



250V N-Channel Trench Power MOSFET

General Description

The SJ025N290 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a wide variety of applications.

Features

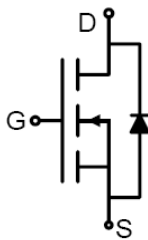
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

Application

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

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	250	V
$R_{DS(ON_TYP)}$	33.2	m Ω
I_D	48	A
Q_G	153	nC



Schematic Diagram



TO-220 top view



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJ025N290	SJ025N290	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 ($V_{GS}=0V$)	250	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	V
I_D	Drain Current-Continuous($T_C=25^\circ\text{C}$)	48	A
	Drain Current-Continuous($T_C=100^\circ\text{C}$)	30	A
I_{DM} (pulse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	192	A
P_D	Maximum Power Dissipation($T_C=25^\circ\text{C}$)	272	W
	Maximum Power Dissipation($T_C=100^\circ\text{C}$)	109	W
E_{AS}	Avalanche energy (Note 2)	625	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		0.46	$^\circ\text{C/W}$



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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	250			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =150V, V _{GS} =0V T _J =25℃			1	μA
		V _{DS} =150V, 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	3		5	V
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =20A		73		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A T _J =25℃		34.7	46	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V,V _{GS} =0V, f=1.0MHz		8503		pF
C _{oss}	Output Capacitance			424		pF
C _{rss}	Reverse Transfer Capacitance			87		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		1.5		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =50V, R _L =1.25Ω, R _{GEN} =3Ω		35.6		nS
t _r	Turn-on Rise Time			9.6		nS
t _{d(off)}	Turn-Off Delay Time			63.2		nS
t _f	Turn-Off Fall Time			6		nS
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =40A		153		nC
Q _{gs}	Gate-Source Charge			21.6		nC
Q _{gd}	Gate-Drain Charge			43.2		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				48	A
V _{SD}	Forward on Voltage ^(Note 3)	V _{GS} =0V, I _S =20A			1.2	V
t _{rr}	Reverse Recovery Time	I _F =40A, dI/dt=100A/μs		156.8		ns
Q _{rr}	Reverse Recovery Charge	I _F =40A, dI/dt=100A/μs		1074		nC

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

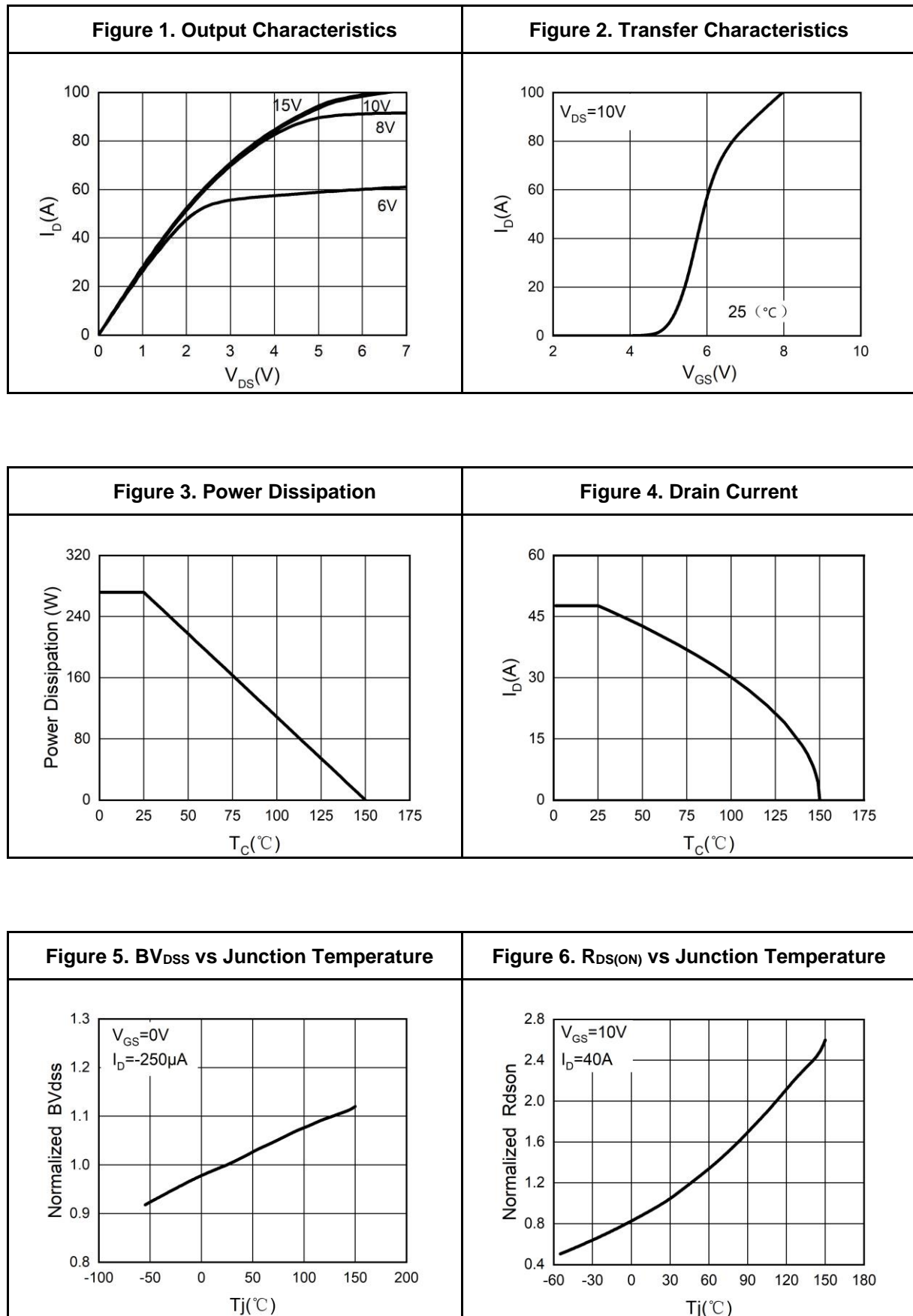
Notes 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=40V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$.

