

MM3721 Series

2023/07/20

Outline

MM3721 series are Li-ion battery protection IC and detect charge current / discharge current with high precision by current sensing resistor (Rsns). MM3721 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 voltage

- Overcharge detection voltage 3.6V to 5.0V, 5mV step Accuracy \pm 20mV
- Overcharge release voltage V_{det1} -0.2V to V_{det1} , 5mV step Accuracy \pm 30mV
- Overdischarge detection voltage 2.0V to 3.0V, 50mV step Accuracy \pm 35mV
- Overdischarge release voltage 2.0V to 3.0V, 50mV step Accuracy $+65/-35$ mV (In case $V_{det2}=V_{rel2}$)
Accuracy $+90/-65$ mV (In case $V_{det2}\neq V_{rel2}$)
- Discharging overcurrent detection voltage 1 20mV to 150mV, 1mV step Accuracy $\pm\Delta V$ ※1
- Discharging overcurrent detection voltage 2 $V_{det3-1} + 10$ mV to 200mV, 1mV step Accuracy $\pm\Delta V$ ※1
- Charging overcurrent detection voltage -150mV to -20mV, 1mV step Accuracy $\pm\Delta V$ ※1
- Short detection voltage 0.4V to 0.9V, 0.05V step Accuracy \pm 100mV
- 0V battery charge inhibition battery voltage 1.3V to 1.8V / 0.1V step Accuracy \pm 100mV
0.9V Accuracy \pm 300mV

2) Delay time setting

- Overcharge detection delay time 256ms to 4.6s
- Overdischarge detection delay time 8ms to 256ms
- Discharging overcurrent 1 detection delay time 8ms to 7168ms
- Discharging overcurrent 2 detection delay time 6ms to 64ms ($tV_{det3-2} < tV_{det3-1}$)

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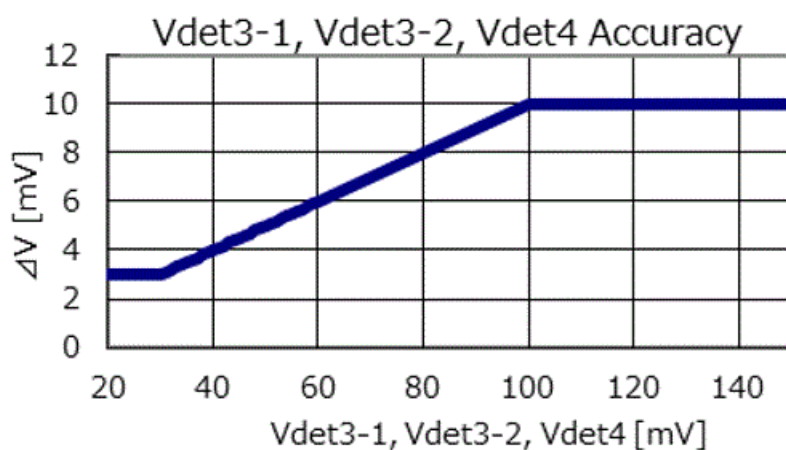
- Charging overcurrent detection delay time 6ms to 64ms
- Short detection delay time 250μs to 400μs

3) 0V battery Charge function Selectable "Permission" or "inhibition"

4) Current consumption

- Normal mode Typ. 3.0μA, Max. 6.0μA
- Stand-by mode Max. 0.1μA(In case Overdischarge latch function Enable.)
Max. 0.6μA(In case Overdischarge latch function Disable.)

*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]
MM3721CK1RRE	SSON-6J	Prohibition	voltage	Latch	Latch	4.425

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MM3721CK2RRE	SSON-6J	Prohibition	voltage	Latch	Latch	4.335
MM3721EF1RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.425
MM3721EF2RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.420
MM3721EF5RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.420
MM3721EF6RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.470
MM3721EF7RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.430
MM3721EF8RRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.275
MM3721EFBRRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.470
MM3721EFDRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.275
MM3721EFERRE	SSON-6J	Prohibition	Latch	Latch	voltage	4.400
MM3721EL1RRE	SSON-6J	Permission	Latch	Latch	voltage	4.425
MM3721EL2RRE	SSON-6J	Permission	Latch	Latch	voltage	4.475
MM3721EL3RRE	SSON-6J	Permission	Latch	Latch	voltage	4.525
MM3721FF1RRE	SSON-6J	Prohibition	voltage	voltage	voltage	4.440
MM3721FF2YRE	SON-6C	Prohibition	voltage	voltage	voltage	4.440
MM3721HF1RRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.440
MM3721HF2RRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.440
MM3721HF4RRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.485
MM3721HF7RRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.470
MM3721HF8RRE	SSON-6J	Prohibition	voltage	Latch	voltage	4.520
MM3721HL1RRE	SSON-6J	Permission	voltage	Latch	voltage	4.475
MM3721JF1YRE	SON-6C	Prohibition	Latch	voltage	voltage	4.275

