





Power MOSFETS


DATASHEET


LM30019NAK8A

N-Channel
Enhancement Mode MOSFET

 Leadpower-semiconductor Corp., Ltd

 sales@leadpower-semi.com

 (03) 6577339 FAX : (03) 6577229

 www.leadpower-semi.com

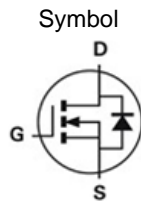
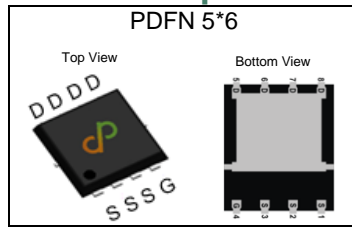


Quality Management Systems

ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Ordering Information

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

Feature

- Low R_{dson} for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and R_g 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 □□□□□□

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	$T_c=25^\circ C$	142	A
I_D	Continuous Drain Current	$T_c=25^\circ C$	141	A
		$T_c=100^\circ C$	111	
P_D	Maximum Power Dissipation	$T_c=25^\circ C$	87	W
		$T_c=100^\circ C$	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.

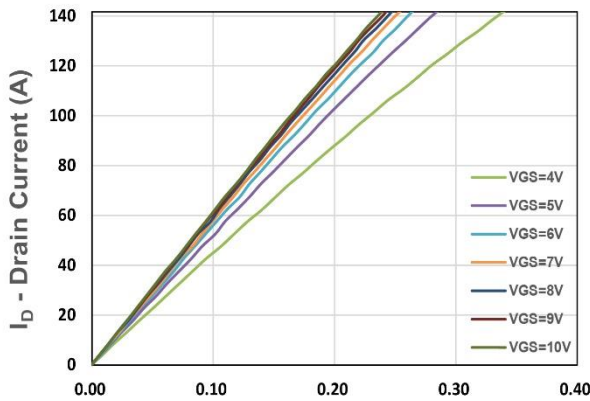
N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

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 ^⑥						
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	-	
t_{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =15V, I _D =1A, R _{GEN} =3Ω	-	30.7	-	nS
t_r	Turn-on Rise Time		-	29.5	-	
t_{d(off)}	Turn-off Delay Time		-	176.8	-	
t_f	Turn-off Fall Time		-	71.4	-	
Q_g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =15V, I _D =20A	-	67.5	-	nC
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =20A	-	140	-	
Q_{gs}	Gate-Source Charge		-	28	-	
Q_{gd}	Gate-Drain Charge		-	25.3	-	
Source-Drain Characteristics						
V_{SD} ^④	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	-	0.6	1.1	V
t_{rr}	Reverse Recovery Time	I _F =1A, V _R =15V	-	46.7	-	nS
Q_{rr}	Reverse Recovery Charge	diF/dt=100A/μs	-	53	-	nC

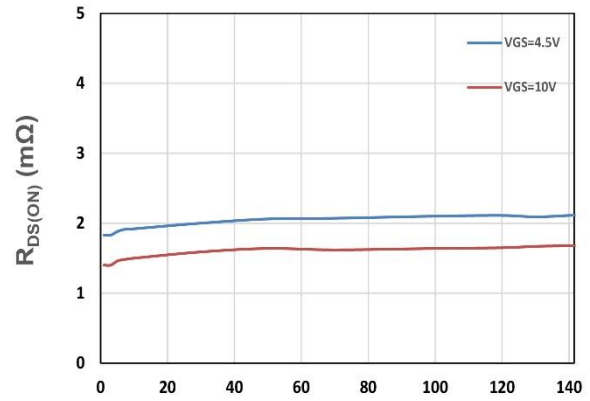
Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

