



LFMNK1P9



85V N-Channel MOSFETs

General Description

These N-Channel enhancement mode power field effect transistors are using trench MOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BV_{DSS}	$R_{DS(ON)}$	I_D
85 V	1.9 m Ω (typ.)	313 A

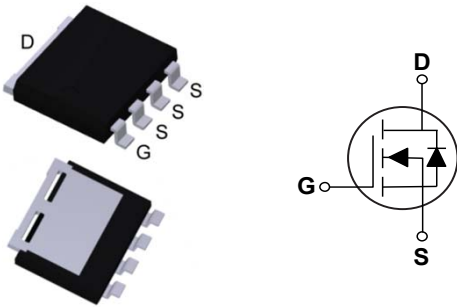
Features

- $R_{DS(ON)} = 1.9m\Omega$ (typ.)@ $V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

Applications

- DC-DC Converters
- Body Control Electronics
- Engine Management Systems

LFP8080 Pin Configuration



Ordering Information

Part No.	Remark	Package
LFMNK1P9	Halogen Free	LFP8080
LFMNK1P9-A	Qualified to AEC-Q101 Standards for High Reliability	

Absolute Maximum Ratings $T_C=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	85	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_C=25^\circ C$)	313	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	1252	A
E_{AS}	Single Pulse Avalanche Energy (L=1mH)	1250	mJ
I_{AS}	Single Pulse Avalanche Current (L=1mH)	50	A
P_D	Power Dissipation ($T_C=25^\circ C$)	300	W
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ C$
Marking Code		NK1P9	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	40	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	0.5	$^\circ C/W$



Electrical Characteristics (T_J=25°C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =1mA	85	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =68V, V _{GS} =0V	---	---	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =25A	---	1.9	---	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2.0	---	4.0	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DD} =40V, V _{GS} =10V, I _D =25A	---	108.3	---	nC
Q _{gs}	Gate-Source Charge		---	36.1	---	
Q _{gd}	Gate-Drain Charge		---	25	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =40V, V _{GS} =10V, R _G =5Ω, I _D =25A	---	30.2	---	nS
T _r	Rise Time		---	55	---	
T _{d(off)}	Turn-Off Delay Time		---	70.5	---	
T _f	Fall Time		---	54.2	---	
C _{iss}	Input Capacitance	V _{DS} =40V, V _{GS} =0V, f=1MHz	---	6965	---	pF
C _{oss}	Output Capacitance		---	1183	---	
C _{rss}	Reverse Transfer Capacitance		---	72	---	
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	---	1.1	---	Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =20A	---	---	1.2	V

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.



