



Power MOSFETS

DATASHEET

LM30019NAK8A

N-Channel
Enhancement Mode MOSFET

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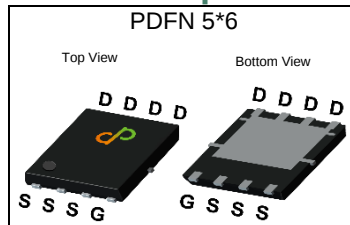


Quality Management Systems

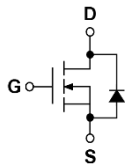
ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Ordering Information

Symbol	N-Channel	Unit
V_{DSS}	30	V
$R_{DS(ON)-Max}$	1.9	m Ω
I_D	142	A

Feature

- Low $R_{DS(on)}$ for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM30019NAK8A	PDFN5*6	Tape & Reel	5000 / Tape & Reel	30019 □□□□□□

Note : □□□□□□ = Lot Code

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

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		30	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	$T_c=25^\circ\text{C}$	141	A
		$T_c=100^\circ\text{C}$	111	
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	87	W
		$T_c=100^\circ\text{C}$	35	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	58	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH	168	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	1.44	°C/W
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	65	°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.

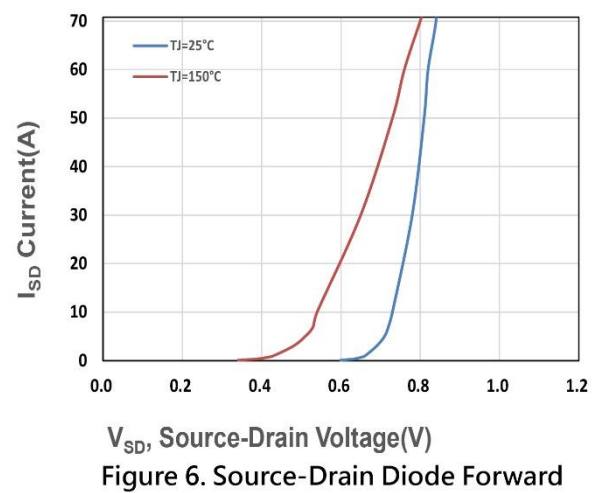
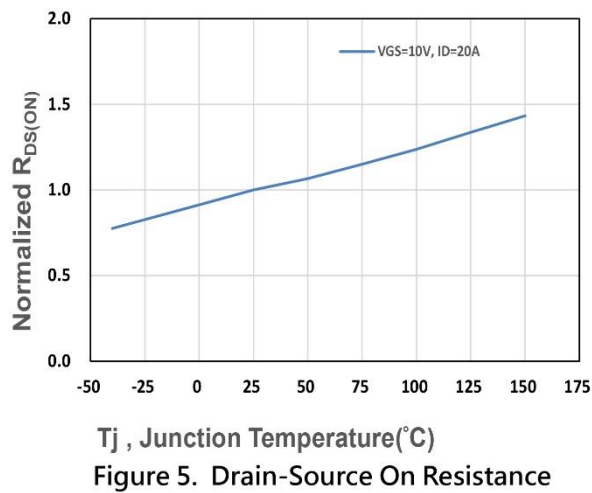
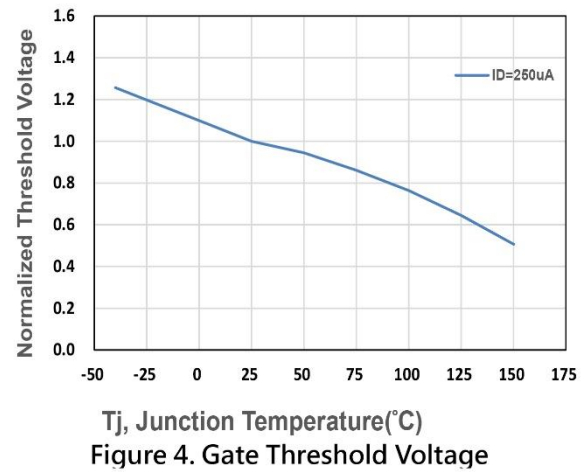
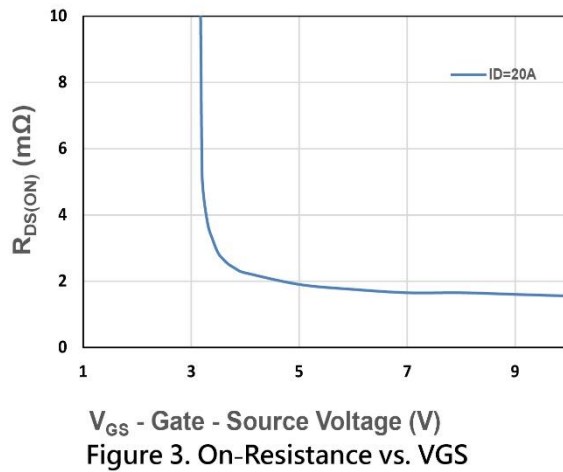
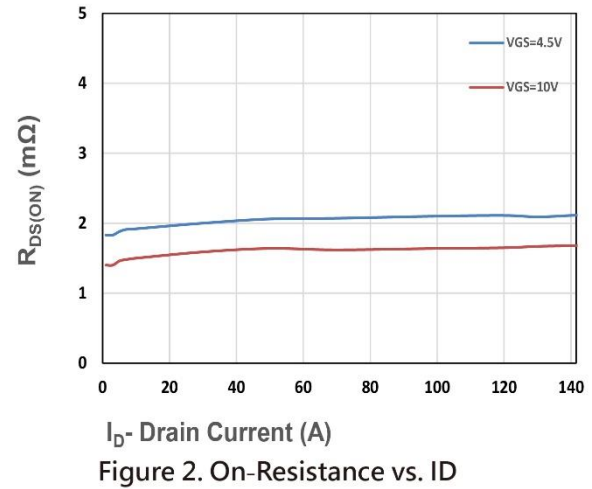
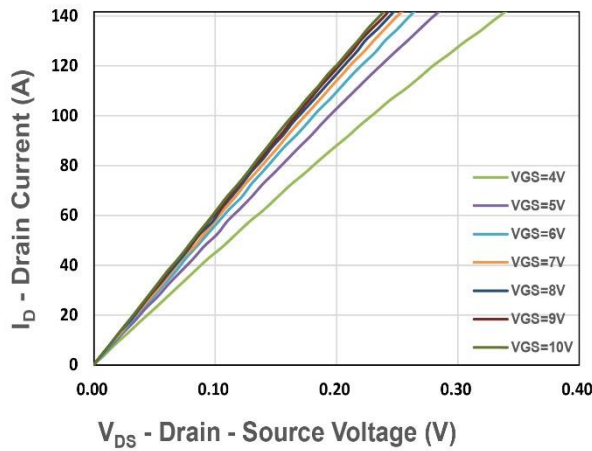
N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

