CED02N7G-1/CEU02N7G-1

N-Channel Enhancement Mode Field Effect Transistor

FEATURES

■ 720V, 1.6A, $R_{DS(ON)}$ = 6.75Ω @V_{GS} = 10V.
  750V@Tc=150°C

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

■ High power and current handing capability.

■ Lead free product is acquired.

■ TO-251 & TO-252 package.

CEU SERIES
TO-252(D-PAK)

CED SERIES
TO-251(I-PAK)
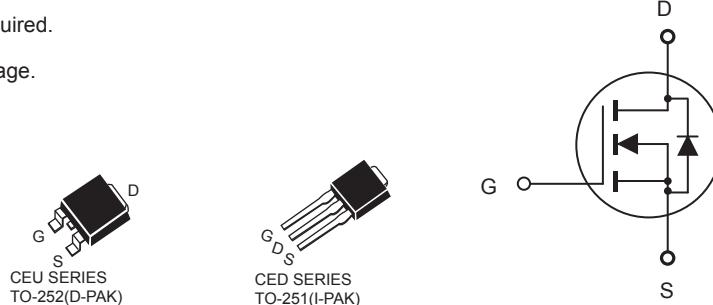
ABSOLUTE MAXIMUM RATINGS T_C = 25°C unless otherwise noted

Parameter	Symbol	Limit		Units
Drain-Source Voltage	V_{DS}	720	(Tc=25°C)	V
		750	(Tc=150°C)	V
Gate-Source Voltage	V_{GS}	±30		V
Drain Current-Continuous @ T_C = 25°C	I_D	1.6		A
@ T_C = 100°C		1.1		A
Drain Current-Pulsed [a]	I_{DM}	6.4		A
Maximum Power Dissipation @ T_C = 25°C	P_D	48		W
- Derate above 25°C		0.38		W/°C
Single Pulsed Avalanche Energy [d]	E_{AS}	11.25		mJ
Single Pulsed Avalanche Current [d]	I_{AS}	1.5		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	RθJC	2.6	°C/W
Thermal Resistance, Junction-to-Ambient	RθJA	50	°C/W

