



40V N-Channel SGT Power MOSFET

General Description

The SJJ012N04 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

- Battery management
- Motor Drivers
- DC-DC Power Supply Control

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	40	V
$R_{DS(ON_TYP)}$	1.4	$m\Omega$
I_D	226	A
Q_G	101	nC



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJJ012N04	SJJ012N04	TO-263	Tape	\	\	1000 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($T_C=25^\circ\text{C}$)	226	A
	Drain Current-Continuous($T_C=100^\circ\text{C}$)	143	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	904	A
P_D	Maximum Power Dissipation($T_C=25^\circ\text{C}$)	147	W
	Maximum Power Dissipation($T_C=100^\circ\text{C}$)	59	W
E_{AS}	Avalanche energy (Note 2)	784	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		0.85	$^\circ\text{C/W}$



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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
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
		$V_{DS}=40V, V_{GS}=0V, T_J=125^\circ\text{C}$			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		2.5	V
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=20A$		66		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=20A, T_J=25^\circ\text{C}$		1.4	1.8	m Ω
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=4.5V, I_D=20A, T_J=25^\circ\text{C}$		1.7	2.3	m Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1.0\text{MHz}$		6112		pF
C_{oss}	Output Capacitance			2137		pF
C_{rss}	Reverse Transfer Capacitance			130		pF
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$		1.8		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DS}=20V, R_L=1\Omega, R_{GEN}=3\Omega$		19.6		nS
t_r	Turn-on Rise Time			27.6		nS
$t_{d(off)}$	Turn-Off Delay Time			85		nS
t_f	Turn-Off Fall Time			31		nS
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=20V, I_D=20A$		101		nC
Q_{gs}	Gate-Source Charge			16		nC
Q_{gd}	Gate-Drain Charge			17.2		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				226	A
V_{SD}	Forward on Voltage (Note 3)	$V_{GS}=0V, I_S=20A$			1.2	V
t_{rr}	Reverse Recovery Time	$I_F=20A, dI/dt=100A/\mu s$		65.2		ns
Q_{rr}	Reverse Recovery Charge	$I_F=20A, dI/dt=100A/\mu s$		74.9		nC

