



## 20V P-Channel Trench Power MOSFET

### General Description

The SJV20P090 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as -2.5V. This device is suitable for use as a wide variety of applications.

### Features

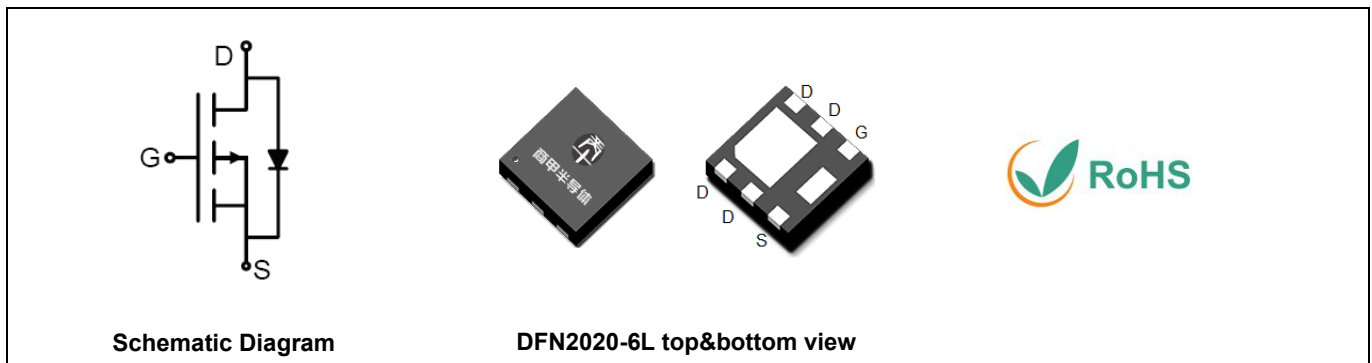
- Low Gate Charge
- High Power and current handing capability
- Lead free product is acquired

### Application

- PWM Applications
- Load Switch
- Power Management

### Key Performance Parametes

Parameter	Value	Unit
$V_{DS}$	-20	V
$R_{DS(ON\_TYP)}$	8.8	m $\Omega$
$I_D$	-19	A
$Q_G$	36	nC



### Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJV20P090	2012	DFN2020-6L	Tape	\	\	3000 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 ( $V_{DS}=0V$ )	$\pm 12$	V
$I_D$	Drain Current-Continuous( $T_C=25^\circ\text{C}$ )	-19	A
	Drain Current-Continuous( $T_C=100^\circ\text{C}$ )	-12	A
$I_{DM}$ (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	-76	A
$P_D$	Maximum Power Dissipation( $T_C=25^\circ\text{C}$ )	6	W
	Maximum Power Dissipation( $T_C=100^\circ\text{C}$ )	2.4	W
$E_{AS}$	Avalanche energy (Note 2)	90	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		21	$^\circ\text{C/W}$



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**Table 3. Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
B <sub>VDSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V I <sub>D</sub> =-250μA	-20			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V T <sub>J</sub> =25°C			-1	μA
		V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V T <sub>J</sub> =125°C			-100	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±12V, 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	-0.5		-1	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-6A		23.9		S
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A T <sub>J</sub> =25°C		8.8	11.4	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-4A T <sub>J</sub> =25°C		11.9	15.8	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1.0MHz		2711		pF
C <sub>oss</sub>	Output Capacitance			321		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			269		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1.0MHz		8.3		Ω
<b>Switching Parameters</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, R <sub>L</sub> =1.5Ω, R <sub>GEN</sub> =6Ω		16.6		nS
t <sub>r</sub>	Turn-on Rise Time			33.2		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			128.4		nS
t <sub>f</sub>	Turn-Off Fall Time			67.2		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-6A		36		nC
Q <sub>gs</sub>	Gate-Source Charge			7		nC
Q <sub>gd</sub>	Gate-Drain Charge			9		nC
<b>Source-Drain Diode Characteristics</b>						
I <sub>SD</sub>	Source-Drain Current (Body Diode)				-19	A
V <sub>SD</sub>	Forward on Voltage <sup>(Note 3)</sup>	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		16.8		ns
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>F</sub> =-6A, dI/dt=-100A/μs		5.1		nC

