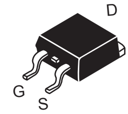
CEP02N65A/CEB02N65A
CEF02N65A

N-Channel Enhancement Mode Field Effect Transistor

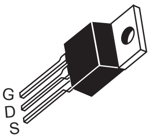
FEATURES

Type	V_{DSS}	$R_{DS(ON)}$	I_D	@V_{GS}
CEP02N65A	650V	10.5Ω	1.3A	10V
CEB02N65A	650V	10.5Ω	1.3A	10V
CEF02N65A	650V	10.5Ω	1.3A [d]	10V

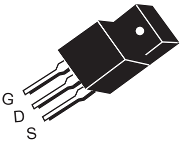
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handing capability.
- RoHS compliant.



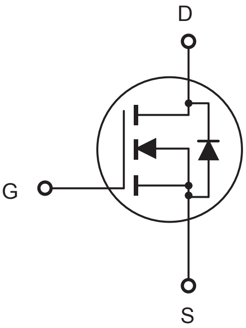
CEB SERIES
TO-263(DD-PAK)



CEP SERIES
TO-220



CEF SERIES
TO-220F



ABSOLUTE MAXIMUM RATINGS

T_C = 25°C unless otherwise noted

Parameter	Symbol	Limit		Units
		TO-220/263	TO-220F	
Drain-Source Voltage	V_{DS}	650		V
Gate-Source Voltage	V_{GS}	±30		V
Drain Current-Continuous @ T_C = 25°C	I_D	1.3	1.3	A
@ T_C = 100°C		0.8	0.8 [d]	A
Drain Current-Pulsed [a]	I_{DM} [e]	5.2	5.2 [d]	A
Maximum Power Dissipation @ T_C = 25°C	P_D	41	27	W
- Derate above 25°C		0.33	0.22	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	$R_{\theta JC}$	3	4.5	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	65	°C/W

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250µA	650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 650V, V_{GS} = 0V			1	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 = 250µA	2.5		4.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 0.5A		8.5	10.5	Ω
Dynamic Characteristics [c]						
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1.0 MHz		205		pF
Output Capacitance	C_{oss}			50		pF
Reverse Transfer Capacitance	C_{rss}			20		pF
Switching Characteristics [c]						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 300V, I_D = 1.2A, V_{GS} = 10V, R_{GEN} =4.7Ω		11		ns
Turn-On Rise Time	t_r			10		ns
Turn-Off Delay Time	$t_{d(off)}$			16		ns
Turn-Off Fall Time	t_f			8		ns
Total Gate Charge	Q_g	V_{DS} = 480V, I_D = 1.2A, V_{GS} = 10V		6.9		nC
Gate-Source Charge	Q_{gs}			0.9		nC
Gate-Drain Charge	Q_{gd}			4.6		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current	I_S [f]				1.3	A
Drain-Source Diode Forward Voltage [b]	V_{SD}	V_{GS} = 0V, I_S = 0.6A [g]			1.5	V

Notes :
a.Repetitive Rating : Pulse width limited by maximum junction temperature .
b.Pulse Test : Pulse Width ≤ 300µs, Duty Cycle ≤ 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 .
f.Full package $I_{S(max)}$ = 1A .
g.Full package V_{SD} test condition I_S = 1A .
h.L = 1mH, I_{AS} =1.2A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25 C.

