

**40V,40A
N-Channel Mosfet**

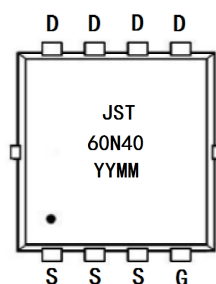
FEATURES

- $R_{DS(ON)} < 7.5m\Omega$ @ $V_{GS} = 10V$
- $R_{DS(ON)} < 14m\Omega$ @ $V_{GS} = 4.5V$

APPLICATIONS

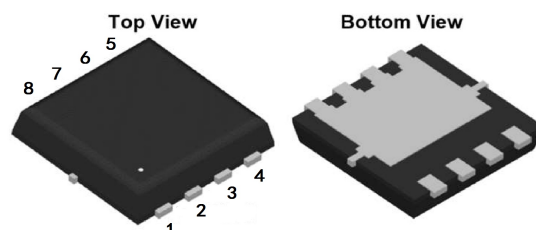
- Load Switch
- PWM Application
- Power management

MARKING



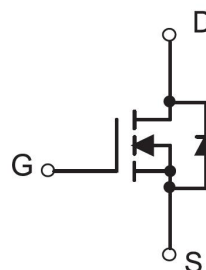
YYMM:Date Code(year&month)

PDFN3.3*3.3-8L



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

N-CHANNEL MOSFET



Absolute Maximum Ratings (TC=25°C unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		40	V
V_{GSS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	40	A
		$T_C = 100^\circ C$	26	A
I_{DM}	Pulsed Drain Current ^{note1}		160	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}		81	mJ
P_D	Power Dissipation	$T_C = 25^\circ C$	21	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		6	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^\circ C$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ 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 =250μA	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} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250μA	1.1	1.7	2.4	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =30A	-	5.7	7.5	mΩ
		V _{GS} =4.5V, I _D =20A	-	10	14	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = 20V, V _{GS} =0V, f = 1.0MHz	-	2400	-	pF
C _{oss}	Output Capacitance		-	192	-	pF
C _{rss}	Reverse Transfer Capacitance		-	165	-	pF
Q _g	Total Gate Charge	V _{DS} =20V, I _D =30A, V _{GS} =10V	-	37	-	nC
Q _{gs}	Gate-Source Charge		-	6	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	7	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =20V, I _D =20A, R _L =1Ω, R _{GEN} =3Ω, V _{GS} =10V	-	12	-	ns
t _r	Turn-on Rise Time		-	12	-	ns
t _{d(off)}	Turn-off Delay Time		-	38	-	ns
t _f	Turn-off Fall Time		-	9	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	40	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	160	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	T _J =25℃, I _F =20A,dI/dt=100A/μs	-	22	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	11	-	nC

