One Cell Lithium-ion/Polymer Battery Protection IC

● Features

➤ Reduction in Board Size due to Miniature Package SOT-23-6.

➤ Ultra-Low Quiescent Current at 3μA (Vcc=3.9V).

➤ Auto recovery

➤ 0v charging

➤ Precision Overcharge Protection Voltage 4.375V ±25mV and 4.425V ±25mV

➤ Load Detection Function during Overcharge Mode.

➤ Two Detection Levels for Overcurrent Protection.

➤ Delay times are generated by internal circuits. No external capacitors required.

● Pin Configuration
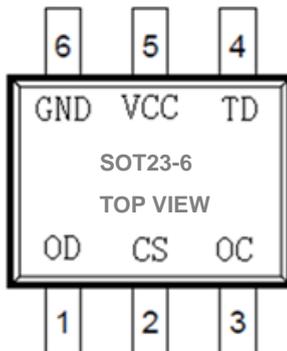
● General Description

The SSC5918 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 SSC5918 into the limited space of battery pack. The accurate ±25mV overcharging detection voltage ensures safe and full utilization charging. The very low standby current drains little current from the cell while in storage.
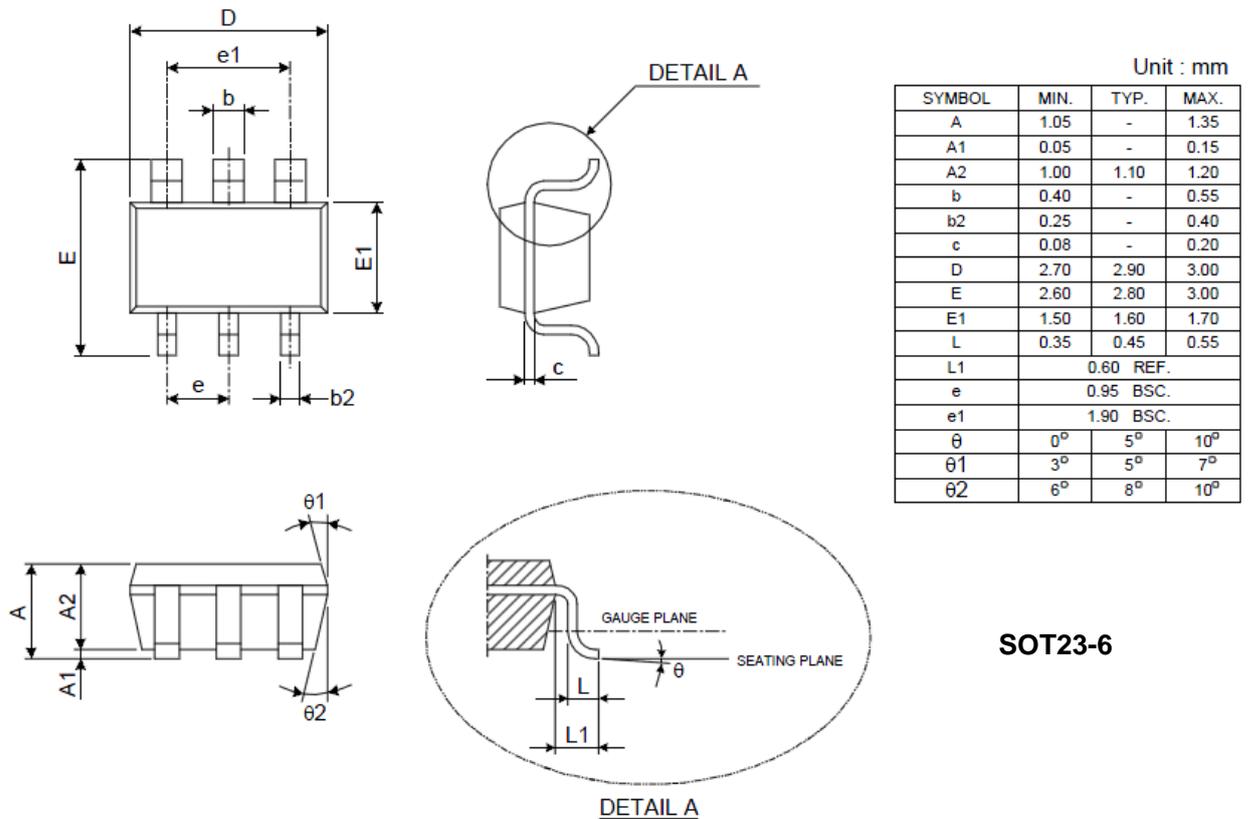
● Applications

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

built-in cell of mobile phone
digital product cell
camera cell
portable power

➤ Reflow soldering internal actual temperature < 250 degrees, time in high temperature < 7 s.

