



Micro Commercial Components

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MCQ4406

N -Channel Enhancement Mode Field Effect Transistor

Features

- Halogen free available upon request by adding suffix "-HF"
- Lead Free Finish/Rohs Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking: Q4406

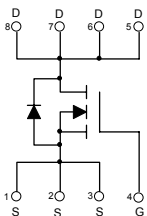
Maximum ratings ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter | Symbol | Rating | Unit |
|---|-----------------|------------|----------------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | I_D | 10 | A |
| Pulsed Drain Current | I_{DM} | 40 | A |
| Single Pulsed Avalanche Energy ⁽¹⁾ | E_{AS} | 105 | mJ |
| Power Dissipation | P_D | 1.4 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 89 | $^{\circ}\text{C/W}$ |
| Operating Junction Temperature | T_J | 150 | $^{\circ}\text{C}$ |
| Storage Temperature | T_{STG} | -55 ~ +150 | |

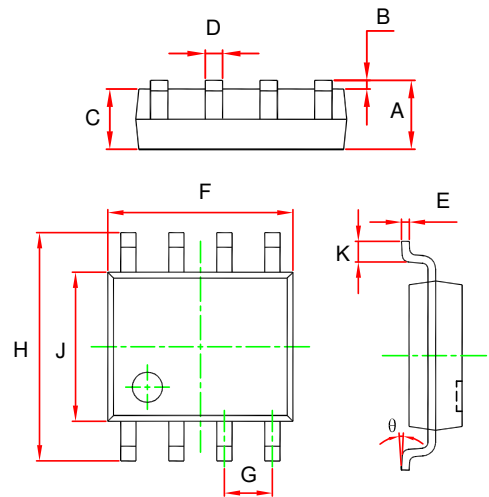
Notes :

(1). E_{AS} condition: $V_{DD}=50\text{V}$, $L=0.5\text{mH}$, $R_G=25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

Equivalent Circuit



SOP-8



| DIM | DIMENSIONS | | | | NOTE |
|----------|--------------|--------------|--------------|--------------|------|
| | INCHES | | MM | | |
| | MIN | MAX | MIN | MAX | |
| A | 0.053 | 0.069 | 1.350 | 1.750 | |
| B | 0.004 | 0.010 | 0.100 | 0.250 | |
| C | 0.053 | 0.061 | 1.350 | 1.550 | |
| D | 0.013 | 0.020 | 0.330 | 0.510 | |
| E | 0.007 | 0.010 | 0.170 | 0.250 | |
| F | 0.189 | 0.197 | 4.800 | 5.000 | |
| G | 0.050 (BSC) | | 1.270 (BSC) | | |
| H | 0.228 | 0.244 | 5.800 | 6.200 | |
| J | 0.150 | 0.157 | 3.800 | 4.000 | |
| K | 0.016 | 0.050 | 0.400 | 1.270 | |
| θ | 0 $^{\circ}$ | 8 $^{\circ}$ | 0 $^{\circ}$ | 8 $^{\circ}$ | |

Electrical characteristics (T_a=25°C unless otherwise noted)

