



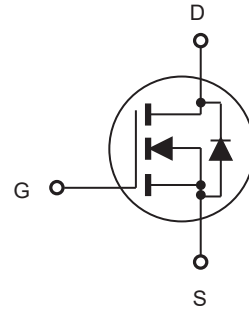
CEP190N10A/CEB190N10A

N-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

FEATURES

- 100V, 189A, $R_{DS(ON)} = 3.7m\Omega$ @ $V_{GS} = 10V$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- Pb-free lead plating ; RoHS compliant.
- Halogen Free.
- TO-220 & TO-263 package.



ABSOLUTE MAXIMUM RATINGS $T_C = 25^\circ C$ unless otherwise noted

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous @ $T_C = 25^\circ C$	I_D	189	A
Drain Current-Continuous @ $T_C = 100^\circ C$		134	A
Drain Current-Pulsed ^a	I_{DM}	756	A
Maximum Power Dissipation @ $T_C = 25^\circ C$ - Derate above $25^\circ C$	P_D	238	W
		1.58	W/ $^\circ C$
Single Pulsed Avalanche Energy ^d	E_{AS}	576	mJ
Single Pulsed Avalanche Current ^d	I_{AS}	48	A
Operating and Store Temperature Range	T_J, T_{stg}	-55 to 175	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.63	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^\circ C/W$

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

Rev 1. 2023.Dec
<http://www.cet-mos.com>



CEP190N10A/CEB190N10A

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}	$V_{GS} = 0V, I_D = 250\mu A$	100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$			1	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 20V, V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -20V, V_{DS} = 0V$			-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	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		3.1	3.7	$m\Omega$
Gate input resistance	R_g	f=1MHz, open Drain		1.4		Ω
Dynamic Characteristics^c						
Input Capacitance	C_{iss}	$V_{DS} = 50V, V_{GS} = 0V, f = 1.0MHz$		7580		pF
Output Capacitance	C_{oss}			1800		pF
Reverse Transfer Capacitance	C_{rss}			45		pF
Switching Characteristics^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 50V, I_D = 20A, V_{GS} = 10V, R_{GEN} = 10\Omega$		54		ns
Turn-On Rise Time	t_r			32		ns
Turn-Off Delay Time	$t_{d(off)}$			120		ns
Turn-Off Fall Time	t_f			61		ns
Total Gate Charge	Q_g	$V_{DS} = 50V, I_D = 20A, V_{GS} = 10V$		105		nC
Gate-Source Charge	Q_{gs}			25		nC
Gate-Drain Charge	Q_{gd}			30		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current	I_S				189	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = 20A$			1.2	V
Reverse Recovery Time	T_{rr}	$I_F = 10A, di/dt = 100A/\mu s$		75		ns
Reverse Recovery Charge	Q_{rr}			480		nC
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.L = 0.5mH, $I_{AS} = 48A, V_{DD} = 25V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.						

