





Power MOSFETS


DATASHEET


LM1A092NHI8A

N-Channel
Enhancement Mode MOSFET

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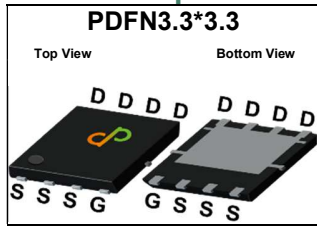


Quality Management Systems

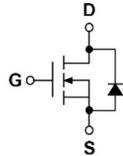
ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

Symbol	N-Channel	Unit
V_{DSS}	100	V
$R_{DS(ON)-Max}$	10	mΩ
I_D	43	A

Feature

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

Applications

- Motor drivers
- DC-DC Converter

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM1A092NHI8A	PDFN3.3*3.3	Tape & Reel	5000 / Tape & Reel	1A092 □□□□□□

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_S	Diode Continuous Forward Current	T _C =25°C	33	A
$I_{DM}^{①}$	Pulse Drain Current Tested	T _C =25°C	128	A
I_D	Continuous Drain Current	T _C =25°C	43	A
		T _C =100°C	27	
P_D	Maximum Power Dissipation	T _C =25°C	36	W
		T _C =100°C	14	
I_D	Continuous Drain Current	T _A =25°C	9	A
		T _A =100°C	7.5	
P_D	Maximum Power Dissipation	T _A =25°C	1.7	W
		T _A =100°C	1.1	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	20	A
		L=0.5mH	15	
$E_{AS}^{③}$	Avalanche Energy, Single pulse	L=0.1mH	20	mJ
		L=0.5mH	56	

Thermal Characteristics

Symbol	Parameter	Rating	Unit	
$R_{θJC}$	Thermal Resistance-Junction to Case	Steady State	3.5	°C/W
$R_{θJA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	75	°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°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	-	8.5	10	mΩ
		V _{GS} =6V, I _{DS} =20A	-	12	15.5	
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =10A	-	20	-	S
Dynamic Characteristics ^⑤						
R_G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	0.9	-	Ω
C_{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =50V, Freq.=1MHz	-	1560	-	pF
C_{oss}	Output Capacitance		-	525	-	
C_{rss}	Reverse Transfer Capacitance		-	55	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V, V _{DS} =30V, I _D =1A, R _{GEN} =6Ω	-	10.4	-	nS
t_r	Turn-on Rise Time		-	17.5	-	
t_{d(OFF)}	Turn-off Delay Time		-	26.5	-	
t_f	Turn-off Fall Time		-	68.9	-	
Q_g	Total Gate Charge	V _{GS} =6V, V _{DS} =50V, I _D =20A	-	20	-	nC
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =20A	-	30.1	-	
Q_{gs}	Gate-Source Charge		-	8.8	-	
Q_{gd}	Gate-Drain Charge		-	8.8	-	
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	-	51	-	nS
Q_{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	40	-	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

