Power MOSFETS

DATASHEET

LM1A092NAI8A

N-Channel

Enhancement Mode MOSFET

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Quality Management Systems

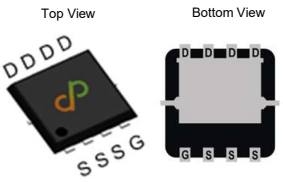
ISO 9001:2015 Certificate

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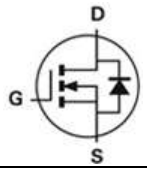
N-Channel Enhancement Mode MOSFET

Pin Description

PDFN3.3*3.3



Symbol



Product Summary

Symbol	N-Channel	Unit
V_{DSS}	100	V
$R_{DS(ON)-Max}$	9.2	mΩ
ID	49	A

Feature

- Advanced trench cell design
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

Applications

- Motor drivers
- DC-DC Converter

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM1A092NAI8A	PDFN3.3*3.3	Tape & Reel	5000 / Tape & Reel	1A092 □□□□□□

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_C=25°C	76	A
I_D	Continuous Drain Current	T_C=25°C	49	A
		T_C=100°C	31	
P_D	Maximum Power Dissipation	T_C=25°C	36	W
		T_C=100°C	14	
I_{AS}②	Avalanche Current, Single pulse	L=0.1mH	27	A
E_{AS}②	Avalanche Energy, Single pulse	L=0.1mH	36	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	3.5	°C/W
$R_{\theta JA}$③	Thermal Resistance-Junction to Ambient	Steady State	75	°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 1in^2 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	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	2	3	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	-	7.6	9.2	mΩ
		V_{GS}=4.5V, I_{DS}=20A	-	11	14	
gfs	Forward Transconductance	V_{DS}=5V, I_{DS}=10A	-	18.8	-	S
Dynamic Characteristics ⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V, Freq.=1MHz	-	1	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=50V, Freq.=1MHz	-	1915	-	pF
C_{oss}	Output Capacitance		-	505	-	
C_{rss}	Reverse Transfer Capacitance		-	35	-	
$td_{(ON)}$	Turn-on Delay Time	V_{GS}=10V,V_{DS}=50V, I_D=1A,R_{GEN}=6Ω	-	9.1	-	nS
t_r	Turn-on Rise Time		-	17.5	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	32.1	-	
t_f	Turn-off Fall Time		-	70	-	
Q_g	Total Gate Charge	V_{GS}=4.5V,V_{DS}=50V I_D=20A	-	22.1	-	nC
Q_g	Total Gate Charge	V_{GS}=10V,V_{DS}=50V, I_D=20A	-	40	-	
Q_{gs}	Gate-Source Charge		-	8.93	-	
Q_{gd}	Gate-Drain Charge		-	10.5	-	
Source-Drain Characteristics						
V_{SD}④	Diode Forward Voltage	I_{SD}=10A, V_{GS}=0V	-	0.8	1.1	V
t_{rr}	Reverse Recovery Time	I_F=10A, V_R=50V dI$_F$/dt=100A/μs	-	37.2	-	nS
Q_{rr}	Reverse Recovery Charge		-	35.1	-	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

