

Features

- Split Gate Trench MOSFET Technology
- Excellent Package for Heat Dissipation
- High Density Cell Design for Low $R_{DS(on)}$
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

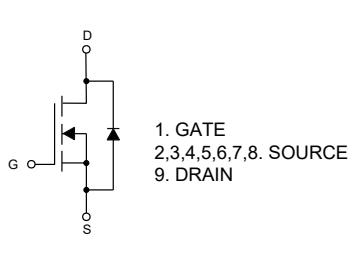
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 40°C/W Junction to Ambient ⁽¹⁾
- Thermal Resistance: 0.25°C/W Junction to Case ⁽¹⁾

| Parameter | Symbol | Rating | Unit | |
|---|----------|-------------------------|------|---|
| Drain-Source Voltage | V_{DS} | 100 | V | |
| Gate-Source Voltage | V_{GS} | ±20 | V | |
| Continuous Drain Current | I_D | $T_C=25^\circ\text{C}$ | 300 | A |
| | | $T_C=100^\circ\text{C}$ | 267 | A |
| Pulsed Drain Current ⁽²⁾ | I_{DM} | 1200 | A | |
| Total Power Dissipation | P_D | 500 | W | |
| Single Pulsed Avalanche Energy ⁽³⁾ | E_{AS} | 800 | mJ | |

Note:

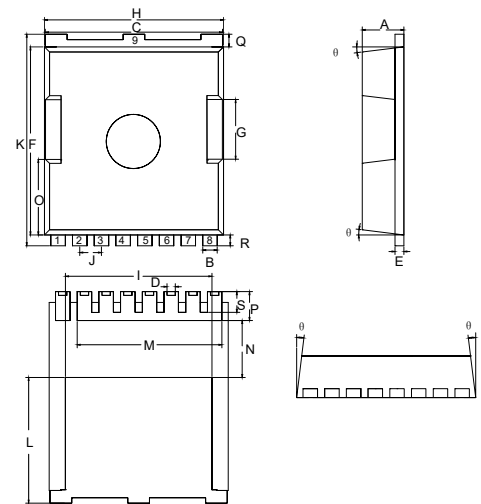
- 1.Surface Mounted on Minimum Footprint Pad Area.
- 2.Pulse Test: Pulse Width ≤ 10μs, Duty Cycle ≤ 1%.
3. $T_J=25^\circ\text{C}$, L=1.0mH, $V_{DD}=50\text{V}$.

Internal Structure and Marking Code



N-CHANNEL MOSFET

TOLL-8L



DIMENSIONS

| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|-------|-------|------|
| | MIN | MAX | MIN | MAX | |
| A | 0.087 | 0.094 | 2.20 | 2.40 | |
| B | 0.028 | 0.035 | 0.70 | 0.90 | |
| C | 0.382 | 0.390 | 9.70 | 9.90 | |
| D | 0.017 | 0.020 | 0.42 | 0.50 | |
| E | 0.016 | 0.024 | 0.40 | 0.60 | |
| F | 0.405 | 0.417 | 10.28 | 10.58 | |
| G | 0.122 | 0.138 | 3.10 | 3.50 | |
| H | 0.382 | 0.398 | 9.70 | 10.10 | |
| I | 0.311 | 0.327 | 7.90 | 8.30 | |
| J | 0.047 | | 1.20 | | BSC |
| K | 0.452 | 0.468 | 11.48 | 11.88 | |
| L | 0.266 | 0.281 | 6.75 | 7.15 | |
| M | 0.315 | | 8.00 | | |
| N | 0.118 | 0.130 | 3.00 | 3.30 | |
| O | 0.157 | 0.172 | 3.98 | 4.38 | |
| P | 0.055 | 0.071 | 1.40 | 1.80 | |
| Q | 0.024 | 0.031 | 0.60 | 0.80 | |
| R | 0.020 | 0.028 | 0.50 | 0.70 | |
| S | 0.039 | 0.051 | 1.00 | 1.30 | |
| θ | 4° | 10° | 4° | 10° | |

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------|---------------|--|-----|-------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 100 | | | V |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 20V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=80V, V_{GS}=0V$ | | | 1 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2 | | 4 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=30A$ | | 1.2 | 1.45 | m Ω |
| | | $V_{GS}=6V, I_D=15A$ | | 1.48 | 1.9 | m Ω |
| Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | | | | 300 | A |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=30A$ | | | 1.3 | V |
| Reverse Recovery Time | t_{rr} | $I_S=30A, di/dt=100A/\mu s$ | | 124 | | ns |
| Reverse Recovery Charge | Q_{rr} | | | 388 | | nC |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=50V, V_{GS}=0V, f=1MHz$ | | 13258 | | pF |
| Output Capacitance | C_{oss} | | | 2058 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 111 | | |
| Total Gate Charge | Q_g | $V_{DS}=50V, V_{GS}=10V, I_D=30A$ | | 240 | | nC |
| Gate-Source Charge | Q_{gs} | | | 60 | | |
| Gate-Drain Charge | Q_{gd} | | | 59 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DS}=50V, V_{GEN}=10V,$ $R_G=4.5\Omega, R_L=1.66\Omega,$ $I_{DS}=30A$ | | 33 | | ns |
| Turn-On Rise Time | t_r | | | 69 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 172 | | |
| Turn-Off Fall Time | t_f | | | 105 | | |

