General Description

The DW01A battery protection IC is designed to protect lithium-ion/polymer battery from damage or degrading the lifetime due to overcharge, overdischarge, and/or overcurrent for one-cell lithium-ion/polymer battery powered systems, such as cellular phones.

The ultra-small package and less required external components make it ideal to integrate the DW01A into the limited space of battery pack. The accurate ±50mV overcharging detection voltage ensures safe and full utilization charging. The very low standby current drains little current from the cell while in storage.

Ordering Information

DW01A

PACKAGE TYPE
SOT-23-6

TEMPERATURE RANGE
-40°C~+85°C

OVERCHARGE PROTECTION
4.3V± 50mV

Features

- **Reduction in Board Size due to Miniature Package SOT-23-6.**
- **Ultra-Low Quiescent Current at 3 μA (Vcc=3.6V).**
- **Overdischarge Current at 4 μA (Vcc=1.8V).**
- **Precision Overcharge Protection Voltage 4.3V ± 50mV**
- **Two Detection Levels for Overcurrent Protection.**
- **Delay times are generated by internal circuits. No external capacitors required.**

Applications

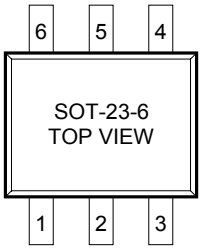
- **Protection IC for One-Cell Lithium-Ion / Lithium-Polymer Battery Pack**

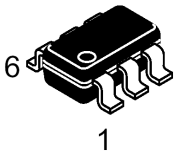
Product Name List

Product	Package	Overcharge detection voltage [VOCP] (V)	Overcharge release voltage [VOCR] (V)	Overdischarge detection voltage [VODP] (V)	Overdischarge release voltage [VODR] (V)	Overcurrent detection voltage [VOI1] (mV)	0V battery charge function	Stand by function release
DW01A	SOT-23-6	4.300±0.050	4.100±0.050	2.50±0.1	2.90 ±0.1	150±20	available	Auto Recovery

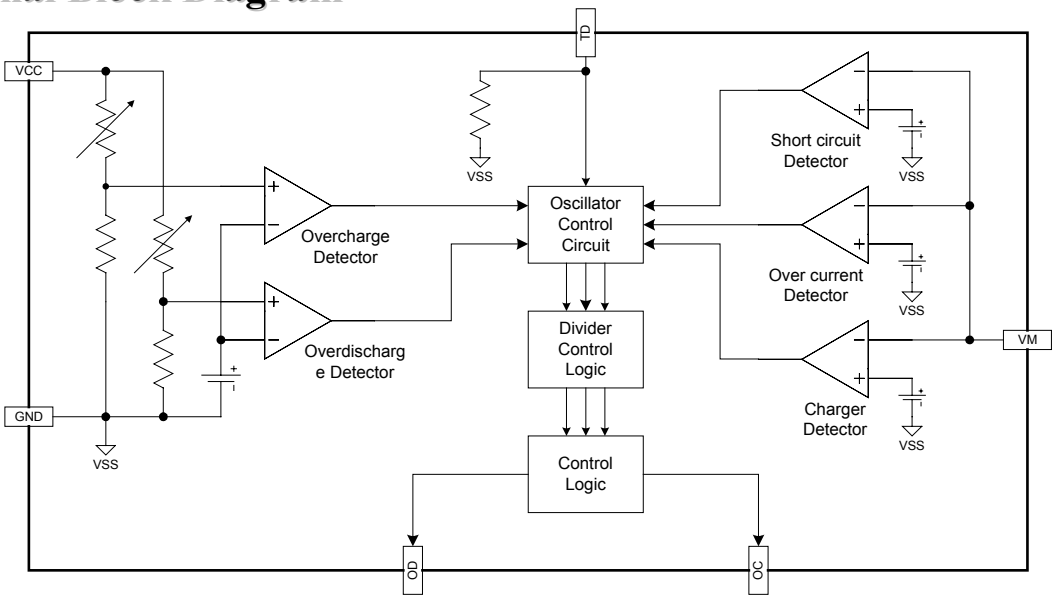
Pin Configuration

Pin No.	Symbol	Description
1	OD	MOSFET gate connection pin for discharge control
2	VM	Input pin for current sense, charger detect
3	OC	MOSFET gate connection pin for charge control
4	TD	Test pin for reduce delay time
5	VCC	Power supply, through a resistor (R1)
6	GND	Ground pin

