



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



## Description

The AP9101C is a protection IC developed for lithium-ion/lithium polymer rechargeable battery with a high-precision voltage detection circuit.

The AP9101C provides a function to protect batteries by detecting overcharge voltage, overdischarge voltage, overcharge current, overdischarge current and other abnormalities and turning off the external MOSFET switch.

The AP9101C also has a built-in fixed time circuit (external capacitors are unnecessary); the protection circuitry can be comprised with fewer external components.

The AP9101C is available in standard packages of SOT25 and SOT26.

## Applications

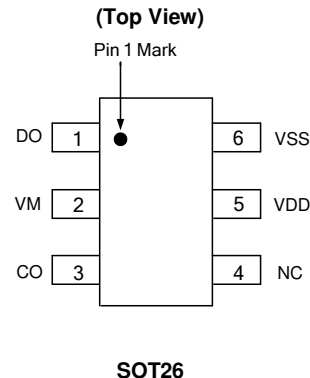
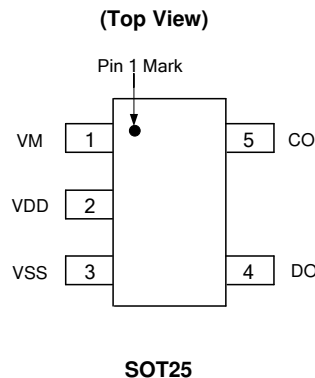
- Lithium-Ion Battery Packs
- Lithium Polymer Battery Packs

## Features

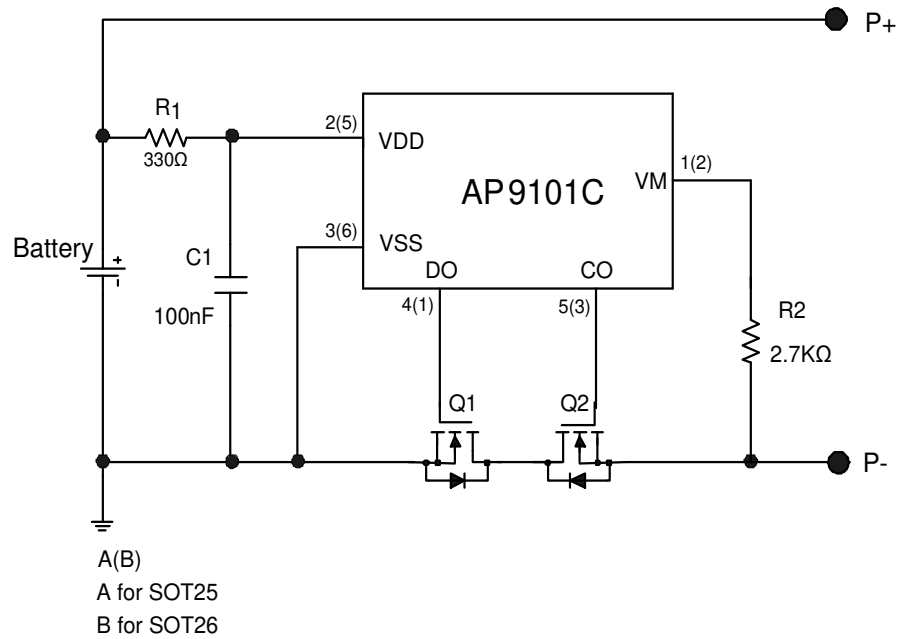
- Low Current Consumption (+25°C)
  - Operation Mode: 3.0µA (Typ)  $V_{DD} = 3.5V$
  - Power-Down Mode: 0.01µA (Typ)
- High-Accuracy Voltage Detection Circuit (+25°C)
  - Overcharge Detection Voltage: 3.5V to 4.5V (5mV Steps) Accuracy  $\pm 25mV$
  - Overcharge Hysteresis Voltage Range: 0.1V to 0.4V (50mV Steps) Accuracy  $\pm 50mV$
  - Overdischarge Detection Voltage: 2.0V to 3.4V (10mV Steps) Accuracy  $\pm 35mV$
  - Overdischarge Hysteresis Voltage Range: 0V to 0.7V (40mV Steps) Accuracy  $\pm 65mV$
  - Discharge Overcurrent Detection Voltage: 0.05V to 0.32V (10mV Steps) Accuracy  $\pm 15mV$
  - Short Current Detection Voltage: 0.45V to 0.7V (50mV Steps) Accuracy  $\pm 100mV$
  - Charge Overcurrent Detection Voltage: -0.2V to -0.05V (10mV Steps) Accuracy  $\pm 15mV$
  - Overcharger Detection Voltage: 8.0V (Fixed) Accuracy  $\pm 2V$
  - Overcharger Release Voltage: 7.3V (Fixed) Accuracy  $\pm 2V$
- Built-In Fixed Detection Delay Time (+25°C): Accuracy  $\pm 20\%$
- Power-Down Mode can be Selectable: Available/Unavailable
- 0V Battery Charge Function can be Selectable: Available/Unavailable
- Overcharge Protection Mode: Release
- High-Voltage CMOS Process: Up to 30V between VDD and VM Pins
- **Totally Lead-free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.  
 2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.  
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

## Pin Assignments



**Typical Applications Circuit** (Note 4)



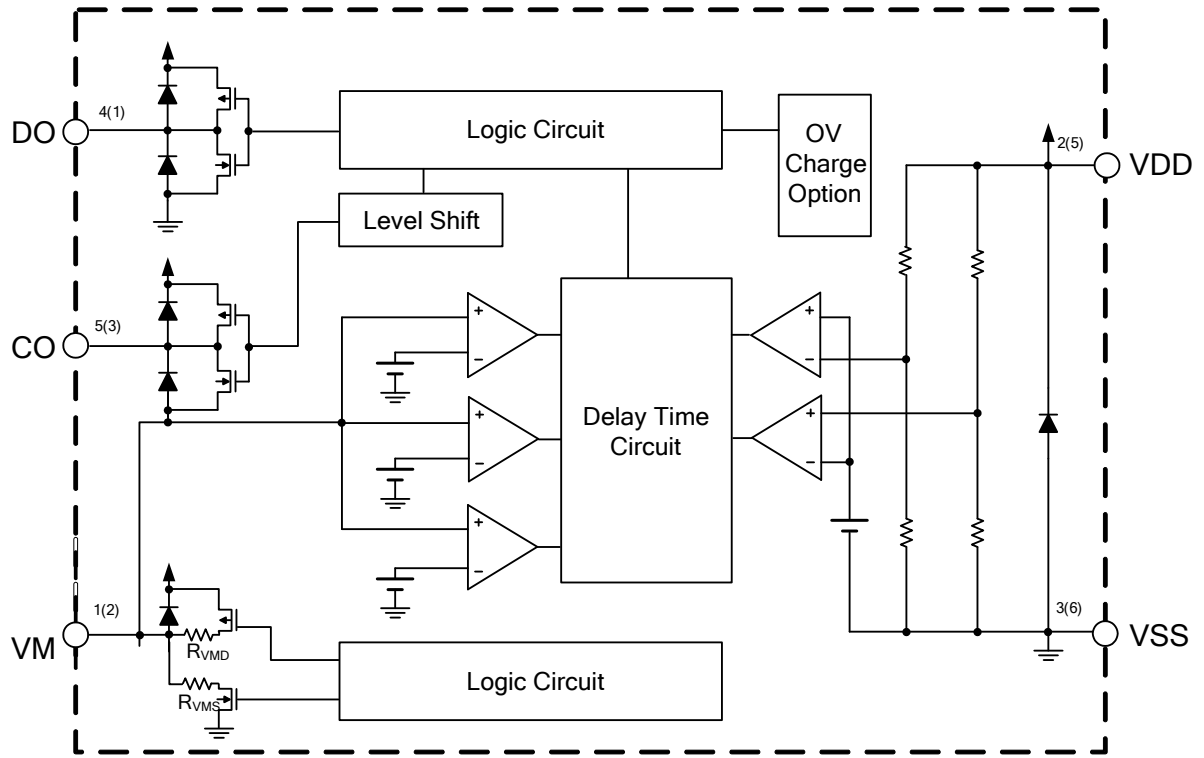
Note 4: R1 and C1 are used to stabilize the supply voltage of the AP9101C. The recommended range of R1 value is 330Ω to 470Ω and C1 value is 10nF to 1000nF, typical value is 100nF. R2 should be connected between P- to VM sense terminal to monitor the status of charger and the charge/discharge current. The R2 should be between 300Ω and 4kΩ, typical value is 2.7kΩ. R1 and R2 are also used as current limit resistors if the battery or charger is connected reversely. Polarity reversing may cause the power consumption of R1 and R2 to go over their power dissipation rating, therefore R1 and R2 values should be selected appropriately for the actual application. If R2 is more than 4kΩ resistor, CO may not cut off Q2 due to the voltage drop on R2.

