

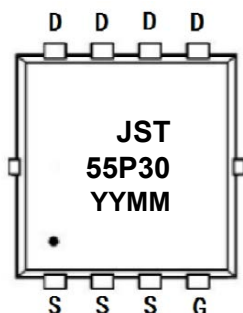
### FEATURES

- $R_{DS(ON)} \leq 10m\Omega$  ( 7.5m $\Omega$  Typ.)  
@  $V_{GS} = -10V$
- $R_{DS(ON)} \leq 16m\Omega$  (11.6m $\Omega$  Typ.)  
@  $V_{GS} = -4.5V$
- AEC Q101 qualified
- Green Product (RoHS compliant)

### APPLICATIONS

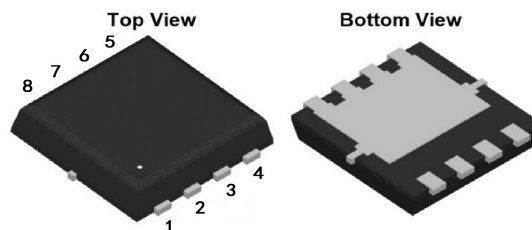
- Automotive domain controller
- PWM Applications
- Load Switch
- Power Management

### MARKING



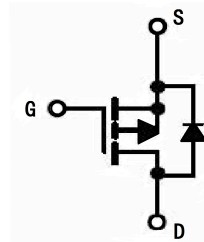
YYMM:Date Code(year&month)

### PDFNWB3.3\*3.3-8L



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

### P-CHANNEL MOSFET



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

Symbol	Parameter		Max.	Units
$V_{DSS}$	Drain-Source Voltage		-30	V
$V_{GSS}$	Gate-Source Voltage		$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	-40	A
		$T_C = 100^\circ C$	-28.3	A
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>		-160	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>		100	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ C$	30.6	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		4.9	$^\circ C/W$
$T_J, T_{STG}$	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	-30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = -30V, 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	-1.6	-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	-	7.5	10	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -10A	-	11.6	16	
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = -15V, V <sub>GS</sub> =0V, f=1.0MHz	-	3459	-	pF
C <sub>oss</sub>	Output Capacitance		-	427	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	394	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = -15V, I <sub>D</sub> = -40A, V <sub>GS</sub> = -10V	-	37	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	6.5	-	nC
Q <sub>gd</sub>	Gate-Drain(“Miller”) Charge		-	9.4	-	nC
Switching Characteristics						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> = -15V, I <sub>D</sub> = -20A, V <sub>GS</sub> = -10V, R <sub>GEN</sub> =2.5Ω	-	16	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	21	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	68	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	52	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	-40	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-160	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> = -40A	-	-0.8	-1.2	V

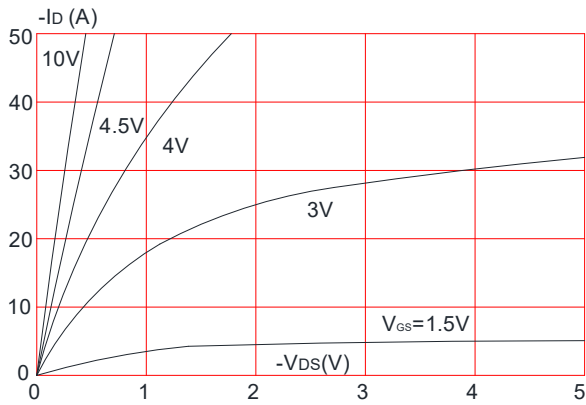
Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition:  $T_J = 25^\circ C$ ,  $V_{DD} = -15V$ ,  $V_G = -10V$ ,  $L = 0.5mH$ ,  $R_G = 25\Omega$ ,  $I_{AS} = -20A$

