Power MOSFETS

DATASHEET

LM1A160NAO2A

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

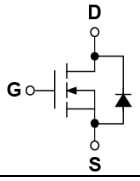
LM1A160NAO2A

N-Channel Enhancement Mode MOSFET

Pin Description

TO-252-2L (TOP view)

Symbol



Product Summary

Symbol	N-Channel	Unit
V_{DSS}	100	V
$R_{DS(ON)-Max}$	15	mΩ
ID	48	A

Feature

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

Applications

- Power Load Switch
- Motor Control

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM1A160NAO2A	TO-252-2L	Tape & Reel	3000 / Tape & Reel	1A160 □□□□□□

Note: □□□□□□ = Lot code

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

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	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	30	A
I_{DM}①	Pulse Drain Current Tested	T_C=25°C	120	A
I_D	Continuous Drain Current	T_C=25°C	48	A
		T_C=100°C	34	
P_D	Maximum Power Dissipation	T_C=25°C	65	W
		T_C=100°C	33	
I_D②	Continuous Drain Current	T_A=25°C	9.2	A
		T_A=70°C	7.7	
P_D②	Maximum Power Dissipation	T_A=25°C	2.4	W
		T_A=70°C	1.7	
I_{AS}③	Avalanche Current, Single pulse	L=0.1mH	10	A
		L=0.5mH	6	
E_{AS}③	Avalanche Energy, Single pulse	L=0.1mH	5	mJ
		L=0.5mH	9	

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R\theta_{JC}$	Thermal Resistance-Junction to Case	Steady State	2.3	°C/W
$R\theta_{JA}$②	Thermal Resistance-Junction to Ambient	Steady State	62	°C/W

Note ① : Max. current is limited by junction temperature.
Note ② : Surface Mounted on 1in^2 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	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V, V_{GS}=0V	-	-	1	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250uA	1	2	3	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}=12.5A	-	12.5	15	mΩ
		V_{GS}=4.5V, I_{DS}=12.5A	-	19	25	
gfs	Forward Transconductance	V_{DS}=5V, I_{DS}=10A	-	18	-	S
Dynamic Characteristics ⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V, Freq.=1MHz	-	0.8	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=50V, Freq.=1MHz	-	1193	-	pF
C_{oss}	Output Capacitance		-	386	-	
C_{rss}	Reverse Transfer Capacitance		-	33	-	
$td_{(ON)}$	Turn-on Delay Time	V_{GS}=10V,V_{DS}=50V, I_D=1A,R_{GEN}=1Ω	-	10.4	-	nS
t_r	Turn-on Rise Time		-	9	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	23	-	
t_f	Turn-off Fall Time		-	85	-	
Q_g	Total Gate Charge	V_{GS}=4.5V,V_{DS}=50V I_D=12.5A	-	11	-	nC
Q_g	Total Gate Charge	V_{GS}=10V,V_{DS}=50V, I_D=12.5A	-	22	-	
Q_{gs}	Gate-Source Charge		-	4.9	-	
Q_{gd}	Gate-Drain Charge		-	5.1	-	
Source-Drain Characteristics						
V_{SD}④	Diode Forward Voltage	I_{SD}=12.5A, V_{GS}=0V	-	0.85	1.1	V
t_{rr}	Reverse Recovery Time	I_F=6.3A, V_R=50V dI$_F$/dt=100A/μs	-	33	-	nS
Q_{rr}	Reverse Recovery Charge		-	21	-	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

