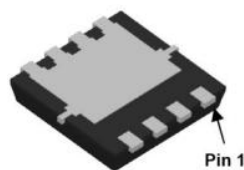
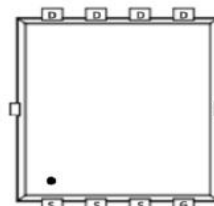
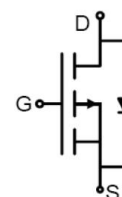


Main Product Characteristics:

V_{DSS}	-30V
$R_{DS(on)}$	5.4m Ω (typ.)
I_D	-54A


PDFN3x3-8L

Pin Assignments

Schematic Diagram
Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

Symbol	Parameter	Max.	Units
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	-54	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	-34	
I_{DM}	Pulsed Drain Current ②	-216	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation ③	33	W
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ $L=0.5\text{mH}$	289	mJ
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

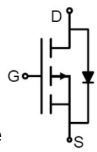
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	3.7	$^{\circ}\text{C}/\text{W}$

Electrical Characterizes @ $T_A=25^{\circ}\text{C}$ unless otherwise specified

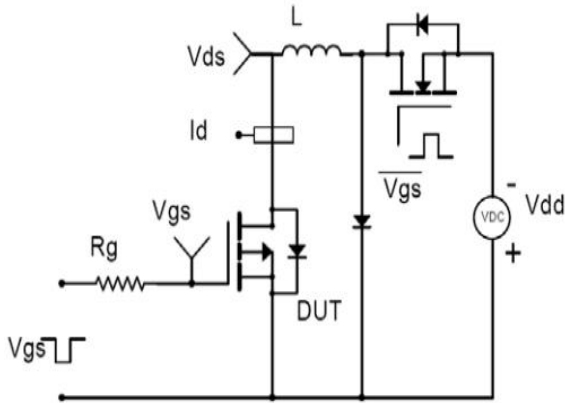
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-30	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	5.4	7	m Ω	$V_{GS} = -10\text{V}, I_D = -20\text{A}$
		—	8.7	11.6		$V_{GS} = -4.5\text{V}, I_D = -15\text{A}$
$V_{GS(th)}$	Gate threshold voltage	-1	—	-2.5	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
I_{DSS}	Drain-to-Source leakage current	—	—	-1	μA	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 20\text{V}$
		—	—	-100		$V_{GS} = -20\text{V}$
C_{iss}	Input capacitance	—	3240	—	pF	$V_{GS} = 0\text{V}$
C_{oss}	Output capacitance	—	380	—		$V_{DS} = -15\text{V}$
C_{rss}	Reverse transfer capacitance	—	230	—		$f = 1\text{MHz}$
Q_g	Total gate charge	—	60	—	nC	$I_D = -20\text{A},$
Q_{gs}	Gate-to-Source charge	—	7.5	—		$V_{DS} = -15\text{V},$
Q_{gd}	Gate-to-Drain("Miller") charge	—	15.5	—		$V_{GS} = -10\text{V}$
$t_{d(on)}$	Turn-on delay time	—	20	—	ns	$V_{GS} = -10\text{V}, V_{DS} = -15\text{V},$ $R_{GEN} = 3\Omega, R_L = 0.75\Omega$
t_r	Rise time	—	18	—		
$t_{d(off)}$	Turn-Off delay time	—	25	—		
t_f	Fall time	—	8	—		

Source-Drain Ratings and Characteristics

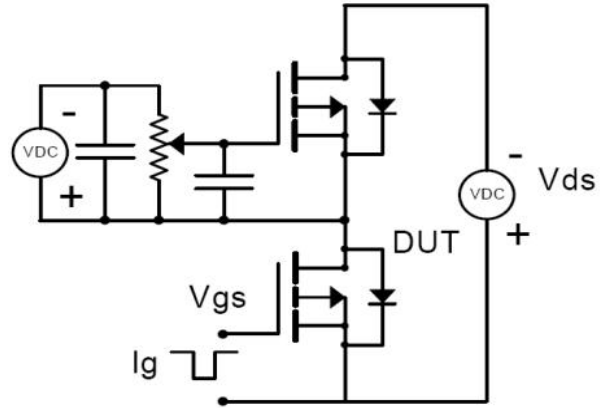
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-54	A	MOSFET symbol showing the integral reverse p-n junction diode 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-216	A	
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	$I_S = -20\text{A}, V_{GS} = 0\text{V}$
t_{rr}	Reverse Recovery Time	—	15	—	ns	$T_J = 25^{\circ}\text{C}, I_F = -10\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Q_{rr}	Reverse Recovery Charge	—	20	—	nC	

