

N-Channel Enhancement Mode MOSFET

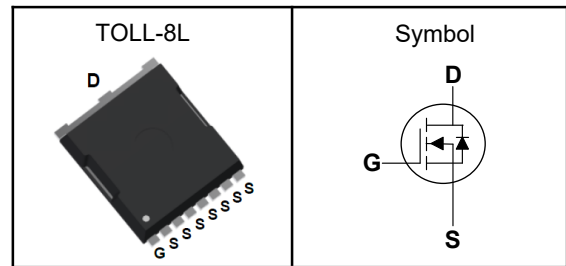
Features

- High Speed Power Switching
- Reliable and Rugged
- ROHS Compliant
- 100% Avalanche Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



| | | |
|------------------|-----|------------|
| V_{DSS} | 100 | V |
| $R_{DS(ON)-Typ}$ | 2.8 | m Ω |
| I_D | 230 | A |

Absolute Maximum Ratings ($T_C=25^{\circ}C$, Unless Otherwise Noted)

| Symbol | Parameter | Rating | Unit |
|--------------|--------------------------------|------------|-------------|
| V_{DSS} | Drain-Source Voltage | 100 | V |
| V_{GSS} | Gate-Source Voltage | ± 20 | V |
| T_J | Maximum Junction Temperature | -55 to 175 | $^{\circ}C$ |
| T_{STG} | Storage Temperature Range | -55 to 175 | $^{\circ}C$ |
| $I_{DM}^{①}$ | Pulse Drain Current Tested | 920 | A |
| I_D | Continuous Drain Current | 230 | A |
| P_D | Maximum Power Dissipation | 375 | W |
| E_{AS} | Avalanche Energy, Single pulse | 240 | mJ |

Thermal Characteristics

| Symbol | Parameter | Rating | Unit |
|-----------------|--|--------|---------------|
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient | 45 | $^{\circ}C/W$ |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | 0.4 | $^{\circ}C/W$ |

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150 $^{\circ}C$.

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.



