DC-DC Synchronous Boost(Step-Up) Converter

Vin: ~12 0V High Efficiency Peak Current 7 0A

Description

FH47177 is a high power density synchronous boost converter which integrates two low $R_{DS(ON)}$ MOSFETs to reduce conduction loss. It provides tiny and high efficiency solution for portable electronics. FH47177 has wide input voltage ranging from 2.7 to 12.0V and can provide output voltage up to 12.6V. It has 7.0A switch current capability and is capable of delivering more than 20.0W power.

FH47177 uses current mode COT control to regulate the output voltage. It works in PWM mode in moderate to heavy load. In light load, the chip adopts PFM to save quiescent power consumption. The switching frequency is adjustable ranging from 200kHz to 2.2MHz by an external resistor. FH47177 is also capable of programming peak current limit. In addition, FH47177 integrates input UVLO, output OVP, soft-start control and thermal shutdown protection.

Feature

- Input voltage range: 2.7V ~ 12.0V
- Output voltage range: 4.5V ~ 12.6V
- Low shutdown current: 1.0uA ~ 4.0uA
- Low $R_{DS(ON)}$ MOSFETs (LSD/HSD): 20mΩ/28mΩ
- Up to 89% efficiency
  (@ V_{IN} = 3.3V, V_{OUT} = 9.0V and I_{OUT} = 2.0A)
- Adjustable switching frequency: 200kHz~2.2MHz
- Programmable peak switch current limit:
  cycle by cycle, I_{LIM} =10.0A @ R_{ILIM} = 150kΩ
- Internal soft-start time: 2.5ms
- Output over-voltage protection @ 13.4V
- Thermal shutdown @ 150°C

Applications

- Quick Charge Power Bank
- E-Cigarette
- Bluetooth™ Speaker
- Portable POS terminal

Package

- 11-pin QFN2.5*2.0-11L

Typical Application

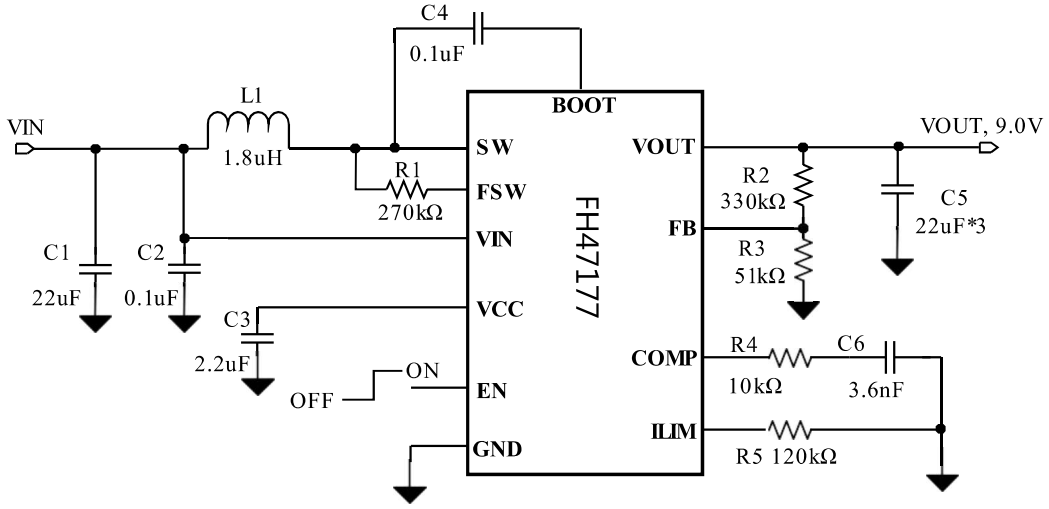


Figure 1. **FH47177 Typical Application Schematic**

高效 7.0A 同步整流升压型 DC-DC 转换器

■ 器件概述

FH47177 是一款高功率密度的同步整流升压 DC-DC 转换器，集成两个低导通电阻的功率开关来减低导通功率损耗，为便携设备提供高效率、小型化的供电方案。FH47177 具有 2.7V ~ 12.0V 的宽输入电压范围， 输出电压最高至 12.6V，具备 7.0A 开关电流能力，可提供20.0W 功率输出。

FH47177 采用电流模自适应恒定关断时间控制架构，在不同负载条件下自动切换工作模式，重载时采用PWM 模式，轻载时为 PFM 模式，同时可通过外部电阻在 200kHz ~ 2.2MHz 之间设定PWM 的开关频率。FH47177 还具有可编程的峰值限流。 除此之外，FH47177 内置输入UVLO、输出 OVP、软启动和 OTP 等功能。

