

P-Channel Enhancement Mode Field Effect Transistor

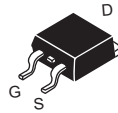
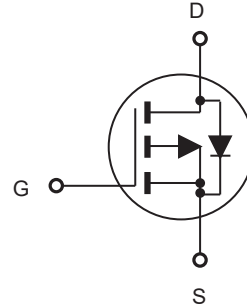
FEATURES

Type	V _{DSS}	R _{DS(ON)}	I _D	@V _{GS}
CEP35P10A	-100V	55mΩ	-33A	-10V
CEB35P10A	-100V	55mΩ	-33A	-10V
CEF35P10A	-100V	55mΩ	-33A ^d	-10V

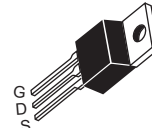
- Super high dense cell design for extremely low R_{DS(ON)}.
- High power and current handling capability.
- Pb-free lead plating ; RoHS compliant.
- Halogen Free.

Applications

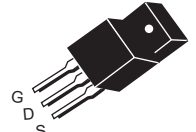
- Switched mode power supplies.
- Lighting.
- DC Motor control.
- Load switch.
- battery powered.



CEP SERIES
TO-263(DD-PAK)



CEP SERIES
TO-220



CEF SERIES
TO-220F

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}	-100		V
Gate-Source Voltage	V _{GS}	± 20		V
Drain Current-Continuous @ T _C = 25°C @ T _C = 100°C	I _D	-33	-33 ^d	A
		-23	-23 ^d	A
Drain Current-Pulsed ^a	I _{DM} ^e	-132	-132 ^d	A
Maximum Power Dissipation @ T _C = 25°C - Derate above 25°C	P _D	107	40	W
		0.71	0.26	W/°C
Single Pulsed Avalanche Energy ^g	E _{AS}	200		mJ
Single Pulsed Avalanche Current ^g	I _{AS}	20		A
Operating and Store Temperature Range	T _J , T _{stg}	-55 to 175		°C

Thermal Characteristics

Parameter	Symbol	Limit		Units
Thermal Resistance, Junction-to-Case	R _{θJC}	1.4	3.7	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	65	°C/W



CEP35P10A/CEB35P10A CEF35P10A

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	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = -250\mu A$	-1		-3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -16A$		44	55	$m\Omega$
		$V_{GS} = -4.5V, I_D = -8A$		48	60	$m\Omega$
Dynamic Characteristics^c						
Input Capacitance	C_{iss}	$V_{DS} = -25V, V_{GS} = 0V,$ $f = 1.0\text{ MHz}$		4340		pF
Output Capacitance	C_{oss}			215		pF
Reverse Transfer Capacitance	C_{rss}			175		pF
Switching Characteristics^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -50V, I_D = -18A,$ $V_{GS} = -10V, R_{GEN} = 3.3\Omega$		20		ns
Turn-On Rise Time	t_r			9		ns
Turn-Off Delay Time	$t_{d(off)}$			85		ns
Turn-Off Fall Time	t_f			17		ns
Total Gate Charge	Q_g		$V_{DS} = -80V, I_D = -18A,$ $V_{GS} = -4.5V$		44	
Gate-Source Charge	Q_{gs}			8		nC
Gate-Drain Charge	Q_{gd}			22		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current	I_S^f				-33	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = -16A$			-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. d.Limited only by maximum temperature allowed . e.Pulse width limited by safe operating area . f.Full package $I_{S(max)} = 20A$. g.L = 1mH, $I_{AS} = 20A$, $V_{DD} = 25V$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.						



