




Power MOSFETS

DATASHEET

LM60025NHK8A

N-Channel
Enhancement Mode MOSFET

 Leadpower-semiconductor Corp., Ltd

 sales@leadpower-semi.com

 (03) 6577339 FAX : (03) 6577229

 www.leadpower-semi.com

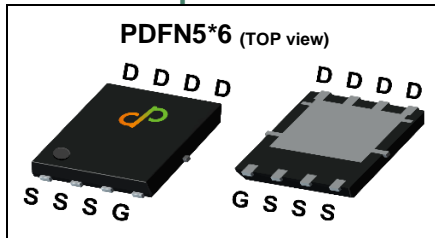


Quality Management Systems

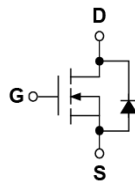
ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

Symbol	N-Channel	Unit
V _{DSS}	60	V
R _{DS(ON)-Max}	3.3	mΩ
I _D	142	A

Feature

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

Applications

- DC/DC converter

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM60025NHK8A	PDFN5*6	Tape & Reel	5000 / Tape & Reel	60025 □□□□□□

Note: □□□□□□ = Lot code

Absolute Maximum Ratings (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter		N-Channel	Unit
V _{DSS}	Drain-Source Voltage		60	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _{DM}	Pulse Drain Current Tested (t < 300us)	T _C =25°C	413	A
I _S	Diode Continuous Forward Current	T _C =25°C	42	A
I _D ^①	Continuous Drain Current	T _C =25°C	142 ^①	A
		T _C =100°C	104	
P _D	Maximum Power Dissipation	T _C =25°C	125	W
		T _C =100°C	50	W
I _D ^②	Continuous Drain Current	T _A =25°C	23.8	W
		T _A =100°C	19	
P _D ^②	Maximum Power Dissipation	T _A =25°C	2.6	W
		T _A =70°C	1.6	W
I _{AS} ^③	Avalanche Current, Single pulse	L=0.1mH	53	A
E _{AS} ^③	Avalanche Energy, Single pulse	L=0.1mH	140	mJ
I _{AS} ^③	Avalanche Current, Single pulse	L=0.5mH	29	A
E _{AS} ^②	Avalanche Energy, Single pulse	L=0.5mH	210	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	1	°C/W
$R_{\theta JA}^{\textcircled{3}}$	Thermal Resistance-Junction to Ambient	Steady State	48	°C/W

Note ① : Max. current is limited by bonding wire. The current limitation of Silicon is 165A.

Note ② : Surface Mounted on 1in² FR-4 board with 1oz.

Note ③ : UIS tested and pulse width are limited by maximum junction temperature 150°C

N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=48V, V_{GS}=0V$	-	-	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2	3	4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
$R_{DS(ON)}^{\textcircled{4}}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=20A$	-	2.7	3.3	m Ω
gfs	Forward Transconductance	$V_{DS}=5V, I_{DS}=10A$	-	29	-	S
Dynamic Characteristics [®]						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V,$ Freq.=1MHz	-	0.7	2	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=30V,$ Freq.=1MHz	-	5607	-	pF
C_{oss}	Output Capacitance		-	1187	-	
C_{rss}	Reverse Transfer Capacitance		-	99	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DS}=40V,$ $I_D=30A, R_{GEN}=3\Omega$	-	26.5	-	nS
t_r	Turn-on Rise Time		-	7.7	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	59.2	-	
t_f	Turn-off Fall Time		-	91.7	-	
Q_g	Total Gate Charge	$V_{GS}=6V, V_{DS}=30V$ $I_D=20A$	-	51.4	-	nC
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=30V,$ $I_D=20A$	-	83.4	-	
Q_{gs}	Gate-Source Charge		-	29.4	-	
Q_{gd}	Gate-Drain Charge		-	13.6	-	
Source-Drain Characteristics						
$V_{SD}^{\textcircled{4}}$	Diode Forward Voltage	$I_{SD}=10A, V_{GS}=0V$	-	0.76	1.1	V
t_{rr}	Reverse Recovery Time	$I_F=10A, V_R=40V$	-	51	-	nS
Q_{rr}	Reverse Recovery Charge	$dI_F/dt=100A/\mu s$	-	65	-	nC

Note ④ : Pulse test (pulse width \leq 300 μs , duty cycle \leq 2%).

Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Typical Characteristics

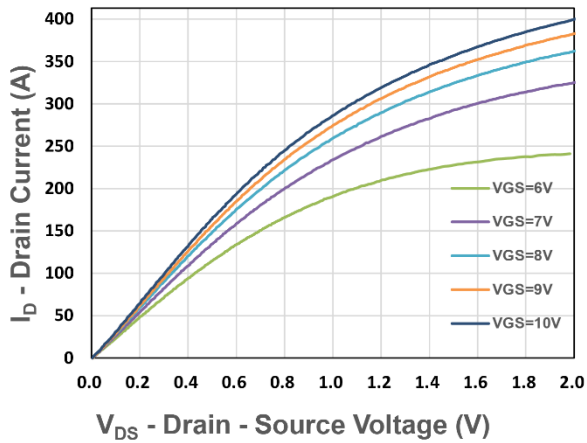


Figure 1. Output Characteristics

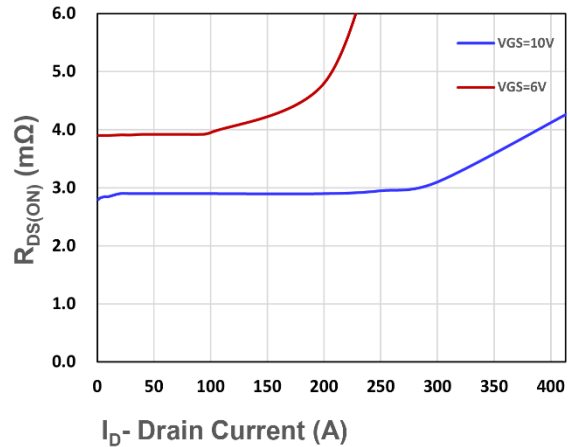


Figure 2. On-Resistance vs. I_D

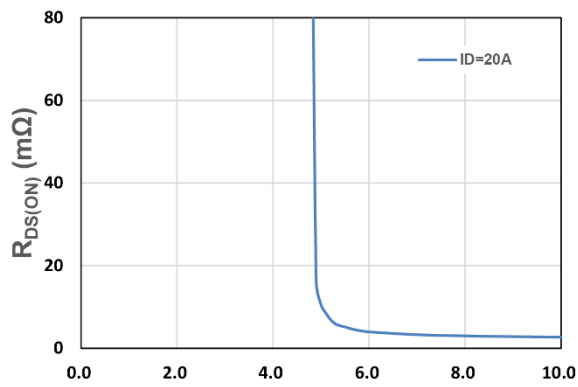


Figure 3. On-Resistance vs. V_{GS}

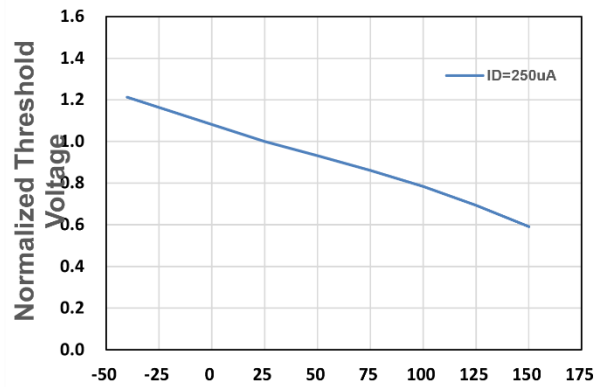


Figure 4. Gate Threshold Voltage

