3 to 5cells lithium-ion/lithium-polymer battery protection IC
Monolithic IC MM3474 Series

Outline

MM3474 series is an overcharge, overdischarge and overcurrent protection IC for a lithium-ion / lithium-polymer rechargeable secondary battery. Lithium-ion / lithium-polymer rechargeable secondary battery overcharge each cell, over discharge, and discharge overcurrent, short circuits can be detected.
This supports 3 to 5 serial cells connected in series, and switches over to the desired no. of cells by sending High / Low signal to SEL terminal.
This also provides the control terminals of output over discharge detection (SDC) and output over charge detection (SOC), which allows configuring an application with fewer external parts for 6 or more cells connected in series.

Features (Unless otherwise specified, Topr=+25°C)

(1) Range and accuracy of detection / release voltage

●Overcharge detection voltage	3.6V to 4.5V, 5mV steps	Accuracy±25mV (Topr=±0 to +50°C)
●Overcharge release voltage	3.4V to 4.5V, 50mV steps	Accuracy±50mV
●Overdischarge detection voltage	2.0V to 3.0V, 50mV steps	Accuracy±80mV
●Overdischarge release voltage	2.0V to 3.4V, 50mV steps	Accuracy±100mV
●Overcurrent detect voltage	50mV to 300mV, 5mV steps	Accuracy±15mV
●Short detection voltage	0.2V to 1.0V, 50mV steps	Accuracy±100mV

(2) Each detection delay time set by the external capacitor

(3) The setting for three cell , for four cell , and for five cell protection can be set with the SEL1 pin and the SEL2 pin.

(4) The charge and discharge of the battery can be controlled with SDC pin and SOC pin.

(5) Low current consumption

●Consumption current1 (Vdd) , Vcell=4.4V	Typ. 10.0μA, Max. 20.0μA
●Consumption current2 (Vdd) , Vcell=3.5V	Typ. 5.0μA, Max. 10.0μA
●Consumption current3 (Vdd) , Vcell=1.8V	Typ. 1.5μA, Max. 3.0μA
●Consumption current1 (V5) , Vcell=4.4V	Typ. 4.0μA, Max. 8.0μA
●Consumption current2 (V5) , Vcell=3.5V	Typ. 3.0μA, Max. 6.0μA
●Consumption current3 (V5) , Vcell=1.8V	Typ. 1.5μA, Max. 3.0μA

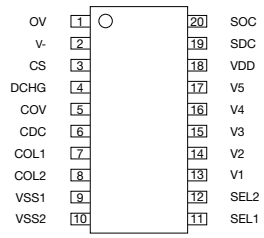
(6) Absolute maximum ratings

●VDD pin	VSS2−0.3V to +30V
●V5 pin	V4−0.3V to VDD+0.3V
●Between the input terminals of voltage of battery	−0.3V to +10V
●V− pin, CS pin	VDD−30V to VDD+0.3V
●OV pin, DCHG pin	VSS2−0.3V to VDD+0.3V
●SEL pin	VSS2−0.3V to VDD+0.3V
●SDC pin, SOC pin	VSS2−0.3V to VDD+0.3V
●Storage temperature	−55°C to +125°C
●Operation temperature	−40°C to +85°C

Pin Assignment

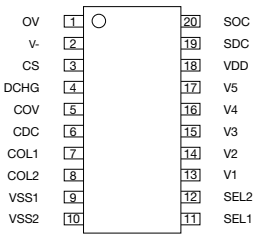
Top view

TSOP-20D



Top view

TSOP-20C



Selection Guide (2000pcs/Reel)

