




Power MOSFETS

DATASHEET

LM80034NHP3A

N-Channel
Enhancement Mode MOSFET

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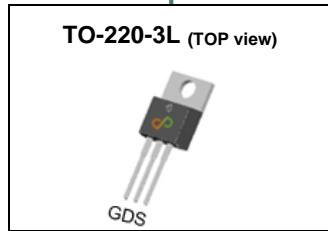


Quality Management Systems

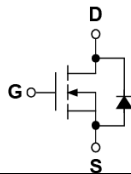
ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

| Symbol | N-Channel | Unit |
|------------------|-----------|------------|
| V_{DSS} | 80 | V |
| $R_{DS(ON)-Max}$ | 4.2 | m Ω |
| ID | 329 | 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 | A |
| $I_{DM}^{①}$ | Pulse Drain Current Tested | $T_C=25^\circ C$ 329 | A |
| I_D | Continuous Drain Current | $T_C=25^\circ C$ 132 | A |
| | | $T_C=100^\circ C$ 83 | |
| P_D | Maximum Power Dissipation | $T_C=25^\circ C$ 125 | W |
| | | $T_C=100^\circ C$ 50 | |
| $I_D^{②}$ | Continuous Drain Current | $T_A=25^\circ C$ 17 | A |
| | | $T_A=70^\circ C$ 13 | |
| $P_D^{②}$ | Maximum Power Dissipation | $T_A=25^\circ C$ 2.0 | W |
| | | $T_A=70^\circ C$ 1.3 | |
| $I_{AS}^{③}$ | Avalanche Current, Single pulse | L=0.1mH 55 | A |
| | | L=0.5mH 30 | A |
| $E_{AS}^{③}$ | Avalanche Energy, Single pulse | L=0.1mH 140 | mJ |
| | | L=0.5mH 210 | |

Thermal Characteristics

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

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°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 | - | |
| t_{d(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≤300us, duty cycle≤2%).

