



40V N-Channel SGT Power MOSFET

General Description

The SJM022N04A 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

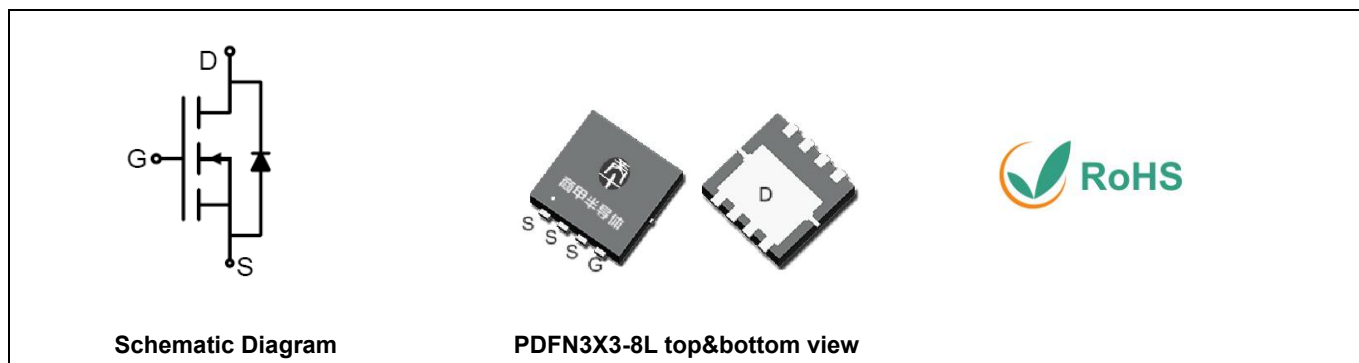
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

Application

- Load switch
- PWM applications
- Power management

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	40	V
$R_{DS(ON_TYP)}$	2.4	$m\Omega$
I_D	132	A
Q_G	32.5	nC



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Pcaking	Reel Size	Tape width	Quantity
SJM022N04A	SJM022N04A	PDFN3*3-8L	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 ($V_{GS}=0V$)	40	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	V
I_D	Drain Current-Continuous($T_c=25^\circ\text{C}$)	132	A
	Drain Current-Continuous($T_c=100^\circ\text{C}$)	83	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	528	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)	240	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	$^\circ\text{C}/\text{W}$



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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	$V_{GS}=0V, I_D=250\mu A$	40			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V, T_J=25^\circ\text{C}$			1	μA
		$V_{DS}=0V, V_{GS}=0V, T_J=125^\circ\text{C}$			100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 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	$V_{GS}=10V, I_D=15A, T_J=25^\circ\text{C}$		2.4	3	m Ω
		$V_{GS}=4.5V, I_D=10A, T_J=25^\circ\text{C}$		3.2	4.3	m Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1.0\text{MHz}$		2020		pF
C_{oss}	Output Capacitance			1290		pF
C_{rss}	Reverse Transfer Capacitance			73		pF
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$		1.7		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DS}=20V, R_L=1.3\Omega, R_{GEN}=3\Omega$		8		nS
t_r	Turn-on Rise Time			18.5		nS
$t_{d(off)}$	Turn-Off Delay Time			31		nS
t_f	Turn-Off Fall Time			12		nS
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=20V, I_D=15A$		32.5		nC
Q_{gs}	Gate-Source Charge			6		nC
Q_{gd}	Gate-Drain Charge			6		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				132	A
V_{SD}	Forward on Voltage (Note 3)	$V_{GS}=0V, I_S=20A$			1.2	V
t_{rr}	Reverse Recovery Time	$I_F=20A, dI/dt=100A/\mu s$		40		ns
Q_{rr}	Reverse Recovery Charge	$I_F=20A, dI/dt=100A/\mu s$		30		nC

