



# 100V N&P-Channel Trench Power MOSFET

## General Description

The SJP01NP235 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a wide variety of applications.

## Features

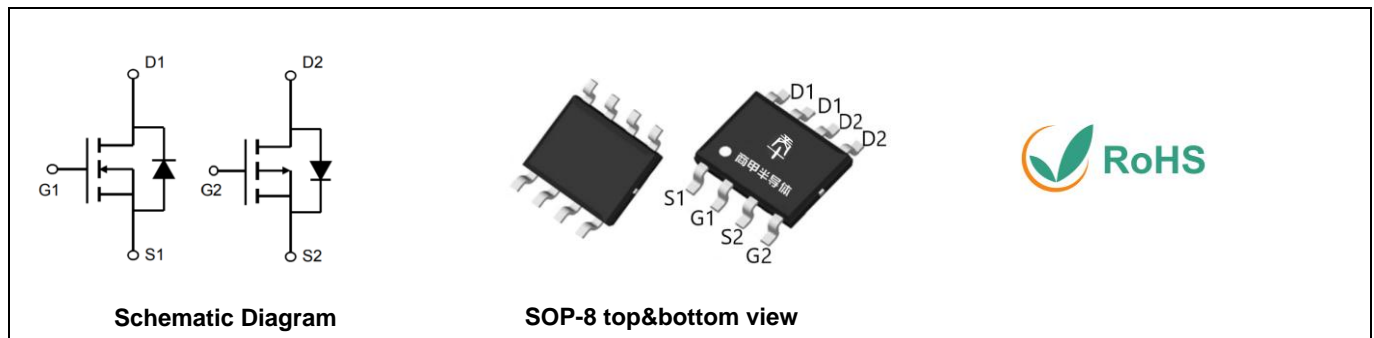
- Low Gate Charge
- High Power and current handling capability
- Lead free product is acquired

## Application

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

## Key Performance Parametes

Parameter	Value	Value	Unit
$V_{DS}$	100	-100	V
$R_{DS(ON\_TYP)}$	83	146	mΩ
$I_D$	3.2	-2.6	A
$Q_G$	21	25	nC



## Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJP01NP235	SJP01NP235	SOP-8	Tape	\	\	4000 Pcs

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

Symbol	Parameter	N Limit	P Limit	Unit
$V_{DS}$	Drain-Source Voltage ( $V_{GS}=0V$ )	100	-100	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0V$ )	$\pm 20$	$\pm 20$	V
$I_D$	Drain Current-Continuous( $T_A=25^{\circ}\text{C}$ )	3.2	-2.6	A
	Drain Current-Continuous( $T_A=100^{\circ}\text{C}$ )	2	-1.6	A
$I_{DM}$ (pulse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	12.8	-10.4	A
$P_D$	Maximum Power Dissipation( $T_A=25^{\circ}\text{C}$ )	2	2.6	W
	Maximum Power Dissipation( $T_A=100^{\circ}\text{C}$ )	0.8	1	W
$E_{AS}$	Avalanche energy (Note 2)	25	64	mJ
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150		$^{\circ}\text{C}$

**Table 2. Thermal Characteristic**

Symbol	Parameter	N Limit	P Limit	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to- Ambient	62	48	$^{\circ}\text{C/W}$



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**Table 3. N-Channel 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	100			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V T <sub>J</sub> =25℃			1	μA
		V <sub>DS</sub> =100V, V <sub>GS</sub> =0V T <sub>J</sub> =125℃			100	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, 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	1		2.5	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =6A		14		S
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =6A T <sub>J</sub> =25℃		83	108	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A T <sub>J</sub> =25℃		85	113	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1.0MHz		996		pF
C <sub>oss</sub>	Output Capacitance			31		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			28		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1.0MHz		1.1		Ω
Switching Parameters						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, R <sub>L</sub> =8.3Ω, R <sub>GEN</sub> =3Ω		11		nS
t <sub>r</sub>	Turn-on Rise Time			7.4		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			35		nS
t <sub>f</sub>	Turn-Off Fall Time			9		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =6A		21		nC
Q <sub>gs</sub>	Gate-Source Charge			3		nC
Q <sub>gd</sub>	Gate-Drain Charge			6		nC
Source-Drain Diode Characteristics						
I <sub>SD</sub>	Source-Drain Current (Body Diode)				3.2	A
V <sub>SD</sub>	Forward on Voltage (Note 3)	V <sub>GS</sub> =0V, I <sub>S</sub> =6A			1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =6A, dI/dt=100A/μs		26		ns
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>F</sub> =6A, dI/dt=100A/μs		27		nC

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

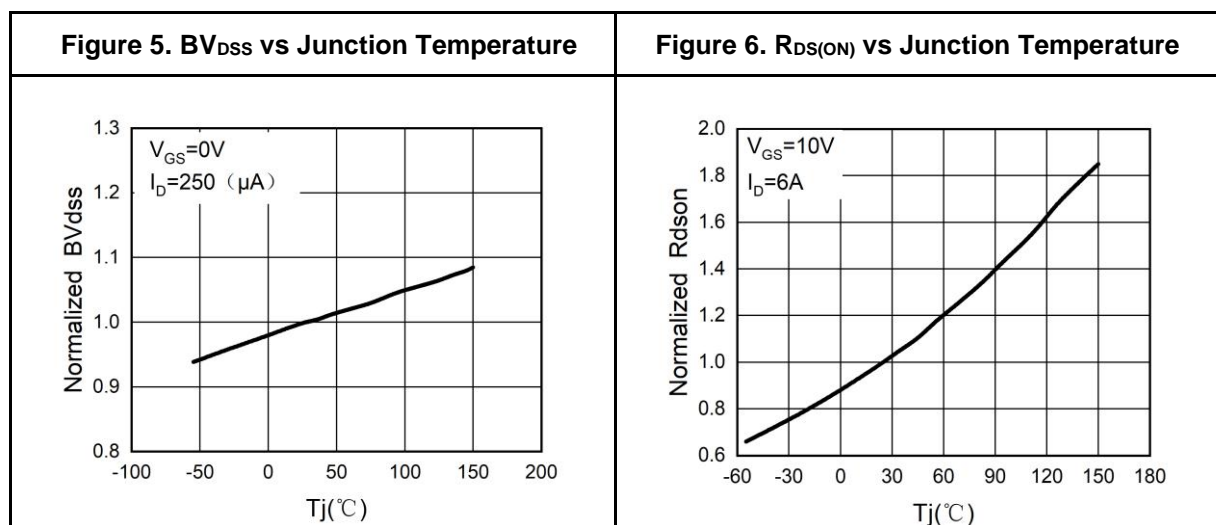
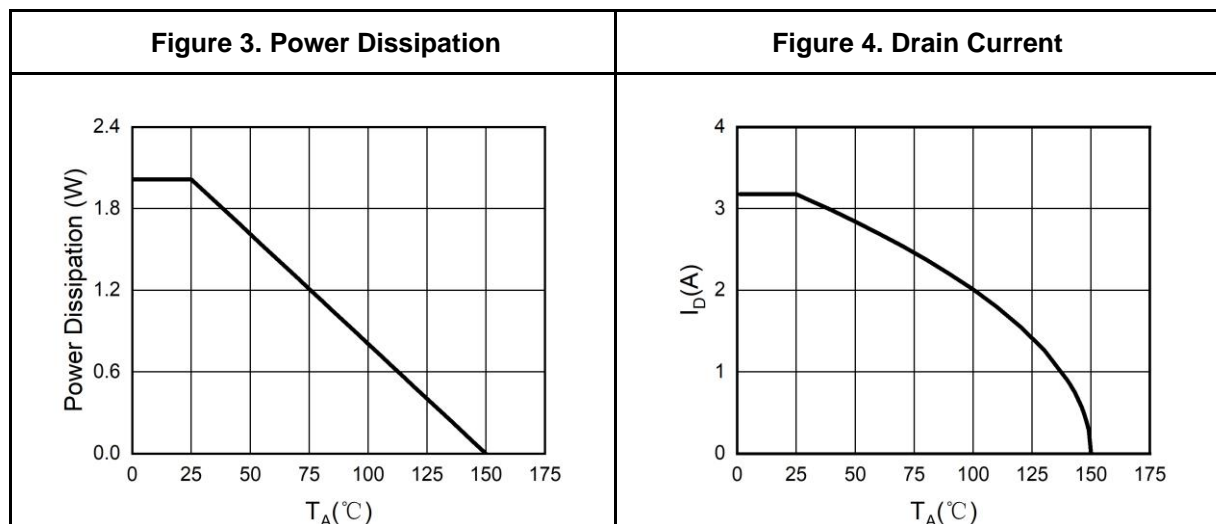
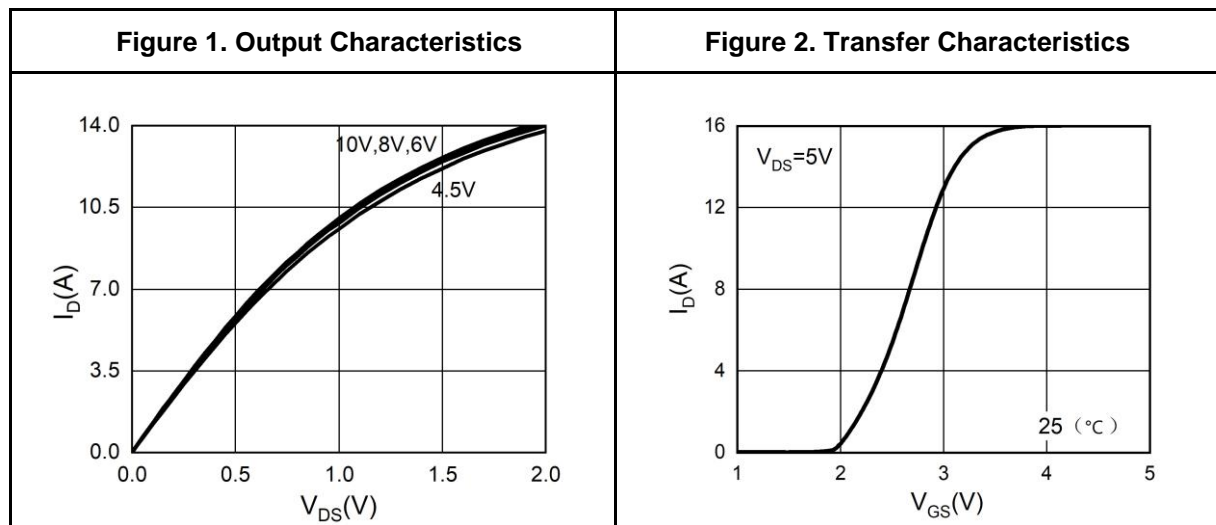
Notes 2.EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, R_g=25\Omega, L=0.5mH$ .

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



# 100V N&P-Channel Trench Power MOSFET

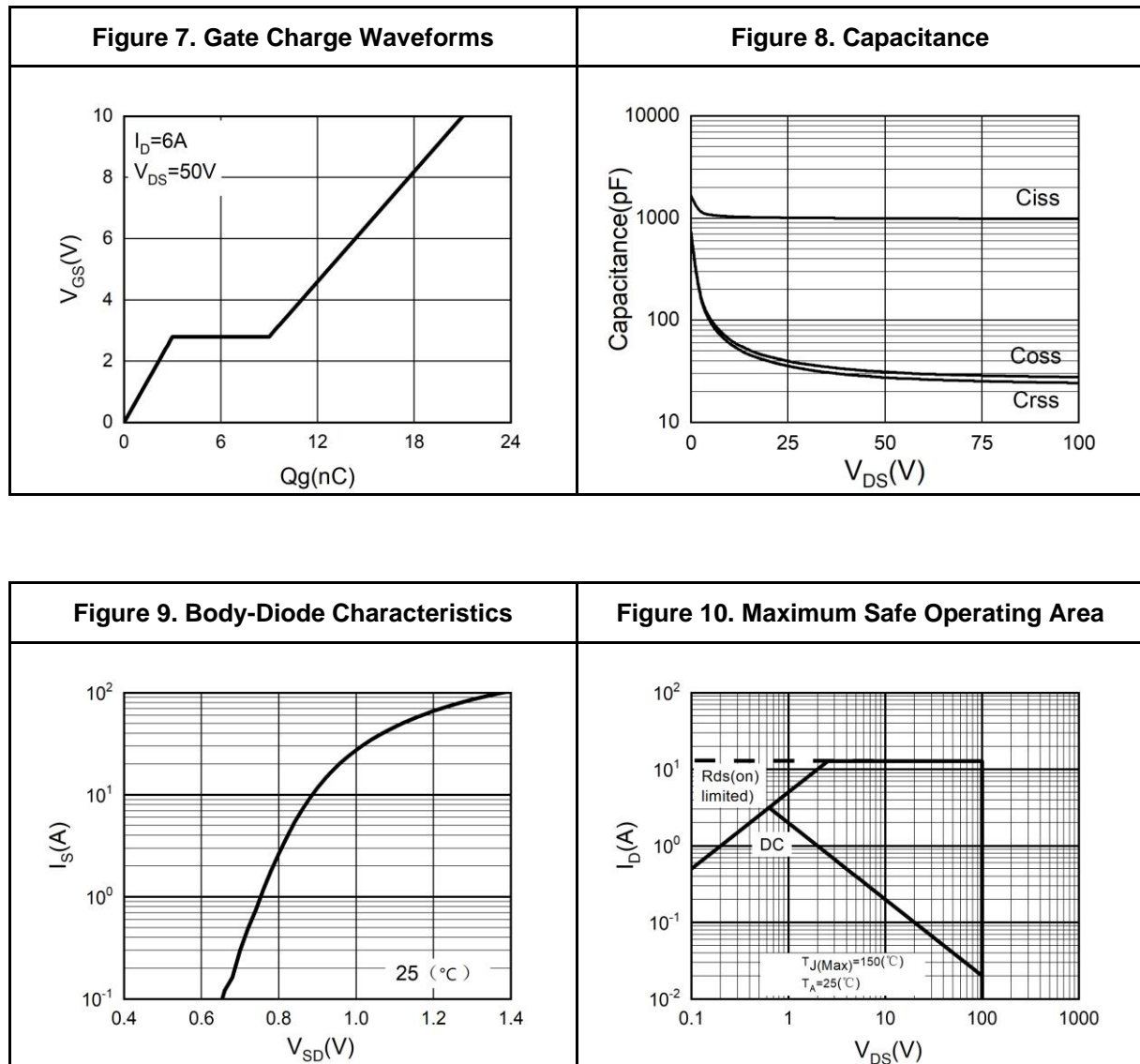
## N-Channel Typical Electrical And Thermal Characteristics (Curves)





## 100V N&P-Channel Trench Power MOSFET

### N-Channel Typical Electrical And Thermal Characteristics (Curves)





# 100V N&P-Channel Trench Power MOSFET

**Table 4. P-Channel 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	-100			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-100V, V <sub>GS</sub> =0V T <sub>J</sub> =25℃			-1	μA
		V <sub>DS</sub> =-100V, V <sub>GS</sub> =0V T <sub>J</sub> =125℃			-100	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, 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	-1		-2.5	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-5A		13		S
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-5A T <sub>J</sub> =25℃		146	183	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A T <sub>J</sub> =25℃		152	202	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-50V, V <sub>GS</sub> =0V, f=1.0MHz		1980		pF
C <sub>oss</sub>	Output Capacitance			47		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			39		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1.0MHz		5		Ω
Switching Parameters						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-50V, R <sub>L</sub> =10Ω, R <sub>GEN</sub> =3Ω		14		nS
t <sub>r</sub>	Turn-on Rise Time			18		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			50		nS
t <sub>f</sub>	Turn-Off Fall Time			18		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-50V, I <sub>D</sub> =-5A		25		nC
Q <sub>gs</sub>	Gate-Source Charge			5		nC
Q <sub>gd</sub>	Gate-Drain Charge			7		nC
Source-Drain Diode Characteristics						
I <sub>SD</sub>	Source-Drain Current (Body Diode)				-2.6	A
V <sub>SD</sub>	Forward on Voltage (Note 3)	V <sub>GS</sub> =0V, I <sub>S</sub> =-5A			-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =-5A, dI/dt=-100A/μs		35		ns
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>F</sub> =-5A, dI/dt=-100A/μs		46		nC

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

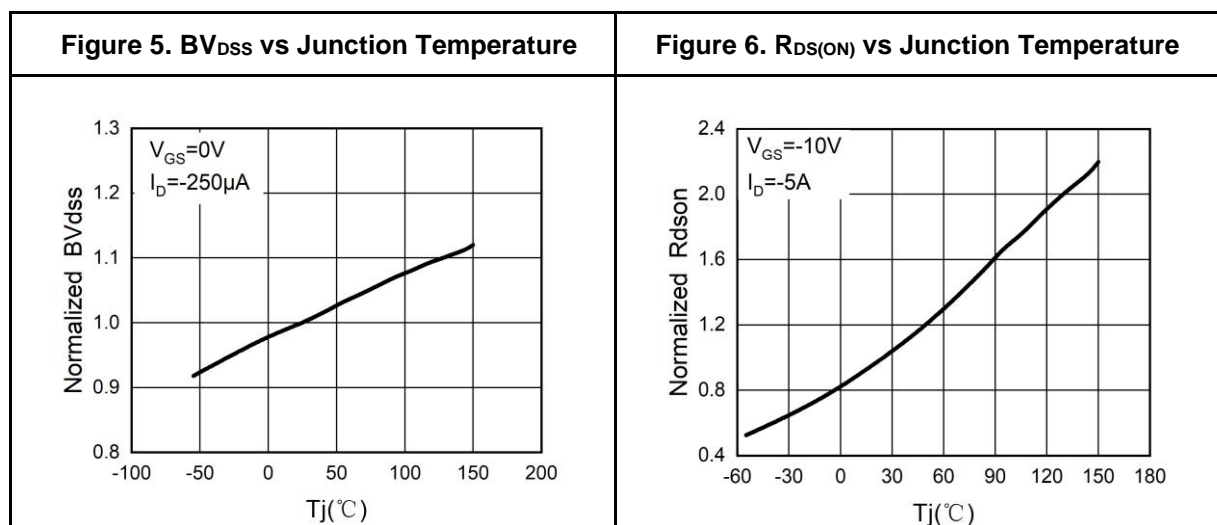
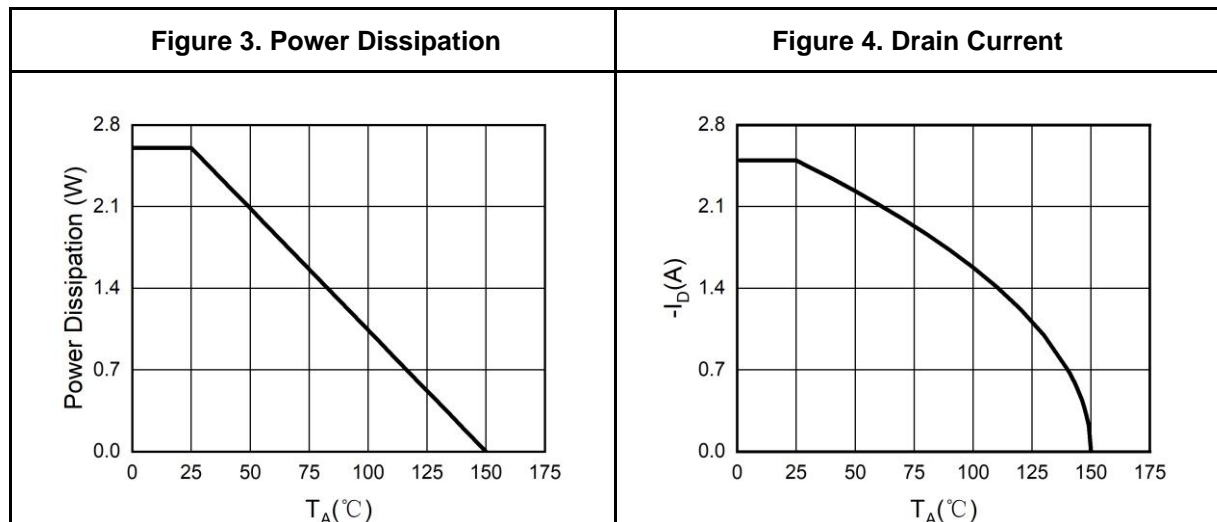
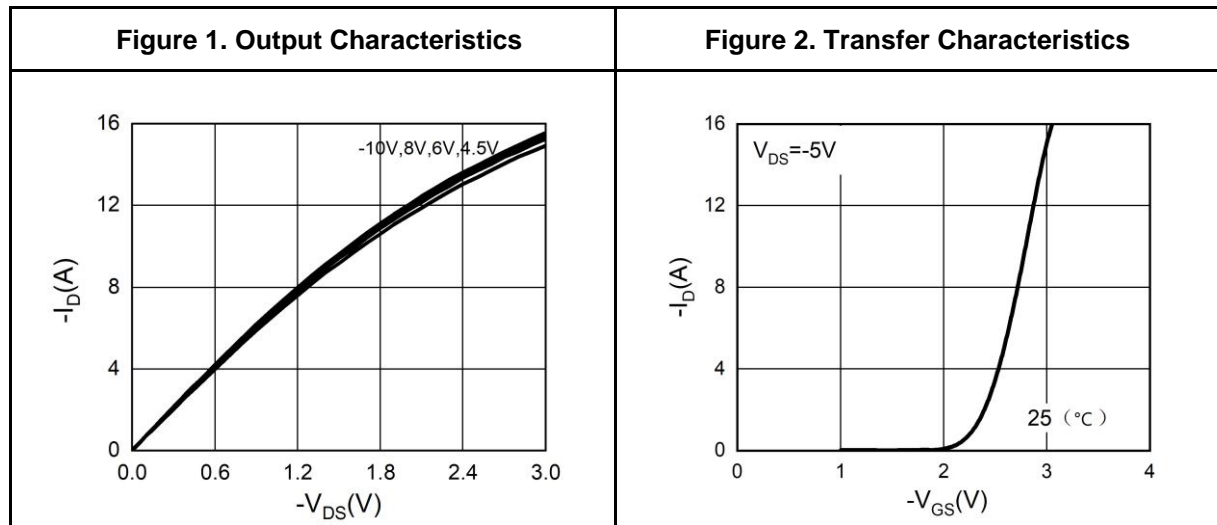
Notes 2.EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=-40V, V_G=-10V, R_g=25\Omega, L=0.5\text{mH}$ .

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



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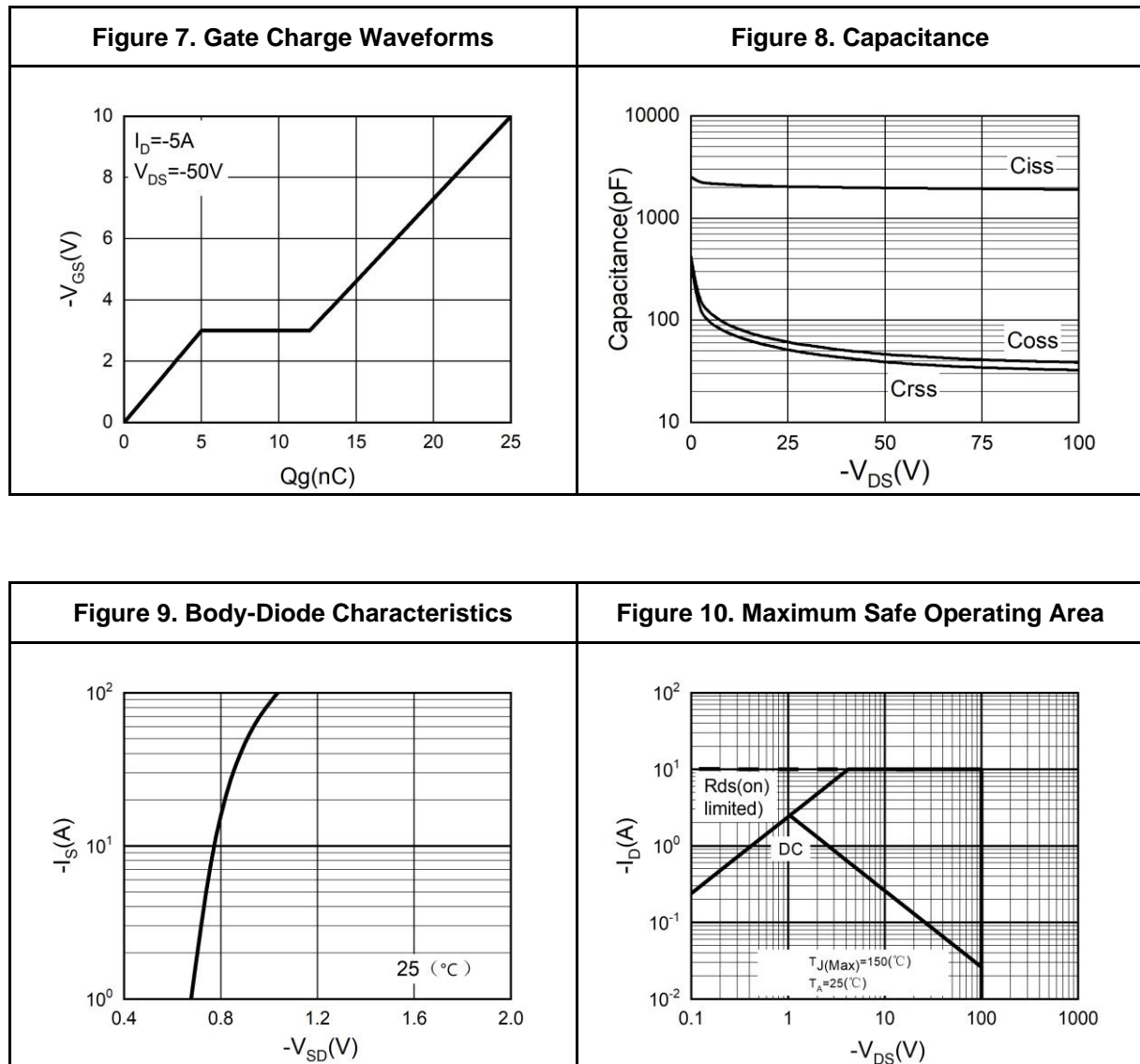
## P-Channel Typical Electrical And Thermal Characteristics (Curves)





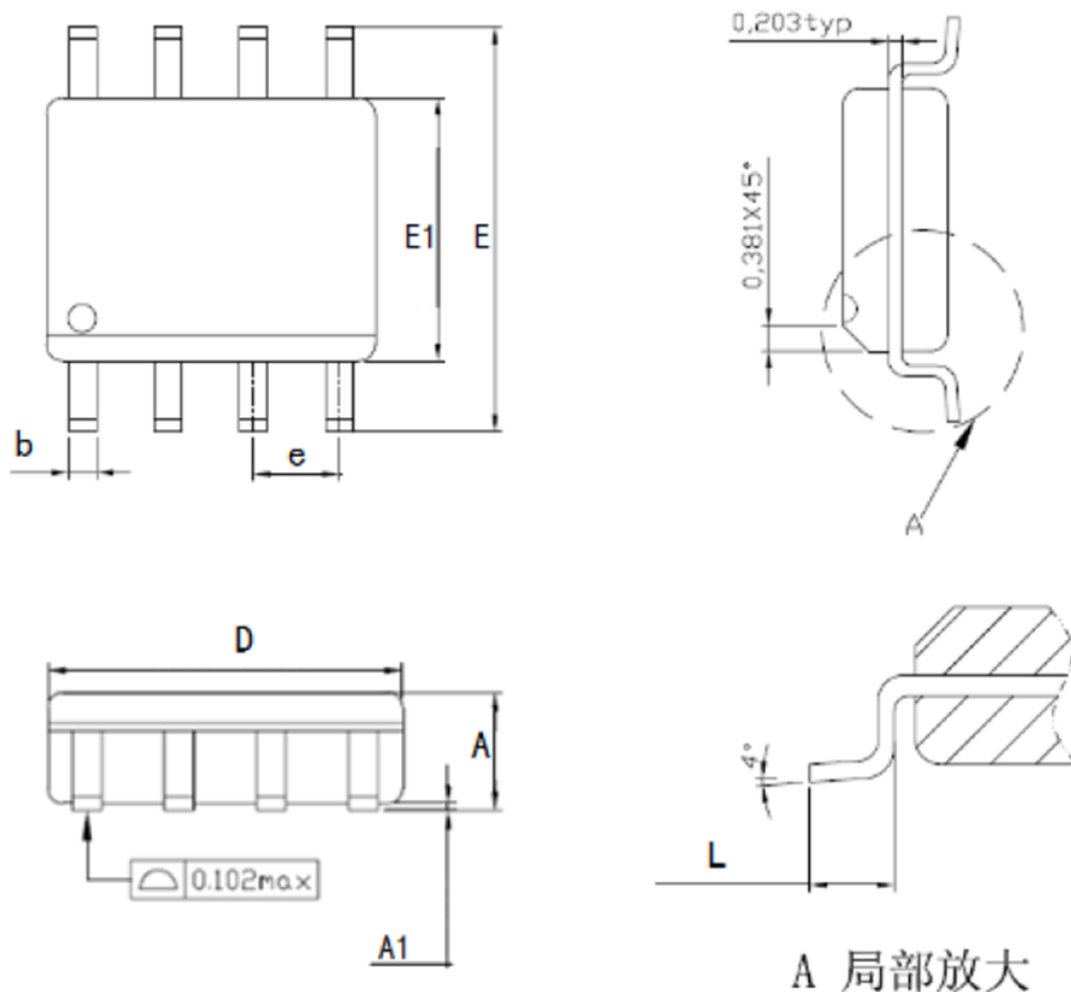
## 100V N&P-Channel Trench Power MOSFET

### P-Channel Typical Electrical And Thermal Characteristics (Curves)





## SOP-8 Package Information



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max
A	1.35	1.55	1.75
A1	0.1	0.15	0.2
b	0.346	0.406	0.466
D	4.8	4.89	4.98
E	5.75	6.00	6.25
E1	3.81	3.90	3.99
e	1.27TYP		
L	0.406	0.838	1.27





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### Attention

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