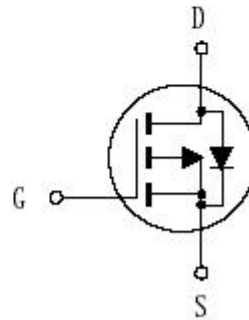


## Single P-Channel Enhancement Mode MOSFET

### FEATURES

- ◆  $-30V$  ,  $-4.9A$  ,  $R_{DS(ON)}=70m\Omega$  @ $V_{GS}=-10V$   
 $R_{DS(ON)}=120m\Omega$  @ $V_{GS}=-4.5V$
- ◆ Super high dense cell design for extremely low  $R_{DS(ON)}$ .
- ◆ High power and current handling capability.
- ◆ TO-220 package for through hole.



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous @ $T_J=125^\circ C$ -Pulsed	$I_D$	$\pm 4.9$	A
	$I_{DM}$	$\pm 30$	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	$^\circ C/W$
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# CEP05P03/CEB05P03

ELECTRICAL CHARACTERISTICS (T<sub>C</sub>=25°C unless otherwise noted)

4

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS} = -30V, V_{DS} = 0V$			-1	$\mu A$
Gate-Body Leakage	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
<b>ON CHARACTERISTICS<sup>a</sup></b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.5	-3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -4.9A$		42	70	$m\Omega$
		$V_{GS} = -4.5V, I_D = -2.0A$		78	120	$m\Omega$
On-State Drain Current	$I_{D(on)}$	$V_{GS} = -5V, V_{DS} = -10V$	-20			A
Forward Transconductance	$g_{FS}$	$V_{GS} = -15V, I_D = -4.9A$	5			S
<b>DYNAMIC CHARACTERISTICS<sup>b</sup></b>						
Input Capacitance	$C_{ISS}$	$V_{DS} = -15V, V_{GS} = 0V$ $f = 1.0MHz$		1040		pF
Output Capacitance	$C_{OSS}$			420		pF
Reverse Transfer Capacitance	$C_{RSS}$			150		pF
<b>SWITCHING CHARACTERISTICS<sup>b</sup></b>						
Turn-On Delay Time	$t_{D(on)}$	$V_{DS} = -15V,$ $I_D = -1A,$ $V_{GEM} = -10V,$ $R_{GEM} = 6\Omega$		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	$Q_g$	$V_{GS} = -15V, I_D = -4.9A,$ $V_{DS} = -10V$		22.5	29	nC
Gate-Source Charge	$Q_{gs}$			2		nC
Gate-Drain Charge	$Q_{gd}$			6		nC

# CEP05P03/CEB05P03

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

4

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>DRAIN-SOURCE DIODE CHARACTERISTICS<sup>a</sup></b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0V, I_S = -1.7A$		-0.79	-1.2	V

### Notes

- a. Pulse Test: Pulse Width  $\leq 300 \mu s$ , Duty Cycle  $\leq 2\%$ .
- b. Guaranteed by design, not subject to production testing.

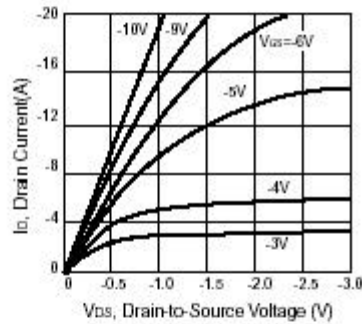


Figure 1. Output Characteristics

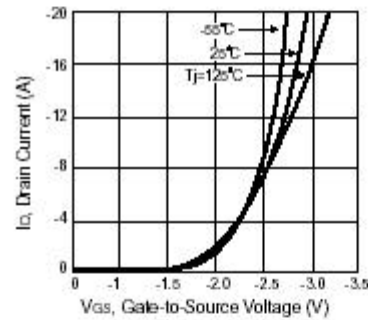


Figure 2. Transfer Characteristics

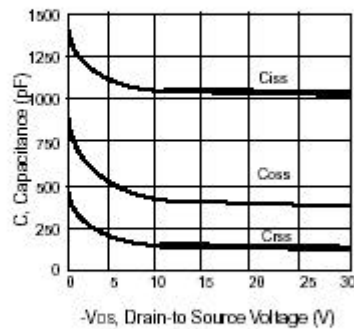


Figure 3. Capacitance

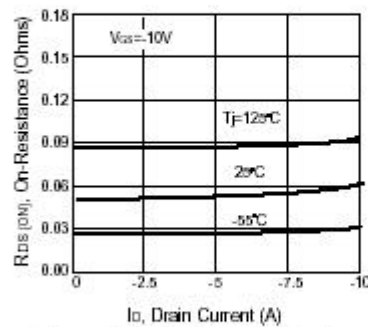
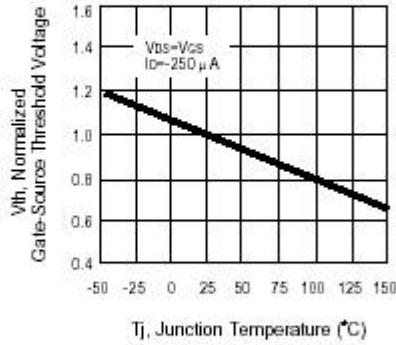


