



Power MOSFETS

DATASHEET

LM1A079NHN3A

N-Channel
Enhancement Mode MOSFET

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Quality Management Systems

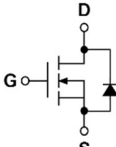
ISO 9001:2015 Certificate

LM1A079NHN3A



N-Channel Enhancement Mode MOSFET

Pin Description

TO-251-3L	Symbol	Symbol	N-Channel	Unit
		V_{DS}	100	V
		$R_{DS(ON)-Max}$	9.6	mΩ
		ID	83	A

Feature

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

Applications

- Power Management in DC/DC Converters
- USB Power Delivery (USB PD)

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM1A079NHN3A	TO-251-3L	Tube	75 / Tube	1A079 □□□□□□

Note : □□□□□□ = Lot Code

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

Symbol	Parameter	N-Channel	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
T_J	Maximum Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
I_S	Diode Continuous Forward Current	T _C =25°C 60	A
$I_{DM}^{①}$	Pulse Drain Current Tested	T _C =25°C 207	A
I_D	Continuous Drain Current	T _C =25°C 83 T _C =100°C 52	A
P_D	Maximum Power Dissipation	T _C =25°C 66 T _C =100°C 26	W
I_D	Continuous Drain Current	T _A =25°C 14.5 T _A =70°C 11.6	A
P_D	Maximum Power Dissipation	T _A =25°C 2.0 T _A =70°C 1.3	W
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH 30 L=0.5mH 18	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH 45 L=0.5mH 81	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State 1.9	°C/W
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State 62	°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 1in² FR-4 board with 1oz

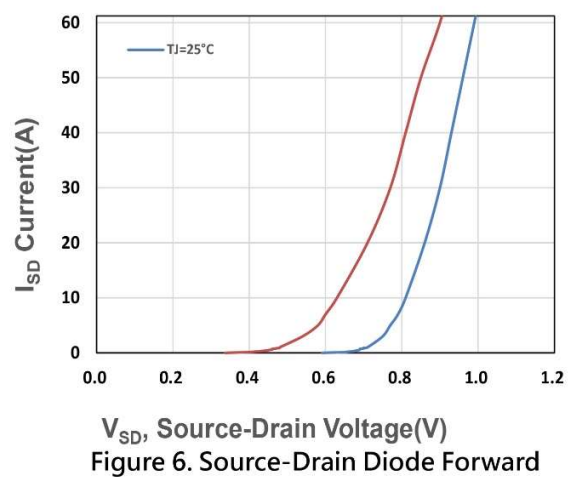
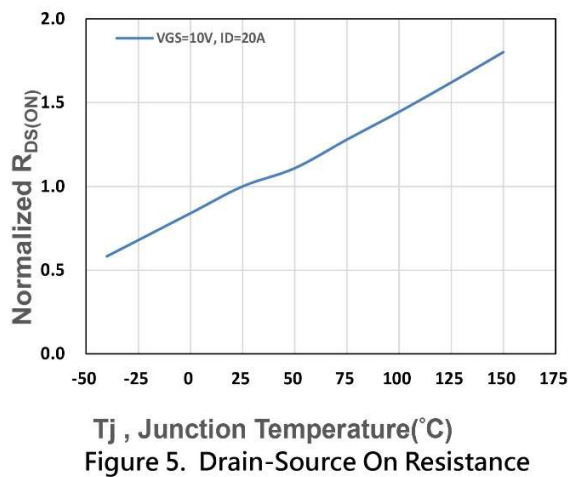
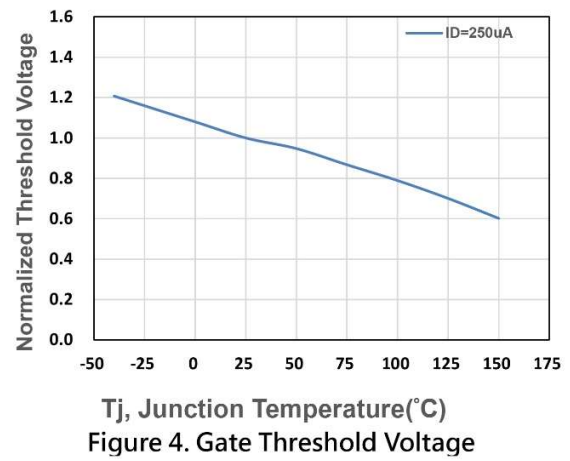
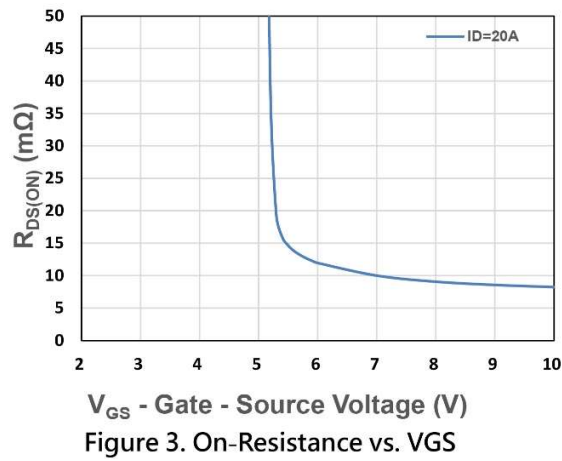
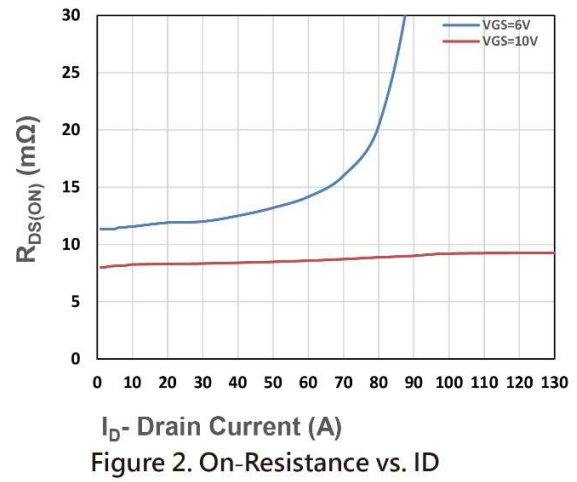
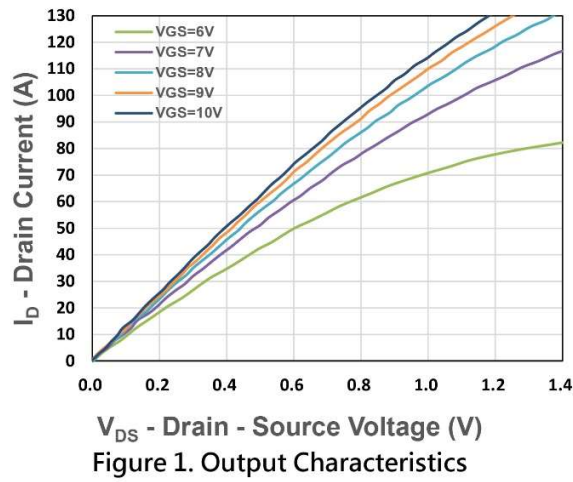
N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