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

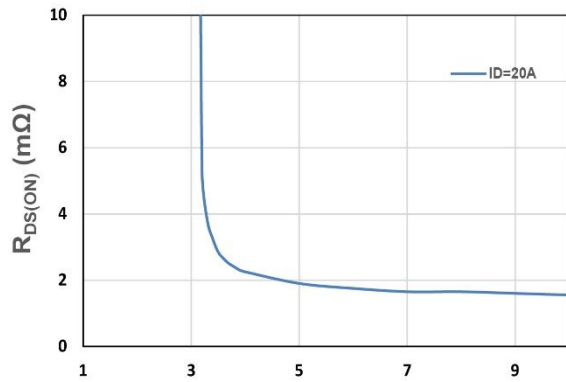
N-Channel Typical Characteristics



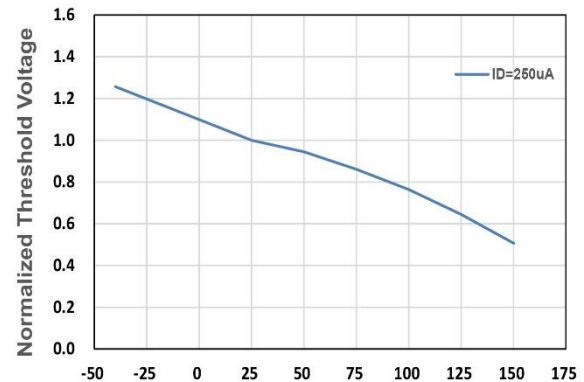
V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



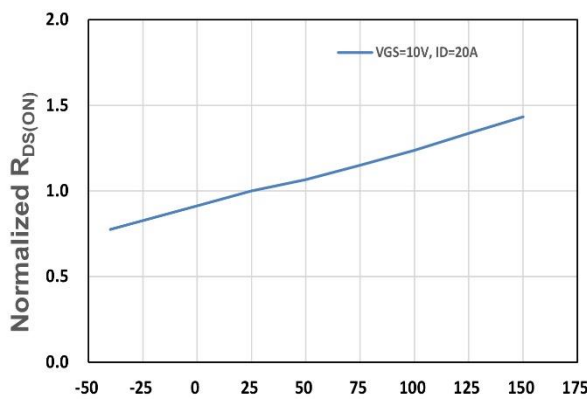
I_D - Drain Current (A)
Figure 2. On-Resistance vs. ID



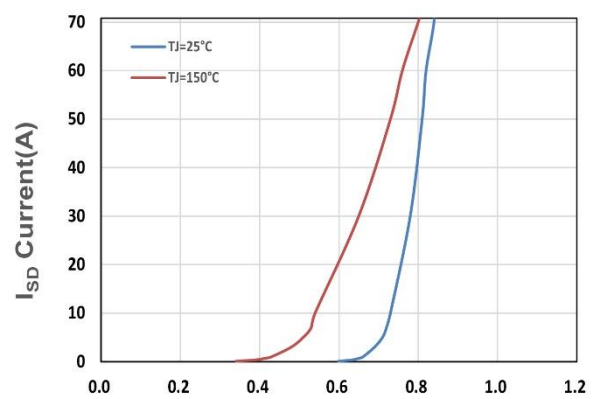
V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. VGS



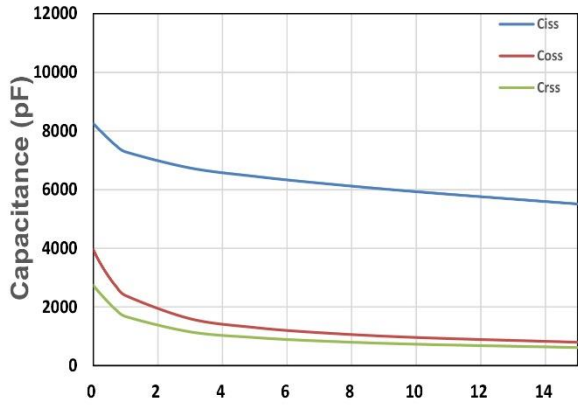
T_j , Junction Temperature($^{\circ}C$)
Figure 4. Gate Threshold Voltage



