

1 cell lithium-ion/lithium-polymer battery protection IC

MJ3401 Series

Outline

MJ3401 series are protection IC with integrated MOS-FET for protection of the rechargeable Lithium-ion or Lithium-polymer battery. The overcharge, overdischarge and discharging and charging overcurrent protection of the rechargeable one-cell

Lithium-ion or Lithium-polymer battery can be detected. It's possible by OTP technology to detect unusual state of a Li-ion battery with very high accuracy.

Features

(Unless otherwise specified, Ta=25°C)

(1) Range and accuracy of detection/release voltage

- Overcharge detection voltage..... 4.15V to 4.50V, 5mV step Accuracy±10mV
Accuracy-20mV to +15mV
(Topr=-5°C to +60°C)
- Overcharge release hysteresis voltage Selection from 0V, 0.1V, 0.2V
- Overdischarge detection voltage..... 2.00V to 3.00V, 100mV step Accuracy±35mV
- Overdischarge release hysteresis voltage..... Selection from 0V, 0.2V, 0.3V, 0.4V
- Discharging overcurrent detection current 4.0A to 8.0A, 0.1A step *1
- Charging overcurrent detection current..... 4.0A to 8.0A, 0.1A step *1
- Short detection voltage..... 180mV to 360mV, 10mV step Accuracy±15mV

(2) Range of detection delay time

- Overcharge detection delay time..... Selection from 1.024s, 4.60s
- Overdischarge detection delay time Selection from 20ms, 96ms, 144ms
- Discharging overcurrent detection delay time ... Selection from 6ms, 8ms, 12ms, 16ms, 20ms, 32ms, 128ms, 256ms
- Charging overcurrent detection delay time..... Selection from 8ms, 16ms, 32ms
- Short detection delay time..... Selection from 500µs, 820µs

(3) 0V battery charge function Selection from "Permission" or "Prohibition" *2

(4) Low current consumption

- Normal mode Typ. 4.5µA, Max. 7.0µA
- Stand-by mode Max. 0.1µA (In case Overdischarge latch function "Enable")
Max. 0.3µA (In case Overdischarge latch function "Disable")

(5) MOS-FET

- Source to Source on state resistance..... Typ. 11.0mΩ (@VDD=3.6V)

(6) Absolute maximum ratings

- VCC pin.....-0.3V to +10V
- V- pin.....VDD-24V to VDD+0.3V
- VPP pinVDD-0.3V to VDD+0.3V
- Drain-source voltage.....Max. 24V
- Drain currentMax. 1.2A
- Total Power DissipationMax. 1.0W
- Storage temperature.....-55°C to +125°C
- Operation temperature.....-40°C to +85°C

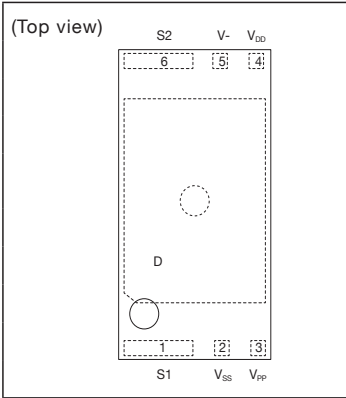
*1 Please inquire to us about details of the accuracy of Overcurrent detection current, which is varies depending on the setting value.

*2 In the case of "0V battery charge inhibition", the setting voltage is selectable from 0.90V/1.25V.

*3 Please inquire to us, if you need another specifications.

Pin assignment

PLP-6G



Pin no.	Symbol	Function
1	S1	Source terminal of discharge MOS-FET. Connect to the negative terminal of the battery.
2	VDD	Negative power supply voltage input terminal. Connect to the negative terminal of the battery.
3	VPP	Test terminal. VPP terminal must be connected to VSS terminal.
4	VDD	Positive power supply voltage input terminal. Connect to the positive terminal of the battery through R1.
5	V-	Charger negative voltage input terminal. Connect to the S2 terminal through R2.
6	S2	Source terminal of charge MOS-FET. Connect to a negative power supply terminal of charger.
-	D	Drain terminal of discharge and charge MOS-FET. Drain terminal must be open electrically.

