



CEP02N9/CEB02N9 CEF02N9

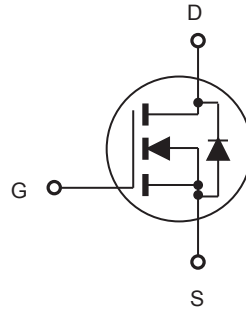
N-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

FEATURES

Type	V _{DSS}	R _{DS(ON)}	I _D	@V _{GS}
CEP02N9	900V	6.8Ω	2.6A	10V
CEB02N9	900V	6.8Ω	2.6A	10V
CEF02N9	900V	6.8Ω	2.6A ^d	10V

- Super high dense cell design for extremely low R_{DS(ON)}.
- High power and current handling capability.
- Lead free product is acquired.



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

Parameter	Symbol	Limit		Units
		TO-220/263	TO-220F	
Drain-Source Voltage	V _{DS}	900		V
Gate-Source Voltage	V _{GS}	±30		V
Drain Current-Continuous @ T _C = 25 °C □ @ T _C = 100 °C	I _D	2.6	2.6 ^d	A
		1.9	1.9 ^d	A
Drain Current-Pulsed ^a	I _{DM} ^e	10.4	10.4 ^d	A
Maximum Power Dissipation @ T _C = 25 °C - Derate above 25 °C	P _D	125	47	W
		0.83	0.3	W/°C
Operating and Store Temperature Range	T _J , T _{stg}	-55 to 175		°C

Thermal Characteristics

Parameter	Symbol	Limit		Units
Thermal Resistance, Junction-to-Case	R _{θJC}	1.2	3.2	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	62.5	°C/W

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

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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}	$V_{GS} = 0V, I_D = 250\mu A$	900			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 900V, V_{GS} = 0V$			25	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 30V, V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -30V, V_{DS} = 0V$			-100	nA
On Characteristics^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	2		4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 1.3A$		5.3	6.8	Ω
Dynamic Characteristics^c						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1.0\text{ MHz}$		690		pF
Output Capacitance	C_{oss}			70		pF
Reverse Transfer Capacitance	C_{rss}			15		pF
Switching Characteristics^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 450V, I_D = 2.2A, V_{GS} = 10V, R_{GEN} = 25\Omega$		20	40	ns
Turn-On Rise Time	t_r			34	68	ns
Turn-Off Delay Time	$t_{d(off)}$			44	88	ns
Turn-Off Fall Time	t_f			28	56	ns
Total Gate Charge	Q_g	$V_{DS} = 720V, I_D = 2.2A, V_{GS} = 10V$		16	20	nC
Gate-Source Charge	Q_{gs}			3		nC
Gate-Drain Charge	Q_{gd}			7		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current	I_S				2	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = 2A$			1.2	V
Notes : □ a. Repetitive Rating : Pulse width limited by maximum junction temperature . b. Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$. □ c. Guaranteed by design, not subject to production testing. □ d. Limited only by maximum temperature allowed . e. Pulse width limited by safe operating area .						



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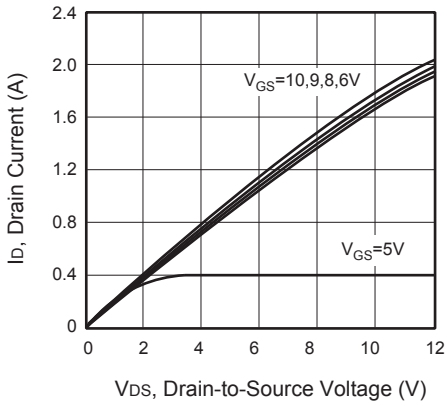


