

40V N-Channel Mosfet

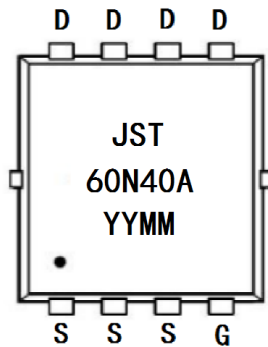
FEATURES

- $R_{DS(ON)} \leq 8m\Omega$ @ $V_{GS}=10V$
- $R_{DS(ON)} \leq 15m\Omega$ @ $V_{GS}=4.5V$

APPLICATIONS

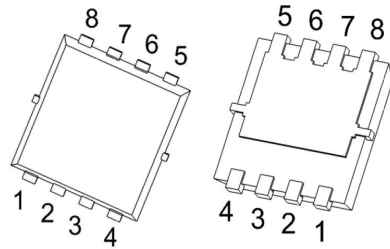
- PWM Applications
- Load Switch
- Power Management

MARKING

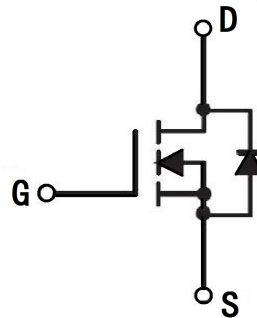


YYMM:Date Code(year & month)

PDFNWB5*6-8L



N-CHANNEL MOSFET



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

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	± 16	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	58
		$T_C = 100^\circ C$	40
I_{DM}	Pulsed Drain Current ^{note1}	232	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	57	mJ
P_D	Power Dissipation	$T_C = 25^\circ C$	41
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.0	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V,$	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 16V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.1	1.5	2.4	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note3</small>	$V_{GS}=10V, I_D=30A$	-	7.4	8	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	10.2	15	
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=15A$	10	27	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V,$ $f=1.0MHz$	-	965	-	pF
C_{oss}	Output Capacitance		-	212	-	pF
C_{rss}	Reverse Transfer Capacitance		-	102	-	pF
Q_g	Total Gate Charge	$V_{DS}=20V, I_D=30A,$ $V_{GS}=10V$	-	28	-	nC
Q_{gs}	Gate-Source Charge		-	6.5	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	6	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=20V, I_D=30A,$ $R_L=1\Omega, R_{GEN}=3\Omega,$ $V_{GS}=10V$	-	10	-	ns
t_r	Turn-on Rise Time		-	28	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	40	-	ns
t_f	Turn-off Fall Time		-	15	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	58	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	232	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A$	-	0.8	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$T_J=25^\circ\text{C},$ $I_F=20A, di/dt=100A/\mu s$	-	12	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	4	-	nC

