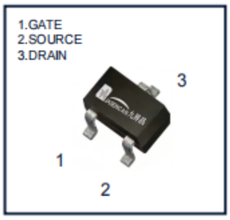
JS-SI2300BC

SOT-23-3L 20V N-Channel Enhancement Mode MOSFET

Description

The SI2300BC uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

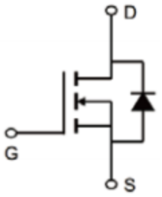
General Features



SOT-23-3L

- V_{DS} = 20V I_D =6A
- $R_{DS(ON)}$ < 25mΩ @ V_{GS}=4.5V

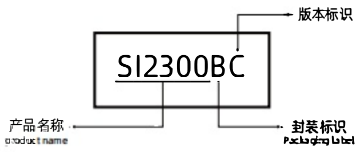
Applications



Equivalent Circuit

- Battery protection
- Load switch
- Uninterruptible power supply

Ordering information

Product ID	Pack	Naming rule	Marking	Qty(PCS)
SI2300BC	SOT-23-3L		2300 00A8C	3000

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_A=25℃	Continuous Drain Current, VGS @4.5V1	6	A
I_D@T_A=70℃	Continuous Drain Current, VGS @4.5V1	2.8	A
I_{DM}	Pulsed Drain Current2	14.4	A
P_D@T_A=25℃	Total Power Dissipation3	1	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-ambient 1	125	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case1	80	℃/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
On/Off States						
B_{VDSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	20	22	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance2	V_{GS}=4.5V , I_D=3A	---	25	30	mΩ
		V_{GS}=2.5V , I_D=2A	---	28	35	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	0.5	0.75	1.2	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=16V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=16V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=3A	---	10.5	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	310	---	pF
C_{oss}	Output Capacitance		---	49	---	
C_{rss}	Reverse Transfer Capacitance		---	35	---	
Q_g	Total Gate Charge (4.5V)	V_{DS}=15V , V_{GS}=4.5V , I_D=3A	---	4.6	---	nC
Q_{gs}	Gate-Source Charge		---	0.7	---	
Q_{gd}	Gate-Drain Charge		---	1.5	---	
Switching Characteristics						
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=10V , V_{GS}=4.5V , R_G=3.3Ω I_D=3A	---	1.6	---	ns
T_r	Rise Time		---	42	---	
$T_{d(off)}$	Turn-Off Delay Time		---	14	---	
T_f	Fall Time		---	7	---	
Drain-Source Diode Characteristics and Maximum Ratings						
IS	Continuous Source Current1,4	V_G=V_D=0V , Force Current	---	---	5.8	A
VSD	Diode Forward Voltage^2	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V

Note :

1、The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、The power dissipation is limited by 150℃ junction temperature

