



Power MOSFETS

DATASHEET

LM1A060NAK8A

N-Channel
Enhancement Mode MOSFET

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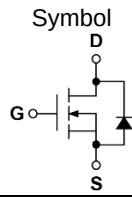
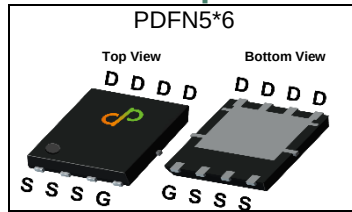


Quality Management Systems

ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Ordering Information

Symbol	N-Channel	Unit
V_{DSS}	100	V
$R_{DS(ON)-Max}$	6	m Ω
I_D	86	A

Feature

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

Applications

- Portable Equipment
- Battery Powered System

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM1A060NAK8A	PDFN5*6	Tape & Reel	5000 / Tape & Reel	1A060 □□□□□□

Note : □□□□□□ = Lot Code

Absolute Maximum Ratings (T_J=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		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$	142	A
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$	86	A
		$T_c=100^\circ\text{C}$	55	
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	89	W
		$T_c=100^\circ\text{C}$	36	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	18	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH	16	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	1.4	°C/W
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	50	°C/W

Note ① : Max. current is limited by bonding wire

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

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

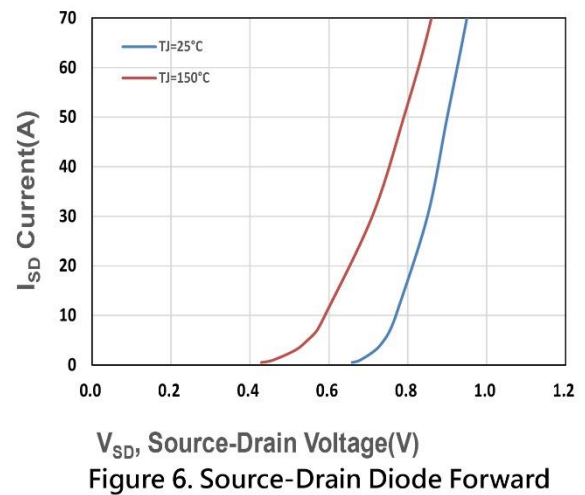
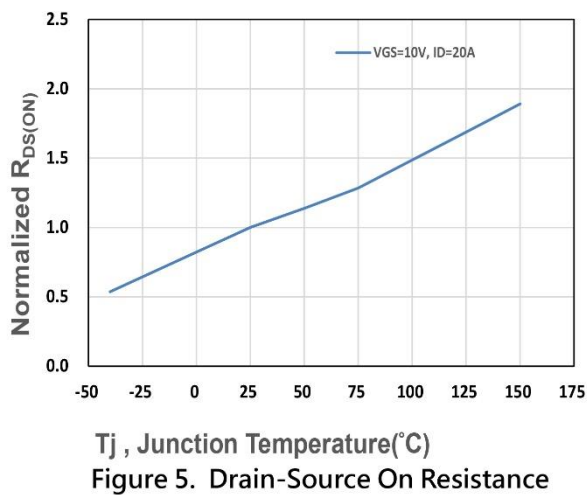
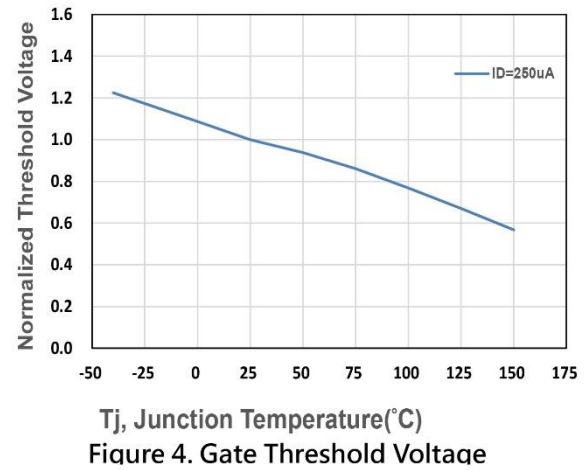
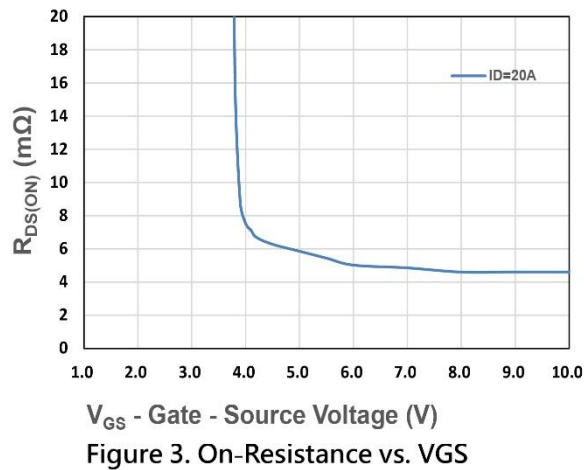
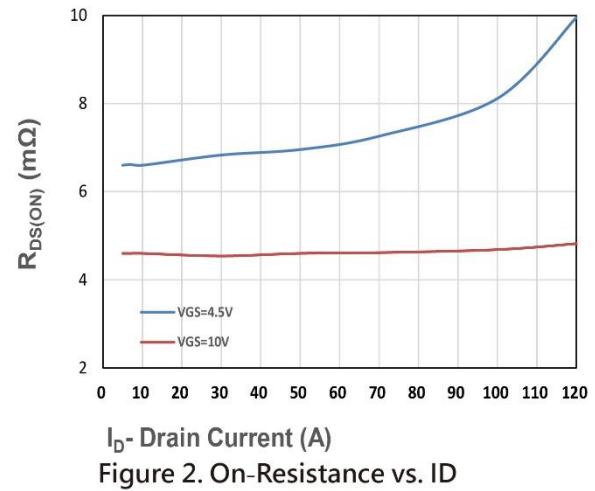
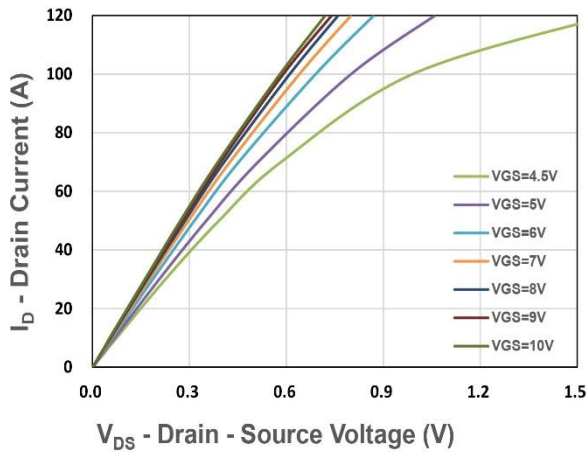
N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

