High-accuracy overcharge detection

Outline

The MM3723 series integrates into 1.09mm × 0.81mm × 0.46mm WLCSP Package. It's using high voltage CMOS process for overcharge, overdischarge and overcurrent protection of the rechargeable Lithium-ion and Lithium-polymer battery. The overcharge, overdischarge, discharging overcurrent, charging overcurrent and short protection of the rechargeable one-cell Lithium-ion and Lithium-polymer battery can be detected.

Features   (Unless otherwise specified, Ta=25°C)

(1) Range and accuracy of detection/release voltage
- Overcharge detection voltage............................ Vdet1 ...... 3.6V to 4.6V, 5mV steps................. Accuracy±12mV
  Accuracy±20m(Ta=-20 to +60°C)
- Overdischarge detection voltage .... Vdet2 ...... 2.0V to 3.0V, 50mV steps............... Accuracy±35mV
- Discharging overcurrent detection voltage .... Vdet3 ...... 20mV to +100mV, 1mV steps........... Accuracy±ΔV *1
- Charging overcurrent detection voltage .... Vdet4 ...... -100mV to -20mV, 1mV steps .... Accuracy±ΔV *1
- Short detection voltage1.................................... Vshort ..... 100mV to 300mV,10mV steps ....Accuracy±8%

  *1 Accuracy of overcurrent detection voltage (Ta=25°C)
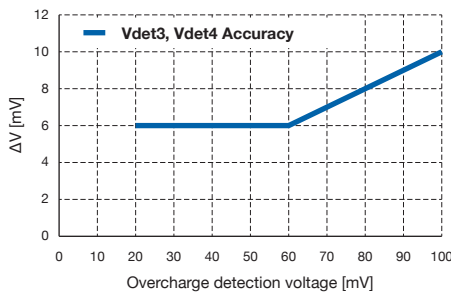
(2) Range of detection delay time
- Overcharge detection delay time ....Selection from 1.0s, 1.2s, 4.0s
- Overdischarge detection delay time ....Selection from 20ms, 24ms, 32ms, 96ms, 128ms
- Discharging overcurrent detection delay time ...Selection from 8ms, 12ms, 16ms, 20ms, 256ms, 512ms
- Charging overcurrent detection delay time........Selection from 4ms, 6ms, 8ms, 10ms, 12ms, 16ms, 96ms
- Short detection delay time................................Selection from 250µßs to 400µs

(3) 0V battery charge function ....Selection from "Permission" or "Prohibition"

(4) Low current consumption (Not include NTC bias current)
- Normal mode ....Typ. 2.5µA, Max. 4.0µA
- Stand-by mode ....Max. 0.1µA (Overdischarge latch function Enable)
  Max. 0.6µA (Overdischarge latch function Disable)

Pin assignment

■ WLCSP-6B

(Top view)

V- ① ⑥ DOUT	
COUT ② ⑤ VSS	
VDD ③ ④ TEST	

Pin no.	Symbol	Function
A1	V-	Negative power supply voltage input terminal
A2	COUT	Charge FET control terminal
B1	VDD	Positive power supply voltage input terminal
B2	TEST	Test mode control terminal
C1	VSS	Negative power supply voltage input terminal
C2	DOUT	Discharge FET control terminal

Detection / Release voltage

LINE UP

Product name	Package	0V battery charge function	Detection / Release voltage							*1 Delay time	Protedtion mode latch function		
			Overcharge detection voltage	Overcharge release voltage	Overdischarge detection voltage	Overdischarge release voltage	Discharging overcurrent detection voltage	Charging overcurrent detection voltage	Short detection voltage		Overcharge	Overdischarge	Discharge overcurrent
			Vdet1	Vrel1	Vdet2	Vrel2	Vdet3	Vdet4	Vshort				
			V	V	V	V	V	V	V				
MM3723CL3LRE	WLCSP-6B	Permission	4.425	4.225	2.300	2.300	0.060	-0.020	0.150	A	Disable	Enable	Disable
MM3723CL4LRE	WLCSP-6B	Permission	4.475	4.275	2.200	2.200	0.070	-0.030	0.200	B	Disable	Enable	Disable

*1 Delay time

Function	tVdet1	tVdet2	tVdet3	tVdet4	tshort1
	ms	ms	ms	ms	μs
A	1.0	96	12	10	300
B	1.0	96	24	20	650

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

MITSUMI ELECTRIC CO., LTD.