

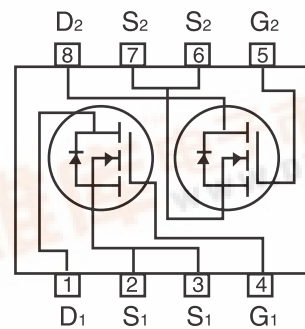
# CEG6946

PRELIMINARY

## Dual N-Channel Enhancement Mode Field Effect Transistor

### FEATURES

- 20V, 2.8A,  $R_{DS(ON)}=80.0m\Omega$  @  $V_{GS}=4.5V$ .  
 $R_{DS(ON)}=110.0m\Omega$  @  $V_{GS}=2.5V$ .
- Super high dense cell design for extremely low  $R_{DS(ON)}$ .
- High power and current handing capability.
- TSSOP-8 for Surface Mount Package.



9

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	20	V
Gate-Source Voltage	V <sub>GS</sub>	±8	V
Drain Current-Continuous <sup>a</sup> @ T <sub>J</sub> =125°C -Pulsed <sup>b</sup>	I <sub>D</sub>	2.8	A
	I <sub>DM</sub>	20	A
Drain-Source Diode Forward Current <sup>a</sup>	I <sub>S</sub>	1.0	A
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	1.0	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

### THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient <sup>a</sup>	R <sub>θJA</sub>	125	°C/W
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# CEG6946

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

Parameter	Symbol	Condition	Min	Typ <sup>c</sup>	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	μA
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V			±100	nA
<b>ON CHARACTERISTICS<sup>b</sup></b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5		1.5	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.8A			80	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =2.1A			110	mΩ
On-State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> =5V, V <sub>GS</sub> =4.5V	±10			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =2.8A	3			S
<b>DYNAMIC CHARACTERISTICS<sup>c</sup></b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V f = 1.0MHz		460	600	pF
Output Capacitance	C <sub>OSS</sub>			310	400	pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			190	250	pF
<b>SWITCHING CHARACTERISTICS<sup>c</sup></b>						
Turn-On Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> = 10V, I <sub>D</sub> = 1A, V <sub>GEN</sub> = 4.5V, R <sub>GEN</sub> = 6Ω R <sub>L</sub> = 10Ω		35	60	ns
Rise Time	t <sub>r</sub>			60	100	ns
Turn-Off Delay Time	t <sub>D(OFF)</sub>			50	100	ns
Fall time	t <sub>f</sub>			55	100	ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 2.8A, V <sub>GS</sub> = 4.5V		16	40	nC
Gate-Source Charge	Q <sub>gs</sub>			3		nC
Gate-Drain Charge	Q <sub>gd</sub>			6		nC

# CEG6946

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>DRAIN-SOURCE DIODE CHARACTERISTICS<sup>a</sup></b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0V, I_S = 1A$			1.2	V

