

MM3511 Series

2023/07/20

Outline

MM3511 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, and short protection of the rechargeable one-cell Lithium-ion or Lithium-polymer battery can be detected. Each of these IC composed of four voltage detectors, short detection circuit, reference voltage sources, oscillator, counter circuit and logical circuits.

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 \pm 20mV
- Overcharge release voltage 3.6V to 4.5V, 50mV steps Accuracy \pm 30mV
- Overdischarge detection voltage 2.0V to 3.0V, 50mV steps Accuracy \pm 35mV
- Overdischarge release voltage 2.0V to 3.5V, 50mV steps Accuracy \pm 100mV
- Discharging overcurrent detection voltage +50mV to +300mV, 5mV steps Accuracy \pm 10mV
- Charging overcurrent detection voltage -300mV to -50mV, 5mV steps Accuracy \pm 20mV
- Short detection voltage 0.5V fixed Accuracy \pm 100mV

2. Range of detection delay time

- Overcharge detection delay time Selection from 143ms, 573ms, 1.0s, 1.2s
- Overdischarge detection delay time Selection from 20ms, 38ms, 64ms, 75ms, 96ms, 150ms
- Discharging overcurrent detection delay time Selection from 4.5ms, 8ms, 9ms, 12ms, 18ms
- Charging overcurrent detection delay time Selection from 4.5ms, 6ms, 8ms, 9ms, 16ms
- Short detection delay time Selection from 250 μ s, 300 μ s, 400 μ s

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

MM3511 Series

2023/07/20

4. 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]
MM3511A16YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511A46YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511A56YRE	SON-6C	Permission	voltage	Latch	voltage	4.280
MM3511A66YRE	SON-6C	Permission	voltage	Latch	voltage	4.280
MM3511A76YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511A86YRE	SON-6C	Permission	voltage	Latch	voltage	4.300
MM3511AA6YRE	SON-6C	Permission	voltage	Latch	voltage	4.225
MM3511AB6YRE	SON-6C	Permission	voltage	Latch	voltage	4.225
MM3511C16YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.280
MM3511C26YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.280
MM3511C36YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.280
MM3511C46YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.280
MM3511C66YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.280
MM3511C76YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.280
MM3511C96YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.280
MM3511CA6YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.225
MM3511E16YRE	SON-6C	Permission	voltage	Latch	voltage	4.325
MM3511G16YRE	SON-6C	Permission	voltage	Latch	voltage	4.350
MM3511H16YRE	SON-6C	Permission	voltage	Latch	voltage	4.280
MM3511H26YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511H46YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511K26YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511K36YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511K46YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511K76YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511K86YRE	SON-6C	Permission	voltage	Latch	voltage	4.275

MM3511 Series

2023/07/20

MM3511L16YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511L36YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511L56YRE	SON-6C	Permission	voltage	Latch	voltage	4.350
MM3511L66YRE	SON-6C	Permission	voltage	Latch	voltage	4.275
MM3511L86YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.275
MM3511L96YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.275
MM3511LA6YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.375
MM3511M16RRE	SSON-6A	Prohibition	Latch	Latch	voltage	4.275
MM3511M16YRE	SON-6C	Prohibition	Latch	Latch	voltage	4.275
MM3511N16YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.280
MM3511W16YRE	SON-6C	Permission	voltage	voltage	voltage	4.225
MM3511W26YRE	SON-6C	Permission	voltage	voltage	voltage	4.375
MM3511WA6YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.390
MM3511WB6YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.390

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]
MM3511A16YRE	4.175	2.300	2.400	0.100	-0.1000	0.500	1.200
MM3511A46YRE	4.075	2.300	2.300	0.150	-0.1000	0.500	1.200
MM3511A56YRE	4.280	2.800	2.800	0.050	-0.1000	0.500	1.200
MM3511A66YRE	4.280	3.000	3.000	0.075	-0.1000	0.500	1.200
MM3511A76YRE	4.175	2.300	2.400	0.050	-0.1000	0.500	1.200
MM3511A86YRE	4.100	2.300	2.300	0.130	-0.1000	0.500	1.200
MM3511AA6YRE	4.025	2.800	2.800	0.150	-0.1000	0.500	1.200
MM3511AB6YRE	4.025	3.000	3.000	0.060	-0.0600	0.500	1.200
MM3511C16YRE	4.080	2.300	2.300	0.100	-0.1000	0.500	1.200
MM3511C26YRE	4.080	2.300	2.300	0.130	-0.1000	0.500	1.200
MM3511C36YRE	4.130	2.600	3.100	0.150	-0.1000	0.500	1.200
MM3511C46YRE	4.130	2.800	3.100	0.150	-0.1000	0.500	1.200
MM3511C66YRE	4.130	2.800	3.100	0.100	-0.1000	0.500	1.200
MM3511C76YRE	4.130	2.800	3.100	0.050	-0.1000	0.500	1.200
MM3511C96YRE	4.130	2.800	2.800	0.150	-0.1000	0.500	1.200
MM3511CA6YRE	4.025	2.300	2.300	0.150	-0.1200	0.500	1.200
MM3511E16YRE	4.075	2.500	2.900	0.150	-0.1000	0.500	1.200
MM3511G16YRE	4.150	2.300	3.000	0.200	-0.1000	0.500	0.143
MM3511H16YRE	4.180	2.300	2.300	0.120	-0.1000	0.500	1.200
MM3511H26YRE	4.075	2.800	3.100	0.100	-0.1000	0.500	1.200

