

CEP6060L/CEB6060L



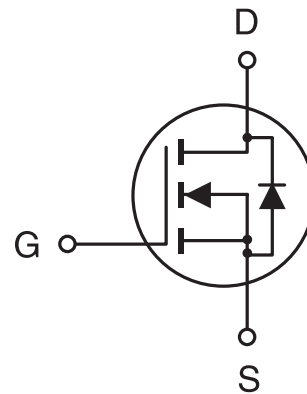
March 1998

4

N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- 60V , 48A , $R_{DS(ON)}=20m\Omega$ @ $V_{GS}=10V$.
 $R_{DS(ON)}=25m\Omega$ @ $V_{GS}= 5 V$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- TO-220 & TO-263 package.



ABSOLUTE MAXIMUM RATINGS (Tc=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	60	V
Gate-Source Voltage	V _{GS}	±16	V
Drain Current -Continuous -Pulsed	I _D	48	A
	I _{DM}	144	A
Drain-Source Diode Forward Current	I _S	60	A
Maximum Power Dissipation @T _c =25°C Derate above 25°C	P _D	100	W
		0.67	W/°C
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to 175	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	R _{θJC}	1.5	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	°C/W

CEP6060L/CEB6060L

ELECTRICAL CHARACTERISTICS (Tc=25°C unless otherwise noted)

4

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			25	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±16V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS^a						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.4	2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =5V, I _D =24A		19	25	mΩ
		V _{GS} =10V, I _D =24A		15	20	mΩ
On-State Drain Current	I _{D(ON)}	V _{GS} =5V, V _{DS} =10V	60			A
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =24A		39		S
DYNAMIC CHARACTERISTICS^b						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V f=1.0MHz		1565	2000	pF
Output Capacitance	C _{OSS}			441	600	pF
Reverse Transfer Capacitance	C _{RSS}			104	140	pF
SWITCHING CHARACTERISTICS^b						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =30V, I _D =48A, V _{GS} =5V V _{GEN} =15V R _{GS} =15Ω		20	30	ns
Rise Time	t _r			400	500	ns
Turn-Off Delay Time	t _{D(OFF)}			75	100	ns
Fall Time	t _f			260	300	ns
Total Gate Charge	Q _g	V _{DS} =48V, I _D =48A, V _{GS} =5V		58	60	nC
Gate-Source Charge	Q _{gs}			8		nC
Gate-Drain Charge	Q _{gd}			13		nC

CEP6060L/CEB6060L

4

ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS ^a						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_s = 24A$		0.8	1.3	V

Notes

a. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2\%$.

b. Guaranteed by design, not subject to production testing.

