



Power MOSFETS

DATASHEET

LM1A092NAI8A

N-Channel
Enhancement Mode MOSFET

 Leadpower-semiconductor Corp., Ltd

 sales@leadpower-semi.com

 (03) 6577339 FAX : (03) 6577229

 www.leadpower-semi.com

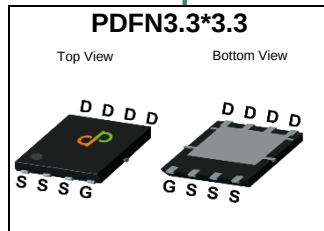


Quality Management Systems

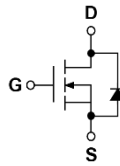
ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



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 □□□□□□

Note : □□□□□□ = Lot Code

Absolute Maximum Ratings ($T_J=25^{\circ}\text{C}$ 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	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range		-55 to 150	$^{\circ}\text{C}$
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_C=25^{\circ}\text{C}$	76	A
I_D	Continuous Drain Current	$T_C=25^{\circ}\text{C}$	49	A
		$T_C=100^{\circ}\text{C}$	31	
P_D	Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$	36	W
		$T_C=100^{\circ}\text{C}$	14	
$I_{AS}^{②}$	Avalanche Current, Single pulse	$L=0.1\text{mH}$	27	A
$E_{AS}^{③}$	Avalanche Energy, Single pulse	$L=0.1\text{mH}$	36	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	3.5	$^{\circ}\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	75	$^{\circ}\text{C/W}$

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.

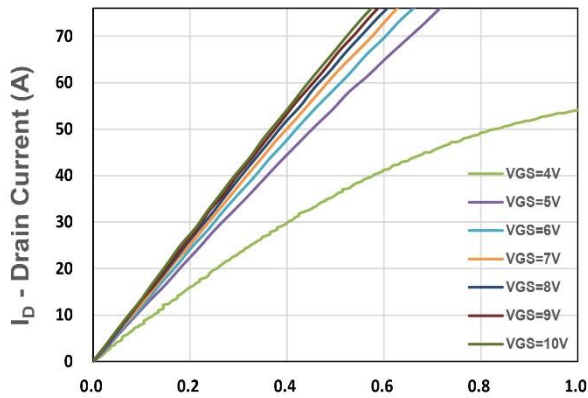
N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

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	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 ⑥						
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	-	37.2	-	nS
Q _{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	35.1	-	nC

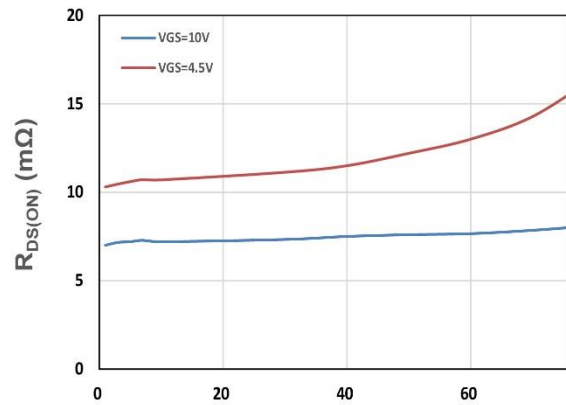
Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

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

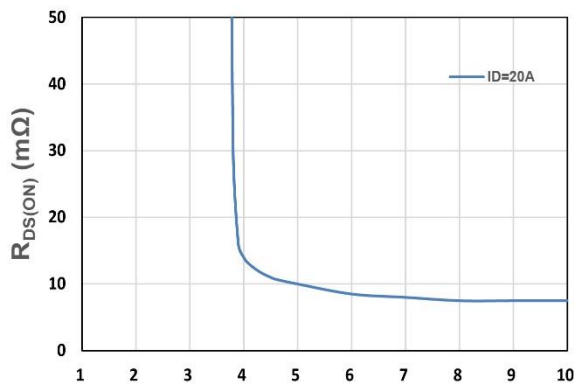
N-Channel Typical Characteristics



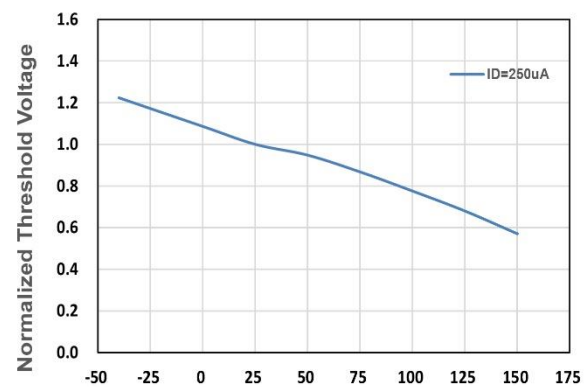
V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



