



Power MOSFETS

DATASHEET

LM80034NHP3A

N-Channel
Enhancement Mode MOSFET



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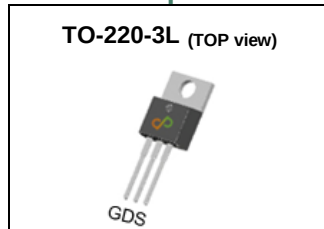


Quality Management Systems

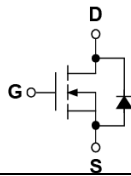
ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

Symbol	N-Channel	Unit
V_{DSS}	80	V
$R_{DS(ON)-Max}$	4.2	mΩ
ID	132	A

Feature

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

Applications

- DC/DC converter

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM80034NHP3A	TO-220-3L	Tube	50 / Tube	80034 □□□□□□

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	$T_C=25^{\circ}C$	38
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_C=25^{\circ}C$	329
I_D	Continuous Drain Current	$T_C=25^{\circ}C$	132
		$T_C=100^{\circ}C$	83
P_D	Maximum Power Dissipation	$T_C=25^{\circ}C$	125
		$T_C=100^{\circ}C$	50
$I_D^{②}$	Continuous Drain Current	$T_A=25^{\circ}C$	17
		$T_A=70^{\circ}C$	13
$P_D^{②}$	Maximum Power Dissipation	$T_A=25^{\circ}C$	2.0
		$T_A=70^{\circ}C$	1.3
$I_{AS}^{③}$	Avalanche Current, Single pulse	L=0.1mH	55
		L=0.5mH	30
$E_{AS}^{③}$	Avalanche Energy, Single pulse	L=0.1mH	140
		L=0.5mH	210

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	1
$R_{\theta JA}^{②}$	Thermal Resistance-Junction to Ambient	Steady State	62.5

Note ① : Max. current is limited by junction temperature.

Note ② : Surface Mounted on 1in² FR-4 board with 1oz.

Note ③ : UIS tested and pulse width are limited by maximum junction temperature 150°C.

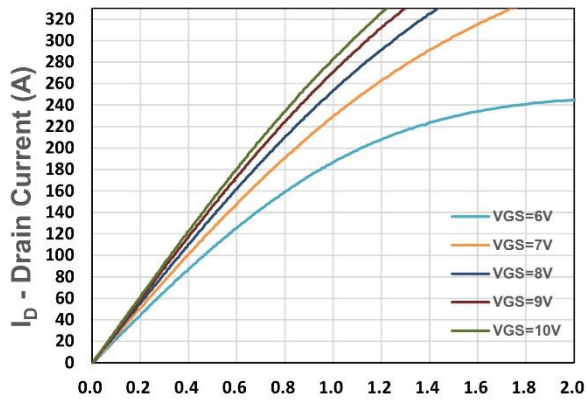
N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

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	-	3.5	4.2	mΩ
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =10A	-	32	-	S
Dynamic Characteristics ^⑤						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V, Freq.=1MHz	-	0.8	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =40V, Freq.=1MHz	-	3931	-	pF
C _{oss}	Output Capacitance		-	1156	-	
C _{rss}	Reverse Transfer Capacitance		-	101	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V,V _{DS} =40V, I _D =1A,R _{GEN} =1Ω	-	19.3	-	nS
t _r	Turn-on Rise Time		-	12.3	-	
t _{d(OFF)}	Turn-off Delay Time		-	47.4	-	
t _f	Turn-off Fall Time		-	92.8	-	
Q _g	Total Gate Charge	V _{GS} =6V,V _{DS} =40V I _D =20A	-	53.4	-	nC
Q _g	Total Gate Charge	V _{GS} =10V,V _{DS} =40V, I _D =20A	-	84.2	-	
Q _{gs}	Gate-Source Charge		-	26.5	-	
Q _{gd}	Gate-Drain Charge		-	16	-	
Source-Drain Characteristics						
V _{SD} ^④	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V	-	0.75	1.1	V
t _{rr}	Reverse Recovery Time	I _F =10A, V _R =64V	-	60.6	-	nS
Q _{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	85	-	nC

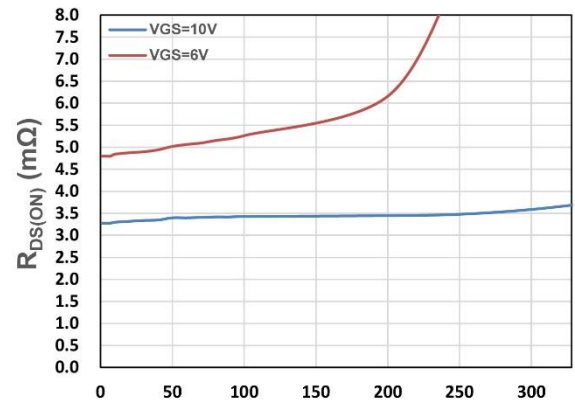
Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

