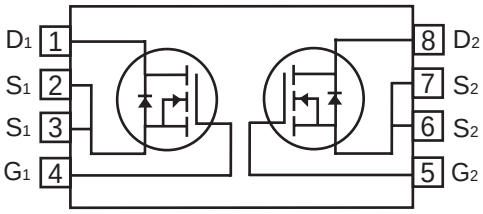
# CEG9926

Nov. 2002

## Dual N-Channel Enhancement Mode Field Effect Transistor

### FEATURES

- 20V , 4.5A , $R_{DS(ON)}$=30mΩ @$V_{GS}$=4.5V.
  $R_{DS(ON)}$=40mΩ @$V_{GS}$=2.5V.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handing capability.
- TSSOP-8 for Surface Mount Package.







TSSOP-8

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### ABSOLUTE MAXIMUM RATINGS ($T_A$=25°C unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | $V_{GS}$ | ±8 | V |
| Drain Current-Continuous [a] | $I_D$ | ±4.5 | A |
| -Pulsed [b] | $I_{DM}$ | ±25 | A |
| Drain-Source Diode Forward Current [a] | $I_S$ | 1.7 | A |
| Maximum Power Dissipation [a] | $P_D$ | 1. 0 | W |
| Operating Junction and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to 150 | °C |

### THERMAL CHARACTERISTICS

| | | | |
|---|---|---|---|
| Thermal Resistance, Junction-to-Ambient [a] | $R_{\theta JA}$ | 125 | °C/W |

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## ELECTRICAL CHARACTERISTICS ($T_A$=25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ [c] | Max | Unit |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$= 0V, $I_D$=250μA | 20 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V, $V_{GS}$=0V | | | 1 | μA |
| Gate-Body Leakage | $I_{GSS}$ | $V_{GS}$=±8V, $V_{DS}$=0V | | | ±100 | nA |
| **ON CHARACTERISTICS[b]** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 0.5 | | 1.0 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}$=4.5V, $I_D$=4.5A | | 24 | 30 | mΩ |
| | | $V_{GS}$=4.0V, $I_D$=5A | | 23 | | mΩ |
| | | $V_{GS}$=2.5V, $I_D$=3.5A | | 32 | 40 | mΩ |
| On-State Drain Current | $I_{D(ON)}$ | $V_{DS}$=5V, $V_{GS}$=4.5V | 10 | | | A |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=10V, $I_D$=4.5A | | 10 | | S |
| **DYNAMIC CHARACTERISTICS[c]** | | | | | | |
| Input Capacitance | $C_{ISS}$ | $V_{DS}$ = 8V, $V_{GS}$ = 0V<br>f =1.0MHz | | 500 | | pF |
| Output Capacitance | $C_{OSS}$ | | | 300 | | pF |
| Reverse Transfer Capacitance | $C_{RSS}$ | | | 140 | | pF |
| **SWITCHING CHARACTERISTICS[c]** | | | | | | |
| Turn-On Delay Time | $t_{D(ON)}$ | $V_{DD}$ = 10V,<br>$I_D$ =1A,<br>$V_{GEN}$ = 4.5V,<br>$R_{GEN}$ = 6Ω | | 20 | 40 | ns |
| Rise Time | $t_r$ | | | 18 | 40 | ns |
| Turn-Off Delay Time | $t_{D(OFF)}$ | | | 60 | 108 | ns |
| Fall time | $t_f$ | | | 28 | 56 | ns |
| Total Gate Charge | $Q_g$ | $V_{DS}$ =10V, $I_D$ =4.5A,<br>$V_{GS}$ =4.5V | | 10 | 15 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 2.3 | | nC |
| Gate-Drain Charge | $Q_{gd}$ | | | 2.9 | | nC |

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## ELECTRICAL CHARACTERISTICS ($T_A$=25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ[c] | Max | Unit |
|---|---|---|---|---|---|---|
| **DRAIN-SOURCE DIODE CHARACTERISTICS [b]** | | | | | | |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$ = 0V, Is =1.7A | | 0.8 | 1.2 | V |

Notes

a.Surface Mounted on FR4 Board, t ≤10sec.
b.Pulse Test:Pulse Width ≤300 μs, Duty Cycle ≤2%.
c.Guaranteed by design, not subject to production testing.

