MC3651 Series

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Outline

The MC3651 series are protection IC with integrated MOS-FET for protection of the rechargeable Lithium-ion or Lithium-polymer battery.The overcharge, overdischarge and discharging and charging overcurrent protection of the rechargeable one-cell Lithium-ion or Lithium-polymer battery can be detected.

Product Series

For one-cell

Features

1. Range and accuracy of detection/release voltage
●Overcharge detection voltage 4.15V to 4.50V, 5mV steps Accuracy±20mV
●Overcharge release voltage 4.00V to 4.35V (Note1) Accuracy±50mV
●Overdischarge detection voltage 2.00V to 3.00V (Note2) Accuracy±100mV
●Overdischarge release voltage 2.00V to 3.00V (Note2) Accuracy±100mV
●Discharge overcurrent detection voltage 20mV to 65mV, 1mV steps Accuracy±5mV
(Discharge current limit　0.310A to 1.00A)
●Charging overcurrent detect voltage -65mV to -25mV, 1mV step Accuracy±5mV
(Charge current limit　0.385A to 1.00A)
●Short detection voltage Selection from 0.19, 0.36V Accuracy±50mV

2. Range of detection delay time
●Overcharge detection delay time Selection from 1.0s fixed
●Overdischarge detection delay time Selection from 100ms, 256ms
●Discharging overcurrent detection delay time Selection from 8ms, 12ms, 16ms, 20ms, 48ms, 224ms
●Charging overcurrent detection delay time Selection from 8.5ms, 16.5ms, 32.5ms
●Short detection delay time Selection from 0.50ms, 0.75ms

3. 0V battery charge functionSelection from "Permission" or "Prohibition" (Note3)

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4. Low current consumption

●Normal mode Typ. 3.0μA, Max. 4.5μA

●Stand-by mode Max. 0.1μA (In case Overdischarge latch function "Enable")

Max. 0.5μA (In case Overdischarge latch function "Disable")

5. MOS-FET　　Source to Source on state resistance Typ. 65.0mΩ (@VDD=3.5V)

Note1：Hysteresis voltagebetween Overcharge detection and release voltage is selectable from 0.10V/0.15V/0.20V/0.25V.

Note2：Please inquire to us about details of the setting of Overdischarge detection and release voltage.

Specifications

Product name	Package	0V battery charge function	Overcharge detection voltage [V]	Overcharge release voltage [V]	Overdischarge detection voltage [V]	Overdischarge release voltage [V]
MC3651DF1AAM	PLP-4E	Prohibition	4.280	4.180	2.700	2.700
MC3651DF3AAM	PLP-4E	Prohibition	4.265	4.065	3.000	3.000
MC3651DF5AAM	PLP-4E	Prohibition	4.480	4.280	2.700	2.700
MC3651DF6AAM	PLP-4E	Permission	4.225	4.125	3.000	3.000
MC3651DF8AAM	PLP-4E	Permission	4.425	4.225	2.600	2.600
MC3651DF9AAM	PLP-4E	Prohibition	4.370	4.170	2.600	2.600
MC3651DFAAAM	PLP-4E	Prohibition	4.370	4.170	2.800	2.800
MC3651DFBAAM	PLP-4E	Prohibition	4.280	4.180	2.700	2.700
MC3651DC1AAM	PLP-4E	Permission	4.425	4.225	3.000	3.000
MC3651DC3AAM	PLP-4E	Permission	4.370	4.170	2.600	2.600
MC3651LC1AAM	PLP-4E	Permission	4.425	4.425	2.700	2.700
MC3651LC2AAM	PLP-4E	Permission	4.475	4.475	2.600	2.600
MC3651LC3AAM	PLP-4E	Permission	4.475	4.475	2.700	2.700
MC3651LF1AAM	PLP-4E	Prohibition	4.500	4.500	2.500	2.500
MC3651RF1AAM	PLP-4E	Prohibition	4.225	4.125	2.600	2.600
MC3651RF3AAM	PLP-4E	Prohibition	4.225	4.125	2.600	2.600

Product	Discharging overcurrent detection	Charging overcurrent detection	Short detection	Overcharge detection	Overdischarge detection	Discharging overcurrent detection	Charging overcurrent

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name	detection voltage [V]	detection voltage [V]	voltage [V]	delay time [s]	delay time [ms]	detection delay time [ms]	detection delay time [ms]
MC3651DF1AAM	0.020	-0.0250	0.190	1.000	100.0	32.0	8.5
MC3651DF3AAM	0.020	-0.0250	0.190	1.000	100.0	20.0	8.5
MC3651DF5AAM	0.020	-0.0250	0.190	1.000	100.0	20.0	8.5
MC3651DF6AAM	0.020	-0.0250	0.190	1.000	100.0	12.0	8.5
MC3651DF8AAM	0.020	-0.0540	0.190	1.000	100.0	12.0	8.5
MC3651DF9AAM	0.020	-0.0300	0.190	1.000	100.0	12.0	8.5
MC3651DFAAAM	0.020	-0.0300	0.190	1.000	100.0	12.0	8.5
MC3651DFBAAM	0.064	-0.0320	0.190	1.000	100.0	12.0	8.5
MC3651DC1AAM	0.030	-0.0300	0.190	1.000	100.0	20.0	8.5
MC3651DC3AAM	0.020	-0.0540	0.190	1.000	100.0	12.0	8.5
MC3651LC1AAM	0.037	-0.0250	0.190	1.000	100.0	12.0	8.5
MC3651LC2AAM	0.057	-0.0460	0.190	1.000	100.0	12.0	32.5
MC3651LC3AAM	0.038	-0.0370	0.190	1.000	100.0	20.0	8.5
MC3651LF1AAM	0.070	-0.0700	0.190	1.000	100.0	224.0	32.5
MC3651RF1AAM	0.020	-0.0250	0.190	1.000	100.0	48.0	8.5
MC3651RF3AAM	0.020	-0.0340	0.190	1.000	100.0	12.0	8.5

Product name	Short detection delay time [ms]	Discharge current limit [A]	Charge current limit [A]
MC3651DF1AAM	0.750	0.315	0.390
MC3651DF3AAM	0.500	0.315	0.390
MC3651DF5AAM	0.500	0.315	0.390
MC3651DF6AAM	0.500	0.315	0.390
MC3651DF8AAM	0.500	0.315	0.845
MC3651DF9AAM	0.500	0.315	0.470
MC3651DFAAAM	0.500	0.315	0.470
MC3651DFBAAM	0.500	1.000	0.500
MC3651DC1AAM	0.500	0.470	0.470
MC3651DC3AAM	0.500	0.315	0.845
MC3651LC1AAM	0.500	0.580	0.390
MC3651LC2AAM	0.500	0.890	0.720
MC3651LC3AAM	0.500	0.595	0.580
MC3651LF1AAM	0.500	1.095	1.095
MC3651RF1AAM	0.500	0.315	0.390
MC3651RF3AAM	0.500	0.315	0.530

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Package

PLP-4E