# CED01N65/CEU01N65

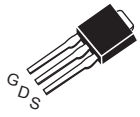
## N-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

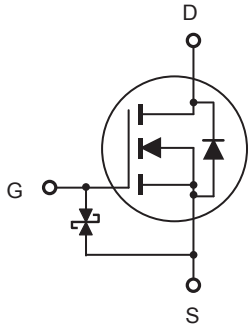
## FEATURES

- 650V, 1.2A, $R_{DS(ON)}$ = 10.5Ω @$V_{GS}$ = 10V.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handing capability.
- Lead free product is acquired.
- TO-251 & TO-252 package.


CEU SERIES
TO-252(D-PAK)




CED SERIES
TO-251(I-PAK)




## ABSOLUTE MAXIMUM RATINGS $T_C$ = 25°C unless otherwise noted

| Parameter | Symbol | Limit | Units |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 650 | V |
| Gate-Source Voltage | $V_{GS}$ | ±30 | V |
| Drain Current-Continuous | $I_D$ | 1.2 | A |
| Drain Current-Pulsed [a] | $I_{DM}$ | 4.8 | A |
| Maximum Power Dissipation @ $T_C$ = 25°C | $P_D$ | 35.7 | W |
| - Derate above 25°C | | 0.29 | W/°C |
| Operating and Store Temperature Range | $T_J$,$T_{stg}$ | -55 to 150 | °C |

## Thermal Characteristics

| Parameter | Symbol | Limit | Units |
|---|---|---|---|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 3.5 | °C/W |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 50 | °C/W |



This is preliminary information on a new product in development now .
Details are subject to change without notice .

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http://www.cetsemi.com

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

| Parameter | Symbol | Test Condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 650 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 650V, $V_{GS}$ = 0V | | | 25 | μA |
| Gate Body Leakage Current, Forward | $I_{GSSF}$ | $V_{GS}$ = 30V, $V_{DS}$ = 0V | | | 10 | uA |
| Gate Body Leakage Current, Reverse | $I_{GSSR}$ | $V_{GS}$ = -30V, $V_{DS}$ = 0V | | | -10 | uA |
| **On Characteristics** [b] | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ = 250μA | 2.5 | | 4.5 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 0.6A | | 8.5 | 10.5 | Ω |
| **Dynamic Characteristics** [c] | | | | | | |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$ = 10V, $I_D$ = 0.6A | | 1 | | S |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = 25V, $V_{GS}$ = 0V, f = 1.0 MHz | | 215 | | pF |
| Output Capacitance | $C_{oss}$ | | | 50 | | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 20 | | pF |
| **Switching Characteristics** [c] | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$ = 300V, $I_D$ = 1.2A, $V_{GS}$ = 10V,$R_{GEN}$ = 4.7Ω | | 14.3 | 38.6 | ns |
| Turn-On Rise Time | $t_r$ | | | 14.6 | 29.2 | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 23 | 46 | ns |
| Turn-Off Fall Time | $t_f$ | | | 17 | 34 | ns |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = 480V, $I_D$ = 1.2A, $V_{GS}$ = 10V | | 5.8 | 11.6 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.9 | | nC |
| Gate-Drain Charge | $Q_{gd}$ | | | 2.4 | | nC |
| **Drain-Source Diode Characteristics and Maximun Ratings** | | | | | | |
| Drain-Source Diode Forward Current | $I_S$ | | | | 1.2 | A |
| Drain-Source Diode Forward Voltage [b] | $V_{SD}$ | $V_{GS}$ = 0V, $I_S$ = 0.6A | | | 1.5 | V |

**Notes :**
a.Repetitive Rating : Pulse width limited by maximum junction temperature.
b.Device 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.

