



## 60V N-Channel Trench Power MOSFET

### General Description

The SJH60N120 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

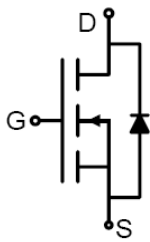
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

### Application

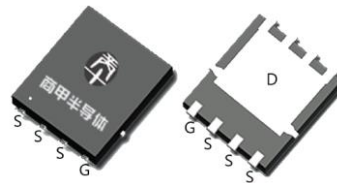
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

### Key Performance Parameters

Parameter	Value	Unit
$V_{DS}$	60	V
$R_{DS(ON\_TYP)}$	13.3	m $\Omega$
$I_D$	37	A
$Q_G$	45.4	nC



Schematic Diagram



PDFN5X6-8L top&bottom view



### Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJH60N120	SJH60N120	PDFN5X6-8L	Tape	\	\	5000 Pcs

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

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage ( $V_{GS}=0\text{V}$ )	60	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0\text{V}$ )	$\pm 20$	V
$I_D$	Drain Current-Continuous( $T_C=25^{\circ}\text{C}$ )	37	A
	Drain Current-Continuous( $T_C=100^{\circ}\text{C}$ )	23	A
$I_{DM}$ (pulse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	148	A
$P_D$	Maximum Power Dissipation( $T_C=25^{\circ}\text{C}$ )	50	W
	Maximum Power Dissipation( $T_C=100^{\circ}\text{C}$ )	20	W
$E_{AS}$	Avalanche energy (Note 2)	110	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
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		2.48	$^{\circ}\text{C/W}$



## 60V N-Channel Trench Power MOSFET

**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	60			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V T <sub>J</sub> =25℃			1	μA
		V <sub>DS</sub> =60V, 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	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =20A		21		S
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =20A T <sub>J</sub> =25℃		13.3	16.6	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A T <sub>J</sub> =25℃		16.8	22.3	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =30V,V <sub>GS</sub> =0V, f=1.0MHz		2098		pF
C <sub>oss</sub>	Output Capacitance			103		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			93		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1.0MHz		1.5		Ω
Switching Parameters						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =10V, V <sub>DS</sub> =30V, R <sub>L</sub> =3Ω, R <sub>GEN</sub> =6Ω		10		nS
t <sub>r</sub>	Turn-on Rise Time			7.6		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			56.4		nS
t <sub>f</sub>	Turn-Off Fall Time			13.2		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =10V, V <sub>DS</sub> =30V, I <sub>D</sub> =10A		45.4		nC
Q <sub>gs</sub>	Gate-Source Charge			9.6		nC
Q <sub>gd</sub>	Gate-Drain Charge			6.4		nC
Source-Drain Diode Characteristics						
I <sub>SD</sub>	Source-Drain Current (Body Diode)				37	A
V <sub>SD</sub>	Forward on Voltage (Note 3)	V <sub>GS</sub> =0V, I <sub>S</sub> =20A			1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =10A, dI/dt=100A/μs		20		ns
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>F</sub> =10A, dI/dt=100A/μs		19.8		nC

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

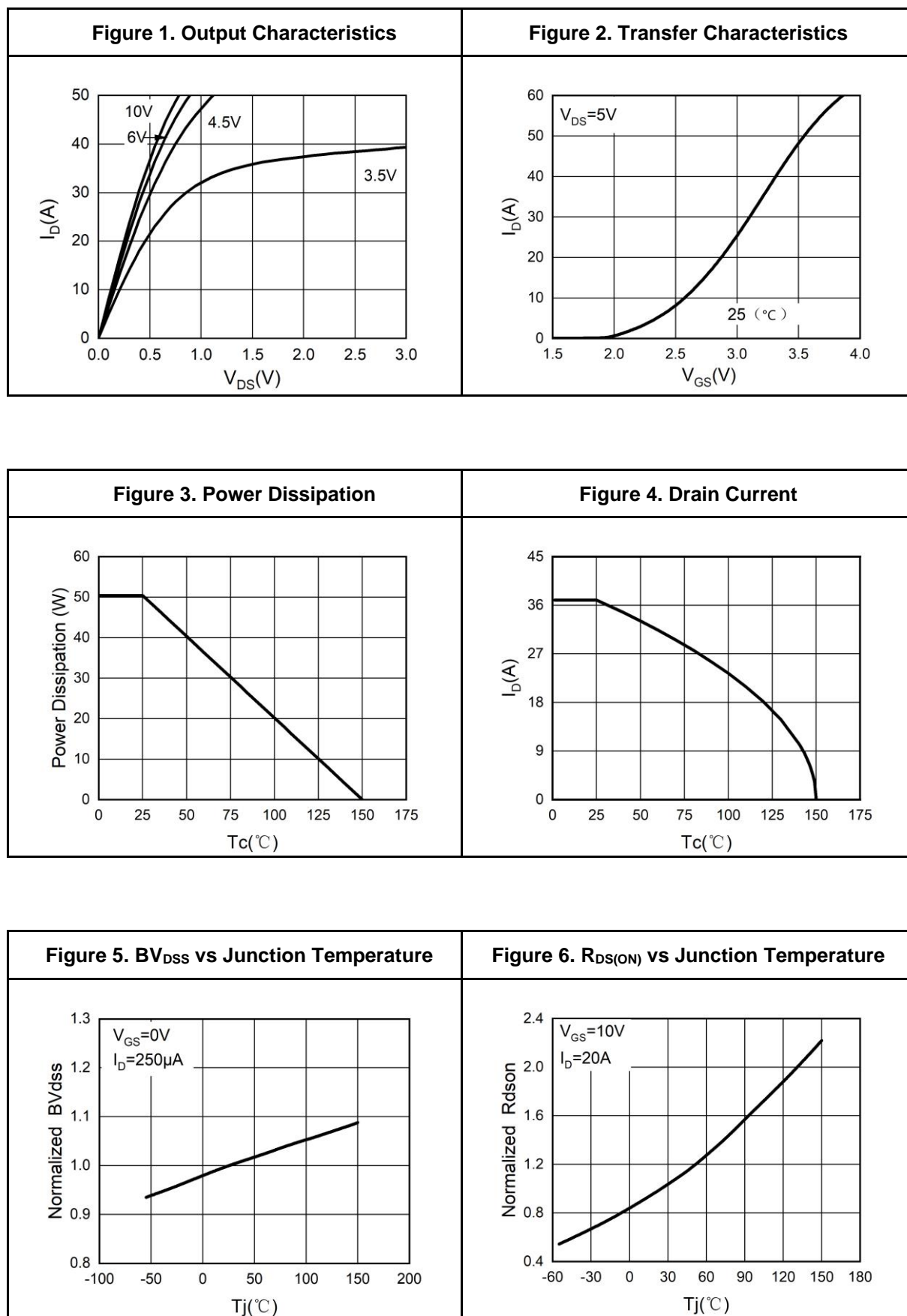
Notes 2.EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=40V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$ .

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



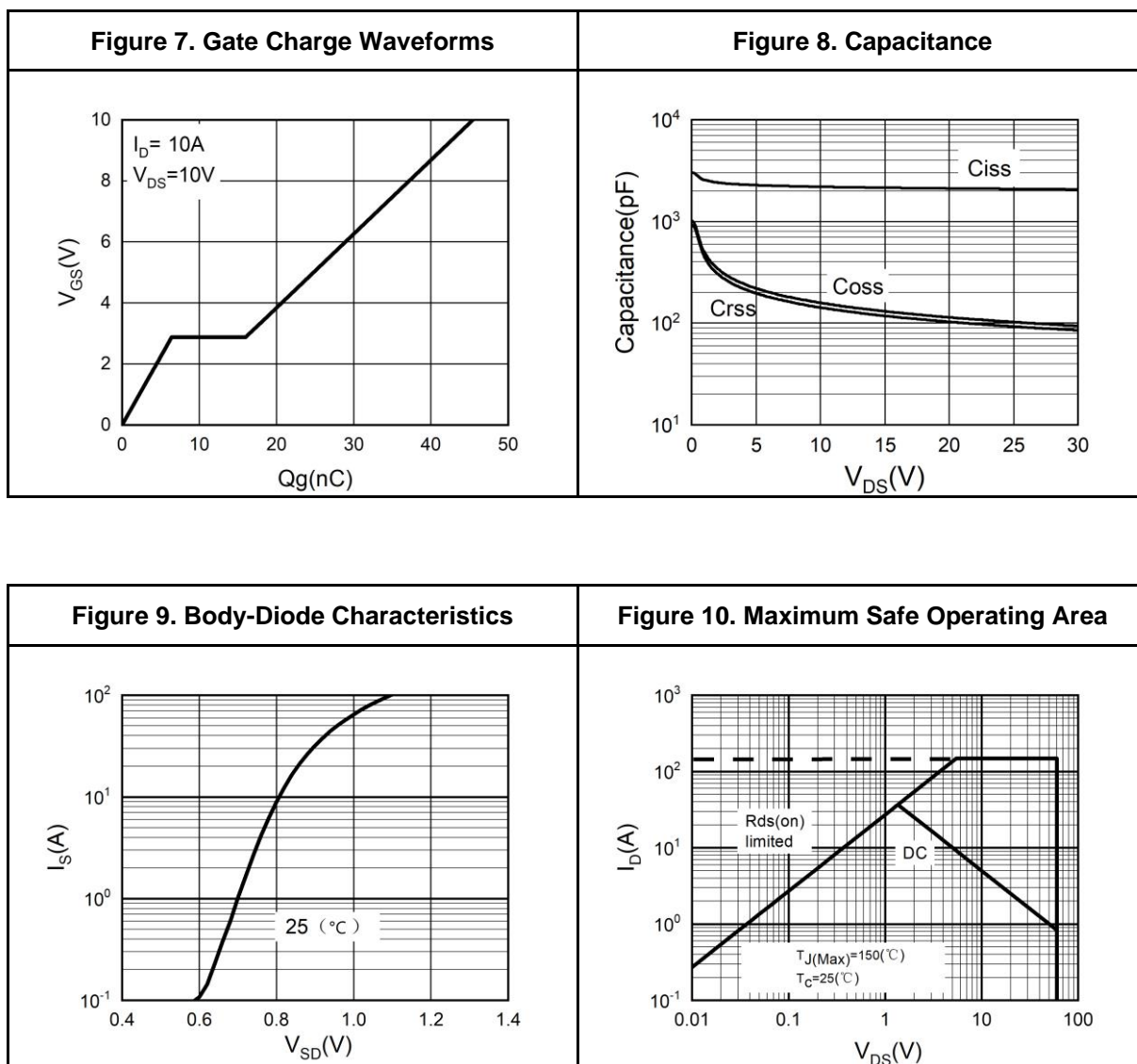
## 60V N-Channel Trench Power MOSFET

### Typical Electrical And Thermal Characteristics (Curves)



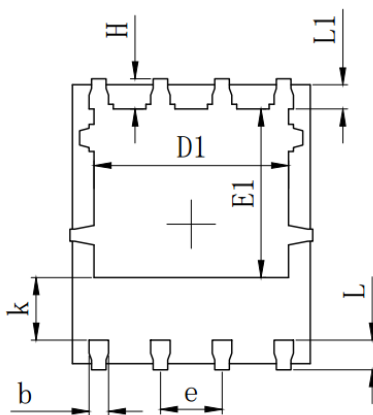
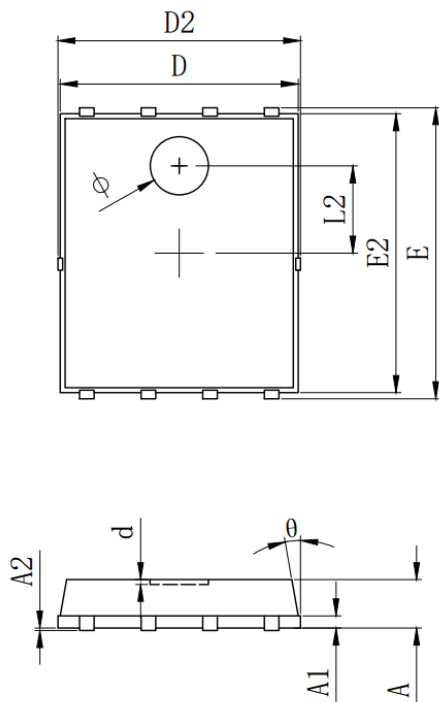


## Typical Electrical And Thermal Characteristics (Curves)





## PDFN5X6-8L Package Information



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.900	1.000	1.100
A1	0.254 REF.		
A2	0~0.05		
D	4.824	4.900	4.976
D1	3.910	4.010	4.110
D2	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.750	5.826
b	0.350	0.400	0.450
e	1.270 TYP.		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF.		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
θ	8°	10°	12°
Φ	1.100	1.200	1.300
d			0.100

Symbol	MILLIMETER		
	Min.	Typ.	Max.
A	0.900	1.000	1.100
A1	0.254 REF.		
A2	0~0.05		
D	4.824	4.900	4.976
D1	3.910	4.010	4.110
D2	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.75	5.826
b	0.350	0.400	0.450
e	1.270 TYP.		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF.		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
θ	8°	10°	12°
Φ	1.100	1.200	1.300
d			0.100



## 60V N-Channel Trench Power MOSFET

---

### 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.

The performances and characteristics of this product in the independent testing state are displayed in this document. Wuxi Shangjia Semiconductor can't guarantee of the performances and characteristics of this described product that mounted in the customer's products or equipments as same as that in the independent testing state. So the customer should evaluate and test devices mounted in the customer's products or equipments.

Wuxi Shangjia Semiconductor reserves the right to improve the designs, functions and reliability of this product and modify any and all information described in this document without notice customer, apart from that when an notice agreement is signed between customer and Wuxi Shangjia Semiconductor.

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Wuxi Shangjia Semiconductor hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.