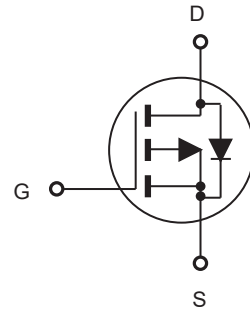


P-Channel Enhancement Mode Field Effect Transistor

FEATURES

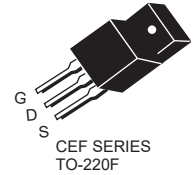
Type	V _{DSS}	R _{DS(ON)}	I _D	@V _{GS}
CEP14P20A	-200V	275mΩ	-13.7A	-10V
CEB14P20A	-200V	275mΩ	-13.7A	-10V
CEF14P20A	-200V	275mΩ	-13.7A ^d	-10V



- 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.

Applications

- Switched mode power supplies.
- Lighting.
- DC Motor control.
- Load switch.
- battery powered.



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°C @ T _C = 100°C	I _D	-13.7	-13.7 ^d	A
		-8.7	-8.7 ^d	A
Drain Current-Pulsed ^a	I _{DM} ^e	-54.8	-54.8 ^d	A
Maximum Power Dissipation @ T _C = 25°C - Derate above 25°C	P _D	104	34	W
		0.83	0.27	W/°C
Single Pulsed Avalanche Energy ^g	E _{AS}	198		mJ
Single Pulsed Avalanche Current ^g	I _{AS}	11.5		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}	1.2	3.6	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	65	°C/W



CEP14P20A/CEB14P20A CEF14P20A

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	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -6.8A$		220	275	$m\Omega$
Dynamic Characteristics^c						
Input Capacitance	C_{iss}	$V_{DS} = -25V, V_{GS} = 0V,$ $f = 1.0\text{ MHz}$		2430		pF
Output Capacitance	C_{oss}			155		pF
Reverse Transfer Capacitance	C_{rss}			90		pF
Switching Characteristics^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -100V, I_D = -13.5A,$ $V_{GS} = -10V, R_{GEN} = 25\Omega$		41		ns
Turn-On Rise Time	t_r			44		ns
Turn-Off Delay Time	$t_{d(off)}$			172		ns
Turn-Off Fall Time	t_f			73		ns
Total Gate Charge	Q_g	$V_{DS} = -160V, I_D = -13.5A,$ $V_{GS} = -10V$		64		nC
Gate-Source Charge	Q_{gs}			11		nC
Gate-Drain Charge	Q_{gd}			22		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current	I_S^f				-13.7	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = -13.7A$			-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 $I_{S(max)} = 8A$. g.L = 3mH, $I_{AS} = 11.5A, V_{DD} = 25V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.						