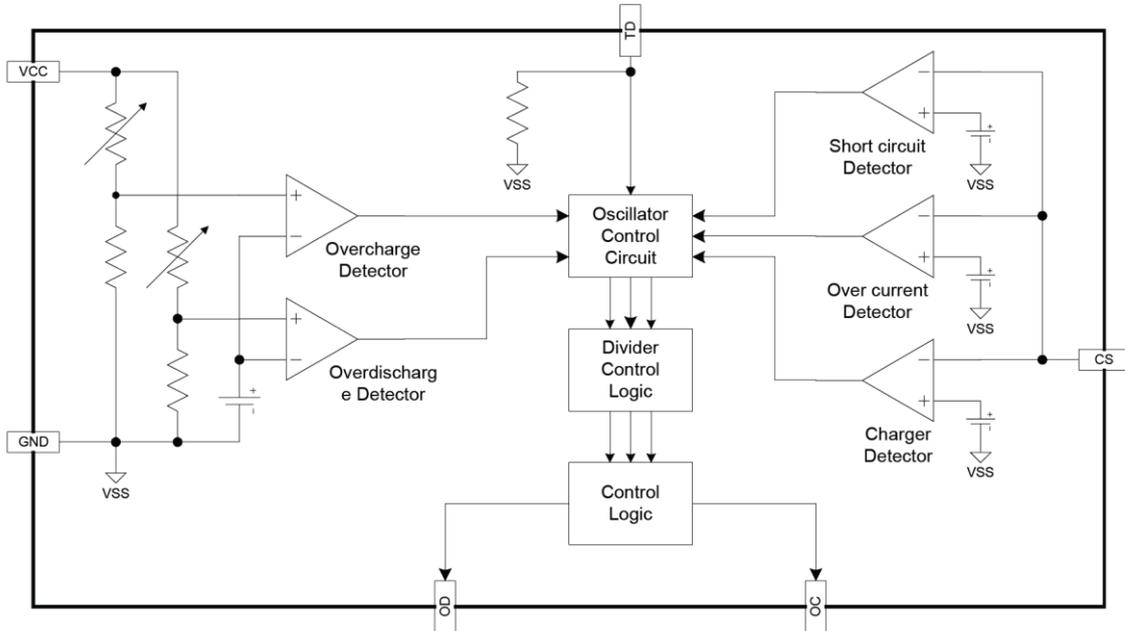| Pin No.	Symbol	I/O	Description
1	OD	O	MOSFET gate connection pin for discharge control
2	CS	I	Input pin for current sense, charger detect
3	OC	O	MOSFET gate connection pin for charge control
4	TD	I	Test pin for reduce delay time
5	VCC	–	Power supply, through a resistor (R1)
6	GND	–	Ground pin

● Product Name List

Model	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)
	SOT23-6					
SSC5918H0a	SOT23-6	4.375±0.025	4.100±0.050	2.40±0.100	3.0±0.100	150±30
SSC5918H0b	SOT23-6	4.375±0.025	4.100±0.050	2.40±0.100	3.0±0.100	175±30
SSC5918G0a	SOT23-6	4.425±0.025	4.425±0.025	2.40±0.100	3.0±0.100	150±30

● Package Information

Unit : mm			
SYMBOL	MIN.	TYP.	MAX.
A	1.05	-	1.35
A1	0.05	-	0.15
A2	1.00	1.10	1.20
b	0.40	-	0.55
b2	0.25	-	0.40
c	0.08	-	0.20
D	2.70	2.90	3.00
E	2.60	2.80	3.00
E1	1.50	1.60	1.70
L	0.35	0.45	0.55
L1	0.60 REF.		
e	0.95 BSC.		
e1	1.90 BSC.		
θ	0°	5°	10°
θ1	3°	5°	7°
θ2	6°	8°	10°

