



## 30V N-Channel SGT Power MOSFET

### General Description

The SJD013N03A 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
$V_{DS}$	30	V
$R_{DS(ON\_TYP)}$	2.1	m $\Omega$
$I_D$	140	A
$Q_G$	29	nC



### Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJD013N03A	SJD013N03A	TO-252	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 ( $V_{GS}=0V$ )	30	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0V$ )	$\pm 20$	V
$I_D$	Drain Current-Continuous( $T_C=25^\circ\text{C}$ )	140	A
	Drain Current-Continuous( $T_C=100^\circ\text{C}$ )	89	A
$I_{DM}$ (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	560	A
$P_D$	Maximum Power Dissipation( $T_C=25^\circ\text{C}$ )	83	W
	Maximum Power Dissipation( $T_C=100^\circ\text{C}$ )	33	W
$E_{AS}$	Avalanche energy (Note 2)	324	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		1.5	$^\circ\text{C/W}$



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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V, T_J=25^{\circ}\text{C}$			1	$\mu A$
		$V_{DS}=30V, V_{GS}=0V, T_J=125^{\circ}\text{C}$			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	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		2.5	V
$g_{FS}$	Forward Transconductance	$V_{DS}=5V, I_D=15A$		45		S
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=15A, T_J=25^{\circ}\text{C}$		2.1	2.6	m $\Omega$
		$V_{GS}=4.5V, I_D=10A, T_J=25^{\circ}\text{C}$		2.8	3.7	m $\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1.0\text{MHz}$		2010		pF
$C_{oss}$	Output Capacitance			1030		pF
$C_{rss}$	Reverse Transfer Capacitance			50		pF
$R_g$	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$		1.7		$\Omega$
<b>Switching Parameters</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DS}=15V, R_L=0.75\Omega, R_{GEN}=3\Omega$		24		nS
$t_r$	Turn-on Rise Time			50		nS
$t_{d(off)}$	Turn-Off Delay Time			35		nS
$t_f$	Turn-Off Fall Time			30		nS
$Q_g$	Total Gate Charge	$V_{GS}=10V, V_{DS}=15V, I_D=15A$		29		nC
$Q_{gs}$	Gate-Source Charge			6		nC
$Q_{gd}$	Gate-Drain Charge			5.5		nC
<b>Source-Drain Diode Characteristics</b>						
$I_{SD}$	Source-Drain Current (Body Diode)				140	A
$V_{SD}$	Forward on Voltage (Note 3)	$V_{GS}=0V, I_S=15A$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F=15A, dI/dt=100A/\mu s$		55		ns
$Q_{rr}$	Reverse Recovery Charge	$I_F=15A, dI/dt=100A/\mu s$		61		nC

