

Features

- High Dense Cell Design For Extremely Low $R_{DS(ON)}$
- Rugged and reliable
- High Speed Switching
- 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)

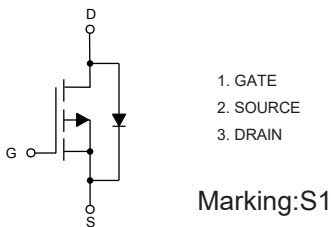
Maximum Ratings

- Operating Junction Temperature Range : -55°C to $+150^{\circ}\text{C}$
- Storage Temperature Range: -55°C to $+150^{\circ}\text{C}$
- Maximum Thermal Resistance: 125°C/W Junction to Ambient^(Note 2)

| Parameter | Symbol | Rating | Unit |
|---|----------|---------|------|
| Drain -source Voltage | V_{DS} | -20V | V |
| Gate -Source Voltage | V_{GS} | ± 8 | V |
| Drain Current-Continuous | I_D | -2.8 | A |
| Drain Current-Pulse ^(Note 2) | I_{DM} | -10 | A |
| Power Dissipation | P_D | 1.0 | W |

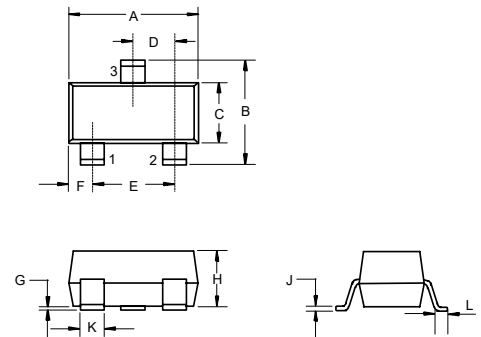
Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Internal Structure



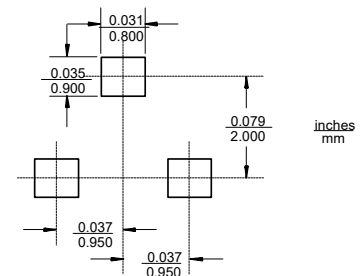
P-Channel MOSFET

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 | 0.004 | 0.01 | 0.10 | |
| H | 0.035 | 0.041 | 0.90 | 1.025 | |
| 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 | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=-250\mu A$ | -20 | | | V |
| Gate-Threshold Voltage ^(Note 4) | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -0.5 | -0.7 | -0.9 | 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) | $R_{DS(on)}$ | $V_{GS}=-4.5V, I_D=-2.8A$ | | 80 | 120 | m Ω |
| | | $V_{GS}=-2.5V, I_D=-2.0A$ | | 110 | 150 | |
| Forward Transconductance | g_{FS} | $V_{DS}=-5V, I_D=-2.8A$ | | 8 | | S |
| Diode Forward Current ^(Note 3) | I_S | | | | -2.8 | A |
| Diode Forward Voltage ^(Note 4) | V_{SD} | $V_{GS}=0V, I_S=-2.8A$ | | | -1.2 | V |
| Dynamic Characteristics^(Note 5) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=-6V, V_{GS}=0V, f=1MHz$ | | 880 | | pF |
| Output Capacitance | C_{oss} | | | 270 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 175 | | |
| Switching Characteristics^(Note 5) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=-6V, V_{GS}=-4.5V, I_D=-1A, R_{GEN}=6\Omega$ | | 11 | 20 | ns |
| Turn-On Rise Time | t_r | | | 5 | 10 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 32 | 65 | |
| Turn-Off Fall Time | t_f | | | 23 | 45 | |
| Total Gate Charge | Q_g | $V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.8A$ | | 11 | 14.5 | nC |
| Gate-Source Charge | Q_{gs} | | | 1.5 | | |
| Gate-Drain Charge | Q_{gd} | | | 2.1 | | |

Note:

