





Power MOSFETS

DATASHEET


LM80012NHX8A

N-Channel
Enhancement Mode MOSFET

 Leadpower-semi CO., LTD.

 sales@leadpower-semi.com

 (03) 6577339 FAX : (03) 6577229

 www.leadpower-semi.com

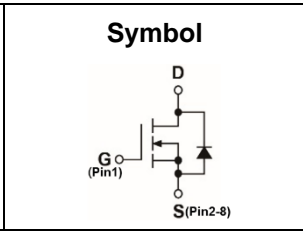
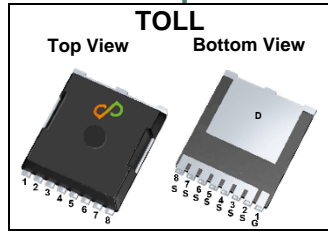


Quality Management Systems

ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Product Summary

Symbol	N-Channel	Unit
V_{DS}	80	V
$R_{DS(ON)-Max}$	1.25	m Ω
ID	426	A

Feature

- Surface-mounted package
- Advanced trench cell design
- 100% UIS and Rg Tested

Applications

- Battery Management System
- Machine tool
- High power inverter system

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM80012NHX8A	TOLL	Tape & Reel	2000 / Tape & Reel	80012 □□□□□□

Note : □□□□□□ = Lot Code

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

Symbol	Parameter	N-Channel	Unit
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	±20	
T_J	Maximum Junction Temperature	175	°C
T_{STG}	Storage Temperature Range	-55 to 175	°C
I_S	Diode Continuous Forward Current	T _C =25°C 113	A
I_{DM}	Pulse Drain Current Tested	T _C =25°C 1066	A
$I_D^{①}$	Continuous Drain Current	T _C =25°C 429 T _C =100°C 301	A
P_D	Maximum Power Dissipation	T _C =25°C 375 T _C =100°C 188	W
$I_D^{②}$	Continuous Drain Current	T _A =25°C 43 T _A =70°C 36	A
$P_D^{②}$	Maximum Power Dissipation	T _A =25°C 3.8 T _A =70°C 2.6	W
$I_{AS}^{③}$	Avalanche Current, Single pulse	L=0.1mH 100 L=0.5mH 55	A
$E_{AS}^{③}$	Avalanche Energy, Single pulse	L=0.1mH 500 L=0.5mH 756	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	0.4 °C/W
$R_{\theta JA}^{②}$	Thermal Resistance-Junction to Ambient	Steady State	40 °C/W

Note ① : Max. current is limited by max. junction temperature.

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

Note ③ : UIS tested and pulse width are limited by maximum junction temperature 175°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} =250uA	80	-	-	V
I_{DSS}	Drain Leakage Current	V _{DS} =64V, V _{GS} =0V	-	-	1	uA
V_{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	2	-	4	V
I_{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R_{DS(ON)}^④	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =30A	-	1.0	1.25	mΩ
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =50A	-	87	-	S
Dynamic Characteristics^⑤						
R_G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	0.7	-	Ω
C_{iSS}	Input Capacitance	V _{GS} =0V, V _{DS} =40V, Freq.=1MHz	-	12230	-	pF
C_{oss}	Output Capacitance		-	3370	-	
C_{rSS}	Reverse Transfer Capacitance		-	29	-	
t_{d(ON)}	Turn-on Delay Time	V _{GEN} =10V, V _{DS} =40V, I _{DS} =1A, R _{GEN} =1Ω	-	44	-	nS
t_r	Turn-on Rise Time		-	27	-	
t_{d(OFF)}	Turn-off Delay Time		-	137	-	
t_f	Turn-off Fall Time		-	13	-	
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =40V, I _D =30A	-	197	-	nC
Q_{gs}	Gate-Source Charge		-	61	-	
Q_{gd}	Gate-Drain Charge		-	47	-	
Source-Drain Characteristics						
V_{SD}^④	Diode Forward Voltage	I _{SD} =30A, V _{GS} =0V	-	0.75	1.1	V
t_{rr}	Reverse Recovery Time	I _{DS} =15A, V _{GS} =0V dI _{SD} /dt=100A/μs	-	27	-	nS
Q_{rr}	Reverse Recovery Charge		-	34	-	nC

Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

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

N-Channel Typical Characteristics

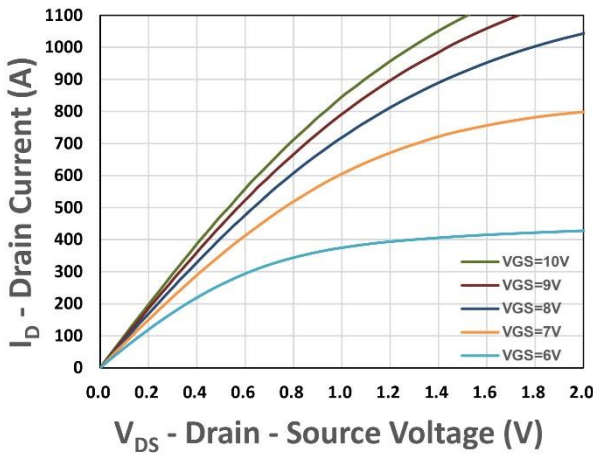


Figure 1. Output Characteristics

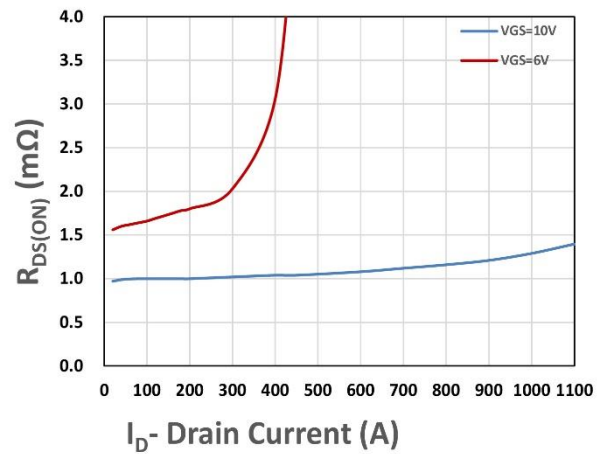


Figure 2. On-Resistance vs. I_D

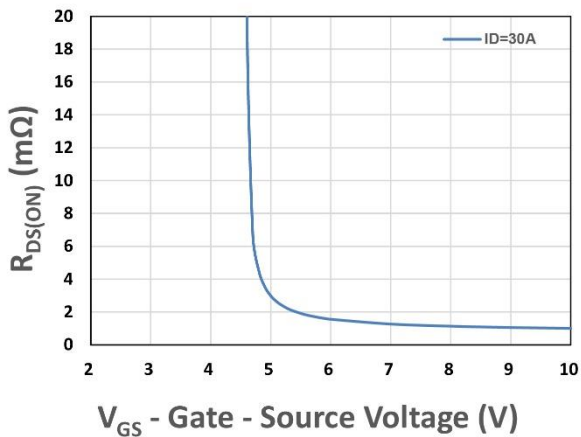


Figure 3. On-Resistance vs. V_{GS}

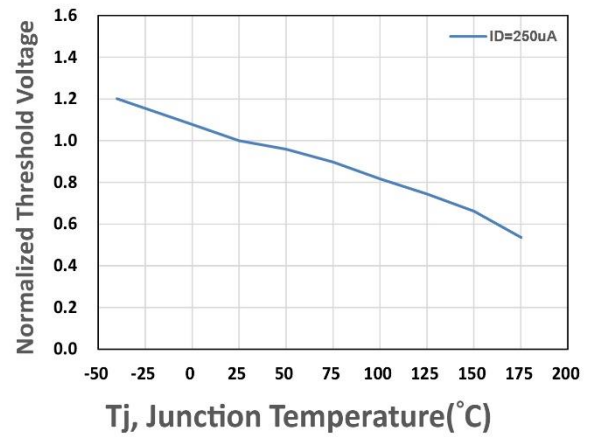


