

# MM3638 Series

2023/07/20

## Outline

MM3638 series are protection IC for lithium-ion and lithium-polymer battery. MM3638 protects the battery pack from overcharge, overdischarge, and overcurrent, etc. by controlling FET SW.

In the One-cell battery pack, on resistance of the FET SW has been used for overcurrent detection. MM3638 realize overcurrent protection with high accuracy and with no temperature dependence by using a chip resistor.

## 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 +65mV, 1mV steps Accuracy±15%  
+65mV to +300mV, 5mV steps Accuracy±10mV
- Charging overcurrent detection voltage -65mV to -20mV, 1mV steps Accuracy±15%  
-300mV to -65mV, 5mV steps Accuracy±10mV
- Short detection voltage 0.4V/0.5V/0.6V Accuracy±150mV  
0.9V Accuracy±300mV

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 Selection from 250μs, 400μs

## MM3638 Series

2023/07/20

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

4) Low current consumption

● Normal mode Typ. 3.0μA, Max. 6.0μA

● Stand-by mode Max. 0.1μA (For "Charger connection release" the overdischarge release condition.)

Max. 0.6μA (For "Voltage release" the overdischarge release condition.)

## Specifications

Product name	Package	0V battery charge function	Overcharge release function	Overdischarge release function	Discharging overcurrent release function	Overcharge detection voltage [V]
MM3638A01RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.280
MM3638A01YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.280
MM3638A02RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.405
MM3638A02YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.405
MM3638A03RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.280
MM3638B01RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.275
MM3638B01YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.275
MM3638B02YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.425
MM3638D01YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.225
MM3638D02YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.225
MM3638D03YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.225
MM3638D04YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.275
MM3638D05YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.225
MM3638D06YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.375
MM3638D07YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.325
MM3638DA1YRE	SON-6C	Prohibition	voltage	voltage	voltage	4.400
MM3638E01RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.280
MM3638E02RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.280
MM3638E04RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.405

## MM3638 Series

2023/07/20

MM3638E09YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.280
MM3638E12RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.380
MM3638E13RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.380
MM3638E15RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.280
MM3638F01YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.425
MM3638F01RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.425
MM3638F03RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.275
MM3638F04RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.280
MM3638F07RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.405
MM3638F09RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.230
MM3638F11RRE	SSON-6J	Prohibition	voltage	Latch	Latch	4.430
MM3638F12YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.430
MM3638F14RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.420
MM3638F16RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.370
MM3638F17RRE	SSON-6J	Prohibition	voltage	Latch	Latch	4.420
MM3638F19YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.425
MM3638F20YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.425
MM3638F21YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.425
MM3638F22YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.425
MM3638F22RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.425
MM3638F23RRE	SSON-6J	Prohibition	voltage	Latch	Latch	4.375
MM3638F26RRE	SSON-6J	Prohibition	Latch	voltage	voltage	4.280
MM3638FH1RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.470
MM3638G02YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.225
MM3638G05YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.225
MM3638H01YRE	SON-6C	Permission	voltage	voltage	voltage	4.280
MM3638KA1YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.470

