



Micro Commercial Components

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MCQ16N03

N-Channel Enhancement Mode Field Effect Transistor

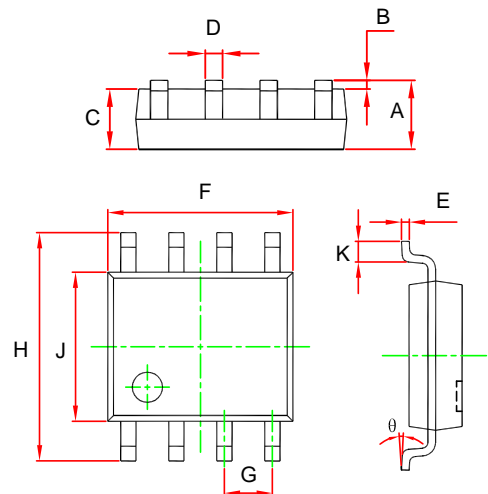
Features

- 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

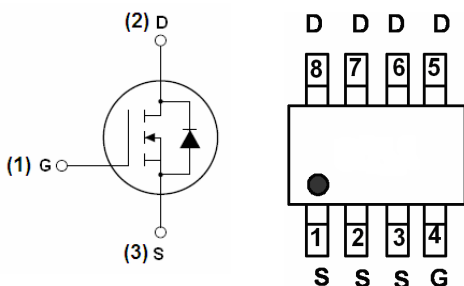
Maximum Ratings @ 25°C Unless Otherwise Specified

| Parameter | Symbol | Limit | Unit |
|---|------------|------------|--------------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Drain Current-Continuous | I_D | 16 | A |
| Drain Current-Continuous($T_C=100^\circ\text{C}$) | I_D | 6 | A |
| Pulsed Drain Current(Note 1) | I_{DM} | 50 | A |
| Maximum Power Dissipation | P_D | 2.5 | W |
| Thermal Resistance, Junction-to-Case(Note 2) | R_{thJC} | 50 | $^\circ\text{C/W}$ |
| Operating Junction Temperature Range | T_J | -55 To 150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{STG} | -55 To 150 | $^\circ\text{C}$ |

SOP-8



EQUIVALENT CIRCUIT



| 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° | 8° | 0° | 8° | |

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|--|--------------|---|-----|------|-----------|------------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 30 | 33 | - | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=30V, V_{GS}=0V$ | - | - | 1 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | - | - | ± 100 | nA |
| On Characteristics ^(Note 3) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1 | 1.6 | 3 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=10A$ | - | 8 | 12 | m Ω |
| | | $V_{GS}=4.5V, I_D=5A$ | - | 11 | 16 | |
| Forward Transconductance | g_{FS} | $V_{DS}=5V, I_D=10A$ | 15 | - | - | S |
| Dynamic Characteristics ^(Note 4) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=15V, V_{GS}=0V,$ $F=1.0\text{MHz}$ | - | 1550 | - | PF |
| Output Capacitance | C_{oss} | | - | 300 | - | PF |
| Reverse Transfer Capacitance | C_{rss} | | - | 180 | - | PF |
| Switching Characteristics ^(Note 4) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}=25V, I_D=1A$ $V_{GS}=10V, R_{GEN}=6\Omega$ | - | 30 | - | nS |
| Turn-on Rise Time | t_r | | - | 20 | - | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 100 | - | nS |
| Turn-Off Fall Time | t_f | | - | 80 | - | nS |
| Total Gate Charge | Q_g | $V_{DS}=15V, I_D=10A,$ $V_{GS}=5V$ | - | 13 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 5.5 | - | nC |
| Gate-Drain Charge | Q_{gd} | | - | 3.5 | - | nC |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage ^(Note 3) | V_{SD} | $V_{GS}=0V, I_S=10A$ | - | - | 1.2 | V |
| Diode Forward Current ^(Note 2) | I_S | | - | - | 16 | A |

