





Power MOSFETS

DATASHEET

LM80080NH8A

N-Channel
Enhancement Mode MOSFET

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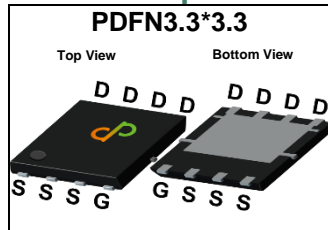


Quality Management Systems

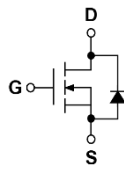
ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

Symbol	N-Channel	Unit
V_{DSS}	80	V
$R_{DS(ON)-Max}$	8.5	m Ω
ID	51	A

Feature

- Advanced trench cell design
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

Applications

- Motor drivers
- DC-DC Converter

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM80080NHI8A	PDFN3.3*3.3	Tape & Reel	5000 / Tape & Reel	80080 □□□□□□

Note : □□□□□□ = Lot Code

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

Symbol	Parameter	N-Channel	Unit	
V_{DSS}	Drain-Source Voltage	80	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	18	A
$I_{DM}^{①}$	Pulse Drain Current Tested	T _C =25°C	127	A
I_D	Continuous Drain Current	T _C =25°C	51	A
		T _C =100°C	32	
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	10.9	A
		T _A =70°C	8.7	
P_D	Maximum Power Dissipation	T _A =25°C	1.7	W
		T _A =70°C	1.1	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	28	A
		L=0.5mH	16	
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH	39	mJ
		L=0.5mH	64	

Thermal Characteristics

Symbol	Parameter	Rating	Unit	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	3.5	°C/W
$R_{\theta JA}^{③}$	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.

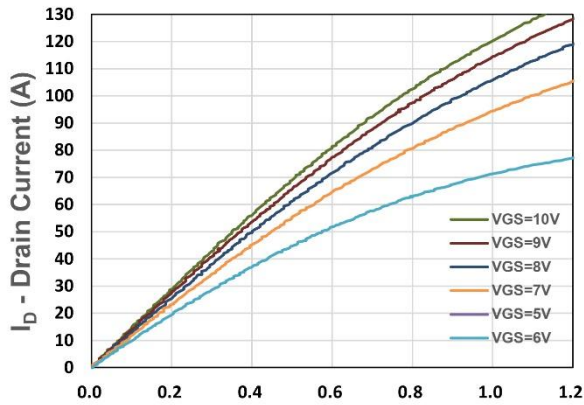
N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	80	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V _{DS} =64V, 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	-	7	8.5	mΩ
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =10A	-	18	-	S
Dynamic Characteristics^⑤						
R_G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	1	-	Ω
C_{iSS}	Input Capacitance	V _{GS} =0V, V _{DS} =40V, Freq.=1MHz	-	1583	-	pF
C_{oss}	Output Capacitance		-	497	-	
C_{rSS}	Reverse Transfer Capacitance		-	48	-	
t_{d(ON)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =40V, I _D =1A, R _{GEN} =1Ω	-	13	-	nS
t_r	Turn-on Rise Time		-	8	-	
t_{d(OFF)}	Turn-off Delay Time		-	25	-	
t_f	Turn-off Fall Time		-	54	-	
Q_g	Total Gate Charge	V _{GS} =6V, V _{DS} =40V I _D =20A	-	19	-	nC
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =40V, I _D =20A	-	28	-	
Q_{gs}	Gate-Source Charge		-	8.9	-	
Q_{gd}	Gate-Drain Charge		-	7.4	-	
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 =40V	-	25	-	nS
Q_{rr}	Reverse Recovery Charge	di _F /dt=100A/μs	-	17	-	nC

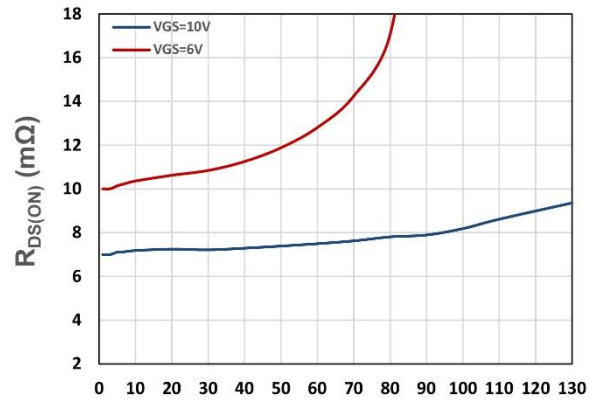
Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤ : Guaranteed by design, not subject to production testing.