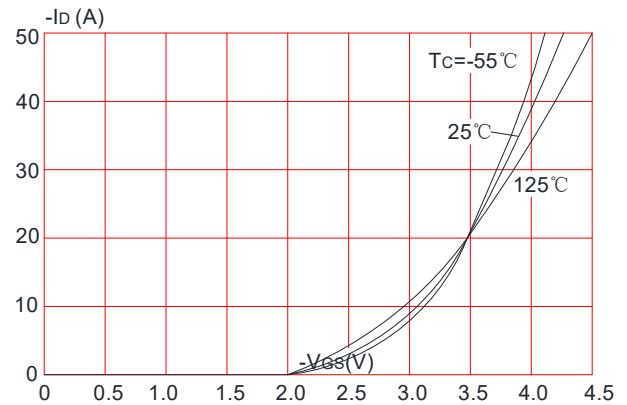
3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$

## Typical Performance Characteristics

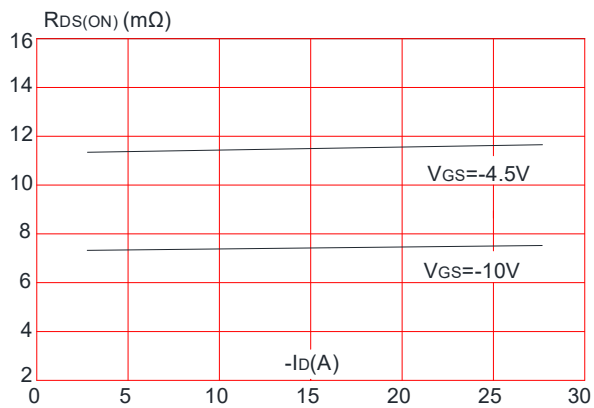
**Figure1:** Output Characteristics



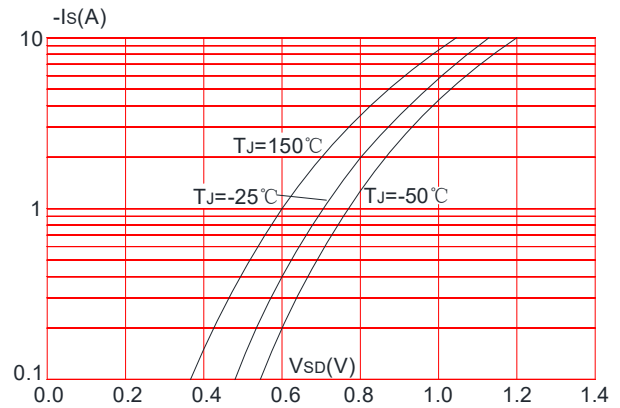
**Figure 2:** Typical Transfer Characteristics



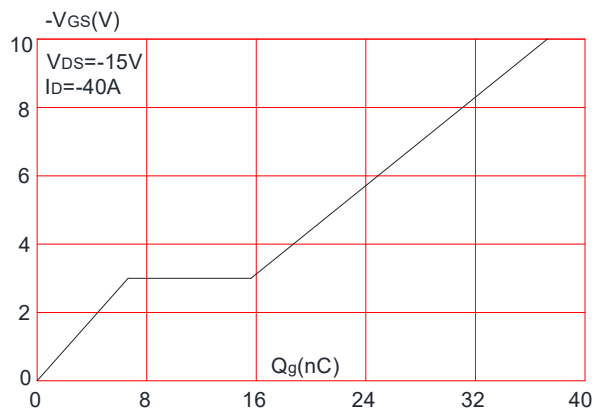
**Figure 3:** On-resistance vs. Drain Current



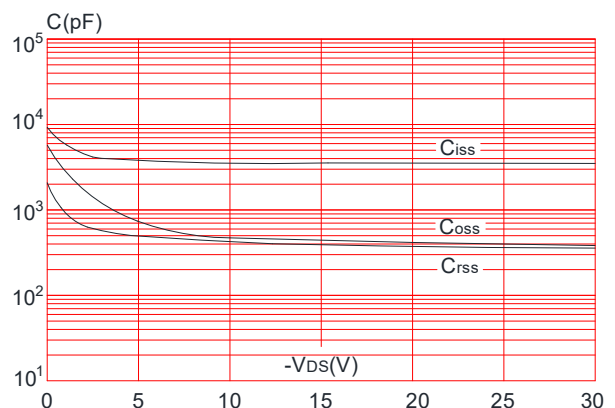
**Figure 4:** Body Diode Characteristics