2. Surface Mounted on FR4 Board, $t < 5$ sec.

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

4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

5. Guaranteed by Design, Not Subject to Production Testing.

Curve Characteristics

Fig. 1 - Output Characteristics

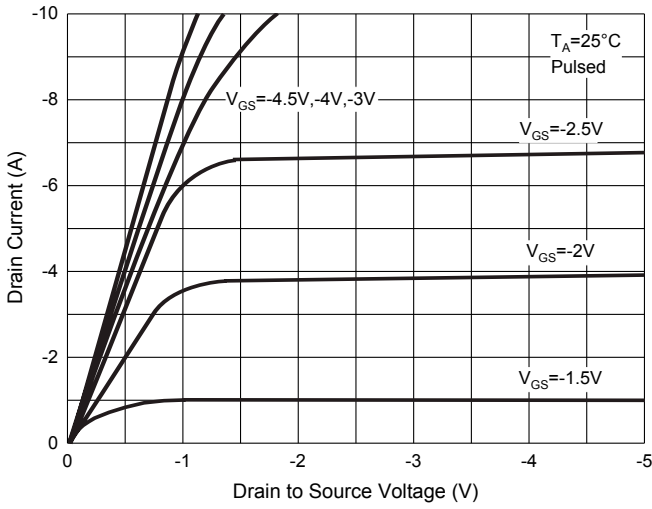


Fig. 2 - Transfer Characteristics

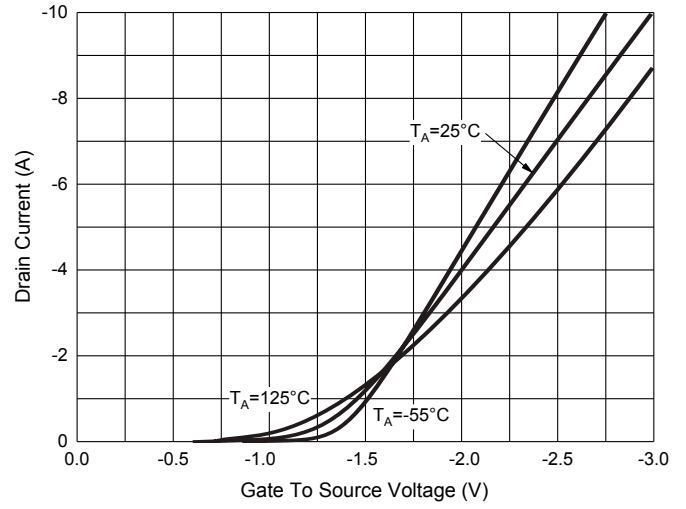


Fig. 3 - Capacitance Characteristics

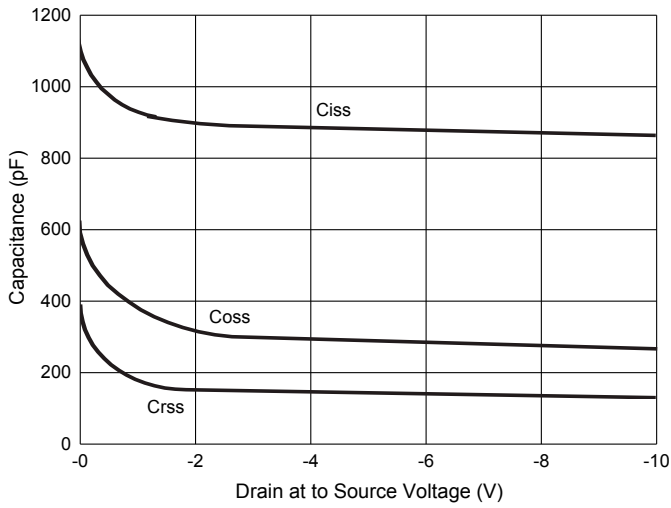


Fig. 4 - $R_{DS(ON)}$ —Temperature

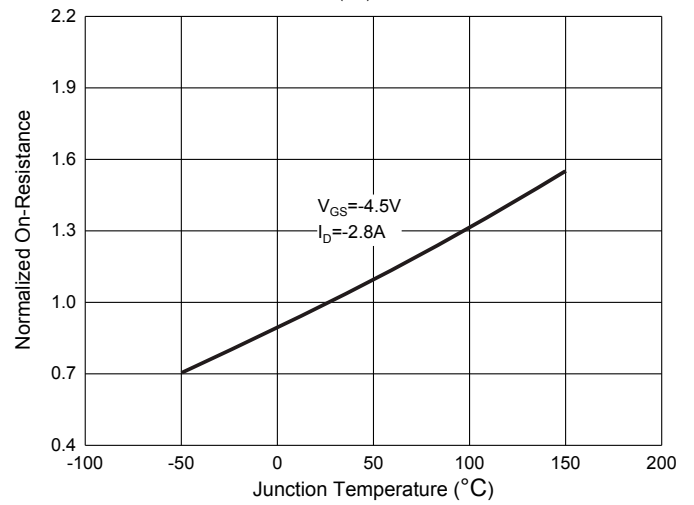


Fig. 5 - Threshold Voltage

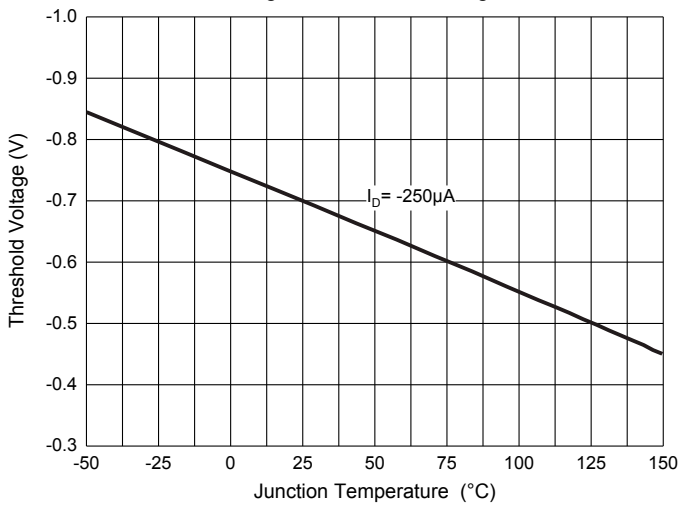
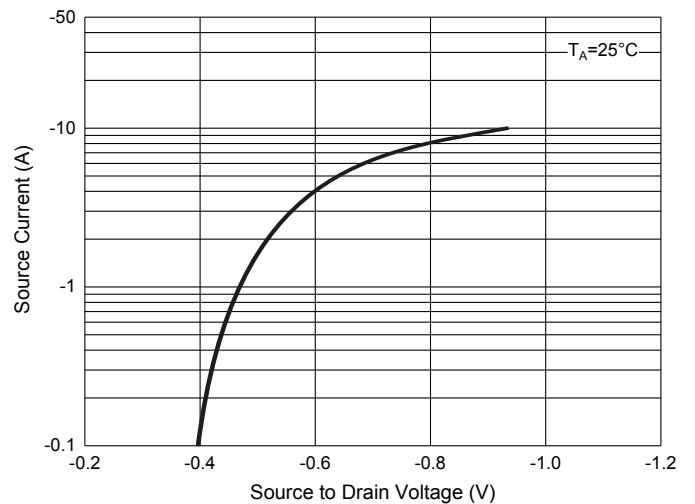


Fig. 6 - I_S — V_{SD}



Ordering Information

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

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