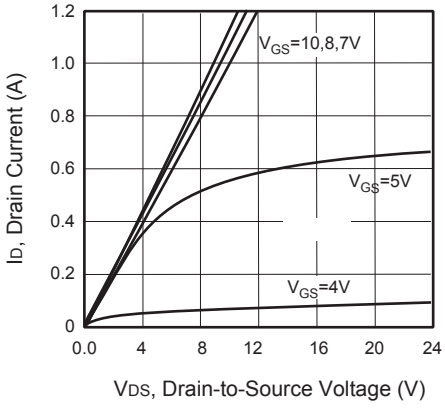


**Figure 1. Output Characteristics**

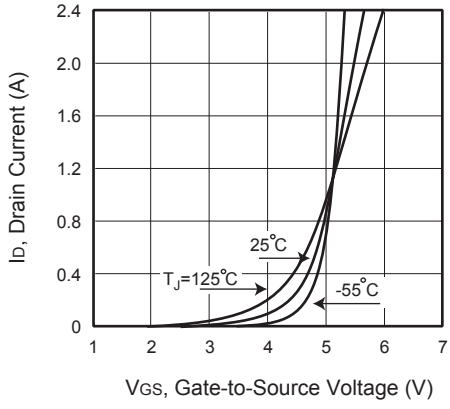


**Figure 2. Transfer Characteristics**

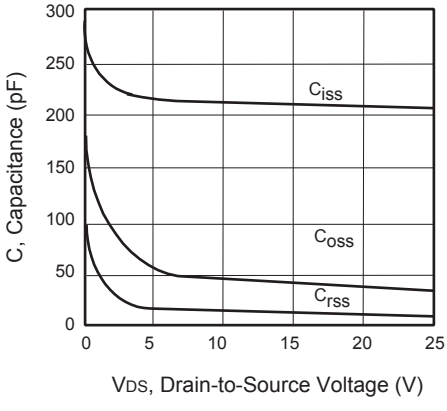


**Figure 3. Capacitance**

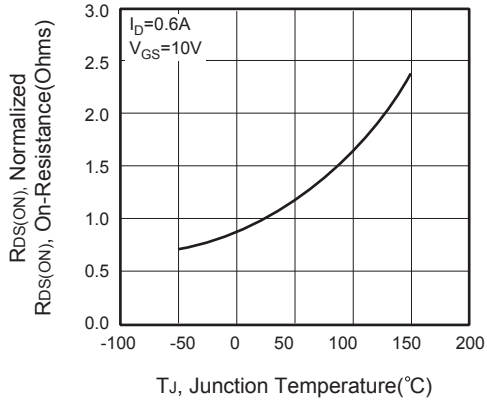


**Figure 4. On-Resistance Variation with Temperature**

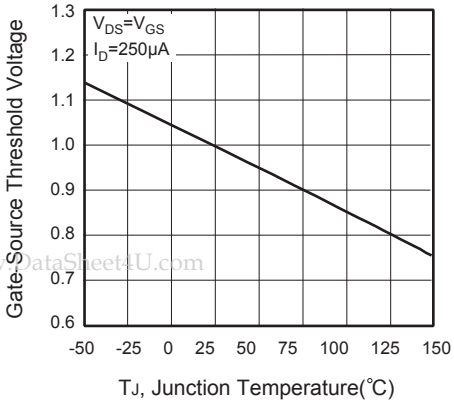




**Figure 5. Gate Threshold Variation with Temperature**

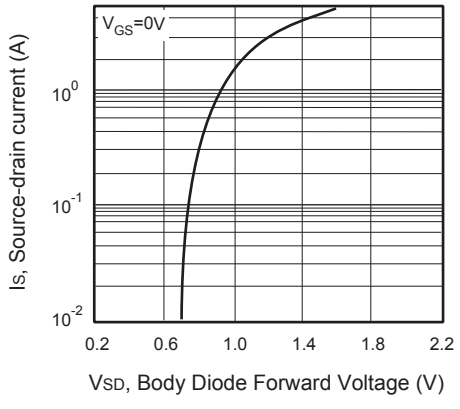