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

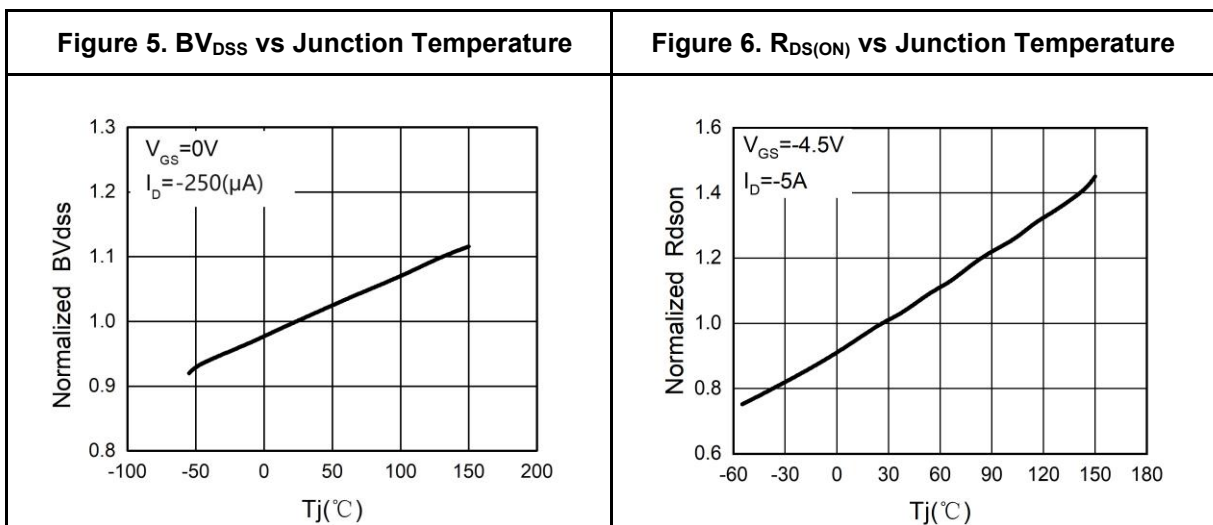
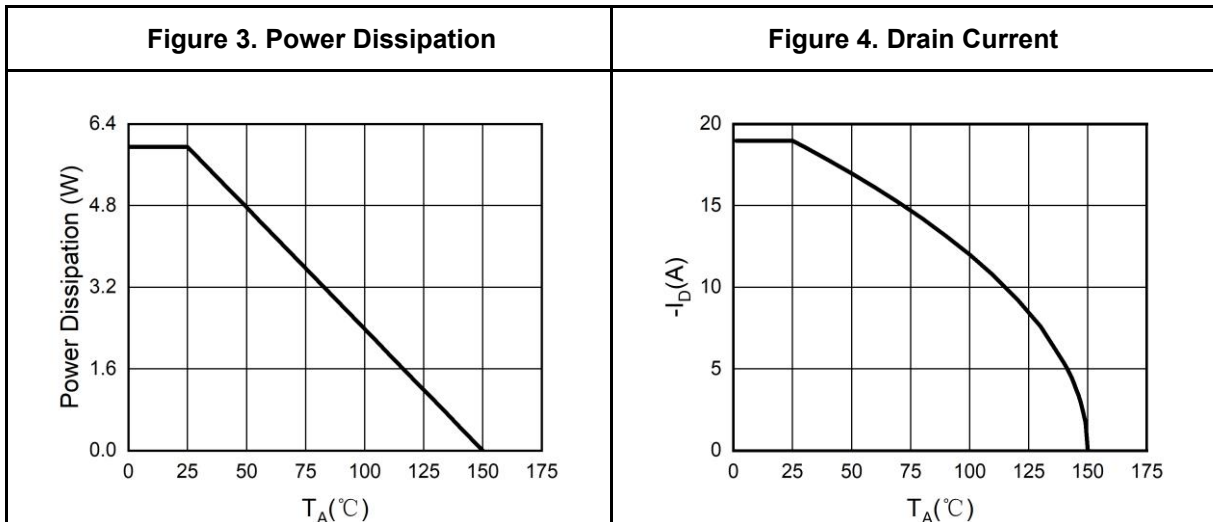
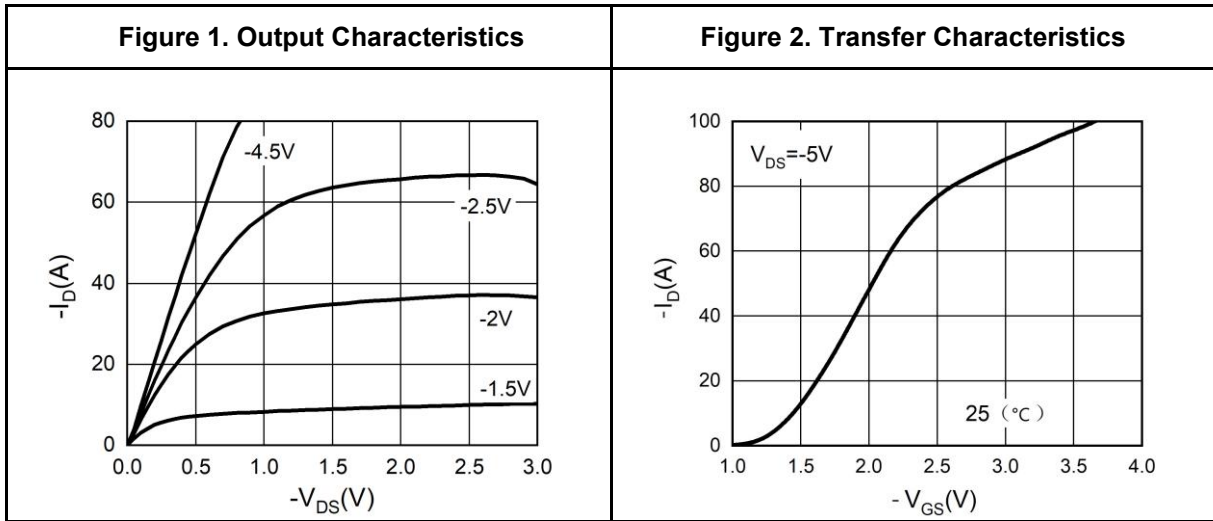
Notes 2.EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=-20V, V<sub>G</sub>=-10V, R<sub>g</sub>=25Ω, L=0.5mH.

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



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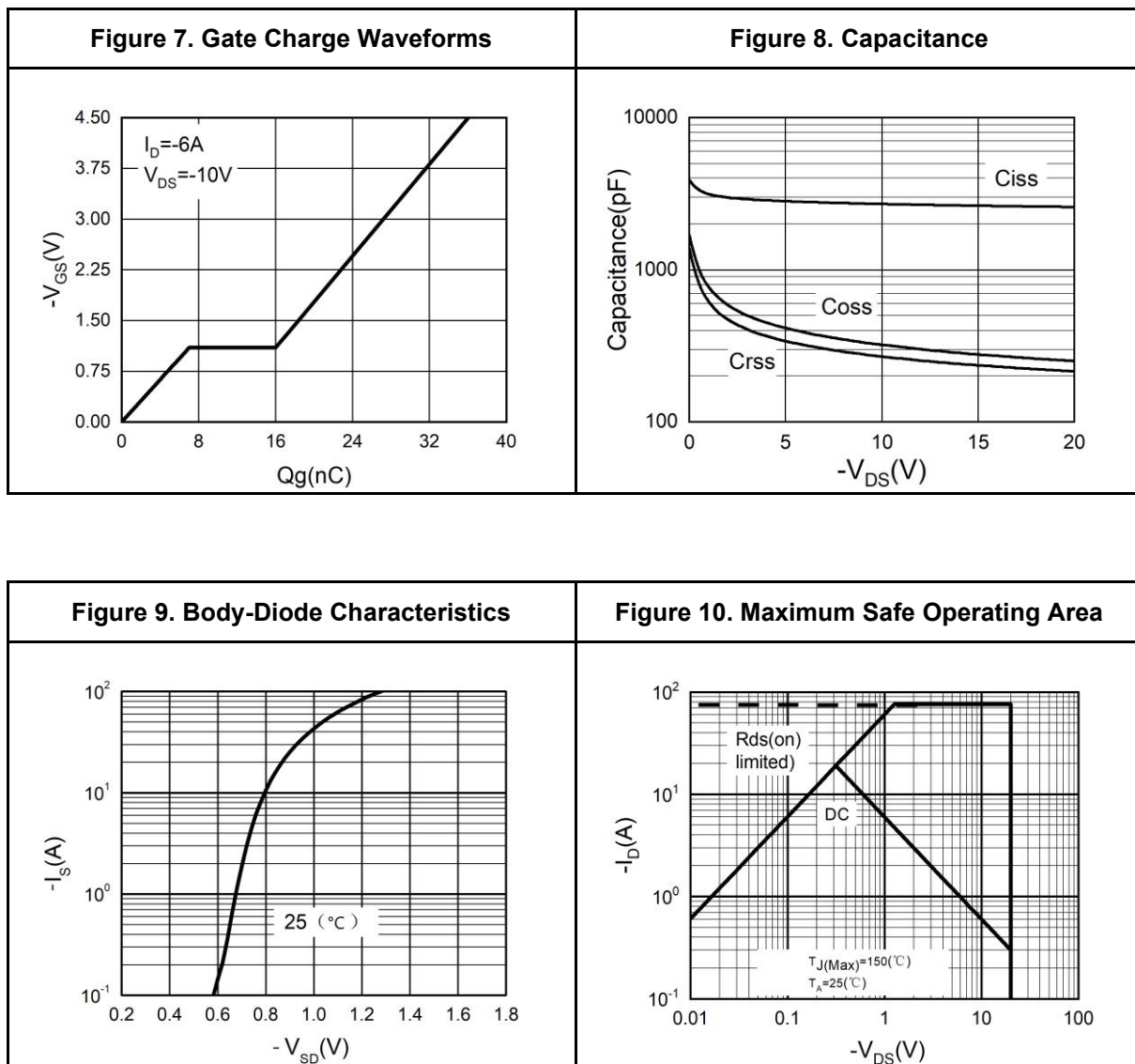
## Typical Electrical And Thermal Characteristics (Curves)





