

MM3825 Series

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Outline

The MM3825 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 voltage

- Overcharge detection voltage 3.6V to 5.0V, 5mV steps Accuracy \pm 20mV
- Overdischarge detection voltage 2.0V to 3.0V, 50mV steps Accuracy \pm 35mV
- Discharging overcurrent detection voltage +20mV to +300mV, 1mV steps Accuracy \pm 2.5mV
- Charging overcurrent detection voltage -300mV to -20mV, 1mV steps Accuracy \pm 2.5mV
- Short detection voltage +70mV to +350mV, 1mV steps Accuracy \pm 8%
- 0V Battery Charging Inhibition Voltage 0.9VFix. or 1.1V~2.4V, 0.1V steps Accuracy \pm 0.3V (0.9V)
Accuracy \pm 0.1V (1.1V~2.4V)

2) Low current consumption (Normal)

- Normal mode Typ. 2.5 μ A, Max. 4.0 μ A
- Stand-by mode (Overdischarge Latch "ENABLE") Max. 0.1 μ A
- Stand-by mode (Overdischarge Latch "DISABLE") Max. 0.5 μ A

3) Low current consumption (MM3825Txx series)

- Normal mode Typ. 2.0 μ A, Max. 3.0 μ A
- Stand-by mode (Overdischarge Latch "ENABLE") Max. 0.05 μ A

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- Stand-by mode (Overdischarge Latch "DISABLE") Max. 0.5μA

Specifications

Product name	Package	0V battery charge function	Overcharge release function	Overdischarge release function	Discharging overcurrent release function	Overcharge detection voltage [V]
MM3825AC7YLE	SON-6C	Prohibition	voltage	voltage	voltage	4.550
MM3825ACCYLE	SON-6C	Prohibition	voltage	voltage	voltage	4.475
MM3825ACDYLE	SON-6C	Prohibition	voltage	voltage	voltage	4.480
MM3825CM1RRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.275
MM3825CM3YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.475
MM3825CN3YRE	SON-6C	Permission	voltage	Latch	voltage	4.475
MM3825EE1RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.450
MM3825EM4RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.500
MM3825EM5RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.275
MM3825EM6RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.570
MM3825EN1RRE	SSON-6J	Permission	Latch	Latch	voltage	4.450
MM3825EN2RRE	SSON-6J	Permission	Latch	Latch	voltage	4.375
MM3825EN3RRE	SSON-6J	Permission	Latch	Latch	voltage	4.275
MM3825EN4RRE	SSON-6J	Permission	Latch	Latch	voltage	4.530
MM3825TM3YRE	SON-6C	Prohibition	voltage	voltage	voltage	4.475
MM3825TM4RRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.200
MM3825TM8YRE	SON-6C	Prohibition	voltage	Latch	voltage	4.470
MM3825TM9RRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.175
MM3825TMAYRE	SON-6C	Prohibition	voltage	Latch	voltage	4.495
MM3825TMDRRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.500

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MM3825TMEYRE	SON-6C	Prohibition	voltage	Latch	voltage	4.545
MM3825TMGRRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.280
MM3825TMHRRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.380
MM3825TMJRRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.280
MM3825TMKRRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.525
MM3825TMLRRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.560
MM3825TN1YRE	SON-6C	Permission	voltage	Latch	voltage	4.495
MM3825TN1RR4	SSON-6UorV	Permission	voltage	Latch	voltage	4.495
MM3825TN3RRE	SSON-6J	Permission	Latch	Latch	voltage	4.450
MM3825TN4RRE	SSON-6J	Permission	Latch	Latch	voltage	4.280
MM3825TN5RRE	SSON-6J	Permission	voltage	Latch	voltage	4.525
MM3825TN6RRE	SSON-6J	Permission	voltage	Latch	voltage	4.560