CEP35P10A/CEB35P10A CEF35P10A

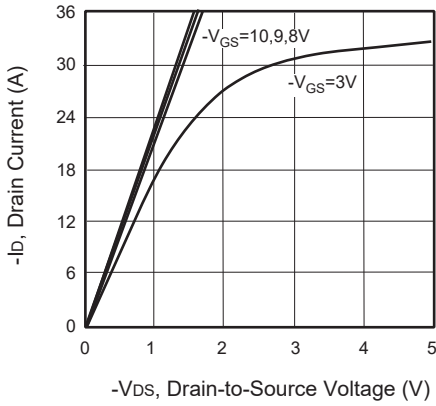


Figure 1. Output Characteristics

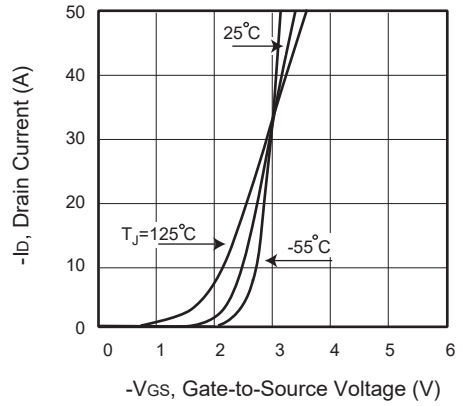


Figure 2. Transfer Characteristics

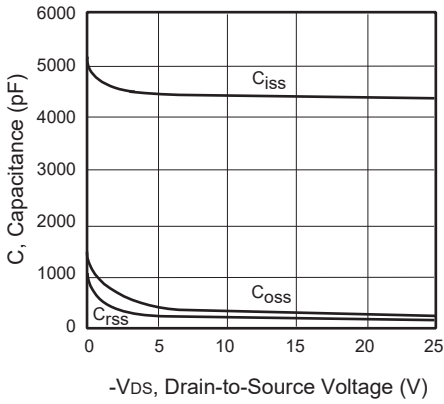


Figure 3. Capacitance

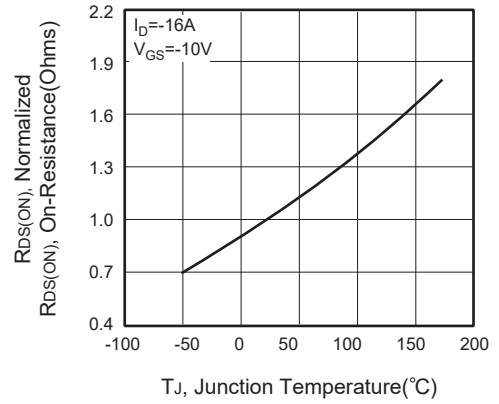


Figure 4. On-Resistance Variation with Temperature

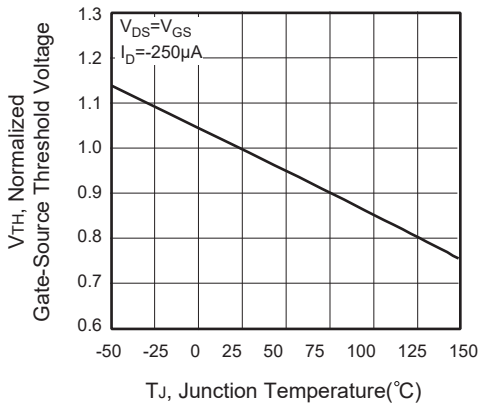


Figure 5. Gate Threshold Variation with Temperature

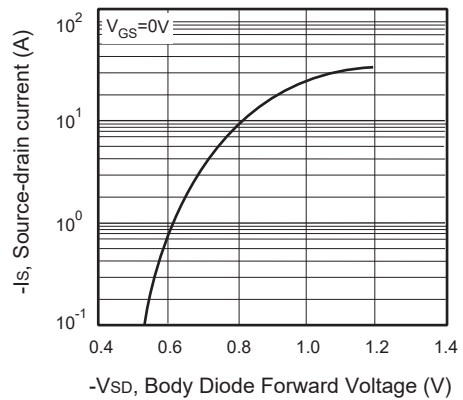


Figure 6. Body Diode Forward Voltage Variation with Source Current

