



20V P-Channel Trench Power MOSFET

General Description

The SJM20P055 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

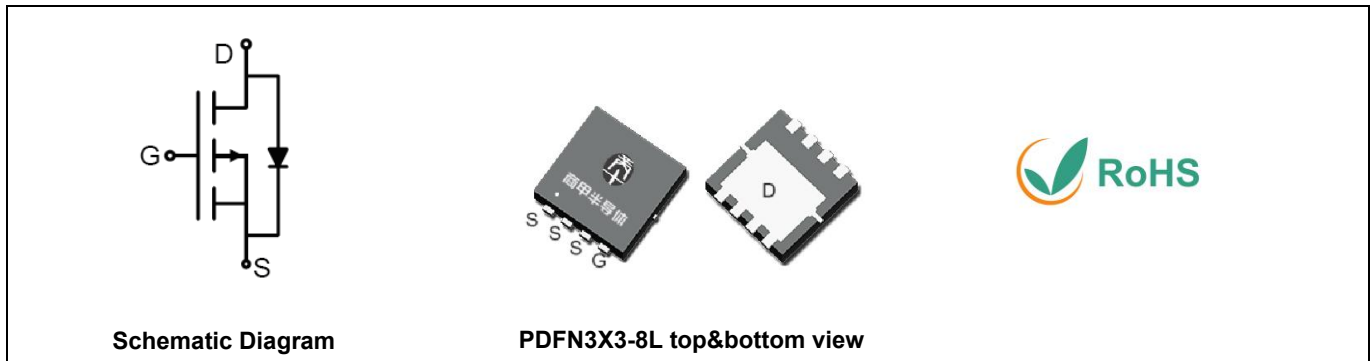
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

Application

- PWM Applications
- Load Switch
- Power Management

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	-20	V
$R_{DS(ON_TYP)}$	5.5	m Ω
I_D	-68	A
Q_G	45	nC



Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJM20P055	SJM20P055	PDFN3X3-8L	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($T_C=25^\circ\text{C}$)	-68	A
	Drain Current-Continuous($T_C=100^\circ\text{C}$)	-43	A
$I_{DM (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	-272	A
P_D	Maximum Power Dissipation($T_C=25^\circ\text{C}$)	46	W
	Maximum Power Dissipation($T_C=100^\circ\text{C}$)	19	W
E_{AS}	Avalanche energy (Note 2)	225	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		2.7	$^\circ\text{C}/\text{W}$



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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	$V_{DS}=-5V, I_D=-20A$		61		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=-4.5V, I_D=-20A, T_J=25^\circ\text{C}$		5.5	6.9	m Ω
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=-2.5V, I_D=-15A, T_J=25^\circ\text{C}$		7.8	10.4	m Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1.0\text{MHz}$		3830		pF
C_{oss}	Output Capacitance			458		pF
C_{rss}	Reverse Transfer Capacitance			377		pF
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1.0\text{MHz}$		7.5		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=-4.5V, V_{DS}=-10V, R_L=0.5\Omega, R_{GEN}=3\Omega$		8		nS
t_r	Turn-on Rise Time			57		nS
$t_{d(off)}$	Turn-Off Delay Time			110		nS
t_f	Turn-Off Fall Time			42		nS
Q_g	Total Gate Charge	$V_{GS}=-4.5V, V_{DS}=-10V, I_D=-20A$		45		nC
Q_{gs}	Gate-Source Charge			7		nC
Q_{gd}	Gate-Drain Charge			10		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				-68	A
V_{SD}	Forward on Voltage (Note 3)	$V_{GS}=0V, I_S=-20A$			-1.2	V
t_{rr}	Reverse Recovery Time	$I_F=-20A, dI/dt=-100A/\mu s$		18		ns
Q_{rr}	Reverse Recovery Charge	$I_F=-20A, dI/dt=-100A/\mu s$		8		nC