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



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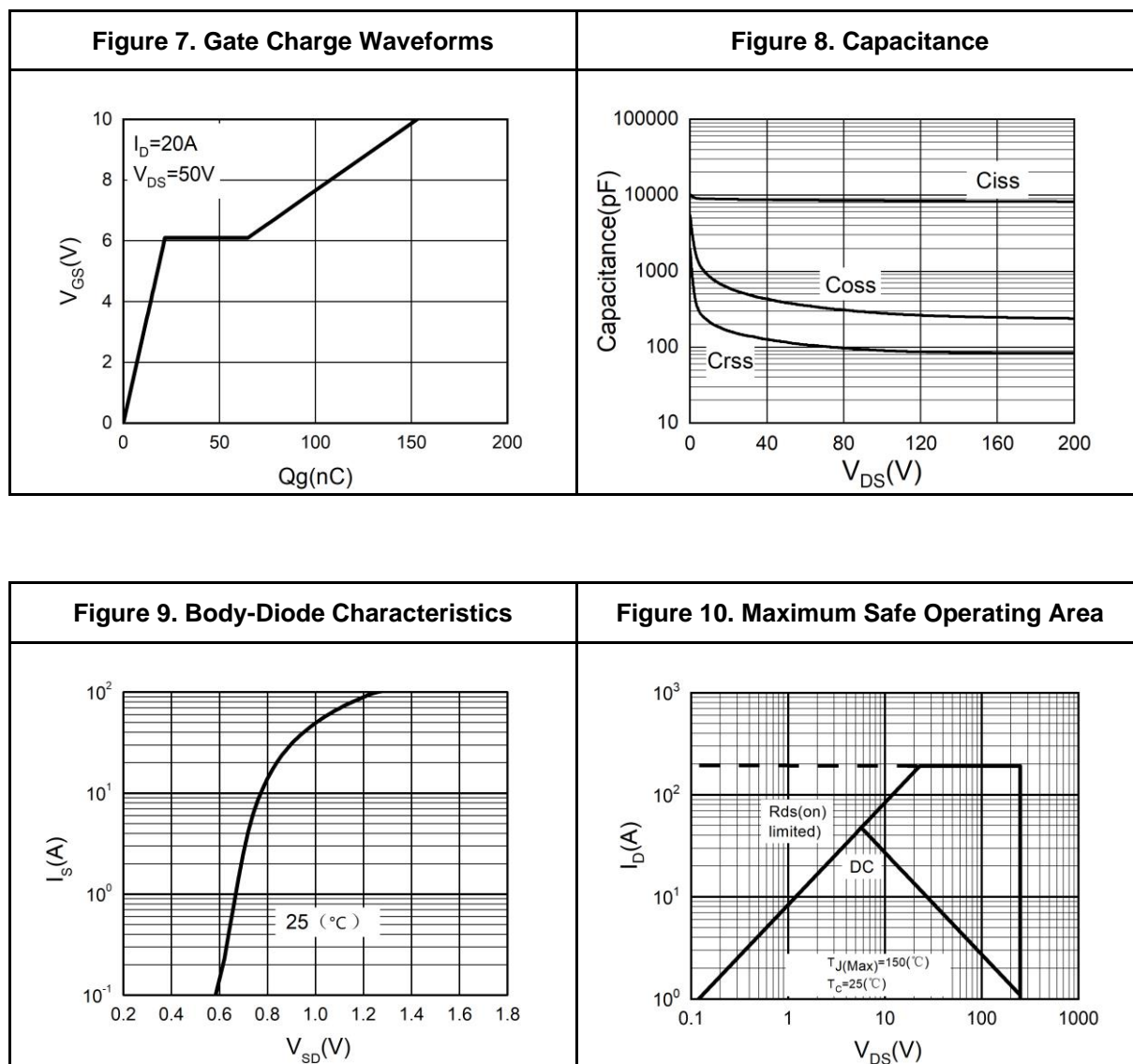
Typical Electrical And Thermal Characteristics (Curves)





