

Description

The P1465 is an Over-Voltage-Protection (OVP) load switch with adjustable 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. When the OVLO input set below the external OVLO select voltage, the P1465 automatically chooses the internal fixed OVLO threshold voltage. The over voltage protection threshold voltage can be adjusted with external resistor divider and the OVLO threshold voltage range is 4V~15V. The Over temperature protection (OTP) function monitors chip temperature to protect the device. The P1465 is available in 6-Ball wafer level Chip-Scale-Package. Standard products are Pb-free and Halogen-free.

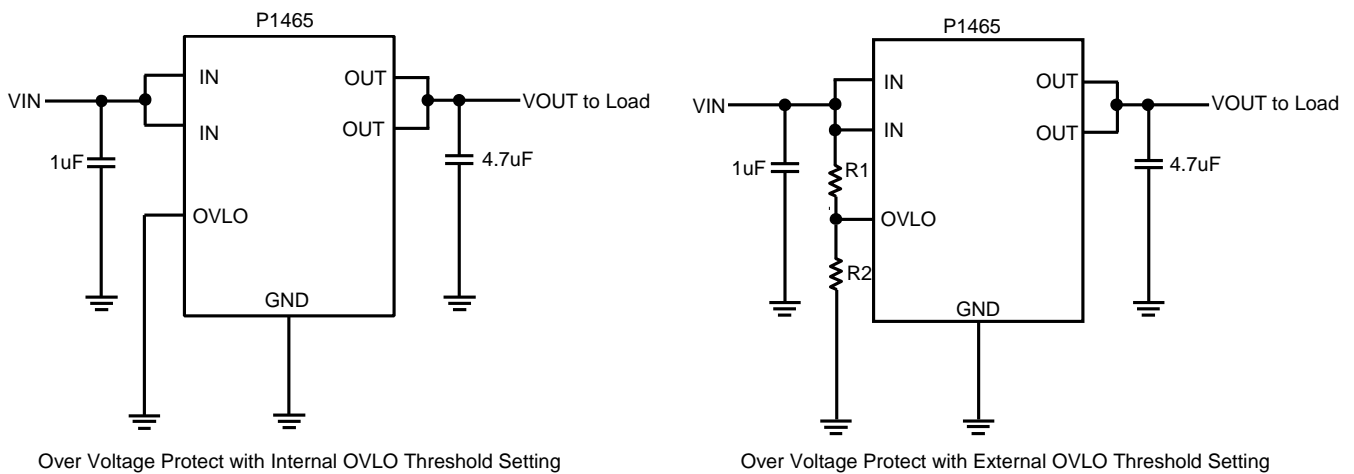


Figure 1: Typical Application

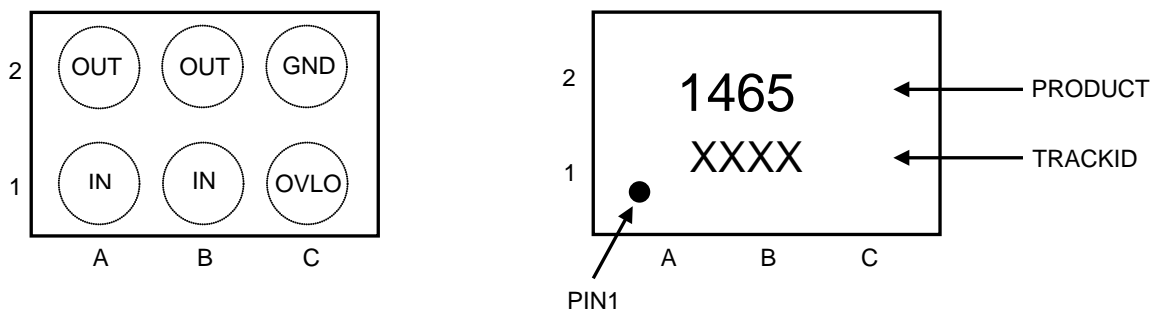


Figure 2: Pin order (Top view) and Marking (Top view)

Feature

- Maximum input voltage : 29V
- Switch ON resistance : 35m Typ.
- Ultra fast OVP response time: 50ns Typ.
- OVLO threshold voltage
Reference voltage for adjustable version
2.4V : P1465 with $\pm 2\%$ accuracy

Application

- Mobile Handsets and Tablets
- Portable Media Players
- Peripherals

Pin Definitions

Pin No.	Symbol	Descriptions
A1, B1	IN	Switch Input and Device Power Supply.
A2, B2	OUT	Switch Output to Load.
C1	OVLO	External OVLO adjustment. Connect a resistor-divider to set different OVLO threshold, $V_{OVLO}=2.4x(1+R1/R2)$ as shown typical application diagram. Connect OVLO to GND when using the internal fixed threshold voltage.
C2	GND	Ground

