## Features

- Trench MOSFET Technology
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free. “Green” Device(Note 1)
- Moisture Sensitivity Level 3

# Dual P-Channel Power MOSFET

## Maximum Ratings

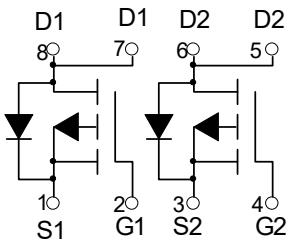
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 73°C/W Junction to Ambient(Note 2)

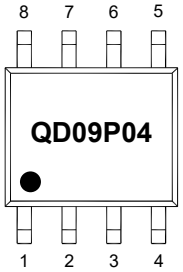
| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -40 | V |
| Gate-Source Volltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $T_C$=25°C | $I_D$ | -9 | A |
| | $T_C$=100°C | | -5.7 | |
| Pulsed Drain Current(Note3) | | $I_{DM}$ | -36 | A |
| Total Power Dissipation(Note4) | | $P_D$ | 1.7 | W |
| Single Pulsed Avalanche Energy(Note5) | | $E_{AS}$ | 64 | mJ |

Note:

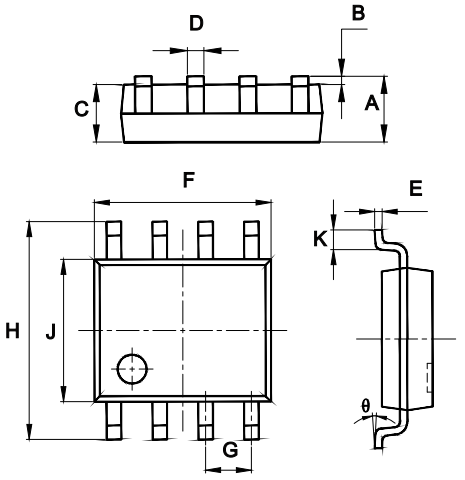
1. Halogen free "Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$ =25°C. The Power dissipation $P_{DSM}$ is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
4. $P_D$ is based on max. junction temperature, using junction-ambient thermal resistance.
5. $T_J$=25°C, $V_{DD}$=-25V,L=0.5mH

## Internal Structure and Marking Code



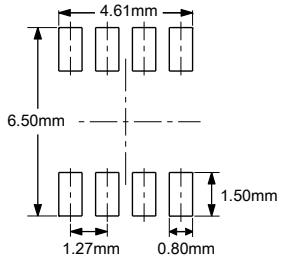




## SOP-8




| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| DIM | INCHES | | MM | | NOTE |
| | MIN | MAX | MIN | MAX | |
| A | 0.053 | 0.069 | 1.35 | 1.75 | |
| B | 0.004 | 0.010 | 0.10 | 0.25 | |
| C | 0.053 | 0.061 | 1.35 | 1.55 | |
| D | 0.013 | 0.020 | 0.33 | 0.51 | |
| E | 0.007 | 0.010 | 0.17 | 0.25 | |
| F | 0.185 | 0.200 | 4.70 | 5.10 | |
| G | 0.050 | | 1.270 | | TYP. |
| H | 0.228 | 0.244 | 5.80 | 6.20 | |
| J | 0.150 | 0.157 | 3.80 | 4.00 | |
| K | 0.016 | 0.050 | 0.40 | 1.27 | |
| θ | 0° | 8° | 0° | 8° | |

**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, $I_D$=-250μA | -40 | | | V |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$ =±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-40V, $V_{GS}$=0V | | | -1 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=-250μA | -1.0 | -1.5 | -2.5 | V |
| Drain-Source On-Resistance(Note 3) | $R_{DS(on)}$ | $V_{GS}$=-10V, $I_D$=-9A | | 17 | 23 | mΩ |
| | | $V_{GS}$=-4.5V, $I_D$=-5A | | 21 | 28 | |
| Gate Resistance | $R_g$ | F=1 MHz, Open drain | | 10 | | Ω |
| **Diode Characteristics** | | | | | | |
| Continuous Body Diode Current | $I_S$ | | | | -9 | A |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_S$=-9A | | | -1.2 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_F$=-4A, $dI_F/dt$=100A/μs | | | 51 | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | | | 41 | nC |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-30V,$V_{GS}$=0V,f=1MHz | | 3302 | | pF |
| Output Capacitance | $C_{oss}$ | | | 224 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 198 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-20V,$V_{GS}$=-10V,$I_D$=-4A | | 75 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 8 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 15 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$=-20V, $V_{GS}$=-10V, $R_{GEN}$=3Ω, $I_{DS}$=-4A | | 7.5 | | ns |
| Turn-On Rise Time | $t_r$ | | | 4.2 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 200 | | |
| Turn-Off Fall Time | $t_f$ | | | 70 | | |