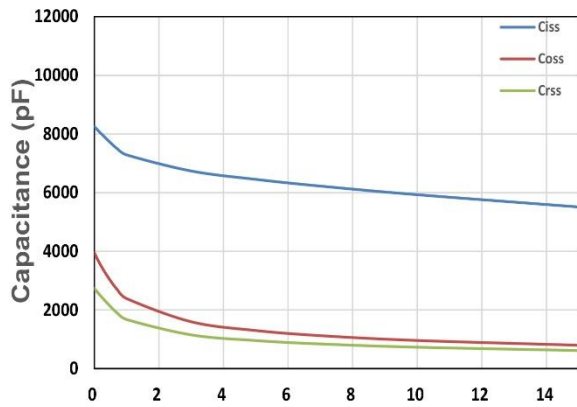
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V	-	-	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1	1.5	2	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	-	1.6	1.9	mΩ
		V _{GS} =4.5V, I _{DS} =20A	-	1.9	2.5	
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =20A	-	49	-	S
Dynamic Characteristics ⑤						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V, Freq.=1MHz	-	1.4	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Freq.=1MHz	-	5509	-	pF
C _{oss}	Output Capacitance		-	800	-	
C _{rss}	Reverse Transfer Capacitance		-	621	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V,V _{DS} =15V, Id=1A,RGEN=3Ω	-	30.7	-	nS
tr	Turn-on Rise Time		-	29.5	-	
td(OFF)	Turn-off Delay Time		-	176.8	-	
tf	Turn-off Fall Time		-	71.4	-	
Qg	Total Gate Charge	V _{GS} =4.5V,V _{DS} =15V Id=20A	-	67.5	-	nC
Qg	Total Gate Charge	V _{GS} =10V,V _{DS} =15V, Id=20A	-	140	-	
Qgs	Gate-Source Charge		-	28	-	
Qgd	Gate-Drain Charge		-	25.3	-	
Source-Drain Characteristics						
VSD④	Diode Forward Voltage	ISD=1A, VGS=0V	-	0.6	1.1	V
trr	Reverse Recovery Time	IF=1A, VR=15V	-	46.7	-	nS
Qrr	Reverse Recovery Charge	dIF/dt=100A/μs	-	53	-	nC

