



## 20V P-Channel Trench Power MOSFET

### General Description

The SJS2305A 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

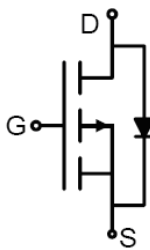
- Low Gate Charge
- High Power and current handling capability
- Lead free product is acquired

### Application

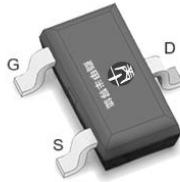
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

### Key Performance Parametes

Parameter	Value	Unit
$V_{DS}$	-20	V
$R_{DS(ON\_TYP)}$	18.8	mΩ
$I_D$	-6.7	A
$Q_G$	8	nC



Schematic Diagram



SOT-23 top view



### Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJS2305A	2305A	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 ( $V_{GS}=0\text{V}$ )	-20	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0\text{V}$ )	$\pm 12$	V
$I_D$	Drain Current-Continuous( $T_A=25^{\circ}\text{C}$ )	-6.7	A
	Drain Current-Continuous( $T_A=100^{\circ}\text{C}$ )	-4.2	A
$I_{DM}(\text{pluse})$	Drain Current-Continuous@ Current-Pulsed (Note 1)	26.8	A
$P_D$	Maximum Power Dissipation( $T_A=25^{\circ}\text{C}$ )	1.6	W
	Maximum Power Dissipation( $T_A=100^{\circ}\text{C}$ )	0.6	W
$E_{AS}$	Avalanche energy (Note 2)	36	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		79	$^{\circ}\text{C/W}$



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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 <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V I <sub>D</sub> =-250μA	-20			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V T <sub>J</sub> =25℃			-1	μA
		V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V T <sub>J</sub> =125℃			-100	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	-0.5		-1	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-3A		11.7		S
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3A T <sub>J</sub> =25℃		18.8	24.4	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2A T <sub>J</sub> =25℃		24.8	30	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-10V,V <sub>GS</sub> =0V, f=1.0MHz		1230		pF
C <sub>oss</sub>	Output Capacitance			133		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			116		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1.0MHz		5.8		Ω
Switching Parameters						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, R <sub>L</sub> =3.3Ω, R <sub>GEN</sub> =3Ω		26		nS
t <sub>r</sub>	Turn-on Rise Time			45		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			70		nS
t <sub>f</sub>	Turn-Off Fall Time			58		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-3A		8		nC
Q <sub>gs</sub>	Gate-Source Charge			1.4		nC
Q <sub>gd</sub>	Gate-Drain Charge			1.6		nC
Source-Drain Diode Characteristics						
I <sub>SD</sub>	Source-Drain Current (Body Diode)				-6.7	A
V <sub>SD</sub>	Forward on Voltage (Note 3)	V <sub>GS</sub> =0V, I <sub>S</sub> =-3A			-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =-3A, dI/dt=100A/μs		17		ns
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>F</sub> =-3A, dI/dt=100A/μs		7		nC

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

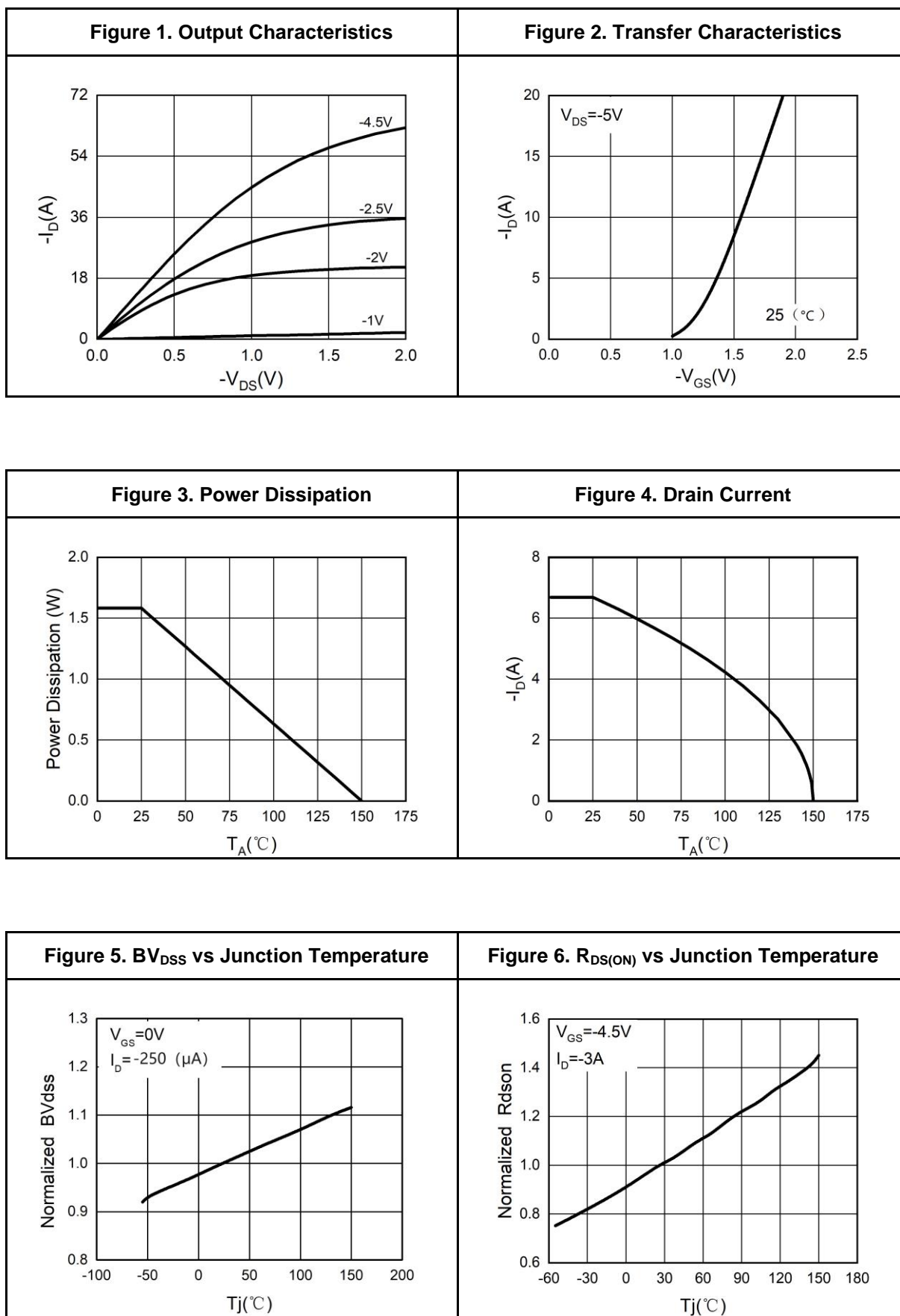
Notes 2.EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=-20V, V_G=-10V, R_g=25\Omega, L=0.5\text{mH}$ .