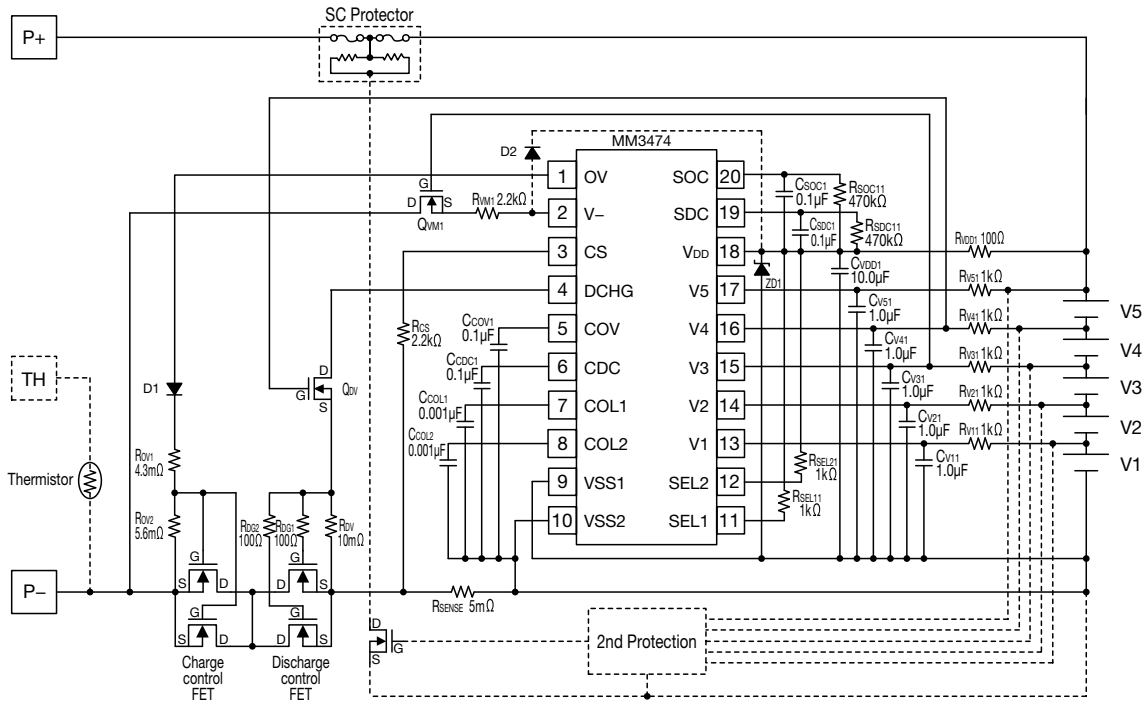
Product name	Detection / Release voltage						Detection / Release voltage						Optional function
	Overcharge detection voltage	Overcharge release voltage	Overdischarge detection voltage	Overdischarge release voltage	Overcurrent detection voltage	Short detection voltage	Overcharge detection dead time	Overcharge release dead time	Overdischarge detection dead time	Overdischarge release dead time	Overcurrent detection dead time	Overcurrent release dead time	Overdischarge release
	V_{CELLU}	V_{CELLO}	V_{CELLS}	V_{CELLD}	V_{OC}	V_{SHORT}	t_{OV1}	t_{OV2}	t_{DC1}	t_{DC2}	t_{OC1}	t_{OC2}	*1
	V	V	V	V	mV	V	sec	msec	sec	msec	msec	msec	
MM3474C01VBE	4.25	4.15	2.8	3	250	1	1	0.1	1	Max.15	10	10	Non Latch
MM3474C02VBE	4.25	4.15	2.4	2.6	250	1	1	0.1	1	Max.15	10	10	Non Latch
MM3474C03VBE	4.25	4.15	2.8	3	250	0.8	1	0.1	1	Max.15	10	10	Non Latch
MM3474C04VBE	4.25	4.15	2.8	3	150	0.25	1	0.1	1	Max.15	10	10	Latch
MM3474C05VBE	4.25	4.15	2.8	3	150	0.25	1	0.1	1	Max.15	10	10	Non Latch
MM3474D01VBE	3.85	3.65	2.3	2.5	150	1	1	0.1	1	Max.15	10	10	Non Latch
MM3474D03VBE	3.8	3.6	2	2.5	150	0.6	1	0.1	1	Max.15	10	10	Non Latch
MM3474E01VBE	4.25	4.15	2.8	3	150	1	1	0.1	1	Max.15	10	10	Non Latch
MM3474E02VBE	4.2	4.1	2.8	3	150	1	1	0.1	1	Max.15	10	10	Non Latch
MM3474E03VBE	4.175	4.1	2.8	3	150	0.5	1	0.1	1	Max.15	10	10	Non Latch
MM3474E04VBE	4.25	4.15	2.8	3	100	0.5	1	0.1	1	Max.15	10	10	Non Latch
MM3474E05VBE	4.25	4.15	2.8	3	50	0.4	1	0.1	1	Max.15	10	10	Non Latch
MM3474F01VBE	4.25	4.15	2.5	3	150	1	1	0.1	1	Max.15	10	10	Non Latch
MM3474F02VBE	4.2	4.1	2.5	3	100	1	1	0.1	1	Max.15	10	10	Non Latch
MM3474F03VBE	4.25	4.15	2.5	3	100	0.3	1	0.1	1	Max.15	10	10	Latch
MM3474F04VBE	4.25	4.21	2.5	3	100	0.8	1	0.1	1	Max.15	10	10	Non Latch