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Typical Characteristics

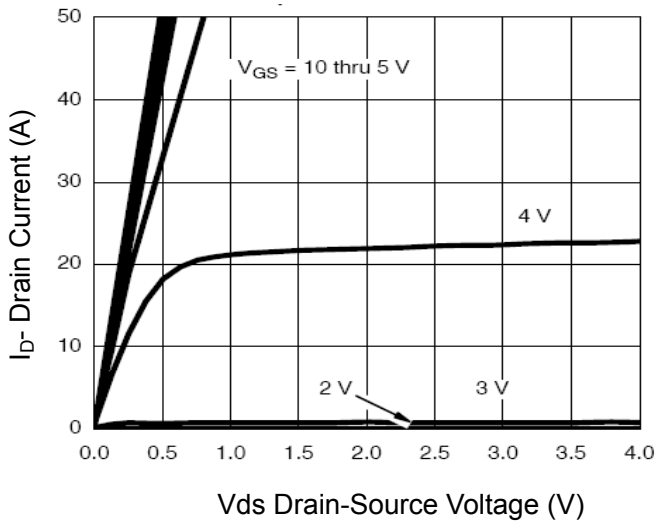


Figure 1 Output Characteristics

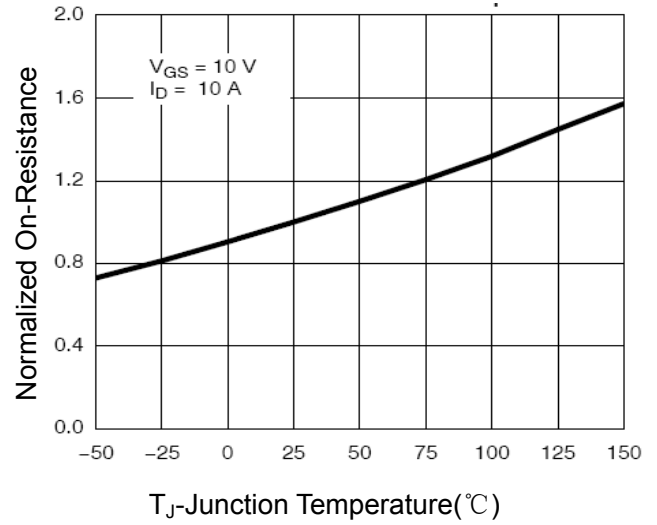


Figure 4 Rdson-Junction Temperature

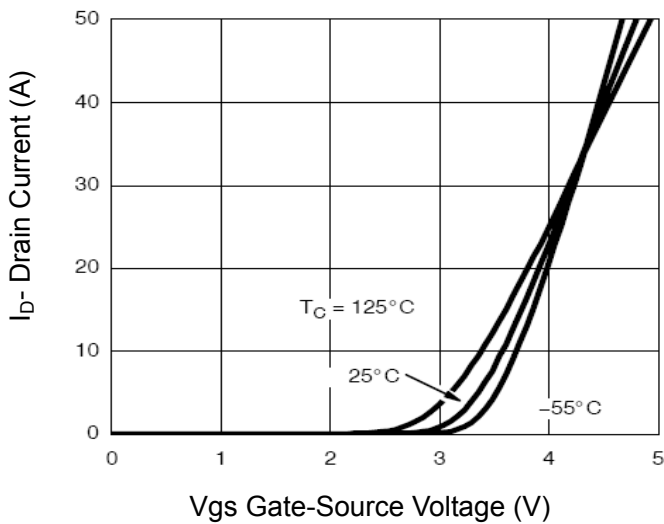


Figure 2 Transfer Characteristics