Figure 1. Output Characteristics

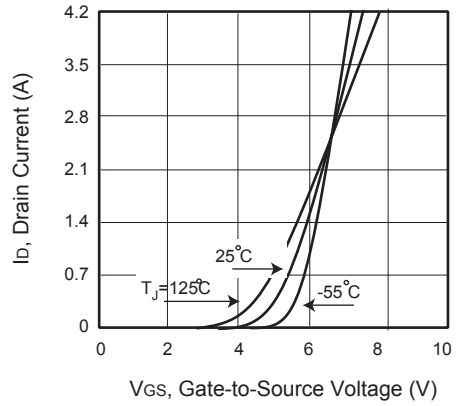


Figure 2. Transfer Characteristics

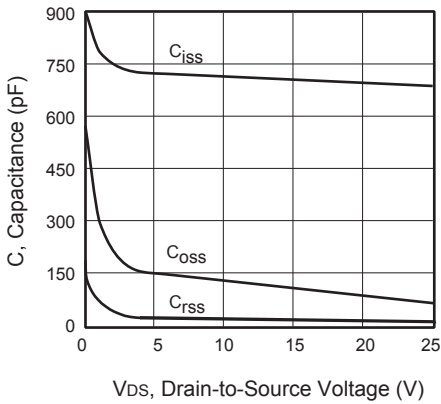


Figure 3. Capacitance

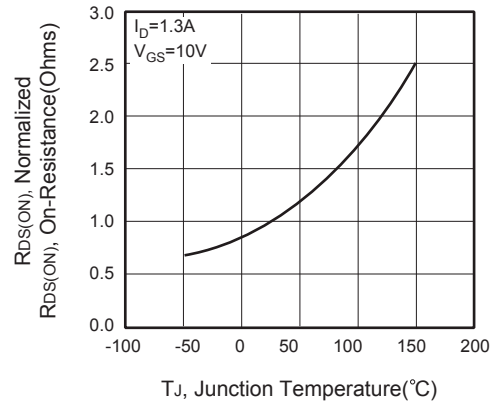


Figure 4. On-Resistance Variation with Temperature



Figure 5. Gate Threshold Variation with Temperature

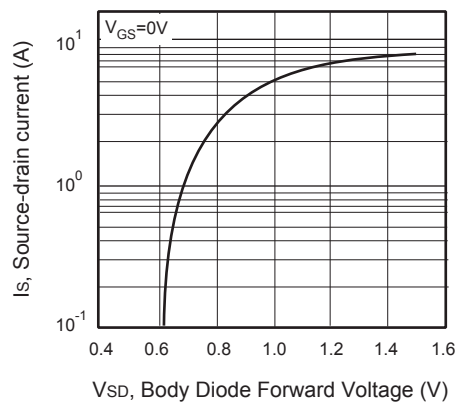


Figure 6. Body Diode Forward Voltage Variation with Source Current



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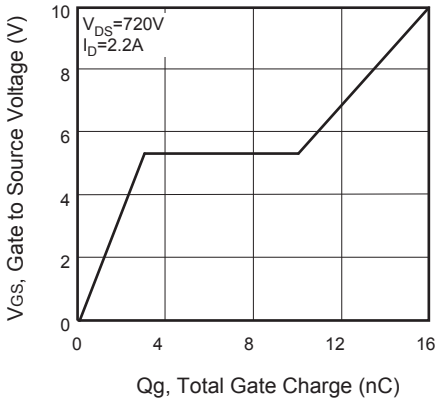


Figure 7. Gate Charge

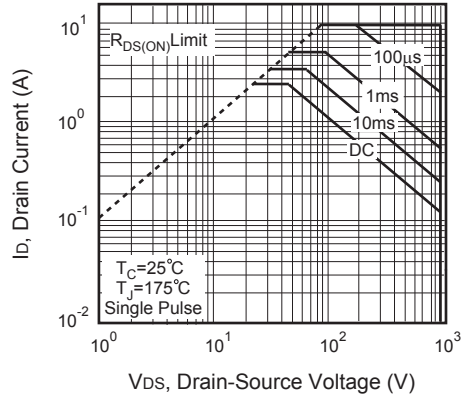


Figure 8. Maximum Safe Operating Area



Figure 9. Switching Test Circuit



Figure 10. Switching Waveforms

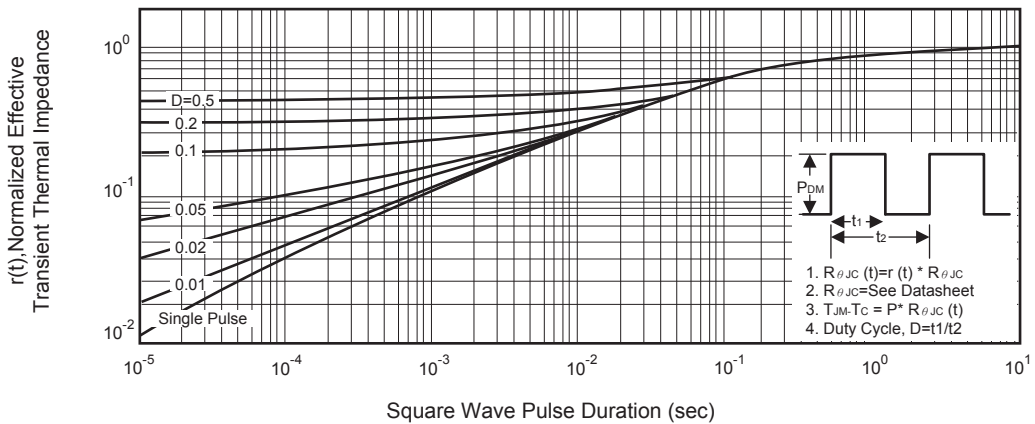


Figure 11. Normalized Thermal Transient Impedance Curve