Features

- Green Device Available
- Excellent Cdv/dt effect decline
- Super Low Gate Charge
- Advanced high cell density Trench technology

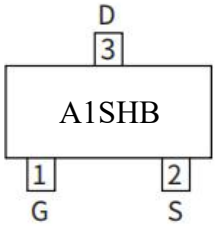
Bvdss	Rdson	ID
-20V	75mΩ	-3A

Application

RoHS

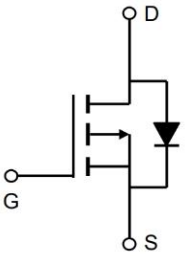
- Battery protection
- Load Switch
- Uninterruptible power supply

Package



Marking and pin assignment

SOT23 top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
A1SHB	2301	SOT23	3000

Absolute Maximum Ratings (T_A=25℃unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current,V_{GS}@-4.5V[1]	I_D@T_A=25℃	-3	A
	I_D@T_A=70℃	-2.2	A
Pulsed Drain Current[2]	I_{DM}	-12	A
Total Power Dissipation	P_D	1	W
Storage Temperature Range	T_{STG}	-55 ~ 150	℃
Operating Junction Temperature Range	T_J	-55 ~ 150	℃

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Ambient[1]	$R_{\theta JA}$	125	℃/W
Thermal Resistance Junction-Case	$R_{\theta JC}$	-	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	S	D	
HL2301	SOT23	1	2	3	Tape Reel

Electrical Characteristics (T_J=25℃unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{DSS}	V_{GS}=0V,I_D=-250μA	-20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V,V_G =±12V	-	-	±100	nA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.5	-0.7	-1	V
Drain-Source On-Resistance[2]	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-3A	-	75	97	mΩ
		V_{GS}=-2.5V, I_D=-2A	-	95	123	
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, f =1MHz	-	503	-	pF
Output Capacitance	C_{oss}		-	67	-	
Reverse Transfer Capacitance	C_{rss}		-	58	-	
Total Gate Charge	Q_g	V_{GS}=-10V, V_{DS}=-4.5V, I_D=-2A	-	4.1	-	nC
Gate−Source Charge	Q_{gs}		-	0.8	-	
Gate−Drain Charge	Q_{gd}		-	1.1	-	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V, R_G=1Ω, R_L=1.2Ω,V_G=-4.5V,I_D=-3A	-	11	-	ns
Rise Time	t_r		-	52	-	
Turn-off Delay Time	$t_{d(off)}$		-	16	-	
Fall Time	t_f		-	10	-	
Continuous Source Current	I_S	-	-	-	-3	A
Source Diode Forward Current	I_{SM}	-	-	-	-12	A
Drain Forward Voltage	V_{SD}	I_S=-3A,V_{GS}=0V	-	-	-1.2	V

Notes:

1. Repetitive rating, pulse width limited by junction temperature
2. Pulse Test: Pulse width≤300μs, duty cycle≤2%.

Typical Performance Characteristics

Figure1: Output Characteristics

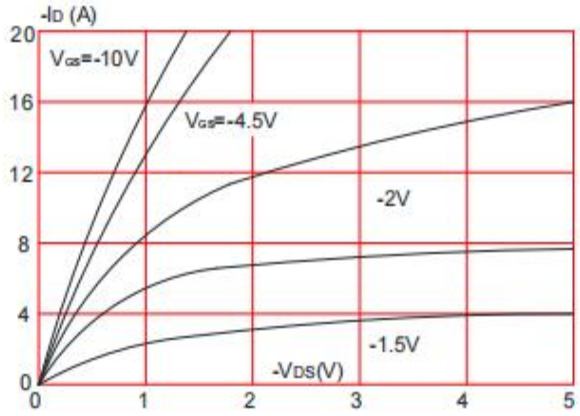


Figure 2: Typical Transfer Characteristics

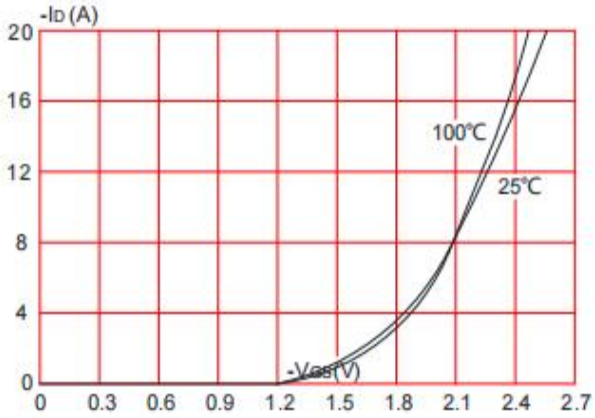


Figure 3: On-resistance vs. Drain Current

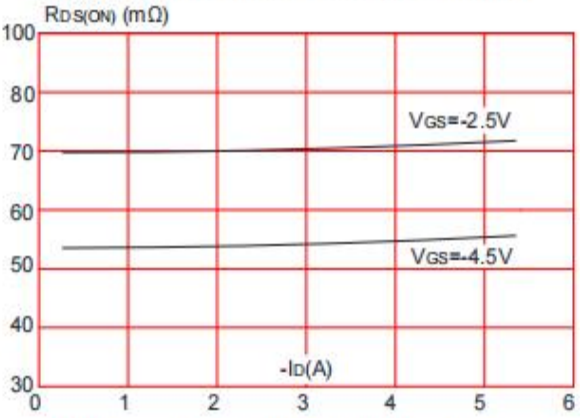


Figure 4: Body Diode Characteristics

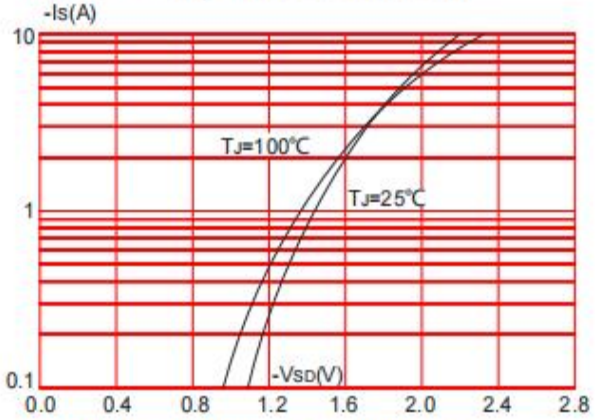


