

## 60V Dual N-Channel Mosfet

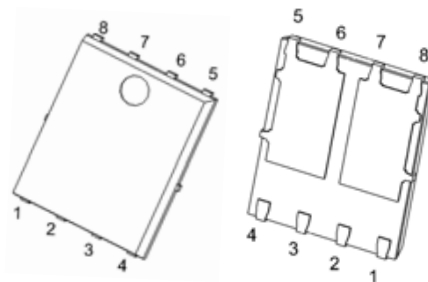
### FEATURES

- $R_{DS(ON)} \leq 14.5m\Omega$  (12m $\Omega$  Typ.)  
@ $V_{GS}=10V$
- $R_{DS(ON)} \leq 18.2m\Omega$  (14m $\Omega$  Typ.)  
@ $V_{GS}=4.5V$
- AEC Q101 qualified
- Green Product (RoHS compliant)
- 100% UIS TEST

### APPLICATIONS

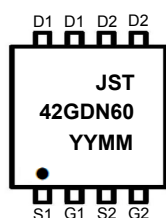
- Automotive Lighting
- Synchronous rectification
- Power Management
- PWM Applications

### PDFN5\*6-8L



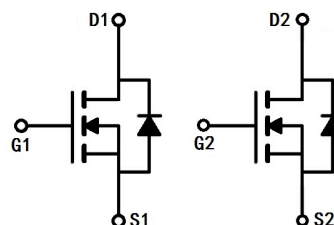
1: S1      3: S2      5: D2      7: D1  
2: G1      4: G2      6: D2      8: D1

### MARKING



YYMM:Date Code(year & month)

### N-CHANNEL MOSFET



### MAXIMUM RATINGS (Tc=25°C unless otherwise noted)

Symbol	Parameter		Max.	Units
$V_{DSS}$	Drain-Source Voltage		60	V
$V_{GSS}$	Gate-Source Voltage		$\pm 20$	V
$I_D$	Continuous Drain Current @ $V_{GS}=10V$	$T_C = 25^\circ C$	40	A
		$T_C = 100^\circ C$	28	A
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>		160	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>		169	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ C$	43	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		3.5	$^\circ C/W$
$T_J, T_{STG}$	Operating and Storage Temperature Range		-55 to +175	$^\circ C$

## MOSFET ELECTRICAL CHARACTERISTICS Tc=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	1.0	1.4	2.5	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance note3	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	12	14.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A	-	14	18.2	
Dynamic Characteristics note4						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = 40V, V <sub>GS</sub> =0V, f = 1.0MHz	-	1550	-	pF
C <sub>oss</sub>	Output Capacitance		-	262	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	15	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =40V, I <sub>D</sub> =25A, V <sub>GS</sub> =10V	-	36	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	9.0	-	nC
Q <sub>gd</sub>	Gate-Drain(“Miller”) Charge		-	4.7	-	nC
Switching Characteristics note4						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =40V, I <sub>D</sub> =25A, R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =10V	-	9.5	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	6.9	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	29	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	14.8	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =20A	-	-	1.2	V

