



20V P-Channel Trench Power MOSFET

General Description

The SJH20P050 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

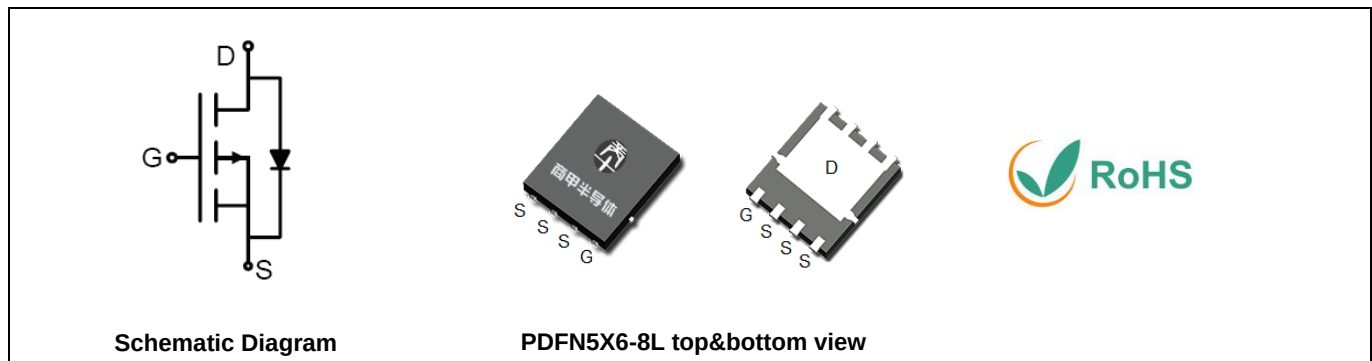
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

Application

- PWM Applications
- Load Switch
- Power Management

Key Performance Parametes

Parameter	Value	Unit
V_{DS}	-20	V
$R_{DS(ON_TYP)}$	4.4	m Ω
I_D	-68	A
Q_G	16.5	nC



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJH20P050	SJH20P050	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 ($V_{GS}=0V$)	-20	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 12	V
I_D	Drain Current-Continuous($T_C=25^\circ\text{C}$)	-68	A
	Drain Current-Continuous($T_C=100^\circ\text{C}$)	-43	A
$I_{DM} \text{ (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	-272	A
P_D	Maximum Power Dissipation($T_C=25^\circ\text{C}$)	38	W
	Maximum Power Dissipation($T_C=100^\circ\text{C}$)	15	W
E_{AS}	Avalanche energy (Note 2)	225	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		3.3	$^\circ\text{C/W}$



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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 _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =-250μA	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V T _J =25℃			-1	μA
		V _{DS} =-20V, V _{GS} =0V T _J =125℃			-100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.5		-1	V
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-20A		75		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-20A T _J =25℃		4.4	5.6	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-2.5V, I _D =-10A T _J =25℃		5.5	7.3	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-10V,V _{GS} =0V, f=1.0MHz		5840		pF
C _{oss}	Output Capacitance			553		pF
C _{rss}	Reverse Transfer Capacitance			504		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		3.5		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =-10V, V _{DS} =-10V, R _L =0.5Ω, R _{GEN} =3Ω		19.6		nS
t _r	Turn-on Rise Time			50		nS
t _{d(off)}	Turn-Off Delay Time			100		nS
t _f	Turn-Off Fall Time			38		nS
Q _g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-20A		80		nC
Q _{gs}	Gate-Source Charge			16		nC
Q _{gd}	Gate-Drain Charge			25		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				-68	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/μs		40		ns
Q _{rr}	Reverse Recovery Charge	I _F =-20A, dI/dt=-100A/μs		55		nC