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]
MM3825AC7YLE	4.250	2.300	2.500	0.025	-0.0300	0.075	1.024
MM3825ACCYLE	4.275	2.500	2.900	0.020	-0.0200	0.070	1.024
MM3825ACDYLE	4.280	2.500	2.900	0.045	-0.0400	0.095	1.024
MM3825CM1RRE	4.175	2.400	2.400	0.090	-0.0250	0.250	1.024
MM3825CM3YRE	4.275	2.700	2.700	0.045	-0.0450	0.145	1.024
MM3825CN3YRE	4.275	2.500	2.500	0.030	-0.0300	0.105	1.024
MM3825EE1RRE	4.450	2.500	2.500	0.055	-0.0350	0.150	2.048
MM3825EM4RRE	4.500	2.500	2.500	0.030	-0.0250	0.150	1.024
MM3825EM5RRE	4.275	2.200	2.200	0.073	-0.0350	0.300	1.024
MM3825EM6RRE	4.570	2.500	2.500	0.045	-0.0250	0.150	1.024
MM3825EN1RRE	4.450	2.600	2.600	0.025	-0.0200	0.110	1.024
MM3825EN2RRE	4.375	2.600	2.600	0.050	-0.0300	0.100	1.024
MM3825EN3RRE	4.275	2.300	2.300	0.066	-0.0300	0.260	1.024
MM3825EN4RRE	4.530	2.600	2.600	0.040	-0.0200	0.110	1.024
MM3825TM3YRE	4.275	2.500	2.800	0.060	-0.0600	0.190	1.024

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MM3825TM4RRE	4.000	2.800	2.800	0.050	-0.0500	0.150	1.024
MM3825TM8YRE	4.270	2.500	2.500	0.060	-0.0600	0.190	1.024
MM3825TM9RRE	3.975	2.800	2.800	0.050	-0.0500	0.150	1.024
MM3825TMAYRE	4.295	2.500	2.700	0.060	-0.0600	0.185	1.024
MM3825TMDRRE	4.500	2.650	2.650	0.055	-0.0250	0.130	1.024
MM3825TMEYRE	4.345	2.500	2.700	0.060	-0.0600	0.185	1.024
MM3825TMGRRE	4.080	2.800	2.800	0.050	-0.1000	0.150	1.024
MM3825TMHRRE	4.180	2.800	2.800	0.050	-0.1000	0.150	1.024
MM3825TMJRRE	4.280	2.800	2.800	0.055	-0.1000	0.180	1.024
MM3825TMKRRE	4.325	2.800	2.800	0.080	-0.0800	0.200	1.024
MM3825TMLRRE	4.360	2.800	2.800	0.080	-0.0800	0.200	1.024
MM3825TN1YRE	4.295	2.500	2.500	0.045	-0.0450	0.150	1.024
MM3825TN1RR4	4.295	2.500	2.500	0.045	-0.0450	0.150	1.024
MM3825TN3RRE	4.450	2.700	2.700	0.052	-0.0200	0.100	1.024
MM3825TN4RRE	4.280	2.900	2.900	0.045	-0.0900	0.150	1.024
MM3825TN5RRE	4.325	2.800	2.800	0.040	-0.0400	0.200	1.024
MM3825TN6RRE	4.360	2.800	2.800	0.040	-0.0400	0.200	1.024