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

2. EAS condition  $T_J=25^\circ C, V_{DD}=20V, V_G=10V, L=0.5mH$ 3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$ 

4. Guaranteed by design, not subject to production testing

## TYPICAL PERFORMANCE CHARACTERISTICS

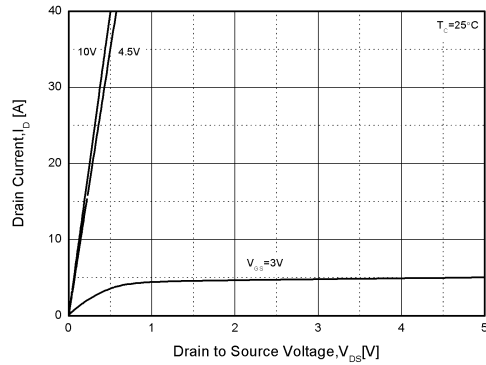


Figure1. Output Characteristics

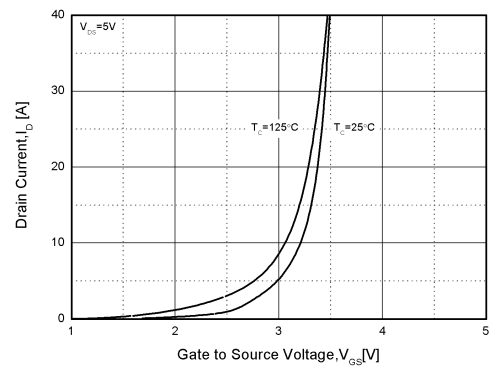


Figure2. Transfer Characteristics

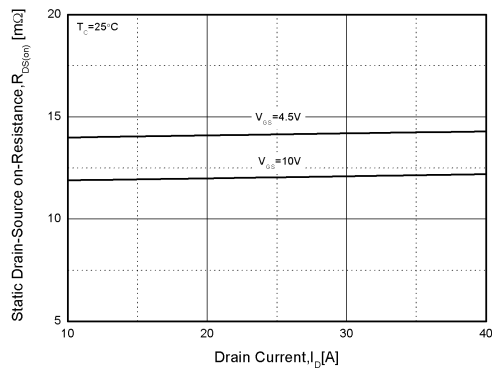


Figure3. Rdson-Drain Current

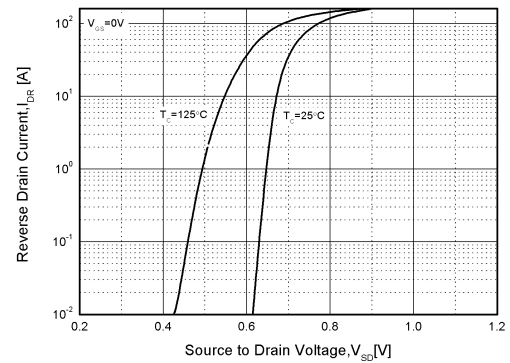


Figure4. Typical Source-Drain Diode Forward Voltage

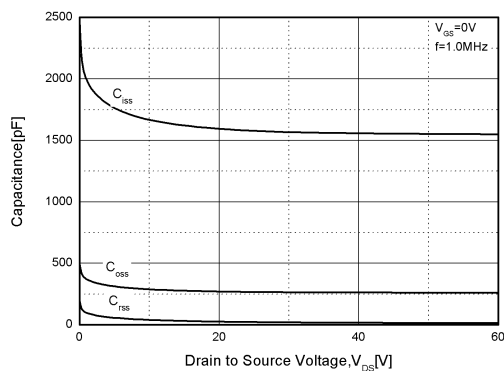


Figure5. Capacitance Characteristics

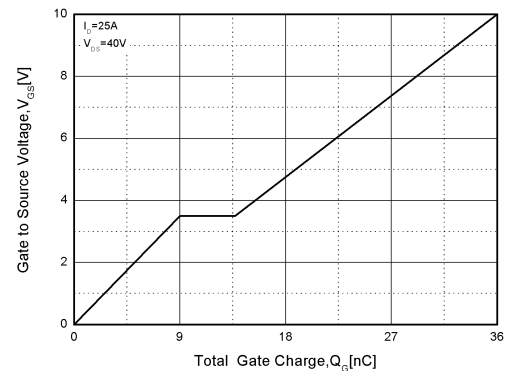


Figure6. Gate Charge

## TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

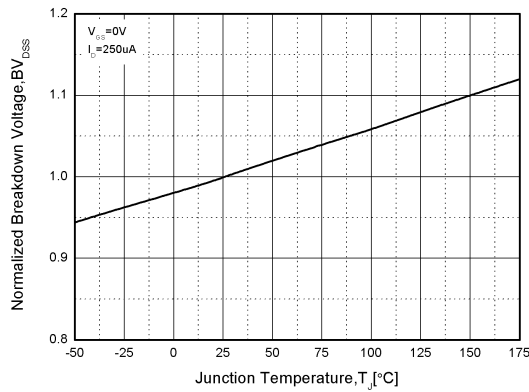


Figure7. Normalized Breakdown Voltage vs. Temperature

