



Power MOSFETS

DATASHEET

LM60140NAO2A

N-Channel
Enhancement Mode MOSFET

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Quality Management Systems

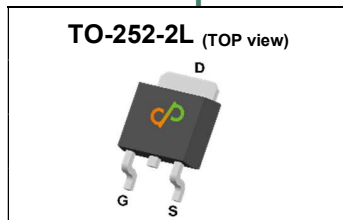
ISO 9001:2015 Certificate

LM60140NAO2A

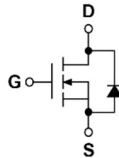


N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

Symbol	N-Channel	Unit
V_{DSS}	60	V
$R_{DS(ON)-Max}$	17	mΩ
I_D	42	A

Feature

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

Applications

- Power switching application
- Hard switched and high frequency circuits

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM60140NAO2A	TO-252-2L	Tape & Reel	3000 / Tape & Reel	60140 □□□□□□

Note : □□□□□□ = Lot Code

Absolute Maximum Ratings ($T_J=25^\circ\text{C}$ 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} ^①	Pulse Drain Current Tested	T _c =25°C	104	A
I _D	Continuous Drain Current	T _c =25°C	42	A
		T _c =100°C	26	
P _D	Maximum Power Dissipation	T _c =25°C	54	W
		T _c =100°C	22	
I _{AS} ^②	Avalanche Current, Single pulse	L=0.1mH	23	A
E _{AS} ^②	Avalanche Energy, Single pulse	L=0.1mH	26	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
R_{θJC}	Thermal Resistance-Junction to Case	Steady State	2.3	°C/W
R_{θJA} ^③	Thermal Resistance-Junction to Ambient	Steady State	55	°C/W

Note ① : Max. current is limited by junction temperature

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C

Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.

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	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =48V, V _{GS} =0V	-	-	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1	1.5	2.5	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} =6A	-	14	17	mΩ
		V _{GS} =4.5V, I _{DS} =5A	-	15	19.5	
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =3A	-	16	-	S
Dynamic Characteristics ⑤						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	1.2	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, Freq.=1MHz	-	2172	-	pF
C _{oss}	Output Capacitance		-	112	-	
C _{rss}	Reverse Transfer Capacitance		-	87	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V, V _{DS} =30V, I _D =1A, R _{GEN} =6Ω	-	9	-	nS
tr	Turn-on Rise Time		-	18	-	
td(OFF)	Turn-off Delay Time		-	40	-	
tf	Turn-off Fall Time		-	30	-	
Qg	Total Gate Charge	V _{GS} =4.5V, V _{DS} =30V I _D =6A	-	25	-	nC
Qg	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =6A	-	52	-	
Qgs	Gate-Source Charge		-	10	-	
Qgd	Gate-Drain Charge		-	8	-	
Source-Drain Characteristics						
VSD ④	Diode Forward Voltage	ISD=1A, VGS=0V	-	0.7	1.1	V
trr	Reverse Recovery Time	IF=1A, VR=0V	-	18	-	nS
Qrr	Reverse Recovery Charge	dIF/dt=100A/μs	-	11.5	-	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

