



20V P-Channel Trench Power MOSFET

General Description

The SJS2301B 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 wide variety of applications.

Features

- Low Gate Charge
- High Power and current handing capability
- Lead free product is acquired

Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Key Performance Parametes

Parameter	Value	Unit
V_{DS}	-20	V
$R_{DS(ON_TYP)}$	98	m Ω
I_D	-2.2	A
Q_G	2.2	nC



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJS2301B	2301	SOT-23	Tape	\	\	3000 Pcs

Table 1. Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	-20	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 12	V
I_D	Drain Current-Continuous($T_A=25^\circ\text{C}$)	-2.2	A
	Drain Current-Continuous($T_A=100^\circ\text{C}$)	-1.4	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	-8.8	A
P_D	Maximum Power Dissipation($T_A=25^\circ\text{C}$)	0.86	W
	Maximum Power Dissipation($T_A=100^\circ\text{C}$)	0.3	W
E_{AS}	Avalanche energy (Note 2)	4	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ\text{C}$

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		145	$^\circ\text{C}/\text{W}$



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Table 3. Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-20V, V_{GS}=0V, T_J=25^\circ\text{C}$			-1	μA
		$V_{DS}=-20V, V_{GS}=0V, T_J=125^\circ\text{C}$			-100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	-0.5		-1	V
g_{FS}	Forward Transconductance	$V_{DS}=-5V, I_D=-1A$		3.4		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=-4.5V, I_D=-1A, T_J=25^\circ\text{C}$		98	123	m Ω
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=-2.5V, I_D=-1A, T_J=25^\circ\text{C}$		129	172	m Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1.0\text{MHz}$		197		pF
C_{oss}	Output Capacitance			29		pF
C_{rss}	Reverse Transfer Capacitance			21		pF
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$		62		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=-4.5V, V_{DS}=-10V, R_L=10\Omega, R_{GEN}=3\Omega$		5		nS
t_r	Turn-on Rise Time			10		nS
$t_{d(off)}$	Turn-Off Delay Time			48		nS
t_f	Turn-Off Fall Time			24		nS
Q_g	Total Gate Charge	$V_{GS}=-4.5V, V_{DS}=-10V, I_D=-1A$		2.2		nC
Q_{gs}	Gate-Source Charge			0.5		nC
Q_{gd}	Gate-Drain Charge			0.4		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				-2.2	A
V_{SD}	Forward on Voltage (Note 3)	$V_{GS}=0V, I_S=-1A$			-1.2	V
t_{rr}	Reverse Recovery Time	$I_F=-1A, dI/dt=100A/\mu s$		4.5		ns
Q_{rr}	Reverse Recovery Charge	$I_F=-1A, dI/dt=100A/\mu s$		0.8		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

