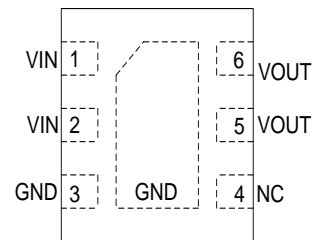


**WS3208D**
**Over Voltage and Over Current Protection IC**
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)
**Descriptions**

The WS3208D is an Over-Voltage-Protection (OVP) and Over-Current-Protection (OCP) device. The device will switch off internal MOSFET to disconnect VIN to VOUT to protect load when any of input voltage, input current over the threshold. The over temperature protection (OTP) function monitors chip temperature to protect the device.

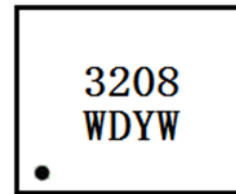
The WS3208D is available in DFN2x2-6L package. Standard products are Pb-free and Halogen-free.


**DFN2x2-6L**

**Features**

- High voltage technology
- Maximum input voltage : 28V
- Output power ON time : 1.5ms (Typ.)
- OVP threshold : 5.7V (Typ.)
- OVP response time : 1us (Typ.)
- OCP threshold : 2A (Min.)
- Output discharge
- Package :DFN2x2-6L

**Applications**

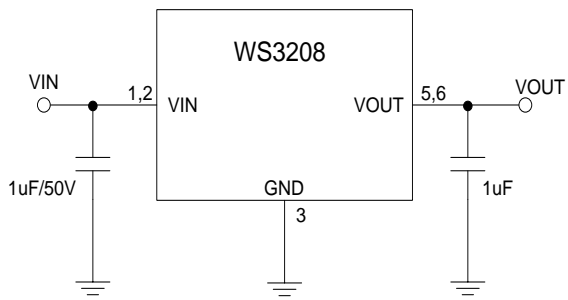
- GPS
- PMP
- MID
- PAD
- Digital cameras
- Digital Videos

**Pin configuration (Top view)**


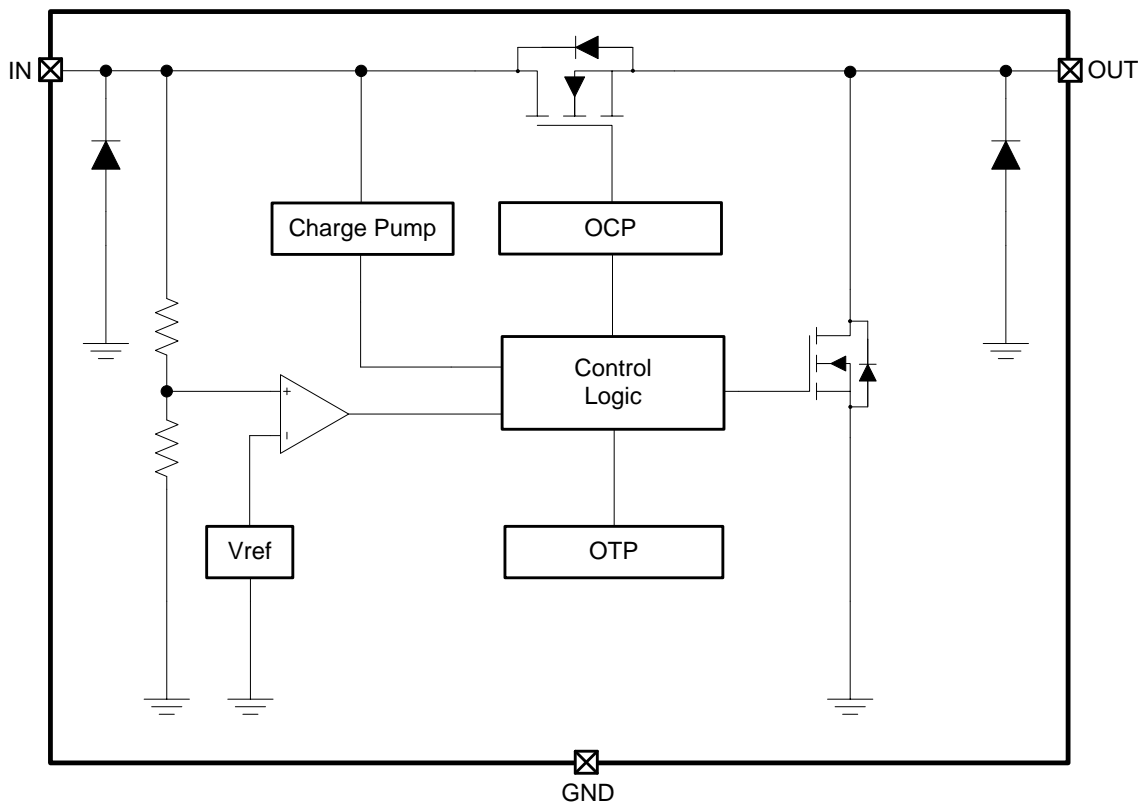
**3208** = Device code  
**WD** = Company code  
**YW** = Year Week  
**Marking**