Curve Characteristics

Fig. 1 - Typical Output Characteristics

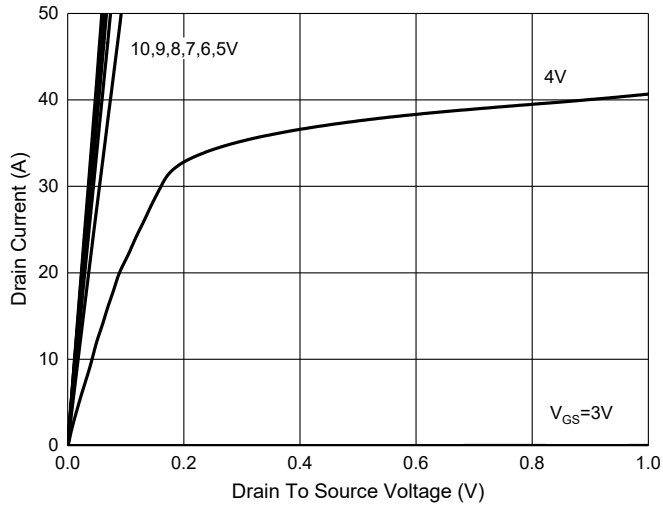


Fig. 2 - $R_{DS(ON)} - V_{GS}$

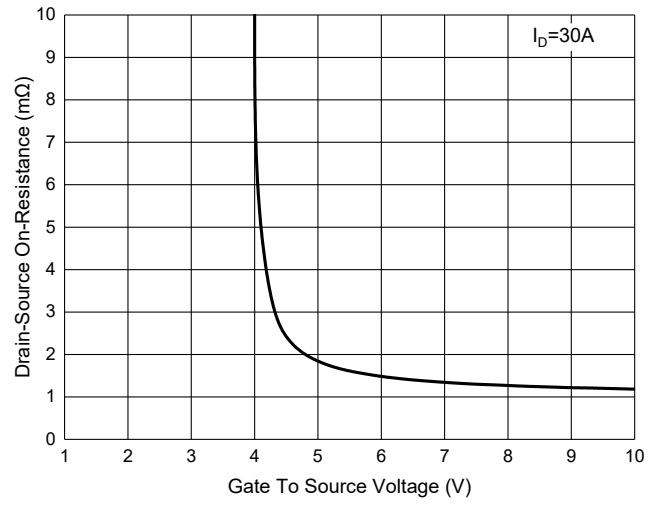


Fig. 3 - $R_{DS(ON)} - I_D$

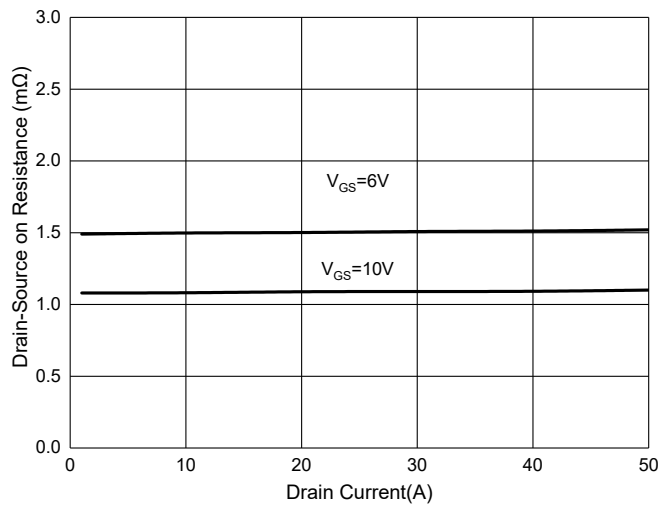


Fig. 4 - Normalized On Resistance Characteristics

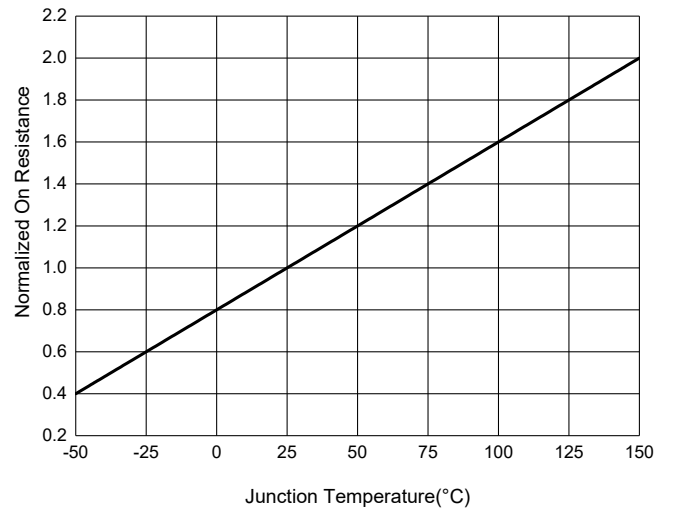


Fig. 5 - Capacitance Characteristics

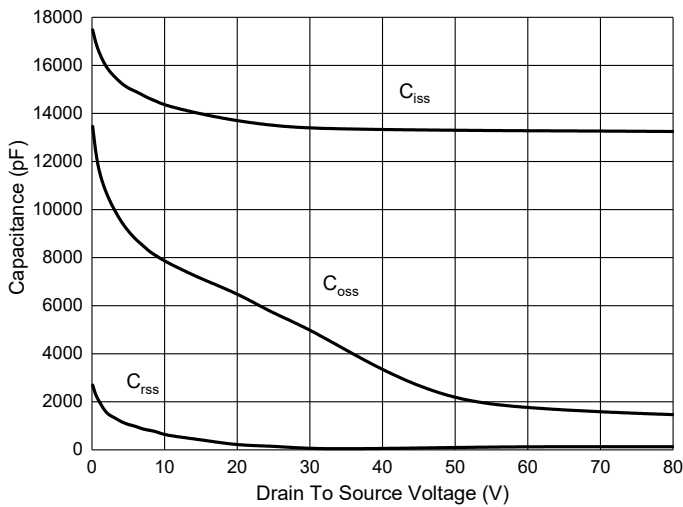