Test Circuits and Waveforms

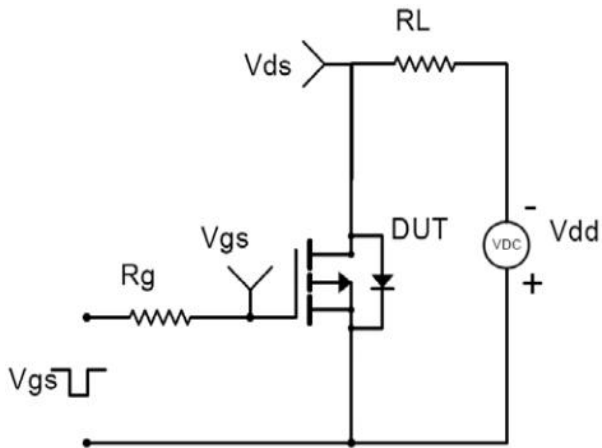
EAS Test Circuit:



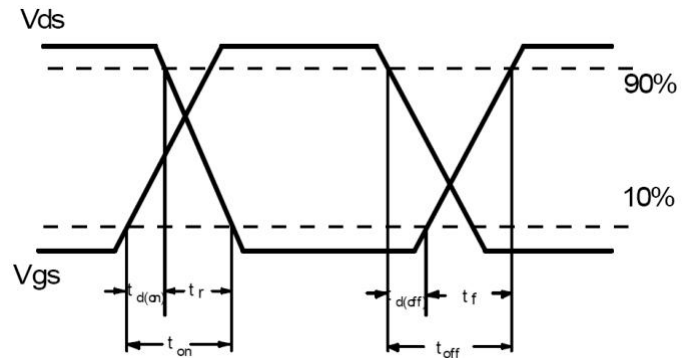
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching Waveforms:



Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

Typical Electrical and Thermal Characteristics

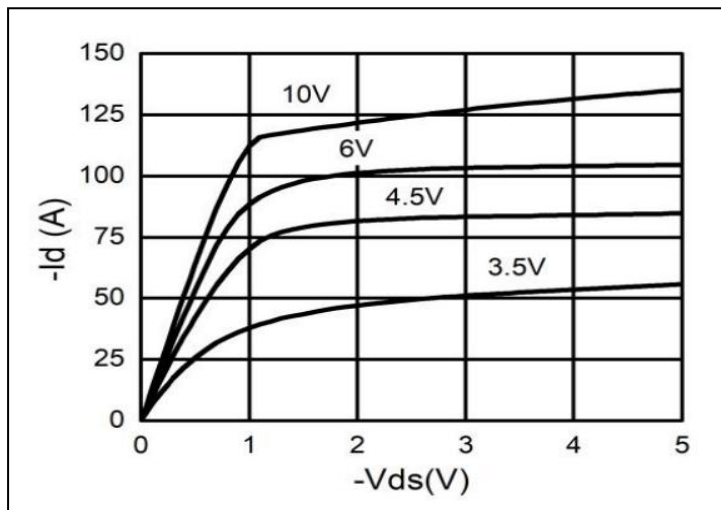


Figure1. Typical Output Characteristics

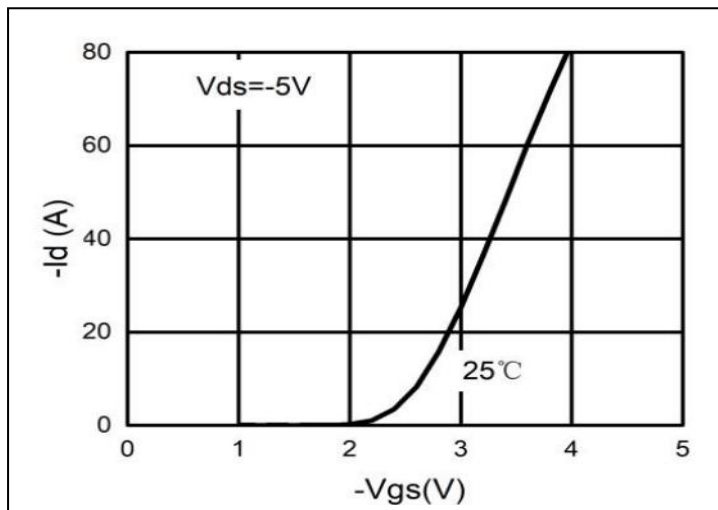


Figure2. Transfer Characteristics

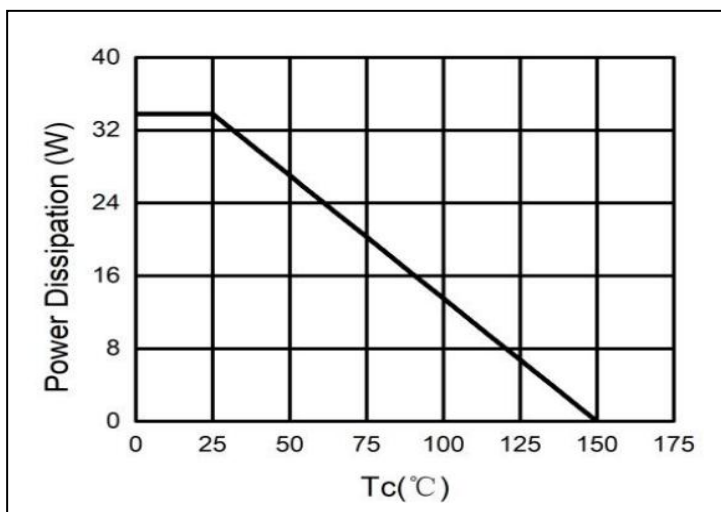


Figure3. Power Dissipation

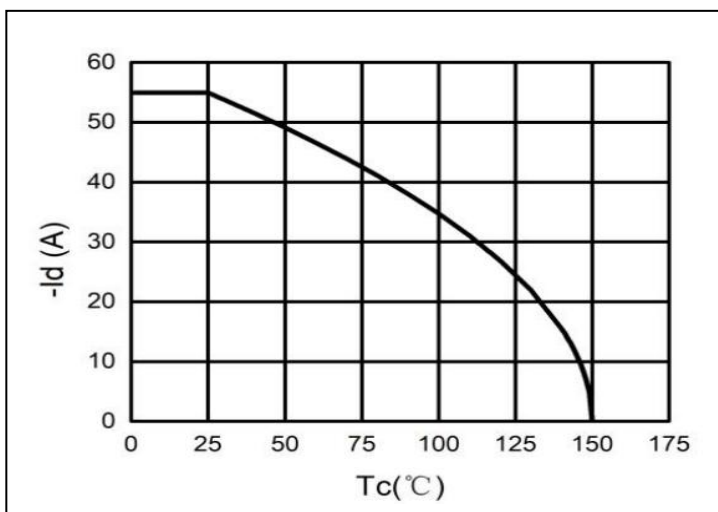


Figure 4. Drain Current