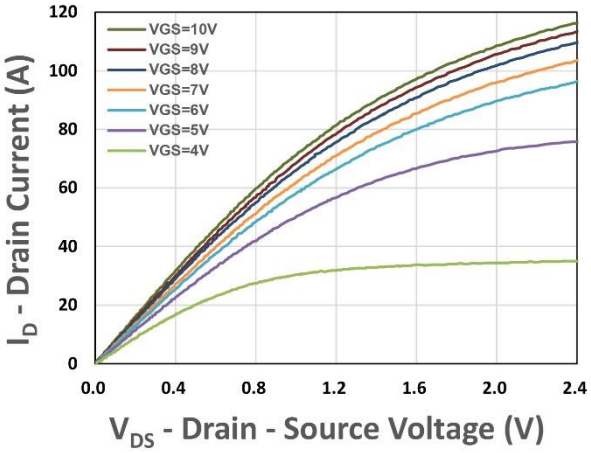


Figure 1. Output Characteristics

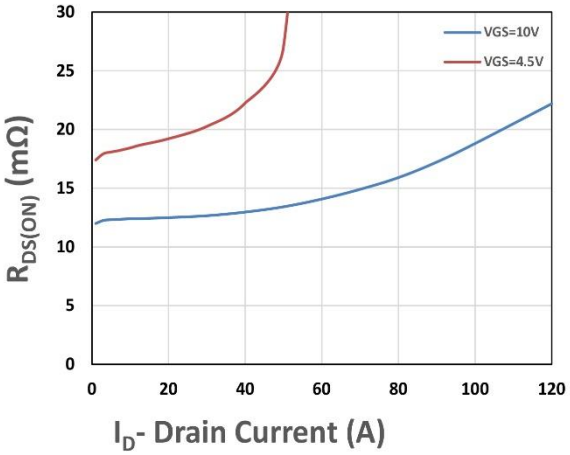


Figure 2. On-Resistance vs. ID

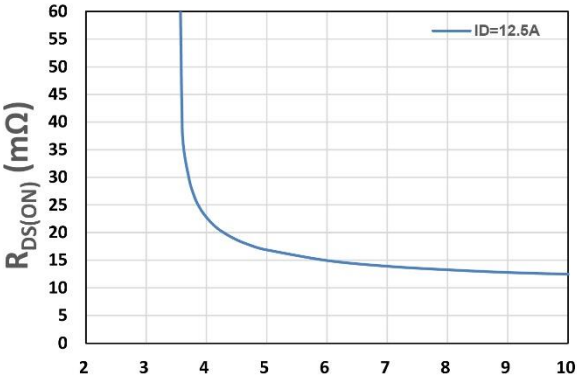


Figure 3. On-Resistance vs. VGS

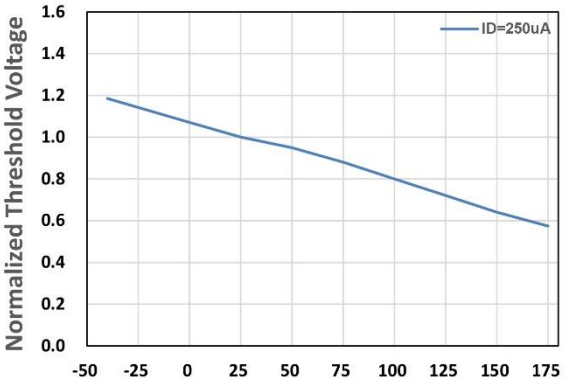


Figure 4. Gate Threshold Voltage

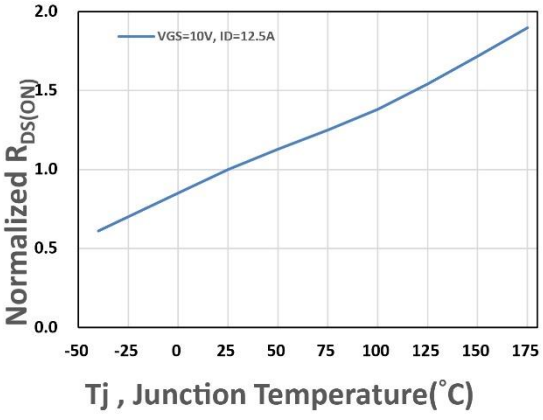


