

Features

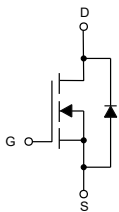
- TrenchFET Power MOSFET
- Low $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

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: 357°C/W Junction to Ambient

| Parameter | Symbol | Rating | Unit |
|--|----------|----------|------|
| Drain-Source Voltage | V_{DS} | 100 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Drain Current-Continuous | I_D | 2.0 | A |
| Drain Current-Pulsed ^(Note 1) | I_{DM} | 8.0 | A |

Internal Structure

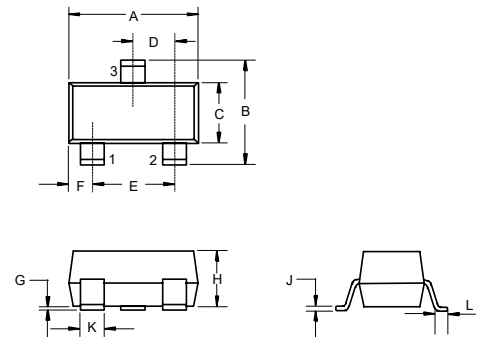


1. GATE
2. SOURCE
3. DRAIN

Marking: S24

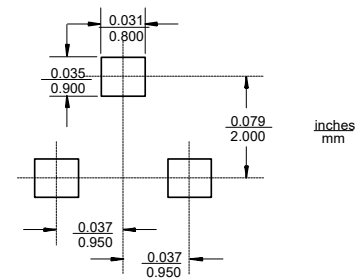
N-Channel MOSFET

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 (Ta=25°C unless otherwise specified)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---|---------------|---|-----|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 100 | | | V |
| Gate-Threshold Voltage ^(Note 2) | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1.2 | | 2.8 | V |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=100V, V_{GS}=0V$ | | | 1 | μA |
| Drain-Source On-Resistance ^(Note2) | $R_{DS(on)}$ | $V_{GS}=10V, I_D=1.5A$ | | | 234 | m Ω |
| | | $V_{GS}=6.0V, I_D=1.0A$ | | | 267 | |
| | | $V_{GS}=4.5V, I_D=0.5A$ | | | 278 | |
| Forward Transconductance ^(Note2) | g_{FS} | $V_{DS}=20V, I_D=1.5A$ | | 2.0 | | S |
| Diode Forward voltage | V_{SD} | $V_{GS}=0V, I_S=1.3A$ | | | 1.2 | V |
| Dynamic Characteristics^(Note 3) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=50V, V_{GS}=0V, f=1MHz$ | | 190 | | pF |
| Output Capacitance | C_{oss} | | | 22 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 13 | | |
| Gate Resistance | R_g | $f=1MHz$ | 0.3 | | 2.8 | Ω |
| Switching Characteristics^(Note 3) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=50V, R_L=39\Omega, V_{GEN}=4.5V, I_D=1.3A, R_{GEN}=1\Omega$ | | | 45 | ns |
| Turn-On Rise Time | t_r | | | | 39 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | | 26 | |
| Turn-Off Fall Time | t_f | | | | 20 | |
| Total Gate Charge | Q_g | $V_{DS}=50V, V_{GS}=4.5V, I_D=1.6A$ | | | 5.8 | nC |
| Gate-Source Charge | Q_{gs} | | | 0.75 | | |
| Turn-Off Fall Time | Q_{gd} | | | 1.4 | | |

Notes:

- 1.Repetitive Rating: Pluse Width Limited By Junction Temperature.
- 2.Pulse Test: Pulse Width $\leq 300\mu A$, Duty Cycle $\leq 0.5\%$.
- 3.Guaranteed By Design, Not Subject to Production Testing.

