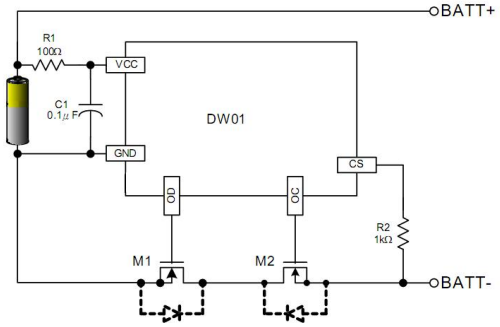
DW01A

Battery Protection IC For 1-Cell Pack 單鋰電池保護電路

■Features 特點

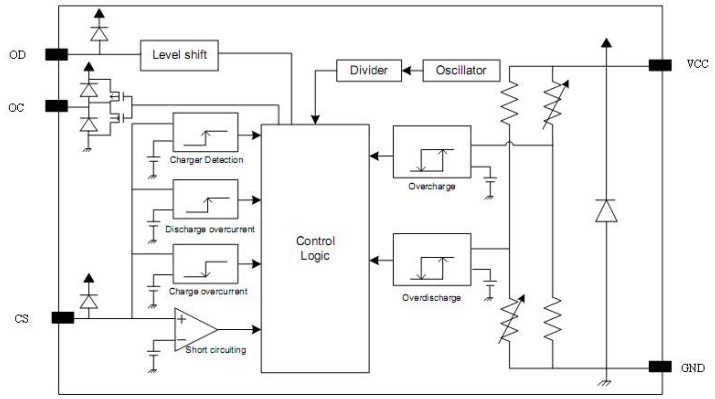
0V charging，Over discharge Self-recovery 零伏充電，過放自恢復
Precision Overcharge Protection Voltage ±50mV 精確的過充保護電壓
Wide operating temperature range -40 to +85℃ 寬工作溫度範圍
SOT23-6 Small Package 小型封裝

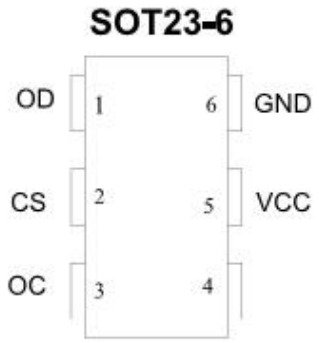
■Application Circuit 應用電路



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				

■Internal Schematic Diagram 內部結構





■Absolute Maximum Ratings 最大額定值

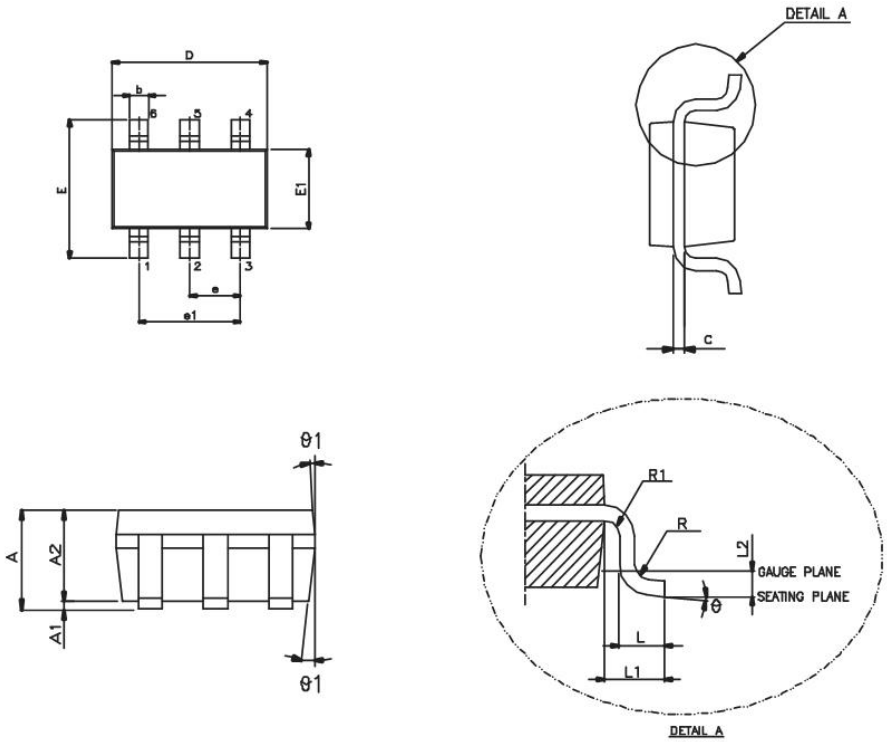
Characteristic 特性參數	Symbol 符號	Rating 額定值	Unit 單位
Supply voltage 供電電壓	V_{CC}	-0.3~10	V
CS terminal input voltage CS 端輸入電壓	V_{CS}	V_{CC}-28~V_{CC}+0.3	V
OC terminal Output voltage OC 端輸出電壓	V_{OC}	V_{CC}-28~V_{CC}+0.3	V
OD terminal Output voltage OD 端輸出電壓	V_{OD}	V_{CC}-0.3~V_{CC}+0.3	V
Operation Temperature 工作溫度	T_{opr}	-40~+85	℃
Storage Temperature 儲存溫度	T_{stg}	-55~+125	℃

