



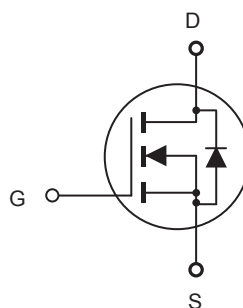
# CED08N6A/CEU08N6A

## N-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

### FEATURES

- 600V, 6.2A,  $R_{DS(ON)} = 1.25\Omega$  @  $V_{GS} = 10V$ .
- Super high dense cell design for extremely low  $R_{DS(ON)}$ .
- High power and current handling capability.
- Lead-free plating ; RoHS compliant.
- TO-251 & TO-252 package.



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

| Parameter   | Symbol         | Limit      | Units         |
|---|----------------|------------|---------------|
| Drain-Source Voltage  | $V_{DS}$       | 600        | V             |
| Gate-Source Voltage   | $V_{GS}$       | $\pm 30$   | V             |
| Drain Current-Continuous @ $T_C = 25^\circ C$<br>@ $T_C = 100^\circ C$        | $I_D$          | 6.2        | A             |
|   |                | 4.4        | A             |
| Drain Current-Pulsed <sup>a</sup>   | $I_{DM}$       | 24.8       | A             |
| Maximum Power Dissipation @ $T_C = 25^\circ C$<br>- Derate above $25^\circ C$ | $P_D$          | 107        | W             |
|   |                | 0.7        | W/ $^\circ C$ |
| Single Pulsed Avalanche Energy <sup>e</sup>                                   | $E_{AS}$       | 192        | mJ            |
| Single Pulsed Avalanche Current <sup>e</sup>                                  | $I_{AS}$       | 6.2        | A             |
| Operating and Store Temperature Range   | $T_J, T_{stg}$ | -55 to 175 | $^\circ C$    |

### Thermal Characteristics

| Parameter                               | Symbol          | Limit | Units        |
|---|-----------------|-------|--------------|
| Thermal Resistance, Junction-to-Case    | $R_{\theta JC}$ | 1.4   | $^\circ C/W$ |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 50    | $^\circ C/W$ |