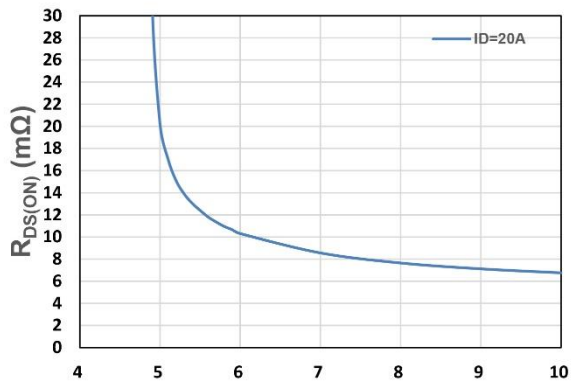
N-Channel Typical Characteristics



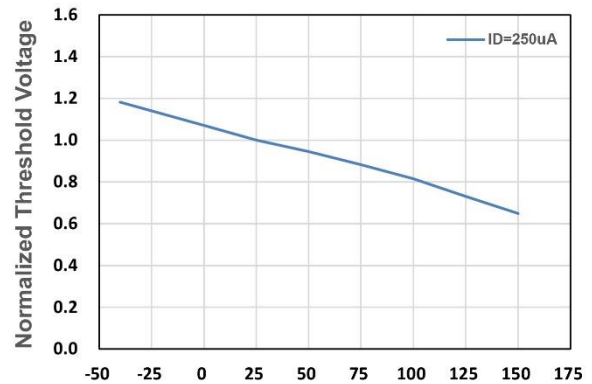
V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



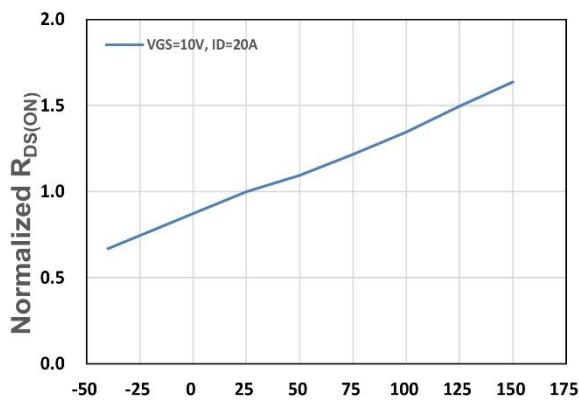
I_D - Drain Current (A)
Figure 2. On-Resistance vs. ID



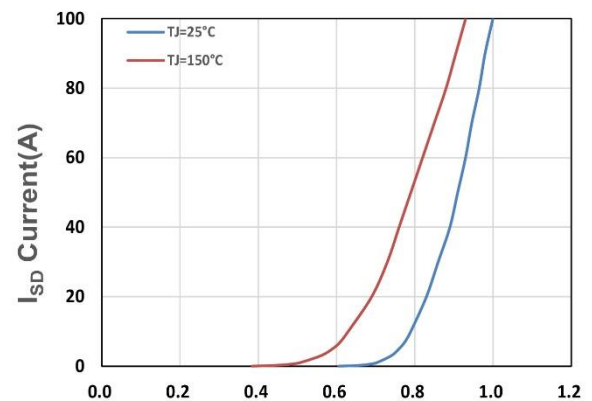
V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. VGS



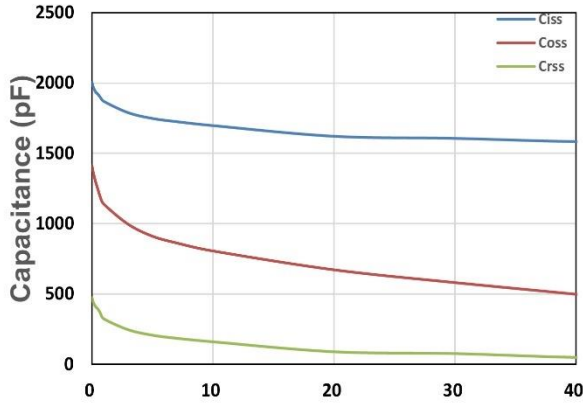
T_j , Junction Temperature($^{\circ}C$)
Figure 4. Gate Threshold Voltage



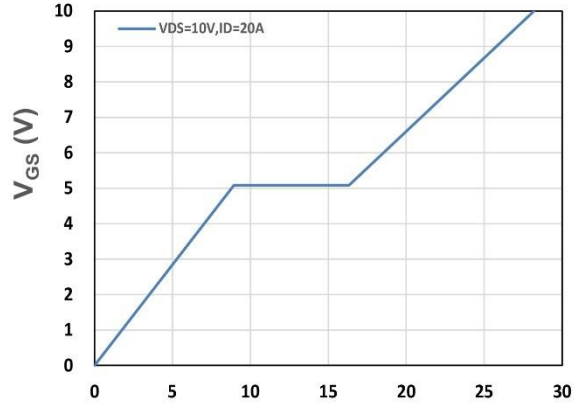
T_j , Junction Temperature($^{\circ}C$)
Figure 5. Drain-Source On Resistance



