



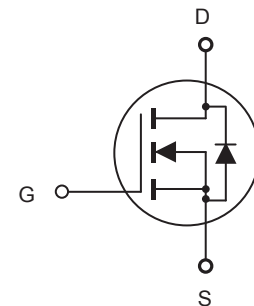
CED04N65/CEU04N65

N-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

FEATURES

- 650V, 3.2A, $R_{DS(ON)} = 2.8\Omega$ @ $V_{GS} = 10V$.
- 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 $T_C = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current-Continuous @ $T_C = 25^\circ\text{C}$ @ $T_C = 100^\circ\text{C}$	I_D	3.2	A
		2	A
Drain Current-Pulsed ^a	I_{DM}	12.8	A
Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$ - Derate above 25°C	P_D	70	W
		0.56	W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy ^d	E_{AS}	220	mJ
Single Pulsed Avalanche Current ^d	I_{AS}	4.2	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	$R_{\theta JC}$	1.8	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	$^\circ\text{C/W}$

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

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<http://www.cetsemi.com>



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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}	$V_{GS} = 0V, I_D = 250\mu A$	650			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 650V, V_{GS} = 0V$			1	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	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 1.6A$		2.3	2.8	Ω
Dynamic Characteristics ^c						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1.0\text{ MHz}$		610		pF
Output Capacitance	C_{oss}			75		pF
Reverse Transfer Capacitance	C_{rss}			15		pF
Switching Characteristics ^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 300V, I_D = 4A, V_{GS} = 10V, R_{GEN} = 25\Omega$		18		ns
Turn-On Rise Time	t_r			18		ns
Turn-Off Delay Time	$t_{d(off)}$			33		ns
Turn-Off Fall Time	t_f			16		ns
Total Gate Charge	Q_g	$V_{DS} = 480V, I_D = 4A, V_{GS} = 10V$		12		nC
Gate-Source Charge	Q_{gs}			3		nC
Gate-Drain Charge	Q_{gd}			5		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current	I_S				3.2	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = 3.2A$			1.2	V
Notes : a.Repetitive Rating : Pulse width limited by maximum junction temperature b.Pulse Test : Pulse Width < 300 μ s, Duty Cycle < 2%. c.Guaranteed by design, not subject to production testing. d.L = 25mH, $I_{AS} = 4.2A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25\text{ }^{\circ}\text{C}$						



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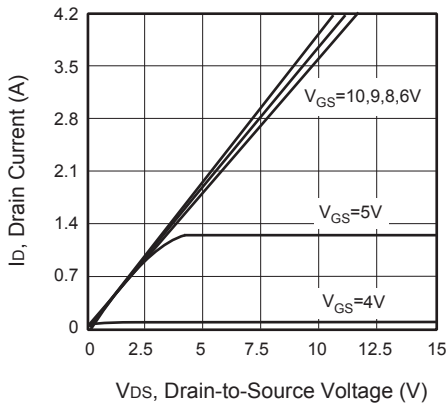


