## Features

- Trench MOSFET Technology
- Moisture Sensitivity Level 3
- Halogen Free. “Green” Device(Note1)
- 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

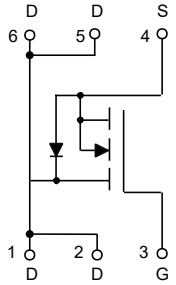
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 70°C/W Junction to Ambient (Note2)

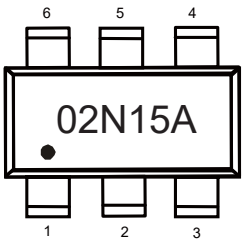
| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 150 | V |
| Gate-Source Volltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $T_A$=25°C | $I_D$ | 2 | A |
| | $T_A$=100°C | | 1.3 | A |
| Pulsed Drain Current (Note3) | | $I_{DM}$ | 8 | A |
| Total Power Dissipation (Note4) | | $P_D$ | 1.8 | W |

Note:

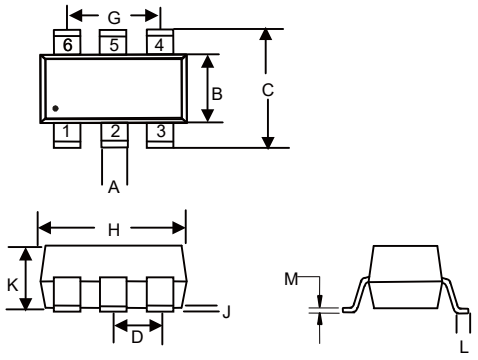
1. Halogen free "Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in$^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$=25°C.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

## Internal Structure and Marking Code




## SOT23-6L




| DIM | MIN | INCHES MAX | MM MIN | MM MAX | NOTE |
|---|---|---|---|---|---|
| A | 0.012 | 0.020 | 0.30 | 0.50 | |
| B | 0.051 | 0.070 | 1.30 | 1.80 | |
| C | 0.087 | 0.126 | 2.20 | 3.20 | |
| D | 0.037 | | 0.95 | | TYP. |
| G | 0.074 | | 1.90 | | TYP. |
| H | 0.106 | 0.122 | 2.70 | 3.10 | |
| J | 0.002 | 0.006 | 0.05 | 0.15 | |
| K | 0.030 | 0.051 | 0.75 | 1.30 | |
| L | 0.012 | 0.024 | 0.30 | 0.60 | |
| M | 0.003 | 0.008 | 0.08 | 0.22 | |

## 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 | 150 | | | V |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$ =±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=150V, $V_{GS}$=0V | | | 1 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1.0 | 1.8 | 2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=10V, $I_D$=2A | | 214 | 290 | mΩ |
| | | $V_{GS}$=8V, $I_D$=1.5A | | 215 | 300 | |
| Forward Transconductance | $g_{fs}$ | $V_{DS}$ =50V, $I_D$ =1A | | 13 | | S |
| Gate Resistance | $R_g$ | F=1 MHz, Open drain | | 2.4 | | Ω |
| **Diode Characteristics** | | | | | | |
| Continuous Body Diode Current | $I_S$ | | | | 2 | A |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_S$=1A | | | 1.3 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_F$=2A, $dI_F/dt$=100A/μs | | 28 | | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | | 33 | | nC |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=100V,$V_{GS}$=0V,f=1MHz | | 666 | | pF |
| Output Capacitance | $C_{oss}$ | | | 15 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 10 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=75V,$V_{GS}$=10V,$I_D$=2A | | 14 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.9 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 3.5 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$=75V, $V_{GS}$=10V, $R_{GEN}$=4.5Ω, $I_{DS}$=2A | | 5.9 | | ns |
| Turn-On Rise Time | $t_r$ | | | 2.5 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 18 | | |
| Turn-Off Fall Time | $t_f$ | | | 3.3 | | |

