



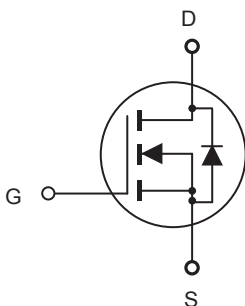
# CED730G/CEU730G

## N-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

### FEATURES

- 400V, 5A,  $R_{DS(ON)} = 1\Omega$  @  $V_{GS} = 10V$ .
- Super high dense cell design for extremely low  $R_{DS(ON)}$ .
- High power and current handling capability.
- Lead free product is acquired.
- TO-251 & TO-252 package.



### ABSOLUTE MAXIMUM RATINGS $T_C = 25^\circ\text{C}$ unless otherwise noted

| Parameter                                                                                 | Symbol         | Limit      | Units               |
|-------------------------------------------------------------------------------------------|----------------|------------|---------------------|
| Drain-Source Voltage                                                                      | $V_{DS}$       | 400        | V                   |
| Gate-Source Voltage                                                                       | $V_{GS}$       | $\pm 30$   | V                   |
| Drain Current-Continuous                                                                  | $I_D$          | 5          | A                   |
| Drain Current-Pulsed <sup>a</sup>                                                         | $I_{DM}$       | 20         | A                   |
| Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$<br>- Derate above $25^\circ\text{C}$ | $P_D$          | 68         | W                   |
|                                                                                           |                | 0.54       | W/ $^\circ\text{C}$ |
| Operating and Store Temperature Range                                                     | $T_J, T_{stg}$ | -55 to 150 | $^\circ\text{C}$    |

### Thermal Characteristics

| Parameter                               | Symbol          | Limit | Units                     |
|-----------------------------------------|-----------------|-------|---------------------------|
| Thermal Resistance, Junction-to-Case    | $R_{\theta JC}$ | 2.2   | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 50    | $^\circ\text{C}/\text{W}$ |

[www.DataSheet4U.com](http://www.DataSheet4U.com)

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

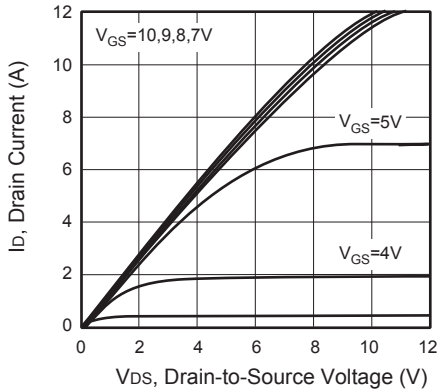
Rev 1. 2009.Nov  
<http://www.cetsemi.com>