4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

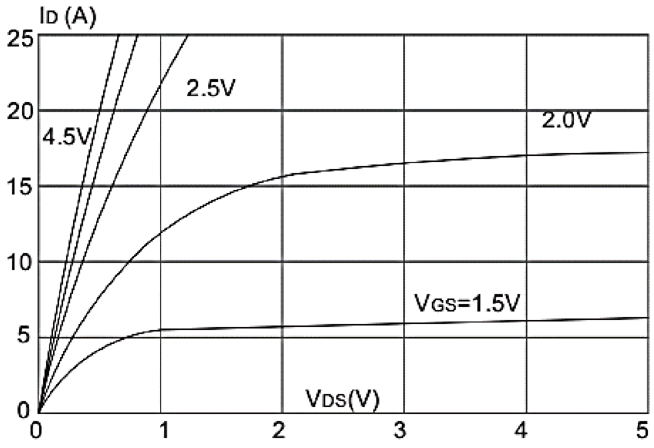


Figure1: Output Characteristics

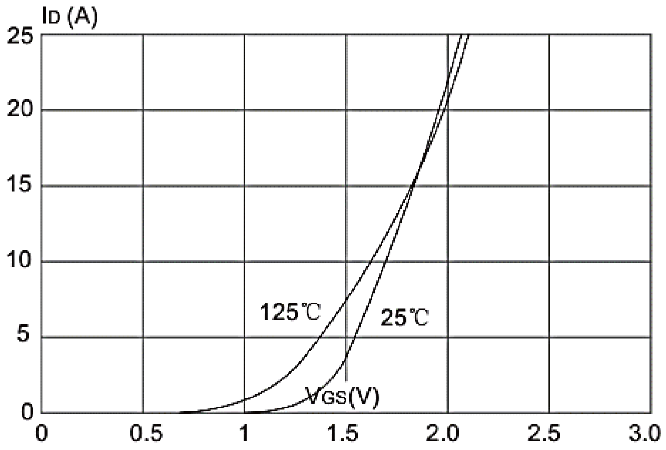


Figure 2: Typical Transfer Characteristics

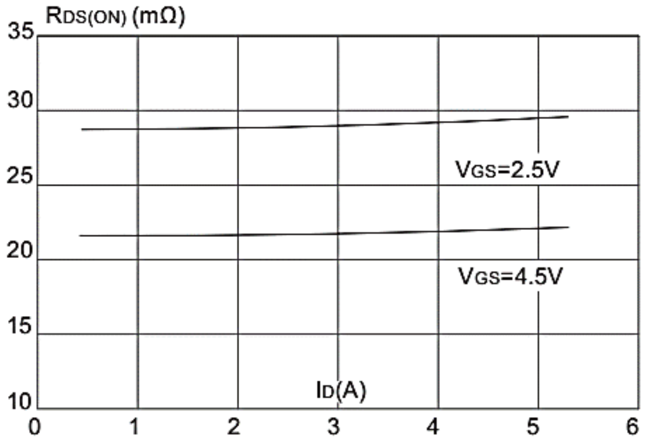


Figure 3:On-resistance vs. Drain Current

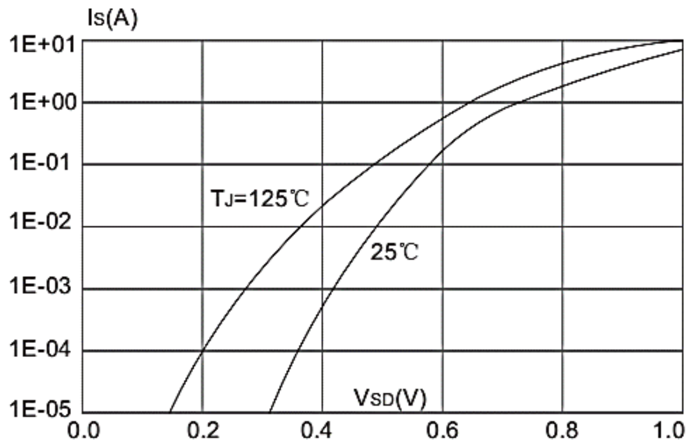


Figure 4: Body Diode Characteristics

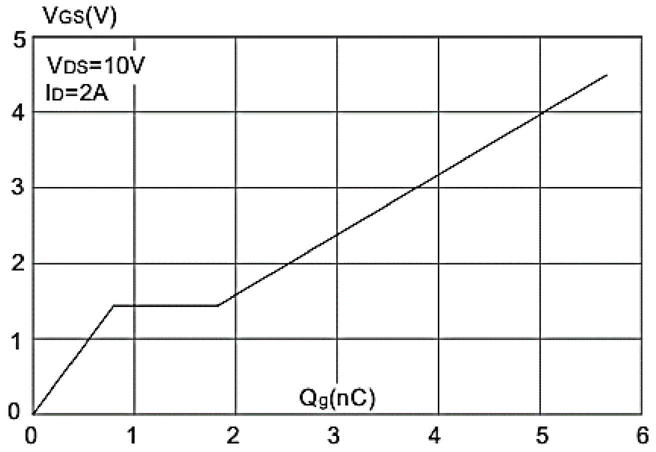


