



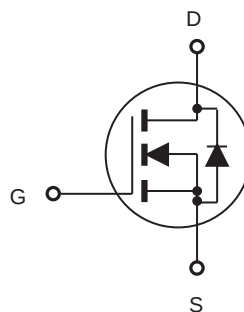
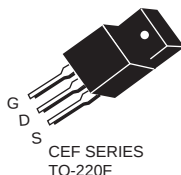
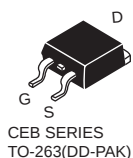
CEP09N7A/CEB09N7A CEF09N7A

N-Channel Enhancement Mode Field Effect Transistor

FEATURES

Type	V _{DSS}	R _{DS(ON)}	I _D	@V _{GS}
CEP09N7A	700V	1.2Ω	8A	10V
CEB09N7A	700V	1.2Ω	8A	10V
CEF09N7A	700V	1.2Ω	8A ^e	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}	700		V
Gate-Source Voltage	V _{GS}	±30		V
Drain Current-Continuous	I _D	8	8 ^e	A
Drain Current-Pulsed ^a	I _{DM} ^f	30	30 ^e	A
Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$ - Derate above 25°C	P _D	167	50	W
		1.33	0.4	W/°C
Operating and Store Temperature Range	T _J , T _{stg}	-55 to 150		°C

Thermal Characteristics

Parameter	Symbol	Limit		Units
Thermal Resistance, Junction-to-Case	R _{θJC}	0.75	2.5	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	65	°C/W



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CEF09N7A

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

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Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	700			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 700V, V_{GS} = 0V$			50	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	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 5A$			1.2	Ω
On-Resistance						
Dynamic Characteristics ^c						
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 8A$		8		S
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1.0\text{ MHz}$		1800		pF
Output Capacitance	C_{oss}			160		pF
Reverse Transfer Capacitance	C_{rss}			17		pF
Switching Characteristics ^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 300V, I_D = 8A,$ $V_{GS} = 10V, R_{GEN} = 10\Omega$		20	40	ns
Turn-On Rise Time	t_r			7	14	ns
Turn-Off Delay Time	$t_{d(off)}$			38	76	ns
Turn-Off Fall Time	t_f	$V_{DS} = 480V, I_D = 8A,$ $V_{GS} = 10V$		7	14	ns
Total Gate Charge	Q_g			32	42.5	nC
Gate-Source Charge	Q_{gs}			10		nC
Gate-Drain Charge	Q_{gd}			9		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current	I_S ^g				8	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = 8A$			1.6	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.						
e.Limited only by maximum temperature allowed .						
f.Pulse width limited by safe operating area .						
g.Full package $I_{S(max)} = 4.3A$.						



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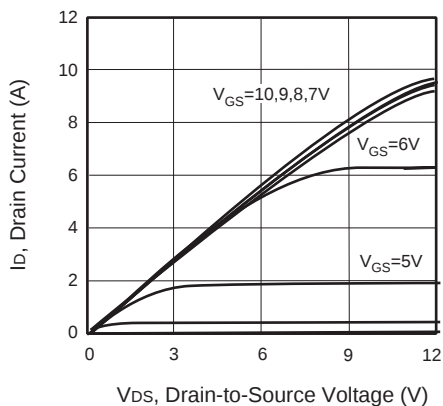