## MM3638 Series

2023/07/20

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]
MM3638A01RRE	4.280	2.400	2.400	0.025	-0.0200	0.900	1.000
MM3638A01YRE	4.280	2.400	2.400	0.025	-0.0200	0.900	1.000
MM3638A02RRE	4.405	2.400	2.400	0.032	-0.0200	0.900	1.000
MM3638A02YRE	4.405	2.400	2.400	0.032	-0.0200	0.900	1.000
MM3638A03RRE	4.280	2.400	2.400	0.032	-0.0300	0.900	1.000
MM3638B01RRE	4.275	2.100	2.100	0.047	-0.0250	0.600	1.000
MM3638B01YRE	4.275	2.100	2.100	0.047	-0.0250	0.600	1.000
MM3638B02YRE	4.425	2.100	2.100	0.047	-0.0250	0.600	1.000
MM3638D01YRE	4.025	2.500	2.500	0.075	-0.0480	0.900	1.000
MM3638D02YRE	4.025	2.500	2.500	0.075	-0.0480	0.900	1.000
MM3638D03YRE	4.025	2.500	2.500	0.075	-0.0600	0.900	1.000
MM3638D04YRE	4.075	2.500	2.500	0.075	-0.0480	0.900	1.000
MM3638D05YRE	4.025	2.500	2.500	0.050	-0.0380	0.900	1.000
MM3638D06YRE	4.175	2.500	2.500	0.075	-0.0600	0.900	1.000
MM3638D07YRE	4.125	2.500	2.500	0.075	-0.0600	0.900	1.000
MM3638DA1YRE	4.200	2.500	2.900	0.075	-0.0600	0.900	1.000
MM3638E01RRE	4.280	2.400	2.400	0.080	-0.0600	0.900	1.000
MM3638E02RRE	4.280	2.400	2.400	0.090	-0.0600	0.900	1.000
MM3638E04RRE	4.405	2.400	2.400	0.080	-0.0500	0.900	1.000
MM3638E09YRE	4.280	2.800	2.800	0.075	-0.0600	0.600	1.000
MM3638E12RRE	4.380	2.800	2.800	0.085	-0.0500	0.600	1.000
MM3638E13RRE	4.380	2.800	2.800	0.085	-0.0500	0.600	1.000
MM3638E15RRE	4.080	2.800	2.800	0.025	-0.0200	0.600	1.000
MM3638F01YRE	4.425	2.500	2.500	0.030	-0.0300	0.600	1.000
MM3638F01RRE	4.425	2.500	2.500	0.030	-0.0300	0.600	1.000
MM3638F03RRE	4.275	2.350	2.350	0.047	-0.0250	0.600	1.000
MM3638F04RRE	4.280	2.400	2.400	0.032	-0.0300	0.600	1.000
MM3638F07RRE	4.405	2.400	2.400	0.032	-0.0250	0.400	1.000
MM3638F09RRE	4.230	2.800	2.800	0.080	-0.0600	0.500	1.000
MM3638F11RRE	4.330	2.400	2.400	0.032	-0.0300	0.600	1.000
MM3638F12YRE	4.230	2.300	2.300	0.030	-0.0300	0.600	1.000
MM3638F14RRE	4.420	2.300	2.300	0.024	-0.0200	0.400	1.000
MM3638F16RRE	4.370	2.300	2.300	0.024	-0.0200	0.400	1.000
MM3638F17RRE	4.320	2.300	2.300	0.029	-0.0270	0.600	1.000
MM3638F19YRE	4.425	2.400	2.400	0.030	-0.0300	0.600	1.000

## MM3638 Series

2023/07/20

MM3638F20YRE	4.425	2.400	2.400	0.030	-0.0300	0.400	1.000
MM3638F21YRE	4.425	2.400	2.400	0.037	-0.0230	0.400	1.000
MM3638F22YRE	4.425	2.800	2.800	0.030	-0.0230	0.400	1.000
MM3638F22RRE	4.425	2.800	2.800	0.030	-0.0230	0.400	1.000
MM3638F23RRE	4.275	2.300	2.300	0.029	-0.0270	0.600	1.000
MM3638F26RRE	4.280	2.300	2.800	0.030	-0.0200	0.600	1.000
MM3638FH1RRE	4.470	2.465	2.465	0.040	-0.0250	0.600	1.000
MM3638G02YRE	4.025	2.800	2.800	0.060	-0.0250	0.900	1.000
MM3638G05YRE	4.025	2.500	2.500	0.025	-0.0230	0.900	1.000
MM3638H01YRE	4.180	2.300	2.500	0.032	-0.0320	0.600	1.000
MM3638KA1YRE	4.470	2.465	2.465	0.040	-0.0300	0.600	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 time [ms]
MM3638A01RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638A01YRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638A02RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638A02YRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638A03RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638B01RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638B01YRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638B02YRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638D01YRE	2.0	96.0	4.0	12.0	4.00	6.0	4.0
MM3638D02YRE	2.0	96.0	4.0	12.0	4.00	6.0	4.0
MM3638D03YRE	2.0	96.0	4.0	12.0	4.00	6.0	4.0
MM3638D04YRE	2.0	96.0	4.0	12.0	4.00	6.0	4.0
MM3638D05YRE	2.0	96.0	4.0	12.0	4.00	6.0	4.0
MM3638D06YRE	2.0	96.0	4.0	12.0	4.00	6.0	4.0
MM3638D07YRE	2.0	96.0	4.0	12.0	4.00	6.0	4.0
MM3638DA1YRE	2.0	96.0	4.0	12.0	4.00	6.0	4.0
MM3638E01RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638E02RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638E04RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638E09YRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638E12RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638E13RRE	16.0	125.0	1.0	48.0	1.00	8.0	1.0
MM3638E15RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0

