



60V N-Channel Trench Power MOSFET

General Description

The SJP60N078 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a wide variety of applications.

Features

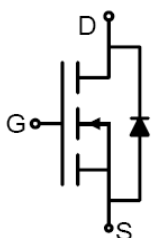
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

Application

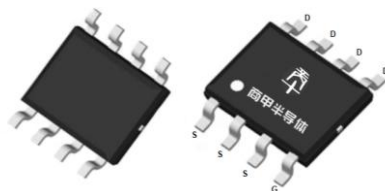
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	60	V
$R_{DS(ON_TYP)}$	8	m Ω
I_D	11.4	A
Q_G	54	nC



Schematic Diagram



SOP-8 top&bottom view



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJP60N078	SJP60N078	SOP-8	Tape	\	\	4000 Pcs

Table 1. Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	60	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	V
I_D	Drain Current-Continuous($T_A=25^\circ\text{C}$)	11.4	A
	Drain Current-Continuous($T_A=100^\circ\text{C}$)	7.2	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	45.6	A
P_D	Maximum Power Dissipation($T_A=25^\circ\text{C}$)	2.6	W
	Maximum Power Dissipation($T_A=100^\circ\text{C}$)	1	W
E_{AS}	Avalanche energy (Note 2)	182	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_{JA}	Thermal Resistance, Junction-to-Ambient		48	$^\circ\text{C/W}$



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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	60			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V T _J =25°C			1	uA
		V _{DS} =60V, V _{GS} =0V T _J =125°C			500	nA
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	1		2.5	V
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =20A		32		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A T _J =25°C		8	10	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =15A T _J =25°C		10.2	13.6	mΩ
Dynamic Characteristics						
C _{iSS}	Input Capacitance	V _{DS} =30V,V _{GS} =0V, f=1.0MHz		2780		pF
C _{oSS}	Output Capacitance			141		pF
C _{rSS}	Reverse Transfer Capacitance			133		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		1.4		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =30V, R _L =1.5Ω, R _{GEN} =6Ω		14.5		nS
t _r	Turn-on Rise Time			12		nS
t _{d(off)}	Turn-Off Delay Time			82		nS
t _f	Turn-Off Fall Time			27.5		nS
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =20A		54		nC
Q _{gs}	Gate-Source Charge			15.2		nC
Q _{gd}	Gate-Drain Charge			13.6		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				11.4	A
V _{SD}	Forward on Voltage (Note 3)	V _{GS} =0V, I _S =20A			0.99	V
t _{rr}	Reverse Recovery Time	I _F =20A, dI/dt=100A/ s		24		ns
Q _{rr}	Reverse Recovery Charge	I _F =20A, dI/dt=100A/ s		9.3		nC