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

2. EAS condition: $T_J=25^{\circ}\text{C}$, $V_{DD}=20V$, $V_G=10V$, $R_G=25\Omega$, $L=0.5mH$, $I_{AS}=18A$

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

Figure1: Output Characteristics

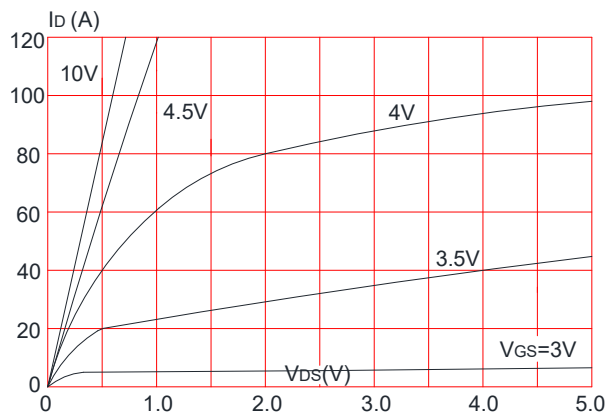


Figure 2: Typical Transfer Characteristics

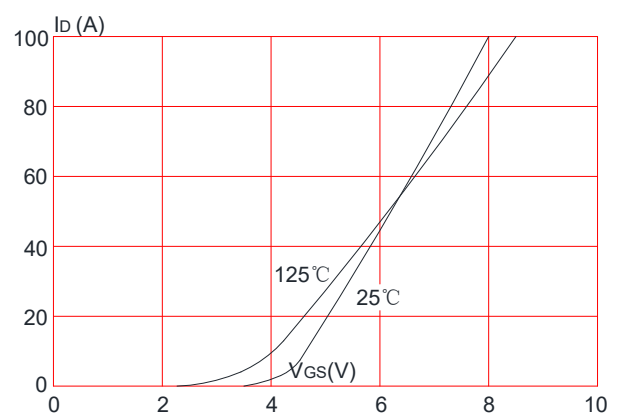


Figure 3: On-resistance vs. Drain Current

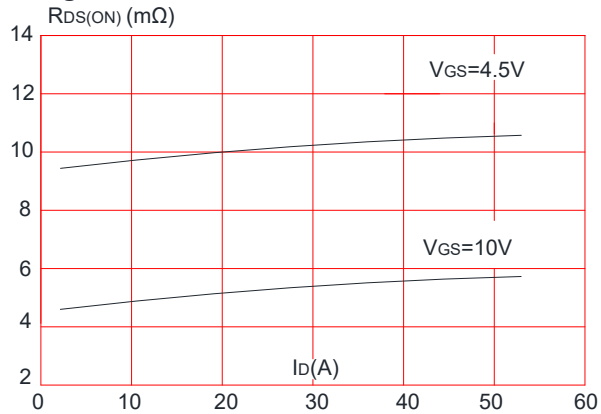


Figure 4: Body Diode Characteristics

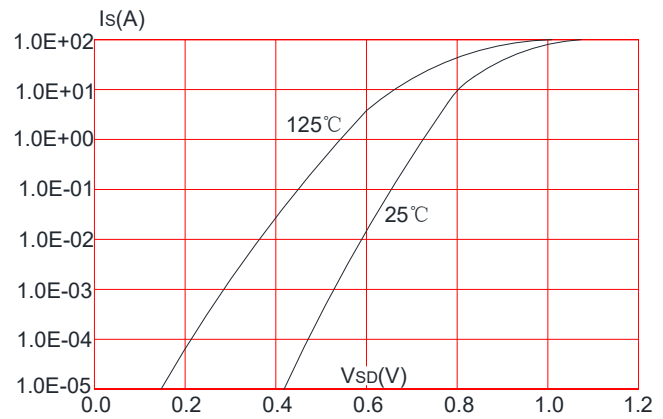


Figure 5: Gate Charge Characteristics

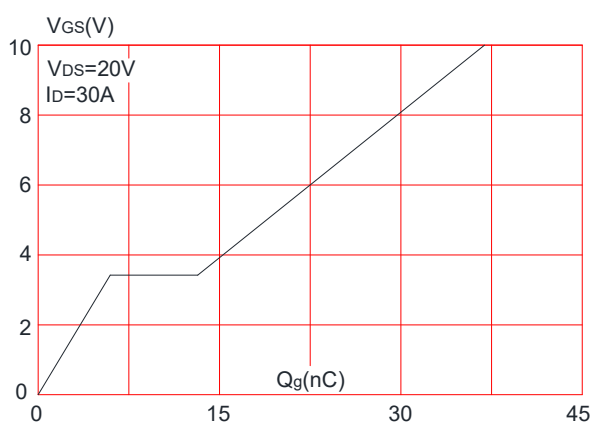


