

180KHz 50V 6A Switching Current Boost / Buck-Boost / Inverting DC/DC Converter
FS2611产品说明书**Features**

- Wide 5V to 32V Input Voltage Range
- Positive or Negative Output Voltage
- Programming with a Single Feedback Pin
- Current Mode Control Provides Excellent Transient Response
- 1.25V reference adjustable version
- Fixed 180KHz Switching Frequency
- Maximum 6A Switching Current
- SW PIN Built in Over Voltage Protection
- Excellent line and load regulation
- EN PIN TTL shutdown capability
- Internal Optimize Power MOSFET
- High efficiency up to 94%
- Built in Frequency Compensation
- Built in Soft-Start Function
- Built in Thermal Shutdown Function
- Built in Current Limit Function
- Available in TO220-5L package

Applications

- EPC / Notebook Car Adapter
- Automotive and Industrial Boost /
- Buck-Boost / Inverting Converters
- Portable Electronic Equipment
-

General Description

The FS2611 regulator is a wide input range, current mode, DC/DC converter which is capable of generating either positive or negative output voltages. It can be configured as either a boost, flyback, SEPIC or inverting converter. The FS2611 built in N-channel power MOSFET and fixed frequency oscillator, current-mode architecture results in stable operation over a wide range of supply and output voltages. The FS2611 regulator is special design for portable electronic equipment applications.

**TO220-5L**

Figure1. Package Type of FS2611

Pin Configurations

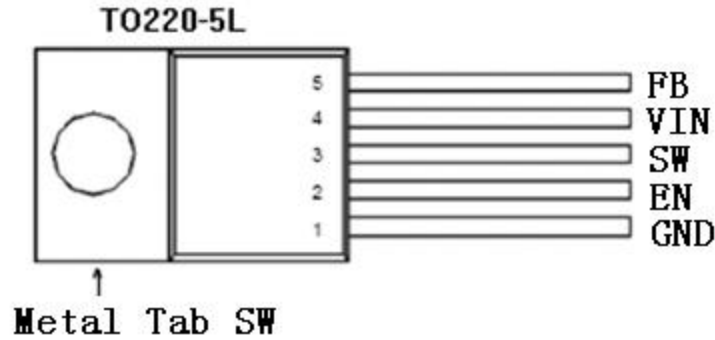


Figure2. Pin Configuration of FS2611 (Top View)

Table 1 Pin Description

Pin Number	Pin Name	Description
1	GND	Ground Pin.
2	EN	Enable Pin. Drive EN pin low to turn off the device, drive it high to turn it on. Floating is default high.
3	SW	Power Switch Output Pin (SW).
4	VIN	Supply Voltage Input Pin. FS2611 operates from a 5V to 32V DC voltage. Bypass Vin to GND with a suitably large capacitor to eliminate noise on the input.
5	FB	Feedback Pin (FB). Through an external resistor divider network, FB senses the output voltage and regulates it. The feedback threshold voltage is 1.25V.

