

## MM3722 Series

2023/07/20

### Outline

MM3722 series are Li-ion battery protection IC and detect charge current / discharge current with high precision by current sensing resistor (Rsns). In the One-cell battery pack, on resistance of the FET SW has been used for over-current/short-current detection. MM3722 realize over-current/short-current 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 voltage

- Overcharge detection voltage 3.6V to 5.0V, 5mV step Accuracy $\pm$ 20mV
- Overcharge release voltage Vdet1-0.2V to Vdet1, 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/-35mV (In case Vdet2=Vrel2)  
Accuracy+90/-65mV (In case Vdet2 $\neq$ Vrel2)
- Discharging overcurrent detection voltage 20mV to 150mV, 1mV step Accuracy $\pm$  $\Delta$  ※1
- Charging overcurrent detection voltage -150mV to -20mV, 1mV step Accuracy $\pm$  $\Delta$  ※1
- Short detection voltage1 40mV to 250mV, 1mV step Accuracy $\pm$  $\Delta$  ※2
- Short detection voltage2 VDD-0.9V Accuracy $\pm$ 300mV
- 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 detection delay time 8ms to 256ms
- Charging overcurrent detection delay time 6ms to 64ms

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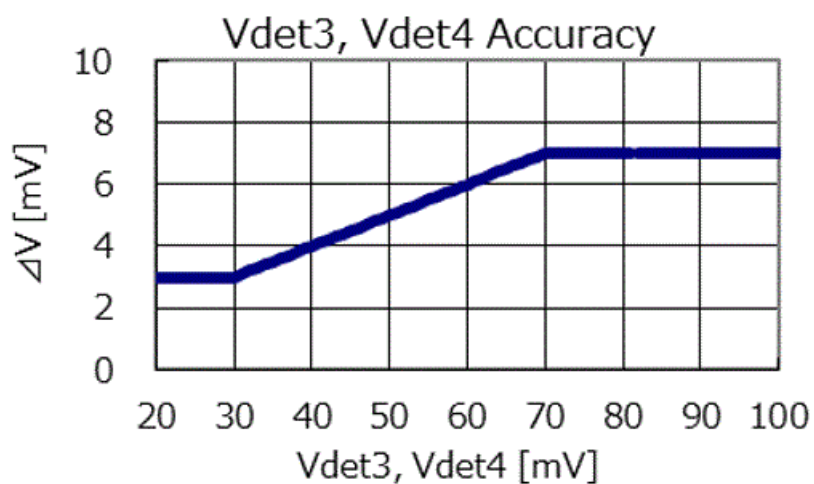
- Short detection delay time 250 $\mu$ s to 400 $\mu$ s

3. 0V battery Charge function Selectable "Permission" or "Inhibition"

