



## 100V N-Channel SGT Power MOSFET

### General Description

The SJ045N10 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

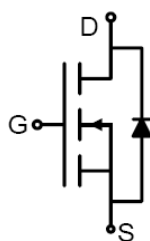
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

### Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

### Key Performance Parametes

Parameter	Value	Unit
$V_{DS}$	100	V
$R_{DS(ON\_TYP)}$	4.6	m $\Omega$
$I_D$	141	A
$Q_G$	47	nC



Schematic Diagram



TO-220 top view



### Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJ045N10	SJ045N10	TO-220	Tube	\	\	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 ( $V_{GS}=0\text{V}$ )	100	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0\text{V}$ )	$\pm 20$	V
$I_D$	Drain Current-Continuous( $T_C=25^{\circ}\text{C}$ )	141	A
	Drain Current-Continuous( $T_C=100^{\circ}\text{C}$ )	89	A
$I_{DM}(\text{pluse})$	Drain Current-Continuous@ Current-Pulsed (Note 1)	564	A
$P_D$	Maximum Power Dissipation( $T_C=25^{\circ}\text{C}$ )	208	W
	Maximum Power Dissipation( $T_C=100^{\circ}\text{C}$ )	83	W
$E_{AS}$	Avalanche energy (Note 2)	576	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		0.6	$^{\circ}\text{C}/\text{W}$



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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 <sub>DSS</sub>	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> =60V, V <sub>GS</sub> =0V T <sub>J</sub> =25℃			1	μA
		V <sub>DS</sub> =60V, V <sub>GS</sub> =0V T <sub>J</sub> =125℃			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	2		4	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =20A		28		S
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =20A T <sub>J</sub> =25℃		4.6	5.6	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz		2944		pF
C <sub>oss</sub>	Output Capacitance			1551		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			71.9		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1.0MHz		1.7		Ω
Switching Parameters						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, R <sub>L</sub> =2.5Ω, R <sub>GEN</sub> =6Ω		22.4		nS
t <sub>r</sub>	Turn-on Rise Time			6.6		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			33.2		nS
t <sub>f</sub>	Turn-Off Fall Time			7.6		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =20A		47		nC
Q <sub>gs</sub>	Gate-Source Charge			14.2		nC
Q <sub>gd</sub>	Gate-Drain Charge			9.8		nC
Source-Drain Diode Characteristics						
I <sub>SD</sub>	Source-Drain Current (Body Diode)				141	A
V <sub>SD</sub>	Forward on Voltage (Note 3)	V <sub>GS</sub> =0V, I <sub>S</sub> =20A			1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =20A, dI/dt=100A/μs		49.2		ns
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>F</sub> =20A, dI/dt=100A/μs		54.1		nC

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

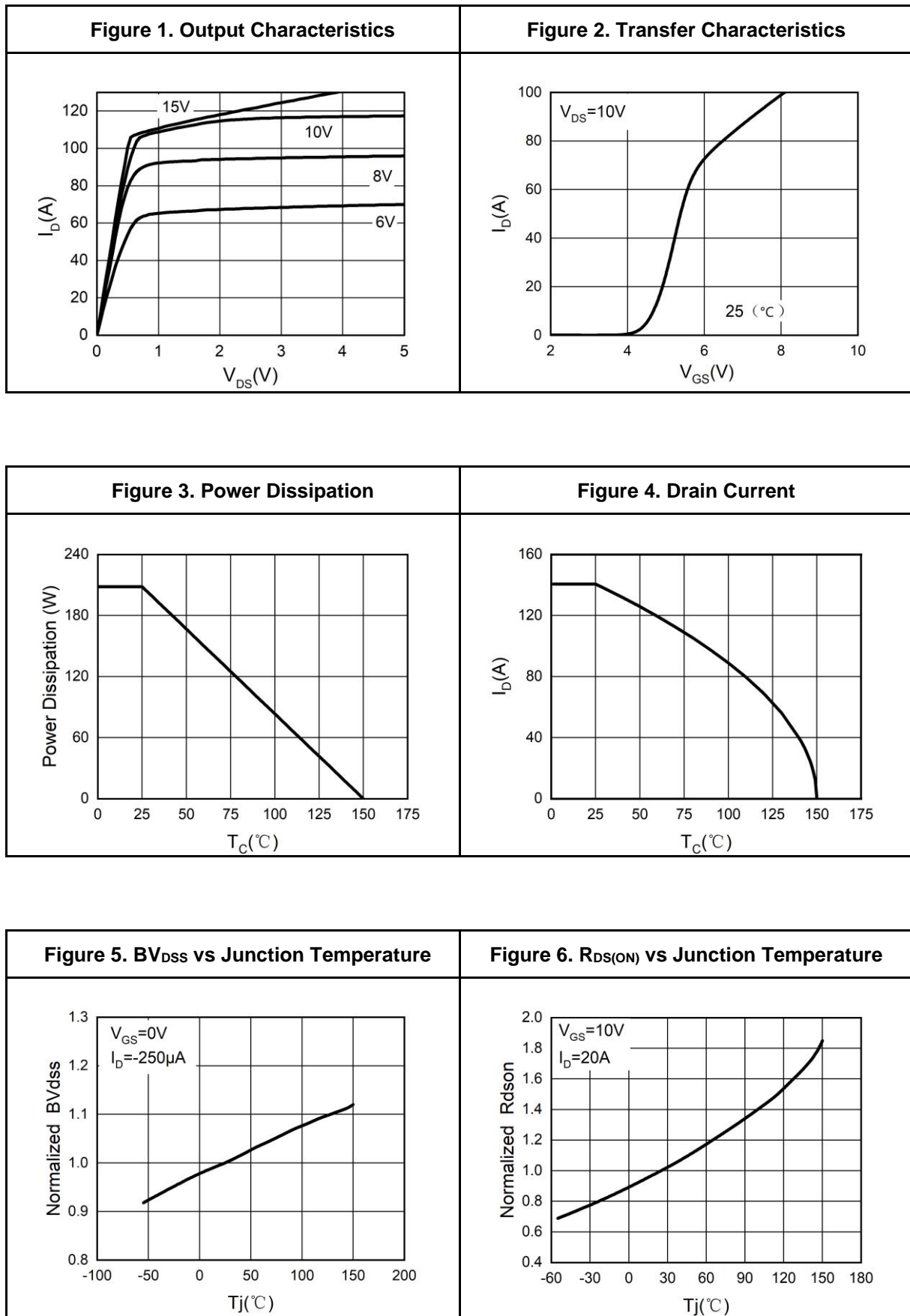
Notes 2.EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=50V, V_G=10V, R_g=25\Omega, L=0.5mH$ .