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

2. EAS condition $T_J=25^\circ\text{C}, V_{DD}=20V, V_G=16V, I_D=8A, I_H=I_D*0.9=7.2A, I_L=I_D*0.1=0.8A, L=1mH$

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Performance Characteristics

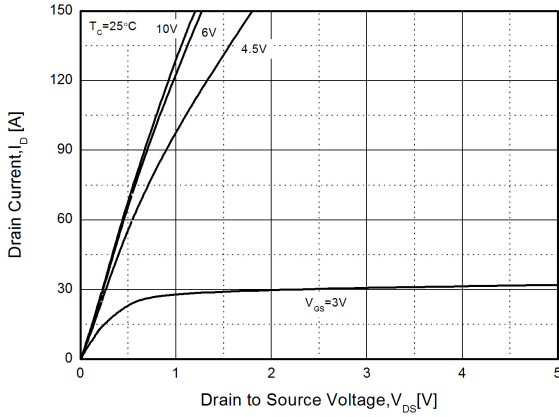


Figure1. Output Characteristics

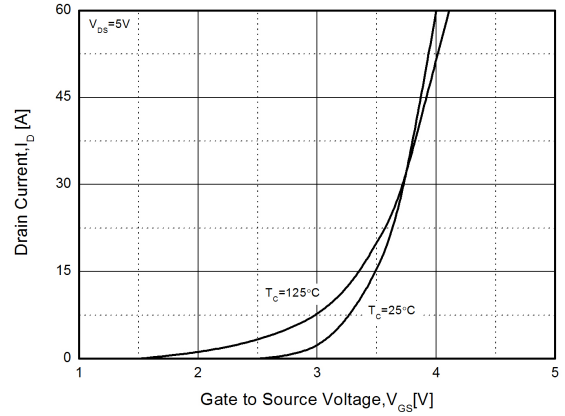


Figure2. Transfer Characteristics

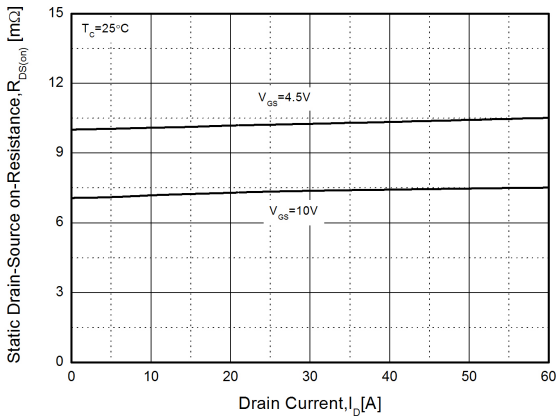


Figure3. Rdson-Drain Current

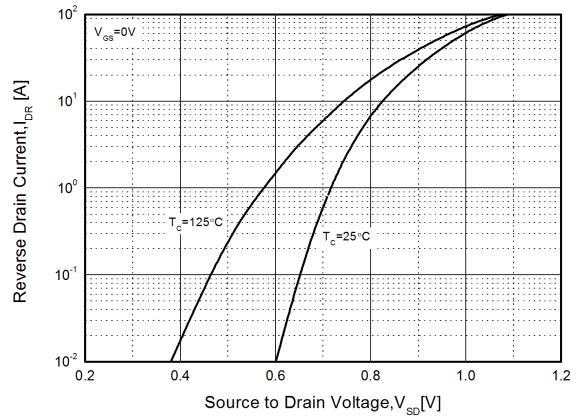


Figure4. Typical Source-Drain Diode Forward Voltage

