

## Features

- Trench MOSFET Technology
- Moisture Sensitivity Level 3
- Halogen Free. "Green" Device<sup>(Note1)</sup>
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

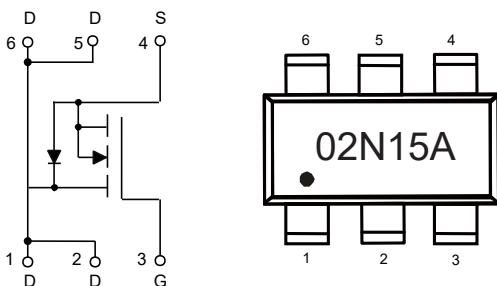
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 70°C/W Junction to Ambient<sup>(Note2)</sup>

| Parameter                                  | Symbol   | Rating                  | Unit |   |
|--|----------|-------------------------|------|---|
| Drain-Source Voltage                       | $V_{DS}$ | 150                     | V    |   |
| Gate-Source Voltage                        | $V_{GS}$ | $\pm 20$                | V    |   |
| Continuous Drain Current                   | $I_D$    | $T_A=25^\circ\text{C}$  | 2    | A |
|  |          | $T_A=100^\circ\text{C}$ | 1.3  | A |
| Pulsed Drain Current <sup>(Note3)</sup>    | $I_{DM}$ | 8                       | A    |   |
| Total Power Dissipation <sup>(Note4)</sup> | $P_D$    | 1.8                     | W    |   |

Note:

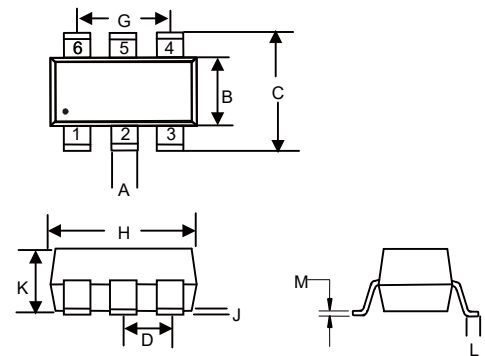
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ .
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



# N-CHANNEL MOSFET

## SOT23-6L



| DIM | MIN DIMENSIONS |       |      |      | NOTE |
|-----|----------------|-------|------|------|------|
|     | INCHES         |       | MM   |      |      |
|     | MAX            | MIN   | MAX  |      |      |
| 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       |
|---------------------------------|---------------|--|-----|-----|-----------|------------|
| <b>Static Characteristics</b>   |               |  |     |     |           |            |
| Drain-Source Breakdown Voltage  | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$                              | 150 |     |           | V          |
| Gate-Source Leakage Current     | $I_{GSS}$     | $V_{DS}=0V, V_{GS}=\pm 20V$                            |     |     | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current | $I_{DSS}$     | $V_{DS}=150V, V_{GS}=0V$                               |     |     | 1         | $\mu A$    |
| Gate-Threshold Voltage          | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$                          | 1.0 | 1.8 | 2.5       | V          |
| Drain-Source On-Resistance      | $R_{DS(on)}$  | $V_{GS}=10V, I_D=2A$                                   |     | 214 | 290       | m $\Omega$ |
|                                 |               | $V_{GS}=8V, I_D=1.5A$                                  |     | 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 |           | $\Omega$   |
| <b>Diode Characteristics</b>    |               |  |     |     |           |            |
| 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           | $t_{rr}$      | $I_F=2A, dI_F/dt=100A/\mu s$                           |     | 28  |           | ns         |
| Reverse Recovery Charge         | $Q_{rr}$      |  |     |     | 33        |            |
| <b>Dynamic Characteristics</b>  |               |  |     |     |           |            |
| 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              | $t_{d(on)}$   | $V_{DD}=75V, V_{GS}=10V, R_{GEN}=4.5\Omega, I_{DS}=2A$ |     | 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

