



20V N-Channel Trench Power MOSFET

General Description

The SJM20N036 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a wide variety of applications.

Features

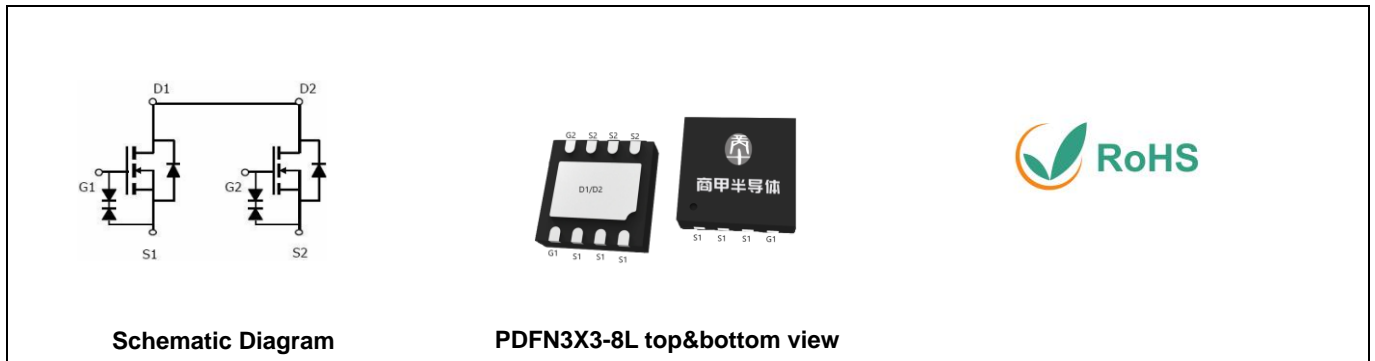
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- ESD Rating: HBM 2KV

Application

- PWM Applications
- Load Switch
- Power Management

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	20	V
$R_{DS(ON_TYP)}$	3	m Ω
I_D	64	A
Q_G	64	nC



Schematic Diagram

PDFN3X3-8L top&bottom view

Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJM20N036	SJM20N036	DFN3X3-8L	Tape	\	\	5000 Pcs

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

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	20	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 12	V
I_D	Drain Current-Continuous($T_C=25^\circ\text{C}$)	64	A
	Drain Current-Continuous($T_C=100^\circ\text{C}$)	40	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	256	A
P_D	Maximum Power Dissipation($T_C=25^\circ\text{C}$)	22	W
	Maximum Power Dissipation($T_C=100^\circ\text{C}$)	8.8	W
E_{AS}	Avalanche energy (Note 2)	121	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		5.7	$^\circ\text{C}/\text{W}$



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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	$V_{GS}=0V, I_D=250\mu A$	20			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$			1	μA
		$V_{DS}=20V, V_{GS}=0V, T_J=125^\circ\text{C}$			100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5		1	V
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=8A$		49		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=4.5V, I_D=8A, T_J=25^\circ\text{C}$		3	3.8	m Ω
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=2.5V, I_D=6A, T_J=25^\circ\text{C}$		3.7	4.9	m Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1.0\text{MHz}$		1750		pF
C_{oss}	Output Capacitance			255		pF
C_{rss}	Reverse Transfer Capacitance			247		pF
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=200\text{KHz}$		3173		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=4.5V, V_{DS}=10V, R_L=1.25\Omega, R_{GEN}=3\Omega$		9		nS
t_r	Turn-on Rise Time			25		nS
$t_{d(off)}$	Turn-Off Delay Time			73		nS
t_f	Turn-Off Fall Time			80		nS
Q_g	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=10V, I_D=8A$		64		nC
Q_{gs}	Gate-Source Charge			8		nC
Q_{gd}	Gate-Drain Charge			12		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				64	A
V_{SD}	Forward on Voltage (Note 3)	$V_{GS}=0V, I_S=8A$			1	V
t_{rr}	Reverse Recovery Time	$I_F=8A, dI/dt=100A/\mu s$		16		ns
Q_{rr}	Reverse Recovery Charge	$I_F=8A, dI/dt=100A/\mu s$		5.5		nC