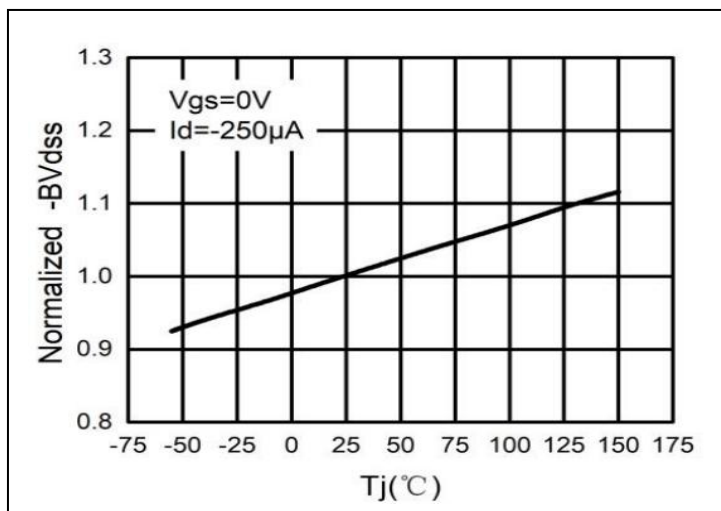


Figure5. BV_{DSS} vs Junction Temperature

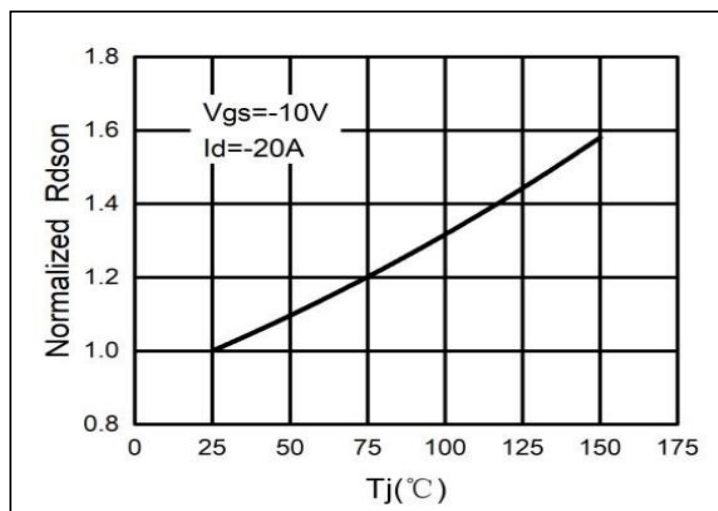


Figure6. $R_{DS(ON)}$ vs Junction Temperature

Typical Electrical and Thermal Characteristics

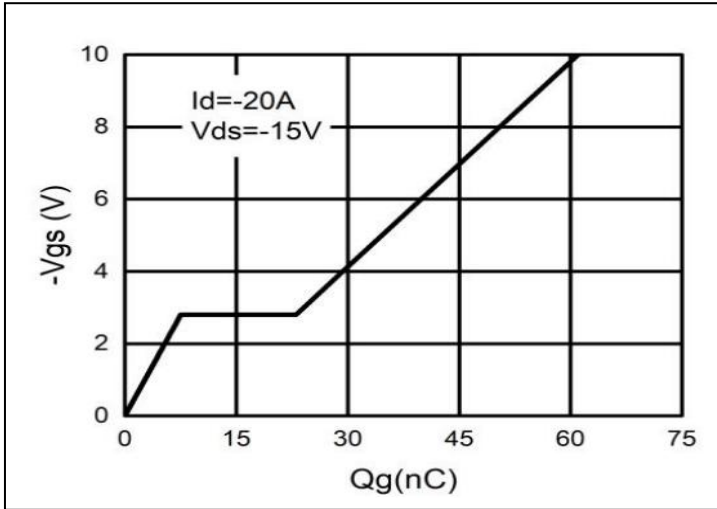


Figure7. Gate Charge Waveforms

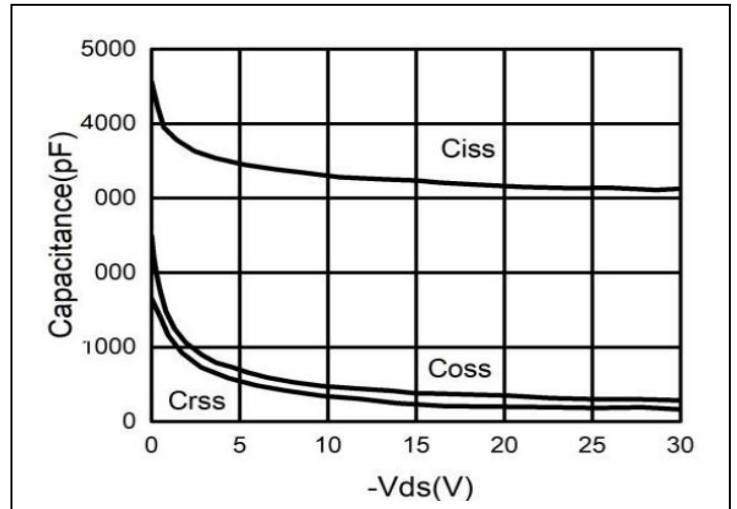


Figure8. Capacitance

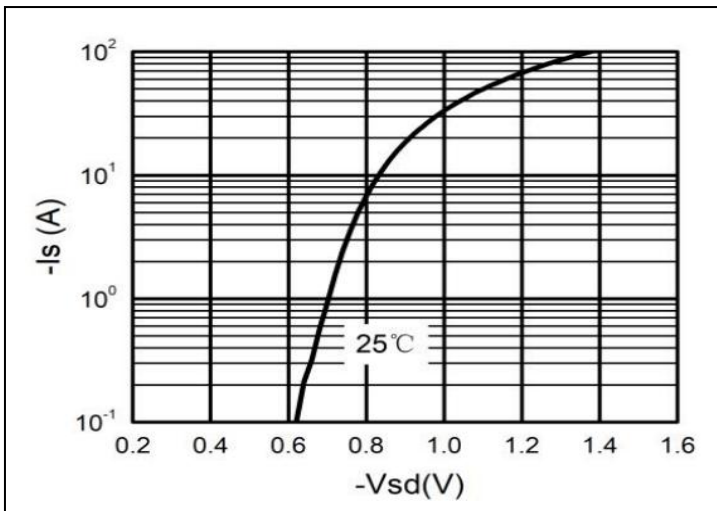


Figure9. Body-Diode Characteristics