Fig. 1 - Typical Output Characteristics

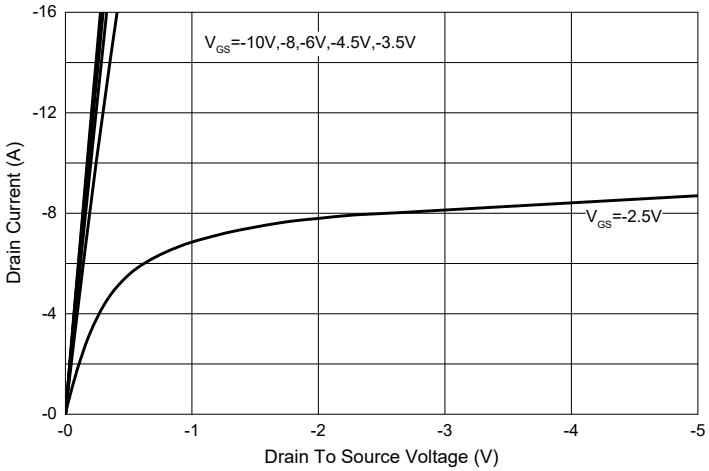



Fig. 2 - Transfer Characteristics

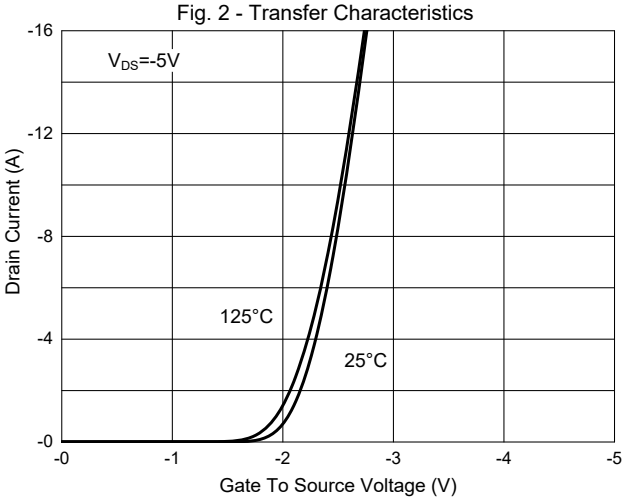



Fig. 3 - $R_{DS(ON)}$—$V_{GS}$

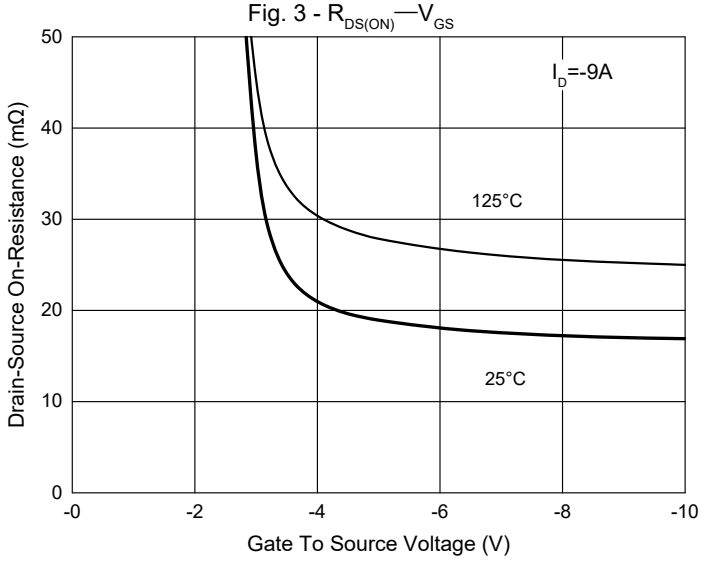



Fig. 4 - $R_{DS(ON)}$—$I_D$

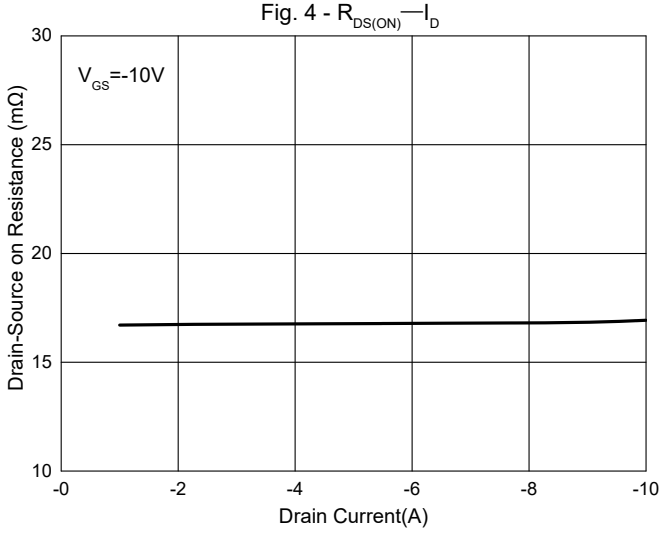



