CEP15N65SF/CEB15N65SF
CEF15N65SF

N-Channel Enhancement Mode Field Effect Transistor With Fast Body Diode

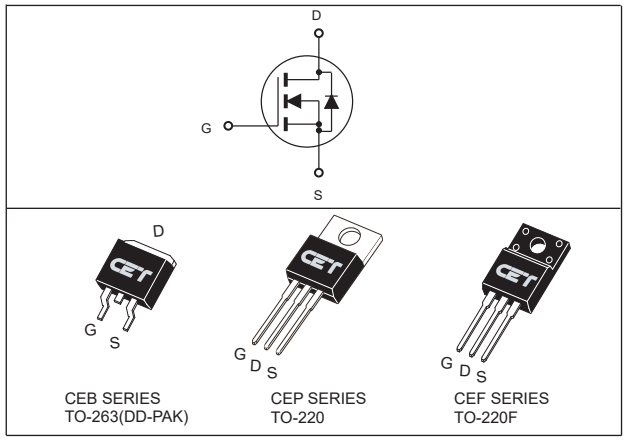
Type	V_{DSS}@$T_{J\ max}$	$R_{DS(ON)\ typ}$ @V_{GS}	I_D
CEP15N65SF	700V	200mΩ@V_{GS} = 10V	15A
CEB15N65SF	700V	200mΩ@V_{GS} = 10V	15A
CEF15N65SF	700V	200mΩ@V_{GS} = 10V	15A [d]

FEATURES

- High power and current handing capability.
- Reliable and rugged.
- Pb-free lead plating ; RoHS compliant.
- Halogen Free.
- Fast reverse recovery time.

APPLICATIONS

- Power factor correction.
- High-frequency Switching.
- Uninterruptible Power Supply.



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	15	15 [d]	A
@ T_C = 70°C		12	12 [d]	A
Drain Current-Pulsed [a]	I_{DM} [e]	60	60 [d]	A
Maximum Power Dissipation @ T_C = 25°C	P_D	112	39	W
- Derate above 25°C		0.9	0.31	W/°C
Single Pulsed Avalanche Energy [g]	E_{AS}	304		mJ
Single Pulsed Avalanche Current [g]	I_{AS}	4.5		A
Operating and Store Temperature Range	T_J,T_{stg}	-55 to 150		°C

Thermal Characteristics

Parameter	Symbol	Limit		Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.12	3.2	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	65	°C/W

Electrical Characteristics T_C = 25°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 = 7A		200	240	mΩ
Dynamic Characteristics [c]						
Input Capacitance	C_{iss}	V_{DS} = 100V, V_{GS} = 0V, f = 1MHz		985		pF
Output Capacitance	C_{oss}			45		pF
Reverse Transfer Capacitance	C_{rss}			5		pF
Switching Characteristics [c]						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 325V, I_D =7.5A, V_{GS} = 10V, R_{GEN} = 25Ω		11		ns
Turn-On Rise Time	t_r			20		ns
Turn-Off Delay Time	$t_{d(off)}$			50		ns
Turn-Off Fall Time	t_f			72		ns
Total Gate Charge	Q_g	V_{DS} = 325V, I_D = 7.5A, V_{GS} = 10V		20		nC
Gate-Source Charge	Q_{gs}			5		nC
Gate-Drain Charge	Q_{gd}			6		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current	I_S [f]				15	A
Pulsed Source Current	I_{SM}				45	A
Drain-Source Diode Forward Voltage [b]	V_{SD}	V_{GS} = 0V, I_S = 15A			1.4	V
Reverse Recovery Time	T_{rr}	I_F = 7.5A,di/dt = 100A/us		196		ns
Reverse Recovery Charge	Q_{rr}			1.9		nC

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 $I_{S(max)}$ = 8.6A .
g.L = 30mH, I_{AS} = 4.5A, V_{DD} = 100V, R_G = 25Ω, Starting T_J = 25°C.

