

1.0MHz, Low Power, Single Inductor, Buck-Boost, 1.6A DC-DC Converter

PRELIMINARY DATASHEET

Description

FH3441A/B is a miniature buck-boost DC-DC converter with ultra-low power consumption and high efficiency. It is applicable to the application scenarios of double/three dry batteries or single lithium battery. It can effectively prolong the service time of the battery.

FH3441A/B consists of current mode PWM control loop, error amplifier, comparator, power switch and other modules. The chip can work efficiently and stably in a wide load range.

The input voltage of FH3441 is 1.8V~5.0V, and the adjustable output voltage is 1.2V~5.0V. When the output voltage is 3.3V and the input voltage is from 3.0V~5.0V(FH3441B) or 2.7V~4.4V(FH3441A), it can provide a maximum current load of 1.6A(FH3441B).

FH3441A/B can set the output voltage by adjusting two external resistors.

FH3441A/B provides a slim DFN2*2-8L package is available for customers to choose, and its rated working temperature range is - 40°C to 85°C.

Applications

- Portable Equipment
- Security Monitoring Equipment
- Backup Power Supply Equipment

Typical Applications

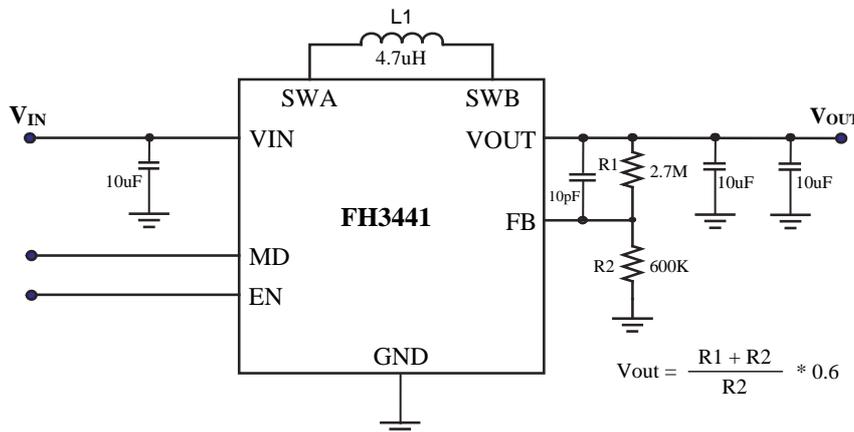


Figure 1. FH3441 Typical Application

Datasheet Brief

Key Features

- Input Voltage Range: 1.8V ~ 5.0V
- Output Voltage Range: 2.0V ~ 5.0V(FH3441B) | 1.2V ~ 5.0V(FH3441A)
- Switching Frequency: 1.0MHz
- Reference Voltage: 0.6V(typ.)
- High Efficiency: Up to 95% (max.)
- Switching current: 2.0A(FH3441B) @Vin:4.2V
- Current Output Capacity (FH3441B)

4.2V→3.3V: 1.6A	3.0V→3.3V: 1.0A
2.5V→3.3V: 0.7A	1.8V→3.3V: 0.3A
3.7V→5.0V: 0.9A	3.0V→5.0V: 0.7A
- Low Quiescent Current: 7.0uA(typ.)
- Soft-Start
- Low Voltage Operation, Up to 100% Duty Cycle
- PWM/PFM Automatic Switching, Duty Cycle is Automatically Adjustable to Maintain High Efficiency and Low Ripple in A Large Load Range

