



Power MOSFETS

DATASHEET

LM30019NAP3A

N-Channel
Enhancement Mode MOSFET

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Quality Management Systems

ISO 9001:2015 Certificate

LM30019NAP3A



N-Channel Enhancement Mode MOSFET

Pin Description

TO-220-3L(TOP view)	Symbol	Symbol	N-Channel	Unit
		V_{DSS}	30	V
		$R_{DS(ON)-Max}$	2.4	m Ω
		I_D	218	A

Ordering Information

Feature

- Low Rdson 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
LM30019NAP3A	TO-220-3L	Tube	50 / Tube	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°C	400	A
I_D	Continuous Drain Current	T _C =25°C	218 ^①	A
		T _C =100°C	144	
P_D	Maximum Power Dissipation	T _C =25°C	125	W
		T _C =100°C	50	
I_D	Continuous Drain Current	T _A =25°C	29	A
		T _A =70°C	23	
P_D	Maximum Power Dissipation	T _A =25°C	2.0	W
		T _A =70°C	1.3	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	58	A
		L=0.5mH	32	
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH	168	mJ
		L=0.5mH	256	

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	1	°C/W
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	62.5	°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.

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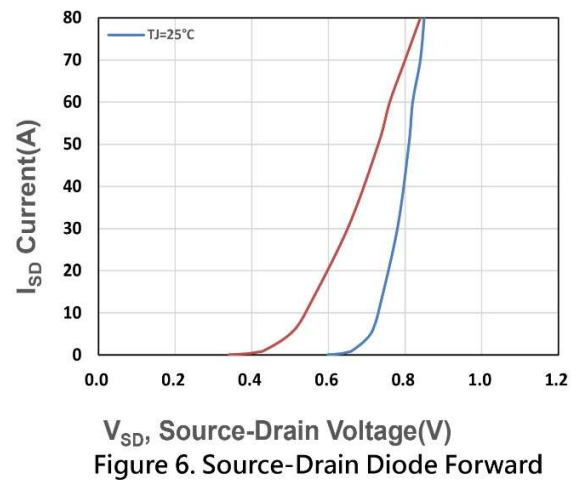
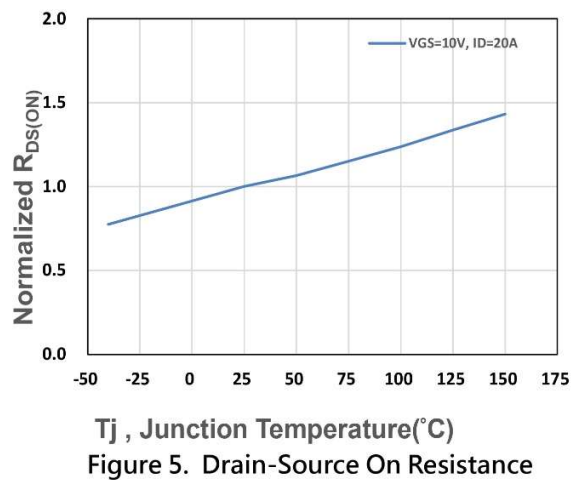
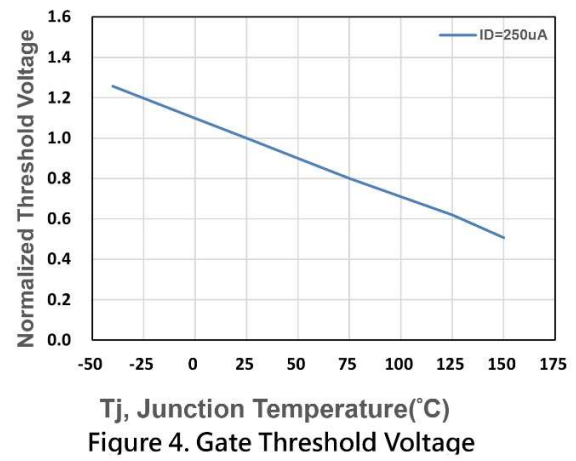
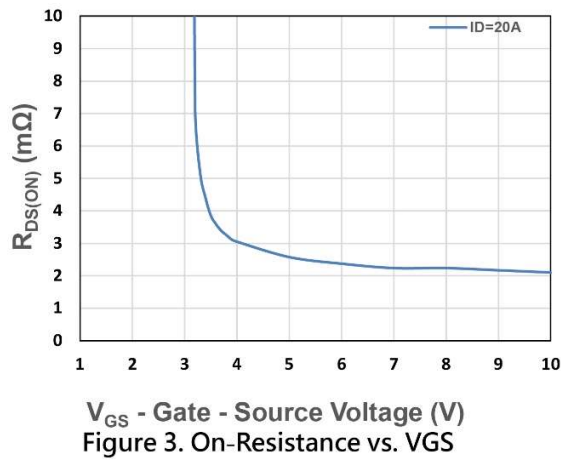
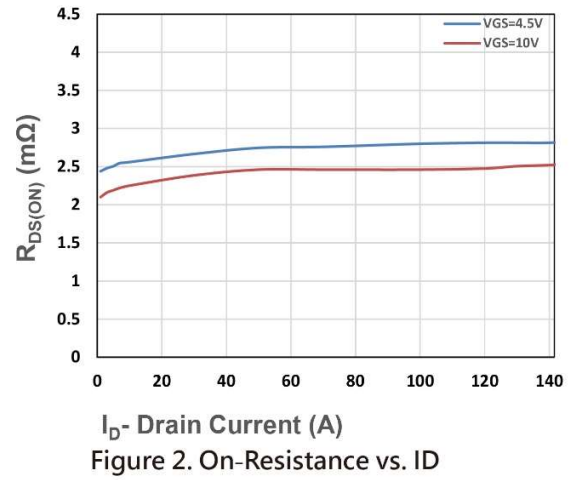
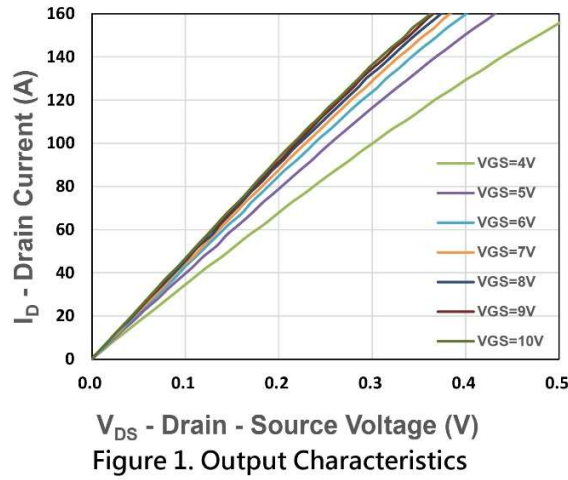
N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

