CEP01N6/CEB01N6
CEI01N6/CEF01N6

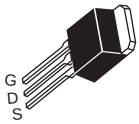
N-Channel Enhancement Mode Field Effect Transistor

FEATURES

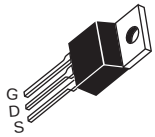
Type	V_{DSS}	$R_{DS(ON)}$	I_D	@V_{GS}
CEP01N6	650V	15Ω	1A	10V
CEB01N6	650V	15Ω	1A	10V
CEI01N6	650V	15Ω	1A	10V
CEF01N6	650V	15Ω	1A [e]	10V

- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handing capability.
- Lead free product is acquired.
- TO-220 & TO-263 & TO-262 package & TO-220F full-pak for through hole.

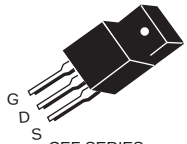
CEB SERIES
TO-263(DD-PAK)



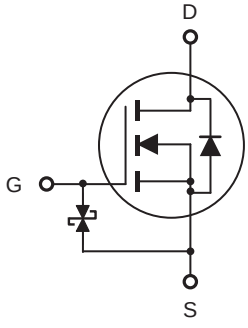
CEI SERIES
TO-262(I2-PAK)



CEP SERIES
TO-220



CEF SERIES
TO-220F



ABSOLUTE MAXIMUM RATINGS T_C = 25°C unless otherwise noted

Parameter	Symbol	Limit		Units
		TO-220/263/262	TO-220F	
Drain-Source Voltage	V_{DS}	650		V
Gate-Source Voltage	V_{GS}	±30		V
Drain Current-Continuous	I_D	1	1 [e]	A
Drain Current-Pulsed [a]	I_{DM} [f]	4	4 [e]	A
Maximum Power Dissipation @ T_C = 25°C	P_D	36	28	W
- Derate above 25°C		0.29	0.22	W/°C
Single Pulsed Avalanche Energy [d]	E_{AS}	60		mJ
Repetitive Avalanche Current	I_{AS}	0.8		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	$R_{\theta JC}$	3.5	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} = 600V, V_{GS} = 0V			1	μA
Gate Body Leakage Current, Forward	I_{GSSF}	V_{GS} = 30V, V_{DS} = 0V			10	μA
Gate Body Leakage Current, Reverse	I_{GSSR}	V_{GS} = -30V, V_{DS} = 0V			-10	μA
On Characteristics						
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 = 0.4A		12	15	Ω
Dynamic Characteristics [c]						
Forwand Transconductance	g_{FS} [b]	V_{DS} = 20V, I_D = 0.4A		0.5		S
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V f = 1.0MHz		136		pF
Output Capacitance	C_{oss}			46		pF
Reverse Transfer Capacitance	C_{rss}			19		pF
Switching Characteristics [c]						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 300V, I_D = 0.4A, V_{GS} = 10V, R_{GEN} = 4.7Ω		19	38	ns
Turn-On Rise Time	t_r			13	26	ns
Turn-Off Delay Time	$t_{d(off)}$			24	48	ns
Turn-On Fall Time	t_f			35	70	ns
Total Gate Charge	Q_g	V_{DS} = 480V, I_D = 0.8A, V_{GS} = 10V		6	8	nC
Gate-Source Charge	Q_{gs}			1.0		nC
Gate-Drain Charge	Q_{gd}			4.4		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current	I_S				0.8	A
Drain-Source Diode Forward Voltage [b]	V_{SD}	V_{GS} = 0V, I_S = 0.8A			1.6	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.L = 190mH, I_{AS} = 0.8A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C .
e.Limited only by maximum temperature allowed .
f .Pulse width limited by safe operating area .

