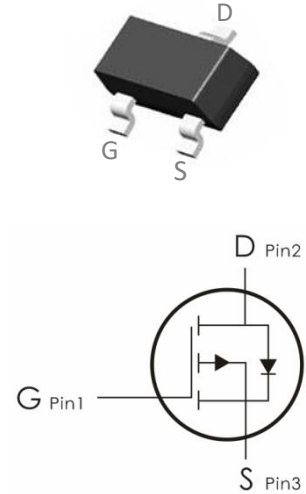


Description:

This P-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=-20V, I_D=-3A, R_{DS(ON)}<55m\ \Omega @V_{GS}=-4.5V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DO2301B	A1SHB	SOT-23	3000 pcs/Reel

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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current- $T_A=25^\circ\text{C}$	-3	A
	Continuous Drain Current- $T_A=100^\circ\text{C}$	-2	
I_{DM}	Pulsed Drain Current ¹	-12	
P_D	Power Dissipation	1	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	125	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-20	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-20V$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-0.5	-0.7	-1	V
$R_{DS(on)}$	Drain-Source On Resistance ²	$V_{GS}=-4.5V, I_D=-3A$	---	43	55	$\text{m}\Omega$
		$V_{GS}=-2.5V, I_D=-2A$	---	54	70	$\text{m}\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$	---	477	---	pF
C_{oss}	Output Capacitance		---	70	---	
C_{rss}	Reverse Transfer Capacitance		---	60	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=-10V, I_D=-3A,$ $R_{ENG}=1\ \Omega, V_{GS}=-4.5V,$ $R_L=1.2\ \Omega$	---	11.5	---	ns
t_r	Rise Time		---	54	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	16.8	---	ns
t_f	Fall Time		---	10.5	---	ns
Q_g	Total Gate Charge		---	4.3	---	nc
Q_{gs}	Gate-Source Charge	$V_{GS}=-4.5V, V_{DS}=-10V,$	---	0.84	---	nc
Q_{gd}	Gate-Drain "Miller" Charge	$I_D=-2A$	---	1.15	---	nc
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage ¹	$V_{GS}=0V, I_{SD}=-3A$	---	---	-1.2	V
I_S	Continuous Drain Current ³	$V_D=V_G=0V$	---	---	-3	A
I_{SM}	Pulsed Drain Current		---	---	-12	A

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

Typical Characteristics: ($T_A=25^\circ\text{C}$ unless otherwise noted)