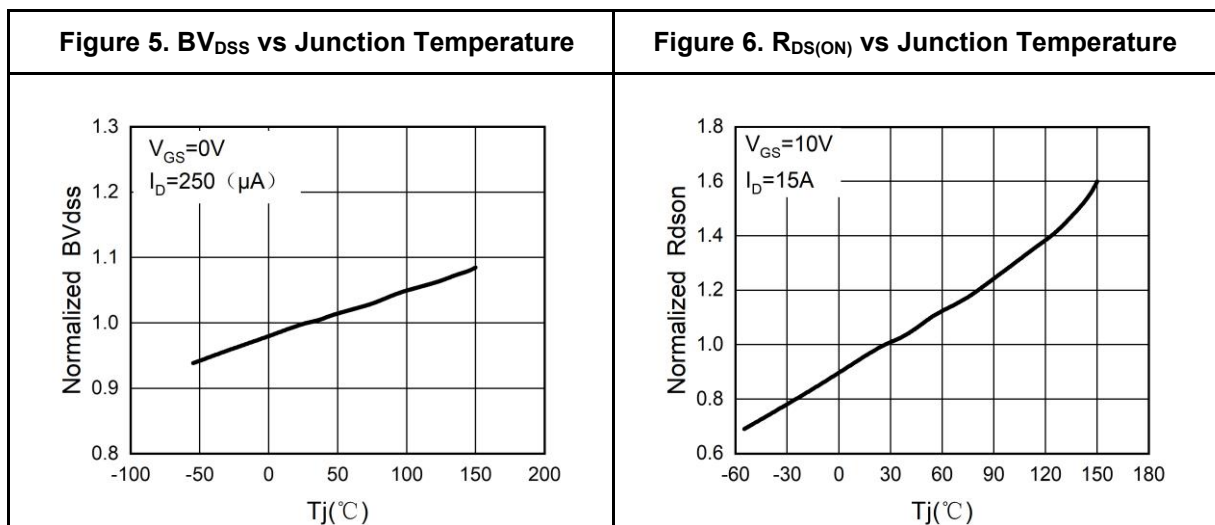
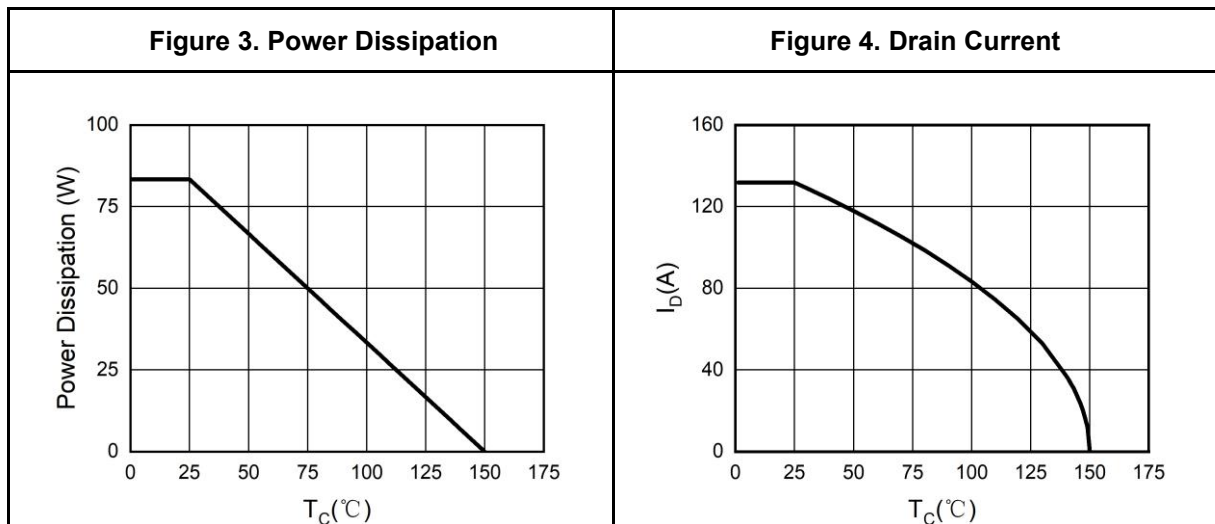
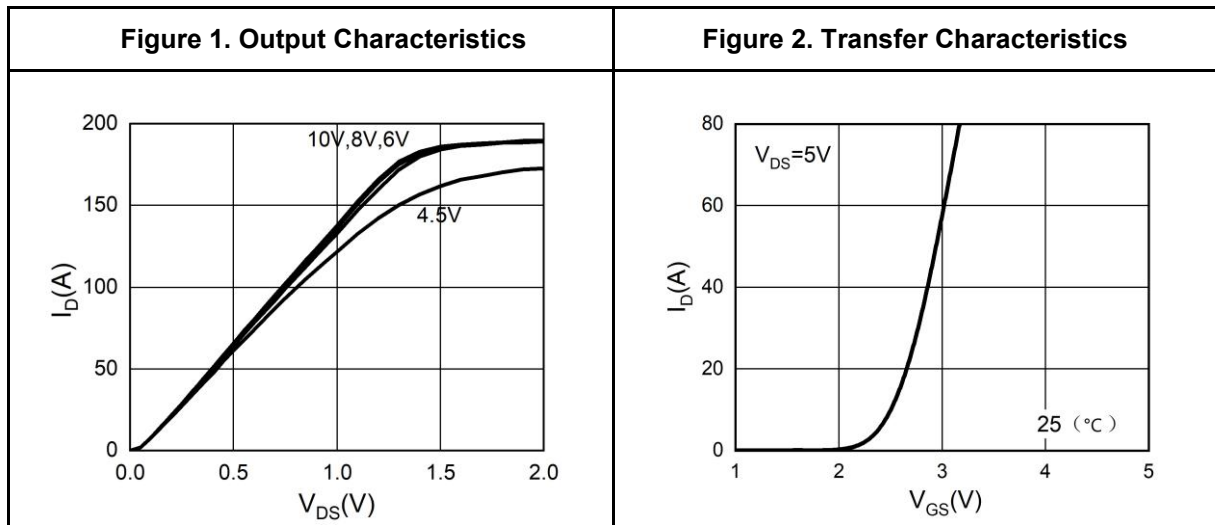
Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