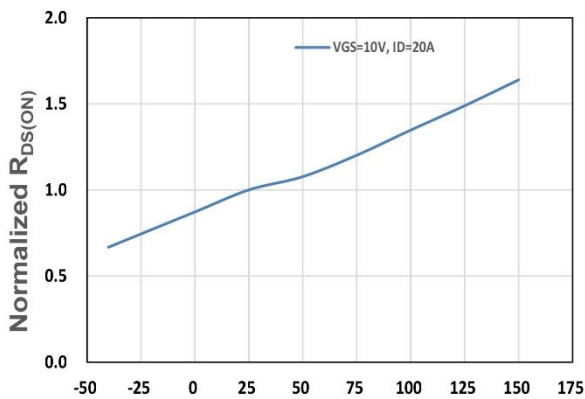
I_D - Drain Current (A)
Figure 2. On-Resistance vs. I_D



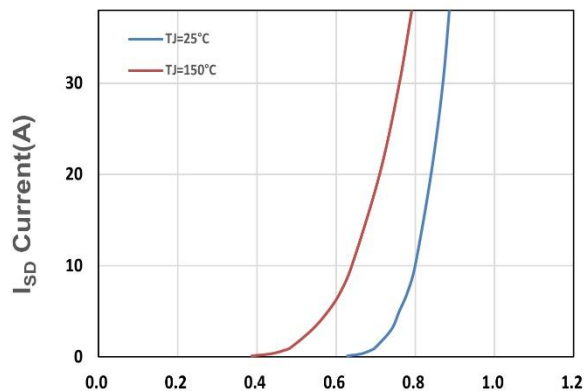
V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. V_{GS}