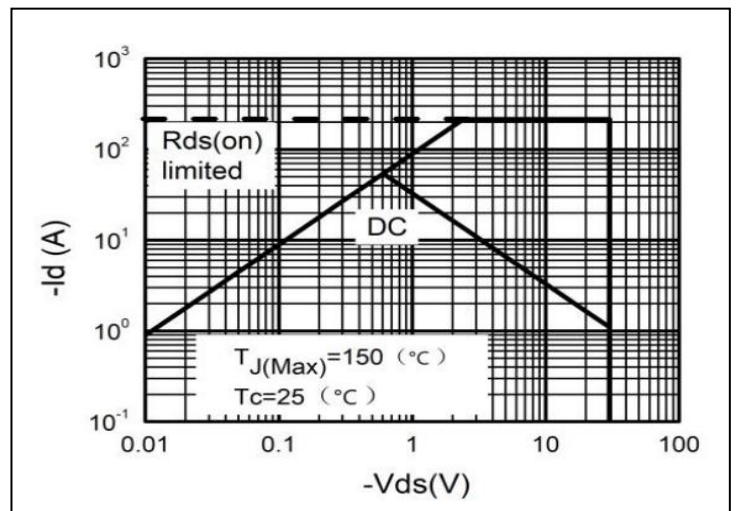
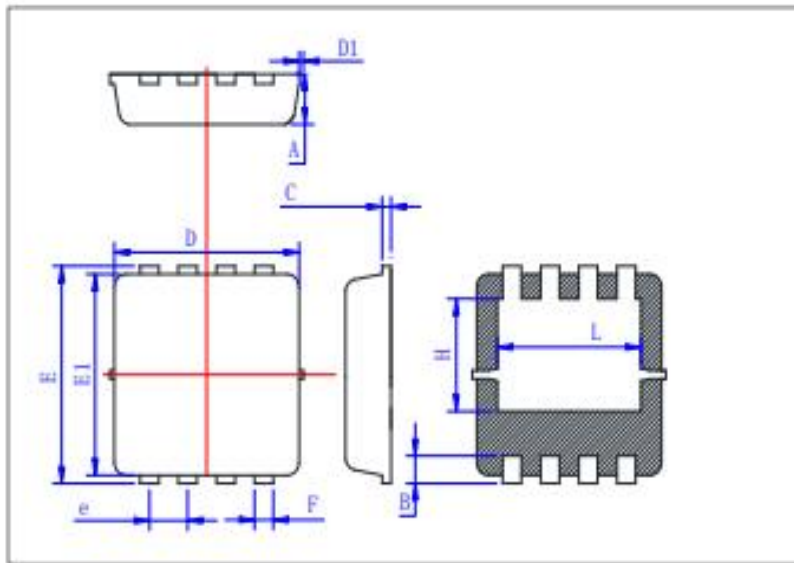


Figure10. Maximum Safe Operating Area

Mechanical Data:



Symbol	Min	Typ	Max
A	0.725	0.775	0.825
B	0.28	0.38	0.48
C	0.13	0.15	0.20
D	3.05	3.15	3.25
D1			0.10
E	3.25	3.35	3.45
EI	3.0	3.1	3.2
e	0.60	0.65	0.70
F	0.25	0.30	0.35
H	1.63	1.73	1.83
L	2.35	2.45	2.55

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