100V N-Channel Trench Power MOSFET

General Description

The SJZ017N12 uses SGT technology to provide excellent Rds(on), low gate charge and fast switching characteristics. This device is suitable for use as a wide variety of applications.

Features

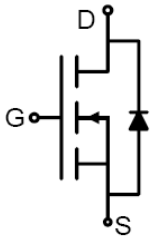
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handing capability
- Lead free product is acquired

Application

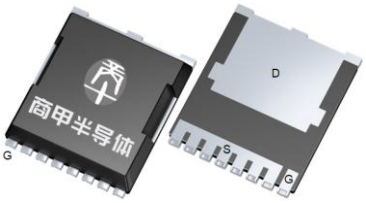
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Key Performance Parametes

Parameter	Value	Unit
V_{DS}	120	V
$R_{DS(ON)\_TYP}$	1.8	mΩ
I_D	242	A
Q_G	204	nC



Schematic Diagram



TOLL top&bottom view

RoHS

Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJZ017N12	SJZ017N12	TOLL	Tube	\	\	1000 Pcs

Table 1. Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage (V_{GS}=0V)	120	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	±20	V
I_D	Drain Current-Continuous(T_C=25℃)	242	A
	Drain Current-Continuous(T_C=100℃)	153	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	968	A
P_D	Maximum Power Dissipation(T_C=25℃)	278	W
	Maximum Power Dissipation(T_C=100℃)	111	W
E_{AS}	Avalanche energy (Note 2)	2500	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		0.45	℃/W

Table 3. Electrical Characteristics (T_J=25℃ 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	120			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=120V, V_{GS}=0V T_J=25℃			1	μA
		V_{DS}=120V, V_{GS}=0V T_J=125℃			100	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		46		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=20A T_J=25℃		1.8	2.2	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=60V,V_{GS}=0V, f=1.0MHz		9860		pF
C_{oss}	Output Capacitance			2570		pF
C_{rss}	Reverse Transfer Capacitance			50		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1.0MHz		0.6		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=10V, V_{DS}=60V, R_L=3Ω, R_{GEN}=6Ω		40		nS
t_r	Turn-on Rise Time			100		nS
$t_{d(off)}$	Turn-Off Delay Time			140		nS
t_f	Turn-Off Fall Time			108		nS
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=60V, I_D=20A		204		nC
Q_{gs}	Gate-Source Charge			60		nC
Q_{gd}	Gate-Drain Charge			50		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				242	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		55		ns
Q_{rr}	Reverse Recovery Charge	I_F=20A, dI/dt=500A/μs		333		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
Notes 2.E_{AS} condition: T_J=25℃,V_{DD}=50V,V_G=10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