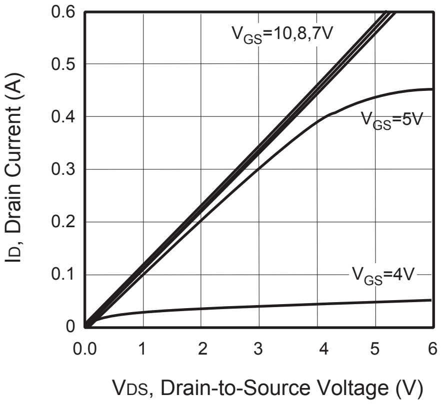


Figure 1. Output Characteristics

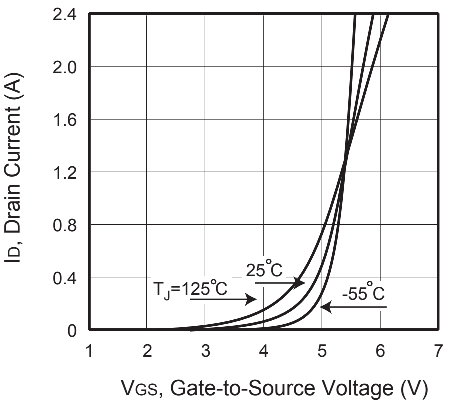


Figure 2. Transfer Characteristics

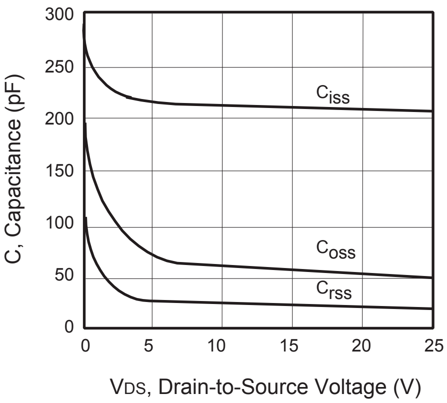


Figure 3. Capacitance

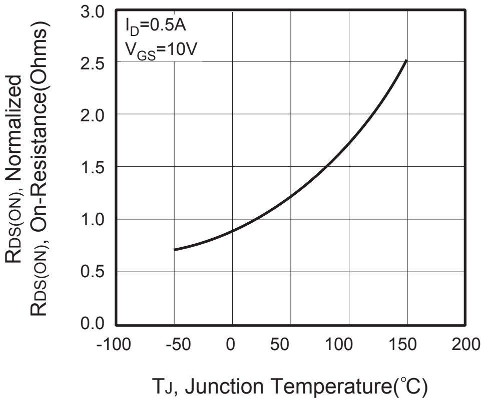


Figure 4. On-Resistance Variation with Temperature

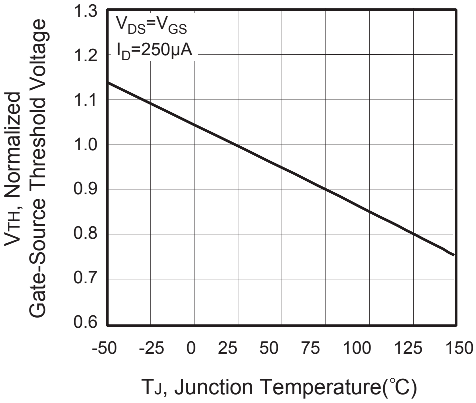


Figure 5. Gate Threshold Variation with Temperature

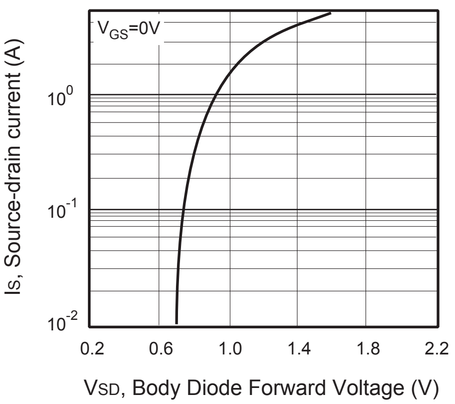


Figure 6. Body Diode Forward Voltage Variation with Source Current

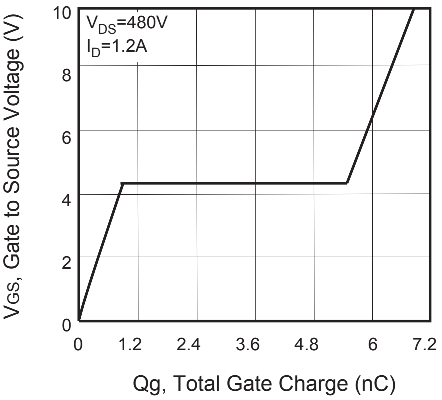


Figure 7. Gate Charge

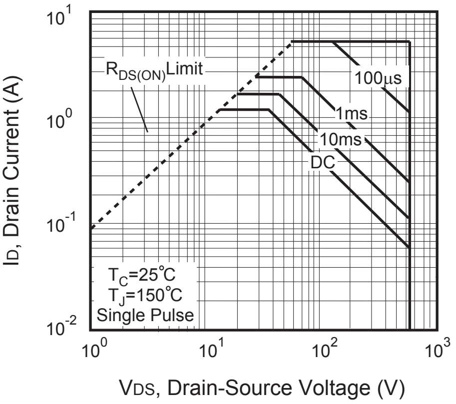


Figure 8. Maximum Safe Operating Area

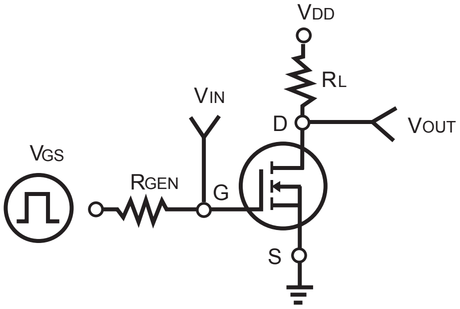


Figure 9. Switching Test Circuit

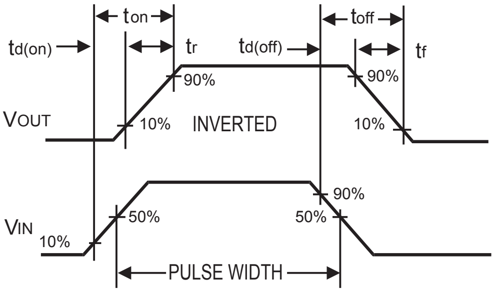


Figure 10. Switching Waveforms

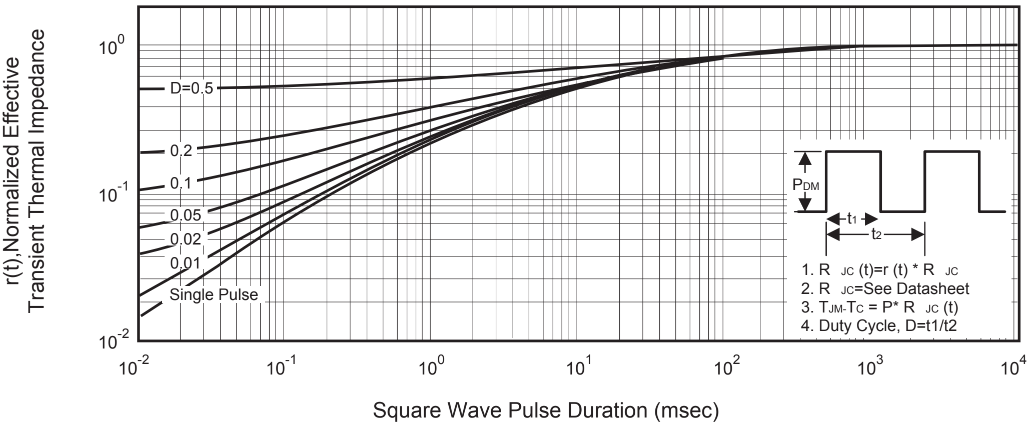


Figure 11. Normalized Thermal Transient Impedance Curve