DETAIL A

SOT23-6
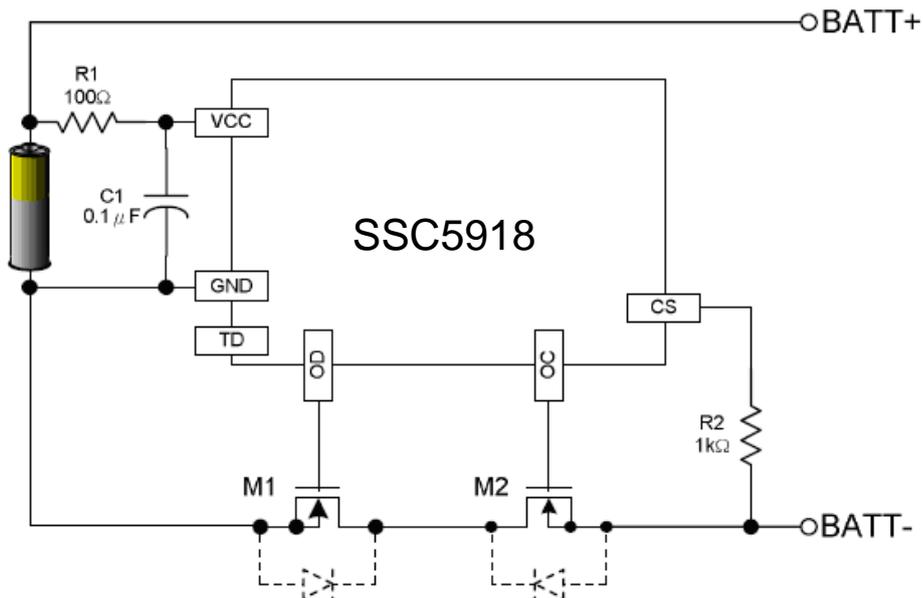
● Functional Block Diagram

● Typical Application Circuit

● Absolute Maximum Ratings(VSS=0V, Ta=25°C unless otherwise specified)

| Item	Symbol	Rating	Unit
Input voltage between VDD and VSS *	V_{DD}	VSS-0.3 to VSS+10	V
OC output pin voltage	V_{OC}	VDD-26 to VDD+0.3	V
OD output pin voltage	V_{OD}	VSS-0.3 to VDD+0.3	V
CS input pin voltage	V_{CS}	VDD-26 to VDD+0.3	V
Operating Temperature Range	T_{OP}	-40~+85	℃
Storage Temperature Range	T_{ST}	-40~+125	℃

Note:SSC5918 contains a circuit that will protect it from static discharge; but please take special care that no excessive static electricity or voltage which exceeds the limit of the protection circuit will be applied to it.

● Electrical Characteristics (Ta=25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Uni
Supply Current	V_{CC}=3.9V	I_{CC}		3.0	6.0	uA
Power-Down Current	V_{CC}=2.0V	I_{PD}			3.0	uA
Overcharge Protection Voltage	SSC5918H	V_{OCP}	4.35	4.375	4.4	V
Overcharge Protection Voltage	SSC5918G	V_{OCP}	4.4	4.425	4.45	V
Overcharge Release Voltage	SSC5918H	V_{OCR}	4.05	4.10	4.15	V
Overcharge Release Voltage	SSC5918G	V_{OCR}	4.4	4.425	4.45	V
Overdischarge Protection Voltage		V_{ODP}	2.30	2.40	2.50	V
Overdischarge Release Voltage		V_{ODR}	2.90	3.00	3.10	V
Overcurrent Protection Voltage		$V_{OIP}(V_{OI1})$	120	150	180	mV
Short Current Protection Voltage	V_{CC}=3.6V	$V_{SIP}(V_{OI2})$	1.25	1.35	1.45	V
Overcharge Delay Time		T_{OC}		80	200	ms
Overdischarge Delay Time	V_{CC}=3.6V to 2.0V	T_{OD}		40	100	ms
Overcurrent Delay Time (1)	V_{CC}=3.6V	T_{OI1}		10	20	ms
Overcurrent Delay Time (2)	V_{CC}=3.6V	T_{OI2}		5	100	us
Charger Detection Threshold Voltage		V_{CH}	-1.2	-0.7	-0.2	V
OD Pin Output "H" Voltage		V_{DH}	V_{CC}-0.1	V_{CC}-0.02		V
OD Pin Output "L" Voltage		V_{DL}		0. 1	0.5	V
OC Pin Output "H" Voltage		V_{CH}	V_{CC}-0.1	V_{CC}-0.02		V
OC Pin Output "L" Voltage		V_{CL}		0.1	0.5	V