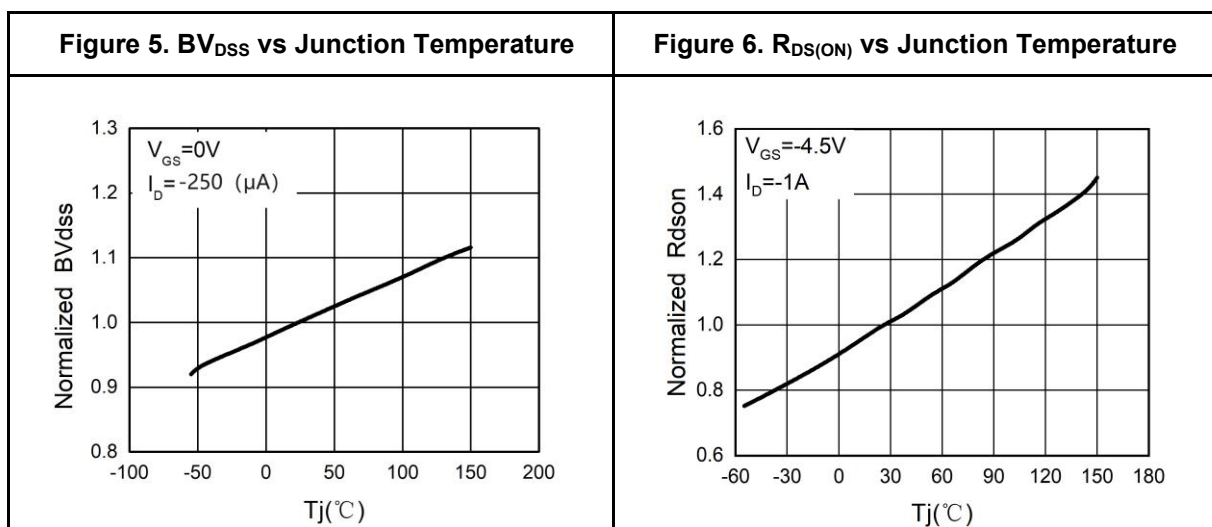
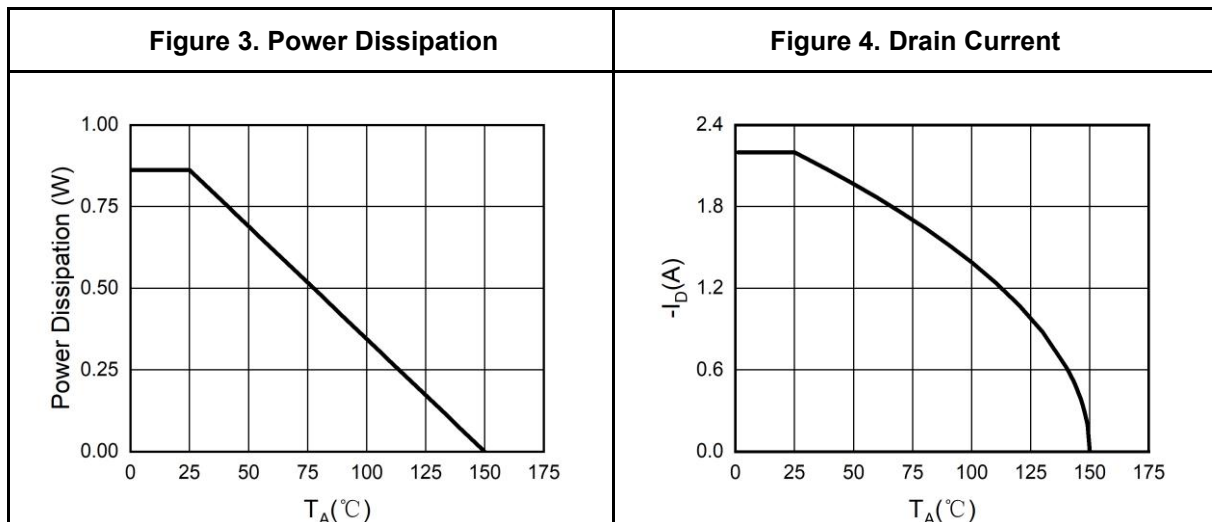
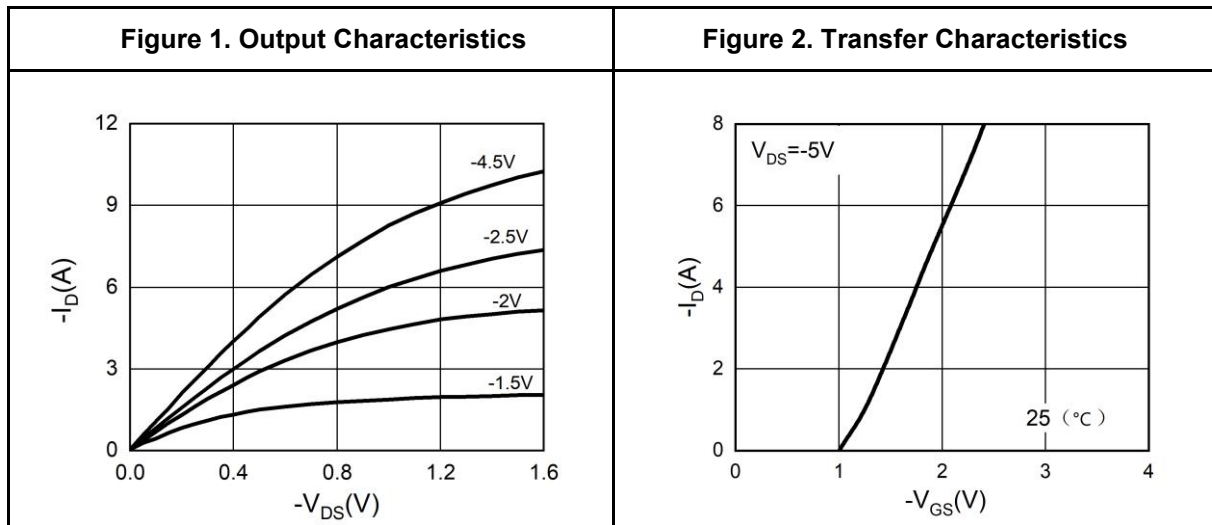
Notes 2.EAS condition: $T_J=25^\circ\text{C}, V_{DD}=-20V, V_G=-10V, R_g=25\Omega, L=0.5\text{mH}$.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.



