## Features

- Split Gate Trench MOSFET Technology
- Excellent Package For Heat Dissipation
- Moisture Sensitivity Level 1
- Halogen Free."Green"Device(Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

# N-CHANNEL MOSFET

## Maximum Ratings

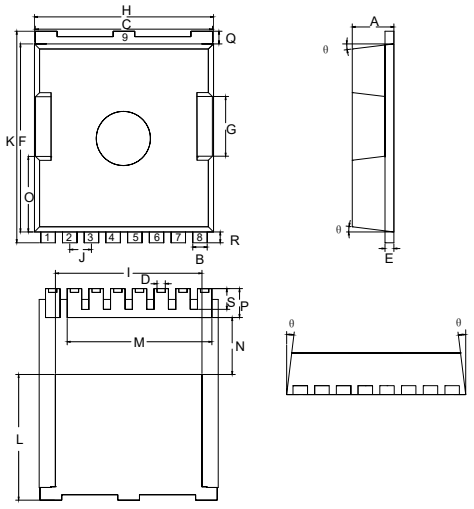
- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 45°C/W Junction to Ambient (Note 2)
- Thermal Resistance: 0.5°C/W Junction to Case

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 100 | V |
| Gate-Source Volltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $T_C$=25°C | $I_D$ | 265 | A |
| | $T_C$=100°C | | 187 | |
| Pulsed Drain Current (Note 3) | | $I_{DM}$ | 1060 | A |
| Total Power Dissipation(Note 4) | | $P_D$ | 375 | W |
| Single Pulsed Avalanche Energy(Note 5) | | $E_{AS}$ | 1482 | mJ |

Note:

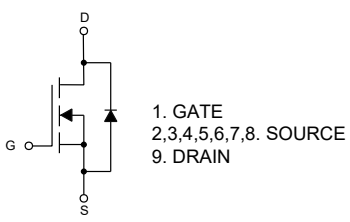
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in$^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$ =25°C.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. $P_D$ is based on max. junction temperature, using junction-case thermal resistance.
5. $T_J$=25°C, $V_{DD}$= 50V, $V_{GS}$=10V,$R_G$=25Ω,L=2mH.

## TOLL-8L

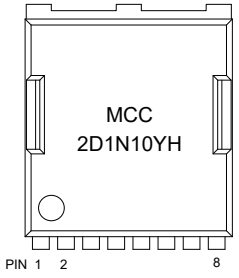



| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| DIM | INCHES | | MM | | NOTE |
| | MIN | MAX | MIN | MAX | |
| A | 0.087 | 0.094 | 2.20 | 2.40 | |
| B | 0.028 | 0.035 | 0.70 | 0.90 | |
| C | 0.382 | 0.390 | 9.70 | 9.90 | |
| D | 0.017 | 0.020 | 0.42 | 0.50 | |
| E | 0.016 | 0.024 | 0.40 | 0.60 | |
| 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° | |

## Internal Structure and Marking Code




1. GATE
2,3,4,5,6,7,8. SOURCE
9. DRAIN



## 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, $I_D$=250μA | 100 | | | V |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$ =±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=100V, $V_{GS}$=0V | | | 1 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 2.2 | 3 | 3.8 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=10V, $I_D$=50A | | 1.5 | 2.1 | mΩ |
| Gate Resistance | $R_g$ | f=1 MHz,Open drain | | 0.9 | | Ω |
| **Diode Characteristics** | | | | | | |
| Continuous Body Diode Current | $I_S$ | | | | 265 | A |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_S$=30A | | | 1.2 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_F$=50A,di/dt=100A/μs | | 93 | | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | | 157 | | nC |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=50V,$V_{GS}$=0V,f=1MHz | | 9600 | | pF |
| Output Capacitance | $C_{oss}$ | | | 3245 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 48 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=50V,$V_{GS}$=10V,$I_D$=50A | | 133 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 55 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 17 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$=50V,$V_{GS}$=10V, $R_{GEN}$=3Ω, $I_D$=50A | | 30 | | ns |
| Turn-On Rise Time | $t_r$ | | | 48 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 59 | | |
| Turn-Off Fall Time | $t_f$ | | | 34 | | |