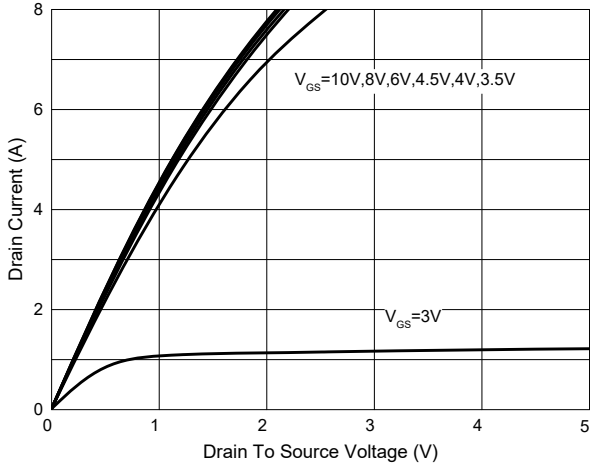


Fig. 2 - Transfer Characteristics

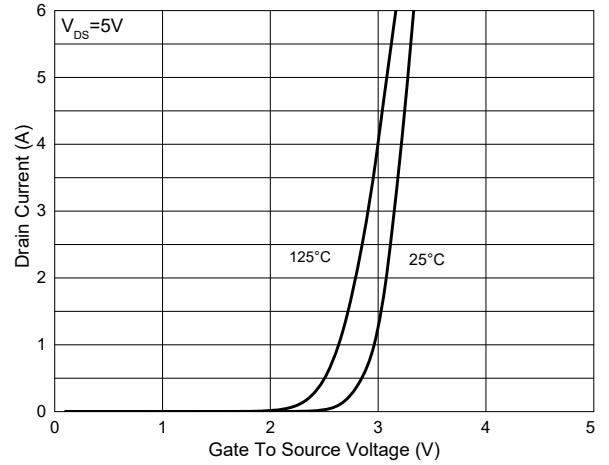


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

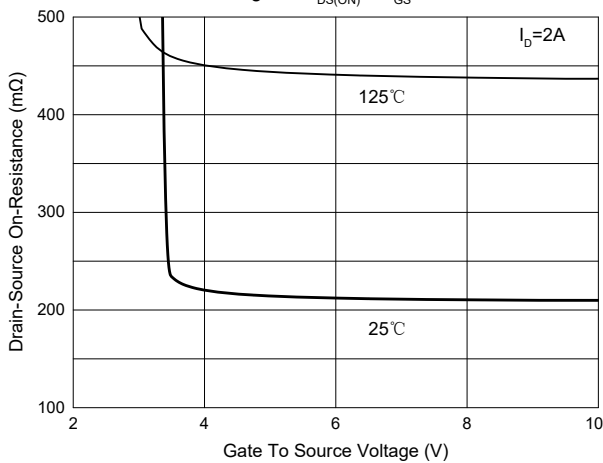


Fig. 4 -  $R_{DS(ON)} - I_D$

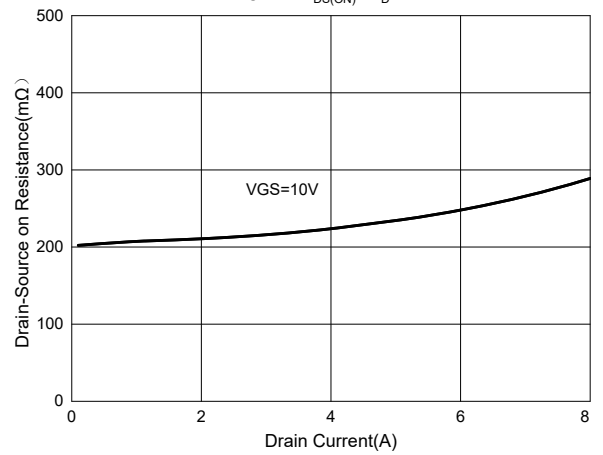