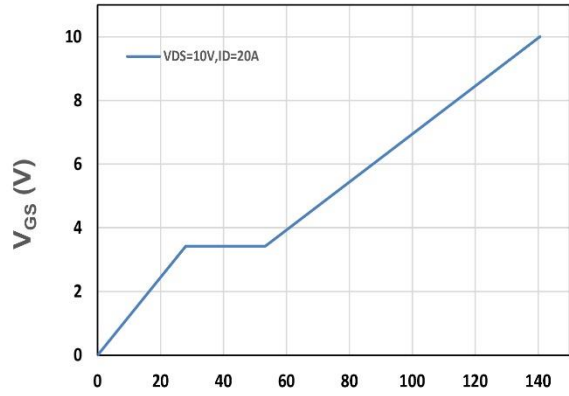
T_j , Junction Temperature($^{\circ}C$)
Figure 5. Drain-Source On Resistance



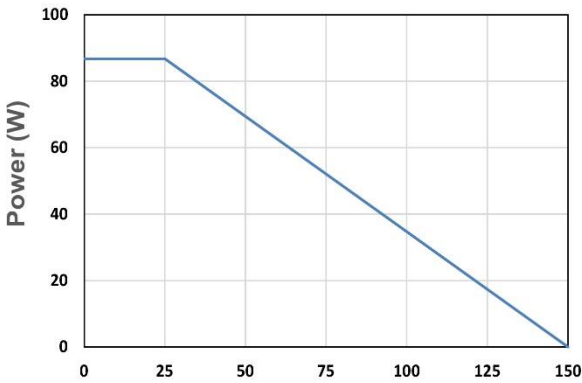
V_{SD} , Source-Drain Voltage(V)
Figure 6. Source-Drain Diode Forward



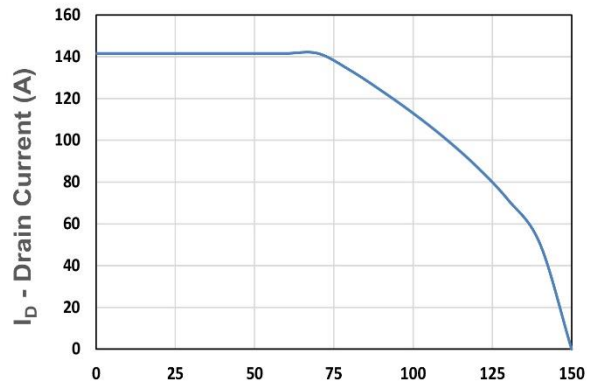
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



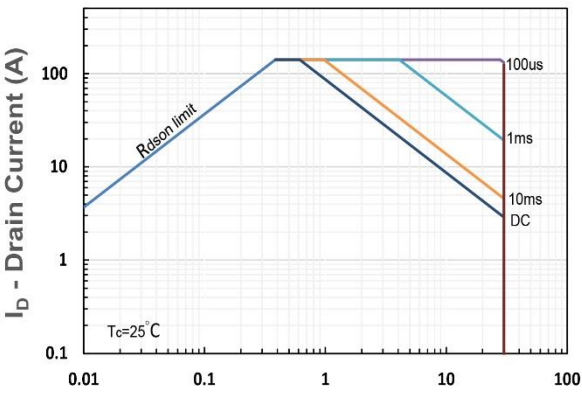
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



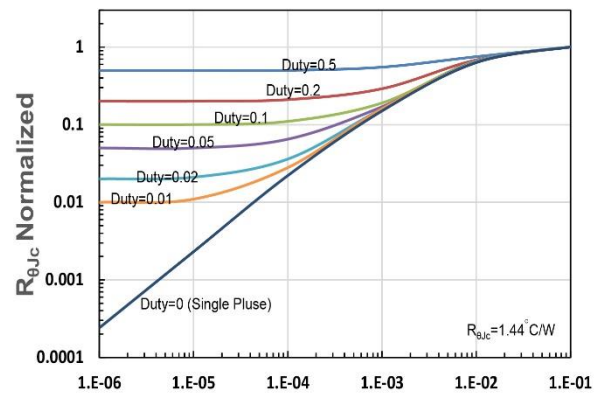
T_c - Case Temperature ($^{\circ}C$)
Figure 9. Power Dissipation



T_c - Case Temperature ($^{\circ}C$)
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