Fig. 5 - Normalized On Resistance Characteristics

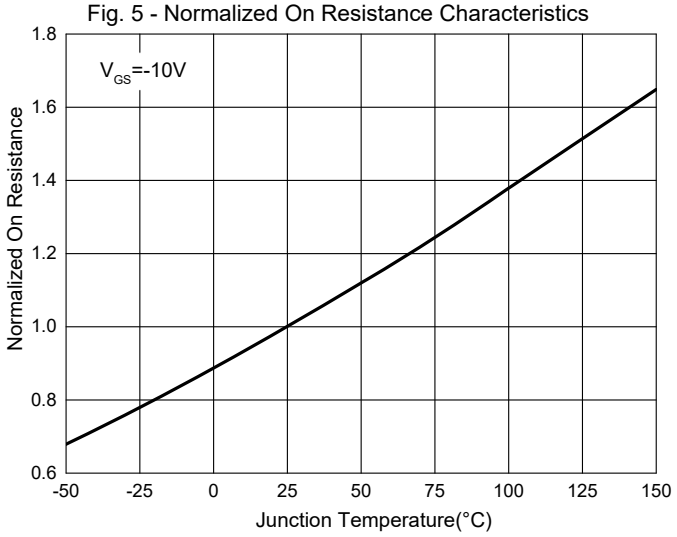



Fig. 6 - Threshold Voltage

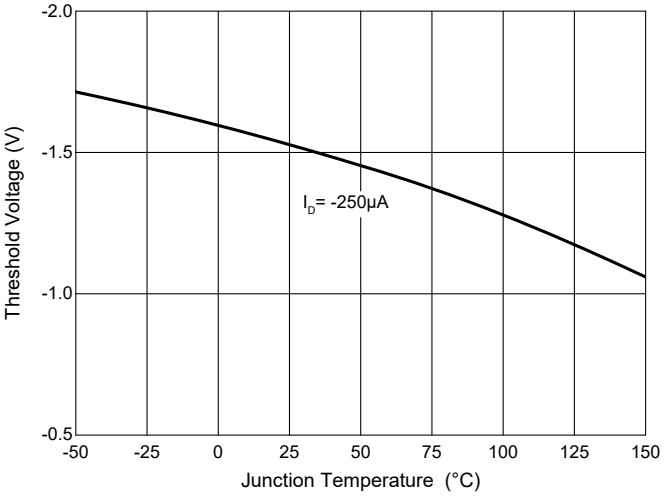


Fig. 7 - Capacitance Characteristics

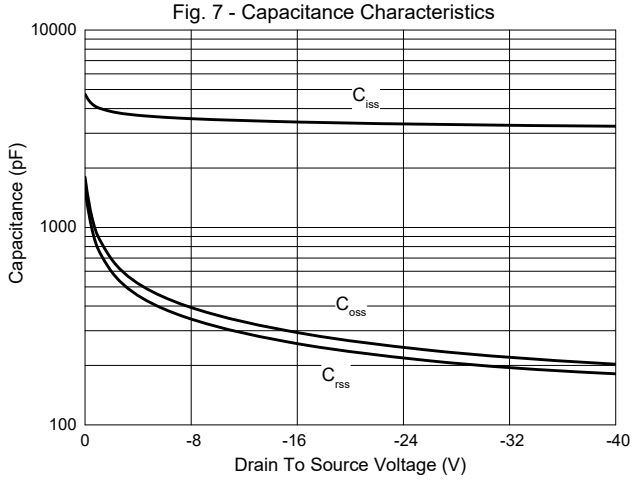



Fig. 8 - Gate Charge

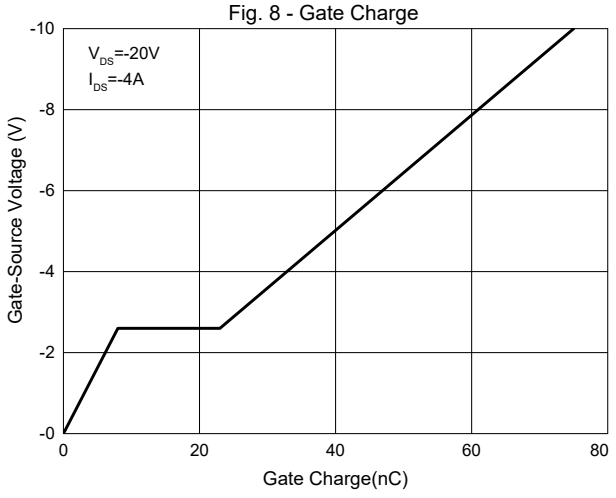



Fig. 9 - $I_S$—$V_{SD}$