**Figure 5:** Gate Charge Characteristics

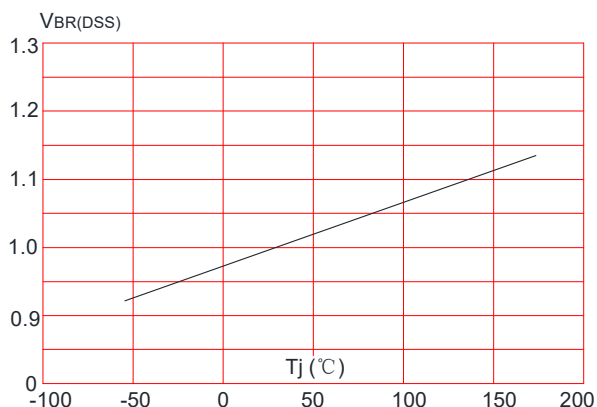


**Figure 6:** Capacitance Characteristics

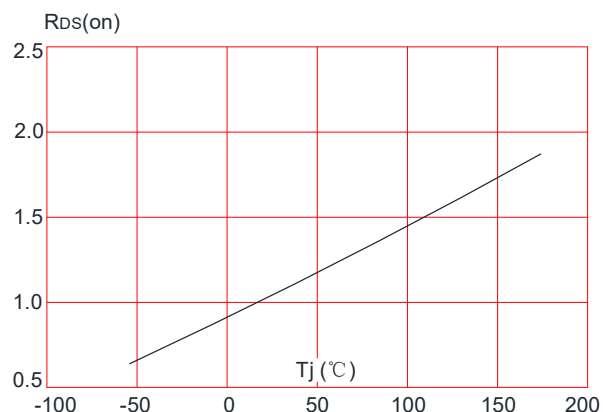


## TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

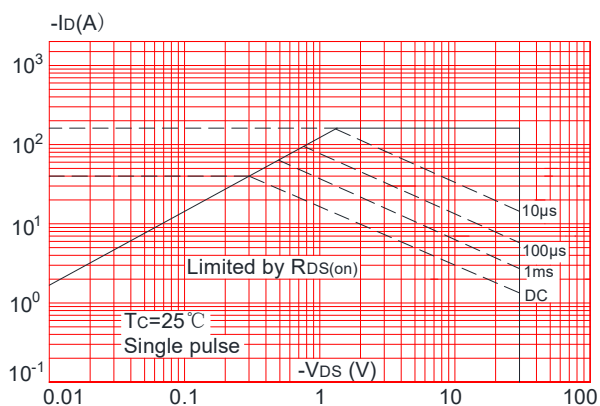
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



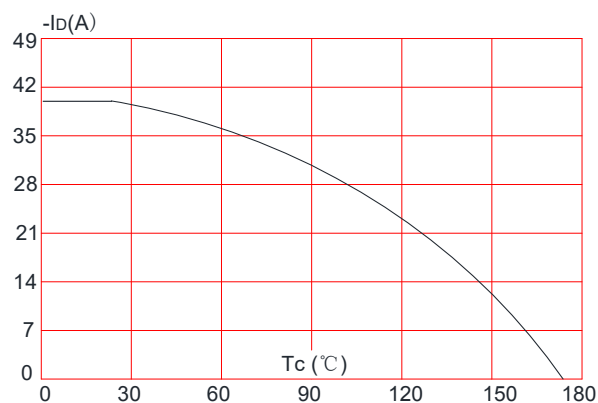
**Figure 8:** Normalized on Resistance vs. Junction Temperature



