

CEP10N6/CEB10N6



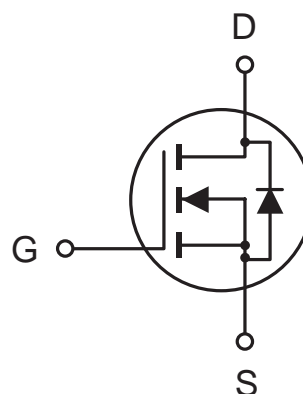
PRELIMINARY

4

N-Channel Logic Level Enhancement Mode Field Effect Transistor

FEATURES

- 600V , 10A , $R_{DS(ON)}=1\Omega$ @ $V_{GS}=10V$.
- 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}	±30	V
Drain Current-Continuous -Pulsed	I _D	10	A
	I _{DM}	30	A
Drain-Source Diode Forward Current	I _S	10	A
Maximum Power Dissipation @Tc=25°C Derate above 25°C	P _D	156	W
		1.25	W/°C
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	R _{θJC}	0.8	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	°C/W

CEP10N6/CEB10N6

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

4

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE AVALANCHE RATING^a						
Single Pulse Drain-Source Avalanche Energy	E _{AS}	V _{DD} =50V, L=11.8mH R _G =25Ω		500		mJ
Maximum Drain-Source Avalanche Current	I _{AS}			10		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			100	μA
Gate-Body Leakage	I _{GSS}	V _{GS} = ±30V, V _{DS} = 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 _{GS} =10V, I _D = 5A		0.75	1.0	Ω
On-State Drain Current	I _{D(ON)}	V _{GS} = 10V, V _{DS} = 10V	10			A
Forward Transconductance	g _{FS}	V _{DS} = 40V, I _D = 5A		9		S
SWITCHING CHARACTERISTICS^b						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =300V, I _D = 10A, V _{GS} = 10V R _{GEN} =25Ω		35	70	ns
Rise Time	t _r			90	170	ns
Turn-Off Delay Time	t _{D(OFF)}			170	255	ns
Fall Time	t _f			120	180	ns
Total Gate Charge	Q _g	V _{DS} =480V, I _D = 10A, V _{GS} =10V		55	70	nC
Gate-Source Charge	Q _{gs}			9		nC
Gate-Drain Charge	Q _{gd}			22		nC

CEP10N6/CEB10N6

4

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DYNAMIC CHARACTERISTICS^b						
Input Capacitance	C_{iss}	$V_{DS}=25\text{V}, V_{GS}=0\text{V}$ $f=1.0\text{MHz}$		1500		pF
Output Capacitance	C_{oss}			125		pF
Reverse Transfer Capacitance	C_{rss}			50		pF
DRAIN-SOURCE DIODE CHARACTERISTICS^a						
Diode Forward Voltage	V_{SD}	$V_{GS}=0\text{V}, I_S=10\text{A}$			1.6	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.