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

N-Channel Typical Characteristics

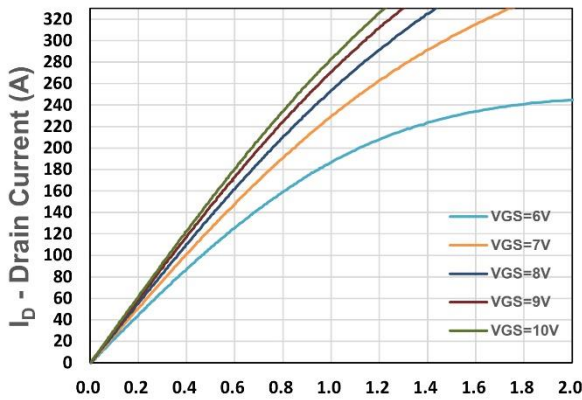


Figure 1. Output Characteristics

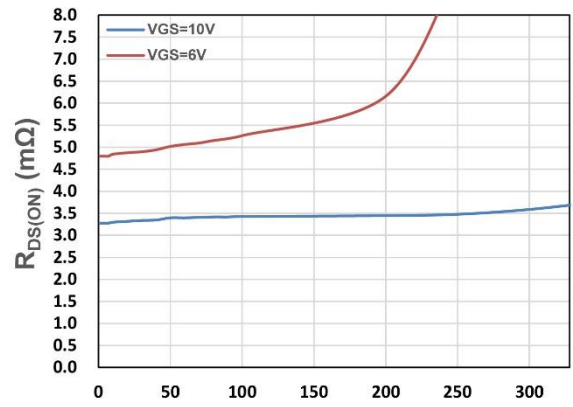


Figure 2. On-Resistance vs. I_D

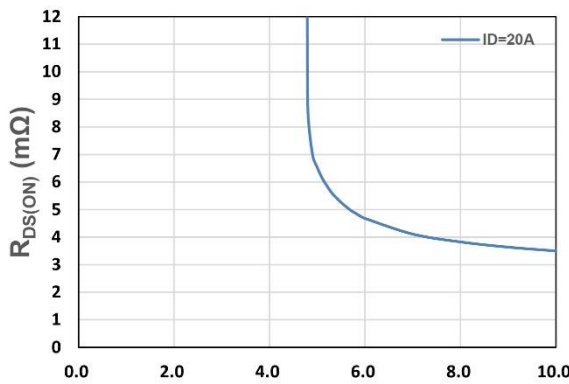


Figure 3. On-Resistance vs. V_{GS}

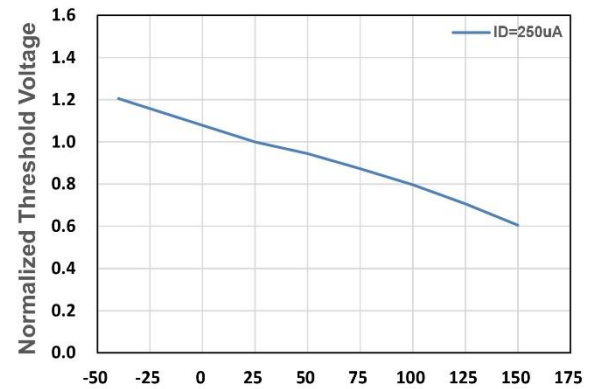


Figure 4. Gate Threshold Voltage

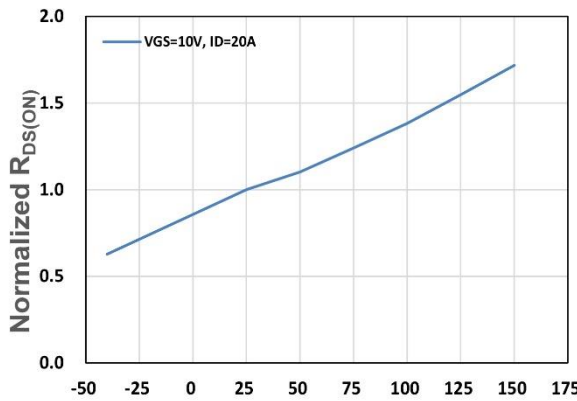


Figure 5. Drain-Source On Resistance

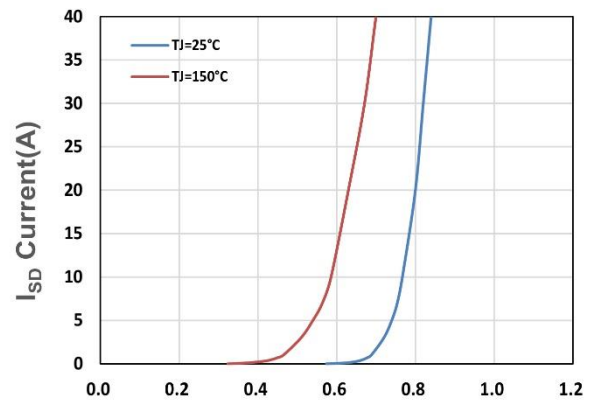
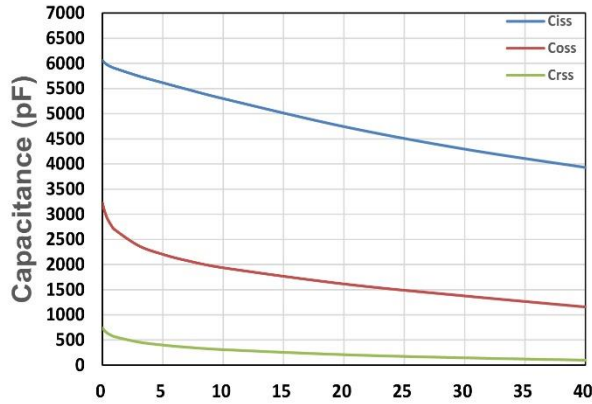
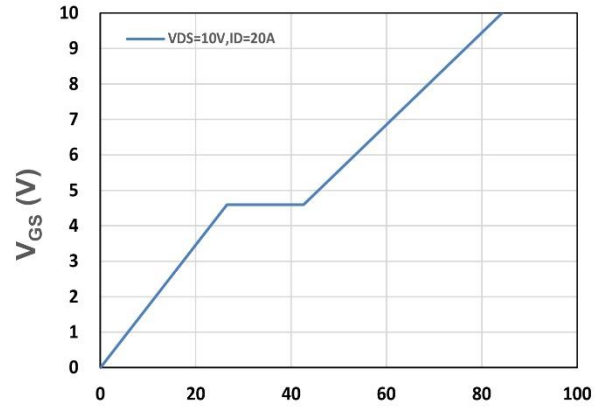