### Notes

- Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

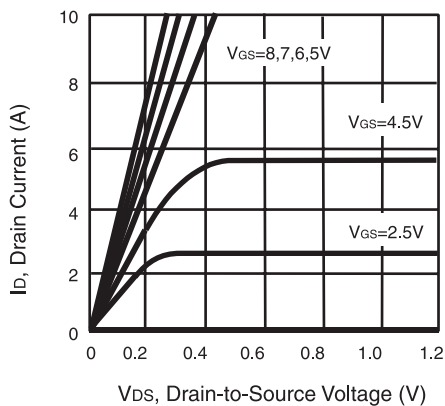


Figure 1. Output Characteristics

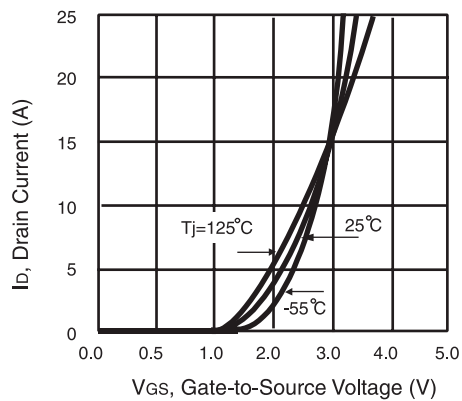


Figure 2. Transfer Characteristics

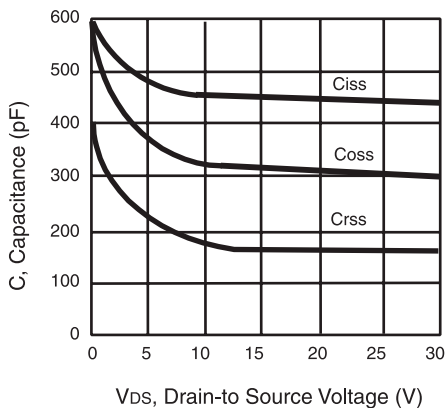


Figure 3. Capacitance

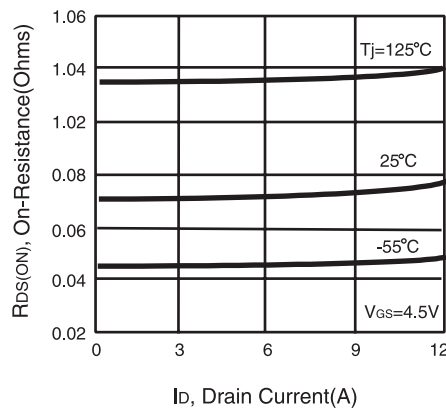
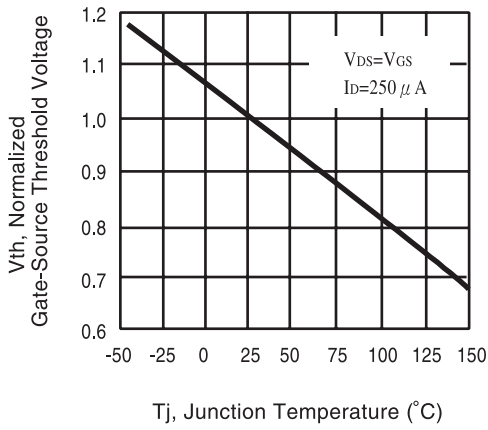
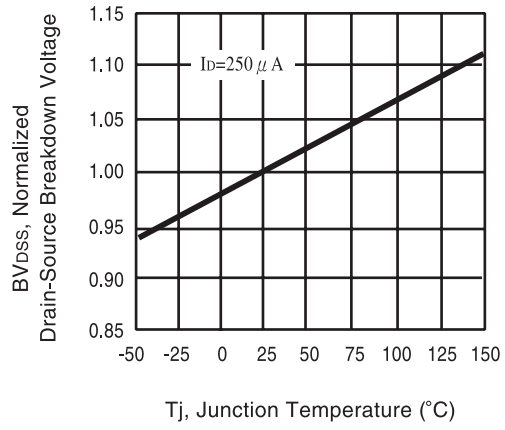


Figure 4. On-Resistance Variation with Drain Current and Temperature

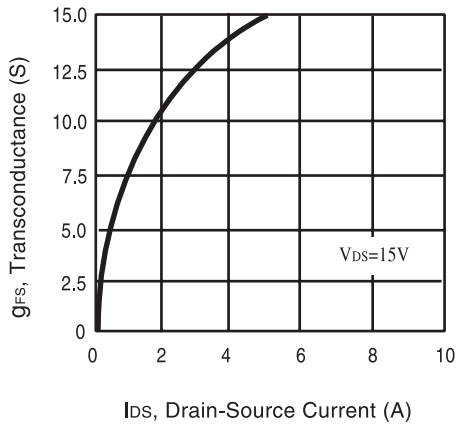
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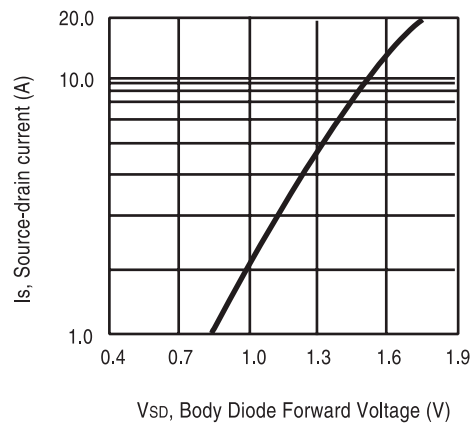
**Figure 5. Gate Threshold Variation with Temperature**