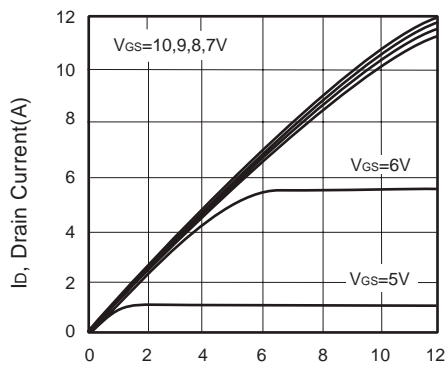


Figure 1. Output Characteristics

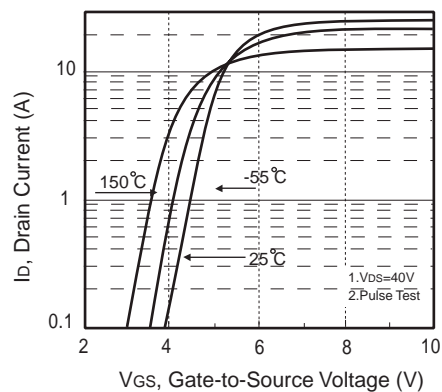


Figure 2. Transfer Characteristics

CEP10N6/CEB10N6

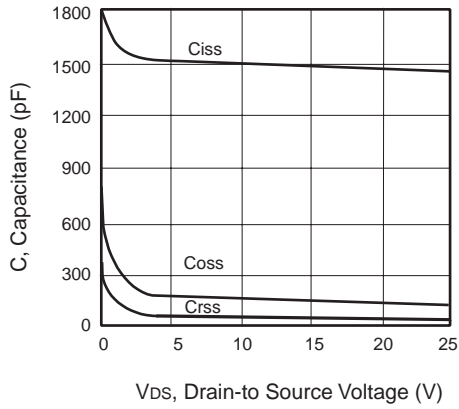


Figure 3. Capacitance

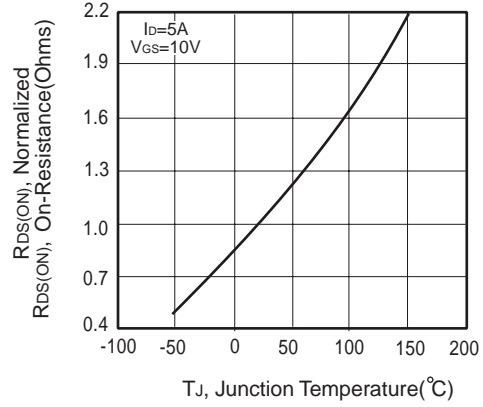


Figure 4. On-Resistance Variation with Temperature

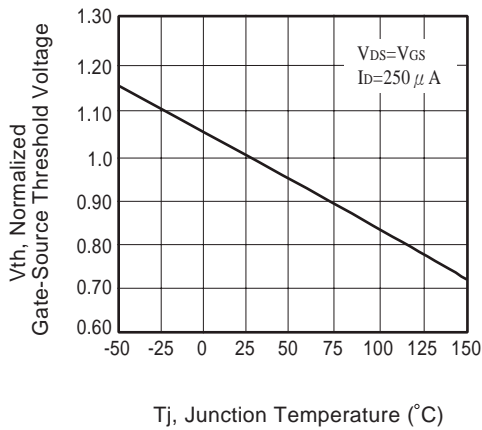


Figure 5. Gate Threshold Variation with Temperature

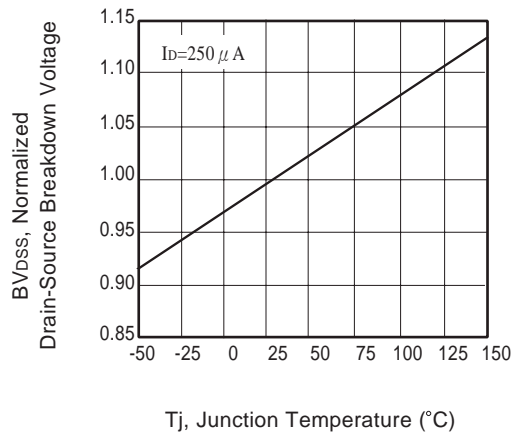


Figure 6. Breakdown Voltage Variation with Temperature

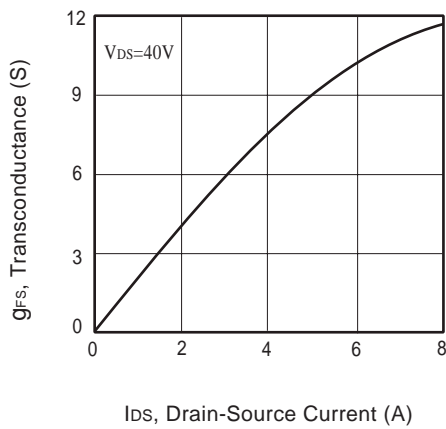