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

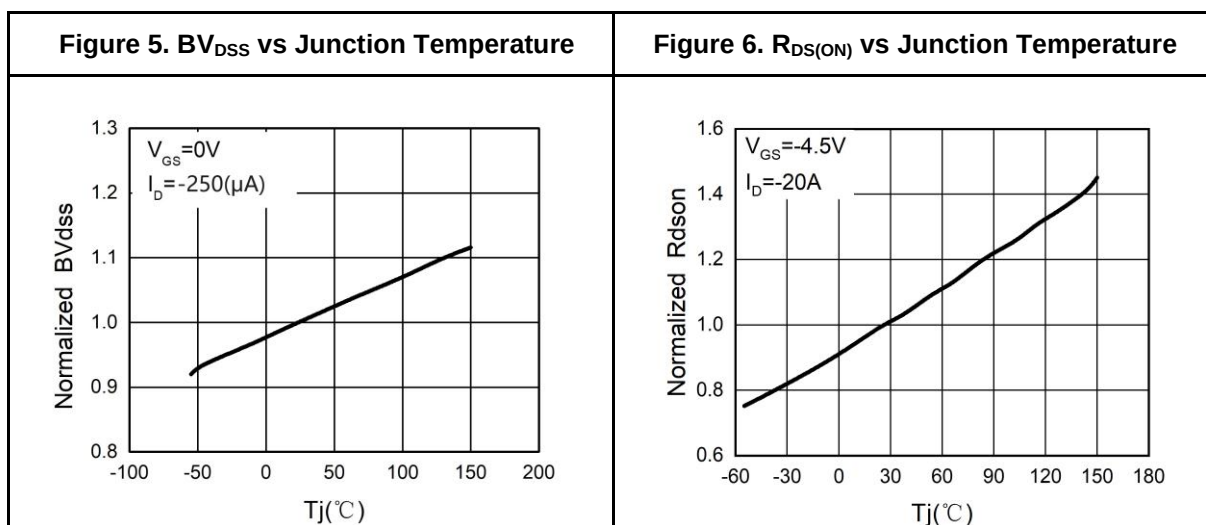
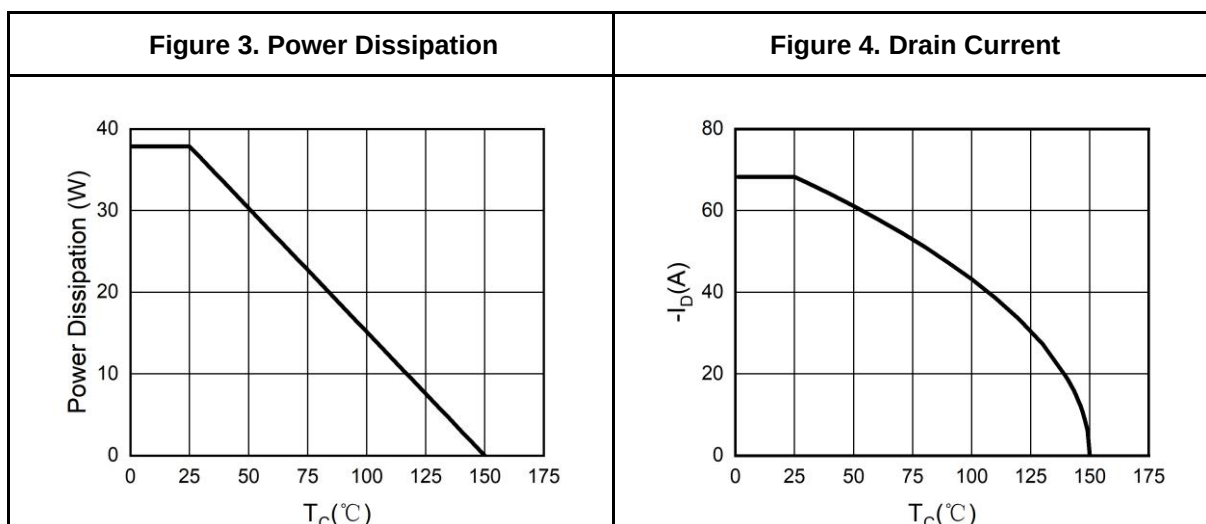
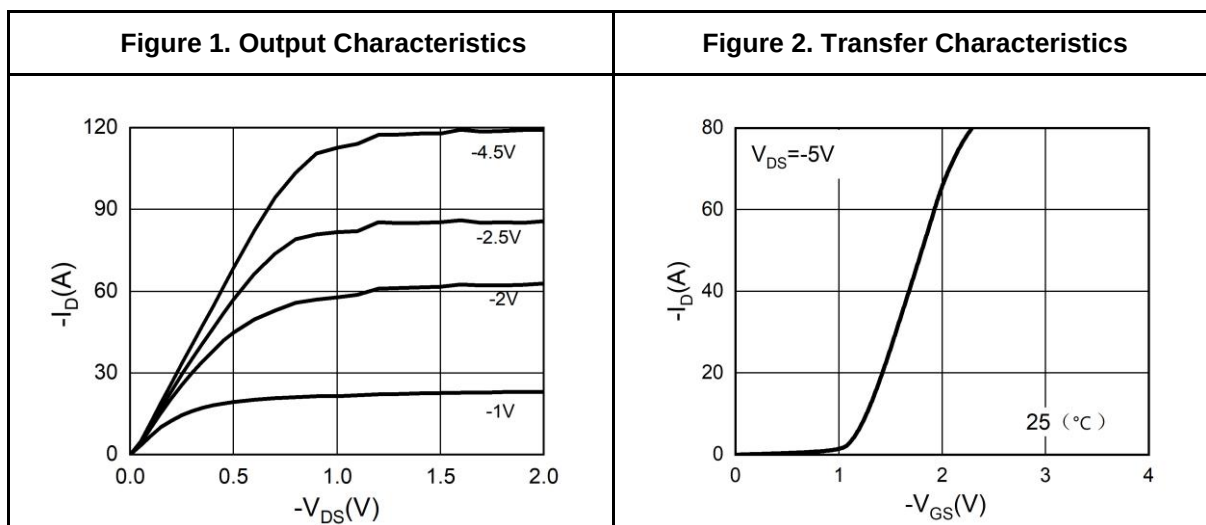
Notes 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=-20V, V_G=-10V, R_g=25\Omega, L=0.5\text{mH}$.