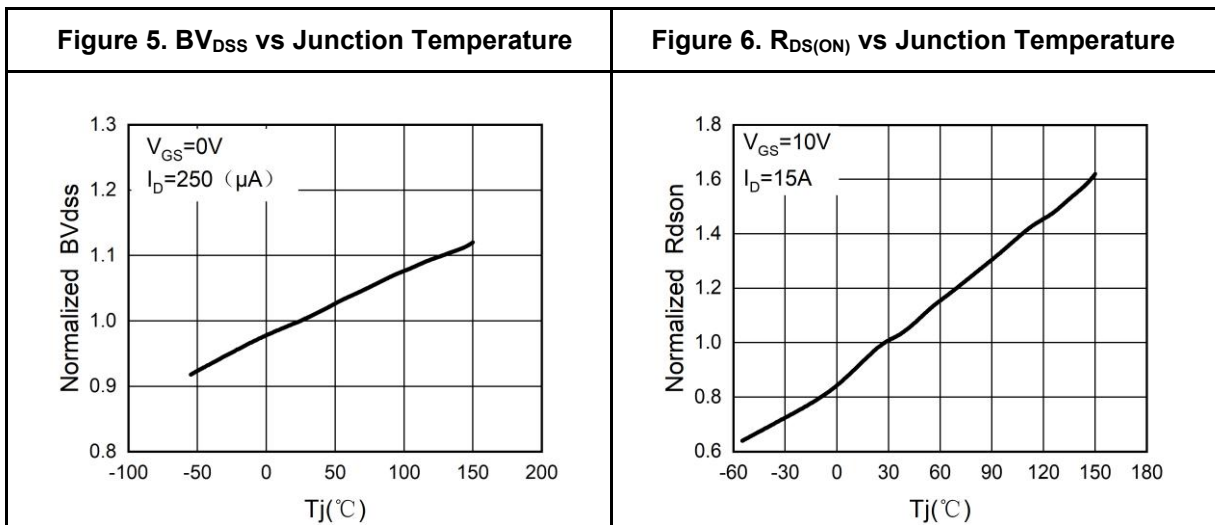
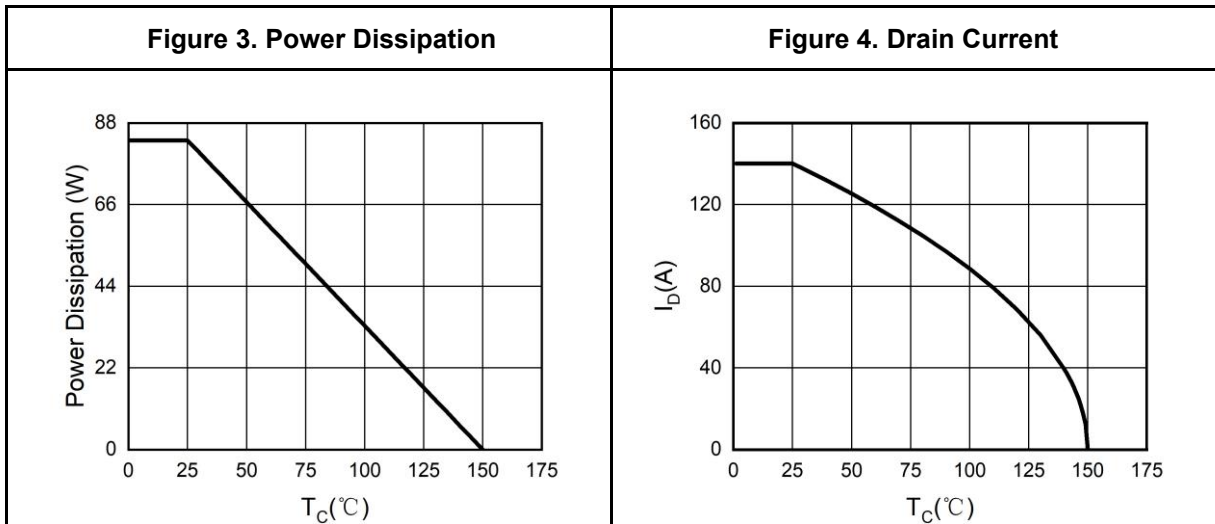
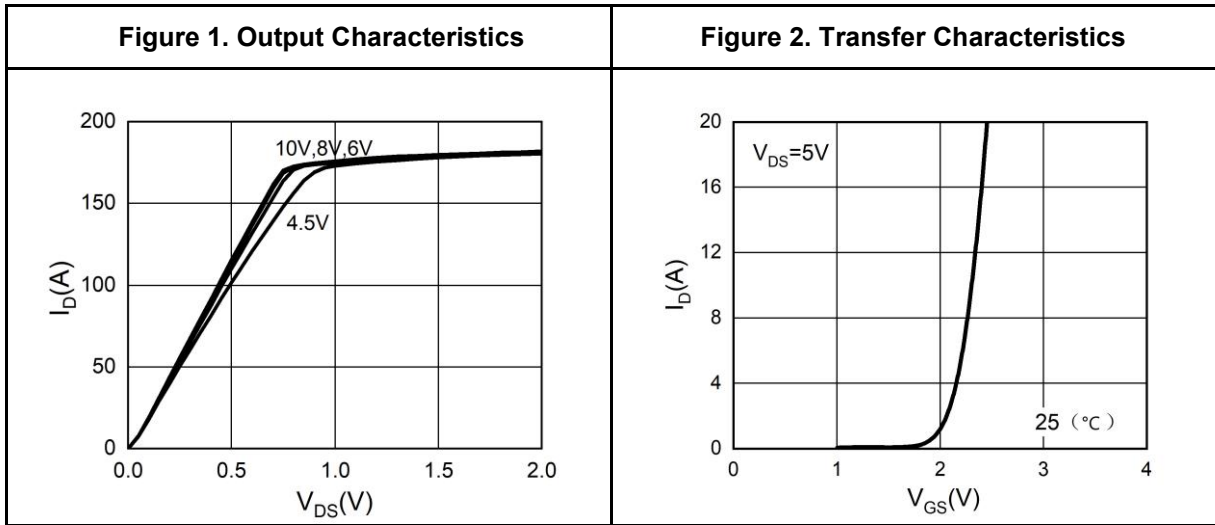
Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$ .