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



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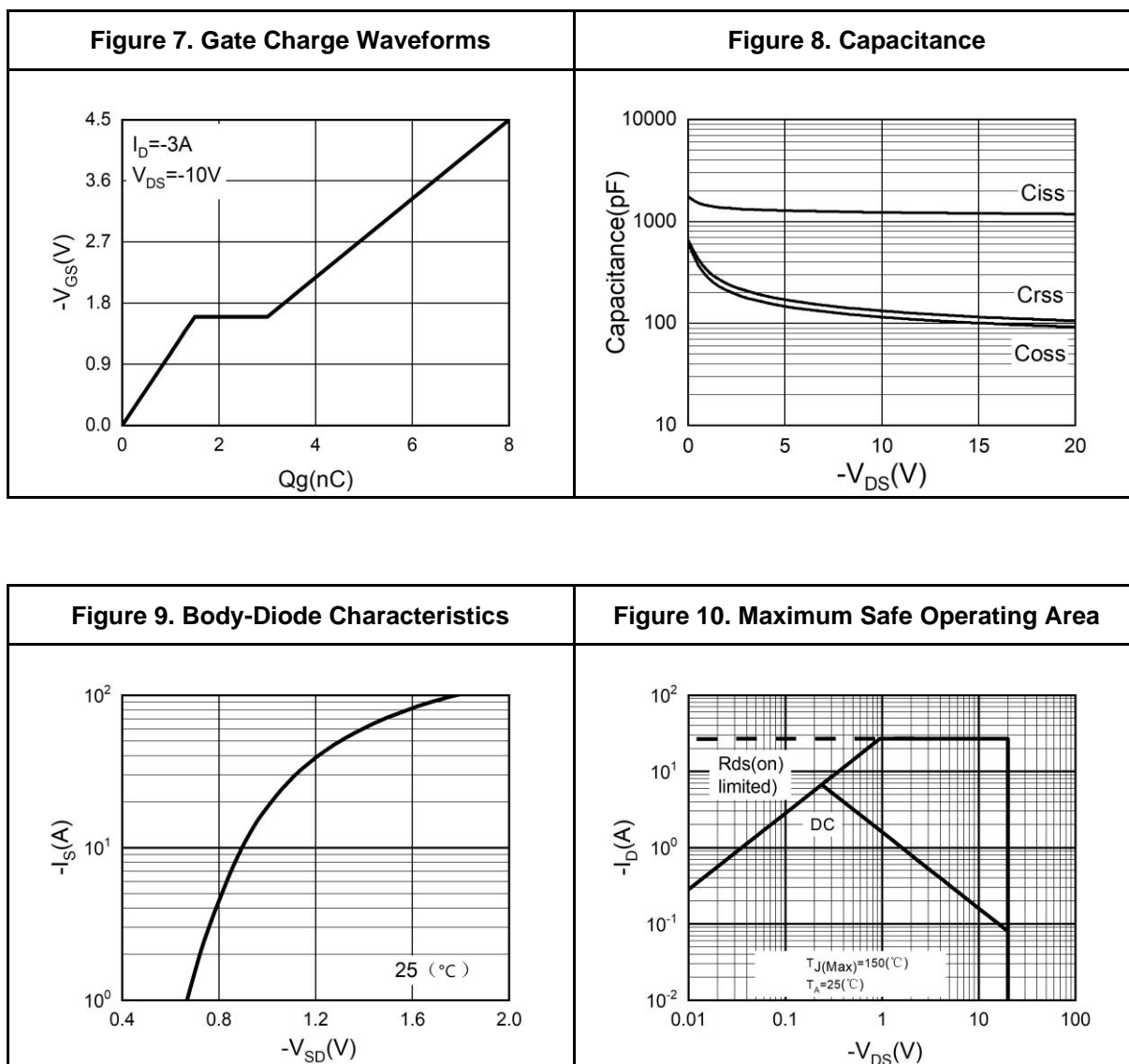
### Typical Electrical And Thermal Characteristics (Curves)





