Features

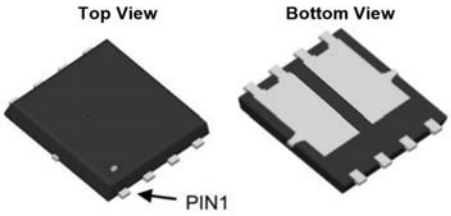
- N-Channel: 30V, 10A

  $R_{DS(ON)}$ Typ= 14mΩ @ V_{GS} = 10V
  $R_{DS(ON)}$ Typ= 22mΩ @ V_{GS} = 4.5V

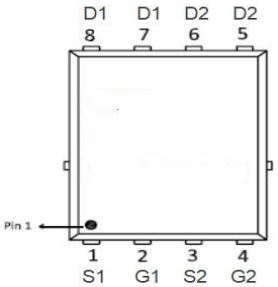
- P-Channel: -30V, -7A

  $R_{DS(ON)}$ Typ= 34mΩ @ V_{GS} = -10V
  $R_{DS(ON)}$ Typ= 46mΩ @ V_{GS} = -4.5V

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

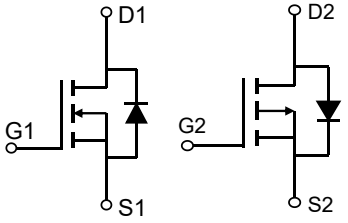


PDFN3.3x3.3-8L-D



Applications

- Battery Protection
- Load Switch
- Power Management



n-channel **p-channel**

Absolute Maximum Ratings (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter		N-Channel Value	P-Channel Value	Units
V_{DS}	Drain-to-Source Voltage		30	-30	V
V_{GS}	Gate-to-Source Voltage		±20	±20	V
I_D	Continuous Drain Current	T_C = 25°C	10	-7	A
		T_C = 100°C	5	-5	
I_{DM}	Pulsed Drain Current (1)		48	-40	A
E_{AS}	Single Pulsed Avalanche Energy (2)		12	20	mJ
P_D	Power Dissipation	T_C = 25°C	6	6.9	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		21	18	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150		°C

N-Channel Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 10V, I_D = 3A	-	14	27	mΩ
		V_{GS} = 4.5V, I_D = 2A	-	22	44	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz	-	511	-	pF
C_{oss}	Output Capacitance		-	66	-	pF
C_{rss}	Reverse Transfer Capacitance		-	52	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V, V_{DS} = 15V, I_D = 3A	-	10	-	nC
Q_{gs}	Gate Source Charge		-	2	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	2	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 15V, I_D= 3A, R_{GEN} = 3Ω	-	4	-	ns
t_r	Turn-On Rise Time		-	6	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	12	-	ns
t_f	Turn-Off Fall Time		-	3	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	48	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 5A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 3A, di/dt = 100A/us	-	8	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	2	-	nC

P-Channel Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = -250μA, V_{GS} = 0V	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -30V, V_{GS} = 0V	-	-	-1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1.0	-1.7	-2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = -10V, I_D = -5A	-	34	48	mΩ
		V_{GS} = -4.5V, I_D = -3A	-	46	67	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = -15V, f = 1MHz	-	516	-	pF
C_{oss}	Output Capacitance		-	71	-	pF
C_{rss}	Reverse Transfer Capacitance		-	60	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to -10V, V_{DS} = -15V, I_D = -3A	-	16	-	nC
Q_{gs}	Gate Source Charge		-	3	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	3	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = -10V, V_{DD} = -15V, I_D= -3A, R_{GEN} = 3Ω	-	4	-	ns
t_r	Turn-On Rise Time		-	2	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	38	-	ns
t_f	Turn-Off Fall Time		-	22	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-7	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-40	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -5A	-	-	-1.2	V
trr	Body Diode Reverse Recovery Time	I_F = -3A, di/dt = 100A/us	-	10	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	3	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E_{AS} condition: Starting T_J=25C, V_{DD}=20V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=7A

   E_{AS} condition: Starting T_J=25C, V_{DD}=-20V, V_G=-10V, R_G=25ohm, L=0.5mH, I_{AS}=-9A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit

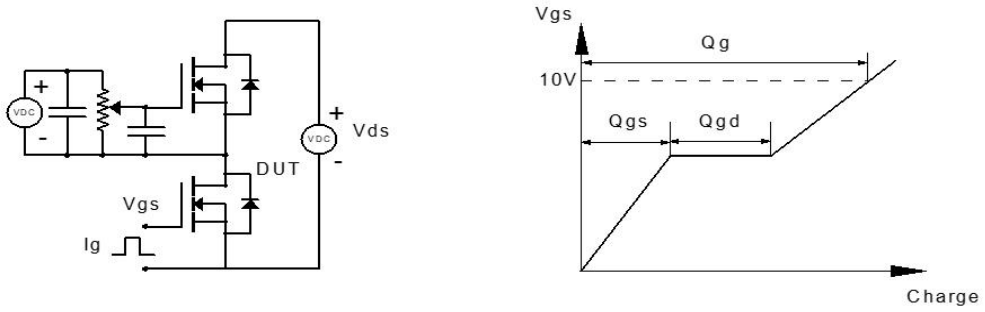


Figure 1: Gate Charge Test Circuit & Waveform

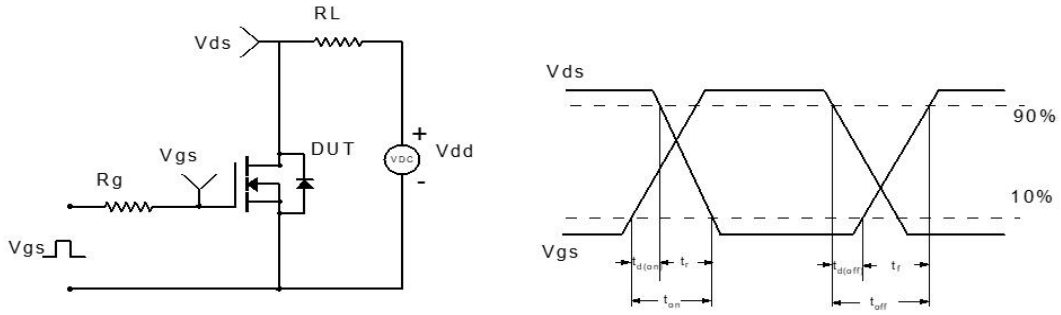


Figure 2: Resistive Switching Test Circuit & Waveform

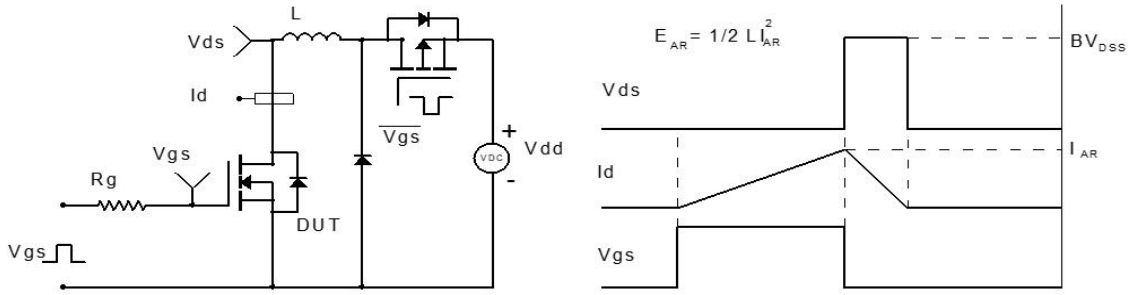


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

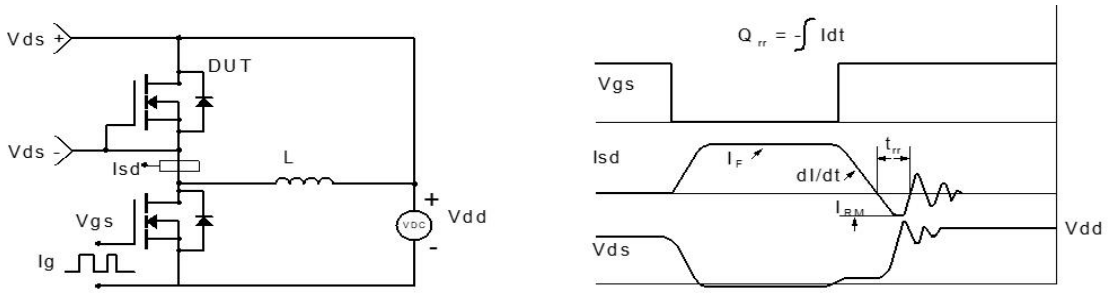
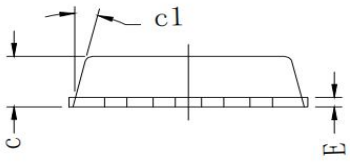
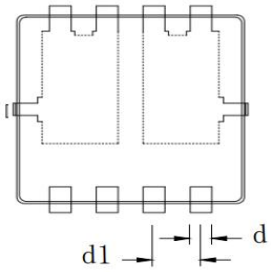
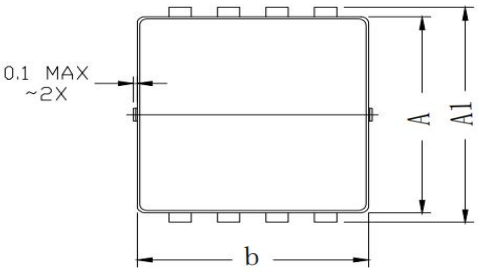


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(PDFN3.3x3.3-8L-D)







COMMON DIMENSION (MM)			
PKG	PDFN 3×3		
Symbol	MIN	MON	MAX
A	3.070	3.100	3.130
A1	3.300	3.400	3.500
b	3.070	3.100	3.130
c	0.770	0.800	0.830
c1	13°		
d	0.300		
d1	0.650		
E	0.152		