



100V N-Channel Trench Power MOSFET

General Description

The SJA7N10 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

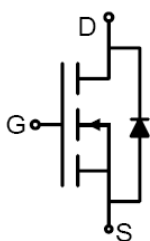
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

Application

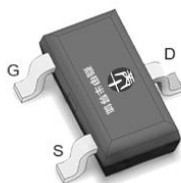
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	100	V
$R_{DS(ON_TYP)}$	114	mΩ
I_D	2.4	A
Q_G	4.4	nC



Schematic Diagram



SOT-23-3L top view



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJA7N10	7N10	SOT-23-3L	Tape	\	\	3000 Pcs

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

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	100	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	V
I_D	Drain Current-Continuous($T_A=25^\circ\text{C}$)	2.4	A
	Drain Current-Continuous($T_A=100^\circ\text{C}$)	1.5	A
$I_{DM}(\text{pluse})$	Drain Current-Continuous@ Current-Pulsed (Note 1)	9.6	A
P_D	Maximum Power Dissipation($T_A=25^\circ\text{C}$)	1.6	W
	Maximum Power Dissipation($T_A=100^\circ\text{C}$)	0.6	W
E_{AS}	Avalanche energy (Note 2)	16	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
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		77	$^\circ\text{C/W}$



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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	100			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V, V _{GS} =0V T _J =25℃			1	μA
		V _{DS} =100V, 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	1		2.5	V
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =3A		6.6		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =3A T _J =25℃		114	142	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =2A T _J =25℃		119	158	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V,V _{GS} =0V, f=1.0MHz		718		pF
C _{oss}	Output Capacitance			25		pF
C _{rss}	Reverse Transfer Capacitance			21		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		1		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =50V, R _L =16.7Ω, R _{GEN} =3Ω		16		nS
t _r	Turn-on Rise Time			4		nS
t _{d(off)}	Turn-Off Delay Time			20		nS
t _f	Turn-Off Fall Time			3.6		nS
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =3A		4.4		nC
Q _{gs}	Gate-Source Charge			1.3		nC
Q _{gd}	Gate-Drain Charge			1.1		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				2.4	A
V _{SD}	Forward on Voltage (Note 3)	V _{GS} =0V, I _S =3A			1.2	V
t _{rr}	Reverse Recovery Time	I _F =3A, dI/dt=100A/μs		20		ns
Q _{rr}	Reverse Recovery Charge	I _F =3A, dI/dt=100A/μs		13		nC

