

CEP8030L/CEB8030L

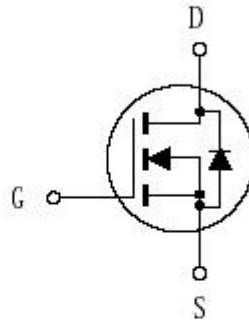


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N-Channel Logic Level Enhancement Mode Field Effect Transistor

FEATURES

- 30V , 75A , $R_{DS(ON)}=6m\Omega$ @ $V_{GS}=10V$,
 $R_{DS(ON)}=9m\Omega$ @ $V_{GS}=4.5V$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- TO-220 & TO-263 package.



ABSOLUTE MAXIMUM RATINGS (Tc=25°C unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|----------------|------------|------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ± 16 | V |
| Drain Current-Continuous -Pulsed | I_D | 75 | A |
| | I_{DM} | 156 | A |
| Drain-Source Diode Forward Current | I_S | 75 | A |
| Maximum Power Dissipation @ $T_c=25^\circ C$ Derate above $25^\circ C$ | P_D | 50 | W |
| | | 0.4 | W/°C |
| Operating and Storage Temperature Range | T_J, T_{STG} | -65 to 175 | °C |

THERMAL CHARACTERISTICS

| | | | |
|---|-----------------|------|------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 2.5 | °C/W |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 62.5 | °C/W |

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ELECTRICAL CHARACTERISTICS (Tc=25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|--|--------------|---|-----|------|-----------|------------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | V_{DSS} | $V_{GS} = 0V, I_D = 250\mu A$ | 30 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 24V, V_{GS} = 0V$ | | | 10 | μA |
| Gate-Body Leakage | I_{GSS} | $V_{GS} = \pm 16V, V_{DS} = 0V$ | | | ± 100 | nA |
| ON CHARACTERISTICS^a | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1 | | 3 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 37.5A$ | | 4 | 6 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 30A$ | | 6 | 9 | m Ω |
| On-State Drain Current | $I_D(on)$ | $V_{GS} = 10V, V_{DS} = 10V$ | 75 | | | A |
| Forward Transconductance | g_{FS} | $V_{DS} = 10V, I_D = 26A$ | | 68 | | S |
| DYNAMIC CHARACTERISTICS^b | | | | | | |
| Input Capacitance | C_{ISS} | $V_{DS} = 15V, V_{GS} = 0V$ $f = 1.0MHz$ | | 4800 | | pF |
| Output Capacitance | C_{OSS} | | | 1480 | | pF |
| Reverse Transfer Capacitance | C_{RSS} | | | 170 | | pF |
| SWITCHING CHARACTERISTICS^b | | | | | | |
| Turn-On Delay Time | $t_{D(on)}$ | $V_{DD} = 15V,$ $I_D = 52A,$ $V_{GS} = 10V$ $R_{\theta JM} = 24\Omega$ | | 10 | 16 | ns |
| Rise Time | t_r | | | 200 | 250 | ns |
| Turn-Off Delay Time | $t_{D(off)}$ | | | 50 | 90 | ns |
| Fall Time | t_f | | | 140 | 200 | ns |
| Total Gate Charge | Q_g | $V_{DS} = 15V, I_D = 40A,$ $V_{GS} = 5V$ | | 70 | 75 | nC |
| Gate-Source Charge | Q_{gs} | | | 12 | | nC |
| Gate-Drain Charge | Q_{gd} | | | 30 | | nC |

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ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ unless otherwise noted)

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| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|--|----------|----------------------------|-----|-----|-----|------|
| DRAIN-SOURCE DIODE CHARACTERISTICS ^a | | | | | | |
| Diode Forward Voltage | V_{SD} | $V_{GS} = 0V, I_S = 37.5A$ | | 0.9 | 1.3 | V |

Notes

a. Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2\%$.

b. Guaranteed by design, not subject to production testing.