Figure 5. Drain-Source On Resistance

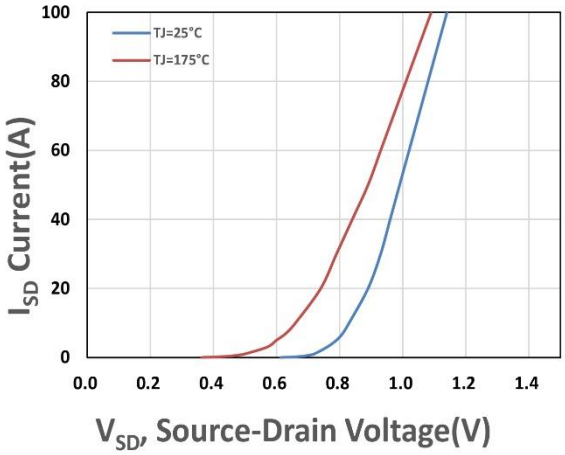
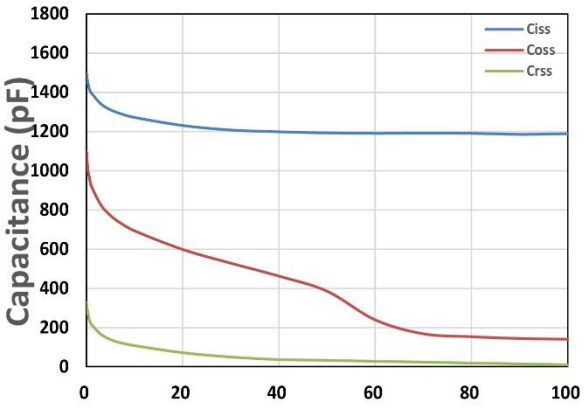
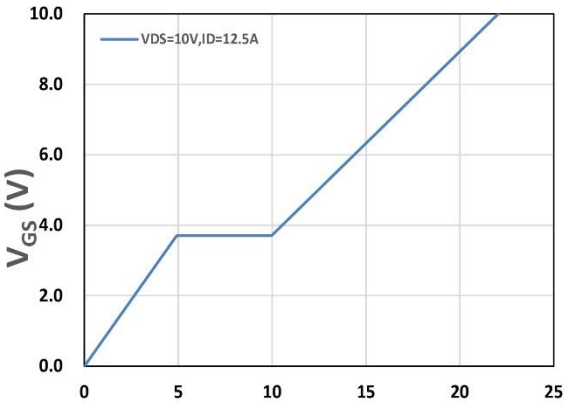


Figure 6. Source-Drain Diode Forward



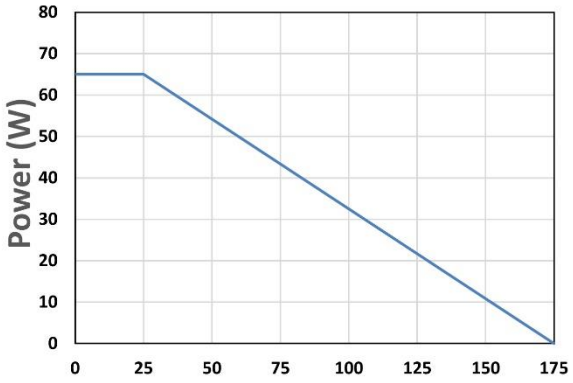
V_{DS} - Drain - Source Voltage (V)

Figure 7. Capacitance



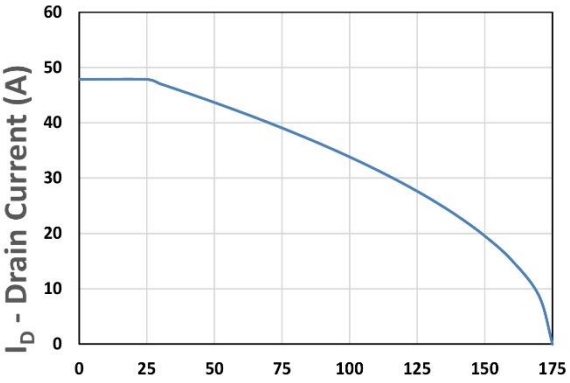
Qg, Total Gate Charge (nC)