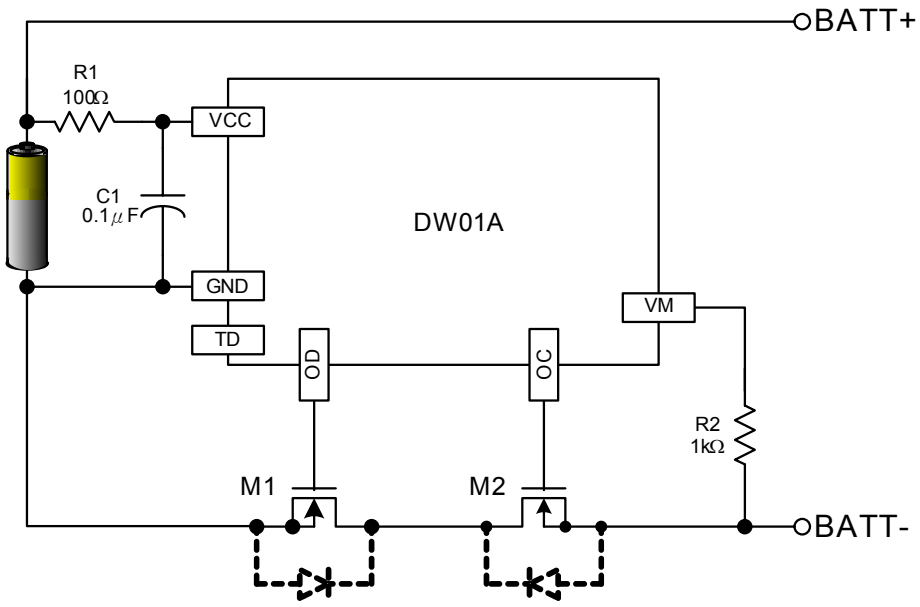




Functional Block Diagram



Typical Application Circuit



Absolute Maximum Ratings

(VSS=0V, Ta=25°C unless otherwise specified)

Item	Symbol	Rating	Unit
Input voltage between VDD and VSS	VDD	0.3 to 10	V
OC output pin voltage	VOC	VDD-24 to VDD+0.3	V
OD output pin voltage	VOD	VSS-0.3 to VDD+0.3	V
CS input pin voltage	VCS	VDD-24 to VDD+0.3	V
Operating Temperature Range	TOP	-40 to +85	°C
Storage Temperature Range	TST	-40 to +125	°C