## Curve Characteristics

**Fig.1 - Typical Output Characteristics**

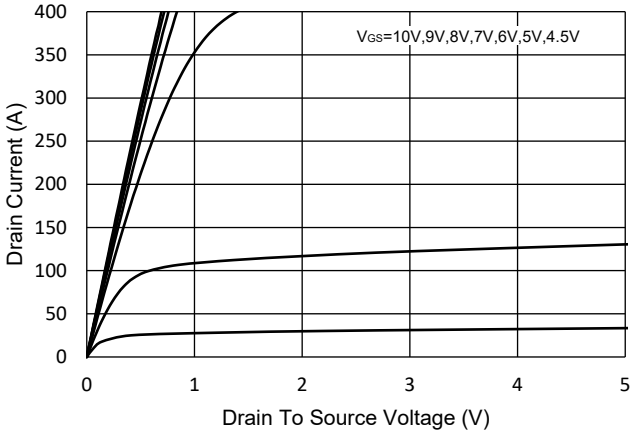



**Fig. 2 - Transfer Characteristics**

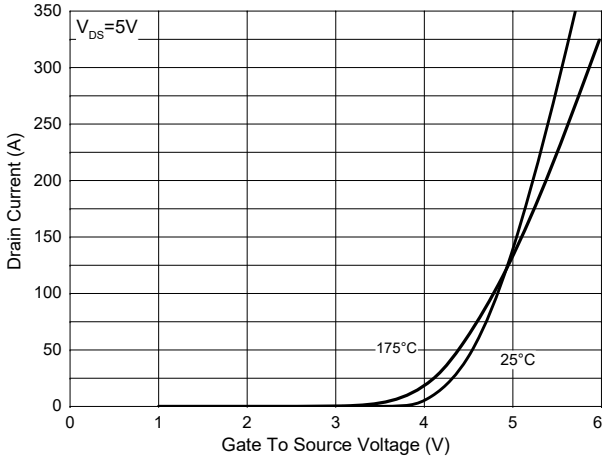



**Fig.3 - $R_{DS(ON)}$ - $V_{GS}$**

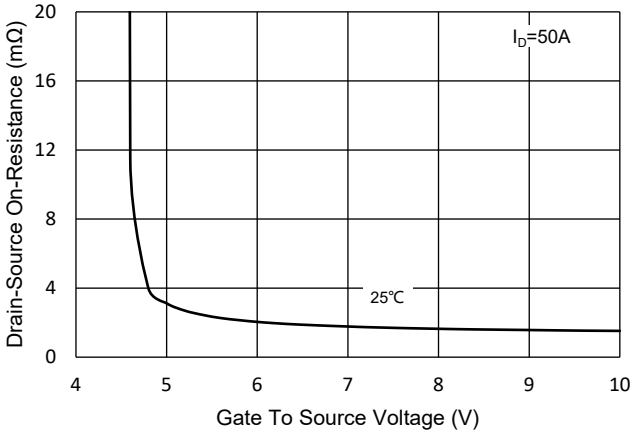



**Fig. 4 - $R_{DS(ON)}$—$I_D$**

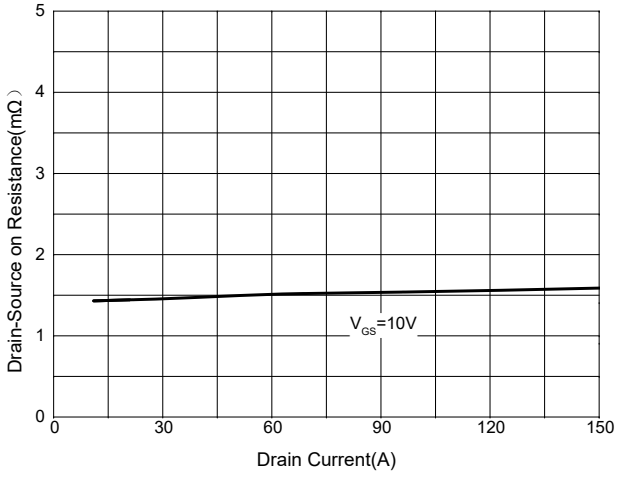



**Fig.5 - Capacitance Characteristics**

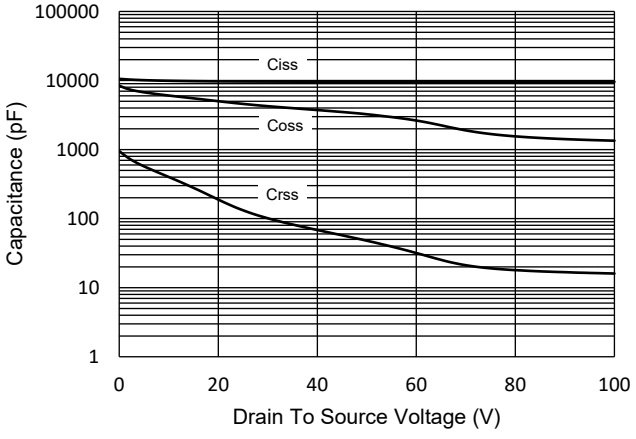
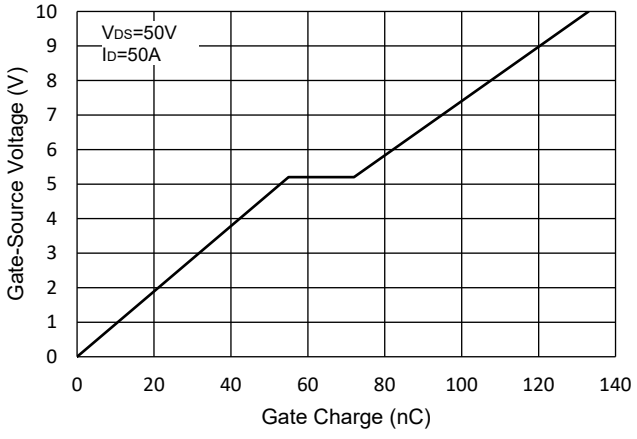



