60V N-Channel Mosfet

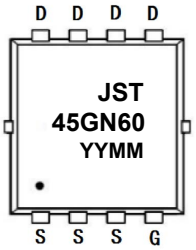
FEATURES

- $R_{DS(ON)}$ ≤ 8.7mΩ (6.3mΩ Typ.) @V_{GS}=10V
- $R_{DS(ON)}$ ≤ 13.7mΩ (10mΩ Typ.) @V_{GS}=4.5V
- AEC Q101 qualified
- Green Product (RoHS compliant)
- 100% UIS TEST

APPLICATIONS

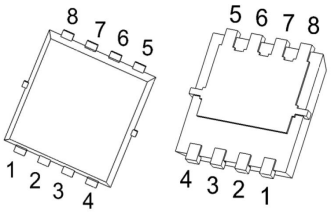
- Automotive Lighting
- Synchronous rectification
- Power Management
- PWM Applications

MARKING



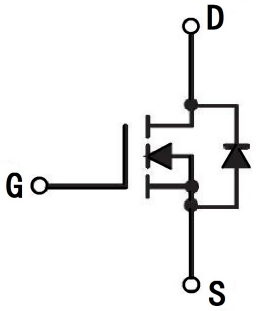
YYMM:Date Code(year & month)

PDFNWB3.3*3.3-8L



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

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	±20	V
I_D	Continuous Drain Current @V_{GS}=10V note1	45	A
I_{DM}	Pulsed Drain Current note2	180	A
P_D	Power Dissipation	35.7	W
E_{AS}	Single Pulsed Avalanche Energy note3	136	mJ
$R_{\theta JC}$	Thermal Resistance, Junction to Case	4.2	℃/W
T_J	Junction Temperature	175	℃
T_{STG}	Storage Temperature Range	-55 to +175	℃

MOSFET ELECTRICAL CHARACTERISTICS Tc=25 °C unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V,I_D = 250μA	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 60V, V_{GS} = 0V, T_J = 25℃	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	V_{GS} = ±20V,V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS},I_D = 250μA	1.0	1.8	2.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance note4	V_{GS} =10V, I_D =14A	-	6.3	8.7	mΩ
		V_{GS} =4.5V, I_D =8A	-	10	13.7	mΩ
Dynamic Characteristics note5						
C_{iss}	Input Capacitance	V_{DS} =30V, V_{GS} = 0V f = 1.0MHz	-	1402	-	pF
C_{oss}	Output Capacitance		-	866	-	pF
C_{rss}	Reverse Transfer Capacitance		-	36	-	pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	1.25	-	Ω
Q_g	Total Gate Charge	V_{DS}=30V, I_D=20A V_{GS}=10V	-	22.2	-	nC
Q_{gs}	Gate-Source Charge		-	6 .1	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	3.5	-	nC
Switching Characteristics note5						
$t_{d(on)}$	Turn-On Delay Time	V_{GS} =10V, V_{DS}=30V R_G =3Ω, I_D=20A	-	8.1	-	ns
t_r	Turn-On Rise Time		-	6.3	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	26.6	-	ns
t_f	Turn-Off Fall Time		-	10.2	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_{SD}=14A T_J = 25℃	-	-	1.2	V

Notes:1. T_C=25℃ Limited only by maximum temperature allowed. Calculated continuous current based on maximum allowable junction temperature.