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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}	Tc=25°C,V_{GS} = 0V, I_D = 250uA	720			V
		Tc=150°C,V_{GS} = 0V, I_D = 250uA	750			
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 700V, 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		5.4	6.75	Ω
Dynamic Characteristics [c]						
Forward Transconductance	g_{FS}	V_{DS} = 50V, I_D = 1A		1.5		S
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1.0 MHz		315		pF
Output Capacitance	C_{oss}			55		pF
Reverse Transfer Capacitance	C_{rss}			20		pF
Switching Characteristics [c]						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 300V, I_D = 1.9A, V_{GS} = 10V, R_{GEN} = 18Ω		14		ns
Turn-On Rise Time	t_r			12.5		ns
Turn-Off Delay Time	$t_{d(off)}$			23		ns
Turn-Off Fall Time	t_f			10		ns
Total Gate Charge	Q_g	V_{DS} = 480V, I_D = 1.9A, V_{GS} = 10V		9		nC
Gate-Source Charge	Q_{gs}			1.5		nC
Gate-Drain Charge	Q_{gd}			5		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current	I_S				1.6	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.Guaraneed by design, not subject to production testing.
d.L =10mH, I_{AS} =1.5A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
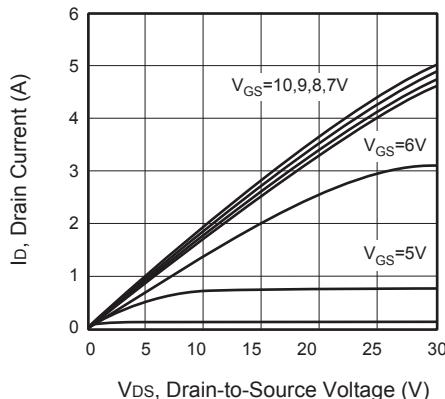
Figure 1. Output Characteristics
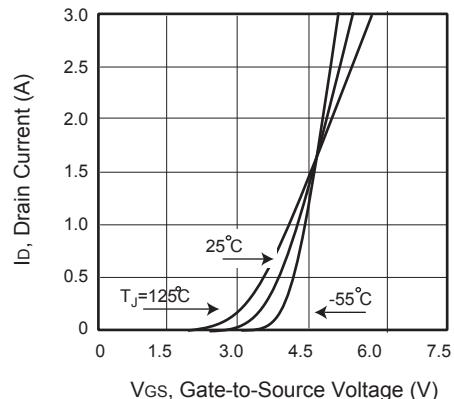
**Figure 2. Transfer Characteristics**
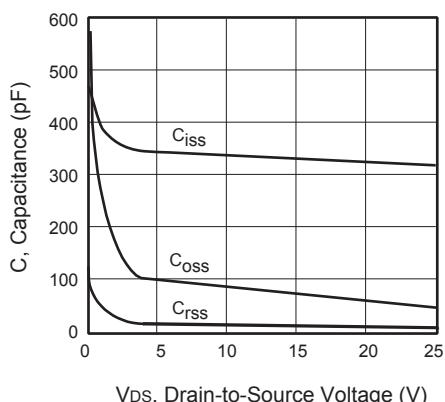
Figure 3. Capacitance
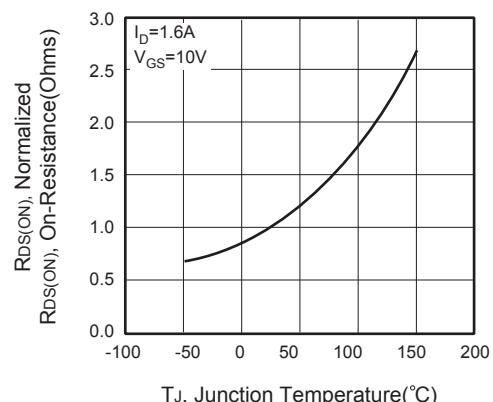
**Figure 4. On-Resistance Variation
with Temperature**
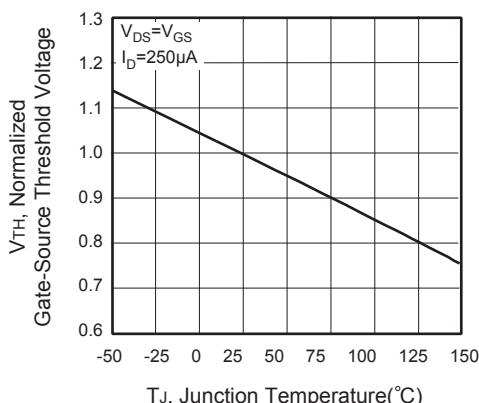
**Figure 5. Gate Threshold Variation
with Temperature**
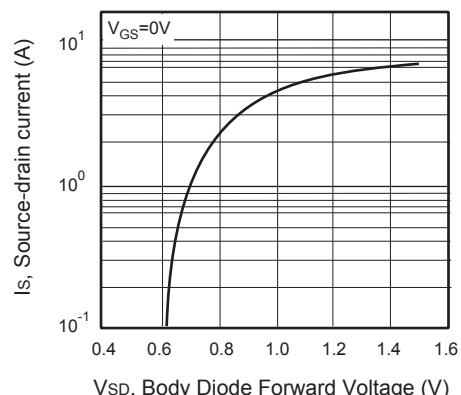
**Figure 6. Body Diode Forward Voltage
Variation with Source Current**
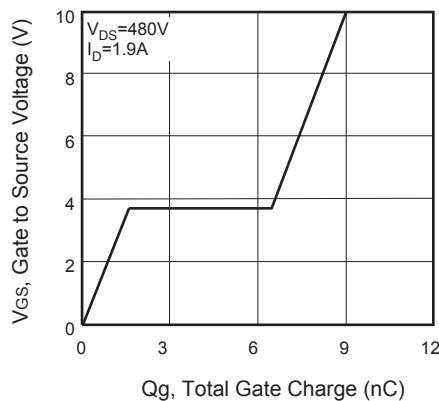
Figure 7. Gate Charge
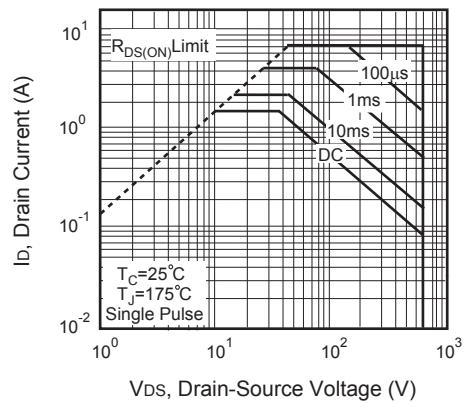
Figure 8. Maximum Safe Operating Area
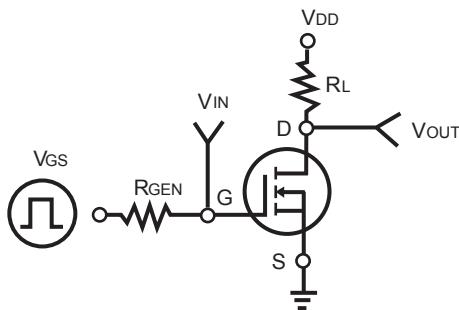
Figure 9. Switching Test Circuit
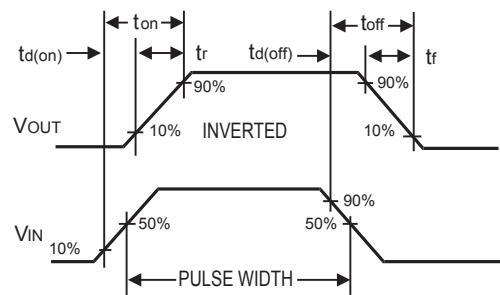
Figure 10. Switching Waveforms