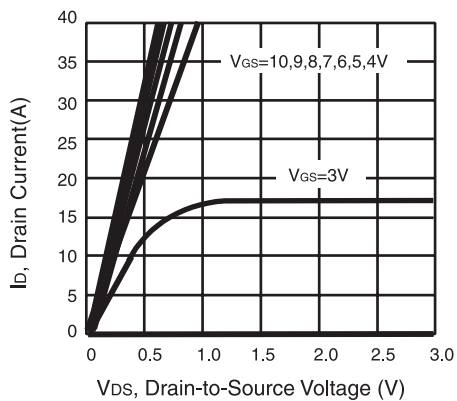


Figure 1. Output Characteristics

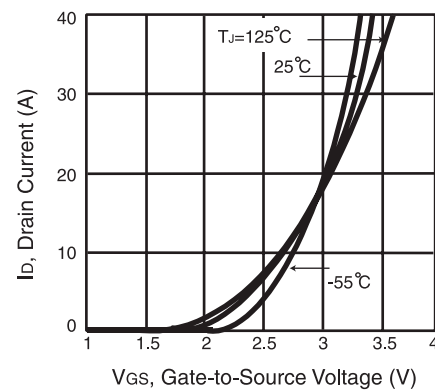


Figure 2. Transfer Characteristics

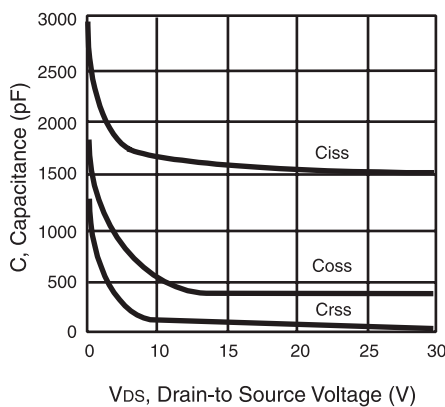


Figure 3. Capacitance

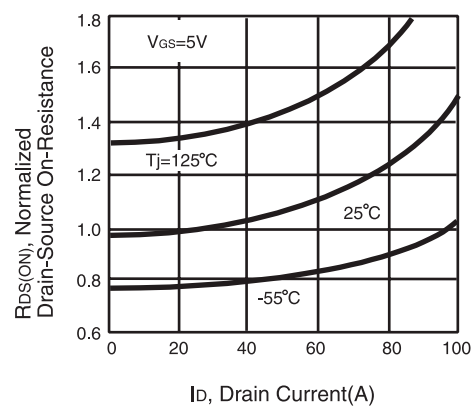


Figure 4. On-Resistance Variation with Drain Current and Temperature

CEP6060L/CEB6060L

4

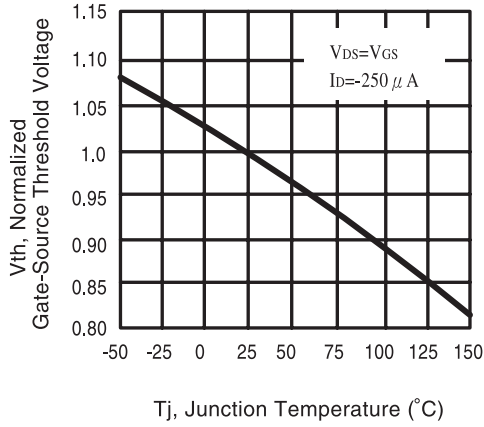


Figure 5. Gate Threshold Variation with Temperature

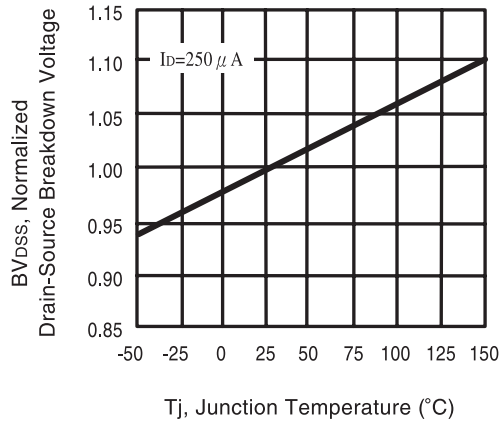


Figure 6. Breakdown Voltage Variation with Temperature

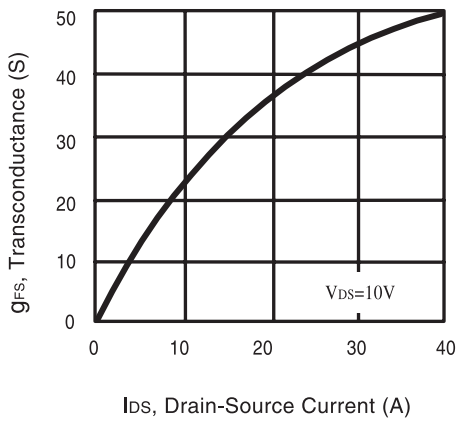


