

Features

- 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)

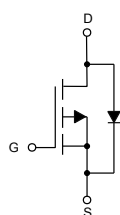
Maximum Ratings

- Operating Junction Temperature Range: -55°C to $+150^{\circ}\text{C}$
- Storage Temperature: -55°C to $+150^{\circ}\text{C}$
- Thermal Resistance: 90°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 |
| Drain Current-Continuous | I_D | -4.2 | A |
| Drain Current-Pulse ^(Note 2) | I_{DM} | -21 | A |
| 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

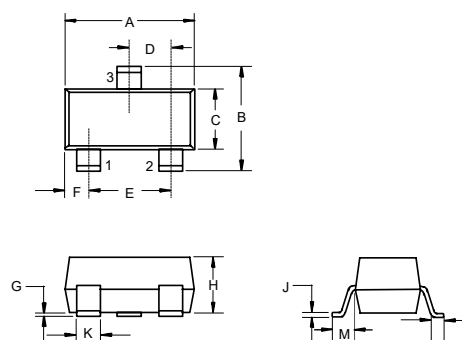


1. GATE
2. SOURCE
3. DRAIN

Marking: S5_B

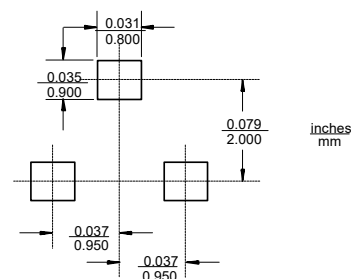
P-Channel MOSFET

SOT-23



| 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 | |
| M | 0.022 REF | | 0.55 REF | | |

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 =-250μA | -20 | | | V |
| Gate-Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =-250μA | -0.5 | | -0.9 | V |
| Gate-Body Leakage Current | I _{GSS} | V _{GS} =±10V, 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 =-4A | | 30 | 39 | mΩ |
| | | V _{GS} =-2.5V, I _D =-3A | | 38 | 49 | |
| | | V _{GS} =-1.8V, I _D =-2A | | 51 | 63 | |
| Forward Tranconductance ^(Note 4) | g _{FS} | V _{DS} =-5V, I _D =-4.1A | 6 | | | S |
| Dynamic Characteristics | | | | | | |
| Input Capacitance ^(Note 2,5) | C _{iss} | V _{DS} =-4V, V _{GS} =0V, f=1MHz | | 740 | | pF |
| Output Capacitance ^(Note 2,5) | C _{oss} | | | 290 | | |
| Reverse Transfer Capacitance ^(Note 2,5) | C _{rss} | | | 190 | | |
| Total Gate Charge ^(Note 2) | 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 2) | Q _{gs} | | | 1.2 | | |
| Gage-Drain Charge ^(Note 2) | Q _{gd} | | | 1.6 | | |
| Gate Resistance ^(Note 2,5) | R _g | f=1MHz | 1.4 | 7 | 14 | Ω |
| Turn-On Delay Time ^(Note 2,5) | t _{d(on)} | V _{DD} =-4V, V _{GEN} =-4.5V, R _L =1.2Ω, I _D =-3.3A, R _G =1Ω | | 13 | 20 | ns |
| Turn-On Rise Time ^(Note 2,5) | t _r | | | 35 | 53 | |
| Turn-Off Delay Time ^(Note 2,5) | t _{d(off)} | | | 32 | 48 | |
| Turn-Off Fall Time ^(Note 2,5) | t _f | | | 10 | 20 | |
| Turn-On Delay Time ^(Note 2,5) | t _{d(on)} | V _{DD} =-4V, V _{GEN} =-8V, R _L =1.2Ω, I _D =-3.3A, R _G =1Ω | | 5 | 10 | ns |
| Turn-On Rise Time ^(Note 2,5) | t _r | | | 11 | 17 | |
| Turn-Off Delay Time ^(Note 2,5) | t _{d(off)} | | | 22 | 33 | |
| Turn-Off Fall Time ^(Note 2,5) | t _f | | | 16 | 24 | |
| Drain-Source Body Diode Characteristics | | | | | | |
| Continuous Source-Drain Diode Current | I _S | T _C =25°C | | | -4.2 | A |
| Pulse Diode Forward Current ^(Note 4) | I _{SM} | | | | -10 | |
| Body Diode Voltage | V _{SD} | I _F =-3.3A | | -0.8 | -1.2 | V |

Note:

2. Guaranteed by Design, Not Subject to Production Testing.
3. Repetitive Rating: Pulse Width Limited by Max. Junction Temperature.
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
5. These Parameters Have No Way to Verify.

