## Features

- TrenchFET Power Mosfet
- Load Switch for Portable Devices
- 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)

# P-Channel MOSFET

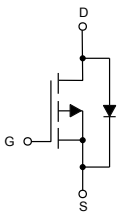
## Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 90°C/W Junction to Ambient

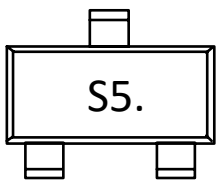
| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Drain -source Voltage | $V_{DS}$ | -8 | V |
| Gate -Source Voltage | $V_{GS}$ | ±8 | V |
| Drain Current-Continuous(Note 2) | $I_D$ | -4.1 | A |
| Drain Source Current-Continuous | $I_S$ | -0.8 | A |
| Total Power Dissipation | $P_D$ | 1.4 | 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.

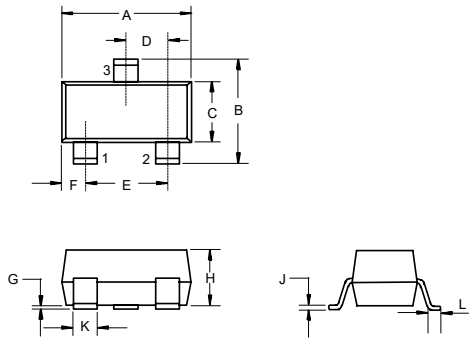
## Internal Structure and Marking Code




1. GATE
2. SOURCE
3. DRAIN

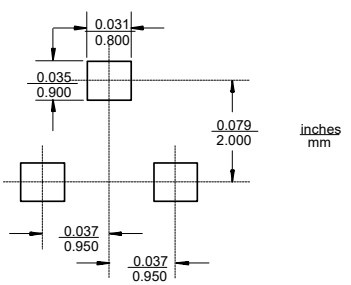



## SOT-23




| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| DIM | INCHES | | MM | | NOTE |
| | 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 (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 | -8 | | | V |
| Gate-Threshold Voltage(Note 4) | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=-250μA | -0.55 | | -0.9 | V |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$ =± 8V, $V_{DS}$ =0V | | | ±0.1 | μA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ =-8V, $V_{GS}$ =0V | | | -1 | μA |
| Drain-Source On-Resistance(Note 2) | $R_{DS(on)}$ | $V_{GS}$=-4.5V, $I_D$=-3.5A | | | 45 | mΩ |
| | | $V_{GS}$=-2.5V, $I_D$=-3.0A | | | 60 | |
| | | $V_{GS}$=-1.8V, $I_D$=-2.0A | | | 90 | |
| Forward Tranconductance(Note 2) | $g_{FS}$ | $V_{DS}$=-5V, $I_D$=-4.1A | 6 | | | S |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance(Note 3,4) | $C_{iss}$ | $V_{DS}$=-4V,$V_{GS}$=0V, f=1MHz | | 740 | | pF |
| Output Capacitance(Note 3,4) | $C_{oss}$ | | | 290 | | |
| Reverse Transfer Capacitance(Note 3,4) | $C_{rss}$ | | | 190 | | |
| Gate Resistance(Note 3,4) | $R_g$ | f =1MHz | 1.4 | 7 | 14 | Ω |
| Total Gate Charge(Note 3) | $Q_g$ | $V_{DS}$=-4V,$V_{GS}$=-4.5V,$I_D$=-4.1A | | 7.8 | 15 | nC |
| | | $V_{DS}$=-4V,$V_{GS}$=-2.5V,$I_D$=-4.1A | | 4.5 | 9 | |
| Gate-Source Chage(Note 3) | $Q_{gs}$ | | | 1.2 | | |
| Gage-Drain Charge(Note 3) | $Q_{gd}$ | | | 1.6 | | |
| Turn-On Delay Time(Note 3,4) | $t_{d(on)}$ | $V_{DD}$=-4V,$V_{GEN}$=-4.5V,$I_D$=-3.3A $R_L$=1.2Ω,$R_{GEN}$=1Ω | | 13 | 20 | ns |
| Turn-On Rise Time(Note 3,4) | $t_r$ | | | 35 | 53 | |
| Turn-Off Delay Time(Note 3,4) | $t_{d(off)}$ | | | 32 | 48 | |
| Turn-Off Fall Time(Note 3,4) | $t_f$ | | | 10 | 20 | |
| Turn-On Delay Time(Note 3,4) | $t_{d(on)}$ | $V_{DD}$=-4V,$V_{GEN}$=-8V,$I_D$=-3.3A $R_L$=1.2Ω,$R_{GEN}$=1Ω | | 5 | 10 | ns |
| Turn-On Rise Time(Note 3,4) | $t_r$ | | | 11 | 17 | |
| Turn-Off Delay Time(Note 3,4) | $t_{d(off)}$ | | | 22 | 33 | |
| Turn-Off Fall Time(Note 3,4) | $t_f$ | | | 16 | 24 | |
| **Drain-source body diode characteristics** | | | | | | |
| Diode Forward Current | $I_S$ | $T_C$=25℃ | | | -1.4 | A |
| Diode Pulsed Forward Current(Note 2) | $I_{SM}$ | $I_F$=-3.3A | | | -10 | A |
| Diode Forward Voltage(Note 4) | $V_{SD}$ | | | -0.8 | -1.2 | V |

