

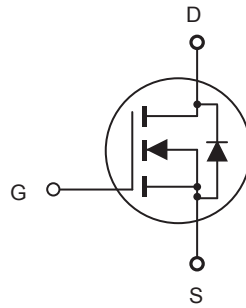


CED730G/CEU730G

N-Channel Enhancement Mode Field Effect Transistor

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 plating.
- 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}	± 30	V
Drain Current-Continuous	I_D	5	A
Drain Current-Pulsed ⁹	I_{DM}	20	A
Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$ - Derate above 25°C	P_D	68	W
		0.54	W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy ⁹	E_{AS}	12.5	mJ
Single Pulsed Avalanche Current ⁹	I_{AS}	5	A
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	$^\circ\text{C}/\text{W}$



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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	μA
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^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	2		4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 3A$		0.8	1	Ω
Forward Transconductance			g_{FS}	$V_{DS} = 50V, I_D = 5A$		6
Dynamic Characteristics^c						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1.0\text{ MHz}$		590		pF
Output Capacitance	C_{oss}			105		pF
Reverse Transfer Capacitance	C_{rss}			20		pF
Switching Characteristics^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 200V, I_D = 3.5A,$ $V_{GS} = 10V, R_{GEN} = 12\Omega$		15		ns
Turn-On Rise Time	t_r			7		ns
Turn-Off Delay Time	$t_{d(off)}$			30		ns
Turn-Off Fall Time	t_f			5		ns
Total Gate Charge	Q_g		$V_{DS} = 320V, I_D = 3.5A,$ $V_{GS} = 10V$		14	
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				5	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = 3A$			1.5	V
Notes : □ a.Repetitive Rating : Pulse width limited by maximum junction temperature . b.Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$. □ c.Guaranteed by design, not subject to production testing. □ d.Limited only by maximum temperature allowed . e.Pulse width limited by safe operating area . f.L = 1mH, $I_{AS} = 5A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^\circ C$.						



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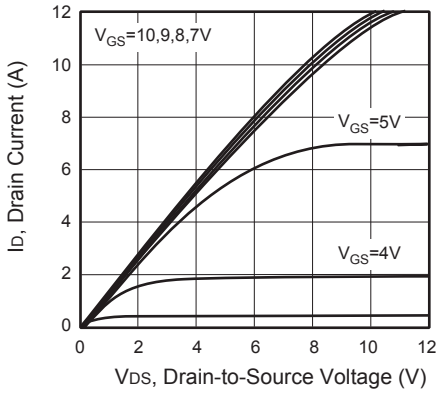