● **Timing Diagram**
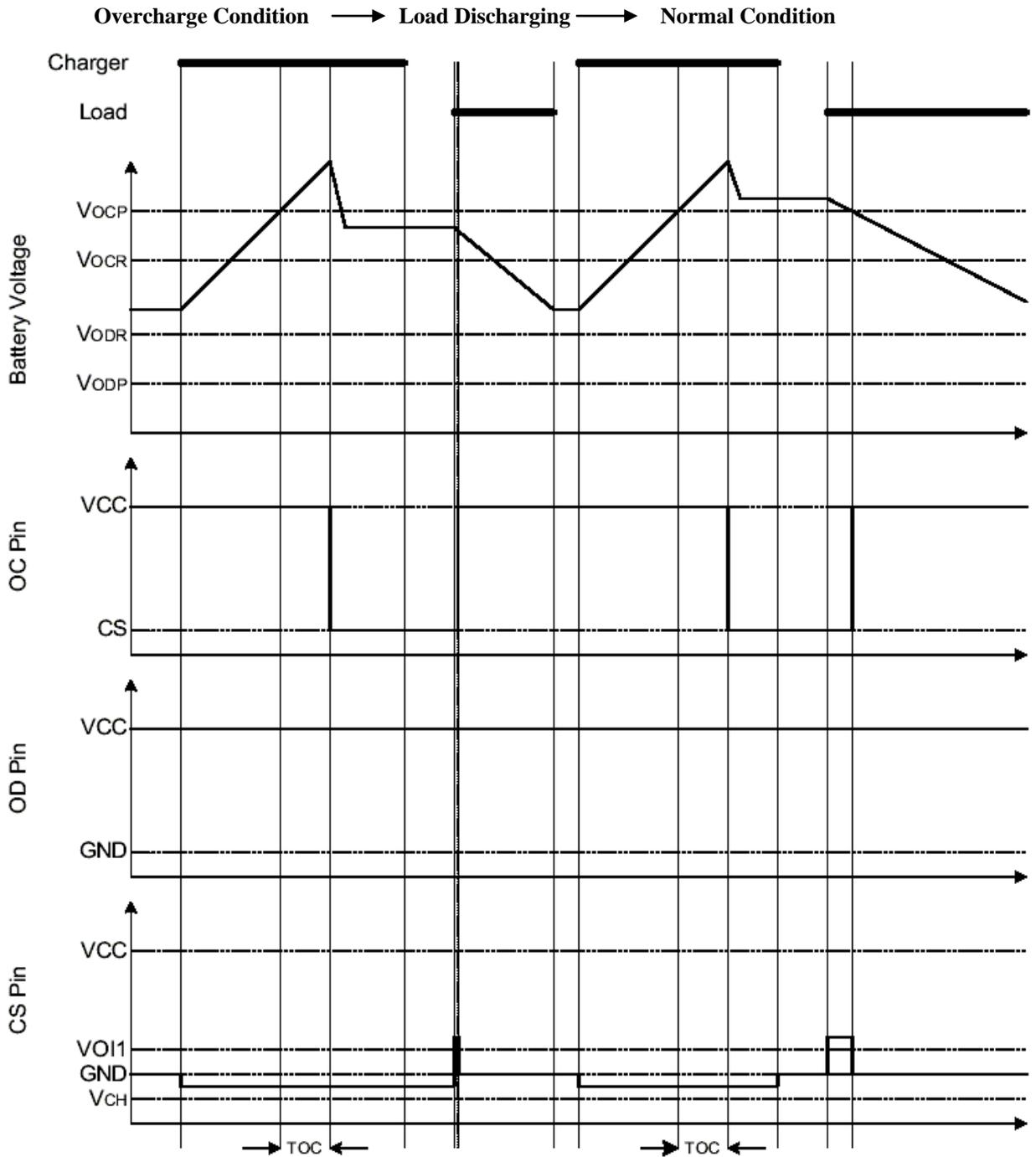
Overdischarge Condition ⟶ **Charging by a