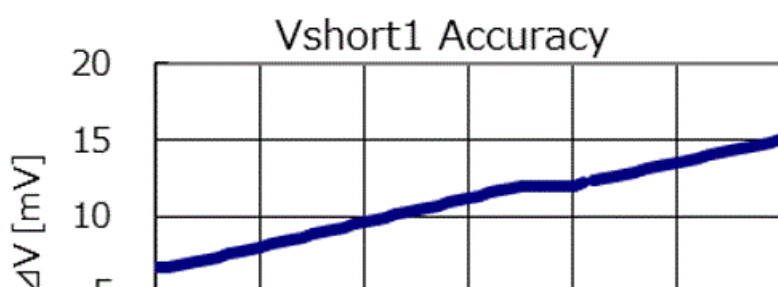
4. Current consumption

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

### \*1 Accuracy of overcurrent detection voltage

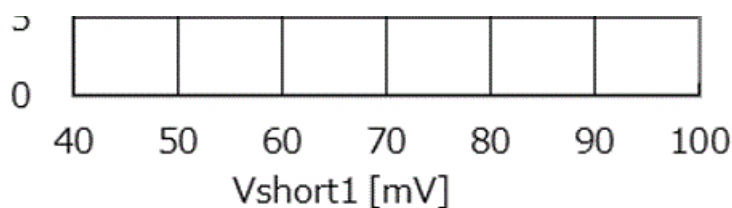


### \*2 Accuracy of Short detection voltage1



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## Specifications

| Product name | Package | 0V battery charge function | Overcharge release function | Overdischarge release function | Discharging overcurrent release function | Overcharge detection voltage [V] |
|--------------|---------|----------------------------|-----------------------------|--------------------------------|--|----------------------------------|
| MM3722AC1YRE | SON-6C  | Prohibition                | voltage                     | voltage                        | voltage                                  | 4.425                            |
| MM3722AJ1YRE | SON-6C  | Permission                 | voltage                     | voltage                        | voltage                                  | 4.425                            |
| MM3722AJ2RRE | SSON-6J | Permission                 | voltage                     | voltage                        | voltage                                  | 4.475                            |
| MM3722AJ4RRE | SSON-6J | Permission                 | voltage                     | voltage                        | voltage                                  | 4.470                            |
| MM3722AJ4YRE | SON-6C  | Permission                 | voltage                     | voltage                        | voltage                                  | 4.470                            |
| MM3722AM1RRE | SSON-6J | Prohibition                | voltage                     | voltage                        | voltage                                  | 4.475                            |
| MM3722AM5RRE | SSON-6J | Prohibition                | voltage                     | voltage                        | voltage                                  | 4.475                            |
| MM3722AM6YRE | SON-6C  | Prohibition                | voltage                     | voltage                        | voltage                                  | 4.475                            |
| MM3722AM7RRE | SSON-6J | Prohibition                | voltage                     | voltage                        | voltage                                  | 4.500                            |
| MM3722AM9RRE | SSON-6J | Prohibition                | voltage                     | voltage                        | voltage                                  | 4.590                            |
| MM3722AMBRRE | SSON-6J | Prohibition                | voltage                     | voltage                        | voltage                                  | 4.600                            |
| MM3722AMCRRE | SSON-6J | Prohibition                | voltage                     | voltage                        | voltage                                  | 4.600                            |
| MM3722CM1RRE | SSON-6J | Prohibition                | voltage                     | Latch                          | voltage                                  | 4.275                            |
| MM3722CM2RRE | SSON-6J | Prohibition                | voltage                     | Latch                          | voltage                                  | 4.380                            |
| MM3722EF1RRE | SSON-6J | Prohibition                | Latch                       | Latch                          | voltage                                  | 4.475                            |

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|              |         |             |       |         |         |       |
|--------------|---------|-------------|-------|---------|---------|-------|
| MM3722EM1RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.275 |
| MM3722EM2RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.275 |
| MM3722EM3RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.275 |
| MM3722EM4RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.275 |
| MM3722EN1RRE | SSON-6J | Permission  | Latch | Latch   | voltage | 4.525 |
| MM3722EN2RRE | SSON-6J | Permission  | Latch | Latch   | voltage | 4.250 |
| MM3722EN3RRE | SSON-6J | Permission  | Latch | Latch   | voltage | 4.525 |
| MM3722JJ1RRE | SSON-6J | Permission  | Latch | voltage | voltage | 4.475 |
| MM3722KF1RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.280 |
| MM3722KF2RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.425 |
| MM3722KF3RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.425 |
| MM3722KF4RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.425 |
| MM3722KF6RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.475 |
| MM3722KF7RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.475 |
| MM3722KF8RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.475 |
| MM3722KF9RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.525 |
| MM3722KFARRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.425 |
| MM3722KFCRRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.475 |
| MM3722PF1RRE | SSON-6J | Prohibition | Latch | Latch   | voltage | 4.250 |

| 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] |
|--------------|--------------------------------|-------------------------------------|-----------------------------------|---|--|-----------------------------|-------------------------------------|
| MM3722AC1YRE | 4.225                          | 2.500                               | 2.900                             | 0.032   | -0.0200                                    | 0.060                       | 1.020                               |

