

## Features

- Advanced trench cell design
- ESD Protected up to 2.5KV (HBM)
- Surface Mount Package
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

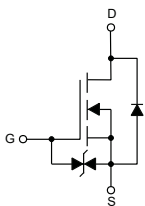
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Maximum Thermal Resistance: 150°C/W Junction to Ambient (Note 2)

| Parameter                | Symbol   | Rating   | Unit |
|--------------------------|----------|----------|------|
| Drain-Source Voltage     | $V_{DS}$ | 30       | V    |
| Gate-Source Voltage      | $V_{GS}$ | $\pm 12$ | V    |
| Continuous Drain Current | $I_D$    | 1.1      | A    |
| Pulsed Drain Current     | $I_{DM}$ | 4.4      | A    |
| Total Power Dissipation  | $P_D$    | 0.83     | W    |

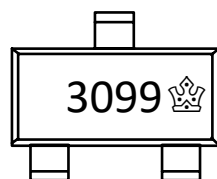
Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

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  $T_A=25^\circ\text{C}$

## Internal Structure and Marking Code

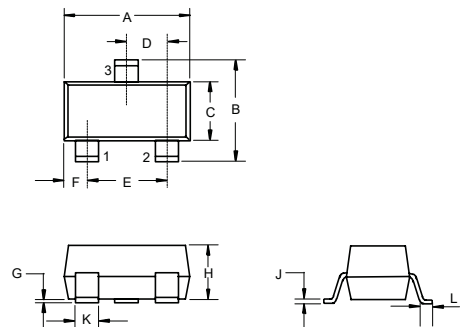


1. GATE
2. SOURCE
3. DRAIN



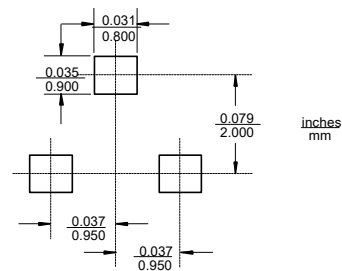
# N-Channel MOSFET

## SOT-23



| DIM | DIMENSIONS |       |      |      | NOTE |
|-----|------------|-------|------|------|------|
|     | INCHES     |       | MM   |      |      |
|     | MIN        | MAX   | MIN  | MAX  |      |
| A   | 0.110      | 0.120 | 2.80 | 3.04 |      |
| B   | 0.083      | 0.104 | 2.10 | 2.64 |      |
| C   | 0.047      | 0.055 | 1.20 | 1.40 |      |
| D   | 0.034      | 0.041 | 0.85 | 1.05 |      |
| E   | 0.067      | 0.083 | 1.70 | 2.10 |      |
| F   | 0.018      | 0.024 | 0.45 | 0.60 |      |
| G   | 0.0004     | 0.006 | 0.01 | 0.15 |      |
| H   | 0.035      | 0.043 | 0.90 | 1.10 |      |
| J   | 0.003      | 0.007 | 0.08 | 0.18 |      |
| K   | 0.012      | 0.020 | 0.30 | 0.51 |      |
| L   | 0.007      | 0.020 | 0.20 | 0.50 |      |