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

Rev 1. 2012.Feb  
<http://www.cetsemi.com>



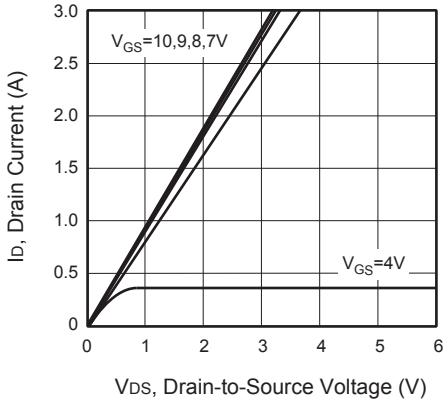
# CED08N6A/CEU08N6A

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

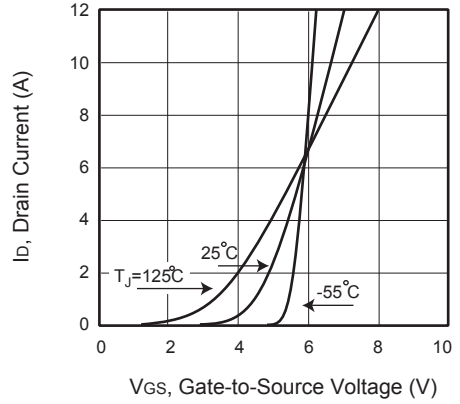
| Parameter  | Symbol       | Test Condition  | Min | Typ  | Max  | Units    |
|--|--------------|---|-----|------|------|----------|
| <b>Off Characteristics</b>   |              |   |     |      |      |          |
| Drain-Source Breakdown Voltage   | $BV_{DSS}$   | $V_{GS} = 0V, I_D = 250\mu A$                               | 600 |      |      | V        |
| Zero Gate Voltage Drain Current  | $I_{DSS}$    | $V_{DS} = 600V, V_{GS} = 0V$                                |     |      | 1    | $\mu A$  |
| 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       |
| <b>On Characteristics<sup>b</sup></b>  |              |   |     |      |      |          |
| Gate Threshold Voltage   | $V_{GS(th)}$ | $V_{GS} = V_{DS}, I_D = 250\mu A$                           | 2   |      | 4    | V        |
| Static Drain-Source On-Resistance  | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 3.1A$                                  |     | 1.05 | 1.25 | $\Omega$ |
| <b>Dynamic Characteristics<sup>c</sup></b>   |              |   |     |      |      |          |
| Input Capacitance  | $C_{iss}$    | $V_{DS} = 25V, V_{GS} = 0V, f = 1.0\text{ MHz}$             |     | 1280 |      | pF       |
| Output Capacitance   | $C_{oss}$    |   |     | 120  |      | pF       |
| Reverse Transfer Capacitance   | $C_{rss}$    |   |     | 11   |      | pF       |
| <b>Switching Characteristics<sup>c</sup></b>   |              |   |     |      |      |          |
| Turn-On Delay Time   | $t_{d(on)}$  | $V_{DD} = 300V, I_D = 6A, V_{GS} = 10V, R_{GEN} = 25\Omega$ |     | 23   | 46   | ns       |
| Turn-On Rise Time  | $t_r$        |   |     | 8    | 16   | ns       |
| Turn-Off Delay Time  | $t_{d(off)}$ |   |     | 55   | 110  | ns       |
| Turn-Off Fall Time   | $t_f$        |   |     | 8    | 6    | ns       |
| Total Gate Charge  | $Q_g$        | $V_{DS} = 480V, I_D = 6A, V_{GS} = 10V$                     |     | 21   | 27   | nC       |
| Gate-Source Charge   | $Q_{gs}$     |   |     | 5    |      | nC       |
| Gate-Drain Charge  | $Q_{gd}$     |   |     | 5    |      | nC       |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b>  |              |   |     |      |      |          |
| Drain-Source Diode Forward Current   | $I_S$        |   |     |      | 6.2  | A        |
| Drain-Source Diode Forward Voltage <sup>b</sup>  | $V_{SD}$     | $V_{GS} = 0V, I_S = 6.2A$                                   |     |      | 1.5  | V        |
| <b>Notes :</b><br>a.Repetitive Rating : Pulse width limited by maximum junction temperature.<br>b.Device Mounted on FR4 Board, $t < 10$ sec.<br>c.Pulse Test : Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$ .<br>d.Guaranteed by design, not subject to production testing.<br>e.L = 10mH, $I_{AS} = 6.2A, V_{DD} = 50V, R_G = 25\Omega$ , Starting $T_J = 25\text{ C}$ . |              |   |     |      |      |          |



