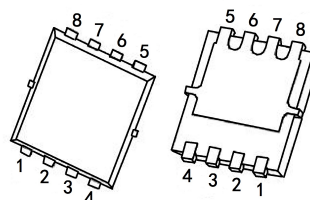


## -40V P-Channel Mosfet

### FEATURES

- $R_{DS(ON)} \leq 12.5m\Omega$  ( 9.4m $\Omega$  Typ.)  
@ $V_{GS}=-10V$
- $R_{DS(ON)} \leq 18.5m\Omega$  ( 13.4m $\Omega$  Typ.)  
@ $V_{GS}=-4.5V$
- AEC Q101 qualified
- Green Product (RoHS compliant)

### PDFN5\*6-8L

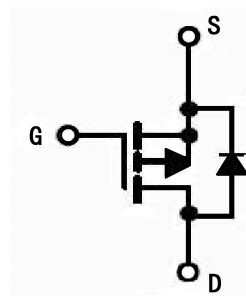


### APPLICATIONS

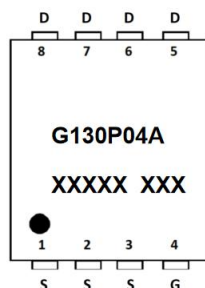
- Automotive domain controller
- PWM Applications
- Load Switch
- Power Management

1: S      3: S      5: D      7: D  
2: S      4: G      6: D      8: D

### P-CHANNEL MOSFET



### MARKING



### MAXIMUM RATINGS ( $T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter		Max.	Units
$V_{DSS}$	Drain-Source Voltage		-40	V
$V_{GSS}$	Gate-Source Voltage		$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^{\circ}C$	-35	A
		$T_C = 100^{\circ}C$	-23	A
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>		-140	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>		132	mJ
$P_D$	Power Dissipation	$T_C = 25^{\circ}C$	26	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		5.7	$^{\circ}C/W$
$T_J, T_{STG}$	Operating and Storage Temperature Range		-55 to +175	$^{\circ}C$

## MOSFET ELECTRICAL CHARACTERISTICS $T_C=25\text{ }^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> = -250μA	-40	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = -40V, 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	-1.0	-1.7	-2.5	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance note3	V <sub>GS</sub> = -10V, I <sub>D</sub> = -20A	-	9.4	12.5	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -10A	-	13.4	18.5	
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = -20V, V <sub>GS</sub> =0V, f=1.0MHz	-	3800	-	pF
C <sub>oss</sub>	Output Capacitance		-	329	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	289	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = -20V, I <sub>D</sub> = -20A, V <sub>GS</sub> = -10V	-	42	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	7.3	-	nC
Q <sub>gd</sub>	Gate-Drain(“Miller”) Charge		-	8.5	-	nC
Switching Characteristics						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> = -20V, I <sub>D</sub> = -20A, V <sub>GS</sub> = -10V, R <sub>GEN</sub> =2.5Ω	-	10	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	21	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	53	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	29	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	-35	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-140	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> = -35A	-	-0.8	-1.2	V
trr	Reverse Recovery Time	V <sub>GS</sub> =0V, I <sub>S</sub> = -30A,	-	39	-	ns
Qrr	Reverse Recovery Charge	di/dt=100A/μs	-	42	-	nC

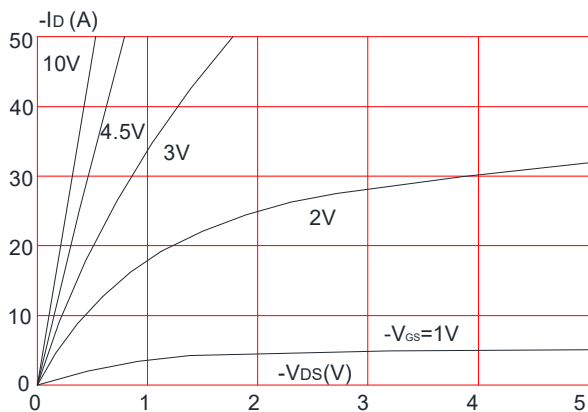
Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition:  $T_J = 25^{\circ}\text{C}$ ,  $V_{DD} = -20V$ ,  $V_G = -10V$ ,  $L = 0.5mH$ ,  $R_G = 25\Omega$ ,  $I_{AS} = -23A$

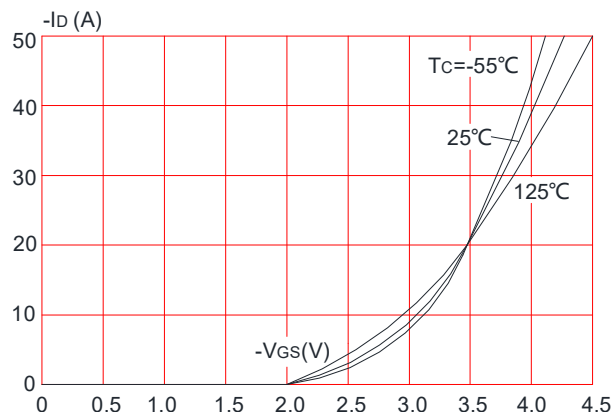
3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$

