



CEP04N6/CEB04N6

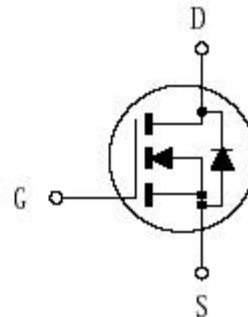
PRELIMINARY

N-Channel Logic Level Enhancement Mode Field Effect Transistor

4

FEATURES

- ◆ 600V, 4A, $R_{DS(on)} = 2.5\Omega$ @ $V_{GS} = 10V$.
- ◆ 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}	600	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous @ $T_J = 125^\circ\text{C}$ - Pulsed	I_D	4	A
	I_{DM}	16	A
Drain-Source Diode Forward Current	I_S	4	A
Maximum Power Dissipation @ $T_c = 25^\circ\text{C}$ Derate above 25°C	P_D	100	W
		0.8	W/ $^\circ\text{C}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case ¹	$R_{\theta JC}$	1.2	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient ²	$R_{\theta JA}$	62	$^\circ\text{C/W}$

CEP04N6/CEB04N6

4

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE AVALANCHE RATING^a						
Single Pulse Drain-Source Avalanche Energy	E _{AS}	V _{DS} = 50V, L = 27nH R _θ = 9.1 Ω		220		nJ
Maximum Drain-Source Avalanche Current	I _{AS}			4		A
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	600			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 600V, V _{GS} = 0V			25	μA
Gate-Body Leakage	I _{GSS}	V _{DS} = ±20V, V _{GS} = 0V			±100	nA
ON CHARACTERISTICS^a						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2		4	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{DS} = 10V, I _D = 2A		2.0	2.5	Ω
On-State Drain Current	I _{D(on)}	V _{DS} = 10V, V _{GS} = 10V	4			A
Forward Transconductance	g _{FS}	V _{DS} = 40V, I _D = 2A		4.5		S
SWITCHING CHARACTERISTICS^b						
Turn-On Delay Time	t _{D(on)}	V _{DS} = 300V, I _D = 4A, V _{GS} = 10V R _{θDS} = 25Ω		25	50	ns
Rise Time	t _r			65	120	ns
Turn-Off Delay Time	t _{D(off)}			75	150	ns
Fall Time	t _f			65	120	ns
Total Gate Charge	Q _g	V _{DS} = 480V, I _D = 4A, V _{GS} = 10V		22	28	nC
Gate-Source Charge	Q _{gs}			4.0		nC
Gate-Drain Charge	Q _{gd}			9.5		nC

CEP04N6/CEB04N6

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

4

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DYNAMIC CHARACTERISTICS^b						
Input Capacitance	C_{iss}	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$		730		pF
Output Capacitance	C_{oss}			85		pF
Reverse Transfer Capacitance	C_{rss}			20		pF
DRAIN-SOURCE DIODE CHARACTERISTICS^a						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{V}, I_S = 4\text{A}$			1.5	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.

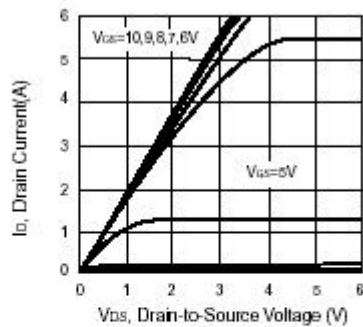


Figure 1. Output Characteristics

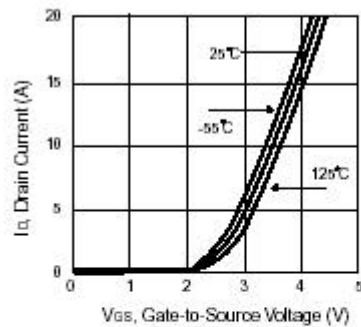


Figure 2. Transfer Characteristics

CEP04N6/CEB04N6

4

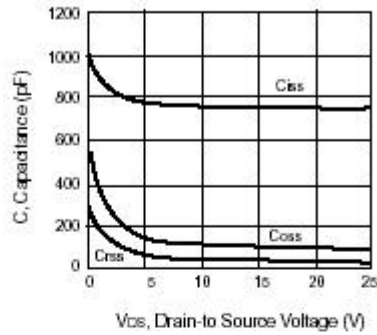


Figure 3. Capacitance

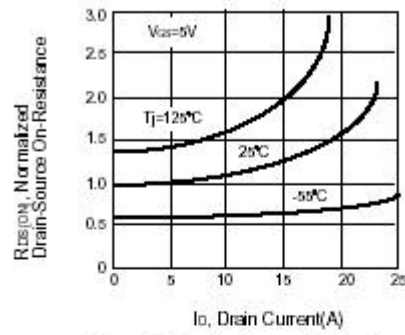


Figure 4. On-Resistance Variation with Drain Current and Temperature

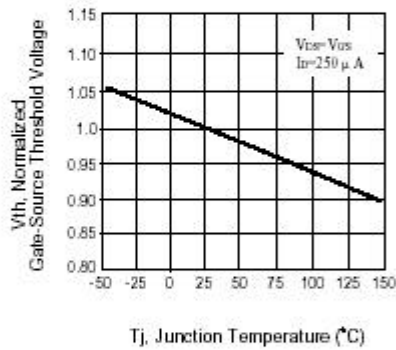


Figure 5. Gate Threshold Variation with Temperature

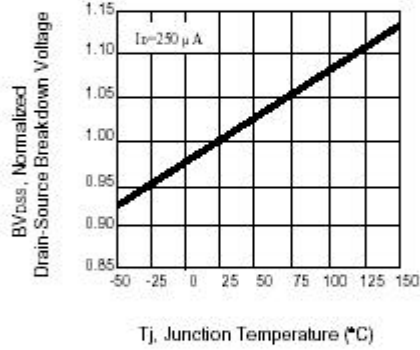


Figure 6. Breakdown Voltage Variation with Temperature

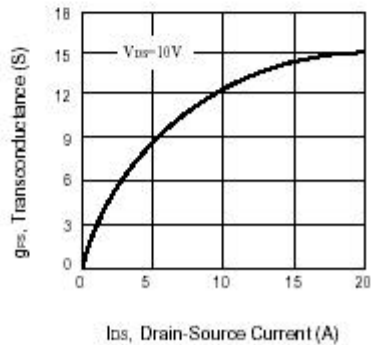


Figure 7. Transconductance Variation with Drain Current

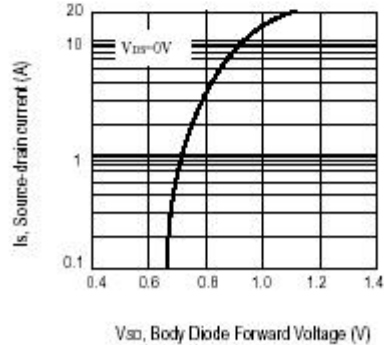


Figure 8. Body Diode Forward Voltage Variation with Source Current