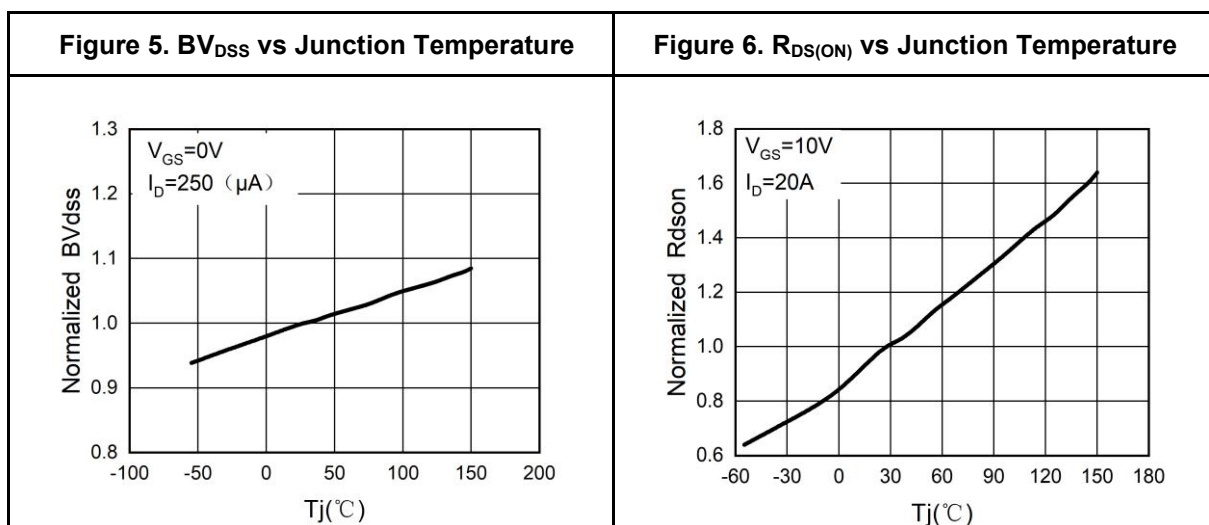
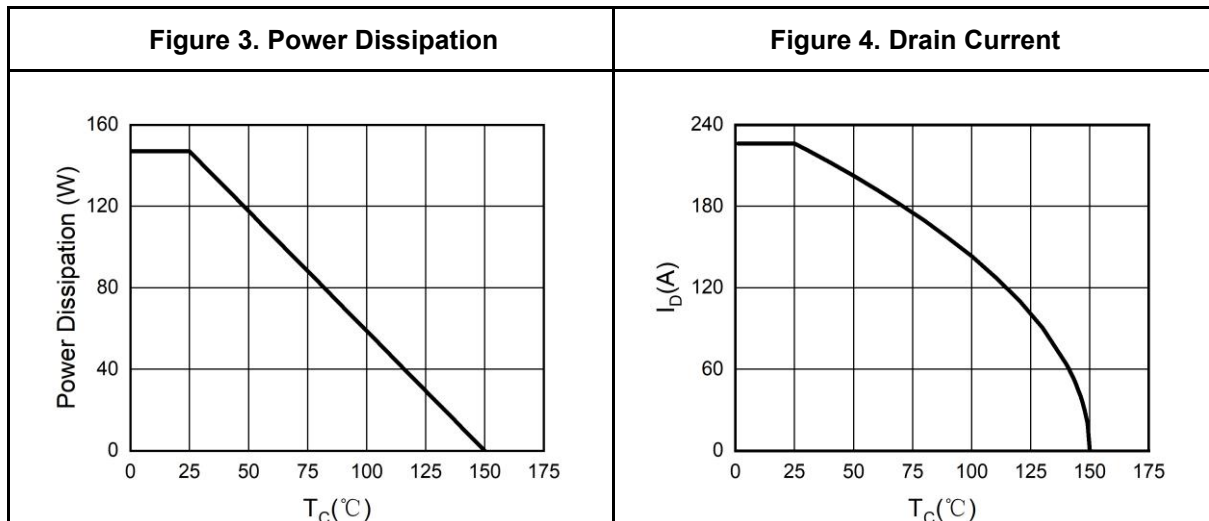
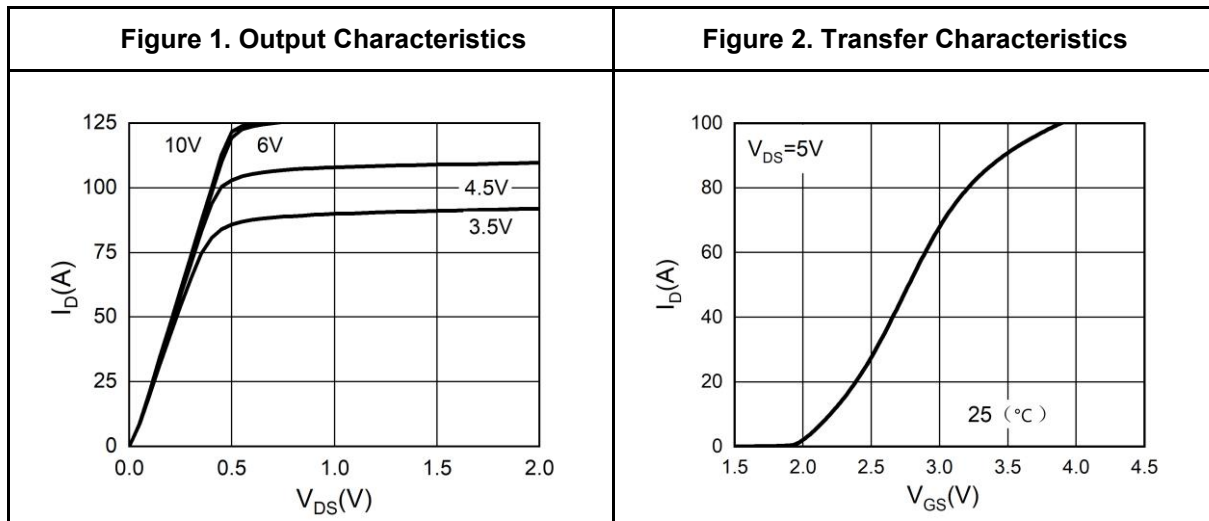
Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.EAS condition: $T_J=25^\circ\text{C}, V_{DD}=40V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$.