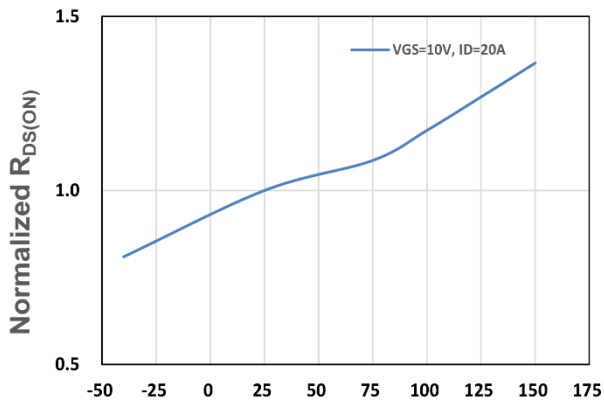


Figure 5. Drain-Source On Resistance

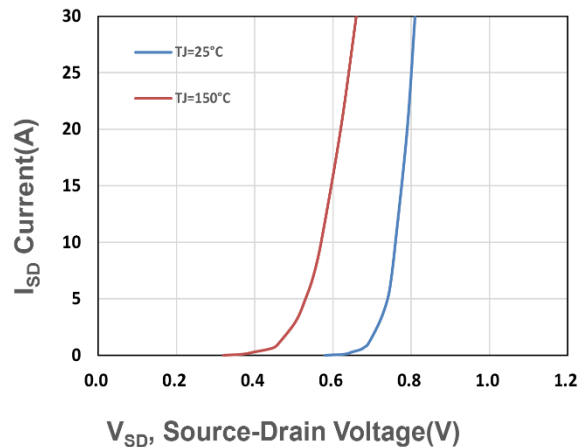
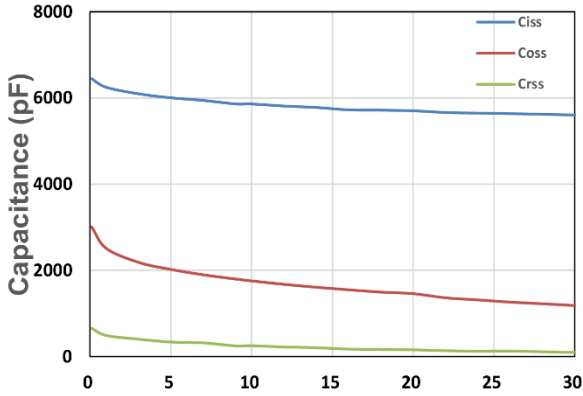
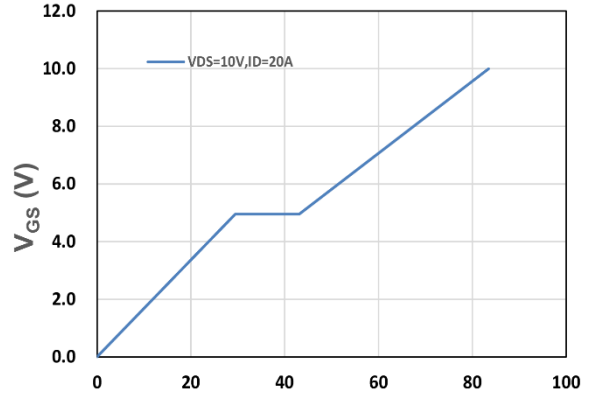


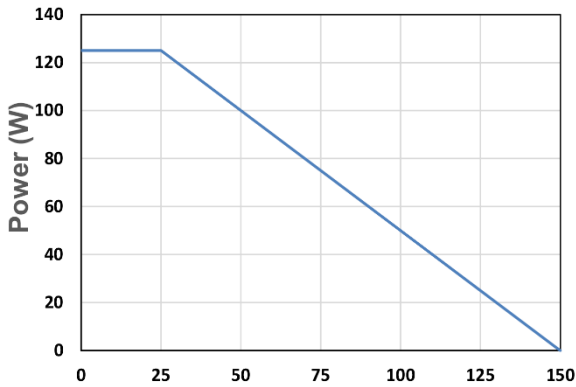
Figure 6. Source-Drain Diode Forward



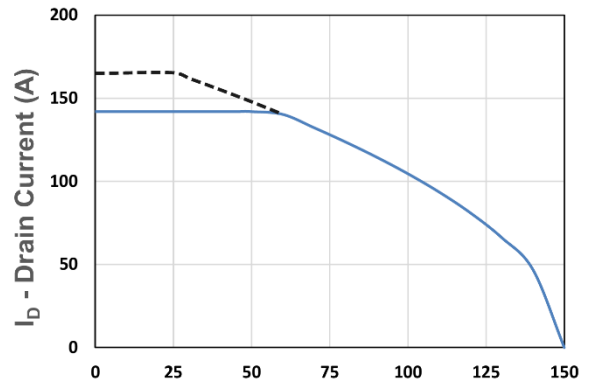
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



