

MM3575 Series

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Outline

The MM3575 series are protection IC using high voltage CMOS process for overcharge, overdischarge and overcurrent protection of the rechargeable Lithium-ion or Lithium-polymer battery. The overcharge, overdischarge, discharging overcurrent, charging overcurrent, cell balance and V5 to V3 pin disconnect of the rechargeable 3 to 5cell Lithium-ion or Lithium-polymer battery can be detected. By using cascade connection, it is also possible to protect 6 or more cells rechargeable Lithium-ion battery. And the regulator can be constructed by using external Nch MOS FET. The internal circuit of IC is composed by the voltage detector, the reference voltage source, delay time control circuit, and the logical circuit, etc.

Product Series

For 3 to 5cells

Features

1) Range and accuracy of detection/release voltage

- Overcharge detection voltage 3.6V to 4.5V, 5mV steps Accuracy±25mV
- Overcharge release voltage 3.4V to 4.5V, 50mV steps Accuracy±50mV
- Overdischarge detection voltage 2.0V to 3.0V, 50mV steps Accuracy±80mV
- Overdischarge release voltage 2.0V to 3.5V, 50mV steps Accuracy±100mV
- Discharging overcurrent detection voltage1 30mV to 300mV, 5mV steps Accuracy±15mV
- Discharging overcurrent detection voltage2 Twice or 4 times of discharging overcurrent1 Accuracy±15%
- Short detection voltage 4 or 8 times or discharging overcurrent 1 Accuracy±100mV
- Charging overcurrent detect voltage -300mV to -20mV, 5mV steps Accuracy±10mV
- Cell balance detection voltage 3.6V to 4.5V, 5mV steps Accuracy±30mV

(2) Ragen of detection delay time

- Overcharge detection delay time Selection from 0.25s, 1.0s, 1.2s, 4.1s Accuracy±25%
- Overcharge release delay time Selection from 10ms, 24ms, 48ms, 100ms Accuracy±25%

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- Overdischarge detection delay time Selection from 0.25s, 1.0s, 1.2s, 4.1s Accuracy±25%
- Overdischarge release delay time Selection from 4ms, 8ms, 12ms, 24ms Accuracy±25%
- Discharging overcurrent detection delay time1 Setting by capacitor of COC pin. Accuracy±30%
- Discharging overcurrent detection delay time2 Setting by capacitor of COC pin. Accuracy±30%
- Short detection delay time Selection from 100μs, 200μs, 300μs Accuracy±50%
- Discharging overcurrent release delay time Setting by capacitor of COC pin. Accuracy±30%
- Charging overcurrent detection delay time Setting by capacitor of COC pin. Accuracy±30%
- Charging overcurrent release delay time Setting by capacitor of COC pin. Accuracy±30%
- Disconnected detection delay time Selection from 25ms, 50ms, 100ms Accuracy±25%
- Disconnected release delay time Selection from 1024ms, 2048ms, 4096ms Accuracy±25%
- Cell balance detection delay time Selection from 0.1s, 0.25s, 0.5s Accuracy±25%
- Cell balance releases delay time Selection from 4ms, 8ms, 12ms Accuracy±25%

(3) Protected operation can be detect of V5 to V1 pin disconnection

(4) The setting for three cell , for four cell , and for five cell protection can be set with the SEL pin.

(5) The charge and discharge of the battery can be controlled with SDC pin and SOC pin.