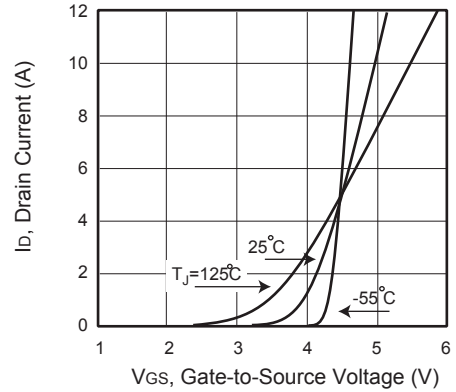
# CED730G/CEU730G

## Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

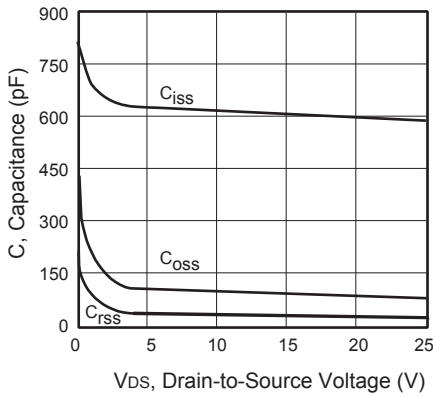
| Parameter                                                                                                                                                                                                                                                                                                                                                                                | Symbol       | Test Condition                                                     | Min | Typ | Max  | Units    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------------------------|-----|-----|------|----------|
| Off Characteristics                                                                                                                                                                                                                                                                                                                                                                      |              |                                                                    |     |     |      |          |
| Drain-Source Breakdown Voltage                                                                                                                                                                                                                                                                                                                                                           | $BV_{DSS}$   | $V_{GS} = 0V, I_D = 250\mu A$                                      | 400 |     |      | V        |
| Zero Gate Voltage Drain Current                                                                                                                                                                                                                                                                                                                                                          | $I_{DSS}$    | $V_{DS} = 400V, V_{GS} = 0V$                                       |     |     | 10   | $\mu A$  |
| Gate Body Leakage Current, Forward                                                                                                                                                                                                                                                                                                                                                       | $I_{GSSF}$   | $V_{GS} = 30V, V_{DS} = 0V$                                        |     |     | 100  | nA       |
| Gate Body Leakage Current, Reverse                                                                                                                                                                                                                                                                                                                                                       | $I_{GSSR}$   | $V_{GS} = -30V, V_{DS} = 0V$                                       |     |     | -100 | nA       |
| On Characteristics <sup>b</sup>                                                                                                                                                                                                                                                                                                                                                          |              |                                                                    |     |     |      |          |
| Gate Threshold Voltage                                                                                                                                                                                                                                                                                                                                                                   | $V_{GS(th)}$ | $V_{GS} = V_{DS}, I_D = 250\mu A$                                  | 2   |     | 4    | V        |
| Static Drain-Source                                                                                                                                                                                                                                                                                                                                                                      | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 3A$                                           |     | 0.8 | 1    | $\Omega$ |
| On-Resistance                                                                                                                                                                                                                                                                                                                                                                            |              |                                                                    |     |     |      |          |
| Forward Transconductance                                                                                                                                                                                                                                                                                                                                                                 | $g_{FS}$     | $V_{DS} = 50V, I_D = 5A$                                           |     | 6   |      | S        |
| Dynamic Characteristics <sup>c</sup>                                                                                                                                                                                                                                                                                                                                                     |              |                                                                    |     |     |      |          |
| Input Capacitance                                                                                                                                                                                                                                                                                                                                                                        | $C_{iss}$    | $V_{DS} = 25V, V_{GS} = 0V,$<br>$f = 1.0\text{ MHz}$               |     | 590 |      | pF       |
| Output Capacitance                                                                                                                                                                                                                                                                                                                                                                       | $C_{oss}$    |                                                                    |     | 105 |      | pF       |
| Reverse Transfer Capacitance                                                                                                                                                                                                                                                                                                                                                             | $C_{rss}$    |                                                                    |     | 20  |      | pF       |
| Switching Characteristics <sup>c</sup>                                                                                                                                                                                                                                                                                                                                                   |              |                                                                    |     |     |      |          |
| Turn-On Delay Time                                                                                                                                                                                                                                                                                                                                                                       | $t_{d(on)}$  | $V_{DD} = 200V, I_D = 3.5A,$<br>$V_{GS} = 10V, R_{GEN} = 12\Omega$ |     | 15  | 30   | ns       |
| Turn-On Rise Time                                                                                                                                                                                                                                                                                                                                                                        | $t_r$        |                                                                    |     | 7   | 14   | ns       |
| Turn-Off Delay Time                                                                                                                                                                                                                                                                                                                                                                      | $t_{d(off)}$ |                                                                    |     | 30  | 60   | ns       |
| Turn-Off Fall Time                                                                                                                                                                                                                                                                                                                                                                       | $t_f$        |                                                                    |     | 5   | 10   | ns       |
| Total Gate Charge                                                                                                                                                                                                                                                                                                                                                                        | $Q_g$        | $V_{DS} = 320V, I_D = 3.5A,$<br>$V_{GS} = 10V$                     |     | 14  | 18   | nC       |
| Gate-Source Charge                                                                                                                                                                                                                                                                                                                                                                       | $Q_{gs}$     |                                                                    |     | 2.5 |      | nC       |
| Gate-Drain Charge                                                                                                                                                                                                                                                                                                                                                                        | $Q_{gd}$     |                                                                    |     | 6   |      | nC       |
| Drain-Source Diode Characteristics and Maximum Ratings                                                                                                                                                                                                                                                                                                                                   |              |                                                                    |     |     |      |          |
| Drain-Source Diode Forward Current                                                                                                                                                                                                                                                                                                                                                       | $I_S^f$      |                                                                    |     |     | 5    | A        |
| Drain-Source Diode Forward Voltage <sup>b</sup>                                                                                                                                                                                                                                                                                                                                          | $V_{SD}$     | $V_{GS} = 0V, I_S = 3A$                                            |     |     | 1.5  | V        |
| Notes :<br><sup>a</sup> Repetitive Rating : Pulse width limited by maximum junction temperature .<br><sup>b</sup> Pulse Test : Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$ .<br><sup>c</sup> Guaranteed by design, not subject to production testing.<br><sup>d</sup> Limited only by maximum temperature allowed .<br><sup>e</sup> Pulse width limited by safe operating area . |              |                                                                    |     |     |      |          |