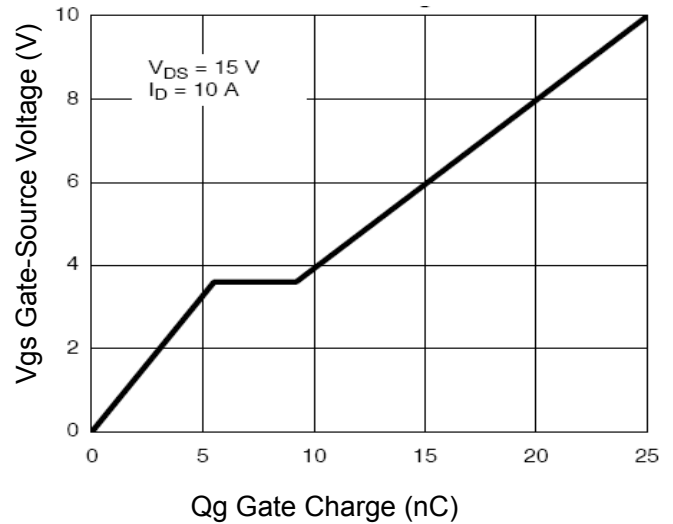


Figure 5 Gate Charge

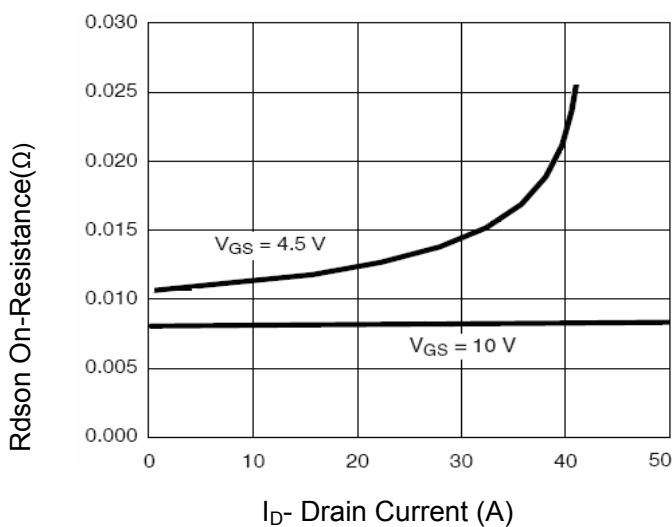


Figure 3 Rdson- Drain Current

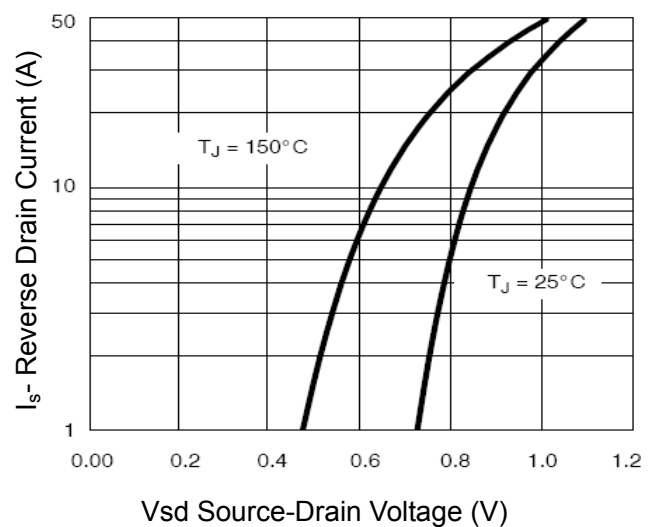
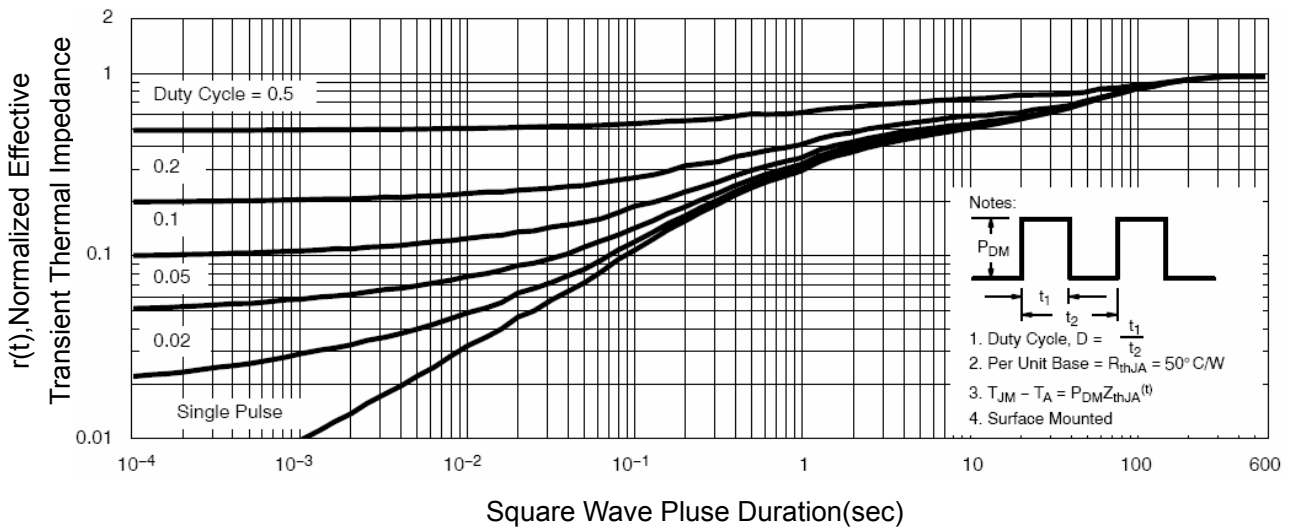
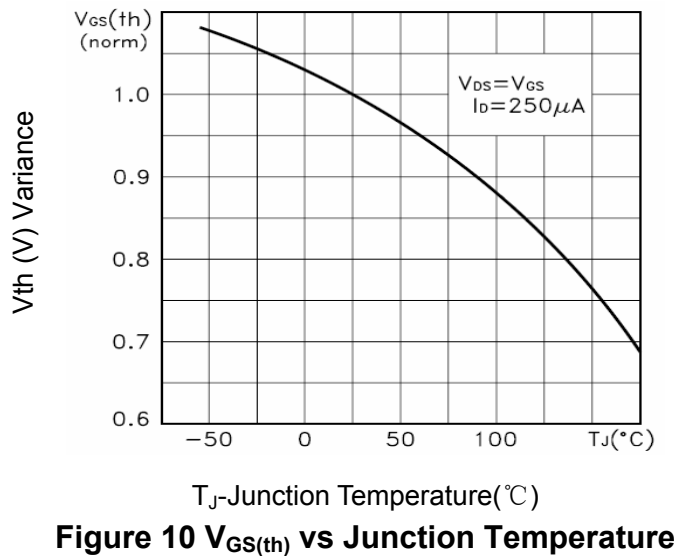
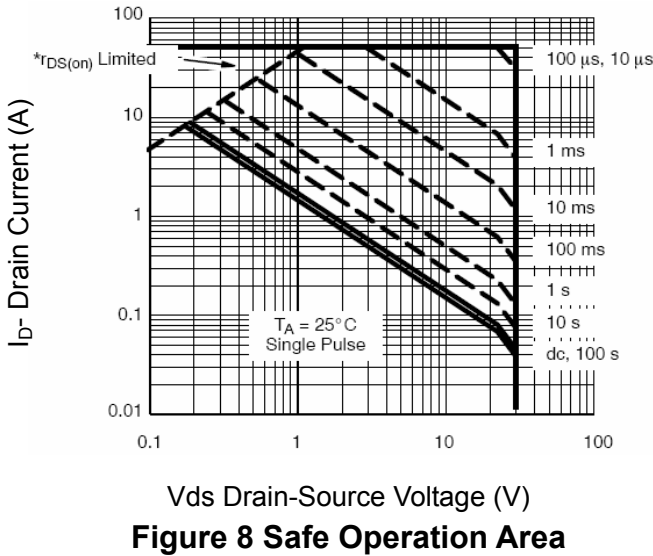