Characteristics Curves

FIG. 1-Continuous Drain Current vs. T_C

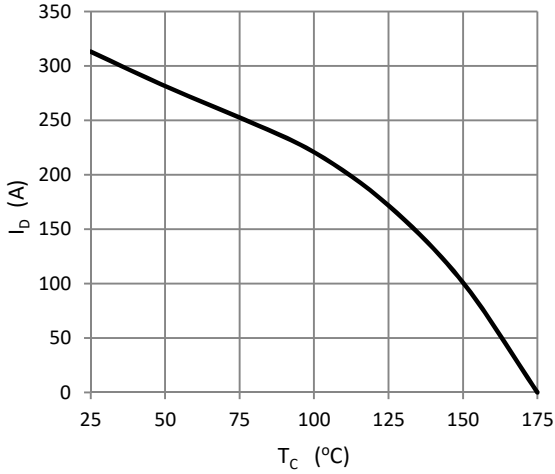


FIG. 2-Normalized $R_{DS(ON)}$ vs. T_J

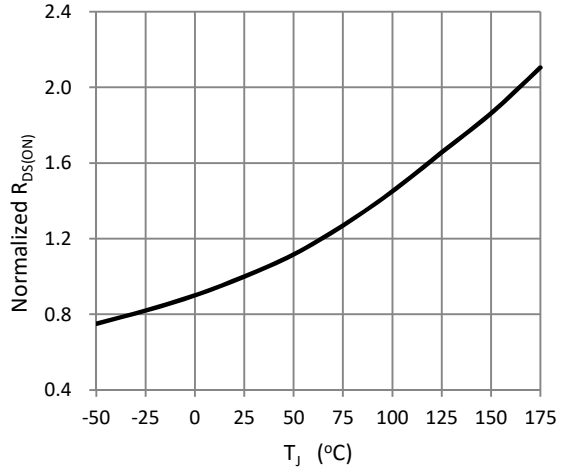


FIG. 3- V_{th} vs. T_J

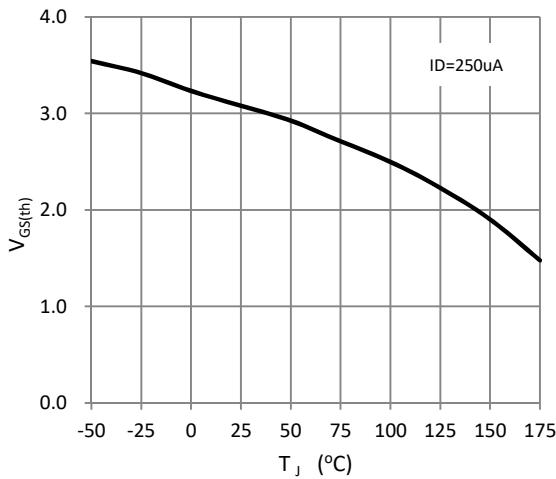


FIG. 4-Normalized $V_{GS(th)}$ vs. T_J

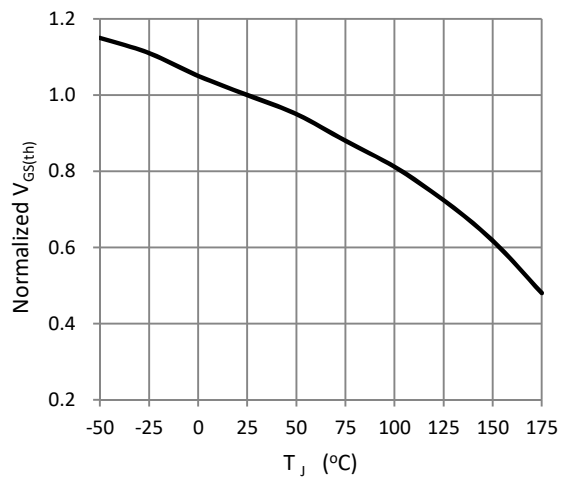


FIG. 5- $R_{DS(ON)}$ vs. V_{GS}

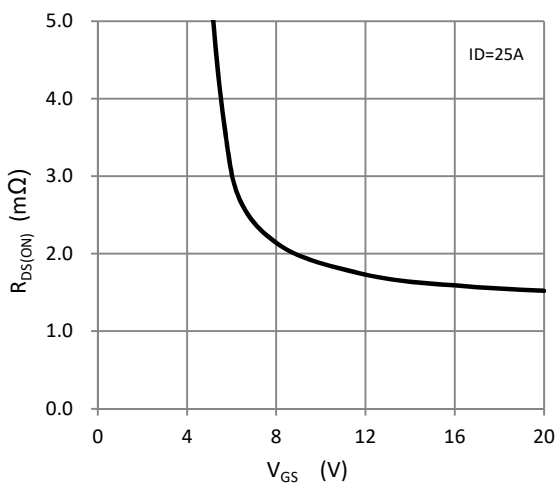
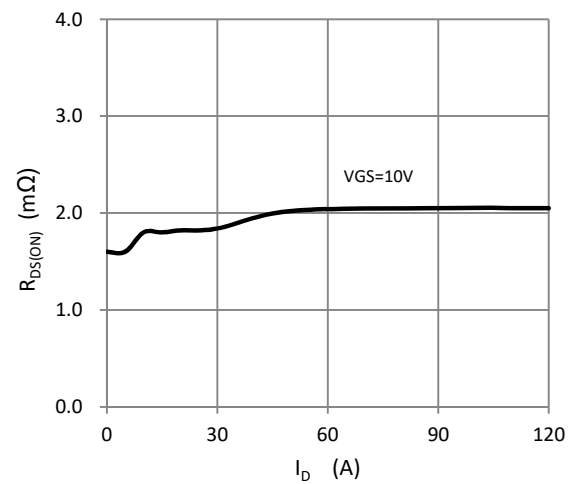


