



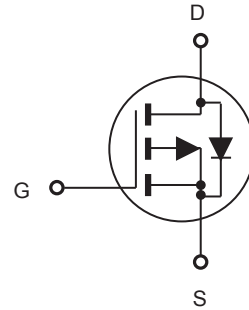
CEP20P10/CEB20P10

P-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

FEATURES

- -100V, -20A, $R_{DS(ON)} = 130m\Omega$ @ $V_{GS} = -10V$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- Lead-free plating ; RoHS compliant.
- TO-220 & TO-263 package.



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

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	-100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	-20	A
Drain Current-Pulsed ^a	I_{DM}	-80	A
Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$ - Derate above 25°C	P_D	115	W
		0.77	W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy ^e	E_{AS}	162	mJ
Single Pulsed Avalanche Current ^e	I_{AS}	18	A
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	$R_{\theta JC}$	1.3	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$

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

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Electrical Characteristics $T_A = 25^\circ\text{C}$ 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 ^c						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = -250\mu A$	-2		-4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -10A$		110	130	m Ω
Dynamic Characteristics ^d						
Input Capacitance	C_{iss}	$V_{DS} = -25V, V_{GS} = 0V, f = 1.0 \text{ MHz}$		1260		pF
Output Capacitance	C_{oss}			210		pF
Reverse Transfer Capacitance	C_{rss}			40		pF
Switching Characteristics ^d						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -50V, I_D = -20A, V_{GS} = -10V, R_{GEN} = 25\Omega$		22		ns
Turn-On Rise Time	t_r			16		ns
Turn-Off Delay Time	$t_{d(off)}$			85		ns
Turn-Off Fall Time	t_f			29		ns
Total Gate Charge	Q_g	$V_{DS} = -80V, I_D = -20A, V_{GS} = -10V$		30		nC
Gate-Source Charge	Q_{gs}			6		nC
Gate-Drain Charge	Q_{gd}			12		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current ^b	I_S				-20	A
Drain-Source Diode Forward Voltage ^c	V_{SD}	$V_{GS} = 0V, I_S = -20A$			-1.5	V
Notes : <input type="checkbox"/> a.Repetitive Rating : Pulse width limited by maximum junction temperature. <input type="checkbox"/> b.Surface Mounted on FR4 Board, $t \leq 10 \text{ sec.}$ <input type="checkbox"/> c.Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$. <input type="checkbox"/> d.Guaranteed by design, not subject to production testing. <input type="checkbox"/> e.L = 1mH, $I_{AS} = 18A$, $V_{DD} = 25V$, $R_G = 25\Omega$, Starting $T_J = 25 \text{ C}$ <input type="checkbox"/>						



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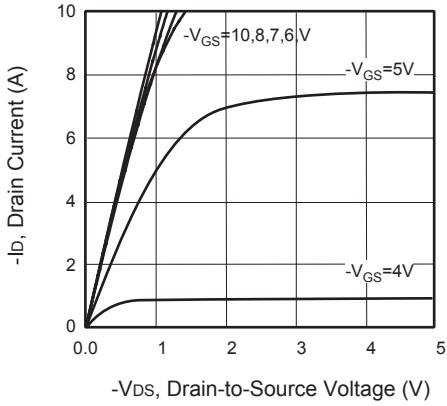