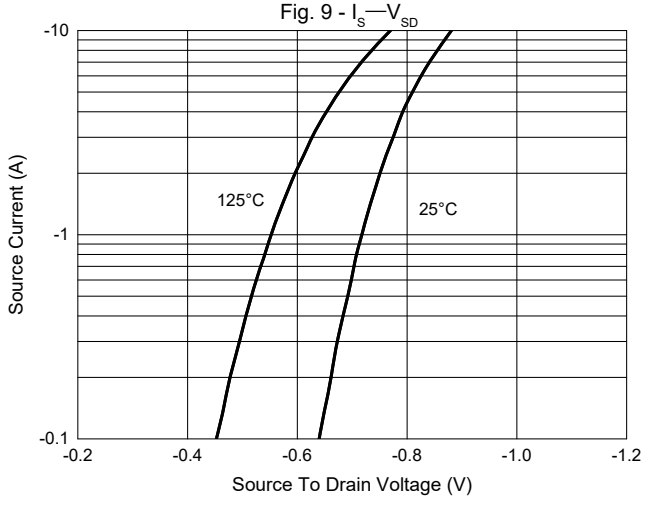



Fig. 10 - ID-TJ

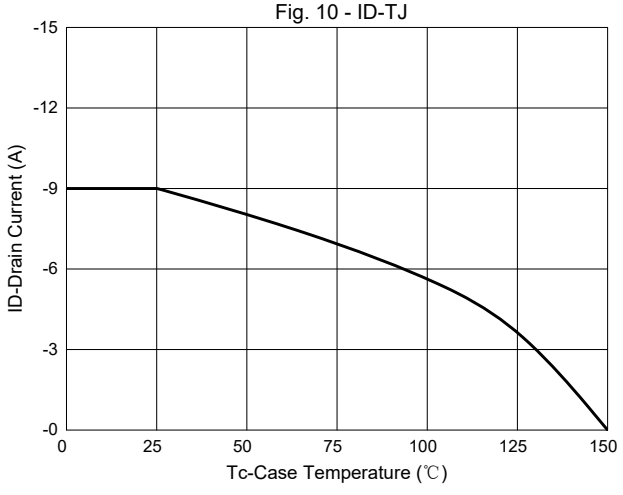



Fig. 11 - PD—TJ

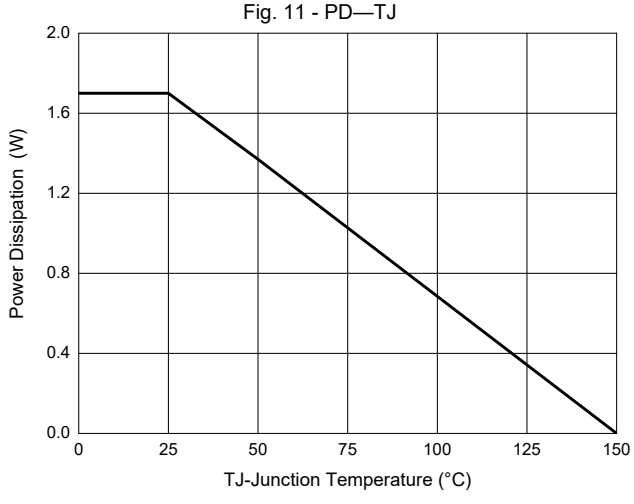


Fig. 12 - Safe Operation Area

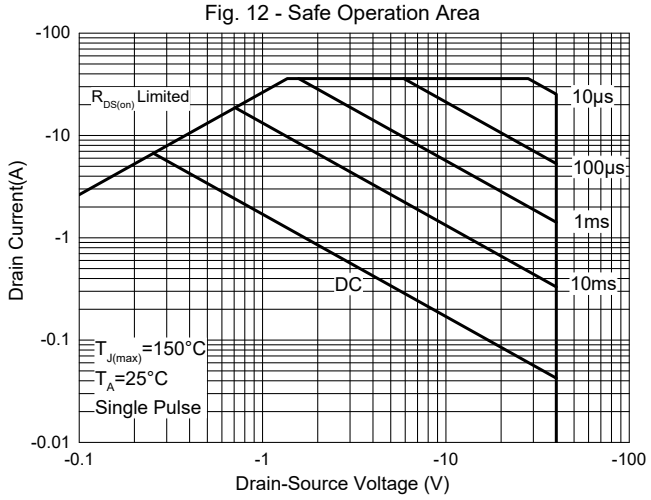
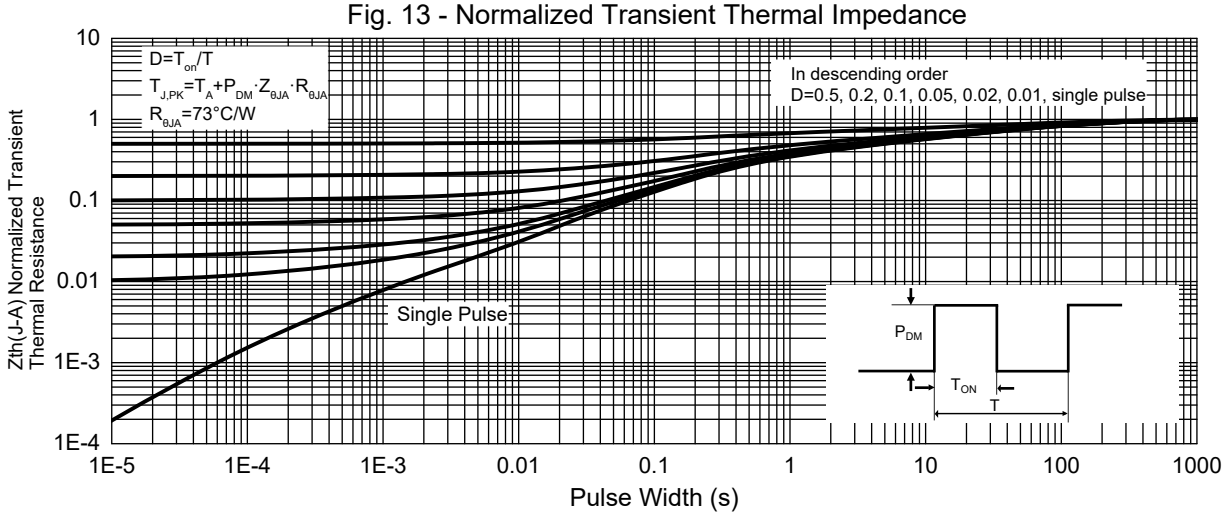



Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

| Device | Packing |
|---|---|
| Part Number-TP | Tape&Reel: 4Kpcs/Reel |

## Revision History

| Datasheet status | Version No | Release date | Update content |
|---|---|---|---|
| New product datasheet | Rev4-1 | 20230109 | |

# Mouser Electronics

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