



## 30V N-Channel SGT Power MOSFET

### General Description

The SJM050ND03 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

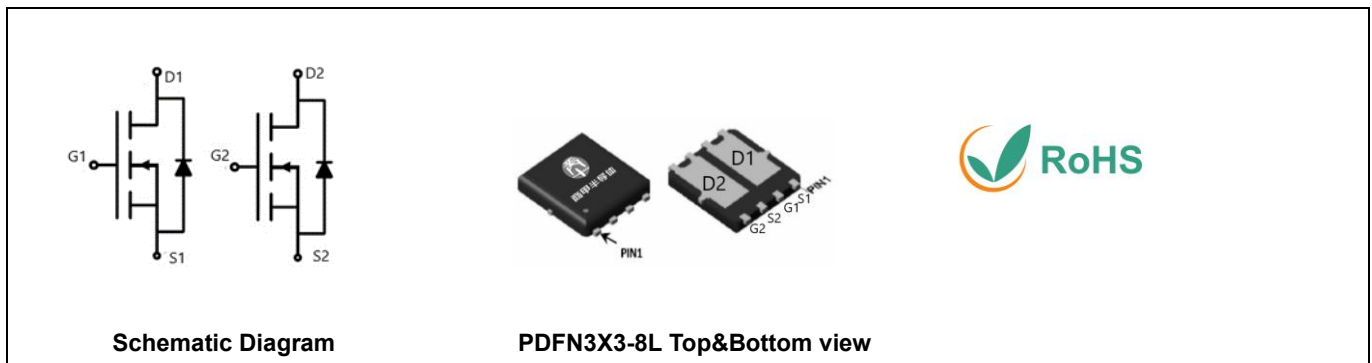
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

### Application

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

### Key Performance Parameters

Parameter	Value	Unit
$V_{DS}$	30	V
$R_{DS(ON\_TYP)}$	6.6	m $\Omega$
$I_D$	60	A
$Q_G$	12.6	nC



### Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJM050ND03	SJM050ND03	PDFN3X3-8L	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 ( $V_{GS}=0V$ )	30	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0V$ )	$\pm 20$	V
$I_D$	Drain Current-Continuous( $T_C=25^\circ\text{C}$ )	60	A
	Drain Current-Continuous( $T_C=100^\circ\text{C}$ )	38	A
$I_{DM}$ (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	240	A
$P_D$	Maximum Power Dissipation( $T_C=25^\circ\text{C}$ )	48	W
	Maximum Power Dissipation( $T_C=100^\circ\text{C}$ )	19	W
$E_{AS}$	Avalanche energy (Note 2)	484	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	2.6		$^\circ\text{C}/\text{W}$



30V N-Channel SGT Power MOSFET

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	$V_{DS}=5V, I_D=20A$		66		S
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=20A, T_J=25^\circ\text{C}$		6.6	8.3	m $\Omega$
		$V_{GS}=4.5V, I_D=20A, T_J=25^\circ\text{C}$		8.4	11.2	m $\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1.0\text{MHz}$		852		pF
$C_{oss}$	Output Capacitance			292		pF
$C_{rss}$	Reverse Transfer Capacitance			17		pF
$R_g$	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$		1.5		$\Omega$
<b>Switching Parameters</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DS}=15V, R_L=0.75\Omega, R_{GEN}=3\Omega$		7		nS
$t_r$	Turn-on Rise Time			4		nS
$t_{d(off)}$	Turn-Off Delay Time			19		nS
$t_f$	Turn-Off Fall Time			3		nS
$Q_g$	Total Gate Charge	$V_{GS}=10V, V_{DS}=15V, I_D=20A$		12.6		nC
$Q_{gs}$	Gate-Source Charge			3		nC
$Q_{gd}$	Gate-Drain Charge			1.8		nC
<b>Source-Drain Diode Characteristics</b>						
$I_{SD}$	Source-Drain Current (Body Diode)				60	A
$V_{SD}$	Forward on Voltage (Note 3)	$V_{GS}=0V, I_S=20A$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F=20A, dI/dt=100A/\mu s$		11		ns
$Q_{rr}$	Reverse Recovery Charge	$I_F=20A, dI/dt=100A/\mu s$		20		nC