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



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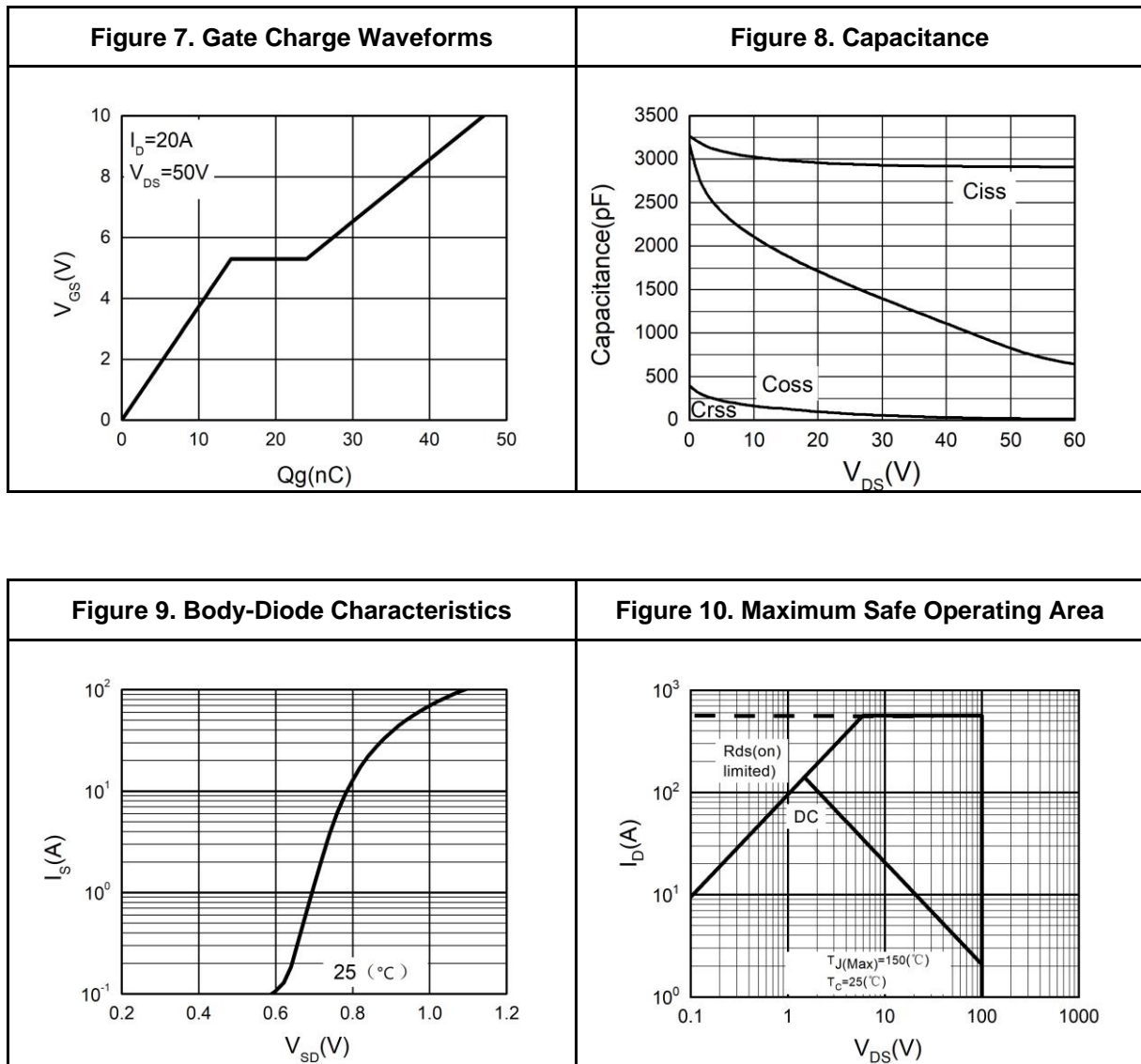
### Typical Electrical And Thermal Characteristics (Curves)