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

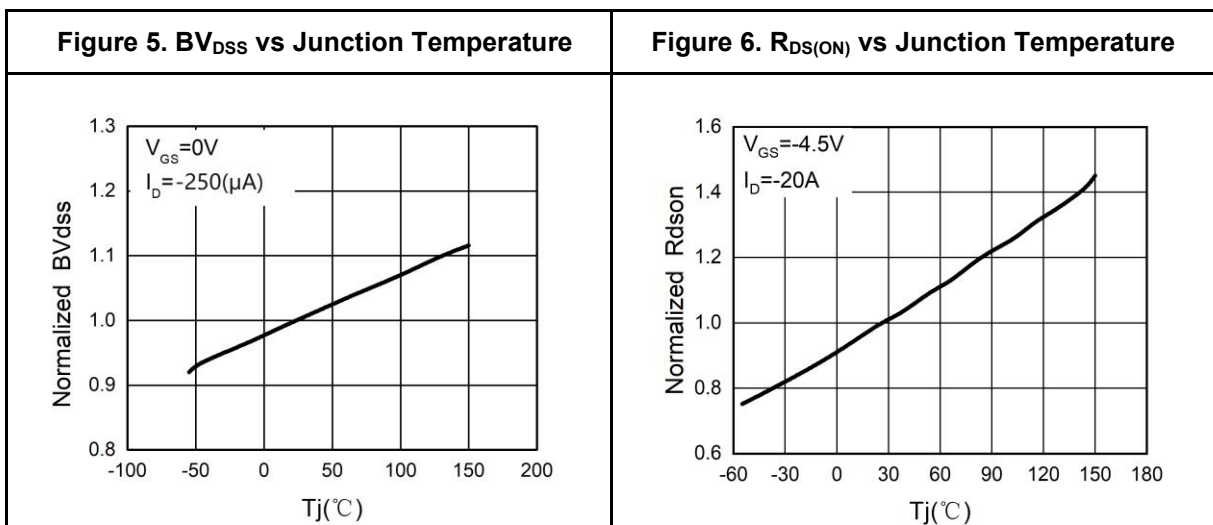
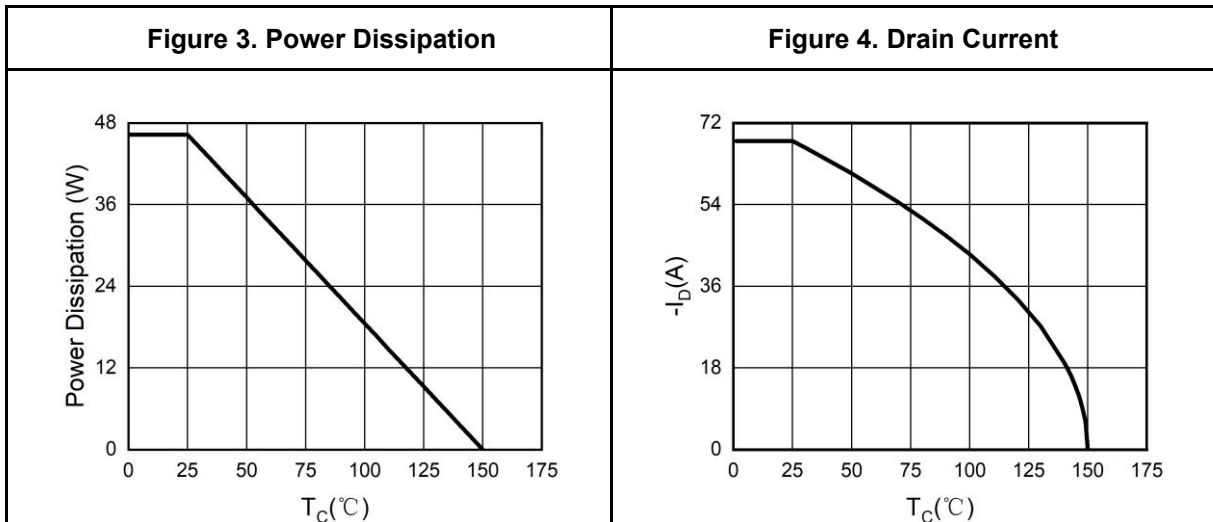
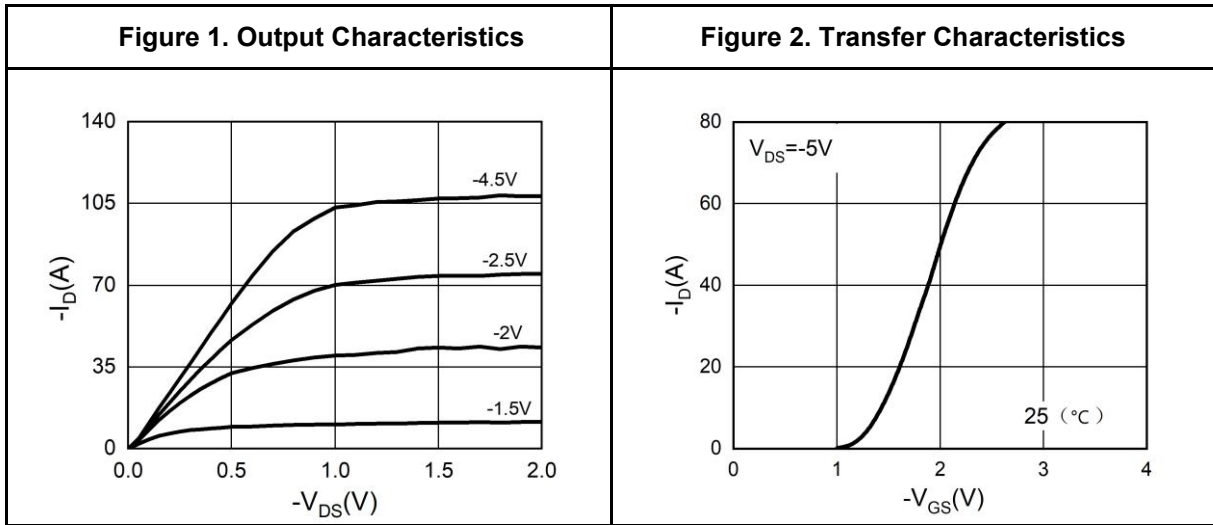
Notes 2.EAS condition: $T_J=25^\circ\text{C}, V_{DD}=-20V, V_G=-10V, R_g=25\Omega, L=0.5\text{mH}$.

