



General Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS 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
40 V	0.7 m Ω	455 A

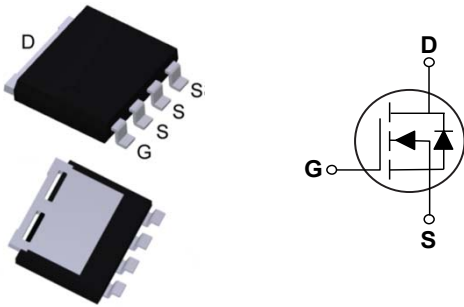
Features

- $R_{DS(ON)} \leq 0.7 m\Omega @ V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

Applications

- DC-DC Converters
- Body Control Electronics
- LED Lighting

LFPK8080 Pin Configuration



Ordering Information

Part No.	Remark	Package
LFMND0P7	Halogen Free	LFPK8080
LFMND0P7-A	AEC-Q101 qualified (NOTE 1)	

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_C=25^\circ\text{C}$)	455	A
I_{DM}	Drain Current - Pulsed (NOTE 2)	1835	A
E_{AS}	Single Pulse Avalanche Energy ($L=0.1\text{mH}$)	500	mJ
I_{AS}	Single Pulse Avalanche Current ($L=0.1\text{mH}$)	100	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	417	W
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
Marking Code		ND0P7	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	28	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	0.36	$^\circ\text{C/W}$



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	40	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =32V, 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	---	0.54	0.7	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} =20V, V _{GS} =10V, I _D =25A	---	116	---	nC
Q _{gs}	Gate-Source Charge		---	36.5	---	
Q _{gd}	Gate-Drain Charge		---	10	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =20V, V _{GS} =10V, R _G =5Ω, I _D =25A	---	28.6	---	nS
T _r	Rise Time		---	39.1	---	
T _{d(off)}	Turn-Off Delay Time		---	98.2	---	
T _f	Fall Time		---	48	---	
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	---	9985	---	pF
C _{oss}	Output Capacitance		---	5746	---	
C _{rss}	Reverse Transfer Capacitance		---	109	---	
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	---	1.9	---	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
T _{rr}	Body Diode Reverse Recovery Time	I _F =25A, di/dt=100A/us	---	116	---	nS
Q _{rr}	Body Diode Reverse Recovery Charge		---	338.1	---	nC

NOTES :

1. Qualified to AEC-Q101 standards for high reliability, but do not have all the necessary attributes of automotive grade products.
2. Repetitive Rating : Pulsed width limited by maximum junction temperature.
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.



