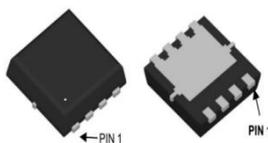
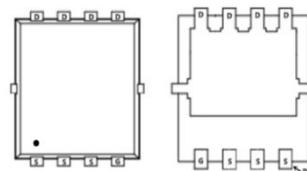
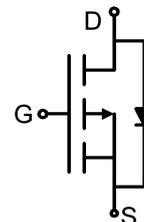


Main Product Characteristics:

V_{DSS}	-40V
$R_{DS(on)}$	11.6m Ω (typ.)
I_D	-13A ①


PDFN 3x3-8L

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 ①	-13	A
I_{DM}	Pulsed Drain Current ②	-52	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation ③	30	W
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.5mH	128	mJ
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

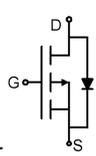
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case ④	—	4.17	°C/W

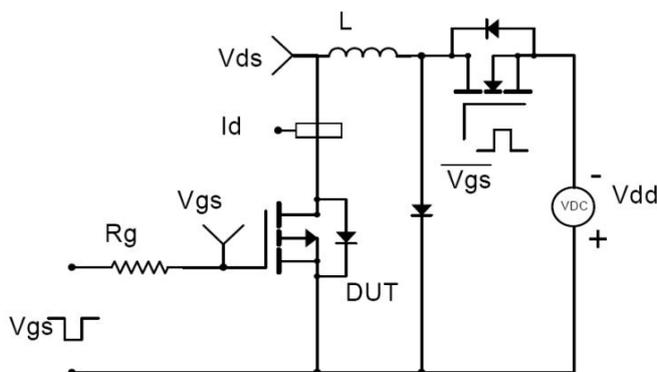
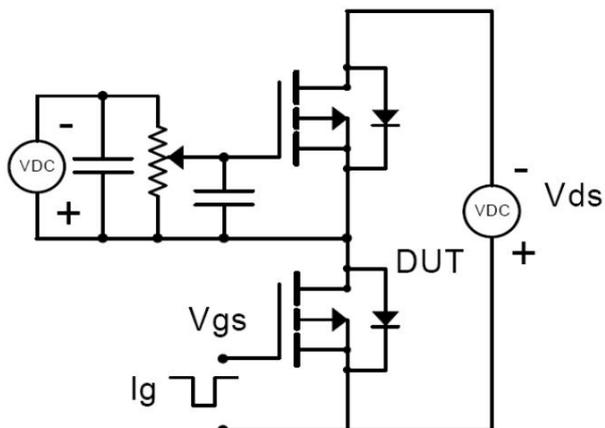
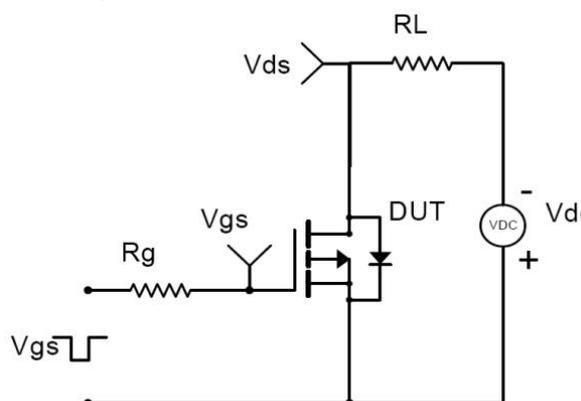
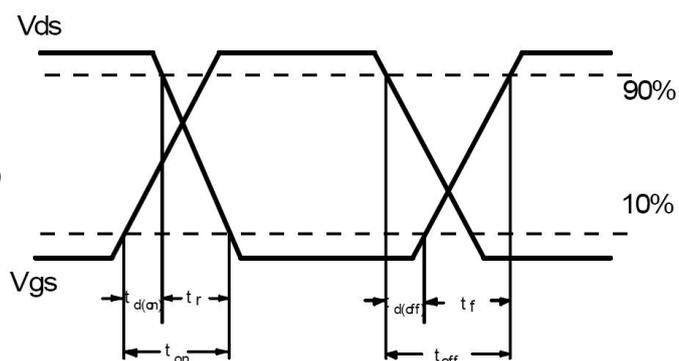
Electrical Characterizes @ $T_A=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-40	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	11.6	15	m Ω	$V_{GS}=-10V, I_D = -10A$
		—	15	22	m Ω	$V_{GS}=-4.5V, I_D = -8A$
$V_{GS(th)}$	Gate threshold voltage	-1	—	-2.5	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
I_{DSS}	Drain-to-Source leakage current	—	—	-1	μA	$V_{DS} = -40V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 20V$
		—	—	-100		$V_{GS} = -20V$
Q_g	Total gate charge	—	20	—	nC	$I_D = -10A,$ $V_{DS}=-32V,$ $V_{GS} = -4.5V$
Q_{gs}	Gate-to-Source charge	—	8	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	8.5	—		
$t_{d(on)}$	Turn-on delay time	—	21.8	—	ns	$V_{GS}=-10V, V_{DS} = -20V,$ $R_{GEN}=3\Omega, I_D = -20A$
t_r	Rise time	—	87.2	—		
$t_{d(off)}$	Turn-Off delay time	—	49.5	—		
t_f	Fall time	—	54.8	—		
C_{iss}	Input capacitance	—	3860	—	pF	$V_{GS} = 0V$ $V_{DS} = -25V$ $f = 1MHz$
C_{oss}	Output capacitance	—	250	—		
C_{riss}	Reverse transfer capacitance	—	240	—		

