

MM3856 Series

2023/07/20

Outline

MM3856 series are Li-ion battery protection IC and detect charge current / discharge current with high precision by current sensing resistor (Rsns). MM3856 have two step discharge overcurrent detection. And system is protected appropriately in the next 2 state, Normal discharge mode and large current discharge mode.

Product Series

For one-cell

Features

(1) Range and accuracy of detection/release voltage

- Overcharge detection voltage 4.1V to 5.0V, 5mV steps Accuracy \pm 20mV
- Overdischarge detection voltage 2.1V to 3.0V, 50mV steps Accuracy \pm 35mV
- Discharging overcurrent detection voltage1 15mV to +100mV, 1mV steps ※1
- Discharging overcurrent detection voltage2 30mV to +100mV, 1mV steps ※1
- Charging overcurrent detection voltage -100mV to -15mV, 1mV steps ※1
- Short detection voltage1 50mV to 200mV, 50mV steps Accuracy \pm 20mV (Discharging overcurrent detection voltage 2 disable.)

Accuracy \pm 25mV (Discharging overcurrent detection voltage 2 enable.)

- 0V battery charge inhibition battery voltage 1.3 to 1.8V, 0.1V steps Accuracy \pm 0.1V
0.9V fixed Accuracy \pm 0.3V

(2) 0V battery charge function Selectable "Permission" or "inhibition"

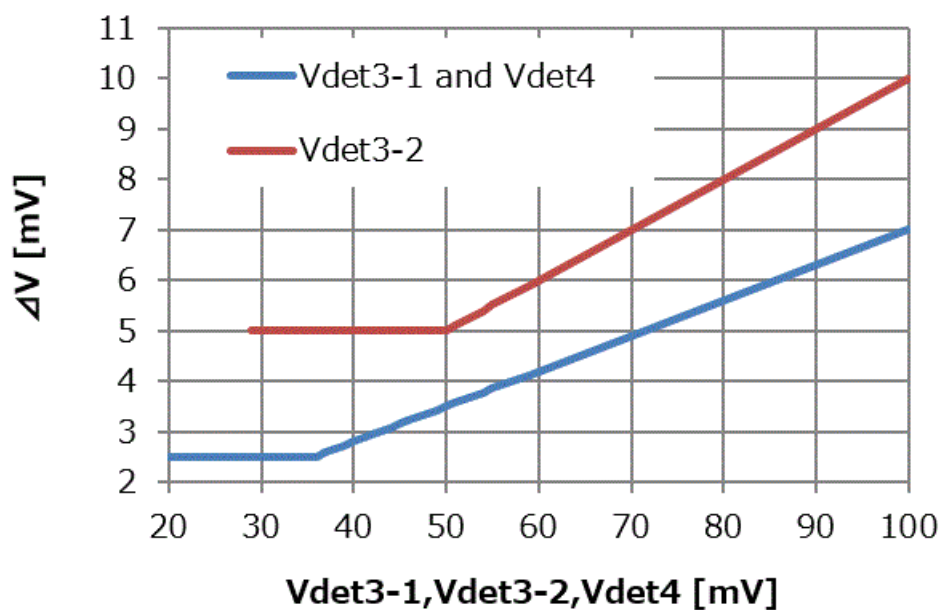
(3) Current consumption

- Normal mode 2.5uA typ.4.0uA max.
- Standby mode 0.1uA max. (Overdischarge latch function enable.)
0.6uA max. (Overdischarge latch function disable.)

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*1 Accuracy of overcurrent detection voltage



Specifications

Product name	Package	0V battery charge function	Overcharge release function	Overdischarge release function	Discharging overcurrent release function	Overcharge detection voltage [V]
MM3856AF1RRE	SSON-6J	Prohibition	voltage	voltage	voltage	4.475
MM3856AJ2YLE	SON-6C	Permission	voltage	voltage	voltage	4.525
MM3856AM1YLE	SON-6C	Prohibition	voltage	voltage	voltage	4.475
MM3856AM1RR4	SSON-6UorV	Prohibition	voltage	voltage	voltage	4.475
MM3856AM2YLE	SON-6C	Prohibition	voltage	voltage	voltage	4.520
MM3856AM2RR4	SSON-6UorV	Prohibition	voltage	voltage	voltage	4.520

