## Features

- Low On-Resistance
- Fast Switching Speed
- 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)

# N-Channel MOSFET

## Maximum Ratings

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Maximum Thermal Resistance: 833°C/W Junction to Ambient

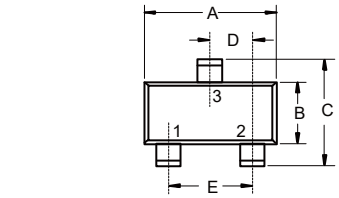
| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Drain -source Voltage | $V_{DS}$ | 20 | V |
| Gate -Source Voltage | $V_{GS}$ | ±12 | V |
| Drain Current-Continuous | $I_D$ | 0.75 | A |
| Pulsed Drain Current(Note 2) | $I_{DM}$ | 3.0 | A |
| Power Dissipation(Note 3) | $P_D$ | 0.15 | W |

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. Repetitive Rating: Pulse width limited by maximum junction temperature.

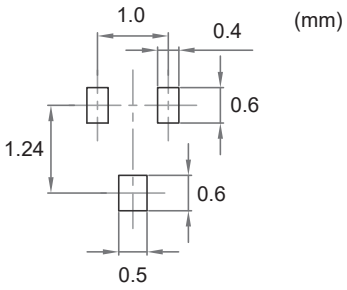
3. This test is performed with no heat sink at Ta=25℃.

## SOT-523

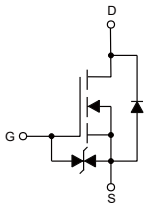



| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| DIM | INCHES | | MM | | NOTE |
| | MIN | MAX | MIN | MAX | |
| A | 0.059 | 0.067 | 1.50 | 1.70 | |
| B | 0.030 | 0.033 | 0.75 | 0.85 | |
| C | 0.057 | 0.069 | 1.45 | 1.75 | |
| D | 0.020 | | 0.50 | | TYP. |
| E | 0.035 | 0.043 | 0.90 | 1.10 | |
| G | 0.000 | 0.004 | 0.00 | 0.10 | |
| H | 0.024 | 0.031 | 0.60 | 0.80 | |
| J | 0.004 | 0.008 | 0.10 | 0.20 | |
| K | 0.006 | 0.014 | 0.15 | 0.35 | |

**Suggested Solder Pad Layout**




## Internal Structure




1. GATE
2. SOURCE
3. DRAIN

**Marking:34K**

## ELECTRICAL CHARACTERISTICS (Ta=25℃ 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 | 20 | | | V |
| Gate-Threshold Voltage(Note 4) | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 0.35 | 0.75 | 1.1 | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ =20V, $V_{GS}$ =0V | | | 1.0 | μA |
| Gate-body Leakage Current | $I_{GSS}$ | $V_{GS}$ =± 10V, $V_{DS}$ =0V | | | ±20 | μA |
| Drain-Source On-Resistance(Note 4) | $R_{DS(on)}$ | $V_{GS}$=4.5V, $I_D$=650mA | | 0.19 | 0.38 | Ω |
| | | $V_{GS}$=2.5V, $I_D$=550mA | | 0.26 | 0.45 | |
| | | $V_{GS}$=1.8V, $I_D$=450mA | | 0.39 | 0.80 | |
| Forward transconductance | $g_{FS}$ | $V_{DS}$=10V, $I_D$=800mA | 1.0 | | | S |
| Diode Forward Voltage(Note 4) | $V_{SD}$ | $V_{GS}$=0V, $I_S$=150mA | | | 1.2 | V |
| **Dynamic Characteristics(Note 5)** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=16V,$V_{GS}$=0V, f=1MHz | | | 120 | pF |
| Output Capacitance | $C_{oss}$ | | | | 20 | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | | 15 | |
| **Switching Characteristics(Note 5)** | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DS}$=10V,$V_{GS}$=4.5V,$I_D$=500 mA, $R_{GEN}$=10Ω | | 6.7 | | ns |
| Turn-off Delay Time | $t_{d(off)}$ | | | 17.3 | | |
| Rise Time | $t_r$ | | | 4.8 | | |
| Fall Time | $t_f$ | | | 7.4 | | |

