

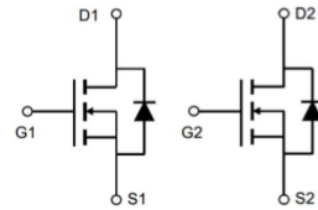
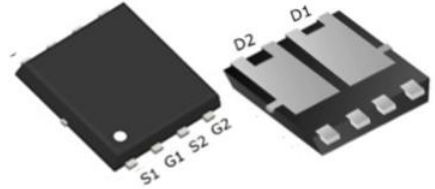
# H14N10FBL

## N-Channel Power MOSFET

### Features

- High Power and Current Handling Capability
- Lead Free Product is Acquired
- Surface Mount Package
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

PDFN5\*6-8L



### Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible Power Supply

### Absolute Maximum Ratings $T_C=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter		Max.	Units
$V_{DSS}$	Drain-Source Voltage		100	V
$V_{GSS}$	Gate-Source Voltage		$\pm 20$	V
$I_D$	Continuous Drain Current <sup>note5</sup>	$T_C = 25^{\circ}\text{C}$	13.8	A
$I_D$	Continuous Drain Current <sup>note5</sup>	$T_C = 100^{\circ}\text{C}$	9.5	A
$I_{DM}$	Pulsed Drain Current <sup>note3</sup>		52	A
$P_D$	Power Dissipation <sup>note2</sup>	$T_C = 25^{\circ}\text{C}$	35	W
$I_{AS}$	Avalanche Current <sup>note3,6</sup>		4.6	A
$E_{AS}$	Single Pulse Avalanche Energy <sup>note3,6</sup>		5.5	mJ
$R_{\theta JC}$	Thermal Resistance, Junction to Case		3.6	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient <sup>note1,4</sup>		62.5	$^{\circ}\text{C}/\text{W}$
$T_J, T_{STG}$	Operating and Storage Temperature Range		-55 to +150	$^{\circ}\text{C}$

## Electrical Characteristics $T_C=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	100	-	-	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	-	-	1	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
On Characteristics						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.4	-	2.4	V
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> = 10V, I <sub>D</sub> =5A	-	75	90	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5A	-	97	116	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	430	-	pF
C <sub>oss</sub>	Output Capacitance		-	32	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	2.3	-	pF
Switching Characteristics						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = 50V, I <sub>D</sub> =10A, V <sub>GS</sub> = 10V	-	6	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	0.98	-	
Q <sub>gd</sub>	Gate-Drain(“Miller”) Charge		-	1.2	-	
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DS</sub> = 50V, I <sub>D</sub> =10A, R <sub>G</sub> = 2Ω, V <sub>GS</sub> =10V	-	16	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	3.1	-	
t <sub>d(off)</sub>	Turn-Off Delay Time		-	13	-	
t <sub>f</sub>	Turn-Off Fall Time		-	2.2	-	
Diode Characteristics						
I <sub>S</sub>	Continuous Source Current		-	-	13.8	A
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =10A . V <sub>GS</sub> = 0V	-	-	1.0	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =10A,	-	42	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI <sub>SD</sub> /dt=100A/μs	-	61	-	nC

Notes:

1. The value of  $R_{\theta JC}$  is measured in a still air environment with  $T_A = 25^{\circ}\text{C}$  and the maximum allowed junction temperature of  $150^{\circ}\text{C}$ . The value in any given application depends on the user's specific board design.
2. The power dissipation  $P_D$  is based on  $T_{J(MAX)} = 150^{\circ}\text{C}$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
3. Single pulse width limited by junction temperature  $T_{J(MAX)} = 150^{\circ}\text{C}$ .
4. The  $R_{\theta JA}$  is the sum of the thermal impedance from junction to case  $R_{\theta JC}$  and case to ambient.
5. The maximum current rating is package limited.