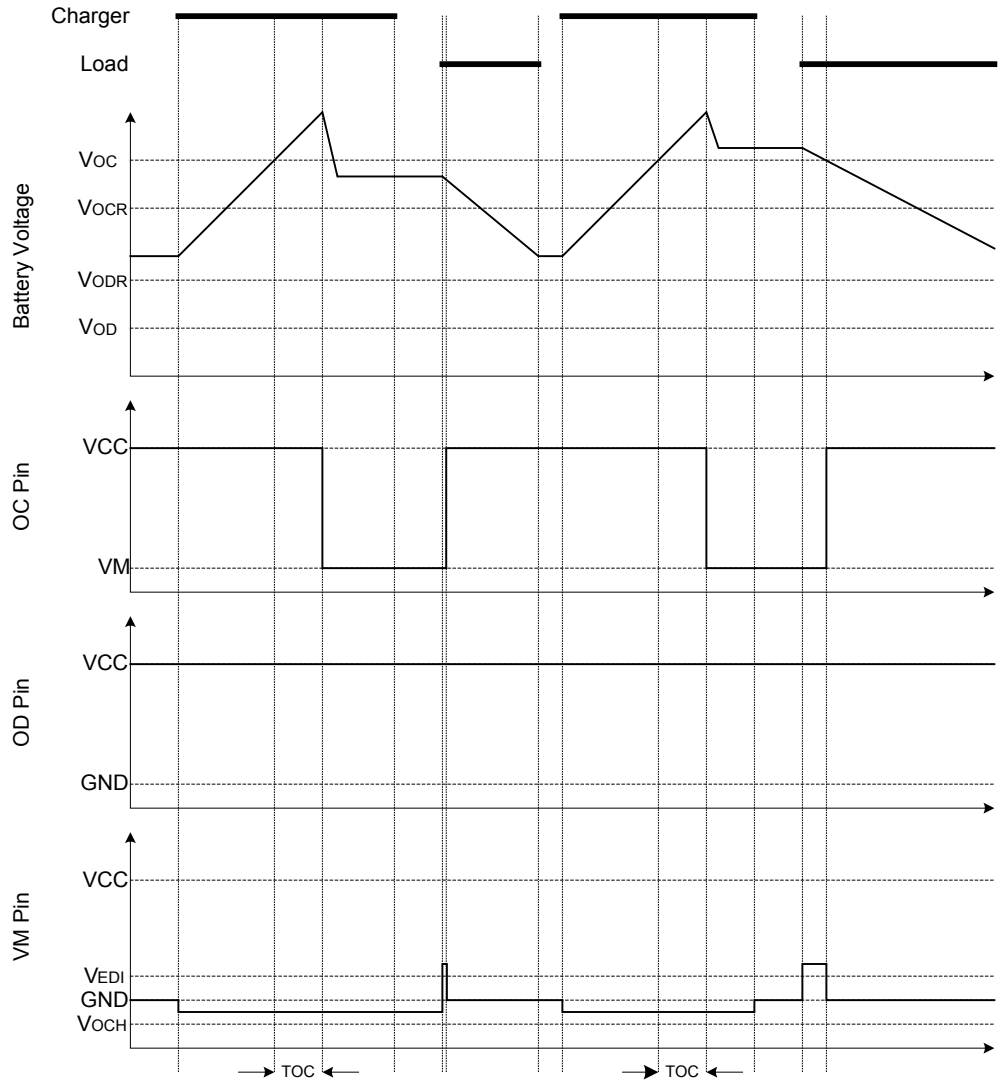
Electrical Characteristics

(Ta=25°C unless otherwise specified)

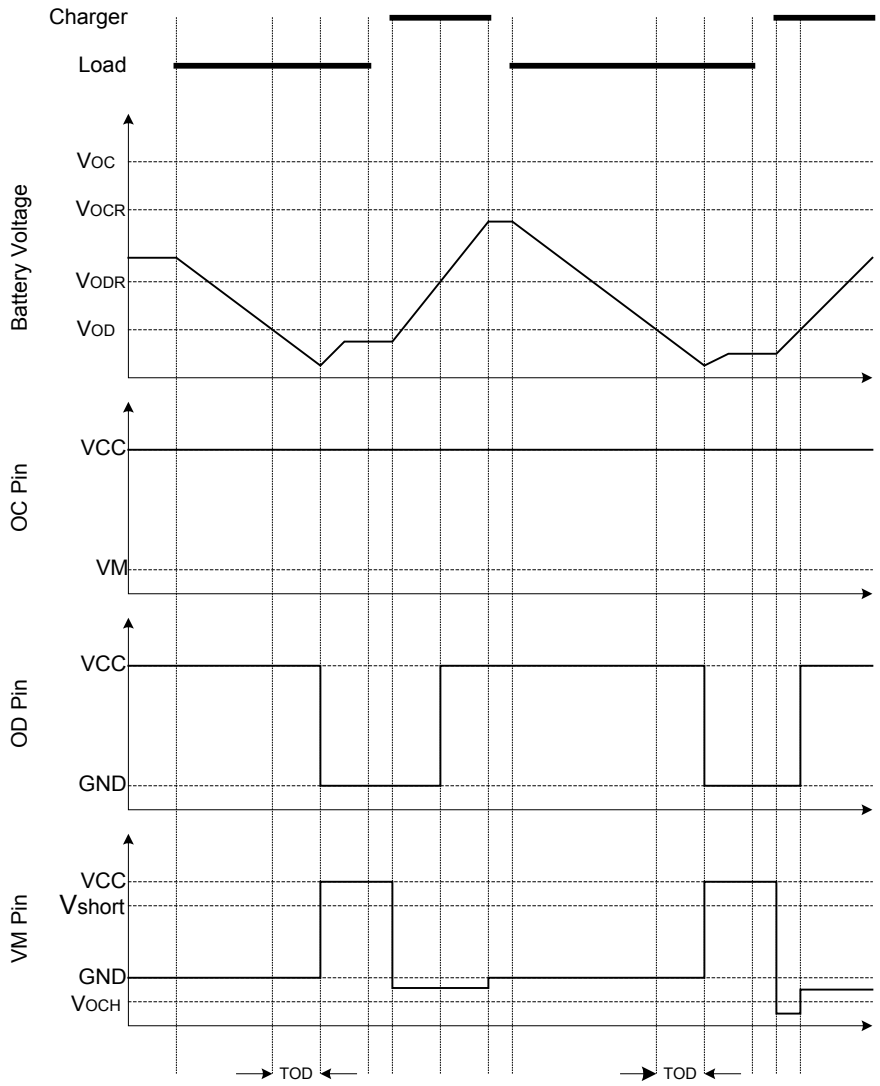
PARAMETER	TEST CONDITIONS	SYMBOL	Min	Typ	Max	UNIT
Supply Current	VCC=3.6V	ICC		3.0	6.0	μA
Power-Down Current	VCC=1.8V	IPD			4	μA
0V Battery Charge Starting Charger Voltage		V0CHA	1.2			V
Overcharge Protection Voltage		VOC	4.25	4.30	4.35	V
Overcharge Release Voltage		VOCR	4.05	4.10	4.15	V
Overdischarge Protection Voltage		VOD	2.40	2.50	2.60	V
Overdischarge Release Voltage		VODR	2.80	2.90	3.00	V
Overcurrent Protection Voltage		VEDI	130	150	170	mV
Short Current Protection Voltage		Vshort	0.82	1.36	1.75	V
Overcharge Delay Time		TOC		110	200	ms
Overdischarge Delay Time	VCC=3.6V to 2.4V	TOD		55	200	ms
Overcurrent Delay Time (1)		TEDI		7	20	ms
Overcurrent Delay Time (2)		Tshort		400	600	μs
OD Pin Output “H” Voltage	VCC=3.9V ICO=10uA	DoutH	VCC-0.4	VCC-0.2		V
OD Pin Output “L” Voltage	VCC=2V IDO=10uA	DoutL		0. 2	0.5	V
OC Pin Output “H” Voltage	VCC=3.9V ICO=10uA	CoutH	VCC-0.1	VCC-0 02		V