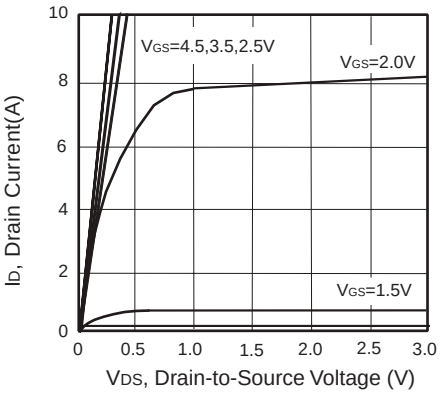



**Figure 1. Output Characteristics**

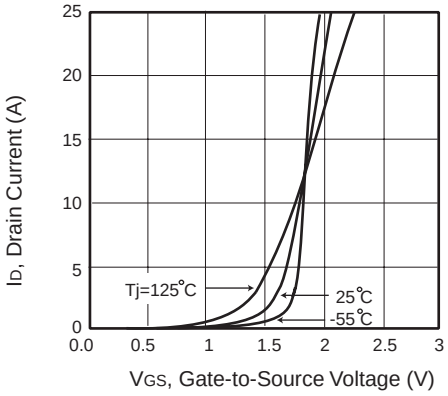



**Figure 2. Transfer Characteristics**

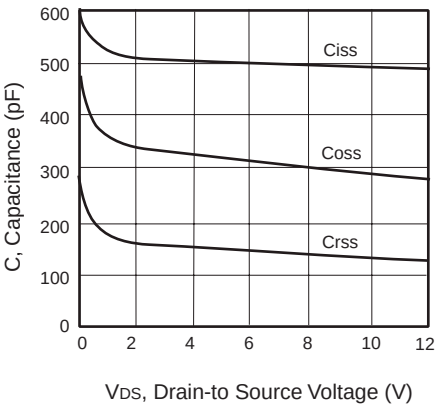



**Figure 3. Capacitance**

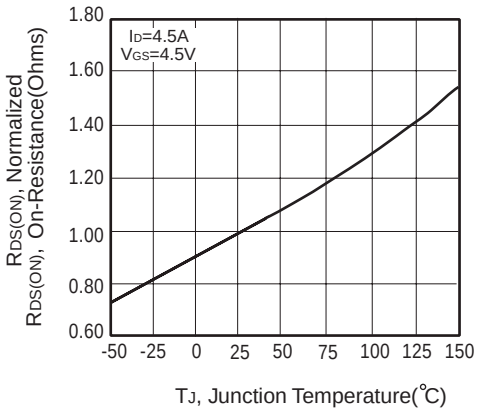



**Figure 4. On-Resistance Variation with Temperature**

# CEG9926

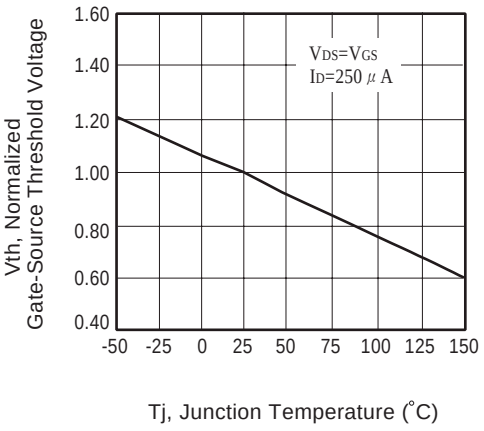



**Figure 5. Gate Threshold Variation with Temperature**

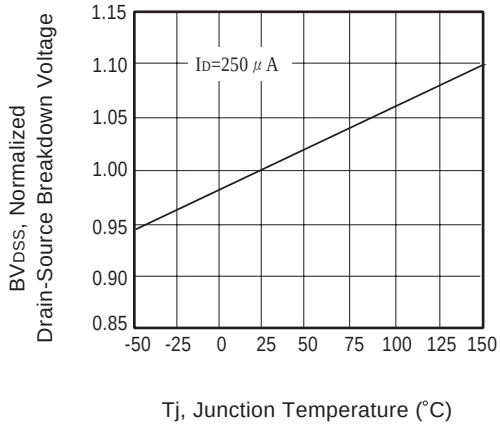



**Figure 6. Breakdown Voltage Variation with Temperature**

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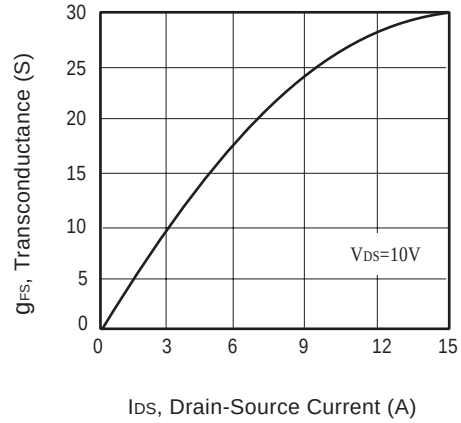