Note:

2. Pulse Test: Pulse Width≤ 300μs,Duty Cycle≤2%.
3. Guaranteed by Design, Not Subject to Production Testing.
4. These Parameters Have No Way to Verify.

## Curve Characteristics

Fig. 1 - Output Characteristics

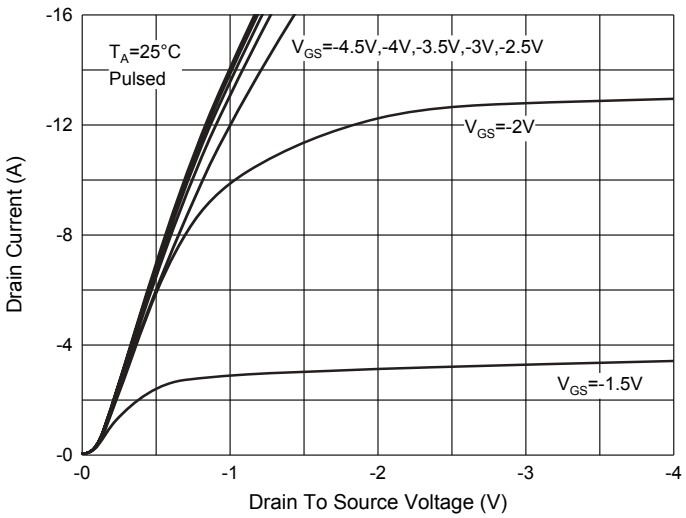



Fig. 2 - Transfer Characteristics