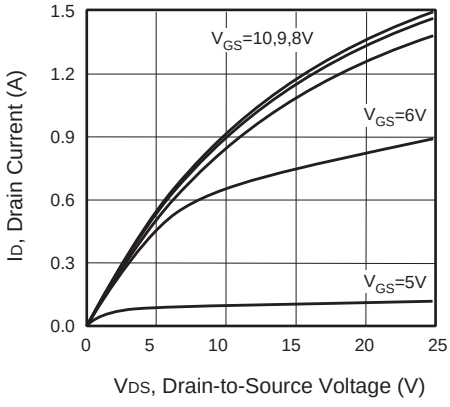


Figure 1. Output Characteristics

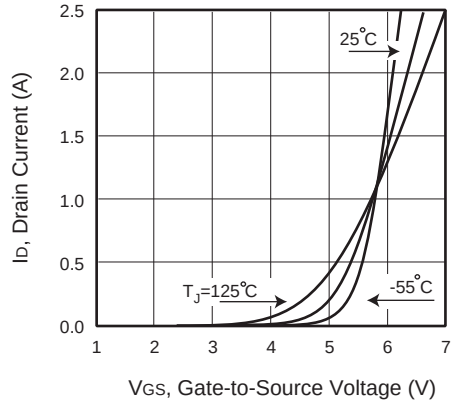


Figure 2. Transfer Characteristics

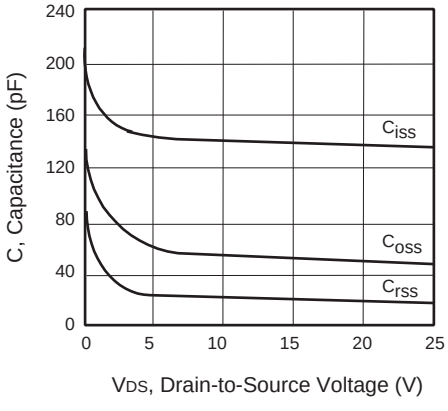


Figure 3. Capacitance

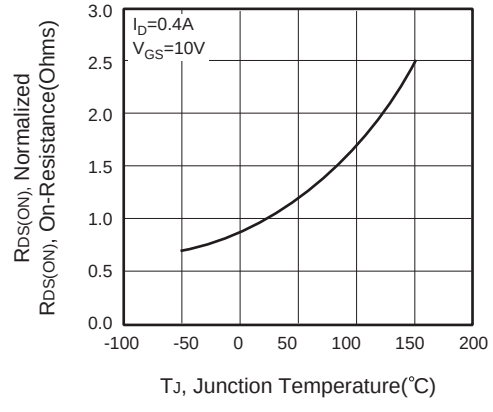


Figure 4. On-Resistance Variation with Temperature

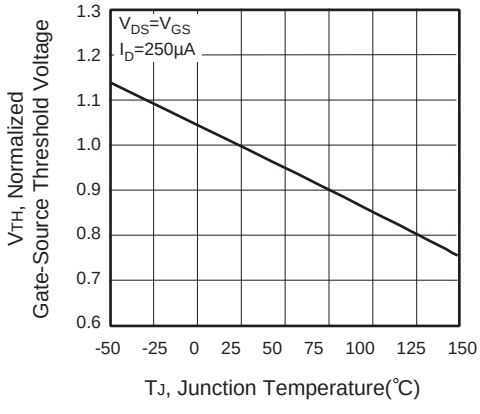


Figure 5. Gate Threshold Variation with Temperature

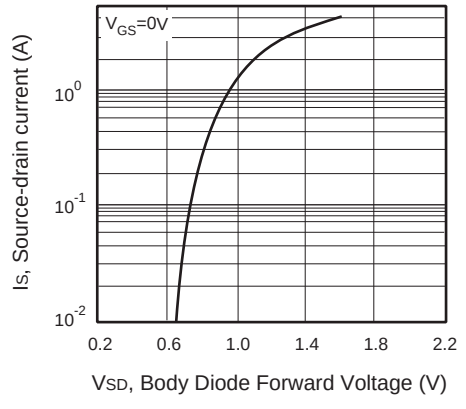