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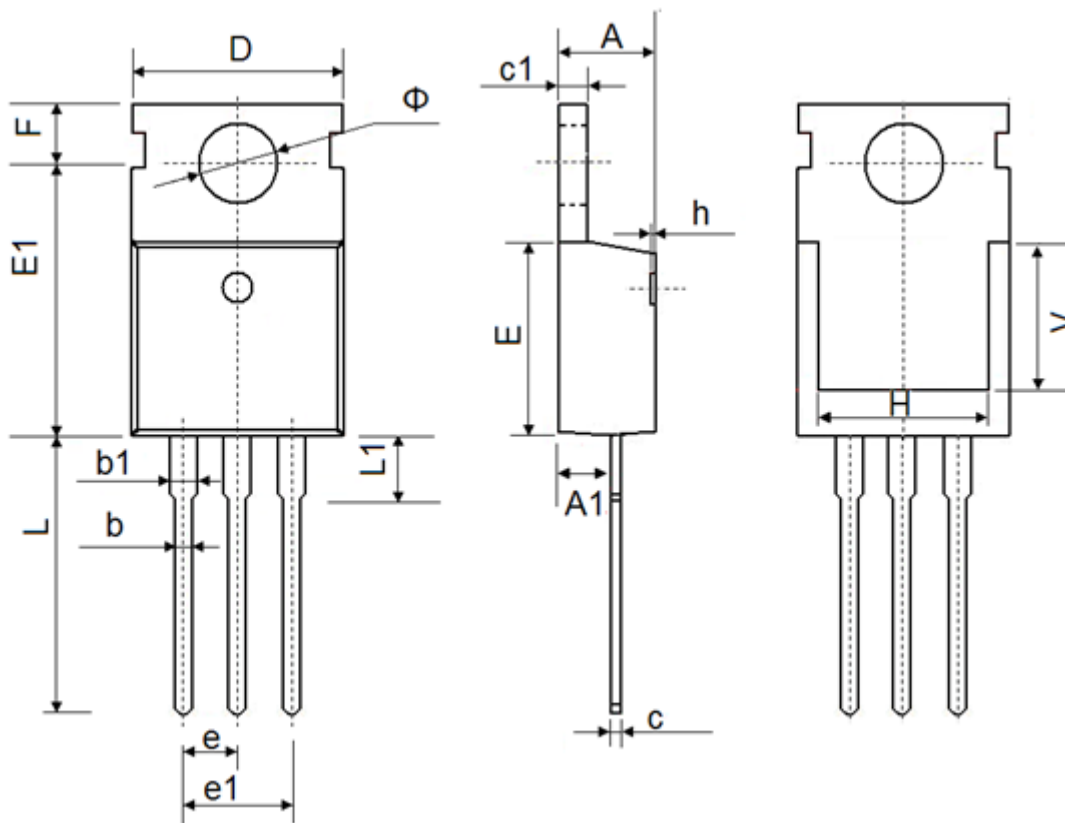
Typical Electrical And Thermal Characteristics (Curves)





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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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