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Function Block

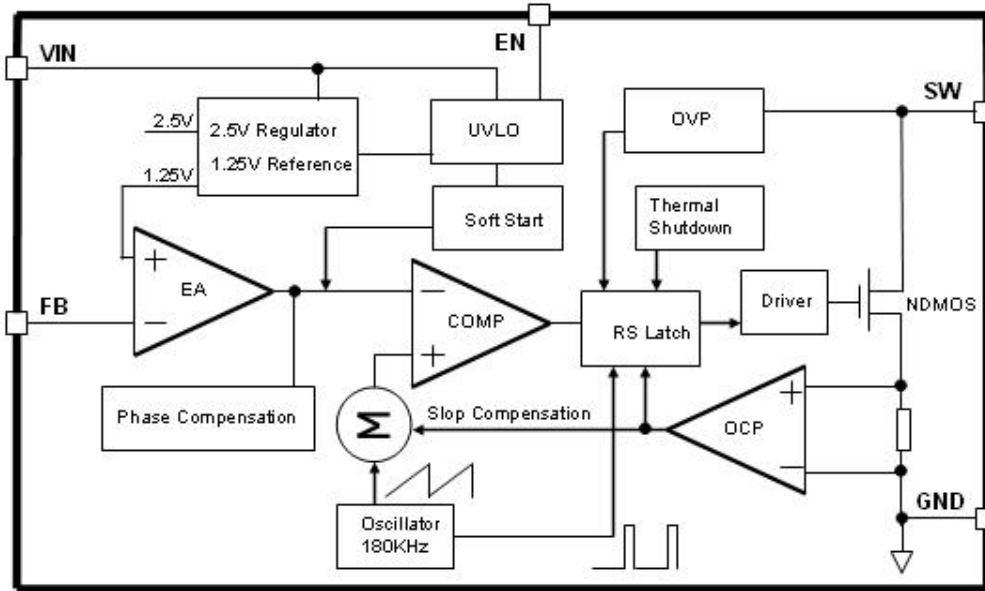


Figure3. Function Block Diagram of FS2611

Typical Application Circuit (Portable Notebook Car Adapter)

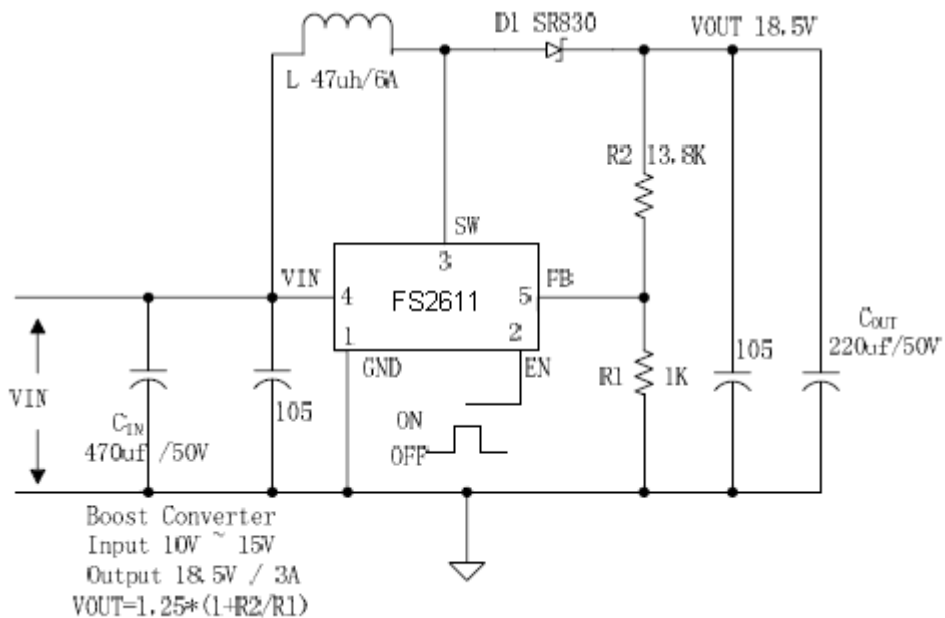


Figure4. FS2611 Typical Application Circuit (Boost Car Adapter)

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Ordering Information

Package	Temperature Range	Part Number	Marking ID	Packing Type
		Lead Free	Lead Free	
		FS2611E1	FS2611E1	Tube
		FS2611TRE1	FS2611E1	Tape & Reel

Pb-free products, as designated with “E1” suffix in the par number, are RoHS compliant.

Absolute Maximum Ratings (Note1)

Parameter	Symbol	Value	Unit
Input Voltage	V_{in}	-0.3 to 34	V
Feedback Pin Voltage	V_{FB}	-0.3 to V_{in}	V
EN Pin Voltage	V_{EN}	-0.3 to V_{in}	V
Output Switch Pin Voltage	V_{Output}	-0.3 to V_{in}	V
Power Dissipation	P_D	Internally limited	mW
Thermal Resistance (TO220-5L) (Junction to Ambient, No Heatsink, Free Air)	R_{JA}	30	°C/W
Operating Junction Temperature	T_J	-40 to 125	°C
Storage Temperature	T_{STG}	-65 to 150	°C
Lead Temperature (Soldering, 10 sec)	T_{LEAD}	260	°C
ESD (HBM)		2000	V

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.