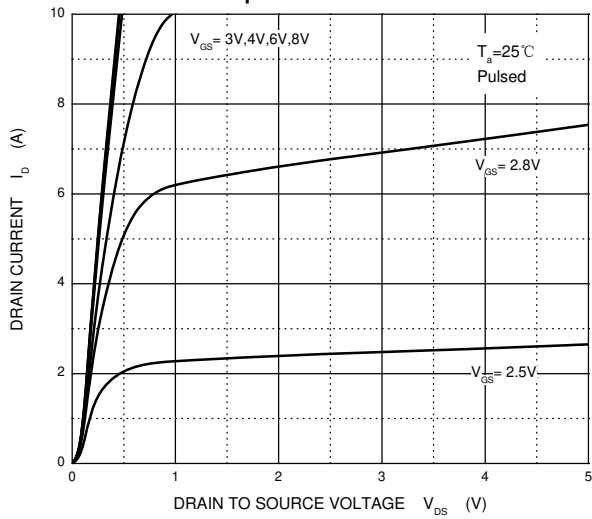
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|-----------------------|--|-----|------|------|------|
| Off characteristics | | | | | | |
| Drain-source breakdown voltage | V _{(BR) DSS} | V _{GS} = 0V, I _D =250μA | 30 | | | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =30V, V _{GS} =0V | | | 1 | μA |
| Gate-body leakage current | I _{GSS} | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA |
| On characteristics (note1) | | | | | | |
| Gate-threshold voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 1.0 | 1.5 | 3.0 | V |
| Static drain-source on-state resistance | R _{DS(on)} | V _{GS} =10V, I _D =12A | | 7.6 | 12 | mΩ |
| | | V _{GS} =4.5V, I _D =10A | | 11 | 16 | mΩ |
| Forward transconductance | g _{FS} | V _{DS} =5V, I _D =10A | | 15 | | S |
| Dynamic characteristics (note 2) | | | | | | |
| Input capacitance | C _{iss} | V _{DS} =15V, V _{GS} =0V, f =1MHz | | 1550 | | pF |
| Output capacitance | C _{oss} | | | 300 | | |
| Reverse transfer capacitance | C _{rss} | | | 180 | | |
| Switching characteristics (note 2) | | | | | | |
| Total gate charge | Q _g | V _{DS} =15V, V _{GS} =5V, I _D =10A | | 13 | | nC |
| Gate-source charge | Q _{gs} | | | 5.5 | | |
| Gate-drain charge | Q _{gd} | | | 3.5 | | |
| Turn-on delay time | t _{d(on)} | V _{DD} =25V, I _D =1A, V _{GS} =10V, R _G =6Ω, R _L =6.7Ω | | 30 | | ns |
| Turn-on rise time | t _r | | | 20 | | |
| Turn-off delay time | t _{d(off)} | | | 100 | | |
| Turn-off fall time | t _f | | | 80 | | |
| Gate Resistance | R _g | f =1MHz, V _{DS} =0V, V _{GS} =0V, | 0.8 | | 2.4 | Ω |
| Drain-Source Diode Characteristics | | | | | | |
| Drain-source diode forward voltage(note1) | V _{SD} | V _{GS} =0V, I _S =10A | | | 1.2 | V |
| Continuous drain-source diode forward current | I _S | | | | 10 | A |
| Pulsed drain-source diode forward current | I _{SM} | | | | 40 | A |

Notes:

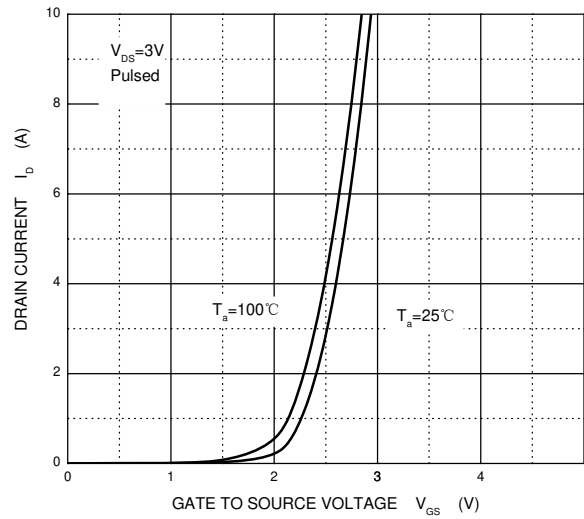
1. Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.
2. Guaranteed by design, not subject to production testing.

