



Power MOSFETS

DATASHEET

LM1AC03NAI3A

N-Channel
Enhancement Mode MOSFET

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Quality Management Systems

ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description

SOT-23 (TOP view)	Symbol	Symbol	N-Channel	Unit
		V_{DSS}	100	V
		$R_{DS(ON)-Max}$	310	m Ω
		ID	1.3	A

Product Summary

Feature

- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Applications

- Power Management in DC/DC Converters

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM1AC03NAI3A	SOT-23	Tape & Reel	3000 / Tape & Reel	09□□□

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	$T_A=25^{\circ}C$	3.2	A
I_D	Continuous Drain Current	$T_A=25^{\circ}C$	1.3	A
		$T_A=70^{\circ}C$	1	
P_D	Maximum Power Dissipation	$T_A=25^{\circ}C$	1.1	W
		$T_A=70^{\circ}C$	0.7	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	3.2	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH	0.5	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	110	°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.

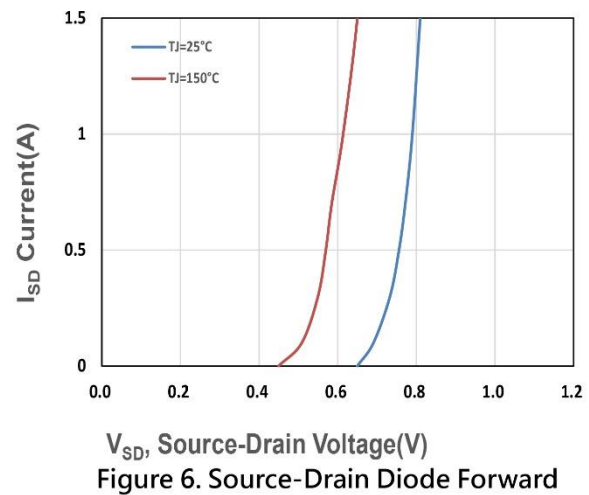
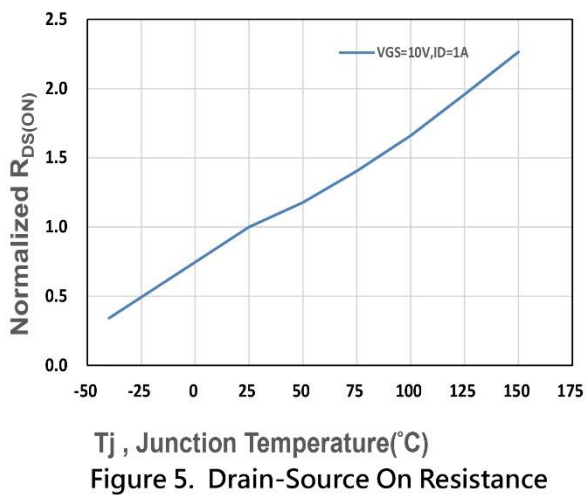
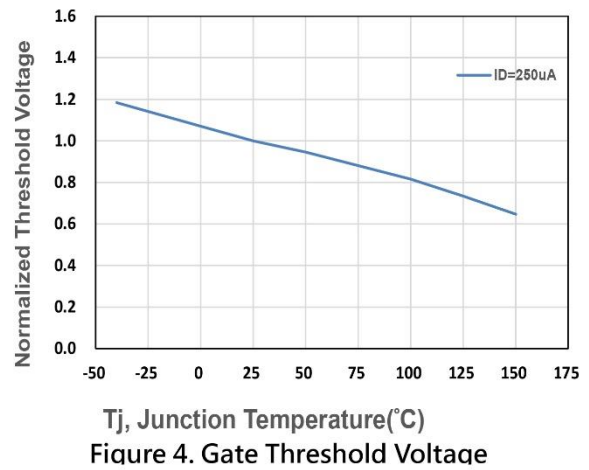
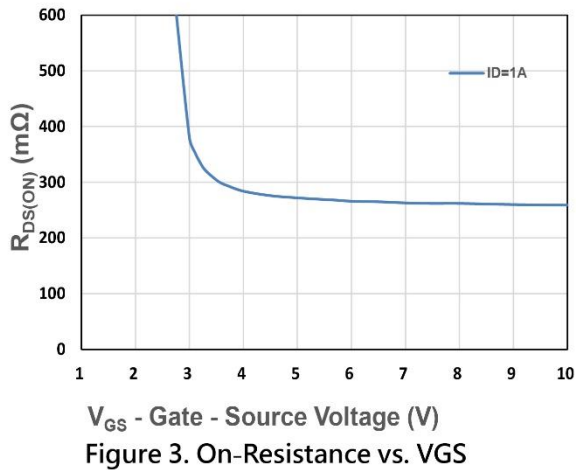
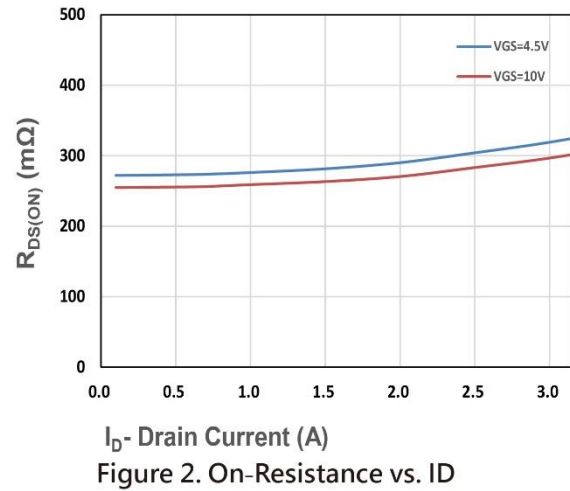
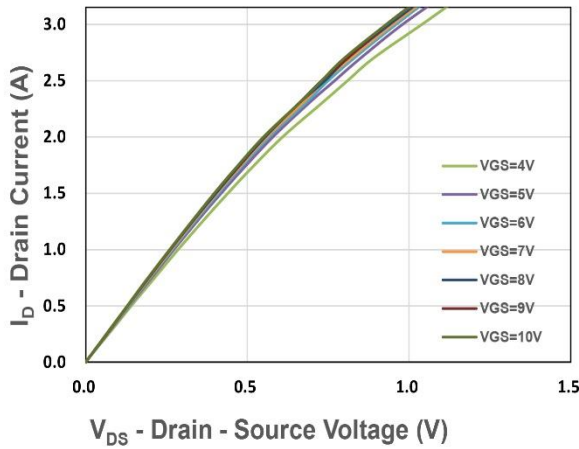
N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