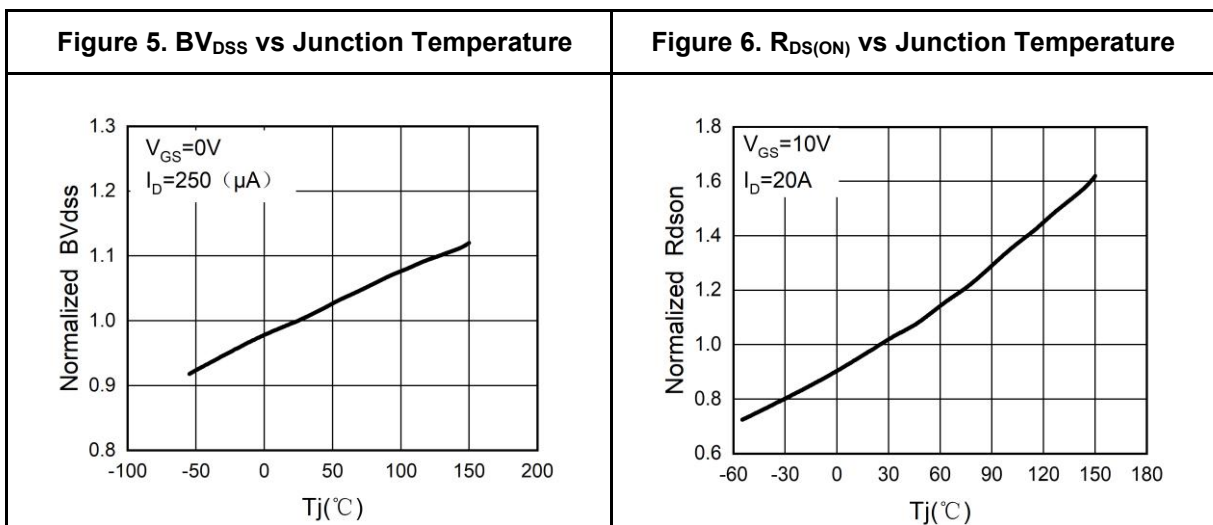
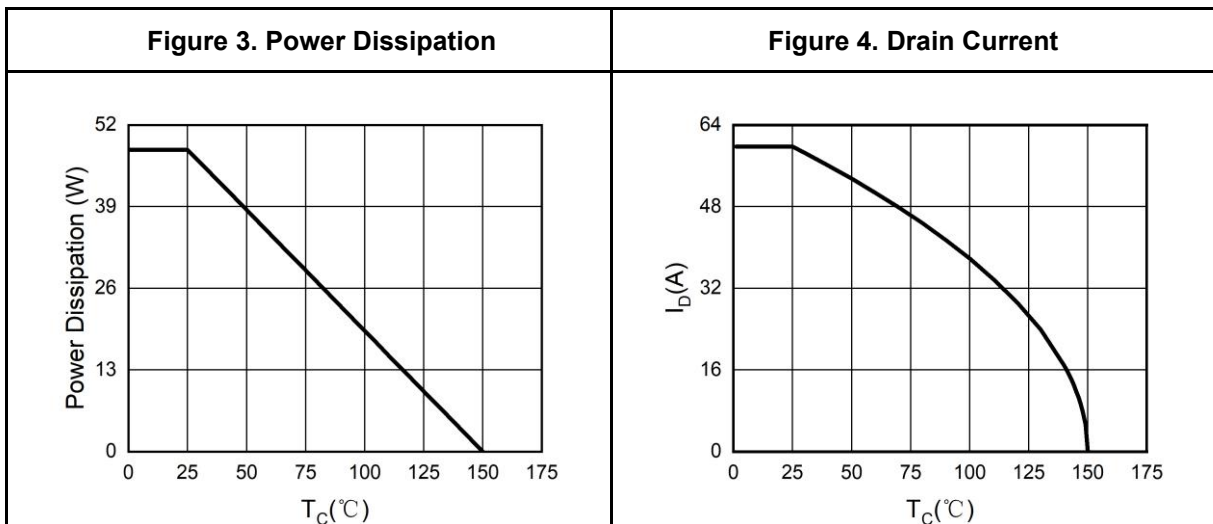
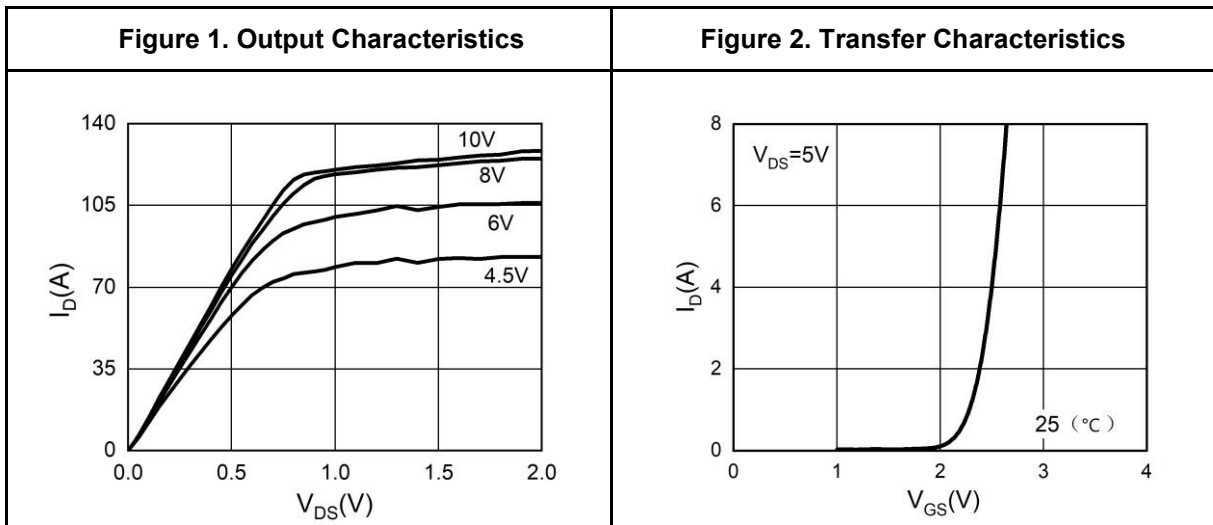
Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