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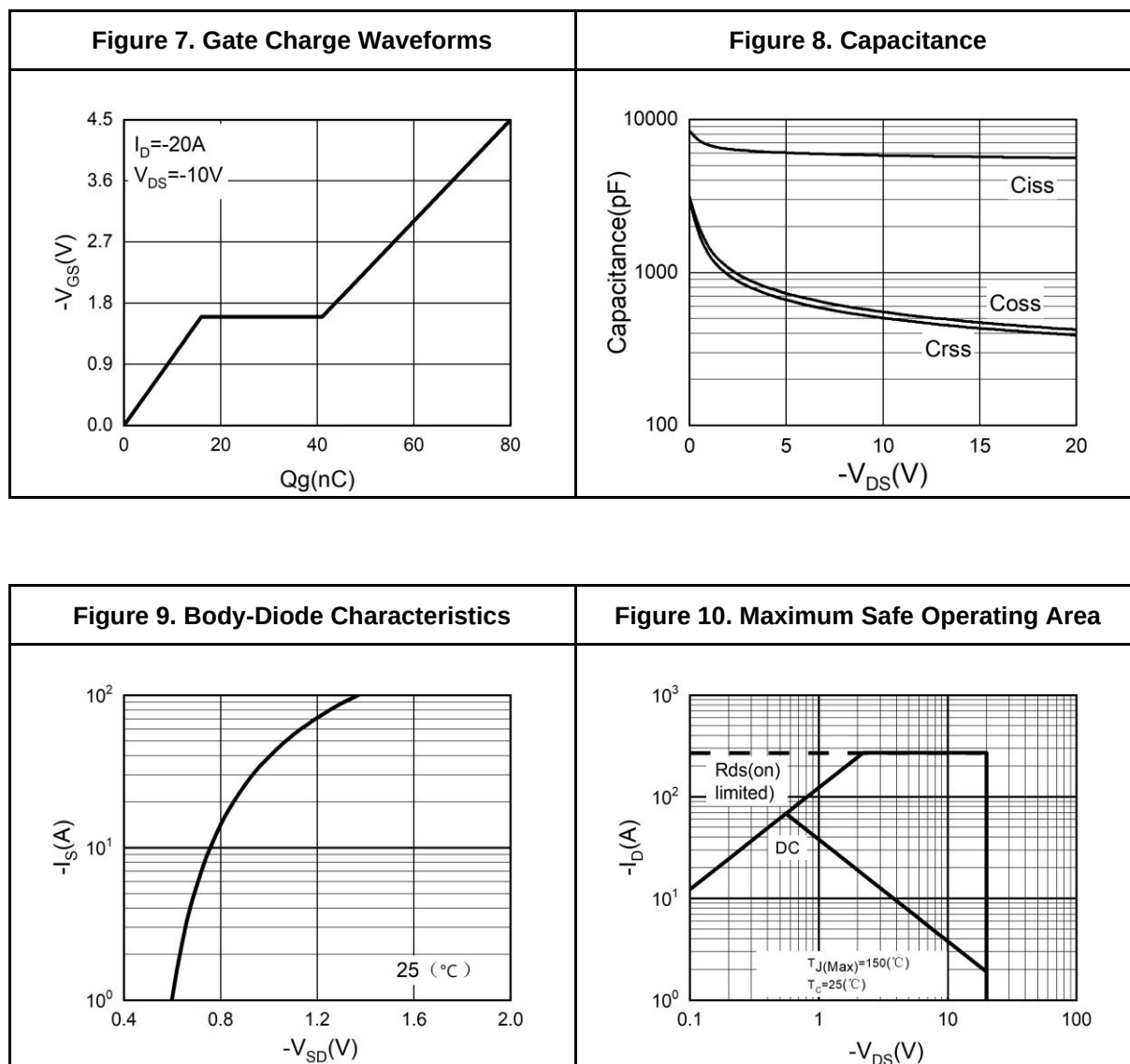
Typical Electrical And Thermal Characteristics (Curves)