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FS2611 Electrical Characteristics

$T_a = 25^{\circ}\text{C}$; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<i>System parameters test circuit figure4</i>						
VFB	Feedback Voltage	$V_{in} = 12\text{V to } 16\text{V}, V_{out}=18\text{V}$ $I_{load}=0.1\text{A to } 4\text{A}$	1.213	1.25	1.287	V
Efficiency	η	$V_{in}=12\text{V}, V_{out}=18.5\text{V}$ $I_{out}=4\text{A}$	-	93	-	%

Electrical Characteristics (DC Parameters)

$V_{in} = 12\text{V}$, $GND=0\text{V}$, V_{in} & GND parallel connect a 220uf/50V capacitor; $I_{out}=0.5\text{A}$, $T_a = 25^{\circ}\text{C}$; the others floating unless otherwise specified.

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input operation voltage	V_{in}		5		32	V
Shutdown Supply Current	I_{STBY}	$V_{EN}=0\text{V}$		70	100	μA
Quiescent Supply Current	I_q	$V_{EN} = 2\text{V},$ $V_{FB} = V_{in}$		2.5	5	mA
Oscillator Frequency	F_{osc}		153	180	207	KhZ
Switch Current Limit	I_L	$V_{FB} = 0$		6		A
EN Pin Threshold	V_{EN}	High (Regulator ON) Low (Regulator OFF)		1.4 0.8		V
EN Pin Input Leakage Current	I_H	$V_{EN} = 2\text{V (ON)}$		3	10	μA
	I_L	$V_{EN} = 0\text{V (OFF)}$		3	10	μA
Max. Duty Cycle	D_{MAX}	$V_{FB}=0\text{V}$		95		%

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Schottky Diode Selection Table

Current	Surface Mount	Through Hole	VR (The same as system maximum input voltage)				
			20V	30V	40V	50V	60V
1A		✓	1N5817	1N5818	1N5819		
3A		✓	1N5820	1N5821	1N5822		
		✓	MBR320	MBR330	MBR340	MBR350	MBR360
	✓		SK32	SK33	SK34	SK35	SK36
	✓			30WQ03	30WQ04	30WQ05	
		✓		31DQ03	31DQ04	31DQ05	
		✓		SR302	SR303	SR304	SR305
5A		✓	1N5823	1N5824	1N5825		
		✓	SR502	SR503	SR504	SR505	SR506
		✓	SB520	SB530	SB540	SB550	SB560
	✓			50WQ03	50WQ04	50WQ05	
8A		✓	SR820	SR830	SR840	SR850	SR860

Typical System Application for EPC/Notebook Car Adapter – Boost (Output 18.5V/3A)

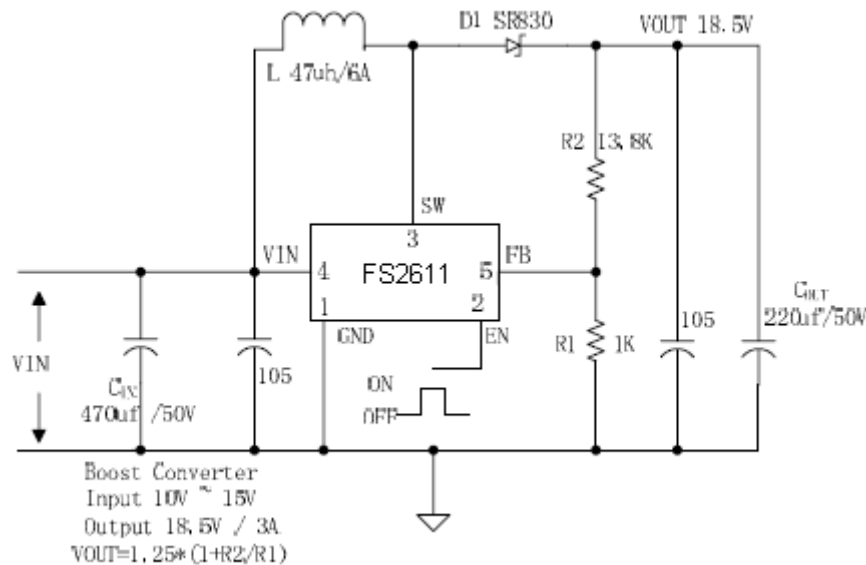


Figure5. FS2611 Typical System Application (Boost Car Adapter)