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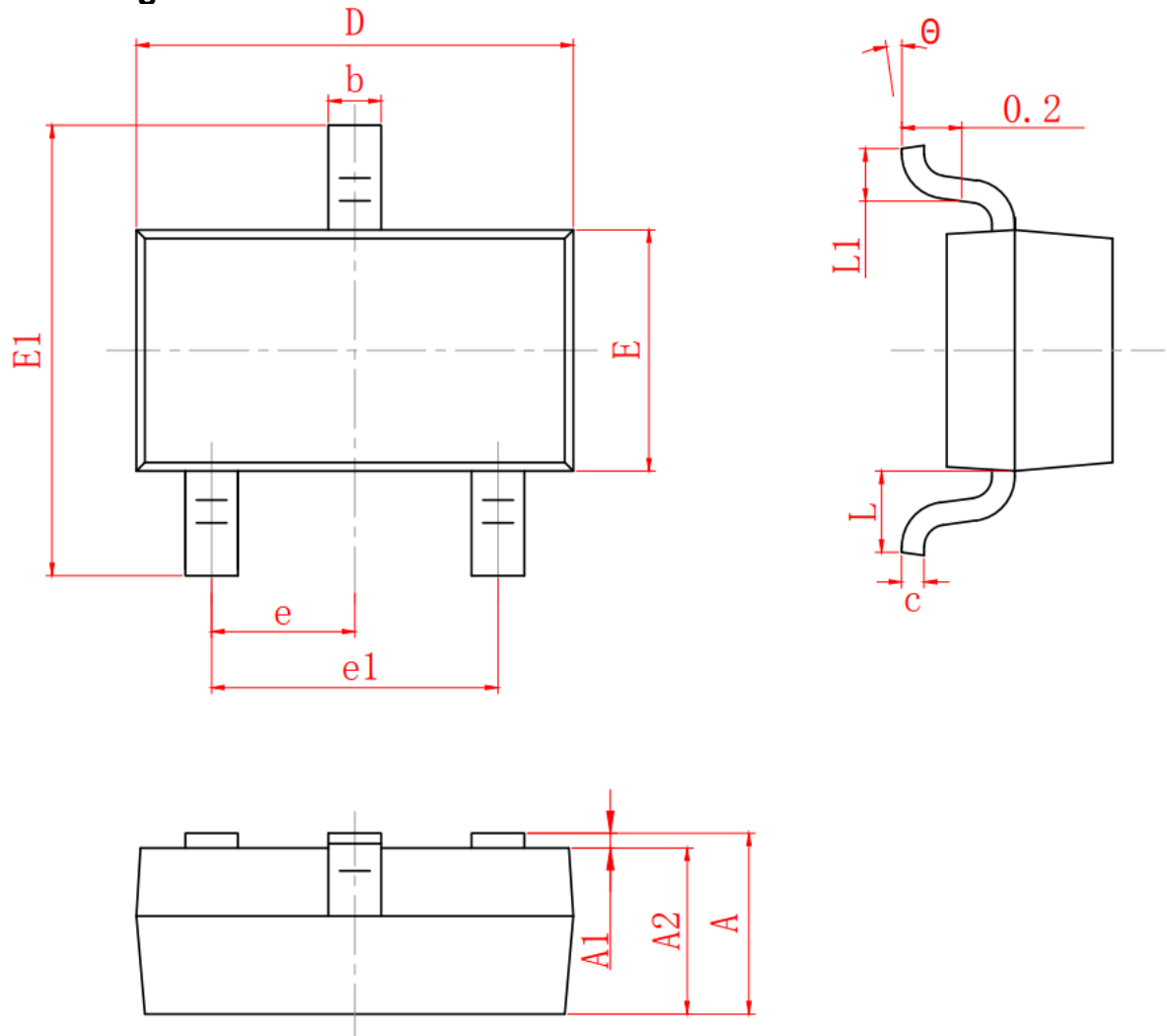
### Typical Electrical And Thermal Characteristics (Curves)





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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
$\theta$	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		



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### Attention

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