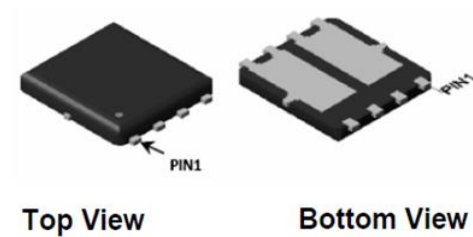
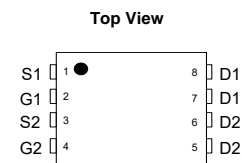


Features

- 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

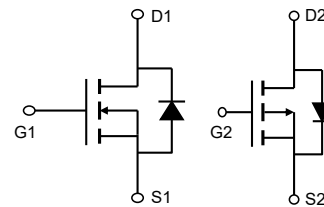


PDFN5x6-8L-D



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	-20	A
		T _C = 100°C	13	-12	A
I _{DM}	Pulsed Drain Current ^{note1}		80	-50	A
E _{AS}	Single Pulsed Avalanche Energy ^{note2}		42	36	mJ
P _D	Power Dissipation	T _C = 25°C	3.2	4.3	W
R _{θJC}	Thermal Resistance, Junction to Case		39	29	°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 = 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	1.6	2.2	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽⁴⁾	V _{GS} = 10V, I _D = 10A	-	8.8	12.2	mΩ
		V _{GS} = 4.5V, I _D = 5A	-	13.0	20.5	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 15V, f = 1MHz	-	810	-	pF
C _{oss}	Output Capacitance		-	101	-	pF
C _{rss}	Reverse Transfer Capacitance		-	87	-	pF
Q _g	Total Gate Charge	V _{GS} = 0 to 10V V _{DS} = 15V, I _D = 15A	-	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 DelayTime	V _{GS} = 10V, V _{DD} = 15V I _D = 15A, R _{GEN} = 3Ω	-	6	-	ns
t _r	Turn-On Rise Time		-	15	-	ns
t _{d(off)}	Turn-Off DelayTime		-	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} = 0V, I _S = 20A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F = 13A, di/dt = 100A/us	-	9.4	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	3.3	-	nC

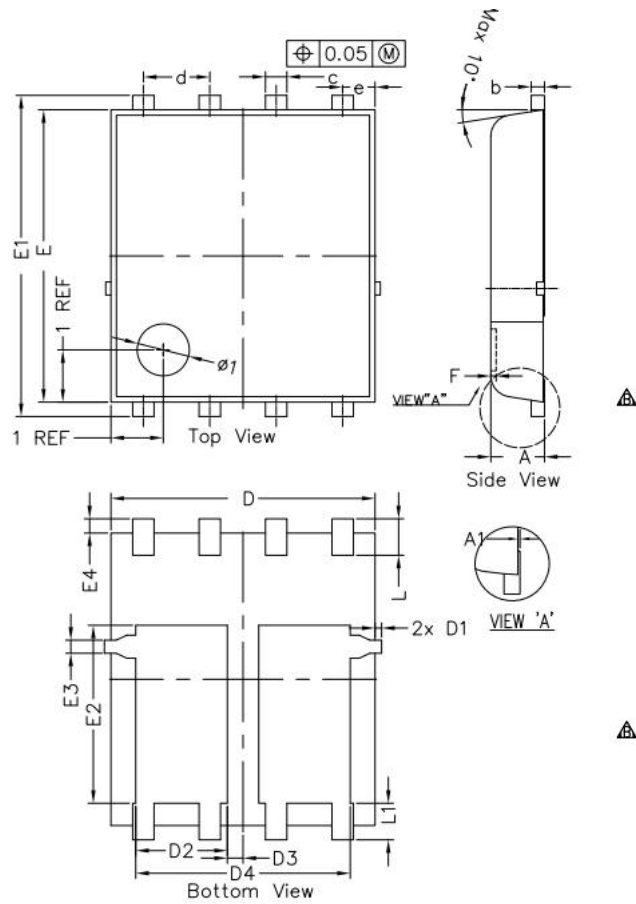
- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. E_{AS} condition: Starting $T_J=25^{\circ}\text{C}$, $V_{DD}=15\text{V}$, $V_G=10\text{V}$, $R_G=25\text{ohm}$, $L=0.5\text{mH}$, $I_{AS}=10\text{A}$
 3. $R_{\theta JA}$ is measured with the device mounted on a 1inch² 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°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	-1.6	-2.5	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽⁴⁾	V _{GS} =-10V, I _D =-10A	-	13.6	23.0	mΩ
		V _{GS} =-4.5V, I _D =-5A	-	18.5	34.0	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = -15V, f = 1MHz	-	1136	-	pF
C _{oss}	Output Capacitance		-	164	-	pF
C _{rss}	Reverse Transfer Capacitance		-	135	-	pF
Q _g	Total Gate Charge	V _{GS} = 0 to -10V V _{DS} = -15V, I _D = -5A	-	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 DelayTime	V _{GS} = -10V, V _{DD} = -15V I _D = -5A, R _{GEN} = 3Ω	-	4	-	ns
t _r	Turn-On Rise Time		-	3	-	ns
t _{d(off)}	Turn-Off DelayTime		-	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} = 0V, I _S =-12A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F = -5A, di/dt = 100A/us	-	12	-	ns
Qrr	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°C, V_{DD}=-15V, V_G=-10V, R_G=25ohm, L=0.5mH, I_{AS}=-8A
 3. R_{θJA} is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
 4. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 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