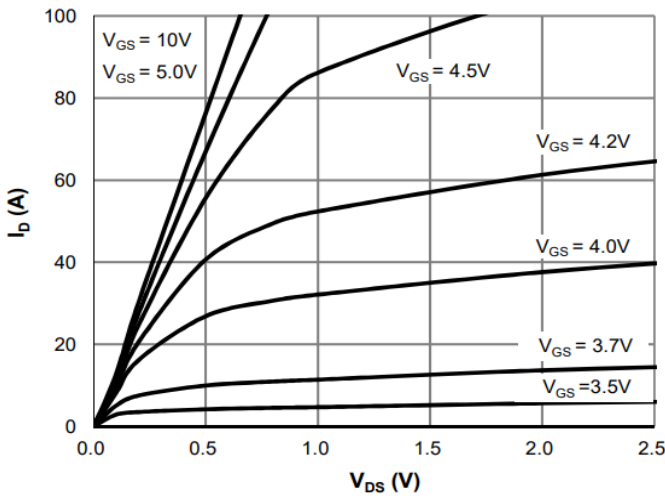
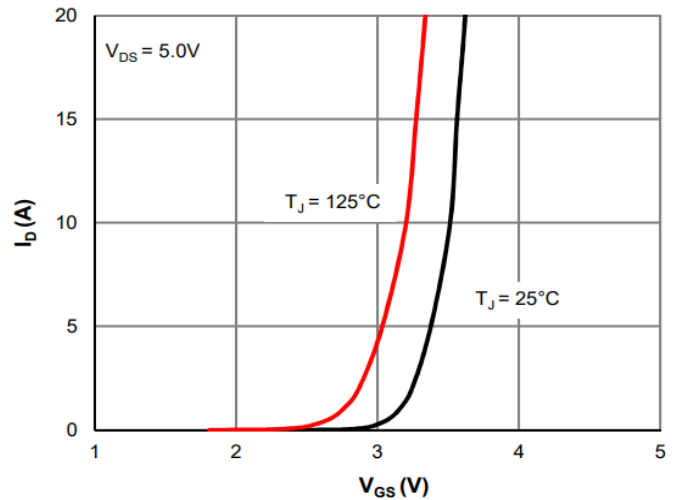
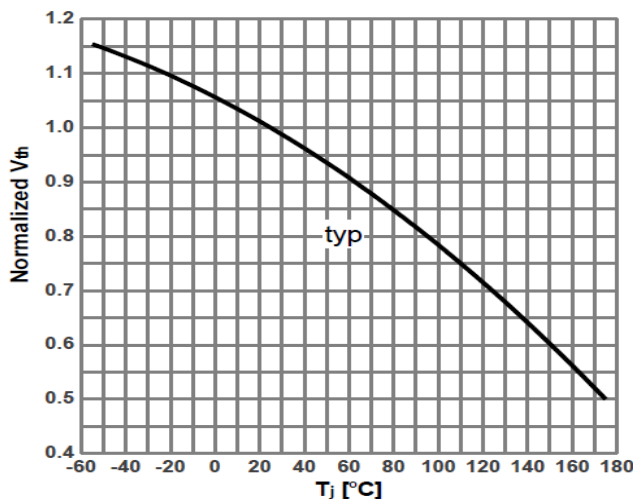
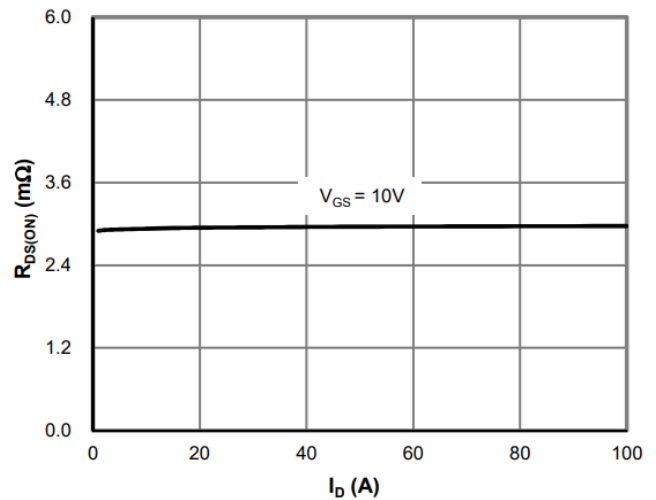
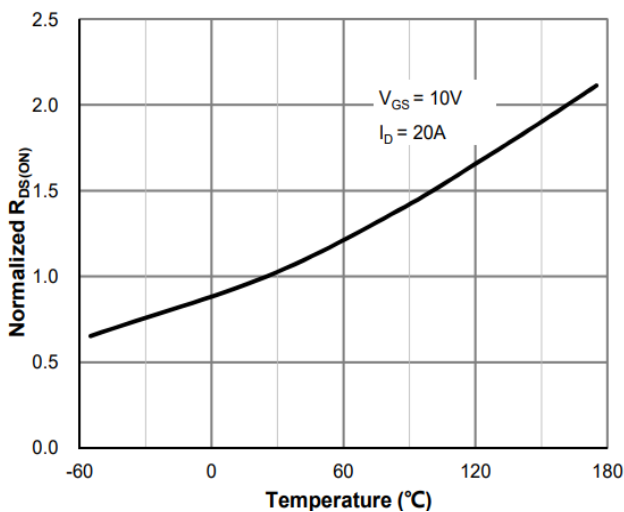
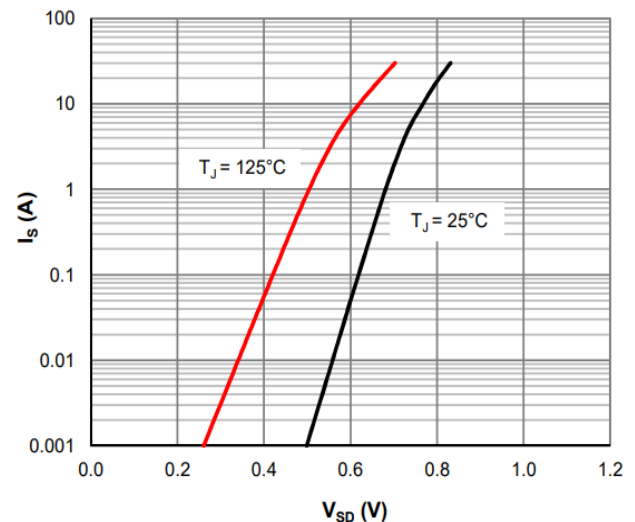
N-Channel Enhancement Mode MOSFET

