



CEP14P20/CEB14P20 CEF14P20

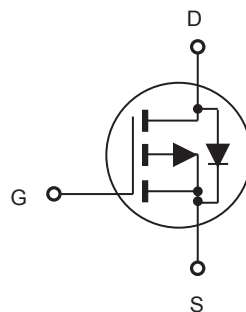
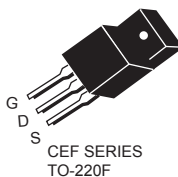
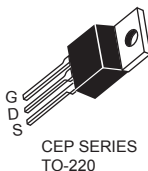
P-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

FEATURES

Type	V _{DSS}	R _{DS(ON)}	I _D	@V _{GS}
CEP14P20	-200V	0.36Ω	-13.5A	-10V
CEB14P20	-200V	0.36Ω	-13.5A	-10V
CEF14P20	-200V	0.36Ω	-13.5A ^d	-10V

- Super high dense cell design for extremely low R_{DS(ON)}.
- High power and current handling capability.
- Lead-free plating ; RoHS compliant.



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

Parameter	Symbol	Limit		Units
		TO-220/263	TO-220F	
Drain-Source Voltage	V _{DS}	-200		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	-13.5	-13.5 ^d	A
		-8.5	-8.5 ^d	A
Drain Current-Pulsed ^a	I _{DM} ^e	-54	-54 ^d	A
Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$ - Derate above 25°C	P _D	139	42	W
		1.11	0.33	W/°C
Single Pulsed Avalanche Energy ^h	E _{AS}	273		mJ
Single Pulsed Avalanche Current ^h	I _{AS}	13.5		A
Operating and Store Temperature Range	T _J , T _{stg}	-55 to 150		°C

Thermal Characteristics

Parameter	Symbol	Limit		Units
Thermal Resistance, Junction-to-Case	R _{θJC}	0.9	3	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	65	°C/W

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

Rev 1. 2012.Mar
<http://www.cetsemi.com>



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CEF14P20

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}	$V_{GS} = 0V, I_D = -250\mu A$	-200			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -200V, V_{GS} = 0V$			-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	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -6.8A$		0.30	0.36	Ω
Dynamic Characteristics ^c						
Input Capacitance	C_{iss}	$V_{DS} = -25V, V_{GS} = 0V, f = 1.0\text{ MHz}$		1620		pF
Output Capacitance	C_{oss}			240		pF
Reverse Transfer Capacitance	C_{rss}			50		pF
Switching Characteristics ^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -100V, I_D = -13.5A, V_{GS} = -10V, R_{GEN} = 25\Omega$		28	56	ns
Turn-On Rise Time	t_r			74	148	ns
Turn-Off Delay Time	$t_{d(off)}$			260	520	ns
Turn-Off Fall Time	t_f			120	240	ns
Total Gate Charge	Q_g	$V_{DS} = -160V, I_D = -13.5A, V_{GS} = -10V$		52	68	nC
Gate-Source Charge	Q_{gs}			9		nC
Gate-Drain Charge	Q_{gd}			25		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current	I_S ^f				-13.5	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = -13.5A$ ^g			-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.Full package $I_{S(max)} = 7.4A$. g.Full package V_{SD} test condition $I_S = 7.4A$. h.L = 3mH, $I_{AS} = 13.5A, V_{DD} = 25V, R_G = 25\Omega$, Starting $T_J = 25\text{ C}$.						



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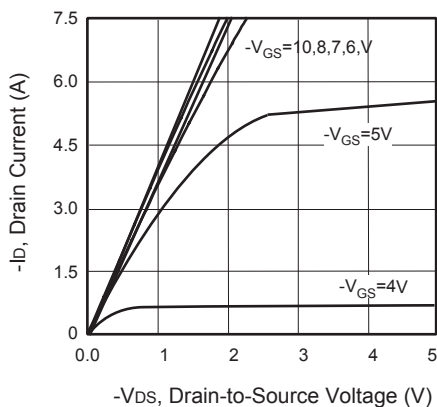


