CEP02N6G/CEB02N6G
CEF02N6G

CET

N-Channel Enhancement Mode Field Effect Transistor

FEATURES

Type	V_{DSS}	$R_{DS(ON)}$	I_D	@V_{GS}
CEP02N6G	600V	5Ω	2.2A	10V
CEB02N6G	600V	5Ω	2.2A	10V
CEF02N6G	600V	5Ω	2.2A [d]	10V

■ Super high dense cell design for extremely low $R_{DS(ON)}$.

■ High power and current handing capability.

■ Lead free product is acquired.

CEB SERIES
TO-263(DD-PAK)

CEP SERIES
TO-220

CEF SERIES
TO-220F
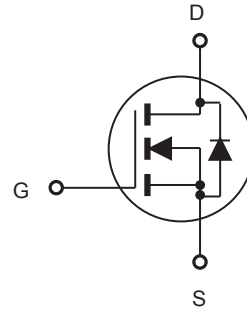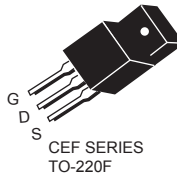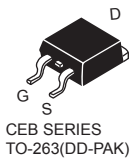
ABSOLUTE MAXIMUM RATINGS T_C = 25°C unless otherwise noted

Parameter	Symbol	Limit		Units
		TO-220/263	TO-220F	
Drain-Source Voltage	V_{DS}	600		V
Gate-Source Voltage	V_{GS}	±30		V
Drain Current-Continuous @ T_C = 25°C	I_D	2.2	2.2 [d]	A
@ T_C = 100°C		1.4	1.4[d]	A
Drain Current-Pulsed [a]	I_{DM} [e]	8.8	8.8 [d]	A
Maximum Power Dissipation @ T_C = 25°C	P_D	60	33	W
- Derate above 25°C		0.48	0.26	W/$^\circ$C
Single Pulsed Avalanche Energy [g]	E_{AS}	11.25		mJ
Single Pulsed Avalanche Current [g]	I_{AS}	1.5		A
Operating and Store Temperature Range	T_J,T_{stg}	-55 to 150		$^\circ$C

Thermal Characteristics

Parameter	Symbol	Limit		Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.1	3.8	$^\circ$C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	65	$^\circ$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	600			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 600V, 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 = 250µA	2		4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 1A		3.8	5	Ω
Dynamic Characteristics [c]						
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1.0 MHz		290		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} = 300V, I_D = 1A, V_{GS} = 10V, R_{GEN} = 18Ω		18	36	ns
Turn-On Rise Time	t_r			10	20	ns
Turn-Off Delay Time	$t_{d(off)}$			28	56	ns
Turn-Off Fall Time	t_f			10	20	ns
Total Gate Charge	Q_g	V_{DS} = 480V, I_D = 1A, V_{GS} = 10V		6.8	9	nC
Gate-Source Charge	Q_{gs}			1.4		nC
Gate-Drain Charge	Q_{gd}			3.1		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current	I_S [f]				2	A
Drain-Source Diode Forward Voltage [b]	V_{SD}	V_{GS} = 0V, I_S = 1A			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 $I_{S(max)}$ = 1.5A .
g.L = 10mH, I_{AS} =1.5A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25 C
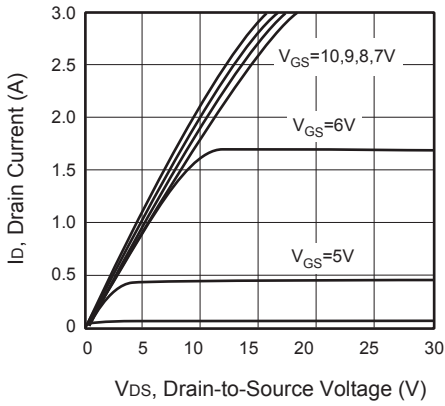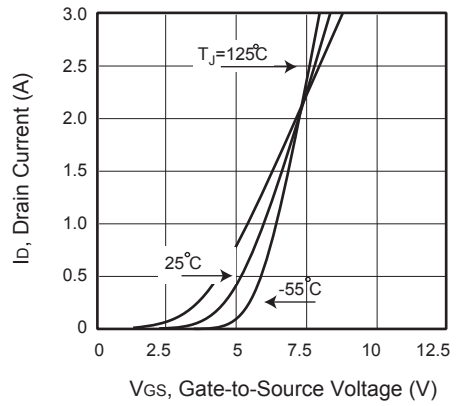
Figure 1. Output Characteristics