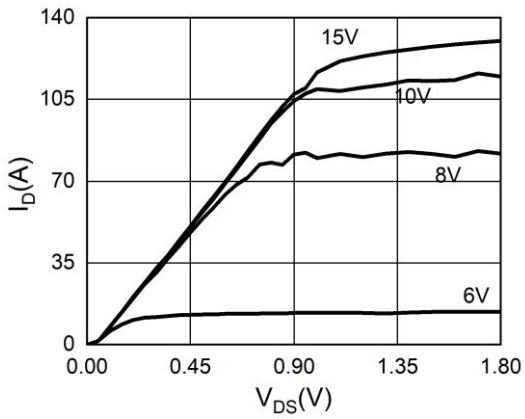


Figure 2. Transfer Characteristics

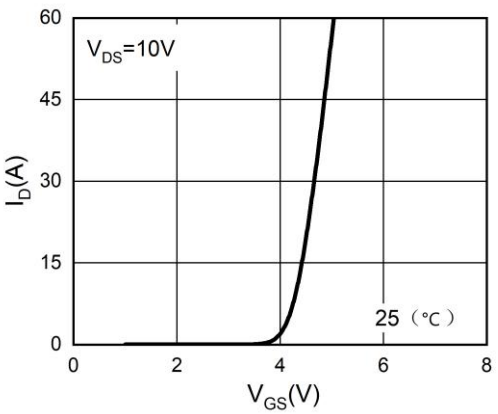


Figure 3. Power Dissipation

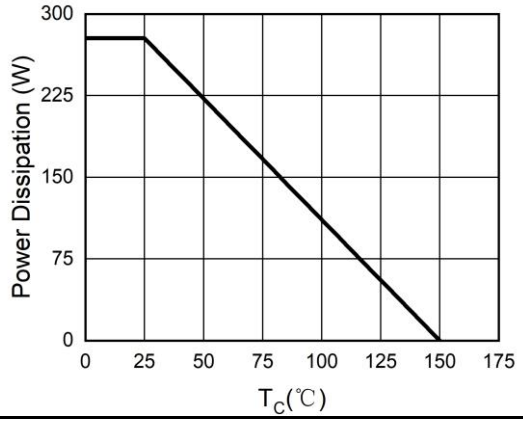


Figure 4. Drain Current

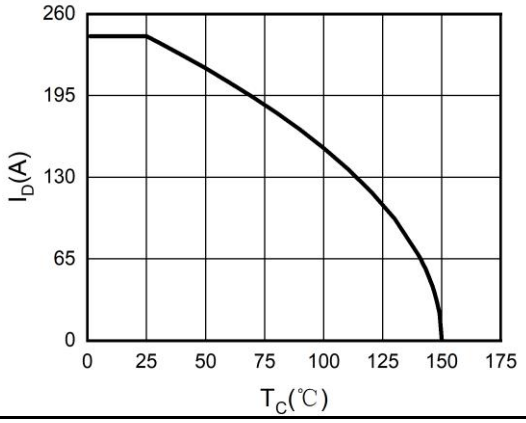


Figure 5. BV_{DSS} vs Junction Temperature

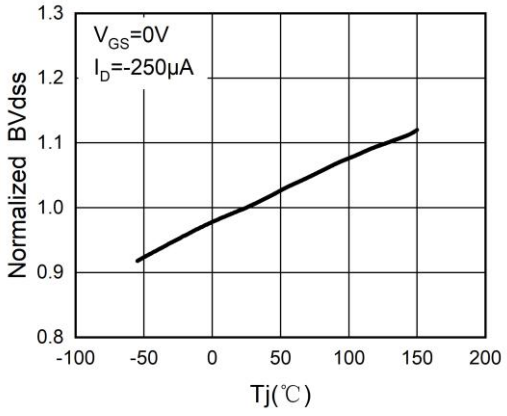
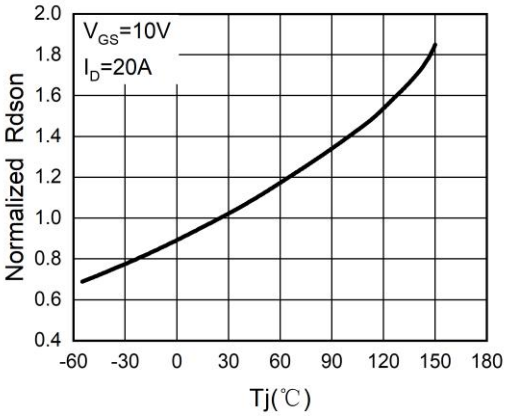


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



Typical Electrical And Thermal Characteristics (Curves)