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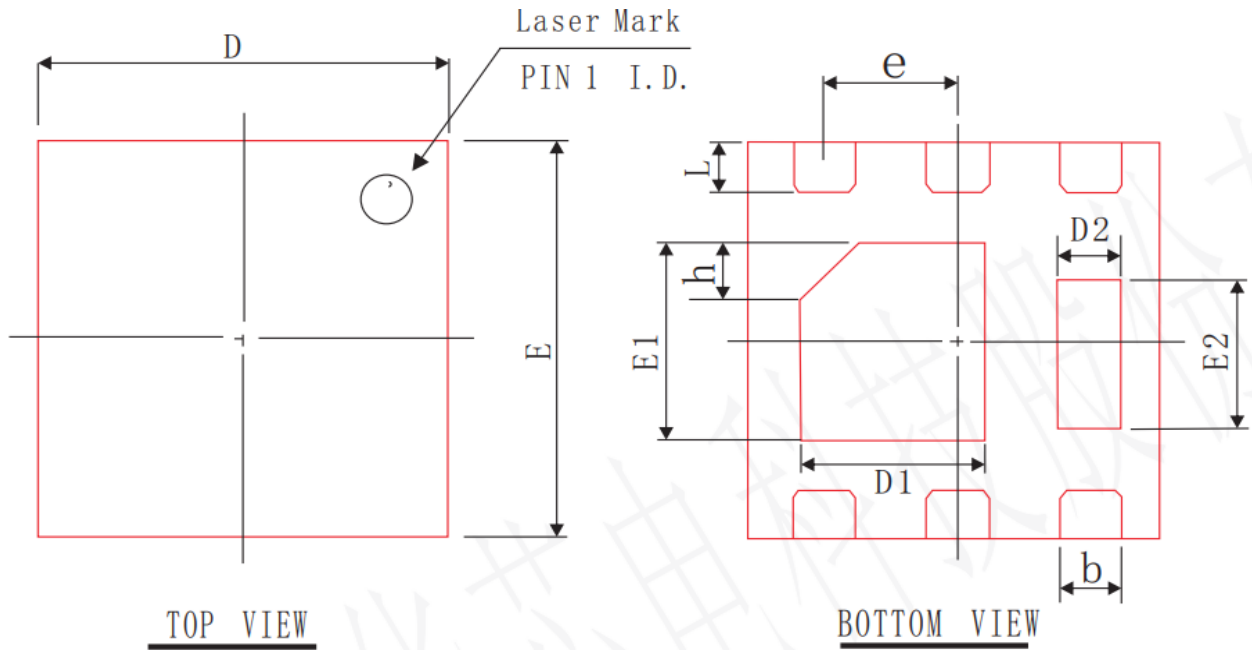
## Typical Electrical And Thermal Characteristics (Curves)





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### DFN2020-6L Package Information



SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
b	0.20	0.25	0.30
D	1.95	2.00	2.07
E	1.95	2.00	2.07
D1	0.80	0.90	1.00
E1	0.90	1.00	1.10
D2	0.20	0.30	0.40
E2	0.65	0.75	0.85
L	0.20	0.25	0.35
h	0.20	0.25	0.30
c	0.203 REF		
e	0.65 BSC		

其它厚度尺寸如下

A	0.55	0.60	0.65
A	0.50	0.55	0.60



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### 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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