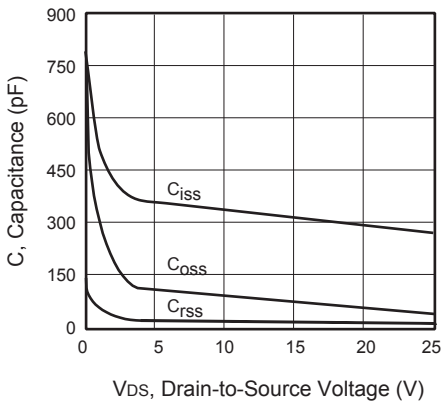**Figure 2. Transfer Characteristics**

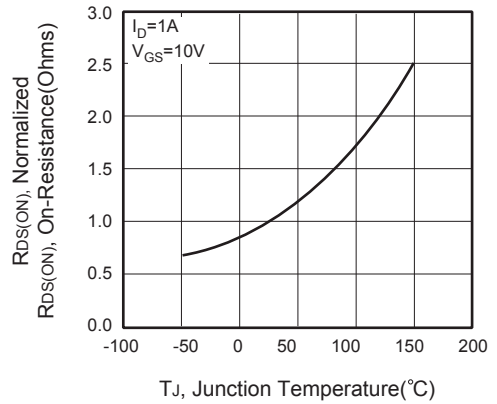**Figure 3. Capacitance**

**Figure 4. On-Resistance Variation
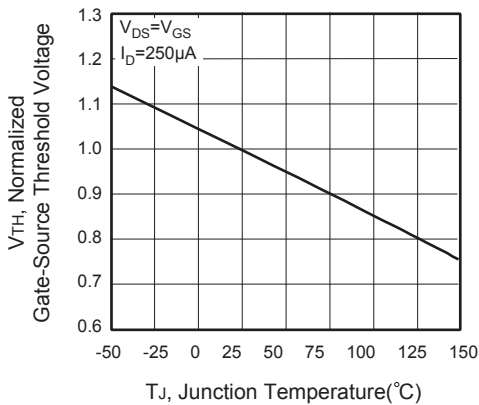with Temperature**

**Figure 5. Gate Threshold Variation
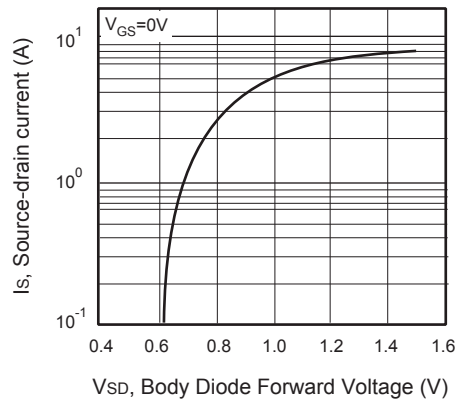with Temperature**

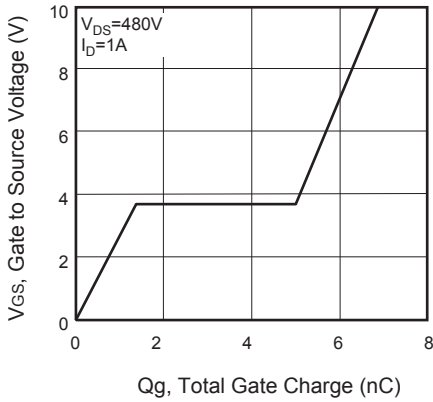**Figure 6. Body Diode Forward Voltage
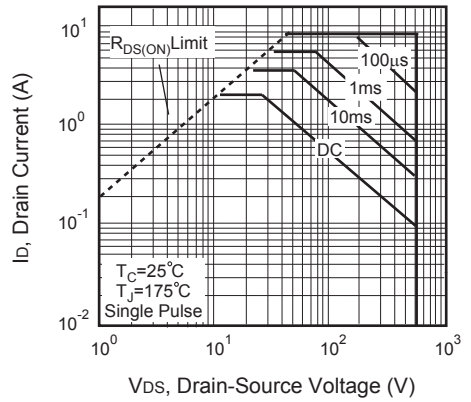Variation with Source Current**

