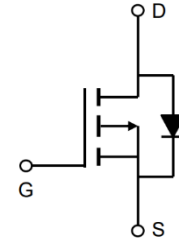


-20V P-Channel Enhancement Mode MOSFET

Description

The XB2301A uses advanced trench technology to provide excellent $R_{DS(ON)}$, 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

$V_{DS} = -20V$ $I_D = -2.3A$

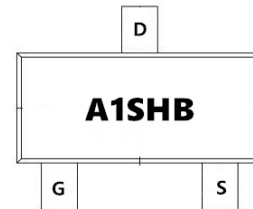
$R_{DS(ON)} < -165m\Omega$ @ $V_{GS} = -4.5V$

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
XB2301A	SOT23	A1SHB	3000

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous	I_D	-2.3	A
Drain Current -Pulsed (Note 1)	I_{DM}	-10	A
Maximum Power Dissipation	P_D	0.7	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	178	$^\circ C/W$



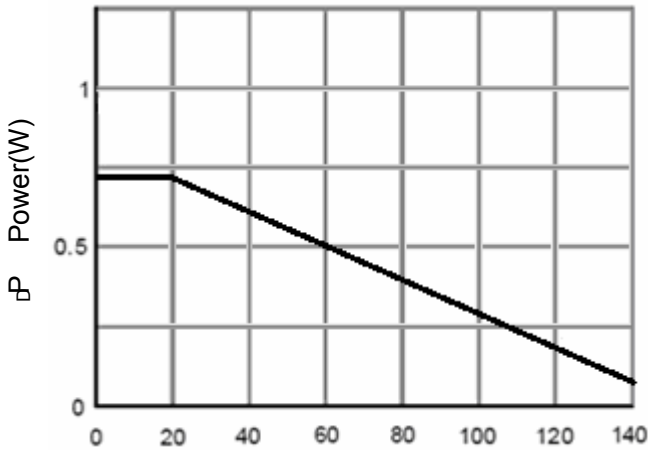
-20V P-Channel Enhancement Mode MOSFET
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-20		-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.7	-1	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-2A$	-	135	165	m Ω
		$V_{GS}=-2.5V, I_D=-1.8A$	-	150	185	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-2A$	4	-	-	S
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V,$ $F=1.0MHz$	-	290	-	PF
Output Capacitance	C_{oss}		-	60	-	PF
Reverse Transfer Capacitance	C_{rss}		-	34	-	PF
Turn-on Delay Time	$t_{d(on)}$		-	10	-	nS
Turn-on Rise Time	t_r	$V_{DD}=-10V, R_L=5\Omega, V_{GS}=-$ $4.5V, R_{GEN}=3\Omega$	-	5.0	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	21	-	nS
Turn-Off Fall Time	t_f		-	7	-	nS
Total Gate Charge	Q_g		-	3.0	-	nC
Gate-Source Charge	Q_{gs}	$V_{DS}=-10V, I_D=-2A,$ $V_{GS}=-4.5V$	-	0.5	-	nC
Gate-Drain Charge	Q_{gd}		-	0.8	-	nC
Diode Forward Voltage ^(Note 3)	V_{SD}	$V_{GS}=0V, I_S=-2A$	-	-	-1.2	V

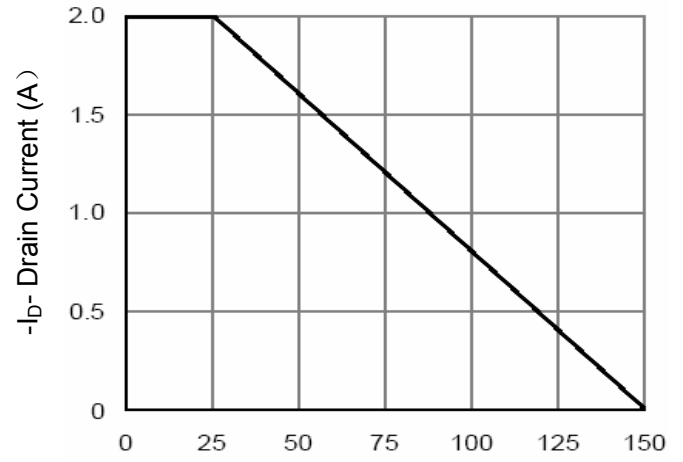
Notes:

- 1、Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2、Surface Mounted on FR4 Board, $t \leq 10$ sec.
- 3、Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 4、Guaranteed by design, not subject to production