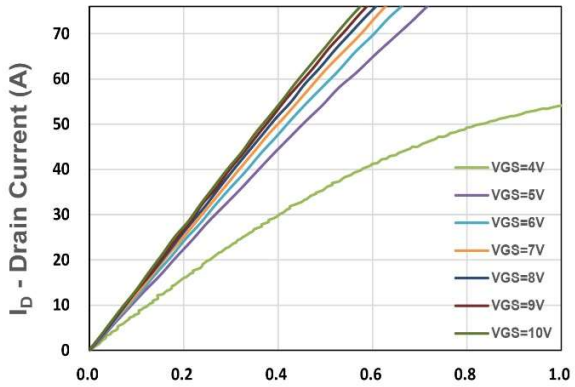


Figure 1. Output Characteristics

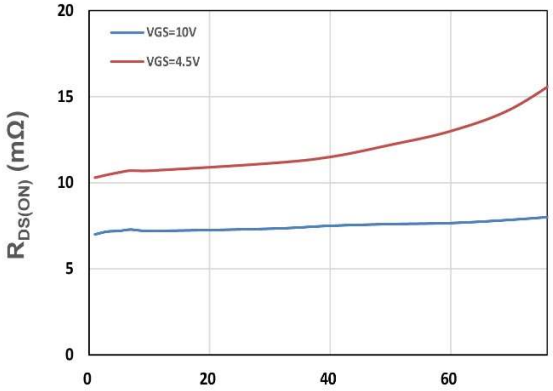


Figure 2. On-Resistance vs. ID

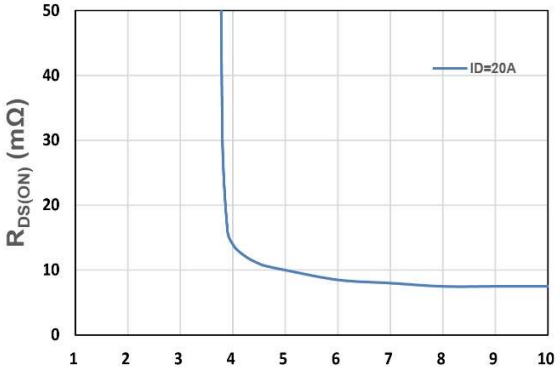


Figure 3. On-Resistance vs. VGS

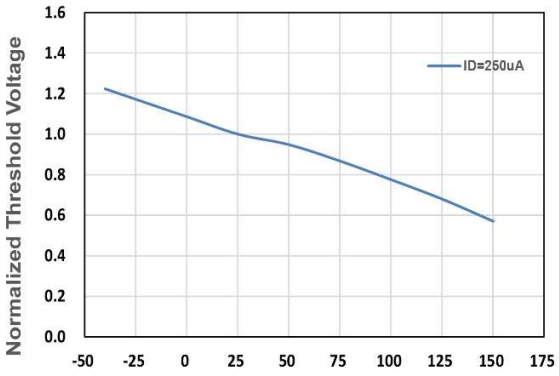


Figure 4. Gate Threshold Voltage

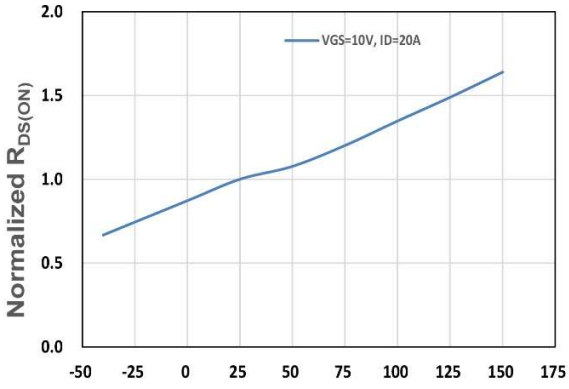


Figure 5. Drain-Source On Resistance

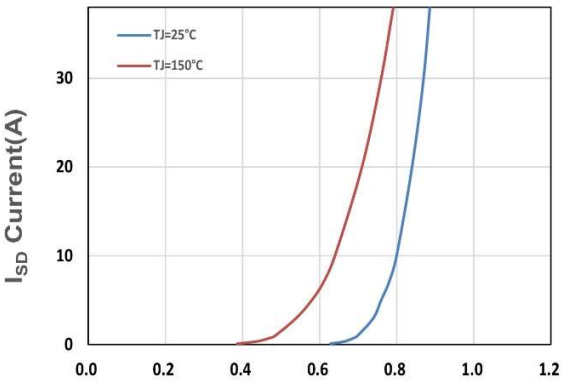


Figure 6. Source-Drain Diode Forward

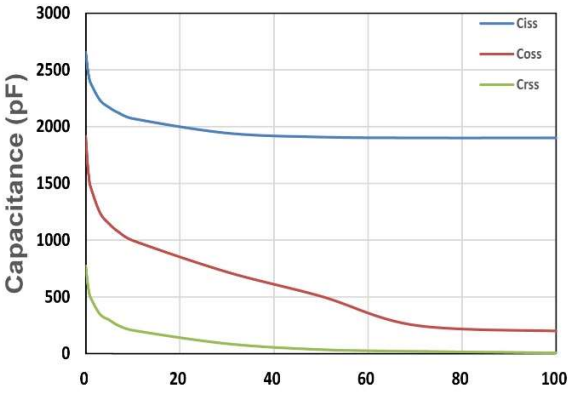