Figure 7. Gate Charge

Figure 8. Maximum Safe Operating Area

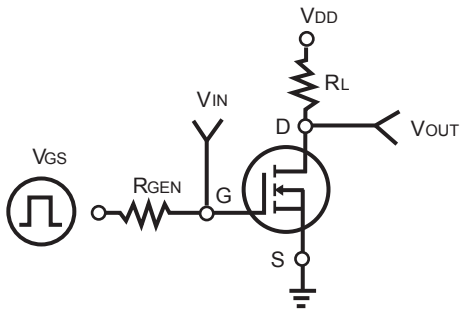**Figure 9. Switching Test Circuit**
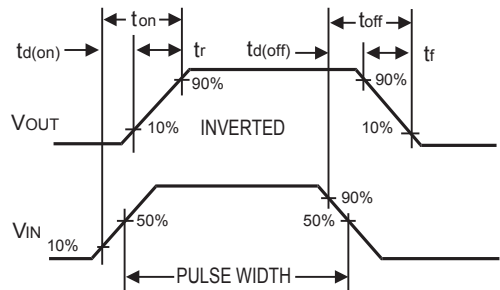
Figure 10. Switching Waveforms

1. $R_{JC}(t) = r(t) * R_{JC}$
2. R_{JC} = See Datasheet
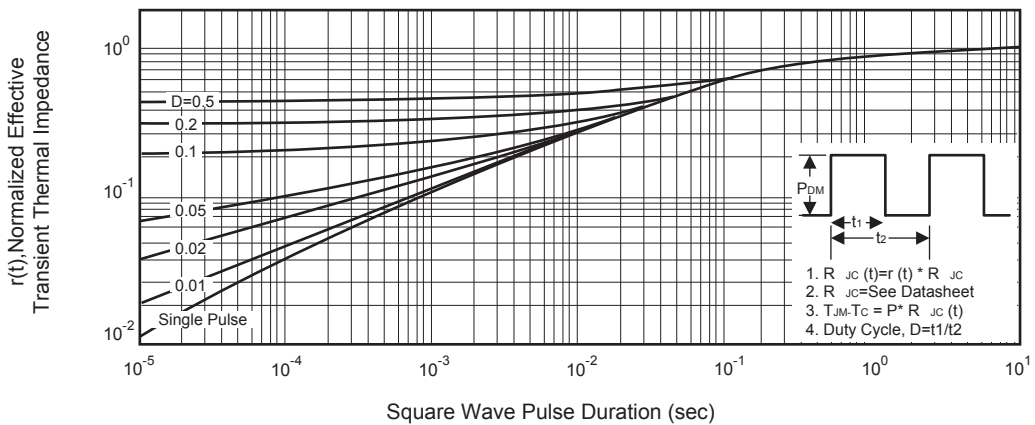3. $T_{JM} - T_C = P * R_{JC}(t)$
4. Duty Cycle, $D = t_1/t_2$

Figure 11. Normalized Thermal Transient Impedance Curve