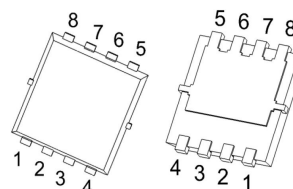


## 60V N-Channel Mosfet

### FEATURES

- $R_{DS(ON)} \leq 18 \text{ m}\Omega$  ( 14 m $\Omega$  Typ.)  
@ $V_{GS}=10\text{V}$
- $R_{DS(ON)} \leq 25 \text{ m}\Omega$  ( 18 m $\Omega$  Typ.)  
@ $V_{GS}=4.5\text{V}$
- AEC Q101 qualified
- Green Product (RoHS compliant)
- 100% UIS TEST

### PDFN3\*3-8L

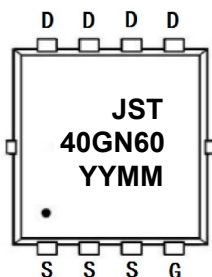


1: S      3: S      5: D      7: D  
2: S      4: G      6: D      8: D

### APPLICATIONS

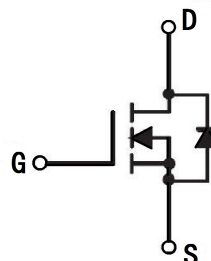
- Automotive Lighting
- PWM Applications
- Load Switch
- Power Management

### MARKING



YYMM:Date Code(year & month)

### N-CHANNEL MOSFET



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

Symbol	Parameter		Max.	Units
$V_{DSS}$	Drain-Source Voltage		60	V
$V_{GSS}$	Gate-Source Voltage		$\pm 20$	V
$I_D$	Continuous Drain Current @ $V_{GS}=10\text{V}$	$T_C = 25^\circ\text{C}$	30	A
		$T_C = 100^\circ\text{C}$	20	A
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>		120	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>		25	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ\text{C}$	33	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		4.5	$^\circ\text{C}/\text{W}$
$T_J, T_{STG}$	Operating and Storage Temperature Range		-55 to +175	$^\circ\text{C}$

## Electrical Characteristics (T<sub>c</sub>=25°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	60	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V,	-	-	1.0	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	1.6	2.5	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note3</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	14	18	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A	-	18	25	
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	930	-	pF
C <sub>oss</sub>	Output Capacitance		-	230	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	8	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =30V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V	-	22	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	4.5	-	nC
Q <sub>gd</sub>	Gate-Drain(“Miller”) Charge		-	3.5	-	nC
Switching Characteristics						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =30V, I <sub>D</sub> =20A, R <sub>G</sub> =1.6Ω, V <sub>GS</sub> =10V	-	4.5	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	2.7	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	13.8	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	2.7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	30	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	120	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =30A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	T <sub>J</sub> =25℃, I <sub>F</sub> =20A,dI/dt=100A/μs	-	18	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	12	-	nC