For power-down mode, when first connecting AP9101C system board to the battery, it is necessary to use charger or to short P- to the battery negative polarity. Once the AP9101C is activated, the charger or connection can be removed, otherwise the battery cannot discharge current through the system board. The values selected should follow the recommended typical range mentioned above.

**Pin Descriptions**

Pin Number		Pin Name	Function
SOT25	SOT26		
1	2	VM	Charger Negative Input Pin
2	5	VDD	Positive Power Input Pin
3	6	VSS	Negative Power Input Pin
4	1	DO	FET Gate Control Pin for Discharge
5	3	CO	FET Gate Control Pin for Charge
—	4	NC	Not Connected

**Functional Block Diagram**



A(B)  
A for SOT25  
B for SOT26

## Absolute Maximum Ratings (Note 5)

Symbol	Parameter	Rating	Unit
V <sub>DS</sub>	Supply Voltage (Between VDD and VSS)	-0.3 to 12	V
V <sub>DM</sub>	Charger Input Voltage (Between VDD and VM)	-0.3 to 30	V
V <sub>CO</sub>	CO Pin Output Voltage	V <sub>M</sub> -0.3 to V <sub>DD</sub> +0.3	V
V <sub>DO</sub>	DO Pin Output Voltage	V <sub>SS</sub> -0.3 to V <sub>DD</sub> +0.3	V
T <sub>OPR</sub>	Operating Temperature Range	-40 to +85	°C
T <sub>J</sub>	Junction Temperature	+150	°C
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	°C
T <sub>LEAD</sub>	Lead Temperature (Soldering, 10sec)	+300	°C
P <sub>D</sub>	Power Dissipation (+25°C)	250	mW
—	ESD (Machine Model)	200	V
—	ESD (Human Body Model)	2,000	V

Note: 5. Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “Recommended Operating Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.

## Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V <sub>DS</sub>	Supply Voltage (Between VDD and VSS)	1.5	5.5	V
V <sub>DM</sub>	Charger Input Voltage (Between VDD and VM)	-0.3	5.5	V
T <sub>A</sub>	Operating Ambient Temperature	-40	+85	°C

## Electrical Characteristics

( $T_A = +25^\circ\text{C}$ ,  $V_{DD} = 3.5\text{V}$ ,  $V_{SS} = 0\text{V}$ ,  $R_1 = 330\Omega$ ,  $R_2 = 2.7\text{k}\Omega$ ,  $C_1 = 100\text{nF}$ , unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit	
$V_{CU}$	Overcharge Detection Voltage	$V_M = 0$	$V_{CU}-0.025$	$V_{CU}$	$V_{CU}+0.025$	V	
$V_{CL}$	Overcharge Release Voltage	$V_{CL} \neq V_{CU}$ , $V_M = 0$	$V_{CL}-0.050$	$V_{CL}$	$V_{CL}+0.050$	V	
		$V_{CL} = V_{CU}$	$V_{CL}-0.025$	$V_{CL}$	$V_{CL}+0.025$	V	
$V_{DL}$	Overdischarge Detection Voltage	$V_M = 0$	$V_{DL}-0.035$	$V_{DL}$	$V_{DL}+0.035$	V	
$V_{DU}$	Overdischarge Release Voltage	$V_{DU} \neq V_{DL}$ , $V_M = 0$	$V_{DU}-0.100$	$V_{DU}$	$V_{DU}+0.100$	V	
		$V_{DU} = V_{DL}$	$V_{DU}-0.035$	$V_{DU}$	$V_{DU}+0.035$	V	
$V_{DOC}$	Discharge Overcurrent Detection Voltage	—	$V_{DOC}-0.015$	$V_{DOC}$	$V_{DOC}+0.015$	V	
$V_{SHORT}$	Load Short-Circuiting Detection Voltage	—	$V_{SHORT}-0.10$	$V_{SHORT}$	$V_{SHORT}+0.10$	V	
$V_{COC}$	Charge Overcurrent Detection Voltage	—	$V_{COC}-0.015$	$V_{COC}$	$V_{COC}+0.015$	V	
$I_{CC}$	Current Consumption During Operation	$V_{DD} = 3.5\text{V}$ , $V_M = 0\text{V}$	1.5	3	4.5	$\mu\text{A}$	
$I_{STB}$	Current Consumption at Power-Down	$V_{DD} = 1.8\text{V}$ , VM Pin Floating	Power-Down Mode	—	—	0.1	$\mu\text{A}$
		Without Power-Down Mode (Auto-Wake-up)	—	—	5.5		
$R_{COH}$	CO Pin Resistance "H"	$V_{DD} = 3.5\text{V}$ , $V_{CO} = 3.0\text{V}$ , $V_M = 0\text{V}$	2	6	10	$\text{k}\Omega$	
$R_{COL}$	CO Pin Resistance "L"	$V_{DD} = 4.5\text{V}$ , $V_{CO} = 0.5\text{V}$ , $V_M = 0\text{V}$	2	4	10	$\text{k}\Omega$	
$R_{DOH}$	DO Pin Resistance "H"	$V_{DD} = 3.5\text{V}$ , $V_{DO} = 3.0\text{V}$ , $V_M = 0\text{V}$	2	5	10	$\text{k}\Omega$	
$R_{DOL}$	DO Pin Resistance "L"	$V_{DD} = 1.8\text{V}$ , $V_{DO} = 0.5\text{V}$ , $V_M = 0\text{V}$	2	5	10	$\text{k}\Omega$	
$R_{VMD}$	Resistance Between VM Pin and VDD Pin	$V_{DD} = 1.8\text{V}$ , $V_M = 0\text{V}$	150	300	500	$\text{k}\Omega$	
$R_{VMS}$	Resistance Between VM Pin and VSS Pin	$V_{DD} = 3.5\text{V}$ , $V_M = 1.0\text{V}$	10	30	50	$\text{k}\Omega$	
$V_{0CHA}$	0V Battery Charge Starting Charger Voltage	0V Battery Charging "Available"	1.2	—	—	V	
$V_{0INH}$	0V Battery Charge Inhibition Battery Voltage	0V Battery Charging "Unavailable"	—	—	0.45	V	
$V_{OVCHG}$	Overvoltage Charger Detection Voltage	$V_{DD} = 3.5\text{V}$	6.0	8.0	10.0	V	
$V_{OVCHGR}$	Overvoltage Charger Release Voltage	$V_{DD} = 3.5\text{V}$	5.3	7.3	9.3	V	
$t_{CU}$	Overcharge Detection Delay Time	—	$t_{CU} \times 0.8$	$t_{CU}$	$t_{CU} \times 1.2$	ms	
$t_{DL}$	Overdischarge Detection Delay Time	—	$t_{DL} \times 0.8$	$t_{DL}$	$t_{DL} \times 1.2$	ms	
$t_{DOC}$	Discharge Overcurrent Detection Delay Time	—	$t_{DOC} \times 0.8$	$t_{DOC}$	$t_{DOC} \times 1.2$	ms	
$t_{SHORT}$	Load Short-Circuiting Detection Delay Time	—	$t_{SHORT} \times 0.8$	$t_{SHORT}$	$t_{SHORT} \times 1.2$	$\mu\text{s}$	
$t_{COC}$	Charge Overcurrent Detection Delay Time	—	$t_{COC} \times 0.8$	$t_{COC}$	$t_{COC} \times 1.2$	ms	

