

True Monolithic Li-Ion/Polymer Battery Protector in Tiny Thin Package

■ Descriptions

The FH7110 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 FH7110 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 FH7110 operates in -40°C to 85°C temperature range, and is in a thin and low profile DFN1.5*2-6L package. This package is convenient for small cell packing design.

■ Typical Applications

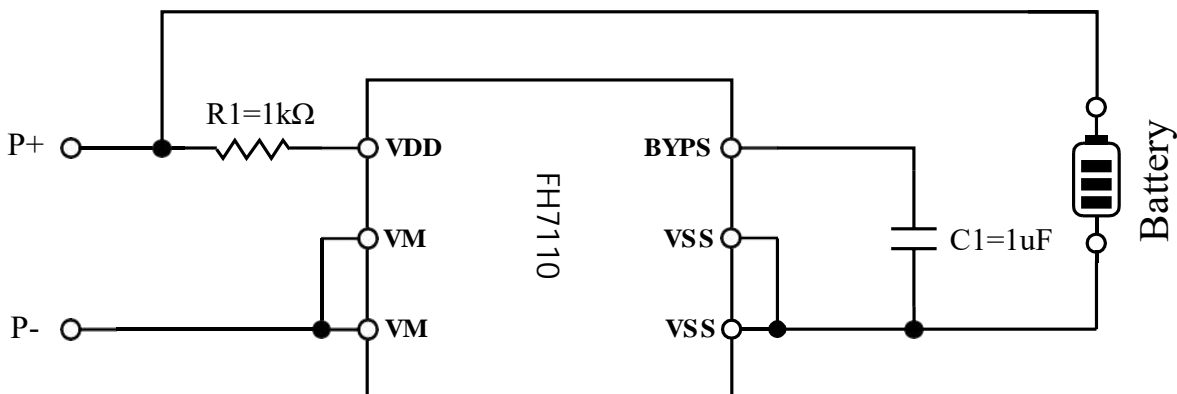


Figure 1. **Typical Application Circuit**

■ Features

- Ultra Compact Protection Solution
- 56mΩ Pass Resistance
- Operation Current: 1.3μA
- Factory Programmable OVP Threshold
Options 4.20V to 4.55V with 0.05V per Step
- Over-Charge/Discharge Current Protection
4 Threshold Combination Options
- Battery Under-Voltage Protection
2.4V/2.5V/2.8V/3.0V Options
- 100nA Deep Discharging Shutdown
- 0V Battery Charge Function (0V充电)
- With High Efficiency Charging Mode
- Input Surge Clamping
- Input Over-Voltage Safe
- Load Short-Circuit Safe
- Reverse Polarity Battery Safe
- Input Reversed-Attaching Safe
- Available in Green DFN1.5*2-6L Package

■ Applications

- Wireless Chargers
- Portable Equipment
- Communication Systems

■ Pin Assignment

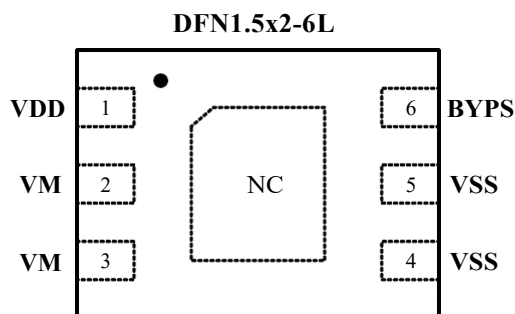


Figure 2. Pin Assignment (Top View)

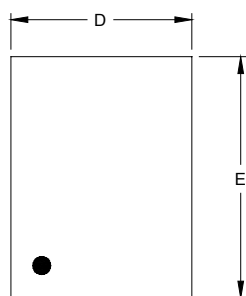
■ Pin Descriptions

FH7110			Description
Pin	Name	Type	
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	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.
4,5	VSS	G	Ground of internal circuit. Connect to battery cathode end.
6	BYPS	I/O	Bypass pin and disconnection locked-off triggering input. Place a 1.0uF capacitor between this and VSS pin. Shorting this pin to VM pin momentarily places the circuit into locked-open state.
Thermal Pad	NC	NC	Not connected internally. Can be connected to VSS.

