

MM3783 Series

2023/07/20

Outline

MM3783 series are an overcharge, overdischarge, overcurrent and temperature protection IC for a Lithiumion/Lithiumpolymer rechargeable battery. Lithium-ion/Lithium-polymer battery overcharge each cell, over discharge, and discharge and charging overcurrent, short circuits can be detected. The detection of the temperature is enabled by connecting resistance between thermistor, TH terminal -VSS terminals between REG terminal -TH terminals. Each of these IC composed of six voltage detectors, short detection circuit, reference voltage sources, delay time generation circuit , logical circuits and regulator circuit etc.

Product Series

For 3-cells

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
- Discharge overcurrent detection voltage 1 30mV to 300mV, 5mV steps 1 Accuracy±15%
- Discharge overcurrent detection voltage 2 Twice or 4 times of discharging 1 Accuracy±20%
- Short detection voltage 4 or 8 times of discharging 1 Accuracy±30%
- Charging overcurrent detect voltage -300mV to -20mV, 5mV steps 1 Accuracy±15%
- Temperature protection detection temperature -25°C to 75°C, 5°C step Accuracy±3°C

2. Range and accuracy of delay time

- Overcharge detection delay time Setting by capacitor of COV Accuracy±50%
- Overdischarge detection delay time Setting by capacitor of CUV Accuracy±50%
- Discharging overcurrent detection delay time 1 Setting by capacitor of CDOC Accuracy±50%
- Discharging overcurrent detection delay time 2 1/10 to 10times of tVDET3-1 Accuracy±50%

MM3783 Series

2023/07/20

- Short detection delay time Typ. 200 μ s fixed Accuracy Min.100 μ s/max.400 μ s
- Charging overcurrent detection delay time Setting by capacitor of CCOC Accuracy \pm 50%
- Temperature protection detection delay time Setting by capacitor of CTH Accuracy \pm 50%

(3) Range and accuracy of regulator output voltage

- VOUT pin output voltage 1.5V to 3.0V, 50mV steps Accuracy \pm 25mV

(4) Low current consumption

- Consumption current1 (VDD), Vcell=4.3V Typ. 20.0 μ A, Max. 30.0 μ A
- Consumption current2 (VDD), Vcell=3.5V Typ. 18.0 μ A, Max. 23.0 μ A
- Consumption current3 (VDD), Vcell=2.0V Typ. 1.5 μ A, Max. 3.0 μ A

Specifications

Product name	Package	0V battery charge function	Overcharge release function	Overdischarge release function	Discharging overcurrent release function	Overcharge detection voltage [V]
MM3783A01VBH	TSOP-16B	Permission	voltage	voltage	Latch	4.250
MM3783A02VBH	TSOP-16B	Permission	voltage	voltage	Latch	4.200
MM3783C01VBH	TSOP-16B	Permission	voltage	Latch	Latch	4.180
MM3783C02VBH	TSOP-16B	Permission	voltage	Latch	Latch	4.200
MM3783C04VBH	TSOP-16B	Permission	voltage	Latch	Latch	4.225
MM3783C06VBH	TSOP-16B	Permission	voltage	Latch	Latch	4.250
MM3783C07VBH	TSOP-16B	Permission	voltage	Latch	Latch	4.250

Product name	Overcharge release voltage [V]	Overdischarge detection voltage [V]	Overdischarge release voltage [V]	Discharging overcurrent detection voltage1 [V]	Discharging overcurrent detection voltage2 [V]	Charging overcurrent detection voltage [V]	Short detect voltage [V]
MM3783A01VBH	4.100	2.750	3.000	0.0400	0.0800	-0.0200	0.160
MM3783A02VBH	4.050	2.750	3.000	0.0400	0.0800	-0.0200	0.160

MM3783 Series

2023/07/20

MM3783C01VBH	4.100	2.750	3.000	0.0900	0.1800	-0.0200	0.360
MM3783C02VBH	4.100	2.750	3.000	0.0900	0.1800	-0.0200	0.360
MM3783C04VBH	4.125	2.500	3.000	0.0500	0.1000	-0.0200	0.300
MM3783C06VBH	4.100	2.750	3.000	0.0400	0.0800	-0.0200	0.160
MM3783C07VBH	4.150	2.500	3.000	0.0900	0.1800	-0.0200	0.360

Product name	Overcharge detection delay time [s]	Overcharge release delay time [ms]	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]
MM3783A01VBH	1.000	100.0	1000.0	100.0	100.0	25.0	100.00
MM3783A02VBH	1.000	100.0	1000.0	100.0	100.0	25.0	100.00
MM3783C01VBH	1.000	100.0	1000.0	100.0	100.0	10.0	100.00
MM3783C02VBH	1.000	100.0	1000.0	100.0	100.0	10.0	100.00
MM3783C04VBH	1.000	100.0	1000.0	100.0	2200.0	300.0	1100.00
MM3783C06VBH	1.000	100.0	1000.0	100.0	470.0	47.0	47.00
MM3783C07VBH	1.000	100.0	1000.0	100.0	470.0	47.0	47.00

Product name	Charging overcurrent detection delay time [ms]	Charging overcurrent release delay time [ms]	Short detection delay time [ms]	Temperature protection detection delay time [s]	Temperature protection release delay time [s]	High temperature detection temperature 1 [deg.C]	High temperature release temperature 1 [deg.C]
MM3783A01VBH	470.0	47.0	0.200	1.000	0.100	70	60
MM3783A02VBH	470.0	47.0	0.200	1.000	0.100	70	60
MM3783C01VBH	470.0	47.0	0.200	1.000	0.100	65	55
MM3783C02VBH	470.0	47.0	0.200	1.000	0.100	75	65
MM3783C04VBH	470.0	47.0	0.200	1.000	0.100	75	60
MM3783C06VBH	470.0	94.0	0.200	1.000	0.100	75	60
MM3783C07VBH	470.0	94.0	0.200	1.000	0.100	75	60

Product name	High temperature detection temperature 2 [deg.C]	High temperature release temperature 2 [deg.C]	Low temperature detection temperature 1 [deg.C]	Low temperature release temperature 1 [deg.C]
MM3783A01VBH	50	40	-10	0
MM3783A02VBH	50	40	-10	0
MM3783C01VBH	55	45	0	5
MM3783C02VBH	55	45	0	5

MM3783 Series

2023/07/20

MM3783CU2VBH	55	45	-10	0
MM3783C04VBH	55	52	-20	-10
MM3783C06VBH	60	50		
MM3783C07VBH	60	50	-20	-10

Package

TSOP-16B