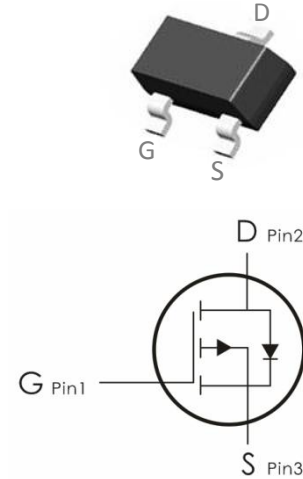


Description:

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) $V_{DS}=-20V, I_D=-2A, R_{DS(ON)}<125m\ \Omega @V_{GS}=-4.5V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



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- $T_A=25^\circ\text{C}$	-2	A
	Continuous Drain Current- $T_A=100^\circ\text{C}$	-1.3	A
I_{DM}	Pulse Drain Current Tested ¹	-8	A
P_D	Power Dissipation- $T_A=25^\circ\text{C}$	0.8	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	156	$^\circ\text{C}/\text{W}$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DO2301E-Q	A1SHB:	SOT-23

Electrical Characteristics: ($T_C=25^\circ\text{C}$ 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	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-0.4	-0.7	-1	V
$R_{DS(on)}$	Drain-Source On Resistance ²	$V_{GS}=-4.5V, I_D=-2A$	---	95	125	$\text{m}\Omega$
		$V_{GS}=-2.5V, I_D=-1A$	---	135	190	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$	---	150	---	pF
C_{oss}	Output Capacitance		---	34	---	
C_{rss}	Reverse Transfer Capacitance		---	24	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=-10V, R_{GEN}=3\ \Omega, V_{GS}=-4.5V$	---	9	---	ns
t_r	Rise Time		---	29	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	62	---	ns
t_f	Fall Time		---	49	---	ns
Q_g	Total Gate Charge		---	2.1	---	nC
Q_{gs}	Gate-Source Charge	$V_{GS}=-4.5V, V_{DS}=-10V,$	---	0.4	---	nC
Q_{gd}	Gate-Drain "Miller" Charge	$I_D=-2A$	---	0.4	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Forward Voltage ¹	$V_{GS}=0V, I_S=-2A$	---	---	-1.2	V
I_D	Continuous Drain Current	$V_G=V_D=0V$	---	---	-2	A
I_{DM}	Pulse Drain Current Tested	$V_G=V_D=0V$	---	---	-8	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:

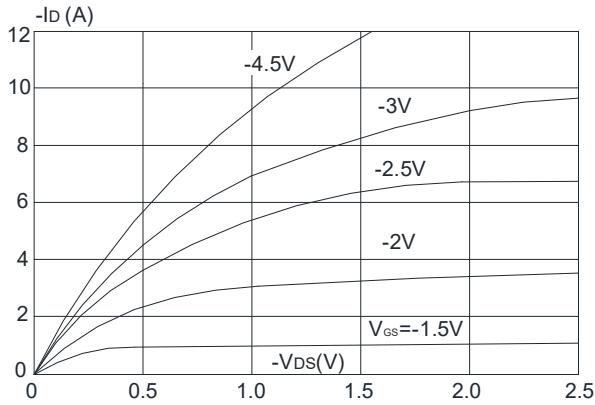


Figure 1: Output Characteristics

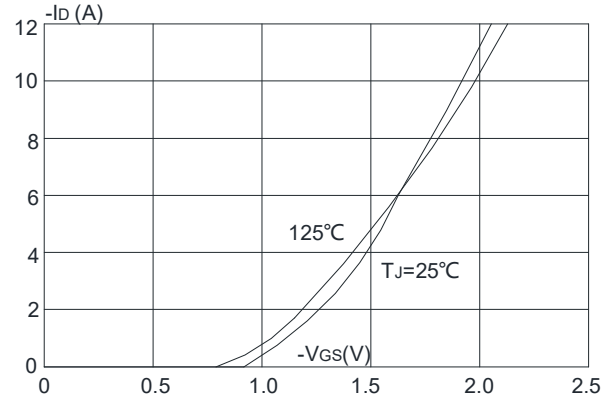


Figure 2: Typical Transfer Characteristics

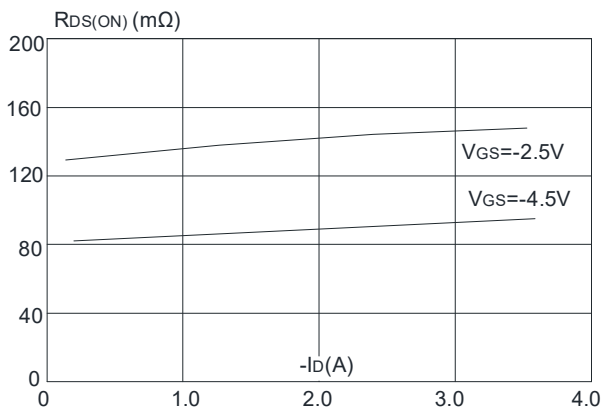


Figure 3: On-resistance vs. Drain Current

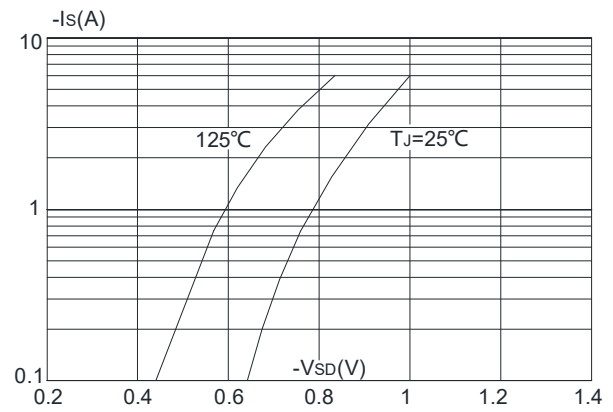


Figure 4: Body Diode Characteristics

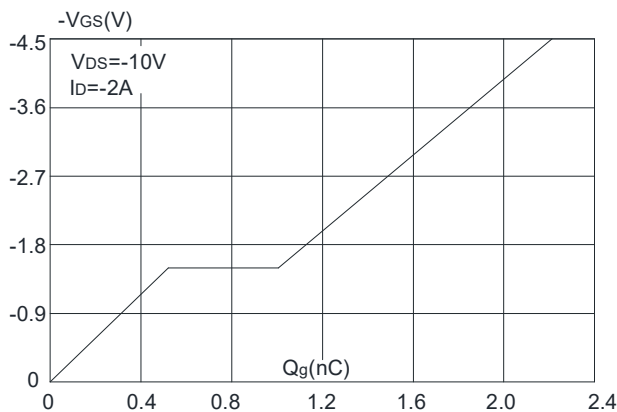


Figure 5: Gate Charge Characteristics

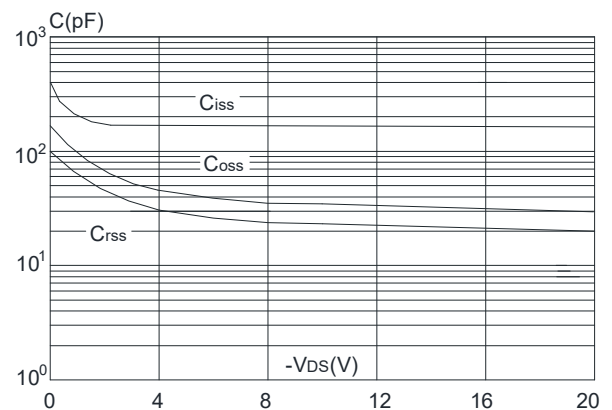


Figure 6: Capacitance Characteristics