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

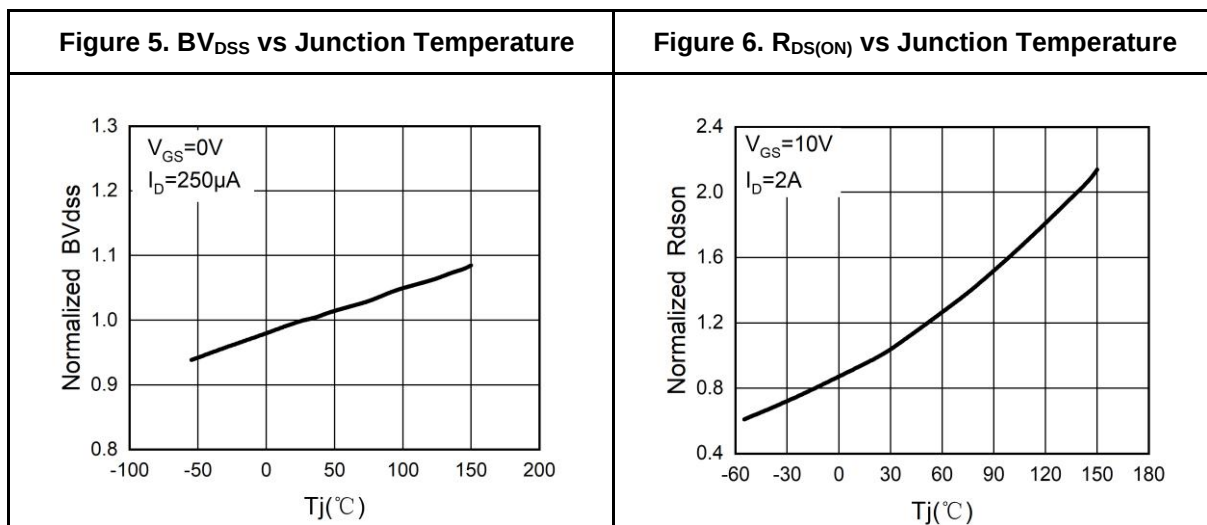
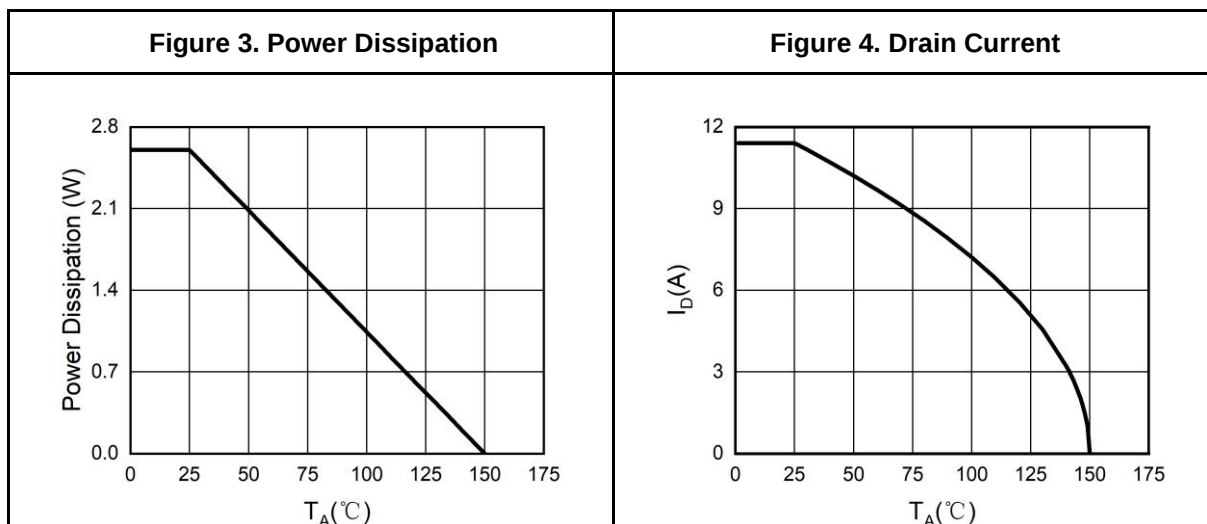
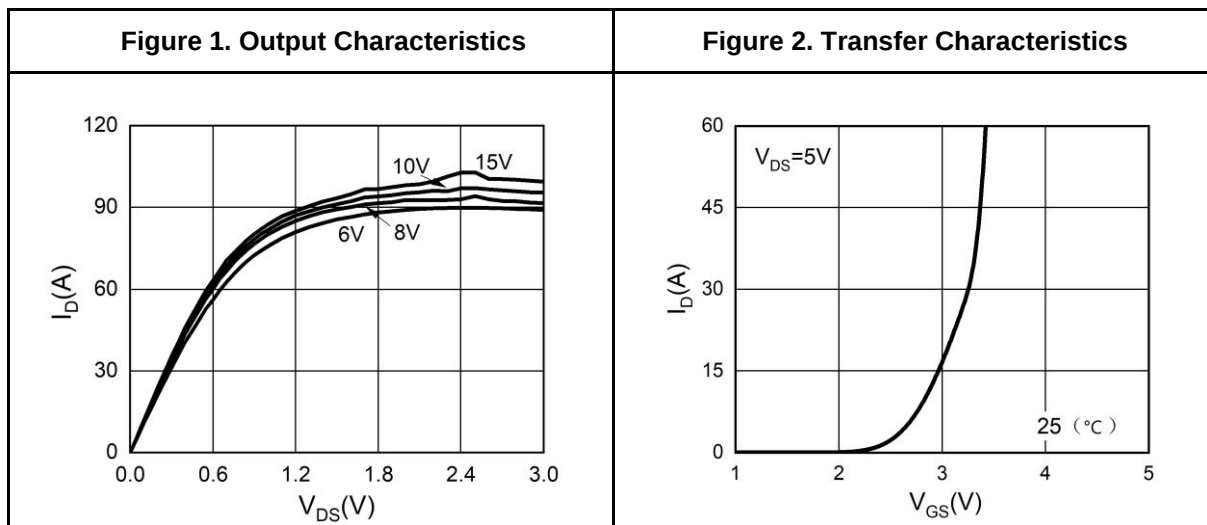
Notes 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=40V, V_G=10V, R_g=25\Omega, L=0.5mH$.