**Electrical Characteristics** (Cont.)

 (T<sub>A</sub> = -40°C to +85°C, V<sub>DD</sub> = 3.5V, V<sub>SS</sub> = 0V, R<sub>1</sub> = 330Ω, R<sub>2</sub> = 2.7kΩ, C<sub>1</sub> = 100nF, unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit	
V <sub>CU</sub>	Overcharge Detection Voltage	V <sub>M</sub> = 0	V <sub>CU</sub> -0.060	V <sub>CU</sub>	V <sub>CU</sub> +0.040	V	
V <sub>CL</sub>	Overcharge Release Voltage	V <sub>CL</sub> ≠ V <sub>CU</sub> , V <sub>M</sub> = 0	V <sub>CL</sub> -0.080	V <sub>CL</sub>	V <sub>CL</sub> +0.065	V	
		V <sub>CL</sub> = V <sub>CU</sub>	V <sub>CL</sub> -0.060	V <sub>CL</sub>	V <sub>CL</sub> +0.040	V	
V <sub>DL</sub>	Overdischarge Detection Voltage	V <sub>M</sub> = 0	V <sub>DL</sub> -0.110	V <sub>DL</sub>	V <sub>DL</sub> +0.130	V	
V <sub>DU</sub>	Overdischarge Release Voltage	V <sub>DU</sub> ≠ V <sub>DL</sub> , V <sub>M</sub> = 0	V <sub>DU</sub> -0.150	V <sub>DU</sub>	V <sub>DU</sub> +0.190	V	
		V <sub>DU</sub> = V <sub>DL</sub>	V <sub>DU</sub> -0.110	V <sub>DU</sub>	V <sub>DU</sub> +0.130	V	
V <sub>DOC</sub>	Discharge Overcurrent Detection Voltage	—	V <sub>DOC</sub> -0.021	V <sub>DOC</sub>	V <sub>DOC</sub> +0.024	V	
V <sub>SHORT</sub>	Load Short-Circuiting Detection Voltage	—	V <sub>SHORT</sub> -0.34	V <sub>SHORT</sub>	V <sub>SHORT</sub> +0.34	V	
V <sub>COC</sub>	Charge Overcurrent Detection Voltage	—	V <sub>COC</sub> -0.040	V <sub>COC</sub>	V <sub>COC</sub> +0.040	V	
I <sub>CC</sub>	Current Consumption during Operation	V <sub>DD</sub> = 3.5V, V <sub>M</sub> = 0V	1.0	3.0	7.0	μA	
I <sub>STB</sub>	Current Consumption at Power-Down	V <sub>DD</sub> = 1.8V, VM Pin Floating	Power-Down Mode	—	—	1.0	μA
			Without Power-Down Mode (Auto-Wake-up)	—	—	8	
R <sub>COH</sub>	CO Pin Resistance "H"	V <sub>DD</sub> = 3.5V, V <sub>CO</sub> = 3.0V, V <sub>M</sub> = 0V	1.2	6	15	kΩ	
R <sub>COL</sub>	CO Pin Resistance "L"	V <sub>DD</sub> = 4.5V, V <sub>CO</sub> = 0.5V, V <sub>M</sub> = 0V	1.2	4	15	kΩ	
R <sub>DOH</sub>	DO Pin Resistance "H"	V <sub>DD</sub> = 3.5V, V <sub>DO</sub> = 3.0V, V <sub>M</sub> = 0V	1.2	5	15	kΩ	
R <sub>DOL</sub>	DO Pin Resistance "L"	V <sub>DD</sub> = 1.8V, V <sub>DO</sub> = 0.5V, V <sub>M</sub> = 0V	1.2	5	15	kΩ	
R <sub>VMD</sub>	Resistance between VM Pin and VDD Pin	V <sub>DD</sub> = 1.8V, V <sub>M</sub> = 0V	100	300	650	kΩ	
R <sub>VMS</sub>	Resistance between VM Pin and VSS Pin	V <sub>DD</sub> = 3.5V, V <sub>M</sub> = 1.0V	5	30	65	kΩ	
V <sub>0CHA</sub>	0V Battery Charge Starting Charger Voltage	0V Battery Charging "Available"	1.2	—	—	V	
V <sub>0INH</sub>	0V Battery Charge Inhibition Battery Voltage	0V Battery Charging "Unavailable"	—	—	0.3	V	
V <sub>OVCHG</sub>	Overvoltage Charger Detection Voltage	V <sub>DD</sub> = 3.5V	5.5	8.0	10.5	V	
V <sub>OVCHGR</sub>	Overvoltage Charger Release Voltage	V <sub>DD</sub> = 3.5V	5.0	7.3	9.5	V	
t <sub>CU</sub>	Overcharge Detection Delay Time	—	t <sub>CU</sub> ×0.6	t <sub>CU</sub>	t <sub>CU</sub> ×1.4	ms	
t <sub>DL</sub>	Overdischarge Detection Delay Time	—	t <sub>DL</sub> ×0.6	t <sub>DL</sub>	t <sub>DL</sub> ×1.4	ms	
t <sub>DOC</sub>	Discharge Overcurrent Detection Delay Time	—	t <sub>DOC</sub> ×0.6	t <sub>DOC</sub>	t <sub>DOC</sub> ×1.4	ms	
t <sub>SHORT</sub>	Load Short-Circuiting Detection Delay Time	—	t <sub>SHORT</sub> ×0.6	t <sub>SHORT</sub>	t <sub>SHORT</sub> ×1.4	μs	
t <sub>COC</sub>	Charge Overcurrent Detection Delay Time	—	t <sub>COC</sub> ×0.6	t <sub>COC</sub>	t <sub>COC</sub> ×1.4	ms	

## Operation Description

### Operation Mode

#### 1. Normal Status

The AP9101C monitors the battery voltage between the VDD Pin and VSS Pin as well as the voltage difference between the VM Pin and VSS Pin to control battery charging and discharging by the CO and DO Pins. When the battery voltage is between overdischarge detection voltage ( $V_{DL}$ ) and overcharge detection voltage ( $V_{CU}$ )—as well as the VM Pin voltage being between the charge overcurrent detection voltage ( $V_{COC}$ ) and discharge overcurrent detection voltage ( $V_{DOC}$ )—the CO and DO Pin of the AP9101C will output high level and turn on charge and discharge MOSFETs. In these conditions, the battery can charge and discharge freely. Also,  $R_{VMD}$  and  $R_{VMS}$  do not connect to VDD and VSS Pins in this status.

#### 2. Overcharge Status

If the battery voltage is more than  $V_{CU}$  during charging status for the overcharge detection delay time ( $t_{CU}$ ) or longer, the AP9101C turns off the charge MOSFET by setting low level to the CO Pin to stop charging.  $R_{VMD}$  and  $R_{VMS}$  are not connected in overcharge status.

When the VM Pin voltage is lower than  $V_{DOC}$  and battery voltage falls below  $V_{CL}$ , the AP9101C will release from overcharge status.

When the VM Pin voltage is equal to or more than  $V_{DOC}$  and battery voltage falls below  $V_{CU}$ , the AP9101C will release from overcharge status.

#### 3. Overdischarge Status

If the battery voltage is less than  $V_{DL}$  during discharging status for the overdischarge detection delay time ( $t_{DL}$ ) or longer, the AP9101C turns off the discharge MOSFET by setting low level to the DO Pin to stop discharging. In overdischarge status,  $R_{VMD}$  is connected to  $V_{DD}$ , and the VM Pin voltage is pulled up to  $V_{DD}$  by  $R_{VMD}$ , but  $R_{VMS}$  is not connected. For standby version, the AP9101C recovers normal status from overdischarge status only by charging the battery through the charger.

When the VM Pin voltage to the VSS Pin voltage is less than typical -0.7V and the battery voltage rises over  $V_{DL}$ , the AP9101C will release from overdischarge status. If the VM Pin voltage to the VSS Pin voltage is higher than typical -0.7V, the AP9101C will release from overdischarge status until the battery voltage rises over  $V_{DU}$ .

For auto-wake-up version AP9101CA, the device recovers to normal status from overdischarge status if either of these two conditions are satisfied.

If charger is connected: the AP9101CA overdischarge status is released in the same way as described above in AP9101C Overdischarge Status section.

If no charger is connected: 1) the battery voltage reaches the overdischarge release voltage ( $V_{DU}$ ) or higher;  
2) maintains continuous time more than overdischarge release delay time  $t_{DLR}$ .

#### 4. Discharge Overcurrent and Short Current Status

When the battery is in discharge overcurrent status, if the voltage of the VM Pin to VSS Pin is equal or more than  $V_{DOC}$  to  $V_{SHORT}$ , for the overdischarge current detection delay time ( $t_{DOC}$ ) or longer, the AP9101C turns off the discharge MOSFET by setting low level to the DO pin to stop discharging.

When the battery is in short current status, if the voltage of the VM Pin to VSS Pin is equal to or more than  $V_{SHORT}$ , for the short current detection delay time or longer, the AP9101C turns off the discharge MOSFET by setting low level to the DO pin to stop discharging.

In discharge overcurrent or short current status,  $R_{VMS}$  is connected to  $V_{SS}$  but  $R_{VMD}$  is not connected. The voltage of VM Pin is almost equal to  $V_{DD}$  as long as the load is connected. When the load is disconnected, the voltage of VM Pin will become almost equal to  $V_{SS}$  (due to  $R_{VMS}$  being connected) then the AP9101C will release from discharge overcurrent or short current status.

