



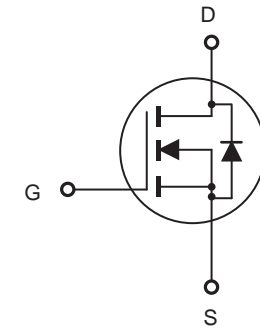
CEP20A03/CEB20A03

N-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

FEATURES

- 30V, 197A, $R_{DS(ON)} = 2\text{ m}\Omega$ @ $V_{GS} = 10\text{V}$.
 $R_{DS(ON)} = 3\text{ m}\Omega$ @ $V_{GS} = 4.5\text{V}$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- Lead-free plating ; RoHS compliant.
- TO-220 & TO-263 package.



ABSOLUTE MAXIMUM RATINGS $T_C = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous @ $T_C = 25^\circ\text{C}$ @ $T_C = 100^\circ\text{C}$	I_D	197	A
		124	A
Drain Current-Pulsed ^a	I_{DM}	788	A
Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$ - Derate above 25°C	P_D	139	W
		1.1	W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy ^d	E_{AS}	800	mJ
Single Pulsed Avalanche Current ^d	I_{AS}	40	A
Operating and Store Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.9	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$

This is preliminary information on a new product in development now .
 Details are subject to change without notice .

Rev 1. 2012.Jun
<http://www.cetsemi.com>



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Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$			1	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 20V, V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -20V, V_{DS} = 0V$			-100	nA
On Characteristics^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	1		3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 30A$		1.6	2	$m\Omega$
		$V_{GS} = 4.5V, I_D = 30A$		2	3	$m\Omega$
Gate input resistance	R_g	$f=1\text{MHz}, \text{open Drain}$		2		Ω
Dynamic Characteristics^c						
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1.0 \text{ MHz}$		7950		pF
Output Capacitance	C_{oss}			1055		pF
Reverse Transfer Capacitance	C_{rss}			740		pF
Switching Characteristics^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15V, I_D = 15A, V_{GS} = 4.5V, R_{GEN} = 1\Omega$		41	82	ns
Turn-On Rise Time	t_r			32	64	ns
Turn-Off Delay Time	$t_{d(off)}$			92	184	ns
Turn-Off Fall Time	t_f			30	60	ns
Total Gate Charge	Q_g	$V_{DS} = 15V, I_D = 50A, V_{GS} = 4.5V$		96	125	nC
Gate-Source Charge	Q_{gs}			24		nC
Gate-Drain Charge	Q_{gd}			39		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current	I_S				115	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = 30A$			1.2	V
Notes : a.Repetitive Rating : Pulse width limited by maximum junction temperature b.Pulse Test : Pulse Width < 300 μs , Duty Cycle < 2%. c.Guaranteed by design, not subject to production testing. d.L = 1mH, $I_S = 40A, V_{DD} = 24V, R_G = 25\Omega$, Starting $T_J = 25 \text{ C}$						



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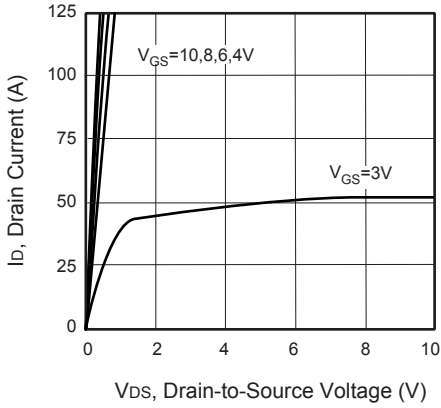