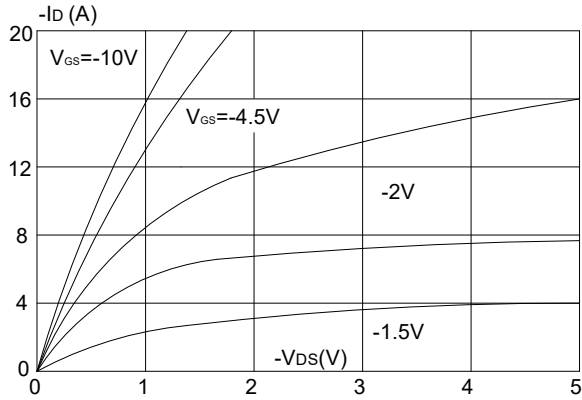


Figure 1: Output Characteristics

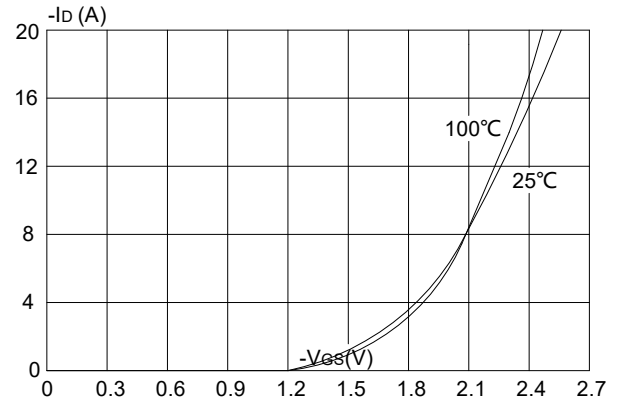


Figure 2: Typical Transfer Characteristics

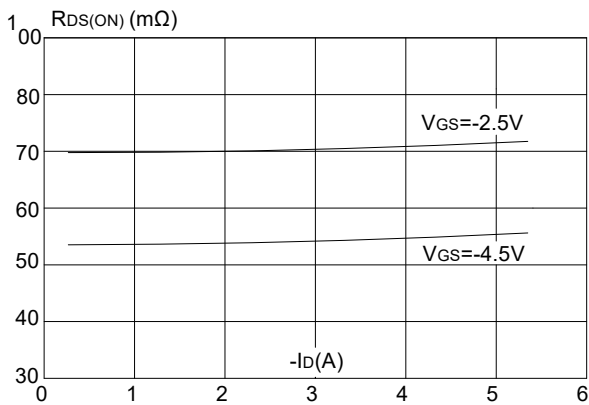


Figure 3: On-resistance vs. Drain Current

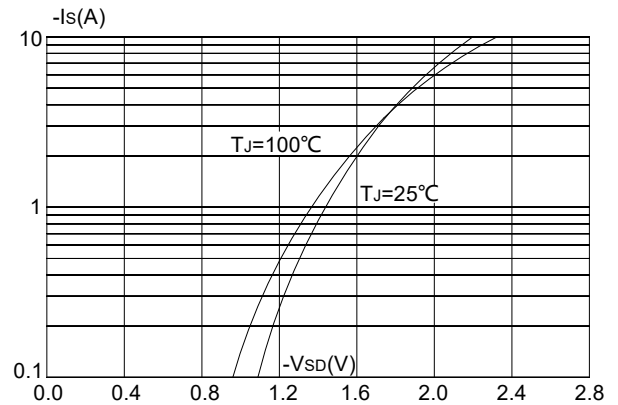


Figure 4: Body Diode Characteristics

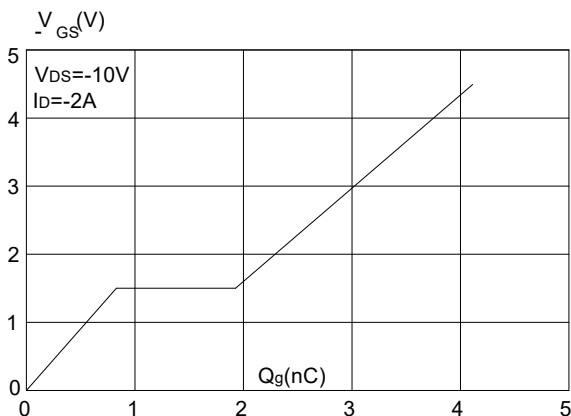


Figure 5: Gate Charge Characteristics

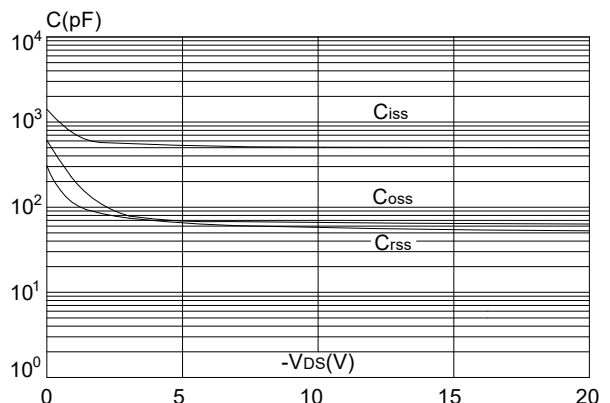


Figure 6: Capacitance Characteristics

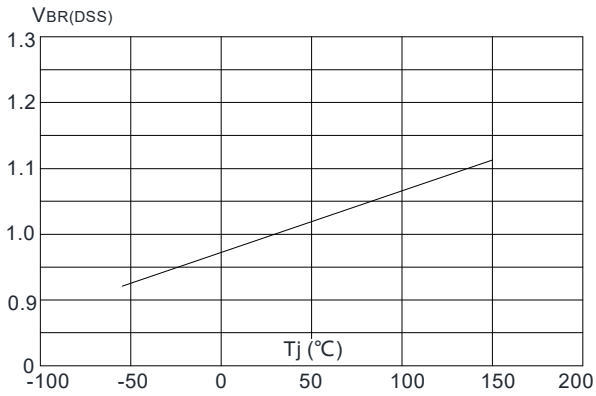


