

Features

- High Power and Current Handling Capability
- 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)

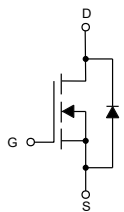
Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 100°C/W Junction to Ambient (Note 2)

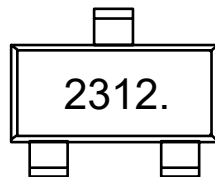
| Parameter | Symbol | Rating | Unit |
|-------------------------------|----------|------------------------|------|
| Drain-Source Voltage | V_{DS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ±10 | V |
| Continuous Drain Current | I_D | $T_A=25^\circ\text{C}$ | 6 |
| | | $T_A=70^\circ\text{C}$ | 4.8 |
| Pulsed Drain Current (Note 3) | I_{DM} | 30 | A |
| Total 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.
 2. Surface Mounted on FR4 Board , $t \leq 10s$.
 3. Repetitive Rating: Pulse Width Limited by Max. Junction Temperature.

Internal Structure and Marking Code

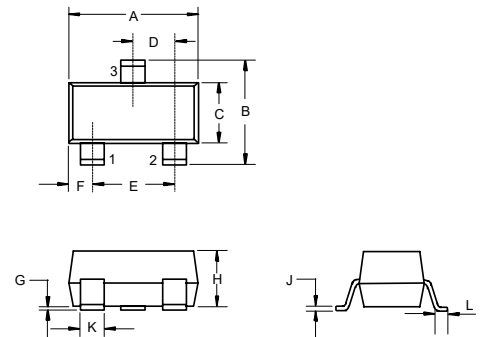


1. GATE
2. SOURCE
3. DRAIN



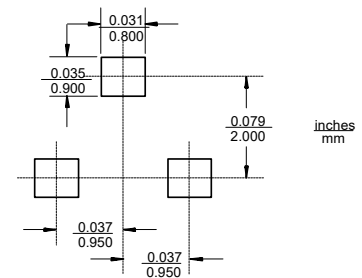
N-CHANNEL MOSFET

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 |
|---|---------------|--|-----|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 20 | 22 | | V |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 10V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=20V, V_{GS}=0V$ | | | 1 | μA |
| Gate-Threshold Voltage ^(Note 4) | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.5 | 0.7 | 1.0 | V |
| Drain-Source On-Resistance ^(Note 4) | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=5A$ | | 20 | 28 | m Ω |
| | | $V_{GS}=2.5V, I_D=4A$ | | 27 | 35 | |
| | | $V_{GS}=1.8V, I_D=2.5A$ | | 31 | 44 | |
| Forward Transconductance ^(Note 4) | g_{FS} | $V_{DS}=5V, I_D=6A$ | | 25 | | S |
| Dynamic Characteristics^(Note 5) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=10V, V_{GS}=0V, f=1MHz$ | | 888 | | pF |
| Output Capacitance | C_{oss} | | | 133 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 117 | | |
| Switching Characteristics^(Note 5) | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=10V, V_{GS}=10V, I_D=6A$ | | 12 | | nC |
| Gate-Source Charge | Q_{gs} | | | 1 | | |
| Gate-Drain Charge | Q_{gd} | | | 2 | | |
| Reverse Recovery Charge | Q_{rr} | $I_F=1.6A, di/dt=100A/\mu s$ | | 1.4 | | ns |
| Reverse Recovery Time | t_{rr} | | | 11.5 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}=10V, V_{DD}=10V, R_L=1.7\Omega, R_{GEN}=3\Omega$ | | 3 | | ns |
| Turn-On Rise Time | t_r | | | 7.5 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 20 | | |
| Turn-Off Fall Time | t_f | | | 6 | | |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage ^(Note 4) | V_{SD} | $V_{GS}=0V, I_S=1A$ | | | 1.2 | V |
| Diode Forward Current ^(Note 3) | I_S | | | | 6 | A |