**Fig.6 - Gate Charge**



## Curve Characteristics

**Fig.7 - Normalized Threshold Voltage**

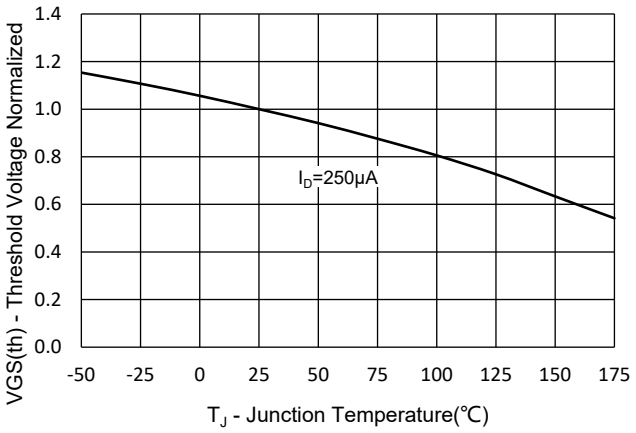



**Fig.8 - Normalized On Resistance Characteristics**

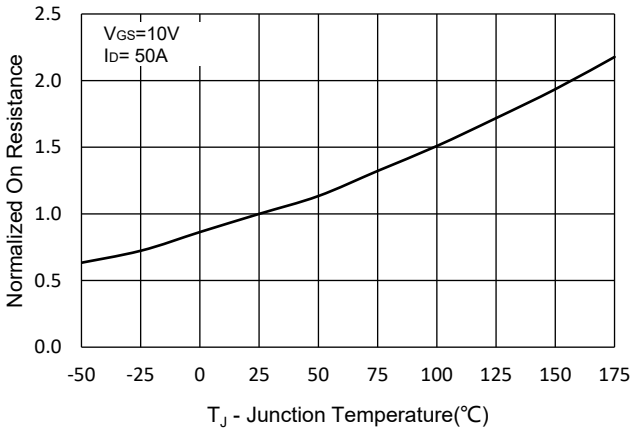



**Fig.9 - $I_S$ - $V_{SD}$**

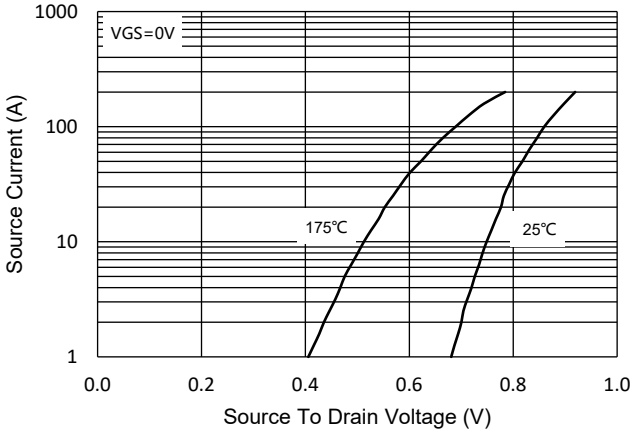



**Fig.10 - Drain Current**

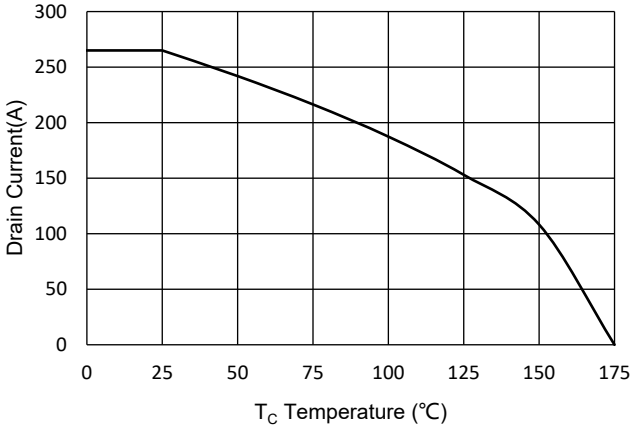