Figure 7. Transconductance Variation with Drain Current

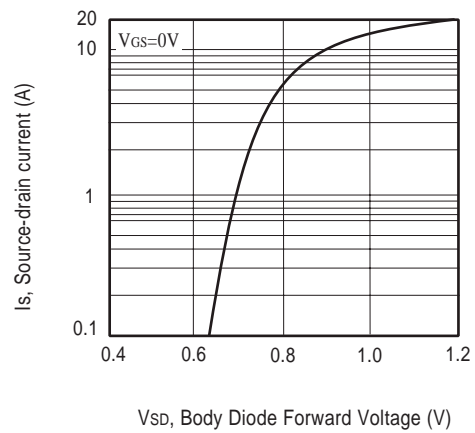


Figure 8. Body Diode Forward Voltage Variation with Source Current

CEP10N6/CEB10N6

4

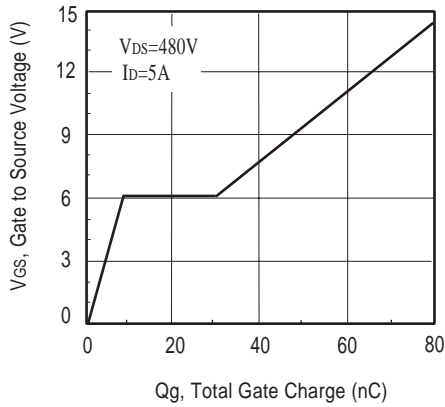


Figure 9. Gate Charge

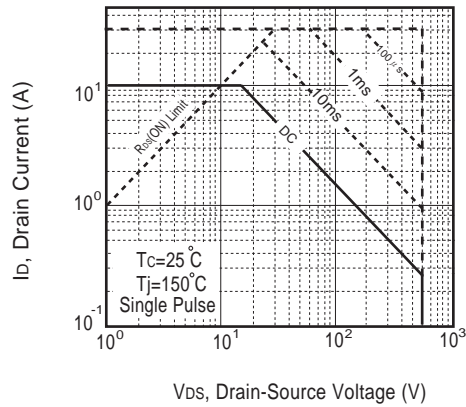


Figure 10. Maximum Safe Operating Area

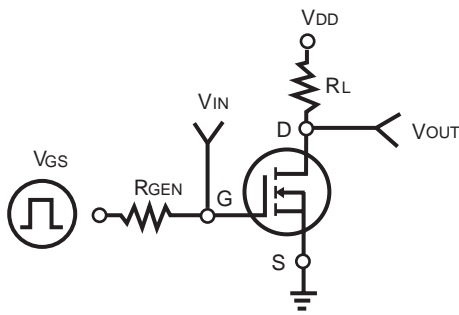


Figure 11. Switching Test Circuit

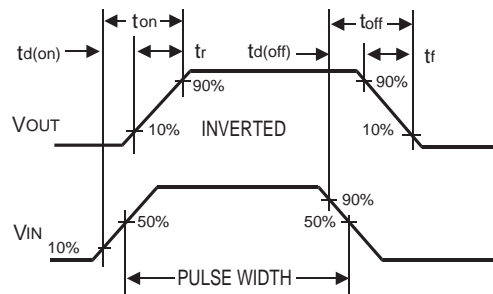


Figure 12. Switching Waveforms

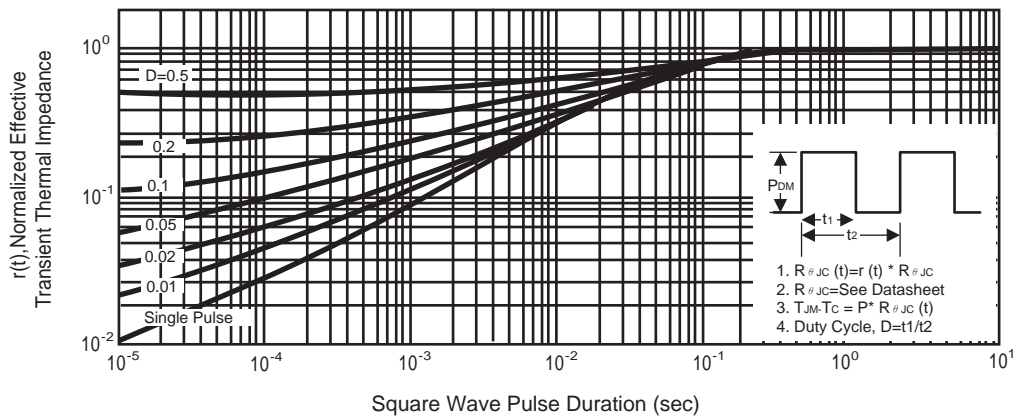


Figure 13. Normalized Thermal Transient Impedance Curve