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

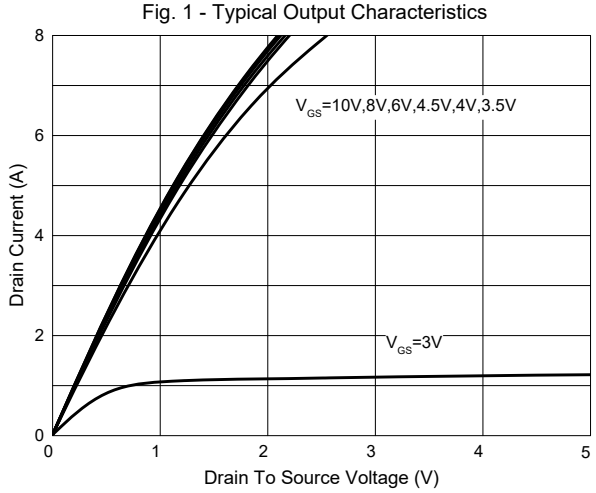



Fig. 2 - Transfer Characteristics

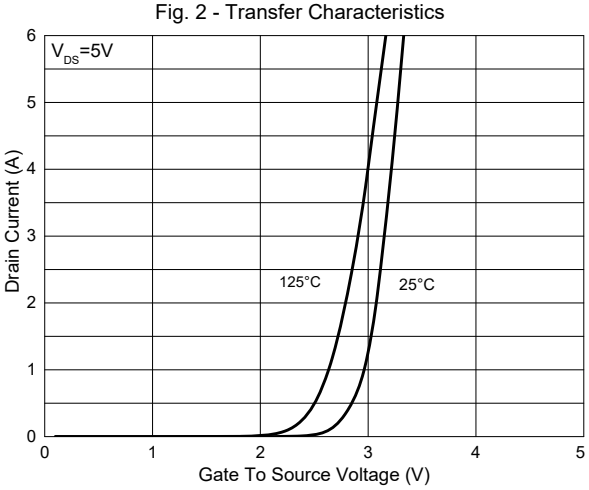



Fig. 3 - $R_{DS(ON)}$—$V_{GS}$

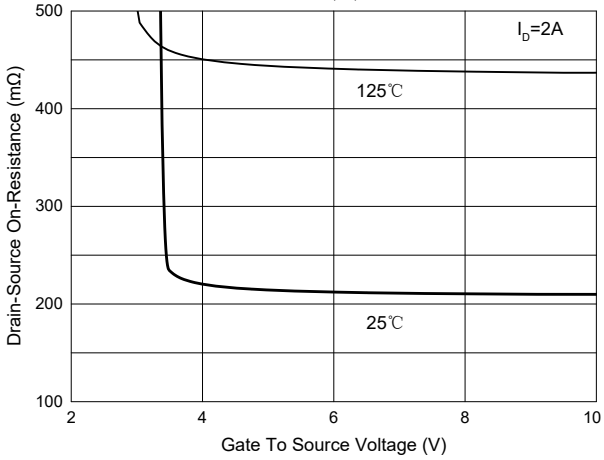



Fig. 4 - $R_{DS(ON)}$—$I_D$

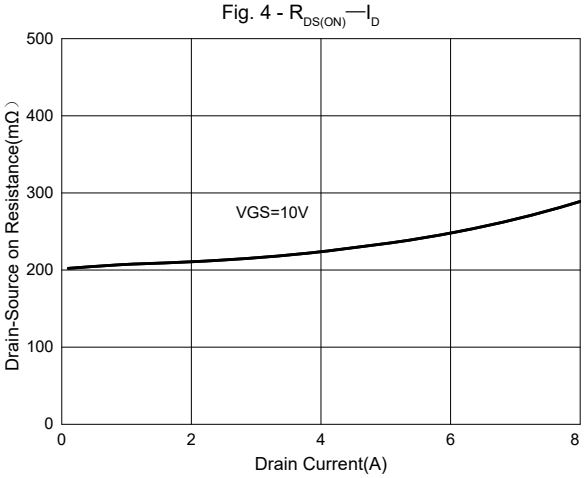



Fig. 5 - Capacitance Characteristics

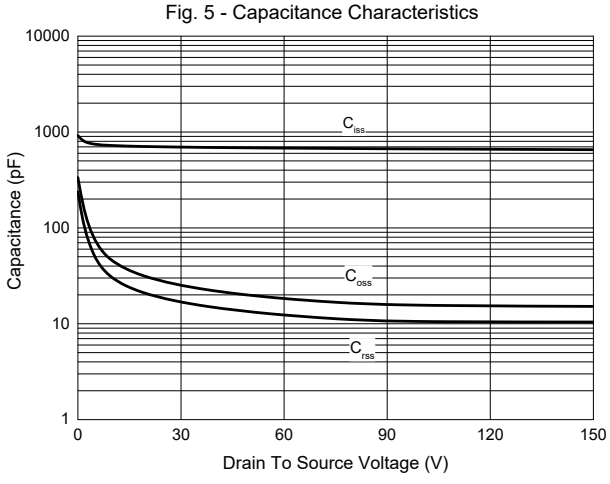
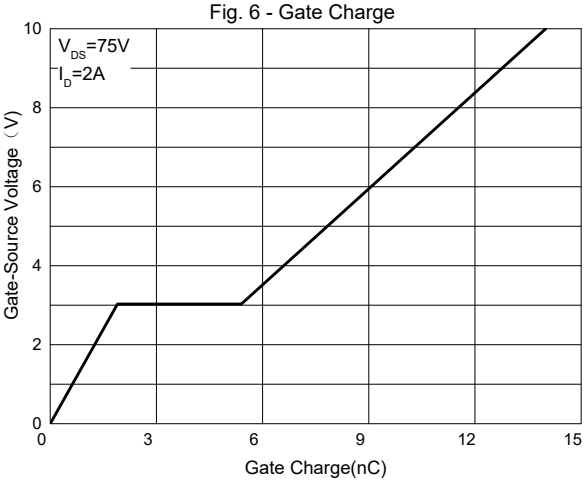