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.

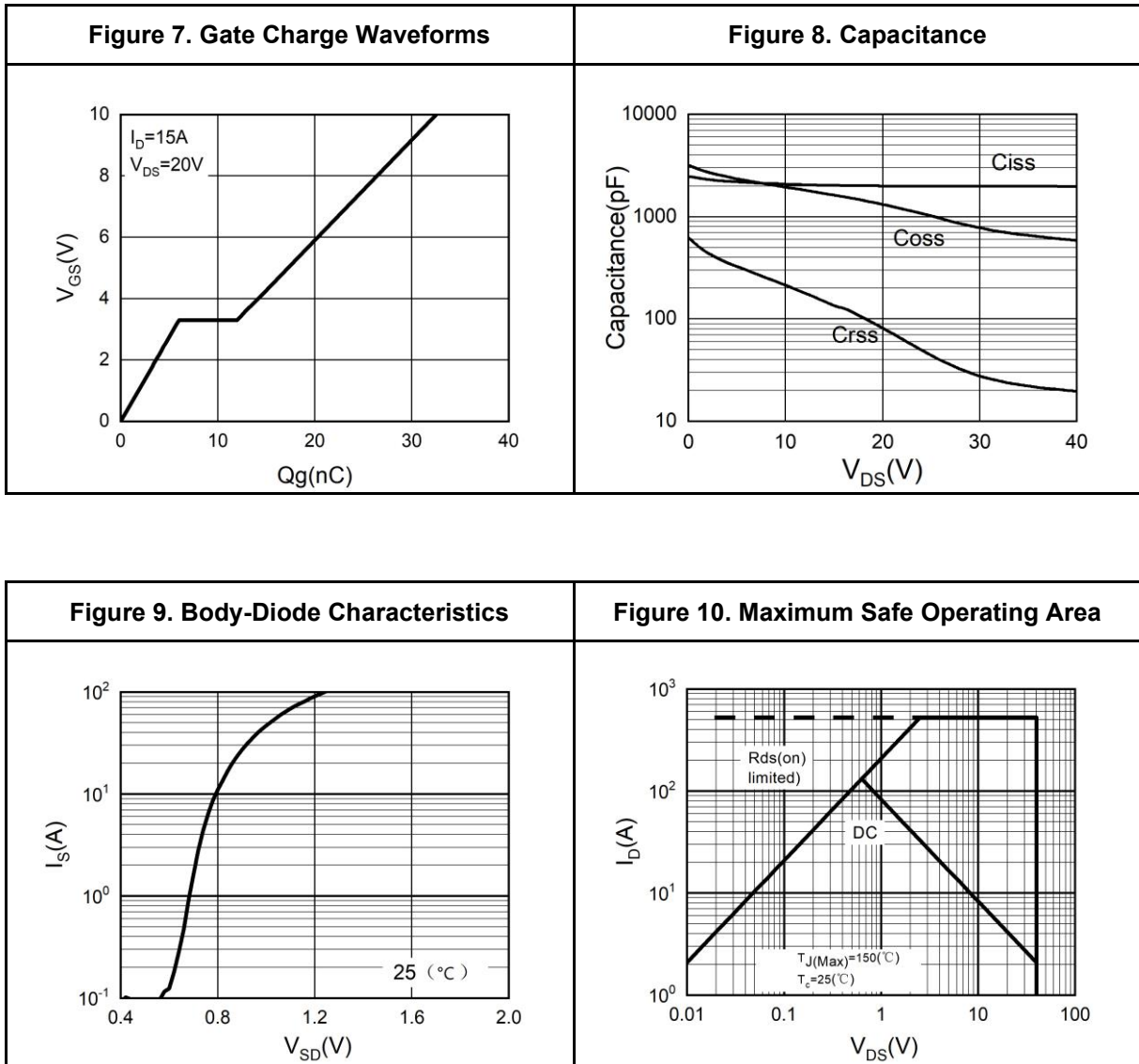


Typical Electrical And Thermal Characteristics (Curves)



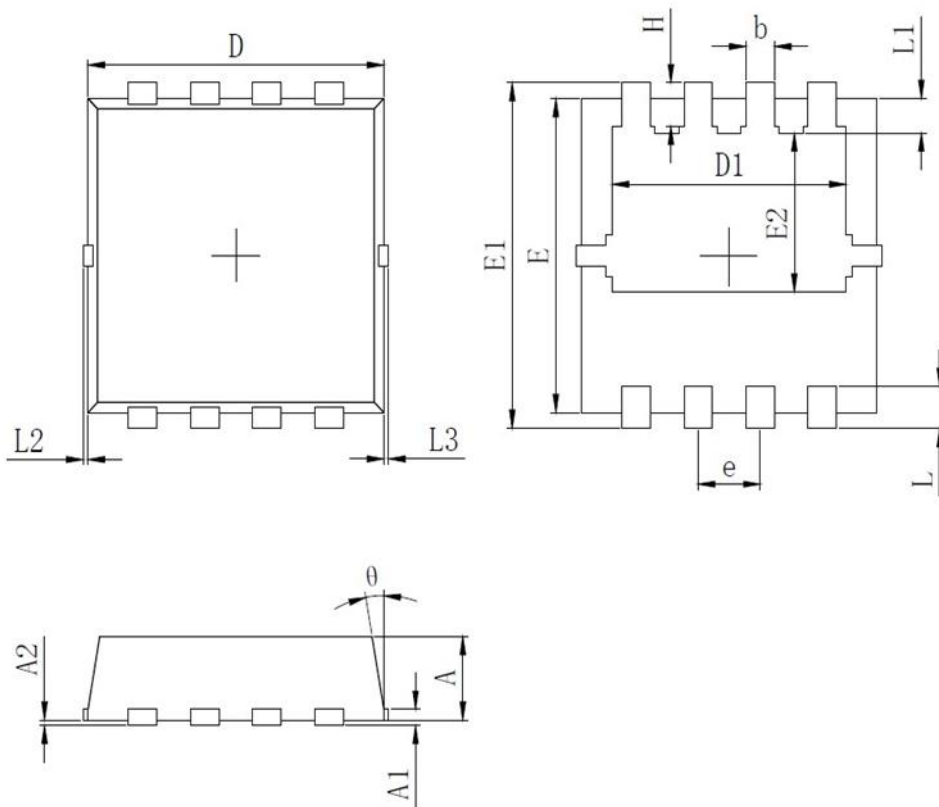


Typical Electrical And Thermal Characteristics (Curves)





PDFN3X3-8L Package Information



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.700	0.800	0.900
A1	0.152 REF.		
A2	0~0.05		
D	3.000	3.100	3.200
D1	2.300	2.450	2.600
E	2.900	3.000	3.100
E1	3.150	3.300	3.450
E2	1.320	1.520	1.720
b	0.200	0.300	0.400
e	0.550	0.650	0.750
L	0.300	0.400	0.500
L1	0.180	0.330	0.480
L2	0~0.100		
L3	0~0.100		
H	0.315	0.415	0.515
θ	8°	10°	12°



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