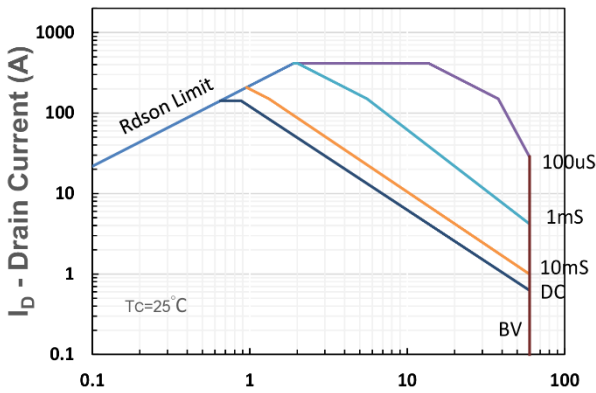
Qg , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



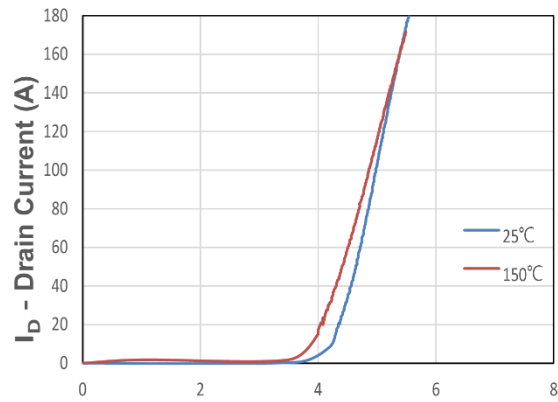
T_c - Case Temperature (°C)
Figure 9. Power Dissipation



T_c - Case Temperature (°C)
Figure 10. Drain Current



V_{DS} - Drain-Source Voltage (V)
Figure 11. Safe Operating Area



V_{GS} - Gate-Source Voltage (V)
Figure 12. Transfer Characteristics

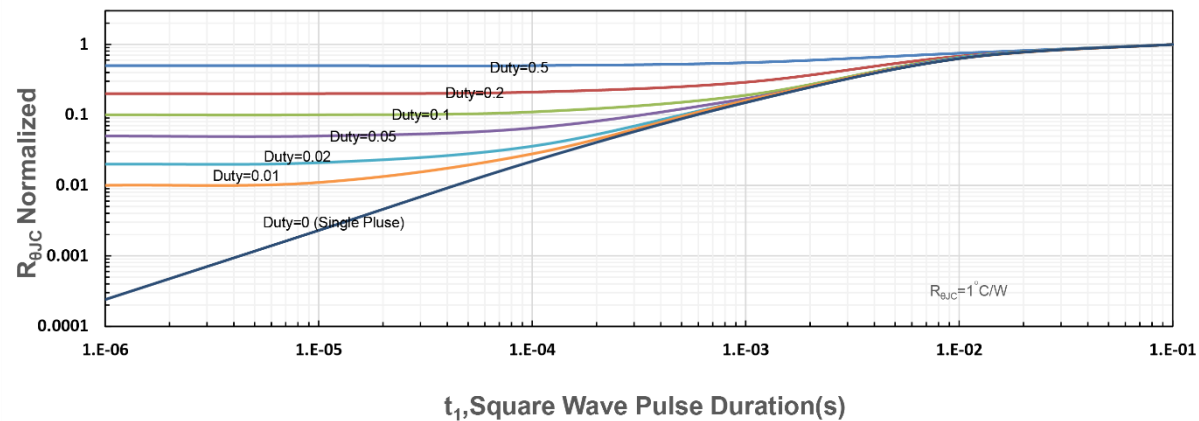


Figure 13. $R_{\theta JC}$ Transient Thermal Impedance