**Note:**

4. Pulse Test : Pulse Width≤300μs, Duty Cycle≤0.5%.
5. These parameters have no way to verify.

## Curve Characteristics

Fig. 1 - Output Charact eristics

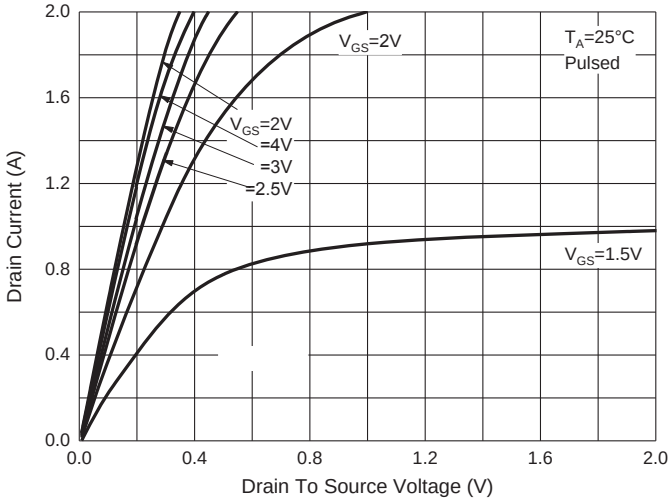



Fig. 2 - Transfer Characteristics

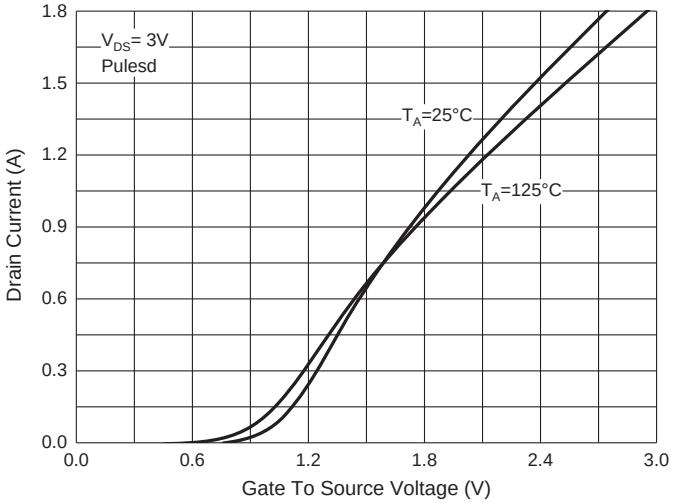



Fig. 3 - $R_{DS(ON)}$—$I_D$

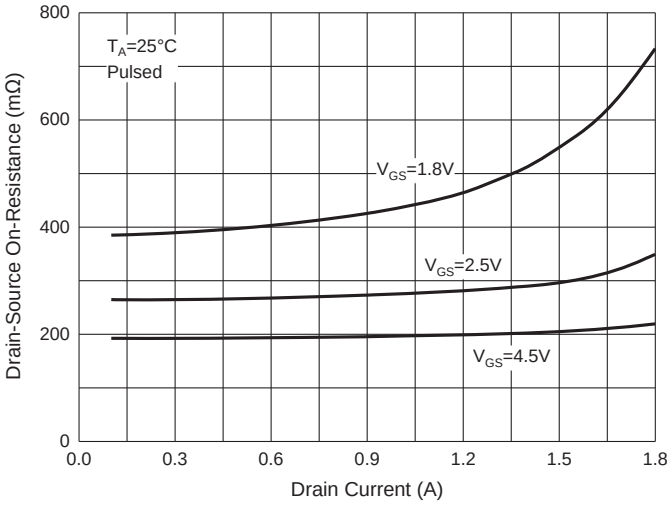



