MM3645 Series

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Outline

MM3645 series are protection ICs for Lithium-ion or Lithium-polymer secondary battery using high voltage CMOS process. They protect the battery pack/system from overcharge, overdischarge, and overcurrent, etc. by controlling FET SW. They realize overcurrent detection with high accuracy and improved temperature dependence by using an external chip resistor. In addition, by using charging off mode, it reduces the off current of system and prevents Lithium-ion battery from discharging when the system is off.

Product Series

For one-cell

Features

1. Range and accuracy of detection / release voltage
● Overcharge detection voltage 3.6V to 5.0V, 5mV steps Accuracy±20mV
● Overdischarge detection voltage 2.0V to 3.0V, 50mV steps Accuracy±35mV
● Discharging overcurrent detection voltage 20mV to 300mV, 1mV steps Accuracy±15%
● Charging overcurrent detection voltage -300mV to -20mV, 1mV steps Accuracy±15%
● Short detection voltage 0.45V to 0.9V, 50mV steps Accuracy±100mV

2. Range of detection delay time
● Overcharge detection delay time Selection from 0.25s, 0.5s, 1.0s
● Overdischarge detection delay time Selection from 20ms, 24ms, 96ms, 125ms
● Discharging overcurrent detection delay time Selection from 8ms, 12ms, 16ms, 20ms, 48ms
● Charging overcurrent detection delay time Selection from 8ms, 12ms, 16ms, 20ms, 48ms
● Short detection delay time 250μs standard

3. 0V battery charge functionSelection from "Prohibition" or "Permission"

4. Forcible discharge OFF mode CNT > VDD-0.4 : DOUT=L Discharge=OFF

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CNT < VSS-0.4 : DOUT=H Discharge=ON

5. Low current consumption
●Normal mode Typ. 3.0μA, Max. 5.5μA
●Stand-by mode Max. 0.1μA

Specifications

Product name	Package	0V battery charge function	Overcharge release function	Overdischarge release function	Discharging overcurrent release function	Overcharge detection voltage [V]
MM3645A01VRE	TSOP-8A	Permission	voltage	Latch	voltage	4.430
MM3645A02VRE	TSOP-8A	Permission	voltage	Latch	voltage	4.405
MM3645B01VRE	TSOP-8A	Prohibition	voltage	Latch	voltage	4.430
MM3645B02VRE	TSOP-8A	Prohibition	voltage	Latch	voltage	4.430
MM3645E03VRE	TSOP-8A	Permission	voltage	voltage	voltage	4.470

Product name	Overcharge release voltage [V]	Overdischarge detection voltage [V]	Overdischarge release voltage [V]	Discharging overcurrent detection voltage [V]	Charging overcurrent detection voltage [V]	Short detection voltage [V]	Overcharge detection delay time [s]
MM3645A01VRE	4.330	2.300	2.300	0.037	-0.0250	0.900	1.000
MM3645A02VRE	4.305	2.500	2.500	0.037	-0.0370	0.900	1.000
MM3645B01VRE	4.330	2.400	2.400	0.043	-0.0250	0.900	1.000
MM3645B02VRE	4.330	2.400	2.400	0.043	-0.0250	0.600	1.000
MM3645E03VRE	4.270	2.500	2.900	0.049	-0.0310	0.250	1.000

Product name	Overcharge release delay time [ms]	Overdischarge detection delay time [ms]	Overdischarge release delay time [ms]	Discharging overcurrent detection delay time [ms]	Discharging overcurrent release delay time [ms]	Charging overcurrent detection delay time [ms]	Charging overcurrent release delay [ms]
MM3645A01VRE	16.0	125.0	1.0	16.0	1.00	8.0	1.0

MM3645A02VRE	16.0	125.0	1.0	16.0	1.00	8.0	1.0
MM3645B01VRE	16.0	125.0	1.0	16.0	1.00	8.0	1.0
MM3645B02VRE	16.0	125.0	1.0	16.0	1.00	8.0	1.0
MM3645E03VRE	16.0	65.0	1.0	12.0	1.00	8.0	1.0

Product name	Short detection delay time [ms]
MM3645A01VRE	0.250
MM3645A02VRE	0.250
MM3645B01VRE	0.250
MM3645B02VRE	0.250
MM3645E03VRE	0.250

Package

TSOP-8A