

General Description

The SI2308 is the high cell density trench N-ch MOSFET, which provides excellent $R_{DS(ON)}$ and efficiency for most of the small power switching and load switch applications.

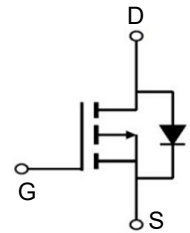
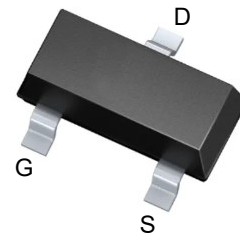


Features

V_{DSS}	60	V
I_D	3	A
$R_{DS(ON)}(at V_{GS}=10V)$	73	m Ω
$R_{DS(ON)}(at V_{GS}=4.5V)$	86	m Ω

Application

- High Frequency Point-of-Load Synchronous
- Power Tool
- Motor Driver
- LED Applications



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
SI2308	SOT-23	A8SHB	3000

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current ^a	I_D	$T_C=25^{\circ}\text{C}$ 3.0	A
		$T_C=70^{\circ}\text{C}$ 1.56	
Drain Current – Pulsed ^a	I_{DM}	10.4	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	1.2	W
Power Dissipation ($T_C=75^{\circ}\text{C}$)		1.1	
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$
Operating Junction Temperature Range	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Thermal Resistance, Junction-to-Ambient1	$R_{\theta JA}$	105	$^{\circ}\text{C/W}$

Electrical Characteristics ($T_J=25\text{ }^{\circ}\text{C}$, unless otherwise noted)

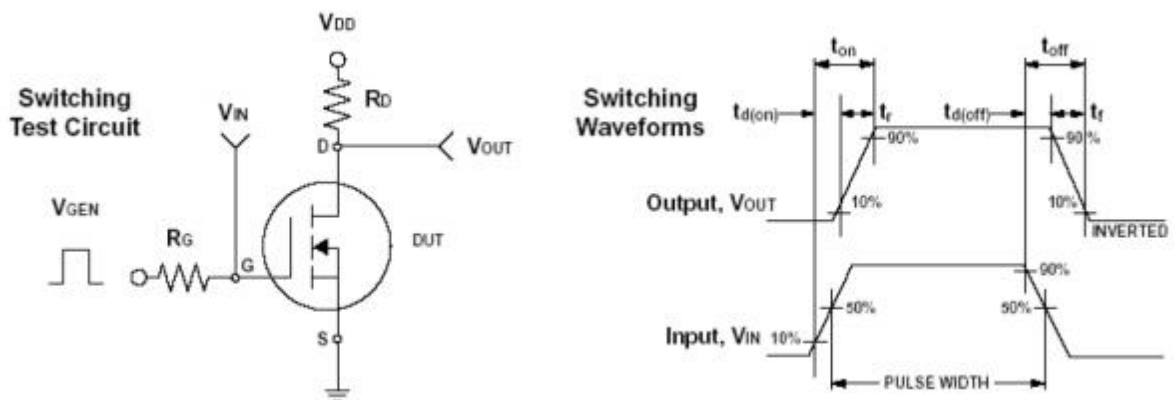
Parameter		Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	60	---	---	V
Zero Gate Voltage Drain Current	T _J =25 °C	I _{DSS}	V _{DS} =48V, V _{GS} =0V	---	---	1	μA
Gate-Body Leakage		I _{GSS}	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
On Characteristics ^a							
Gate Threshold Voltage		V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	---	3.0	V
Drain-Source On-State Resistance		R _{DS(on)}	V _{GS} =10V, I _D =3.0A	---	73	80	mΩ
			V _{GS} =4.5V, I _D =2.0A	---	86	100	
Forward Transconductance		g _{fs}	V _{DS} =10V, I _D =2.6A	8.5	10.3	---	S
Drain-Source Diode Characteristics ^a							
Continuous Source Current		I _S	V _G =V _D =0V, Force Current	---	---	3	A
Diode Forward Voltage		V _{SD}	V _{GS} =0V, I _S =1.0A	---	---	1.2	V
Dynamic Characteristics ^b							
Input Capacitance		C _{iss}	V _{DS} =30V, V _{GS} =0V, F=1MHz	---			pF
Output Capacitance		C _{oss}		---			
Reverse Transfer Capacitance		C _{rss}		---			
Switching Characteristics		^b					
Total Gate Charge		Q _g	V _{DS} =30V, V _{GS} =10V, I _D =2.6A	---			nC
Gate-Source Charge		Q _{gs}		---			
Gate-Drain Charge		Q _{gd}		---			
Turn-On Delay Time		T _{d(on)}	V _{DD} =20V, R _G =6.7Q V _{GS} =10V, R _G =3Q I _D =2A	---			ns
Rise Time		T _r		---			
Turn-Off Delay Time		T _{d(off)}		---			
Fall Time		T _f		---			

Notes: a. Repetitive Rating: Pulsed width limited by maximum junction temperature.

b. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$. Essential independent of operating temperature.

c. Guaranteed by design, not subject to production testing.