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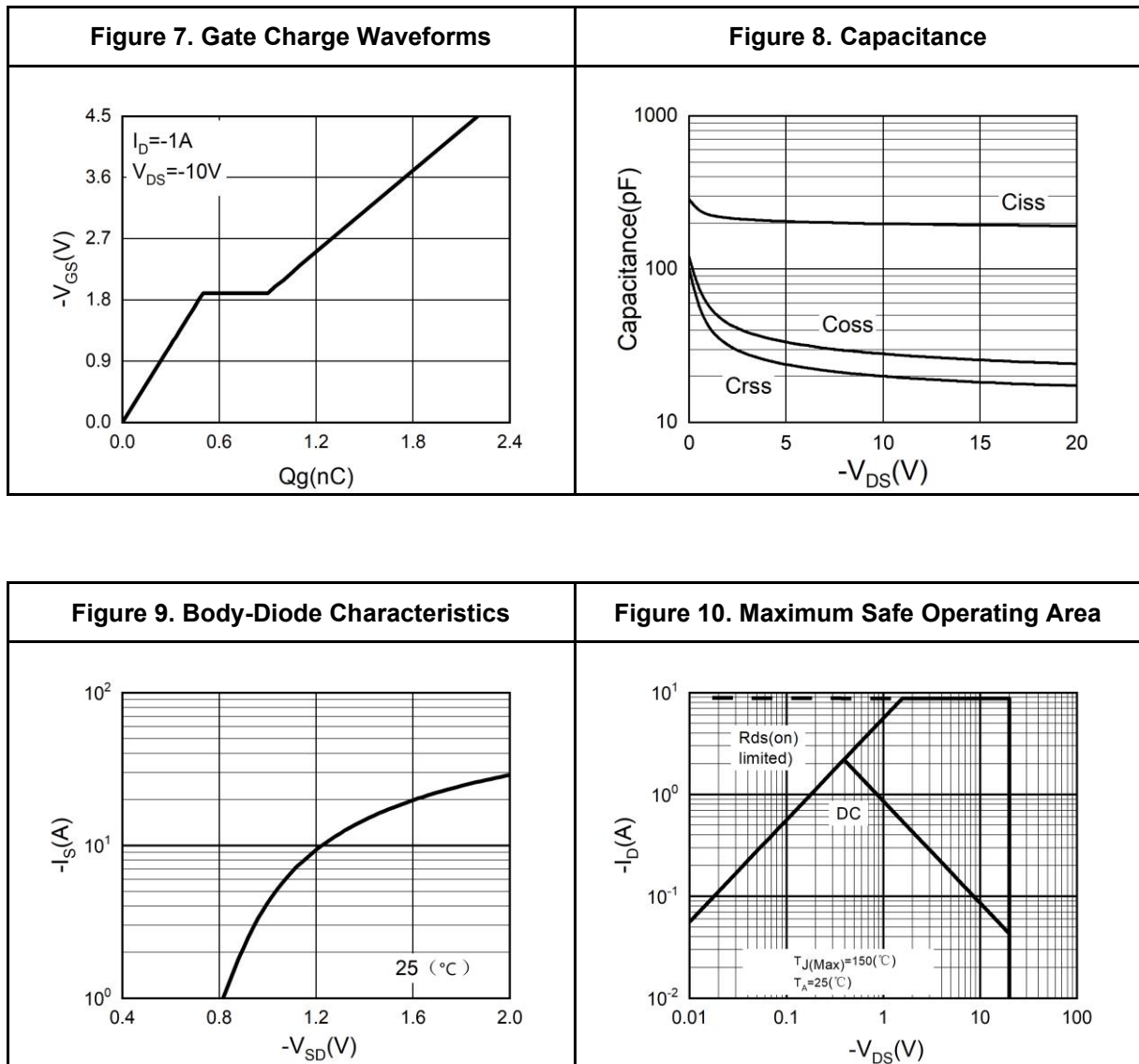
Typical Electrical And Thermal Characteristics (Curves)





