

带输出关断的13V, 12A全集成同步升压转换器

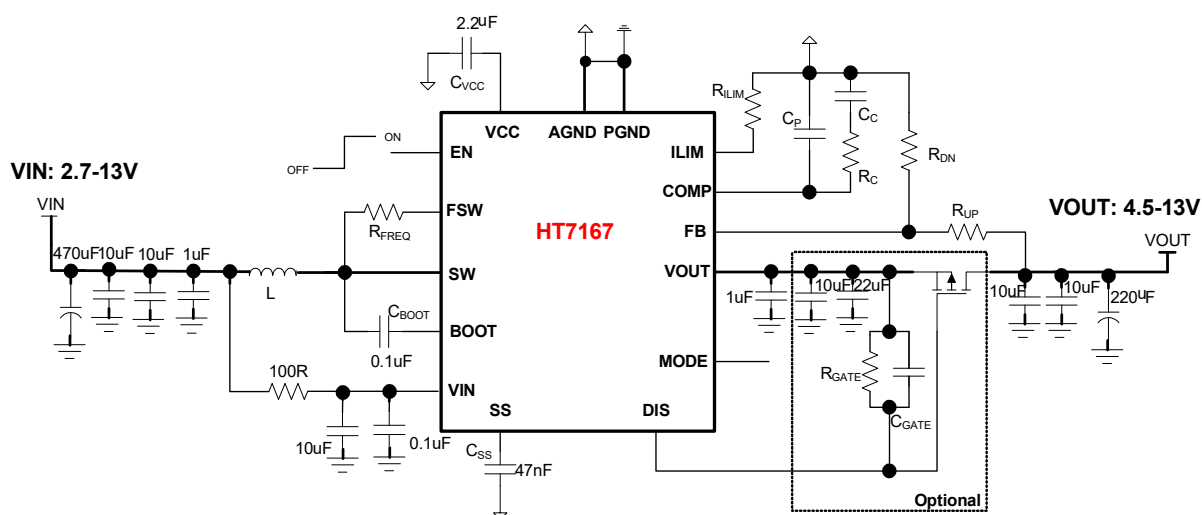
■ 特点

- 输入电压范围 V_{IN} : 2.7V-13V
- 输出电压范围 V_{OUT} : 4.5V-13V
- 可编程峰值电流: 12A
- 高转换效率:
93% ($V_{IN} = 7.4V, V_{OUT} = 12V, I_{OUT} = 3A$)
92% ($V_{IN} = 3.6V, V_{OUT} = 9V, I_{OUT} = 1A$)
- 轻载条件下两种调制方式: 脉频调制 (PFM) 和强制脉宽调制 (PWM)
- 集成输出关断的栅极驱动
- 低关断功耗, 关断电流1 μ A
- 可调节的开关频率: 200k-1.4M
- 可编程软启动
- 输出过压 (14V)、逐周期过流、热关断等保护
- DFN20L, 4.5mm*3.5mm 无铅超薄封装

■ 应用

- | | |
|-------------------|----------|
| · 无线音箱 | · 便携式音箱 |
| · 快充移动电源 | · 电子烟 |
| · USB TYPE-C 电源传输 | · 拉杆音箱 |
| · 平板电脑, 笔记本电脑 | · POS机终端 |

■ 典型应用图



■ 概述

HT7167是一款高功率、全集成升压转换器, 带有负载关断功能的栅极驱动, 集成16m Ω 功率开关管和23m Ω 同步整流管, 为便携式系统提供高效的小尺寸解决方案。

HT7167具有2.7V至13V宽输入电压范围, 可为采用单节或两节锂电池的应用提供支持。该器件具备12A开关电流能力, 并且能够提供13V的输出电压。

HT7167采用自适应恒定关断时间峰值电流控制拓扑结构来调节输出电压。在中等到重负载条件下, HT7167工作在PWM模式。在轻负载条件下, 该器件可通过MODE引脚选择下列两种工作模式之一。一种是可提高效率的PFM模式; 另一种是可避免因开关频率较低而引发应用问题的强制PWM模式。PWM模式下, HT7167的开关频率可通过外部电阻调节, 支持200kHz至1.4MHz的范围。

HT7167还支持可编程的软启动, 以及可调节的开关峰值电流限制。另外, HT7167集成了输出关断功能的栅极驱动, 在SD状态, 可完全断开输入电源。

此外, 该器件还提供有14V输出过压保护、逐周期过流保护和热关断保护。

13V,12A Fully-Integrated Synchronous Boost Converter with Load Disconnect Control

