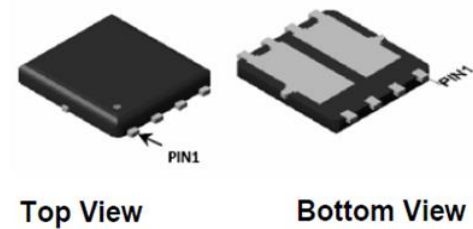
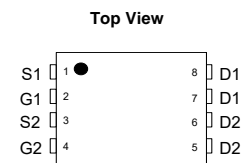


Features

- N-Channel: 30V, 20A
 $R_{DS(ON)}$ Typ= 8.8m Ω @ $V_{GS} = 10V$
 $R_{DS(ON)}$ Typ= 13m Ω @ $V_{GS} = 4.5V$
- P-Channel: -30V, -20A
 $R_{DS(ON)}$ Typ= 13.6m Ω @ $V_{GS} = -10V$
 $R_{DS(ON)}$ Typ= 18.5m Ω @ $V_{GS} = -4.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

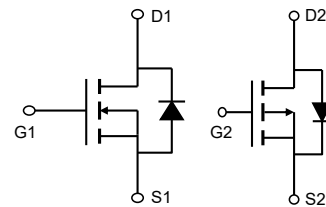


PDFN5x6-8L-D



Applications

- Battery Protection
- Load Switch
- Power Management



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

Symbol	Parameter	Max. N-Channel	Max. P-Channel	Units
V _{DSS}	Drain-Source Voltage	30	-30	V
V _{GSS}	Gate-Source Voltage	±20	±20	V
I _D	Continuous Drain Current	T _C = 25°C	-20	A
		T _C = 100°C	13	A
I _{DM}	Pulsed Drain Current ^{note1}	80	-50	A
E _{AS}	Single Pulsed Avalanche Energy ^{note2}	42	36	mJ
P _D	Power Dissipation	25	25	W
R _{θJC}	Thermal Resistance, Junction to Case	5	5	°C/W
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +150		°C

N-Channel Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.0	1.6	2.2	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance ⁽⁴⁾	$V_{GS} = 10\text{V}, I_D = 10\text{A}$	-	8.8	12.2	$\text{m}\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 5\text{A}$	-	13.0	20.5	$\text{m}\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 15\text{V},$ $f = 1\text{MHz}$	-	810	-	pF
C_{oss}	Output Capacitance		-	101	-	pF
C_{rss}	Reverse Transfer Capacitance		-	87	-	pF
Q_g	Total Gate Charge	$V_{GS} = 0 \text{ to } 10\text{V}$ $V_{DS} = 15\text{V}, I_D = 15\text{A}$	-	16	-	nC
Q_{gs}	Gate Source Charge		-	3.6	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	3.4	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = 10\text{V}, V_{DD} = 15\text{V}$ $I_D = 15\text{A}, R_{GEN} = 3\Omega$	-	6	-	ns
t_r	Turn-On Rise Time		-	15	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	17	-	ns
t_f	Turn-Off Fall Time		-	5	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	20	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	80	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0\text{V}, I_S = 20\text{A}$	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$I_F = 13\text{A}, di/dt = 100\text{A}/\mu\text{s}$	-	9.4	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	3.3	-	nC