FIG. 6- $R_{DS(ON)}$ vs. I_D





Characteristics Curves

FIG. 7-Gate Charge Characteristics

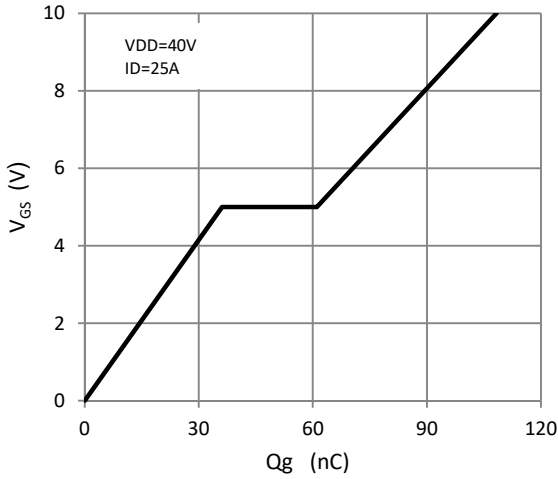


FIG. 8-I_S vs. V_{SD}

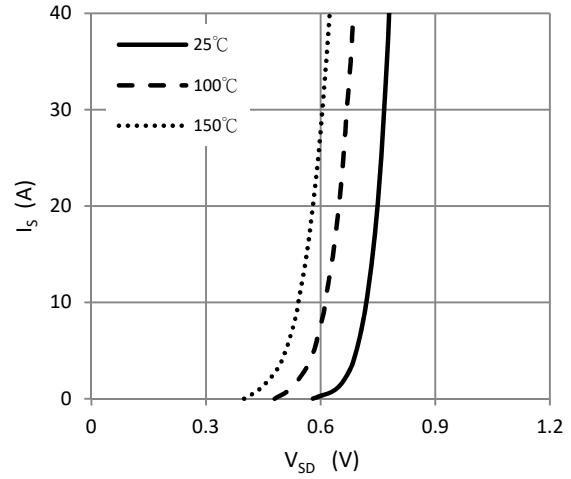


FIG. 9-Junction Capacitance

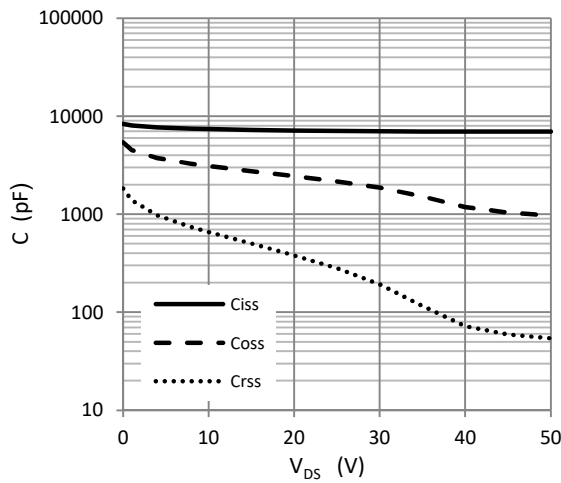
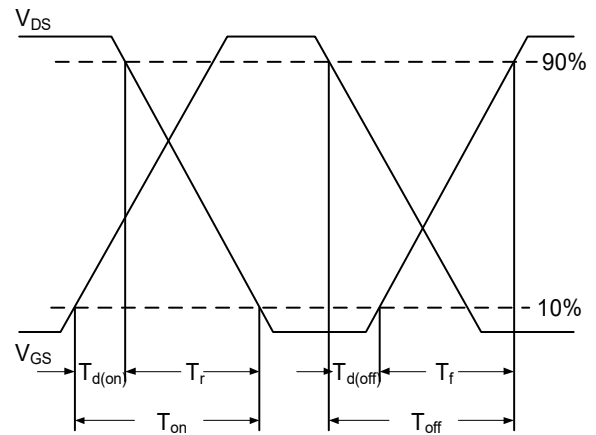