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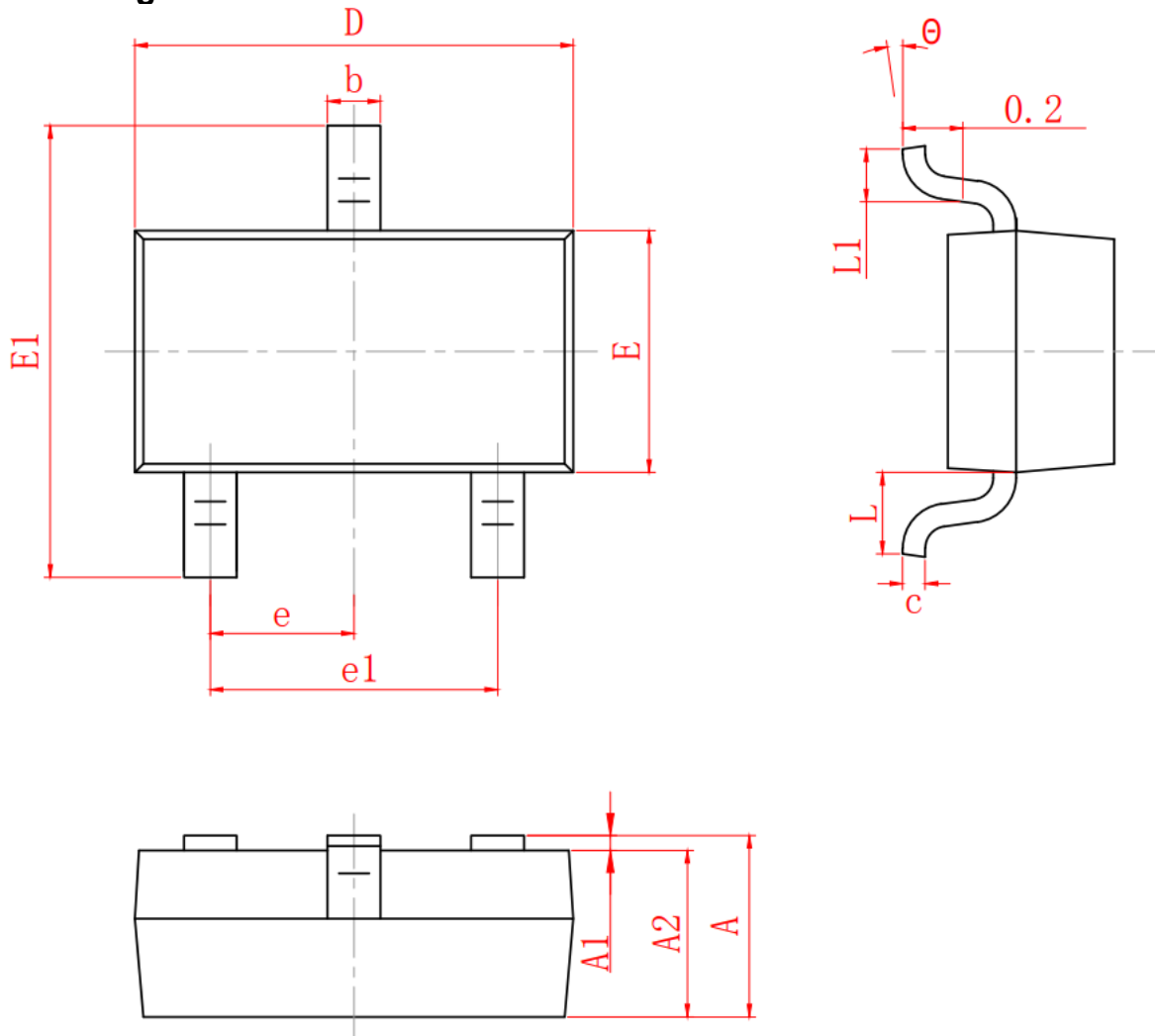
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SOT-23 Package Information



SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		



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