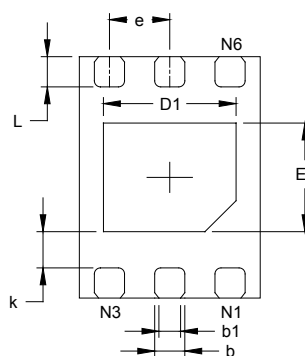
NOTE: I/O: input or output; G: ground; P: power for the circuit; NC: not connected.

■ PACKAGE OUTLINE DIMENSIONS

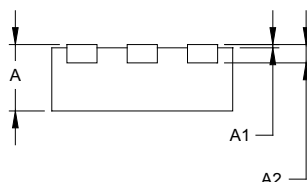
- Type: DFN-1.5×2-6L



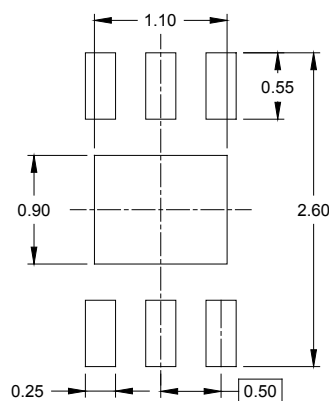
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN(Unit: mm)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.500	0.600	0.020	0.024
A1	0.000	0.050	0.000	0.002
A2	0.152 REF		0.006 REF	
D	1.400	1.600	0.055	0.063
D1	1.000	1.200	0.039	0.047
E	1.900	2.100	0.075	0.083
E1	0.800	1.000	0.031	0.039
k	0.300 REF		0.012 REF	
b	0.200	0.300	0.008	0.012
b1	0.180 REF		0.007 REF	
e	0.500 BSC		0.020 BSC	
L	0.200	0.300	0.008	0.012

■ Ordering Information

Part Number	Option Code "aaa"	Option Code "b"	Option Code "c"	TA	Package	Top Marking	SPQ
FH7110-aaa b c D6	Over Voltage Threshold V_{OV} (V)	Under Voltage Threshold V_{UV} (V)	Over Charge Current I_{OC} (A)	-40 to 85°C	D6: DFN1.5*2-6L	D x y z	3000PCS/Reel

The model code is interpreted

Over Voltage Threshold Options

Option Code "aaa"	420	425	430	435	440	445	450	455
Over Voltage Threshold V_{OV} (V)	4.20	4.25	4.30	4.35	4.40	4.45	4.50	4.55

Under Voltage Threshold Options

Option Code "b"	A	B	C	D
Under Voltage Threshold V_{UV} (V)	2.4	2.5	2.8	3.0

Current Threshold Combination Options

Option Code "c"	A	B	C	D
Over Charge Current I_{OC} (A)	1.33	0.66	1.33	0.66
Over Discharge Current I_{OD} (A)	1.33	1.33	0.66	0.66
Short Circuit Current (A)	2.68	2.68	1.96	1.96

Marking Definition Code: D x y z

Device code

Option Code "D"	FH7110 Product code

Over Voltage Threshold Options

Option Code "x"	2	3	4	5	6	7	8	9
Over Voltage Threshold V_{OV} (V)	4.20	4.25	4.30	4.35	4.40	4.45	4.50	4.55

Under Voltage Threshold Options

Option Code "y"	A	B	C	D
Under Voltage Threshold V_{UV} (V)	2.4	2.5	2.8	3.0

Current Threshold Combination Options

Option Code "z"	A	B	C	D
Over Charge Current I_{OC} (A)	1.33	0.66	1.33	0.66
Over Discharge Current I_{OD} (A)	1.33	1.33	0.66	0.66
Short Circuit Current (A)	2.68	2.68	1.96	1.96

Note:

- FH7110 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.