**Order information**

Device	Package	Shipping
WS3208D56-8/TR	DFN2x2-6L	3000/Reel&Tape

**Typical applications**

**Pin descriptions**

Pin No.	Symbol	Descriptions
3	GND	Power ground
1,2	VIN	Input pin, connect to AC adaptor or VBUS. A 1uF low ESR ceramic capacitor or larger must be connected as close as to this pin. It is recommended to use 50V capacitor or according to application.
5,6	VOUT	Output pin, Connect to load.

**Block diagram**


**Absolute maximum ratings**

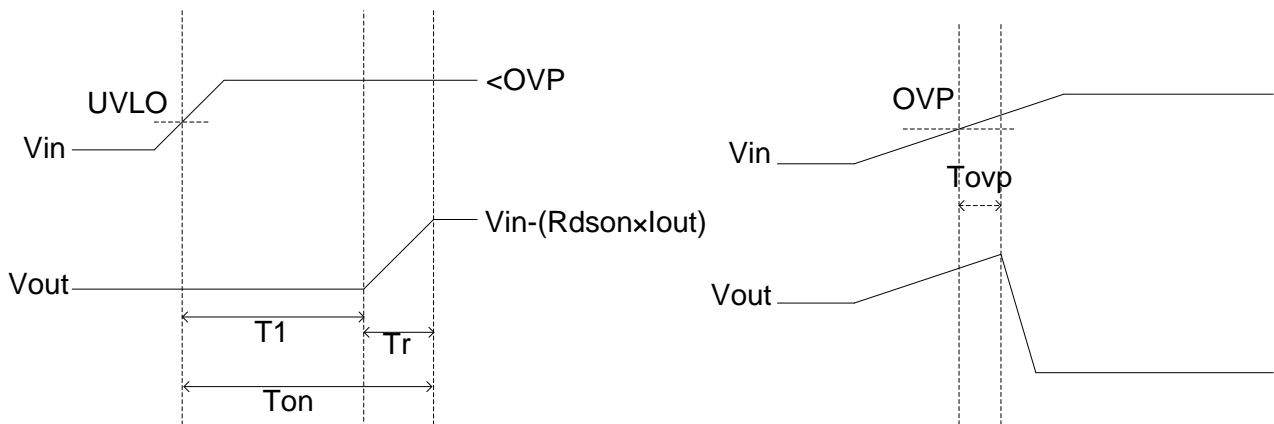
Parameter	Symbol	Value	Unit
Input voltage (IN pin)	$V_{IN}$	-0.3 ~ 28	V
Output voltage (OUT pin)	$V_{OUT}$	-0.3 ~ 6.5	V
Junction temperature	$T_J$	150	°C
Lead temperature(10s)	$T_L$	260	°C
Storage temperature	$T_{stg}$	-55 ~ 150	°C
ESD Ratings	HBM	±4000	V
	MM	±400	V