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]
MM3825AC7YLE	16.0	32.0	1.0	16.0	1.00	16.0	1.0
MM3825ACCYLE	16.0	64.0	1.0	16.0	1.00	16.0	1.0
MM3825ACDYLE	16.0	64.0	1.0	16.0	1.00	16.0	1.0
MM3825CM1RRE	16.0	32.0	1.0	24.0	1.00	8.0	1.0
MM3825CM3YRE	16.0	32.0	1.0	16.0	1.00	8.0	1.0
MM3825CN3YRE	16.0	32.0	1.0	8.0	1.00	8.0	1.0
MM3825EE1RRE	16.0	64.0	4.0	24.0	4.00	24.0	4.0
MM3825EM4RRE	16.0	128.0	4.0	96.0	4.00	16.0	4.0
MM3825EM5RRE	32.0	256.0	4.0	32.0	4.00	20.0	1.0
MM3825EM6RRE	16.0	1024.0	4.0	1024.0	4.00	16.0	4.0
MM3825EN1RRE	16.0	96.0	4.0	48.0	4.00	8.0	4.0
MM3825EN2RRE	16.0	32.0	4.0	16.0	4.00	8.0	4.0
MM3825EN3RRE	16.0	96.0	4.0	10.0	4.00	10.0	1.0
MM3825EN4RRE	16.0	640.0	4.0	640.0	4.00	8.0	4.0
MM3825TM3YRE	16.0	20.0	1.0	12.0	1.00	8.0	1.0
MM3825TM4RRE	8.0	128.0	1.0	8.0	1.00	8.0	1.0
MM3825TM8YRE	16.0	32.0	1.0	16.0	1.00	12.0	1.0
MM3825TM9RRE	3.975	2.800	2.800	0.050	-0.0500	0.150	1.024

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MM3825IM9RRE	8.0	128.0	1.0	8.0	1.00	8.0	1.0
MM3825TMAYRE	16.0	32.0	1.0	16.0	1.00	8.0	1.0
MM3825TMDRRE	16.0	1024.0	4.0	176.0	4.00	16.0	4.0
MM3825TMEYRE	16.0	32.0	1.0	16.0	1.00	8.0	1.0
MM3825TMGRRE	8.0	128.0	1.0	8.0	1.00	8.0	1.0
MM3825TMHRRE	8.0	128.0	4.0	8.0	4.00	8.0	4.0
MM3825TMJRRE	8.0	256.0	4.0	16.0	4.00	16.0	4.0
MM3825TMKRRE	16.0	64.0	4.0	16.0	4.00	16.0	4.0
MM3825TMLRRE	16.0	64.0	4.0	16.0	4.00	16.0	4.0
MM3825TN1YRE	16.0	32.0	1.0	32.0	1.00	8.0	1.0
MM3825TN1RR4	16.0	32.0	1.0	32.0	1.00	8.0	1.0
MM3825TN3RRE	16.0	512.0	4.0	136.0	4.00	8.0	4.0
MM3825TN4RRE	8.0	128.0	4.0	8.0	4.00	8.0	4.0
MM3825TN5RRE	16.0	64.0	4.0	16.0	4.00	16.0	4.0
MM3825TN6RRE	16.0	64.0	4.0	16.0	4.00	16.0	4.0

Product name	Short detection delay time [ms]
MM3825AC7YLE	0.530
MM3825ACCYLE	0.280
MM3825ACDYLE	0.280
MM3825CM1RRE	0.250
MM3825CM3YRE	0.280
MM3825CN3YRE	0.280
MM3825EE1RRE	0.300
MM3825EM4RRE	0.350
MM3825EM5RRE	0.350
MM3825EM6RRE	0.350
MM3825EN1RRE	0.250
MM3825EN2RRE	0.280
MM3825EN3RRE	0.300
MM3825EN4RRE	0.250
MM3825TM3YRE	0.280
MM3825TM4RRE	0.280
MM3825TM8YRE	0.280
MM3825TM9RRE	0.280
MM3825TMAYRE	0.280
MM3825TMDRRE	0.350
MM3825TMEYRE	0.280

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MM3825TMGRRE	0.280
MM3825TMHRRE	0.280
MM3825TMJRRE	0.560
MM3825TMKRRE	0.280
MM3825TMLRRE	0.280
MM3825TN1YRE	0.280
MM3825TN1RR4	0.280
MM3825TN3RRE	0.250
MM3825TN4RRE	0.280
MM3825TN5RRE	0.280
MM3825TN6RRE	0.280

Package

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