



# 100V P-Channel Trench Power MOSFET

## General Description

The SJD01P650 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 handing capability
- Lead free product is acquired

## Application

- PWM Applications
- Load Switch
- Power Management

## Key Performance Parametes

Parameter	Value	Unit
$V_{DS}$	-100	V
$R_{DS(ON\_TYP)}$	60.5	m $\Omega$
$I_D$	-20	A
$Q_G$	58	nC



## Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJD01P650	SJD01P650	TO-252	Tape	\	\	2500 Pcs

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

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage ( $V_{GS}=0V$ )	-100	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0V$ )	$\pm 20$	V
$I_D$	Drain Current-Continuous( $T_C=25^\circ\text{C}$ )	-20	A
	Drain Current-Continuous( $T_C=100^\circ\text{C}$ )	-13	A
$I_{DM}$ (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	-80	A
$P_D$	Maximum Power Dissipation( $T_C=25^\circ\text{C}$ )	69	W
	Maximum Power Dissipation( $T_C=100^\circ\text{C}$ )	28	W
$E_{AS}$	Avalanche energy (Note 2)	210	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		1.8	$^\circ\text{C/W}$



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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>V</sub> DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V I <sub>D</sub> =-250μA	-100			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-200V, V <sub>GS</sub> =0V T <sub>J</sub> =25°C			-1	μA
		V <sub>DS</sub> =-200V, 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> =±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		-2.5	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-9A		25		S
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-9A T <sub>J</sub> =25°C		60.5	75.6	mΩ
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		63.7	84.7	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-50V, V <sub>GS</sub> =0V, f=1.0MHz		5330		pF
C <sub>oss</sub>	Output Capacitance			107		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			88		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1.0MHz		9		Ω
<b>Switching Parameters</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-50V, R <sub>L</sub> =5Ω, R <sub>GEN</sub> =3Ω		8		nS
t <sub>r</sub>	Turn-on Rise Time			27		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			110		nS
t <sub>f</sub>	Turn-Off Fall Time			77		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-50V, I <sub>D</sub> =-10A		58		nC
Q <sub>gs</sub>	Gate-Source Charge			9		nC
Q <sub>gd</sub>	Gate-Drain Charge			10		nC
<b>Source-Drain Diode Characteristics</b>						
I <sub>SD</sub>	Source-Drain Current (Body Diode)				-20	A
V <sub>SD</sub>	Forward on Voltage <sup>(Note 3)</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =-10A			-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =-10A, dI/dt=100A/μs		36		ns
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>F</sub> =-10A, dI/dt=100A/μs		40		nC

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

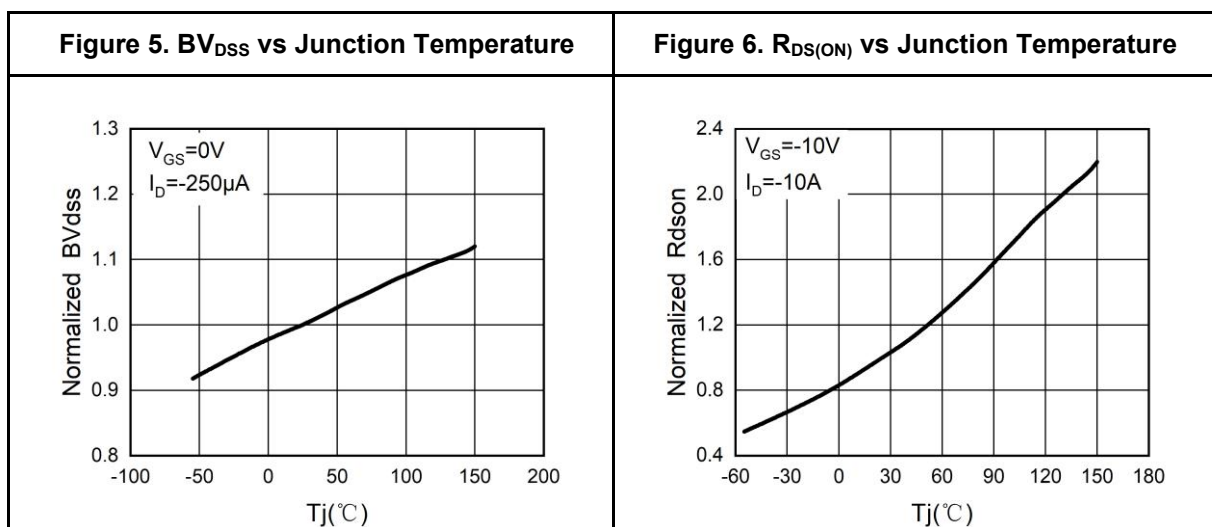
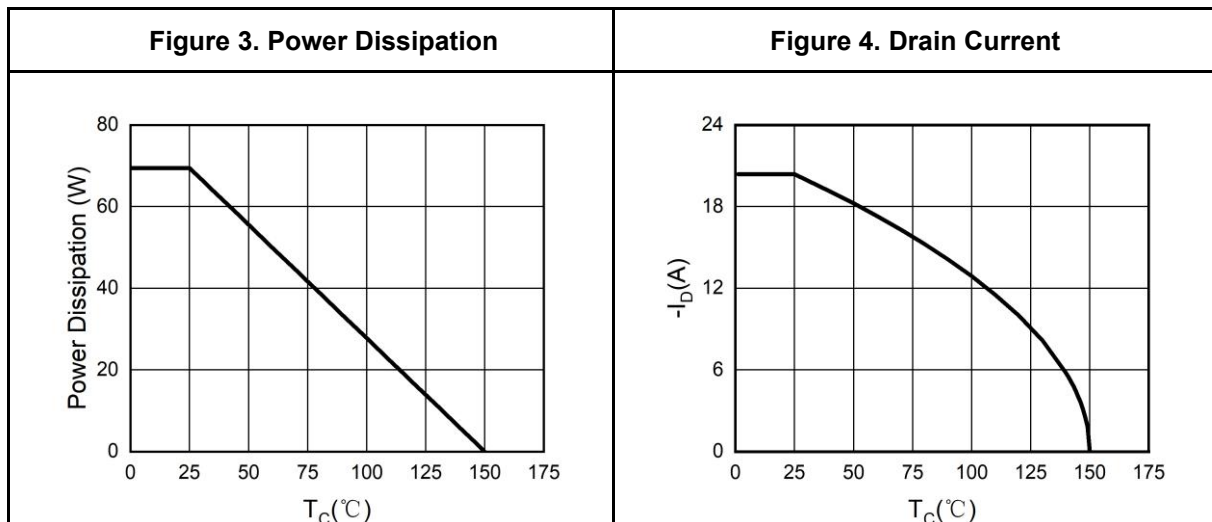
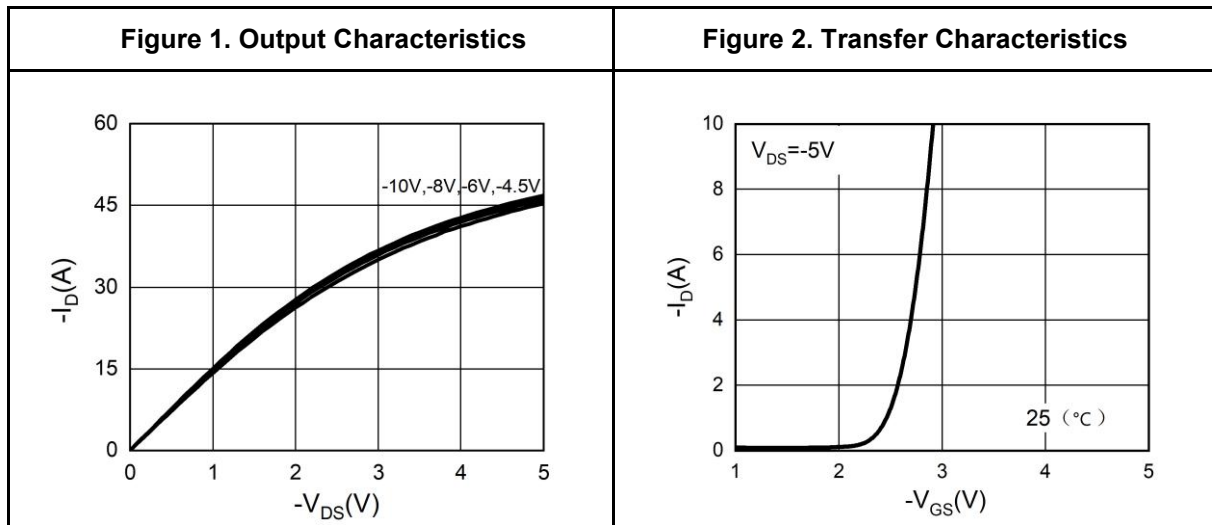
Notes 2.EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=50V, V<sub>G</sub>=-10V, R<sub>g</sub>=25Ω, L=0.5mH.

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



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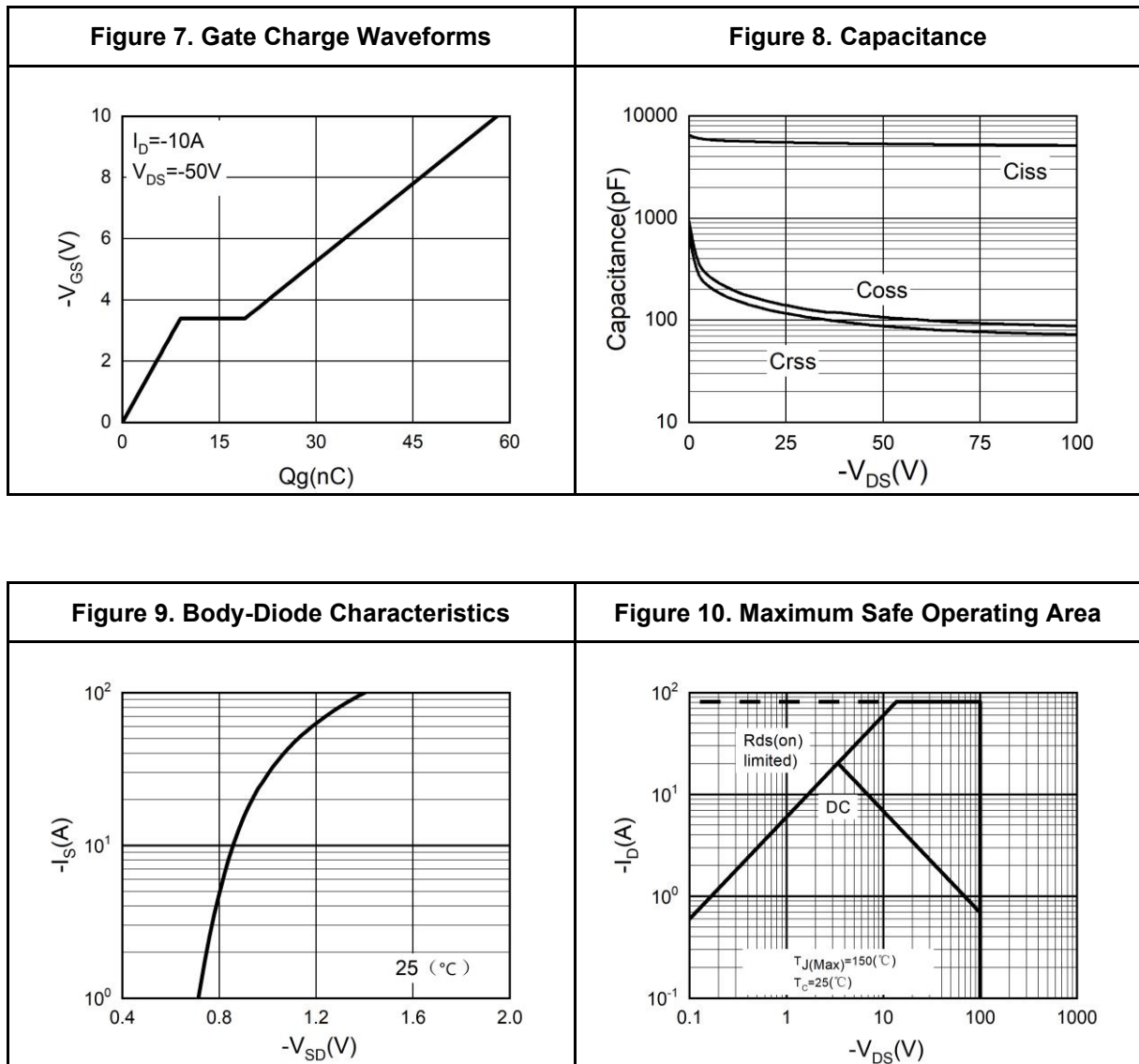
## Typical Electrical And Thermal Characteristics (Curves)





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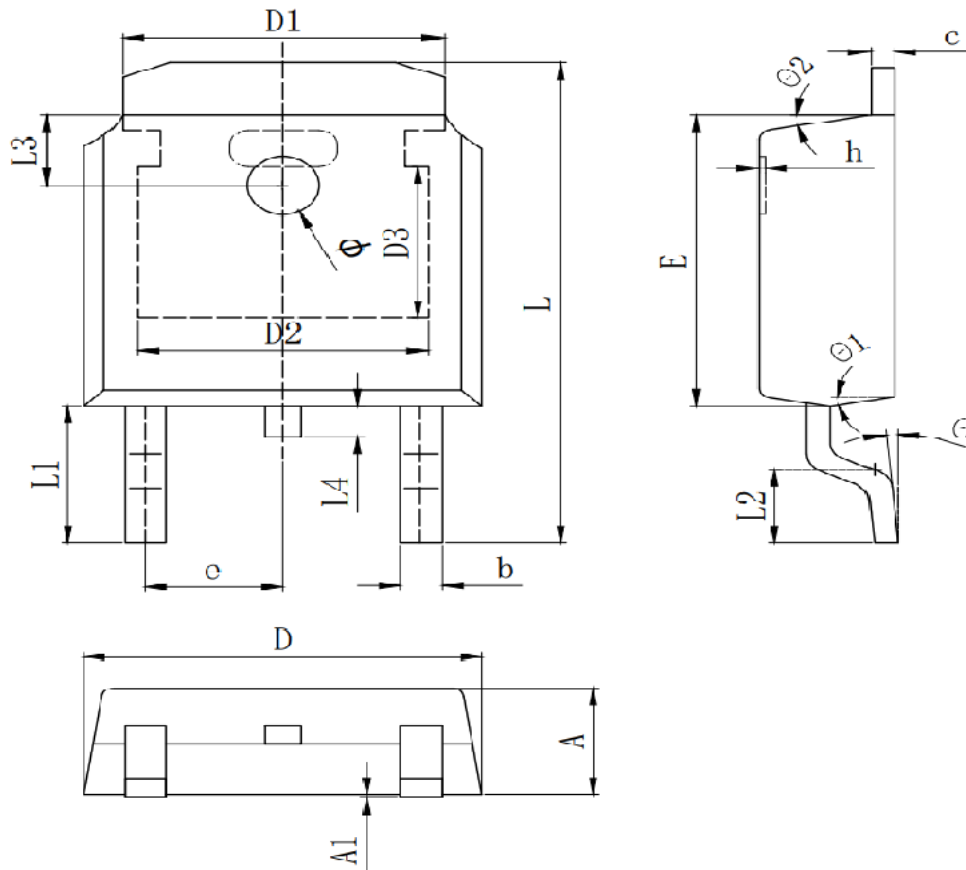
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TO-252 Package Information



Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c(电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1		5.334 REF	
D2		4.826 REF	
D3		3.166 REF	
E	6.000	6.100	6.200
e		2.286 TYP	
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1		2.888 REF	
L2	1.400	1.550	1.700
L3		1.600 REF	
L4	0.600	0.800	1.000
Φ	1.100	1.200	1.300
θ	0°		8°
θ1		9° TYP	
θ2		9° TYP	



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### Attention

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