■ 封装形式

- 11-Pin QFN2.5*2.0-11L

■ 规格特点

- 输入电压范围： 2.7V ~ 12.0V
- 输出电压范围： 4.5 V ~ 12.6V
- 较低的关断电流：1.0uA ~ 4.0uA
- 低开关$R_{DS(ON)}$ (低侧、高侧)：20mΩ、28mΩ
- 效率可达89% @ V_{IN} = 3.3V, V_{OUT} = 9V, I_{OUT} = 2A
- 可调开关频率：200kHz ~ 2.2MHz
- 可调峰值电流限流：I_{LIM} = 10A @ R_{ILIM} = 150kΩ
- 自动切换工作模式：PFM、PWM
- 内部软启动：2.5ms
- 输出过压保护：13.4V
- 过温保护：150°C

■ 应用领域

- 快充移动电源
- 蓝牙扬声器
- 电子烟
- 便携POS终端

■ 典型应用图

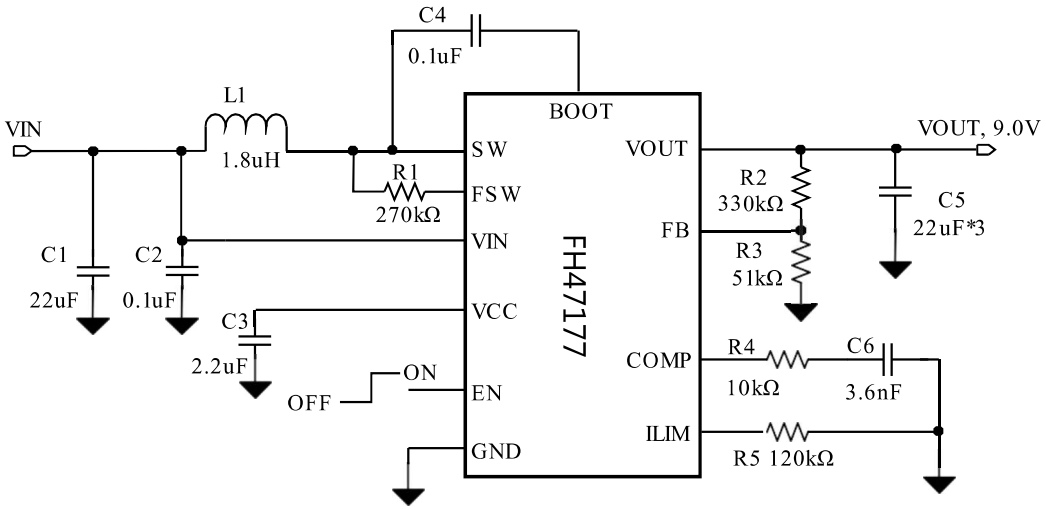


图 2. FH47177 典型应用原理图

■ Pin Configuration

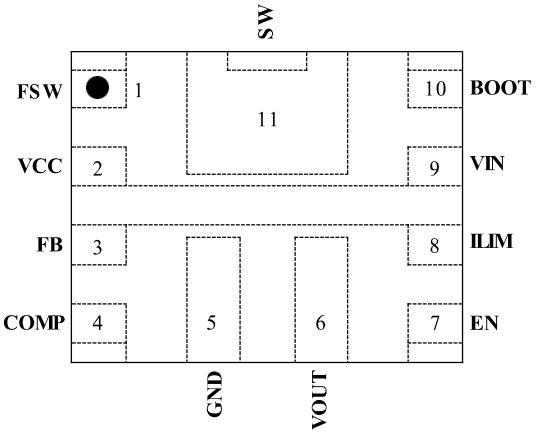


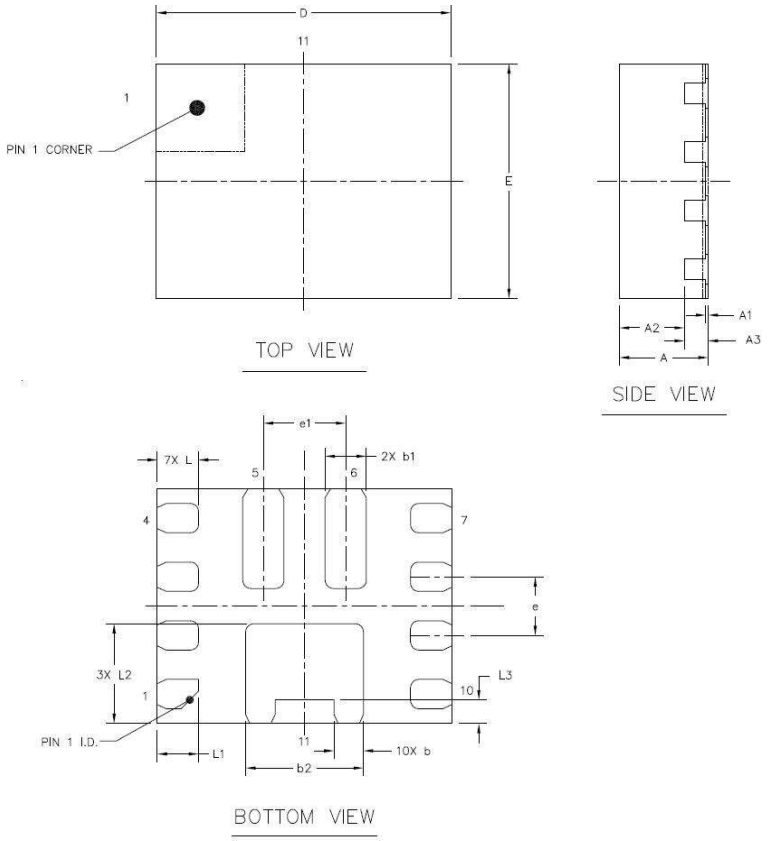
Figure. 4. **FH47177 Package** (TOP View)

■ Pin Assignment

Pin (FH47177)		**Description**
Name	**Number**	
FSW	1	Use external resistor between the FSW pin and the SW pin to set switching frequency
VCC	2	Output of the internal LDO. A ceramic capacitor of more than 1.0uF is required between VCC pin and ground.
FB	3	Voltage feedback. This pin is connected to the tape of a resistor divider.
COMP	4	Output of internal error amplifier. Loop compensate network is required between the COMP pin and GND.
GND	5	Reference ground.
VOUT	6	Output of boost converter.
EN	7	Enable logic input. Logic high enables IC and logic low disables IC.