Figure 5: Gate Charge Characteristics

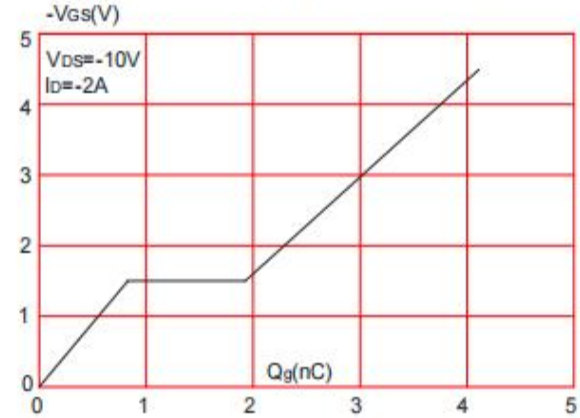


Figure 6: Capacitance Characteristics

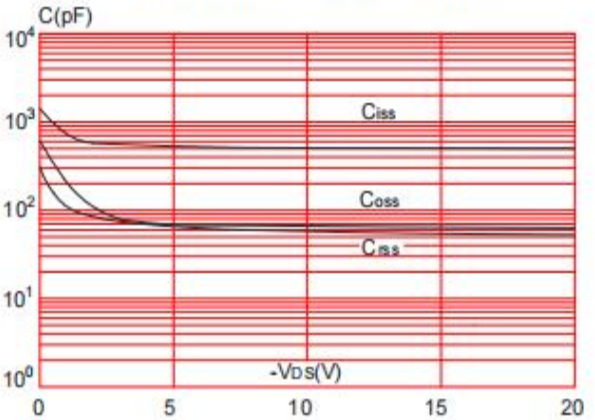


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

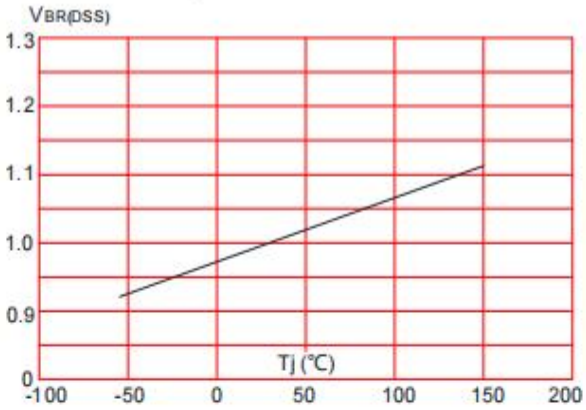


Figure 8: Normalized on Resistance vs. Junction Temperature

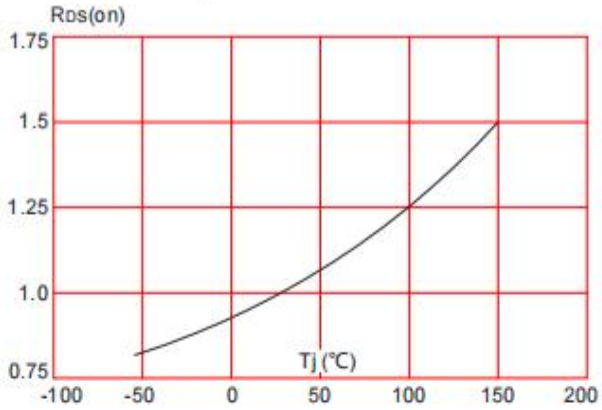


Figure 9: Maximum Safe Operating Area

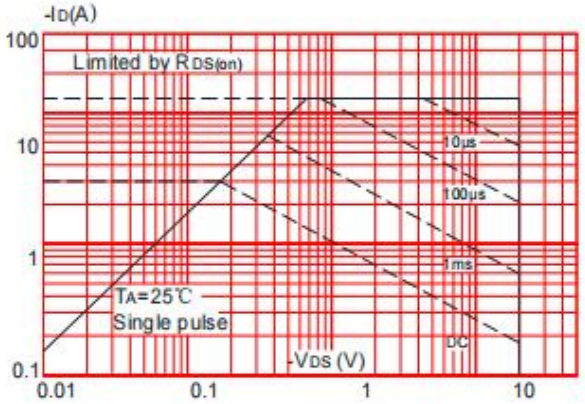


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