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	-13	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	-52	A	
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	

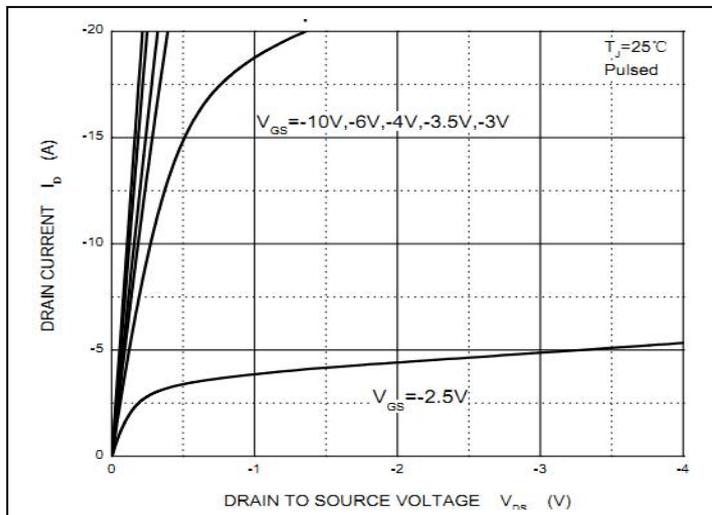