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

2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=10A

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

## Typical Performance Characteristics

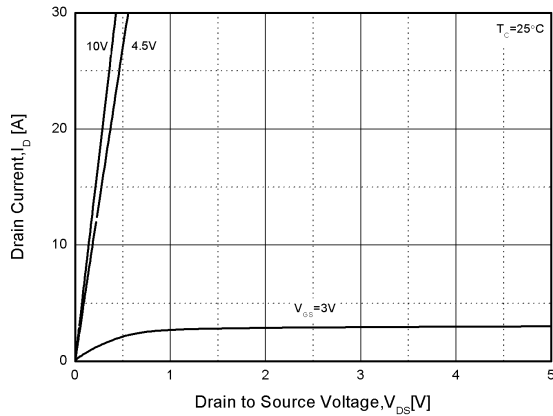


Figure1. Output Characteristics

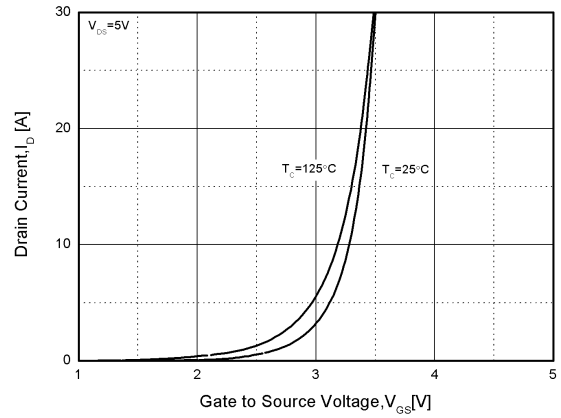


Figure2. Transfer Characteristics

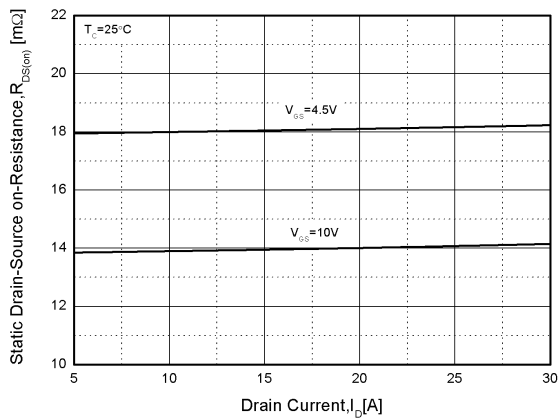


Figure3. Rdson-Drain Current

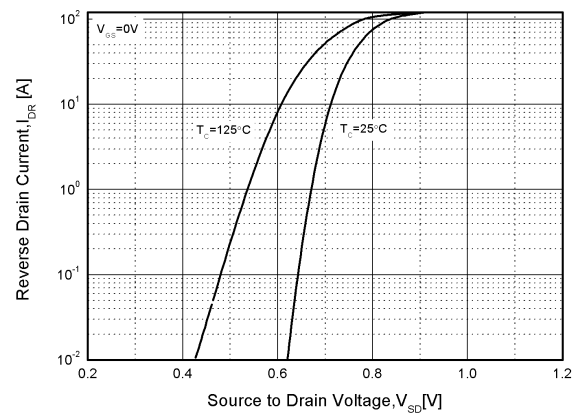


Figure4. Typical Source-Drain Diode Forward Voltage

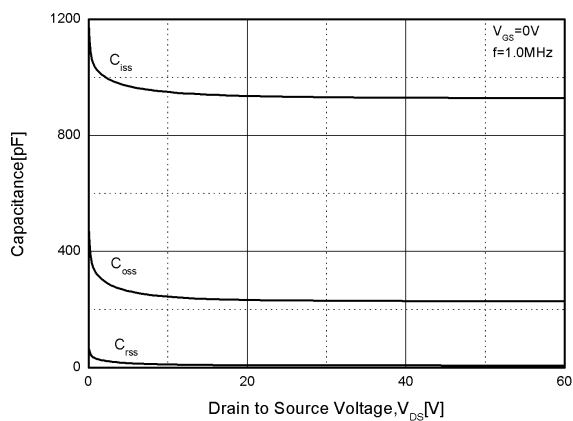


Figure5. Capacitance Characteristics

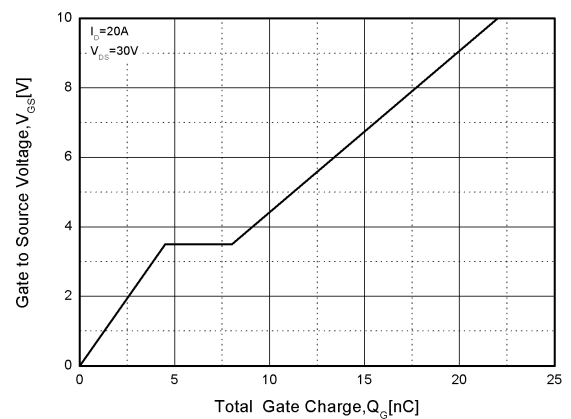


Figure6. Gate Charge

## Typical Performance Characteristics (cont.)

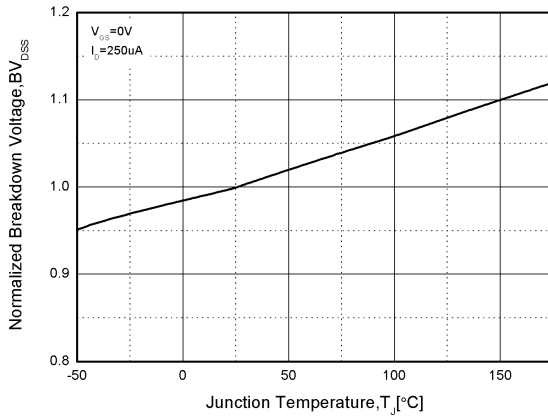


