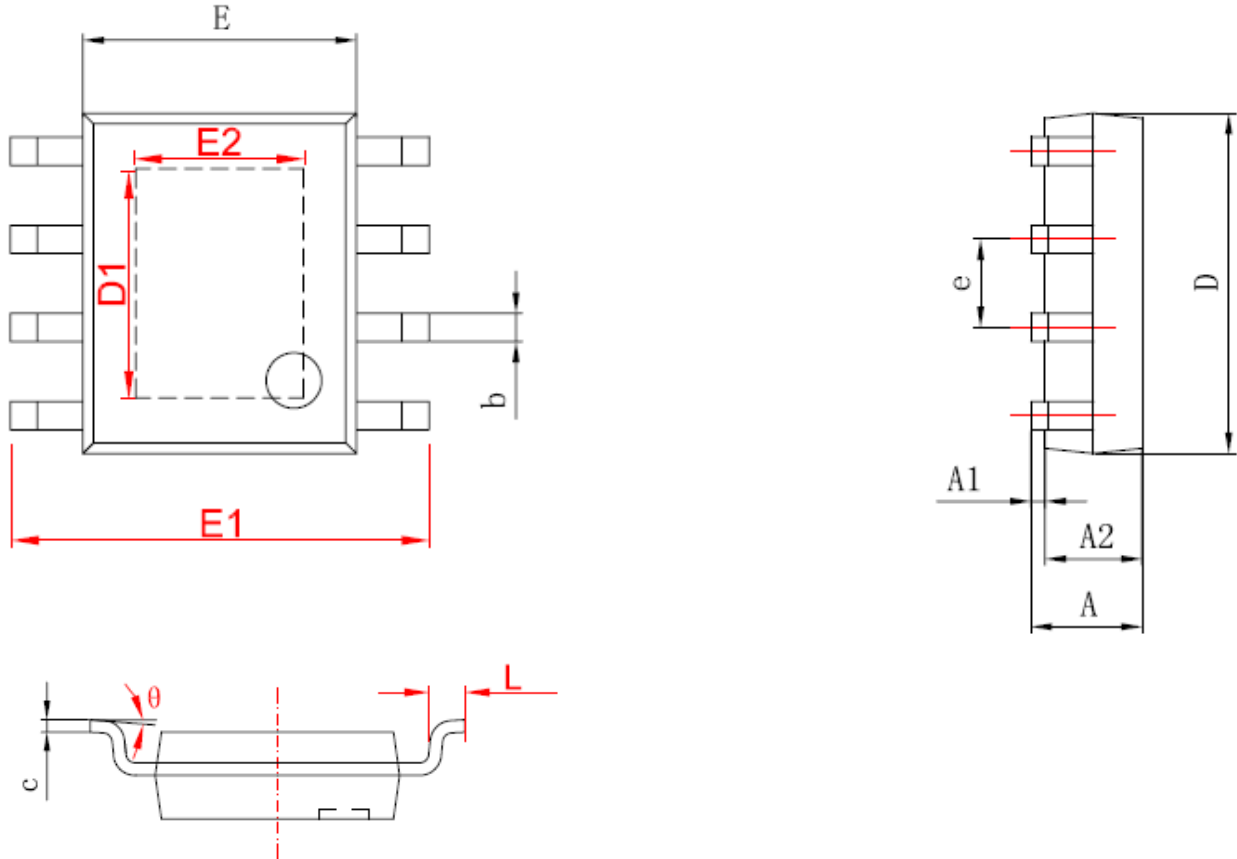


Figure6.GS60125 Single Channel2 Application (VIN=24V~60V, VOUT=5V/0.5A)

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Package Information

Package Information (SOP8-EP)



字符	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.050	0.150	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
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	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
theta	0°	8°	0°	8°