

## Description

The P14C10D is an Over-Voltage-Protection (OVP) load switch with fixed 5.8V OVLO threshold voltage. The device will switch off internal MOSFET to disconnect IN to OUT to protect load when any of input voltage over the threshold. The Over temperature protection (OTP) function monitors chip temperature to protect the device. The P14C10D is available in Green SOT23 package.

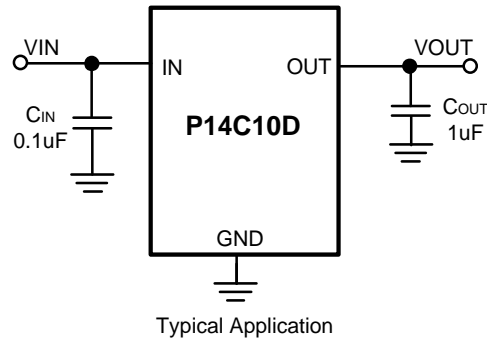


Figure 1: Application Circuit

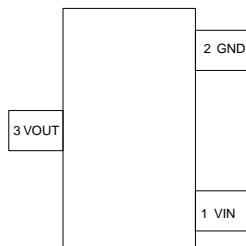


Figure 2: Pin Configurations

### Feature

- Maximum input voltage : 30V
- Ultra fast OVP response time: 50ns (Typ.)
- Fixed OVLO threshold voltage: 5.8V(Typ.)
- Fixed OCP threshold current: 1.1A,  $\pm 10\%$
- 340m $\Omega$  on resistance
- Thermal Shutdown
- Available in Green SOT23 Package

### Application

- TWS
- Portable Media Players
- Low-Power Handheld Devices

## Pin Definitions

Pin No.	Symbol	Descriptions
1	IN	Switch Input and Device Power Supply.
2	GND	Ground Terminal.
3	OUT	Switch output Terminal.

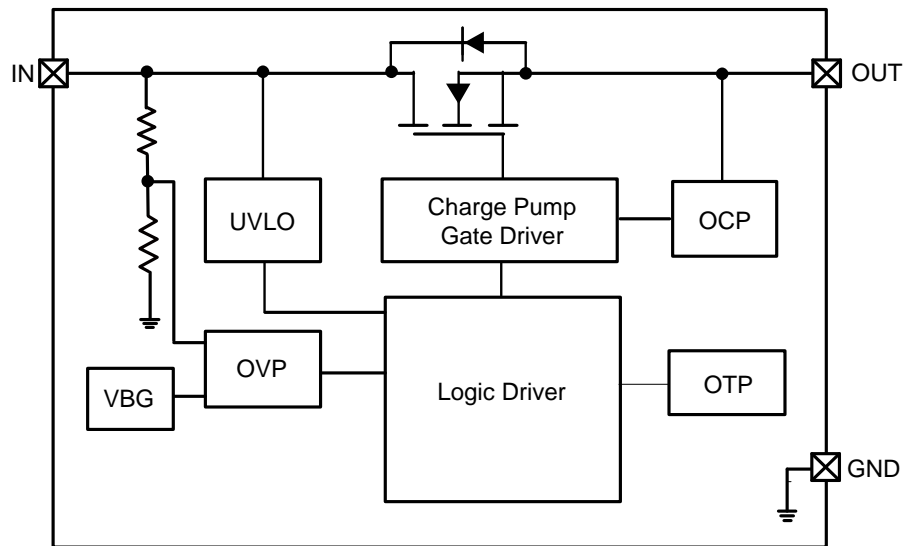


Figure 3: IC Block Diagram

## Ordering Information

ORDER NUMBER	MARKING	PACKAGE	Q'TY/BY REEL
P14C10D	P14C10D	SOT23	3000 / Tape & Reel

**Absolute maximum rating**

Parameter(Note1)	Symbol	Value	Units
Input voltage (IN pin)	$V_{IN}$	-0.3 ~ 30	V
Output voltage (OUT pin)	$V_{OUT}$	-0.3 ~ 6.5	V
Junction temperature	$T_J$	150	°C
Lead temperature(10s)	$T_L$	260	°C
Storage temperature	$T_{stg}$	-55~150	°C
Thermal Resistance	$\theta_{JA}$	270	°C/W
ESD Ratings	HBM	±2000	V
	CDM	±500	V

**Note 1:** 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**

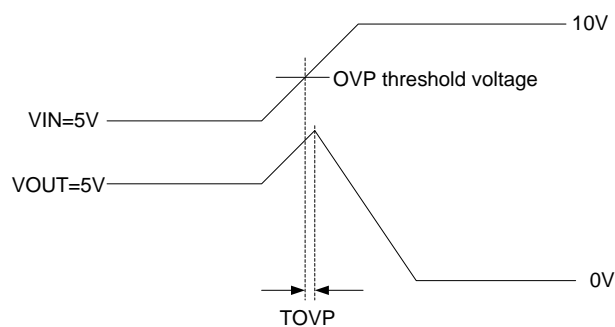
Parameter	Symbol	Value	Units
Input voltage	$V_{IN}$	3~30	V
MAX Continuous Output current	$I_{OUT}$	0.8	A
Ambient operating temperature	$T_{opr}$	-40~85	°C

