

Features

- Advanced Trench MOSFET Process Technology
- 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)

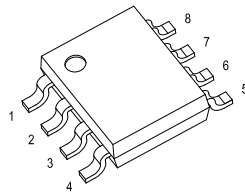
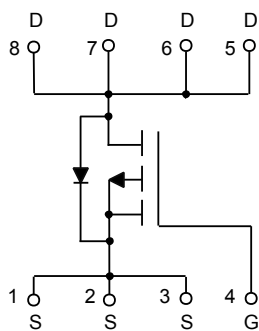
Maximum Ratings

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 89°C/W Junction to Ambient

| Parameter | Symbol | Rating | Unit |
|---|----------|--------|------|
| Drain -Source Voltage | V_{DS} | -30 | V |
| Gate -Source Voltage | V_{GS} | ±20 | V |
| Drain Current-Continuous | I_D | -6.5 | A |
| Drain Current-Pulsed | I_{DM} | -26 | A |
| Power Dissipation | P_D | 1.4 | W |
| Single Pulsed Avalanche Energy ^(Note1) | E_{AS} | 14 | mJ |

Note:
1.EAS condition: $V_{DD}=-50V, L=0.5mH, R_G=25\Omega$, Starting $T_J = 25^\circ C$

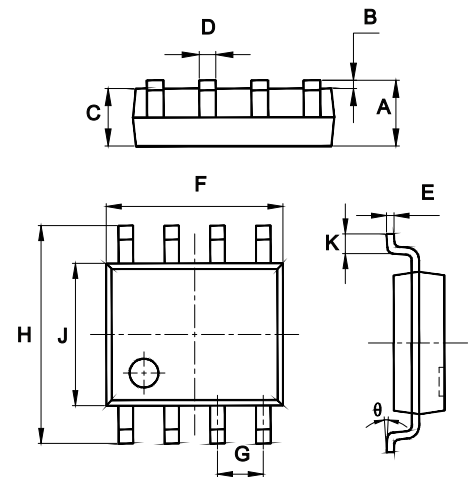
Internal Structure



Marking: Q4459

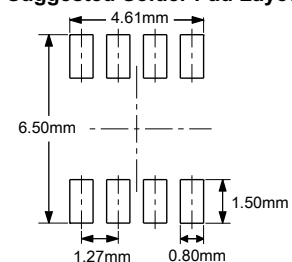
P-Channel Power MOSFET

SOP-8



| 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 (Ta=25°C unless otherwise specified)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--|---------------|---|------|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=-250\mu A$ | -30 | | | V |
| Gate-Threshold Voltage ^(Note1) | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -1.4 | -2.0 | -2.4 | V |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=-30V, V_{GS}=0V$ | | | -1.0 | μA |
| Drain-Source On-Resistance ^(Note1) | $R_{DS(on)}$ | $V_{GS}=-10V, I_D=-6.5A$ | | 26 | 46 | m Ω |
| | | $V_{GS}=-4.5V, I_D=-5.0A$ | | 46 | 72 | |
| Forward Transconductance ^(Note1) | g_{FS} | $V_{DS}=-5.0V, I_D=-6.5A$ | 6.0 | | | S |
| Dynamic Characteristics^(Note2) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=-15V, V_{GS}=0V, f=1MHz$ | 415 | | 625 | pF |
| Output Capacitance | C_{oss} | | 70 | | 130 | |
| Reverse Transfer Capacitance | C_{rss} | | 40 | | 90 | |
| Switching Characteristics^(Note2) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=-15V, I_D=-1.0A, V_{GS}=-10V, R_{GEN}=3.0\Omega, R_L=2.5\Omega$ | | 7.5 | | nS |
| Turn-On Rise Time | t_r | | | 5.5 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 19 | | |
| Turn-Off Fall Time | t_f | | | 7.0 | | |
| Gate Resistance | R_g | $V_{DS}=0V, V_{GS}=0V, f=1MHz$ | 3.5 | 7.5 | 11.5 | Ω |
| Total Gate Charge | Q_g | $V_{DS}=-15V, I_D=-6.5A, V_{GS}=-10V$ | 7.4 | | 11 | nC |
| Gate-Source Charge | Q_{gs} | | 1.3 | | 1.9 | |
| Gate-Drain Charge | Q_{gd} | | 1.3 | | 3.1 | |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage ^(Note1) | V_{SD} | $V_{GS}=0V, I_S=-1A$ | | | -1.0 | V |
| Continuous Drain-Source Diode Forward Current | I_S | | | | -6.5 | A |
| Pulsed Drain-Source Diode Forward Current | I_{SM} | | | | -26 | A |