Overcharge	Overdischarge	Overdischarge	Discharging overcurrent	Discharging overcurrent	Charging overcurrent	Short
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Product name	release voltage [V]	detection voltage [V]	release voltage [V]	detection voltage1 [V]	detection voltage2 [V]	detection voltage [V]	detect voltage [V]
MM3721CK1RRE	4.325	2.300	2.300	0.0290	0.0430	-0.0270	0.400
MM3721CK2RRE	4.225	2.300	2.300	0.0290	0.0430	-0.0270	0.400
MM3721EF1RRE	4.425	2.400	2.400	0.0400	0.0720	-0.0220	0.600
MM3721EF2RRE	4.420	2.300	2.300	0.0300	0.0400	-0.0200	0.400
MM3721EF5RRE	4.420	2.300	2.300	0.0320	0.0470	-0.0280	0.400
MM3721EF6RRE	4.470	2.300	2.300	0.0370	0.0540	-0.0210	0.400
MM3721EF7RRE	4.430	2.300	2.300	0.0340	0.0500	-0.0200	0.400
MM3721EF8RRE	4.275	2.300	2.300	0.0300	0.0400	-0.0200	0.400
MM3721EFBRRE	4.470	2.300	2.300	0.0320	0.0470	-0.0280	0.400
MM3721EFD RRE	4.275	2.300	2.300	0.0300	0.0400	-0.0200	0.400
MM3721EFERRE	4.400	2.300	2.300	0.0300	0.0400	-0.0200	0.400
MM3721EL1RRE	4.425	2.600	2.600	0.0300	0.0450	-0.0250	0.250
MM3721EL2RRE	4.475	2.600	2.600	0.0300	0.0450	-0.0250	0.250
MM3721EL3RRE	4.525	2.600	2.600	0.0300	0.0450	-0.0250	0.250
MM3721FF1RRE	4.240	2.300	2.600	0.0400	0.0630	-0.0200	0.800
MM3721FF2YRE	4.240	2.300	2.600	0.0640	0.0950	-0.0220	0.800
MM3721HF1RRE	4.240	2.300	2.300	0.0250	0.0380	-0.0200	0.400
MM3721HF2RRE	4.240	2.300	2.300	0.0250	0.0340	-0.0200	0.400
MM3721HF4RRE	4.285	2.300	2.300	0.0250	0.0340	-0.0200	0.400
MM3721HF7RRE	4.250	2.400	2.400	0.0240	0.0350	-0.0200	0.400
MM3721HF8RRE	4.310	2.300	2.300	0.0240	0.0350	-0.0200	0.400
MM3721HL1RRE	4.275	2.500	2.500	0.0250	0.0340	-0.0250	0.400
MM3721JF1YRE	4.275	2.300	2.600	0.0280	0.0420	-0.0240	0.400

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]
MM3721CK1RRE	1.024	16.0	125.0	1.0	80.0	8.0	1.00
MM3721CK2RRE	1.024	16.0	125.0	1.0	80.0	8.0	1.00
MM3721EF1RRE	1.024	16.0	125.0	1.0	3072.0	10.0	1.00
MM3721EF2RRE	1.024	16.0	125.0	1.0	5120.0	8.0	1.00
MM3721EF5RRE	1.024	16.0	125.0	1.0	5120.0	8.0	1.00
MM3721EF6RRE	1.024	16.0	125.0	1.0	5120.0	8.0	1.00
MM3721EF7RRE	1.024	16.0	125.0	1.0	5120.0	8.0	1.00
MM3721EF8RRE	1.024	16.0	125.0	1.0	5120.0	8.0	1.00

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MM3721EFBRRE	1.024	16.0	125.0	1.0	2304.0	8.0	1.00
MM3721EFDRE	1.024	16.0	125.0	1.0	5120.0	32.0	1.00
MM3721EFERRE	1.024	16.0	125.0	1.0	5120.0	32.0	1.00
MM3721EL1RRE	1.024	16.0	125.0	1.0	5120.0	16.0	1.00
MM3721EL2RRE	1.024	16.0	125.0	1.0	5120.0	16.0	1.00
MM3721EL3RRE	1.024	16.0	125.0	1.0	5120.0	16.0	1.00
MM3721FF1RRE	4.600	16.0	96.0	1.0	160.0	16.0	1.00
MM3721FF2YRE	4.600	16.0	96.0	1.0	160.0	16.0	1.00
MM3721HF1RRE	4.600	16.0	96.0	1.0	448.0	24.0	1.00
MM3721HF2RRE	4.600	16.0	96.0	1.0	448.0	24.0	1.00
MM3721HF4RRE	4.600	16.0	96.0	1.0	448.0	24.0	1.00
MM3721HF7RRE	1.024	16.0	96.0	1.0	160.0	8.0	2.00
MM3721HF8RRE	1.024	16.0	96.0	1.0	256.0	16.0	2.00
MM3721HL1RRE	1.024	16.0	96.0	1.0	448.0	24.0	1.00
MM3721JF1YRE	1.024	16.0	125.0	1.0	5120.0	8.0	1.00

Product name	Charging overcurrent detection delay time [ms]	Charging overcurrent release delay time [ms]	Short detection delay time [ms]
MM3721CK1RRE	8.0	1.0	0.250
MM3721CK2RRE	8.0	1.0	0.250
MM3721EF1RRE	8.0	1.0	0.300
MM3721EF2RRE	8.0	1.0	0.300
MM3721EF5RRE	8.0	1.0	0.300
MM3721EF6RRE	8.0	1.0	0.300
MM3721EF7RRE	8.0	1.0	0.300
MM3721EF8RRE	8.0	1.0	0.300
MM3721EFBRRE	8.0	1.0	0.300
MM3721EFDRE	8.0	1.0	0.300
MM3721EFERRE	8.0	1.0	0.300
MM3721EL1RRE	8.0	1.0	0.250
MM3721EL2RRE	8.0	1.0	0.250
MM3721EL3RRE	8.0	1.0	0.250
MM3721FF1RRE	8.0	1.0	0.300
MM3721FF2YRE	8.0	1.0	0.300
MM3721HF1RRE	8.0	1.0	0.300
MM3721HF2RRE	8.0	1.0	0.300
MM3721HF4RRE	8.0	1.0	0.300
MM3721HF7RRE	8.0	1.0	0.400

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Part Number	W (mm)	H (mm)	Weight (g)
MM3721HF8RRE	16.0	1.0	0.400
MM3721HL1RRE	8.0	1.0	0.427
MM3721JF1YRE	8.0	1.0	0.300

Package

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