

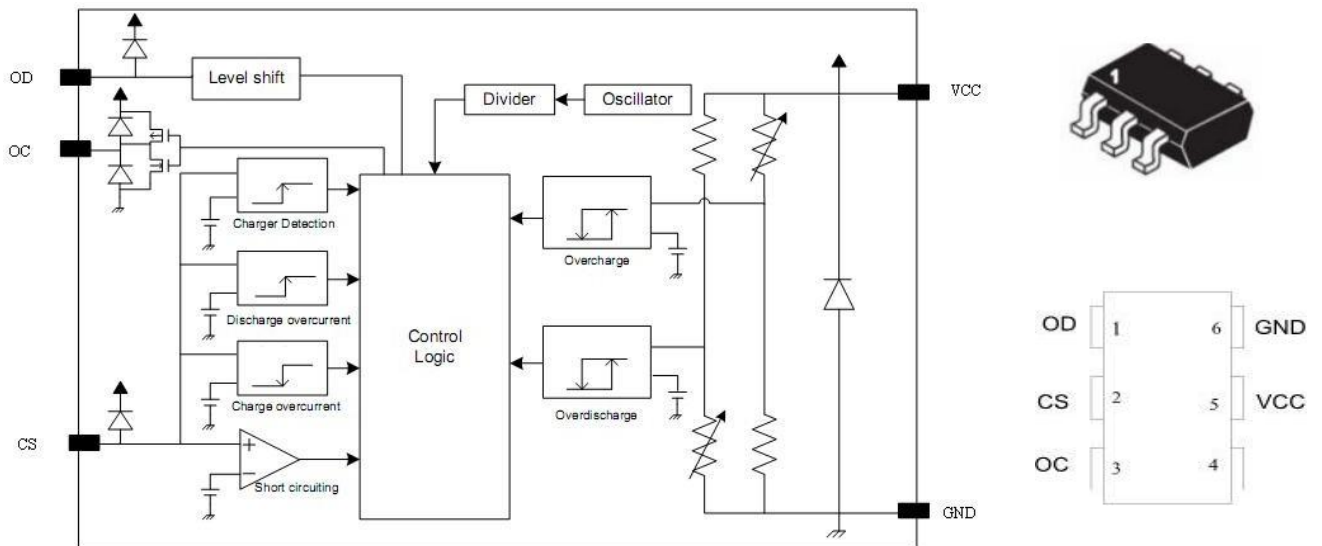
SOT-23-6L Battery Protection IC For 1-Cell Pack

单锂电池保护电路

■ Features 特点

- 0V charging, Over discharge Self-recovery 零伏充电, 过放自恢复
- Precision Overcharge Protection Voltage $\pm 50\text{mV}$ 精确的过充保护
- Wide operating temperature range -40 to $+85^\circ\text{C}$ 宽工作温度范围
- SOT-23-6L Small Package 小型封装

■ Internal Schematic Diagram 内部结构



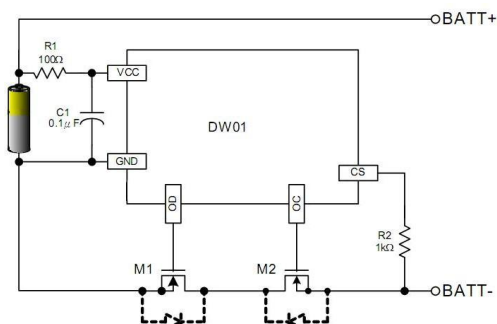
■ Absolute Maximum Ratings 最大额定值

Characteristic 特性参数	Symbol 符号	Rating 额定值	Unit 单位
Supply voltage 供电电压	V_{CC}	$-0.3\sim 10$	V
CS terminal input voltage CS 端输入电压	V_{CS}	$V_{CC}-28\sim V_{CC}+0.3$	V
OC terminal Output voltage OC 端输出电压	V_{OC}	$V_{CC}-28\sim V_{CC}+0.3$	V
OD terminal Output voltage OD 端输出电压	V_{OD}	$V_{CC}-0.3\sim V_{CC}+0.3$	V
Operation Temperature 工作温度	T_{opr}	$-40\sim +85$	$^\circ\text{C}$
Storage Temperature 储存温度	T_{stg}	$-55\sim +125$	$^\circ\text{C}$

■ **Electrical Characteristics 电特性** ($T_A=25^\circ\text{C}$ unless otherwise noted 如无特殊说明, 温度为 25°C)