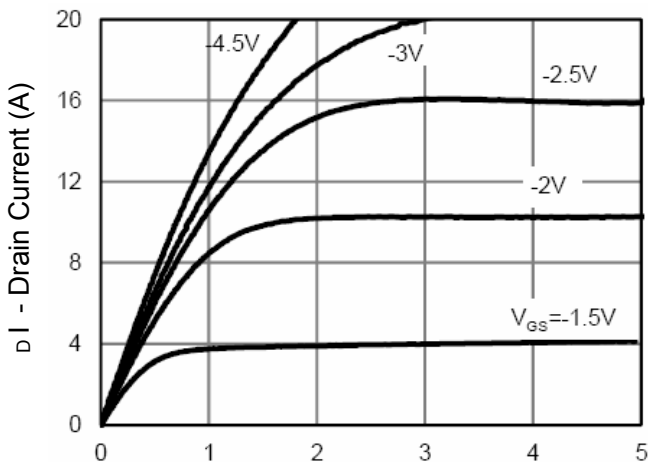
-20V P-Channel Enhancement Mode MOSFET



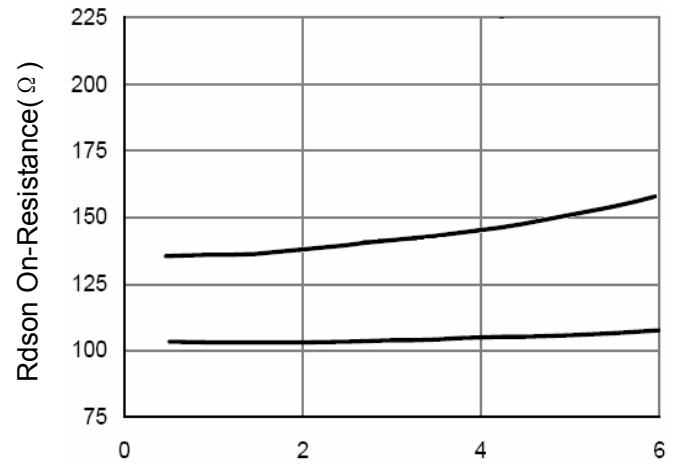
T_J -Junction Temperature ($^{\circ}\text{C}$)
Figure 1 Power Dissipation



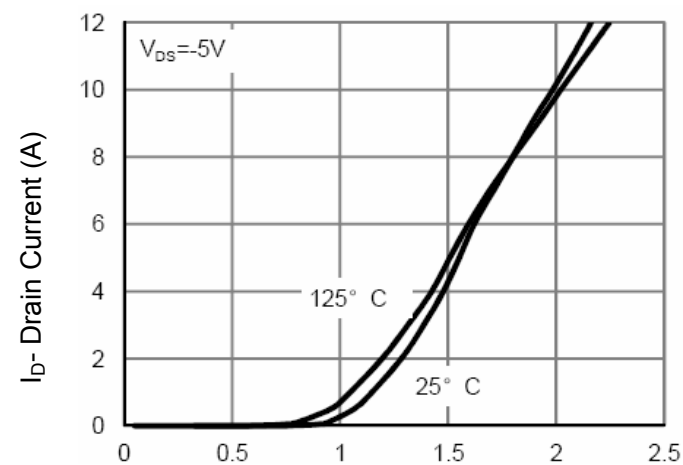
T_J -Junction Temperature ($^{\circ}\text{C}$)
Figure 2 Drain Current



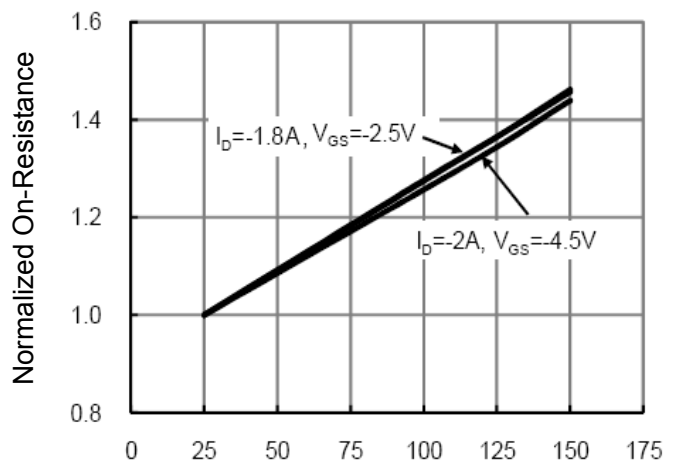
$-V_{DS}$ Drain-Source Voltage (V)
Figure 3 Output Characteristics



$-I_D$ - Drain Current (A)
Figure 4 Drain-Source On-Resistance



$-V_{GS}$ Gate-Source Voltage (V)
Figure 5 Transfer Characteristics



T_J -Junction Temperature ($^{\circ}\text{C}$)
Figure 6 Drain-Source On-Resistance

