1.2A/40V Linear Charger for Single Cell Li-ion Battery with Trickle Charge and Timer

PRELIMINARY DATASHEET

DESCRIPTION

FH5057 is a single cell, fully integrated constant current (CC) / constant voltage (CV) Li-ion battery charger. Its compact package with minimum external components requirement makes the FH5057 ideal for portable applications. No external sense resistor or blocking diode is necessary for the FH5057. Build-in thermal feedback mechanism regulates the charge current to control the die temperature during high power operation or at elevated ambient temperature.

The FH5057 has a pre-charge function for trickle charging deeply discharged batteries.

The fast charge current can be programmed by an external resistor. CV regulation mode is automatically enabled once the battery's charging curve reaches the constant voltage portion. The output current then decays and is finally terminated once the charge current drops to 1/5 of the programmed value.

The FH5057 keeps monitoring the battery voltage and enables a new charge cycle once the voltage drops by 200mV below the CV value.

FH5057 is in an DFN3*3-10L package.

KEY FEATURES

- Input standoff voltage: up to 40V
- Charge termination voltage: 4.20V
- Trickle charge threshold: 2.6V
- Charge current programmable, up to1.2A
- 400nA BAT current when no charging
- Soft-start limits in-rush current
- Fault and Charge Status Indicator
- Input OVP: 7.0V
- Charge-Timer
- Package type: DFN3*3-10L

APPLICATIONS

- E-cigarette
- Digital Cameras
- Bluetooth applications
- Li-ion battery powered devices

Device Information (1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
FH5057	DFN (10L)	3.00mm × 3.00mm

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

TYPICAL APPLICATION

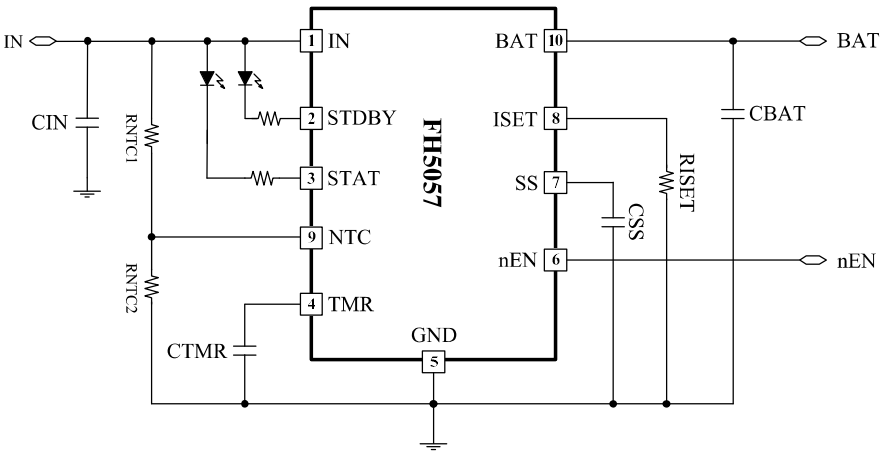
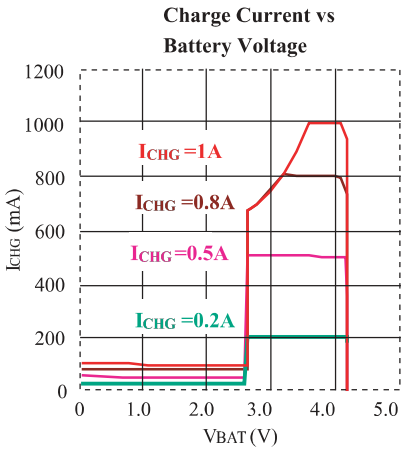
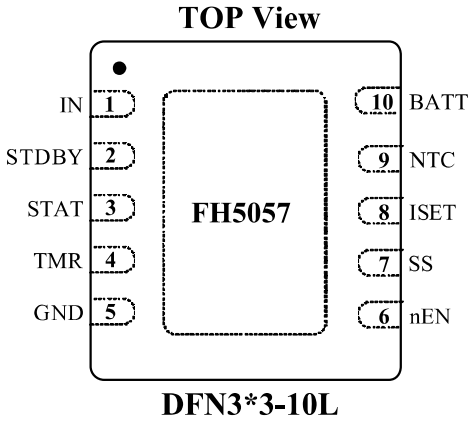