## MM3638 Series

2023/07/20

MM3638F01YRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638F01RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638F03RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638F04RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638F07RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638F09RRE	16.0	20.0	1.0	12.0	1.00	16.0	1.0
MM3638F11RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638F12YRE	16.0	125.0	1.0	16.0	1.00	8.0	1.0
MM3638F14RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638F16RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638F17RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638F19YRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638F20YRE	16.0	125.0	1.0	16.0	1.00	8.0	1.0
MM3638F21YRE	16.0	125.0	1.0	16.0	1.00	8.0	1.0
MM3638F22YRE	16.0	125.0	1.0	16.0	1.00	8.0	1.0
MM3638F22RRE	16.0	125.0	1.0	16.0	1.00	8.0	1.0
MM3638F23RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638F26RRE	16.0	125.0	1.0	24.0	1.00	8.0	1.0
MM3638FH1RRE	16.0	125.0	1.0	8.0	1.00	8.0	1.0
MM3638G02YRE	2.0	125.0	4.0	48.0	4.00	8.0	4.0
MM3638G05YRE	2.0	96.0	4.0	12.0	4.00	6.0	4.0
MM3638H01YRE	16.0	125.0	1.0	16.0	1.00	8.0	1.0
MM3638KA1YRE	16.0	128.0	1.0	8.0	1.00	8.0	1.0

Product name	Short detection delay time [ms]
MM3638A01RRE	0.250
MM3638A01YRE	0.250
MM3638A02RRE	0.250
MM3638A02YRE	0.250
MM3638A03RRE	0.250
MM3638B01RRE	0.250
MM3638B01YRE	0.250
MM3638B02YRE	0.250
MM3638D01YRE	0.400
MM3638D02YRE	0.400
MM3638D03YRE	0.400
MM3638D04YRE	0.400
MM3638D05YRE	0.400

## MM3638 Series

2023/07/20

MM3638D06YRE	0.400
MM3638D07YRE	0.400
MM3638DA1YRE	0.400
MM3638E01RRE	0.250
MM3638E02RRE	0.250
MM3638E04RRE	0.250
MM3638E09YRE	0.250
MM3638E12RRE	0.250
MM3638E13RRE	0.250
MM3638E15RRE	0.250
MM3638F01YRE	0.250
MM3638F01RRE	0.250
MM3638F03RRE	0.250
MM3638F04RRE	0.250
MM3638F07RRE	0.250
MM3638F09RRE	0.250
MM3638F11RRE	0.250
MM3638F12YRE	0.250
MM3638F14RRE	0.250
MM3638F16RRE	0.250
MM3638F17RRE	0.250
MM3638F19YRE	0.250
MM3638F20YRE	0.250
MM3638F21YRE	0.250
MM3638F22YRE	0.250
MM3638F22RRE	0.250
MM3638F23RRE	0.250
MM3638F26RRE	0.250
MM3638FH1RRE	0.250
MM3638G02YRE	0.250
MM3638G05YRE	0.400
MM3638H01YRE	0.250
MM3638KA1YRE	0.250

## Package

[SSON-6J](#)[SON-6C](#)

ミネベアミツミ株式会社

Copyright©MinebeaMitsumi Inc. All right reserved.

## MM3638 Series

2023/07/20