Figure 1. Output Characteristics

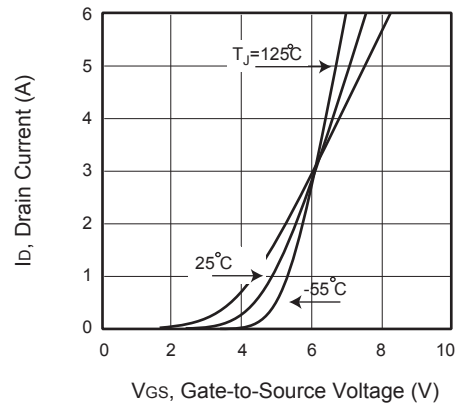


Figure 2. Transfer Characteristics

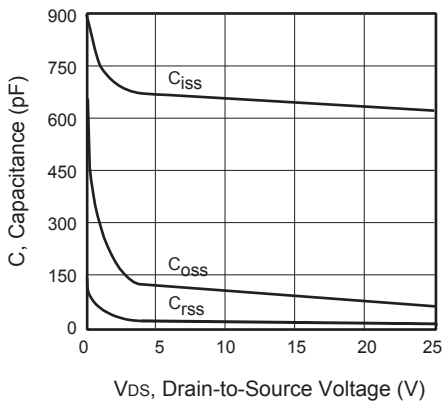


Figure 3. Capacitance

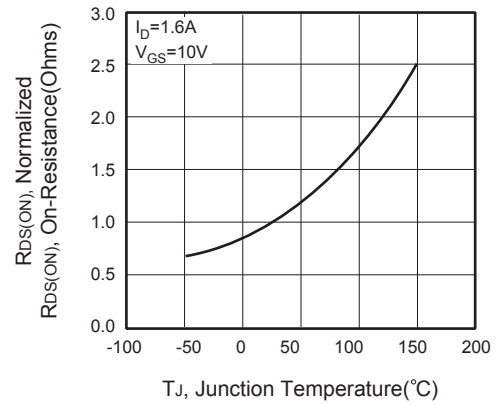


Figure 4. On-Resistance Variation with Temperature

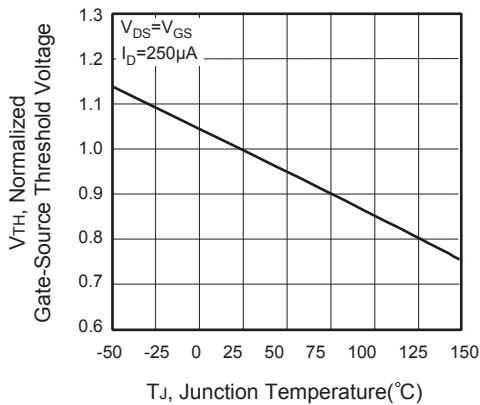


Figure 5. Gate Threshold Variation with Temperature

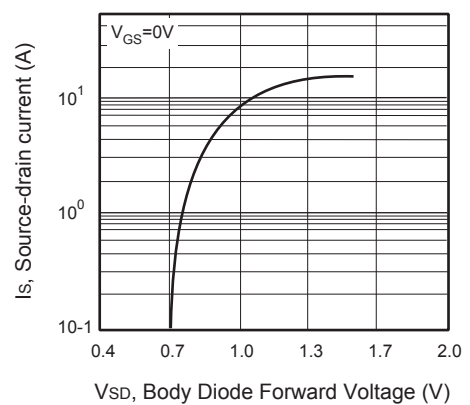


Figure 6. Body Diode Forward Voltage Variation with Source Current



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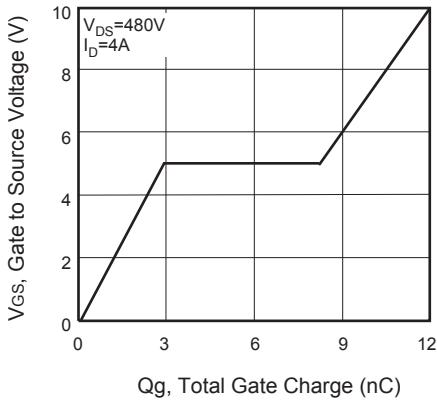


Figure 7. Gate Charge

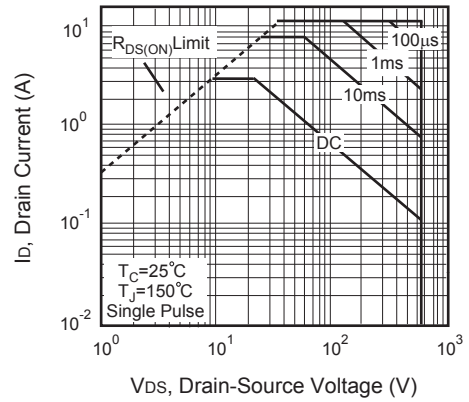


Figure 8. Maximum Safe Operating Area

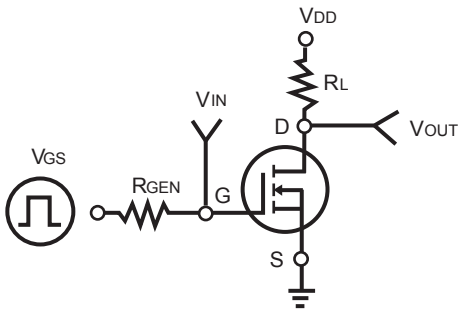


Figure 9. Switching Test Circuit

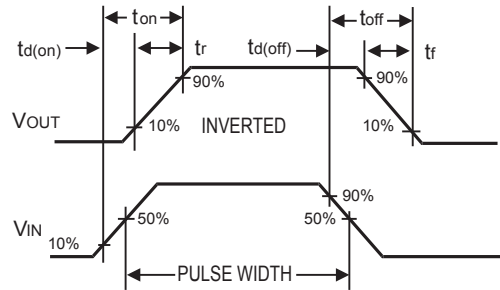


Figure 10. Switching Waveforms

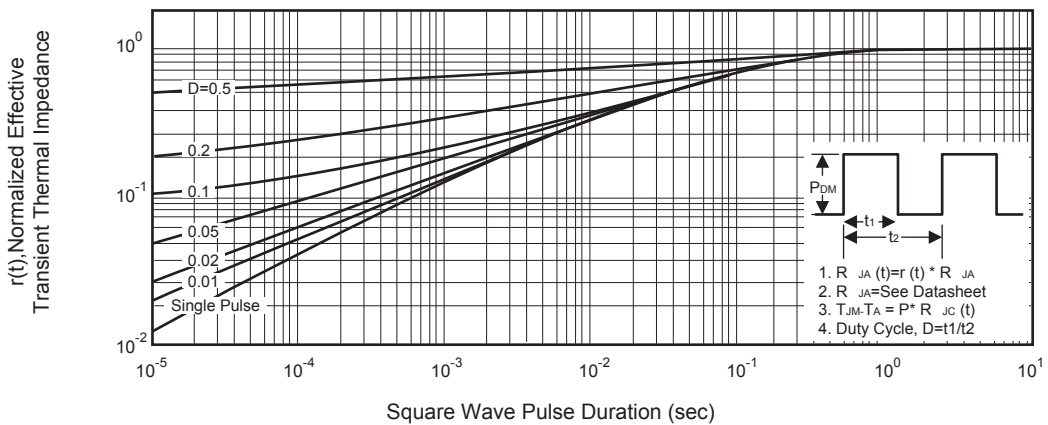


Figure 11. Normalized Thermal Transient Impedance Curve