Figure 7. Gate Charge Waveforms

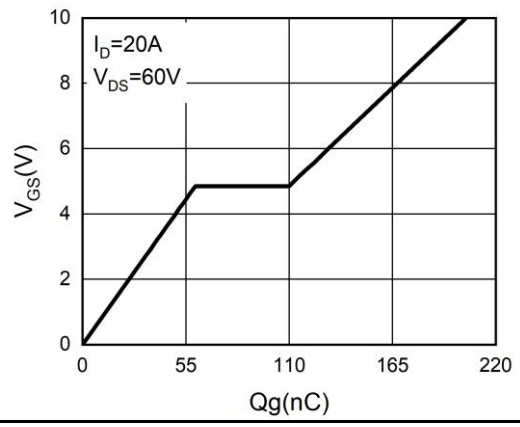


Figure 8. Capacitance

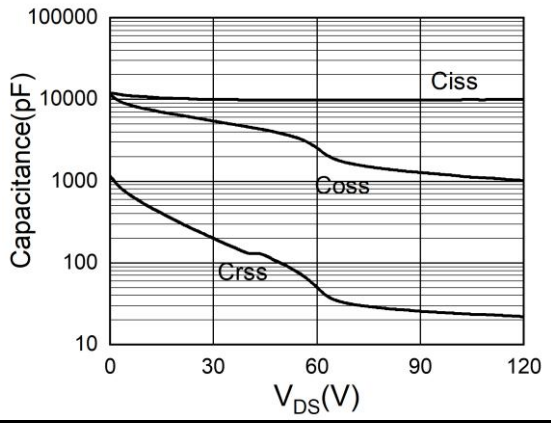


Figure 9. Body-Diode Characteristics

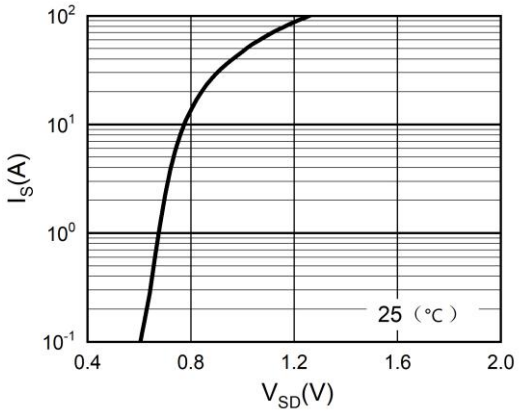
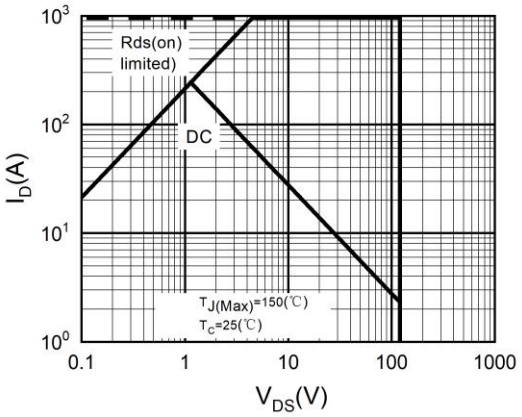
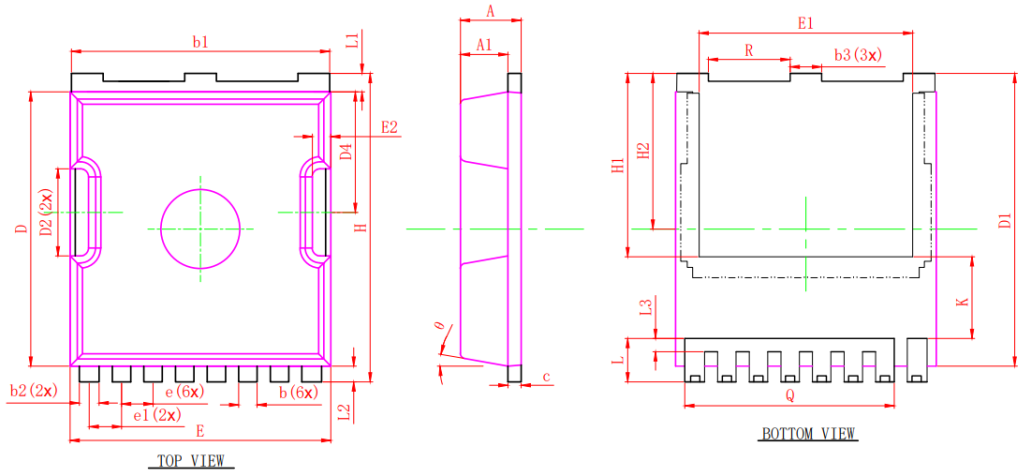
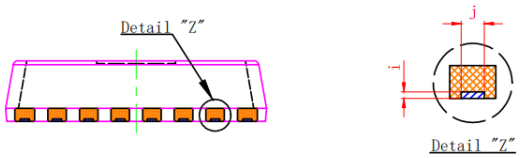


Figure 10. Maximum Safe Operating Area



TOLL Package Information





SYMBOL	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.200	2.300	2.400
A1	1.700	1.800	1.900
b	0.600	0.700	0.800
b1	9.700	9.800	9.900
b2	0.650	0.750	0.850
b3	1.100	1.200	1.300
c	0.400	0.500	0.600
D	10.300	10.400	10.500
D1	11.000	11.100	11.200
D2	3.200	3.300	3.400
D4	4.470	4.570	4.670
E	9.800	9.900	10.000
E1	8.000	8.100	8.200
E2	0.500	0.600	0.700
e	1.200 BSC		
e1	1.225 BSC		
H	11.600	11.700	11.800
H1	6.950 BSC		
H2	5.900 BSC		
i	0.100 REF.		
j	0.350 REF.		
K	3.100 REF.		
L	1.550	1.650	1.750
L1	0.600	0.700	0.800
L2	0.500	0.600	0.700
L3	0.400	0.500	0.600
Q	7.950 REF.		
R	3.000	3.100	3.200
θ	10° REF.		

Attention

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