**Over voltage protector**
**Electrical Characteristics**

( $T_A=25^{\circ}\text{C}$ ,  $V_{IN}=5\text{V}$ ,  $C_{IN}=0.1\mu\text{F}$ ,  $C_{OUT}=1\mu\text{F}$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
<b>General Function</b>						
Input voltage range	$V_{IN}$		3		30	V
Quiescent current	$I_Q$	NO Load, $V_{IN}=5\text{V}$		60		$\mu\text{A}$
Over voltage quiescent current	$I_{Q\_OVP}$	NO Load, $V_{IN}=30\text{V}$		120		$\mu\text{A}$
On resistance	$R_{on}$	$V_{IN}=5\text{V}$ , $I_{OUT}=0.5\text{A}$		340		$\text{m}\Omega$
Turn On Time	$t_{ON}$	$V_{OUT}=V_{IN}*10\%$ to $V_{OUT}=V_{IN}*90\%$		400		$\mu\text{s}$
<b>OVP Function</b>						
OVP response time	$t_{OVP}$	$V_{IN}$ rising, $C_{IN}=C_L=0\text{pF}$ (Note2)		50		ns
OVP voltage	$V_{OVLO}$	$V_{IN}$ rising	5.5	5.8	6.0	V
Output discharge resistance	$R_{DCHG}$	$V_{IN}=5\text{V}$		1.5		$\text{k}\Omega$
<b>OCP Function</b>						
OCP current	$I_{OCP}$	Current Rising		1.1		A
OCP accuracy	$ACCURACY\_I_{OCP}$	$I_{OCP}=1.1\text{A}$		$\pm 10$		%
OCP deglitch time	$T_{DEGLITCH\_OCP}$			0.3		ms
<b>OTP Function</b>						
OTP threshold temperature	$T_{OTP}$	$V_{IN}=5\text{V}$		140		$^{\circ}\text{C}$
OTP hysteresis temperature	$T_{HYS}$	$V_{IN}=5\text{V}$		20		$^{\circ}\text{C}$
<b>Hot-plug ability</b>						
Hot-plug ability		$C_{IN}=0.1\mu\text{F}$ , $C_{OUT}=1\mu\text{F}$			30	V

**Note 2:**Guaranteed by design



**OVP response time test**

**Function Descriptions****1. Over Current Protection (OCP)**

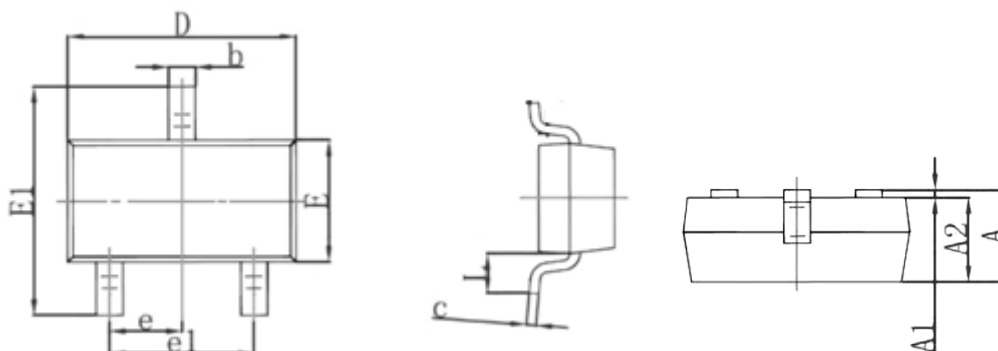
If the output current exceed the  $I_{OCP}$  threshold, the device limits the current for a blanking duration of  $T_{DEGLITCH\_OCP}$ . If the over current situation exceeds the  $T_{DEGLITCH\_OCP}$ , the switch will turned off, and the Fault pin is go low.

**2. Over-voltage Lockout (OVLO)**

The P14C10D Input has an over voltage protection to protect system. When the VIN voltage rises above  $V_{OVLO}$  threshold, the system will turns the switch off.


**3. Over Temperature Protection (OTP)**

The P14C10D monitors its own internal temperature to prevent thermal failures. The chip turns off the power MOSFET when the internal temperature reaches 140°C, and will resume after the internal temperature is cooled down below 20°C.

**Product dimension (SOT23)**


Dim	Millimeters		
	Min.	Typ.	Max.
A	0.90	1.00	1.15
A1	0.00	0.05	0.10
A2	0.89	1.00	1.11
b	0.30	0.40	0.50
c	0.08	0.13	0.18
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.10	2.30	2.55
e	0.95 Typ.		
e1	1.78	1.90	2.04
L	0.550 Ref.		

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