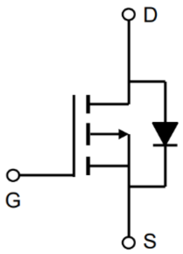
ZS2301BI

-20V P-Channel Enhancement Mode MOSFET

Description

The ZS2301BI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V.

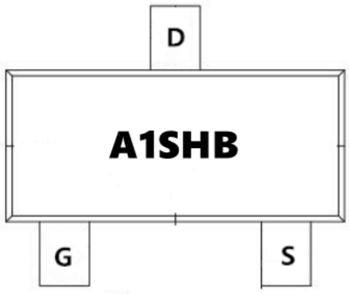
This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = -20V I_D =-2.8A

$R_{DS(ON)}$ < 108mΩ @ V_{GS}=-4.5V **(Type：64mΩ)**

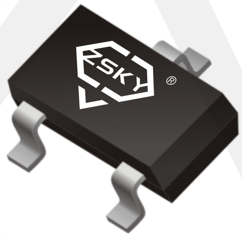


Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
ZS2301BI	SOT23L	A1SHB	3000

Absolute Maximum Ratings (T_C=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, V_{GS} @ -4.5V[1]	-2.8	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-1.1	A
I_{DM}	Pulsed Drain Current[2]	-8.4	A
P_D@T_A=25℃	Total Power Dissipation[3]	1.3	W
P_D@T_A=70℃	Total Power Dissipation[3]	0.8	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
RθJC	Thermal resistance, junction-case	28	℃/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D= -250μA	-20	-	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = -20V, V_{GS} = 0V,	-	-	-1	μA
IGSS	Gate to Body Leakage Current	V_{DS} =0V, V_{GS} = ±12V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D= -250μA	-0.4	-0.7	-1.0	V
RDS(on)	Static Drain-Source on-Resistance	V_{GS} =-4.5V, I_D =-2A	-	64	108	mΩ
		V_{GS} =-2.5V, I_D =-1A	-	89	140	
Ciss	Input Capacitance	V_{DS} = -10V, V_{GS} = 0V, f = 1.0MHz	-	185	-	pF
Coss	Output Capacitance		-	35	-	pF
Crss	Reverse Transfer Capacitance		-	25	-	pF
Q_g	Total Gate Charge	V_{DS} = -10V, I_D = -2A, V_{GS} = -4.5V	-	2.2	-	nC
Qgs	Gate-Source Charge		-	0.5	-	nC
Qgd	Gate-Drain("Miller") Charge		-	0.5	-	nC
td(on)	Turn-on Delay Time	V_{DD} = -10V, R_L=5Ω, R_{GEN}=3Ω,V_{GS}=-4.5V,	-	10	-	ns
tr	Turn-on Rise Time		-	30	-	ns
td(off)	Turn-off Delay Time		-	63	-	ns
t_f	Turn-off Fall Time		-	50	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-2.8	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-8	A
VSD	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -2A	-	-	-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 I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

