





Power MOSFETS

DATASHEET


LM1F195NHK8A

N-Channel
Enhancement Mode MOSFET

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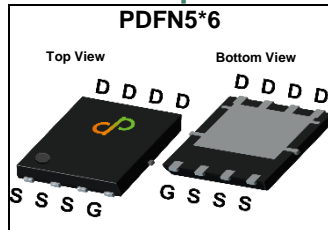


Quality Management Systems

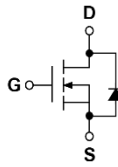
ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

Symbol	N-Channel	Unit
V _{DSS}	150	V
R _{DS(ON)-Max}	19.5	mΩ
ID	65	A

Feature

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

Applications

- Synchronous Rectification in SMPS
- Hard Switching and High Speed Circuit
- DC/DC in Telecoms and Industrial

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM1F195NHNK8A	PDFN5*6	Tape & Reel	5000/ Tape & Reel	1F195 □□□□□□

Note : □□□□□□ = Lot Code

Absolute Maximum Ratings (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter	N-Channel	Unit	
V _{DSS}	Drain-Source Voltage	150	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	76	A
I _{DM} ^①	Pulse Drain Current Tested	T _C =25°C	163	A
I _D	Continuous Drain Current	T _C =25°C	65	A
		T _C =100°C	41	
P _D	Maximum Power Dissipation	T _C =25°C	83	W
		T _C =100°C	33	
I _D	Continuous Drain Current	T _A =25°C	10	A
		T _A =70°C	8	
P _D	Maximum Power Dissipation	T _A =25°C	1.9	W
		T _A =70°C	1.2	
I _{AS} ^②	Avalanche Current, Single pulse	L=0.1mH	21	A
		L=0.5mH	18	
E _{AS} ^②	Avalanche Energy, Single pulse	L=0.1mH	22	mJ
		L=0.5mH	81	

Thermal Characteristics

Symbol	Parameter	Rating	Unit	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	1.5	°C/W
R _{θJA} ^③	Thermal Resistance-Junction to Ambient	Steady State	65	°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	150	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V _{DS} =120V, 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	-	16	19.5	mΩ
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =20A	-	55	-	S
Dynamic Characteristics^⑤						
R_G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	2	-	Ω
C_{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =75V, Freq.=1MHz	-	1960	-	pF
C_{oss}	Output Capacitance		-	130	-	
C_{rss}	Reverse Transfer Capacitance		-	8	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V, V _{DS} =25V, I _D =1A, R _{GEN} =1Ω	-	10	-	nS
t_r	Turn-on Rise Time		-	3.2	-	
t_{d(OFF)}	Turn-off Delay Time		-	21.5	-	
t_f	Turn-off Fall Time		-	66.6	-	
Q_g	Total Gate Charge	V _{GS} =6V, V _{DS} =75V I _D =50A	-	15.5	-	nC
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =75V, I _D =50A	-	24.8	-	
Q_{gs}	Gate-Source Charge		-	11.1	-	
Q_{gd}	Gate-Drain Charge		-	2.87	-	
Source-Drain Characteristics						
V_{SD}^④	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.75	1.1	V
t_{rr}	Reverse Recovery Time	I _F =25A, V _R =75V dI _F /dt=100A/μs	-	65.9	-	nS
Q_{rr}	Reverse Recovery Charge		-	130.8	-	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