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 | $V_{GS}=0V, I_D=250\mu A$ | 100 | --- | --- | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=100V, V_{GS}=0V$ | --- | --- | 1 | μA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2 | --- | 4 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| $R_{DS(on)}$ | Drain-Source On-state Resistance | $V_{GS}=10V, I_D=20A$ | --- | 2.8 | 3.4 | m Ω |
| Dynamic Characteristics^⑤ | | | | | | |
| C_{iss} | Input Capacitance | $V_{DS}=50V, V_{GS}=0V, \text{Freq.}=1\text{MHz}$ | --- | 4850 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 1040 | --- | |
| C_{riss} | Reverse Transfer Capacitance | | --- | 6 | --- | |
| $T_{d(on)}$ | Turn-on Delay Time | $V_{DS}=50V, V_{GS}=10V, I_D=20A, R_G=6\Omega$ | --- | 11 | --- | nS |
| T_r | Turn-on Rise Time | | --- | 22 | --- | |
| $T_{d(off)}$ | Turn-off Delay Time | | --- | 68 | --- | |
| T_f | Turn-off Fall Time | | --- | 48 | --- | |
| Q_g | Total Gate Charge | $V_{DS}=50V, V_{GS}=10V, I_D=20A$ | --- | 70 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 13 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 18 | --- | |
| Source-Drain Characteristics | | | | | | |
| V_{SD} | Diode Forward Voltage | $I_S=15A, V_{GS}=0V$ | --- | --- | 1.3 | V |
| t_{rr} | Reverse Recovery Time | $I_F=15A, V_R=50V, di_F/dt=100A/\mu s$ | --- | 64 | --- | nS |
| Q_{rr} | Reverse Recovery Charge | | --- | 72 | --- | 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.

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Typical Characteristics

Fig 1: Typ. output characteristics

Fig 2: Typ. transfer characteristics

Fig 3: Gate threshold voltage vs. Junction temperature

Fig 4: On-state resistance vs. Drain current

Fig 5: On-state resistance vs. Junction temperature

Fig 6: Forward characteristics of reverse diode

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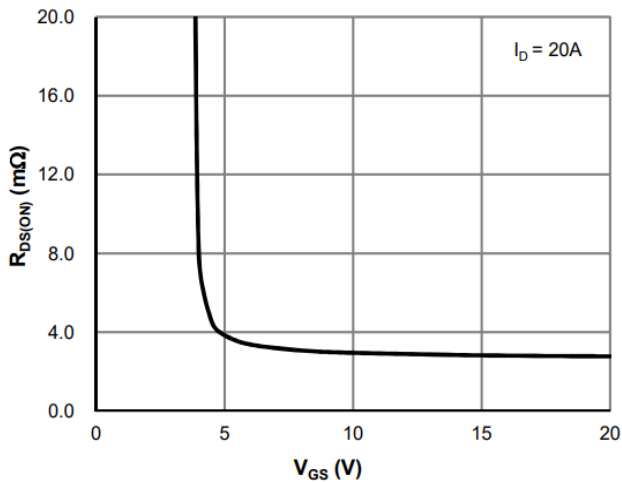