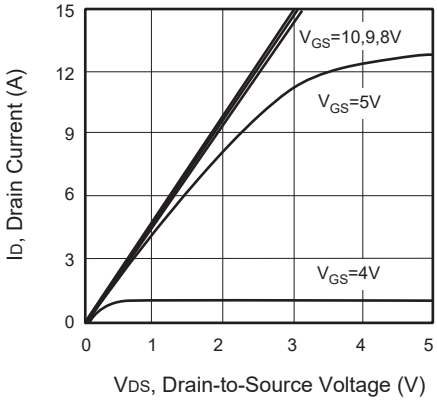


Figure 1. Output Characteristics

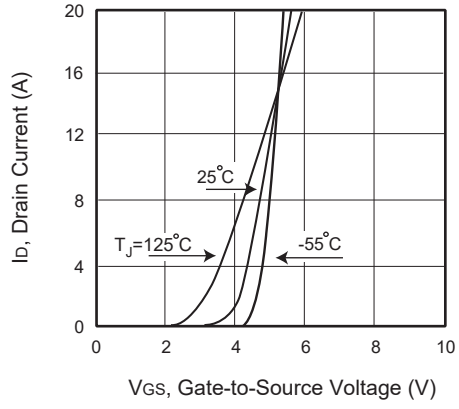


Figure 2. Transfer Characteristics

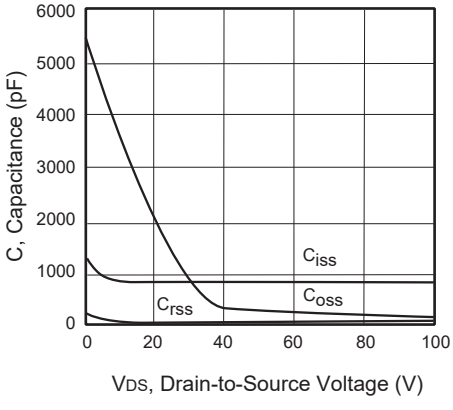


Figure 3. Capacitance

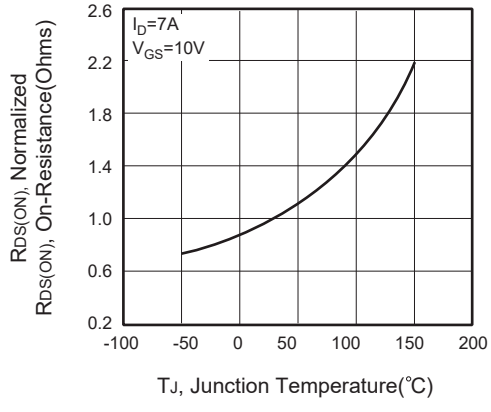


Figure 4. On-Resistance Variation with Temperature

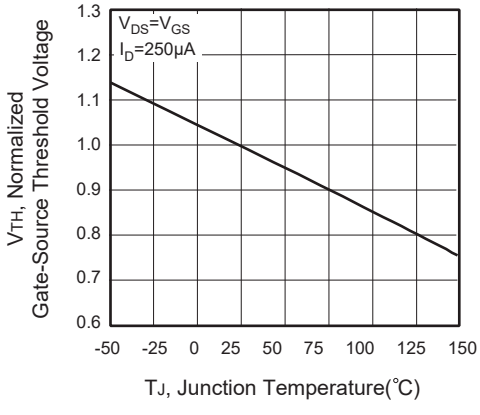


Figure 5. Gate Threshold Variation with Temperature

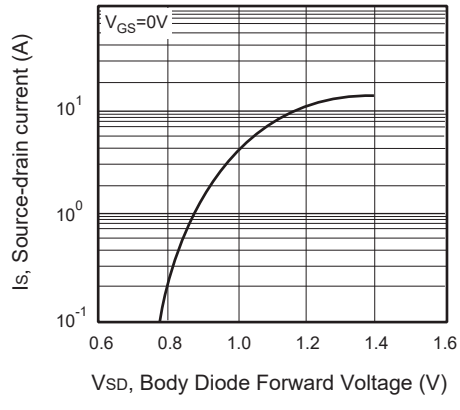


Figure 6. Body Diode Forward Voltage Variation with Source Current

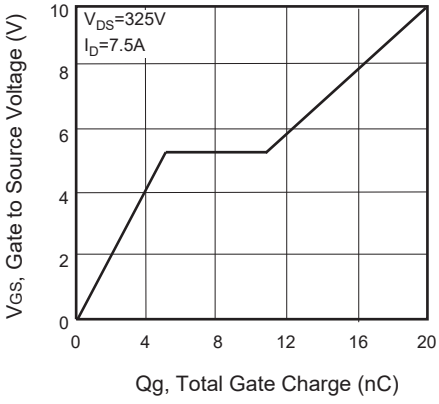


