



80V N-Channel SGT Power MOSFET

General Description

The SJ050N08 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

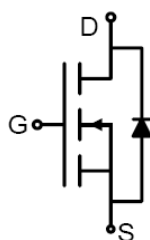
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

Application

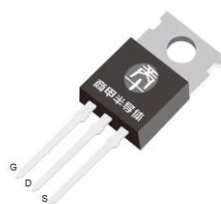
- DC/DC Converter
- Load Switch
- Power Management

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	80	V
$R_{DS(ON_TYP)}$	4.4	m Ω
I_D	135	A
Q_G	42	nC



Schematic Diagram



TO-220 top view



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJ050N08	SJ050N08	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 ($V_{GS}=0V$)	80	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	V
I_D	Drain Current-Continuous($T_c=25^\circ\text{C}$)	135	A
	Drain Current-Continuous($T_c=100^\circ\text{C}$)	85	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	300	A
P_D	Maximum Power Dissipation($T_c=25^\circ\text{C}$)	167	W
	Maximum Power Dissipation($T_c=100^\circ\text{C}$)	67	W
E_{AS}	Avalanche energy (Note 2)	361	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		0.75	$^\circ\text{C/W}$



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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 =250μA	80			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =80V, V _{GS} =0V			1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2		4	V
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =20A		38		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A		4.4	5.3	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =40V, V _{GS} =0V, f=1.0MHz		2420		pF
C _{oss}	Output Capacitance			1080		pF
C _{rss}	Reverse Transfer Capacitance			54		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		0.84		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =40V, R _L =2Ω, R _{GEN} =3Ω		17.5		nS
t _r	Turn-on Rise Time			13.5		nS
t _{d(off)}	Turn-Off Delay Time			39.5		nS
t _f	Turn-Off Fall Time			87		nS
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =40V, I _D =20A		42		nC
Q _{gs}	Gate-Source Charge			8		nC
Q _{gd}	Gate-Drain Charge			11		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				135	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=500A/μs		47		ns
Q _{rr}	Reverse Recovery Charge	I _F =20A, dI/dt=500A/μs		92		nC

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

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

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



Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics	Figure 2. Transfer Characteristics