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} =20A	-	4.6	6	mΩ
		V _{GS} =4.5V, I _{DS} =10A	-	6.6	8.6	
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =20A	-	3.1	-	S
Dynamic Characteristics ⑥						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V, Freq.=1MHz	-	1.7	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =50V, Freq.=1MHz	-	3005	-	pF
C _{oss}	Output Capacitance		-	541	-	
C _{rss}	Reverse Transfer Capacitance		-	20	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V,V _{DS} =50V, I _D =1A,R _{GEN} =3Ω	-	11	-	nS
t _r	Turn-on Rise Time		-	20	-	
t _{d(OFF)}	Turn-off Delay Time		-	42	-	
t _f	Turn-off Fall Time		-	25	-	
Q _g	Total Gate Charge	V _{GS} =4.5V,V _{DS} =50V I _D =20A	-	32.4	-	nC
Q _g	Total Gate Charge	V _{GS} =10V,V _{DS} =50V, I _D =20A	-	59	-	
Q _{gs}	Gate-Source Charge		-	8.1	-	
Q _{gd}	Gate-Drain Charge		-	16.4	-	
Source-Drain Characteristics						
V _{SD} ④	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.85	1.1	V
t _{rr}	Reverse Recovery Time	I _F =20A, V _R =50V	-	55.6	-	nS
Q _{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	109.2	-	nC