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Product name	Package	Protection	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]
MM3856AM4YLE	SON-6C	Prohibition	voltage	voltage	voltage	voltage	voltage	voltage	4.220
MM3856AN2YLE	SON-6C	Permission	voltage	voltage	voltage	voltage	voltage	voltage	4.520
MM3856AN3YLE	SON-6C	Permission	voltage	voltage	voltage	voltage	voltage	voltage	4.475
MM3856AN3RLE	SSON-6J	Permission	voltage	voltage	voltage	voltage	voltage	voltage	4.475
MM3856AN4YLE	SON-6C	Permission	voltage	voltage	voltage	voltage	voltage	voltage	4.520
MM3856AN4RLE	SSON-6J	Permission	voltage	voltage	voltage	voltage	voltage	voltage	4.520
MM3856AN5YLE	SON-6C	Permission	voltage	voltage	voltage	voltage	voltage	voltage	4.475
MM3856AN6YLE	SON-6C	Permission	voltage	voltage	voltage	voltage	voltage	voltage	4.520
MM3856AN7YRE	SON-6C	Permission	voltage	voltage	voltage	voltage	voltage	voltage	4.475
MM3856AN8YRE	SON-6C	Permission	voltage	voltage	voltage	voltage	voltage	voltage	4.520
MM3856AN9YLE	SON-6C	Permission	voltage	voltage	voltage	voltage	voltage	voltage	4.520
MM3856EF1RRE	SSON-6J	Prohibition	Latch	Latch	Latch	voltage	voltage	voltage	4.275
MM3856EN1YLE	SON-6C	Permission	Latch	Latch	Latch	voltage	voltage	voltage	4.230
MM3856EN2RRE	SSON-6J	Permission	Latch	Latch	Latch	voltage	voltage	voltage	4.275
MM3856EN3RRE	SSON-6J	Permission	Latch	Latch	Latch	voltage	voltage	voltage	4.275
MM3856JF1RRE	SSON-6J	Prohibition	Latch	Latch	Latch	voltage	voltage	voltage	4.250
MM3856JF2RRE	SSON-6J	Prohibition	Latch	Latch	Latch	voltage	voltage	voltage	4.300
MM3856KF5RRE	SSON-6J	Prohibition	Latch	Latch	Latch	voltage	voltage	voltage	4.500
MM3856MM1YLE	SON-6C	Prohibition	voltage	voltage	voltage	voltage	voltage	voltage	4.475
MM3856MM2YLE	SON-6C	Prohibition	voltage	voltage	voltage	voltage	voltage	voltage	4.520

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]
MM3856AF1RRE	4.275	2.800	3.000	0.0170	0.0300	-0.0170	0.055
MM3856AJ2YLE	4.350	2.100	2.300	0.0205	0.0295	-0.0335	0.070
MM3856AM1YLE	4.275	2.500	2.900	0.0210		-0.0210	0.080
MM3856AM1RR4	4.275	2.500	2.900	0.0210		-0.0210	0.080
MM3856AM2YLE	4.320	2.100	2.300	0.0210		-0.0240	0.100
MM3856AM2RR4	4.320	2.100	2.300	0.0210		-0.0240	0.100
MM3856AM4YLE	4.165	2.500	2.900	0.0225		-0.0225	0.045
MM3856AN2YLE	4.320	2.300	2.700	0.0360		-0.0300	0.100

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MM3856AN3YLE	4.275	2.500	2.900	0.0210		-0.0270	0.080
MM3856AN3RLE	4.275	2.500	2.900	0.0210		-0.0270	0.080
MM3856AN4YLE	4.320	2.100	2.300	0.0210		-0.0330	0.100
MM3856AN4RLE	4.320	2.100	2.300	0.0210		-0.0330	0.100
MM3856AN5YLE	4.275	2.500	2.900	0.0210		-0.0210	0.080
MM3856AN6YLE	4.320	2.100	2.300	0.0210		-0.0240	0.100
MM3856AN7YRE	4.275	2.600	3.000	0.0210		-0.0210	0.050
MM3856AN8YRE	4.320	2.300	2.700	0.0210		-0.0210	0.070
MM3856AN9YLE	4.320	2.300	2.700	0.0225		-0.0270	0.110
MM3856EF1RRE	4.275	2.350	2.350	0.0300	0.0450	-0.0200	0.150
MM3856EN1YLE	4.230	2.500	2.500	0.0235		-0.0225	0.075
MM3856EN2RRE	4.275	2.300	2.300	0.0175		-0.0150	0.084
MM3856EN3RRE	4.275	2.200	2.200	0.0175		-0.0150	0.084
MM3856JF1RRE	4.250	2.300	2.500	0.0320	0.0420	-0.0200	0.070
MM3856JF2RRE	4.300	2.200	2.400	0.0380	0.0480	-0.0240	0.075
MM3856KF5RRE	4.500	2.400	2.400	0.0360		-0.0280	0.090
MM3856MM1YLE	4.275	2.500	2.900	0.0210		-0.0210	0.080
MM3856MM2YLE	4.320	2.100	2.300	0.0210		-0.0240	0.100