Fig. 6 - Gate Charge



## Curve Characteristics

Fig. 7 - Nomalized Threshold Voltage

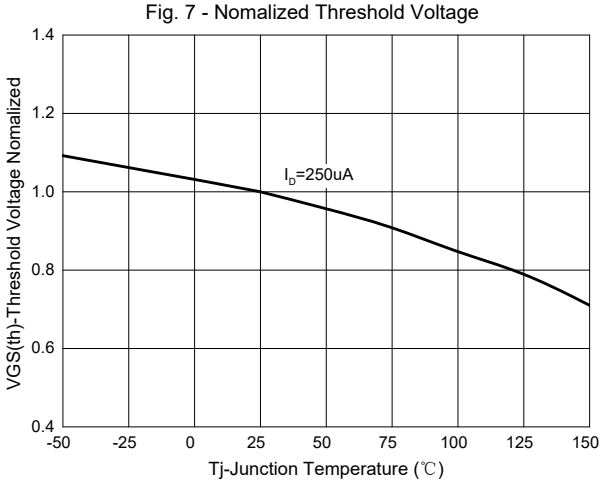



Fig.8-Normalized On Resistance Characteristics

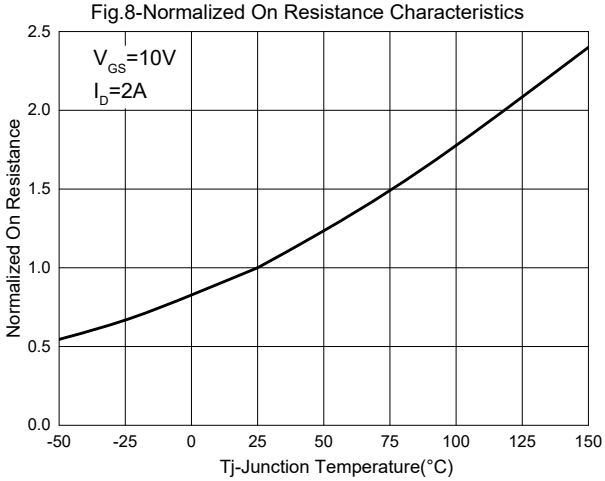



Fig.9 - $I_S$—$V_{SD}$

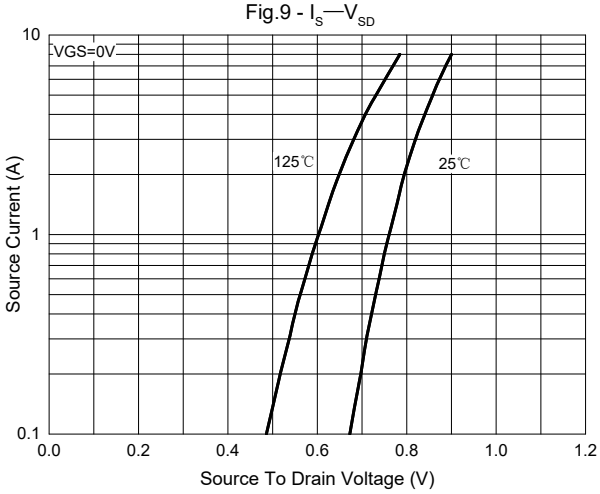



Fig. 10 - Drain Current

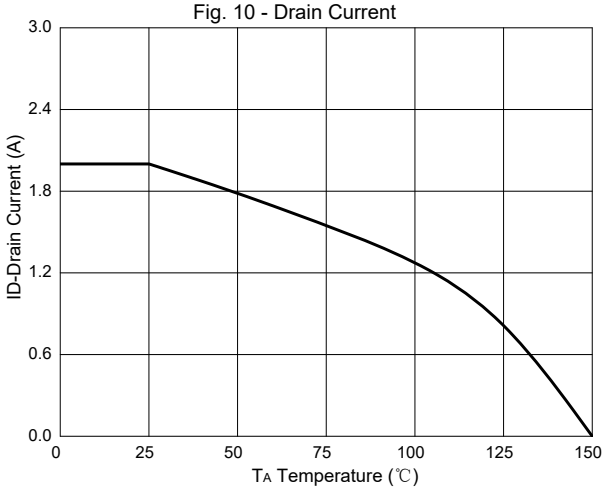