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

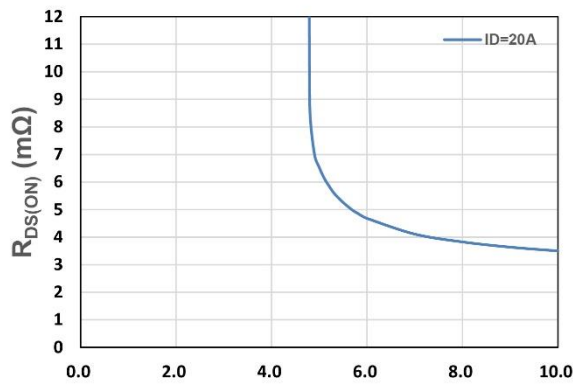
N-Channel Typical Characteristics



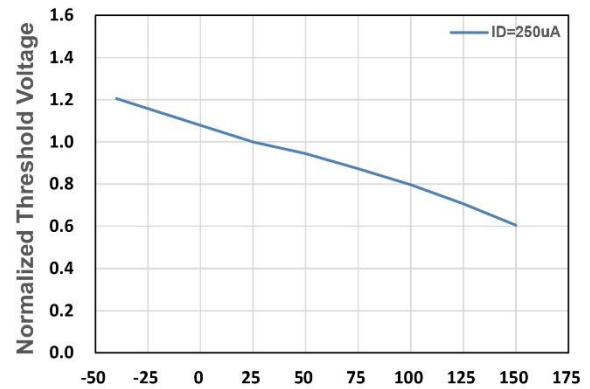
V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



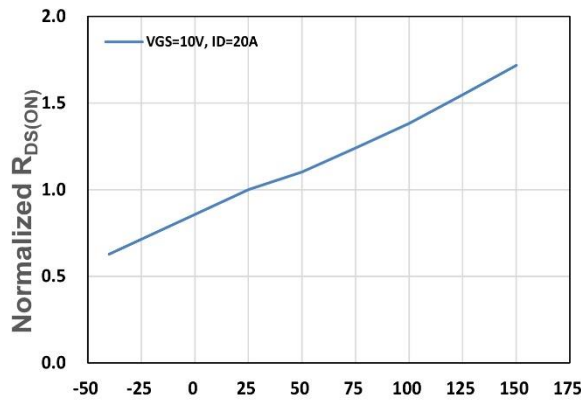
I_D - Drain Current (A)
Figure 2. On-Resistance vs. ID



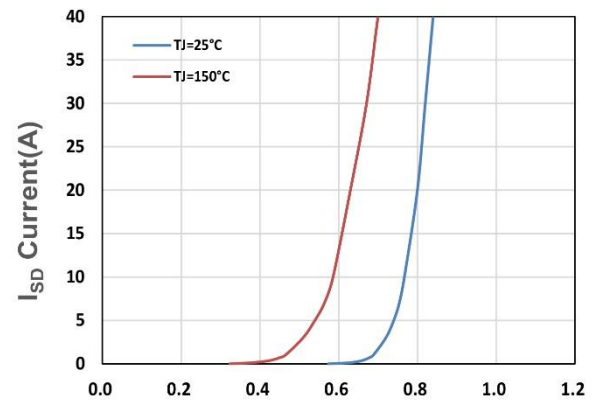
V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. VGS