MM3511 Series

2023/07/20

MM3511H46YRE	4.175	2.400	2.400	0.120	-0.1000	0.500	1.200
MM3511K26YRE	4.075	2.300	2.300	0.120	-0.1000	0.500	1.200
MM3511K36YRE	4.075	2.300	2.300	0.130	-0.1000	0.500	1.200
MM3511K46YRE	4.075	2.300	2.300	0.150	-0.1000	0.500	1.200
MM3511K76YRE	4.075	2.300	2.300	0.130	-0.1300	0.500	1.200
MM3511K86YRE	4.075	2.600	2.600	0.110	-0.0850	0.500	1.200
MM3511L16YRE	4.075	2.600	2.600	0.100	-0.0850	0.500	1.200
MM3511L36YRE	4.075	2.600	2.600	0.180	-0.1200	0.500	1.200
MM3511L56YRE	4.150	2.300	2.300	0.130	-0.1000	0.500	1.200
MM3511L66YRE	4.075	2.600	2.600	0.150	-0.1000	0.500	1.200
MM3511L86YRE	4.075	2.600	2.600	0.100	-0.0800	0.500	1.200
MM3511L96YRE	4.275	2.600	2.600	0.100	-0.0800	0.500	1.200
MM3511LA6YRE	4.375	3.000	3.000	0.150	-0.1500	0.500	1.200
MM3511M16RRE	4.275	2.500	2.500	0.160	-0.1000	0.500	1.200
MM3511M16YRE	4.275	2.500	2.500	0.160	-0.1000	0.500	1.200
MM3511N16YRE	4.080	2.400	2.400	0.050	-0.1000	0.500	1.200
MM3511W16YRE	4.025	2.500	2.900	0.150	-0.1500	0.900	1.000
MM3511W26YRE	4.175	2.400	2.800	0.145	-0.1450	0.900	1.000
MM3511WA6YRE	4.190	2.500	2.500	0.130	-0.1250	0.500	1.000
MM3511WB6YRE	4.190	2.500	2.500	0.200	-0.1250	0.500	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]
MM3511A16YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511A46YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511A56YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511A66YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511A76YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511A86YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511AA6YRE	2.3	75.0	2.3	9.0	0.30	9.0	0.3
MM3511AB6YRE	2.3	75.0	2.3	9.0	0.30	9.0	0.3
MM3511C16YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511C26YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511C36YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511C46YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511C66YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511C76YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3

MM3511 Series

2023/07/20

MM3511C96YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511CA6YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511E16YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511G16YRE	2.3	38.0	2.3	18.0	0.30	9.0	0.3
MM3511H16YRE	2.3	150.0	2.3	18.0	0.30	9.0	0.3
MM3511H26YRE	2.3	150.0	2.3	18.0	0.30	9.0	0.3
MM3511H46YRE	2.3	150.0	2.3	18.0	0.30	9.0	0.3
MM3511K26YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511K36YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511K46YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511K76YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511K86YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511L16YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511L36YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511L56YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511L66YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511L86YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511L96YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511LA6YRE	2.3	38.0	2.3	9.0	0.30	9.0	0.3
MM3511M16RRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511M16YRE	2.3	150.0	2.3	9.0	0.30	9.0	0.3
MM3511N16YRE	2.3	150.0	2.3	4.5	0.30	9.0	0.3
MM3511W16YRE	2.0	96.0	4.0	12.0	4.00	6.0	4.0
MM3511W26YRE	16.0	20.0	1.0	12.0	4.00	16.0	4.0
MM3511WA6YRE	16.0	64.0	1.0	8.0	4.00	8.0	4.0
MM3511WB6YRE	16.0	64.0	1.0	8.0	4.00	8.0	4.0

Product name	Short detection delay time [ms]
MM3511A16YRE	0.300
MM3511A46YRE	0.300
MM3511A56YRE	0.300
MM3511A66YRE	0.300
MM3511A76YRE	0.300
MM3511A86YRE	0.300
MM3511AA6YRE	0.300
MM3511AB6YRE	0.300
MM3511C16YRE	0.300
MM3511C26YRE	0.300

MM3511 Series

2023/07/20

MM3511C36YRE	0.300
MM3511C46YRE	0.300
MM3511C66YRE	0.300
MM3511C76YRE	0.300
MM3511C96YRE	0.300
MM3511CA6YRE	0.300
MM3511E16YRE	0.400
MM3511G16YRE	0.300
MM3511H16YRE	0.300
MM3511H26YRE	0.300
MM3511H46YRE	0.300
MM3511K26YRE	0.300
MM3511K36YRE	0.300
MM3511K46YRE	0.300
MM3511K76YRE	0.300
MM3511K86YRE	0.300
MM3511L16YRE	0.300
MM3511L36YRE	0.300
MM3511L56YRE	0.300
MM3511L66YRE	0.300
MM3511L86YRE	0.300
MM3511L96YRE	0.300
MM3511LA6YRE	0.300
MM3511M16RRE	0.300
MM3511M16YRE	0.300
MM3511N16YRE	0.300
MM3511W16YRE	0.400
MM3511W26YRE	0.400
MM3511WA6YRE	0.250
MM3511WB6YRE	0.250

Package

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