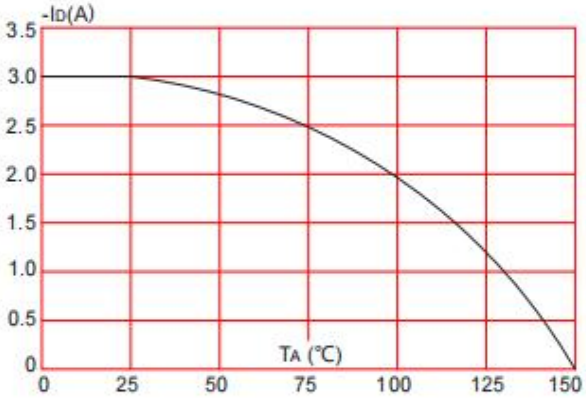
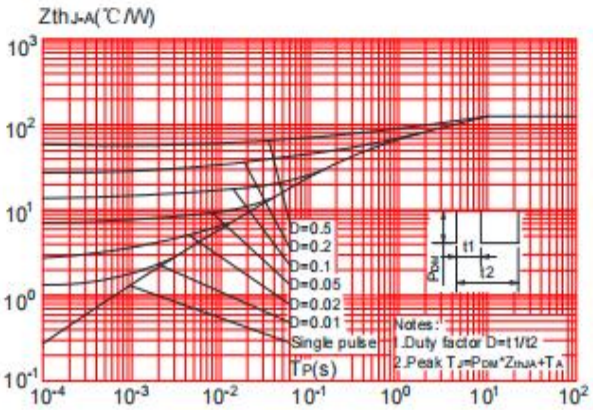
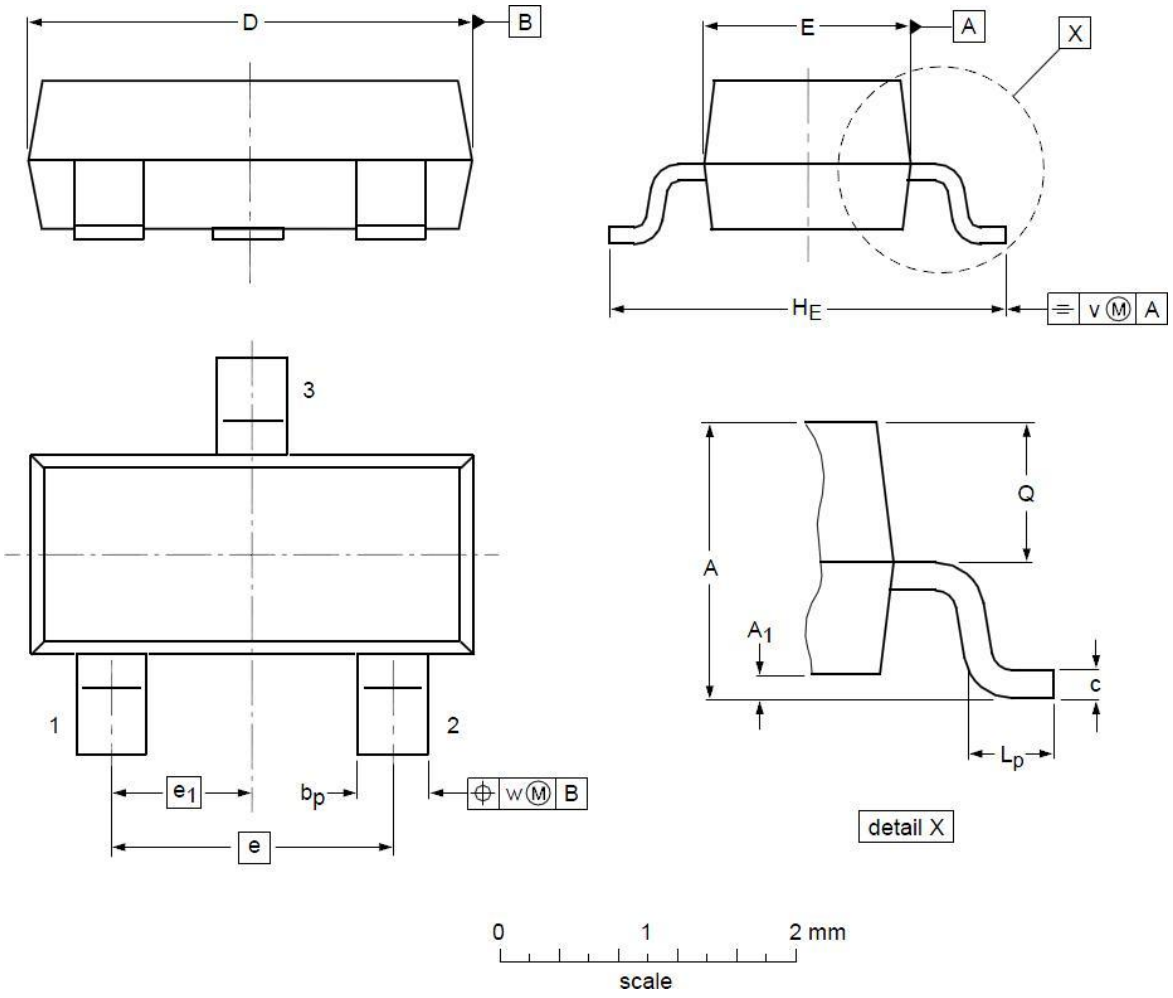


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Package Dimensions SOT23



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	A_1	0.01	0.05	0.10
b_p	0.30	0.42	0.50	c	0.08	0.13	0.15
D	2.80	2.92	3.00	E	1.20	1.33	1.40
e	--	1.90	--	e_1	--	0.95	--
H_E	2.25	2.40	2.55	L_p	0.30	0.42	0.50
Q	0.45	0.49	0.55	v	--	0.20	--
w	--	0.10	--				

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