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|--------------|-------|-------|-------|-------|---------|-------|-------|
| MM3722AJ1YRE | 4.225 | 2.500 | 2.900 | 0.036 | -0.0200 | 0.060 | 1.020 |
| MM3722AJ2RRE | 4.275 | 2.500 | 2.900 | 0.036 | -0.0200 | 0.060 | 1.020 |
| MM3722AJ4RRE | 4.270 | 2.500 | 2.900 | 0.049 | -0.0310 | 0.160 | 1.020 |
| MM3722AJ4YRE | 4.270 | 2.500 | 2.900 | 0.049 | -0.0310 | 0.160 | 1.020 |
| MM3722AM1RRE | 4.275 | 2.500 | 2.900 | 0.032 | -0.0200 | 0.060 | 1.024 |
| MM3722AM5RRE | 4.275 | 2.600 | 3.000 | 0.050 | -0.0300 | 0.180 | 1.024 |
| MM3722AM6YRE | 4.275 | 2.500 | 2.900 | 0.027 | -0.0210 | 0.090 | 1.020 |
| MM3722AM7RRE | 4.300 | 2.600 | 3.000 | 0.040 | -0.0350 | 0.180 | 1.024 |
| MM3722AM9RRE | 4.390 | 2.500 | 2.900 | 0.050 | -0.0500 | 0.240 | 1.024 |
| MM3722AMBRRE | 4.400 | 2.500 | 2.900 | 0.065 | -0.0500 | 0.210 | 1.024 |
| MM3722AMCRRE | 4.400 | 2.100 | 2.300 | 0.065 | -0.0500 | 0.210 | 1.024 |
| MM3722CM1RRE | 4.075 | 2.400 | 2.400 | 0.034 | -0.0220 | 0.180 | 1.024 |
| MM3722CM2RRE | 4.180 | 2.400 | 2.400 | 0.034 | -0.0220 | 0.180 | 1.024 |
| MM3722EF1RRE | 4.475 | 2.800 | 2.800 | 0.030 | -0.0250 | 0.180 | 1.024 |
| MM3722EM1RRE | 4.275 | 2.300 | 2.300 | 0.035 | -0.0250 | 0.060 | 1.024 |
| MM3722EM2RRE | 4.275 | 2.200 | 2.200 | 0.035 | -0.0250 | 0.060 | 1.024 |
| MM3722EM3RRE | 4.275 | 2.300 | 2.300 | 0.020 | -0.0200 | 0.060 | 1.024 |
| MM3722EM4RRE | 4.275 | 2.200 | 2.200 | 0.020 | -0.0200 | 0.060 | 1.024 |
| MM3722EN1RRE | 4.525 | 2.700 | 2.700 | 0.020 | -0.0250 | 0.075 | 1.024 |
| MM3722EN2RRE | 4.250 | 2.500 | 2.500 | 0.024 | -0.0200 | 0.060 | 1.024 |
| MM3722EN3RRE | 4.525 | 2.500 | 2.500 | 0.020 | -0.0250 | 0.075 | 1.024 |
| MM3722JJ1RRE | 4.475 | 2.600 | 3.000 | 0.021 | -0.0210 | 0.050 | 1.024 |
| MM3722KF1RRE | 4.280 | 2.400 | 2.400 | 0.032 | -0.0300 | 0.180 | 1.000 |
| MM3722KF2RRE | 4.425 | 2.400 | 2.400 | 0.034 | -0.0220 | 0.180 | 1.000 |
| MM3722KF3RRE | 4.425 | 2.800 | 2.800 | 0.040 | -0.0300 | 0.180 | 1.000 |
| MM3722KF4RRE | 4.425 | 2.600 | 2.600 | 0.040 | -0.0300 | 0.180 | 1.000 |
| MM3722KF6RRE | 4.475 | 2.400 | 2.400 | 0.040 | -0.0250 | 0.180 | 1.000 |
| MM3722KF7RRE | 4.475 | 2.400 | 2.400 | 0.020 | -0.0300 | 0.180 | 1.000 |
| MM3722KF8RRE | 4.475 | 2.400 | 2.400 | 0.034 | -0.0220 | 0.180 | 1.000 |
| MM3722KF9RRE | 4.525 | 2.300 | 2.300 | 0.020 | -0.0300 | 0.180 | 1.000 |
| MM3722KFARRE | 4.425 | 2.800 | 2.800 | 0.034 | -0.0220 | 0.180 | 1.000 |
| MM3722KFCRRE | 4.475 | 2.800 | 2.800 | 0.040 | -0.0250 | 0.180 | 1.000 |
| MM3722PF1RRE | 4.250 | 2.600 | 2.600 | 0.060 | -0.0600 | 0.180 | 1.020 |

| 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] |
|--------------|------------------------------------|---|---------------------------------------|---|---|--|--|
| MM3722AC1YRE | 16.0                               | 96.0                                    | 1.0                                   | 12.0  | 1.00  | 10.0   | 1.0  |
| MM3722AJ1YRE | 16.0                               | 96.0                                    | 1.0                                   | 12.0  | 1.00  | 10.0   | 1.0  |