■ FEATURES

- Input voltage range V_{IN} : 2.7V to 13V
- Output voltage range V_{OUT} : 4.5V to 13V
- Programmable switch peak current limit: up to 12A
- High Efficiency
93% ($V_{IN} = 7.4V, V_{OUT}=12V, I_{OUT} =3A$)
92% ($V_{IN} = 3.6V, V_{OUT}=9V, I_{OUT} =1A$)
- 2 modulation mode available: PFM or PWM mode at light load
- Integrated gate driver for load disconnect and output short protection
- 1.0 μ A current consumption during shutdown
- Adjustable switching frequency: 200k to 1.4MHz
- Programmable soft start
- Output overvoltage protection (at 14V), cycle-by-cycle overcurrent protection, thermal shutdown protection
- Pb-free Packages, DFN20L, 4.5mm*3.5mm

■ APPLICATIONS

- Wireless/ Speakers • Portable Speakers
- Quick Charge Power Bank • E-Cigarette
- Power Interface (USB Type-C, Thunderbolt)
- POS Terminal • Tablet PC/Note Book

■ DESCRIPTION

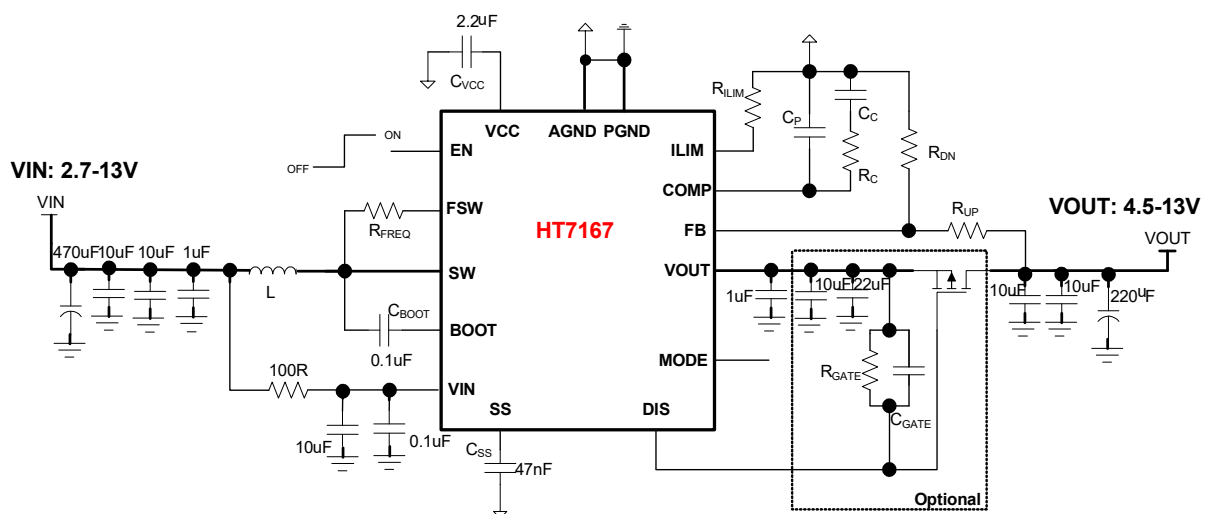
The HT7167 is a high-power density, fully integrated synchronous boost converter with a 16m Ω power switch and a 23m Ω rectifier switch to provide a high efficiency and small size solution in portable systems. The HT7167 has wide input voltage range from 2.7V to 13V to support applications with single cell and two cell Lithium batteries. The device has 12A switch current capability and can provide an output voltage up to 13V.

The HT7167 uses adaptive constant off-time peak current control topology to regulate the output voltage. In moderate to heavy load condition, it works in the PWM mode. In light load condition, the device has two operation modes selected by the MODE pin. One is PFM mode to improve the efficiency and another one is the forced PWM mode to avoid application problems caused by low switching frequency. The switching frequency in the PWM mode is adjustable ranging from 200kHz to 1.4MHz by an external resistor.

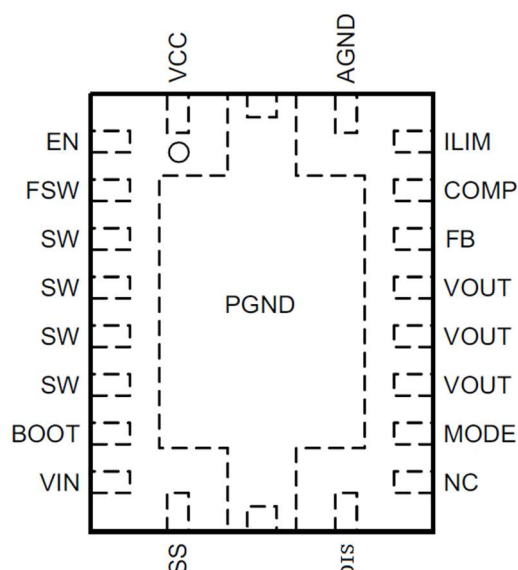
HT7167 could isolate the output from input side when shut down by a gate drive output disconnecting external FET, so that the load current consumption could be limited.