Characteristics 特性参数 (Test Condition 测试条件)	Symbol 符号	Min 最小值	Typ 典型值	Max 最大值	Unit 单位
Operating voltage between V_{CC} & GND 间工作电压	V_{CC}	1.5	—	9.0	V
Operating voltage between OC & CS 间工作电压		1.5	—	25.0	V
Minimum operating voltage for 0V charging 零充电状态工作电压	V_{st}	—	—	1.2	V
Discharging overcurrent release resistance 放电过流释放电阻($V_{CC}=3.6\text{V}, V_{CS}=1\text{V}$)	R_{short}	30	50	100	K Ω
OC pin Nch ON voltage OC 脚 N 沟道开启电压	V_{CL}	—	0.4	0.5	V
OC pin Pch ON voltage OC 脚 P 沟道开启电压	V_{CH}	$V_{CC}-0.1$	$V_{CC}-0.02$	—	V
OD pin Nch ON voltage OD 脚 N 沟道开启电压	V_{DL}	—	0.2	0.5	V
OD pin Pch ON voltage OD 脚 P 沟道开启电压	V_{DH}	$V_{CC}-0.1$	$V_{CC}-0.02$	—	V
Current consumption 消耗电流($V_{CC}=3.5\text{V}, V_{CS}=0\text{V}$)	I_{CC}	1.2	2.4	6.0	μA
Overdischarge current consumption (Self-recovery) 过放电(自恢复)消耗电流($V_{CC}=V_{CS}=2.0\text{V}$)	I_{DOX}	—	1.8	3.0	μA
Overcharge Protection Voltage 过充保护电压($R1=100\Omega$)	V_{OCP}	4.25	4.30	4.35	V
Overcharge Release Voltage 过充释放电压($R1=100\Omega$)	V_{OCR}	4.05	4.10	4.15	V
Overcharge Hysteresis Voltage 过充滞后电压 ($V_{hys}=V_{OCP}-V_{OCR}, R1=100\Omega$)	V_{hys}	—	0.2	—	V
Overdischarge Protection Voltage 过放保护电压($V_{CS}=0\text{V}, R1=100\Omega$)	V_{ODP}	2.30	2.40	2.50	V
Overdischarge Release Voltage ($R1=100\Omega$) 过放释放电压 ($R1=100\Omega, R2=1\text{K}\Omega, V_{CS}=V_{chg}$)	V_{ODR}	2.90 2.30	3.00 2.40	3.10 2.50	V
Discharging overcurrent detection voltage 放电过流检测电压($V_{CC}=3\text{V}, R2=1\text{K}\Omega$)	V_{DO}	0.11	0.14	0.17	V
Short Current Protection Voltage 短路保护电压($V_{CC}=3.0\text{V}$)	V_{short}	0.9	1.2	1.5	V
Overcharge Delay Time 过充延时($V_{CC}=3.8\text{V}\rightarrow 4.5\text{V}$)	T_{OC}	50	100	200	ms
Overdischarge Delay Time 过放延时($V_{CC}=3.2\text{V}\rightarrow 2.2\text{V}$)	T_{OD}	50	100	200	ms
Discharging overcurrent delay time 放电过流延时 ($V_{CC}=3.0\text{V}, V_{CS}=0\rightarrow 0.2\text{V}$)	T_{DO}	5	10	20	ms
Short delay time 短路延时($V_{CC}=3.5\text{V}, V_{CS}=0\rightarrow 1.0\text{V}$)	T_{short}	—	50	100	s
Charger detection voltage 充电检测电压($V_{CC}=3.6\text{V}, R2=1\text{K}\Omega$)	V_{chg}	0.3	0.7	1.1	V

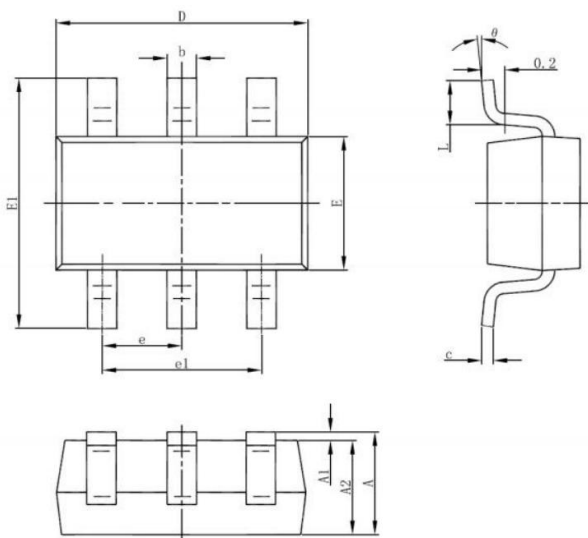
■ Application Circuit 应用电路



Discrete	Components	Function	Min.	Typ.	Max.	Unit
R1	Resistor	Current limit Noise filtering	-	100	1K	Ω
R2	Resistor	Current limit ESD protection	300	1K	2K	Ω
C1	Capacitor	Noise filtering	0.022	0.1	1.0	μF
M1	N-MOSFET	Discharge switch				
M2	N-MOSFET	Charge switch				

No.脚号	Name 名称	Description 功能
1	OD	Over-discharge protect control output 过放保护输出
2	CS	Current detect input 电流检测输入
3	OC	Over-charge protect control output 过充保护输出
4		NC 空
5	VCC	Positive power Supply 正电源供电
6	GND	Negative power supply of battery side 电池侧负电源供电

■ Dimension 外形封装尺寸



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.600REF		0.024REF	
θ	0°	8°	0°	8°