2. PW≤10μs, Duty cycle≤1%

3 . EAS condition TJ=25℃, VD=20V,VG=10V, ID=23.4A, L=0.5mH

4 . Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%

5 . Guaranteed by design, not subject to production testing

TYPICAL PERFORMANCE CHARACTERISTICS

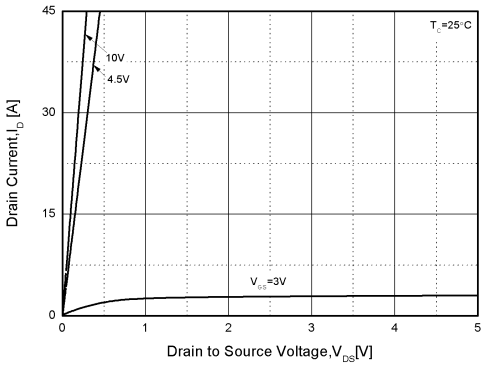


Figure1. Output Characteristics

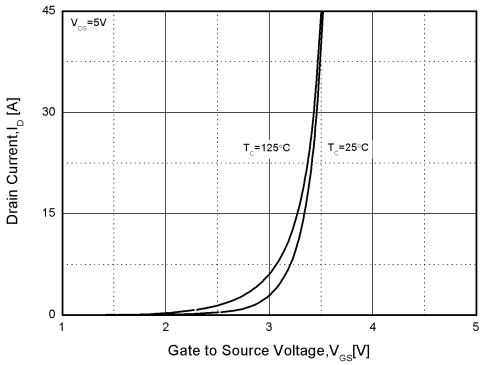


Figure2. Transfer Characteristics

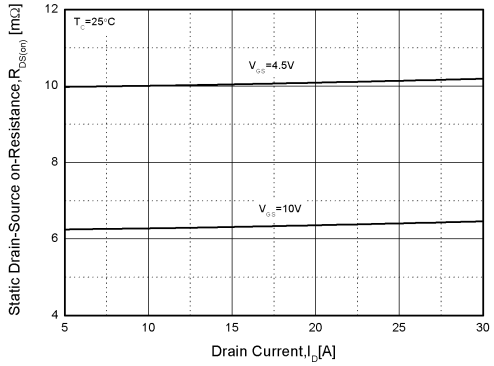


Figure3. Rdson-Drain Current

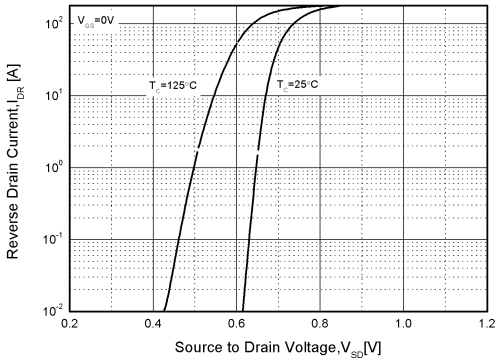


Figure4. Typical Source-Drain Diode Forward Voltage

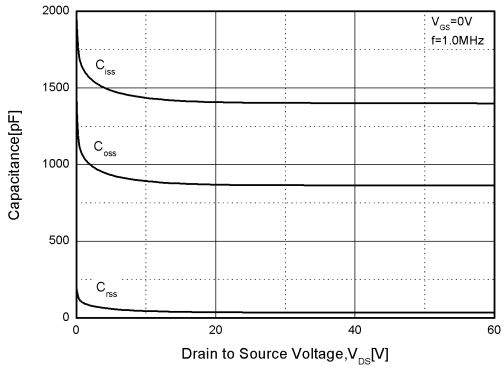


Figure5. Capacitance Characteristics

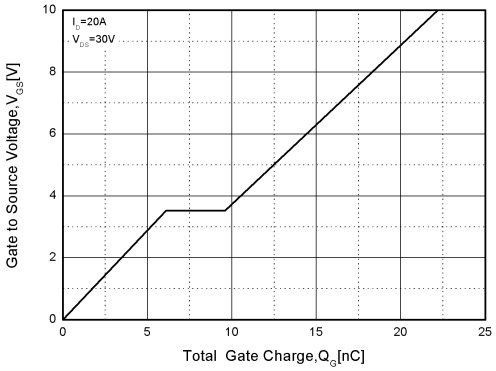