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|--------------|------|--------|-----|-------|------|------|-----|
| MM3722AJ1RRE | 16.0 | 96.0   | 1.0 | 12.0  | 1.00 | 10.0 | 1.0 |
| MM3722AJ2RRE | 16.0 | 96.0   | 1.0 | 12.0  | 1.00 | 10.0 | 1.0 |
| MM3722AJ4RRE | 16.0 | 125.0  | 1.0 | 16.0  | 1.00 | 8.0  | 1.0 |
| MM3722AJ4YRE | 16.0 | 125.0  | 1.0 | 16.0  | 1.00 | 8.0  | 1.0 |
| MM3722AM1RRE | 16.0 | 96.0   | 1.0 | 12.0  | 1.00 | 10.0 | 1.0 |
| MM3722AM5RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722AM6YRE | 16.0 | 96.0   | 1.0 | 12.0  | 1.00 | 10.0 | 1.0 |
| MM3722AM7RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722AM9RRE | 16.0 | 32.0   | 1.0 | 20.0  | 1.00 | 32.0 | 1.0 |
| MM3722AMBRRE | 16.0 | 32.0   | 1.0 | 20.0  | 1.00 | 32.0 | 1.0 |
| MM3722AMCRRE | 16.0 | 32.0   | 1.0 | 20.0  | 1.00 | 32.0 | 1.0 |
| MM3722CM1RRE | 16.0 | 20.0   | 1.0 | 32.0  | 4.00 | 16.0 | 1.0 |
| MM3722CM2RRE | 16.0 | 20.0   | 1.0 | 32.0  | 4.00 | 16.0 | 1.0 |
| MM3722EF1RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 10.0 | 1.0 |
| MM3722EM1RRE | 16.0 | 96.0   | 1.0 | 12.0  | 1.00 | 10.0 | 1.0 |
| MM3722EM2RRE | 32.0 | 256.0  | 1.0 | 24.0  | 1.00 | 20.0 | 1.0 |
| MM3722EM3RRE | 16.0 | 768.0  | 1.0 | 704.0 | 1.00 | 10.0 | 1.0 |
| MM3722EM4RRE | 32.0 | 1280.0 | 1.0 | 832.0 | 1.00 | 20.0 | 1.0 |
| MM3722EN1RRE | 16.0 | 96.0   | 1.0 | 640.0 | 1.00 | 8.0  | 1.0 |
| MM3722EN2RRE | 16.0 | 128.0  | 4.0 | 256.0 | 4.00 | 8.0  | 4.0 |
| MM3722EN3RRE | 16.0 | 96.0   | 1.0 | 640.0 | 1.00 | 8.0  | 1.0 |
| MM3722JJ1RRE | 16.0 | 64.0   | 1.0 | 16.0  | 1.00 | 8.0  | 1.0 |
| MM3722KF1RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722KF2RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722KF3RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722KF4RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722KF6RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722KF7RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722KF8RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722KF9RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722KFARRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722KFCRRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |
| MM3722PF1RRE | 16.0 | 20.0   | 1.0 | 12.0  | 1.00 | 16.0 | 1.0 |

| Product name | Short detection delay time [ms] |
|--------------|---------------------------------|
| MM3722AC1YRE | 0.300                           |
| MM3722AJ1YRE | 0.300                           |
| MM3722AJ2RRE | 0.300                           |
| MM3722AJ4RRE | 0.250                           |

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|              |       |
|--------------|-------|
| MM3722AJ4RRE | 0.250 |
| MM3722AJ4YRE | 0.250 |
| MM3722AM1RRE | 0.300 |
| MM3722AM5RRE | 0.250 |
| MM3722AM6YRE | 0.300 |
| MM3722AM7RRE | 0.250 |
| MM3722AM9RRE | 0.500 |
| MM3722AMBRRE | 0.500 |
| MM3722AMCRRE | 0.500 |
| MM3722CM1RRE | 0.250 |
| MM3722CM2RRE | 0.250 |
| MM3722EF1RRE | 0.250 |
| MM3722EM1RRE | 0.300 |
| MM3722EM2RRE | 0.530 |
| MM3722EM3RRE | 0.300 |
| MM3722EM4RRE | 0.530 |
| MM3722EN1RRE | 0.300 |
| MM3722EN2RRE | 0.280 |
| MM3722EN3RRE | 0.300 |
| MM3722JJ1RRE | 0.280 |
| MM3722KF1RRE | 0.250 |
| MM3722KF2RRE | 0.250 |
| MM3722KF3RRE | 0.250 |
| MM3722KF4RRE | 0.250 |
| MM3722KF6RRE | 0.250 |
| MM3722KF7RRE | 0.250 |
| MM3722KF8RRE | 0.250 |
| MM3722KF9RRE | 0.250 |
| MM3722KFARRE | 0.250 |
| MM3722KFCRRE | 0.250 |
| MM3722PF1RRE | 0.250 |

## Package

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