Fig. 4 - $R_{DS(ON)}$—$V_{GS}$

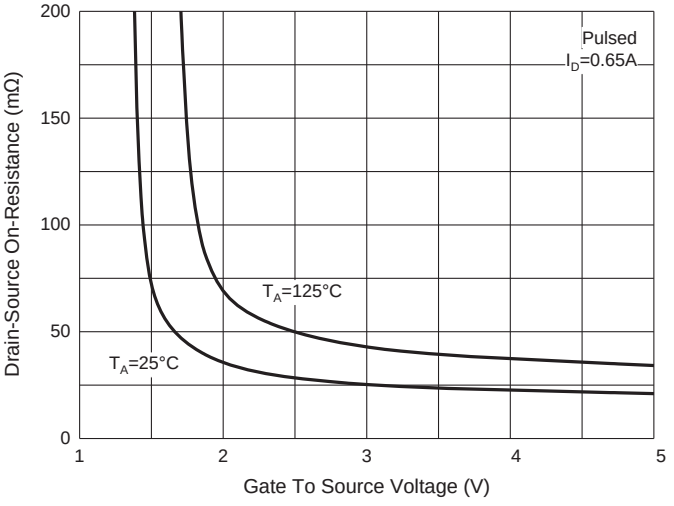



Fig. 3 - $I_S$—$V_{SD}$

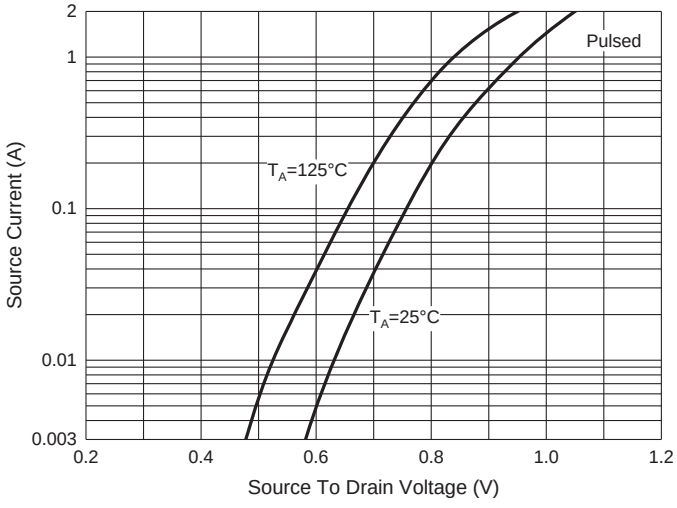
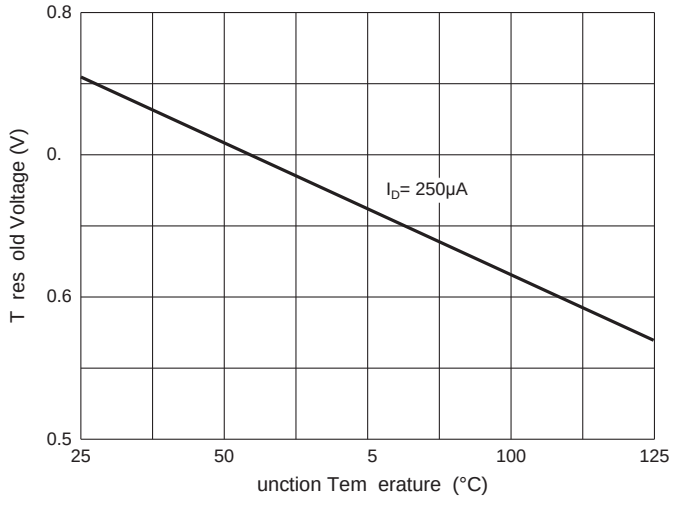



Fig. 6 - T res old Voltage



## Ordering Information

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

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