Figure 1. Output Characteristics

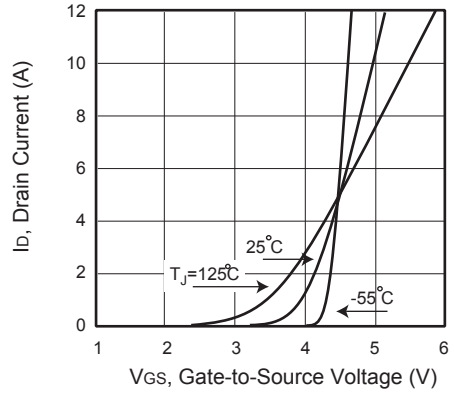


Figure 2. Transfer Characteristics

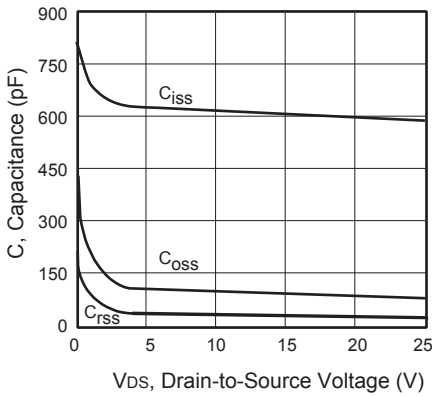


Figure 3. Capacitance

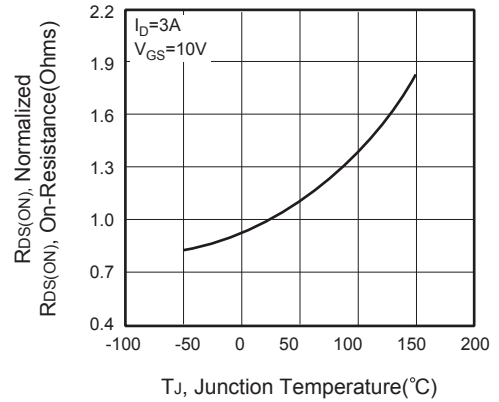


Figure 4. On-Resistance Variation with Temperature



Figure 5. Gate Threshold Variation with Temperature

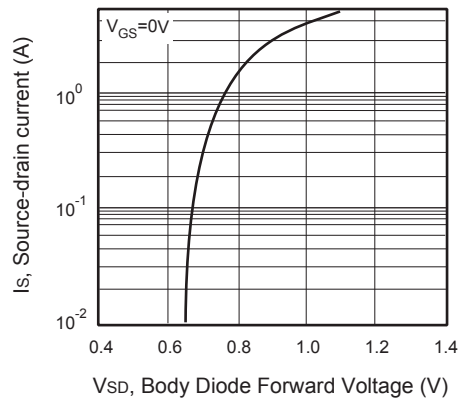


Figure 6. Body Diode Forward Voltage Variation with Source Current



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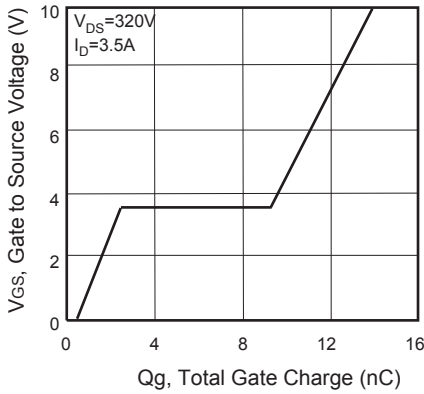


Figure 7. Gate Charge

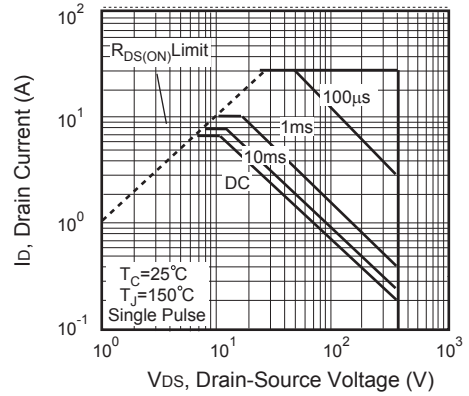


Figure 8. Maximum Safe Operating Area

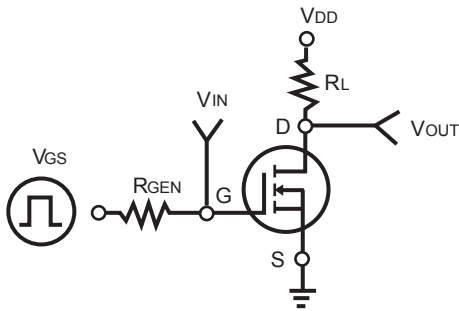


Figure 9. Switching Test Circuit

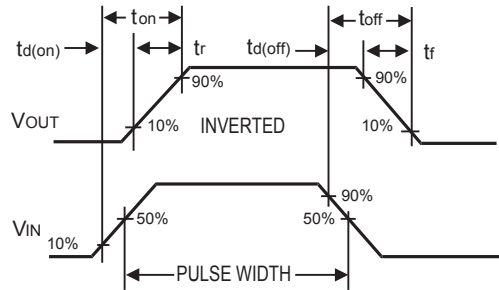


Figure 10. Switching Waveforms

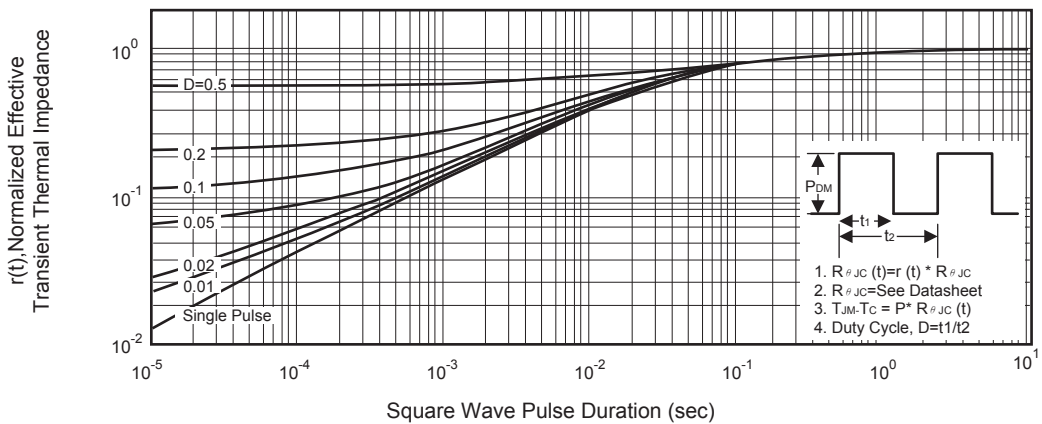


Figure 11. Normalized Thermal Transient Impedance Curve