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

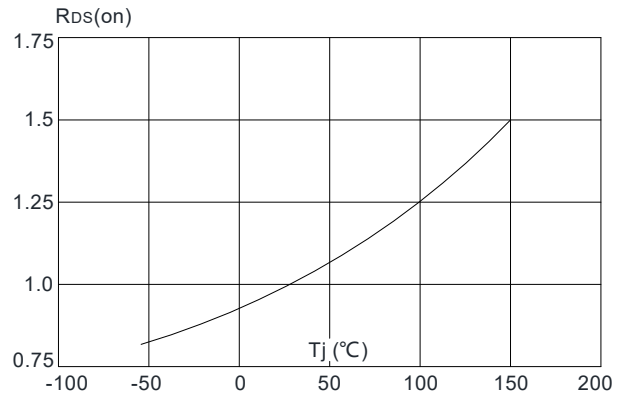


Figure 8: Normalized on Resistance vs. Junction Temperature

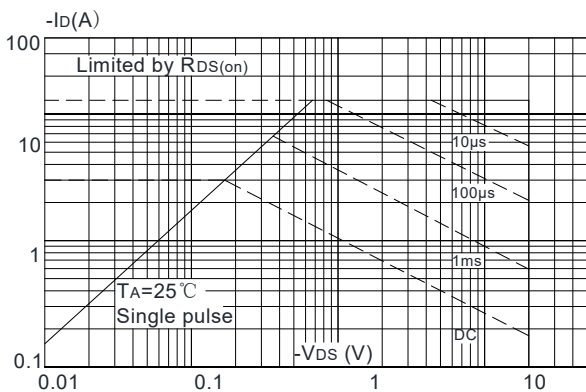


Figure 9: Maximum Safe Operating Area

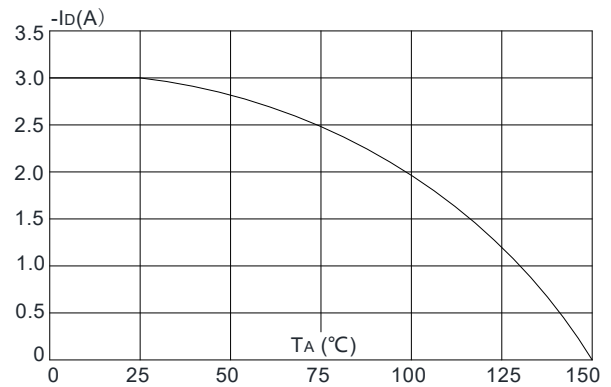


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

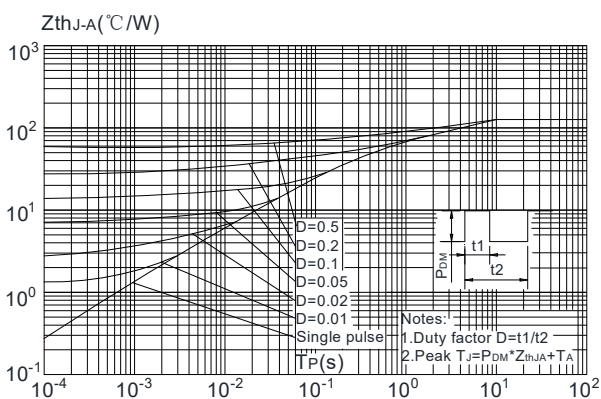
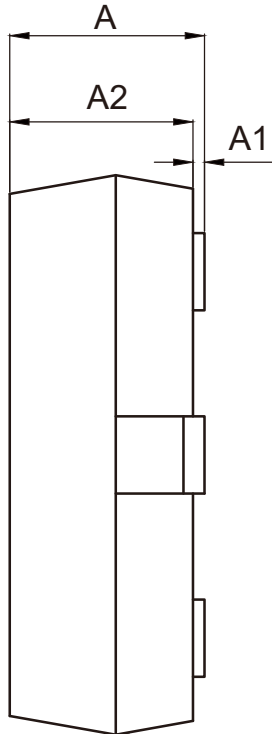
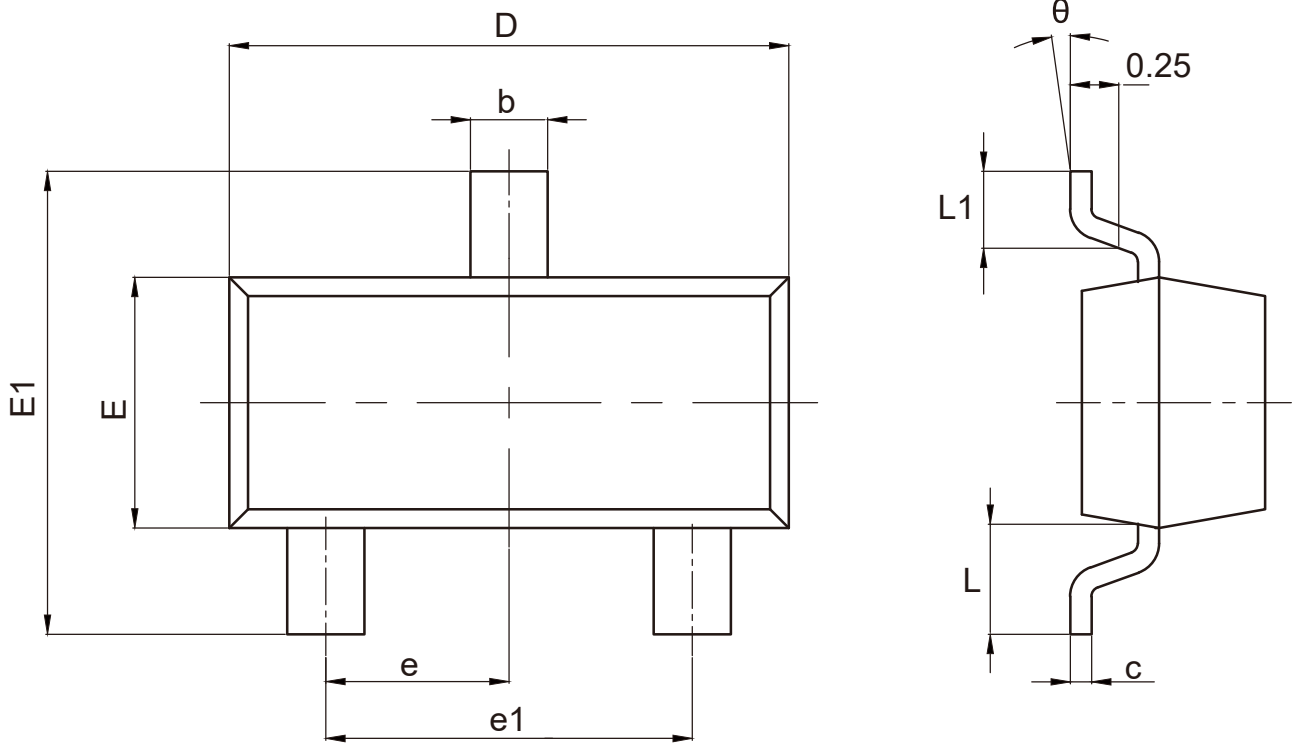


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

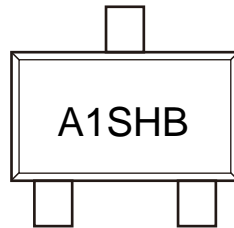
SOT-23 Package Outline Data



COMMON DIMENSIONS			
CUNITS MEASURE=MILLIMETER			
SYMBOL	MIN	NOM	MAX
A	0.900	--	1.150
A1	0.000	--	0.100
A2	0.900	--	1.050
c	0.100	--	0.200
b	0.300	0.400	0.500
D	2.800	2.900	3.000
E	1.200	--	1.400
E1	2.250	--	2.550
e	0.950TYP		
e1	1.800	1.900	2.000
L	0.550REF		
L1	0.300	0.400	0.500
θ	0°	--	8°

Unit:mm

Marking Information:



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2024-06-22	Release of final version

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