ILIM	8	Use external resistor between the ILIM pin and GND to set peak current limit.
VIN	9	Power supply for IC.
BOOT	10	Power supply for the HSD gate driver. A ceramic capacitor of more than 0.2uF is required between the BOOT pin and GND.
SW	11	Switching node of the boost converter. It is connected to the drain of LSD and the source of HSD.

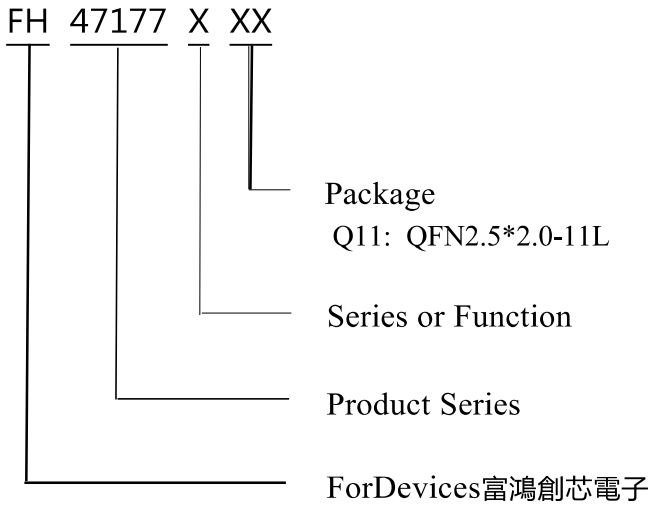
■ Packaging Information

- Package Type: **QFN2.5*2.0-11L**



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.7	0.8	0.0276	0.0315
A1		0.05		0.0020
A2	0.55		0.0216	
A3	0.203		0.0080	
b	0.2	0.3	0.0079	0.0118
b1	0.3	0.4	0.0118	0.0157
b2	0.95	1.05	0.0374	0.0413
D	2.5 BSC		0.0984 BSC	
E	2 BSC		0.0787 BSC	
e	0.5 BSC		0.0197 BSC	
e1	0.7 BSC		0.0276 BSC	
L	0.3	0.4	0.0118	0.0157
L1	0.25	0.45	0.0098	0.0177
L2	0.8	0.9	0.0315	0.0354
L3	0.2 REF		0.0079 REF	

■ Ordering Information



Part Number	Product Description	Package Type	Top Mark	SPQ
FH47177AQ11	Vin: ~ 12.0V Vout: ~ 12.6V Peak Current: 7.0A T_A: -40 ~85°C	QFN2.5*2.0-11L	47177 (Device Code) * * * * * (Date Code)	3000PCS/Reel

- FH47177 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.

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➢ Update by Dec.2020