One cell lithium–ion/lithium–polymer battery secondary protection IC

MM3734 series

Outline

The MM3734 series are voltage monitor ICs for rechargeable Lithium-ion or Lithium-polymer batteries secondary protection, using a high voltage CMOS process. 1-cell Lithium-ion or Lithium-polymer battery can be detected overcharge state. Internal circuit is composed of voltage detectors, reference voltage sources, an oscillator, a counter circuit and logical circuits.

Features

(Unless otherwise specified,Ta=25℃)

1) Range and accuracy of detection/release voltage
 ・Overcharge detection voltage   4.0V to 5.0V, 5mV steps   Accuracy±20mV
 ・Hysteresis voltage   0V to 1.0V, 50mV steps
                  However,"Detection voltage-Hysteresis voltage<4.0V" is disabled.

2) Range of detection delay time
 ・Overcharge detection delay time   Selection from 0.25s, 1.02s, 2.048s, 4.096s

3) Low current consumption
 ・Normal mode   Typ. 1.5uA, Max. 3.0uA
 ・Stand-by mode   Max. 0.8uA

4) Package type
 ・ SON-6C   1.60 × 2.00 × 0.55 [mm]

Pin explanations

SON-6C	Pin No.	Symbol	Function
	1	NC	No connection.
	2	OUT	Output of detecting voltage. Output type is CMOS.
	3	DS	Delay shorten terminal.
	4	VSS	VSS terminal. Connected to ground.
	5	VDD	VDD terminal. Connected to IC substrait.
	6	NC	No connection.

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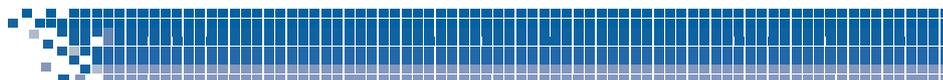
Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply voltage	VDD	-0.3	12	V
DS terminal input voltage	VDS	VSS-0.3	VDD+0.3	V
OUT terminal voltage	VOUT	VSS-0.3	VDD+0.3	V
Storage temperature	Tstg	-55	125	℃

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Operating ambient temperature	Topr	-40	85	℃
Operating voltage	Vop	1.5	5.5	V

Electrical characteristics

(Unless otherwise specified,Ta=25℃)

| Parameter	Symbol	Note	Min	Typ	Max	Unit
Input/Output voltage						
OUT L level output voltage	VoL	Icout=-30uA, VDD=4.0V	-	0.1	0.5	V
OUT H level output voltage	VoH	Icout=30uA, VDD=Vdet+0.1V	VDD-0.5	VDD-0.1	-	V
Current consumption						
Current consumption	Idd	VDD=4.0V	-	1.5	3.0	uA
Current consumption at stand-by	Is	VDD=3.4V	-	0.6	0.8	uA
Detection/Release voltage						
Overcharge detection voltage	Vdet	Ta=+25℃	Typ-0.020	Vdet	Typ+0.020	V
		Ta=-5～+60℃	Typ-0.025		Typ+0.025	
Overcharge release voltage	Vrel	Ta=+25℃	Typ-0.030	Vrel	Typ+0.030	V
		Ta=-5～+60℃	Typ-0.050		Typ+0.050	
Standby mode change voltage	Vsta		3.7	3.8	3.9	V
Detection/Release delay time						
Overcharge detection delay time	tVdet		Typ*0.8	tVdet	Typ*1.2	s
Overcharge release delay time	tVrel		12.8	16.0	19.2	ms