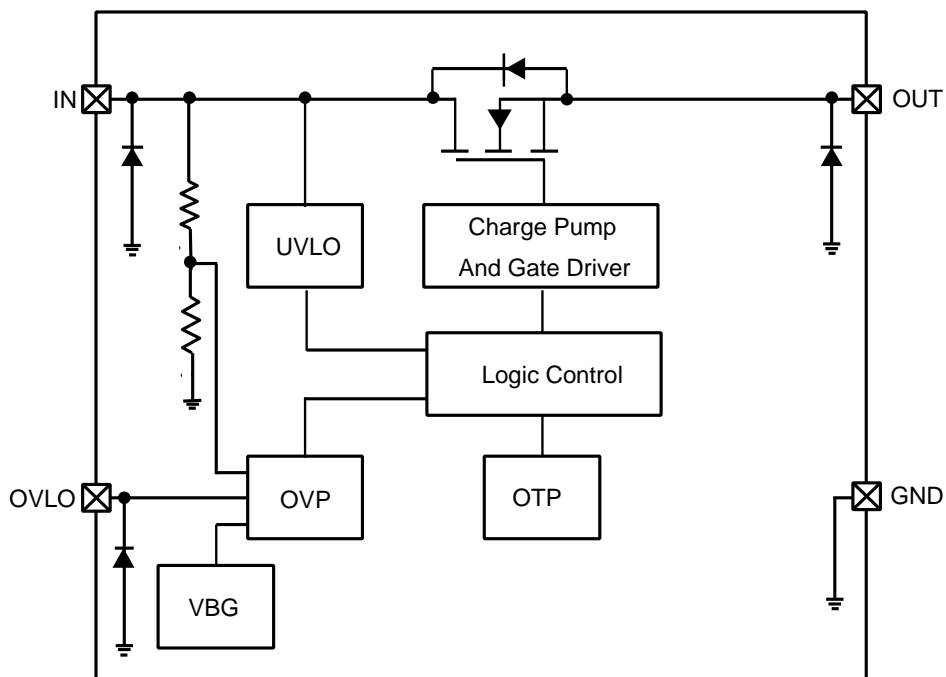
Block Diagram


Figure 3: IC Block Diagram

Absolute maximum rating

Parameter(Note1)	Symbol	Value	Units
Input voltage (IN pin)	V_{IN}	-0.3 ~ 29	V
Output voltage (OUT pin)	V_{OUT}	-0.3 ~ 22	V
Input voltage (OVLO pin)	V_{OVLO}	-0.3 ~ 15	V
Thermal resistance	$R_{\theta JA}$	TBD	°C/W
Junction temperature	T_J	150	°C
Lead temperature(10s)	T_L	260	°C
Storage temperature	T_{stg}	-55~150	°C
ESD Ratings	HBM	±4000	V
	MM	±800	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

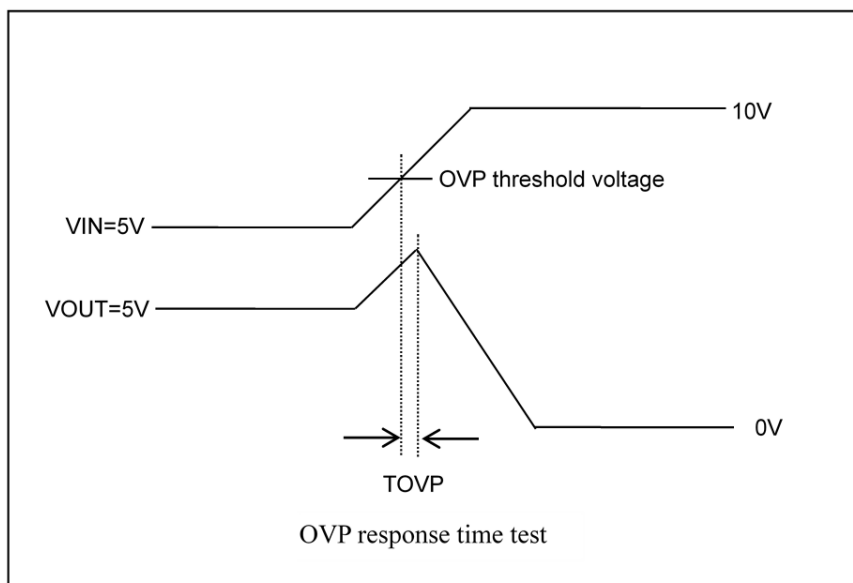
Parameter	Symbol	Value	Units
Input voltage	V_{IN}	2.5~28	V
MAX Continuous Output current	I_{OUT}	3	A
Ambient operating temperature	T_{opr}	-40~85	°C