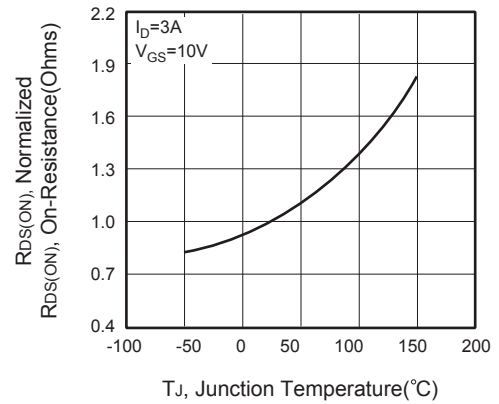
**Figure 1. Output Characteristics**



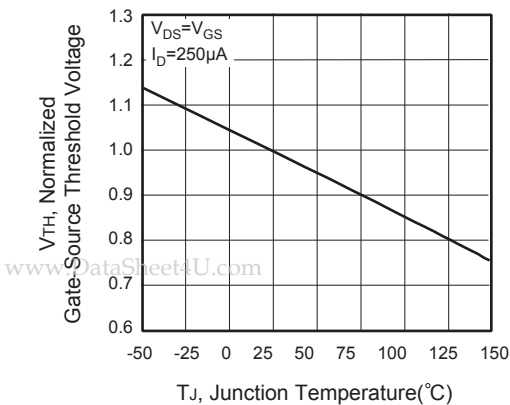
**Figure 2. Transfer Characteristics**



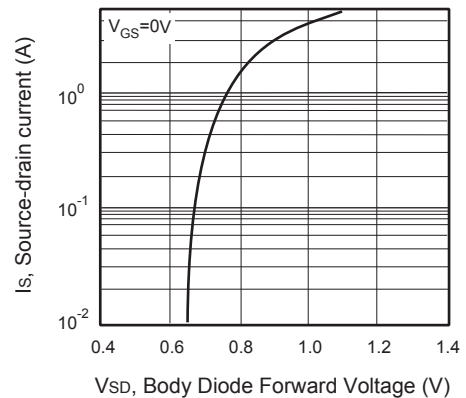
**Figure 3. Capacitance**



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



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



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

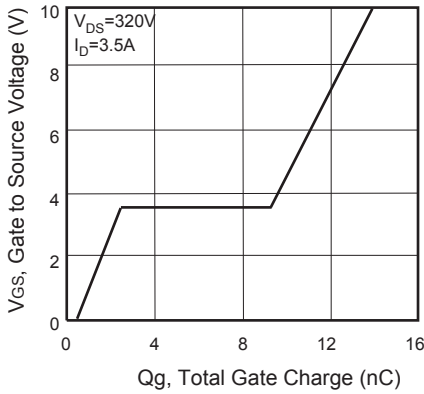


Figure 7. Gate Charge

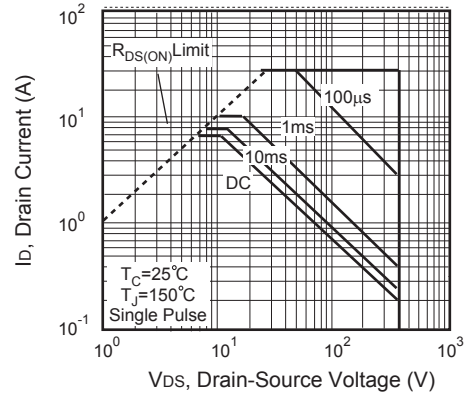


Figure 8. Maximum Safe Operating Area

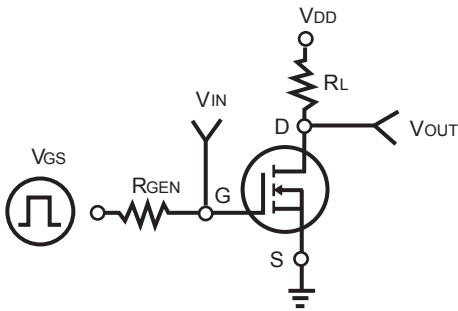


Figure 9. Switching Test Circuit

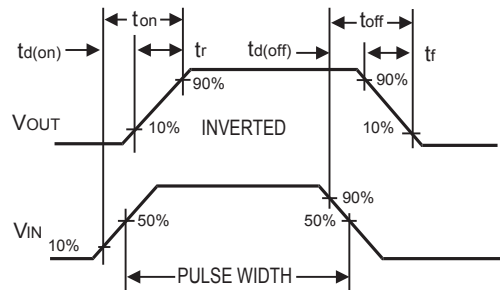


Figure 10. Switching Waveforms

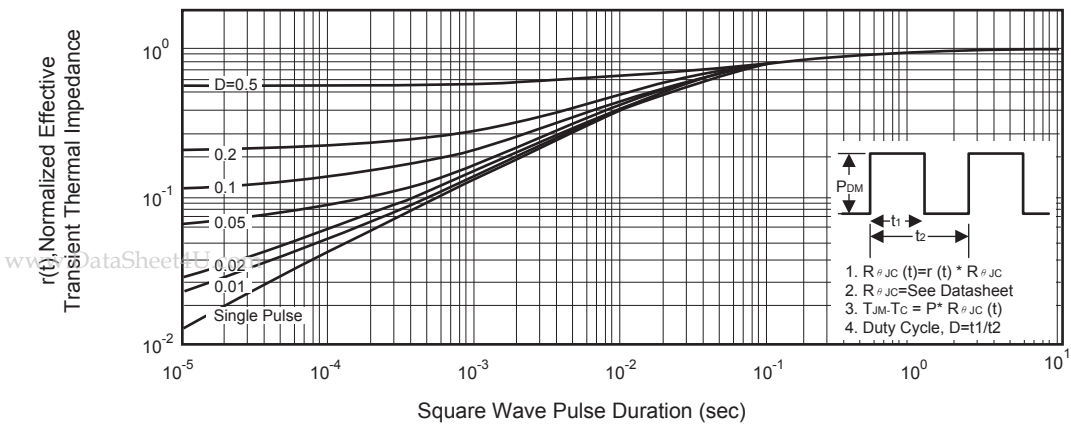


Figure 11. Normalized Thermal Transient Impedance Curve