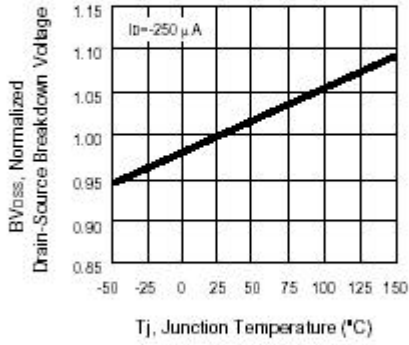
Figure 4. On-Resistance Variation with Drain Current and Temperature

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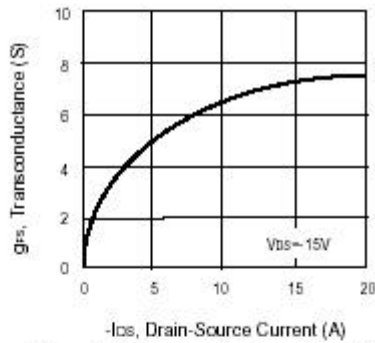
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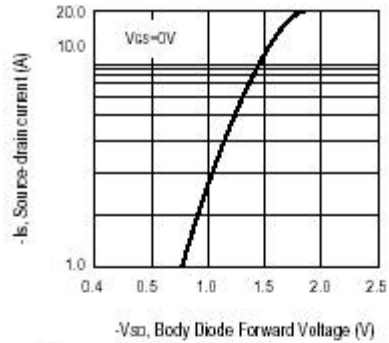
**Figure 5. Gate Threshold Variation with Temperature**



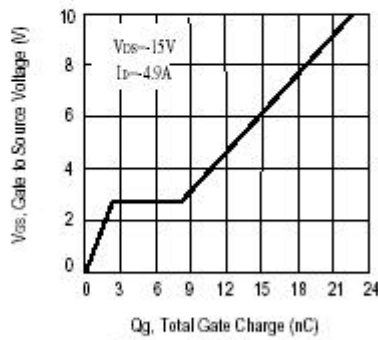
**Figure 6. Breakdown Voltage Variation with Temperature**



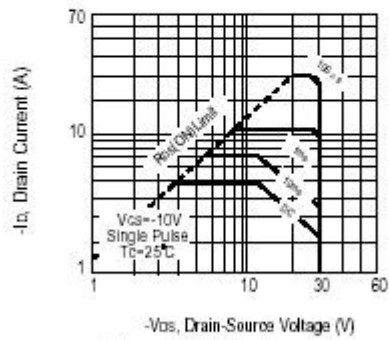
**Figure 7. Transconductance Variation with Drain Current**



**Figure 8. Body Diode Forward Voltage Variation with Source Current**



**Figure 9. Gate Charge**



**Figure 10. Maximum Safe Operating Area**

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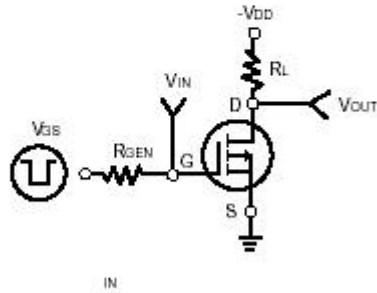


Figure 11. Switching Test Circuit

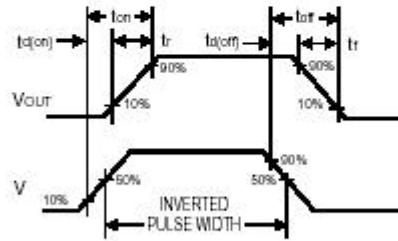


Figure 12. Switching Waveforms

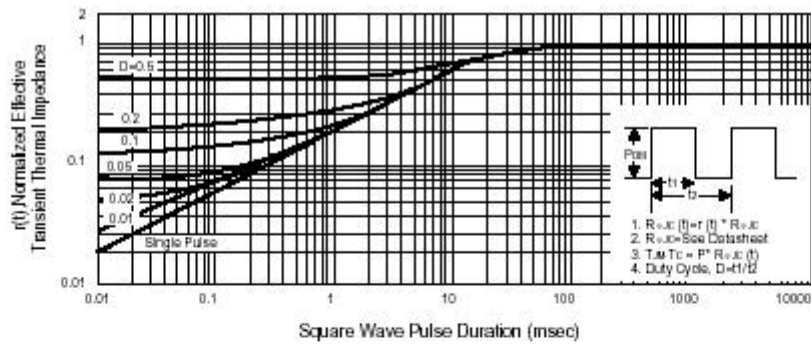


Figure 13. Normalized Thermal Transient Impedance Curve