Figure 4. Gate Threshold Voltage

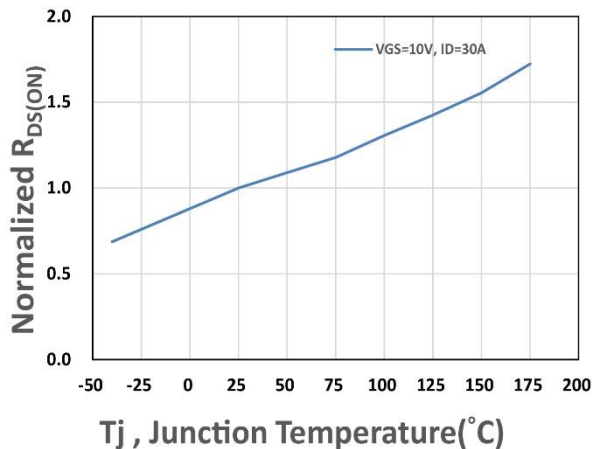


Figure 5. Drain-Source On Resistance

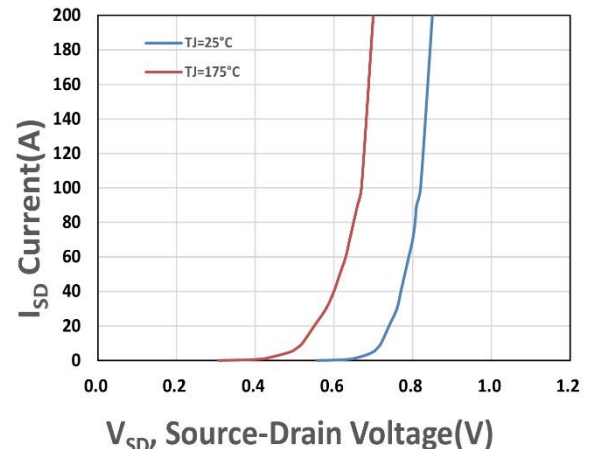
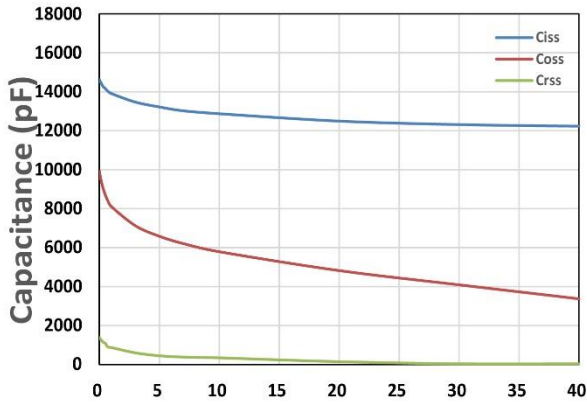
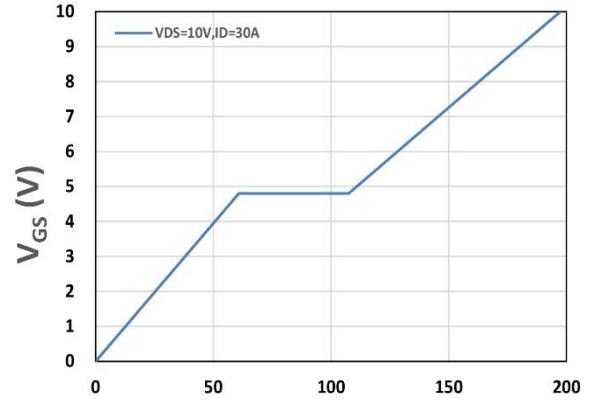


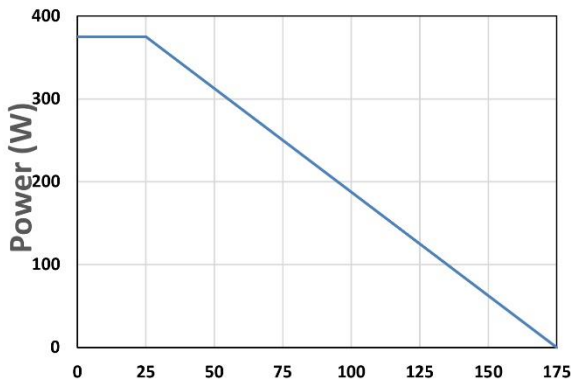
Figure 6. Source-Drain Diode Forward



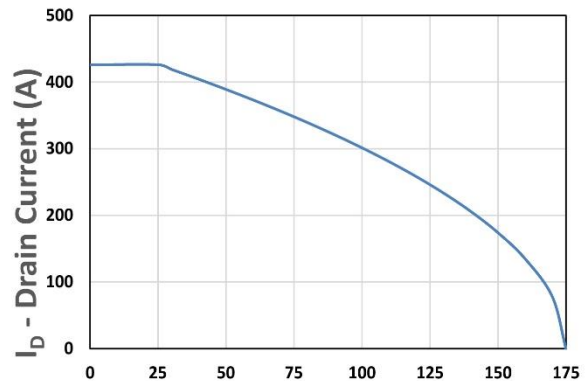
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