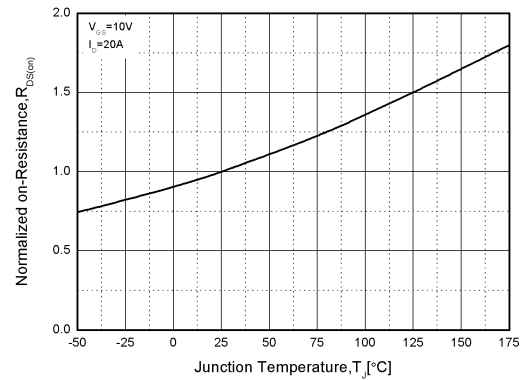


Figure8. Normalized on Resistance vs. Temperature

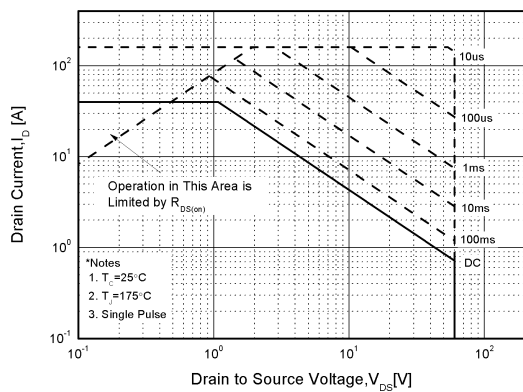


Figure9. Safe Operation Area

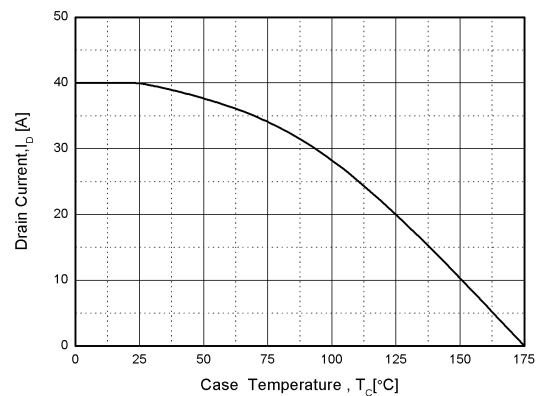


Figure10. Drain Current vs. Case Temperature

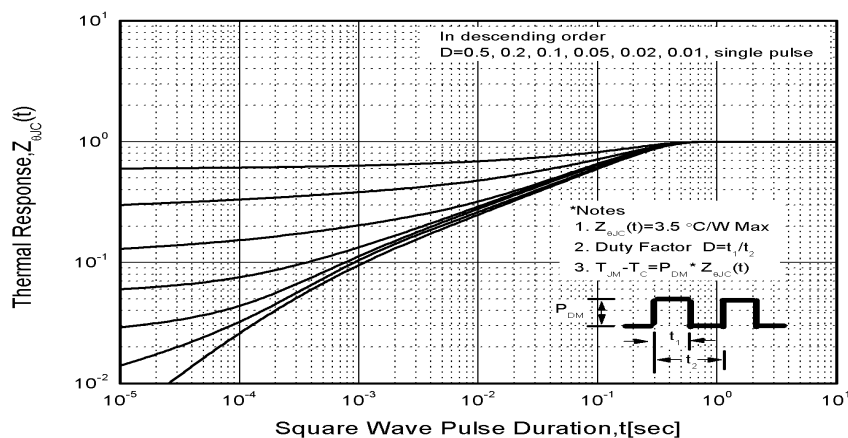
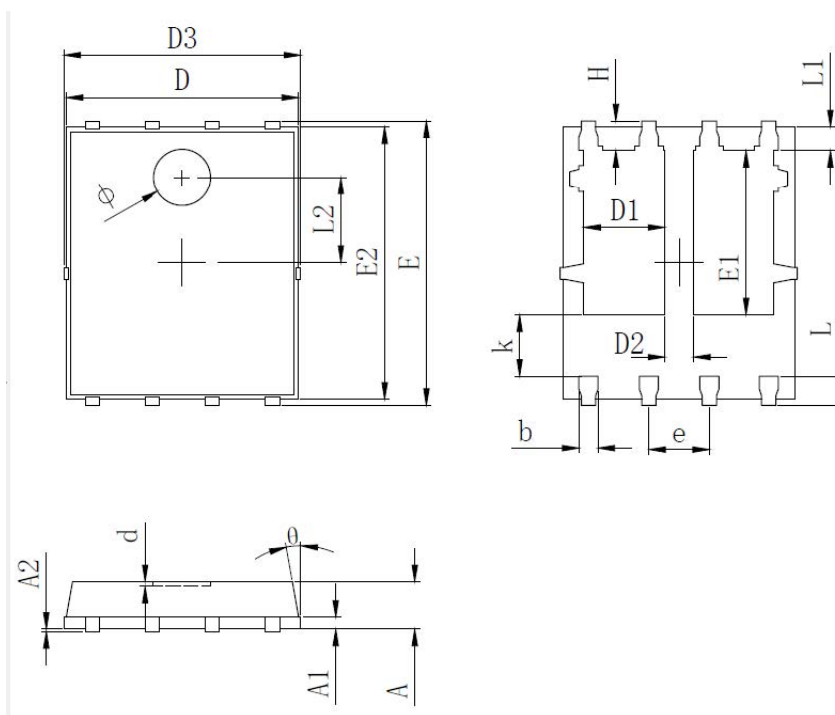


Figure11. Transient Thermal Response Curve

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



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.900	1.000	1.100
A1	0.254 REF.		
A2	0~0.05		
D	4.824	4.900	4.976
D1	1.605	1.705	1.805
D2	0.500	0.600	0.700
D3	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.750	5.826
b	0.350	0.400	0.450
e	1.270 TYP.		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF.		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
θ	8°	10°	12°
Φ	1.100	1.200	1.300
d			0.100