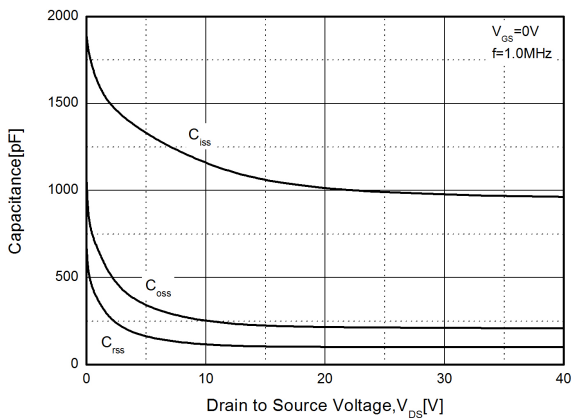


Figure5. Capacitance Characteristics

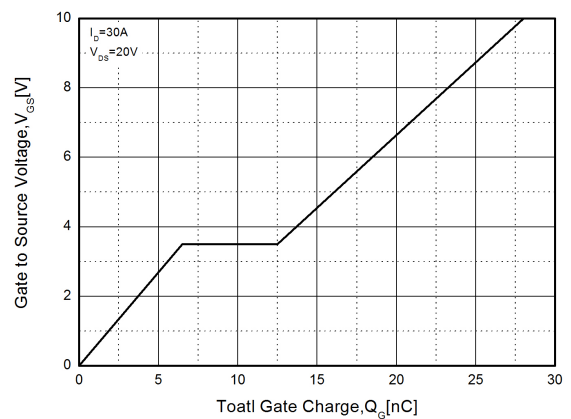


Figure6. Gate Charge

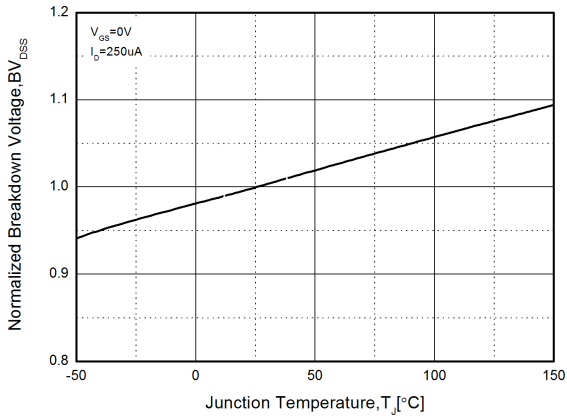


Figure7. Normalized Breakdown Voltage vs. Temperature

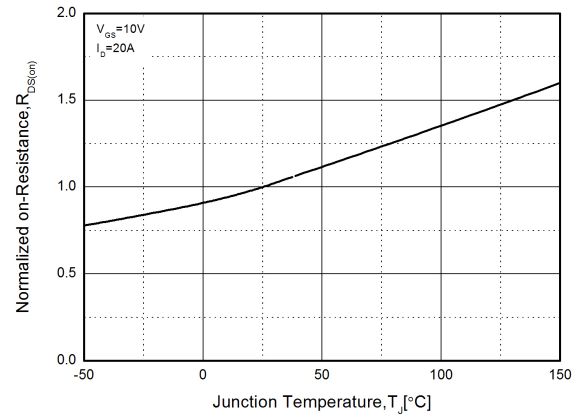


Figure8. Normalized on Resistance vs. Temperature

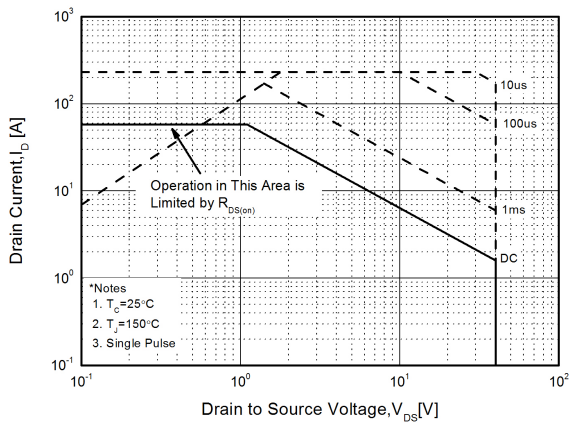


Figure9. Safe Operation Area

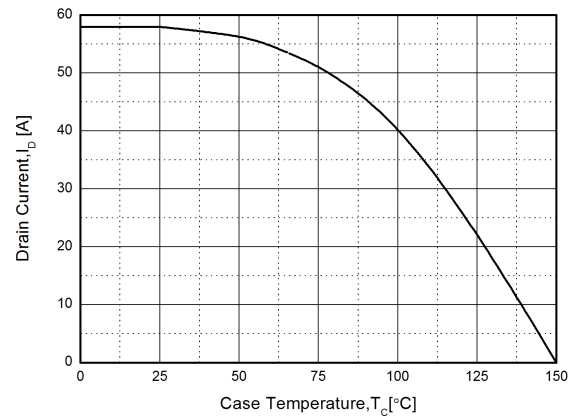


Figure10. Drain Current vs. Case Temperature

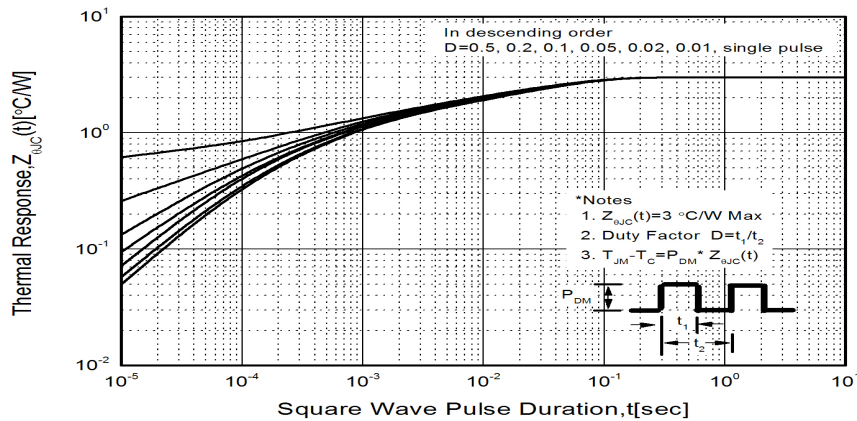


Figure11. Transient Thermal Response Curve