-20V P-Channel Enhancement Mode MOSFET

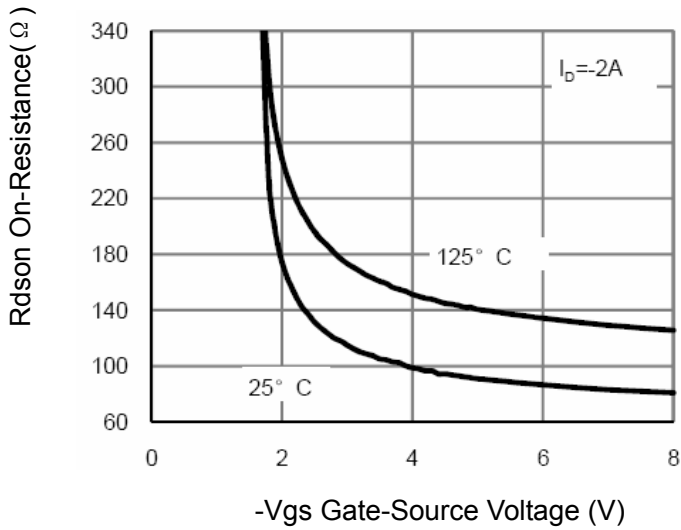


Figure 7 Rdson vs Vgs

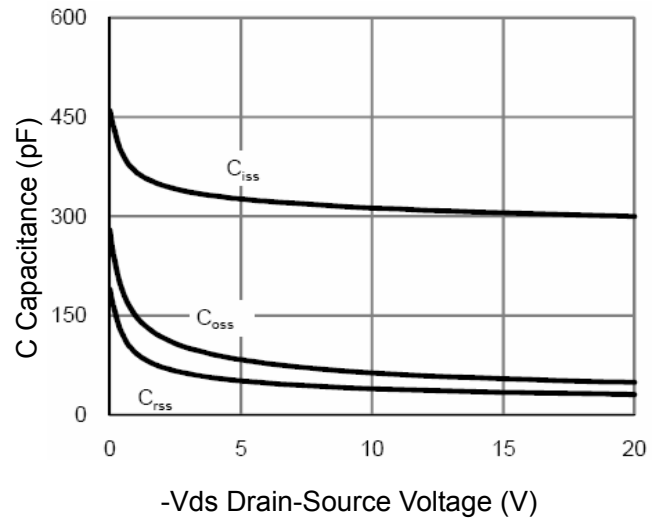


Figure 8 Capacitance vs Vds

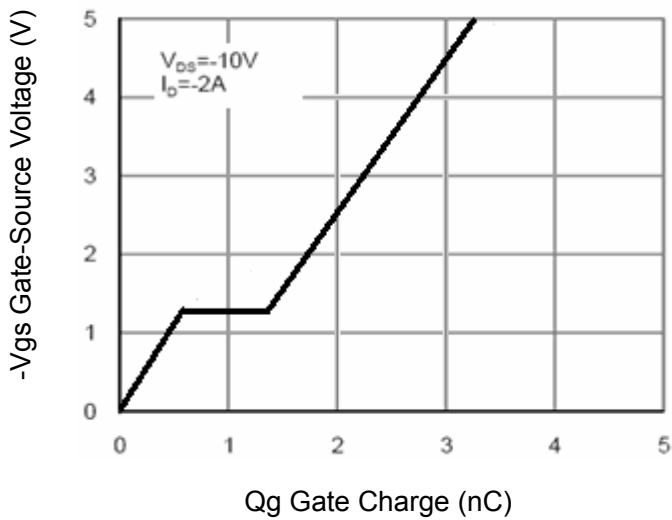


Figure 9 Gate Charge

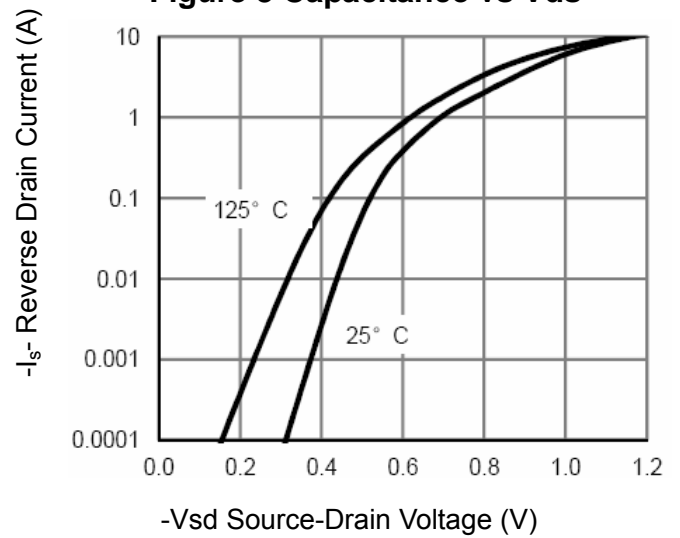