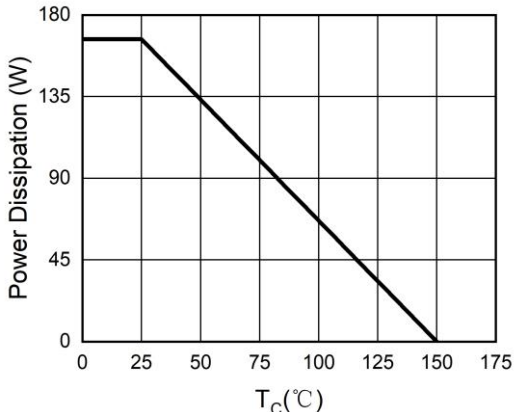
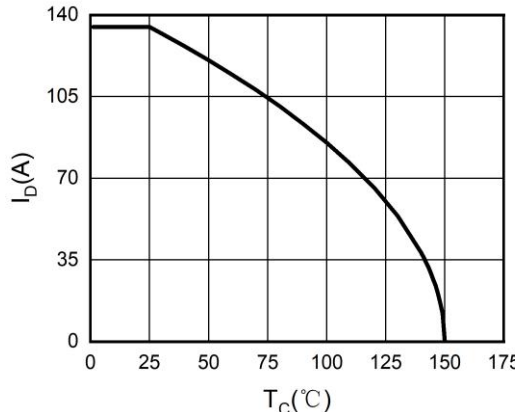
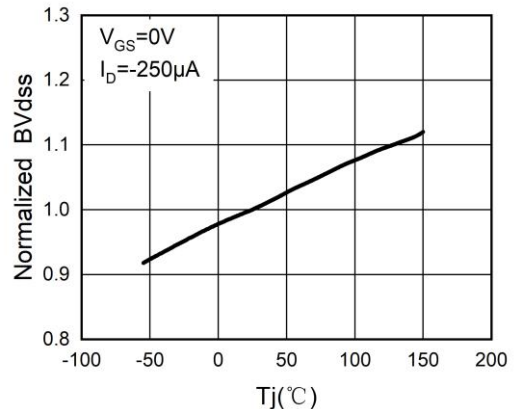
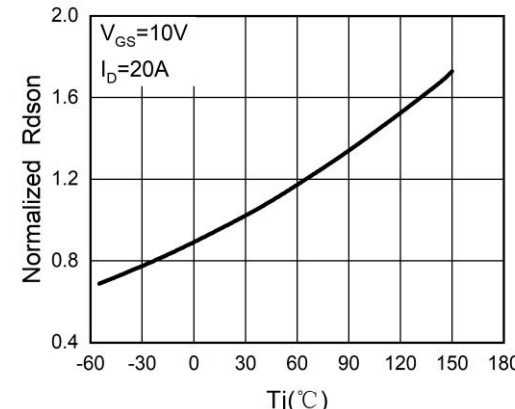
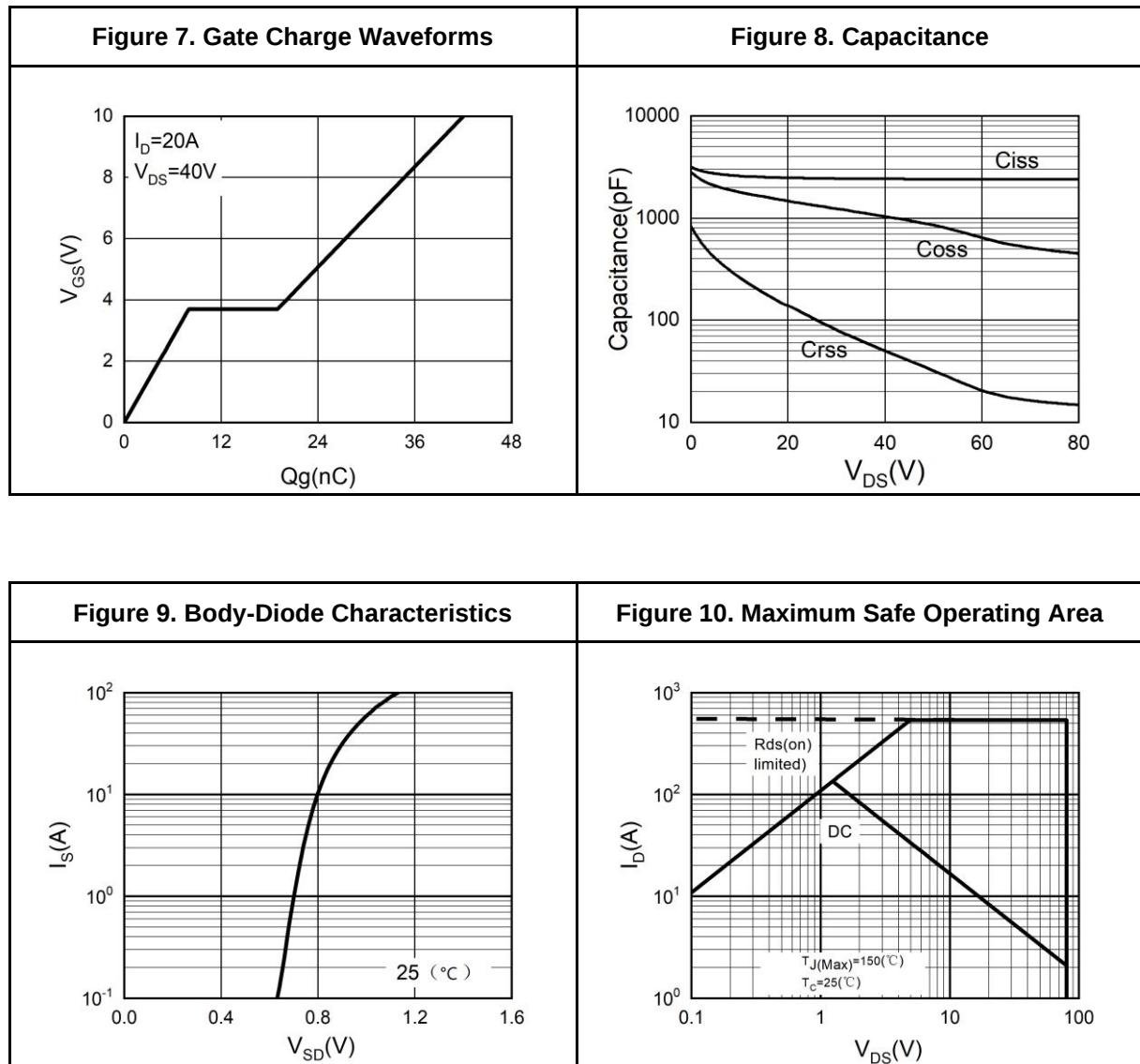
Figure 3. Power Dissipation	Figure 4. Drain Current
	