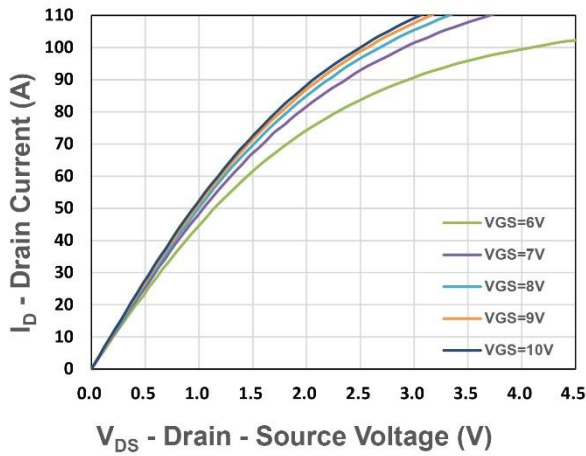


Figure 1. Output Characteristics

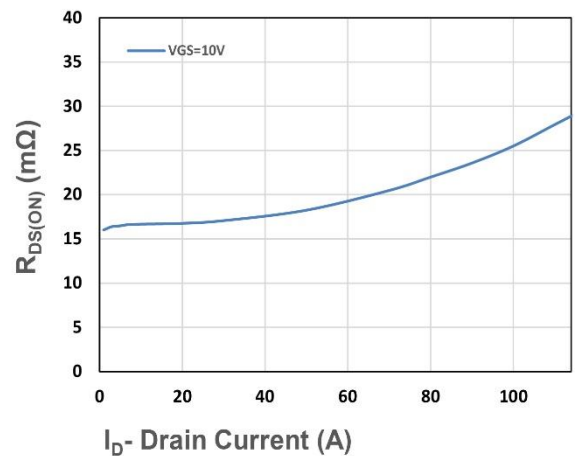


Figure 2. On-Resistance vs. I_D

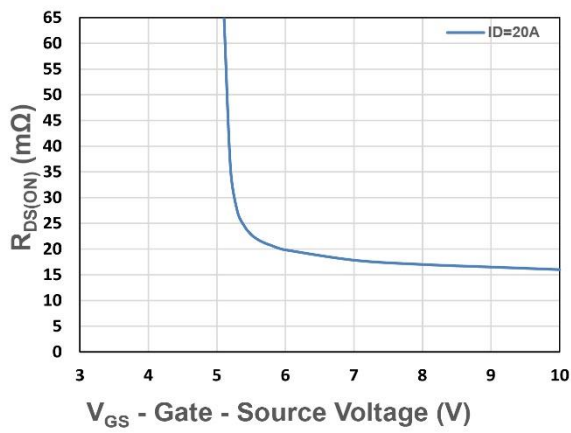


Figure 3. On-Resistance vs. V_{GS}

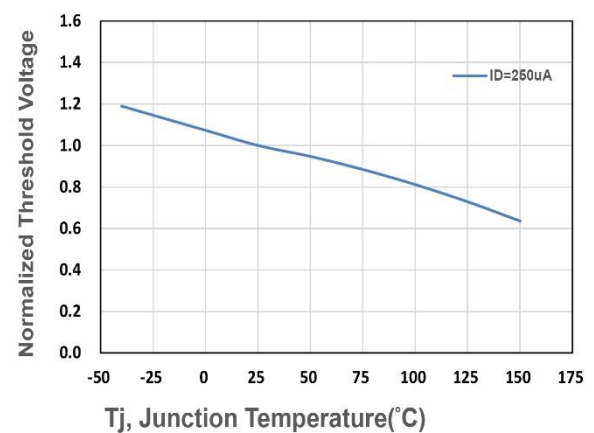


Figure 4. Gate Threshold Voltage

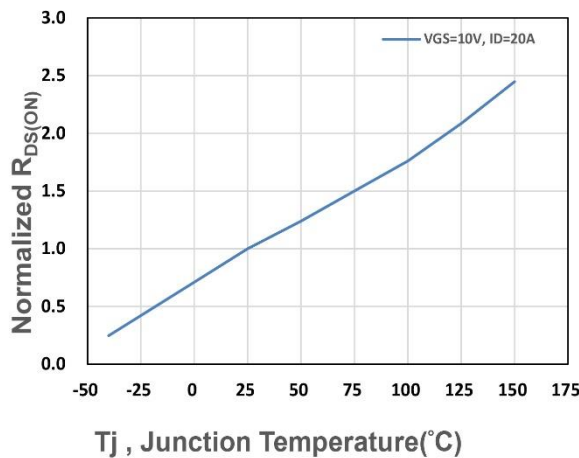


Figure 5. Drain-Source On Resistance

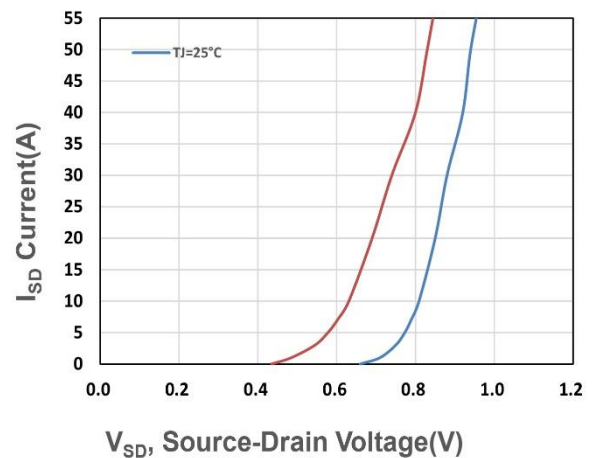
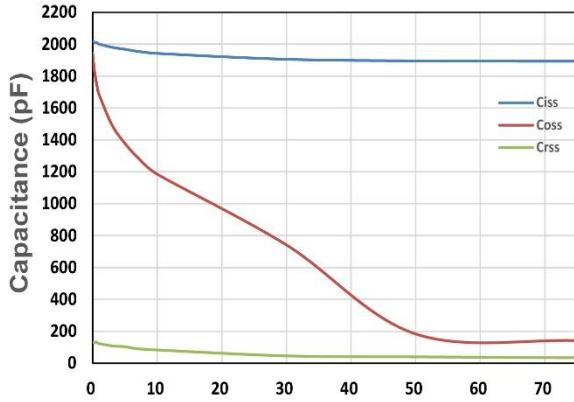
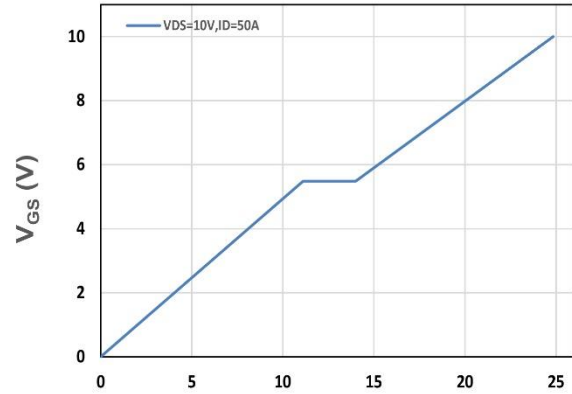