Note:

- 1.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 2.Guaranteed by design, not subject to production testing.

Curve Characteristics

Fig. 1 - Output Characteristics

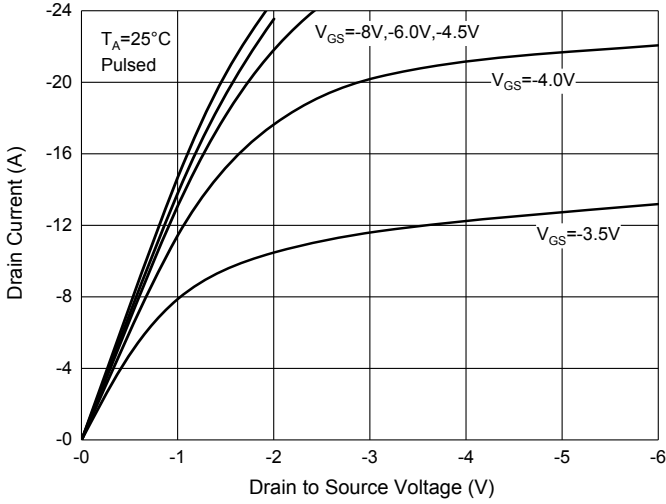


Fig. 2 - Transfer Characteristics

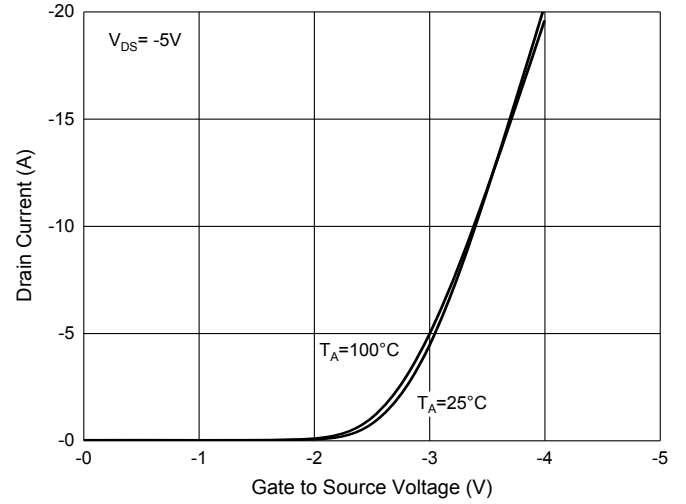


Fig. 3 - $R_{DS(ON)} - I_D$

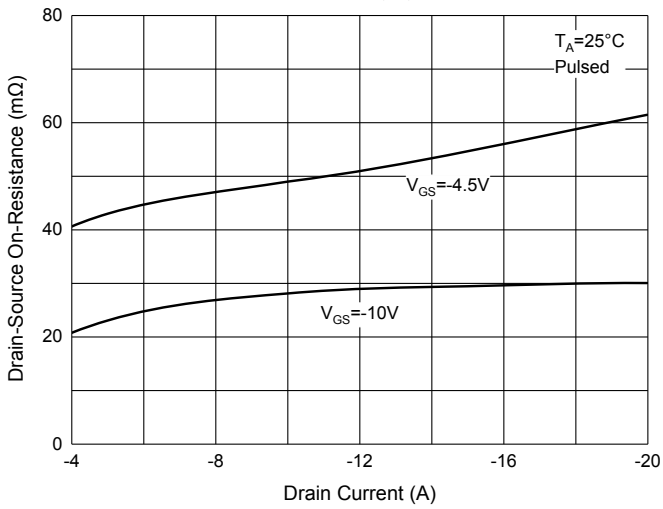