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



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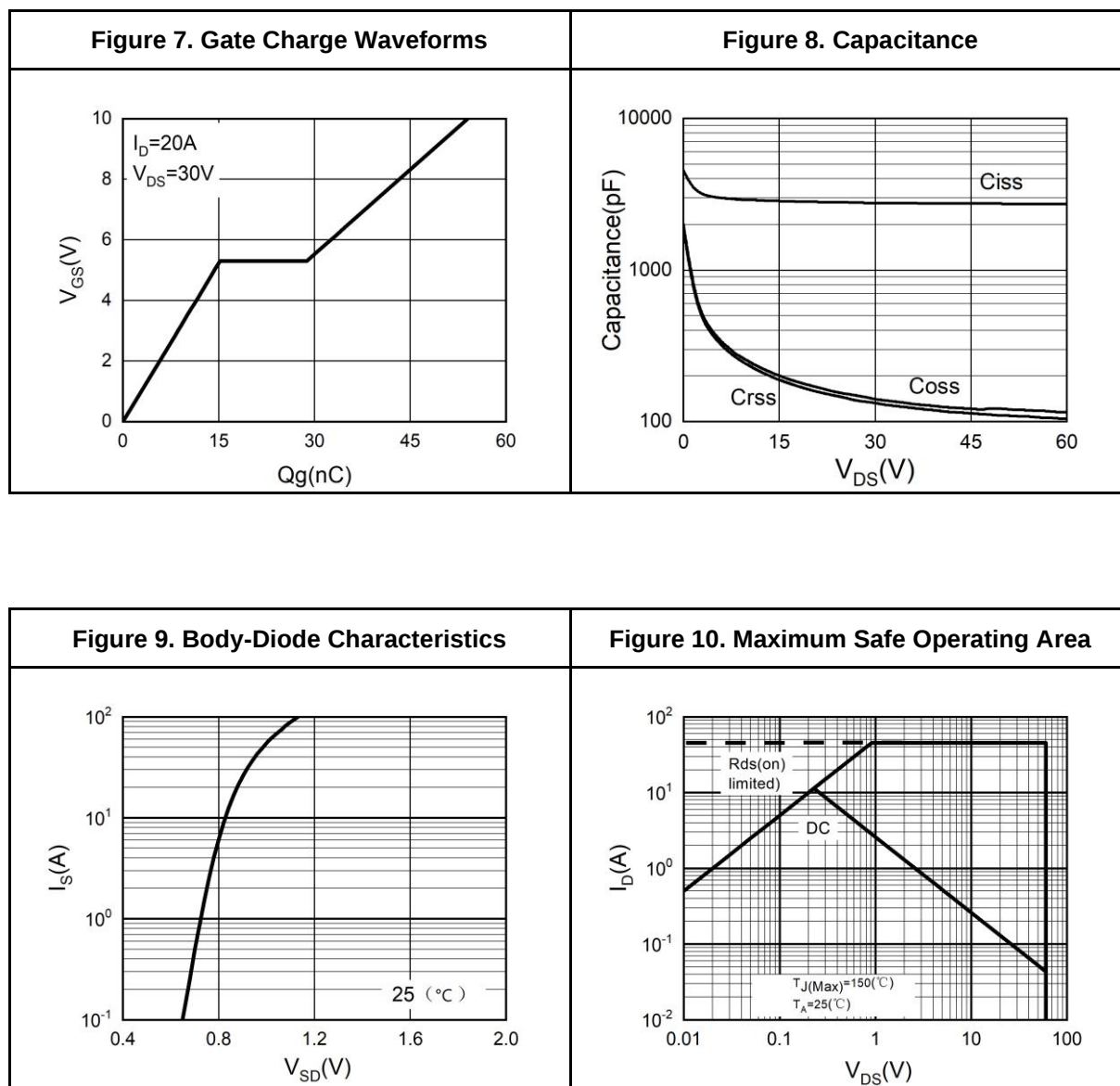
Typical Electrical And Thermal Characteristics (Curves)





