



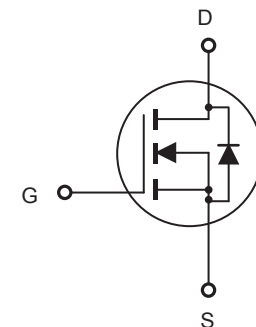
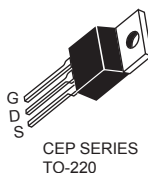
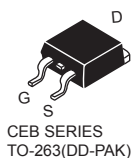
CEP83A3G/CEB83A3G

N-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

FEATURES

- 30V, 102A, $R_{DS(ON)} = 4.5 \text{ m}\Omega$ @ $V_{GS} = 10\text{V}$.
 $R_{DS(ON)} = 7.0 \text{ m}\Omega$ @ $V_{GS} = 4.5\text{V}$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- Lead free product is acquired.
- 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}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous @ $T_C = 25^\circ\text{C}$ @ $T_C = 100^\circ\text{C}$	I_D	102	A
		72	A
Drain Current-Pulsed ^a	I_{DM}	408	A
Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$ - Derate above 25°C	P_D	83	W
		0.55	W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy ^d	E_{AS}	151	mJ
Single Pulsed Avalanche Current ^d	I_{AS}	55	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	$R_{\theta JC}$	1.8	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$



CEP83A3G/CEB83A3G

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}	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$			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	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 30A$		3.4	4.5	m Ω
On-Resistance		$V_{GS} = 4.5V, I_D = 20A$		5	7	m Ω
Dynamic Characteristics ^c						
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V,$ $f = 1.0\text{ MHz}$		2855		pF
Output Capacitance	C_{oss}			510		pF
Reverse Transfer Capacitance	C_{rss}			390		pF
Switching Characteristics ^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15V, I_D = 40A, \square$ $V_{GS} = 4.5V, R_{GEN} = 4.7\Omega$		31		ns
Turn-On Rise Time	t_r			26		ns
Turn-Off Delay Time	$t_{d(off)}$			45		ns
Turn-Off Fall Time	t_f			24		ns
Total Gate Charge	Q_g	$V_{DS} = 15V, I_D = 40A,$ $V_{GS} = 5V$		37		nC
Gate-Source Charge	Q_{gs}			7		nC
Gate-Drain Charge	Q_{gd}			17		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current	I_S				50	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = 50A$			1.5	V
Notes : a.Repetitive Rating : Pulse width limited by maximum junction temperature b.Pulse Test : Pulse Width < 300μs, Duty Cycle < 2% c.Guaranteed by design, not subject to production testing d.L = 0.1mH, $I_{AS} = 55A, V_{DD} = 24V, R_G = 25\Omega$, Starting $T_J = 25\text{ C}$						