Charger** ⟶ **Normal Condition**
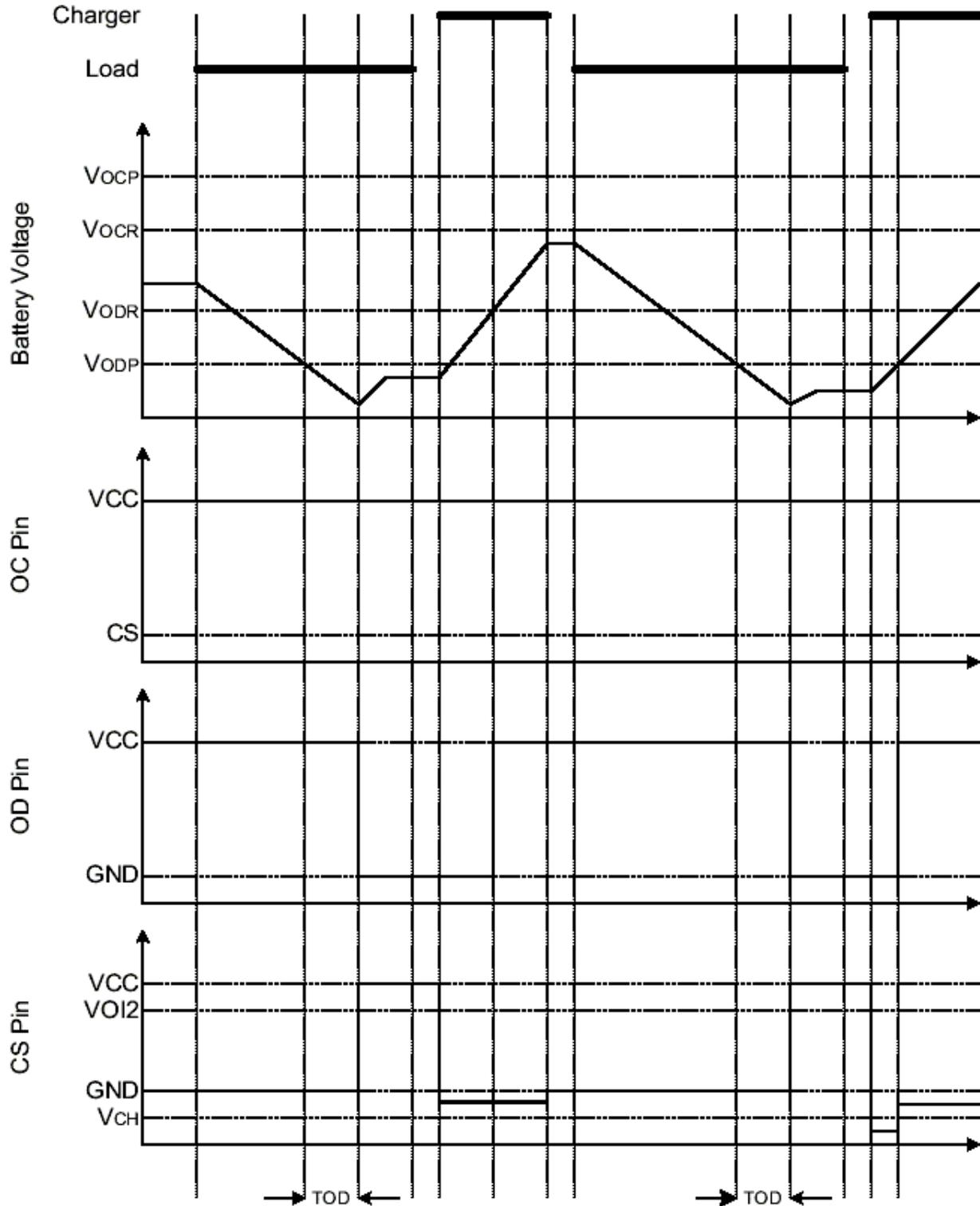
Over Current Condition ⟶ **Normal Condition**