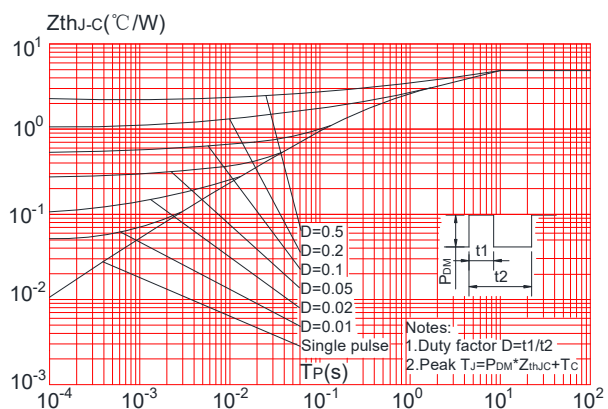
**Figure 9:** Maximum Safe Operating Area



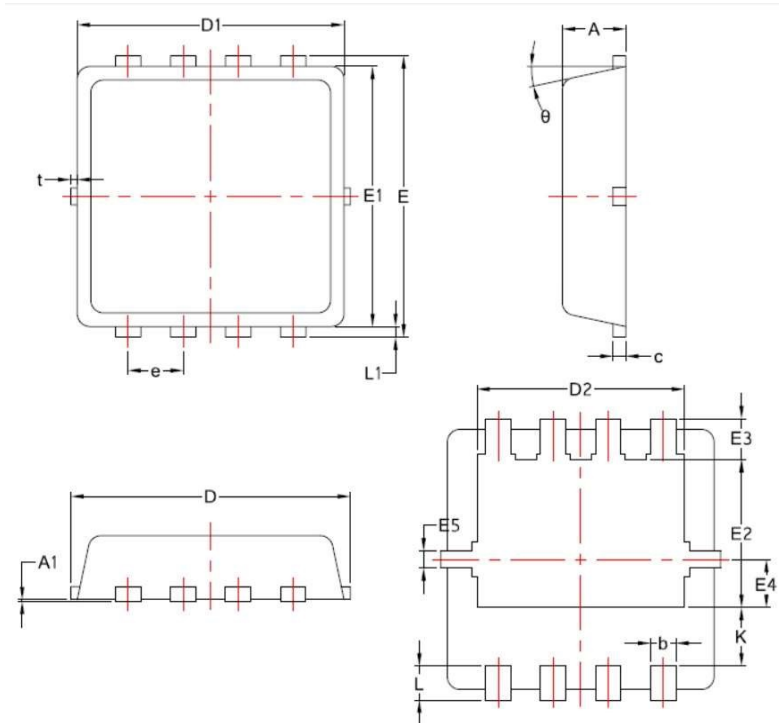
**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



PDFN3.3X3.3-8L PACKAGE OUTLINE DRAWING



Symbols	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.70	0.75	0.85	0.028	0.030	0.033
A1	---	---	0.05	---	---	0.002
b	0.20	0.30	0.40	0.008	0.012	0.016
c	0.10	0.152	0.25	0.004	0.152	0.010
D	3.15	3.30	3.45	0.124	0.130	0.136
D1	3.00	3.15	3.25	0.118	0.124	0.128
D2	2.29	2.45	2.65	0.090	0.096	0.104
E	3.15	3.30	3.45	0.124	0.130	0.136
E1	2.90	3.05	3.20	0.114	0.120	0.126
E2	1.54	1.74	1.94	0.060	0.069	0.076
E3	0.28	0.48	0.65	0.011	0.019	0.026
E4	0.37	0.57	0.77	0.015	0.022	0.030
E5	0.10	0.20	0.30	0.004	0.008	0.012
e	0.60	0.65	0.70	0.024	0.026	0.028
K	0.59	0.69	0.89	0.023	0.027	0.035
L	0.30	0.40	0.50	0.012	0.016	0.020
L1	0.06	0.125	0.20	0.002	0.005	0.008
t	0	0.075	0.13	0	0.003	0.005
θ	10°	12°	14°	10°	12°	14°