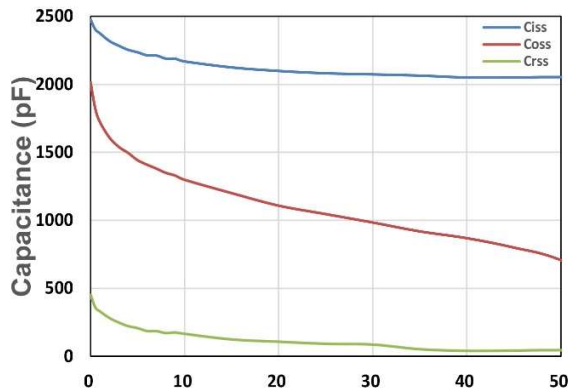
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =80V, V _{GS} =0V	-	-	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	2	3	4	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	-	8	9.6	mΩ
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =10A	-	15.6	-	S
Dynamic Characteristics ⑤						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V, Freq.=1MHz	-	0.6	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =50V, Freq.=1MHz	-	2053	-	pF
C _{oss}	Output Capacitance		-	708	-	
C _{rss}	Reverse Transfer Capacitance		-	45	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V,V _{DS} =50V, Id=1A,RGEN=1Ω	-	12.7	-	nS
tr	Turn-on Rise Time		-	7.3	-	
td(OFF)	Turn-off Delay Time		-	29.6	-	
tf	Turn-off Fall Time		-	84	-	
Qg	Total Gate Charge	V _{GS} =6V,V _{DS} =50V Id=20A	-	23.4	-	nC
Qg	Total Gate Charge	V _{GS} =10V,V _{DS} =50V, Id=20A	-	35.3	-	
Qgs	Gate-Source Charge		-	10.7	-	
Qgd	Gate-Drain Charge		-	9.6	-	
Source-Drain Characteristics						
VSD ④	Diode Forward Voltage	ISD=10A, VGS=0V	-	0.8	1.1	V
trr	Reverse Recovery Time	IF=10A, VR=50V	-	42.6	-	nS
Qrr	Reverse Recovery Charge	dIF/dt=100A/μs	-	40.2	-	nC