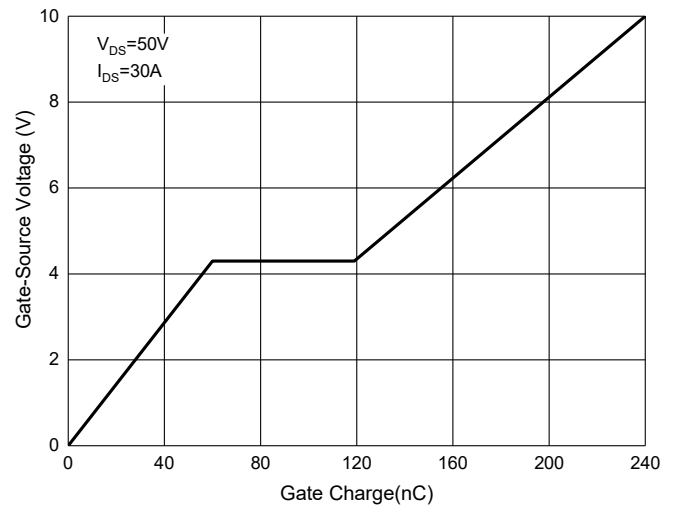


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - $I_S - V_{SD}$

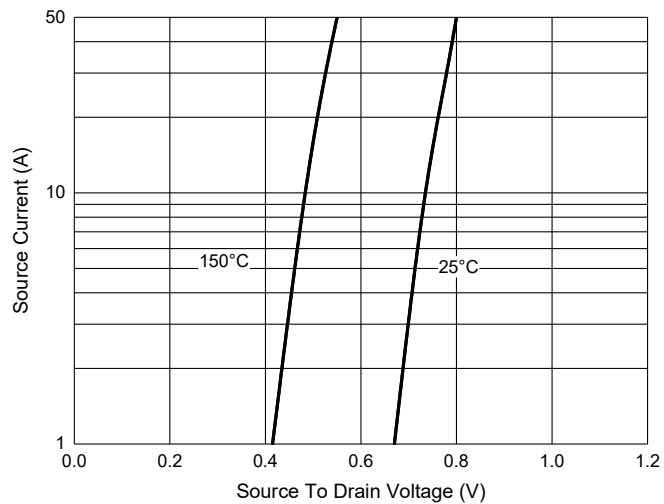
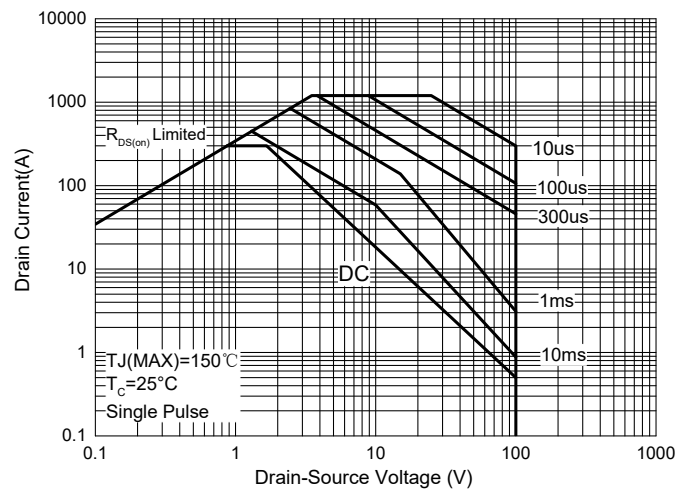


Fig. 8 - Safe Operation Area



Ordering Information

| Device | Packing |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 2Kpcs/Reel |

Note : Adding "-HF" Suffix For Halogen Free, eg. Part Number-TP-HF

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