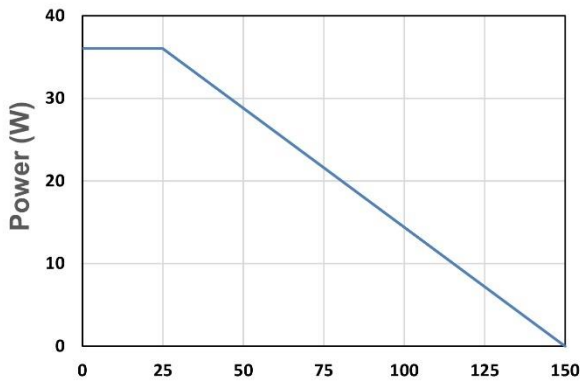
V_{SD} , Source-Drain Voltage(V)
Figure 6. Source-Drain Diode Forward



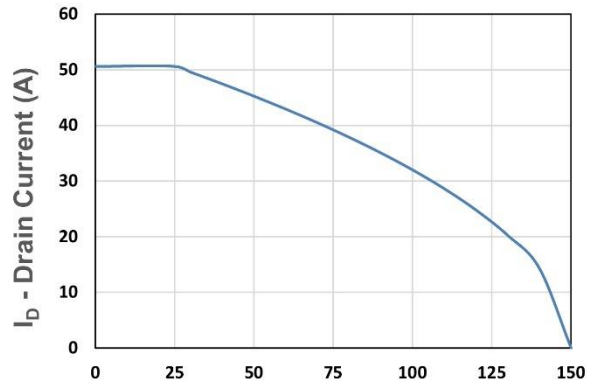
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



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

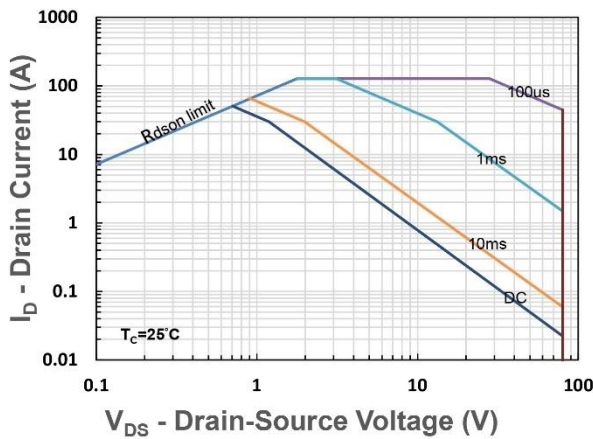


Figure 11. Safe Operating Area

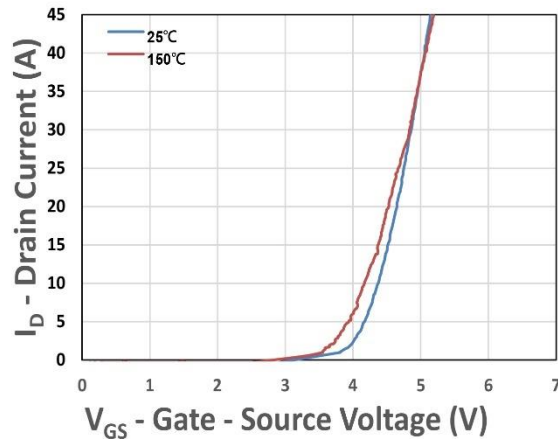


Figure 12. Transfer Characteristics

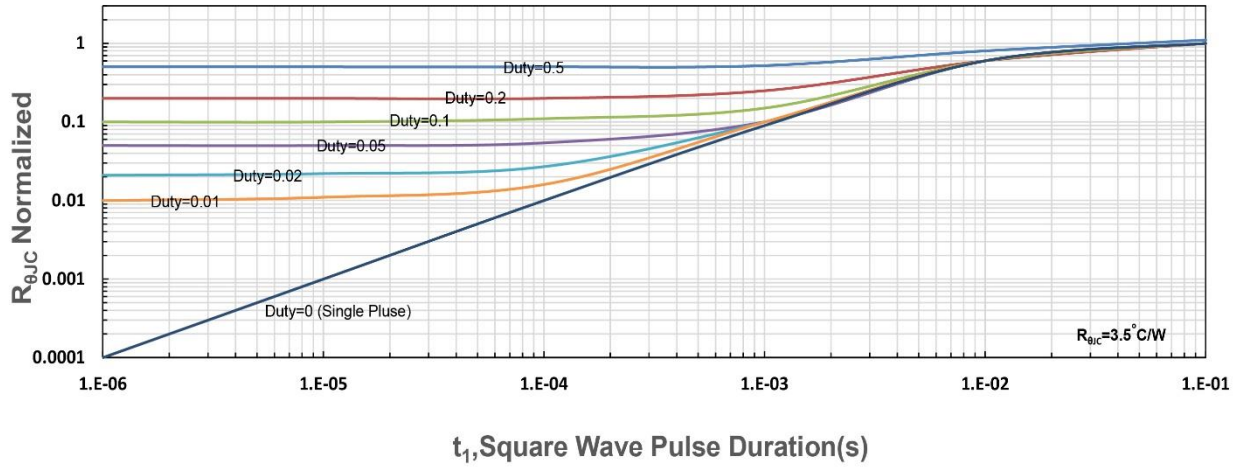


Figure 13. $R_{\theta JC}$ Transient Thermal Impedance