





Power MOSFETS


DATASHEET

LM1A092NHK8A

N-Channel
Enhancement Mode MOSFET

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Quality Management Systems

ISO 9001:2015 Certificate

LM1A092NHNK8A



N-Channel Enhancement Mode MOSFET

Pin Description

Product Summary

<p>PDFN5*6</p> <p>Top View</p> <p>Bottom View</p>	<p>Symbol</p>	Symbol	N-Channel	Unit
		V _{DSS}	100	V
		R _{DS(ON)-Max}	9.6	mΩ
		ID	53	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
LM1A092NHNK8A	PDFN5*6	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	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 46	A
I _{DM} ^①	Pulse Drain Current Tested	T _C =25°C 132	A
I _D	Continuous Drain Current	T _C =25°C 53 T _C =100°C 33	A
P _D	Maximum Power Dissipation	T _C =25°C 50 T _C =100°C 20	W
I _D	Continuous Drain Current	T _A =25°C 12 T _A =70°C 9	A
P _D	Maximum Power Dissipation	T _A =25°C 2.5 T _A =70°C 1.6	W
I _{AS} ^②	Avalanche Current, Single pulse	L=0.1mH 20 L=0.5mH 15	A
E _{AS} ^②	Avalanche Energy, Single pulse	L=0.1mH 20 L=0.5mH 56	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	2.5 °C/W
R _{θJA} ^③	Thermal Resistance-Junction to Ambient	Steady State	50 °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 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	9.6	mΩ
		V _{GS} =6V, I _{DS} =20A	-	12	15.5	
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =10A	-	14	-	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	-	1558	-	pF
C_{oss}	Output Capacitance		-	523	-	
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	-	19.9	-	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	-	50.8	-	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

