

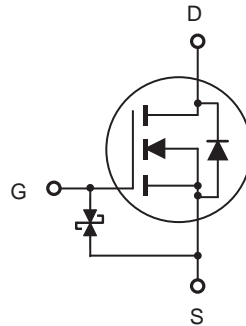


CED2182/CEU2182

N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- 20V, 42A, $R_{DS(ON)} = 18m\Omega @ V_{GS} = 4.5V$.
 $R_{DS(ON)} = 25m\Omega @ V_{GS} = 2.5V$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- Lead free product is acquired.
- 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}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous	I_D	42	A
Drain Current-Pulsed ^a	I_{DM}	170	A
Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$ - Derate above 25°C	P_D	50	W
		0.33	W/ $^\circ\text{C}$
Operating and Store Temperature Range	T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.0	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	$^\circ\text{C/W}$



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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}	$V_{GS} = 0V, I_D = 250\mu A$	20			V	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16V, V_{GS} = 0V$			1	μA	
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 12V, V_{DS} = 0V$			10	μA	
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -12V, V_{DS} = 0V$			-10	μA	
On Characteristics^b							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	0.6		1.2	V	
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 15A$		15	18	$m\Omega$	
		$V_{GS} = 2.5V, I_D = 10A$		20	25	$m\Omega$	
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 18A$		36		S	
Dynamic Characteristics^c							
Input Capacitance	C_{iss}	$V_{DS} = 8V, V_{GS} = 0V,$ $f = 1.0\text{ MHz}$		950		μF	
Output Capacitance	C_{oss}				470		μF
Reverse Transfer Capacitance	C_{rss}				150		μF
Switching Characteristics^c							
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10V, I_D = 1A,$ $V_{GS} = 4.5V, R_{GEN} = 6\Omega$		13	40	ns	
Turn-On Rise Time	t_r			12	40	ns	
Turn-Off Delay Time	$t_{d(off)}$			60	130	ns	
Turn-Off Fall Time	t_f			30	40	ns	
Total Gate Charge	Q_g	$V_{DS} = 10V, I_D = 6A,$ $V_{GS} = 4.5V$		15	20	nC	
Gate-Source Charge	Q_{gs}			2.5		nC	
Gate-Drain Charge	Q_{gd}			3.5		nC	
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Current	I_S				18	A	
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = 18A$			1.2	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.							



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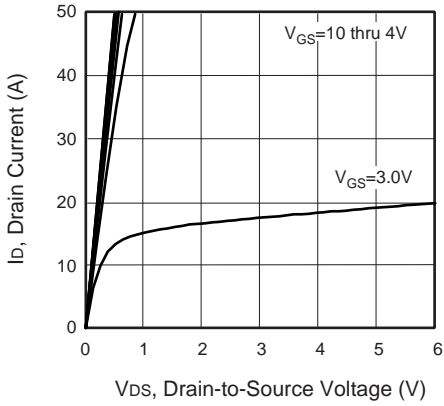