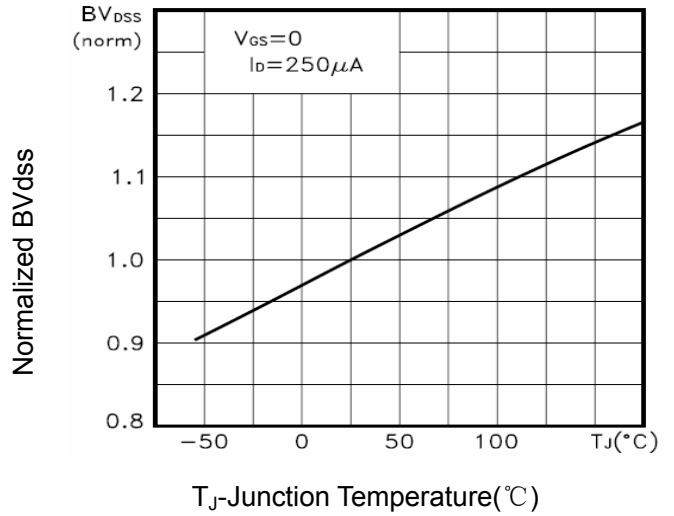
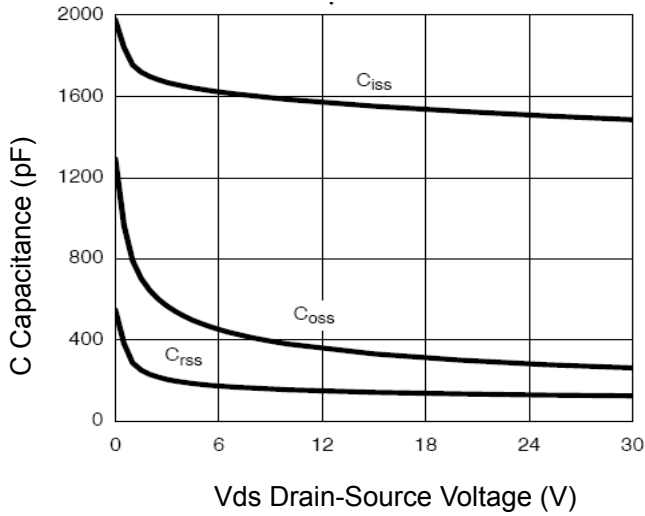


Figure 6 Source- Drain Diode Forward

Typical Characteristics





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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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