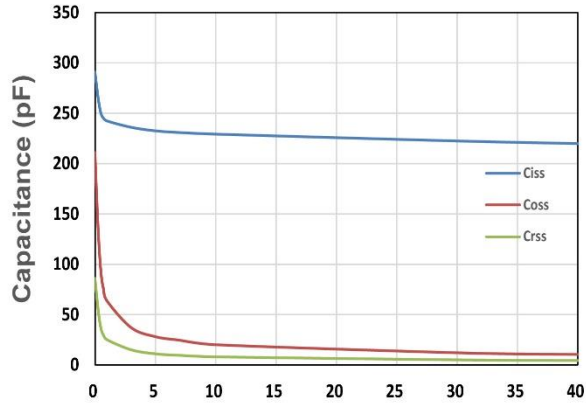
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =80V, V _{GS} =0V	-	-	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1.3	1.8	2.5	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} =1A	-	260	310	mΩ
		V _{GS} =4.5V, I _{DS} =0.5A	-	275	355	
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =1A	-	3.09	-	S
Dynamic Characteristics ⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	4.5	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =50V, Freq.=1MHz	-	220	-	pF
C _{oss}	Output Capacitance		-	10	-	
C _{rss}	Reverse Transfer Capacitance		-	4	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V, V _{DS} =50V, I _D =1A, R _{GEN} =6Ω	-	3	-	nS
t _r	Turn-on Rise Time		-	3.8	-	
t _{d(OFF)}	Turn-off Delay Time		-	9	-	
t _f	Turn-off Fall Time		-	28	-	
Q _g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =50V I _D =1A	-	2.3	-	nC
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =1A	-	4.5	-	
Q _{gs}	Gate-Source Charge		-	0.6	-	
Q _{gd}	Gate-Drain Charge		-	1	-	
Source-Drain Characteristics						
V _{SD} ④	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	-	0.8	1.1	V
t _{rr}	Reverse Recovery Time	I _F =1A, V _R =50V	-	17.6	-	nS
Q _{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	10.5	-	nC

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

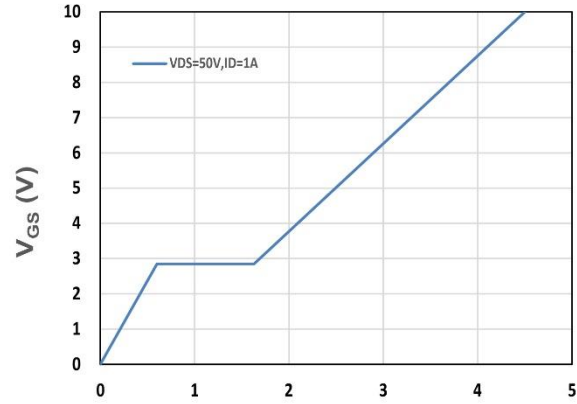
Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Typical Characteristics

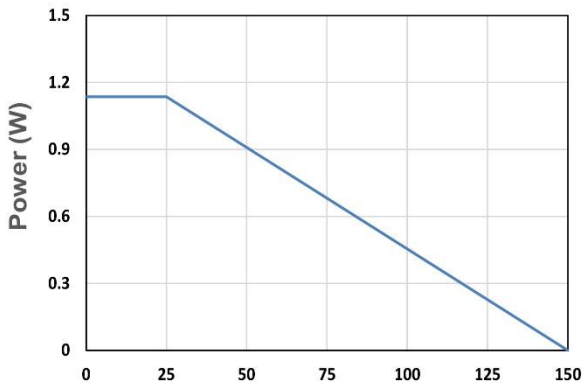




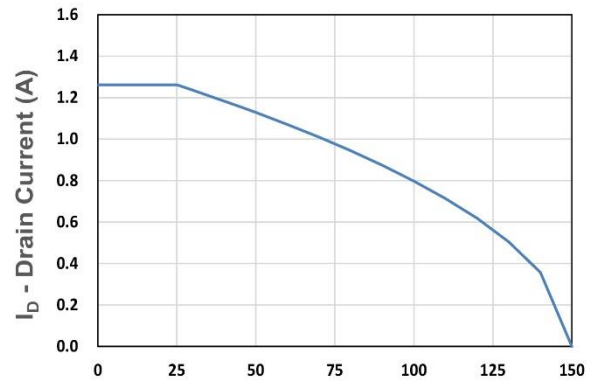
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



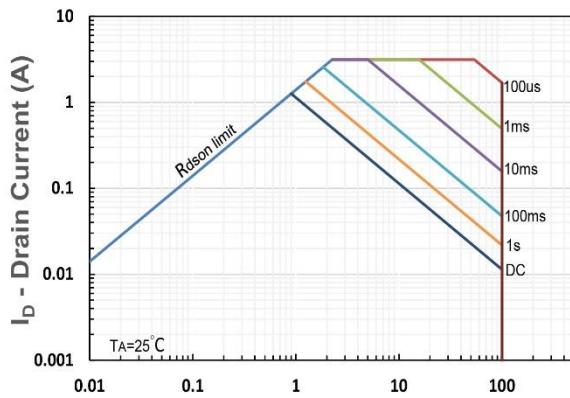
Qg , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



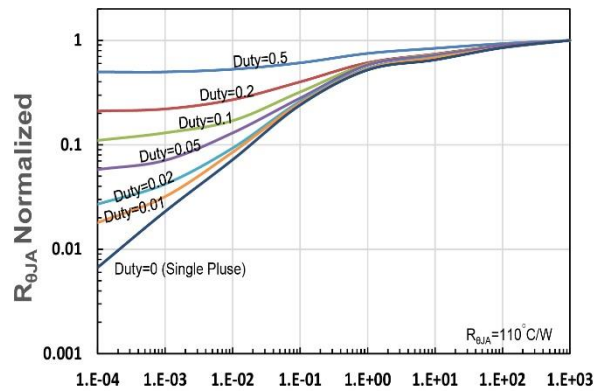
T_A - Ambient Temperature (°C)
Figure 9. Power Dissipation



T_A - Ambient 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. $R_{\theta JA}$ Transient Thermal Impedance