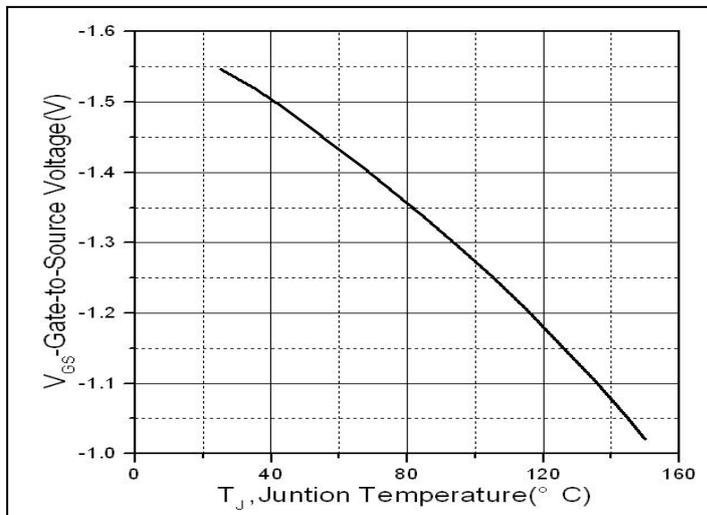
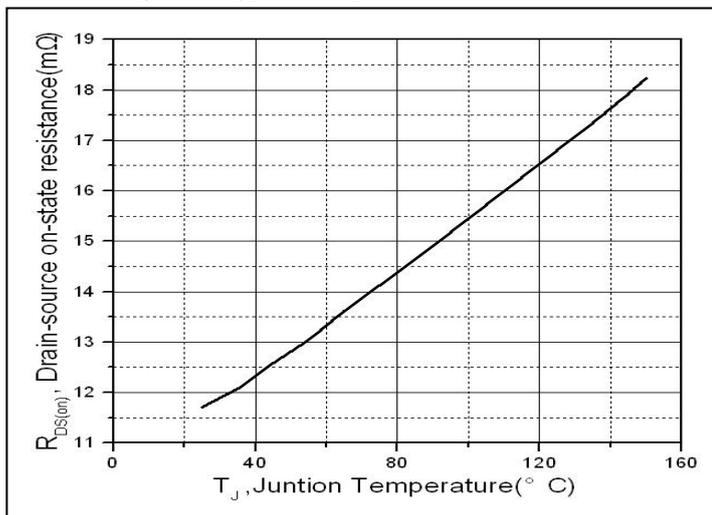
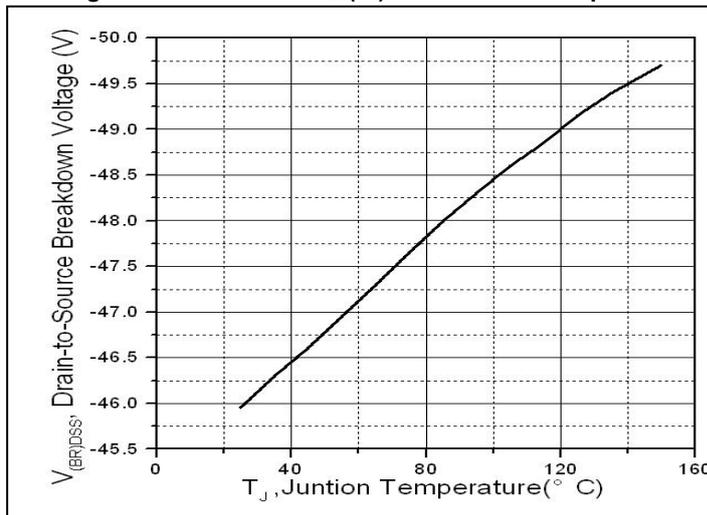
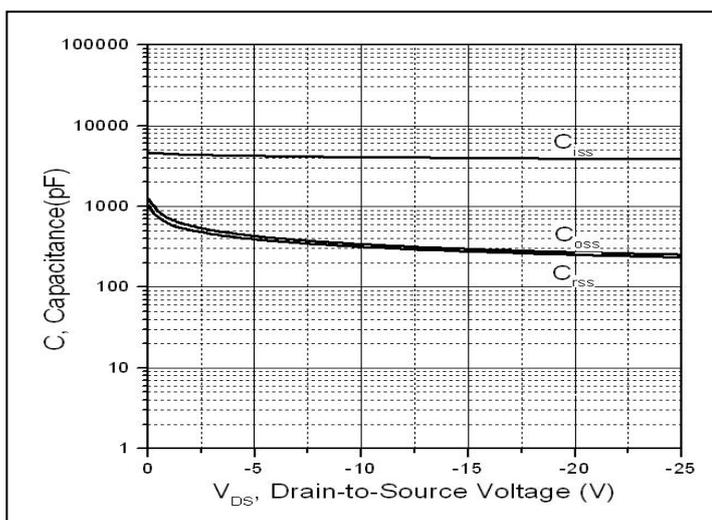
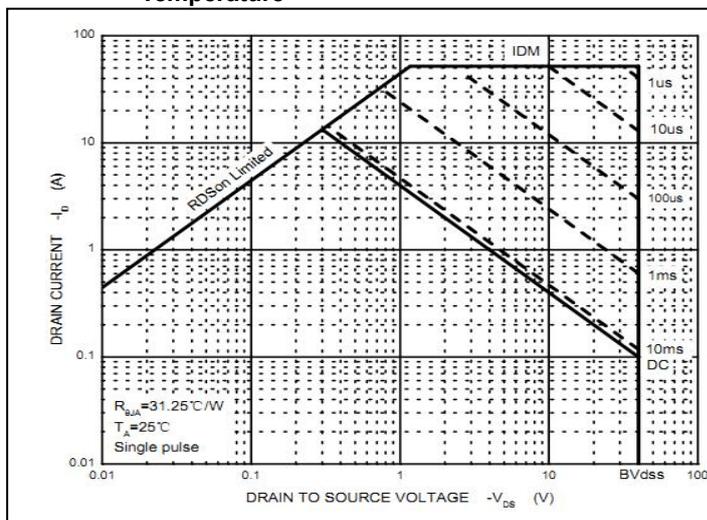
Test Circuits and Waveforms