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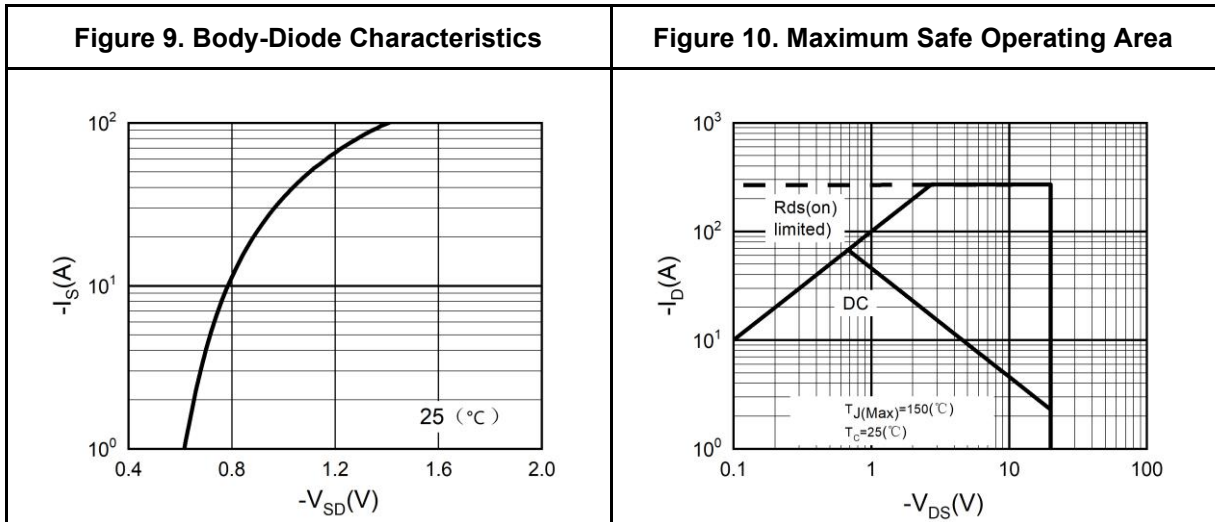
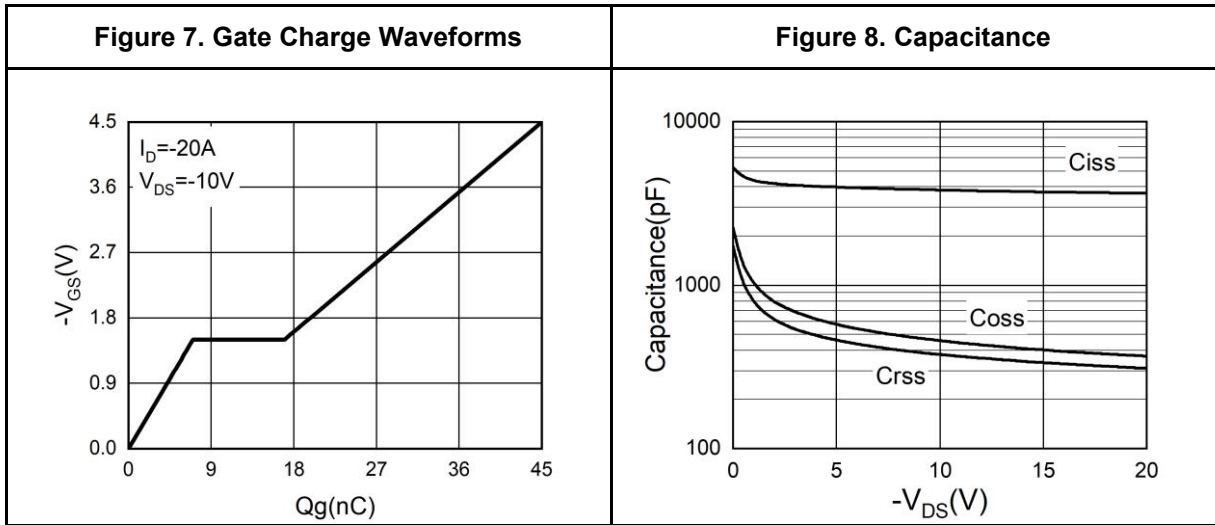
Typical Electrical And Thermal Characteristics (Curves)