Figure6. Gate Charge

TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

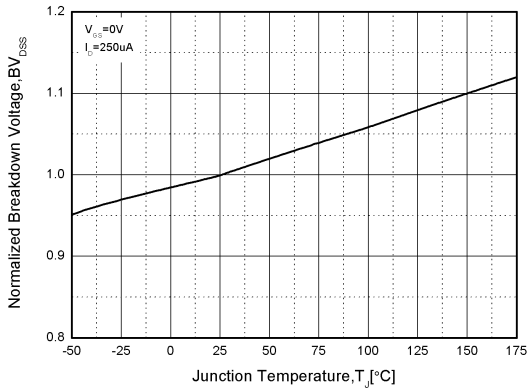


Figure7. Normalized Breakdown Voltage vs. Temperature

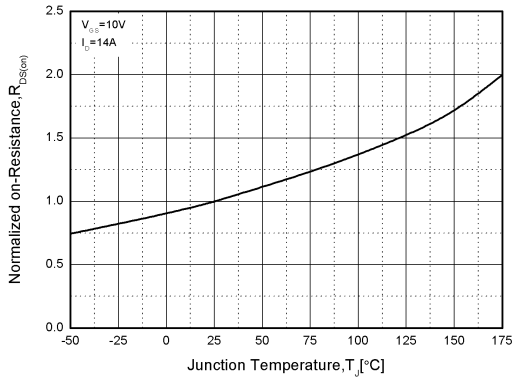


Figure8. Normalized on Resistance vs. Temperature

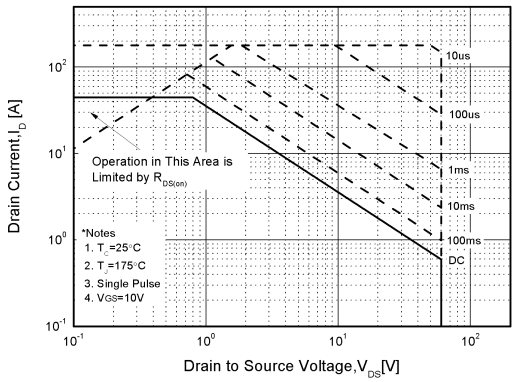


Figure9. Safe Operation Area

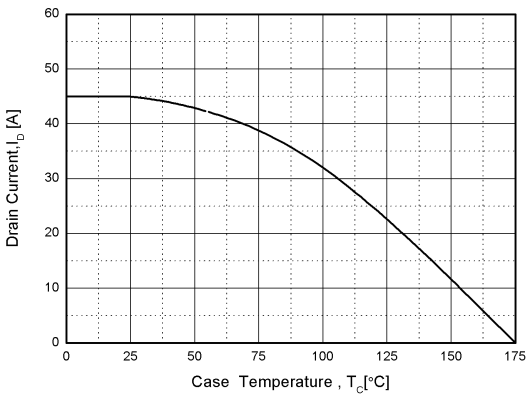


Figure10. Drain Current vs .Case Temperature

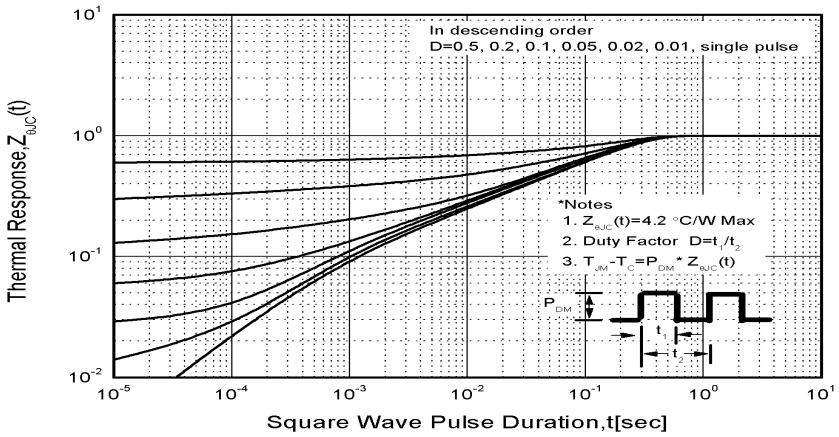
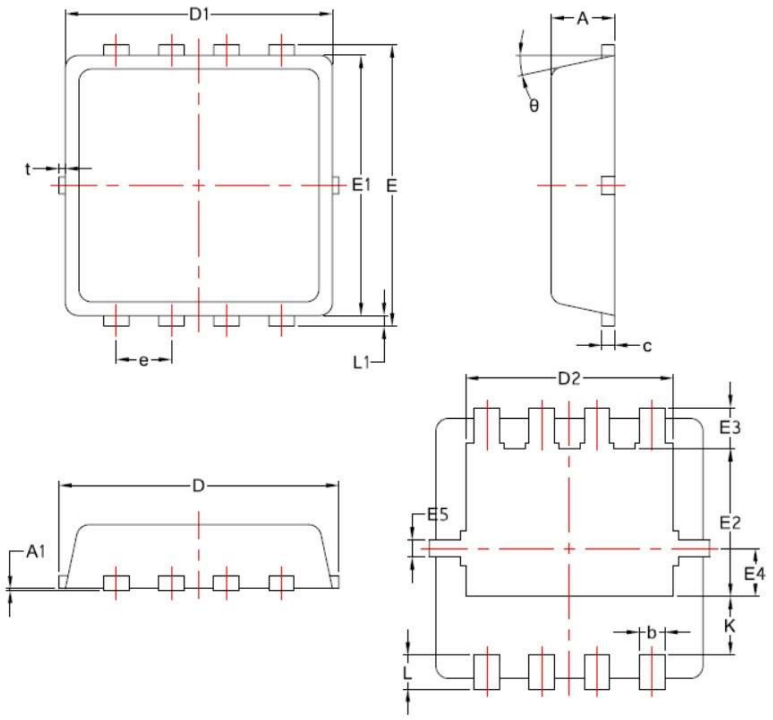


Figure11. Transient Thermal Response Curve

PDFNWB3.3*3.3-8L Package Outline Dimensions



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°