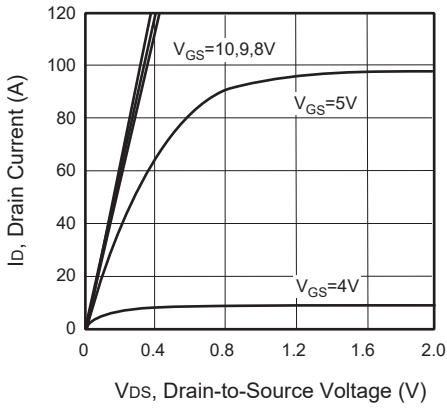


Figure 1. Output Characteristics

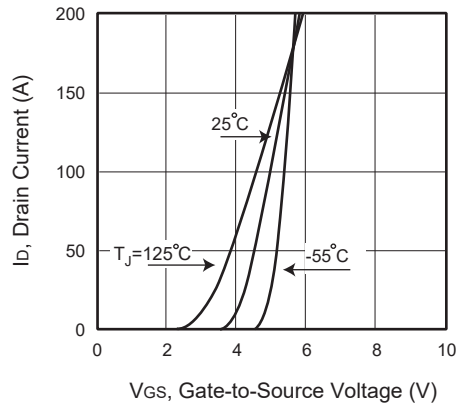


Figure 2. Transfer Characteristics

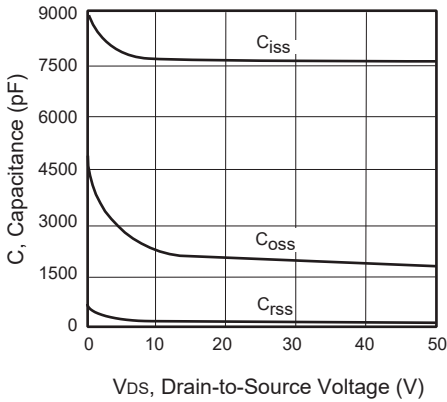


Figure 3. Capacitance

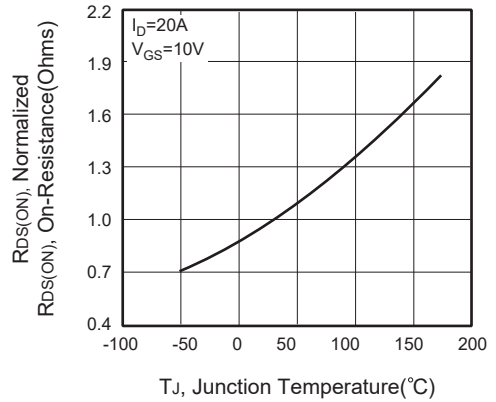


Figure 4. On-Resistance Variation with Temperature



Figure 5. Gate Threshold Variation with Temperature

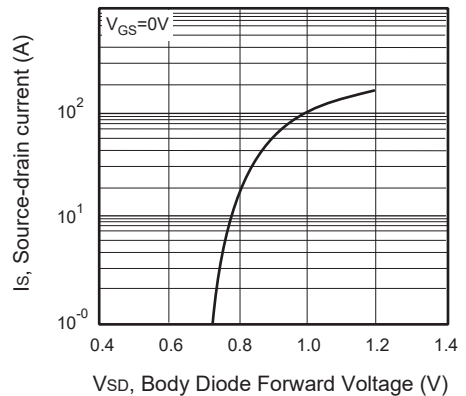


Figure 6. Body Diode Forward Voltage Variation with Source Current

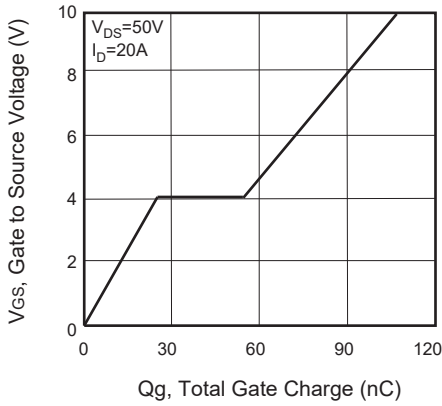


Figure 7. Gate Charge

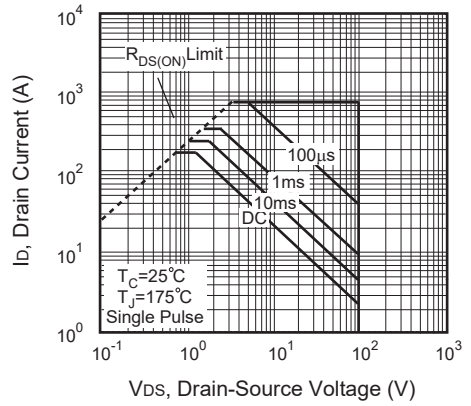


Figure 8. Maximum Safe Operating Area

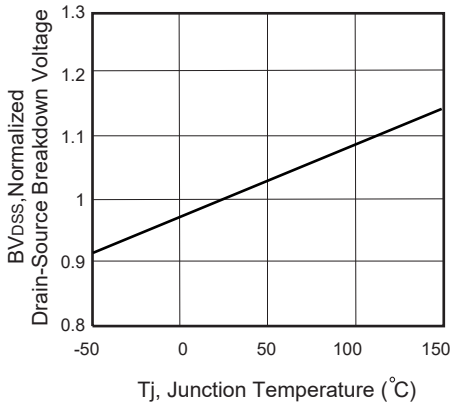


Figure 9. Breakdown Voltage Variation VS Temperature

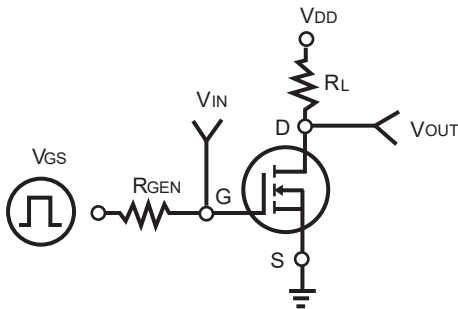


Figure 10. Switching Test Circuit

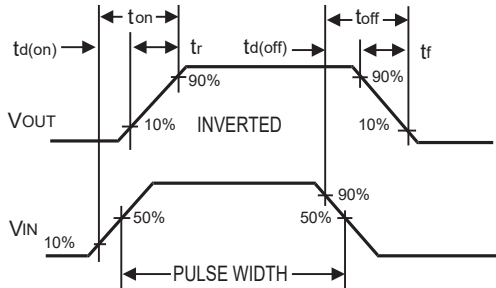


Figure 11. Switching Waveforms

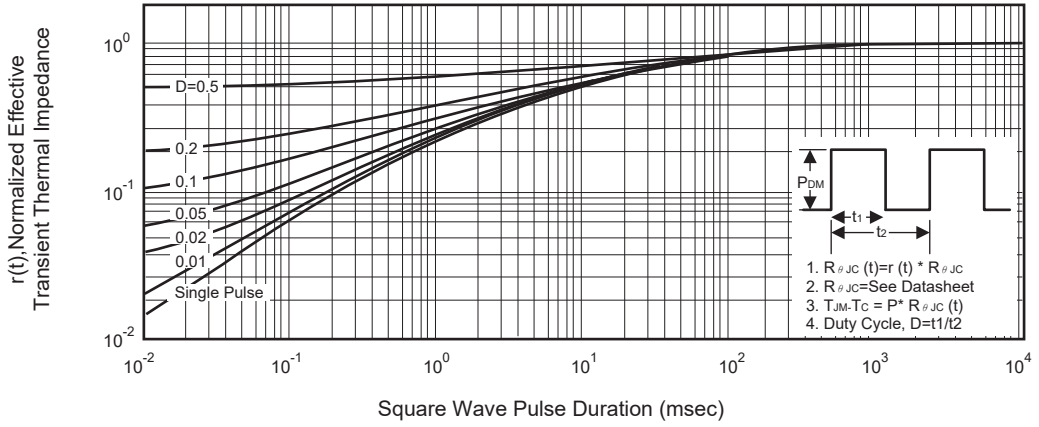


Figure 12. Normalized Thermal Transient Impedance Curve