1.0A Advanced Linear Charge Management Controller

Description

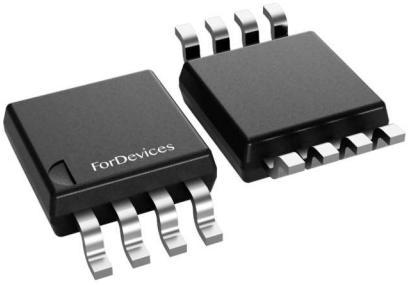
The FH5411 is a highly advanced complete constant current/constant voltage linear charger for cell lithium-ion batteries. Its package and low external component count make the FH5411 ideally suited for portable applications. The charge current can be programmed externally with a single resistor, which may be programmed up to 1.0A.

FH5411 determines the charge mode by detecting the battery voltage: Pre-charge, constant current charging, constant voltage charging. The charge current of open-charging and constant-current charging is adjustable. The FH5411 is monitored by temperature monitor during the constant-current and constant-voltage charging. There are two LEDs indicate the charge mode.

The FH5411 is available in the SOP-8L package.

Package Type

- SOP-8L



Features

- Preset 8.4V Charge Voltage with 1% Accuracy
- Programmable Charge Current Up to 1.0A
- Input Voltage: 9.2V ～ 13.0V
- Pre-Charging, the Charge Current is adjustable
- Ideal for Dual-Cell (8.4V)Li-Ion Batteries
- Constant -Current Charging, the Charge Current is adjustable
- Constant-Voltage Charging
- Constant-Current/Constant-Voltage Charging with Temperature Monitoring
- Automatic Recharge
- Double LEDs Charge Status Indication
- Available in SOP-8L Package

Applications

- Charger for Li-Ion Coin Cell Batteries
- Bluetooth Applications
- Portable MP3 Players, Wireless Headsets

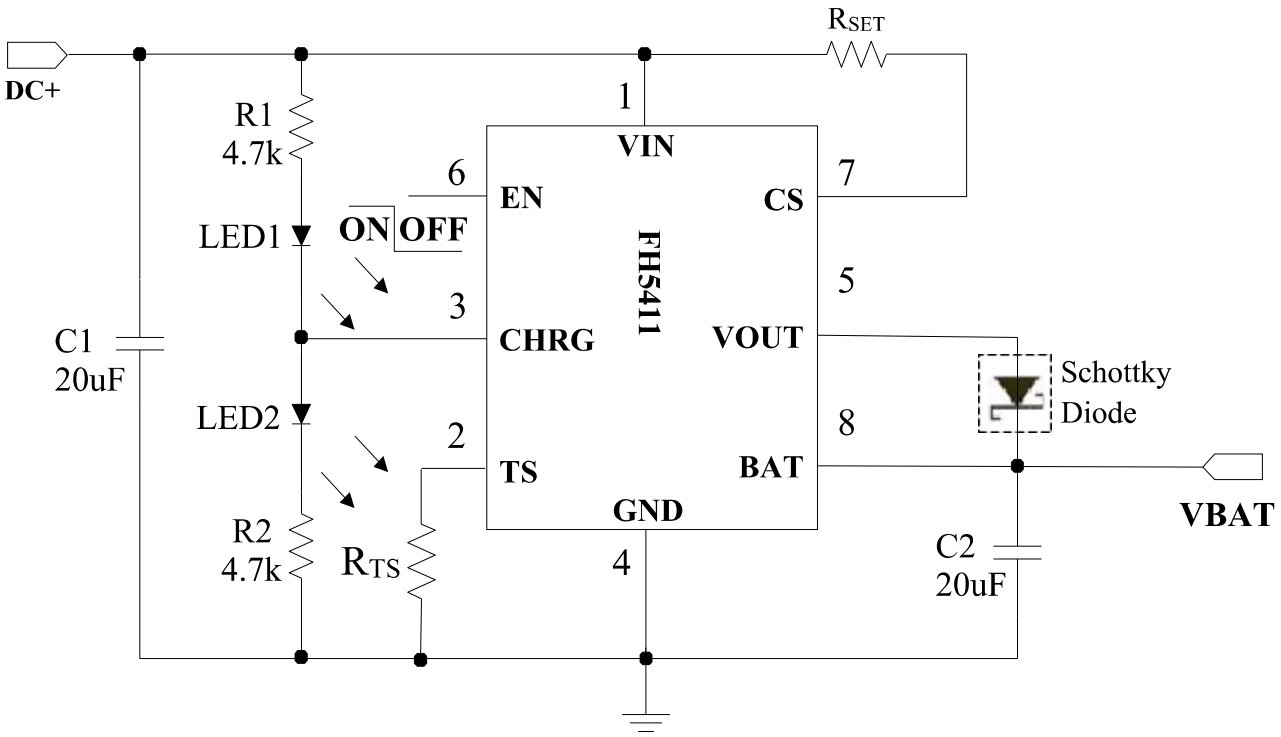
Absolute Maximum Ratings (Note 2)