### Suggested Solder Pad Layout



**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

| Parameter                             | Symbol        | Test Conditions                                      | Min | Typ  | Max      | Unit       |
|---------------------------------------|---------------|--|-----|------|----------|------------|
| <b>Static Characteristics</b>         |               |  |     |      |          |            |
| Drain-Source Breakdown Voltage        | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$                            | 30  |      |          | V          |
| Gate-Source Leakage Current           | $I_{GSS}$     | $V_{DS}=0V, V_{GS}=\pm 12V$                          |     |      | $\pm 10$ | $\mu A$    |
| Zero Gate Voltage Drain Current       | $I_{DSS}$     | $V_{DS}=24V, V_{GS}=0V$                              |     |      | 100      | nA         |
| Gate-Threshold Voltage                | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$                        | 0.5 | 1    | 1.5      | V          |
| Drain-Source On-Resistance            | $R_{DS(on)}$  | $V_{GS}=10V, I_D=0.5A$                               |     | 340  | 408      | m $\Omega$ |
|                                       |               | $V_{GS}=4.5V, I_D=0.4A$                              |     | 415  | 518      |            |
|                                       |               | $V_{GS}=2.5V, I_D=0.3A$                              |     | 616  | 800      |            |
| Diode Forward Voltage                 | $V_{SD}$      | $V_{GS}=0V, I_S=0.5A$                                |     |      | 1.2      | V          |
| Maximum Body-Diode Continuous Current | $I_S$         |  |     |      | 1.1      | A          |
| <b>Dynamic Characteristics</b>        |               |  |     |      |          |            |
| Input Capacitance                     | $C_{iss}$     | $V_{DS}=15V, V_{GS}=0V, f=1MHz$                      |     | 61   |          | pF         |
| Output Capacitance                    | $C_{oss}$     |  |     | 14   |          |            |
| Reverse Transfer Capacitance          | $C_{rss}$     |  |     | 7    |          |            |
| <b>Switching Characteristics</b>      |               |  |     |      |          |            |
| Total Gate Charge                     | $Q_g$         | $V_{DS}=15V, V_{GS}=10V, I_D=0.5A$                   |     | 1.72 |          | nC         |
| Gate-Source Charge                    | $Q_{gs}$      |  |     | 0.35 |          |            |
| Gate-Drain Charge                     | $Q_{gd}$      |  |     | 0.17 |          |            |
| Turn-On Delay Time                    | $t_{d(on)}$   | $V_{GS}=10V, V_{DS}=15V, I_D=10A, R_{GEN}=2.2\Omega$ |     | 2.2  |          | ns         |
| Turn-On Rise Time                     | $t_r$         |  |     | 17.8 |          |            |
| Turn-Off Delay Time                   | $t_{d(off)}$  |  |     | 18.8 |          |            |
| Turn-Off Fall Time                    | $t_f$         |  |     | 21   |          |            |