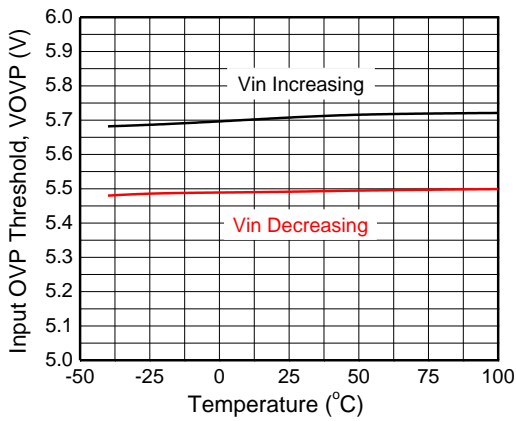
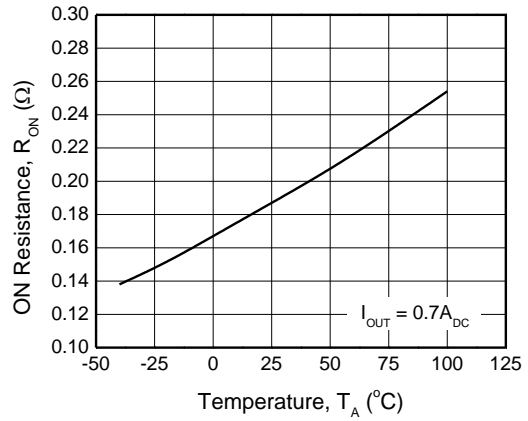
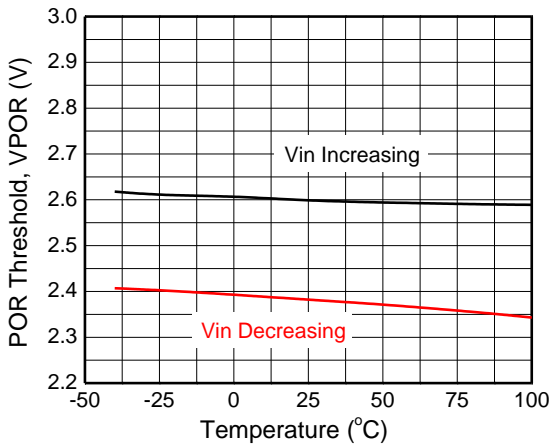
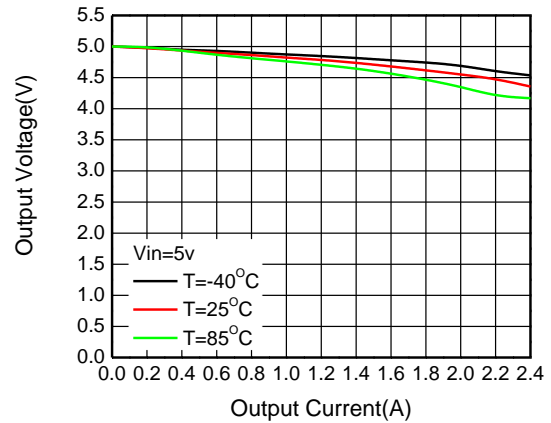
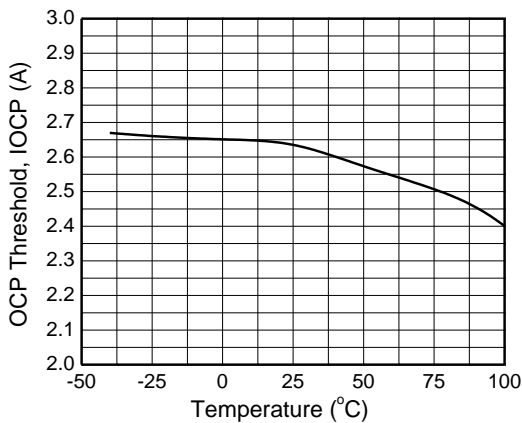
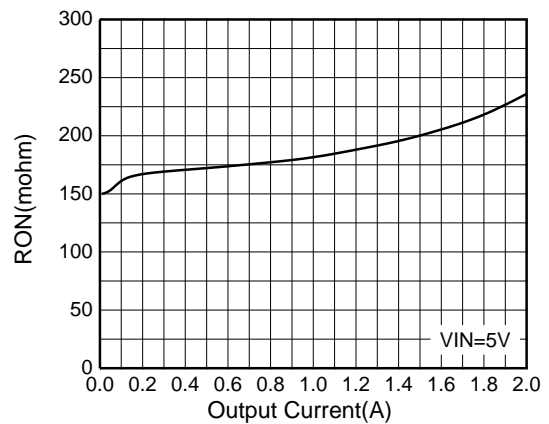
**Recommend operating conditions (Ta=25°C, unless otherwise noted)**