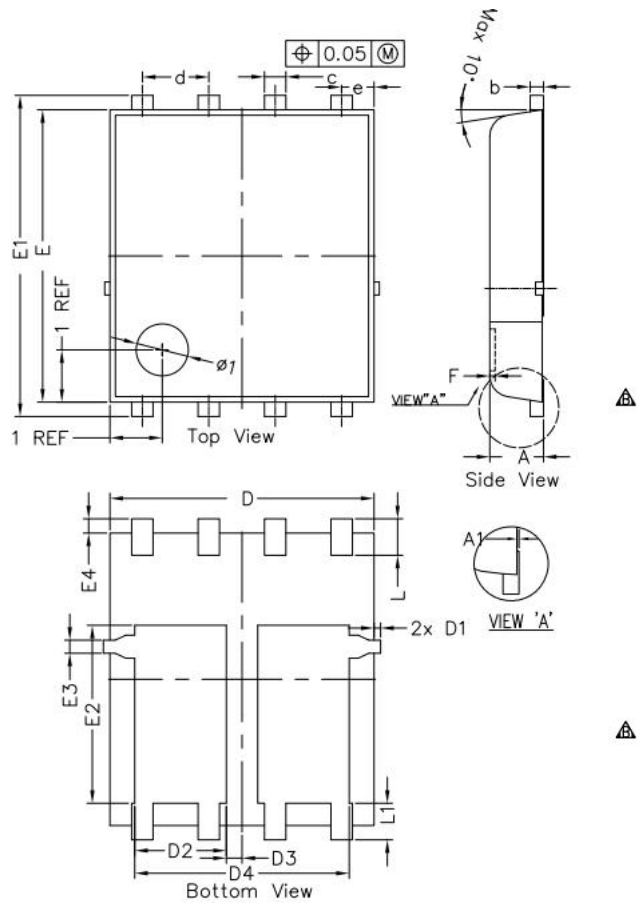
- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. E_{AS} condition: Starting $T_J=25^\circ\text{C}$, $V_{DD}=15\text{V}$, $V_G=10\text{V}$, $R_G=25\text{ohm}$, $L=0.5\text{mH}$, $I_{AS}=10\text{A}$
 3. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB
 4. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.

P-Channel Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$I_D = -250\mu\text{A}, V_{GS} = 0\text{V}$	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	-1.0	-1.6	-2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance ⁽⁴⁾	$V_{GS} = -10\text{V}, I_D = -10\text{A}$	-	13.6	23.0	$\text{m}\Omega$
		$V_{GS} = -4.5\text{V}, I_D = -5\text{A}$	-	18.5	34.0	$\text{m}\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = -15\text{V}, f = 1\text{MHz}$	-	1136	-	pF
C_{oss}	Output Capacitance		-	164	-	pF
C_{rss}	Reverse Transfer Capacitance		-	135	-	pF
Q_g	Total Gate Charge	$V_{GS} = 0 \text{ to } -10\text{V}$ $V_{DS} = -15\text{V}, I_D = -5\text{A}$	-	23	-	nC
Q_{gs}	Gate Source Charge		-	4.0	-	nC
Q_{gd}	Gate Drain ("Miller") Charge		-	5.0	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = -10\text{V}, V_{DD} = -15\text{V}$ $I_D = -5\text{A}, R_{GEN} = 3\Omega$	-	4	-	ns
t_r	Turn-On Rise Time		-	3	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	60	-	ns
t_f	Turn-Off Fall Time		-	50	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-20	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-50	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0\text{V}, I_S = -12\text{A}$	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$I_F = -5\text{A}, di/dt = 100\text{A}/\mu\text{s}$	-	12	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	4	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. EAS condition: Starting $T_J=25^\circ\text{C}$, $V_{DD}=-15\text{V}$, $V_G=-10\text{V}$, $R_G=25\text{ohm}$, $L=0.5\text{mH}$, $I_{AS}=-8\text{A}$
 3. $R_{\theta JA}$ is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
 4. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.

Package Mechanical Data-PDFN5x6-8L-D



SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
* A	0.900	1.000	1.100	0.035	0.039	0.043
A1	0.000	---	0.050	0.000	----	0.002
b	0.246	0.254	0.312	0.010	0.010	0.012
* c	0.310	0.410	0.510	0.012	0.016	0.020
d	1.27 BSC			0.050 BSC		
* D	4.950	5.050	5.150	0.195	0.199	0.203
* D1	---	---	0.125	---	---	0.005
* D2	1.650	1.750	1.850	0.065	0.069	0.073
D3	0.200	0.300	0.400	0.008	0.012	0.016
D4	4.000	4.100	4.200	0.157	0.161	0.165
e	0.62 BSC			0.024 BSC		
* E	5.500	5.600	5.700	0.217	0.220	0.224
* E1	6.050	6.150	6.250	0.238	0.242	0.246
E2	3.310	3.410	3.510	0.130	0.134	0.138
E3	0.150	0.250	0.350	0.006	0.010	0.014
* E4	0.175	0.275	0.375	0.007	0.011	0.015
F	-	-	0.100	-	-	0.004
* L	0.500	0.600	0.700	0.02	0.02	0.03
L1	0.600	0.700	0.800	0.02	0.03	0.03