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

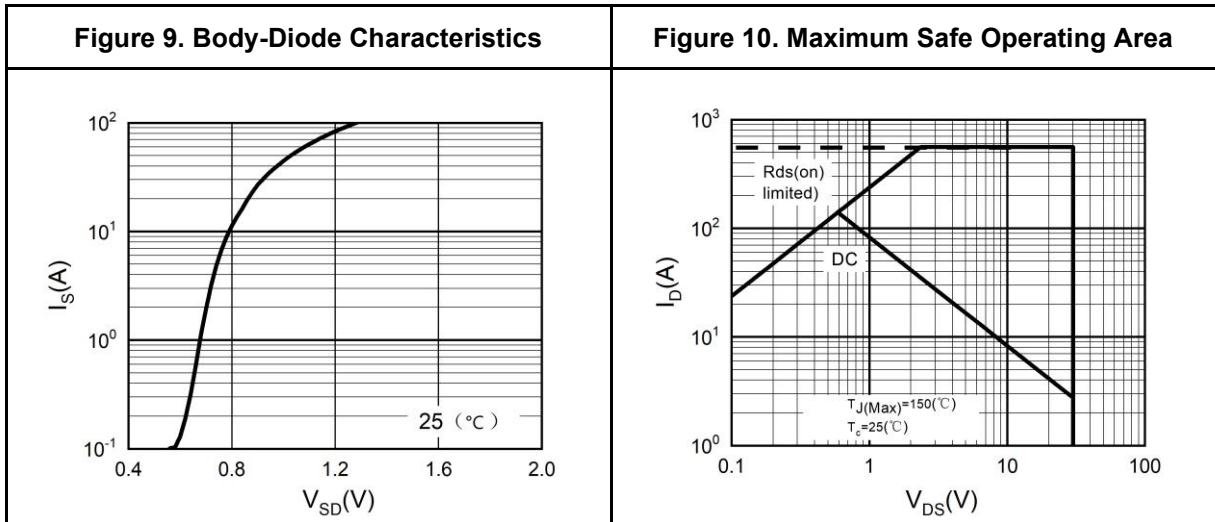
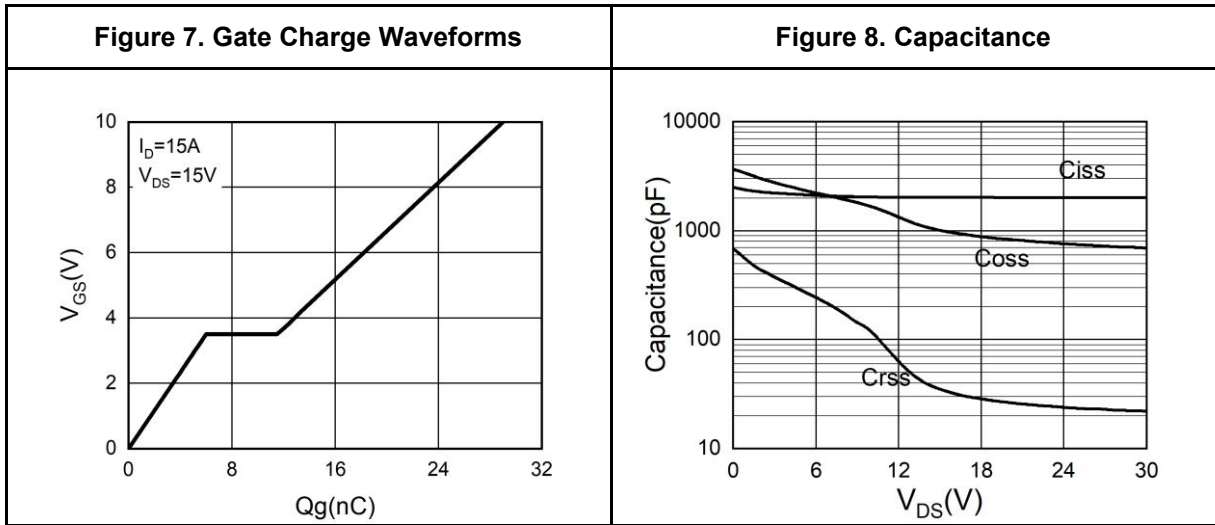