#### 5. Charge Overcurrent Status

When the battery is in charge overcurrent status, if the voltage of the VM Pin to VSS Pin is equal to or less than  $V_{COC}$ , for the charge overcurrent detection delay time ( $t_{COC}$ ) or longer, the AP9101C turns off the charge MOSFET by setting low level to the CO pin to stop charging.



---

**Operation Description** (Cont.)

---

**6. 0V Battery Charging Function (Option)**

This function is available as an option and can be factory set internally. AP9101C has this function built in.

0V charging function permits charger to recharge the battery whose voltage is 0V due to self-discharge. If 0V charging function is not present, the device will prevent the charger to recharge the battery whose voltage is 0V due to self-discharge. (If a device without 0V charging function is needed, please contact Diodes sales team).

**7. Overvoltage Charger Detection Circuit**

This function is used to monitor the charger voltage between the VDD Pin and VM Pin, and when this voltage exceeds overvoltage charger detection voltage (8.0V Typ.), the AP9101C will set the CO Pin low level to turn off charge MOSFET. When this voltage drops below overvoltage charger release voltage (7.3V Typ.), the CO Pin will be set to high level and turn on charge MOSFET. There are no delay times set for detection and release.

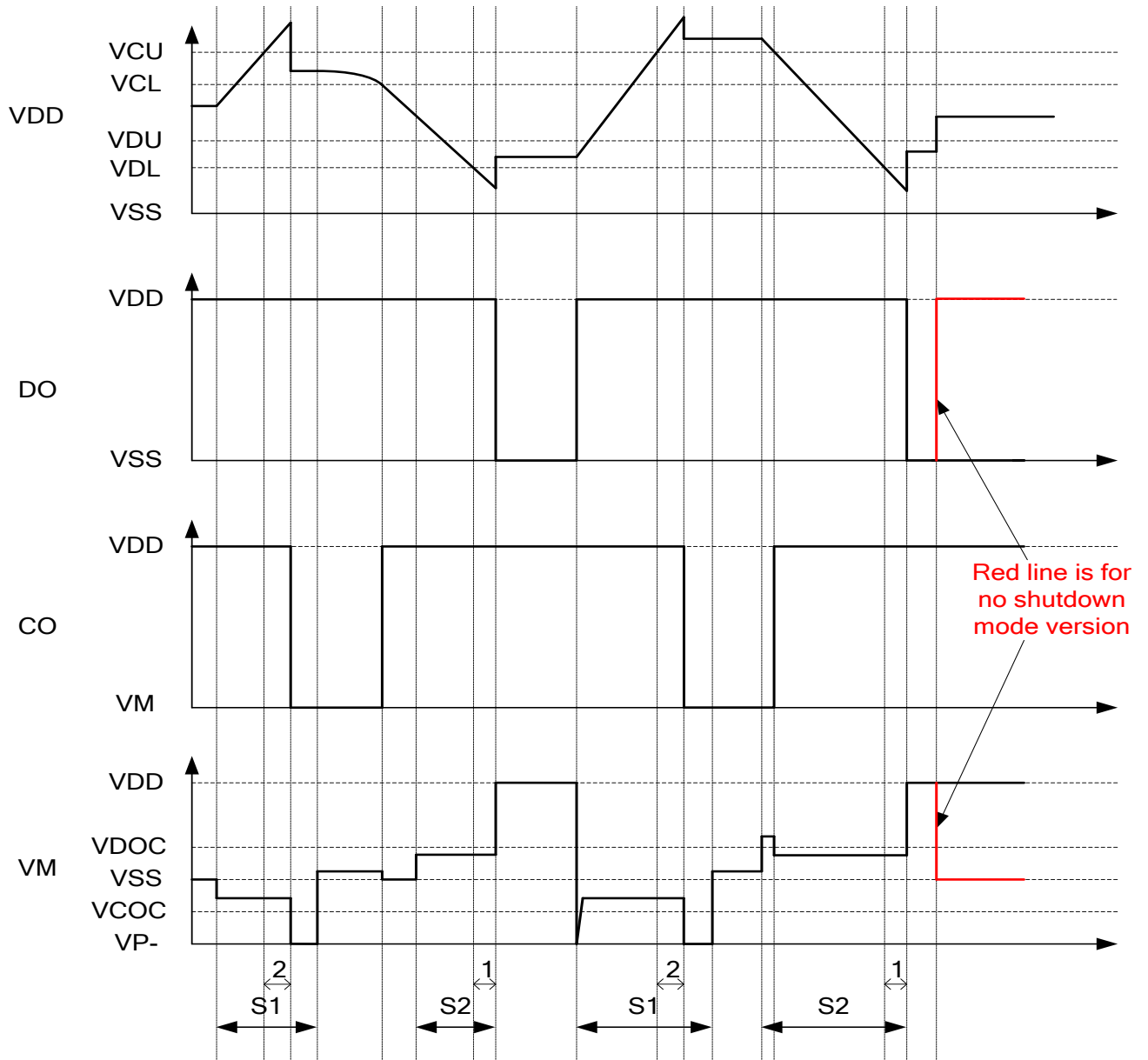
**8. Power-Down Mode or Auto-Wake-Up Function (Option)**

In the device with power-down function, during power-down mode, the device enters the overdischarge status. The IC enters sleep mode and the current consumption becomes very low, typically 0.1 $\mu$ A. To release from power-down status to normal status, charger connection is required.

In the device with auto-wake-up mode, the IC remains active in the overdischarge state. The IC is released into normal state by the operation that increases the battery voltage more than the overdischarge release voltage.