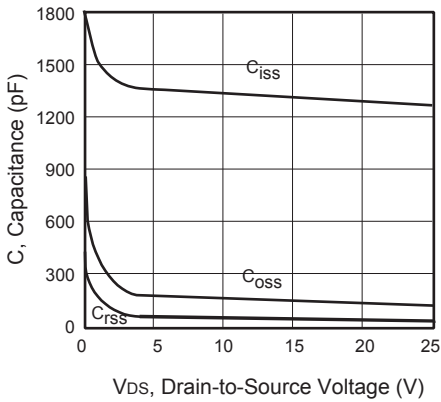
# CED08N6A/CEU08N6A



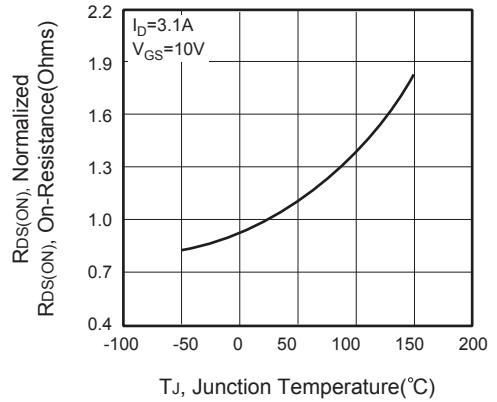
**Figure 1. Output Characteristics**



**Figure 2. Transfer Characteristics**



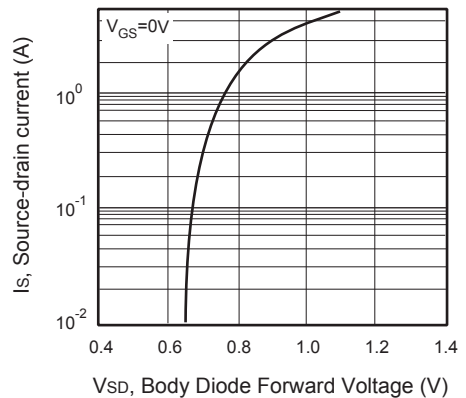
**Figure 3. Capacitance**



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



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



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



# CED08N6A/CEU08N6A

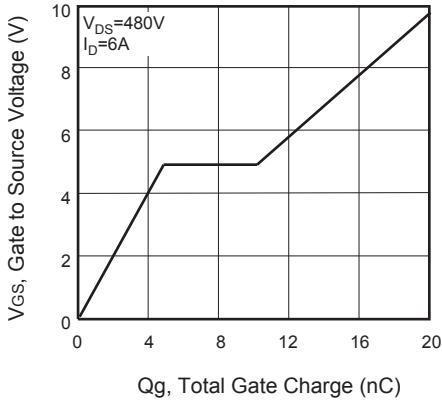


Figure 7. Gate Charge

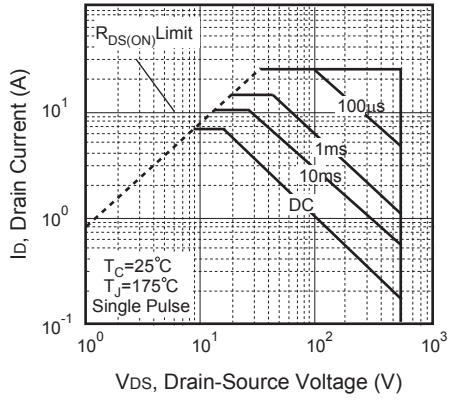


Figure 8. Maximum Safe Operating Area

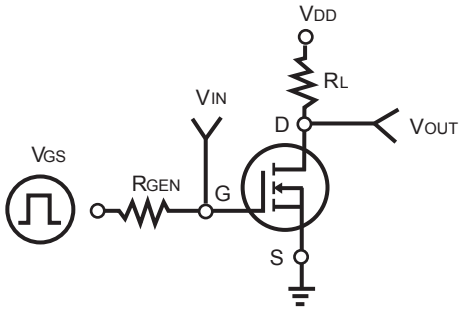


Figure 9. Switching Test Circuit

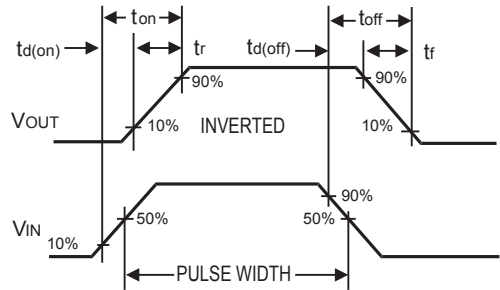


Figure 10. Switching Waveforms

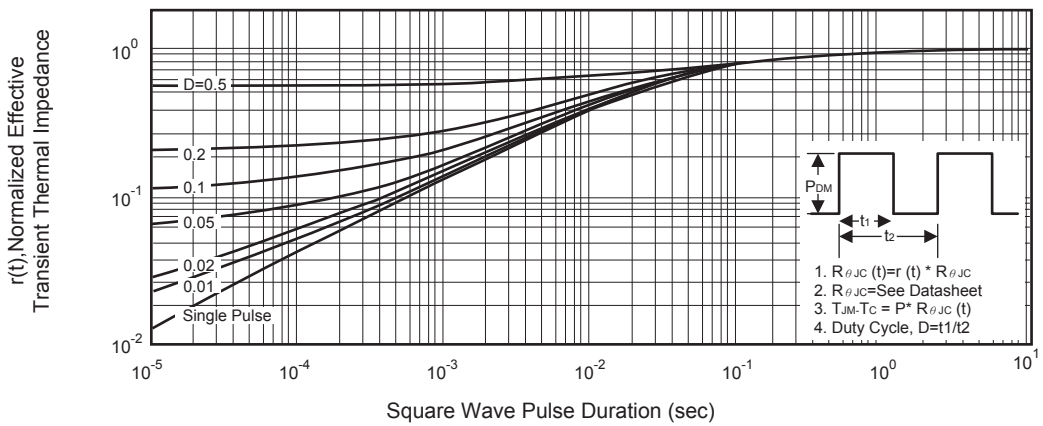


Figure 11. Normalized Thermal Transient Impedance Curve