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Typical System Application for Portable Notebook Car Adapter
- SEPIC Buck-Boost Topology (Input 10V~30V, Output 12V/4A)

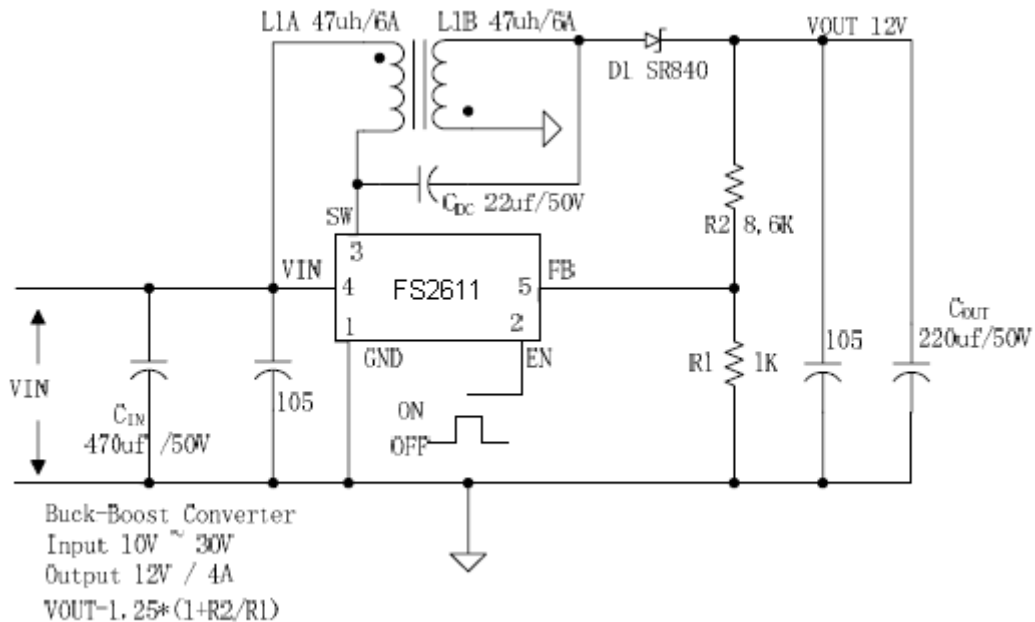


Figure6. FS2611 Typical System Application (SEPIC Buck-Boost Converter)

Typical System Application for Portable Notebook Car Adapter
- SEPIC Buck-Boost Topology (Input 10V~30V, Output 18.5V/3A)