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

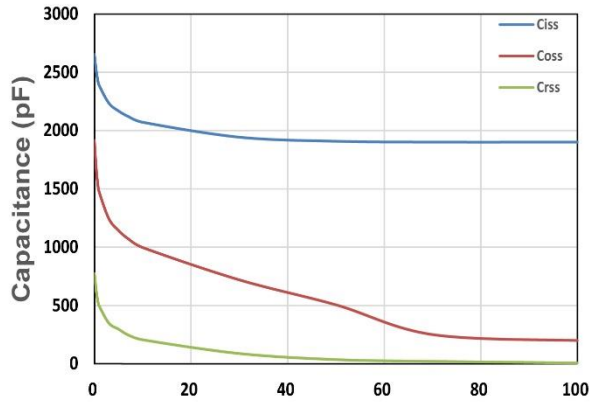


Figure 7. Capacitance

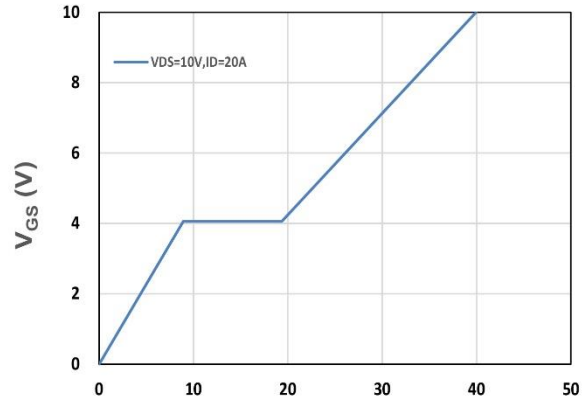


Figure 8. Gate Charge Characteristics

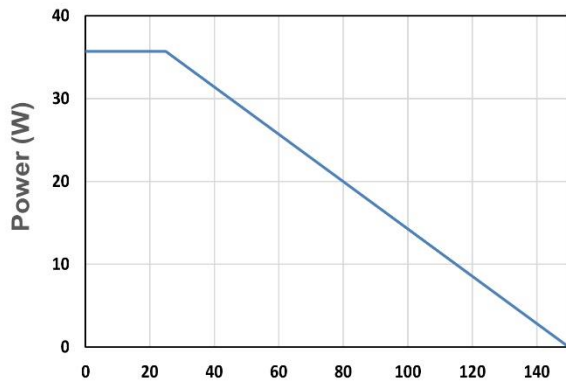


Figure 9. Power Dissipation

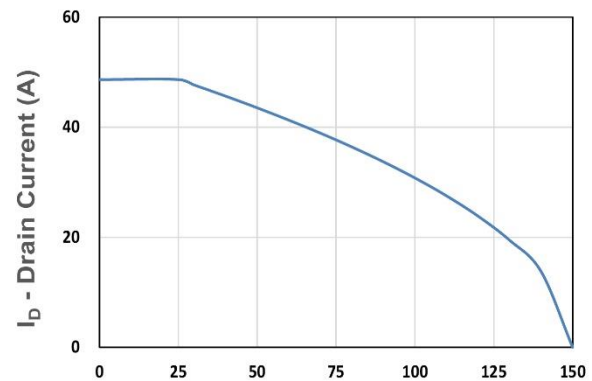


Figure 10. Drain Current

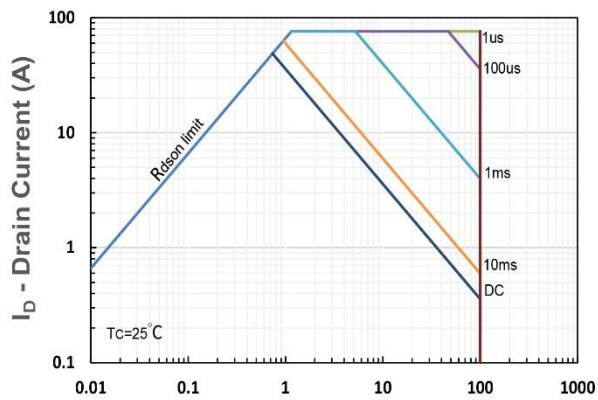


Figure 11. Safe Operating Area

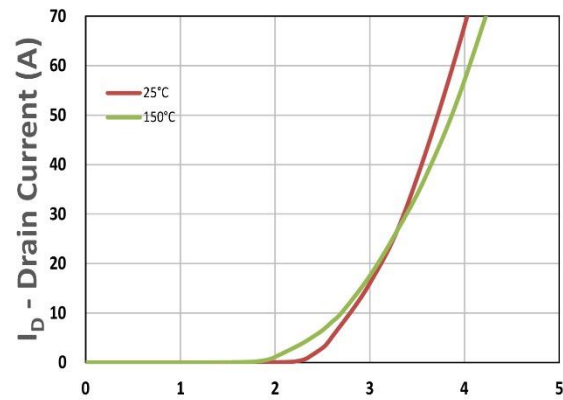
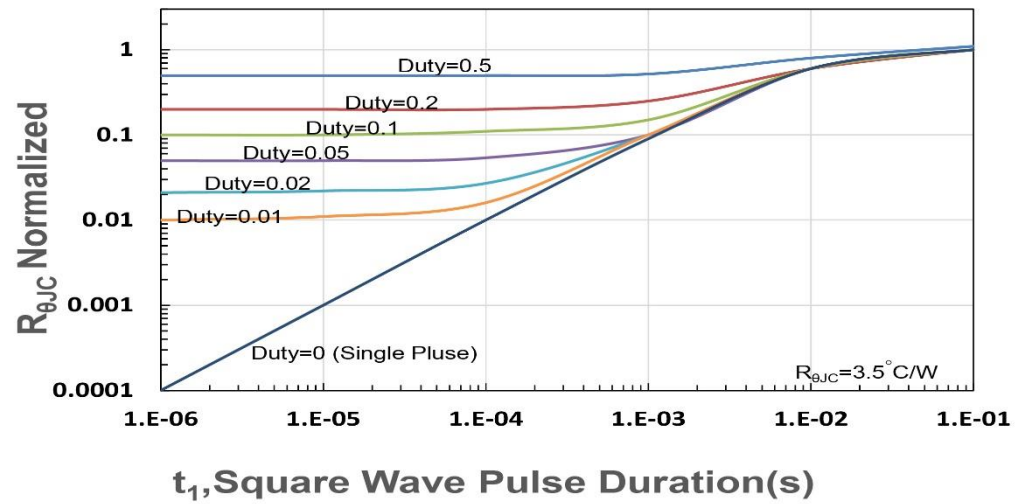


Figure 12. Transfer characteristics

Figure 13. $R_{\theta JC}$ Transient Thermal Impedance