CEP14P20A/CEB14P20A CEF14P20A

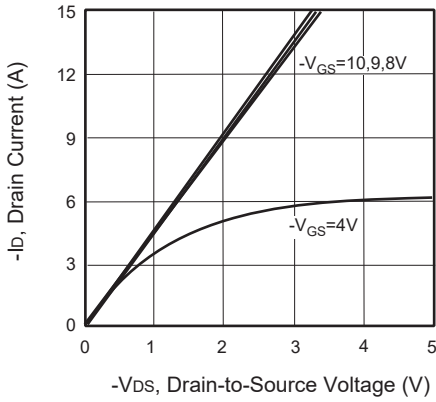


Figure 1. Output Characteristics

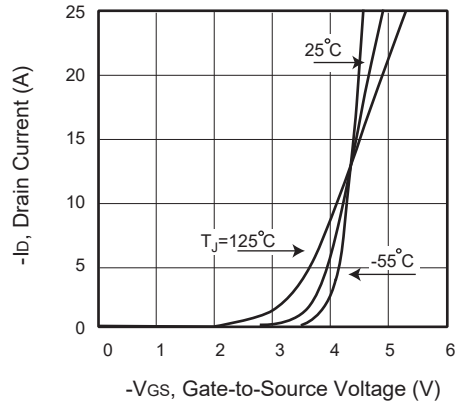


Figure 2. Transfer Characteristics

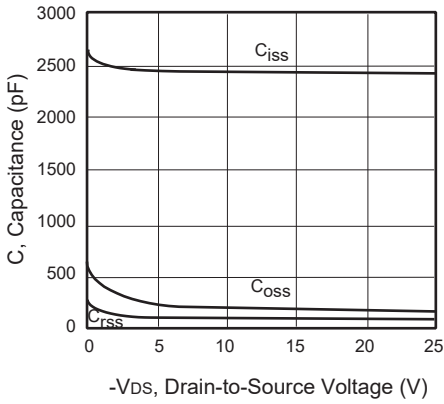


Figure 3. Capacitance

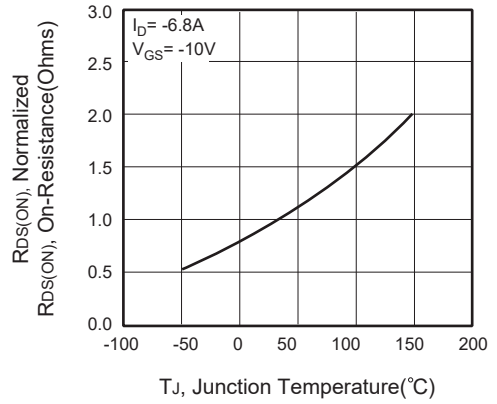


Figure 4. On-Resistance Variation with Temperature

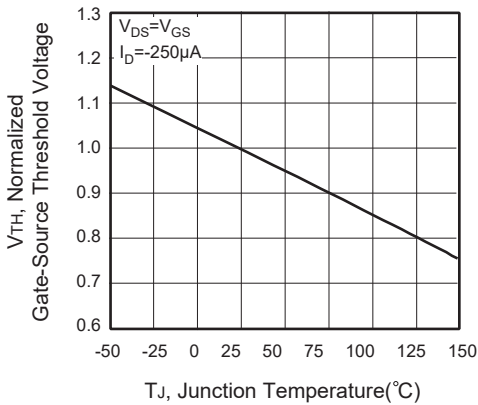


Figure 5. Gate Threshold Variation with Temperature

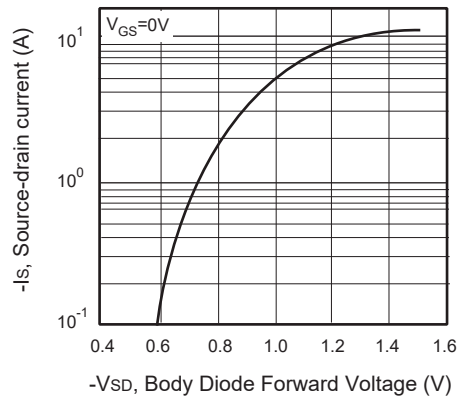


Figure 6. Body Diode Forward Voltage Variation with Source Current

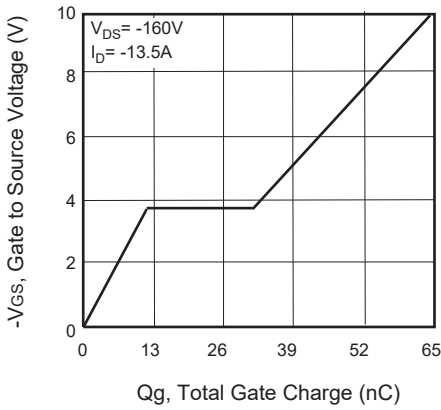


Figure 7. Gate Charge

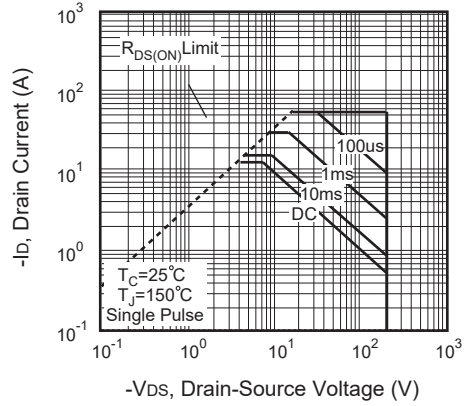


Figure 8. Maximum Safe Operating Area



Figure 9. Breakdown Voltage Variation VS Temperature

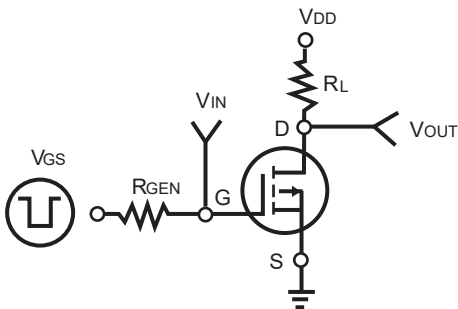


Figure 10. Switching Test Circuit

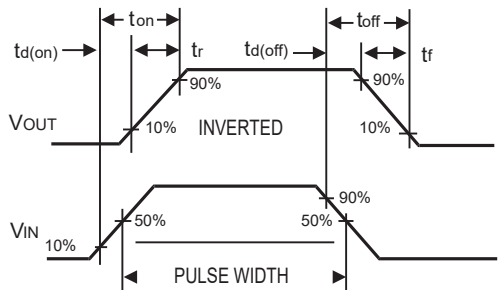


Figure 11. Switching Waveforms



CEP14P20A/CEB14P20A CEF14P20A

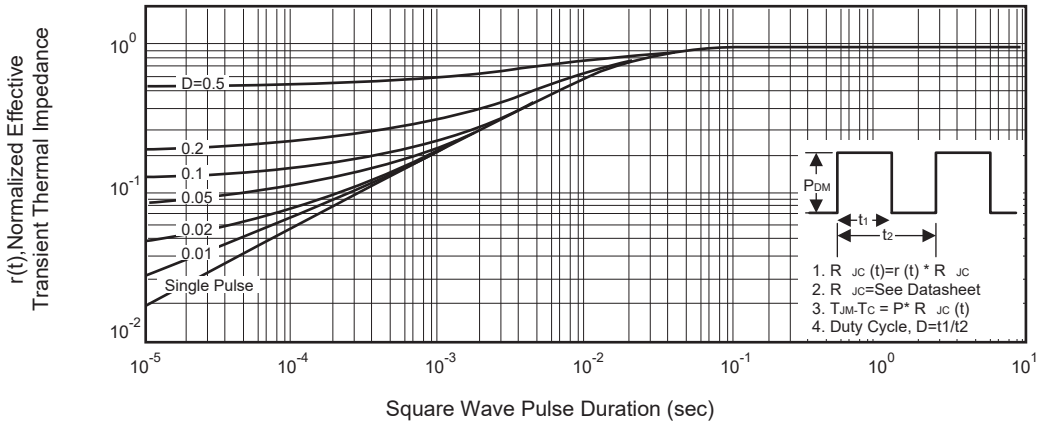


Figure 12. Normalized Thermal Transient Impedance Curve