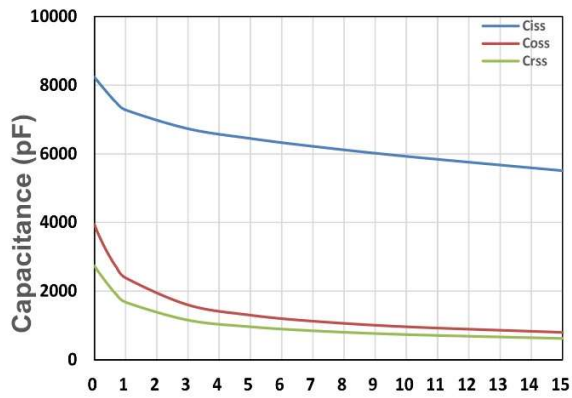
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V	-	-	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , 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	-	2.1	2.4	mΩ
		V _{GS} =4.5V, I _{DS} =20A	-	2.4	3.2	
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	-	5510	-	pF
C _{oss}	Output Capacitance		-	800	-	
C _{rss}	Reverse Transfer Capacitance		-	621	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V, V _{DS} =15V, I _D =1A, R _{GEN} =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 I _D =20A	-	67.5	-	nC
Qg	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =20A	-	140	-	
Qgs	Gate-Source Charge		-	28	-	
Qgd	Gate-Drain Charge		-	25.3	-	
Source-Drain Characteristics						
VSD ^④	Diode Forward Voltage	ISD=1A, VGS=0V	-	0.7	1.1	V
trr	Reverse Recovery Time	IF=1A, VR=15V	-	46	-	nS
Qrr	Reverse Recovery Charge	dIF/dt=100A/μs	-	53	-	nC