Figure 7. Transconductance Variation with Drain Current

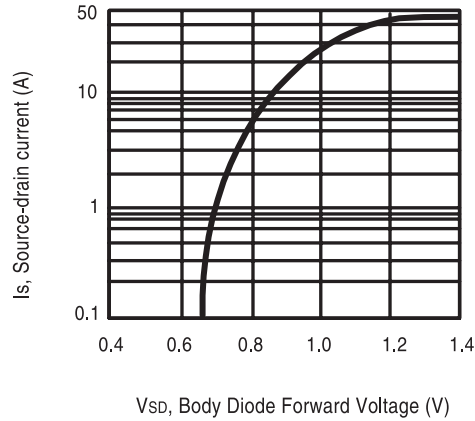


Figure 8. Body Diode Forward Voltage Variation with Source Current

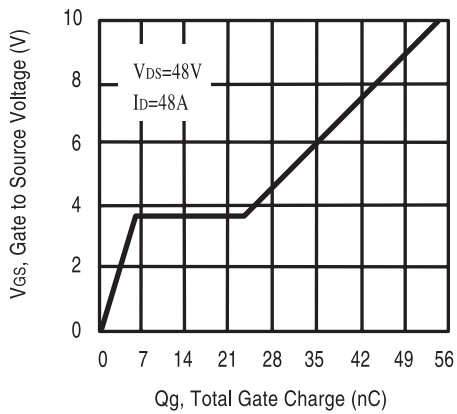


Figure 9. Gate Charge

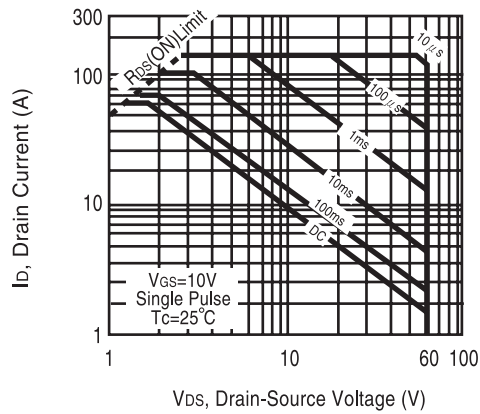


Figure 10. Maximum Safe Operating Area

CEP6060L/CEB6060L

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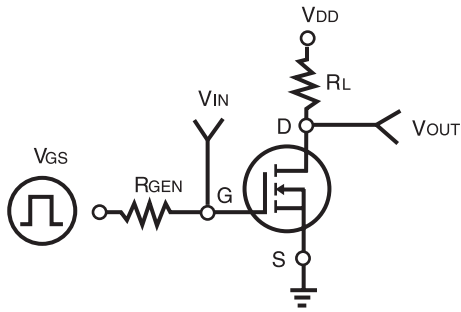


Figure 11. Switching Test Circuit

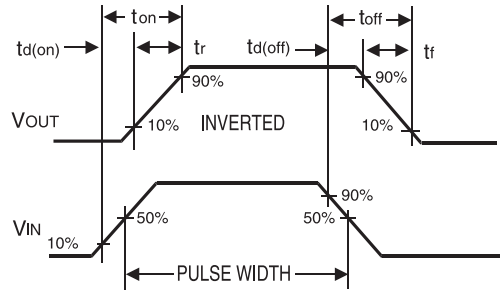


Figure 12. Switching Waveforms

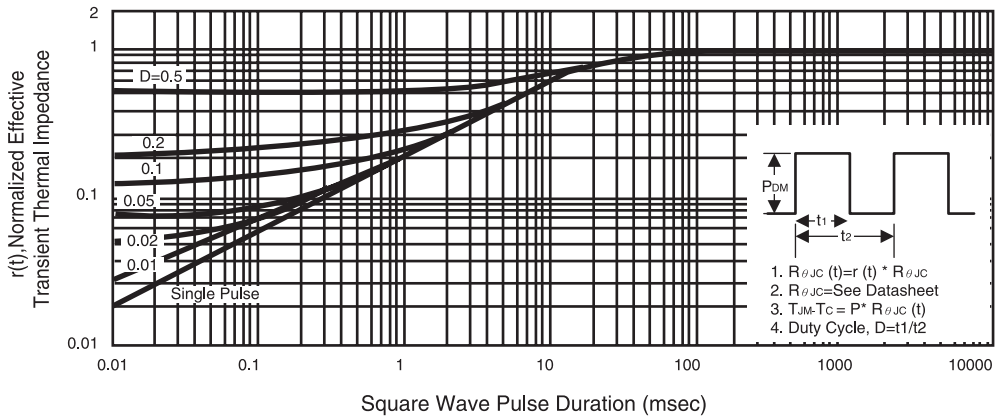


Figure 13. Normalized Thermal Transient Impedance Curve