Figure 8. Gate Charge Characteristics



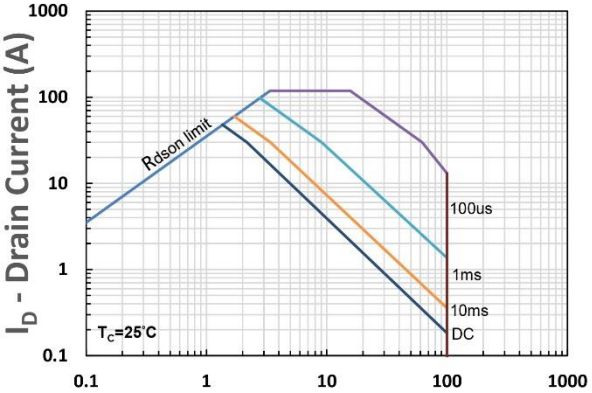
Tc - Case Temperature (˚C)

Figure 9. Power Dissipation



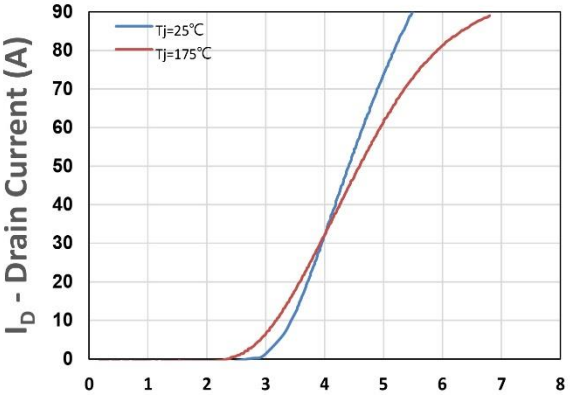
Tc - Case Temperature (˚C)

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

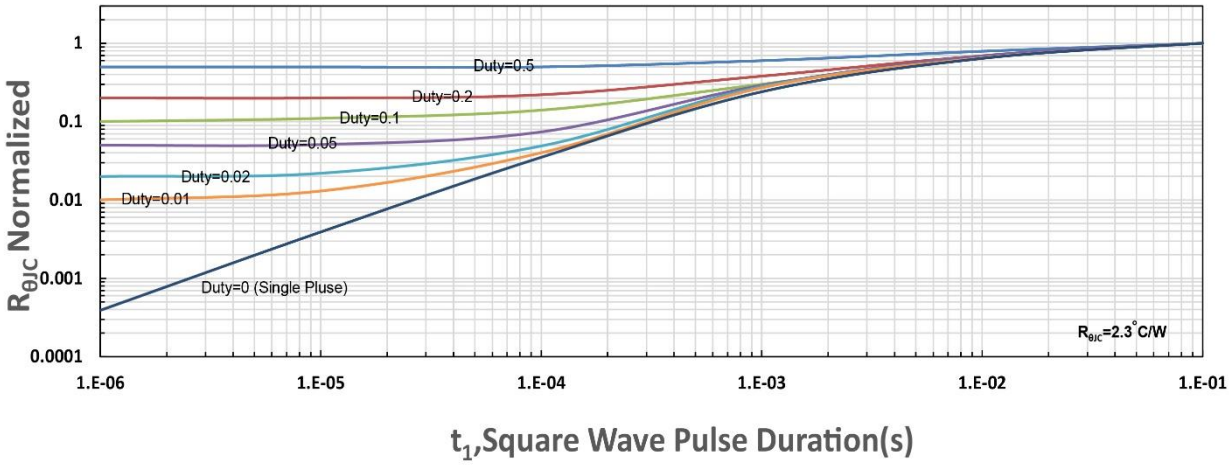


Figure 13. RθJC Transient Thermal Impedance