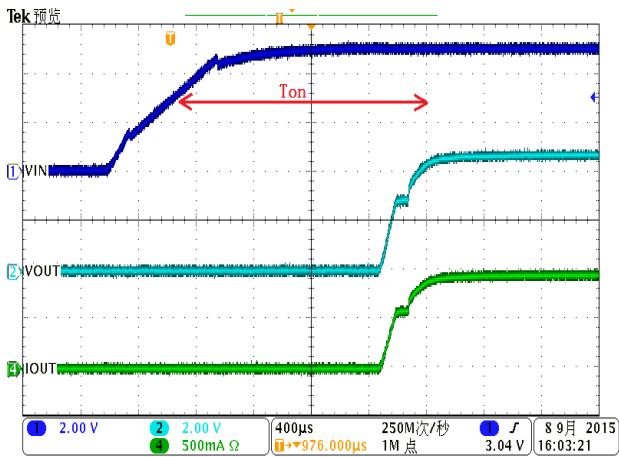
Parameter	Symbol	Value	Unit
Input voltage	$V_{IN}$	3 ~ 28	V
Output current	$I_{OUT}$	≤ 1.5	A
Ambient operating temperature	$T_{opr}$	-40 ~ 85	°C

**Electronics Characteristics (Ta=25°C, Vin=5V, Cin=Cout=1uF, unless otherwise noted)**

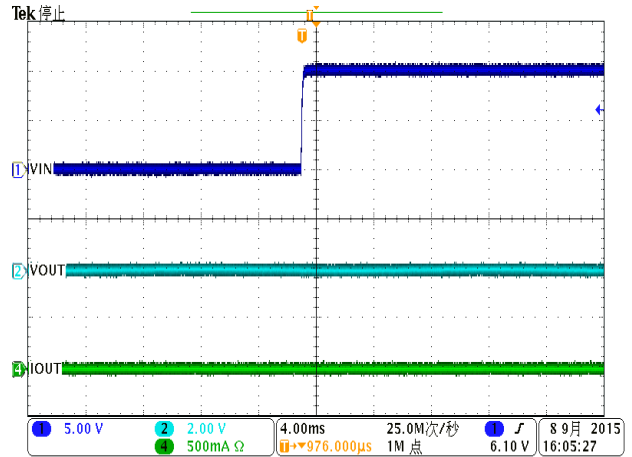
Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
<b>DC characteristics and Power-ON-Reset</b>						
Input quiescent current	$I_Q$	$I_{OUT}=0A$		280	380	$\mu A$
IN-to-OUT ON resistance	$R_{ON}$	$I_{OUT}=0.7A$		190	250	$m\Omega$
Output discharge resistance	$R_{DISCHARGE}$			500		$\Omega$
Under voltage lock out threshold	UVLO	$V_{IN}$ increasing from 0~3V	2.3		2.9	V
Under voltage lock out hysteresis	$V_{HYS-UVLO}$	$V_{IN}$ decreasing from 3~0V	200	250	300	mV
Output power-on time	$T_{ON}$	From $V_{in} > UVLO$ to $V_{out} = 90\% \times V_{outset}$	0.9	1.5	2.5	ms
Output power-on delay time	T1	From $V_{in} > UVLO$ to $V_{out} = 10\% \times V_{outset}$		1.3		ms
Output rise time	Tr	From $V_{out} = 10\% \times V_{outset}$ to $V_{out} = 90\% \times V_{outset}$		0.2		ms
<b>Input Over-Voltage-Protection (OVP)</b>						
OVP threshold	$V_{OVP}$	$V_{IN}$ increasing from 5~7V	5.5	5.7	5.9	V
OVP hysteresis	$V_{HYS-OVP}$	$V_{IN}$ decreasing from 7~5V	200	300	400	mV
OVP active time	$T_{OVP}$	From $V_{in} > V_{OVP}$ to $V_{out}$ began to decline		1		$\mu s$
OVP recovery time	$T_{ON(OVP)}$	From $V_{in} < V_{OVP} - V_{HYS-OVP}$ to $V_{out} = 90\% \times V_{outset}$	0.9	1.5	2.5	ms
<b>Input Over-Current-Protection (OCP)</b>						
OCP threshold	$I_{OCP}$		2.0			A
<b>Over-Temperature-Protection (OTP)</b>						
OTP threshold				165		$^{\circ}C$
OTP hysteresis				40		$^{\circ}C$