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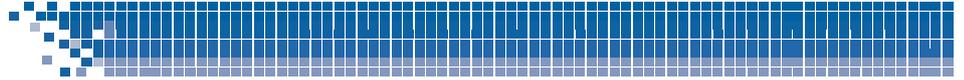
Block diagram
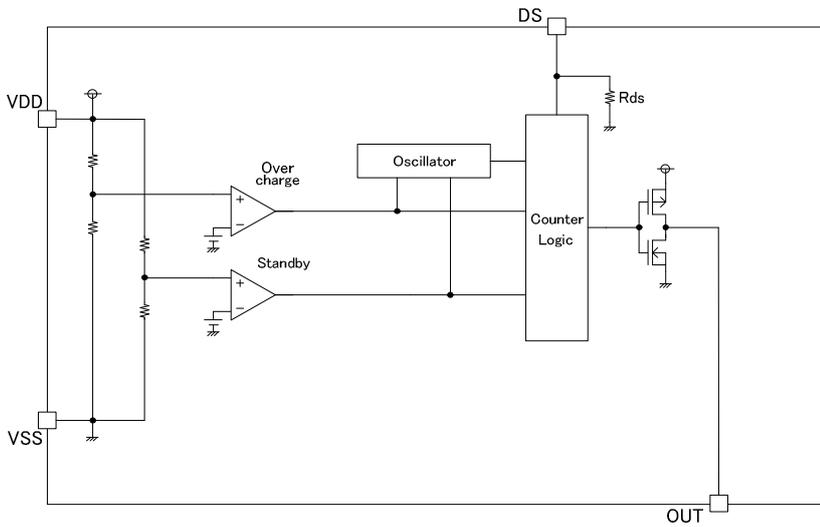
Typical application circuit
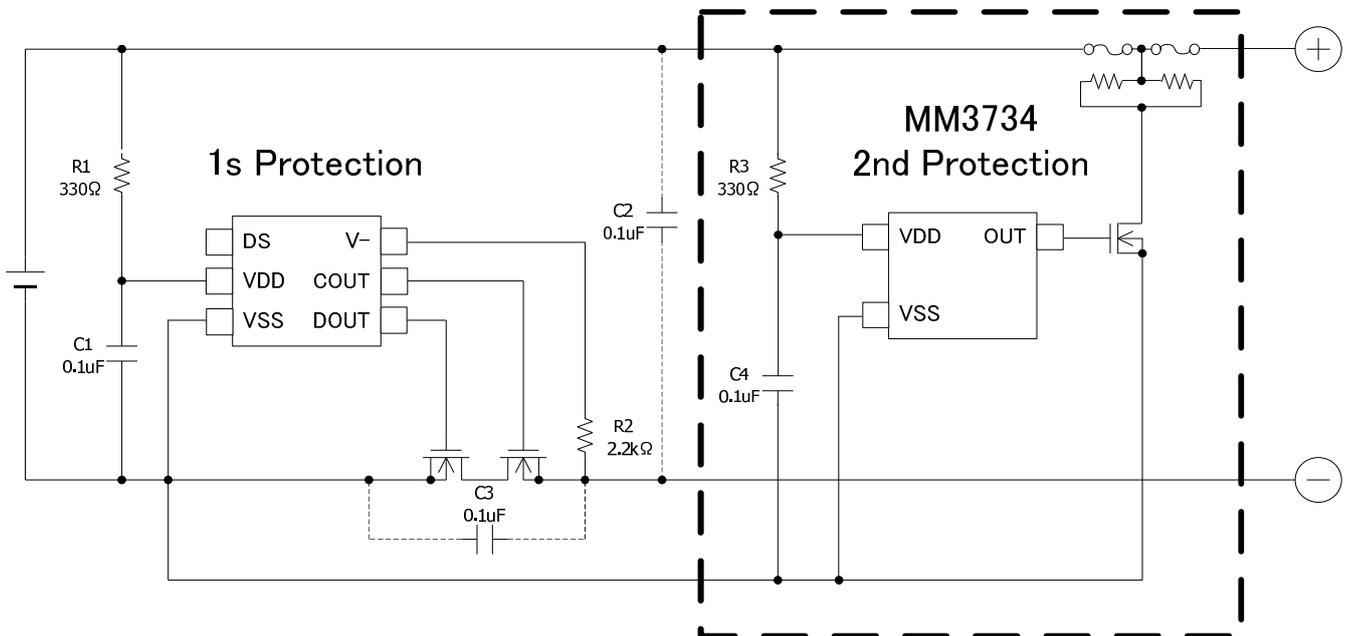
R3 and C4 stabilize a supply voltage ripple. However, the detection voltage rises by the current of penetration in IC of the voltage detection when R3 is enlarged, and the value of R3 is adjusted to 1kohm or less. Moreover, adjust the value of C4 to 0.01uF or more to do the stability operation, please.