Figure 7. Capacitance

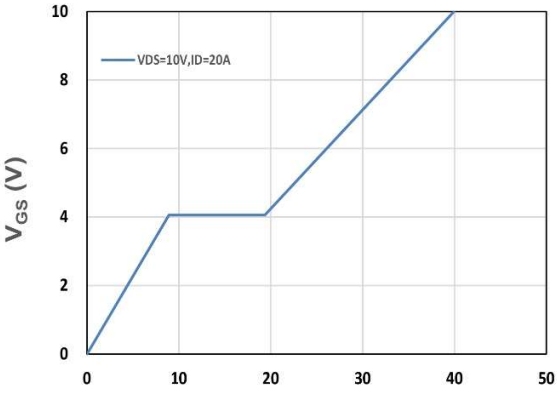


Figure 8. Gate Charge Characteristics

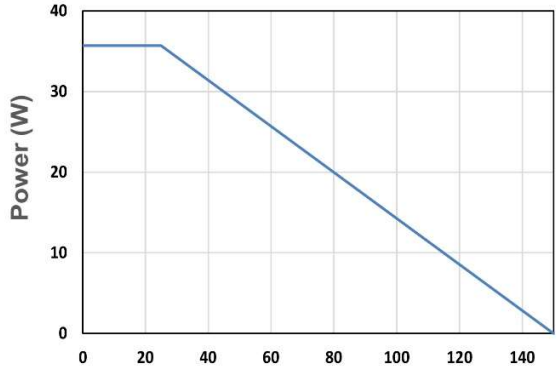


Figure 9. Power Dissipation

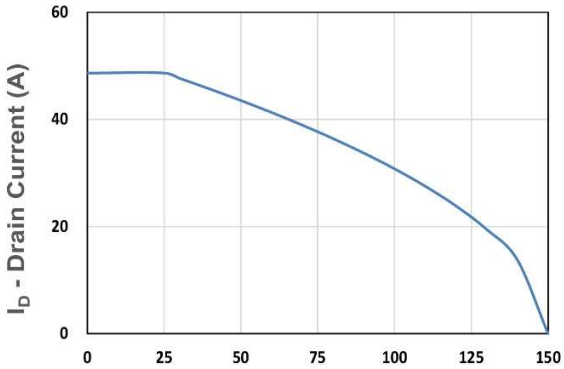


Figure 10. Drain Current

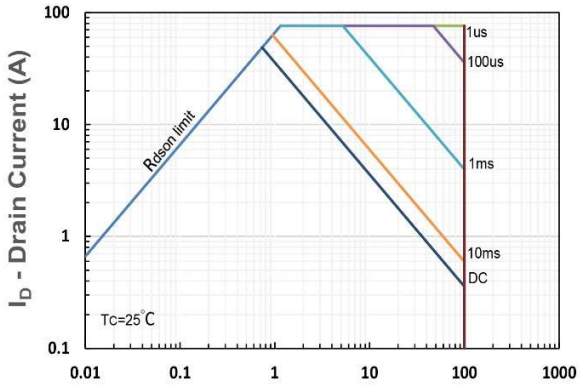


Figure 11. Safe Operating Area

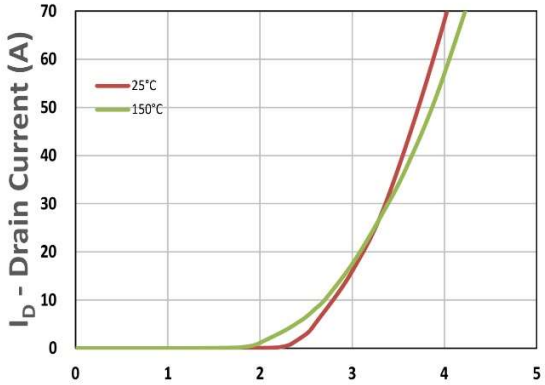


Figure 12. Transfer characteristics

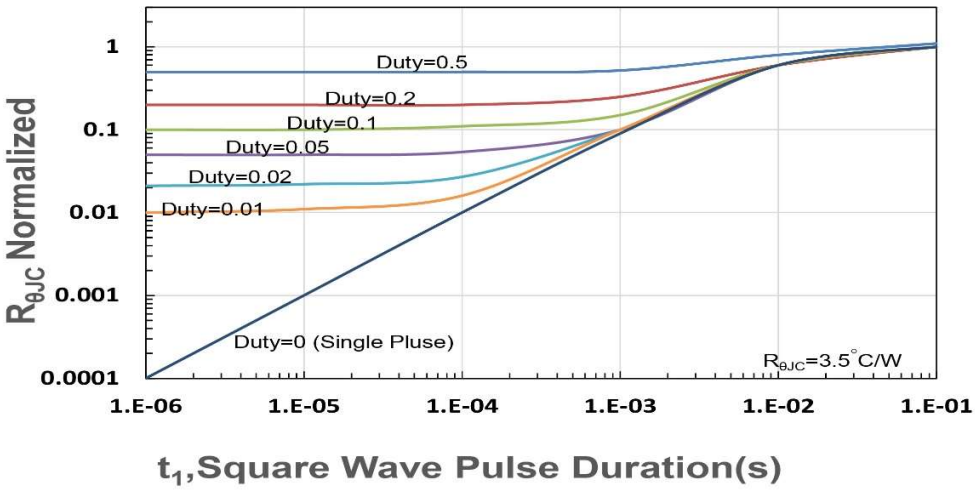


Figure 13. RθJC Transient Thermal Impedance