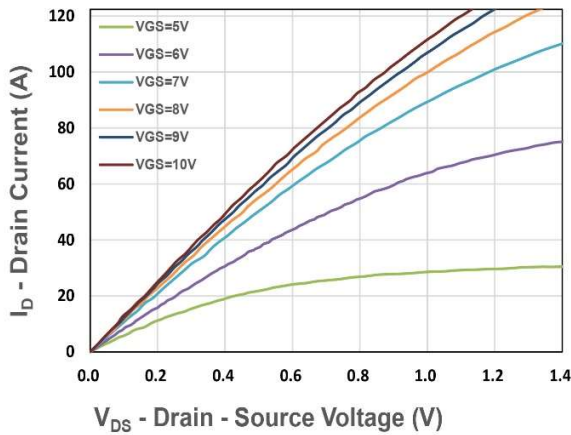


Figure 1. Output Characteristics

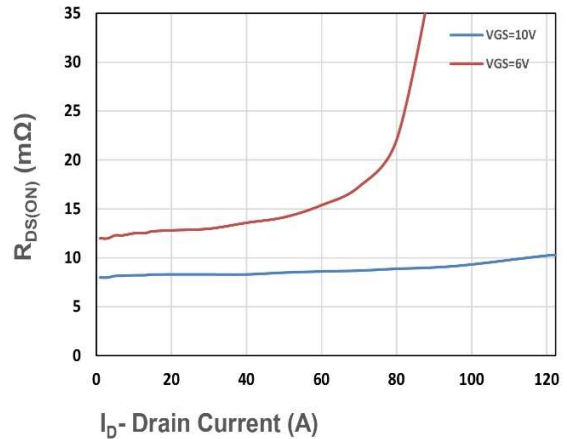


Figure 2. On-Resistance vs. ID

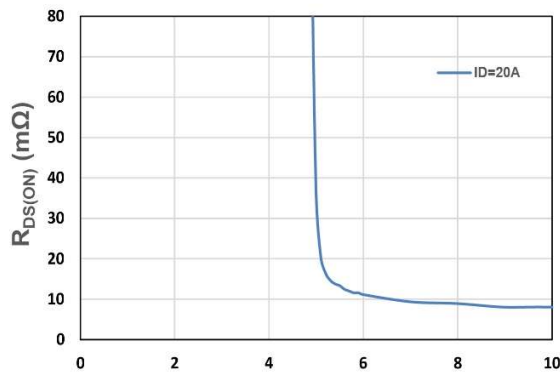


Figure 3. On-Resistance vs. VGS

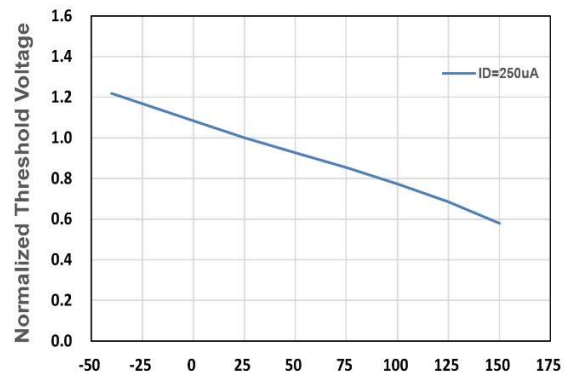


Figure 4. Gate Threshold Voltage

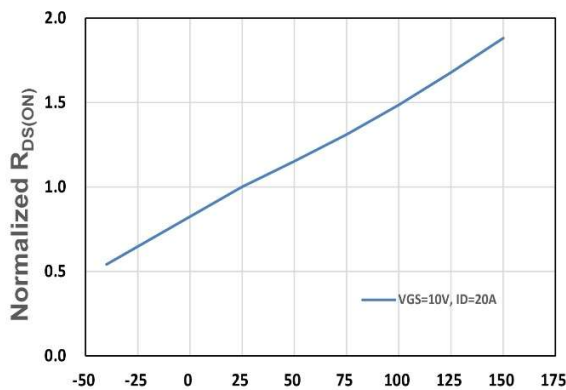


Figure 5. Drain-Source On Resistance

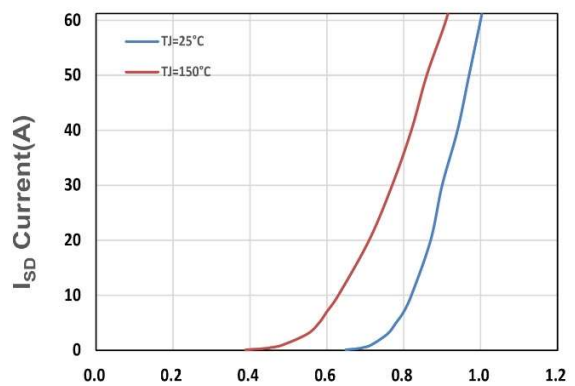
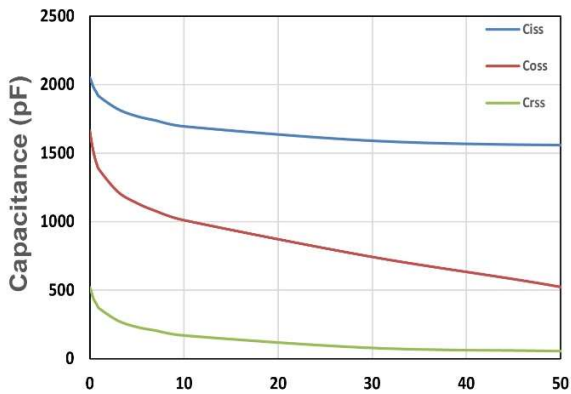


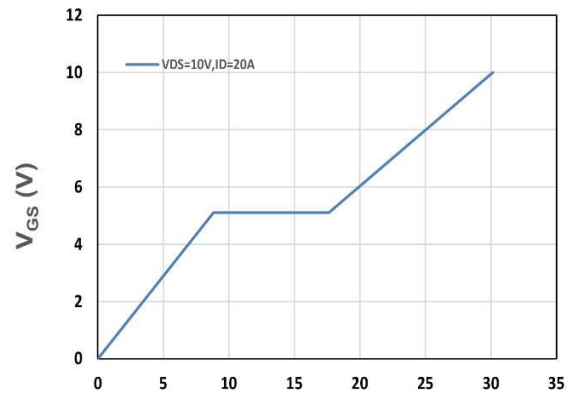
Figure 6. Source-Drain Diode Forward

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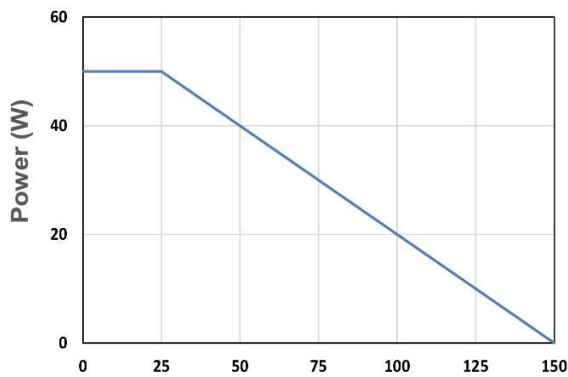
V_{DS} - Drain - Source Voltage (V)

Figure 7. Capacitance



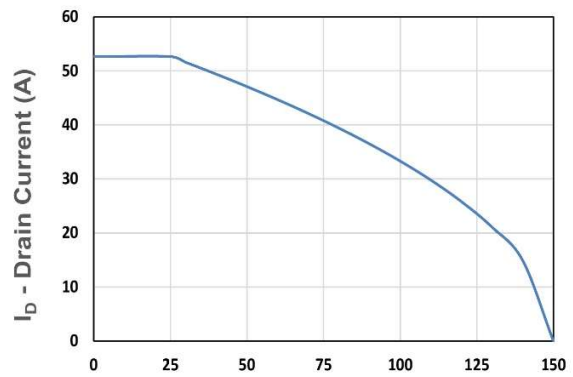
Qg , Total Gate Charge (nC)

Figure 8. Gate Charge Characteristics



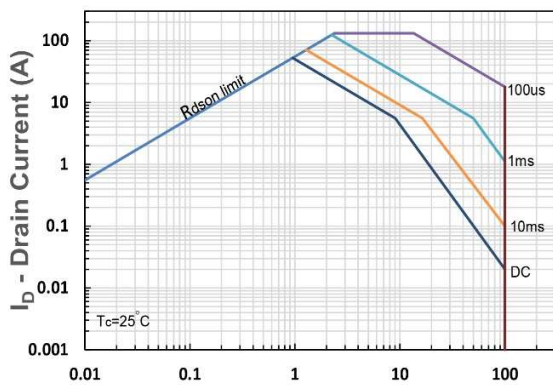
T_c - Case Temperature ($^{\circ}C$)

Figure 9. Power Dissipation



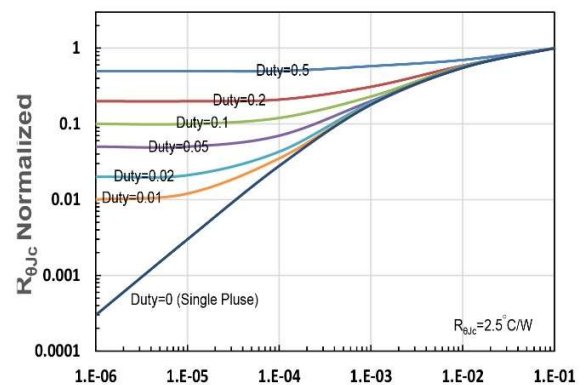
T_c - Case Temperature ($^{\circ}C$)

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