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

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

N-Channel Typical Characteristics



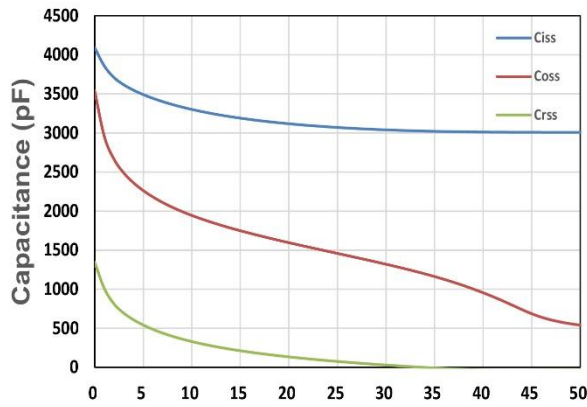


Figure 7. Capacitance

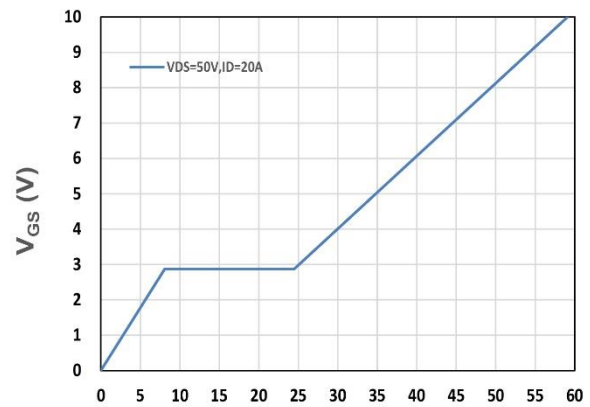


Figure 8. Gate Charge Characteristics

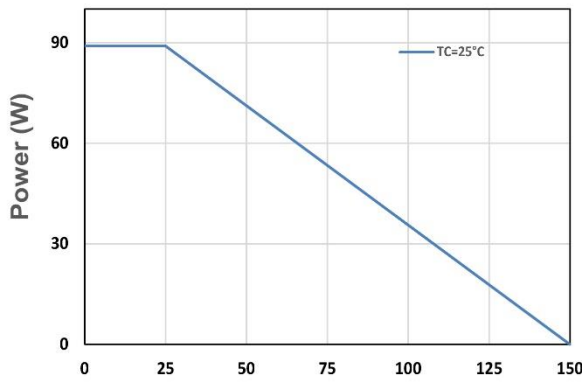


Figure 9. Power Dissipation

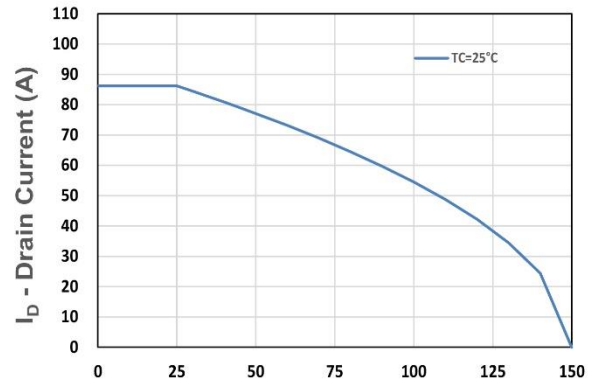


Figure 10. Drain Current

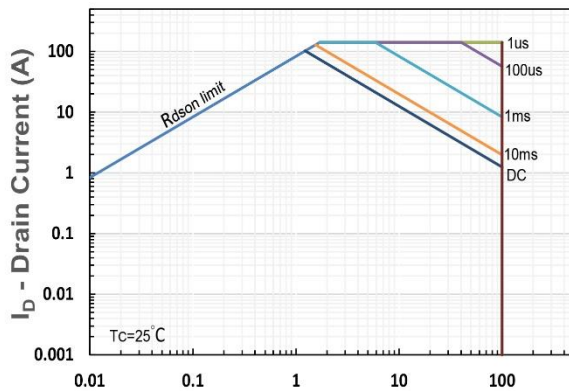


Figure 11. Safe Operating Area

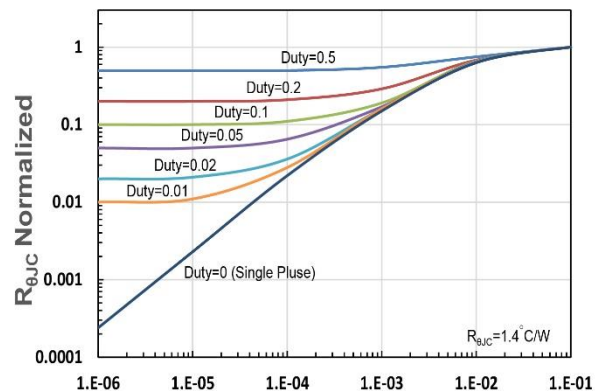


Figure 12. $R_{\theta JC}$ Transient Thermal Impedance