**Figure 6. Body Diode Forward Voltage Variation with Source Current**

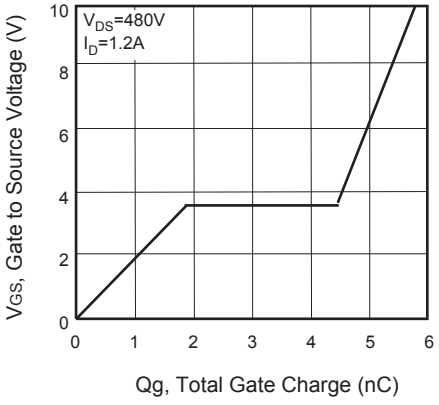


**Figure 7. Gate Charge**

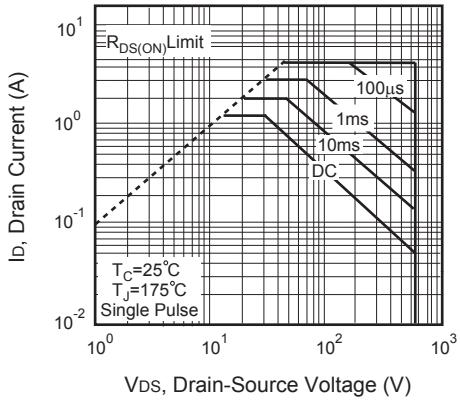


**Figure 8. Maximum Safe Operating Area**

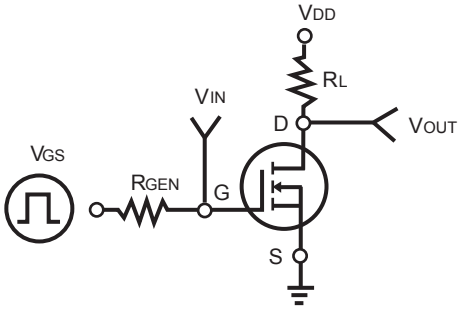


**Figure 9. Switching Test Circuit**

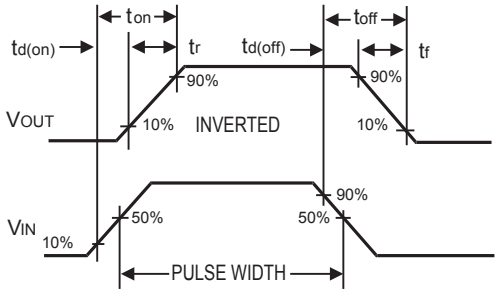


**Figure 10. Switching Waveforms**

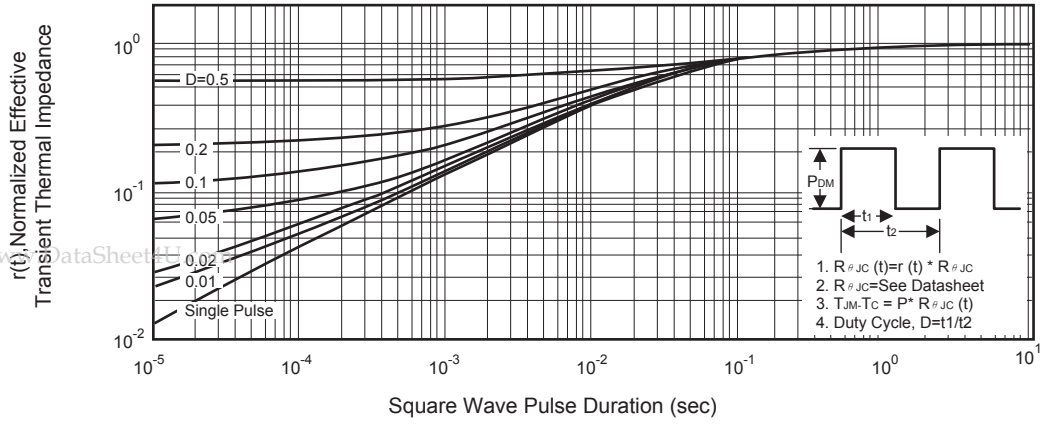




**Figure 11. Normalized Thermal Transient Impedance Curve**