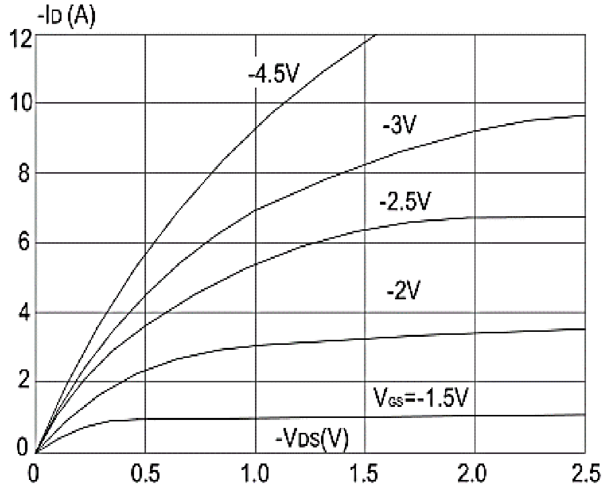


Figure1: Output Characteristics

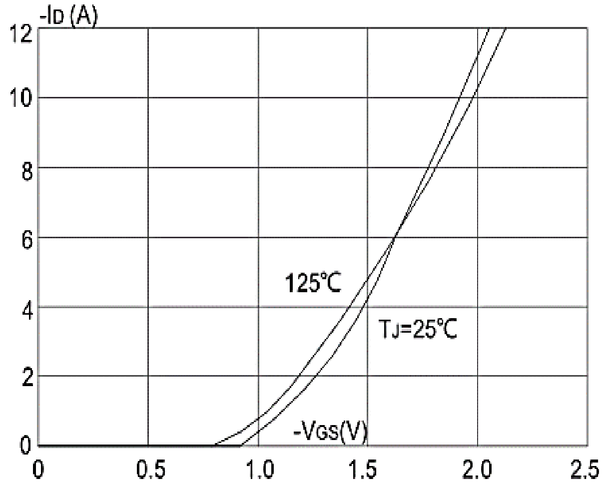


Figure 2: Typical Transfer Characteristics

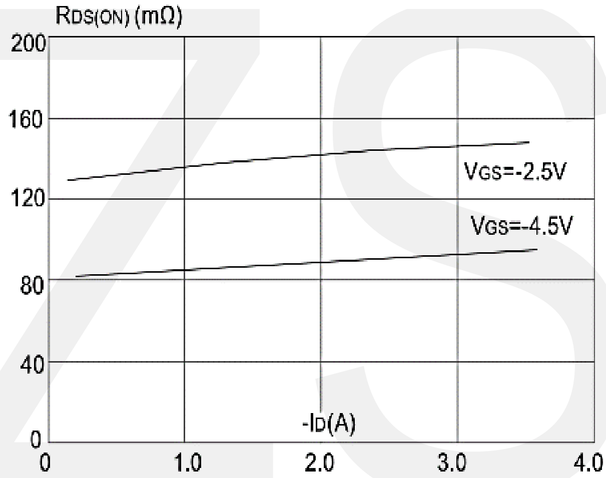


Figure 3:On-resistance vs. Drain Current

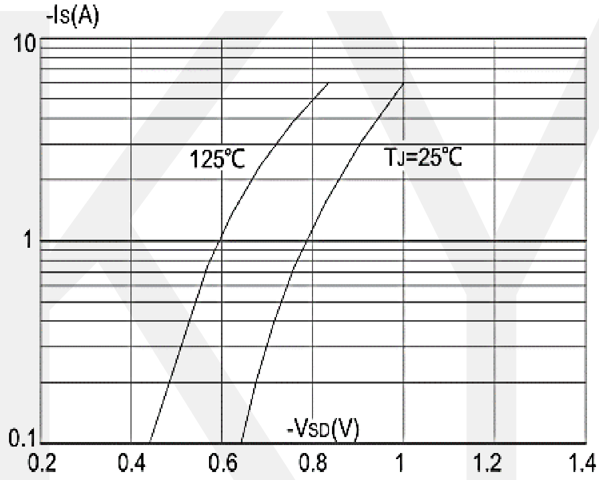


Figure 4: Body Diode Characteristics

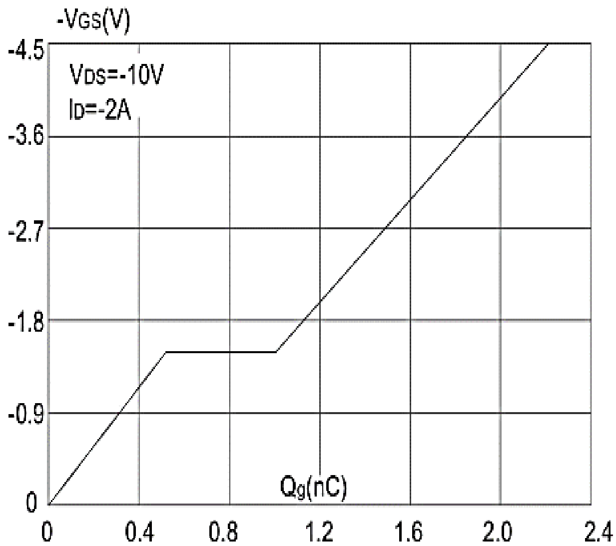