Curve Characteristics

Fig. 1 - Output Characteristics

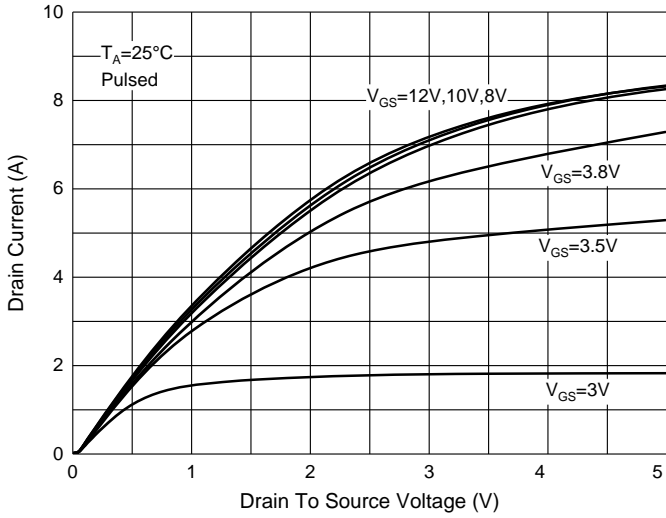


Fig. 2 - Transfer Characteristics

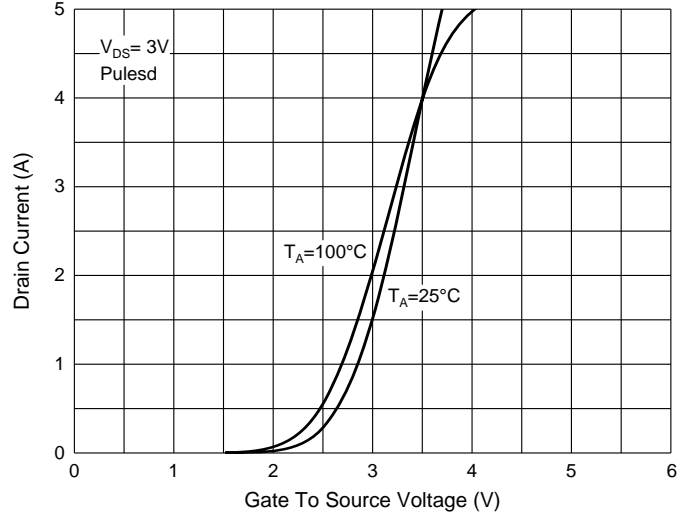


Fig. 3 - $R_{DS(ON)} - I_D$

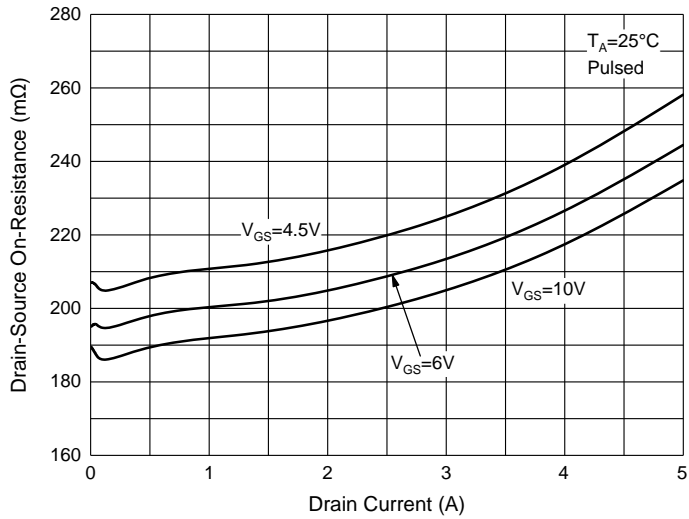


Fig. 4 - $R_{DS(ON)} - V_{GS}$

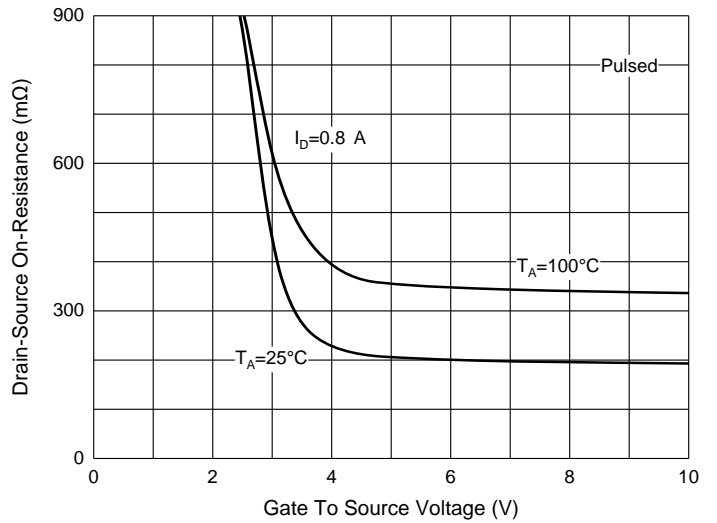


Fig. 5 - $I_S - V_{SD}$

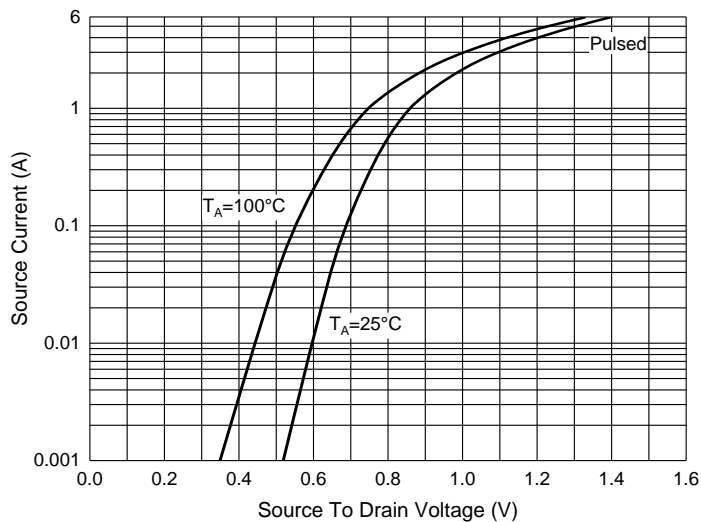
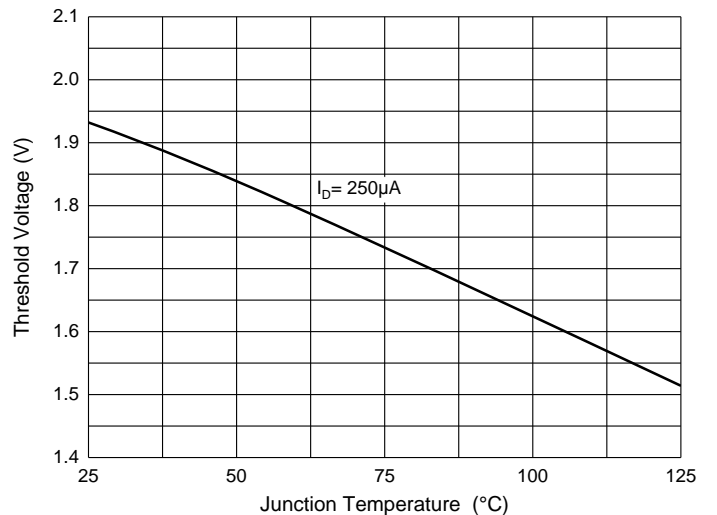


Fig. 6 - Threshold Voltage



Ordering Information

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

Note : Adding "-HF" Suffix For Halogen Free, eg. Part Number-TP-HF

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