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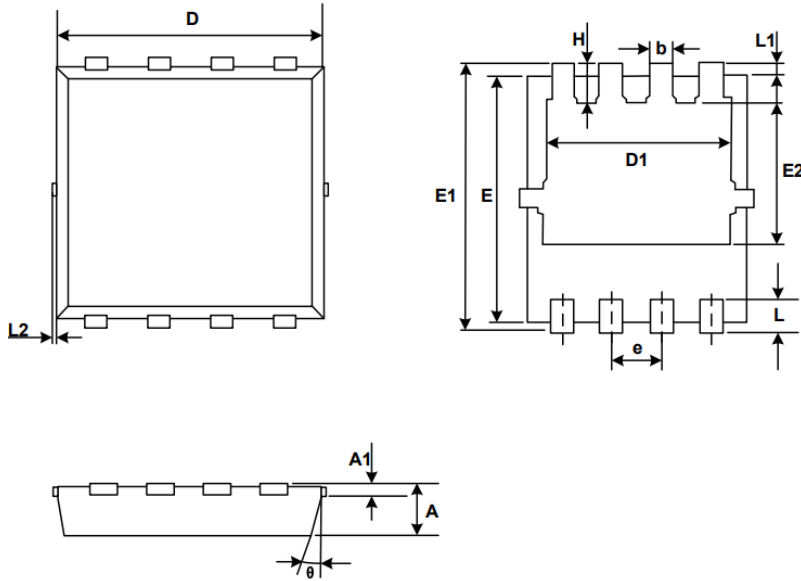
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PDFN3X3-8L Package Information

COMMON DIMENSIONS



SYMBOL	MM	
	MIN	MAX
A	0.65	0.90
A1	0.10	0.25
D	2.90	3.25
D1	2.25	2.69
E	2.90	3.20
E1	3.00	3.60
E2	1.35	2.20
b	0.20	0.40
e	0.65BSC	
L	0.15	0.50
L1	0.13BSC	
L2	0.00	0.20
H	0.15	0.65
θ	0°	14°



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