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

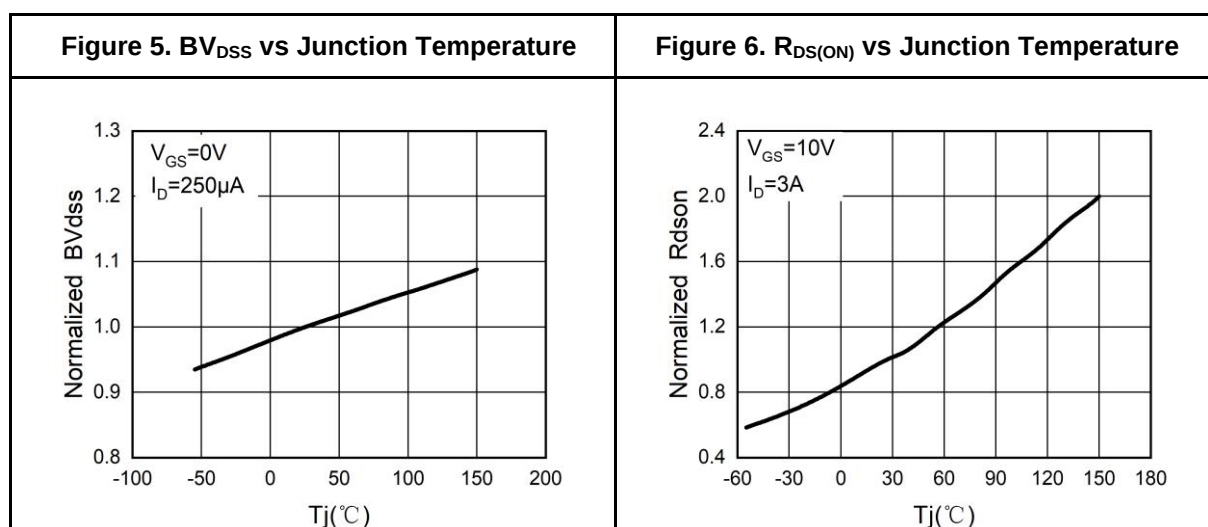
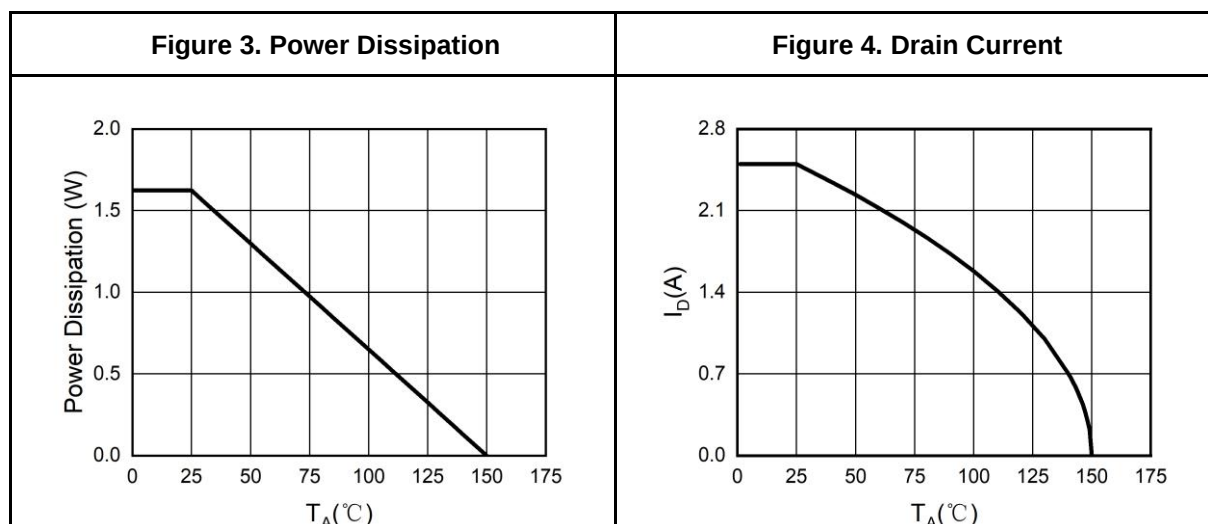
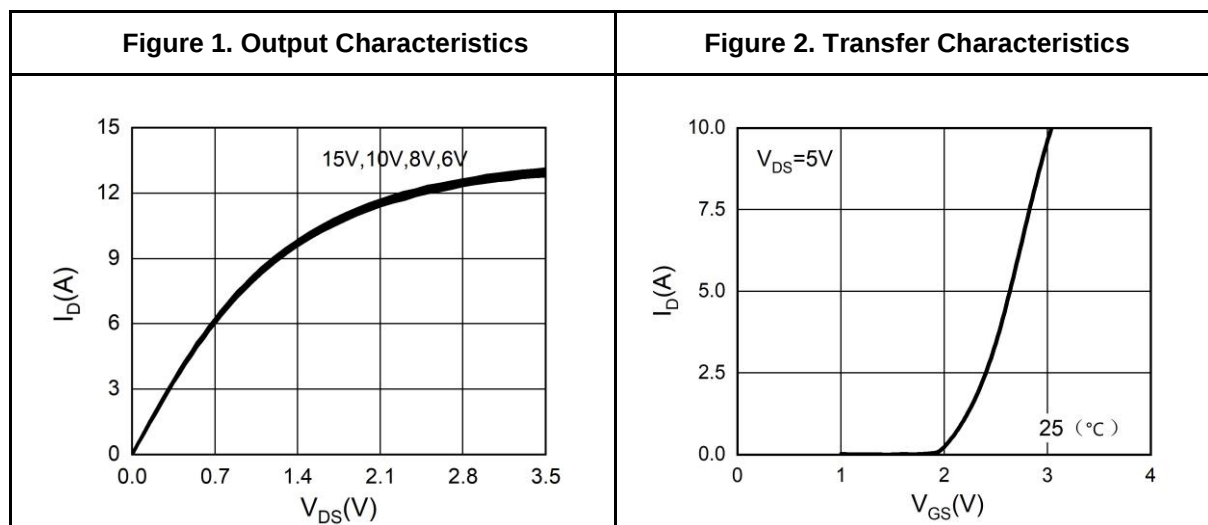
Notes 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=60V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$.

