



100V N&P-Channel Trench Power MOSFET

General Description

The SJM01NP235 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

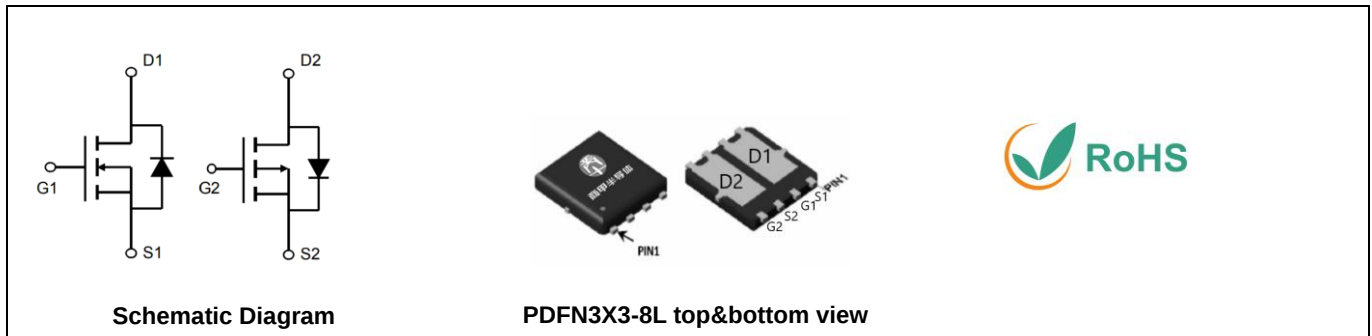
- Low Gate Charge
- High Power and current handing capability
- Lead free product is acquired

Application

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

Key Performance Parametes

Parameter	Value	Value	Unit
V_{DS}	100	-100	V
$R_{DS(ON_TYP)}$	92	162	mΩ
I_D	10.3	-9	A
Q_G	21	25	nC



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJM01NP235	SJM01NP235	PDFN3X3-8L	Tape	\	\	5000 Pcs

Table 1. Absolute Maximum Ratings ($T_c=25^\circ\text{C}$ 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 ($V_{DS}=0V$)	± 20	± 20	V
I_D	Drain Current-Continuous($T_c=25^\circ\text{C}$)	10.3	-9	A
	Drain Current-Continuous($T_c=100^\circ\text{C}$)	6.5	-5.6	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	41.2	-36	A
P_D	Maximum Power Dissipation($T_c=25^\circ\text{C}$)	23	34	W
	Maximum Power Dissipation($T_c=100^\circ\text{C}$)	9.1	13.7	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	5.5	3.64	$^\circ\text{C/W}$



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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 _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	100			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V, V _{GS} =0V T _J =25℃			1	μA
		V _{DS} =100V, V _{GS} =0V T _J =125℃			100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1		2.5	V
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =6A		14		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =6A T _J =25℃		92	115	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =4A T _J =25℃		95	123.5	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1.0MHz		996		pF
C _{oss}	Output Capacitance			31		pF
C _{rss}	Reverse Transfer Capacitance			28		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		1.1		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =50V, R _L =8.3Ω, R _{GEN} =3Ω		11		nS
t _r	Turn-on Rise Time			7.4		nS
t _{d(off)}	Turn-Off Delay Time			35		nS
t _f	Turn-Off Fall Time			9		nS
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =6A		21		nC
Q _{gs}	Gate-Source Charge			3		nC
Q _{gd}	Gate-Drain Charge			6		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				10.3	A
V _{SD}	Forward on Voltage ^(Note 3)	V _{GS} =0V, I _S =6A			1.2	V
t _{rr}	Reverse Recovery Time	I _F =6A, dI/dt=100A/μs		26		ns
Q _{rr}	Reverse Recovery Charge	I _F =6A, dI/dt=100A/μs		27		nC

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

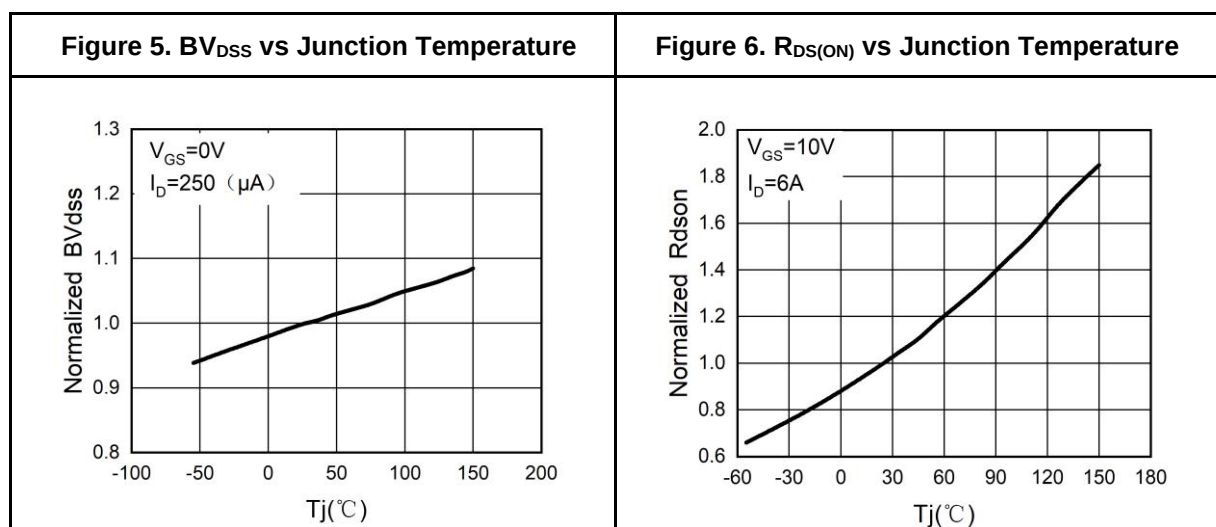
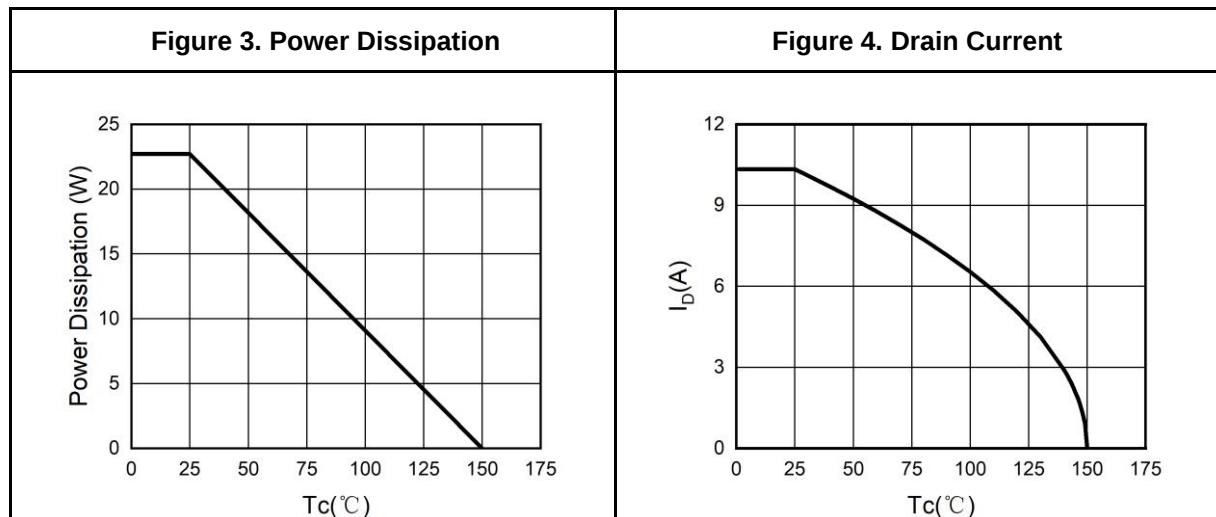
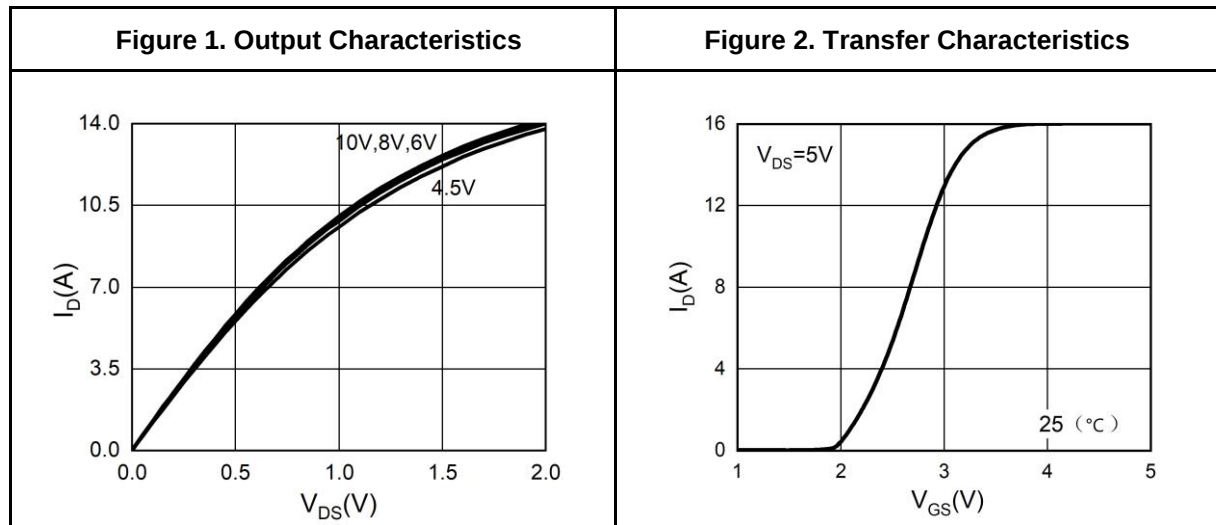
Notes 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, R_g=25\Omega, L=0.5mH$.

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



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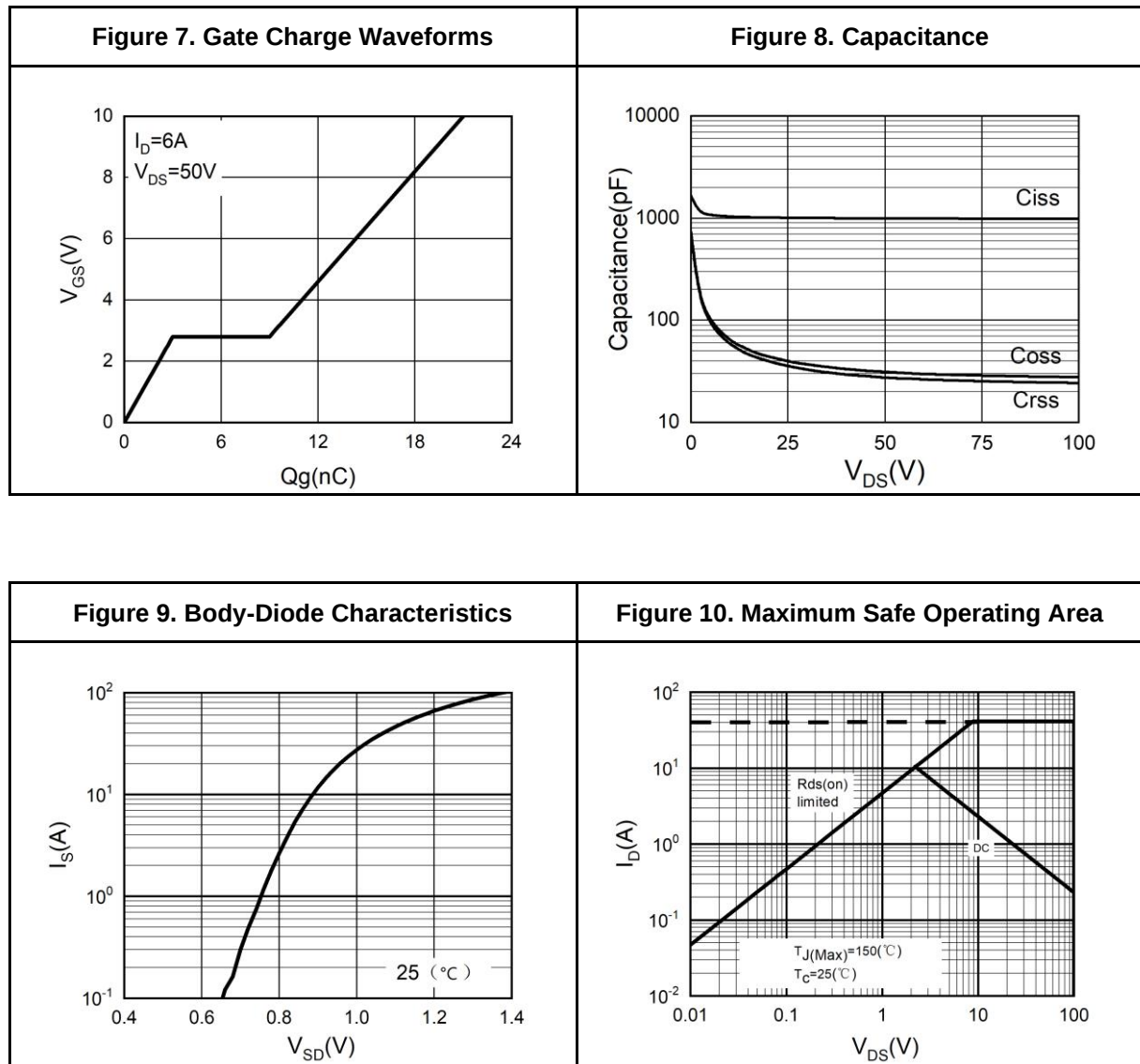
N-Channel Typical Electrical And Thermal Characteristics (Curves)





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 _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =-250μA	-100			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-100V, V _{GS} =0V T _J =25℃			-1	μA
		V _{DS} =-100V, V _{GS} =0V T _J =125℃			-100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1		-2.5	V
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-5A		13		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-5A T _J =25℃		162	202.5	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-4A T _J =25℃		171	222.3	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-50V,V _{GS} =0V, f=1.0MHz		1980		pF
C _{oss}	Output Capacitance			47		pF
C _{rss}	Reverse Transfer Capacitance			39		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		5		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =-10V, V _{DS} =-50V, R _L =10Ω, R _{GEN} =3Ω		14		nS
t _r	Turn-on Rise Time			18		nS
t _{d(off)}	Turn-Off Delay Time			50		nS
t _f	Turn-Off Fall Time			18		nS
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-50V, I _D =-5A		25		nC
Q _{gs}	Gate-Source Charge			5		nC
Q _{gd}	Gate-Drain Charge			7		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				-9	A
V _{SD}	Forward on Voltage (Note 3)	V _{GS} =0V, I _S =-5A			-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-5A, dI/dt=-100A/μs		35		ns
Q _{rr}	Reverse Recovery Charge	I _F =-5A, dI/dt=-100A/μs		46		nC

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

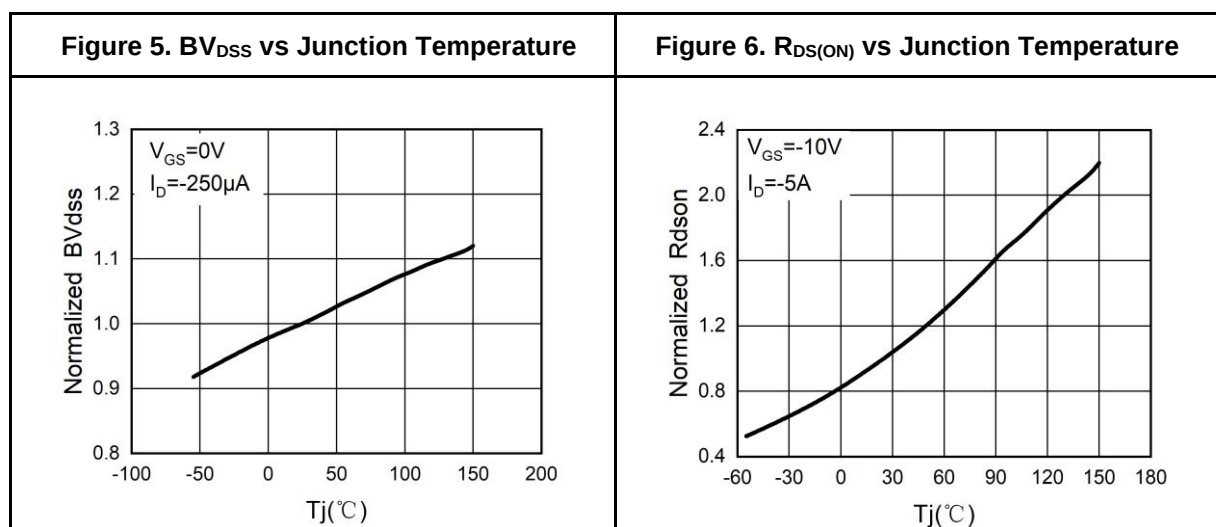
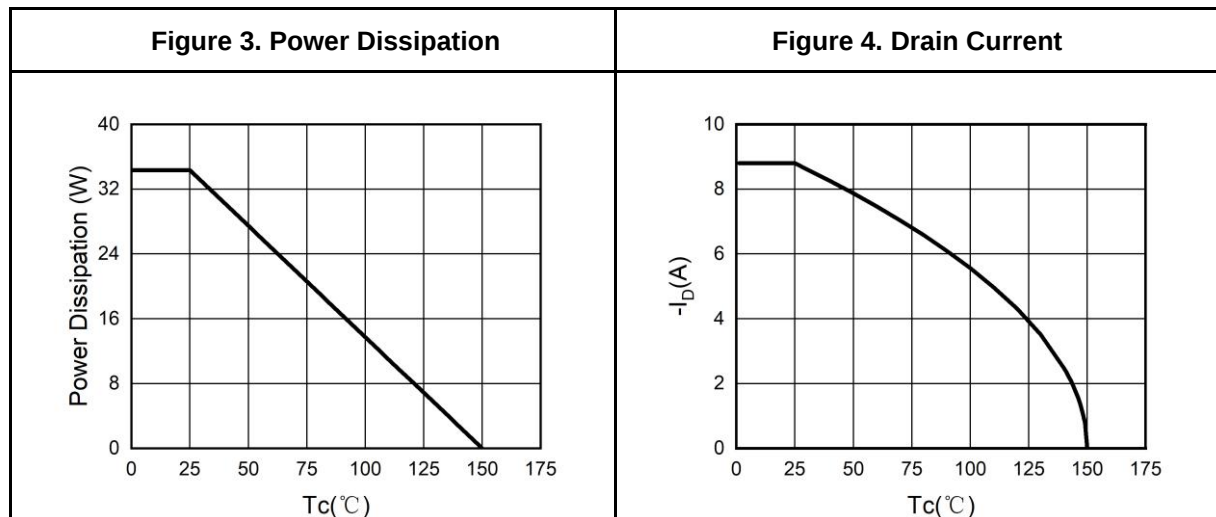
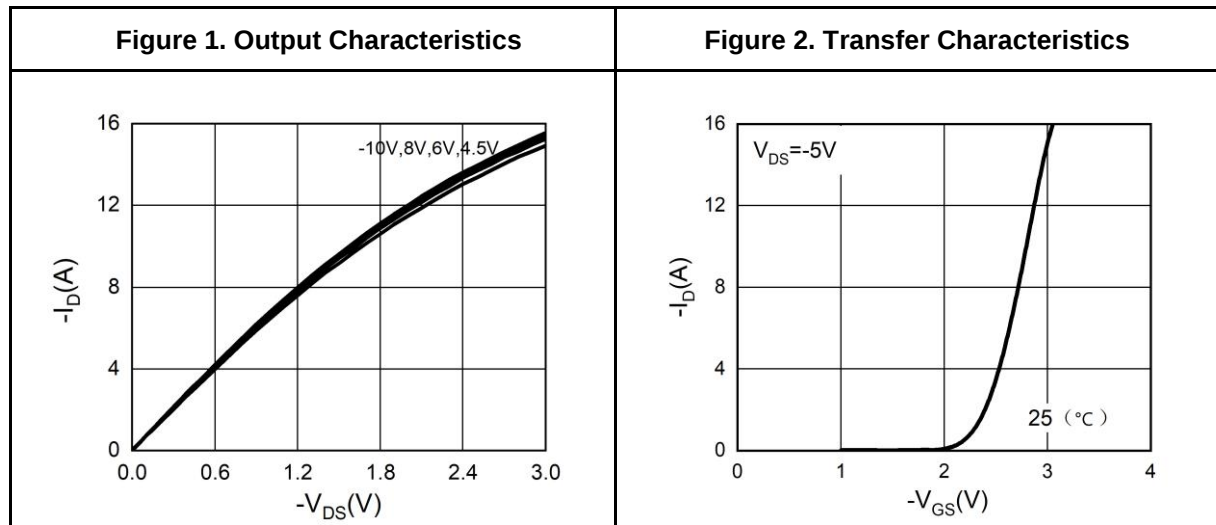
Notes 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=-40V, V_G=-10V, R_g=25\Omega, L=0.5\text{mH}$.

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



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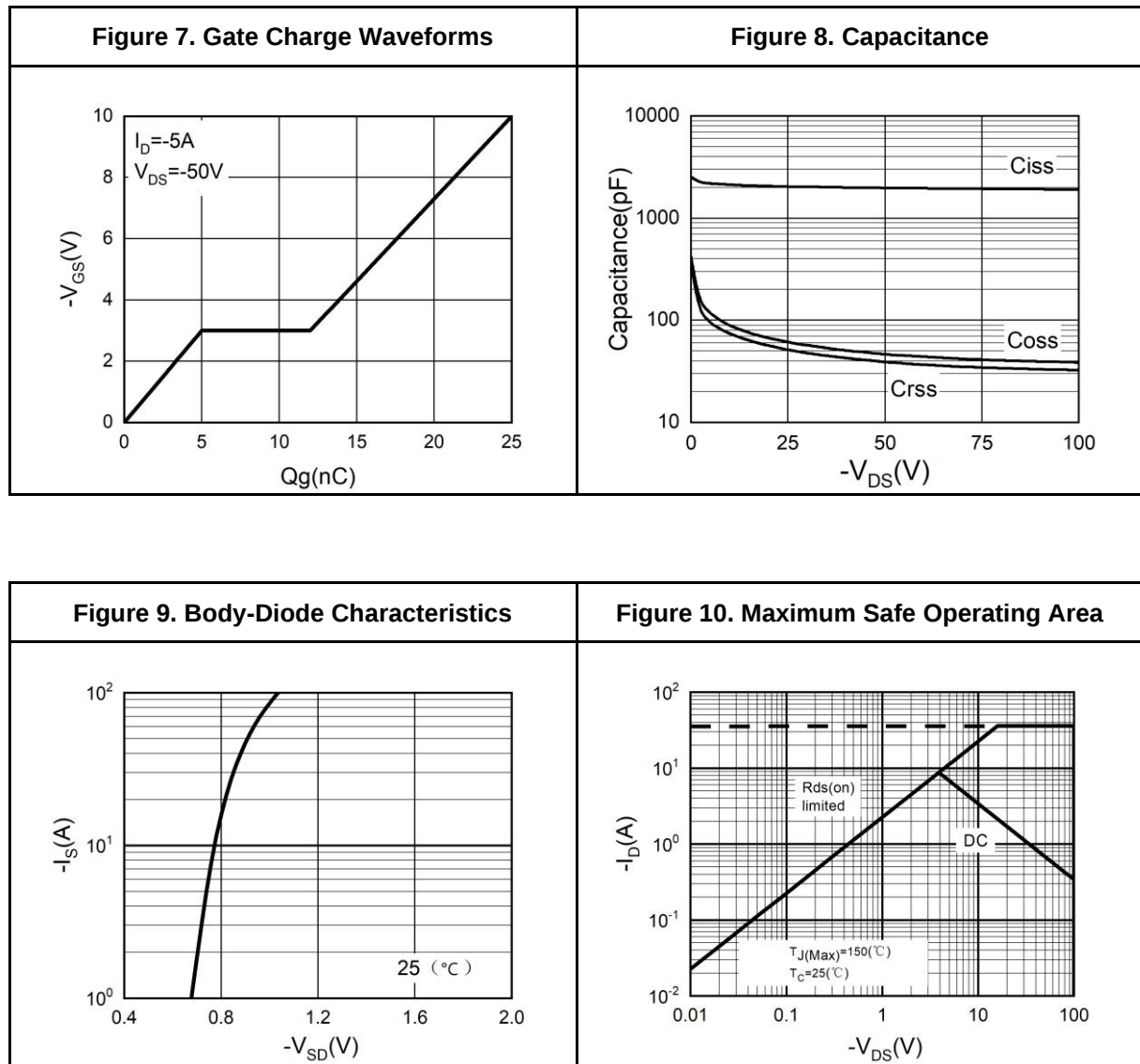
P-Channel Typical Electrical And Thermal Characteristics (Curves)





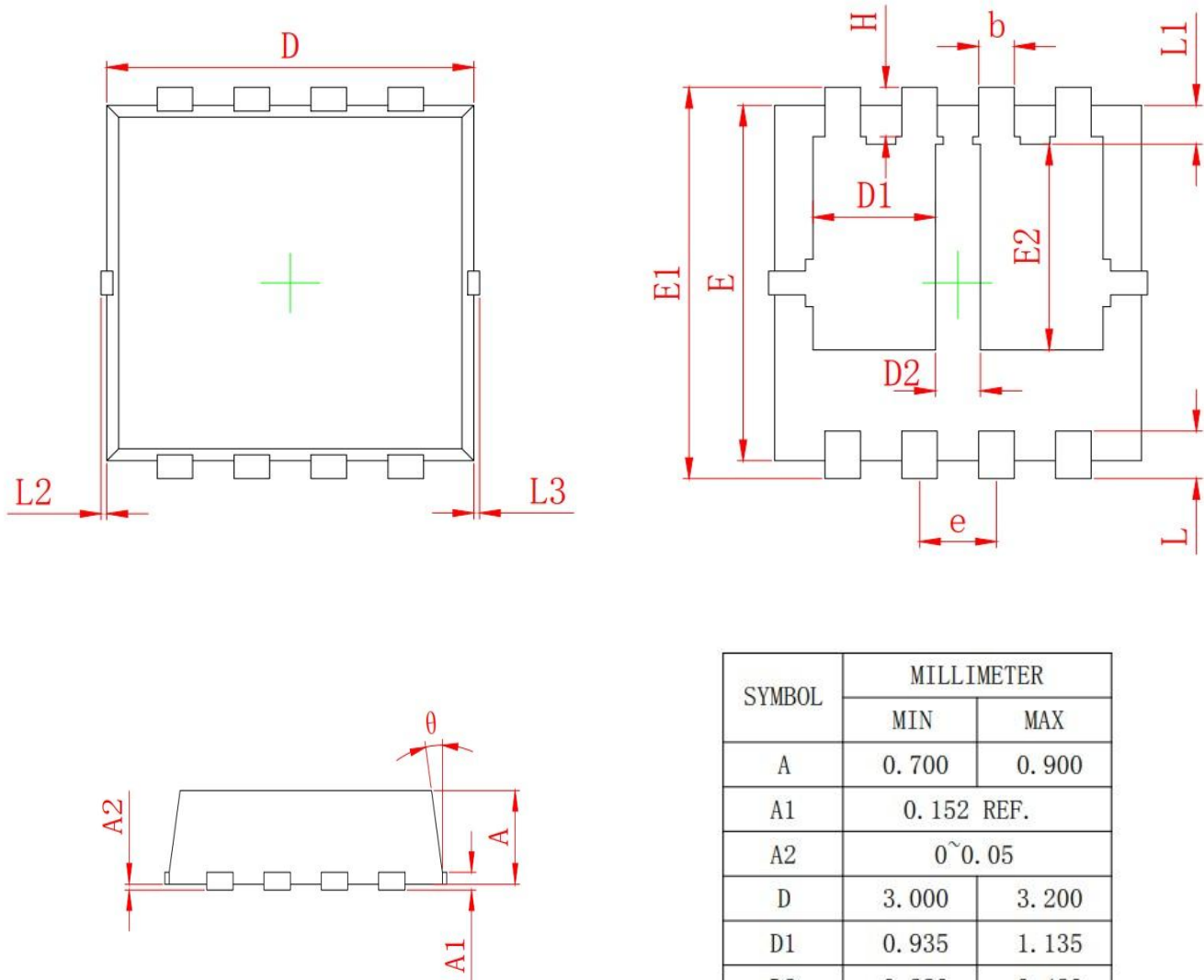
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P-Channel Typical Electrical And Thermal Characteristics (Curves)





PDFN3X3-8L Package Information



SYMBOL	MILLIMETER	
	MIN	MAX
A	0.700	0.900
A1	0.152 REF.	
A2	0~0.05	
D	3.000	3.200
D1	0.935	1.135
D2	0.280	0.480
E	2.900	3.100
E1	3.150	3.450
E2	1.535	1.935
b	0.200	0.400
e	0.550	0.750
L	0.300	0.500
L1	0.180	0.480
L2	0~0.100	
L3	0~0.100	
H	0.315	0.515
θ	8°	12°



Attention

This product described in this document can not be used in life support devices or systems, aircraft's control systems, and other applications whose failure can be reasonably expected to result in serious physical and/or material damage, apart from that when an application agreement is signed between customer and Wuxi Shangjia Semiconductor.

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