(6) 0V battery charge function Selection from "Permission" or "Prohibition"

(7) Power save mode Built-in

(8) Regulator function Built-in

(9) Low current consumption

- VDD pin current consumption(Vcell=4.3V) Typ. 25.0μA Max. 35.0μA
- VDD pin current consumption(Vcell=3.5V) Typ. 20.0μA Max. 30.0μA
- VDD pin current consumption(Vcell=2.0V) Typ. 10.0μA, Max. 15.0μA
- VDD pin current consumption at power save1(Vcell=3.5V) Typ. 12.0μA, Max. 16.0μA
- VDD pin current consumption at power save2(Vcell=3.5V) Typ. 4.0μA, Max. 6.0μA
- V5 pin current consumption(Vcell=4.3V) Typ. 4.0μA, Max. 6.0μA
- V5 pin current consumption(Vcell=3.5V) Typ. 2.0μA, Max. 3.0μA
- V5 pin current consumption(Vcell=2.0V) Typ. 1.0μA, Max. 1.5μA
- V5 pin current consumption at power save(Vcell=3.5V) Max. 0.05μA

Specifications

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Product name	Package	OV battery charge function	Overcharge detection voltage [V]	Overcharge release voltage [V]	Overdischarge detection voltage [V]	Overdischarge release voltage [V]
MM3575A02WBH	VSOP-24A	Prohibition	4.250	4.175	2.800	2.900
MM3575A08WBH	VSOP-24A	Prohibition	4.250	4.100	2.600	3.200
MM3575A13WBH	VSOP-24A	Prohibition	4.270	4.170	2.800	3.200
MM3575A14WBH	VSOP-24A	Prohibition	4.270	4.170	2.400	2.900
MM3575D01WBH	VSOP-24A	Prohibition	4.230	4.180	2.800	3.000

Product name	Discharging overcurrent detection voltage1 [V]	Discharging overcurrent detection voltage2 [V]	Charging overcurrent detection voltage [V]	Short detection voltage [V]	Cell balance detection voltage [V]	Overcharge detection delay time [s]	Overcharge release delay time [ms]
MM3575A02WBH	0.1000	0.2000	-0.0200	0.400	4.180	1.000	100.0
MM3575A08WBH	0.0900	0.1800	-0.0300	0.360	4.180	1.000	100.0
MM3575A13WBH	0.0500	0.1000	-0.0300	0.300	4.180	0.200	5.0
MM3575A14WBH	0.0500	0.1000	-0.0300	0.300	4.180	0.200	5.0
MM3575D01WBH	0.1000	0.4000	-0.1000	0.800	4.180	1.000	100.0

Product name	Overdischarge detection delay time [ms]	Overdischarge release delay time [ms]	Discharging overcurrent detection delay time 1 [ms]	Discharging overcurrent detection delay time 2 [ms]	Discharging overcurrent release delay time [ms]	Charging overcurrent detection delay time [ms]	Charging overcurrent release delay time [ms]
MM3575A02WBH	1000.0	4.0	10.0	2.0	4.00	1024.0	128.0
MM3575A08WBH	2000.0	4.0	1536.0	60.0	4.00	100.0	128.0
MM3575A13WBH	200.0	2.0	5.0	1.0	4.00	1024.0	50.0
MM3575A14WBH	200.0	2.0	5.0	1.0	4.00	1024.0	50.0
MM3575D01WBH	100.0	4.0	2048.0	20.0	8.00	512.0	128.0

Product name	Short detection delay time [ms]	Disconnect detection delay time [ms]	Disconnect release delay time [ms]	Cell balance detection delay time [ms]	Cell balance release delay time [ms]
MM3575A02WBH	100.0	10.0	10.0	10.0	10.0
MM3575A08WBH	100.0	10.0	10.0	10.0	10.0
MM3575A13WBH	100.0	10.0	10.0	10.0	10.0
MM3575A14WBH	100.0	10.0	10.0	10.0	10.0
MM3575D01WBH	100.0	10.0	10.0	10.0	10.0

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MM3575A02WBH	0.200	200.0	4096.0	256.0	8.0
MM3575A08WBH	0.200	200.0	4096.0	256.0	8.0
MM3575A13WBH	0.200			200.0	8.0
MM3575A14WBH	0.200			200.0	8.0
MM3575D01WBH	0.200			256.0	4096.0

Package

VSOP-24A