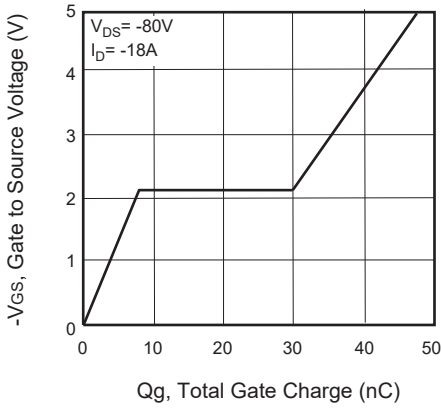


Figure 7. Gate Charge

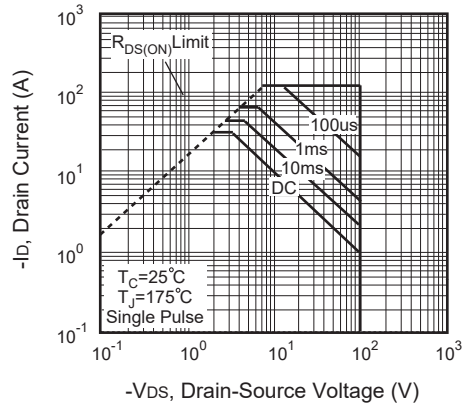


Figure 8. Maximum Safe Operating Area



Figure 9. Breakdown Voltage Variation VS Temperature

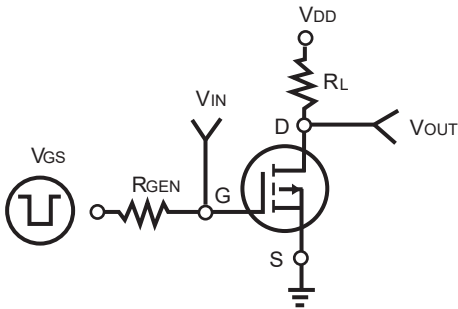


Figure 10. Switching Test Circuit

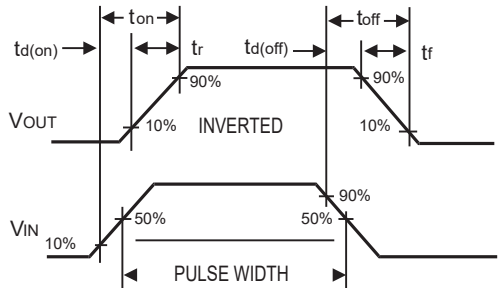


Figure 11. Switching Waveforms



CEP35P10A/CEB35P10A CEF35P10A

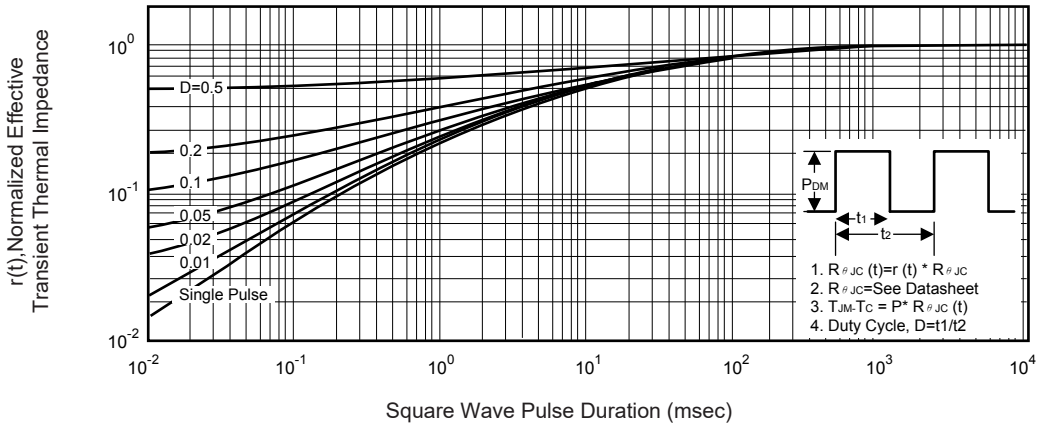


Figure 12. Normalized Thermal Transient Impedance Curve