**Time Chart**

(1) Overcharge and Overdischarge Detection

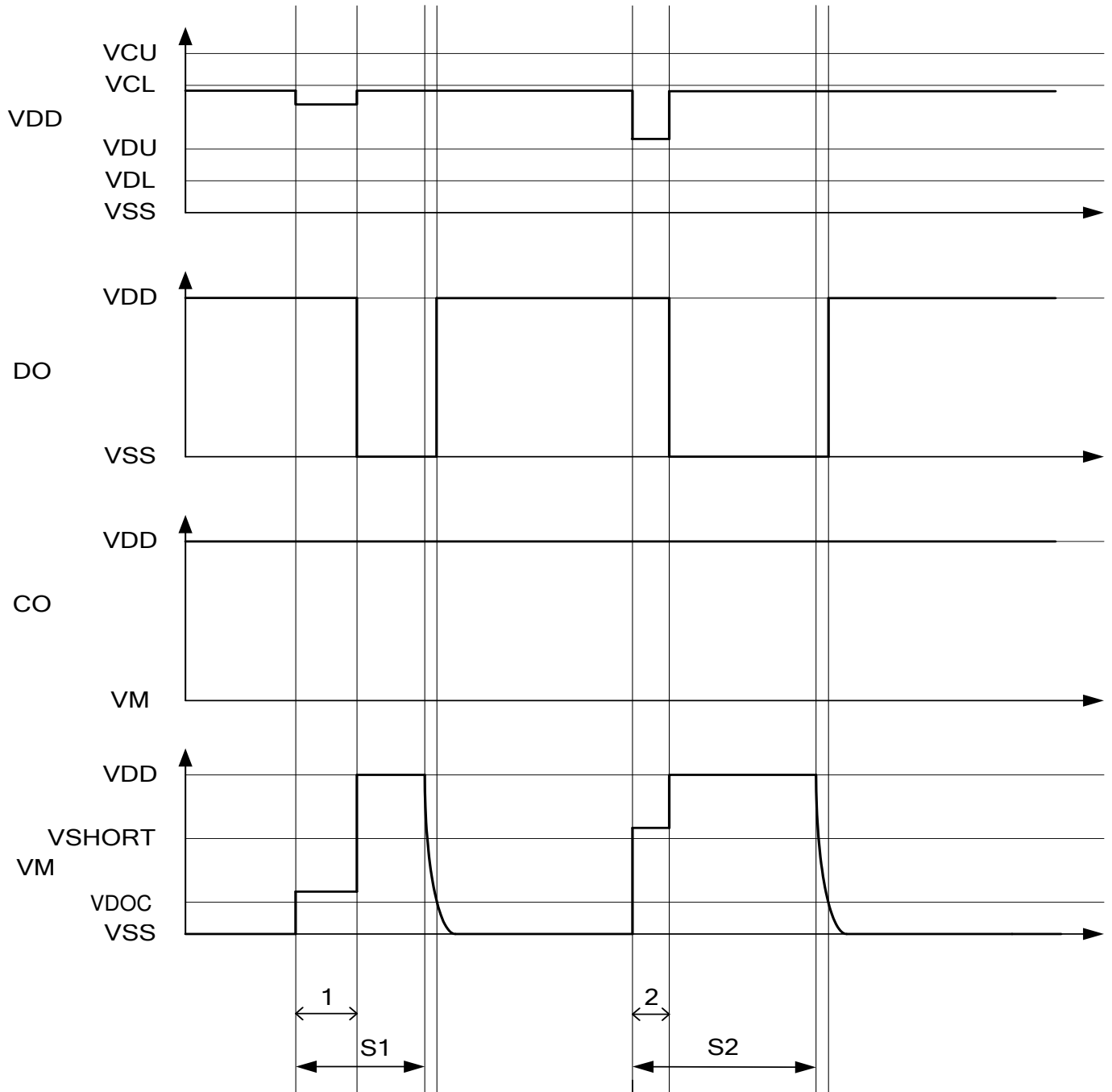


1:  $t_{DL}$   
2:  $t_{CU}$

S1: Charger connection  
S2: Load connection

**Time Chart** (Cont.)

(2) Discharge Overcurrent Detection

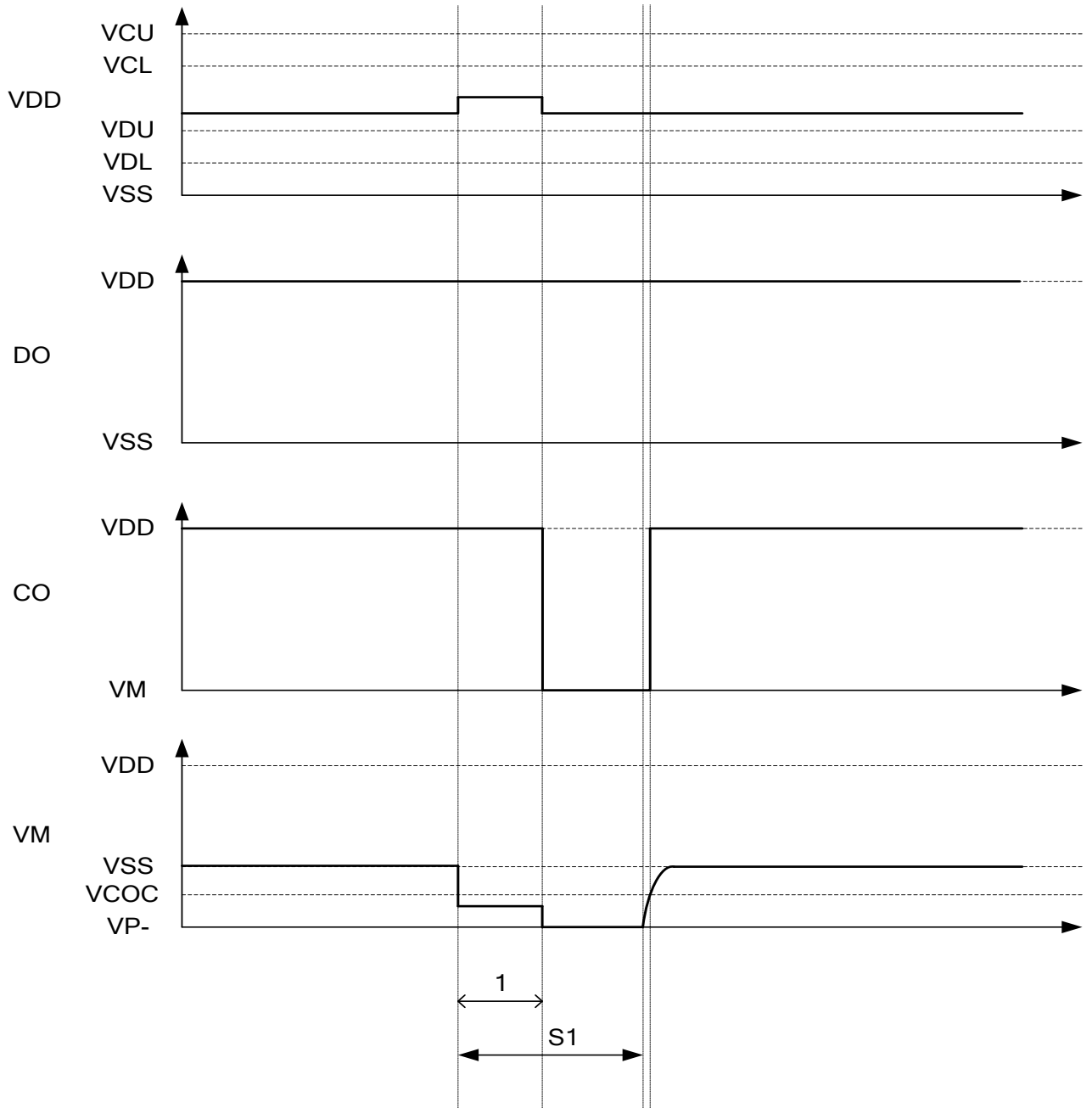


1:  $t_{DOC}$   
2:  $t_{SHORT}$

S1: Connect over current load  
S2: Connect short current load

**Time Chart** (Cont.)

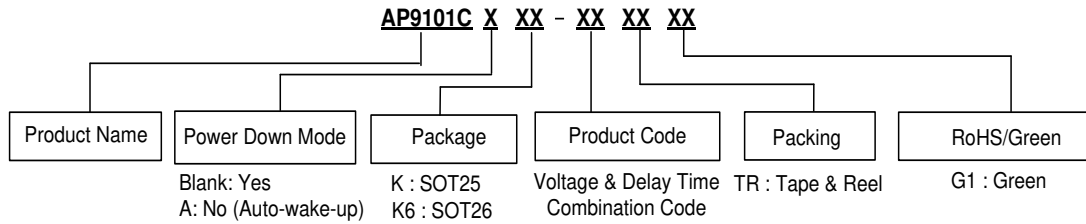
(3) Charge Overcurrent Detection



1:  $t_{COC}$

S1: Connect over current charger

## Ordering Information



### Voltage and Delay Time Combination

Part Number	Overcharge Detection Voltage V <sub>CU</sub>	Overcharge Release Voltage V <sub>CL</sub>	Over-Discharge Detection Voltage V <sub>DL</sub>	Over-Discharge Release Voltage V <sub>DU</sub>	Discharge Overcurrent Detection Voltage V <sub>DOC</sub>	Load Short Detection Voltage V <sub>SHORT</sub>	Charge Overcurrent Detection Voltage V <sub>COC</sub>	Over Voltage Charger Detection Voltage V <sub>OVCHG</sub>	Over Voltage Charger Release Voltage V <sub>OVCHGR</sub>	Power-Down Function	Overcharge Protection Mode	Delay Time	0V Battery Charge Function
AP9101Cxxx-AATRG1	4.375V	4.175V	2.500V	2.900V	0.150V	0.700V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-ABTRG1	4.425V	4.225V	2.500V	2.900V	0.150V	0.700V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-ACTRG1	4.375V	4.175V	2.500V	2.900V	0.095V	0.700V	-0.095V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-ADTRG1	4.375V	4.175V	2.500V	2.900V	0.120V	0.700V	-0.120V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-AETRG1	4.200V	4.100V	2.500V	3.000V	0.300V	0.550V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-AFTRG1	4.375V	4.175V	2.500V	2.900V	0.180V	0.700V	-0.180V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-AGTRG1	4.375V	4.175V	2.500V	2.900V	0.075V	0.700V	-0.075V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-AHTRG1	4.425V	4.225V	2.500V	2.900V	0.075V	0.700V	-0.075V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-AITRG1	4.500V	4.300V	2.400V	2.800V	0.150V	0.700V	-0.075V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-AJTRG1	4.375V	4.175V	2.400V	2.800V	0.125V	0.700V	-0.125V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-AKTRG1	4.250V	4.050V	2.400V	3.000V	0.150V	0.700V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-ALTRG1	4.275V	4.175V	2.300V	2.400V	0.180V	0.700V	-0.180V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-AMTRG1	4.375V	4.175V	2.300V	2.400V	0.180V	0.700V	-0.180V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-ANTRG1	4.225V	4.025V	3.200V	3.400V	0.060V	0.450V	-0.060V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-AOTRG1	4.425V	4.225V	2.500V	2.900V	0.064V	0.450V	-0.073V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-ASTRG1	3.800V	3.700V	2.300V	2.400V	0.180V	0.700V	-0.180V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-ATTRG1	4.400V	4.200V	2.800V	3.000V	0.150V	0.700V	-0.200V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-AUTRG1	4.300V	4.100V	2.500V	2.900V	0.100V	0.700V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-AXTRG1	4.280V	4.080V	2.800V	2.800V	0.100V	0.500V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission

## Ordering Information (Cont.)

Part Number	Overcharge Detection Voltage V <sub>CU</sub>	Overcharge Release Voltage V <sub>CL</sub>	Over-Discharge Detection Voltage V <sub>DL</sub>	Over-Discharge Release Voltage V <sub>DU</sub>	Discharge Overcurrent Detection Voltage V <sub>DOC</sub>	Load Short Detection Voltage V <sub>SHORT</sub>	Charge Overcurrent Detection Voltage V <sub>COC</sub>	Over Voltage Charger Detection Voltage V <sub>OVCHG</sub>	Over Voltage Charger Release Voltage V <sub>OVCHGR</sub>	Power-Down Function	Overcharge Protection Mode	Delay Time	0V Battery Charge Function
AP9101Cxxx -AYTRG1	4.275V	4.075V	2.800V	2.900V	0.150V	0.500V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Prohibition
AP9101Cxxx -AZTRG1	4.275V	4.075V	2.500V	2.900V	0.150V	0.500V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Prohibition
AP9101Cxxx -BATRG1	4.475V	4.275V	2.500V	2.900V	0.150V	0.500V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BBTRG1	4.475V	4.275V	2.500V	2.900V	0.200V	0.500V	-0.200V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BCTRG1	4.465V	4.265V	2.100V	2.100V	0.150V	0.500V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BDTRG1	4.425V	4.225V	2.500V	2.500V	0.160V	0.500V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BETRG1	4.425V	4.225V	2.500V	2.500V	0.160V	0.500V	-0.160V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BFTRG1	4.425V	4.225V	2.500V	2.800V	0.160V	0.500V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BGTRG1	4.425V	4.225V	2.500V	2.800V	0.200V	0.500V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BHTRG1	4.425V	4.225V	2.500V	2.900V	0.200V	0.500V	-0.200V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BITRG1	4.425V	4.225V	2.500V	2.900V	0.130V	0.500V	-0.130V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BJTRG1	4.400V	4.300V	3.000V	3.200V	0.250V	0.600V	-0.200V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BKTRG1	4.400V	4.200V	2.800V	3.000V	0.150V	0.600V	-0.200V	8.0V	7.3V	Selectable	Auto Release	Option 1	Prohibition
AP9101Cxxx -BLTRG1	4.380V	4.280V	2.600V	2.800V	0.150V	0.600V	-0.175V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BMTRG1	4.375V	4.175V	2.300V	2.400V	0.150V	0.600V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BNTRG1	4.325V	4.075V	2.500V	2.900V	0.150V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Prohibition
AP9101Cxxx -BOTRG1	4.325V	4.075V	2.500V	2.900V	0.150V	0.500V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Prohibition
AP9101Cxxx -BPTRG1	4.325V	4.125V	2.500V	2.800V	0.150V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BQTRG1	4.300V	4.100V	2.300V	2.300V	0.250V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BRTRG1	4.280V	4.080V	3.000V	3.300V	0.080V	0.500V	-0.080V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BSTRG1	4.280V	4.080V	3.000V	3.300V	0.080V	0.500V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BTTRG1	4.280V	4.080V	2.300V	2.300V	0.160V	0.500V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx -BUTRG1	4.280V	4.080V	2.300V	2.300V	0.125V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission

## Ordering Information (Cont.)

Part Number	Overcharge Detection Voltage V <sub>CU</sub>	Overcharge Release Voltage V <sub>CL</sub>	Over-Discharge Detection Voltage V <sub>DL</sub>	Over-Discharge Release Voltage V <sub>DU</sub>	Discharge Overcurrent Detection Voltage V <sub>DOC</sub>	Load Short Detection Voltage V <sub>SHORT</sub>	Charge Overcurrent Detection Voltage V <sub>COC</sub>	Over Voltage Charger Detection Voltage V <sub>OVCHG</sub>	Over Voltage Charger Release Voltage V <sub>OVCHGR</sub>	Power-Down Function	Overcharge Protection Mode	Delay Time	0V Battery Charge Function
AP9101Cxxx-BVTRG1	4.280V	4.080V	2.800V	3.000V	0.100V	0.500V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-BWTRG1	4.280V	4.180V	3.000V	3.000V	0.180V	0.600V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-BXTRG1	4.280V	4.180V	2.800V	2.800V	0.050V	0.600V	-0.050V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-BYTRG1	4.280V	4.180V	2.800V	2.800V	0.250V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-BZTRG1	4.280V	4.130V	2.800V	3.100V	0.100V	0.500V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CATRG1	4.275V	4.175V	2.300V	2.800V	0.250V	0.600V	-0.200V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CBTRG1	4.275V	4.175V	2.300V	2.400V	0.200V	0.500V	-0.200V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CCTRG1	4.275V	4.075V	2.500V	2.900V	0.150V	0.500V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Prohibition
AP9101Cxxx-CDTRG1	4.275V	4.075V	2.300V	2.300V	0.150V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CETRG1	4.275V	4.175V	2.300V	2.400V	0.100V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CFTRG1	4.275V	4.075V	2.800V	2.800V	0.150V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CGTRG1	4.275V	4.075V	2.800V	3.000V	0.150V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CHTRG1	4.250V	4.150V	2.500V	2.700V	0.250V	0.600V	-0.200V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CITRG1	4.250V	4.150V	2.700V	3.000V	0.250V	0.600V	-0.200V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CJTRG1	4.250V	4.050V	2.500V	2.800V	0.200V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CKTRG1	4.250V	4.150V	2.800V	3.000V	0.150V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CLTRG1	4.250V	4.150V	2.500V	3.000V	0.150V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CMTRG1	4.200V	4.100V	2.800V	3.000V	0.150V	0.550V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Prohibition
AP9101Cxxx-CNTRG1	4.200V	4.100V	2.500V	2.500V	0.150V	0.600V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-COTRG1	4.190V	4.090V	2.700V	3.000V	0.100V	0.600V	-0.050V	8.0V	7.3V	Selectable	Auto Release	Option 1	Prohibition
AP9101Cxxx-CPTRG1	3.650V	3.450V	2.100V	2.300V	0.150V	0.550V	-0.150V	8.0V	7.3V	Selectable	Auto Release	Option 1	Permission
AP9101Cxxx-CQTRG1	4.250V	4.050V	2.800V	3.000V	0.150V	0.500V	-0.100V	8.0V	7.3V	Selectable	Auto Release	Option 1	Prohibition

## Ordering Information (Cont.)

### Delay Time Option Overview

Delay Time Option	Overcharge Detection Delay Time (t <sub>cu</sub> )	Overdischarge Detection Delay Time (t <sub>DL</sub> )	Discharge Overcurrent Detection Delay Time (t <sub>DOC</sub> )	Charge Overcurrent Detection Delay Time (t <sub>COC</sub> )	Load Short Circuiting Detection Delay Time (t <sub>SHORT</sub> )
1	1,000ms	115ms	10ms	10ms	320μs
2	125ms	32ms	8ms	8ms	160μs
3	1,000ms	20ms	12ms	10ms	320μs
4	1,000ms	42ms	10ms	10ms	320μs
5	1,000ms	115ms	10ms	10ms	160μs