## TYPICAL CHARACTERISTICS

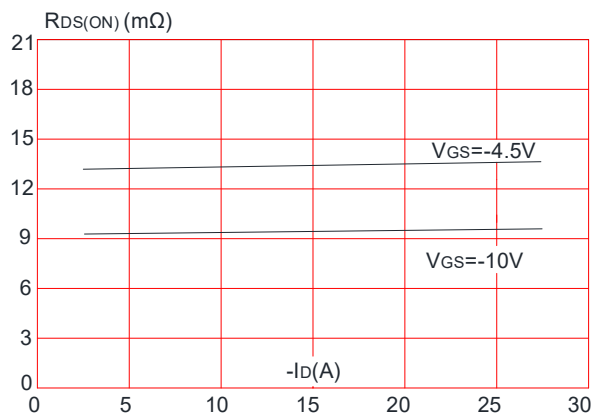
**Figure1: Output Characteristics**



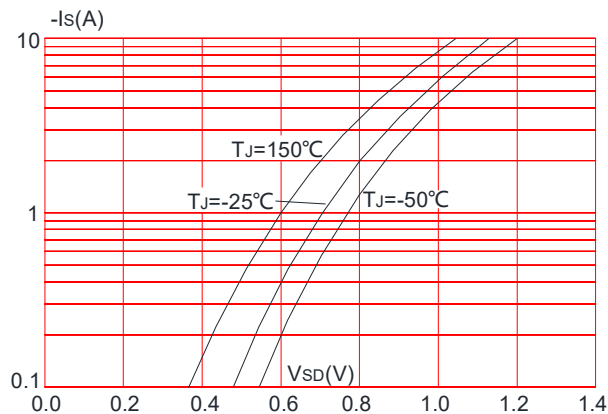
**Figure 2: Typical Transfer Characteristics**



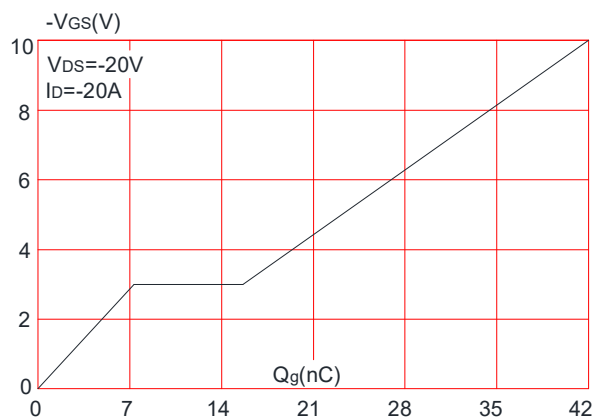
**Figure 3: On-resistance vs. Drain Current**



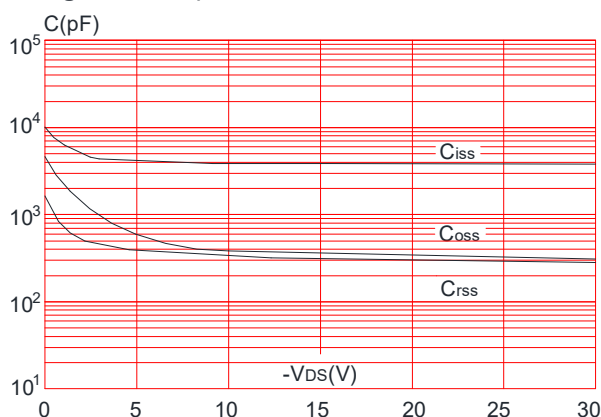
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