Figure 5: Gate Charge Characteristics

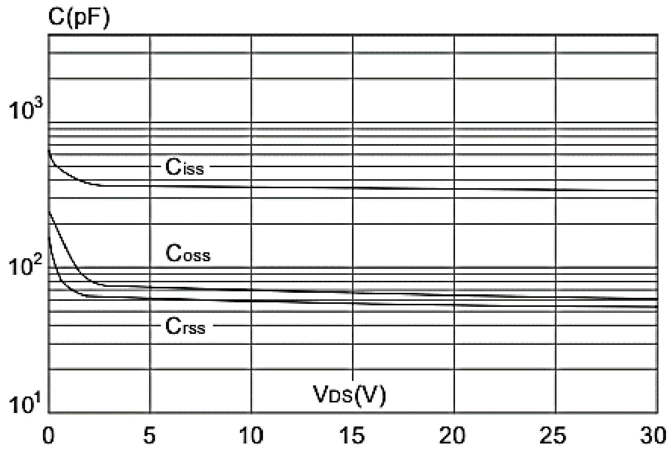


Figure 6: Capacitance Characteristics

Typical Characteristics

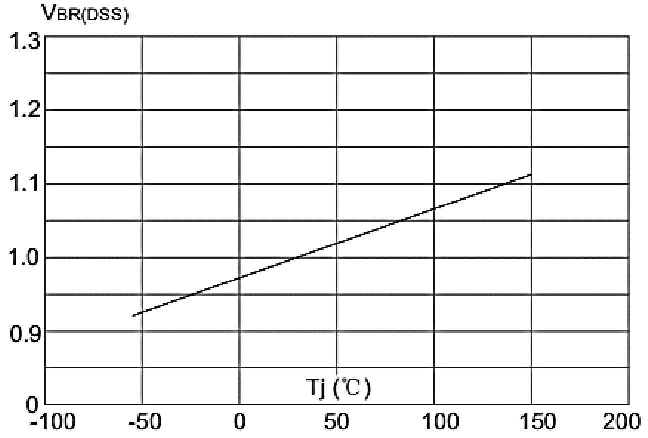


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

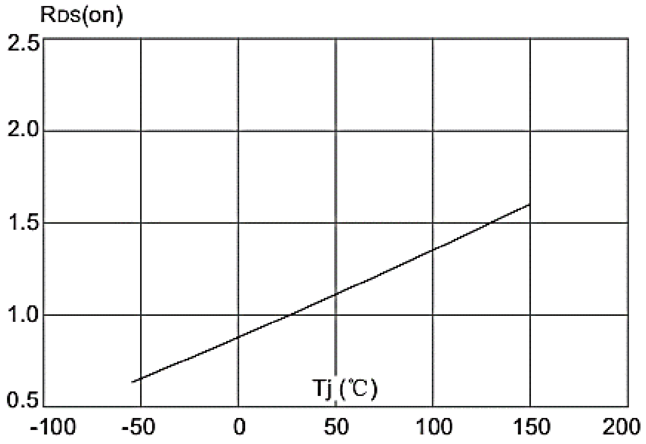


Figure 8: Normalized on Resistance vs. Junction Temperature

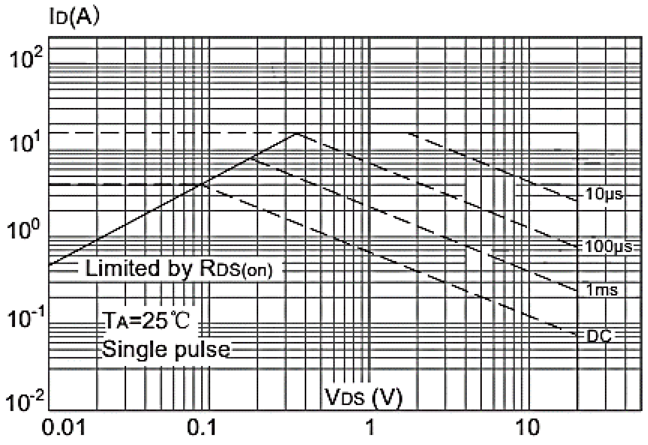


Figure 9: Maximum Safe Operating Area

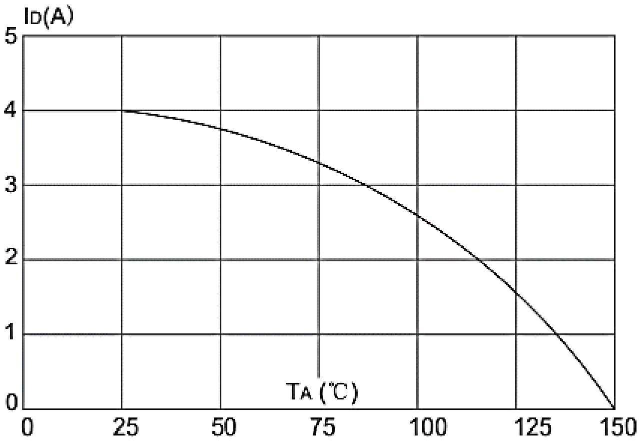