**Ordering Information** (Cont.) (Note 6)

Product Name	Package	Part Number	Marking ID	Packing
AP9101C	SOT25	AP9101CK-AATR1G1	GQA	3000/Tape & Reel
		AP9101CK-ABTR1G1	G6U	3000/Tape & Reel
		AP9101CK-ACTR1G1	GQJ	3000/Tape & Reel
		AP9101CK-ADTR1G1	GQK	3000/Tape & Reel
		AP9101CK-AETR1G1	GQD	3000/Tape & Reel
		AP9101CK-AFTR1G1	GQL	3000/Tape & Reel
		AP9101CK-AGTR1G1	GQM	3000/Tape & Reel
		AP9101CK-AHTR1G1	GQN	3000/Tape & Reel
		AP9101CK-AITR1G1	GQP	3000/Tape & Reel
		AP9101CK-AJTR1G1	GQQ	3000/Tape & Reel
		AP9101CK-AKTR1G1	GQG	3000/Tape & Reel
		AP9101CK-ALTR1G1	GQR	3000/Tape & Reel
		AP9101CK-AMTR1G1	GQS	3000/Tape & Reel
		AP9101CK-ANTR1G1	GQT	3000/Tape & Reel
		AP9101CK-AOTR1G1	GRT	3000/Tape & Reel
		AP9101CK-ASTR1G1	GQV	3000/Tape & Reel
		AP9101CAK-AATR1G1	GRA	3000/Tape & Reel
		AP9101CAK-ABTR1G1	GSC	3000/Tape & Reel
		AP9101CAK-ACTR1G1	GRJ	3000/Tape & Reel
		AP9101CAK-ADTR1G1	GRK	3000/Tape & Reel
		AP9101CAK-AETR1G1	GRD	3000/Tape & Reel
		AP9101CAK-AFTR1G1	GRL	3000/Tape & Reel
		AP9101CAK-AGTR1G1	GRM	3000/Tape & Reel
		AP9101CAK-AHTR1G1	GRN	3000/Tape & Reel
		AP9101CAK-AITR1G1	GRP	3000/Tape & Reel
		AP9101CAK-AJTR1G1	GRQ	3000/Tape & Reel
		AP9101CAK-AKTR1G1	GRG	3000/Tape & Reel
		AP9101CAK-ALTR1G1	GRR	3000/Tape & Reel
		AP9101CAK-AMTR1G1	GRS	3000/Tape & Reel
		AP9101CAK-ANTR1G1	GST	3000/Tape & Reel
		AP9101CAK-AOTR1G1	GTT	3000/Tape & Reel
		AP9101CAK-ASTR1G1	GSV	3000/Tape & Reel
		AP9101CAK-ATTR1G1	GSW	3000/Tape & Reel
		AP9101CAK-CPTR1G1	GSZ	3000/Tape & Reel

Note: 6. Current voltage versions are built by delay time option 1. If any other voltage versions or delay time option products are needed, please contact with the local sale's office.

**Ordering Information** (Cont.) (Note 6)

Product Name	Package	Part Number	Marking ID	Packing
AP9101C	SOT26	AP9101CK6-AATR1G1	GQB	3000/Tape & Reel
		AP9101CK6-ABTR1G1	GQC	3000/Tape & Reel
		AP9101CK6-ACTR1G1	GSJ	3000/Tape & Reel
		AP9101CK6-ADTR1G1	GSK	3000/Tape & Reel
		AP9101CK6-AETR1G1	GQE	3000/Tape & Reel
		AP9101CK6-AFTR1G1	GSL	3000/Tape & Reel
		AP9101CK6-AGTR1G1	GSM	3000/Tape & Reel
		AP9101CK6-AHTR1G1	GSN	3000/Tape & Reel
		AP9101CK6-AITR1G1	GSP	3000/Tape & Reel
		AP9101CK6-AJTR1G1	GSQ	3000/Tape & Reel
		AP9101CK6-AKTR1G1	GQH	3000/Tape & Reel
		AP9101CK6-ALTR1G1	GSR	3000/Tape & Reel
		AP9101CK6-AMTR1G1	GSS	3000/Tape & Reel
		AP9101CK6-ANTR1G1	GQU	3000/Tape & Reel
		AP9101CK6-AOTR1G1	GRU	3000/Tape & Reel
		AP9101CK6-ASTR1G1	GRW	3000/Tape & Reel
		AP9101CK6-ATTR1G1	GRV	3000/Tape & Reel
		AP9101CK6-AUTR1G1	GQW	3000/Tape & Reel
		AP9101CK6-AXTR1G1	GPU	3000/Tape & Reel
		AP9101CK6-AYTR1G1	GPV	3000/Tape & Reel
		AP9101CK6-AZTR1G1	GPW	3000/Tape & Reel
		AP9101CK6-BATR1G1	GXA	3000/Tape & Reel
		AP9101CK6-BBTR1G1	GXB	3000/Tape & Reel
		AP9101CK6-BCTR1G1	GXC	3000/Tape & Reel
		AP9101CK6-BDTR1G1	GXD	3000/Tape & Reel
		AP9101CK6-BETR1G1	GXE	3000/Tape & Reel
		AP9101CK6-BFTR1G1	GXF	3000/Tape & Reel
		AP9101CK6-BGTR1G1	GXG	3000/Tape & Reel
		AP9101CK6-BHTR1G1	GXH	3000/Tape & Reel
		AP9101CK6-BITR1G1	GXJ	3000/Tape & Reel
		AP9101CK6-BJTR1G1	GXK	3000/Tape & Reel
		AP9101CK6-BKTR1G1	GXL	3000/Tape & Reel
AP9101CK6-BLTR1G1	GXM	3000/Tape & Reel		
AP9101CK6-BMTR1G1	GXN	3000/Tape & Reel		
AP9101CK6-BNTR1G1	GXP	3000/Tape & Reel		

Note: 6. Current voltage versions are built by delay time option 1. If any other voltage versions or delay time option products are needed, please contact with the local sale's office.

### Ordering Information (Cont.) (Note 6)

Product Name	Package	Part Number	Marking ID	Packing
AP9101C	SOT26	AP9101CK6-BOTRG1	GXQ	3000/Tape & Reel
		AP9101CK6-BPTRG1	GXR	3000/Tape & Reel
		AP9101CK6-BQTRG1	GXS	3000/Tape & Reel
		AP9101CK6-BRTRG1	GXT	3000/Tape & Reel
		AP9101CK6-BSTRG1	GXU	3000/Tape & Reel
		AP9101CK6-BTTRG1	GXZ	3000/Tape & Reel
		AP9101CK6-BUTRG1	GXV	3000/Tape & Reel
		AP9101CK6-BVTRG1	GXW	3000/Tape & Reel
		AP9101CK6-BWTRG1	GYS	3000/Tape & Reel
		AP9101CK6-BXTRG1	GYT	3000/Tape & Reel
		AP9101CK6-BYTRG1	GYU	3000/Tape & Reel
		AP9101CK6-BZTRG1	GYV	3000/Tape & Reel
		AP9101CK6-CATRG1	GYA	3000/Tape & Reel
		AP9101CK6-CBTRG1	GYB	3000/Tape & Reel
		AP9101CK6-CCTRG1	GYC	3000/Tape & Reel
		AP9101CK6-CDTRG1	GYD	3000/Tape & Reel
		AP9101CK6-CETRG1	GYE	3000/Tape & Reel
		AP9101CK6-CFTRG1	GYF	3000/Tape & Reel
		AP9101CK6-CGTRG1	GYG	3000/Tape & Reel
		AP9101CK6-CHTRG1	GYH	3000/Tape & Reel
		AP9101CK6-CITRG1	GYJ	3000/Tape & Reel
		AP9101CK6-CJTRG1	GYK	3000/Tape & Reel
		AP9101CK6-CKTRG1	GYL	3000/Tape & Reel
		AP9101CK6-CLTRG1	GYM	3000/Tape & Reel
		AP9101CK6-CMTRG1	GYN	3000/Tape & Reel
		AP9101CK6-CNTRG1	GYP	3000/Tape & Reel
		AP9101CK6-COTRG1	GYQ	3000/Tape & Reel
		AP9101CK6-CPTRG1	GYR	3000/Tape & Reel
		AP9101CK6-CQTRG1	GYW	3000/Tape & Reel
		AP9101CAK6-AATRG1	GRB	3000/Tape & Reel
		AP9101CAK6-ABTRG1	GRC	3000/Tape & Reel
		AP9101CAK6-ACTRG1	GTJ	3000/Tape & Reel
		AP9101CAK6-ADTRG1	GTK	3000/Tape & Reel
AP9101CAK6-AETRG1	GRE	3000/Tape & Reel		
AP9101CAK6-AFTRG1	GTL	3000/Tape & Reel		
AP9101CAK6-AGTRG1	GTM	3000/Tape & Reel		

Note: 6. Current voltage versions are built by delay time option 1. If any other voltage versions or delay time option products are needed, please contact with the local sale's office.