**TIMING DIAGRAMS**


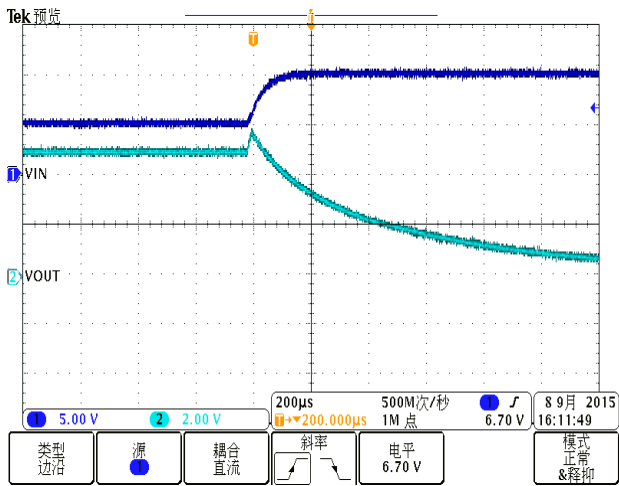
**Typical Characteristics (Ta=25°C, Vin=5V, Cin=Cout=1uF, unless otherwise noted)**

**OVP threshold vs. Temperature**

**IN-to-OUT ON resistance vs. Temperature**

**UVLO threshold vs. Temperature**

**Output voltage vs. Output current**

**OCP threshold vs. Temperature**

**ON resistance vs. Output current**



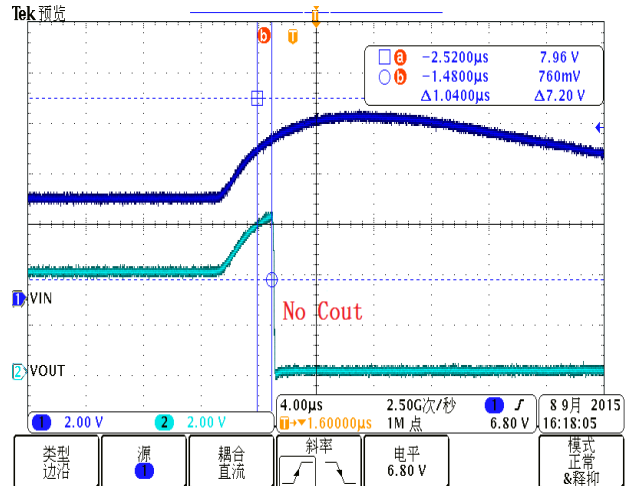
Normally Power ON



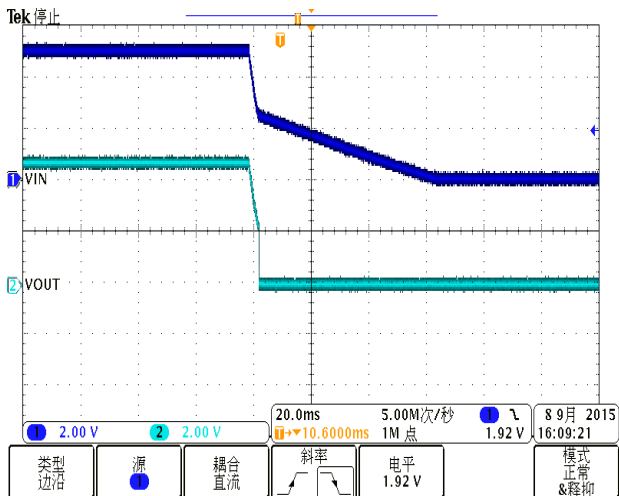
Power ON with Input Overvoltage



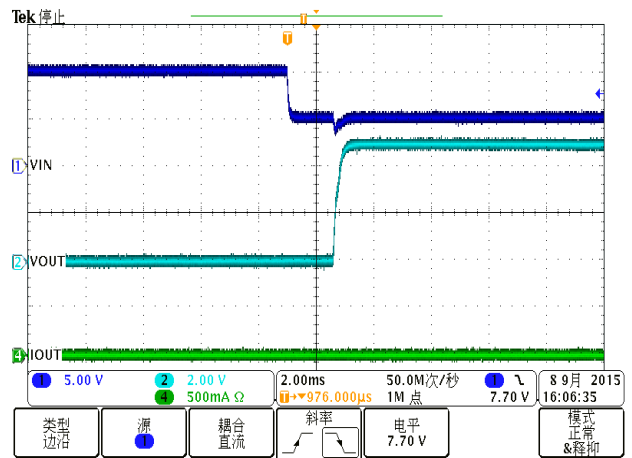
OVP Active Time



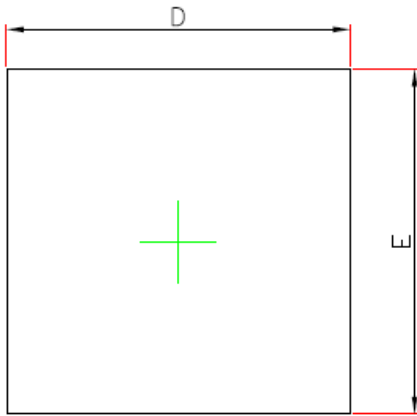