Characteristics Curves

FIG. 1-Continuous Drain Current vs. T_C

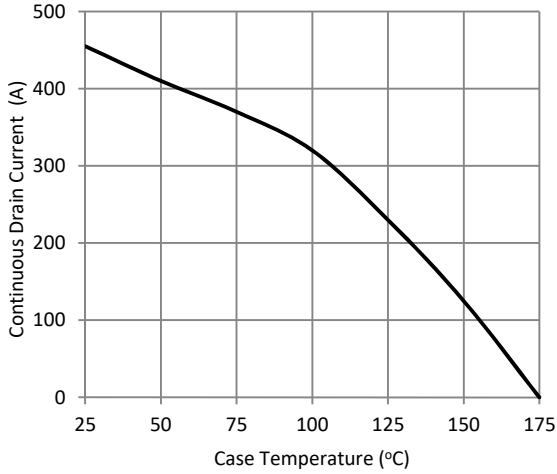


FIG. 2-Normalized $R_{DS(ON)}$ vs. T_J

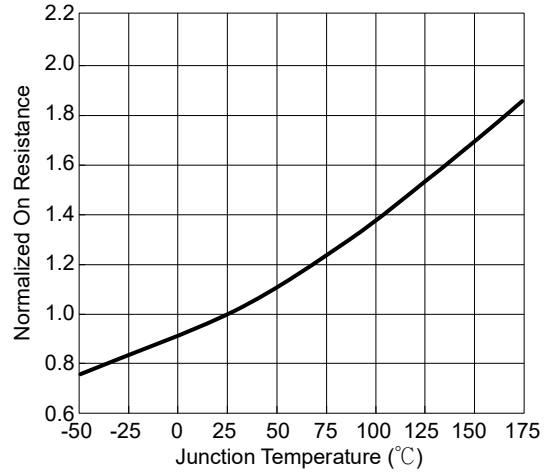


FIG. 3- V_{th} vs. T_J

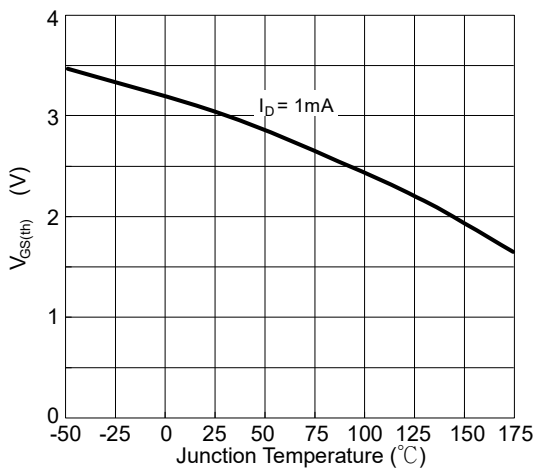


FIG. 4-Gate Charge Characteristics

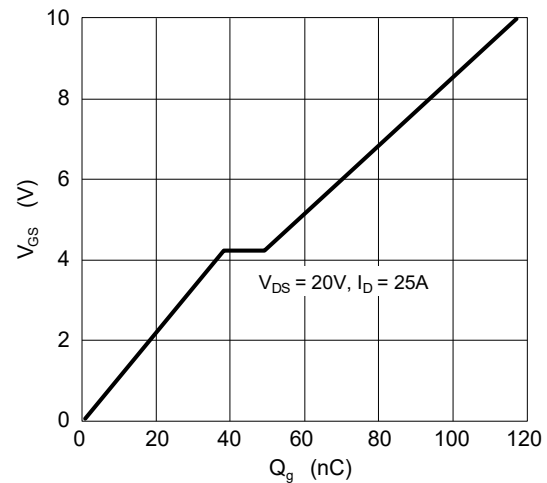


FIG. 5-Transient Thermal Resistance

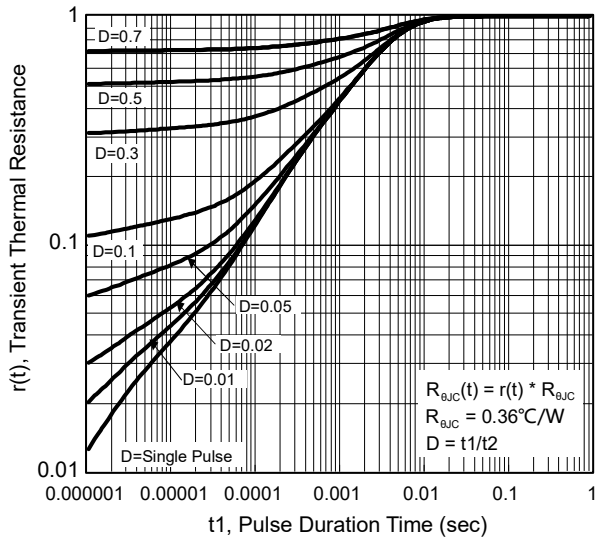
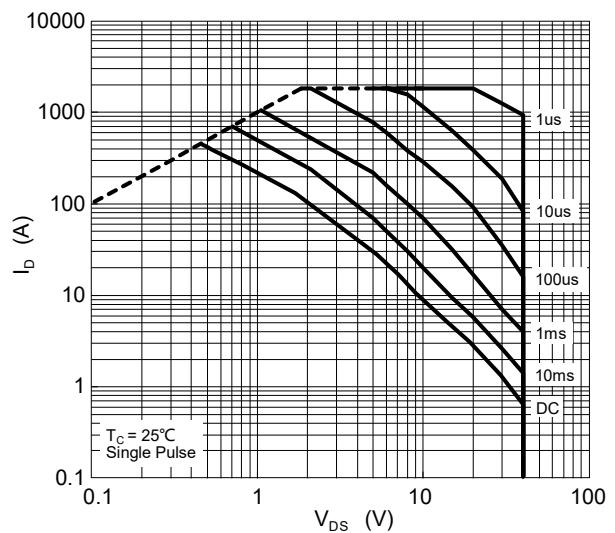