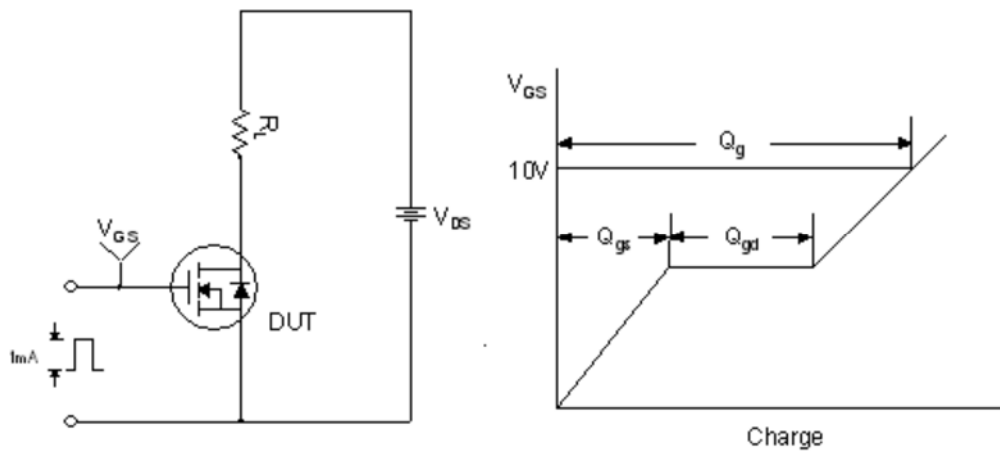


Figure 1. Gate Charge Test Circuit & Waveform

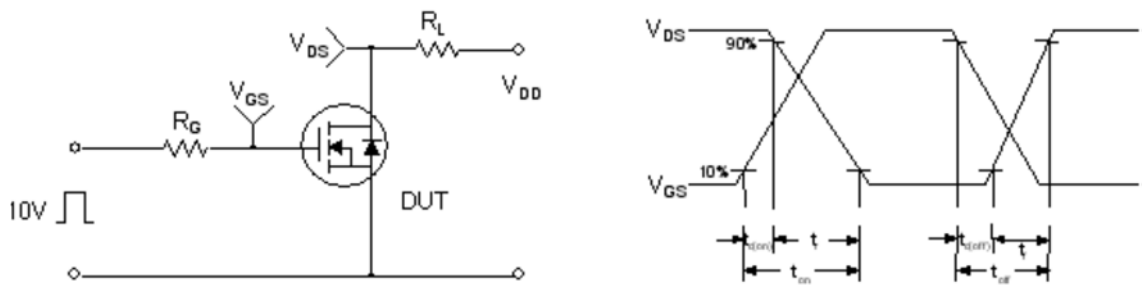


Figure 2. Resistive Switching Test Circuit & Waveforms

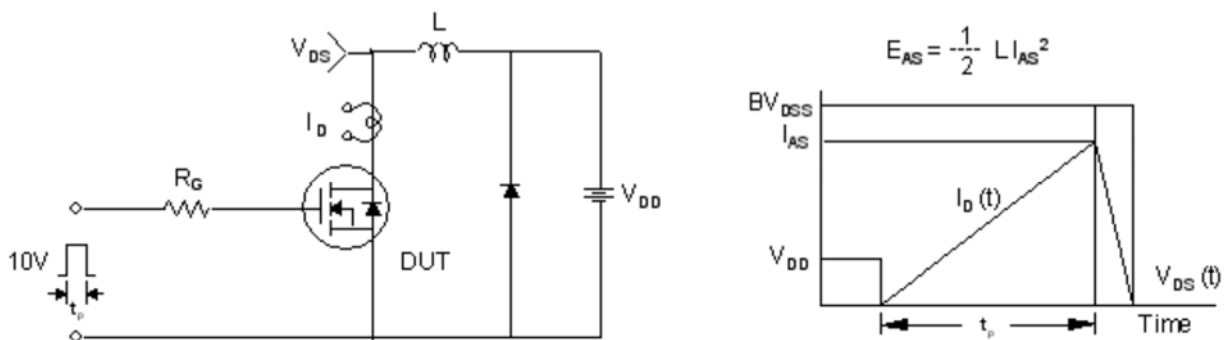
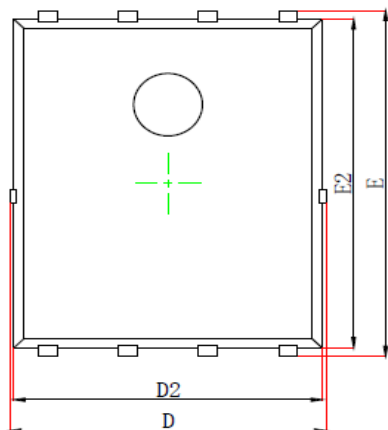
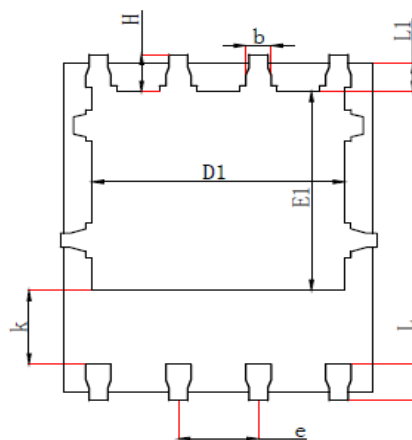


Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms

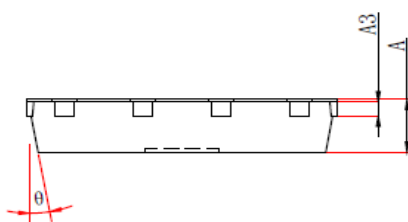
PDFNWB5×6-8L (P1.27T0.95) PACKAGE OUTLINE DIMENSIONS



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	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°