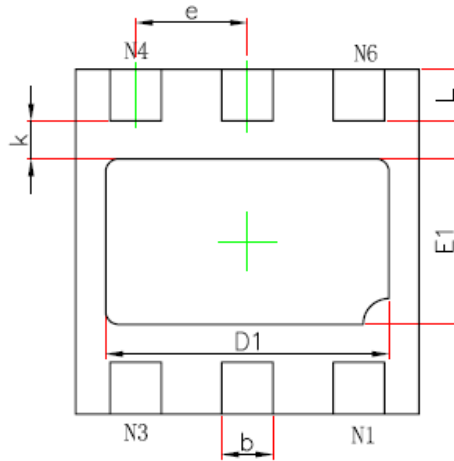
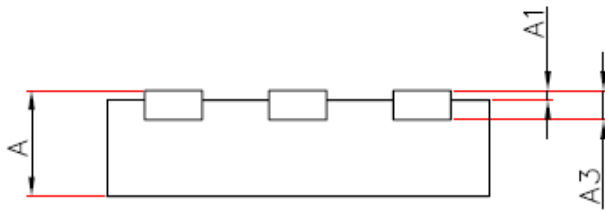
OVP Active Time



Normally Power OFF



OVP Recovery Time

**Package outline dimensions**

**TOP VIEW**

**BOTTOM VIEW**

**SIDE VIEW**

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.500	0.600	0.020	0.024
A1	0.000	0.050	0.000	0.002
A3	0.700	0.800		
A3	0.152REF.		0.006REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.075	0.083
D1	1.550	1.750	0.061	0.069
E1	0.860	1.060	0.034	0.042
k	0.200MIN.		0.008MIN.	
b	0.250	0.350	0.007	0.012
e	0.650TYP.		0.026TYP.	
L	0.224	0.376	0.009	0.015