■Electrical Characteristics 電特性

(T_A=25℃ unless otherwise noted 如無特殊說明，溫度爲 25℃)

Characteristics 特性參數 (Test Condition 測試條件)	Symbol 符號	Min 最小值	Typ 典型值	Max 最大值	Unit 單位
Operating voltage between V_{CC} & GND 間工作電壓	V_{CC}	1.5	—	9.0	V
Operating voltage between OC & CS 間工作電壓		1.5	—	25.0	V
Minimum operating voltage for 0V charging 零充電狀態工作電壓	V_{st}	—	—	1.2	V
Discharging overcurrent release resistance 放電過流釋放電阻(V_{CC}=3.6V,V_{CS}=1V)	R_{short}	30	50	100	KΩ
OC pin Nch ON voltage OC 腳 N 溝道開啟電壓	V_{CL}	—	0.4	0.5	V
OC pin Pch ON voltage OC 腳 P 溝道開啟電壓	V_{CH}	V_{CC}-0.1	V_{CC}-0.02	—	V
OD pin Nch ON voltage OD 腳 N 溝道開啟電壓	V_{DL}	—	0.2	0.5	V
OD pin Pch ON voltage OD 腳 P 溝道開啟電壓	V_{DH}	V_{CC}-0.1	V_{CC}-0.02	—	V
Current consumption 消耗電流(V_{CC}=3.5V, V_{CS}=0V)	I_{CC}	1.2	2.4	6.0	uA
Overdischarge current consumption (Self-recovery) 過放電(自恢復)消耗電流(V_{CC}=V_{CS}=2.0V)	I_{DOX}	—	1.8	3.0	uA
Overcharge Protection Voltage 過充保護電壓(R1=100Ω)	V_{OCP}	4.25	4.30	4.35	V
Overcharge Release Voltage 過充釋放電壓(R1=100Ω)	V_{OCR}	4.05	4.10	4.15	V
Overcharge hysteresis voltage 過充滯後電壓 (V_{hys}=V_{OCP}-V_{OCR},R1=100Ω)	V_{hys}	—	0.2	—	V
Overdischarge Protection Voltage 過放保護電壓(V_{CS}=0V,R1=100Ω)	V_{ODP}	2.30	2.40	2.50	V
Overdischarge Release Voltage (R1=100Ω) 過放釋放電壓(R1=100Ω,R2=1KΩ,V_{CS}=V_{chg})	V_{ODR}	2.90 2.30	3.00 2.40	3.10 2.50	V
Discharging overcurrent detection voltage 放電過流檢測電壓(V_{CC}=3V,R2=1KΩ)	V_{DO}	0.11	0.14	0.17	V
Short Current Protection Voltage 短路保護電壓(V_{CC}=3.0V)	V_{short}	0.9	1.2	1.5	V
Overcharge Delay Time 過充延時(V_{CC}=3.8V→4.5V)	T_{OC}	50	100	200	ms
Overdischarge Delay Time 過放延時(V_{CC}=3.2V→2.2V)	T_{OD}	50	100	200	ms
Discharging overcurrent delay time 放電過流延時 (V_{CC}=3.0V, V_{CS}=0→0.2V)	T_{DO}	5	10	20	ms
Short delay time 短路延時(V_{CC}=3.5V, V_{CS}=0→1.0V)	T_{short}	—	50	100	us
Charger detection voltage 充電檢測電壓 (V_{CC}=3.6V, R2=1KΩ)	V_{chg}	0.3	0.7	1.1	V

■DIMENSION 外形封裝尺寸



SYMBOL	MIN.	NOM.	MAX.
A	–	–	1.45
A1	–	–	0.15
A2	0.90	1.15	1.30
b	0.30	–	0.50
c	0.08	–	0.22
D		2.90 BSC.	
E		2.80 BSC.	
E1		1.60 BSC.	
e		0.95 BSC	
e1		1.90 BSC.	
L	0.30	0.45	0.60
L1		0.60 REF.	
L2		0.25 BSC.	
R	0.10	–	–
R1	0.10	–	0.25
θ	0°	4°	8°
θ1	5°	10°	15°