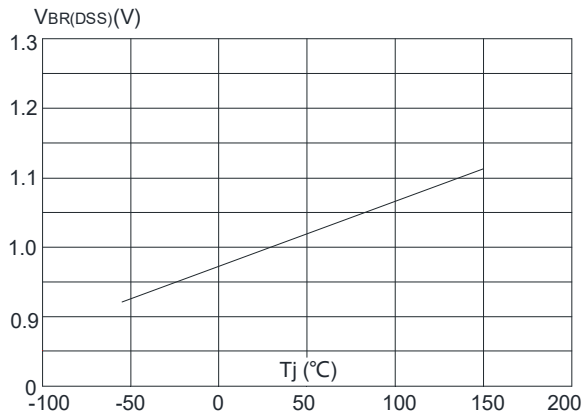


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

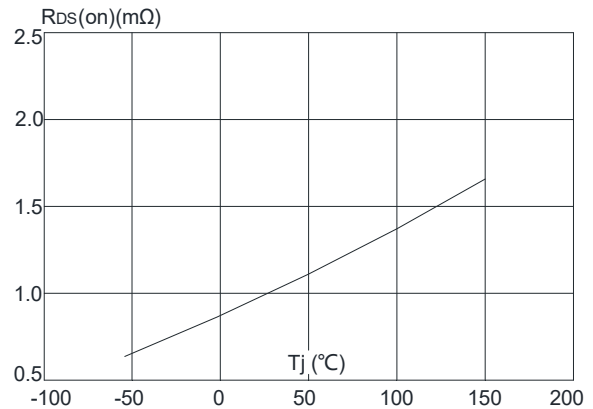


Figure 8: Normalized on Resistance vs. Junction Temperature

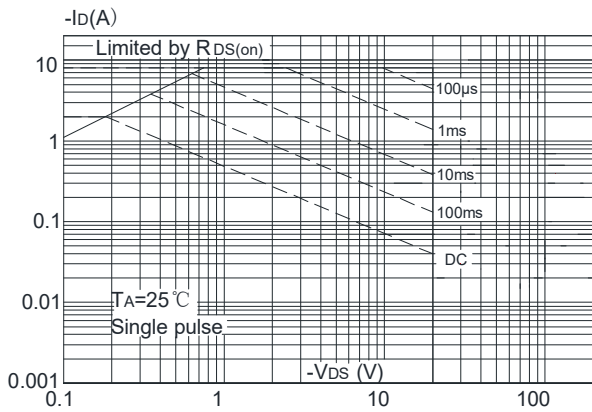


Figure 9: Maximum Safe Operating Area

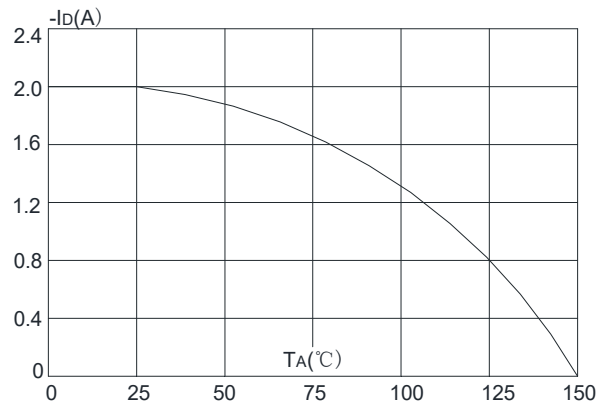


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

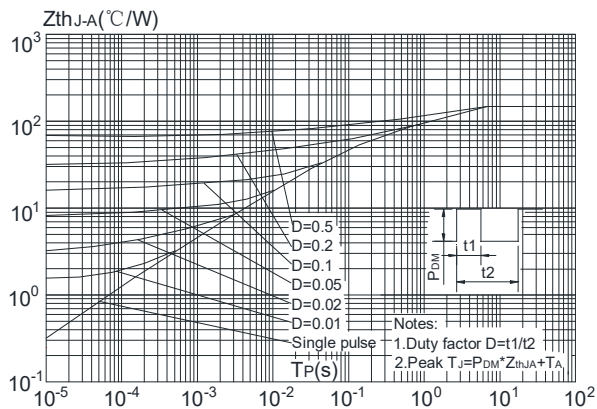


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient