



## 40V N-Channel SGT Power MOSFET

### General Description

The SJH009N04H uses SGT technology to provide excellent  $R_{DS(ON)}$ , low gate charge and fast switching characteristics. This device is suitable for use as a wide variety of applications.

### Features

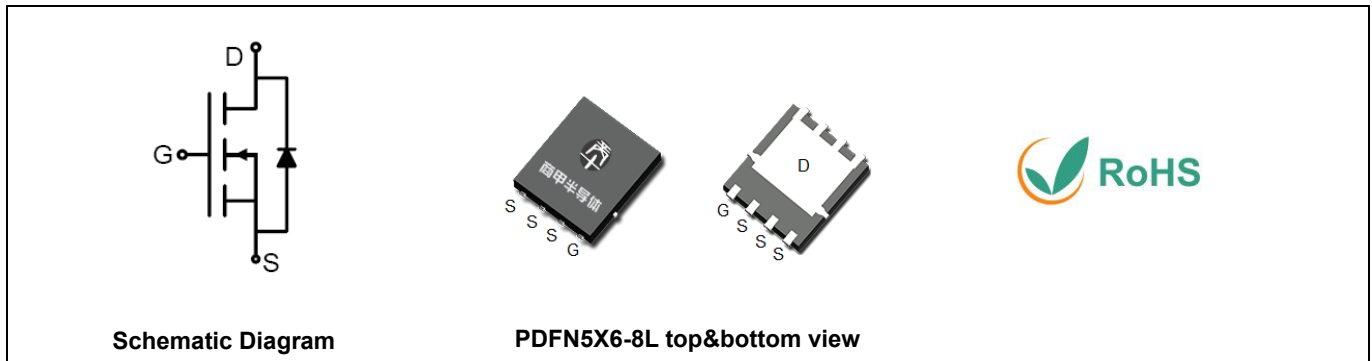
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

### Application

- DC/DC Converter
- Load Switching, Quick/Wireless Charging, Motor Driving

### Key Performance Parametes

Parameter	Value	Unit
$V_{DS}$	40	V
$R_{DS(ON\_TYP)}$	1.2	m $\Omega$
$I_D$	255	A
$Q_G$	71	nC



### Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJH009N04H	SJH009N04H	PDFN5X6	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 ( $V_{GS}=0V$ )	40	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0V$ )	$\pm 20$	V
$I_D$	Drain Current-Continuous( $T_C=25^\circ\text{C}$ )	255	A
	Drain Current-Continuous( $T_C=100^\circ\text{C}$ )	161	A
$I_{DM}$ (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	1020	A
$P_D$	Maximum Power Dissipation( $T_C=25^\circ\text{C}$ )	160	W
	Maximum Power Dissipation( $T_C=100^\circ\text{C}$ )	64	W
$E_{AS}$	Avalanche energy (Note 2)	930	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		0.78	$^\circ\text{C}/\text{W}$



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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V, T_J=25^\circ\text{C}$			1	$\mu A$
		$V_{DS}=40V, V_{GS}=0V, T_J=125^\circ\text{C}$			100	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2		4	V
$g_{FS}$	Forward Transconductance	$V_{DS}=10V, I_D=20A$		50		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=20A, T_J=25^\circ\text{C}$		1.2	1.5	m $\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1.0\text{MHz}$		5460		pF
$C_{oss}$	Output Capacitance			4220		pF
$C_{rss}$	Reverse Transfer Capacitance			123		pF
$R_g$	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$		2.6		$\Omega$
<b>Switching Parameters</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DS}=20V, R_L=1\Omega, R_{GEN}=3\Omega$		19.6		nS
$t_r$	Turn-on Rise Time			27.6		nS
$t_{d(off)}$	Turn-Off Delay Time			85		nS
$t_f$	Turn-Off Fall Time			31		nS
$Q_g$	Total Gate Charge	$V_{GS}=10V, V_{DS}=20V, I_D=20A$		71		nC
$Q_{gs}$	Gate-Source Charge			24		nC
$Q_{gd}$	Gate-Drain Charge			14		nC
<b>Source-Drain Diode Characteristics</b>						
$I_{SD}$	Source-Drain Current (Body Diode)				255	A
$V_{SD}$	Forward on Voltage (Note 3)	$V_{GS}=0V, I_S=20A$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F=20A, dI/dt=100A/\mu s$		80		ns
$Q_{rr}$	Reverse Recovery Charge	$I_F=20A, dI/dt=100A/\mu s$		196		nC

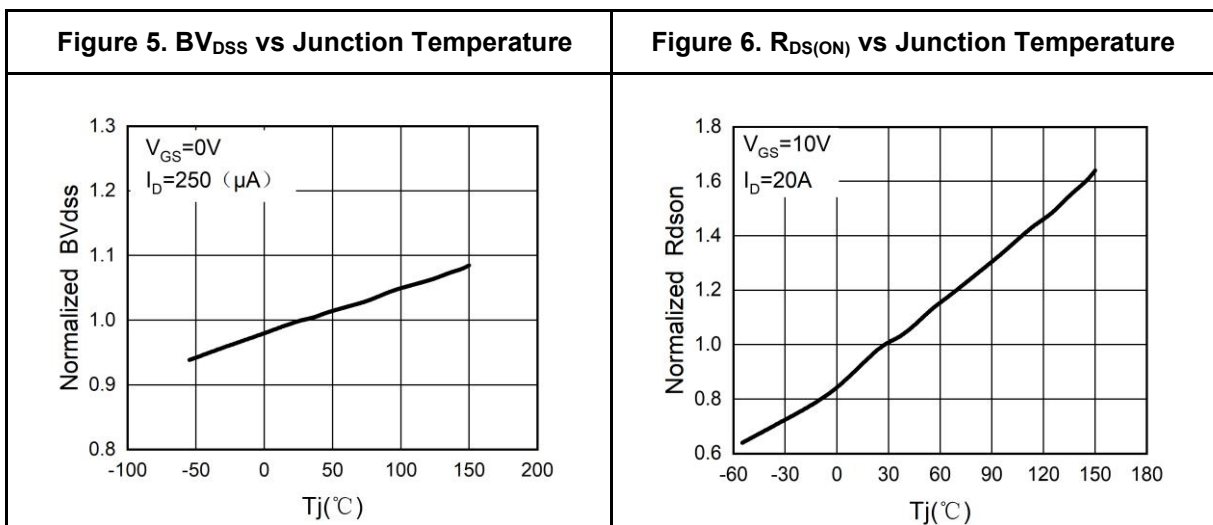
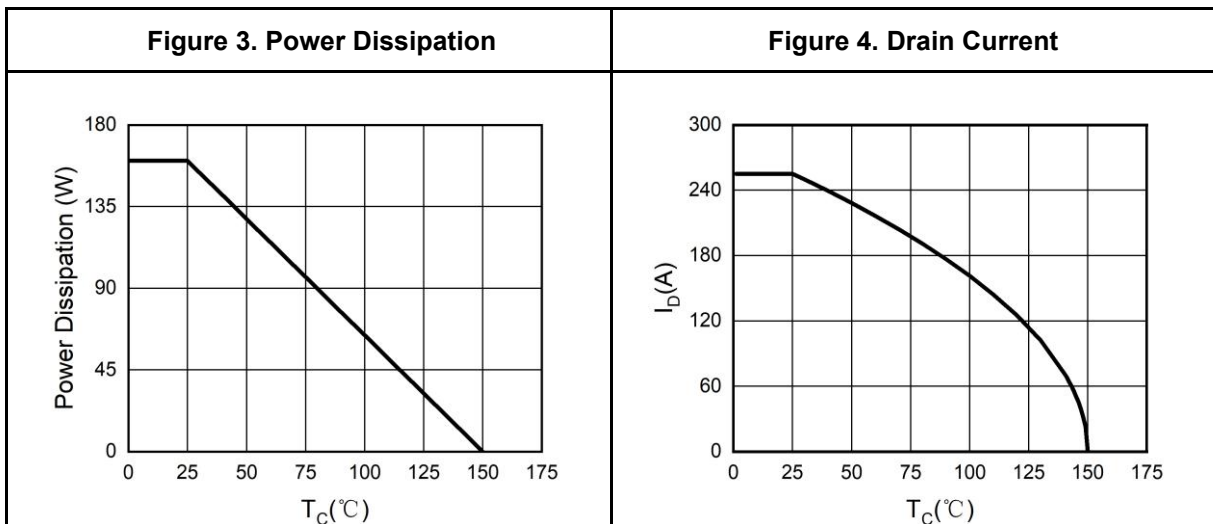
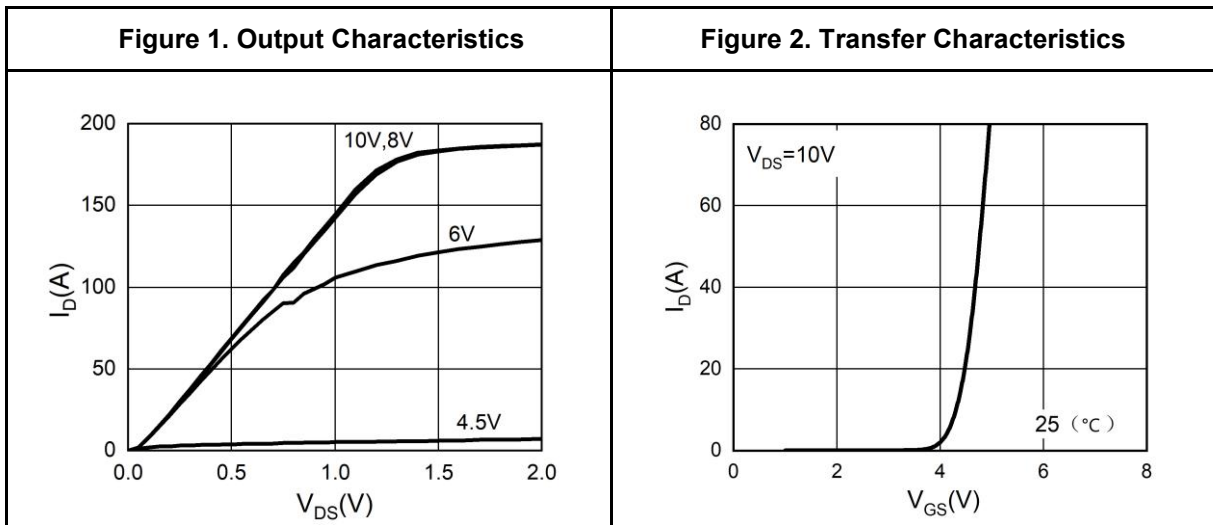
Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

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.

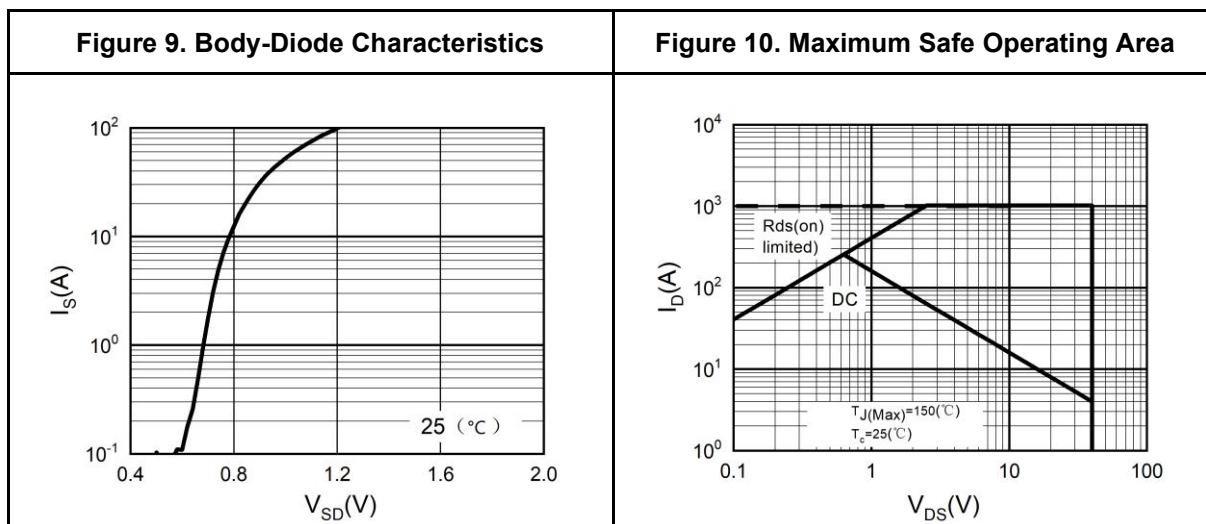
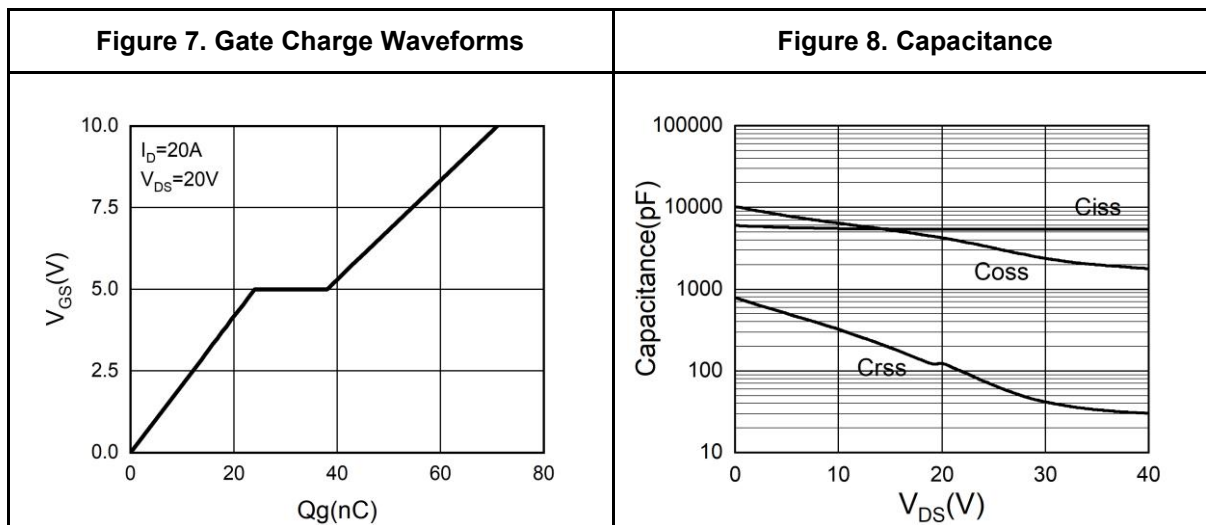


Typical Electrical And Thermal Characteristics (Curves)



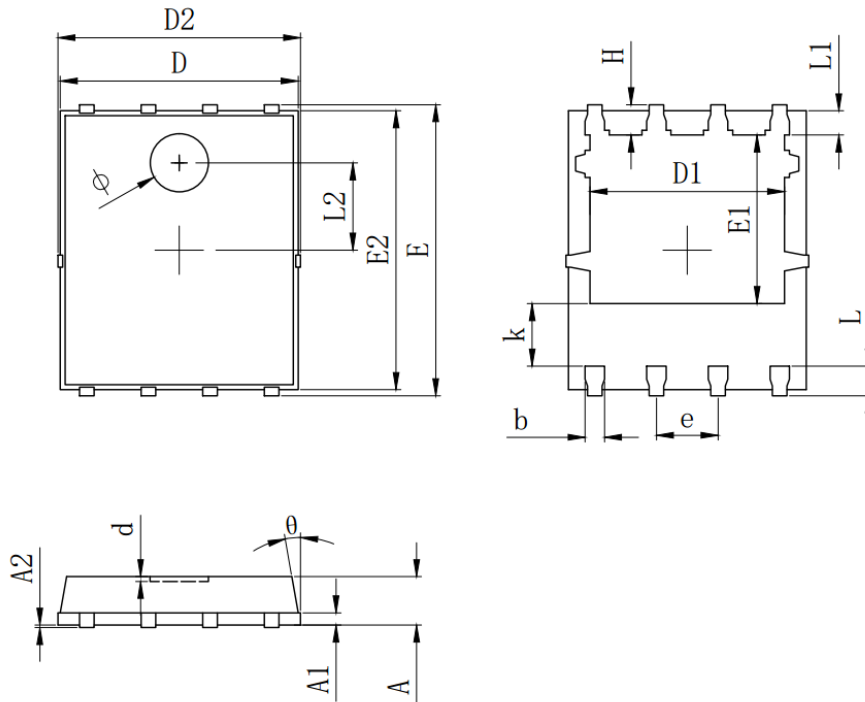


Typical Electrical And Thermal Characteristics (Curves)





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
theta	8°	10°	12°
phi	1.100	1.200	1.300
d			0.100

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theta	8°	10°	12°
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d			0.100



## 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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