## Typical Performance Characteristics

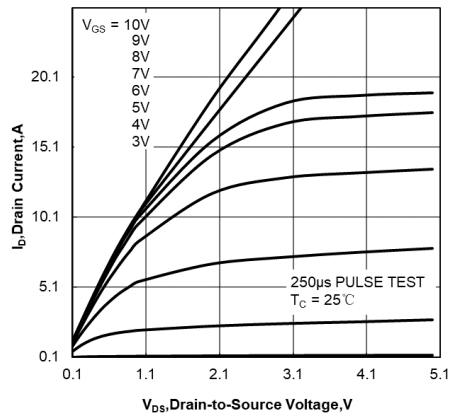


Figure 1. Output Characteristics

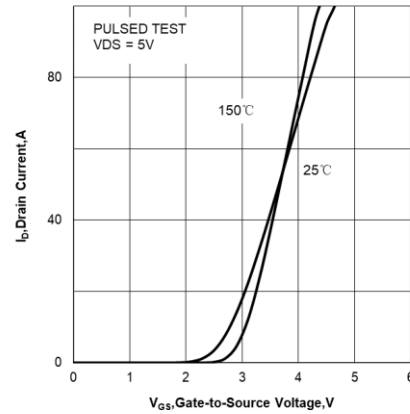


Figure 2. Transfer Characteristics

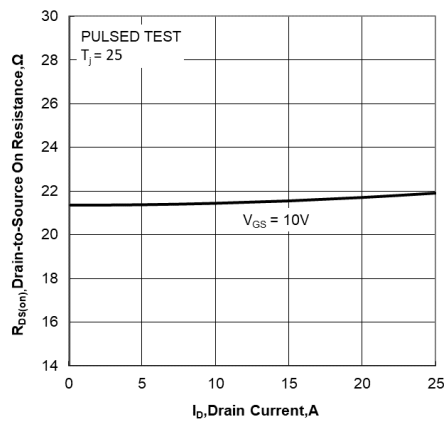


Figure 3. Drain-to-Source On Resistance vs Drain Current

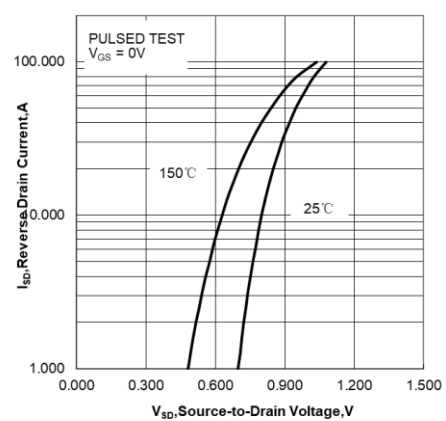


Figure 4. Body Diode Forward Voltage vs Source Current and Temperature

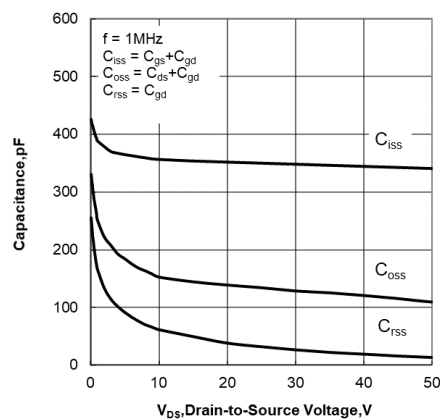


Figure 5. Capacitance Characteristics

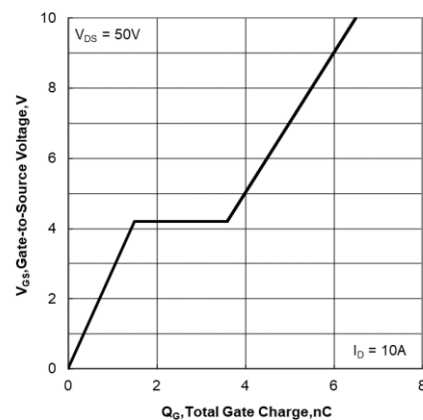