Figure 6. Body Diode Forward Voltage Variation with Source Current

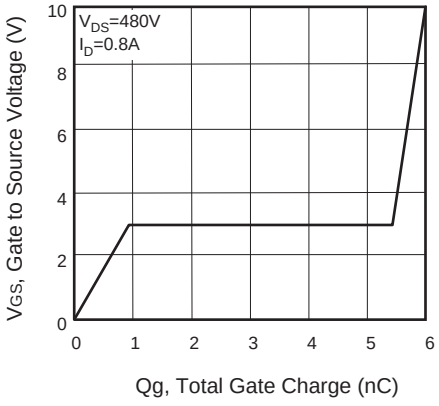


Figure 7. Gate Charge

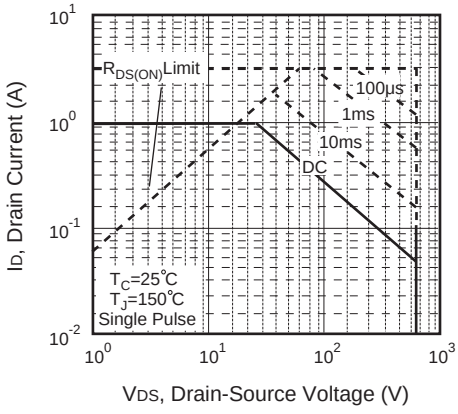


Figure 8. Maximum Safe Operating Area

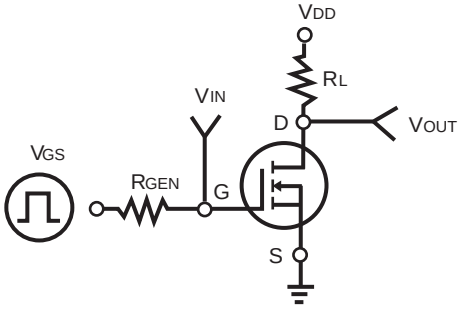


Figure 9. Switching Test Circuit

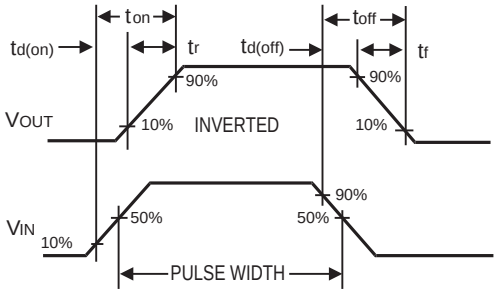


Figure 10. Switching Waveforms

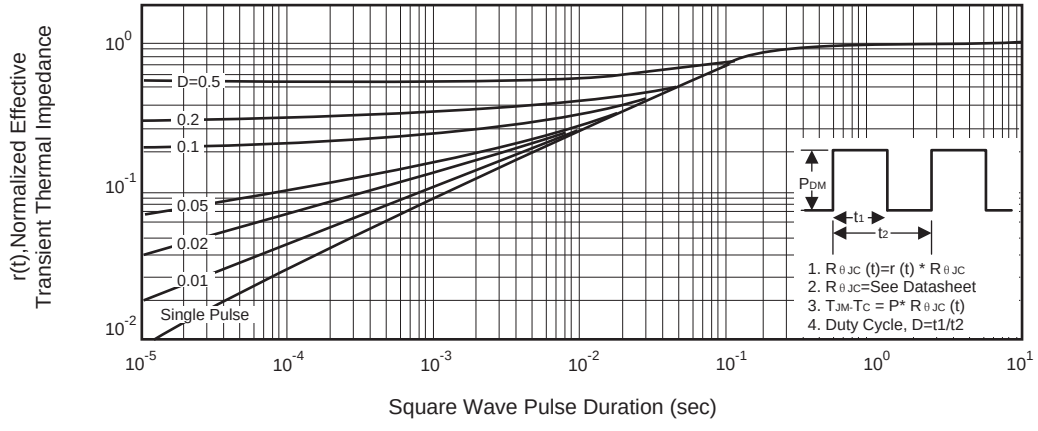


Figure 11. Normalized Thermal Transient Impedance Curve