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

5. Guaranteed by Design, Not Subject to Producing.

Curve Characteristics

Fig. 1 - Output Characteristics

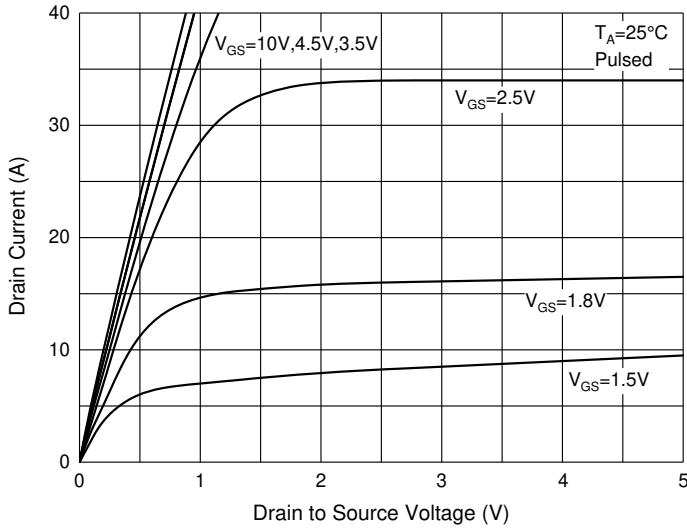


Fig. 2 - Transfer Characteristics

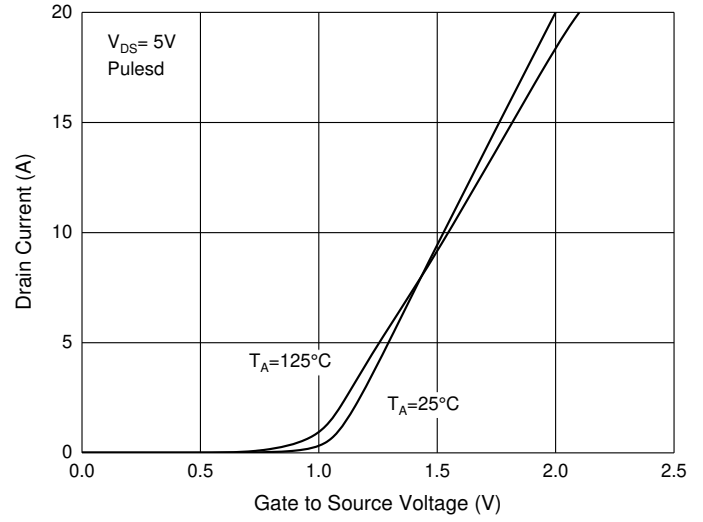


Fig. 3 - $R_{DS(ON)} - I_D$

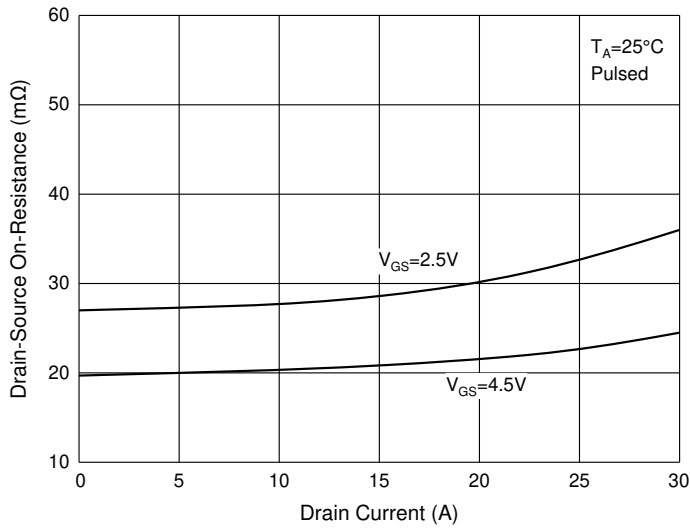
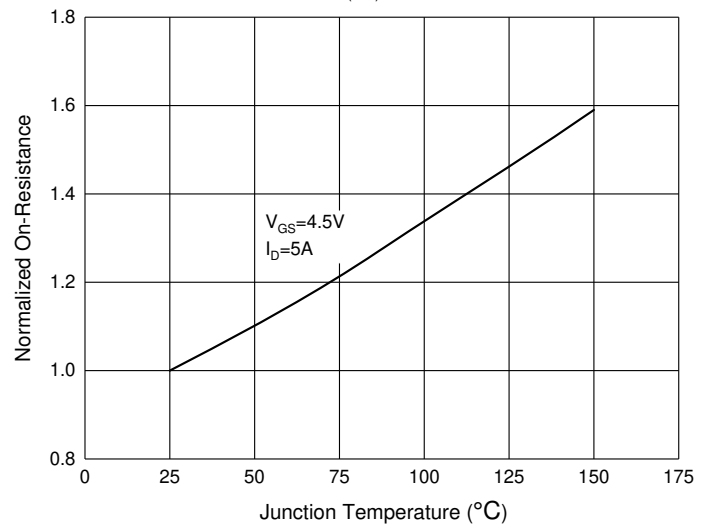


Fig. 4 - $R_{DS(ON)} - \text{Temperature}$



Ordering Information

| Device | Packing |
|-----------------|------------------------|
| Part Number-TP | Tape&Reel: 3Kpcs/Reel |
| Part Number-13P | Tape&Reel: 10Kpcs/Reel |

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