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

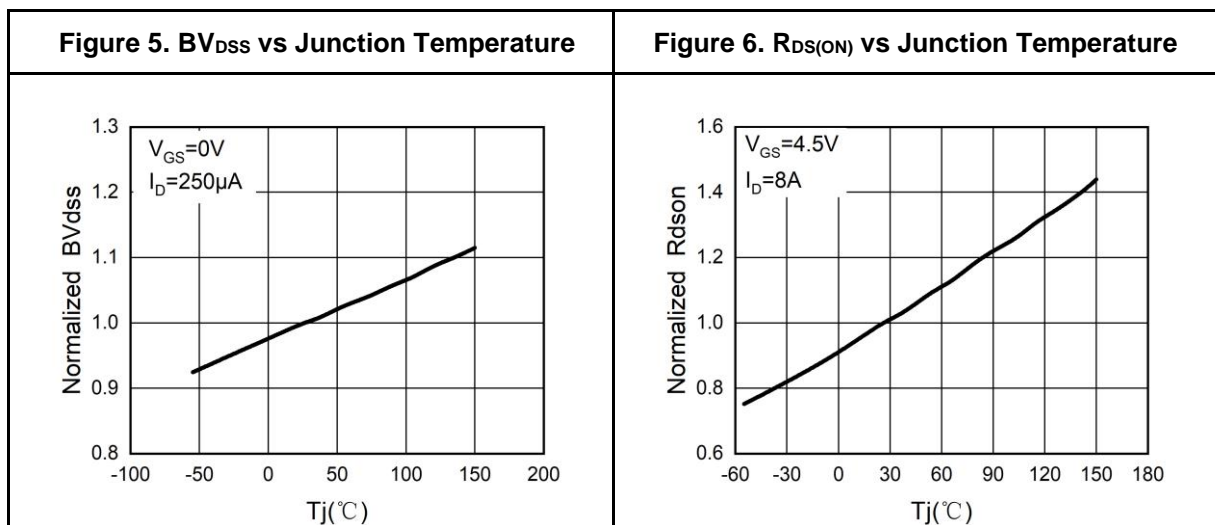
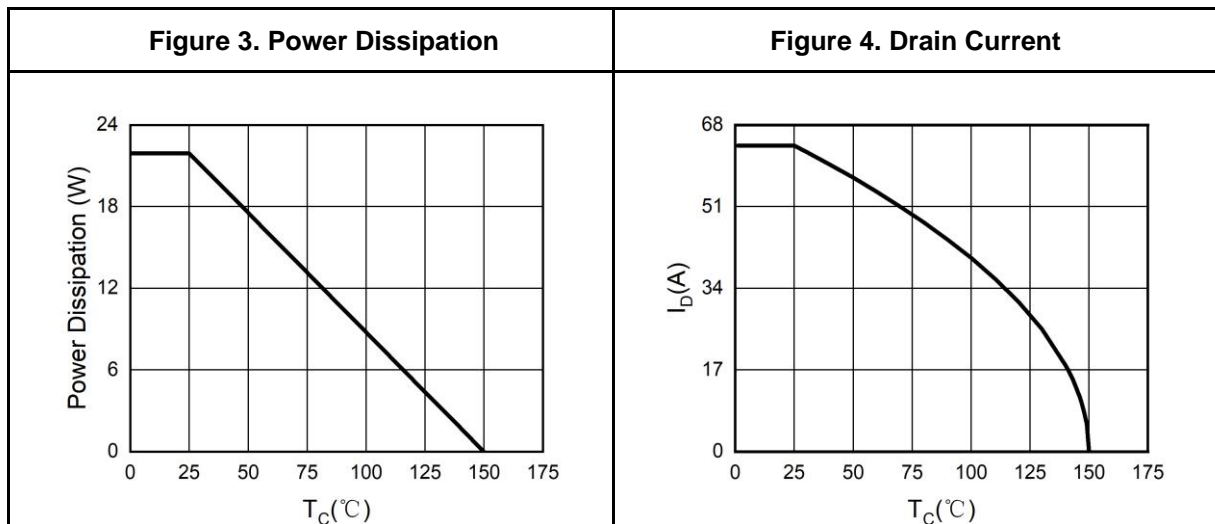
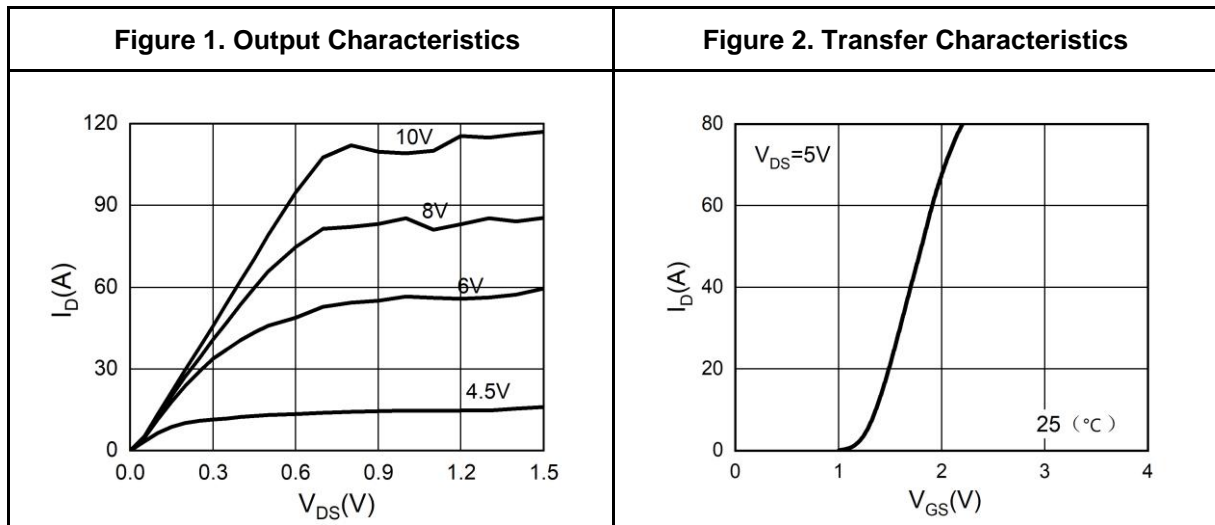
Notes 2.EAS condition: $T_J=25^\circ\text{C}, V_{DD}=10V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$.