Timing Diagram

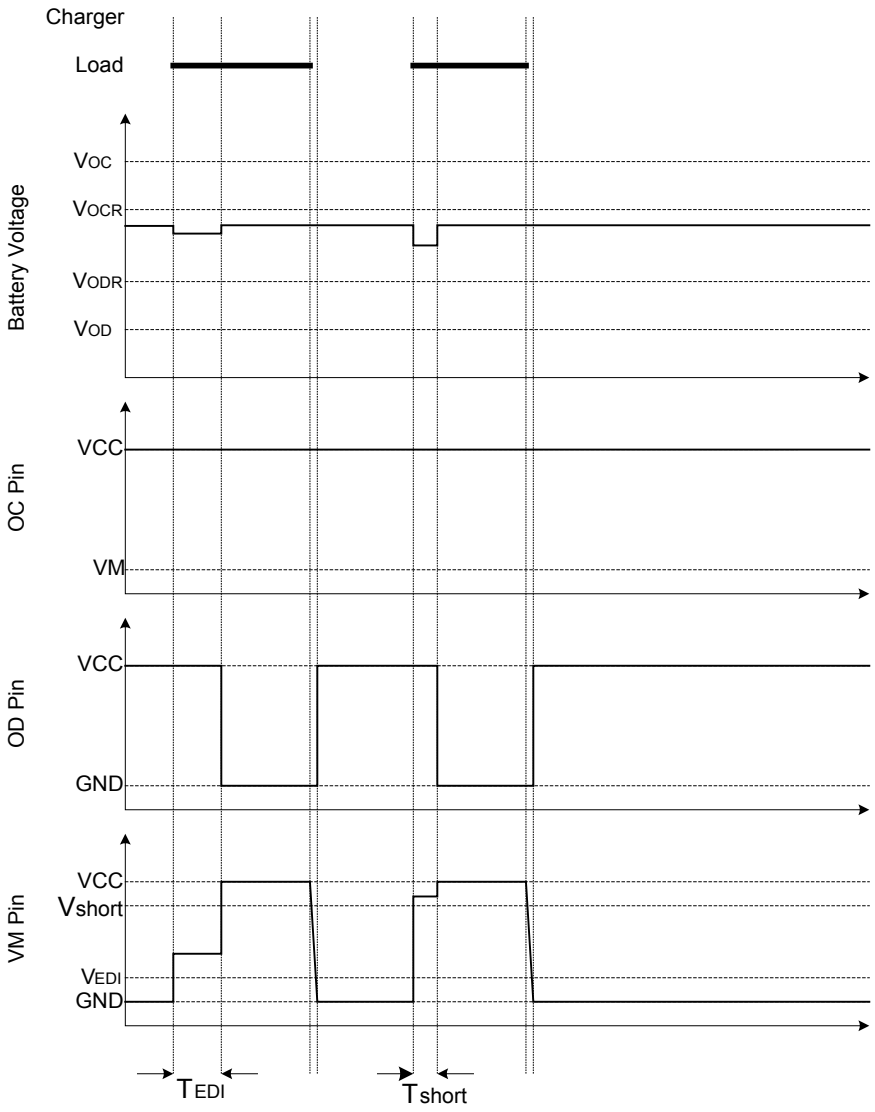
1. Overcharge Condition →Load Discharging → Normal Condition



2. Overdischarge Condition → Charging by a Charger →Normal Condition



3. Over Current Condition → Normal Condition



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