Electrical Characteristics

($T_A=25^{\circ}\text{C}$, $V_{IN}=5\text{V}$, $C_{IN}=1\mu\text{F}$, $C_{OUT}=4.7\mu\text{F}$, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Input voltage range	V_{IN}		2.5		28	V
Quiescent current	I_Q	NO Load, $OVLO=GND$		110		μA
ON resistance	R_{ON}	$V_{IN}=5\text{V}$, $I_{OUT}=1\text{A}$		35	45	$\text{m}\Omega$
OVP response time	t_{OVP}	V_{IN} rising, $C_{IN}=C_L=0\text{pF}$ (Note2)		50		ns
OVP threshold voltage	V_{OVLO_TH}		2.33	2.4	2.47	V
Adjust OVP voltage range	VOVP_EXTSEL	V_{IN} rising	4		15	V
	VOVP_INTSEL			6.8		V
External OVLO select voltage	VOVLO_EXTS EL		0.4			V
Internal OVLO select voltage	VOVLO_INTSE L				0.15	V
OVP hysteresis voltage	VOVLO_HYS	V_{IN} falling		0.15		V
UVLO threshold voltage	VUVLO	V_{IN} rising		2.3		V
UVLO hysteresis voltage	VUVLO_HYS	V_{IN} falling		0.25		V
Turn ON time	TON	$V_{IN}>UVLO$ to $V_{OUT}=V_{IN}*90\%$ $C_L=0$		1		ms
Output discharge resistance	RDCHG	$V_{IN}=5\text{V}$		300		Ω
OTP threshold temperature	TOTP	$V_{IN}=5\text{V}$		140		$^{\circ}\text{C}$
OTP hysteresis temperature	THYS	$V_{IN}=5\text{V}$		20		$^{\circ}\text{C}$