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]
MM3856AF1RRE	1.024	16.0	256.0	1.0	128.0	16.0	1.00
MM3856AJ2YLE	1.024	1.0	64.0	1.0	4096.0	16.0	8.00
MM3856AM1YLE	1.024	1.0	64.0	1.0	224.0		8.00
MM3856AM1RR4	1.024	1.0	64.0	1.0	224.0		8.00
MM3856AM2YLE	1.024	1.0	64.0	1.0	448.0		8.00
MM3856AM2RR4	1.024	1.0	64.0	1.0	448.0		8.00
MM3856AM4YLE	1.024	1.0	20.0	1.0	32.0		8.00
MM3856AN2YLE	1.024	1.0	64.0	1.0	32.0		8.00
MM3856AN3YLE	1.024	1.0	64.0	1.0	224.0		8.00
MM3856AN3RLE	1.024	1.0	64.0	1.0	224.0		8.00
MM3856AN4YLE	1.024	1.0	64.0	1.0	448.0		8.00
MM3856AN4RLE	1.024	1.0	64.0	1.0	448.0		8.00
MM3856AN5YLE	1.024	1.0	64.0	1.0	224.0		8.00
MM3856AN6YLE	1.024	1.0	64.0	1.0	448.0		8.00
MM3856AN7YRE	1.024	1.0	64.0	1.0	16.0		8.00
MM3856AN8YRE	1.024	1.0	64.0	1.0	32.0		8.00

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MM3856AN9YLE	1.024	1.0	40.0	1.0	64.0		8.00
MM3856EF1RRE	1.024	16.0	20.0	1.0	5120.0	12.0	1.00
MM3856EN1YLE	1.024	1.0	20.0	1.0	32.0		8.00
MM3856EN2RRE	1.024	16.0	96.0	1.0	512.0		1.00
MM3856EN3RRE	1.024	32.0	256.0	1.0	1280.0		1.00
MM3856JF1RRE	1.024	16.0	128.0	4.0	128.0	8.0	4.00
MM3856JF2RRE	2.048	16.0	256.0	4.0	256.0	16.0	4.00
MM3856KF5RRE	1.024	16.0	2048.0	1.0	2048.0		4.00
MM3856MM1YLE	1.024	1.0	64.0	1.0	16.0		8.00
MM3856MM2YLE	1.024	1.0	64.0	1.0	32.0		8.00

Product name	Charging overcurrent detection delay time [ms]	Charging overcurrent release delay time [ms]	Short detection delay time [ms]
MM3856AF1RRE	64.0	1.0	0.300
MM3856AJ2YLE	16.0	4.0	0.280
MM3856AM1YLE	16.0	1.0	0.250
MM3856AM1RR4	16.0	1.0	0.250
MM3856AM2YLE	16.0	1.0	0.250
MM3856AM2RR4	16.0	1.0	0.250
MM3856AM4YLE	16.0	1.0	0.250
MM3856AN2YLE	16.0	1.0	0.400
MM3856AN3YLE	16.0	1.0	0.250
MM3856AN3RLE	16.0	1.0	0.250
MM3856AN4YLE	16.0	1.0	0.250
MM3856AN4RLE	16.0	1.0	0.250
MM3856AN5YLE	16.0	1.0	0.250
MM3856AN6YLE	16.0	1.0	0.250
MM3856AN7YRE	8.0	1.0	0.280
MM3856AN8YRE	16.0	1.0	0.530
MM3856AN9YLE	16.0	1.0	0.280
MM3856EF1RRE	16.0	1.0	0.250
MM3856EN1YLE	16.0	1.0	0.250
MM3856EN2RRE	10.0	1.0	0.300
MM3856EN3RRE	20.0	1.0	0.530
MM3856JF1RRE	48.0	4.0	0.250
MM3856JF2RRE	64.0	4.0	0.560
MM3856KF5RRE	16.0	1.0	0.280

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MM3856MM1YLE	16.0	1.0	0.250
MM3856MM2YLE	16.0	1.0	0.250

Package

[SSON-6J](#)[SSON-6M](#)[SON-6C](#)[SSON-6U](#)[SSON-6V](#)