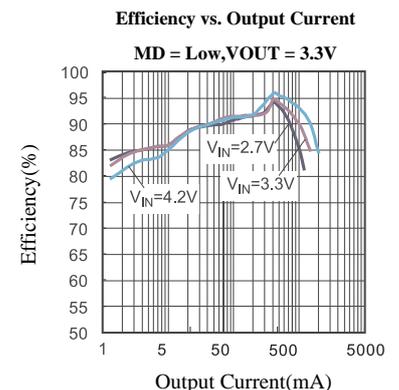
Package Type

- 8-pin DFN2*2

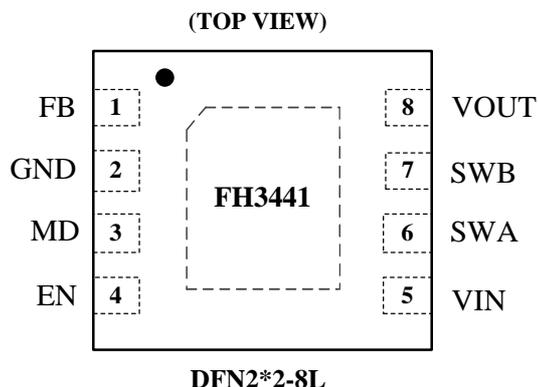
Device Information (1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
FH3441A/B	DFN (8L)	2.00mm × 2.00mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.



PIN Configuration



Pin Function

PIN	NAME	I/O	DESCRIPTION
1	FB	I	Output voltage feedback terminal, $V_{FB} = 0.6V$
2	GND	-	Ground
3	MD	I	Mode selection, high-level forced PWM mode, low-level PSM mode
4	EN	I	Enable the control terminal and the high-level chip works
5	VIN	I	Input voltage port
6	SWA	O	Buck inductor port
7	SWB	O	Boost inductor port
8	VOUT	O	Output voltage port

1.0MHz, 低功耗, 同步整流升降压, 1.6A, DC/DC 电压调整器

器件概述

FH3441A/B 是一款超微型, 超低功耗, 高效率, 升降压一体 DC-DC 调整器。适用于两节, 三节干电池或者单节锂电池 的应用场景. 可以有效的延长电池的使用时间。

FH3441A/B 由电流模 PWM 控制环路, 误差放大器, 比较器和功率 开关等模块组成。该芯片可在较宽负载范围内高效稳定的工作。

FH3441A/B 的输入电压为 3.0V 至 5.0V 提供可调输出 电压为 (3.0V 至 5V)。在输出电压为 3.3V 的情况下, 输入从 3.0V 到 5.0V, 它能提供最大 1.6A 的电流负载. FH3441A/B 可以通过调整两个外加电阻来设定输出电压。

FH3441A/B 提供了纤小的 DFN2*2-8L 封装形式可供客户选择, 其额定的工作温度范围为: -40°C 至 85°C。

应用领域

- 便携式设备
- 安防监控设备
- 后备电源设备

引脚分布

引脚	符号	I/O	功能
1	FB	输入	输出电压反馈端, $V_{FB} = 0.6V$
2	GND	地	接地
3	MD	输入	模式选择, 高电平强制 PWM 模式, 低电平 PSM 模式
4	EN	输入	使能控制端, 高电平芯片工作
5	VIN	输入	输入电压端
6	SWA	输出	降压电感端
7	SWB	输出	升压电感端
8	VOU	输出	输出电压端

电气特性

- 输入电压范围: 1.8~5.0V
- 输出电压范围: 2.0~5V (FH3441B)、1.2~5V (FH3441A)
- 最大效率可达 95%
- 电流输出能力 (FH3441B):
 - 4.2V→3.3V:1.6A(FH3441B) / 1.0A(FH3441A)
 - 3.0V→3.3V:1.0A(FH3441B) / 0.5A(FH3441A)
 - 2.5V→3.3V:0.7A(FH3441B) / 0.6A(FH3441A)
 - 1.8V→3.3V:0.3A(FH3441A/B)
 - 3.7V→5.0V:0.9A(FH3441B) / 0.7A(FH3441A)
 - 3.0V→5.0V:0.7A(FH3441B) / 0.5A(FH3441A)
- 低静态电流: 8uA
- 开关频率: 1.0MHz
- 反馈基准电压: 0.6V
- 软启动
- 低压操作, 可达 100% 占空比
- PWM/PFM 自动切换占空比自动可调以保持极大负载范围内的高效率, 低纹波