MM3474F05VBE	4.25	4.15	2.5	3	100	0.25	1	0.1	1	Max.15	10	10	Non Latch
MM3474F06VBE	4.225	4.15	2	3	50	0.2	1	0.1	1	Max.15	10	10	Non Latch
MM3474F08VBE	4.4	4.3	2.5	3	120	0.25	1	0.1	1	Max.15	10	10	Non Latch
MM3474F11VBE	4.4	4.3	2.5	3	150	0.5	1	0.1	1	Max.15	10	10	Non Latch
MM3474F12VBE	4.25	4.15	2.5	3	200	0.5	1	0.1	1	Max.15	10	10	Non Latch
MM3474G01VBE	4.2	4.1	2.75	3	100	1	1	0.1	1	Max.15	10	10	Non Latch
MM3474G02VBE	4.25	4.15	2.75	3	100	1	1	0.1	1	Max.15	10	10	Non Latch
MM3474G03VBE	4.2	4.1	2.75	3	100	0.4	1	0.1	1	Max.15	10	10	Non Latch
MM3474G05VBE	4.25	4.15	2.75	3	100	0.4	1	0.1	1	Max.15	10	10	Non Latch
MM3474G06VBE	4.225	4.1	2.75	3	100	0.8	1	0.1	1	Max.15	10	10	Non Latch
MM3474G07VBE	4.25	4.15	2.75	3	100	0.2	1	0.1	1	Max.15	10	10	Non Latch
MM3474J01VBE	4.25	4.1	2.8	3	50	1	1	0.1	1	Max.15	10	10	Non Latch
MM3474K02VBE	4.25	4.1	3	3.225	100	0.4	1	0.1	1	Max.15	10	10	Non Latch
MM3474K03VBE	4.25	4.19	3	3.2	80	0.7	1	0.1	1	Max.15	10	10	Latch
MM3474K04VBE	4.175	4.1	3	3.2	100	0.5	1	0.1	1	Max.15	10	10	Non Latch
MM3474L02VBE	3.75	3.55	2.2	2.7	100	0.4	1	0.1	1	Max.15	10	10	Non Latch
MM3474L03VBE	3.65	3.5	2	2.7	200	0.25	1	0.1	1	Max.15	10	10	Non Latch
MM3474L04VBE	3.75	3.55	2.2	2.7	100	0.4	1	0.1	1	Max.15	10	10	Latch
MM3474M01VBE	4.35	4.15	2.3	3	150	0.5	1	0.1	1	Max.15	10	10	Non Latch
MM3474N01VBE	3.9	3.6	2	3	100	0.2	1	0.1	1	Max.15	10	10	Latch
MM3474P03VBE	4.23	4.22	2.8	3.4	100	0.8	1	0.1	1	Max.15	10	10	Non Latch
MM3474P04VBE	4.2	4.17	2.75	2.8	100	1	1	0.1	1	Max.15	10	10	Non Latch
MM3474P05VBE	4.2	4.14	2.75	2.81	100	0.5	1	0.1	1	Max.15	10	10	Latch
MM3474P06VBE	4.23	4.22	2.8	3	100	0.8	1	0.1	1	Max.15	10	10	Non Latch
MM3474S01VBE	3.6	3.5	2.8	3	100	0.4	1	0.1	1	Max.15	10	10	Non Latch