Fig. 4 - $R_{DS(ON)} - V_{GS}$

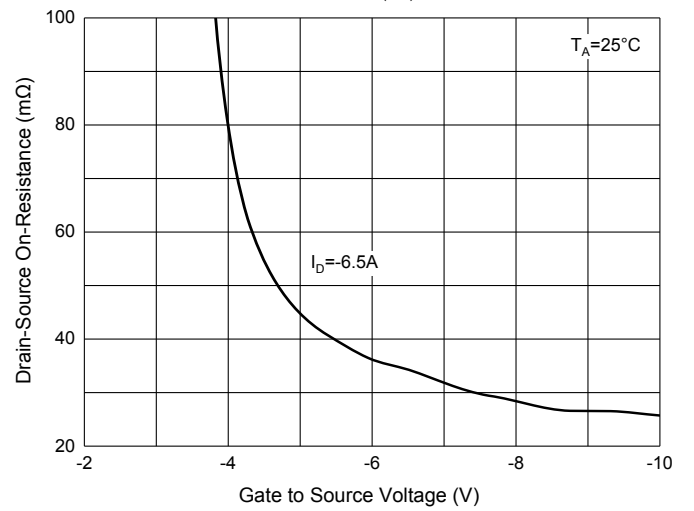


Fig. 5 - Threshold Voltage

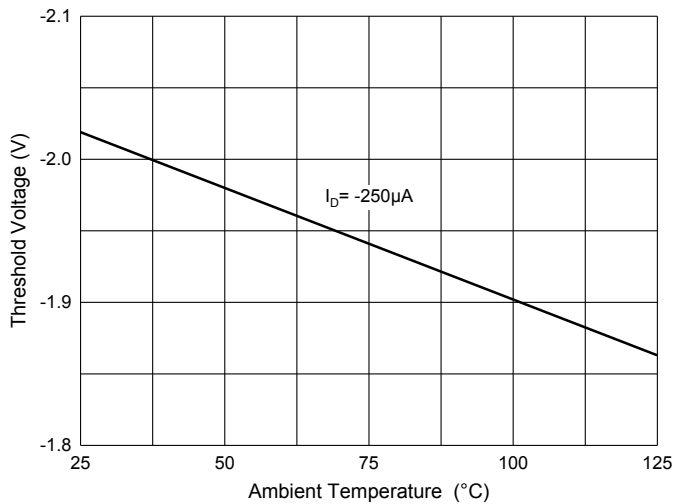
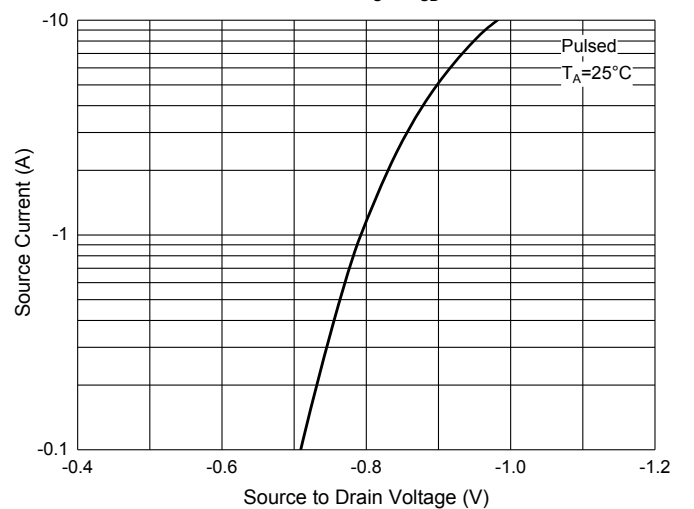


Fig. 6 - $I_S - V_{SD}$



Ordering Information

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

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

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