极限参数表

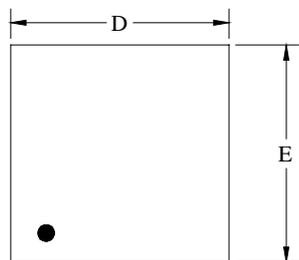
参数	描述	数值	单位
V_{DD}	无信号输入时供电电源	6.0	V
V_I	输入电压	-0.3 ~ V_{DD} +0.3	V
T_J	结工作温度范围	-40 ~ 150	°C
T_{SDR}	引脚温度(焊接 10 秒)	260	°C
T_{STG}	存储温度范围	-65 ~ 150	°C
T_A	环境温度范围	-40 ~ 85	°C
θ_{JA}	封装热阻--芯片到环境热阻	80	°C/W
HBM	ESD 范围 HBM(人体静电模式)	±4000	V
MM	ESD 范围 MM(机器静电模式)	±400	V

1. 上述参数仅仅是器件工作的极限值, 不建议器件的工作条件超过此极限值, 否则会对器件的可靠性及寿命产生影响, 甚至造成永久性损坏。

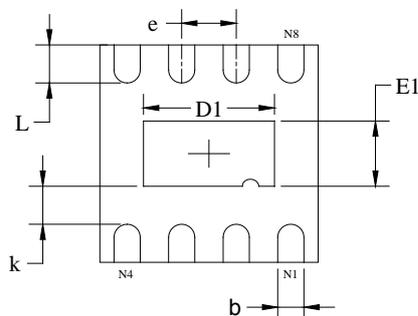
2. PCB 板放置 FH3441 的地方, 需要有散热设计, 使得 FH3441 的底部散热片和 PCB 的散热区域相连, 并通过 过孔和地相连。

封装信息

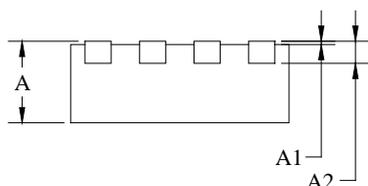
DFN2*2-8L



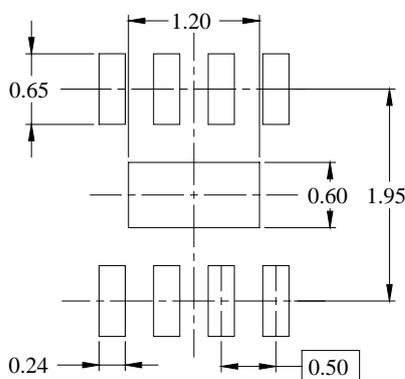
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	1.900	2.100	0.075	0.083
D1	1.100	1.300	0.043	0.051
E	1.900	2.100	0.075	0.083
E1	0.500	0.700	0.020	0.028
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007	0.012
e	0.500 TYP		0.020 TYP	
L	0.250	0.450	0.010	0.018

ORDERING INFORMATION

Part Number	Input Voltage	Features	Operating Temperature	Package Type	Top Mark	SPQ
FH3441AD8	1.8V ~ 5.5V	<ul style="list-style-type: none"> • Synchronous Buck-Boost • VFB Voltage: 0.6V • Vout: 1.2V~5.0V(ADJ) • Switching Frequency: 1.0MHz • Current Limit: 1.1A 	-40°C to +85°C	DFN2.0*2.0-8L	FFB*	3000EA/Reel
FH3441BD8	1.8V ~ 5.5V	<ul style="list-style-type: none"> • Synchronous Buck-Boost • VFB Voltage: 0.6V • Vout: 2.0V~5.0V(ADJ) • Switching Frequency: 1.0MHz • Current Limit: 2.0A 	-40°C to +85°C	DFN2.0*2.0-8L	FFB*	3000EA/Reel

Note:

- **FH3441A | FH3441B** 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.
- FOCCMU Inc. reserves the right to amend and legally interpret the electrical parameters of this chip device. (<http://www.fordevices.com>)



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 Oct.2023