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

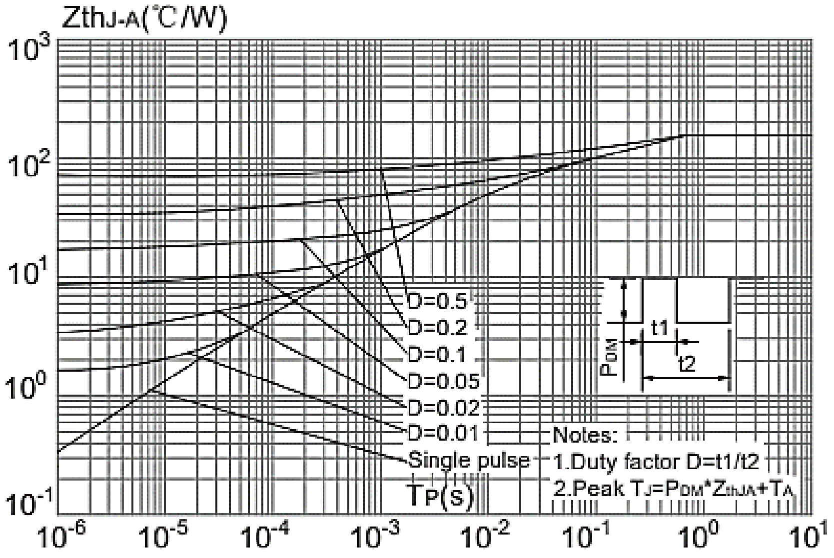
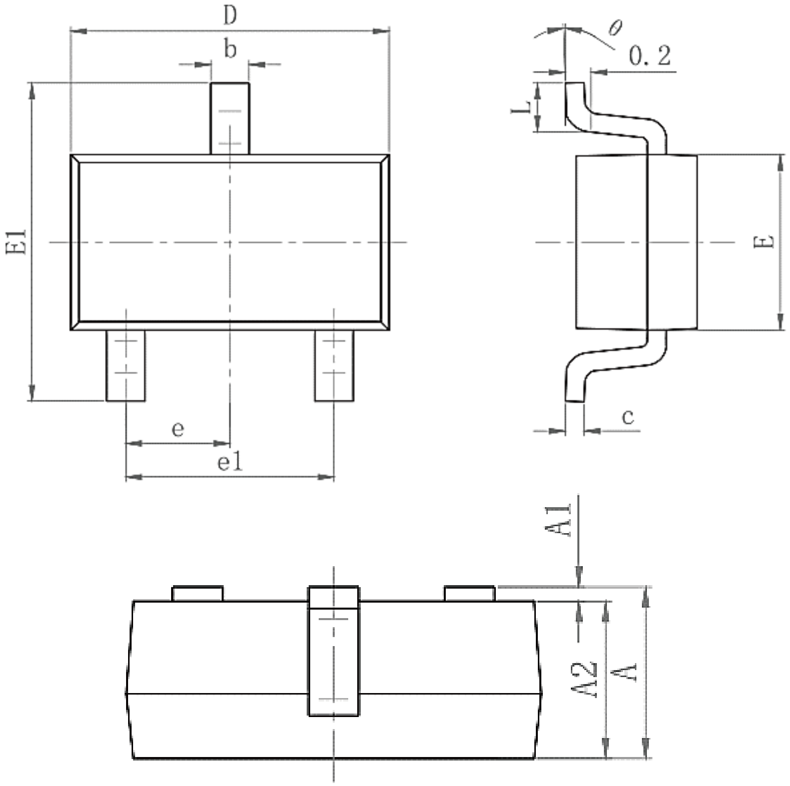


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

SOT23-3L Package Outline Dimensions



Symbol	Dimensions in Millimeters	
	mm	
	Min	Max
A	1.05	1.25
A1	0.000	0.100
A2	1.05	1.15
b	0.25	0.45
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950（BSC）	
e1	1.800	2.000
L	0.300	0.500
θ	0°	8°