CEP83A3G/CEB83A3G

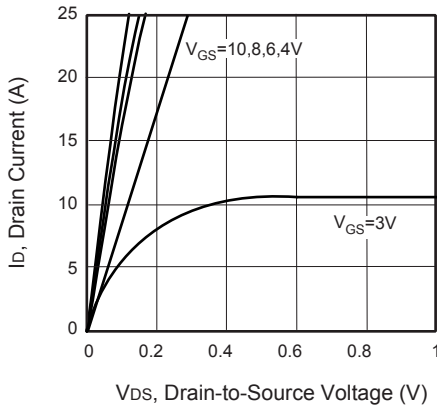


Figure 1. Output Characteristics

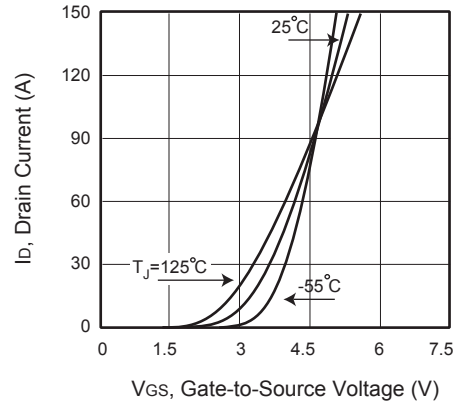


Figure 2. Transfer Characteristics

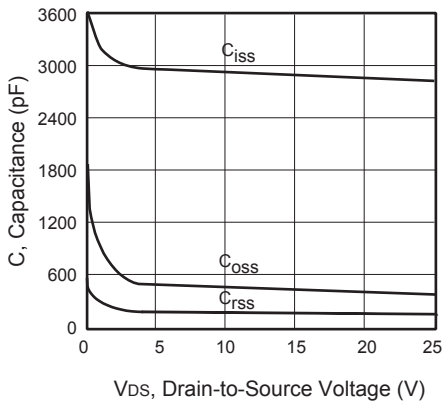


Figure 3. Capacitance

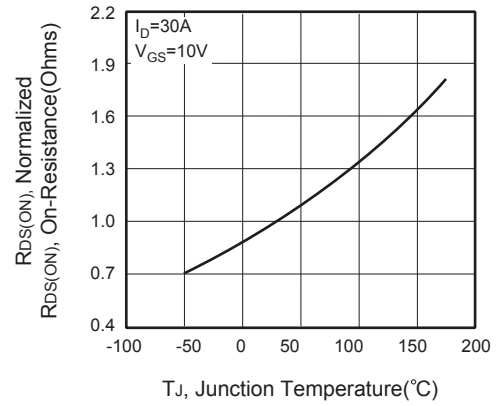


Figure 4. On-Resistance Variation with Temperature

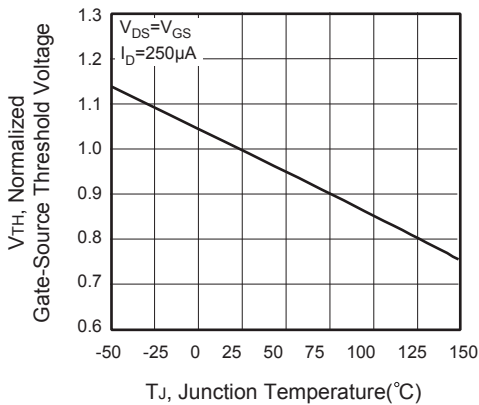


Figure 5. Gate Threshold Variation with Temperature

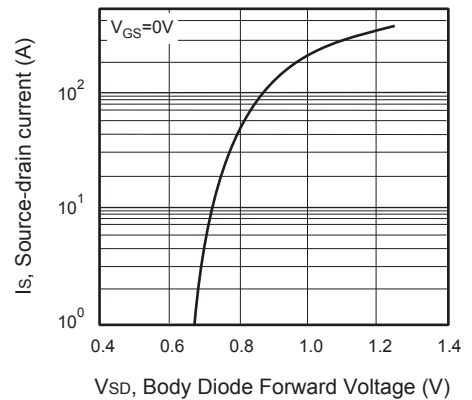


Figure 6. Body Diode Forward Voltage Variation with Source Current



CEP83A3G/CEB83A3G

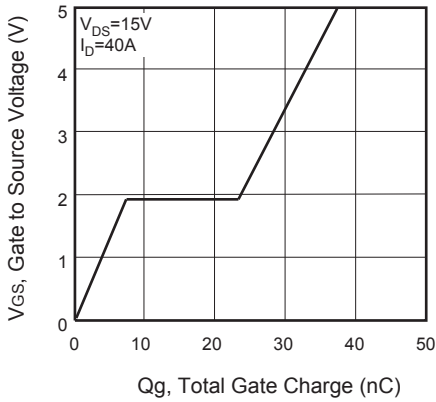


Figure 7. Gate Charge

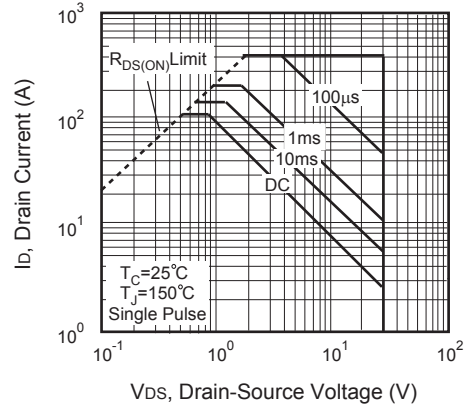


Figure 8. Maximum Safe Operating Area

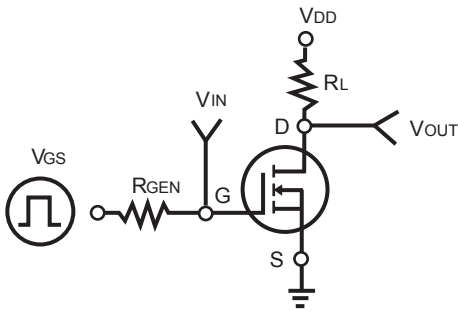


Figure 9. Switching Test Circuit

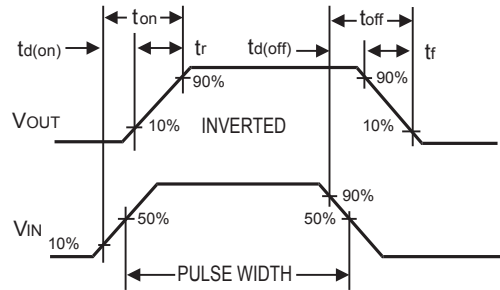


Figure 10. Switching Waveforms

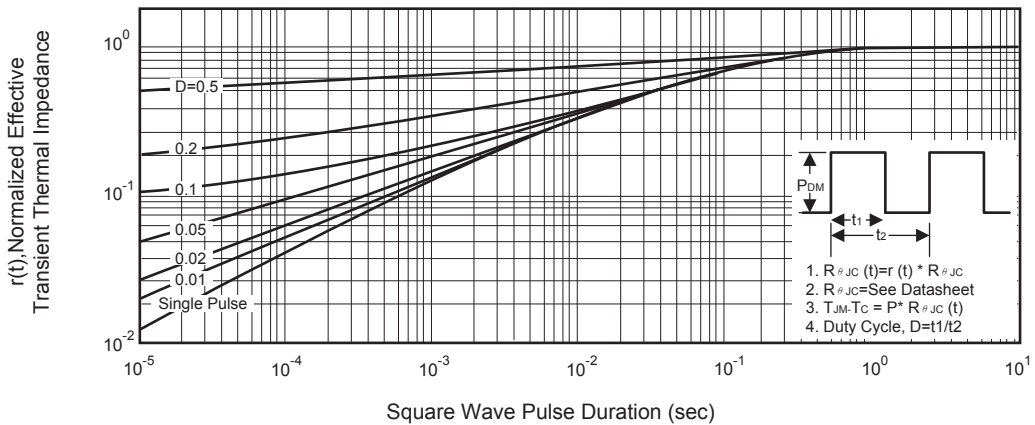


Figure 11. Normalized Thermal Transient Impedance Curve