EAS Test Circuit:

Gate Charge Test Circuit:

Switching Time Test Circuit:

Switching Waveforms:


Notes:

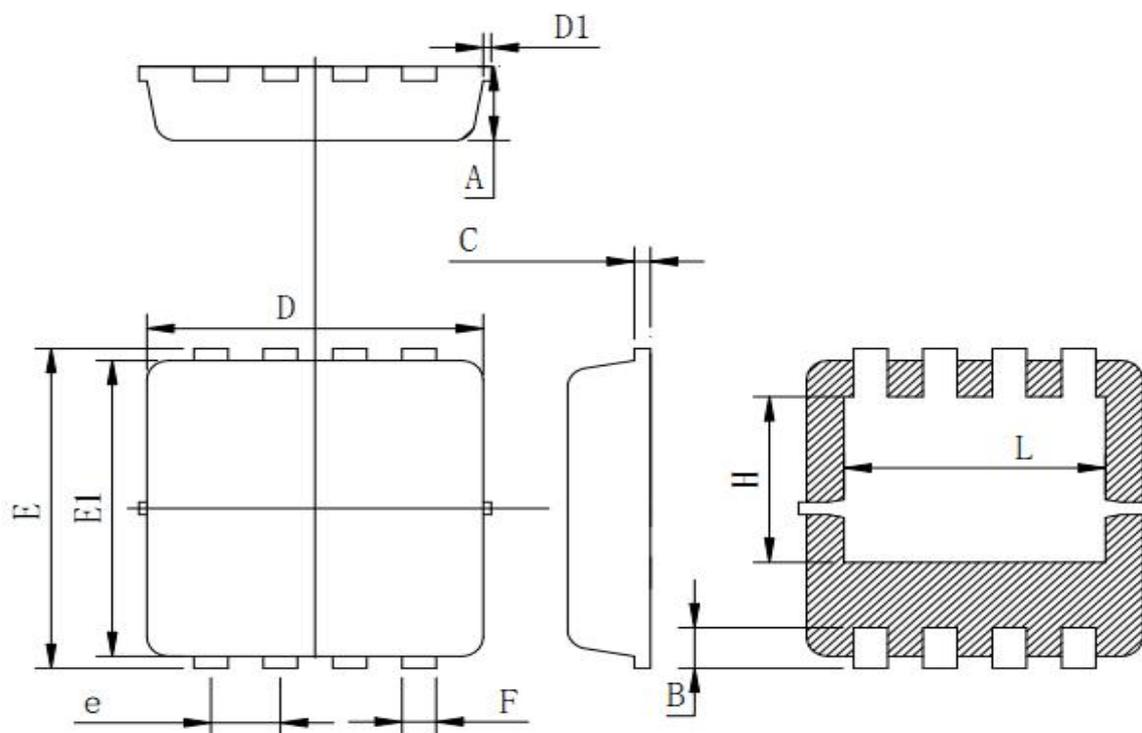
- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ C$

Typical Electrical and Thermal Characteristics


Figure 1. Typical Output Characteristics

Figure 2. Normalized $V_{GS(th)}$ vs. Junction Temperature

Figure 3. Normalized On-Resistance vs. Junction Temperature

Figure 4. Drain-to-Source Breakdown Voltage vs. Junction Temperature

Figure 5. Capacitance Characteristics

Figure 6. Safe Operation Area

Mechanical Data:

PDFN3*3 Outline (Unit: mm)



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
E1	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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