# CEP05P03

CBT

PRELIMINARY

4

Single P-Channel Enhancement Mode MOSFET

FEATURES

- -30V , -4.9A , $R_{DS(ON)}$=70mΩ @V_{GS}=-10V

  $R_{DS(ON)}$=120mΩ @V_{GS}=-4.5V

- Super high dense cell design for extremely low $R_{DS(ON)}$.

- High power and current handling capability.

- TO-220 package for through hole.

CEP SERIES
TO-220

D

G

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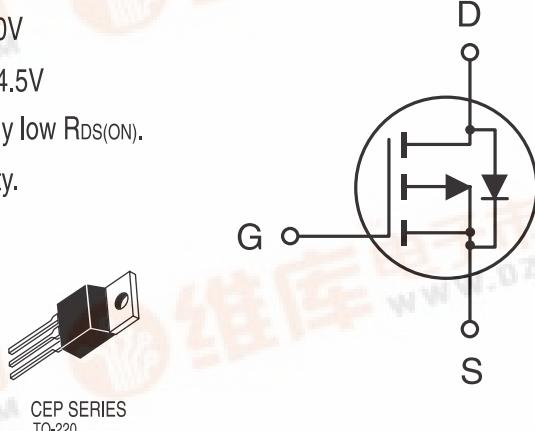
ABSOLUTE MAXIMUM RATINGS (Tc=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Gurrent-Continuous @T_J=125°C	I_D	±4.9	A
-Pulsed	I_{DM}	±30	A
Drain-Source Diode Forward Current	I_S	-1.7	A
Maximum Power Dissipation	P_D	50	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ$C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^\circ$C/W

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=-250µA	-30	-35		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V			-1	µA
Gate-Body Leakage	I_{GSS}	V_{GS}=20V, V_{DS}=0V			100	nA
ON CHARACTERISTICS[a]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D= -250µA	-1	-1.6	-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4.9A		50	70	mΩ
		V_{GS}=-4.5V, I_D=-2.0A		100	120	mΩ
On-State Drain Current	$I_{D(ON)}$	V_{DS}=-5V, V_{GS}=-10V	-20			A
Forward Transconductance	g_{FS}	V_{DS}=-15V, I_D=-4.9A	5			S
DYNAMIC CHARACTERISTICS[b]						
Input Capacitance	C_{ISS}	V_{DS} = -15V, V_{GS} = 0V f =1.0MHz		840	1200	pF
Output Capacitance	C_{OSS}			420	600	pF
Reverse Transfer Capacitance	C_{RSS}			140	200	pF
SWITCHING CHARACTERISTICS[b]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} = -15V, I_D = -1A, V_{GEN} = -10V, R_{GEN} =6Ω R_L= 15Ω		8	15	ns
Rise Time	t_r			11	20	ns
Turn-Off Delay Time	$t_{D(OFF)}$			23	40	ns
Fall time	t_f			14	25	ns
Total Gate Charge	Q_g	V_{DS} = -15V, I_D = -4.9A, V_{GS} = -10V		16	25	nC
Gate-Source Charge	Q_{gs}			5		nC
Gate-Drain Charge	Q_{gd}			2		nC

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [a]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is = -1.7A		-0.79	-1.2	V

Notes

a.Pulse Test:Pulse Width ≤300 μ s, Duty Cycle ≤ 2%.
b.Guaranteed by design, not subject to production testing.
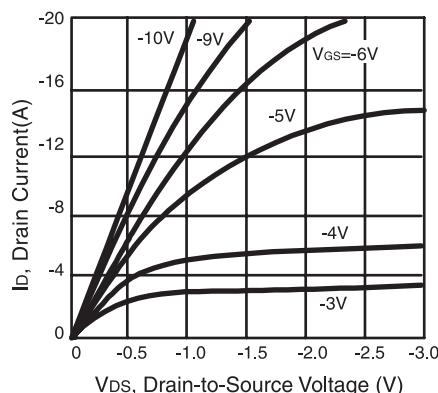

