

# One Cell Lithium-ion/Polymer Battery Protection IC

PRELIMINARY DATASHEET

## DESCRIPTION

The FH7010 is designed for primary protection of Li-Ion/Polymer rechargeable cells. The product integrates all the protections required for safe operation of polymer rechargeable cells. The device is packaged in a tiny and thin package. Its small solution size leaves more space for fitting the battery cell into a given cavity for small size wearable devices.

The FH7010 integrates all the protections and the required low on-resistance disconnect switch on one die. The protection features include charging and discharging protection, detection and protection of a cell in over-charging, over-discharging, over-current, and battery under-voltage. The low standby current drains little current from cell while in storage.

The FH7010 operates in  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$  temperature range, and is in a thin and low profile DFN2\*2-6L package. This package is convenient for small cell packing design.

## APPLICATIONS

- Wireless Chargers
- Portable Equipment
- Communication Systems

## FEATURES

- Protection of Charger Reverse Connection
- Protection of Battery Cell Reverse Connection
- Integrate Advanced Power MOSFET with Equivalent of  $52\text{m}\Omega$   $R_{\text{SS(ON)}}$
- Ultra-small DFN2\*2-6L Package
- Only One External Capacitor Required
- Over-temperature Protection (OTP)
- Overcharge Current Protection (OCP)
- Two-step Over-current Detection:
  - ▲ Overdischarge Current
  - ▲ Load Short Circuiting
- Charger Detection Function
- 0V Battery Charging Function
- Delay Times are generated inside
- High-accuracy Voltage Detection
- Low Current Consumption
- Operation Mode:  $2.8\mu\text{A}$  typ.
- Power-down Mode:  $0.1\mu\text{A}$  typ.
- RoHS Compliant and Lead (Pb) Free

## Typical Applications

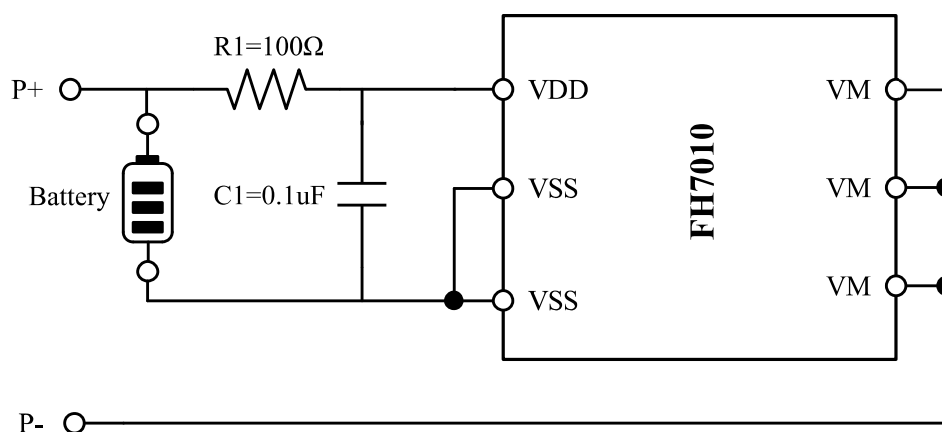
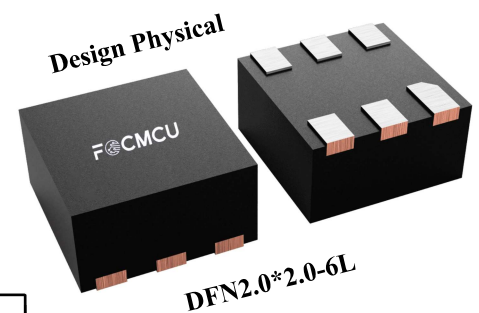
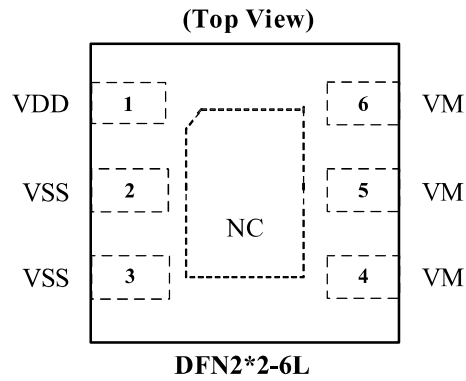