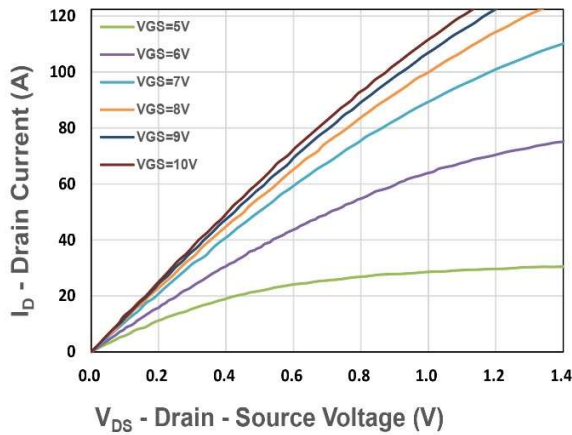


Figure 1. Output Characteristics

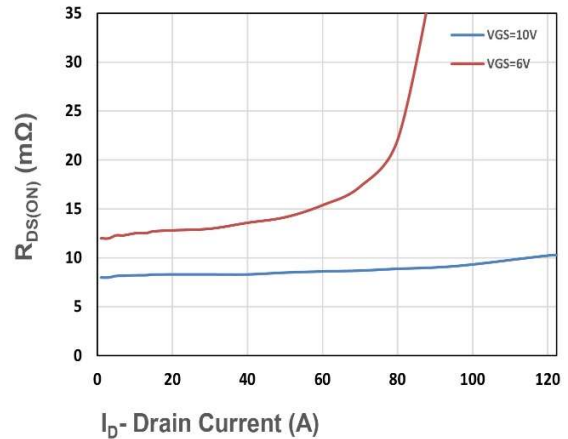


Figure 2. On-Resistance vs. ID

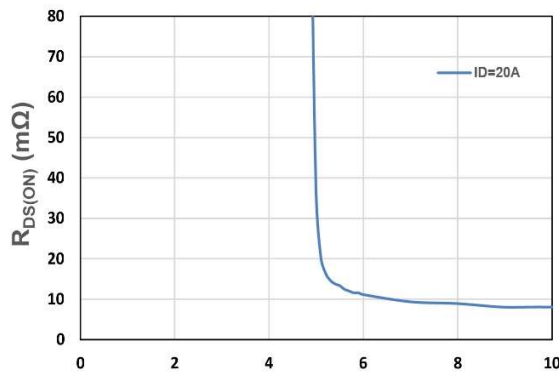


Figure 3. On-Resistance vs. VGS

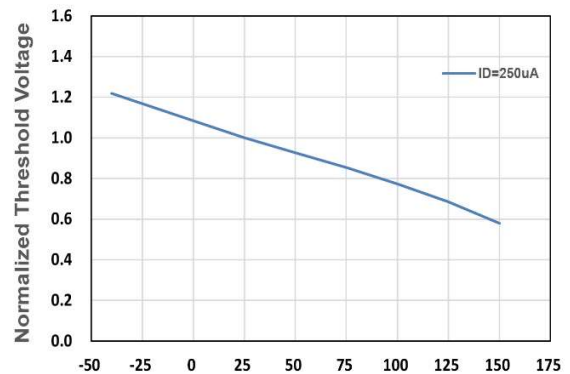


Figure 4. Gate Threshold Voltage

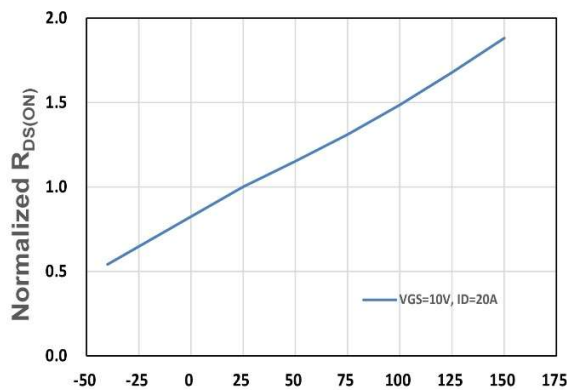


Figure 5. Drain-Source On Resistance

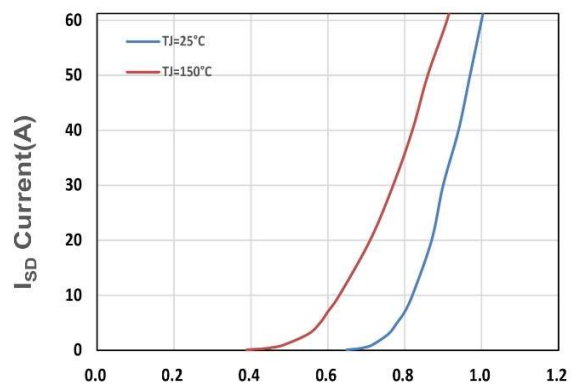
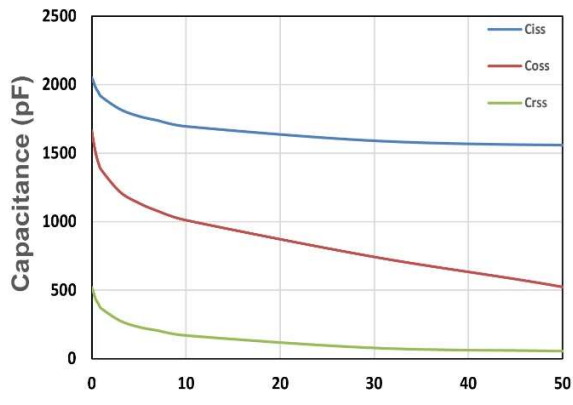