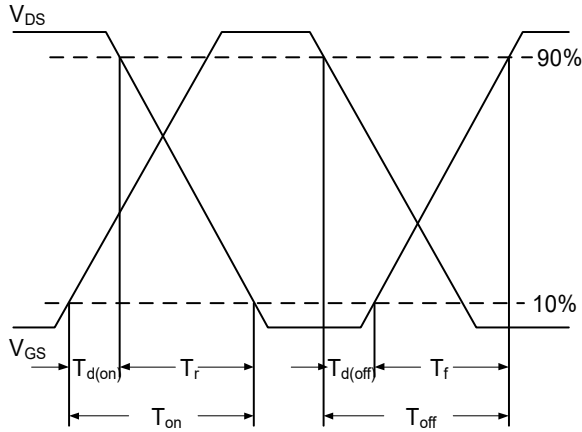
FIG. 6-Safe Operating Area



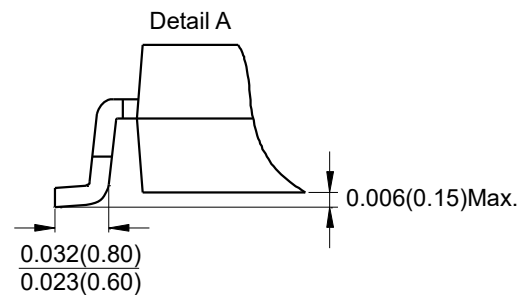
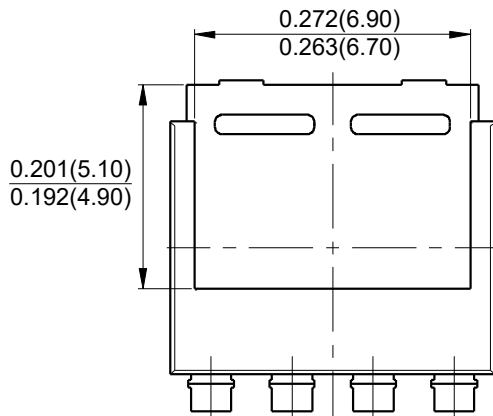
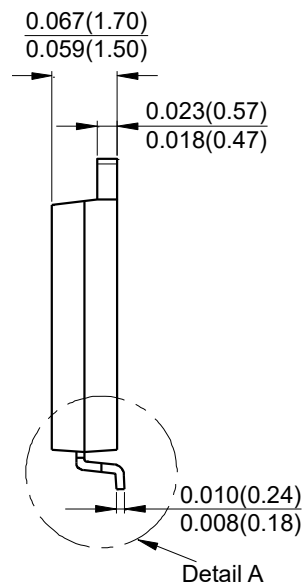
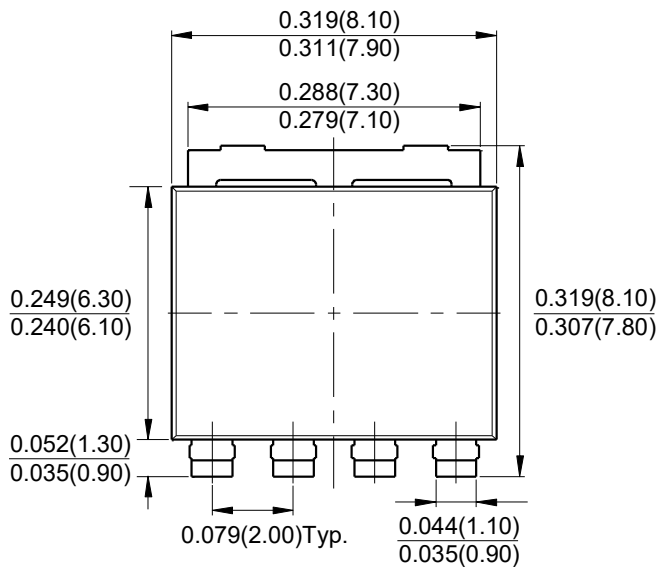


Characteristics Curves

FIG. 7-Switching Time Waveform



Package Outline Dimensions



LFAK8080

Dimensions in inches and (millimeters)



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