Figure 5: Gate Charge Characteristics

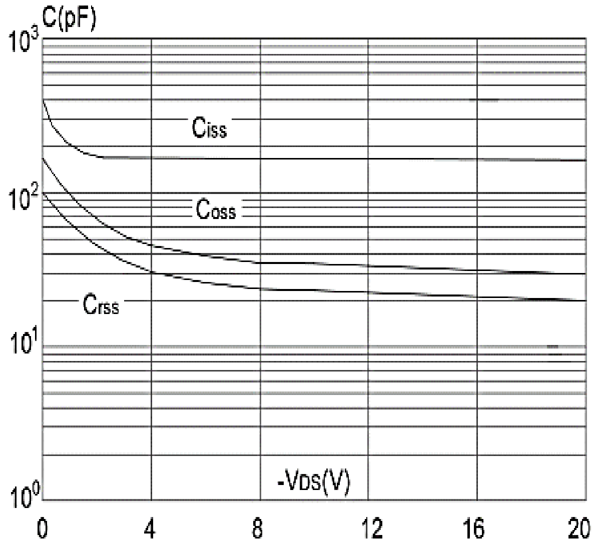


Figure 6: Capacitance Characteristics

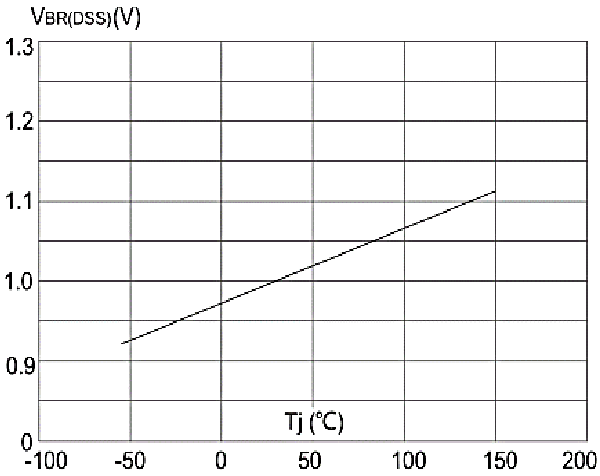


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

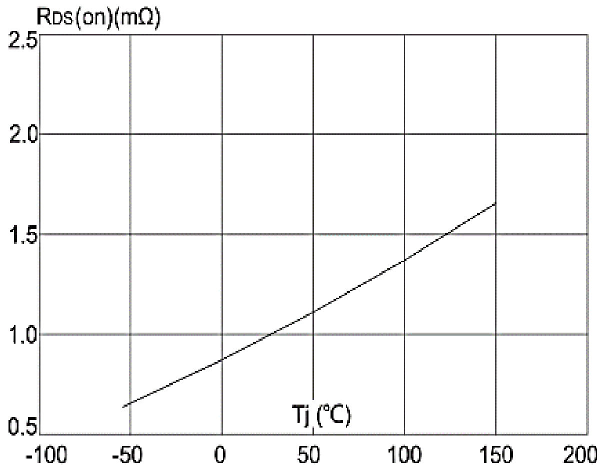


Figure 8: Normalized on Resistance vs. Junction Temperature

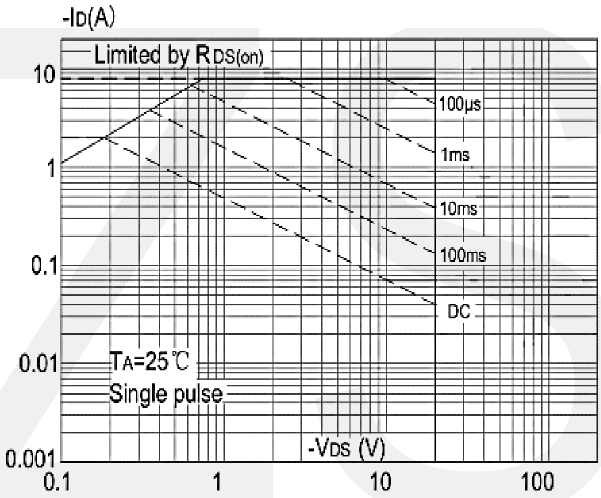


Figure 9: Maximum Safe Operating Area