1. $R_{\theta JC}(t) = r(t) * R_{\theta JC}$
2. $R_{\theta JC}$ = See Datasheet
3. $T_{JM} - T_C = P * R_{\theta JC}(t)$
4. Duty Cycle, $D = t_1/t_2$
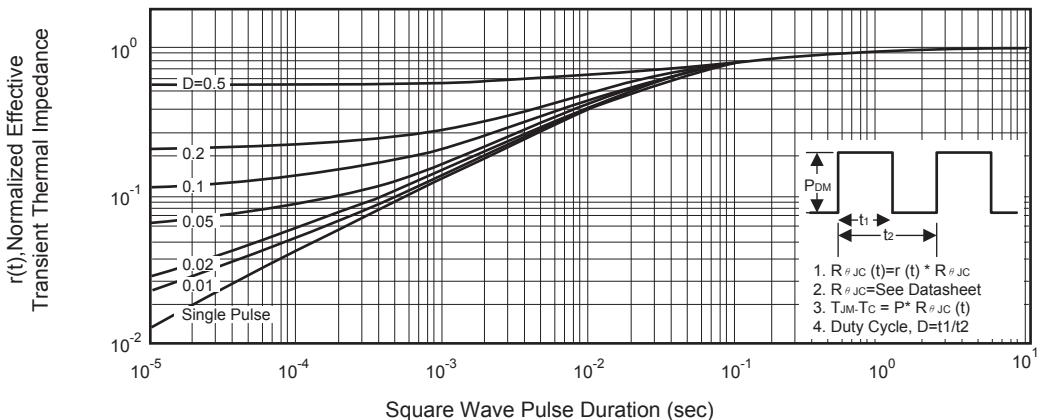
Figure 11. Normalized Thermal Transient Impedance Curve