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

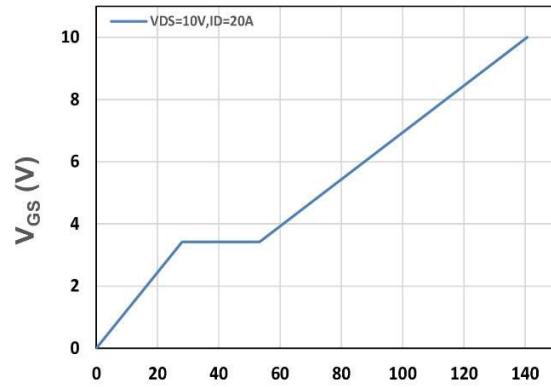
Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Typical Characteristics

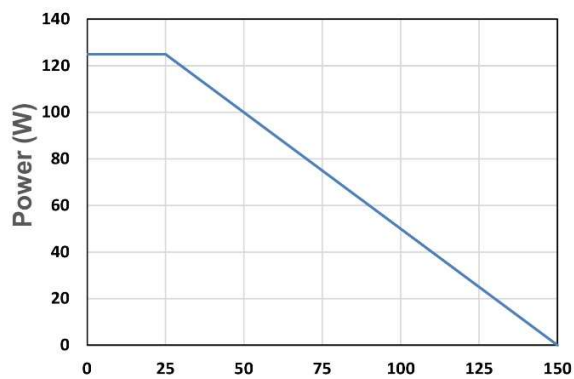




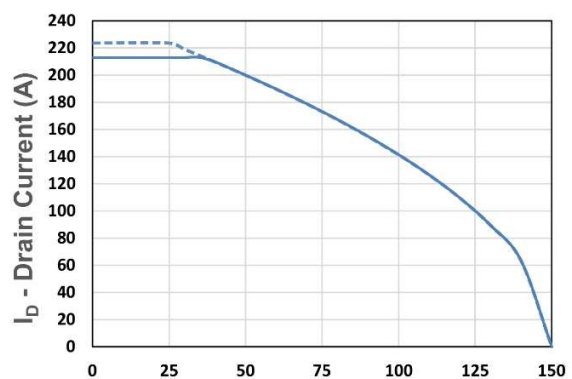
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



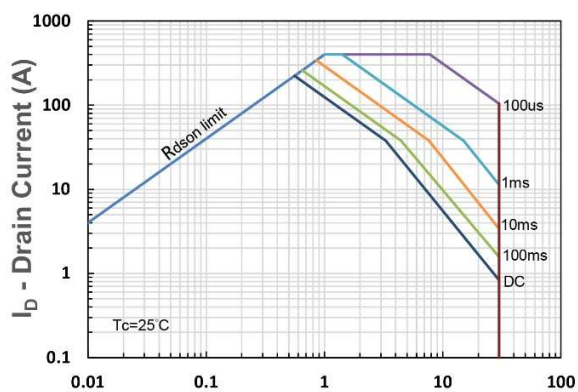
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



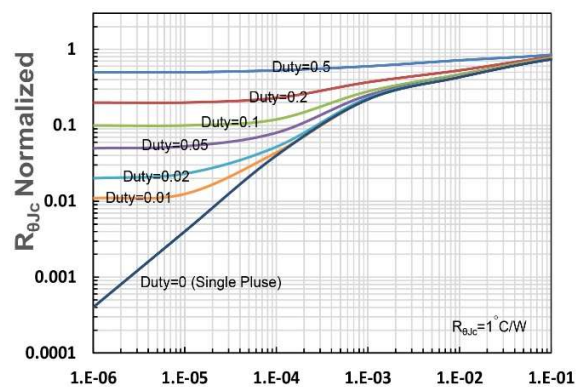
T_c - Case Temperature (°C)
Figure 9. Power Dissipation



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