Figure 6. Source-Drain Diode Forward



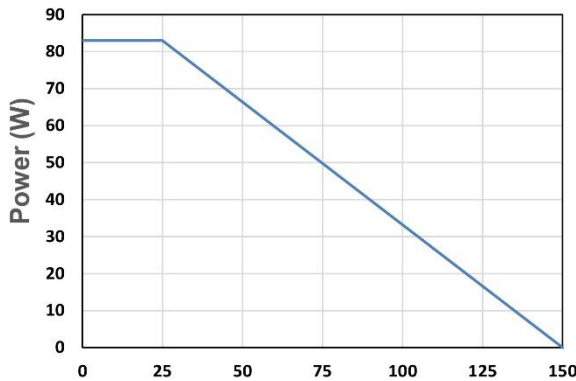
V_{DS} - Drain - Source Voltage (V)

Figure 7. Capacitance



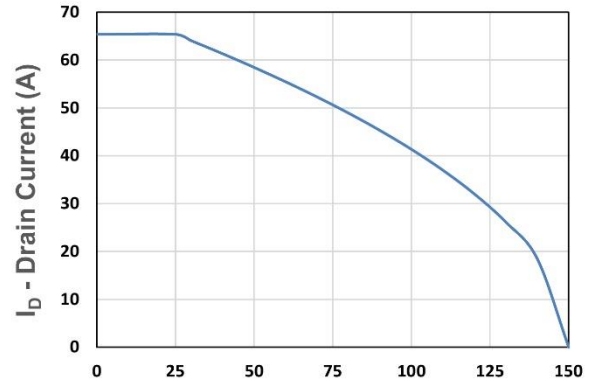
Q_g , Total Gate Charge (nC)

Figure 8. Gate Charge Characteristics



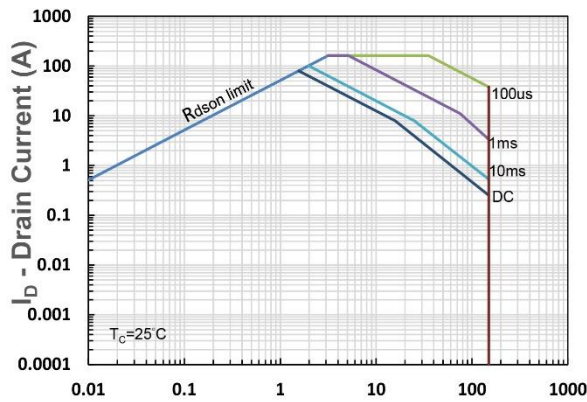
T_c - Case Temperature ($^{\circ}C$)

Figure 9. Power Dissipation



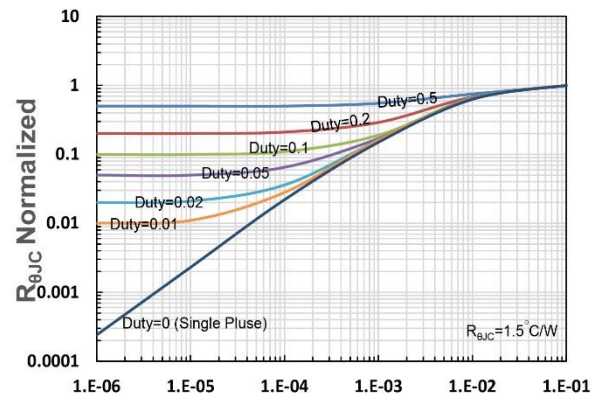
T_c - Case Temperature ($^{\circ}C$)

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