**Figure 7. Transconductance Variation with Drain Current**

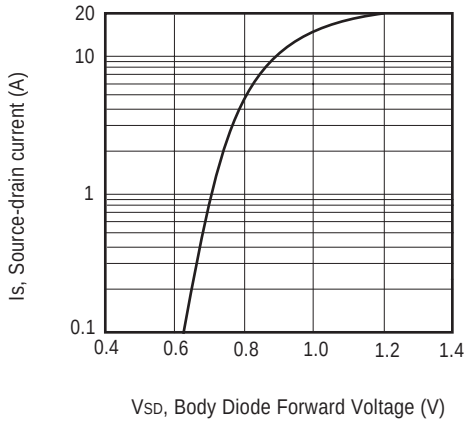



**Figure 8. Body Diode Forward Voltage Variation with Source Current**

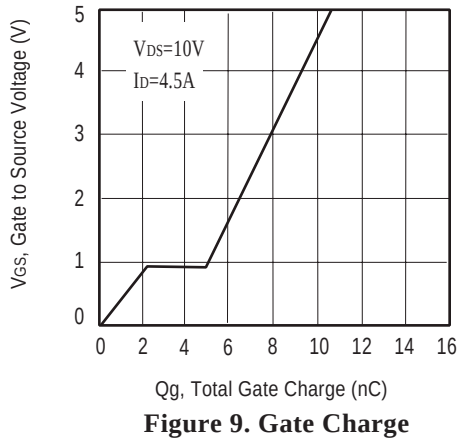



**Figure 9. Gate Charge**

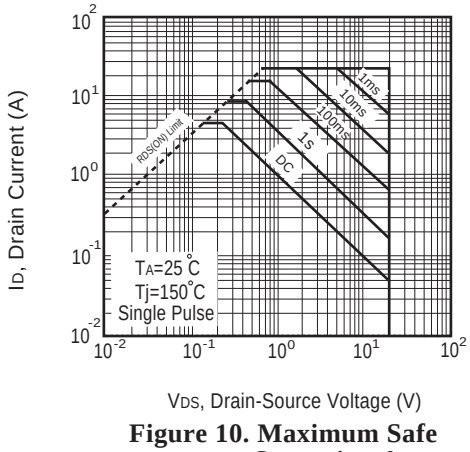



**Figure 10. Maximum Safe Operating Area**

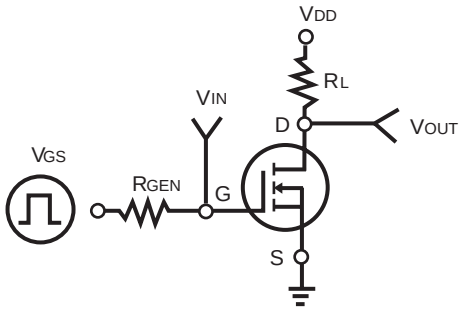



**Figure 11. Switching Test Circuit**

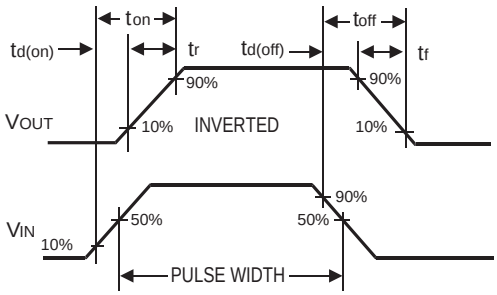



**Figure 12. Switching Waveforms**



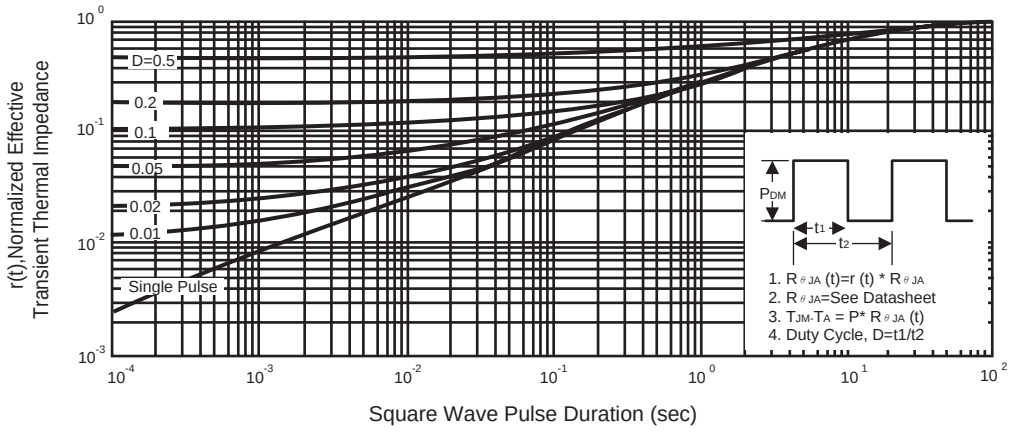



**Figure 13. Normalized Thermal Transient Impedance Curve**