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

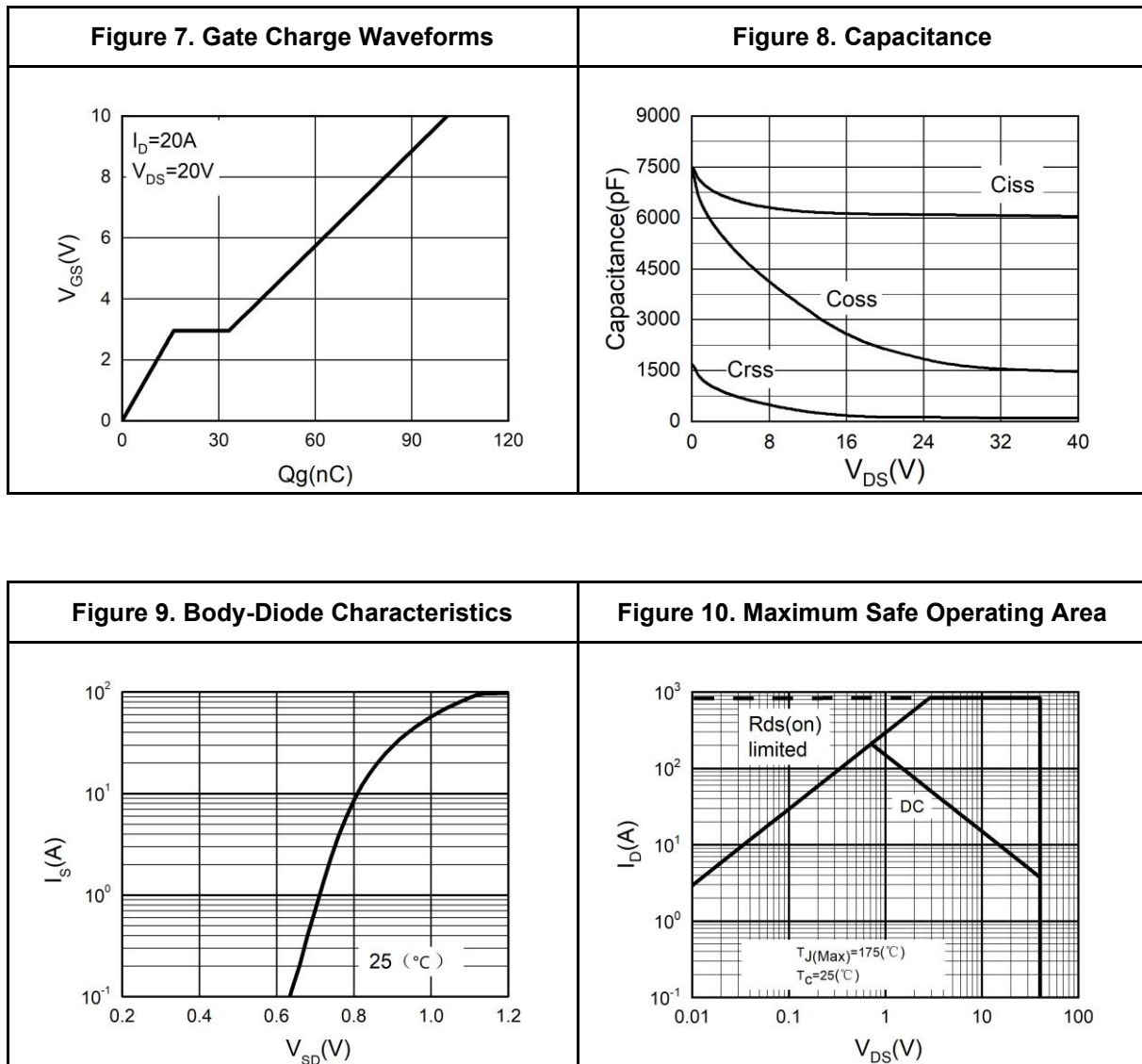


Typical Electrical And Thermal Characteristics (Curves)



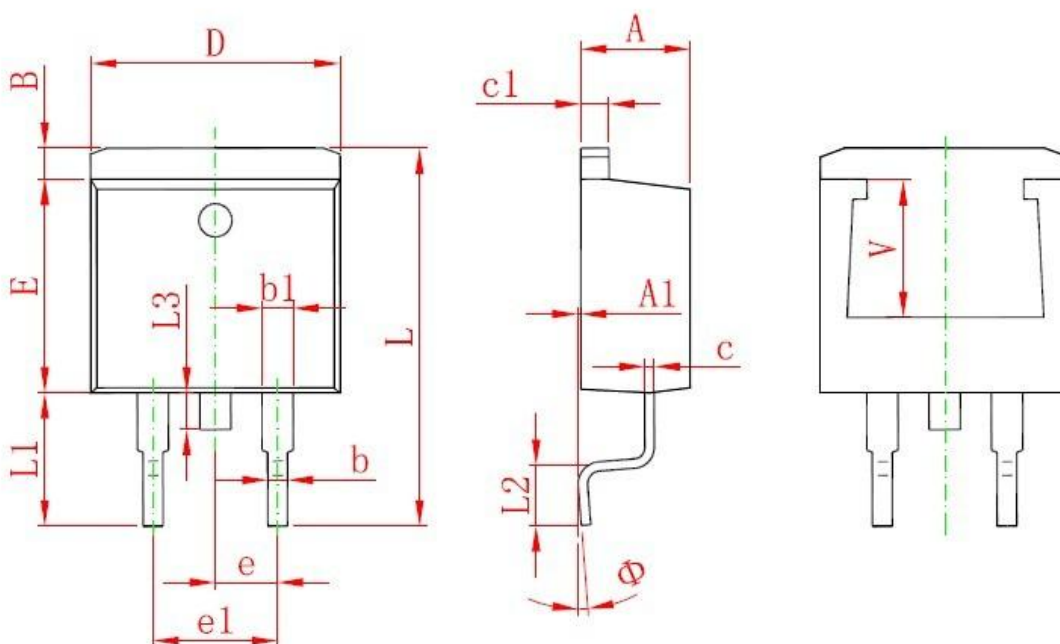


Typical Electrical And Thermal Characteristics (Curves)





TO-263 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
V	5.600 REF.		0.220REF.	
Φ	0°	8°	0°	8°



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