General Description

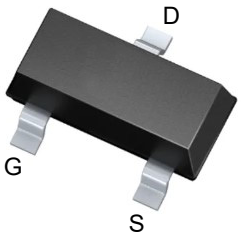
The SI2308 is the high cell density trench N-ch MOSFET, which provides excellent $R_{DS(ON)}$ and efficiency for most of the s mall power switching and load switch applications.

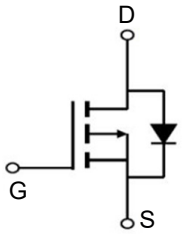
Features

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

Application

- GHigh 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℃unless otherwise noted)

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

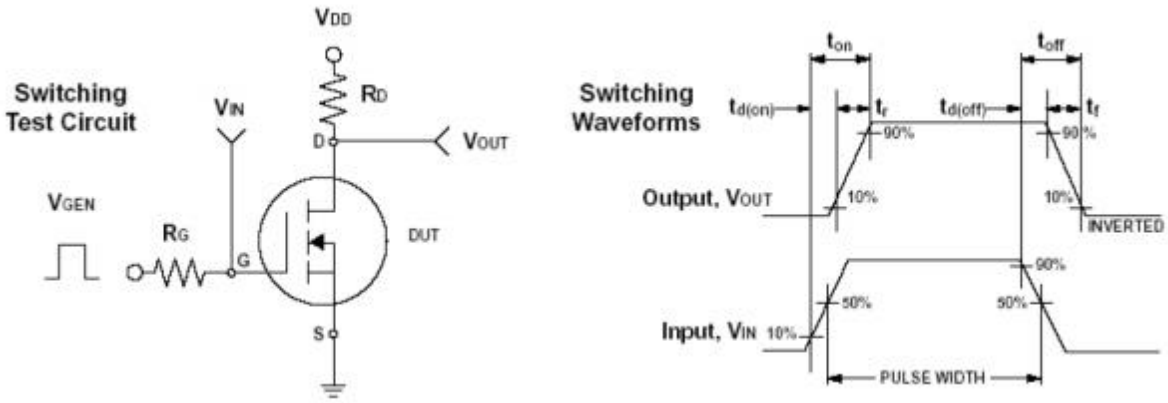
Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

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		gfs	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		Ciss	V_{DS}=30V, V_{GS}=0V, F=1MHz	---			pF
Output Capacitance		Coss		---			
Reverse Transfer Capacitance		Crss		---			
Switching Characteristics [b]							
Total Gate Charge		Qg	V_{DS}=30V, V_{GS}=10V, I_D=2.6A	---			nC
Gate-Source Charge		Qgs		---			
Gate-Drain Charge		Qgd		---			
Turn-On Delay Time		Td(on)	V_{DD}=20V, R_G=6.7Q V_{GS}=10V, R_G=3Q I_D=2A	---			ns
Rise Time		Tr		---			
Turn-Off Delay Time		Td(off)		---			
Fall Time		Tf		---			

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

b. Pulse test: pulse width ≤ 300us, duty cycle ≤ 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=10ºC~35ºC, Humidity=65%±15%
2. Reflow soldering of surface mount devices

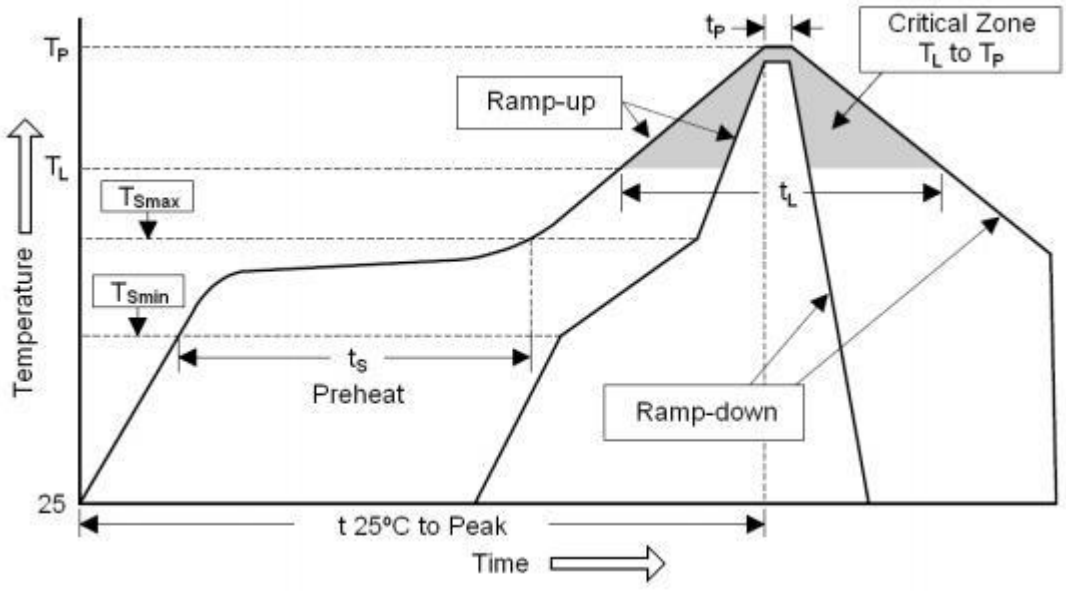


Figure : Temperature Profile

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

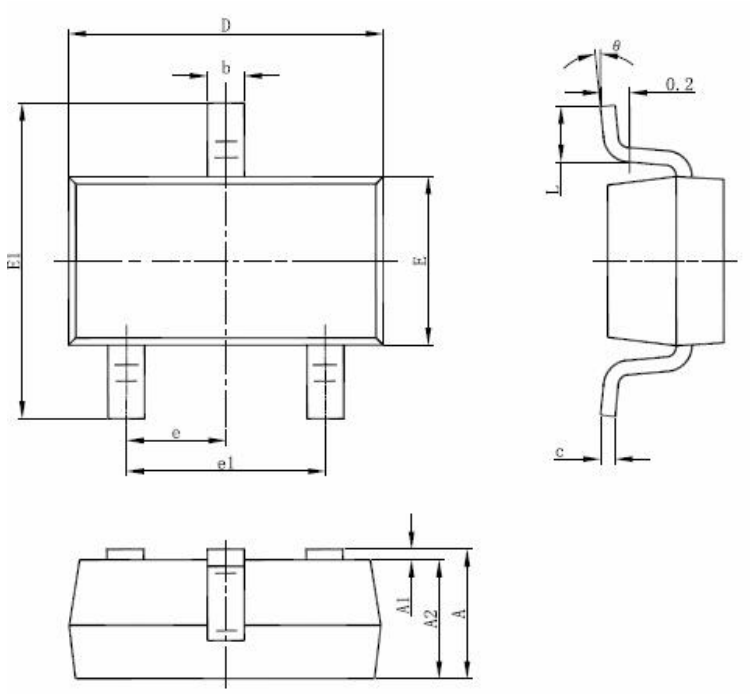
3. Flow (wave) soldering (solder dipping)

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

Notices:

- All companies, brands, logos, pictures, product names and trademarks are the property of owner respective companies.

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°