*1 Non Latch : voltage release
Latch : voltage release + load remove

Please inquire to us, if you request a rank other than the above.

Application Circuit

· 5 cells protection circuit



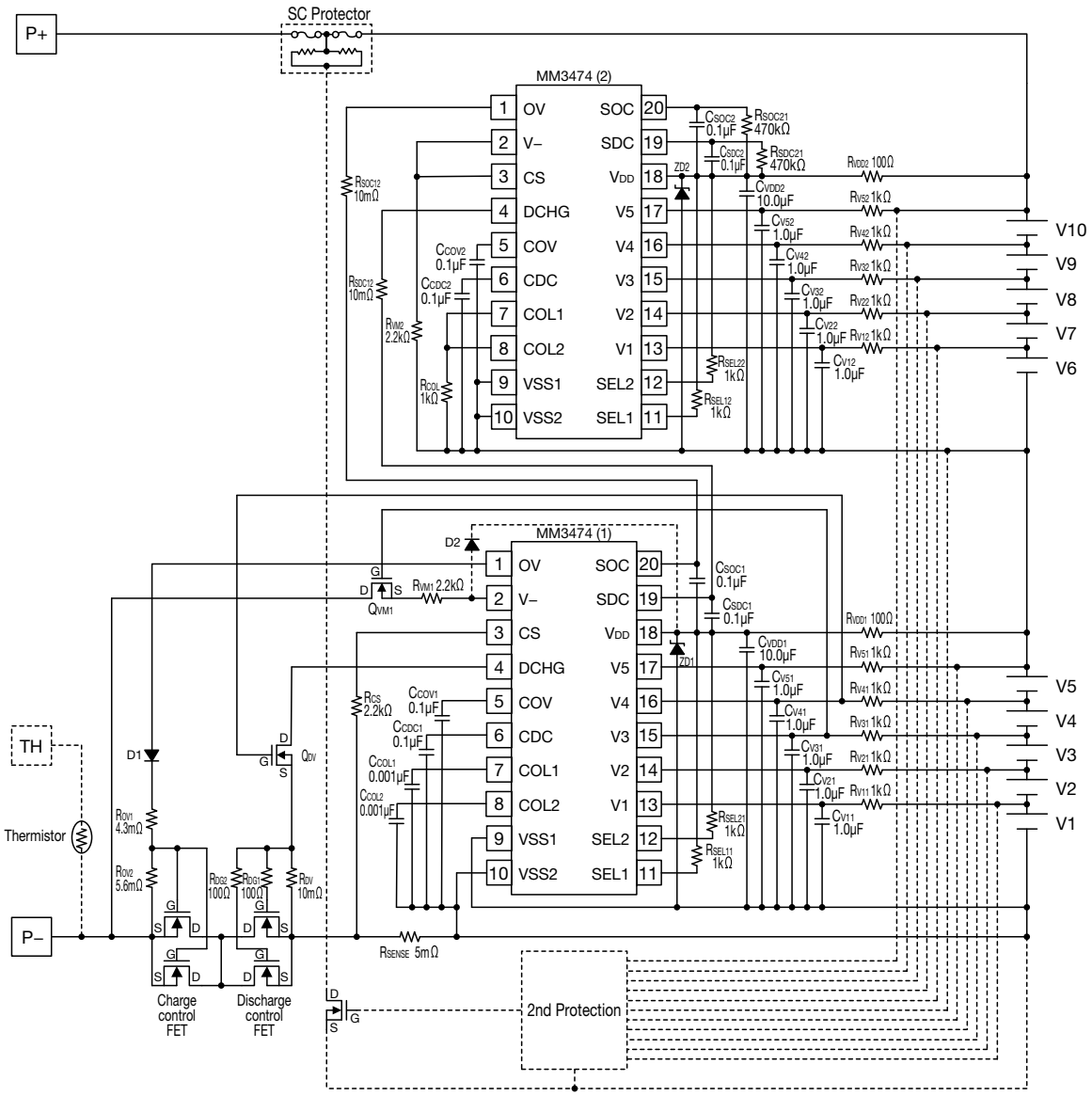
This circuit is shown as an example of typical application for reference.

According to the conditions which are actually used, the maximum rating (voltage, power dissipation, ESD tolerance, etc.) of each parts should be verified enough.

Mitsumi Electric Co., Ltd. assumes no responsibility for any trouble or damage as a result of the use beyond standard range of this product indicated to the electrical characteristics of this specifications.

Application Circuit

· 10 cells protection circuit



This circuit is shown as an example of typical application for reference.

According to the conditions which are actually used, the maximum rating (voltage, power dissipation, ESD tolerance, etc.) of each parts should be verified enough.

Mitsumi Electric Co., Ltd. assumes no responsibility for any trouble or damage as a result of the use beyond standard range of this product indicated to the electrical characteristics of this specifications.