Curve Characteristics

Fig. 1 - On-Resistance Characteristics

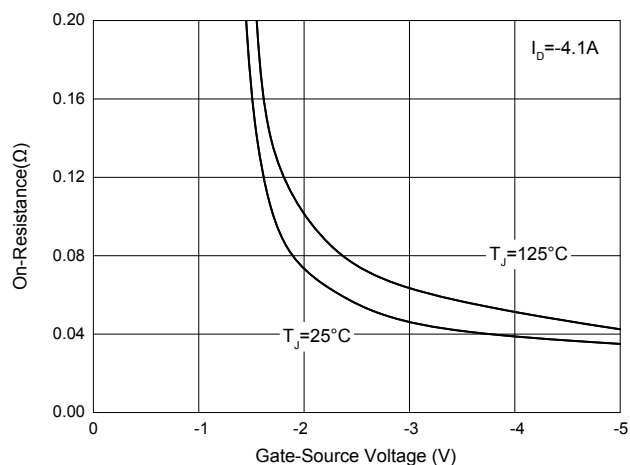


Fig. 2 - Drain Current Characteristics

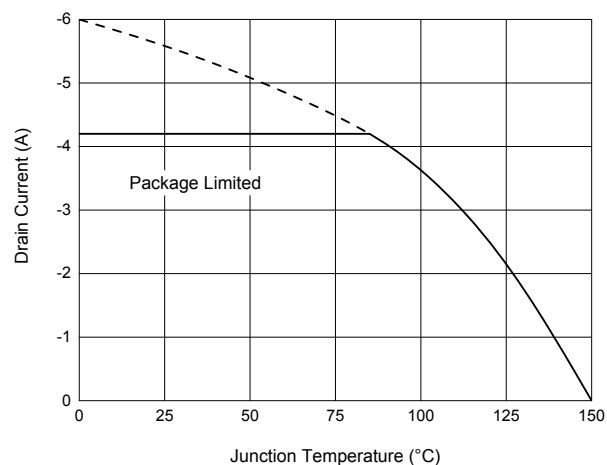


Fig. 3 - Output Characteristics

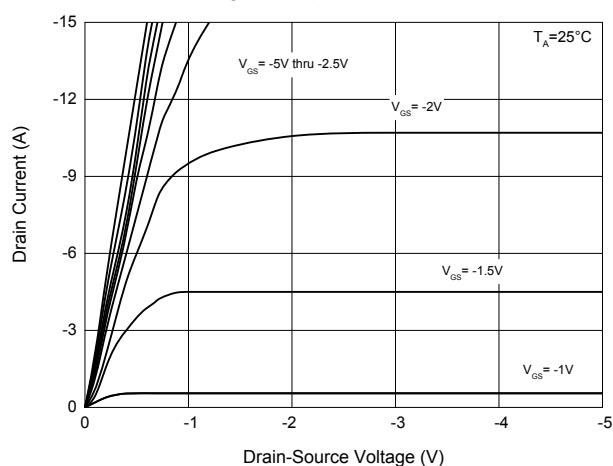


Fig. 4 - On-Resistance Characteristics

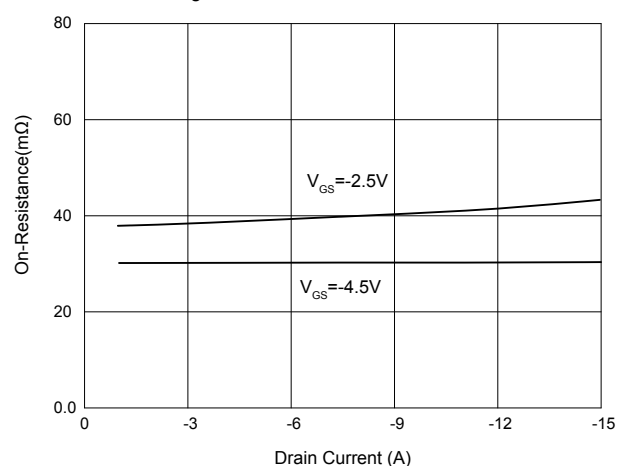
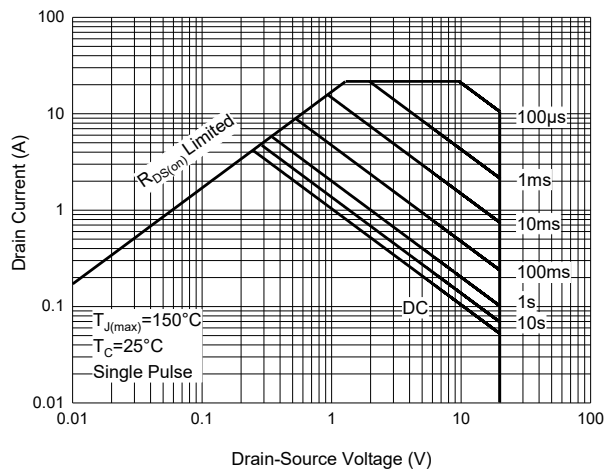


Fig. 5 - Safe Operation Area



Ordering Information

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

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