Figure7. Normalized Breakdown Voltage vs. Temperature

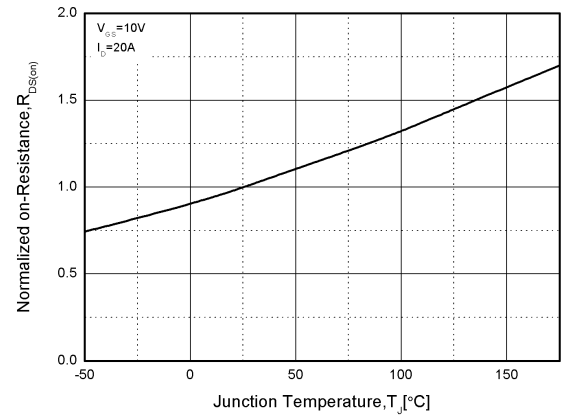


Figure8. Normalized on Resistance vs. Temperature

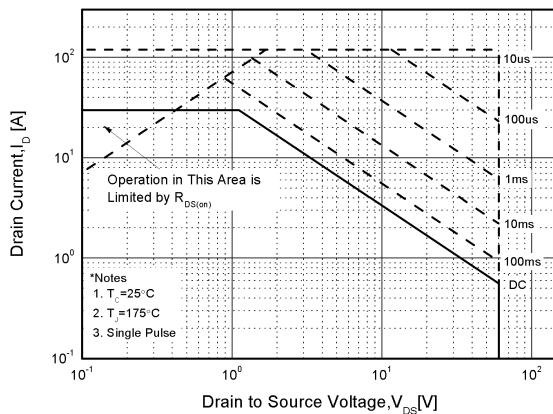


Figure9. Safe Operation Area

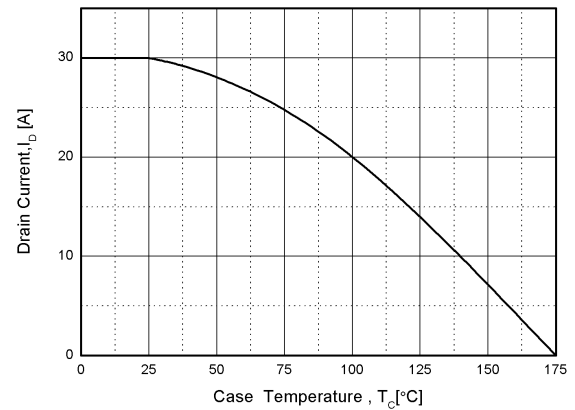


Figure10. Drain Current vs. Case Temperature

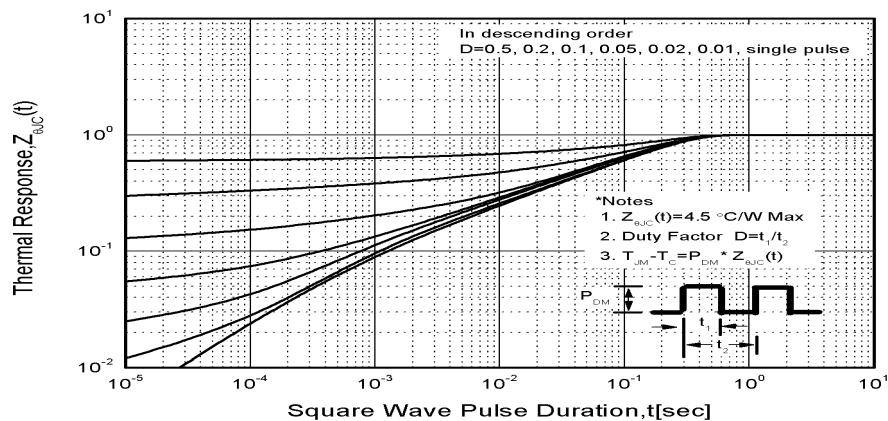
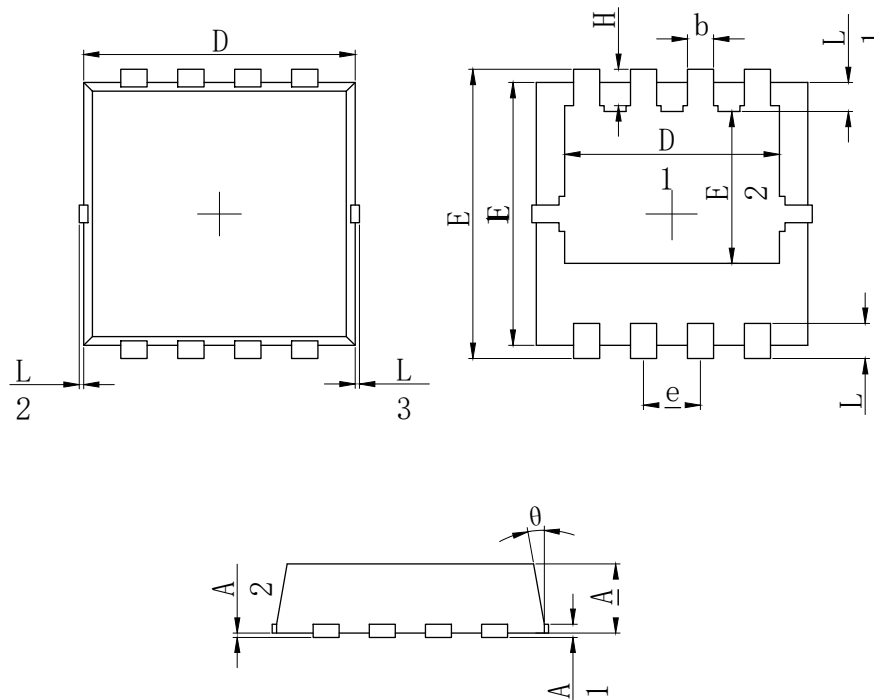


Figure11. Transient Thermal Response Curve

PDFNWB3\*3-8L Package Outline Dimensions



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.700	0.800	0.900
A1	0.152 REF.		
A2	0~0.05		
D	3.000	3.100	3.200
D1	2.300	2.450	2.600
E	2.900	3.000	3.100
E1	3.150	3.300	3.450
E2	1.535	1.735	1.935
b	0.200	0.300	0.400
e	0.550	0.650	0.750
L	0.300	0.400	0.500
L1	0.180	0.330	0.480
L2	0~0.100		
L3	0~0.100		
H	0.315	0.415	0.515
θ	8°	10°	12°