FIG. 10-Switching Time Waveform



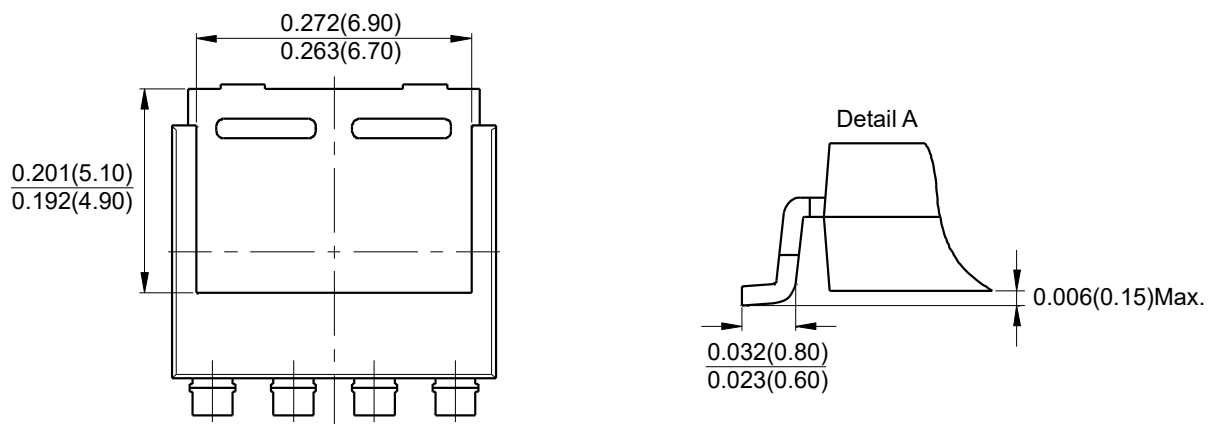
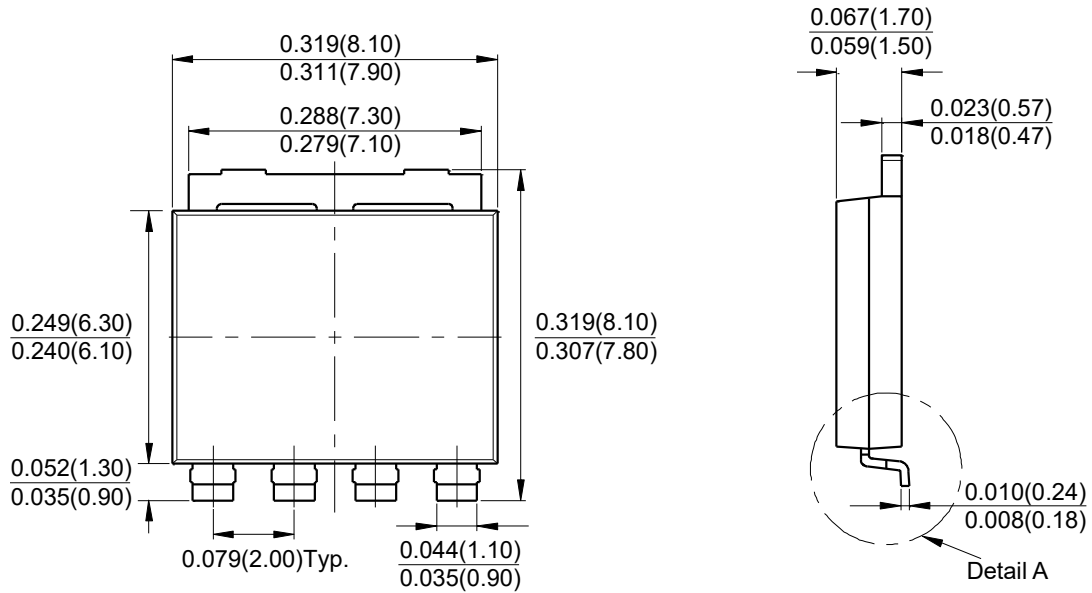


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Package Outline Dimensions



LFAK8080

Dimensions in inches and (millimeters)



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