Figure 7. Gate Charge

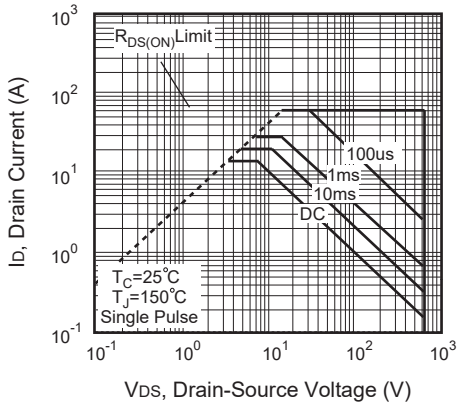


Figure 8. Maximum Safe Operating Area

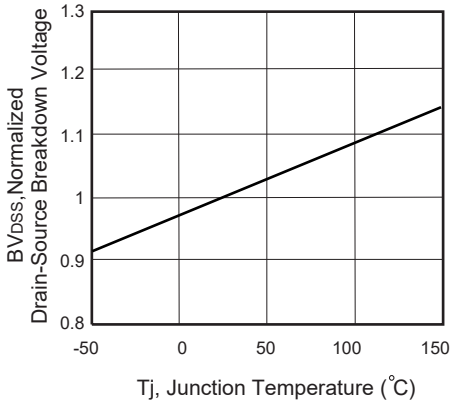


Figure 9. Breakdown Voltage Variation VS Temperature

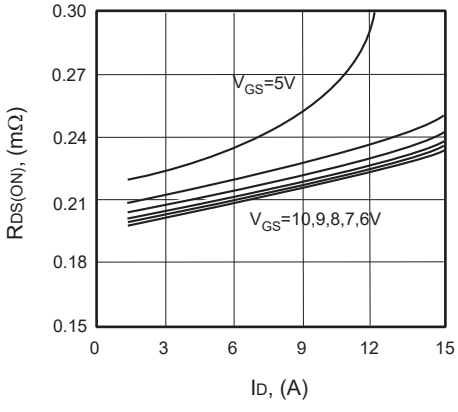


Figure 10. On-Resistance vs. Drain Current

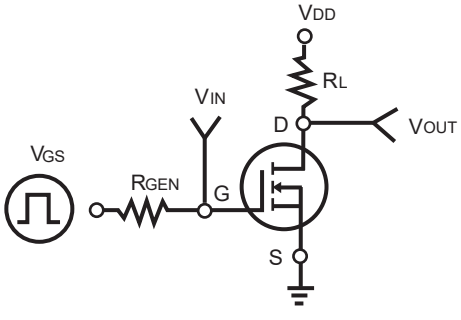


Figure 11. Switching Test Circuit

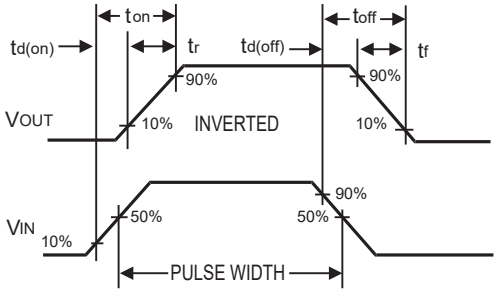


Figure 12. Switching Waveforms

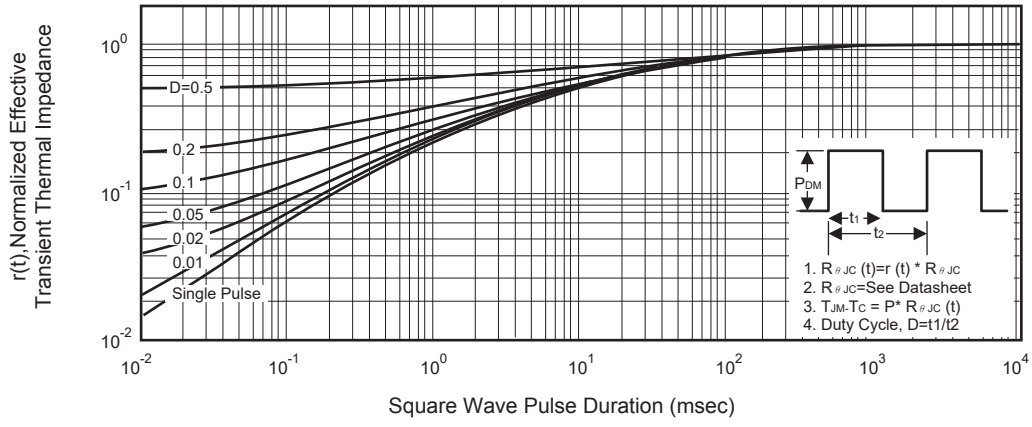


Figure 12. Normalized Thermal Transient Impedance Curve