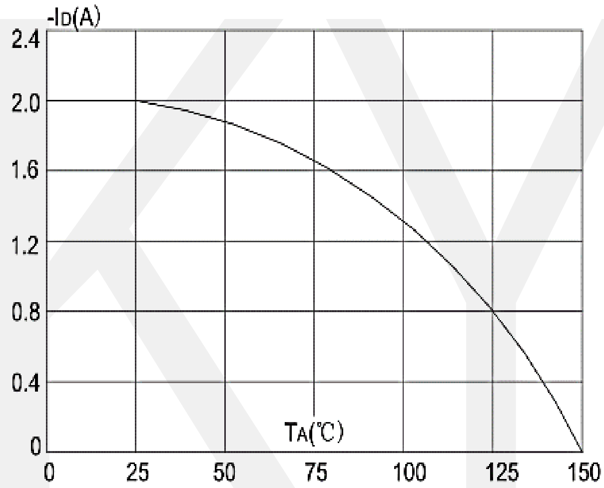


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

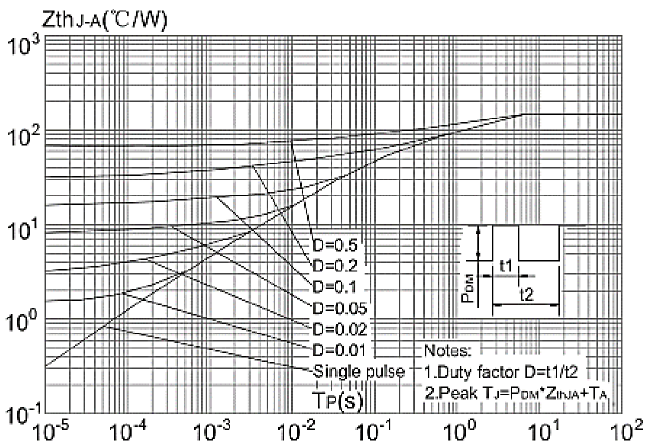
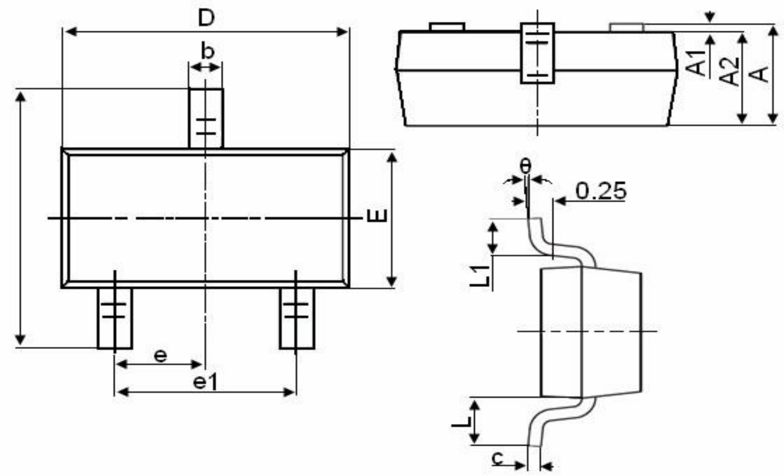


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Package Mechanical Data-SOT23-XC-Single



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

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