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



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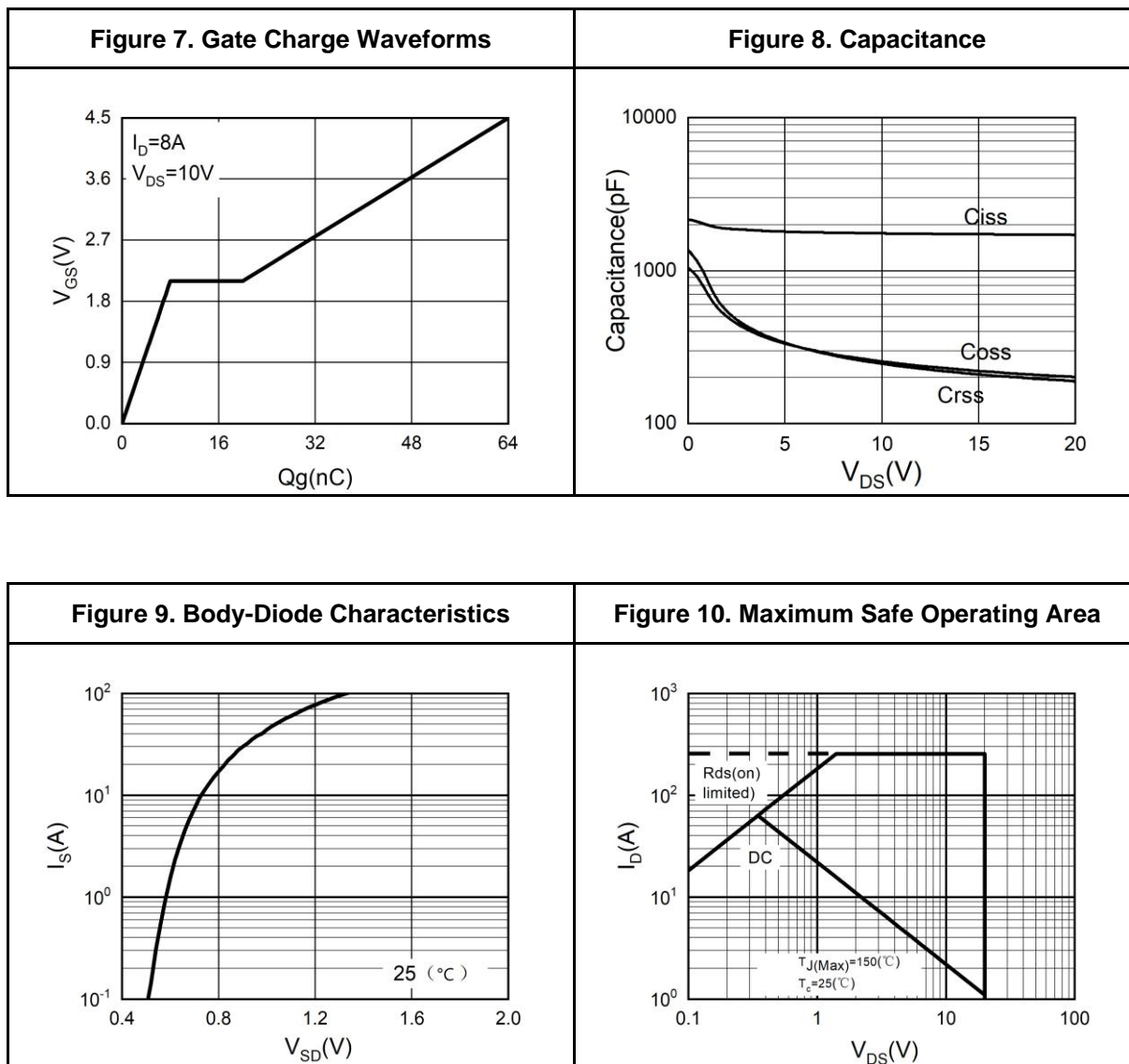
Typical Electrical And Thermal Characteristics (Curves)