T_j , Junction Temperature(°C)
Figure 4. Gate Threshold Voltage



T_j , Junction Temperature(°C)
Figure 5. Drain-Source On Resistance



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

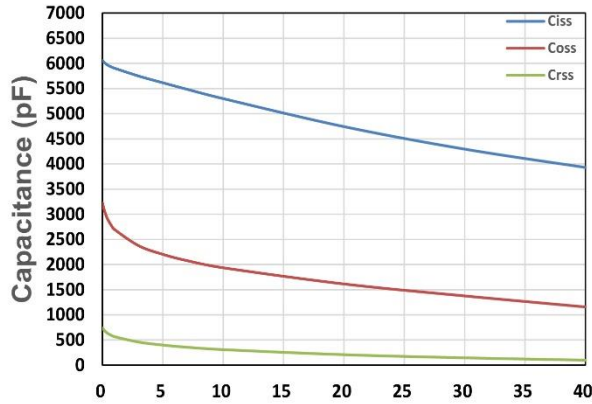


Figure 7. Capacitance

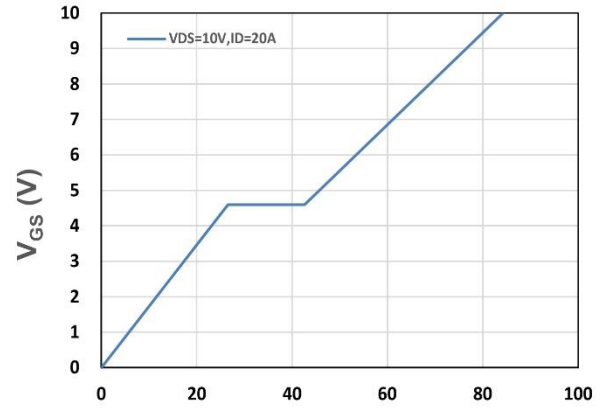


Figure 8. Gate Charge Characteristics

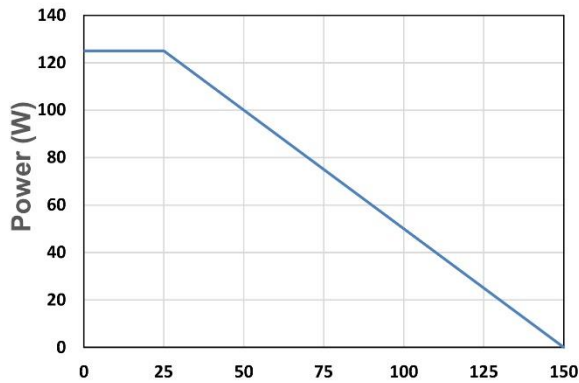


Figure 9. Power Dissipation

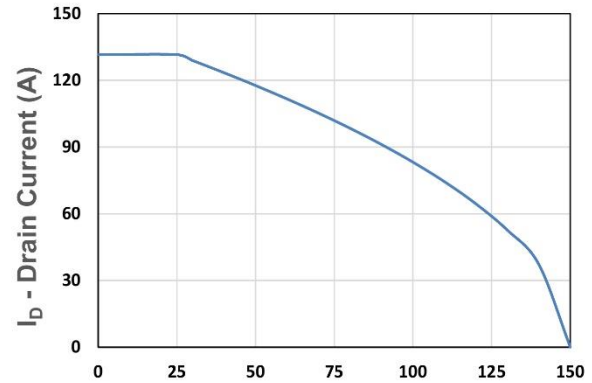


Figure 10. Drain Current

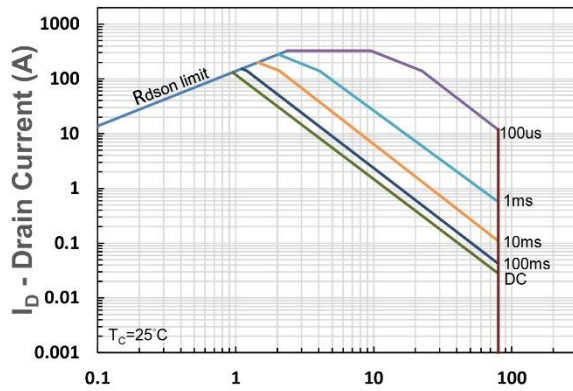


Figure 11. Safe Operating Area

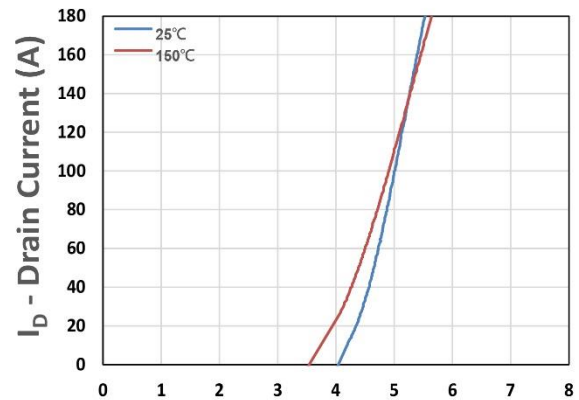


Figure 12. Transfer Characteristics

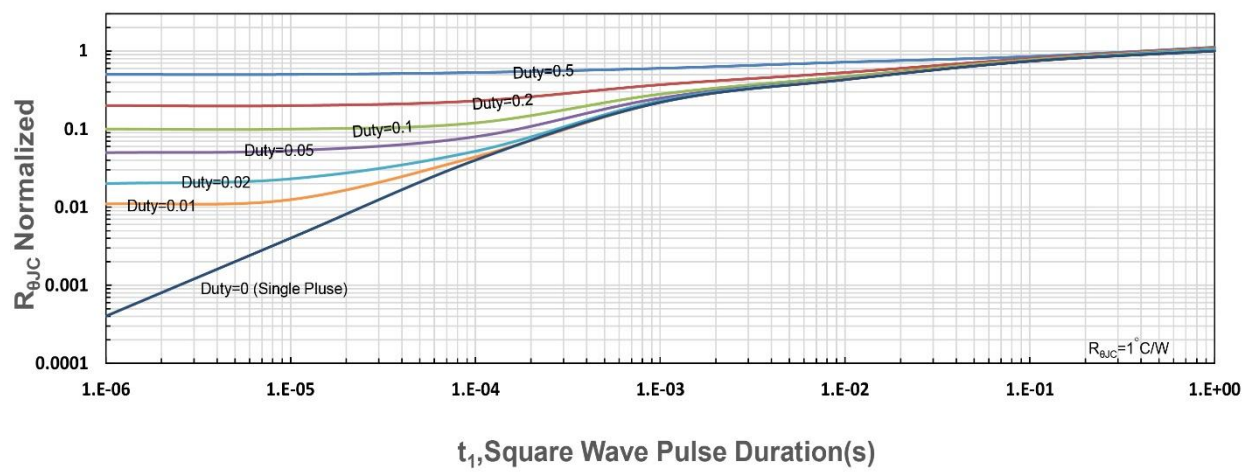


Figure 13. $R_{\theta JC}$ Transient Thermal Impedance