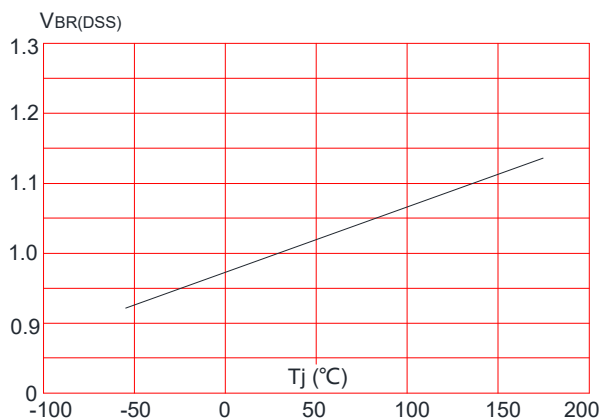


**Figure 6: Capacitance Characteristics**

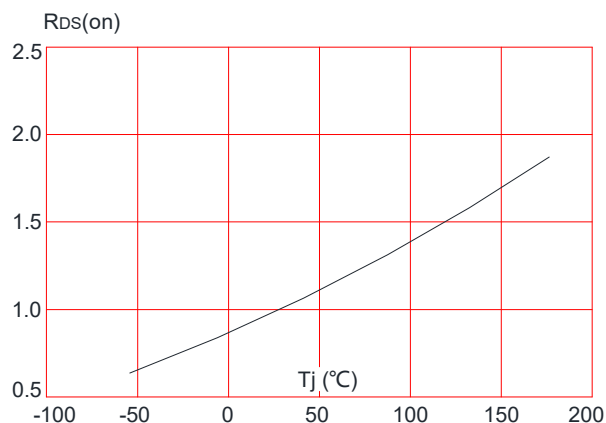


## TYPICAL CHARACTERISTICS (cont.)

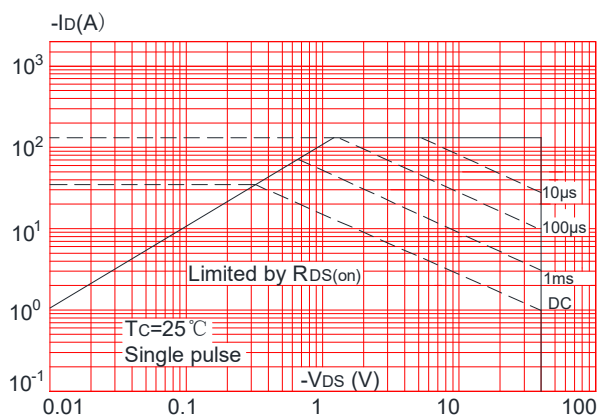
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



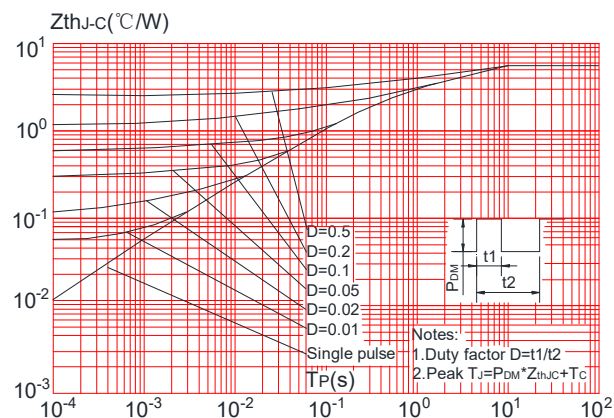
**Figure 8:** Normalized on Resistance vs. Junction Temperature



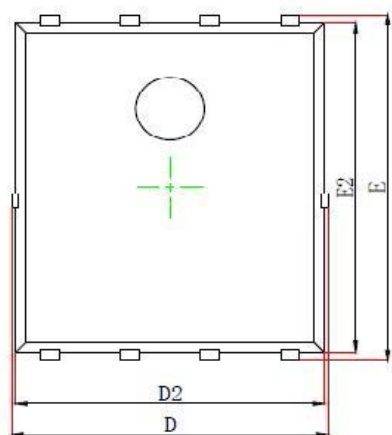
**Figure 9:** Maximum Safe Operating Area



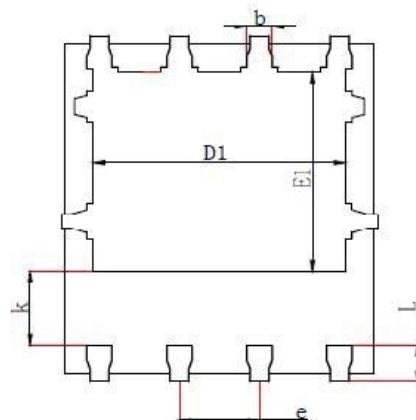
**Figure.10:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



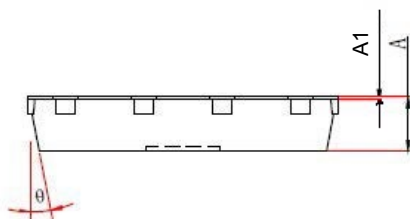
## PDFN5\*6-8L PACKAGE OUTLINE DRAWING



Top View  
[顶视图]



Bottom View  
[背视图]



Side View  
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.100	0.031	0.043
A1	0.000	0.05	0.000	0.002
D	-	5.4	-	0.212
E	-	6.250	-	0.246
D1	3.900	4.200	0.153	0.165
E1	3.350	3.650	0.132	0.144
D2	4.800	5.150	0.189	0.203
E2	5.500	5.950	0.216	0.234
k	1.100	1.500	0.043	0.059
b	0.250	0.510	0.010	0.020
e	1.170	1.370		
L	0.510	0.800	0.020	0.031
θ	6°	14°	6°	14°