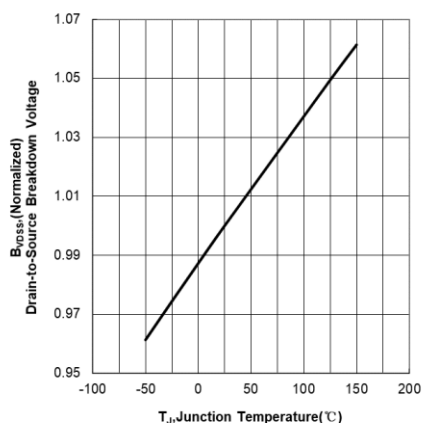
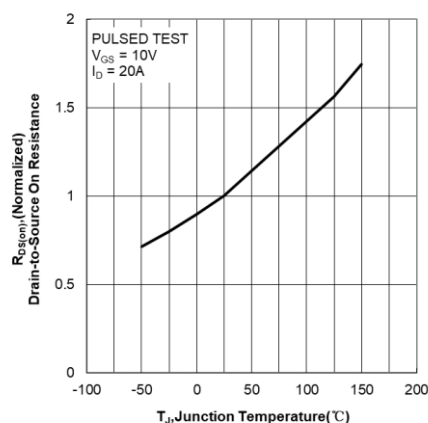


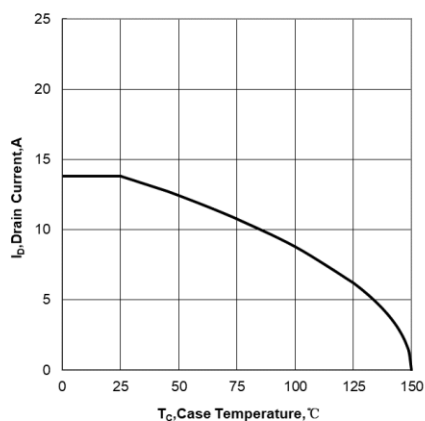
Figure 6. Gate Charge Characteristics



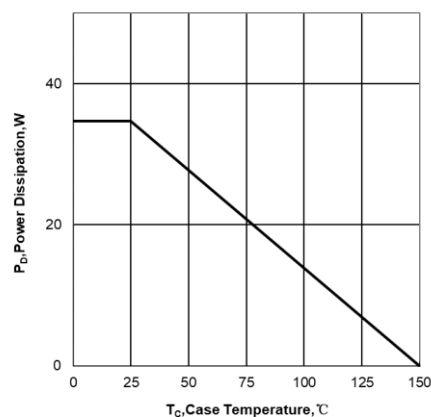
**Figure 7. Normalized Breakdown Voltage vs Junction Temperature**



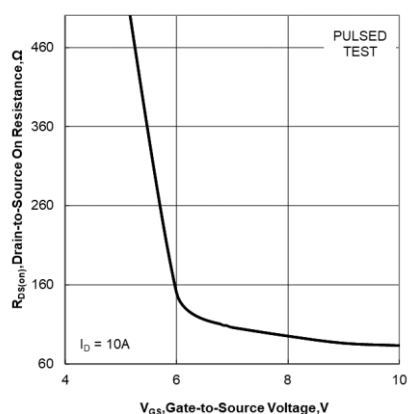
**Figure 8. Normalized On Resistance vs Junction Temperature**



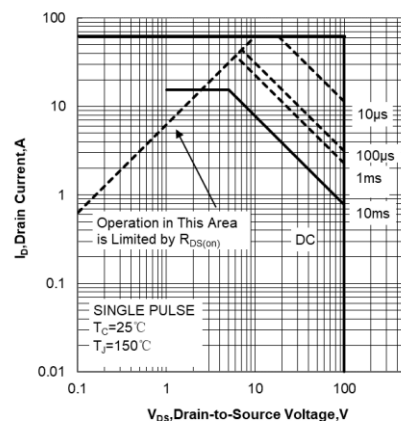
**Figure 9. Maximum Continuous Drain Current vs Case Temperature**