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

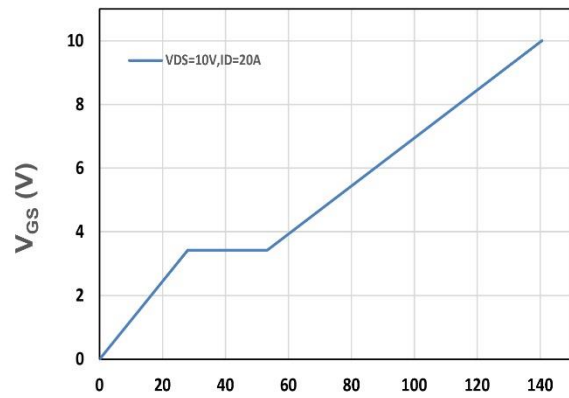
Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Typical Characteristics

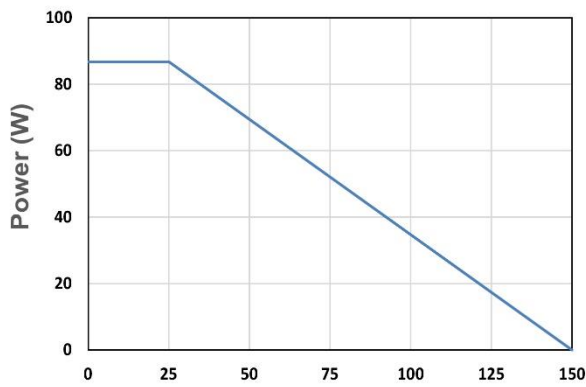




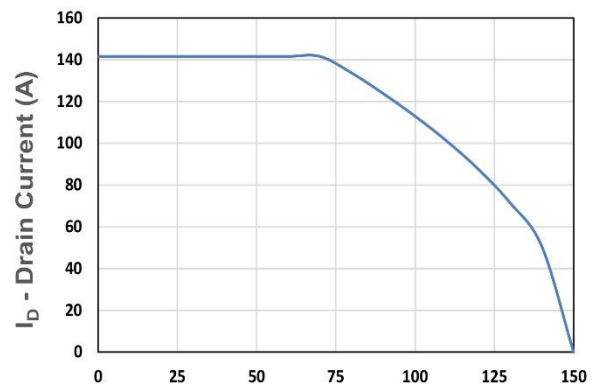
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



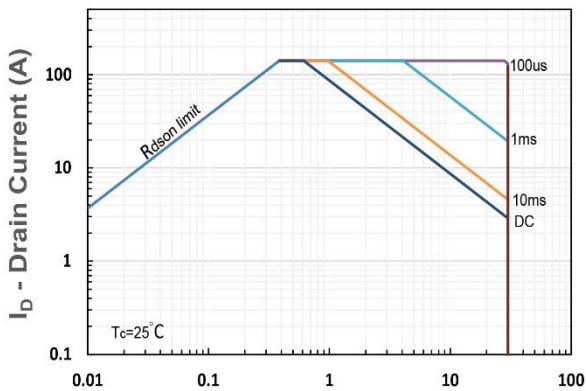
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



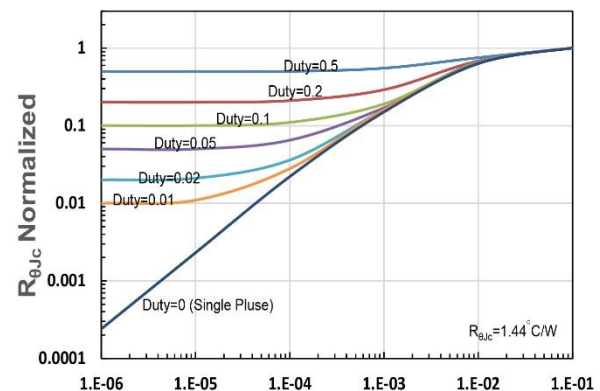
T_c - Case Temperature (°C)
Figure 9. Power Dissipation



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



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



t_1 , Square Wave Pulse Duration (s)
Figure 12. $R_{\theta JC}$ Transient Thermal Impedance