Typical Characteristics

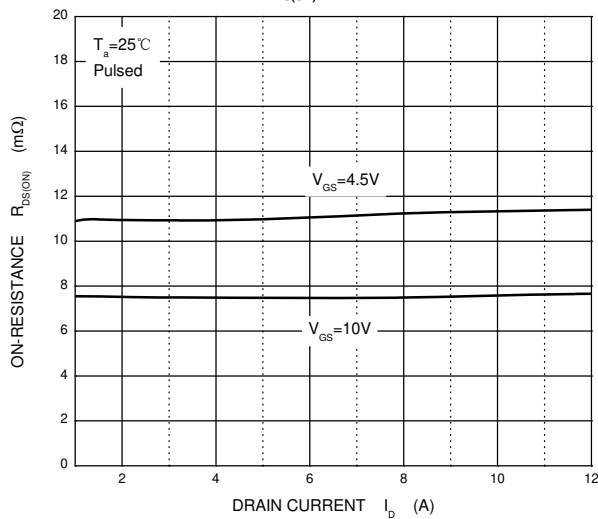
Output Characteristics



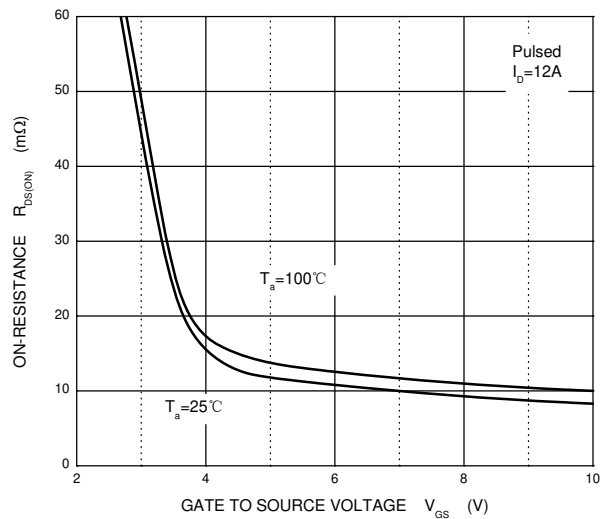
Transfer Characteristics



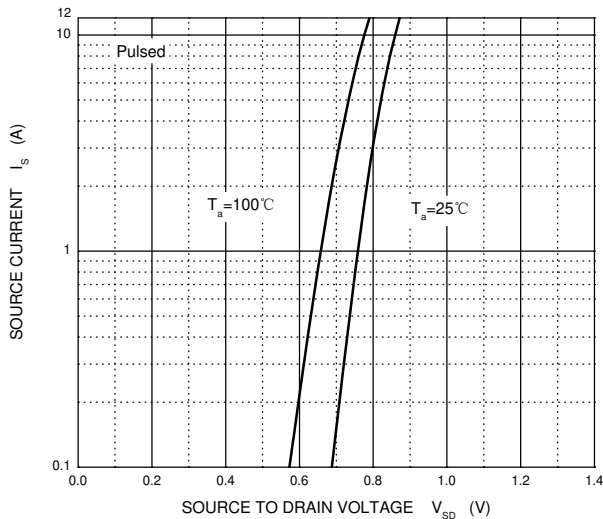
$R_{DS(ON)}$ — I_D



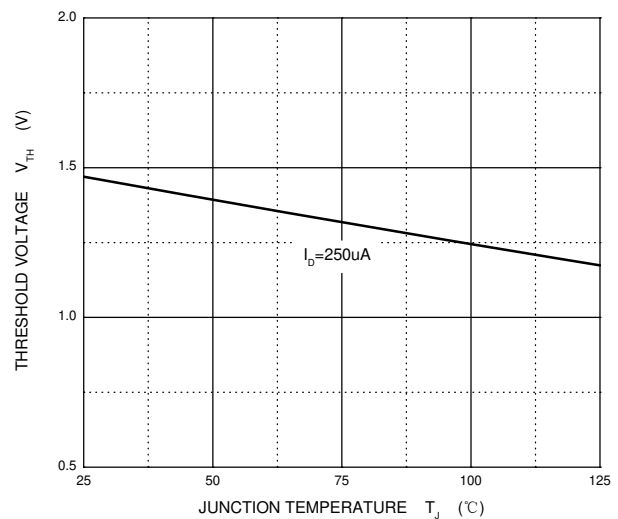
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage





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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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