Curve Characteristics

Fig. 1 - Typical Output Characteristics

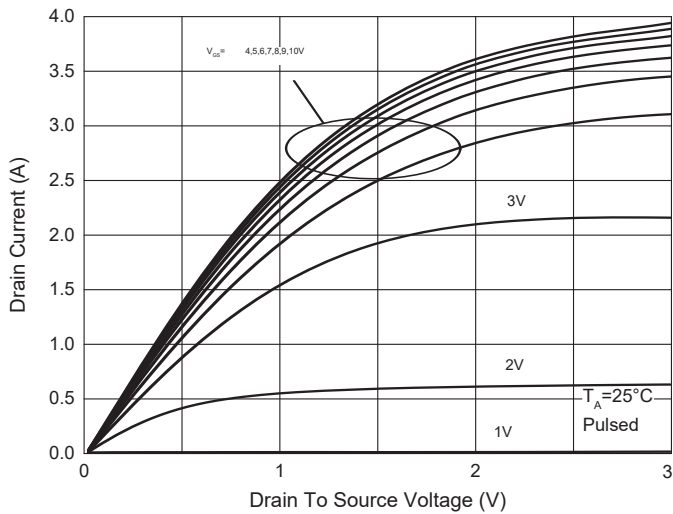


Fig. 2 -  $R_{DS(ON)} - I_D$

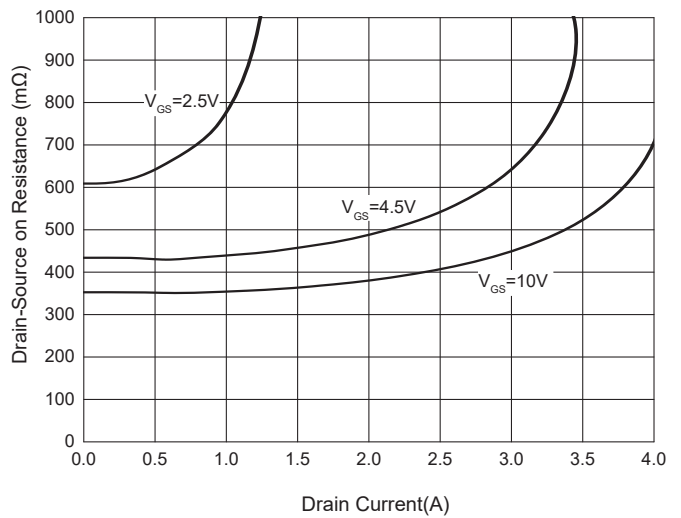


Fig. 3 - Capacitance Characteristics

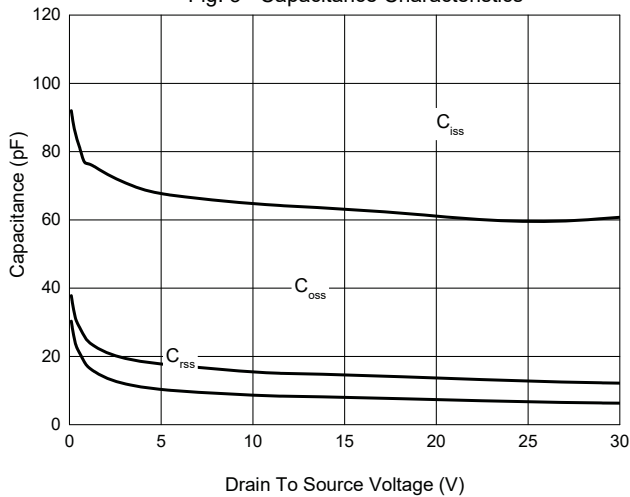


Fig. 4 - Gate Charge

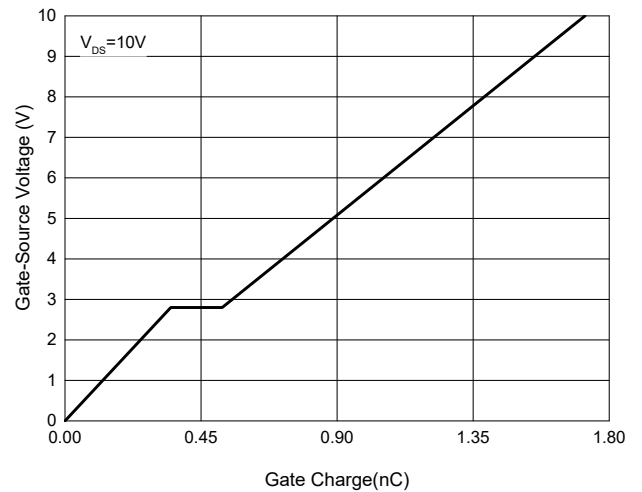


Fig. 5-  $I_S - V_{SD}$

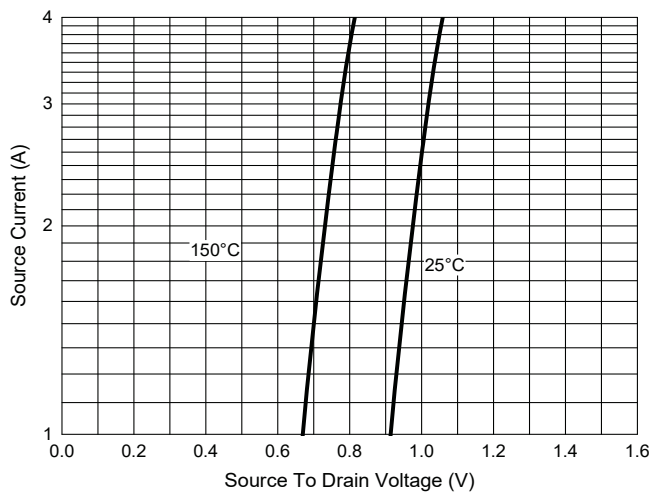
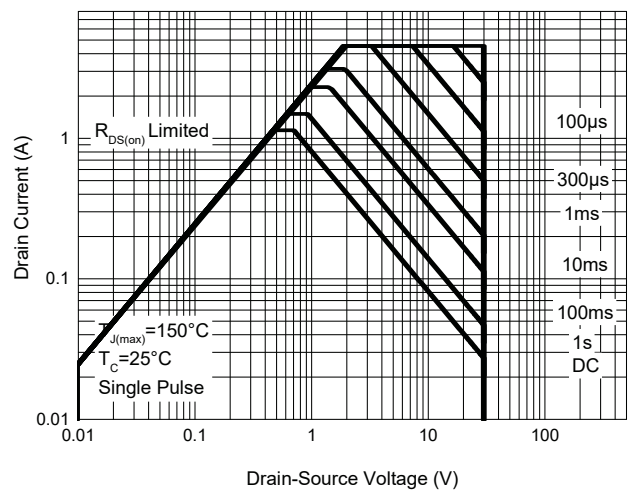


Fig. 6 - Safe Operation Area



## Ordering Information

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

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