- Input Supply Voltage (VIN) ..... -0.3V ～ 8.0V
- TS、CHRG、CS ..... -0.3V ～ VIN + 0.3V
- VOUT Pin Current 1.0A
- Maximum Junction Temperature ..... +150℃
- Operating Ambient Temperature Range (Note 3) ..... -40℃ ～ +85℃
- Storage Temperature Range ..... -65℃ ～ +125℃
- Lead Temperature (Soldering, 10 sec) ..... +265℃

Note 2: Stresses listed as the above "Absolute Maximum Ratings" may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

Note 3: The FH5411 is guaranteed to meet performance specifications from 0℃ to 70℃. Specifications over the -40℃ to 85℃ operating temperature range are assured by design, characterization and correlation with statistical process controls.

Typical Application Circuit



* The charge current $I_{O(REG)}$ =V_{CS}/R_{SET} (V_{CS} is usually 200mV). Note that OFF indicates the LED is turned off.

* The reverse-blocking protection diode is optional. In addition, the reverse-leakage current of the diode should be kept as small as possible.

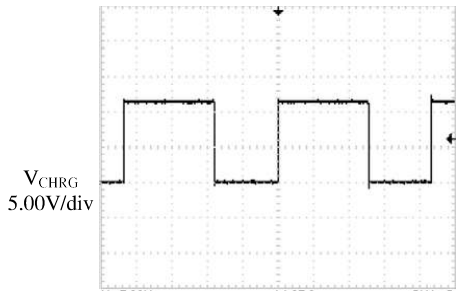
Table1. Charge Status Summary

Condition	LED1	LED2
Battery Charging	ON	OFF
Charge Complete(Done)	OFF	ON
No -Load (Note 1)	Flash	Flash

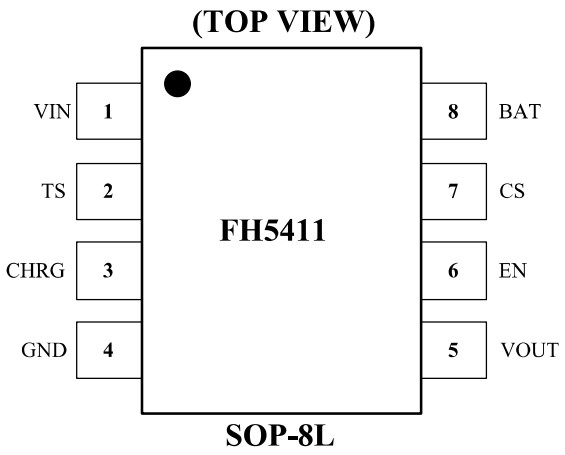
Note 1: See right figure for the V_{CHRG} waveform.

Duty Cycle

(Vin=12.0V, No-load)



Pin Assignment and Description



PIN	NAME	DESCRIPTION
1	VIN	Positive Input Supply Voltage.
2	TS	Temperature Sense
3	CHRG	Open-Drain Charge Status Output
4	GND	Ground
5	VOUT	Charge Current Output
6	EN	ON/OFF Control (High Enable)
7	CS	Charge Current Program
8	BAT	Battery Connection

Pin Functions

VIN (Pin 1): Positive Input Supply Voltage.
It Provides power to the charger VIN and should be bypassed with a 10μF capacitor.

TS (Pin 2): Temperature Sense.

CHRG (Pin 3): Charge Status Indication. When the battery is charging, the CHRG pin is pulled low.
When the charge cycle is completed, the CHRG pin is pulled high.
When no AC is detected, CHRG is forced high impedance.

GND (Pin 4): Ground.