Fig 7: On-state resistance vs. Vgs characteristics

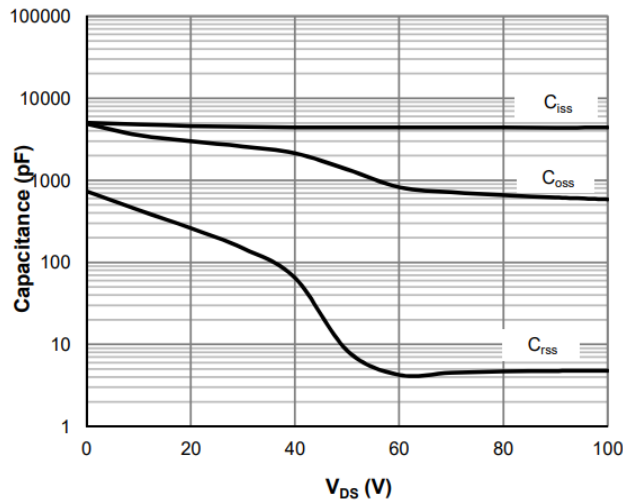


Fig 8: Typ. capacitances

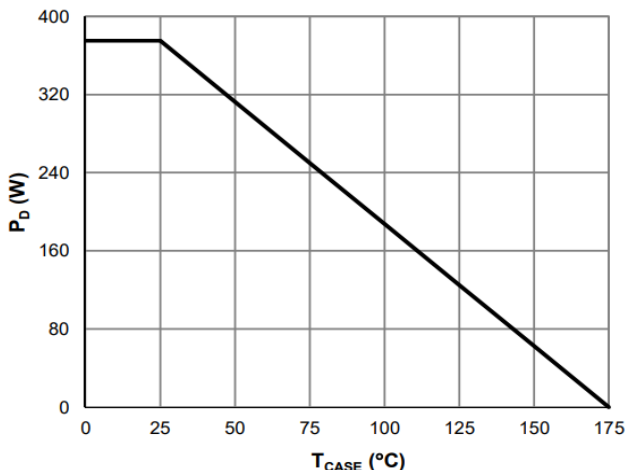


Fig 9: Power dissipation

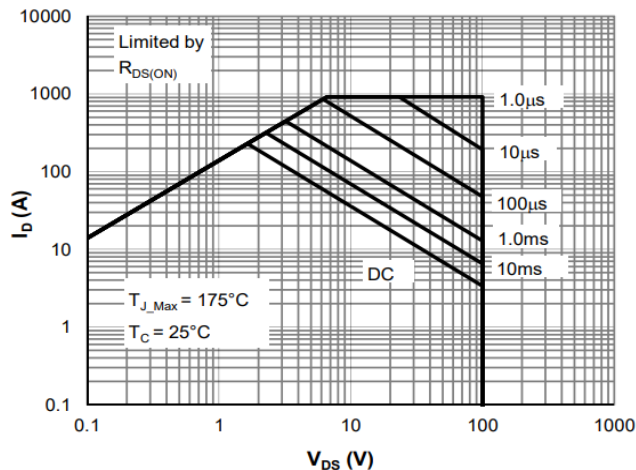


Fig 10: Max. Safe operating area

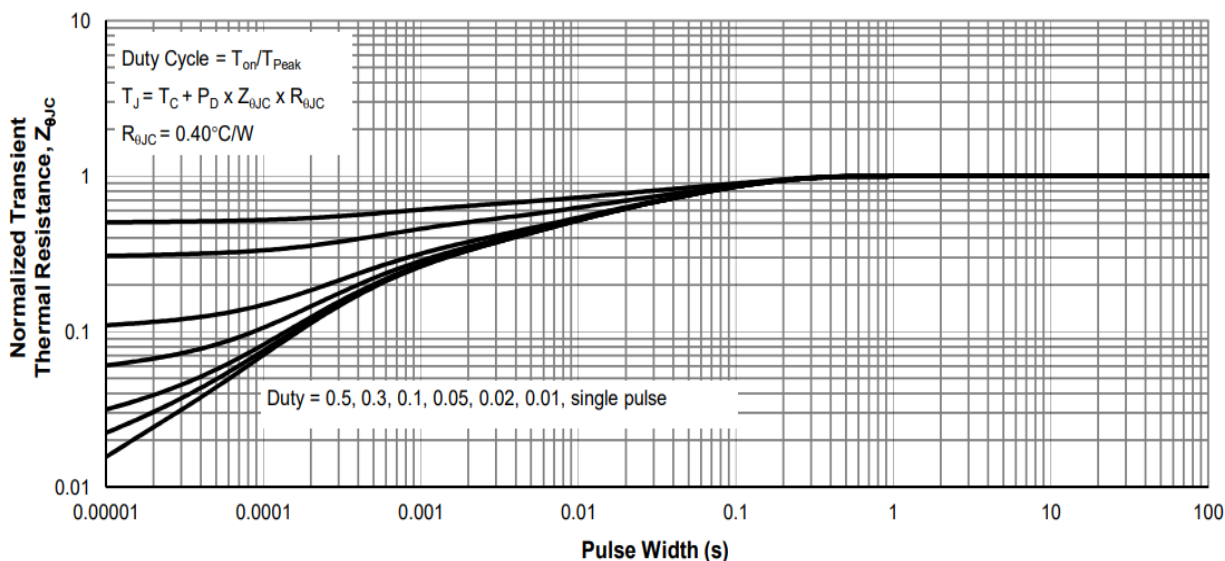
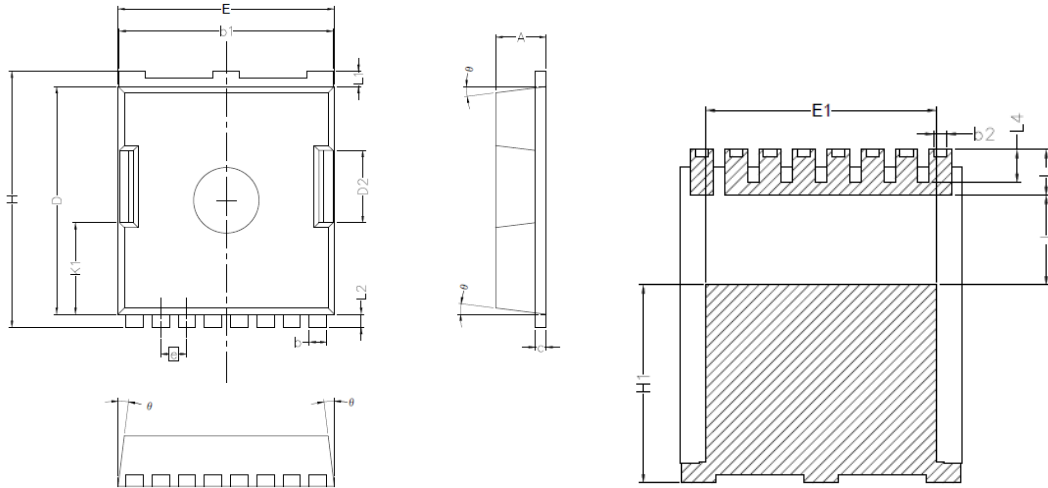


Fig 11: Normalized Maximum Transient Thermal Impedance

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TOLL-8L Package Outline Data


| Symbol | Dimensions In Millimeters | |
|----------|---------------------------|-------|
| | MIN. | MAX. |
| A | 2.20 | 2.40 |
| b | 0.70 | 0.90 |
| b1 | 9.70 | 9.90 |
| b2 | 0.42 | 0.50 |
| c | 0.40 | 0.60 |
| D | 10.28 | 10.58 |
| D2 | 3.10 | 3.60 |
| E | 9.70 | 10.10 |
| E1 | 7.90 | 8.30 |
| e | 1.20BSC | |
| H | 11.48 | 11.88 |
| H1 | 6.75 | 7.15 |
| N | 8 | |
| J | 3.00 | 3.30 |
| K1 | 3.98 | 4.38 |
| L | 1.40 | 1.80 |
| L1 | 0.60 | 0.80 |
| L2 | 0.50 | 0.70 |
| L4 | 1.00 | 1.30 |
| θ | 4° | 10° |