Fig. 5 - Capacitance Characteristics

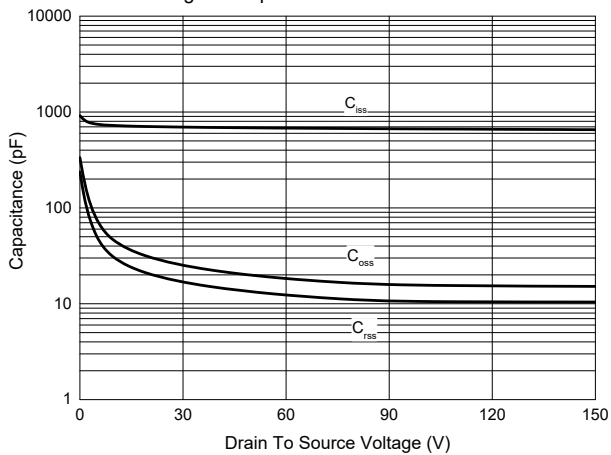
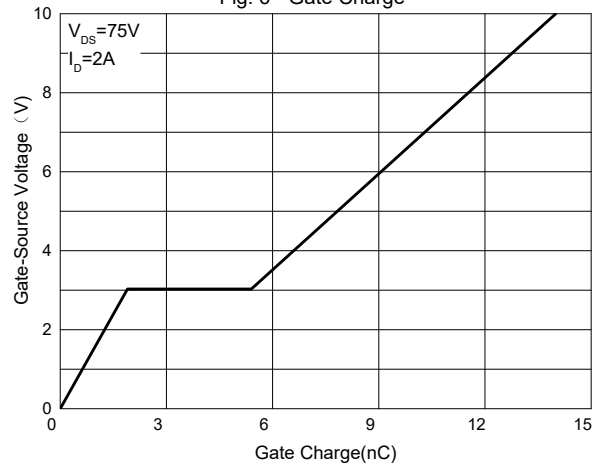
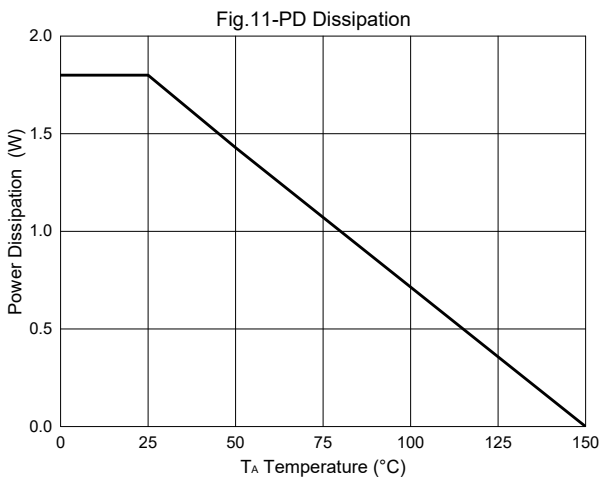
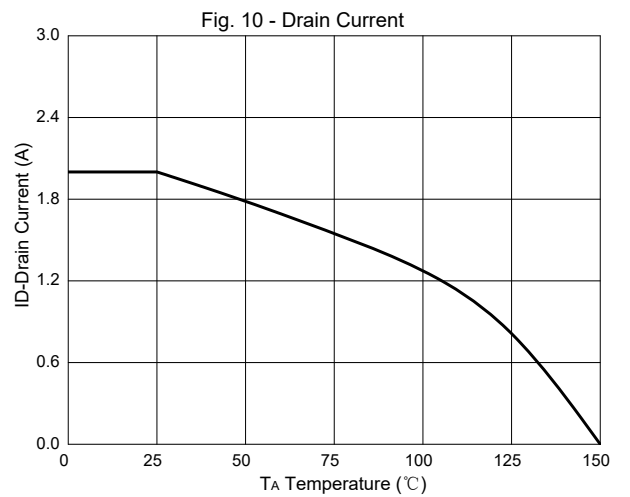
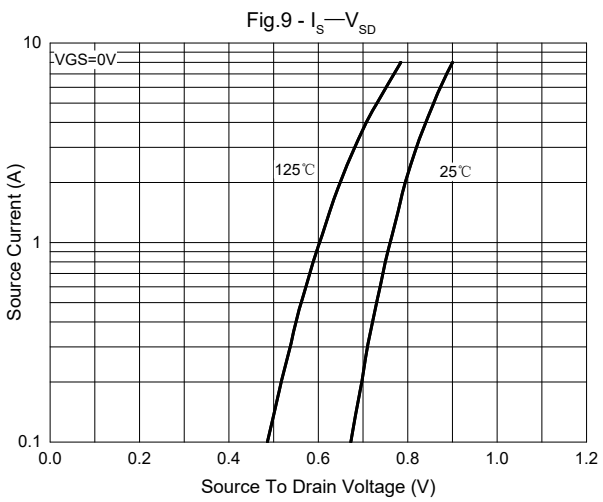
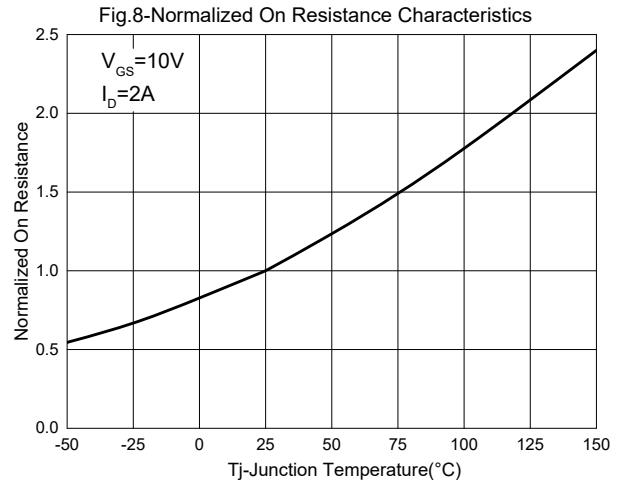
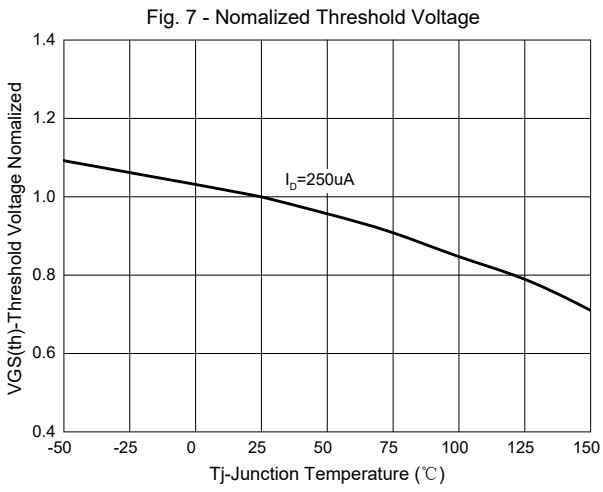