Note 2:Guaranteed by design



Over voltage protector
Typical Characteristics

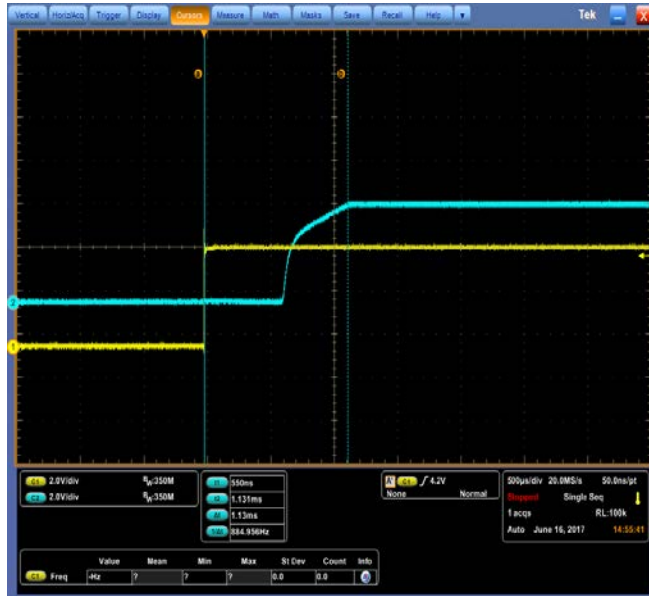


Fig 1. Start-up waveform

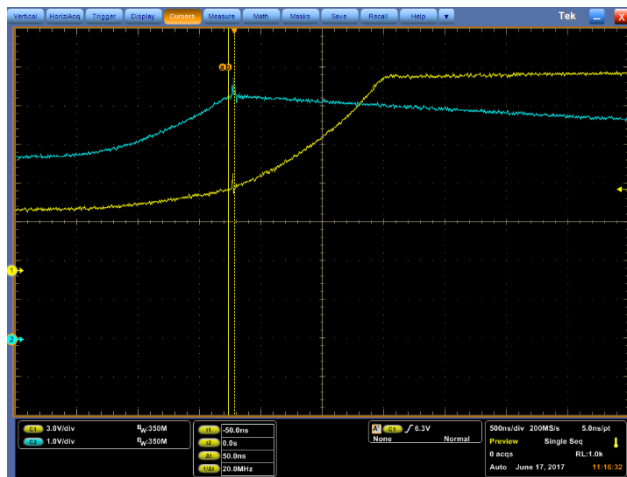


Fig2. OVP response

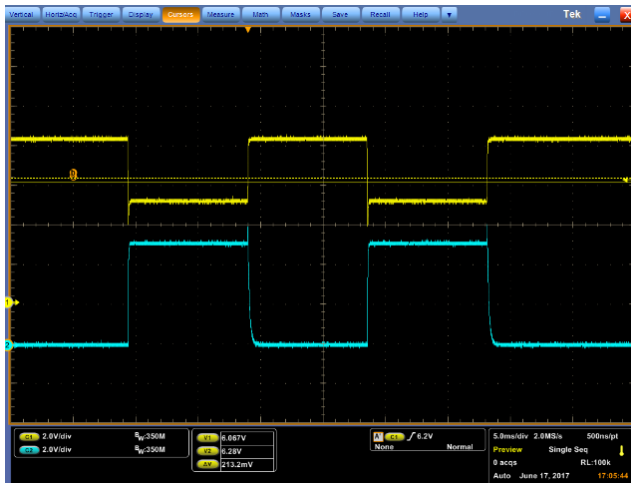


Fig3. OVP recovery waveform

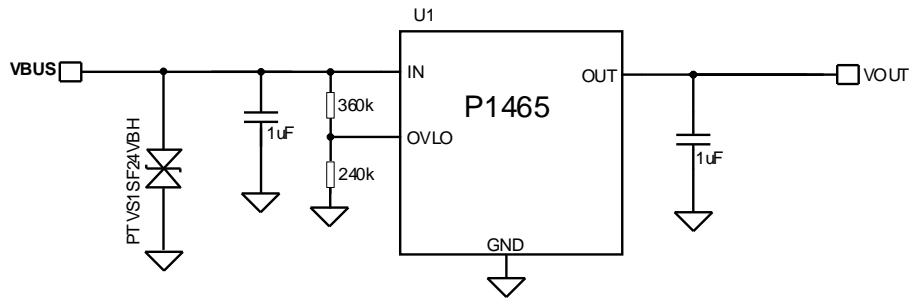


Fig4. OVP test schematic

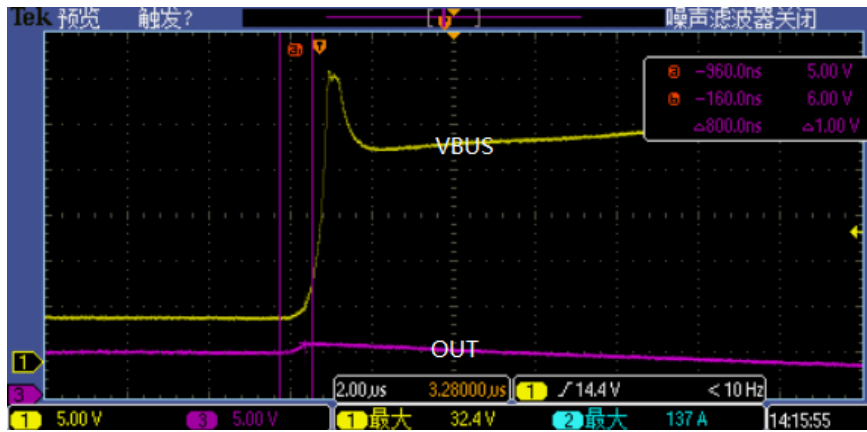
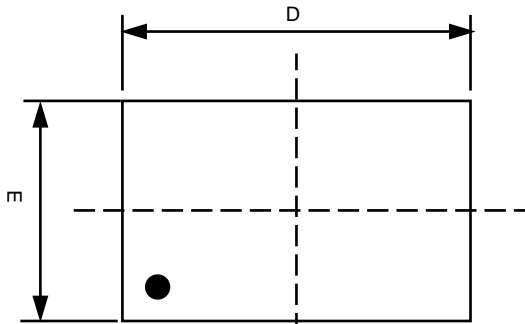
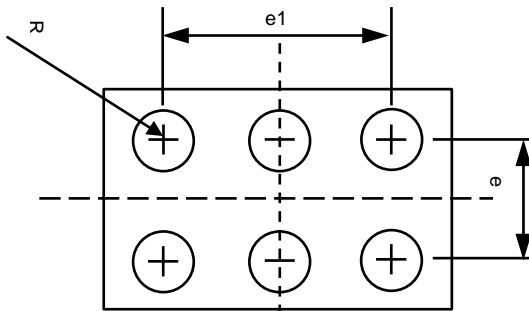
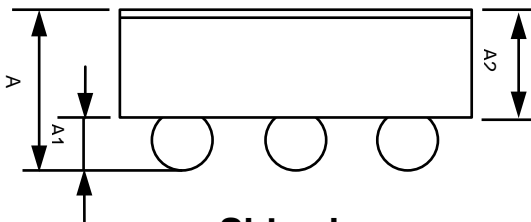



Fig5. 8-20 Surge test (Base on Schematic, Fig 4.)

**Over voltage protector
Product dimension (WLCSP-6L)**

Top view

Bottom view

Side view

Dim	Millimeters		
	MIN	Typ.	MAX
A	0.525	0.575	0.625
A1	0.165	0.195	0.220
A2	0.335	0.360	0.385
D	1.196	1.226	1.256
E	0.826	0.856	0.886
e	0.400 (typ.)		
e1	0.800 (typ.)		
R	0.190	0.230	0.270


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