Figure 1. Output Characteristics

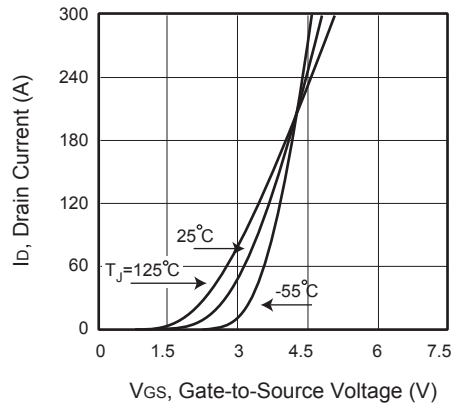


Figure 2. Transfer Characteristics

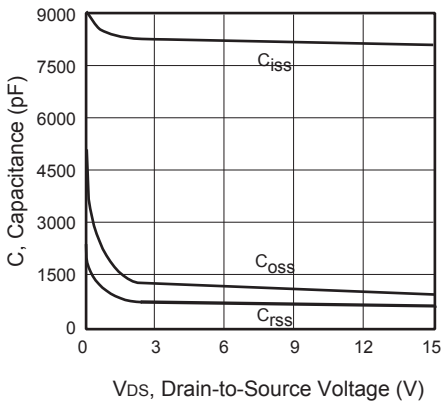


Figure 3. Capacitance

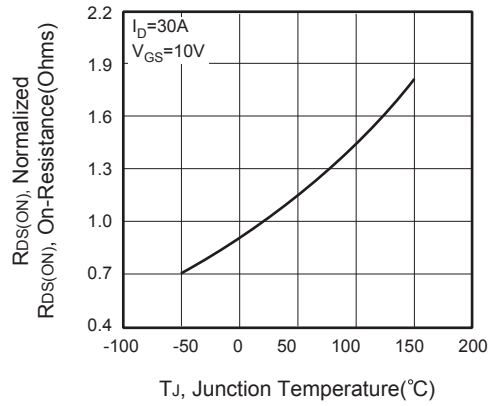


Figure 4. On-Resistance Variation with Temperature



Figure 5. Gate Threshold Variation with Temperature

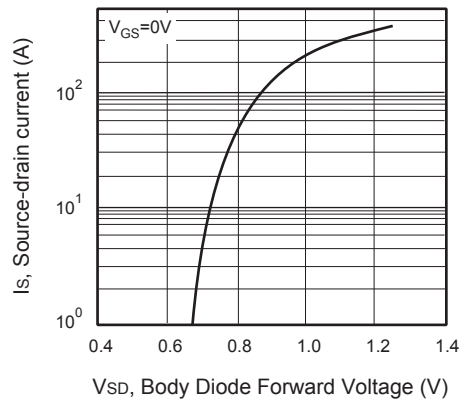


Figure 6. Body Diode Forward Voltage Variation with Source Current



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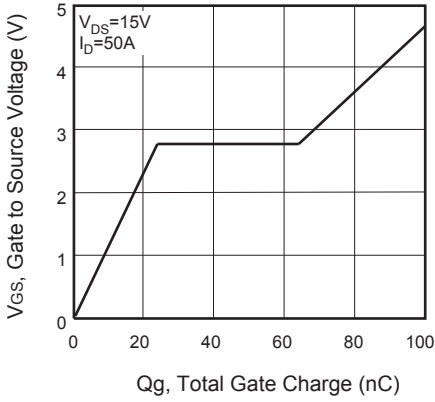


Figure 7. Gate Charge

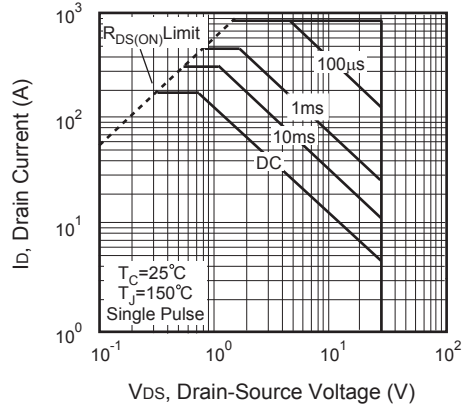


Figure 8. Maximum Safe Operating Area

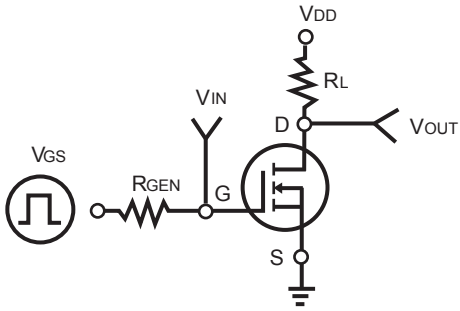


Figure 9. Switching Test Circuit



Figure 10. Switching Waveforms

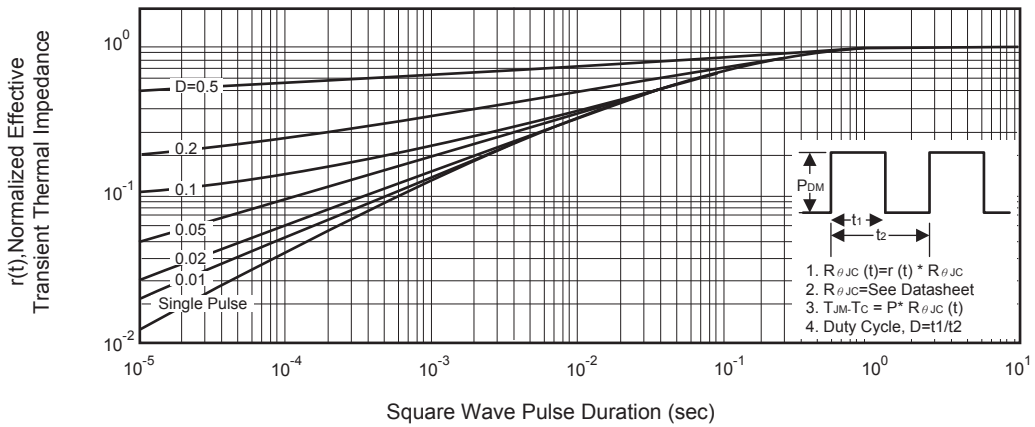


Figure 11. Normalized Thermal Transient Impedance Curve