Figure 1. Output Characteristics

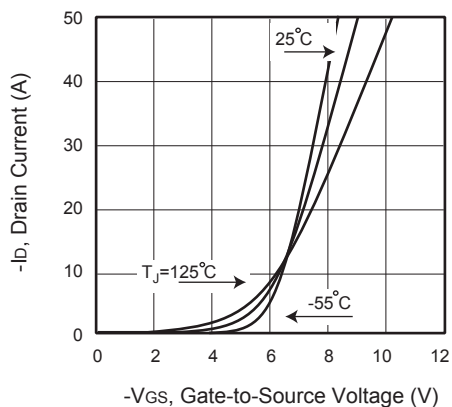


Figure 2. Transfer Characteristics

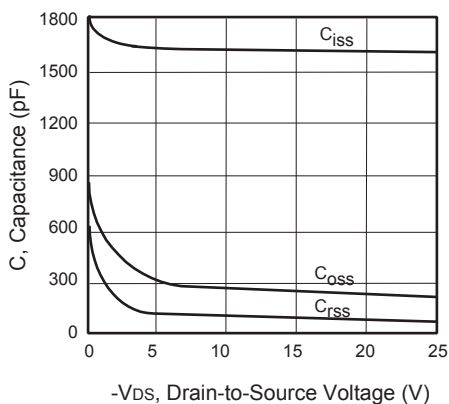


Figure 3. Capacitance

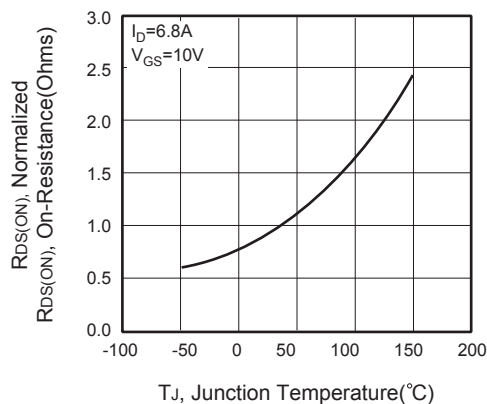


Figure 4. On-Resistance Variation with Temperature

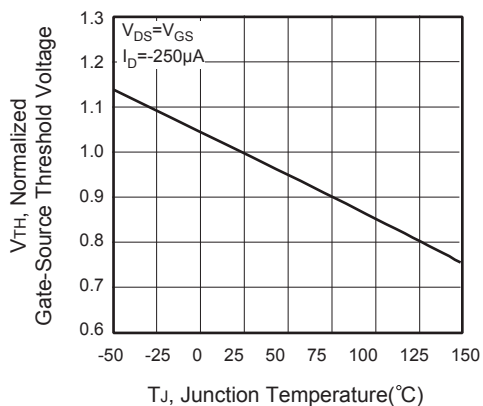


Figure 5. Gate Threshold Variation with Temperature

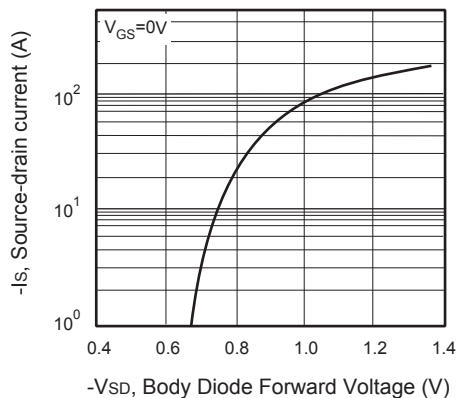


Figure 6. Body Diode Forward Voltage Variation with Source Current



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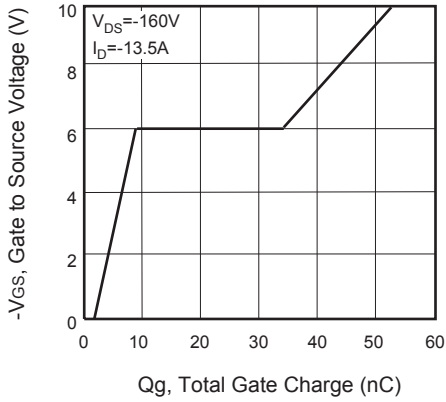


Figure 7. Gate Charge

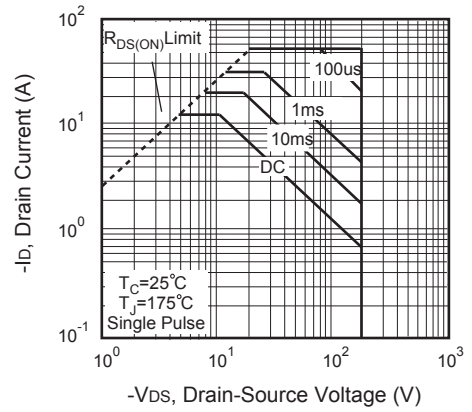


Figure 8. Maximum Safe Operating Area

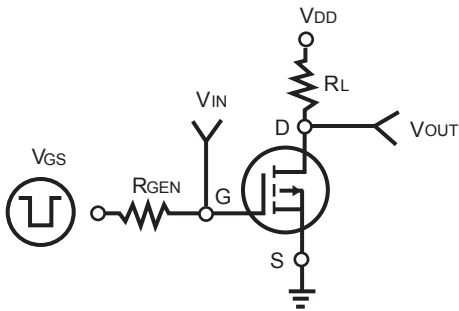


Figure 9. Switching Test Circuit



Figure 10. Switching Waveforms

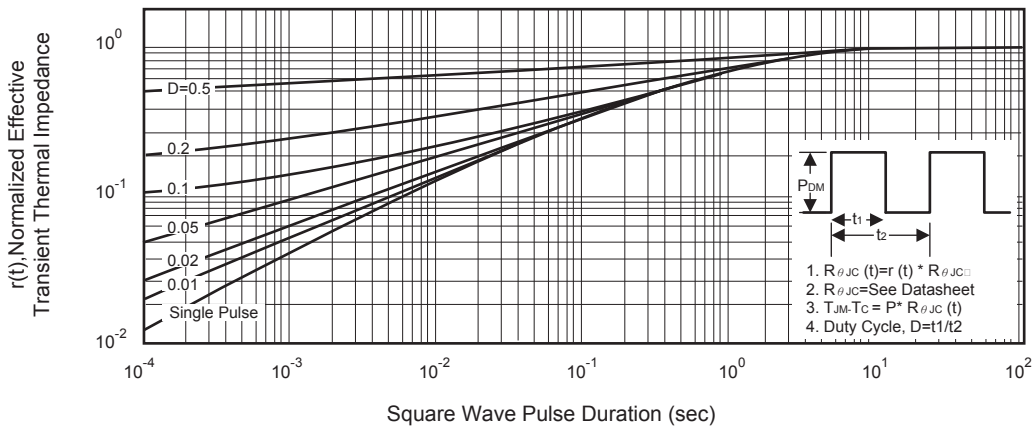


Figure 11. Normalized Thermal Transient Impedance Curve