Figure 1. FH5057 Typical application circuit



PIN CONFIGURATION

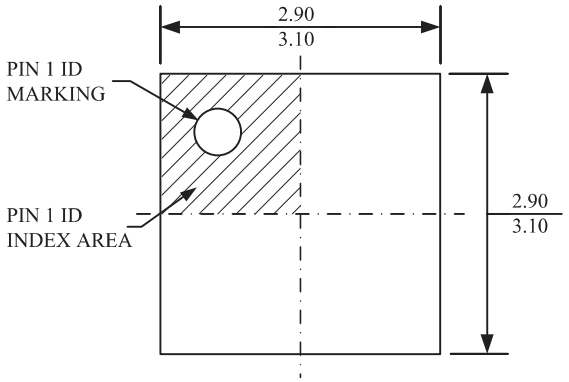


PIN DESCRIPTION

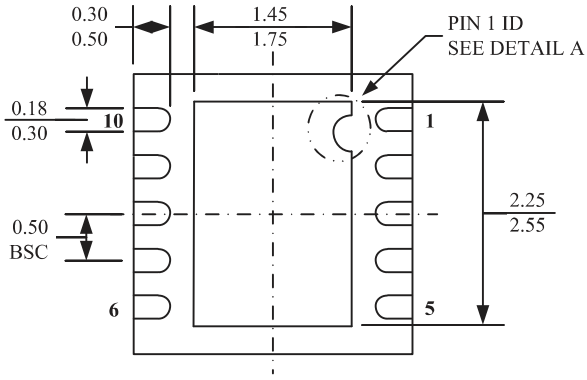
PIN#	NAME	DESCRIPTION
1	IN	Input, 40V standoff voltage, and with OVP function, UVLO=3.6V, when UVLO is about reached, decrease charge current first when reached to 3.8V
2	STDBY	Open drain, pull low when charge terminated
3	STAT	Open drain, pull low in charging, high when charge terminated, togging when the battery is in fault condition
4	TMR	Oscillator Period Timer. Connect a timing capacitor between this pin and GND to set the oscillator period.
5	GND	Ground
6	nEN	Charge Enable. An input “Low” signal at this pin or pin floating will enable the IC
7	SS	Soft-Start. Connect a capacitor to ground to set the soft-start time. The rising time constant is SS 800000 * C_{SS}, where C_{SS} is in µF.
8	ISET	Charge current setting. Program, Monitor the charge current and Shutdown. This pin set to 1.0V in constant-current mode. The charge current can be calculated using the following formula: $I_{BAT}(mA) = \frac{1850}{R_{set}\ (K\Omega)}$ The ISET pin can also be used to switch the charger to shutdown mode by disconnecting the program resistor from ground.
9	NTC	Negative Thermal Coefficient (NTC) Thermistor Pin. Connect a 500kΩ resistor from this pin to the IN pin and a 100kΩ NTC resistor (within the battery pack) from this pin to ground. If NTC function is not used, replace NTC resistor with a regular 100kΩ resistor from this pin to ground. Do not leave this pin floating.
10	BATT	Battery node. Has to withstand 15V, and reverse connecting protection. Current from battery into BATT pin should be less than 1.0uA.

PACKAGE INFORMATION

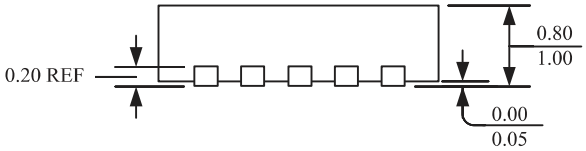
Type: DFN10 (3mm x 3mm)



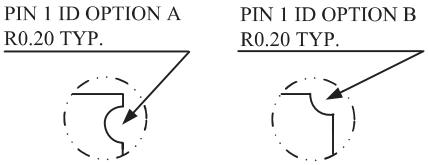
TOP VIEW



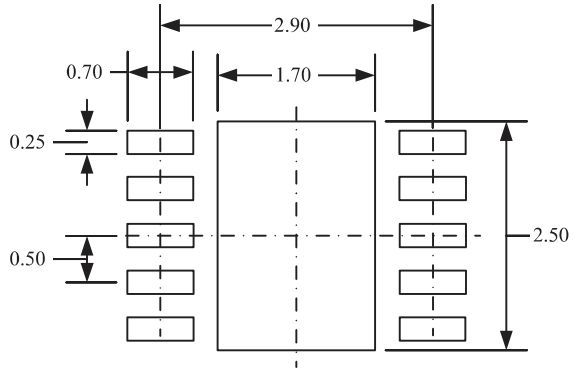
BOTTOM VIEW



SIDE VIEW



DETAIL A



RECOMMENDED LAND PATTERN

NOTE:

1) ALL DIMENSIONS ARE IN MILLIMETERS.
2) EXPOSED PADDLE SIZE DOES NOT INCLUDE MOLD FLASH.
3) LEAD COPLANARITY SHALL BE 0.10 MILLIMETER MAX.
4) DRAWING CONFORMS TO JEDEC MO-229, VARIATION VEED-5.
5) DRAWING IS NOT TO SCALE.

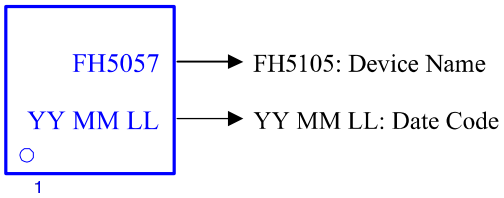
ORDERING INFORMATION

Part Number	Input Standoff Voltage	Features	Operating Temperature	Package Type	Top Mark	SPQ
FH5057D10	~ 40.0V	● Linear charger ● Charge Voltage: 4.2V ● Input OVP: 7.0V(typ.) ● Threshold voltage: 2.6V ● Charge current up to 1.2A	-40°C to +85°C	DFN3.0*3.0-10L	FH5057 Y W L	5000EA/Reel

Note:

- **FH5057** 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.
- FOCMCU Inc. reserves the right to amend and legally interpret the electrical parameters of this chip device. (http://www.fordevices.com)

Device Name: DFN3*3-10L



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 Sep.2023