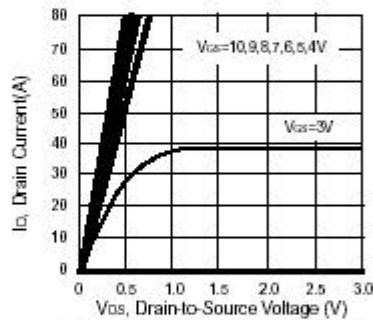


Figure 1. Output Characteristics

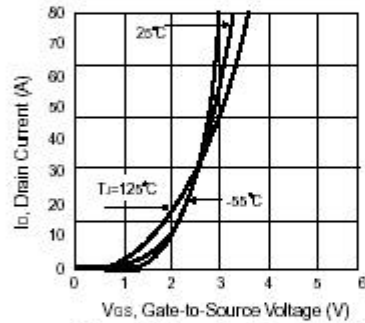


Figure 2. Transfer Characteristics

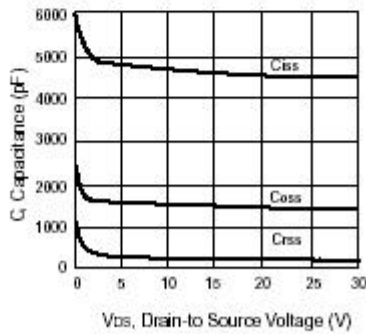


Figure 3. Capacitance

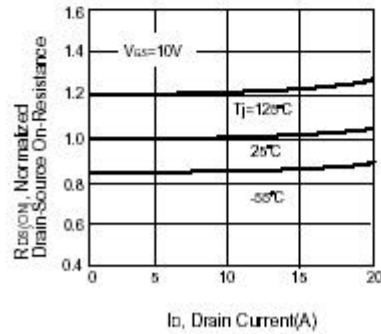
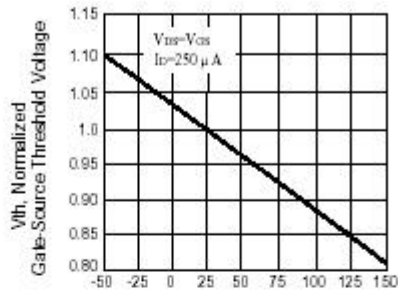


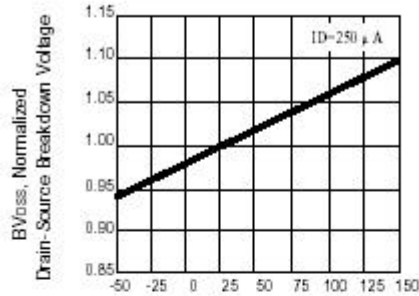
Figure 4. On-Resistance Variation with Drain Current and Temperature

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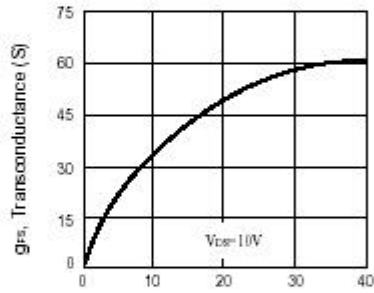
T_j, Junction Temperature (°C)

Figure 5. Gate Threshold Variation with Temperature



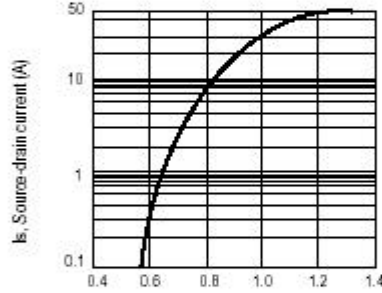
T_j, Junction Temperature (°C)

Figure 6. Breakdown Voltage Variation with Temperature



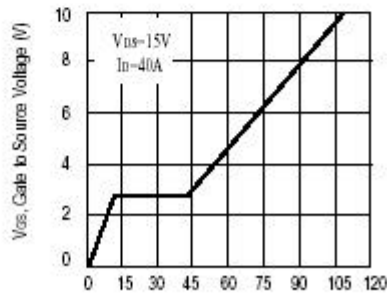
I_{cs}, Drain-Source Current (A)

Figure 7. Transconductance Variation with Drain Current



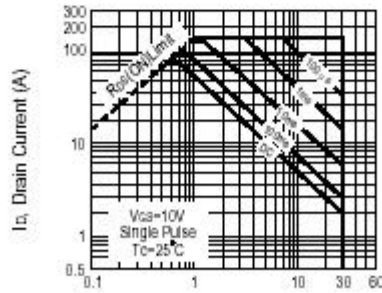
V_{sd}, Body Diode Forward Voltage (V)

Figure 8. Body Diode Forward Voltage Variation with Source Current



Q_g, Total Gate Charge (nC)

Figure 9. Gate Charge



V_{ds}, Drain-Source Voltage (V)

Figure 10. Maximum Safe Operating Area

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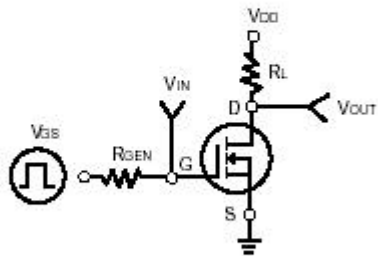


Figure 11. Switching Test Circuit

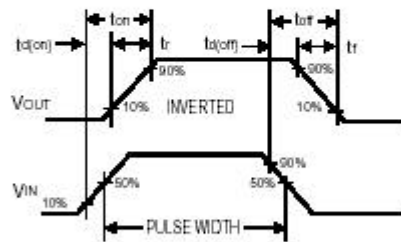


Figure 12. Switching Waveforms

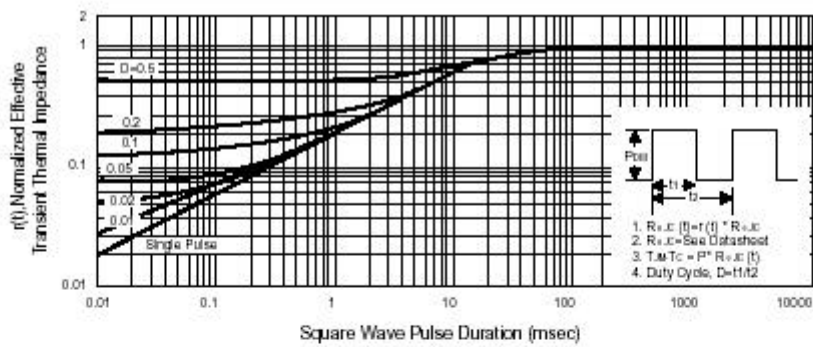


Figure 13. Normalized Thermal Transient Impedance Curve