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.

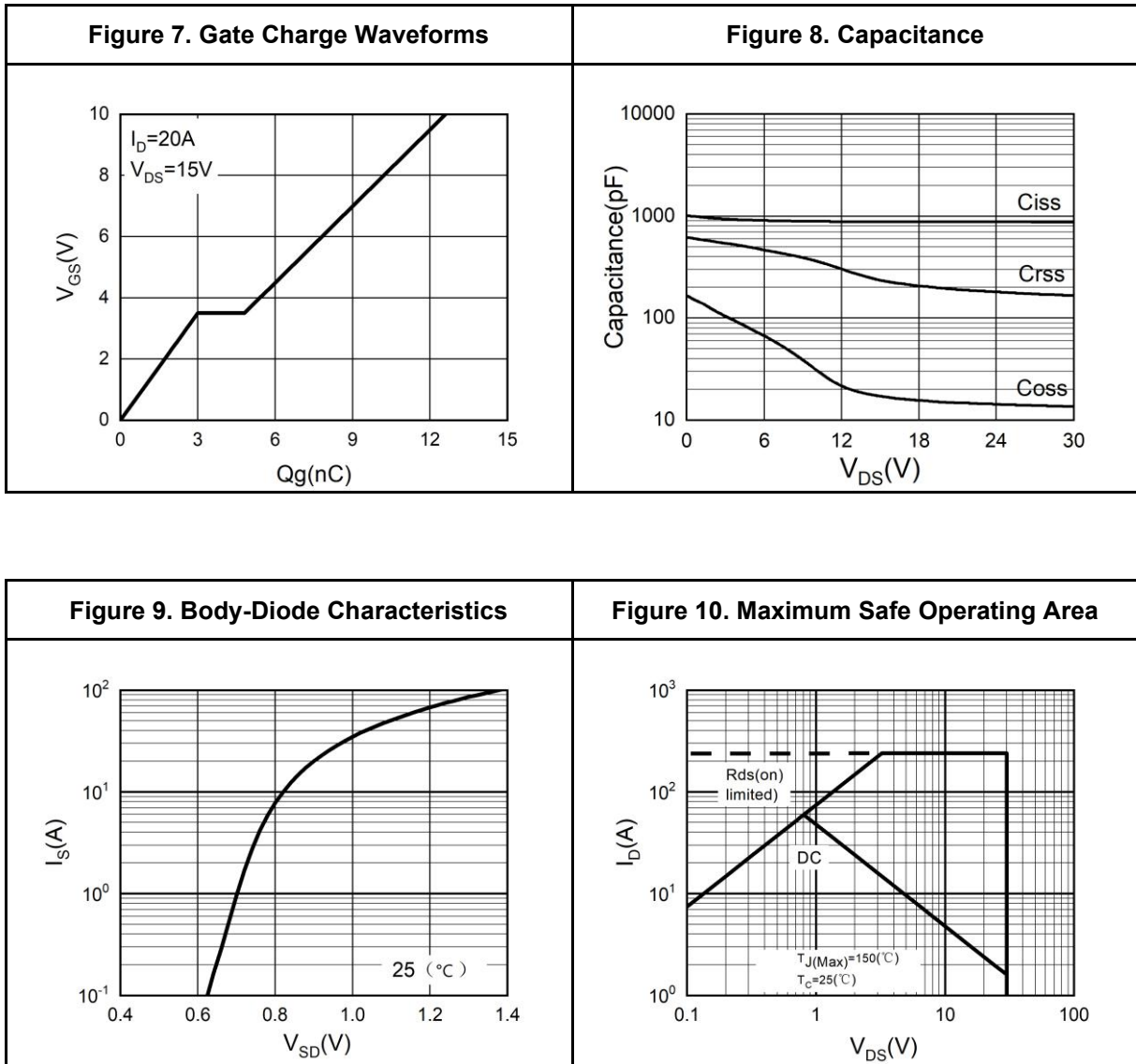


Typical Electrical And Thermal Characteristics (Curves)



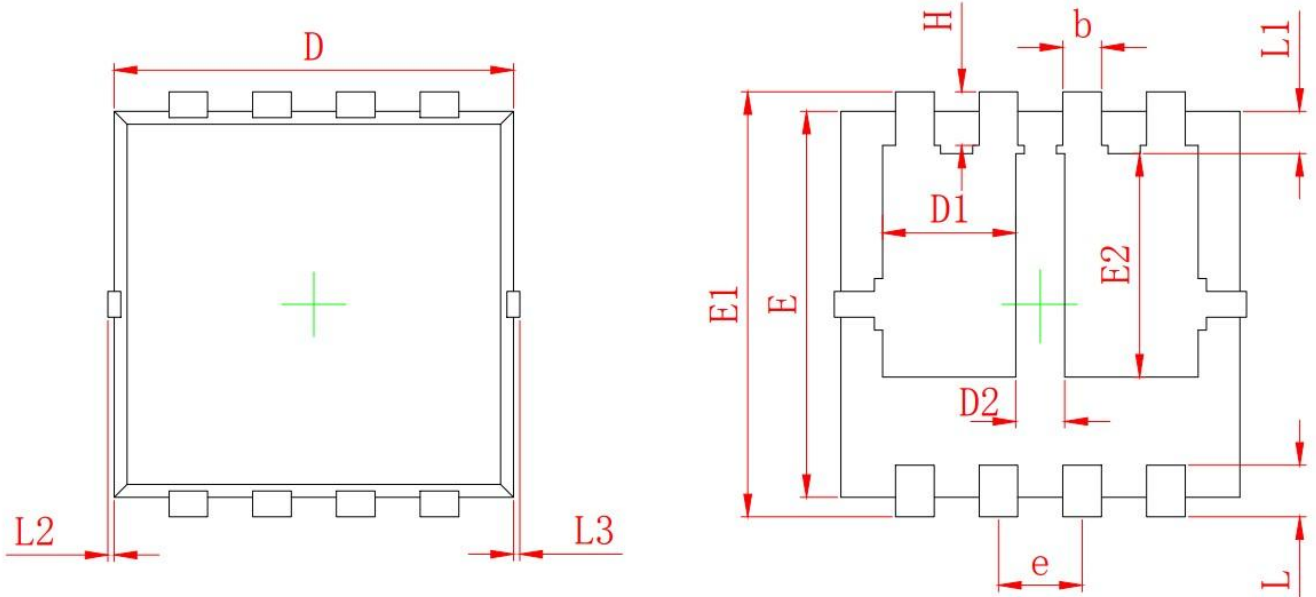


Typical Electrical And Thermal Characteristics (Curves)





PDFN3X3-8L Package Information



SYMBOL	MILLIMETER	
	MIN	MAX
A	0.700	0.900
A1	0.152 REF.	
A2	0~0.05	
D	3.000	3.200
D1	0.935	1.135
D2	0.280	0.480
E	2.900	3.100
E1	3.150	3.450
E2	1.535	1.935
b	0.200	0.400
e	0.550	0.750
L	0.300	0.500
L1	0.180	0.480
L2	0~0.100	
L3	0~0.100	
H	0.315	0.515
$\theta$	8°	12°



## **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

The performances and characteristics of this product in the independent testing state are displayed in this document. Wuxi Shangjia Semiconductor can't guarantee of the performances and characteristics of this described product that mounted in the customer's products or equipments as same as that in the independent testing state. So the customer should evaluate and test devices mounted in the customer's products or equipments.

Wuxi Shangjia Semiconductor reserves the right to improve the designs, functions and reliability of this product and modify any and all information described in this document without notice customer, apart from that when a notice agreement is signed between customer and Wuxi Shangjia Semiconductor.

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Wuxi Shangjia Semiconductor hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.