Figure 1. Output Characteristics

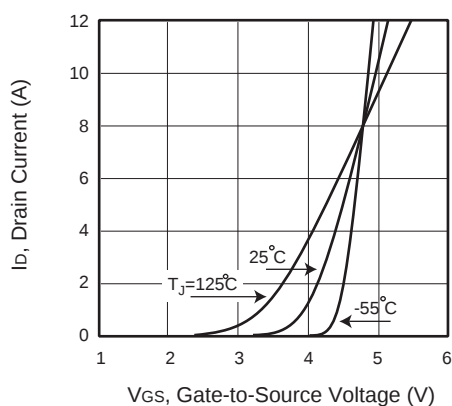


Figure 2. Transfer Characteristics

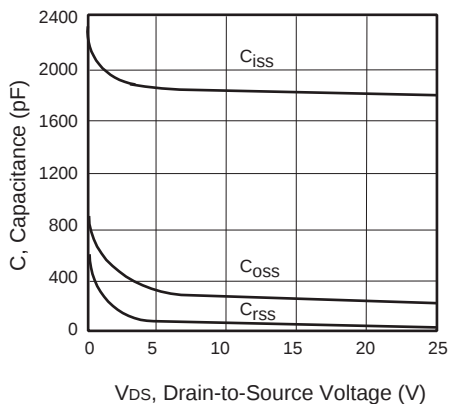


Figure 3. Capacitance

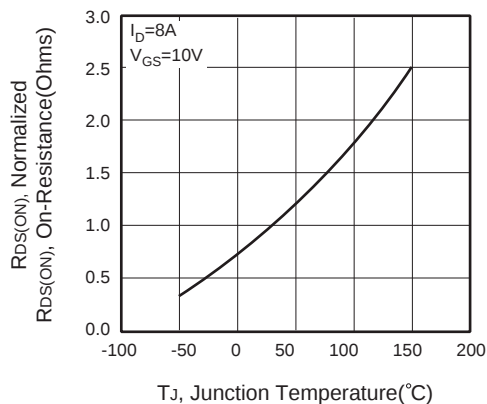


Figure 4. On-Resistance Variation with Temperature

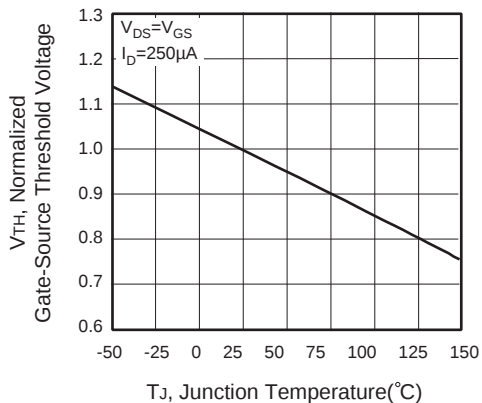


Figure 5. Gate Threshold Variation with Temperature

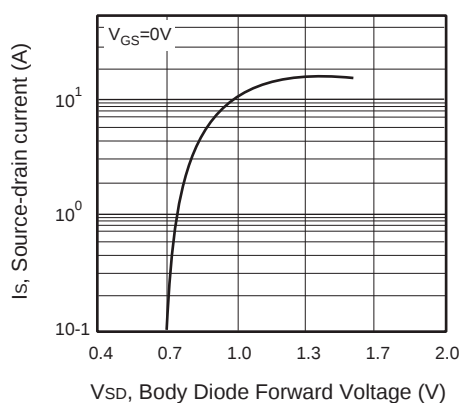


Figure 6. Body Diode Forward Voltage Variation with Source Current



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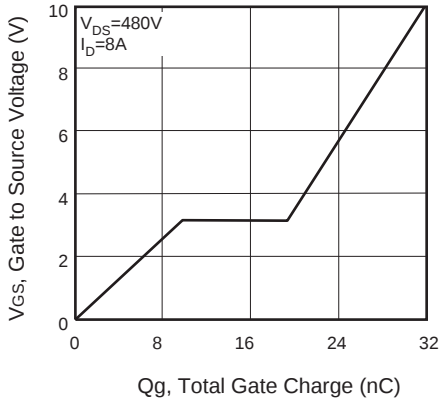


Figure 7. Gate Charge

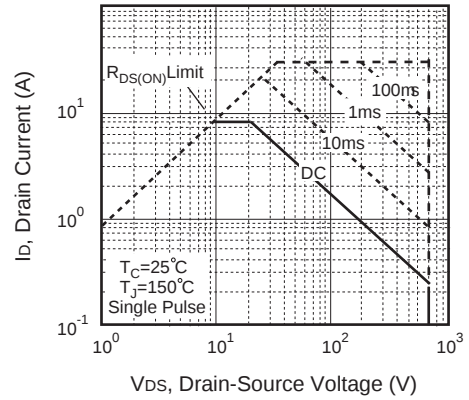


Figure 8. Maximum Safe Operating Area

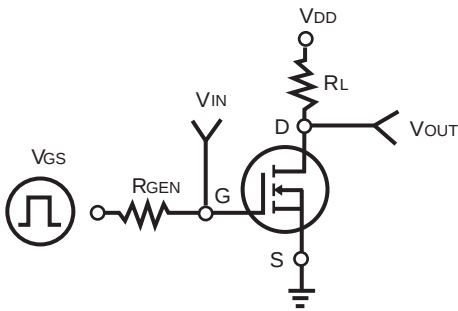


Figure 9. Switching Test Circuit

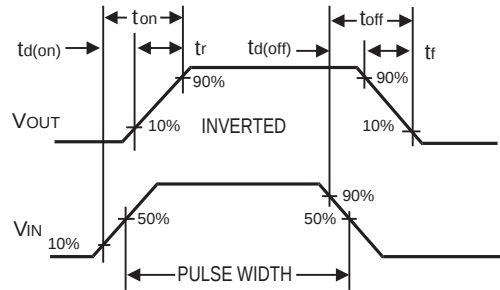


Figure 10. Switching Waveforms

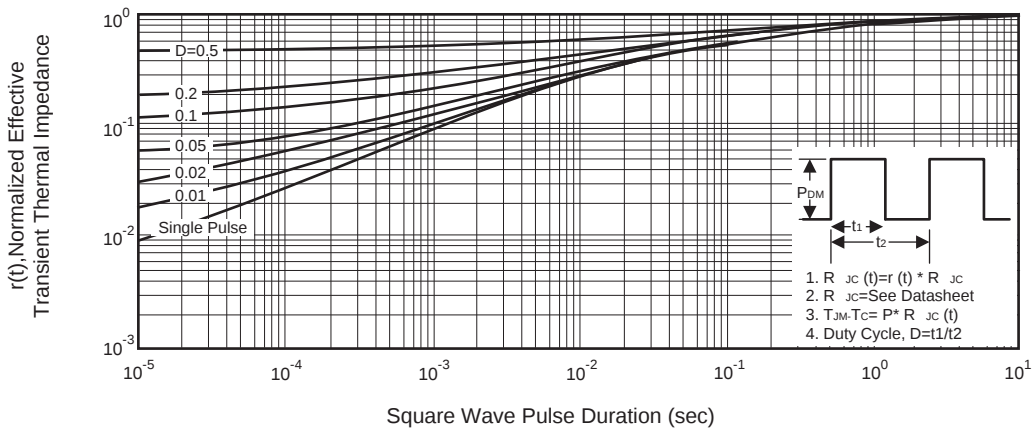


Figure 11. Normalized Thermal Transient Impedance Curve