Fig. 6 - Gate Charge



**Curve Characteristics**



## Curve Characteristics

Fig. 12 - Safe Operation Area

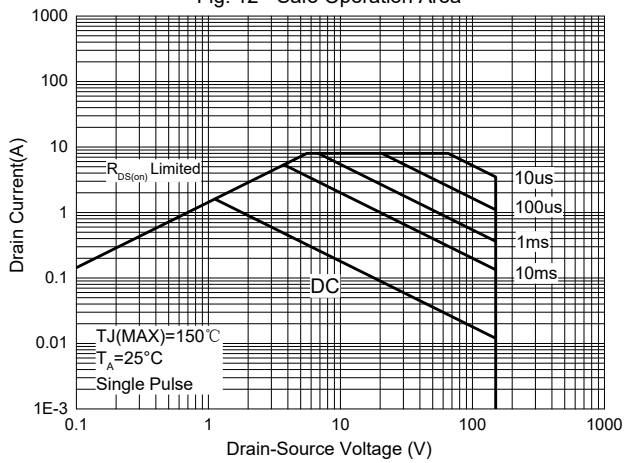
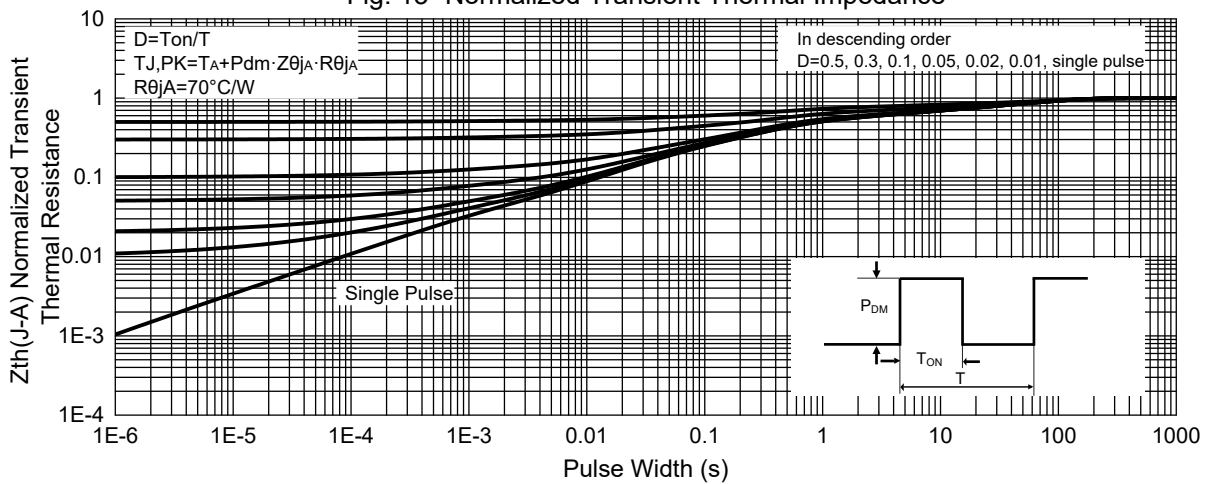


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

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

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