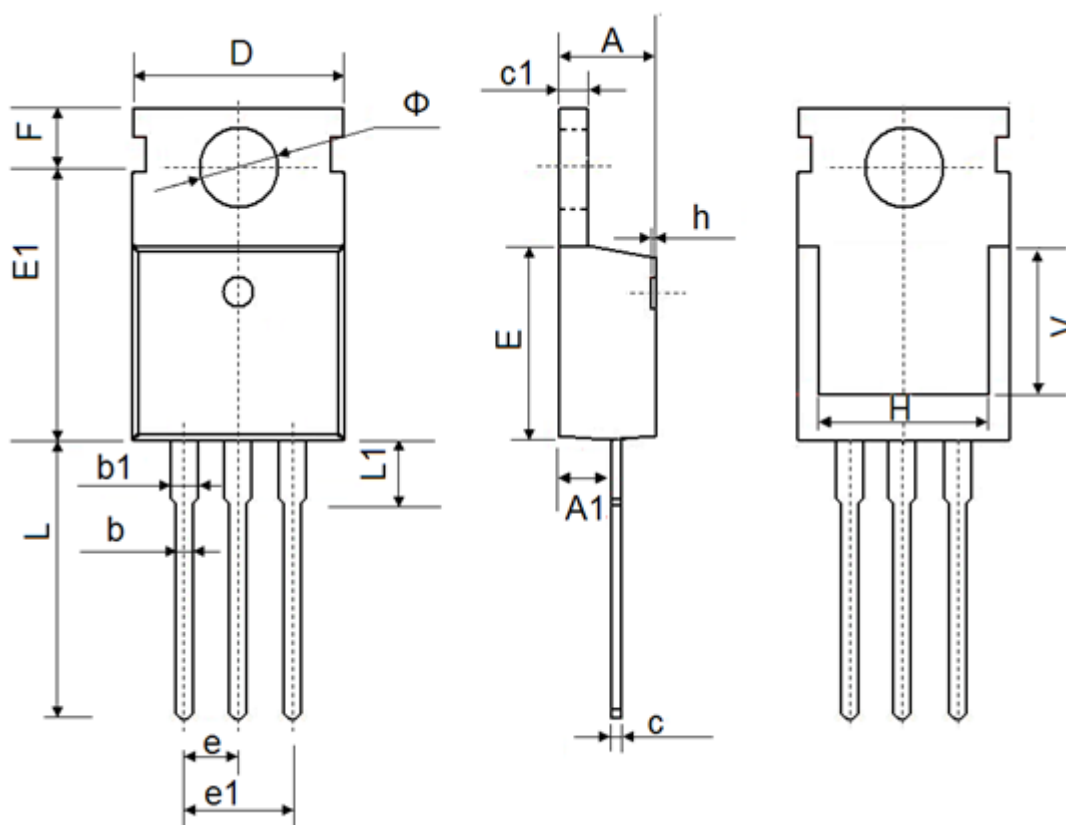
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### Typical Electrical And Thermal Characteristics (Curves)





## TO-220 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max
A	4.300	4.700	0.169	0.185
A1	2.200	2.600	0.087	0.102
b	0.700	0.950	0.028	0.037
b1	1.170	1.410	0.046	0.056
c	0.450	0.650	0.018	0.026
c1	1.200	1.400	0.047	0.055
D	9.600	10.400	0.378	0.409
E	8.8500	9.750	0.348	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.750	14.300	0.502	0.563
L1	2.850	3.950	0.112	0.156
V	7.500 REF.		0.295 REF.	
Φ	3.400	4.000	0.134	0.157



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