Figure 1. Output Characteristics
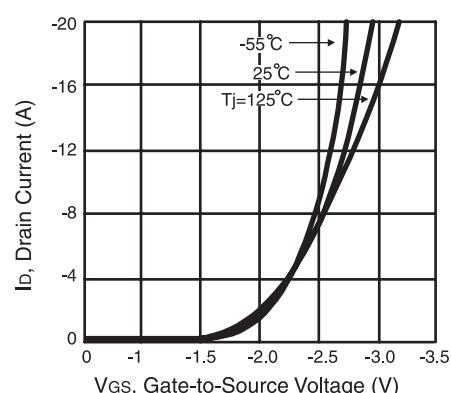
Figure 2. Transfer Characteristics
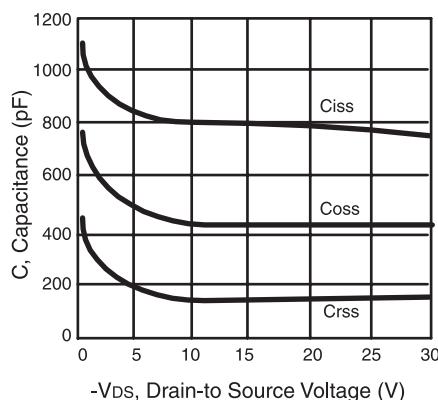
Figure 3. Capacitance
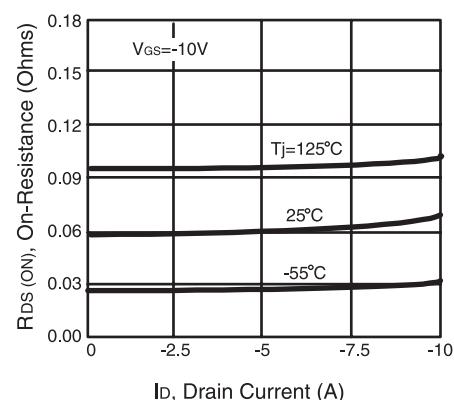
Figure 4. On-Resistance Variation with Drain Current and Temperature
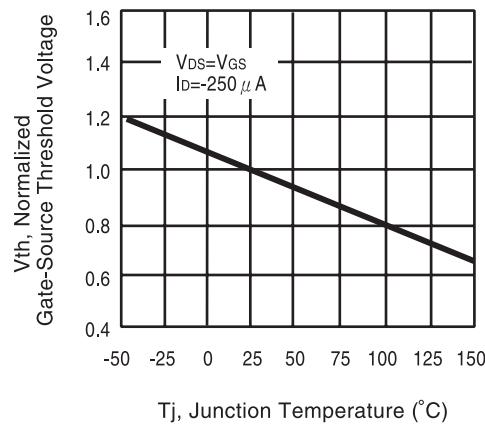
Figure 5. Gate Threshold Variation
with Temperature
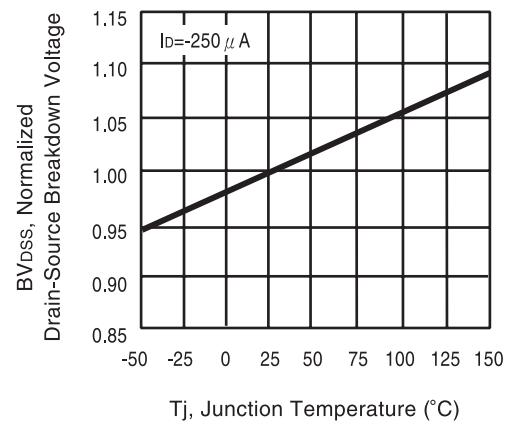
Figure 6. Breakdown Voltage Variation
with Temperature
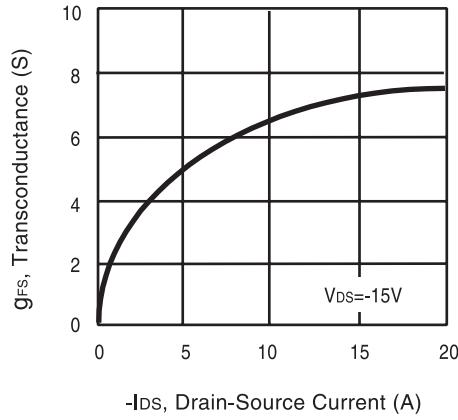
Figure 7. Transconductance Variation
with Drain Current
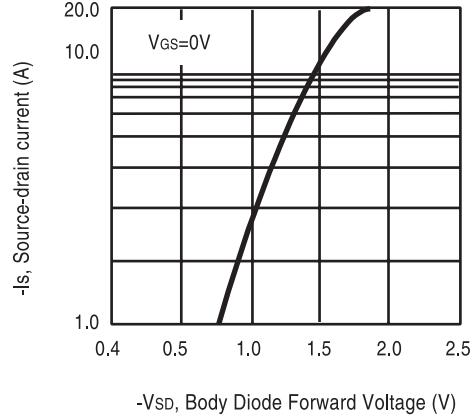
Figure 8. Body Diode Forward Voltage
Variation with Source Current
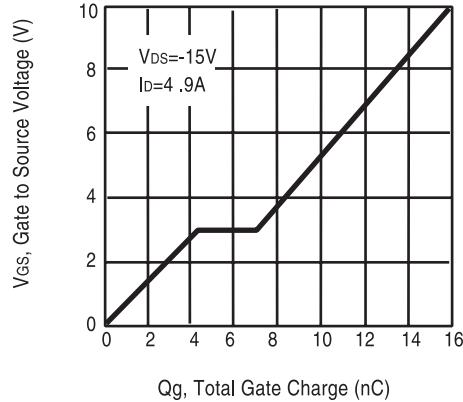
Figure 9. Gate Charge
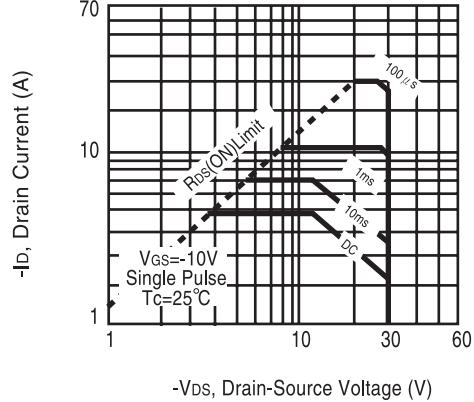
Figure 10. Maximum Safe
Operating Area