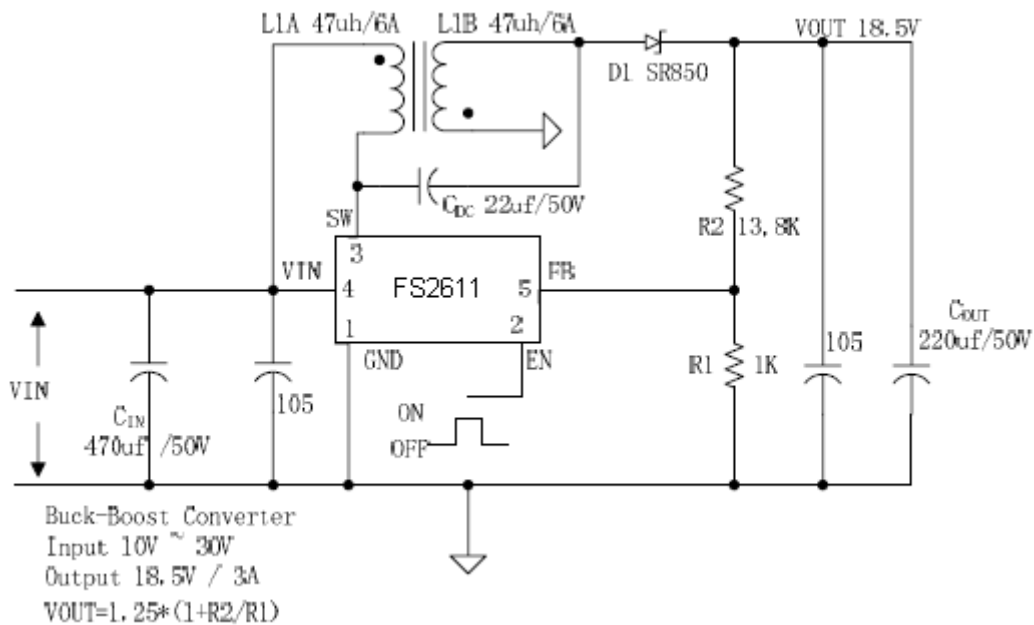


Figure7. FS2611 Typical System Application (SEPIC Buck-Boost Converter)

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Typical System Application for Boost High Voltage Converter

- FLYBACK Boost Topology (Input 10V~30V, Output 300V/0.1A ~ 0.5A)

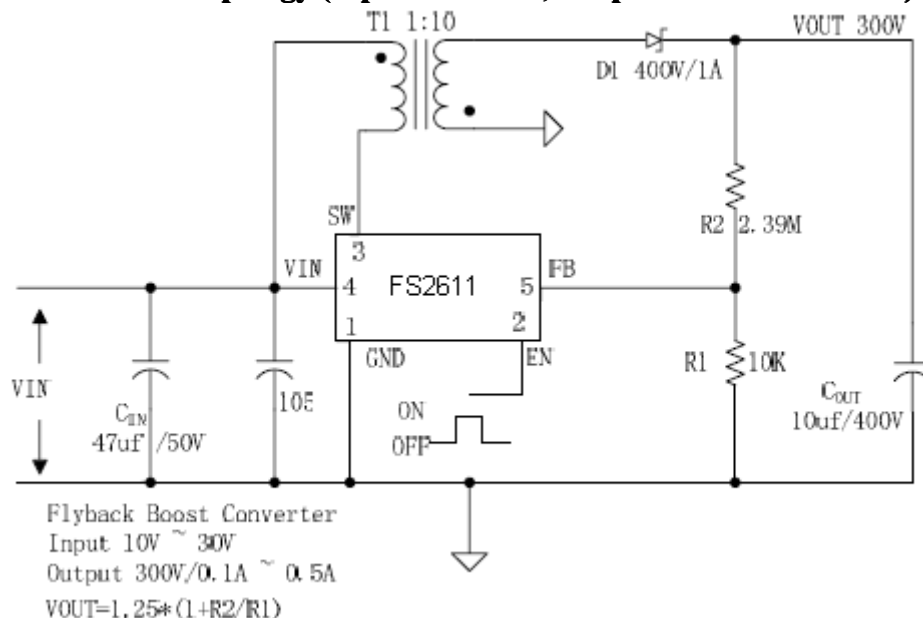


Figure8. FS2611 Typical System Application (Flyback Boost Converter)

Typical System Application for Inverting Converter

- SEPIC Inverting Topology (Input 10V~30V, Output + -12V/2A)