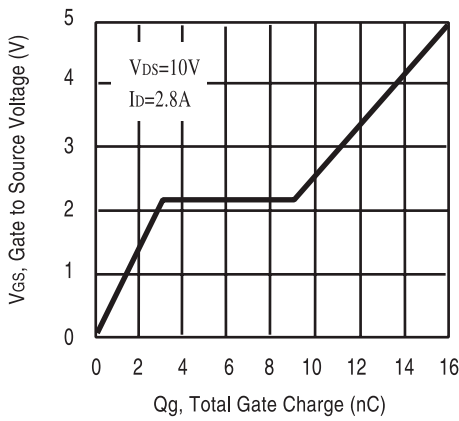
**Figure 6. Breakdown Voltage Variation with Temperature**



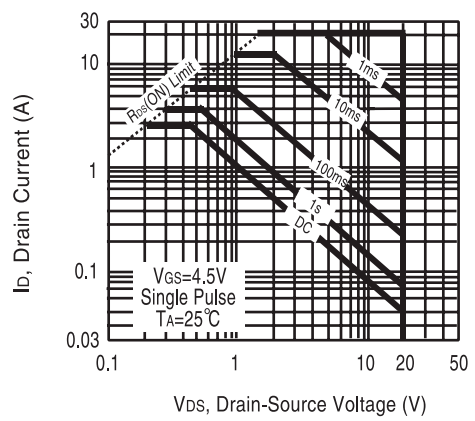
**Figure 7. Transconductance Variation with Drain Current**



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



**Figure 9. Gate Charge**



**Figure 10. Maximum Safe Operating Area**

# CEG6946

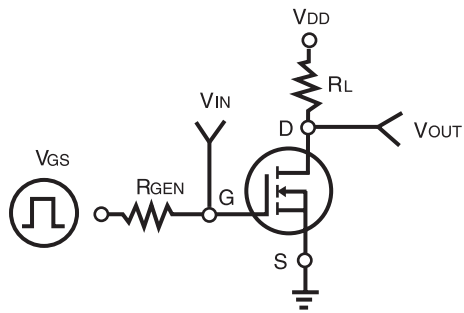


Figure 11. Switching Test Circuit

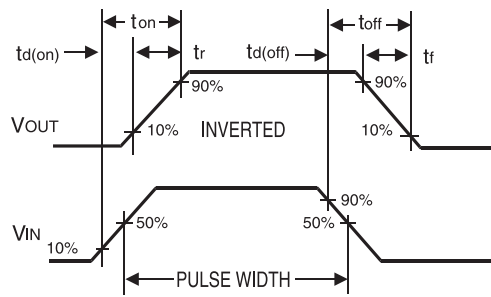


Figure 12. Switching Waveforms

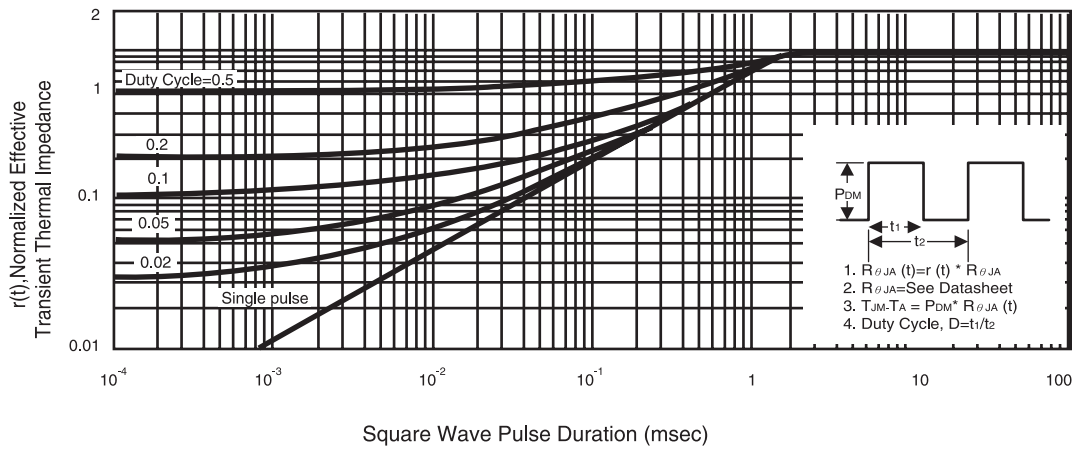


Figure 13. Normalized Thermal Transient Impedance Curve