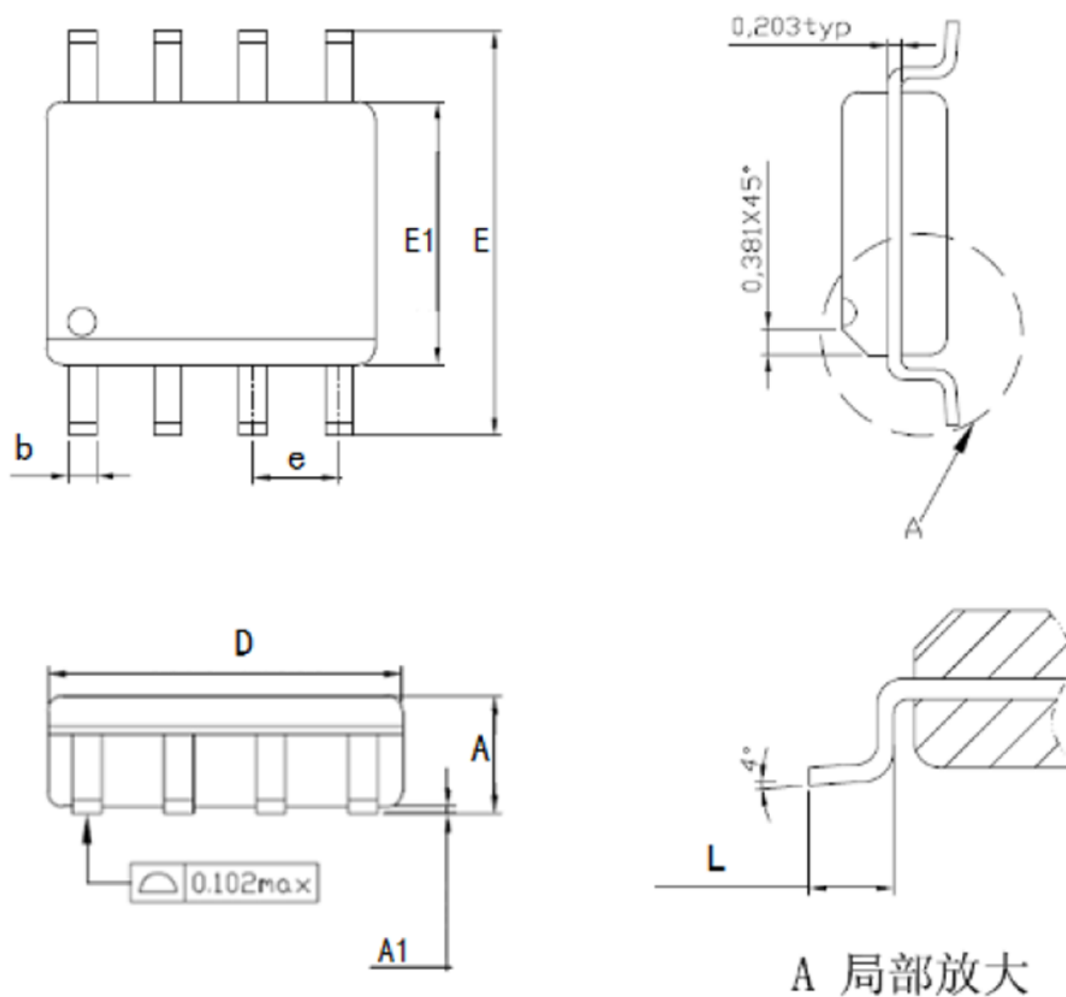
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Typical Electrical And Thermal Characteristics (Curves)





SOP-8 Package Information



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max
A	1.35	1.55	1.75
A1	0.1	0.15	0.2
b	0.346	0.406	0.466
D	4.8	4.89	4.98
E	5.75	6.00	6.25
E1	3.81	3.90	3.99
e	1.27TYP		
L	0.406	0.838	1.27



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