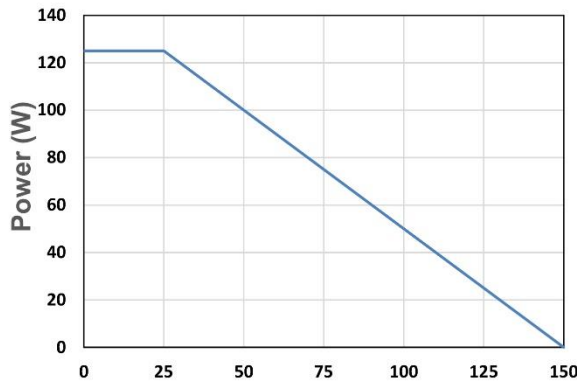
Figure 6. Source-Drain Diode Forward



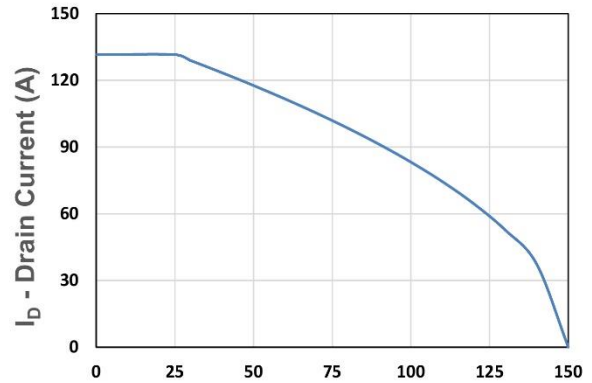
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



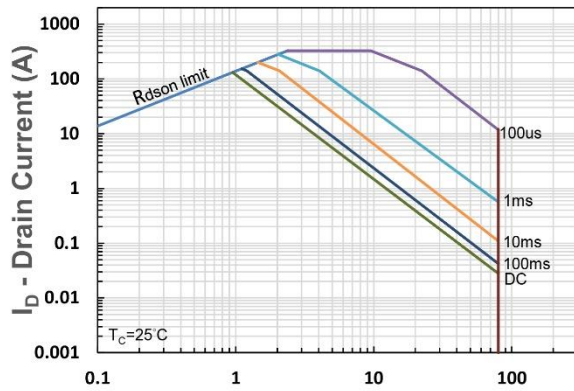
Qg , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



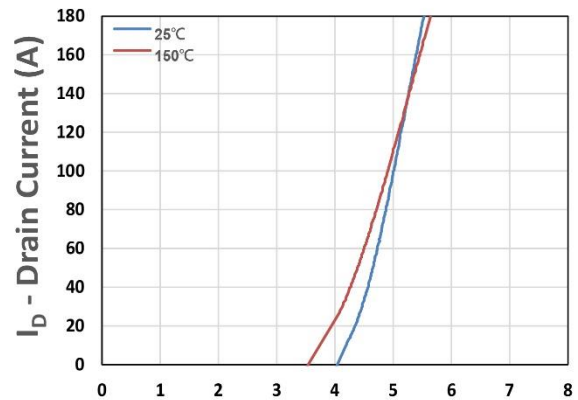
T_c - Case Temperature (°C)
Figure 9. Power Dissipation



T_c - Case Temperature (°C)
Figure 10. Drain Current



V_{DS} - Drain-Source Voltage (V)
Figure 11. Safe Operating Area



V_{GS} - Gate - Source Voltage (V)
Figure 12. Transfer Characteristics

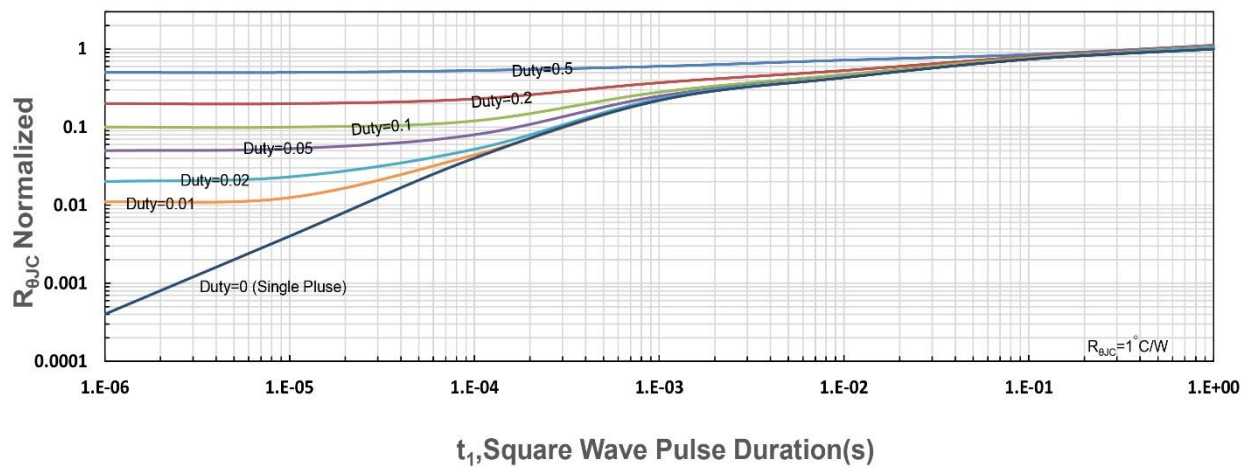


Figure 13. $R_{\theta JC}$ Transient Thermal Impedance