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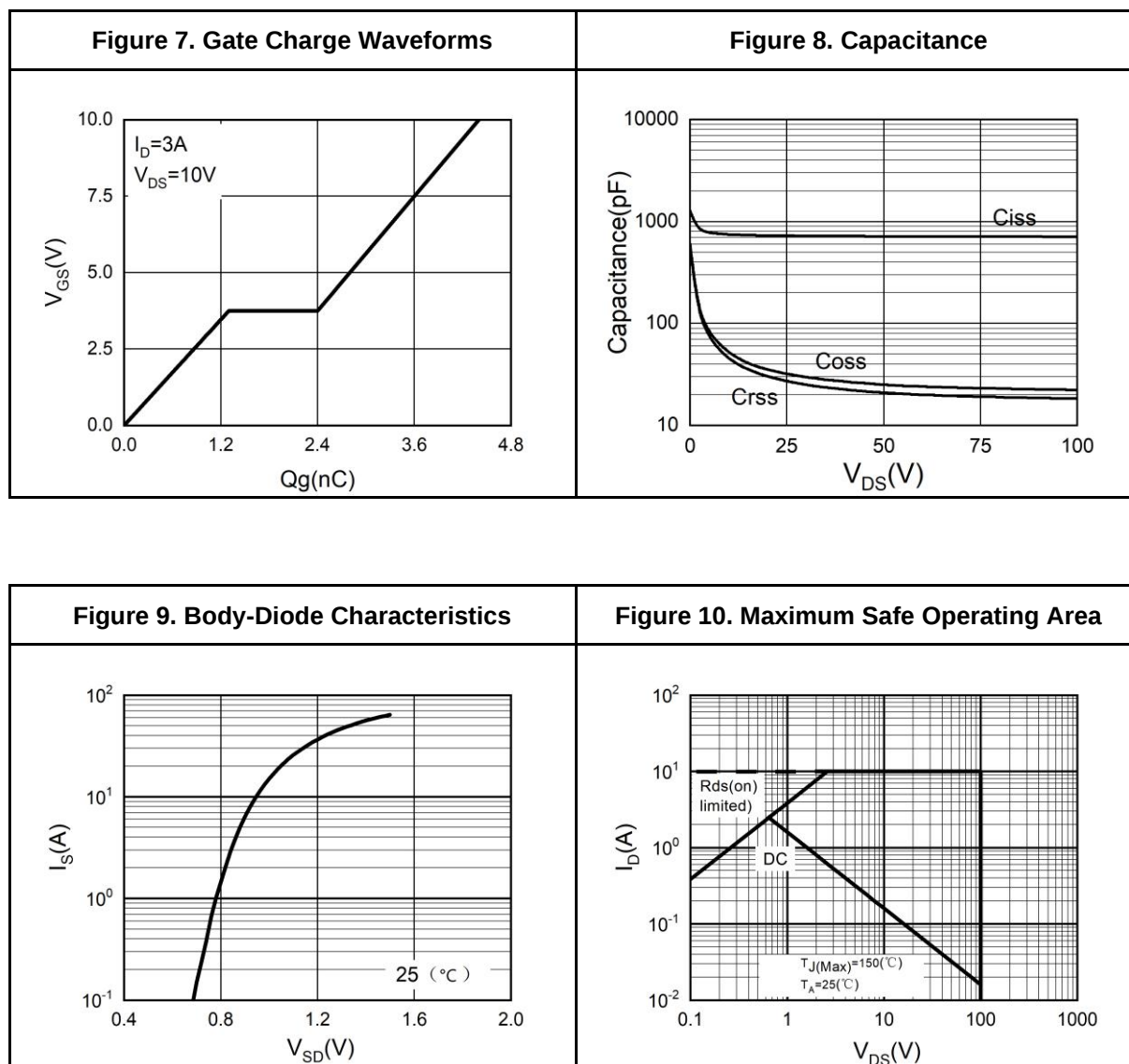
Typical Electrical And Thermal Characteristics (Curves)





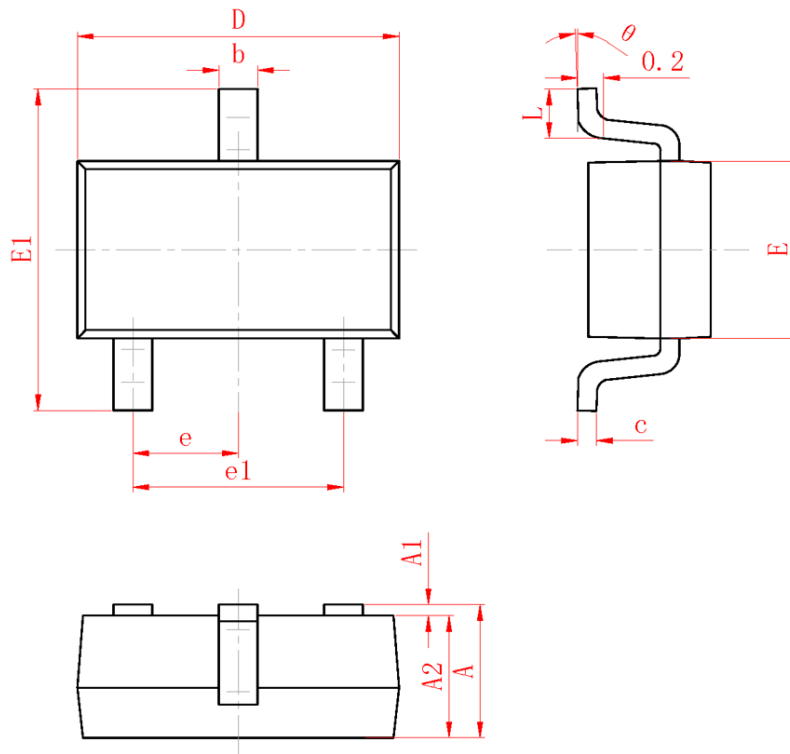
100V N-Channel Trench Power MOSFET

Typical Electrical And Thermal Characteristics (Curves)





SOT-23-3L Package Information



SYMBOL	MILLIMETER	
	MIN	MAX
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.250	0.450
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950 (BSC)	
e1	1.800	2.000
L	0.300	0.500
θ	0°	8°

Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.250	0.450
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950(BSC)	
e 1	1.800	2.000
L	0.300	0.500
θ	0°	8°



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