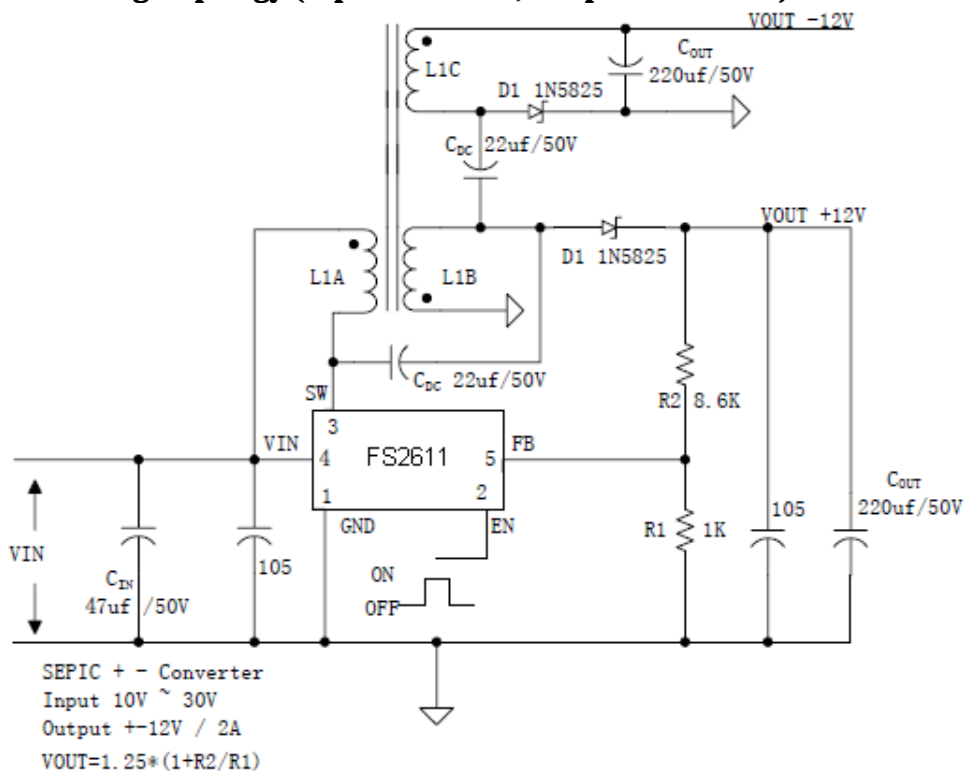
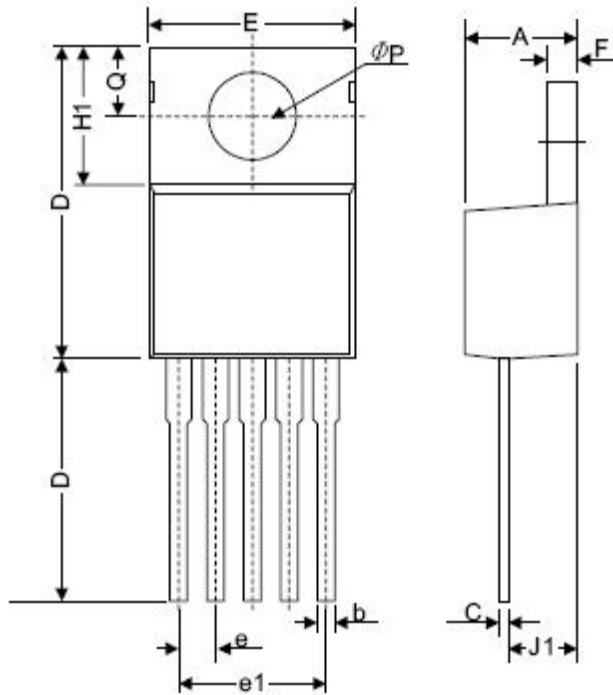


Figure9. FS2611 Typical System Application (SEPIC Inverting Converter)

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Package Information

TO220-5L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.06	4.83	0.160	0.190
b	0.76	1.02	0.030	0.040
C	0.36	0.64	0.014	0.025
D	14.22	15.49	0.560	0.610
E	9.78	10.54	0.385	0.415
e	1.57	1.85	0.062	0.073
e(1)	6.68	6.93	0.263	0.273
F	1.14	1.40	0.045	0.055
H(1)	5.46	6.86	0.215	0.270
J(1)	2.29	3.18	0.090	0.125
L	13.21	14.73	0.520	0.580
ϕP	3.68	3.94	0.145	0.155
Q	2.54	2.92	0.100	0.115