Figure 10 Source- Drain Diode Forward

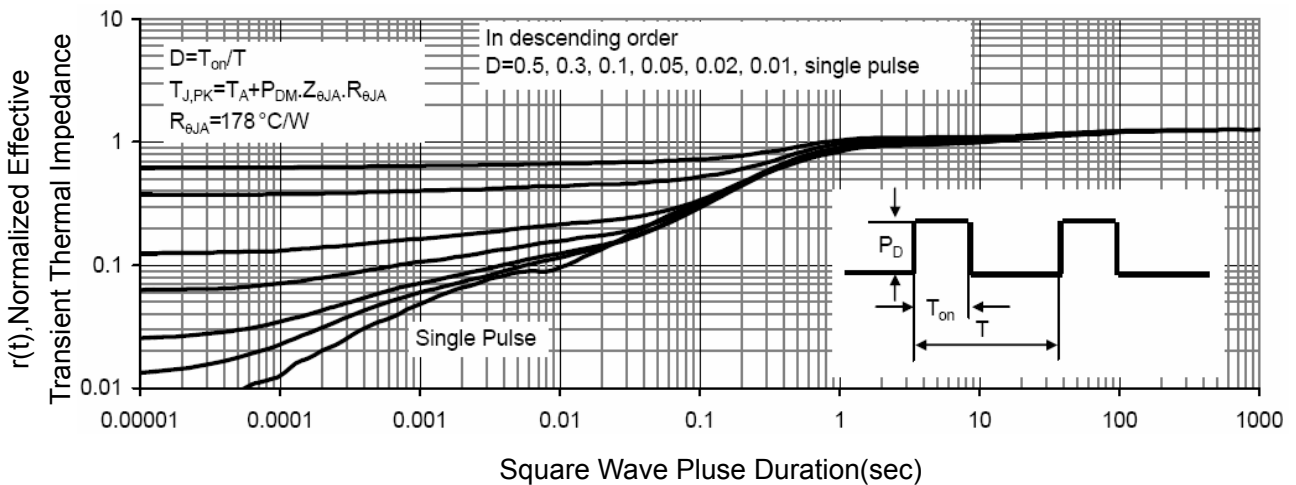
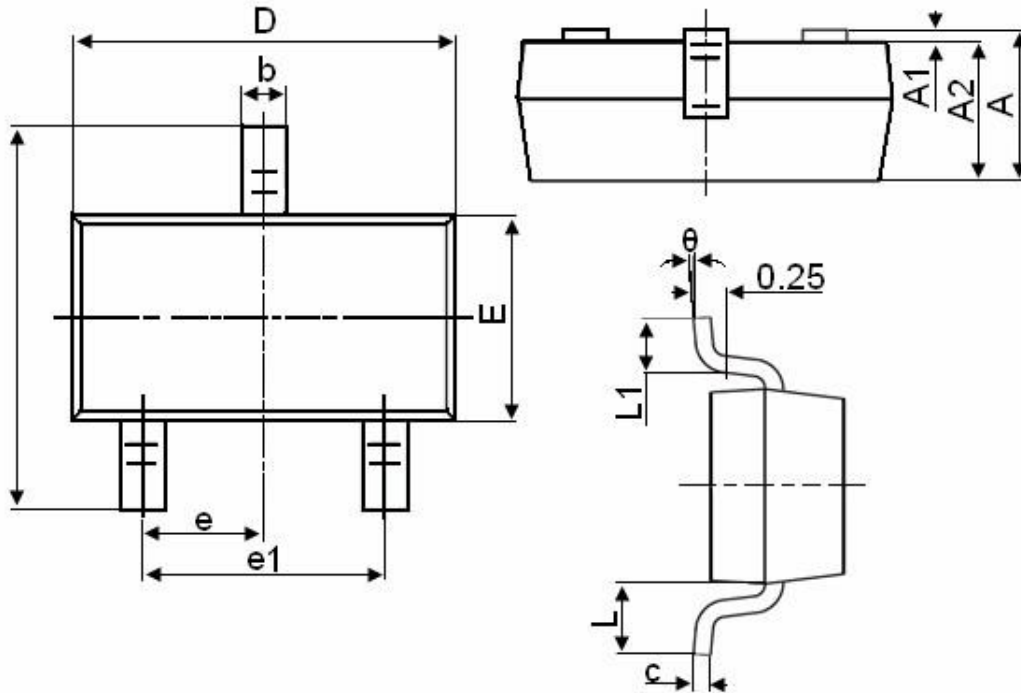


Figure 11 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-SOT-23



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°