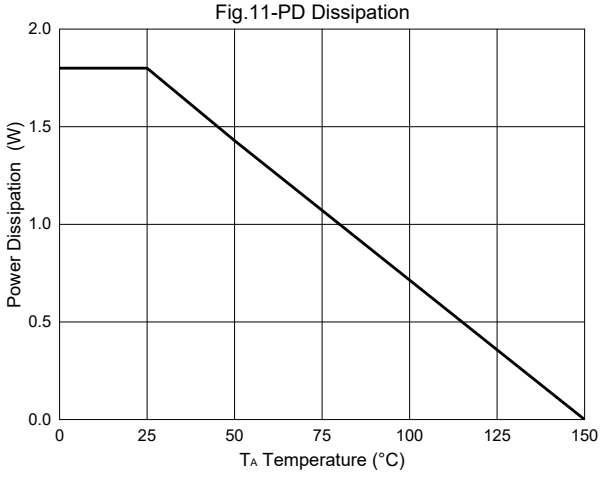



Fig.11-PD Dissipation



## Curve Characteristics

Fig. 12 - Safe Operation Area

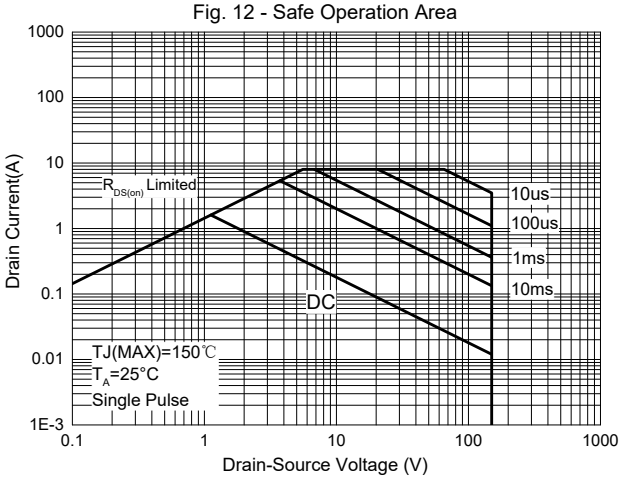
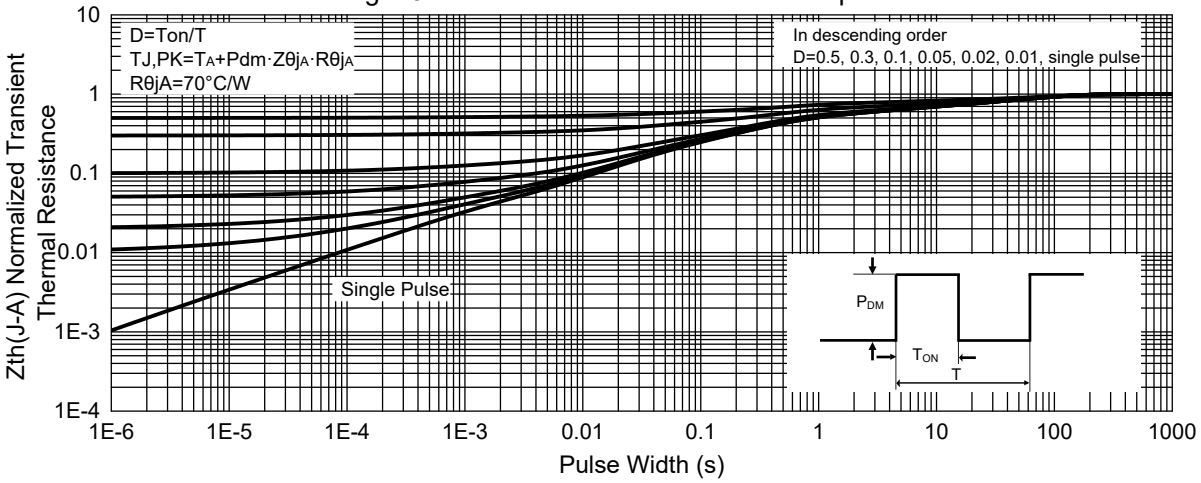



Fig. 13 -Normalized Transient Thermal Impedance



## Ordering Information

| Device | Packing |
|---|---|
| Part Number-TP | Tape&Reel: 3Kpcs/Reel |