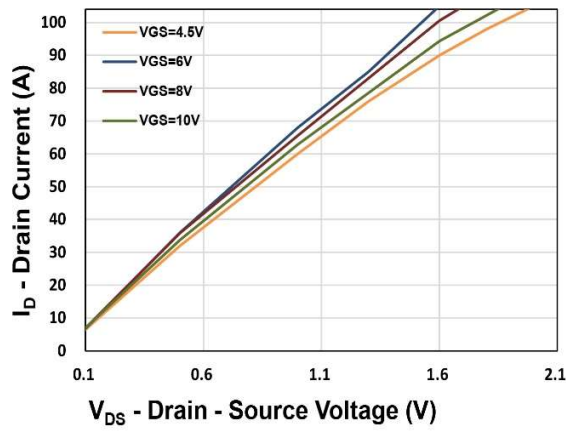


Figure 1. Output Characteristics

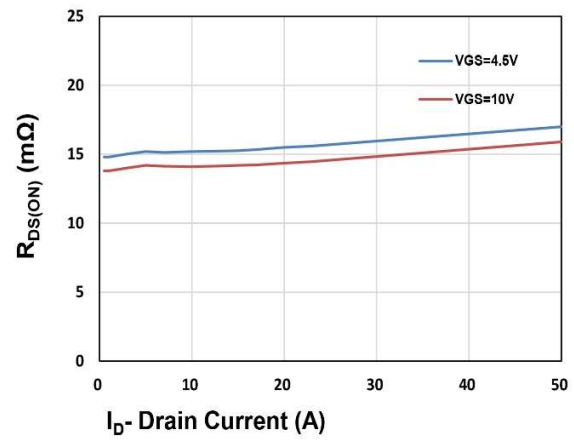


Figure 2. On-Resistance vs. I_D

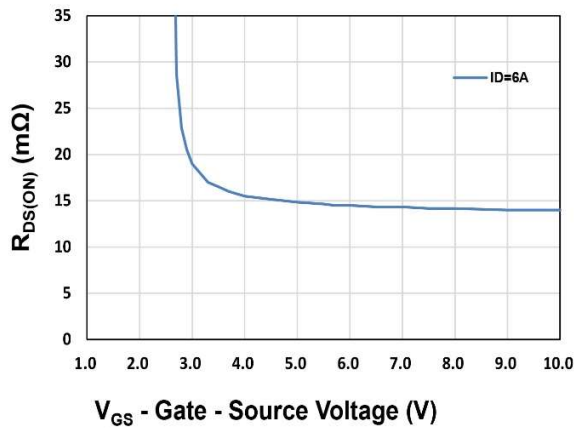


Figure 3. On-Resistance vs. V_GS

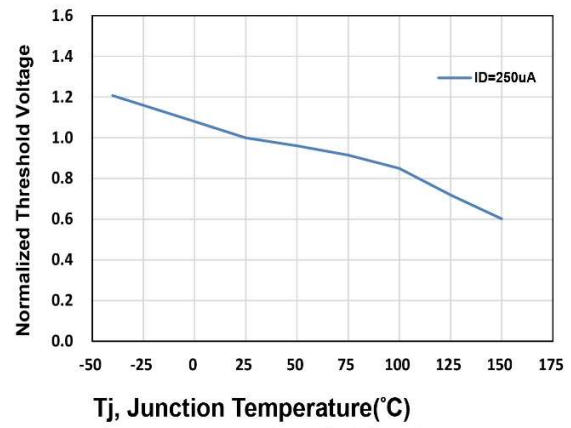


Figure 4. Gate Threshold Voltage

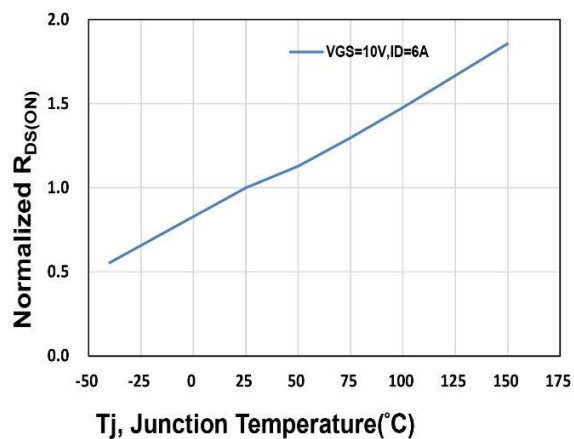


Figure 5. Drain-Source On Resistance

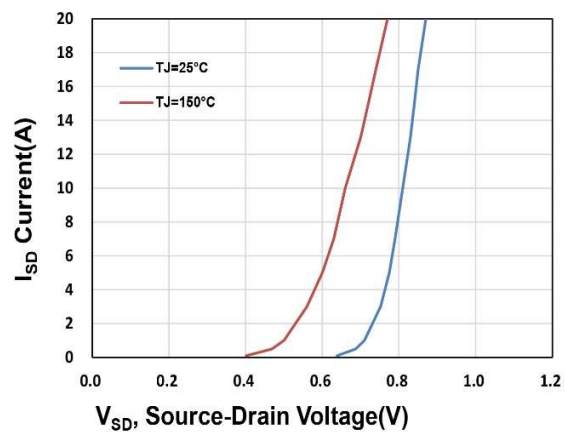


Figure 6. Source-Drain Diode Forward