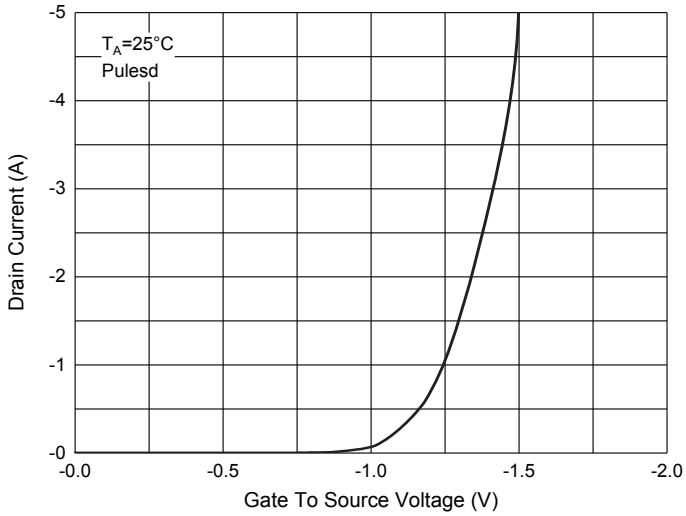



Fig. 3 - $R_{DS(ON)}$—$I_D$

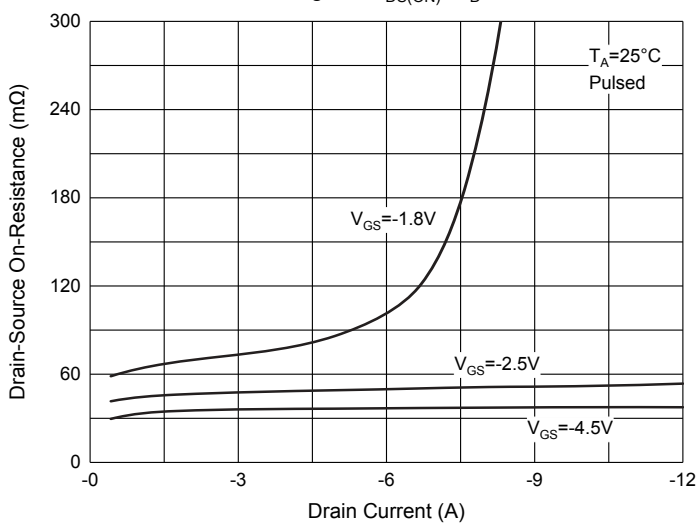



Fig. 4 - $R_{DS(ON)}$—$V_{GS}$

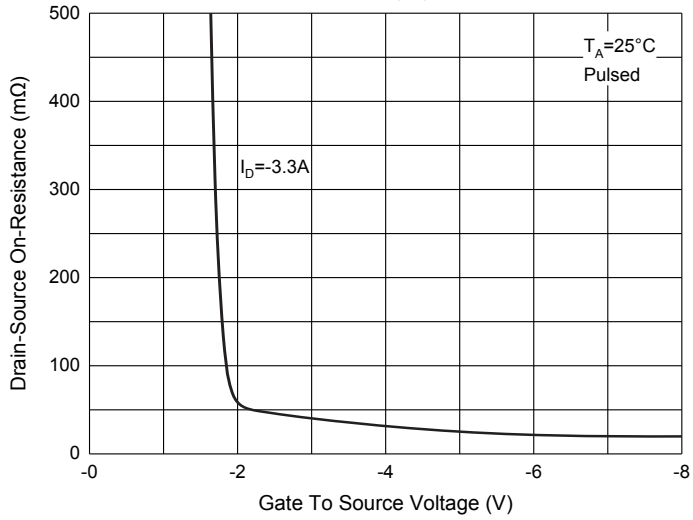
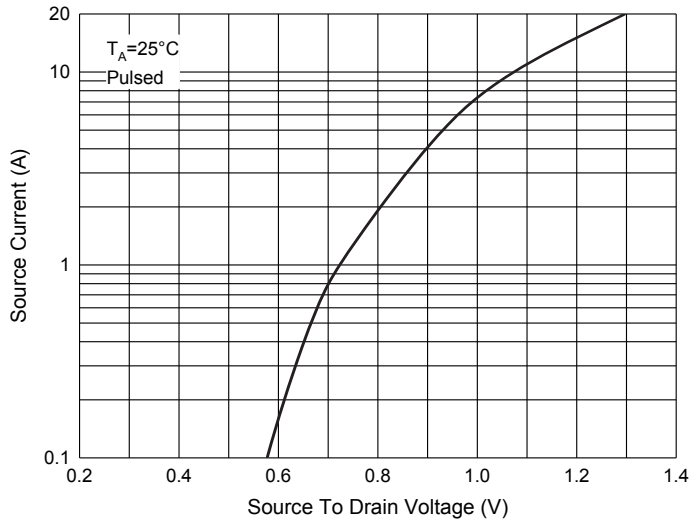



Fig. 5 - $I_S$—$V_{SD}$



## Ordering Information

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