Figure 5. BV_{DSS} vs Junction Temperature	Figure 6. $R_{DS(ON)}$ vs Junction Temperature
	

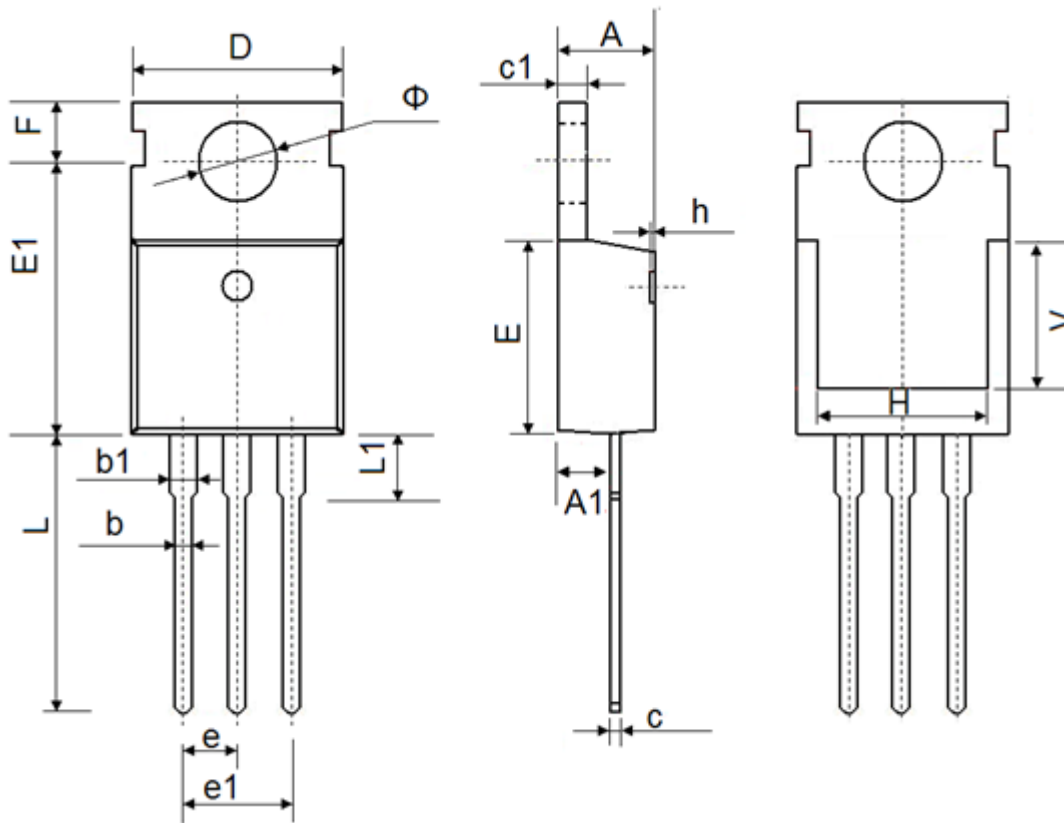


Typical Electrical And Thermal Characteristics (Curves)





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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