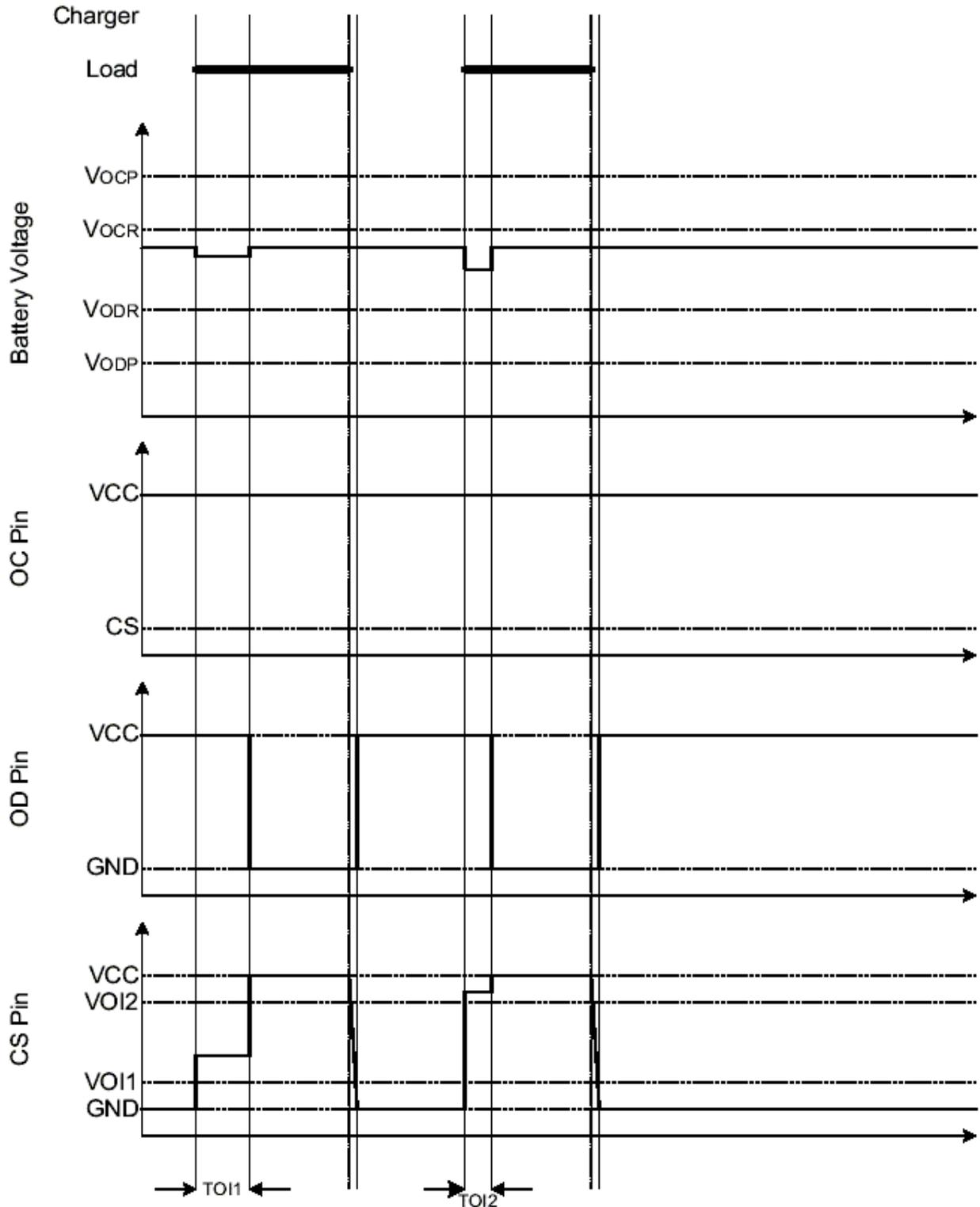
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