Figure 6: Capacitance Characteristics

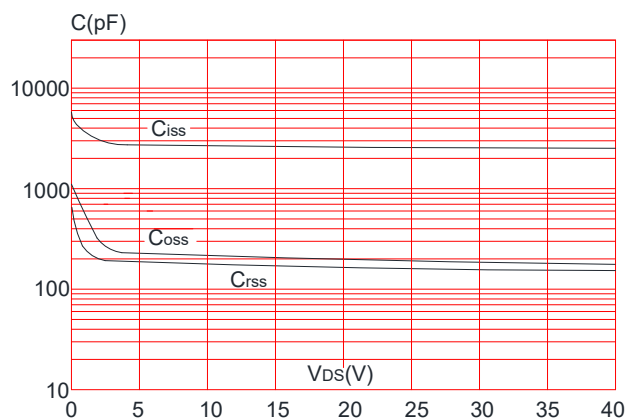


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

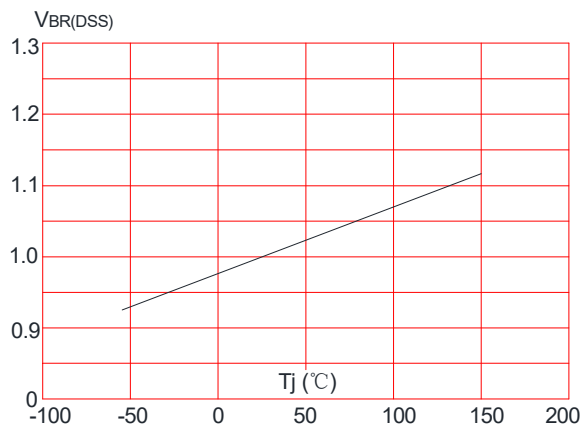


Figure 8: Normalized on Resistance vs. Junction Temperature

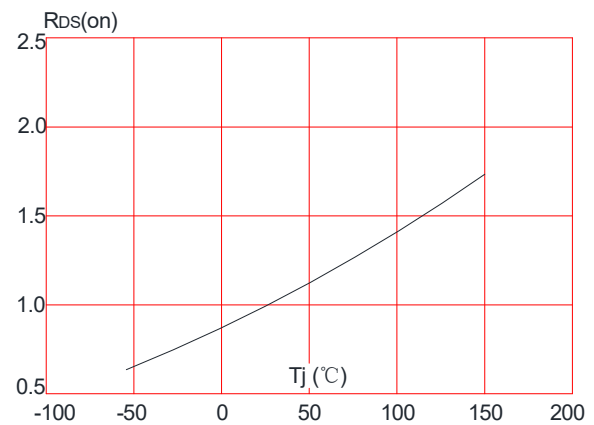


Figure 9: Maximum Safe Operating Area

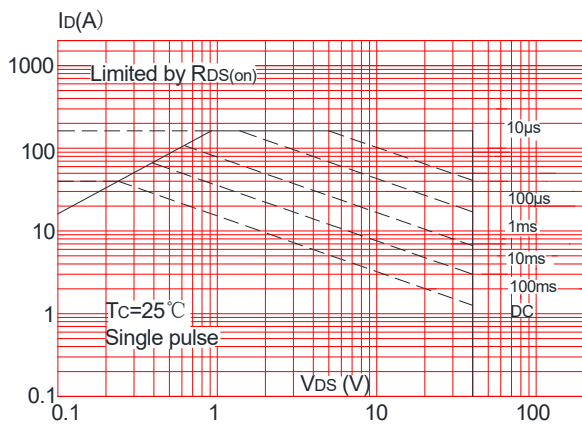


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

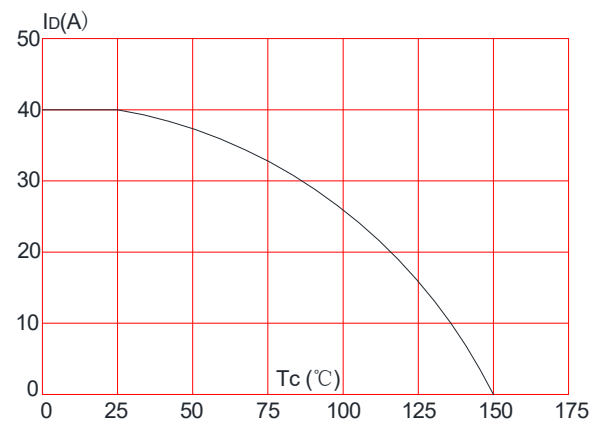
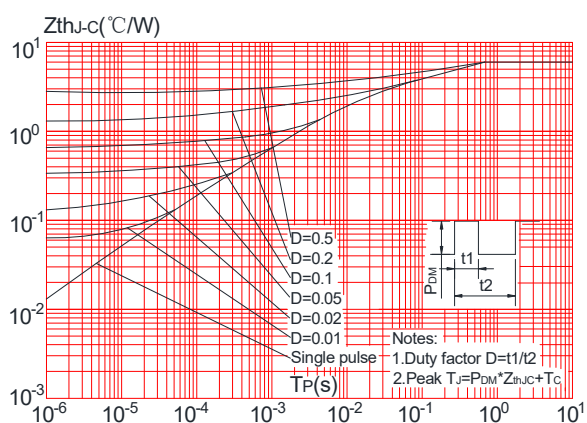
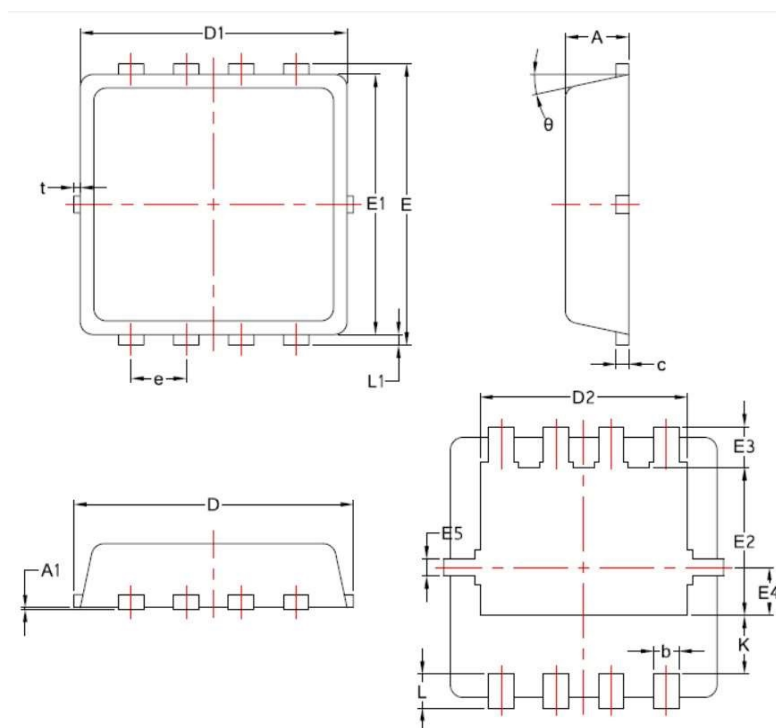


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



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°