

Features

- Rugged and Reliable
- Lead Free Product is Acquired
- High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- 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)

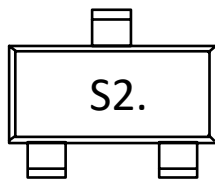
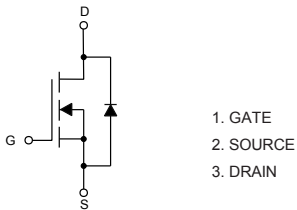
Maximum Ratings

- Operating Junction Temperature Range: -55°C to $+150^{\circ}\text{C}$
- Storage Temperature Range: -55°C to $+150^{\circ}\text{C}$
- Thermal Resistance: 100°C/W Junction to Ambient

| Parameter | Symbol | Rating | Unit |
|------------------------------------------|----------|---------|------|
| Drain-Source Voltage | V_{DS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ± 8 | V |
| Drain Current-Continuous | I_D | 3.0 | A |
| Drain Current-Pulsed ^(Note 2) | I_{DM} | 10 | A |
| Power Dissipation | P_D | 1.25 | 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.

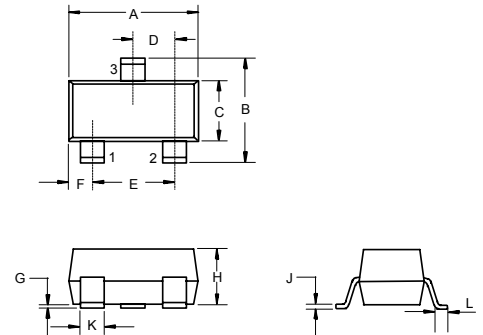
Internal Structure and Marking Code



1. GATE
2. SOURCE
3. DRAIN

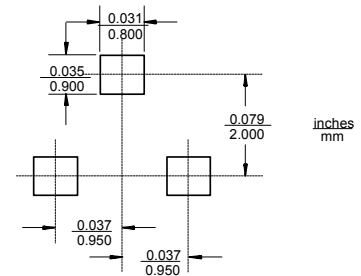
**N-Channel
Enhancement Mode
Field Effect Transistor**

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 (Ta=25°C unless otherwise specified)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---------------------------------------------------------------|---------------|------------------------------------------------------|------|-----|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=10\mu A$ | 20 | | | V |
| Gate-Threshold Voltage ^(Note 4) | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.65 | | 1.2 | V |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 8V, V_{DS}=0V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=20V, V_{GS}=0V$ | | | 1 | μA |
| Drain-Source On-Resistance ^(Note 4) | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=3.6A$ | | 55 | 72 | m Ω |
| | | $V_{GS}=2.5V, I_D=3.1A$ | | 82 | 110 | |
| Forward Transconductance ^(Note 4) | g_{FS} | $V_{DS}=5V, I_D=3.6A$ | | 8.5 | | S |
| Dynamic Characteristics^(Note 5) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=10V, V_{GS}=0V, f=1MHz$ | | 237 | | pF |
| Output Capacitance | C_{oss} | | | 120 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 45 | | |
| Switching Characteristics^(Note 5) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=10V, V_{GS}=4.5V, I_D=3.6A, R_{GEN}=6\Omega$ | | 23 | 45 | ns |
| Turn-On Rise Time | t_r | | | 11 | 30 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 34 | 70 | |
| Turn-Off Fall Time | t_f | | | 36 | 70 | |
| Total Gate Charge | Q_g | $V_{DS}=10V, V_{GS}=4.5V, I_D=3.6A$ | | 6 | 10 | nC |
| Gate-Source Charge | Q_{gs} | | | 1.4 | | |
| Gate-Drain Charge | Q_{gd} | | | 1.8 | | |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| Diode Forward Voltage ^(Note3) | V_{SD} | $V_{GS}=0V, I_S=0.94A$ | | | 1.2 | V |
| Drain-Source Diode Forward Current ^(Note2) | I_S | | | | 0.94 | A |

Notes:

2. Repetitive Rating : Pulse Width limited By Maximum Junction Temperature.
3. Surface Mounted on FR4 Board, t < 10 sec.
4. Pulse Test : Pulse Width < 300 μs , Duty Cycle < 2%.
5. Guaranteed By Design, Not Subject to Production Testing.