Figure 1. Typical Application Circuit



## PIN CONFIGURATION

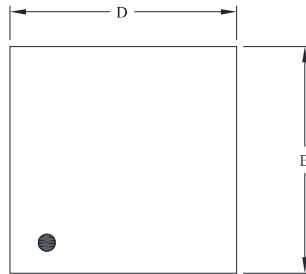


## PIN DESCRIPTION

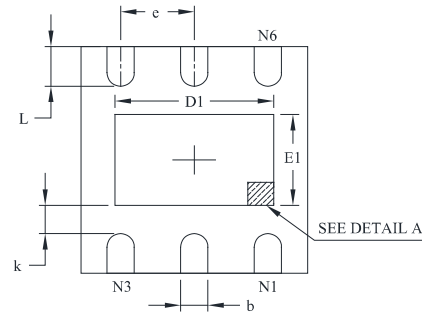
Pin	Name	Type	Description
1	VDD	P	Power input and output, the battery pack positive connection. The default state after battery attached is Closed or locked-off, dependent on the external circuitry.
2,3	VSS	G	Ground of internal circuit. Connect to battery cathode end.
4,5,6	VM	P	Power input and output, the battery pack cathode. Short this pin to the VSS pin to release off the lock-open state, and make the output path closed.
Thermal Pad	NC	NC	Not connected internally. Can be connected to VSS.

## PACKAGE OUTLINE DIMENSIONS

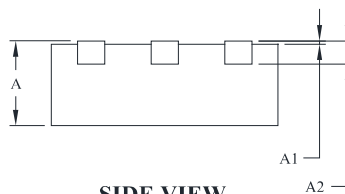
DFN2\*2-6L Unit: inches/mm



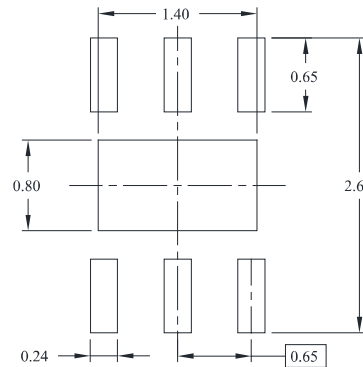
TOP VIEW



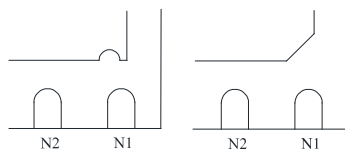
BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN(Unit: mm)



DETAIL A

Pin #1 ID and Tie Bar Mark Options

NOTE: The configuration of the Pin #1 identifier is optional, but must be located within the zone indicated.

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	1.450	0.043	0.057
E	1.900	2.100	0.075	0.083
E1	0.600	0.850	0.024	0.034
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007	0.012
e	0.650 TYP		0.026 TYP	
L	0.250	0.450	0.010	0.018

NOTE: This drawing is subject to change without notice.

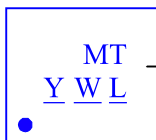
## ORDERING INFORMATION

Part Number	Features	Operating Temperature	Package Type	Top Mark	SPQ
FH7010D6	<ul style="list-style-type: none"> <li>Overcharge detection voltage(VCU): 4.30V</li> <li>Overcharge release voltage(VCL): 4.10V</li> <li>Overdischarge Detection Voltage(VDL): 2.80V</li> <li>Overdischarge Release Voltage(VDR): 3.0V</li> <li>Overcurrent Detection Current (IOV1): 0.95A</li> </ul>	-40°C to +85°C	DFN2.0*2.0-6L	MT <u>Y W L</u>	3000EA/Reel

**Note:**

- **FH7010D6** 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: DFN2x2-6L**



MT: Device Code  
Y W L: Date Code

#1



**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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