Figure 1. Output Characteristics

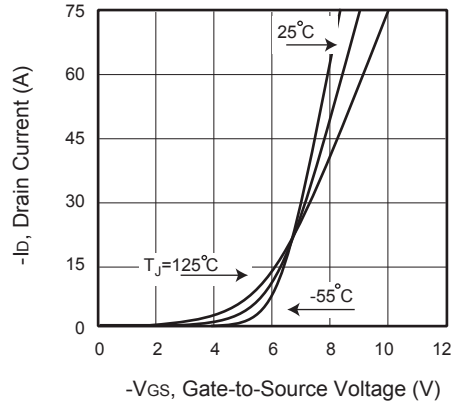


Figure 2. Transfer Characteristics

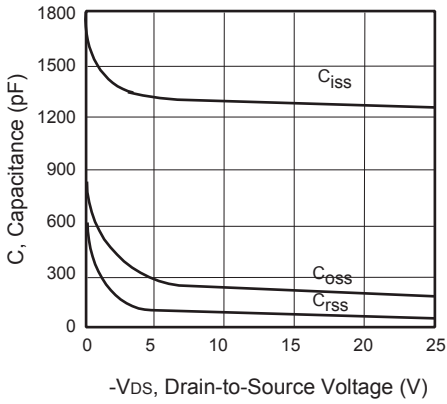


Figure 3. Capacitance

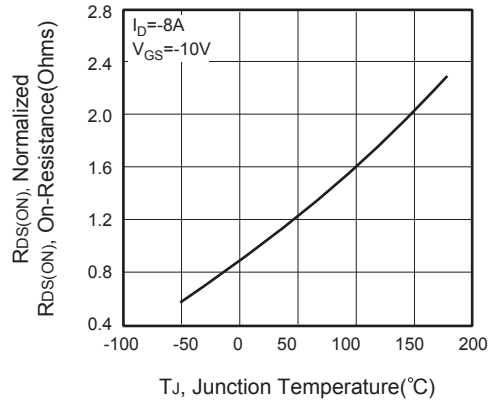


Figure 4. On-Resistance Variation with Temperature



Figure 5. Gate Threshold Variation with Temperature

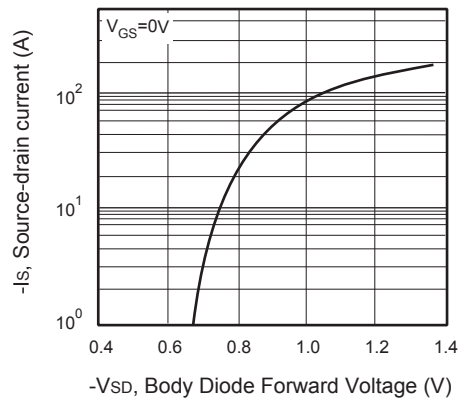


Figure 6. Body Diode Forward Voltage Variation with Source Current



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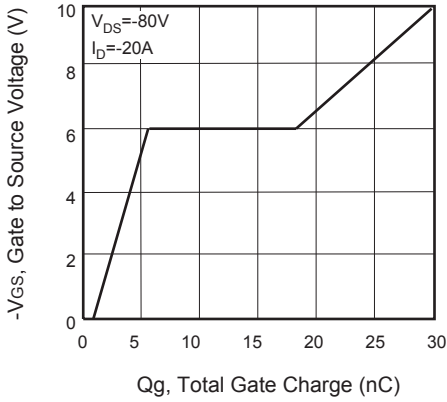


Figure 7. Gate Charge

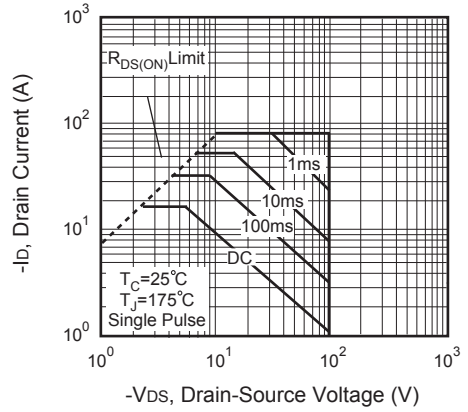


Figure 8. Maximum Safe Operating Area

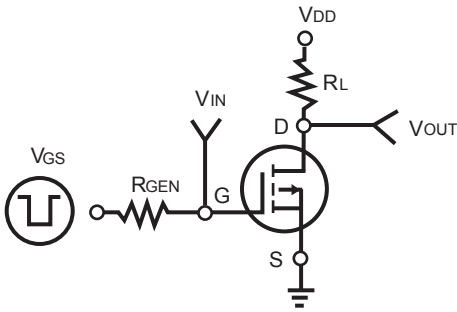


Figure 9. Switching Test Circuit



Figure 10. Switching Waveforms

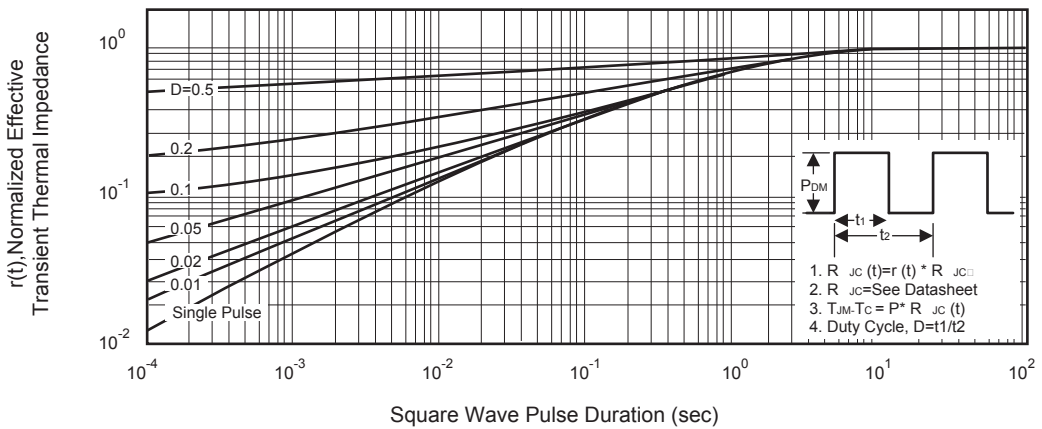


Figure 11. Normalized Thermal Transient Impedance Curve