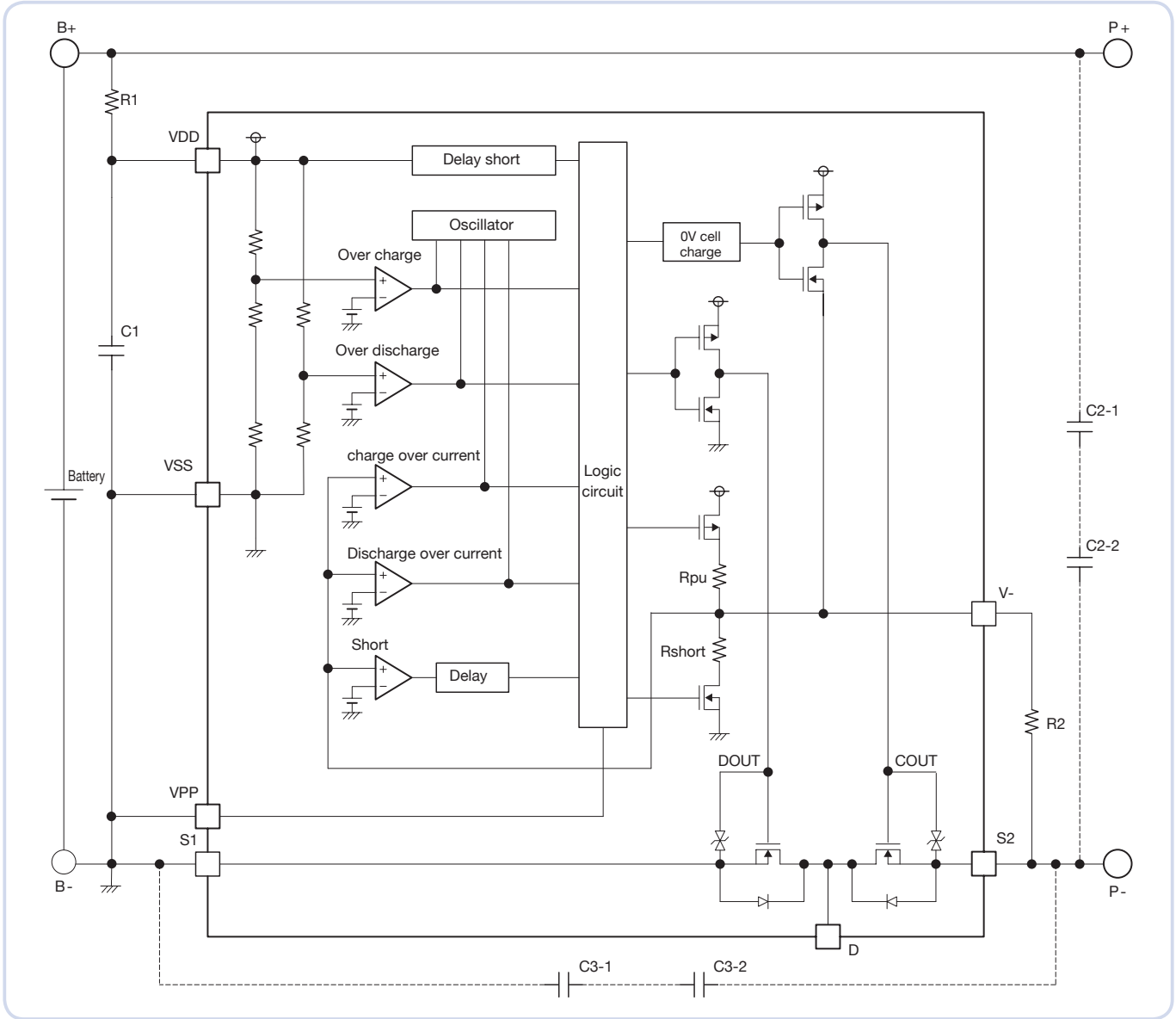
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Product name	Package	Optional function	Detection / Release voltage							Detection delay time					Optional function		MOS -FET																	
			0V battery charge function	Overdischarge detection Latch function	Overcharge detection Latch function	Overcharge detection voltage	Overcharge release voltage	Overdischarge detection voltage	Overdischarge release voltage	Discharging overcurrent detection voltage (@VDD=3.6V)	Charging overcurrent detection voltage (@VDD=3.6V)	Short detection voltage	Overcharge detection delay time	Overdischarge detection delay time	Discharging overcurrent detection delay time	Charging overcurrent detection delay time	Short detection delay time	Discharge current limit (@VCC=3.6V)	Charge current limit (@VCC=3.6V)	Source to source on-state resistance (@VCC=3.6V)														
																					Vdet1	Vrel1	Vdet2	Vrel2	Vdet3	Vdet4	Vshort	tVdet1	tVdet2	tVdet3	tVdet4	tshort	Idsc36	Ichg36
			V	V	V	V	mV	mV	V	s	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms	ms
MJ3401A01DAM	PLP-6G	Permission	x	x	4.425	4.220	2.500	2.925	*2	*3	0.360	1.024	96.0	12.0	8.0	500	6.00	6.60	11.0															
MJ3401A07DAM	PLP-6G	Permission	x	x	4.425	4.220	2.500	2.925	*2	*3	0.180	1.024	96.0	12.0	8.0	500	8.00	6.00	11.0															
MJ3401A08DAM	PLP-6G	Permission	x	x	4.475	4.265	2.300	2.690	*2	*3	0.360	1.024	96.0	20.0	32.0	500	9.20	6.90	11.0															
MJ3401C01DAM	PLP-6G	0.90V	○	○	4.425	4.425	2.800	2.800	*2	*3	0.180	1.024	144.0	16.0	8.0	500	7.50	6.00	11.0															
MJ3401C02DAM	PLP-6G	0.90V	○	○	4.435	4.435	2.800	2.800	*2	*3	0.180	1.024	144.0	16.0	8.0	500	7.50	6.00	11.0															

*1 Optional functions ○ Provided. × Not provided.
 *2 Discharging overcurrent detection voltage (Vdet3) = Idch36 * Rss(on)36
 *3 Charging overcurrent detection voltage (Vdet4) = Ichg36 * Rss(on)36

PLP-6G ... 5,000pcs/Reel
 Please inquire to us, if you request a rank other than the above.

Typical application circuit



Symbol	Parts	Min.	Typ.	Max.	Purpose
R1	Resistor	-	330Ω	-	For voltage fluctuation, For ESD
C1	Capacitor	0.01μF	0.1μF	1.0μF	For voltage fluctuation
R2	Resistor	-	1.0kΩ	10kΩ	Current limit for charger reverse connection
C2	Capacitor	-	0.1μF	-	For exogenous noise
C3	Capacitor	-	0.1μF	-	For exogenous noise