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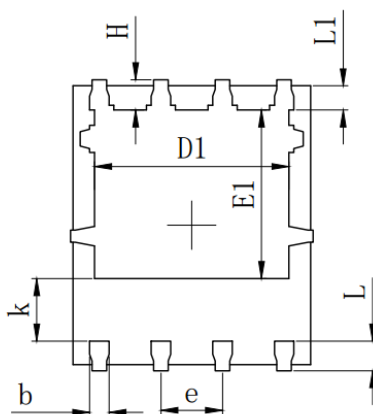
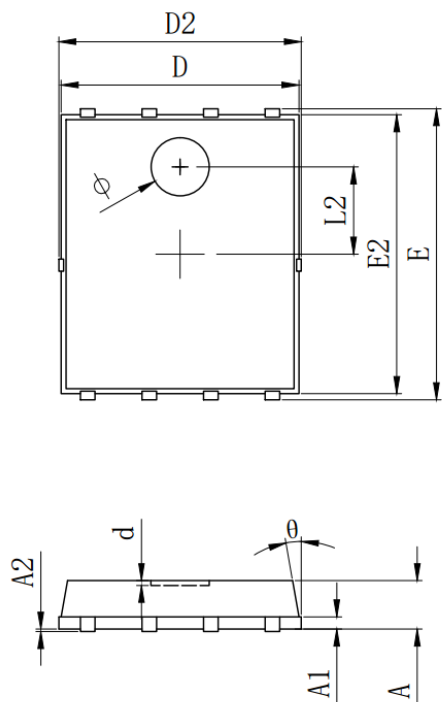
Typical Electrical And Thermal Characteristics (Curves)





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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

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Φ	1.100	1.200	1.300
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Attention

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