Typical Electrical And Thermal Characteristics (Curves)



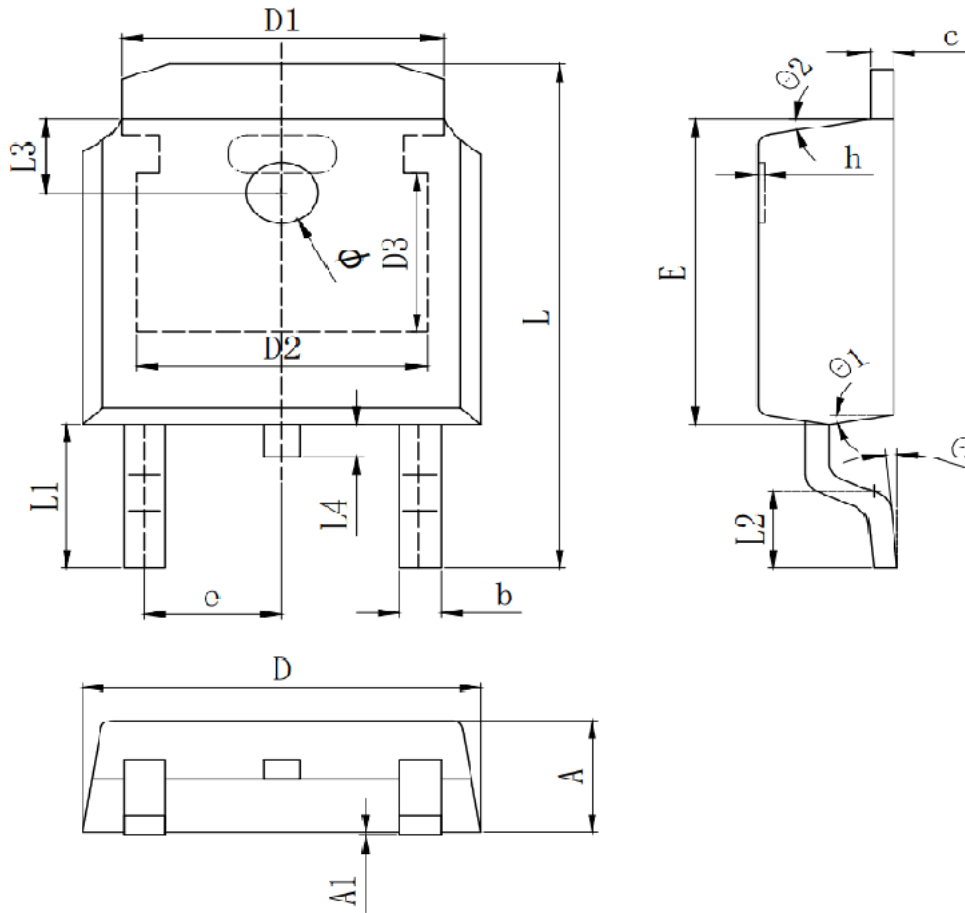


Typical Electrical And Thermal Characteristics (Curves)





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		



## **Attention**

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