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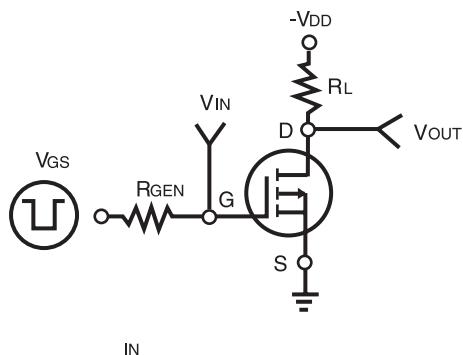
Figure 11. Switching Test Circuit
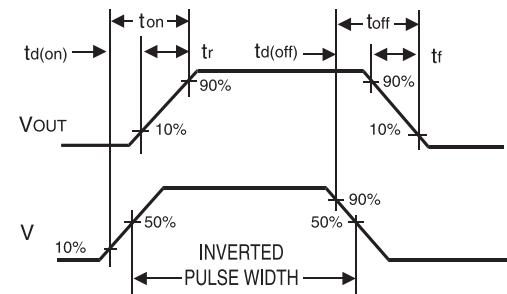
Figure 12. Switching Waveforms
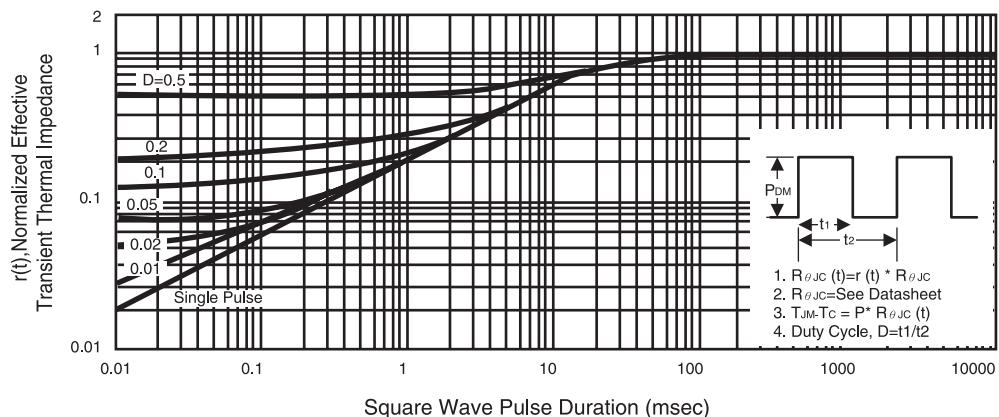
Figure 13. Normalized Thermal Transient Impedance Curve