Figure 1. Output Characteristics

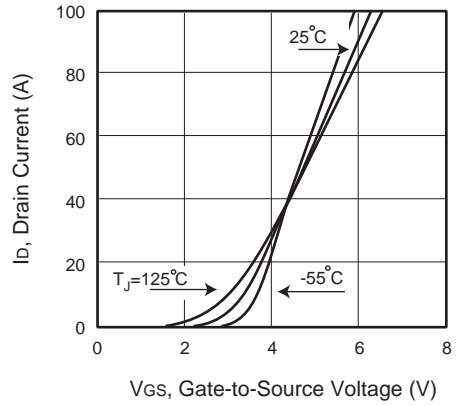


Figure 2. Transfer Characteristics

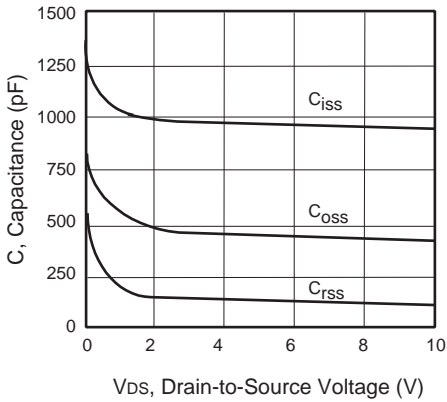


Figure 3. Capacitance

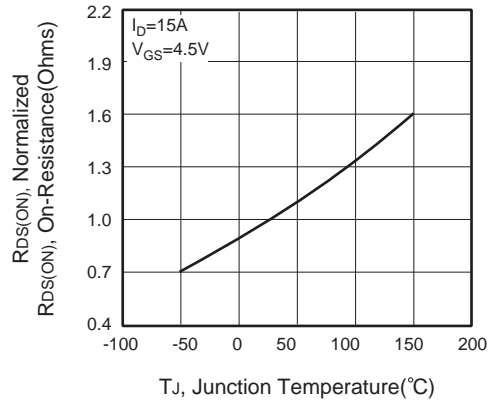


Figure 4. On-Resistance Variation with Temperature

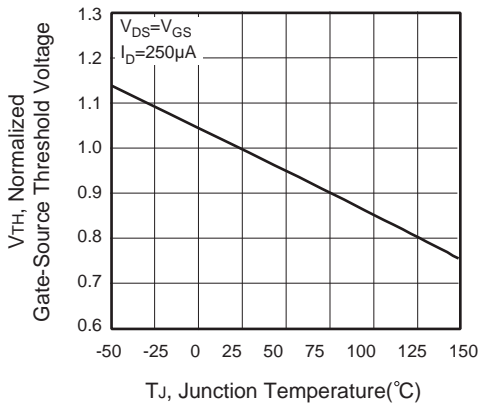


Figure 5. Gate Threshold Variation with Temperature

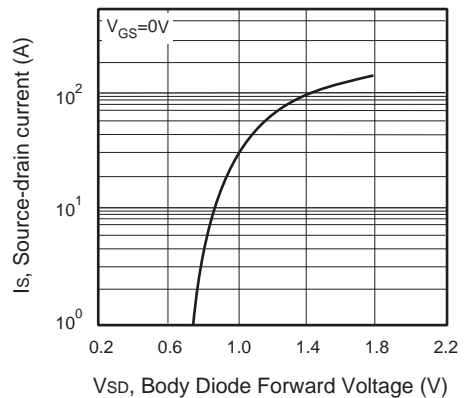


Figure 6. Body Diode Forward Voltage Variation with Source Current



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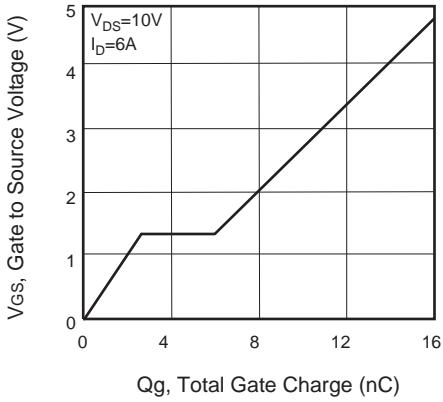


Figure 7. Gate Charge

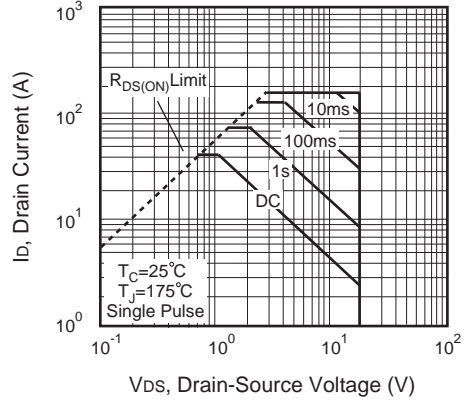


Figure 8. Maximum Safe Operating Area

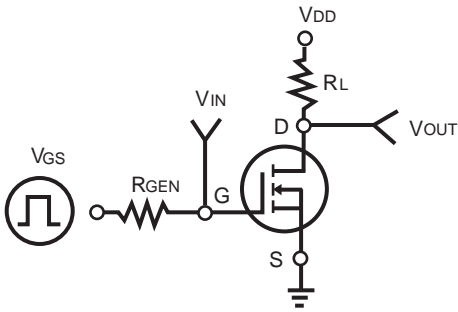


Figure 9. Switching Test Circuit

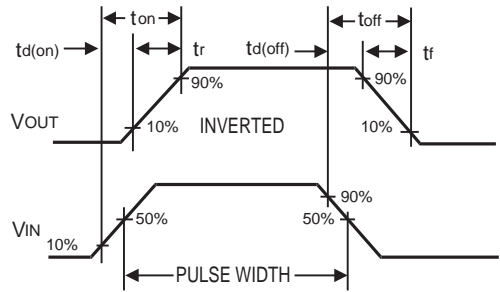


Figure 10. Switching Waveforms

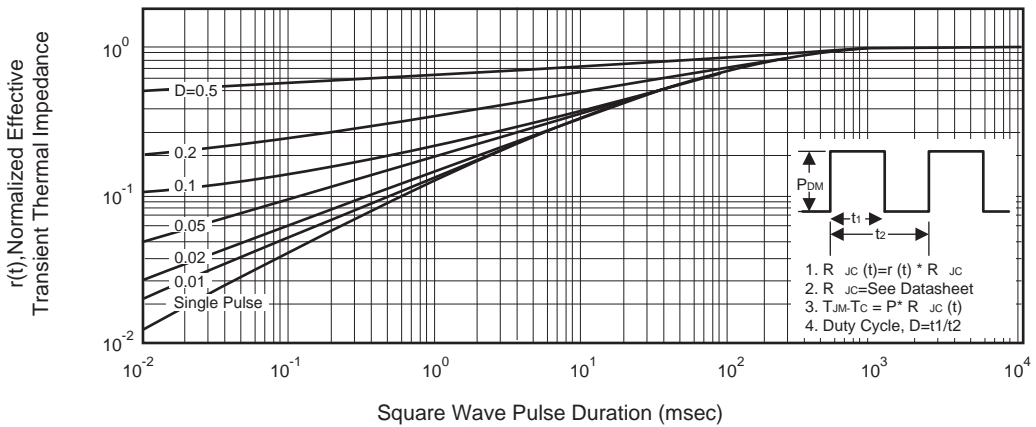


Figure 11. Normalized Thermal Transient Impedance Curve