Curve Characteristics

Fig. 1 - Output Characteristics

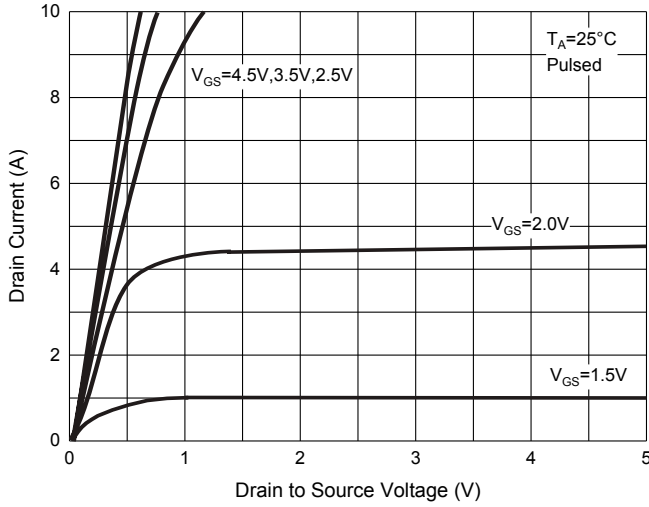


Fig. 2 - Transfer Characteristics

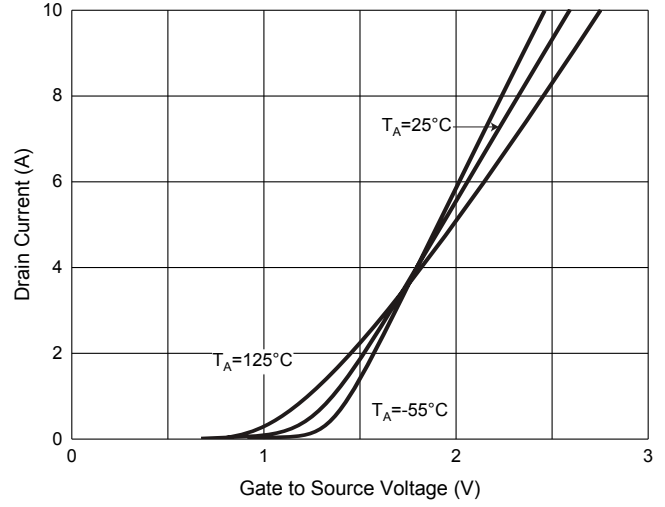


Fig. 3 - Capacitance Characteristics

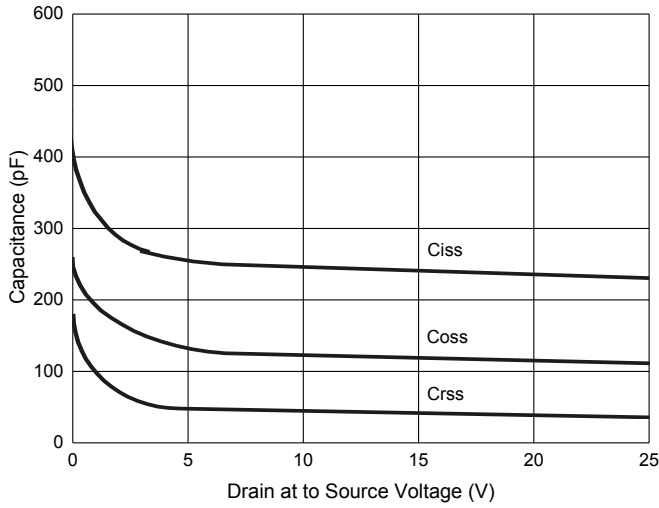


Fig. 4 - $R_{DS(ON)}$ —Temperature

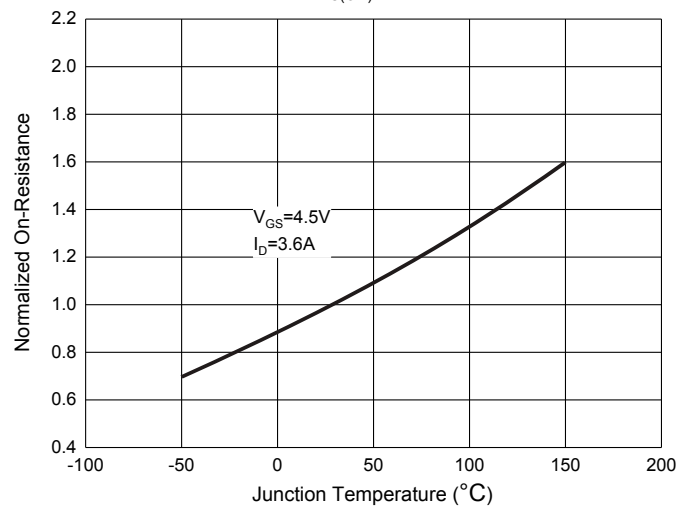


Fig. 5 - Threshold Voltage

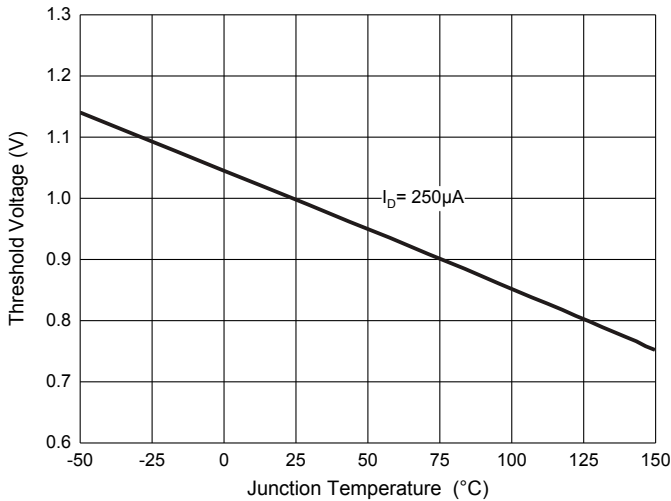
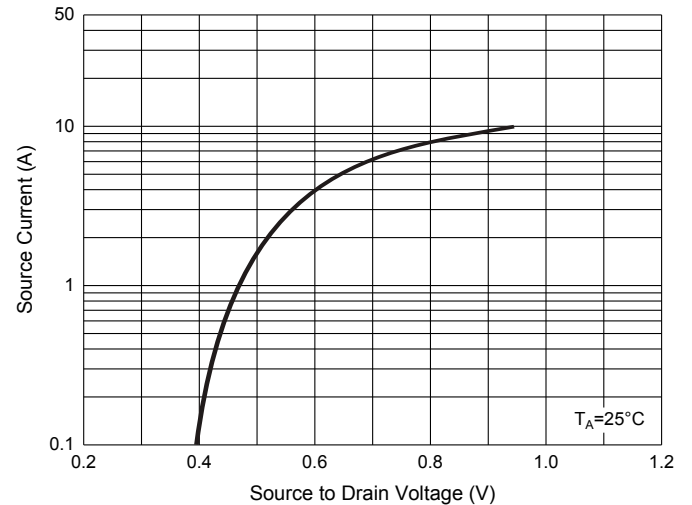


Fig. 6 - I_S — V_{SD}



Ordering Information

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

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