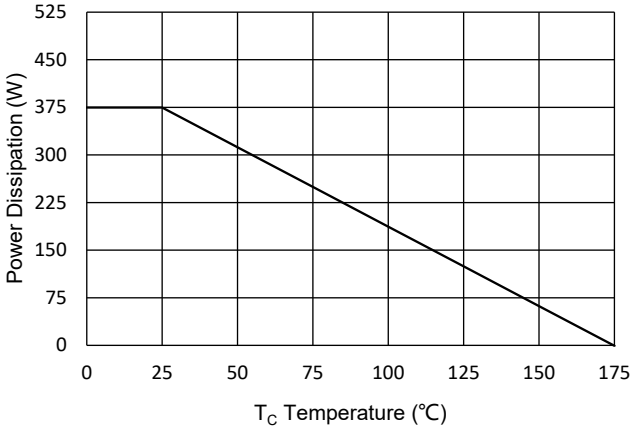



**Fig.11 - PD Dissipation**



## Curve Characteristics

**Fig.12 - Safe Operation Area**

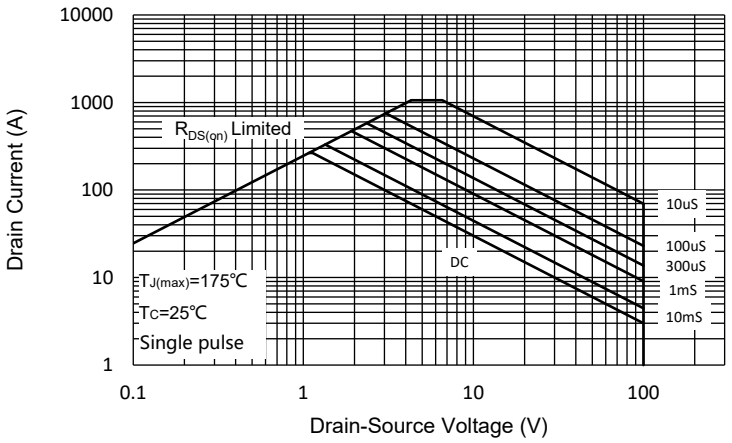
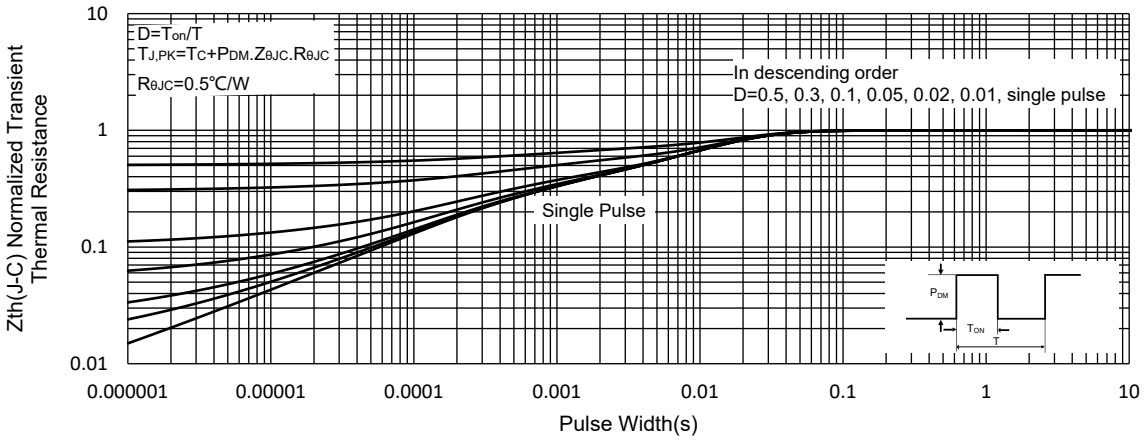



**Fig.13 - Normalized Transient Thermal Impedance**



## Ordering Information

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