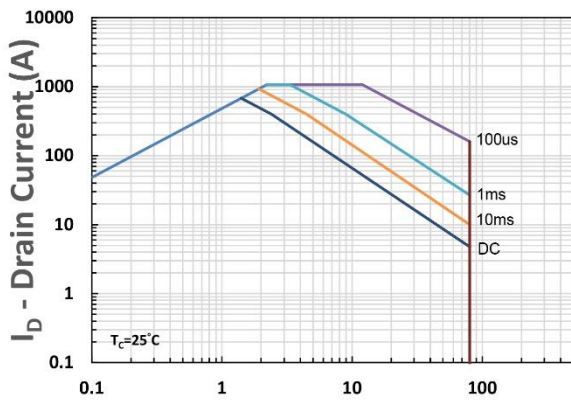
Qg, Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



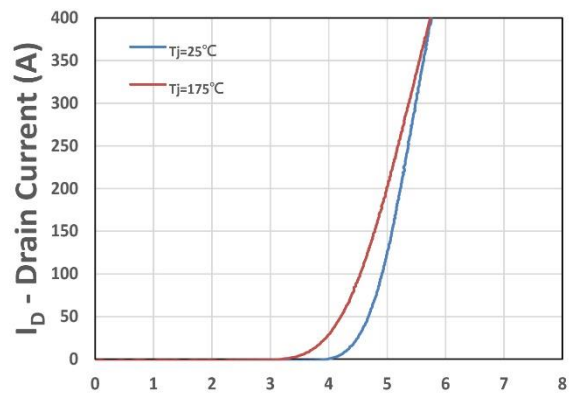
Tc - Case Temperature (°C)
Figure 9. Power Dissipation



Tc - 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

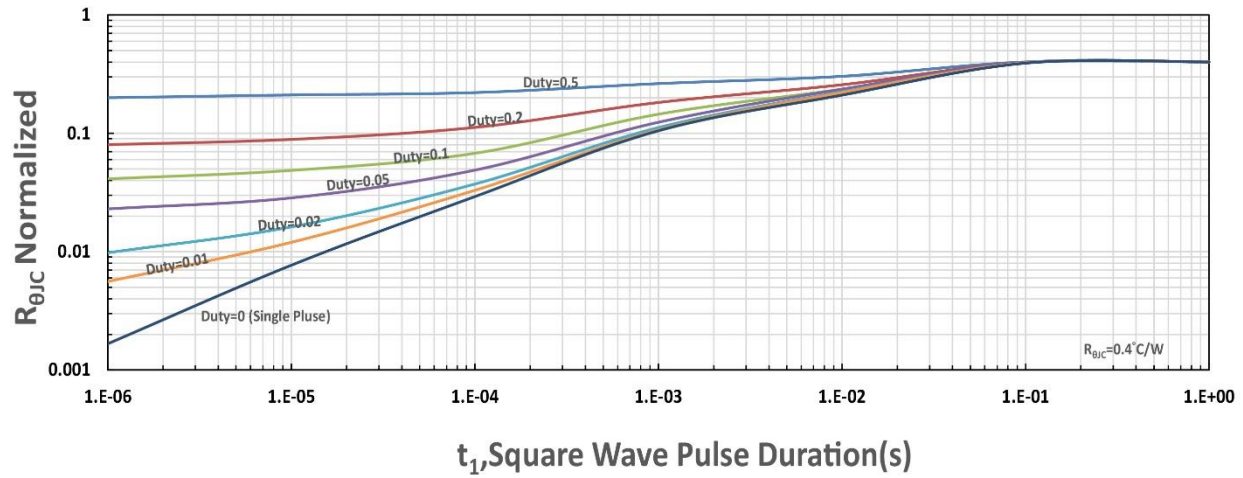


Figure 13. $R_{\theta JC}$ Transient Thermal Impedance