VOUT (Pin 5): Charge Current Output.
It provides charge current to the battery and regulates the final float voltage to 8.4V.

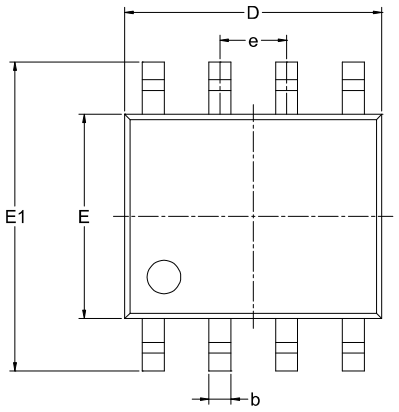
EN (Pin 6): En Control Input.
Forcing this pin above 1.0V enables the part.
Forcing this pin below 0.8V shuts down the device.
In shutdown, all functions are disabled drawing <1μA supply current.
Do not leave EN floating.

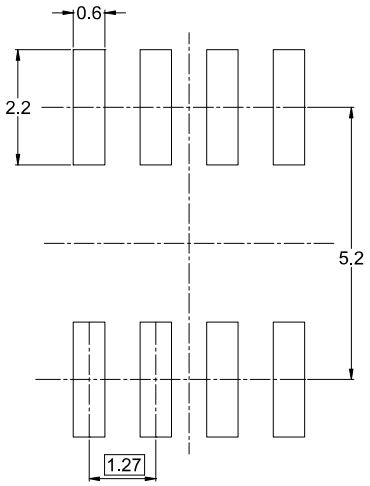
CS (Pin 7): Charge Current Program, Charge Current Monitor and Shutdown Pin.
The charge current is programmed by connecting a resistor, RSET.

BAT (Pin 8): Battery Connection.

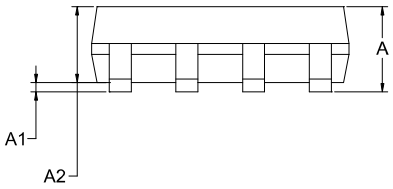
Packaging Information

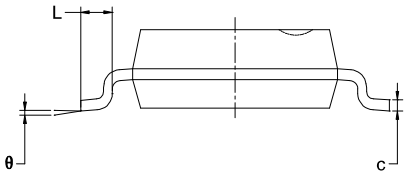
- Package Outline Dimension: **SOP-8L**





RECOMMENDED LAND PATTERN (Unit: mm)





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	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
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0	8	0	8

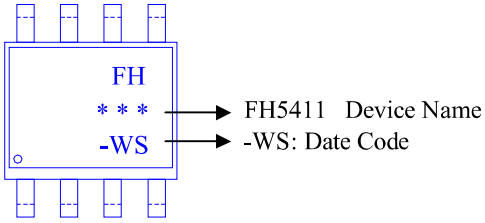
ORDERING INFORMATION

Part Number	Voltage Range	Features	Operating Temperature	Package Type	Top Mark	SPQ
FH5411S8	9.2V~13.0V	● 8.40V Charge Voltage (#2Cell Battery) ● Charge Current: 1.0A ● #2 LED Charge Status ● Temperature Monitoring	-40℃ to 85℃	SOP-8L	* * *- WS	2500PCS/Reel

Note:

- FH5411S8 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.

Device Name: SOP-8L



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.

Product Folder | Order Now | Technical Documents | Tools & Software | Support & Community

Note:

- The information described herein is subject to change without notice.
- ForDevices Inc. is not responsible for any problems caused by circuits or diagrams described herein whose related industrial properties, patents, or other rights belong to third parties. The application circuit examples explain typical applications of the products, and do not guarantee the success of any specific mass-production design.
- Use of the information described herein for other purposes and/or reproduction or copying without the express permission of ForDevices Inc. is strictly prohibited.
- The products described herein cannot be used as part of any device or equipment affecting the human body, such as exercise equipment, medical equipment, security systems, gas equipment, or any apparatus installed in airplanes and other vehicles, without prior written permission of ForDevices Inc.
- Although ForDevices Inc. exerts the greatest possible effort to ensure high quality and reliability, the failure or malfunction of semiconductor products may occur. The user of these products should therefore give thorough consideration to safety design, including redundancy, fire-prevention measures, and malfunction prevention, to prevent any accidents, fires, or community damage that may ensue.

▲ Update by Jan.2018