The HT7167 also implements a programmable soft-start function and an adjustable switching peak current limit function. In addition, the device provides 14V output overvoltage protection, cycle-by-cycle overcurrent protection, and thermal shutdown protection.

■ TYPICAL APPLICATION



■ TERMINAL CONFIGURATION



■ TERMINAL FUNCTION

Terminal No.	NAME	I/O ^{*1}	Description
1	VCC	O	Output of the internal regulator. A ceramic capacitor of 2.2uF is required between this pin and ground.
2	EN	I	Enable logic input. Logic high level enables the device. Logic low level disables the device and turns it into shutdown mode.
3	FSW	I	The switching frequency is programmed by a resistor between this pin and the SW pin.
4/5/6/7	SW	PWR	The switching node pin of the converter.
8	BOOT	O	Power supply for high-side MOSTFET gate driver. A ceramic capacitor of 0.1uF must be connected between this pin and the SW pin.
9	VIN	I	IC power supply input.
10	SS	O	Soft-start programming pin. An external capacitor connected to ground sets the ramp rate of the internal error amplifier's reference voltage during soft-start
11	DIS	O	A gate drive output for the external disconnect FET. Connect the DISDRV pin to the gate of the external FET. Leave it floating if not using the load disconnect function.
12	NC	-	No connection inside the device. Connect these two pins to ground plane on the PCB for good thermal dissipation.
13	MODE	I	Operation mode selection pin for the device in light load condition. When this pin is connected to ground, the device works in PWM mode. When this pin is left floating, the device works in PFM mode.
14/15/16	VOUT	PWR	Boost converter output.
17	FB	I	Voltage feedback.
18	COMP	O	Output of the internal error amplifier, the loop compensation network should be connected between this pin and the AGND pin.
19	ILIM	I	Adjustable switch peak current limit. An external resistor should be connected between this pin and the AGND pin.
20	AGND	-	Signal ground of the IC.
0	PGND	PWR	Power ground of the IC.

¹ I: input O: output PWR: power

ORDERING INFORMATION

Part Number	Package Type	Marking	Operating Temperature Range	Shipping Package / MOQ
HT7167DNER	DFN20L	HT7167	-40°C~85°C	Tape and Reel / 5000PCS

IMPORTANT NOTICE**注意**

Jiaxing Heroic Electronic Technology Co., Ltd (HT) reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any products or services. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete.

嘉兴禾润电子科技有限公司（以下简称HT）保留对产品、服务、文档的任何修改、更正、提高、改善和其他改变，或停止提供任何产品和服务的权利。客户在下单和生产前应确保所得到的信息是最新、最完整的。

HT assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using HT components.

HT对相关应用的说明和协助以及客户产品的板级设计不承担任何责任。

HT products are not authorized for use in safety-critical applications (such as life support devices or systems) where a failure of the HT product would reasonably be expected to affect the safety or effectiveness of that devices or systems.

HT的产品并未授权用于诸如生命维持设备等安全性极高的应用中。

The information included herein is believed to be accurate and reliable. However, HT assumes no responsibility for its use; nor for any infringement of patents or other rights of third parties which may result from its use.

本文中的相关信息是精确和可靠的，但HT并不对其负责，也不对任何可能的专利和第三方权利的侵害负责。

Following are URLs and contacts where you can obtain information or supports on any HT products and application solutions:

下面是可以联系到我公司的相关链接和联系方式：

嘉兴禾润电子科技有限公司**Jiaxing Heroic Electronic Technology Co., Ltd.**

地址：浙江省嘉兴市凌公塘路3339号JRC大厦A座三层

Address: A 3rd floor, JRC Building, No. 3339, LingGongTang Road, Jiaxing, Zhejiang Province

Sales: 0573-82585539, sales@heroic.com.cn

Support: 0573-82586151, support@heroic.com.cn

Fax: 0573-82585078

Website: www.heroic.com.cn; wap.heroic.com.cn

Wechat MP: HEROIC_JX

请及时关注禾润官方微信公众号，随时获取最新产品信息和技术资料！

