## Electrical Characteristics $T_A$ = 25°C unless otherwise noted

| Parameter | Symbol | Test Condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$ = 0V, $I_D$ = 10μA | 20 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 20V, $V_{GS}$ = 0V | | | 1 | μA |
| Gate Body Leakage Current, Forward | $I_{GSSF}$ | $V_{GS}$ = 8V, $V_{DS}$ = 0V | | | 100 | nA |
| Gate Body Leakage Current, Reverse | $I_{GSSR}$ | $V_{GS}$ = -8V, $V_{DS}$ = 0V | | | -100 | nA |
| **On Characteristics** [c] | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ = 50μA | 0.65 | | 1.2 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ = 4.5V, $I_D$ = 3.6A | | 55 | 72 | mΩ |
| | | $V_{GS}$ = 2.5V, $I_D$ = 3.1A | | 82 | 110 | mΩ |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$ = 5V, $I_D$ = 3.6A | | 8.5 | | S |
| **Dynamic Characteristics** [d] | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = 10V, $V_{GS}$ = 0V, f = 1.0 MHz | | 237 | | pF |
| Output Capacitance | $C_{oss}$ | | | 120 | | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 45 | | pF |
| **Switching Characteristics** [d] | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$ = 10V, $I_D$ = 3.6A, $V_{GS}$ = 4.5V, $R_{GEN}$ = 6Ω | | 23 | 45 | ns |
| Turn-On Rise Time | $t_r$ | | | 11 | 30 | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 34 | 70 | ns |
| Turn-On Fall Time | $t_f$ | | | 36 | 70 | ns |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = 10V, $I_D$ = 3.6A, $V_{GS}$ = 4.5V | | 6 | 10 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.4 | | nC |
| Gate-Drain Charge | $Q_{gd}$ | | | 1.8 | | nC |
| **Drain-Source Diode Characteristics and Maximun Ratings** | | | | | | |
| Drain-Source Diode Forward Current [b] | $I_S$ | | | | 0.94 | A |
| Drain-Source Diode Forward Voltage [c] | $V_{SD}$ | $V_{GS}$ = 0V, $I_S$ = 0.94A | | | 1.2 | V |

**Notes :**
a.Repetitive Rating : Pulse width limited by maximum junction temperature.
b.Surface Mounted on FR4 Board, t ≤ 10 sec.
c.Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
d.Guaranteed by design, not subject to production testing.