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

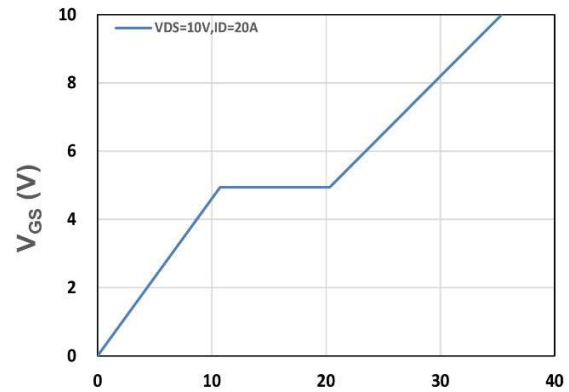
Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Typical Characteristics

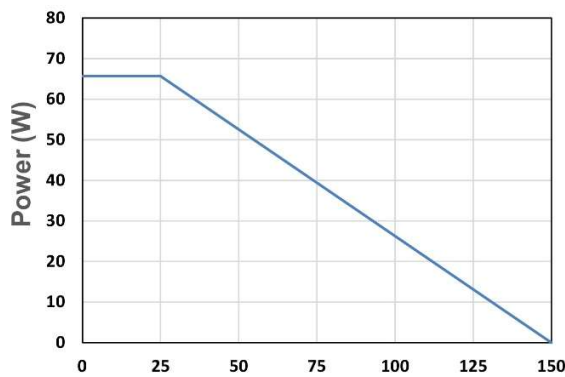




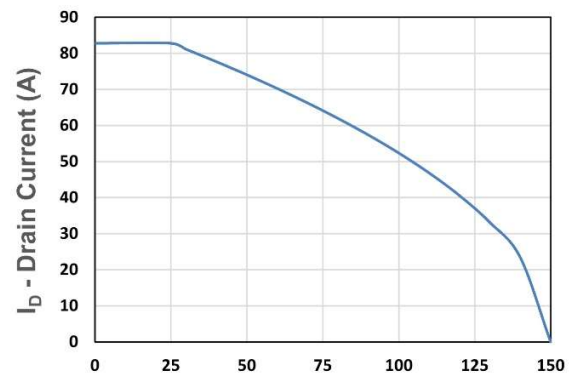
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



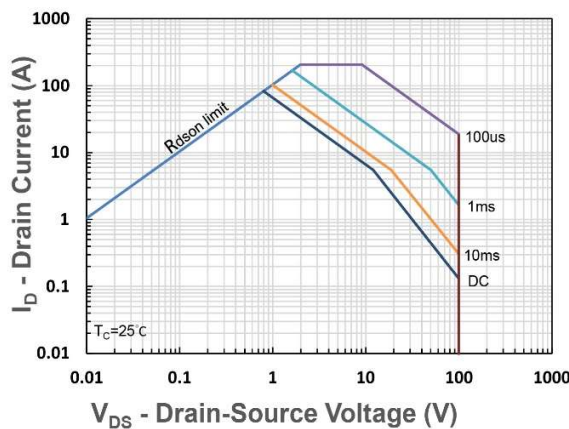
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



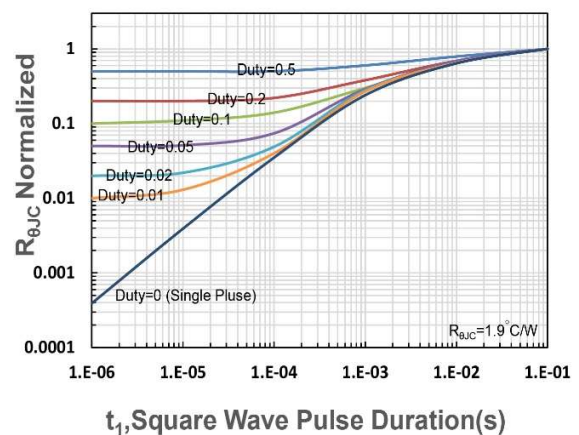
T_c - Case Temperature (°C)
Figure 9. Power Dissipation



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