**Ordering Information (Cont.) (Note 6)**

Product Name	Package	Part Number	Marking ID	Packing
AP9101C	SOT26	AP9101CAK6-AHTRG1	GTN	3000/Tape & Reel
		AP9101CAK6-AITRG1	GTP	3000/Tape & Reel
		AP9101CAK6-AJTRG1	GTQ	3000/Tape & Reel
		AP9101CAK6-AKTRG1	GRH	3000/Tape & Reel
		AP9101CAK6-ALTRG1	GTR	3000/Tape & Reel
		AP9101CAK6-AMTRG1	GTS	3000/Tape & Reel
		AP9101CAK6-ANTRG1	GSU	3000/Tape & Reel
		AP9101CAK6-AOTRG1	GTU	3000/Tape & Reel
		AP9101CAK6-ASTRG1	GTW	3000/Tape & Reel
		AP9101CAK6-ATTRG1	GTV	3000/Tape & Reel
		AP9101CAK6-AUTRG1	GUT	3000/Tape & Reel
		AP9101CAK6-AXTRG1	GUU	3000/Tape & Reel
		AP9101CAK6-AYTRG1	GUV	3000/Tape & Reel
		AP9101CAK6-AZTRG1	GUW	3000/Tape & Reel
		AP9101CAK6-BATRG1	GVA	3000/Tape & Reel
		AP9101CAK6-BBTRG1	GVB	3000/Tape & Reel
		AP9101CAK6-BCTRG1	GVC	3000/Tape & Reel
		AP9101CAK6-BDTRG1	GVD	3000/Tape & Reel
		AP9101CAK6-BETRG1	GVE	3000/Tape & Reel
		AP9101CAK6-BFTRG1	GVF	3000/Tape & Reel
		AP9101CAK6-BGTRG1	GVG	3000/Tape & Reel
		AP9101CAK6-BHTRG1	GVH	3000/Tape & Reel
		AP9101CAK6-BITRG1	GVJ	3000/Tape & Reel
		AP9101CAK6-BJTRG1	GVK	3000/Tape & Reel
		AP9101CAK6-BKTRG1	GVL	3000/Tape & Reel
		AP9101CAK6-BLTRG1	GVM	3000/Tape & Reel
		AP9101CAK6-BMTRG1	GVN	3000/Tape & Reel
		AP9101CAK6-BNTRG1	GVP	3000/Tape & Reel
		AP9101CAK6-BOTRG1	GVQ	3000/Tape & Reel
		AP9101CAK6-BPTRG1	GVR	3000/Tape & Reel
		AP9101CAK6-BQTRG1	GVS	3000/Tape & Reel
		AP9101CAK6-BRTRG1	GVT	3000/Tape & Reel
AP9101CAK6-BSTRG1	GVU	3000/Tape & Reel		
AP9101CAK6-BTTRG1	GVV	3000/Tape & Reel		
AP9101CAK6-BUTRG1	GVW	3000/Tape & Reel		
AP9101CAK6-BVTRG1	GWS	3000/Tape & Reel		

Note: 6. Current voltage versions are built by delay time option 1. If any other voltage versions or delay time option products are needed, please contact with the local sale's office.

---

**Ordering Information** (Cont.) (Note 6)
 

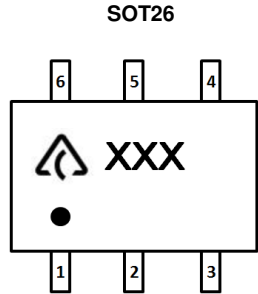
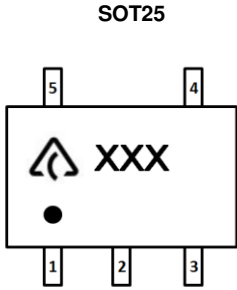
---


Product Name	Package	Part Number	Marking ID	Packing
AP9101C	SOT26	AP9101CAK6-BWTRG1	GWT	3000/Tape & Reel
		AP9101CAK6-BXTRG1	GWU	3000/Tape & Reel
		AP9101CAK6-BYTRG1	GWV	3000/Tape & Reel
		AP9101CAK6-BZTRG1	GWW	3000/Tape & Reel
		AP9101CAK6-CATRG1	GWA	3000/Tape & Reel
		AP9101CAK6-CBTRG1	GWB	3000/Tape & Reel
		AP9101CAK6-CCTRG1	GWC	3000/Tape & Reel
		AP9101CAK6-CDTRG1	GWD	3000/Tape & Reel
		AP9101CAK6-CETRG1	GWE	3000/Tape & Reel
		AP9101CAK6-CFTRG1	GWF	3000/Tape & Reel
		AP9101CAK6-CGTRG1	GWG	3000/Tape & Reel
		AP9101CAK6-CHTRG1	GWH	3000/Tape & Reel
		AP9101CAK6-CITRG1	GWJ	3000/Tape & Reel
		AP9101CAK6-CJTRG1	GWK	3000/Tape & Reel
		AP9101CAK6-CKTRG1	GWL	3000/Tape & Reel
		AP9101CAK6-CLTRG1	GWM	3000/Tape & Reel
		AP9101CAK6-CMTRG1	GWN	3000/Tape & Reel
		AP9101CAK6-CNTRG1	GWP	3000/Tape & Reel
		AP9101CAK6-COTRG1	GWQ	3000/Tape & Reel
		AP9101CAK6-CPTRG1	GWR	3000/Tape & Reel

Note: 6. Current voltage versions are built by delay time option 1. If any other voltage versions or delay time option products are needed, please contact with the local sale's office.

**Marking Information**

(Top View)

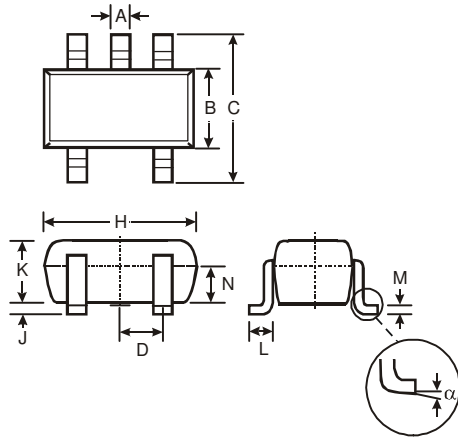


 : Logo  
XXX : Marking ID (See Ordering Information)

**Package Outline Dimensions**

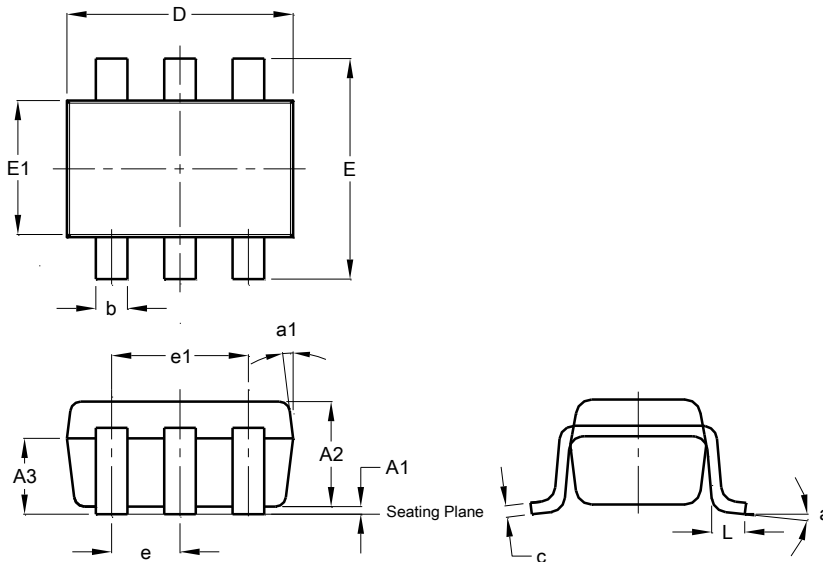
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(1) Package Type: SOT25



SOT25			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	-	-	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
N	0.70	0.80	0.75
α	0°	8°	-
All Dimensions in mm			

(2) Package Type: SOT26

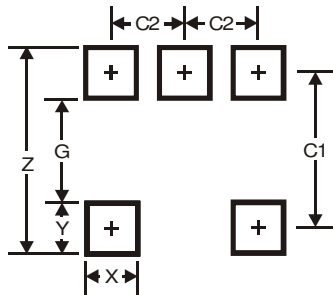


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

## Suggested Pad Layout

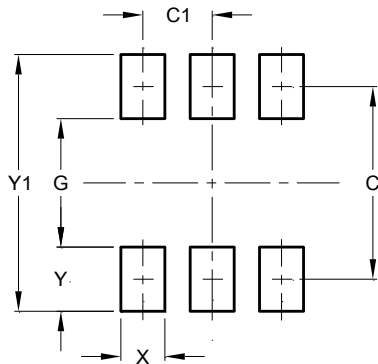
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(1) Package Type: SOT25



Dimensions	Value
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

(2) Package Type: SOT26



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20



**IMPORTANT NOTICE**

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

**LIFE SUPPORT**

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2017, Diodes Incorporated

[www.diodes.com](http://www.diodes.com)