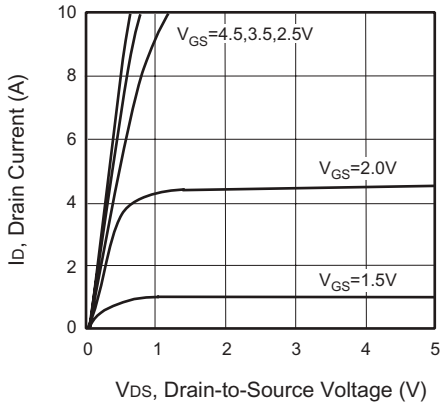


**Figure 1. Output Characteristics**

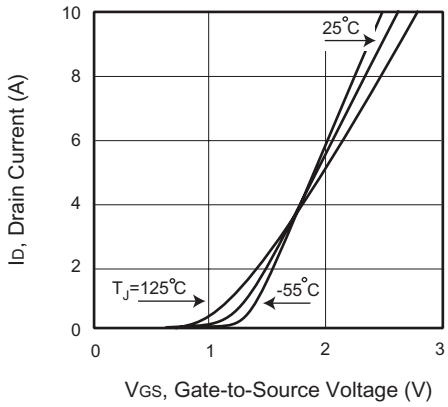


**Figure 2. Transfer Characteristics**

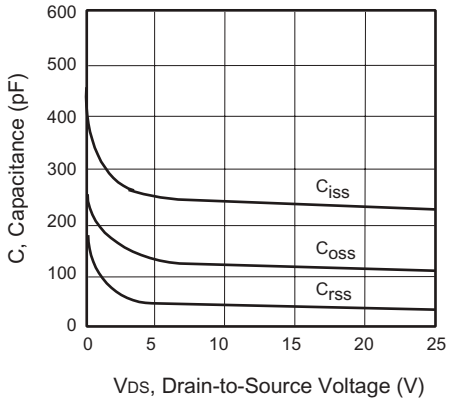


**Figure 3. Capacitance**

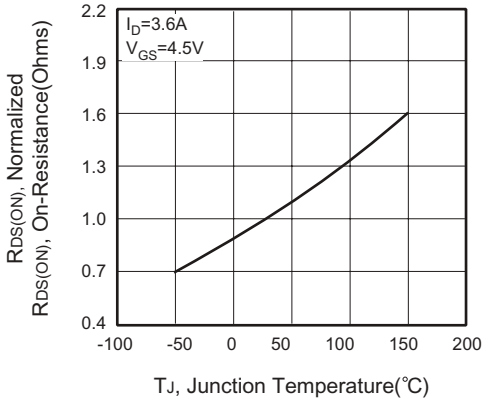


**Figure 4. On-Resistance Variation with Temperature**

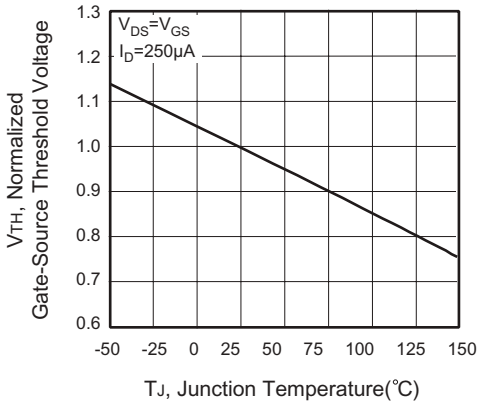


**Figure 5. Gate Threshold Variation with Temperature**

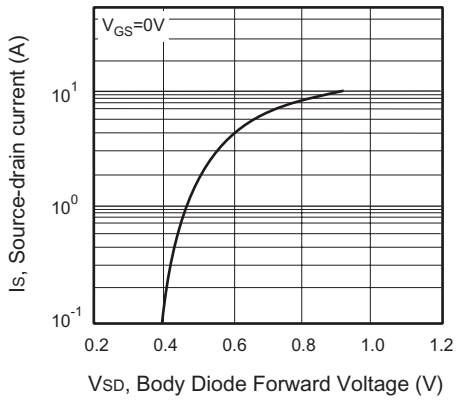


**Figure 6. Body Diode Forward Voltage Variation with Source Current**

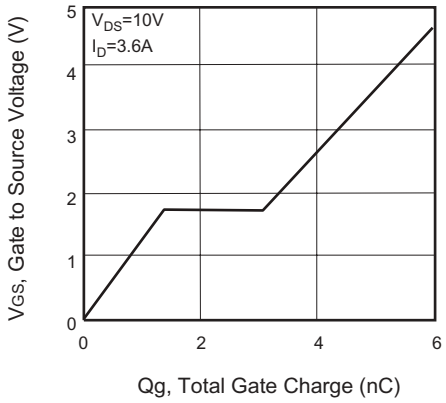


**Figure 7. Gate Charge**

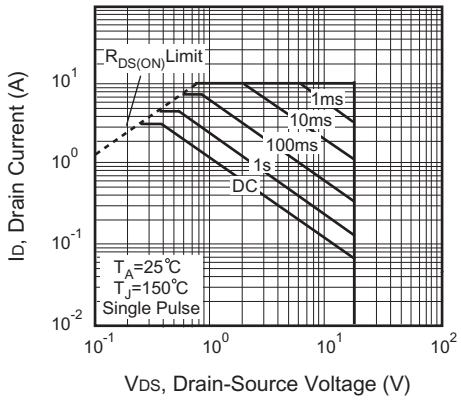


**Figure 8. Maximum Safe Operating Area**

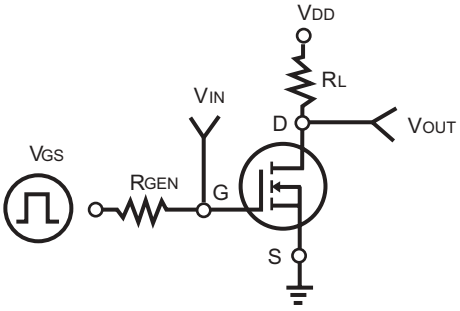


**Figure 9. Switching Test Circuit**

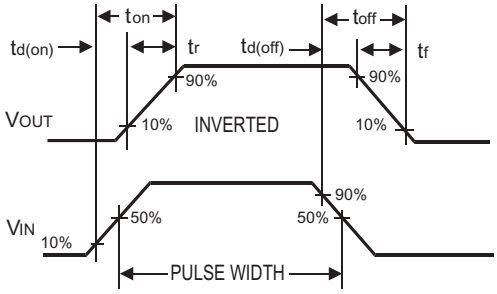


**Figure 10. Switching Waveforms**

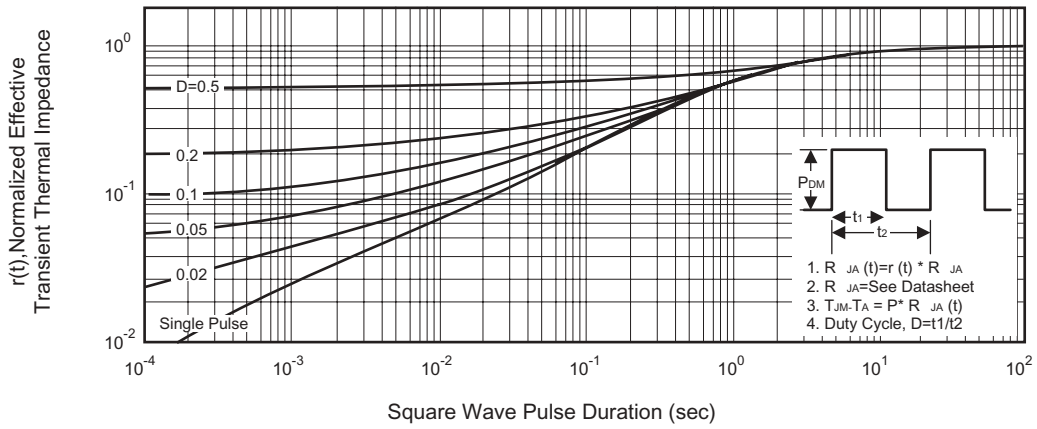


**Figure 11. Normalized Thermal Transient Impedance Curve**

Micro Commercial Components

## Ordering Information :

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

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

| ***IMPORTANT NOTICE*** |
|---|
| ***Micro Commercial Components Corp.*** reserves the right to make changes without further notice to any product herein to make corrections, modifications , enhancements , improvements , or other changes . ***Micro Commercial Components Corp .*** does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights ,nor the rights of others . The user of products in such applications shall assume all risks of such use and will agree to hold ***Micro Commercial Components Corp .*** and all the companies whose products are represented on our website, harmless against all damages. |
| ***LIFE SUPPORT*** |
| MCC's products are not authorized for use as critical components in life support devices or systems without the express written approval of Micro Commercial Components Corporation. |
| ***CUSTOMER AWARENESS*** |
| Counterfeiting of semiconductor parts is a growing problem in the industry. Micro Commercial Components (MCC) is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. MCC strongly encourages customers to purchase MCC parts either directly from MCC or from Authorized MCC Distributors who are listed by country on our web page cited below. Products customers buy either from MCC directly or from Authorized MCC Distributors are genuine parts, have full traceability, meet MCC's quality standards for handling and storage. **MCC will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources.** MCC is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors. |