**Figure 10. Maximum Power Dissipation vs Case Temperature**

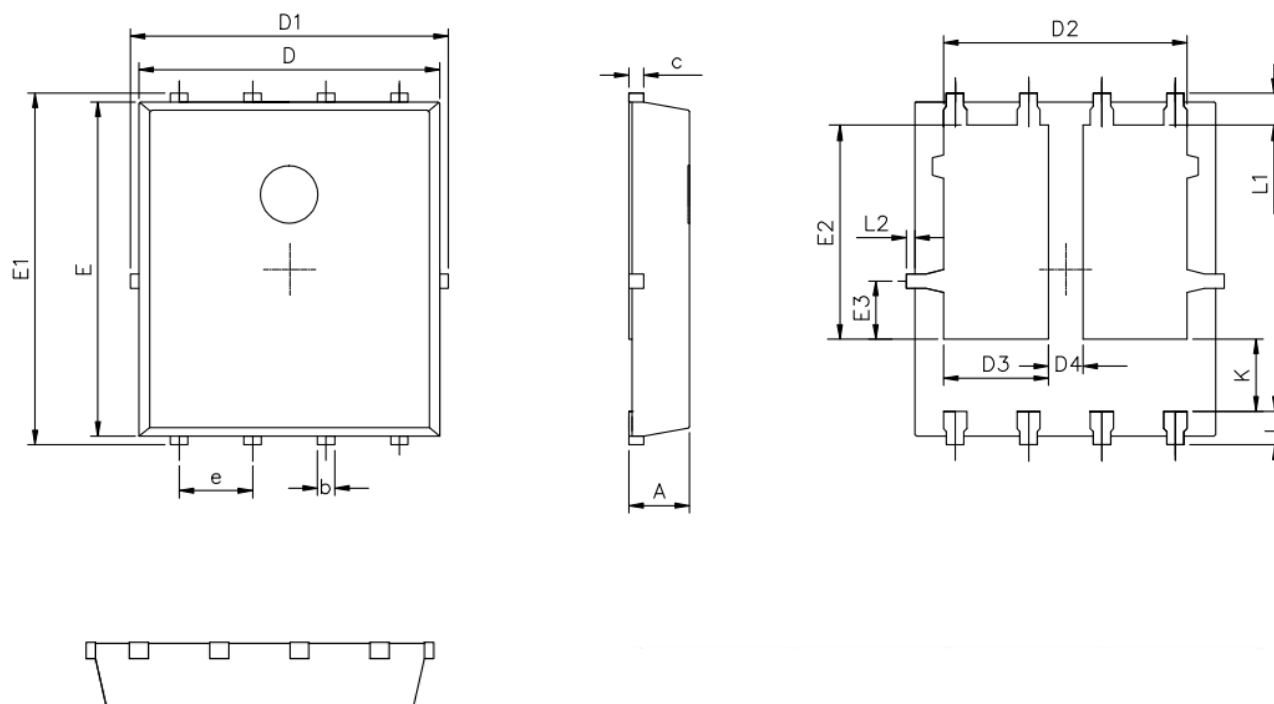


**Figure 11. Drain-to-Source On Resistance vs Gate Voltage and Drain Current**



**Figure 12. Maximum Safe Operating Area**

## PDFN5x6-8L Package Outline Dimensions



Symbol	unit (mm)		
	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.25	0.35	0.50
c	0.10	0.20	0.30
D	4.80	5.00	5.30
D1	4.90	5.10	5.50
D2	3.92	4.02	4.20
D3	1.605	1.705	1.805
D4	0.50	0.60	0.70
E	5.83	5.86	5.89
E1	6.05	6.15	6.25
E2	3.325	3.525	3.775
E3	0.80	0.90	1.00
e		1.27	
L	0.40	0.55	0.70
L1		0.65	
L2	0.00		0.15
K	1.00	1.30	1.50