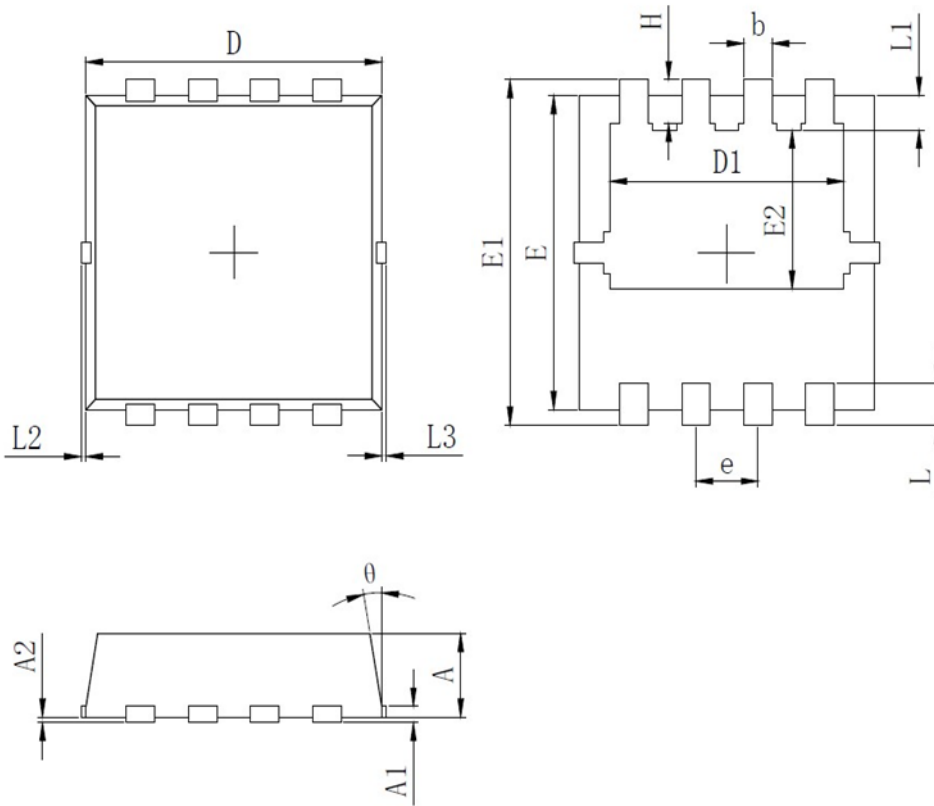
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Typical Electrical And Thermal Characteristics (Curves)





PDFN3X3-8L Package Information



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.700	0.800	0.900
A1	0.152 REF.		
A2	0 [~] 0.05		
D	3.000	3.100	3.200
D1	2.300	2.450	2.600
E	2.900	3.000	3.100
E1	3.150	3.300	3.450
E2	1.320	1.520	1.720
b	0.200	0.300	0.400
e	0.550	0.650	0.750
L	0.300	0.400	0.500
L1	0.180	0.330	0.480
L2	0 [~] 0.100		
L3	0 [~] 0.100		
H	0.315	0.415	0.515
θ	8°	10°	12°



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