Switching Time Test Circuit and Waveforms



Soldering Methods For Products

1. Storage environment : Temperature= $10^{\circ}\text{C}\sim 35^{\circ}\text{C}$, Humidity= $65\%\pm 15\%$
2. Reflow soldering of surface mount devices

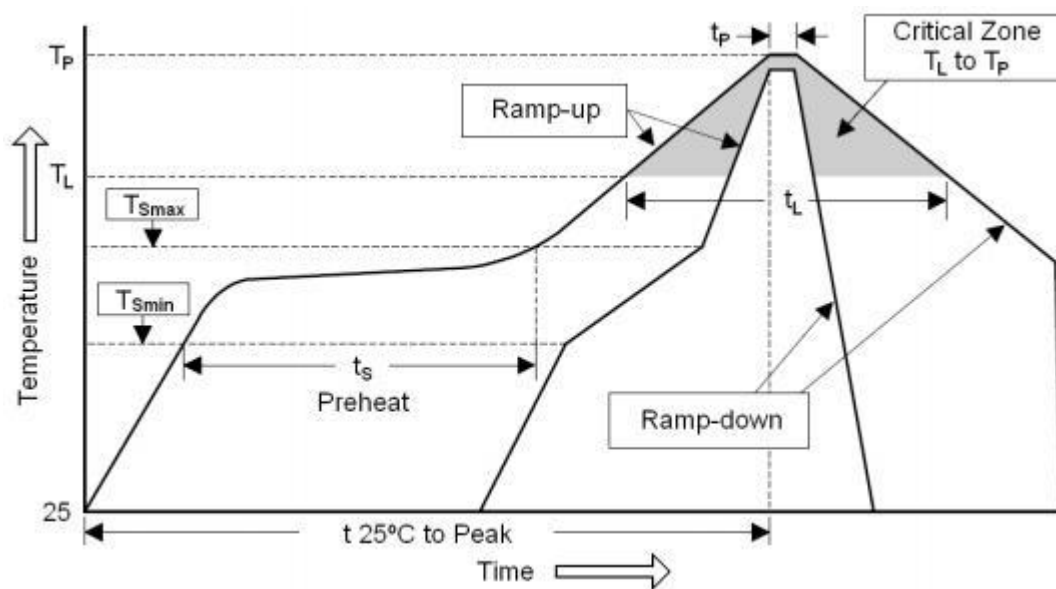


Figure : Temperature Profile

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	< 3°C/sec	< 3°C/sec
Preheat		
- Temperature Min (T_{Smin})	100°C	100°C
- Temperature Max (T_{Smax})	150°C	200°C
- Time (Min to Max) (t_s)	60 ~ 120 sec	60 ~ 180 sec
T_{Smax} to T_L		
- Ramp-up rate	< 3°C/sec	< 3°C/sec
Time maintained above:		
- Temperature (T_L)	183°C	217°C
- Time (t_L)	60 ~ 150 sec	60 ~ 150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10 ~ 30 sec	20 ~ 40 sec
Ramp-down rate	< 6°C/sec	< 6°C/sec
Time 25°C to Peak Temperature	< 6 minutes	< 8 minutes

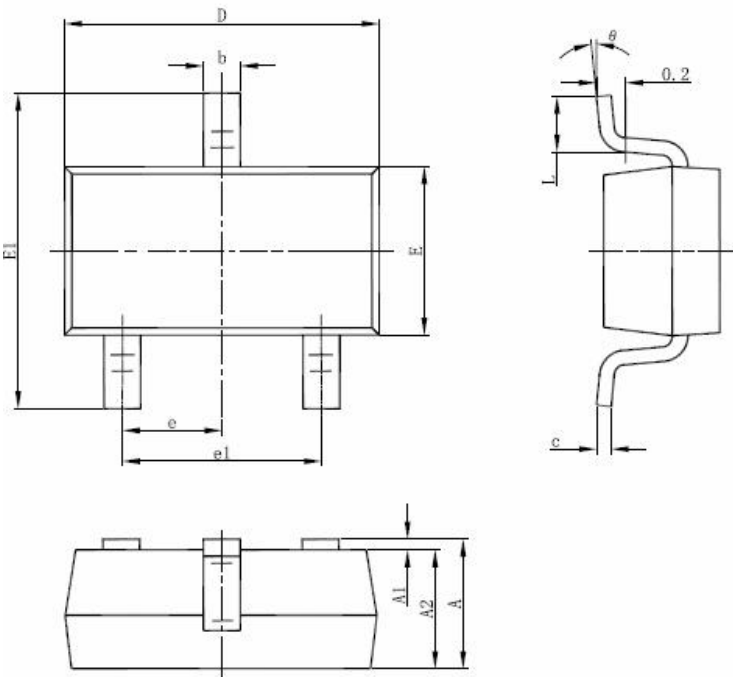
3. Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb devices	245°C ±5°C	5sec ±1sec
Pb-Free devices	260°C +0/-5°C	5sec ±1sec

Notices:

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Package Mechanical Data-SOT-23



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°