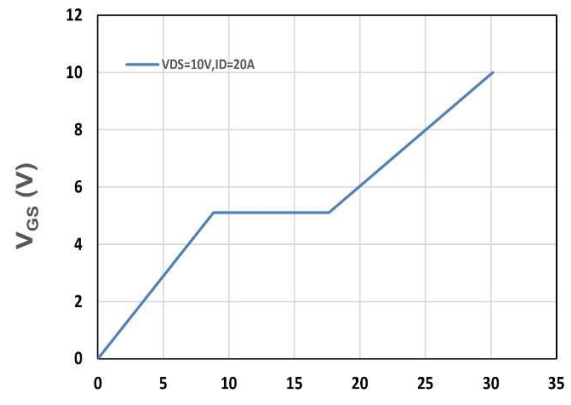
Figure 6. Source-Drain Diode Forward

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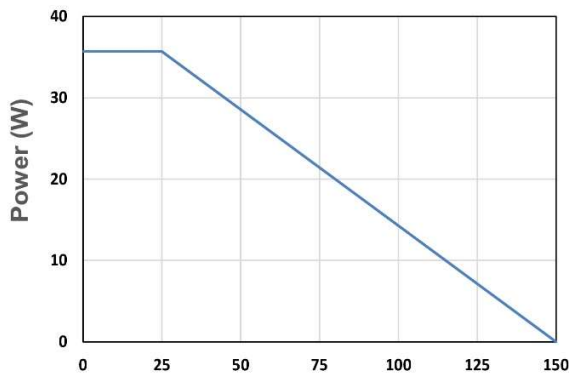
V_{DS} - Drain - Source Voltage (V)

Figure 7. Capacitance



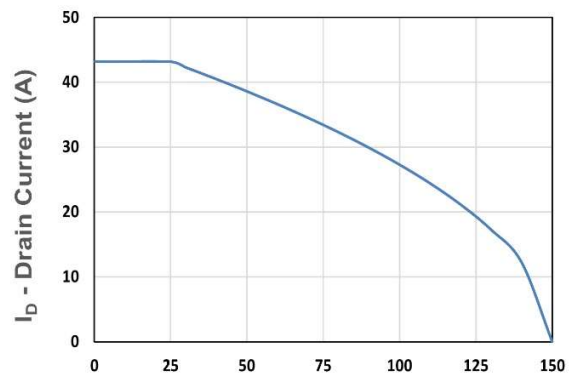
Q_g , Total Gate Charge (nC)

Figure 8. Gate Charge Characteristics



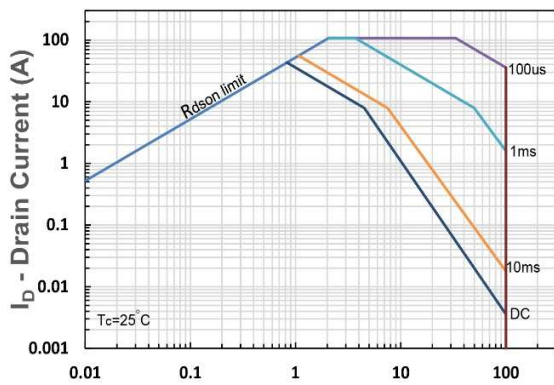
T_c - Case Temperature ($^{\circ}C$)

Figure 9. Power Dissipation



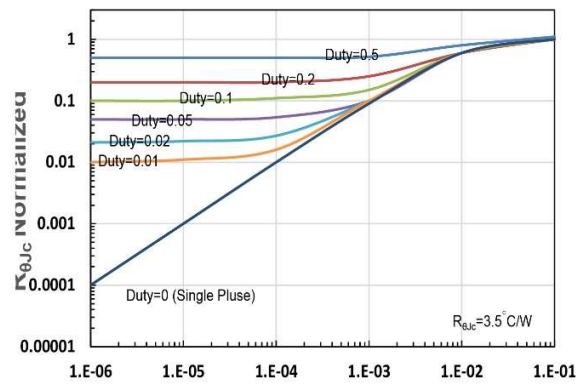
T_c - Case Temperature ($^{\circ}C$)

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