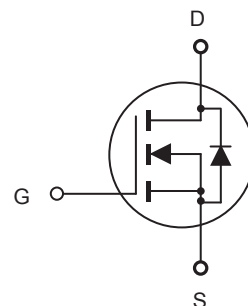# CED25N15L/CEU25N15L

N-Channel Enhancement Mode Field Effect Transistor

FEATURES

■ 150V, 25A, $R_{DS(ON)}$ = 70mΩ   @V_{GS} = 10V.

   $R_{DS(ON)}$ = 80mΩ   @V_{GS} = 5V.

■ 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}	150	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	25	A
Drain Current-Pulsed [a]	I_{DM}	100	A
Maximum Power Dissipation @ T_C = 25°C	P_D	83.3	W
- Derate above 25°C		0.66	W/$^{\circ}$C
Operating and Store Temperature Range	T_J, T_{stg}	-55 to 175	$^{\circ}$C

Thermal Characteristics

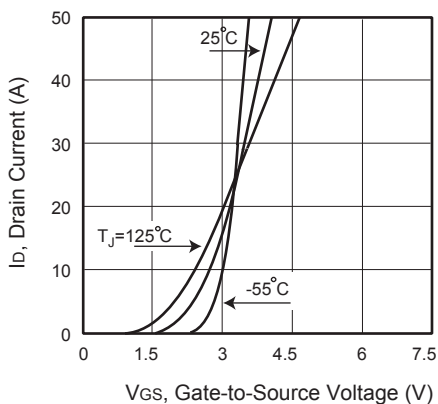| Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.8	$^{\circ}$C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	$^{\circ}$C/W

CED25N15L/CEU25N15L

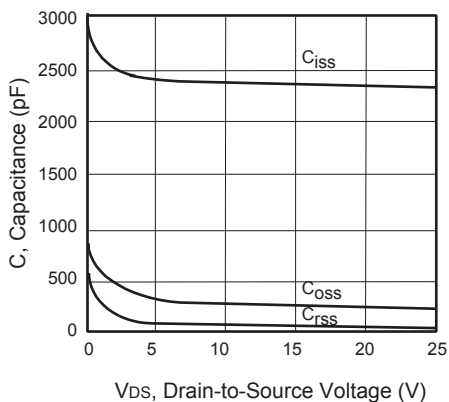## Electrical Characteristics $T_C = 25^{\circ}C$ unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	150	165		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 150V$, $V_{GS} = 0V$			1	µA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 20V$, $V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -20V$, $V_{DS} = 0V$			-100	nA
On Characteristics [b]						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}$, $I_D = 250\mu A$	1	1.5	3	V
Static Drain-Source	$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 12A$		55	70	mΩ
On-Resistance		$V_{GS} = 5V$, $I_D = 10A$		60	80	mΩ
Dynamic Characteristics [c]						
Input Capacitance	C_{iss}	$V_{DS} = 25V$, $V_{GS} = 0V$, f = 1.0 MHz		2320		pF
Output Capacitance	C_{oss}			245		pF
Reverse Transfer Capacitance	C_{rss}			30		pF
Switching Characteristics [c]						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 75V$, $I_D = 20A$, $V_{GS} = 10V$, $R_{GEN} = 1\Omega$		16	32	ns
Turn-On Rise Time	t_r			3	6	ns
Turn-Off Delay Time	$t_{d(off)}$			60	120	ns
Turn-Off Fall Time	t_f			3	6	ns
Total Gate Charge	Q_g	$V_{DS} = 120V$, $I_D = 20A$, $V_{GS} = 10V$		72	94	nC
Gate-Source Charge	Q_{gs}			5		nC
Gate-Drain Charge	Q_{gd}			14		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current	I_S				25	A
Drain-Source Diode Forward Voltage [b]	V_{SD}	$V_{GS} = 0V$, $I_S = 25A$			1.2	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.

CED25N15L/CEU25N15L

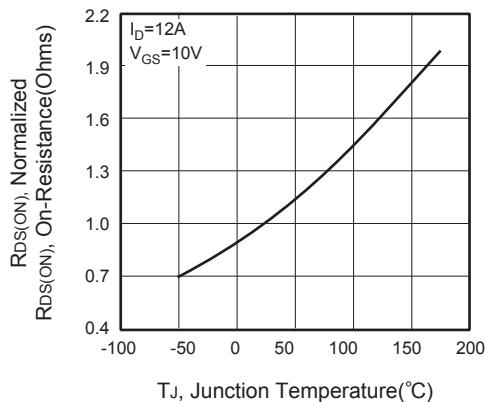Figure 1. Output Characteristics
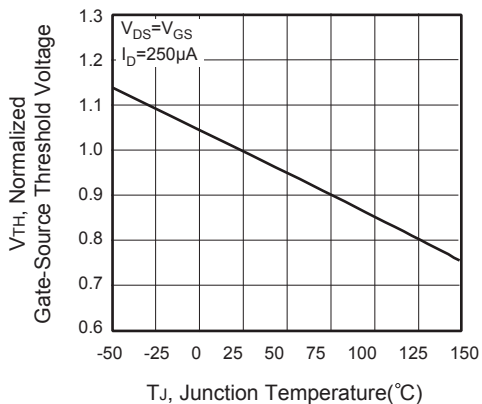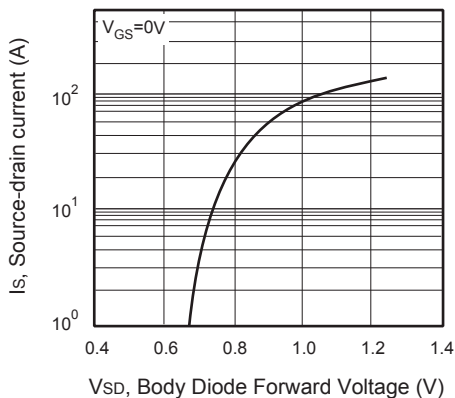
Figure 2. Transfer Characteristics

Figure 3. Capacitance

Figure 4. On-Resistance Variation with Temperature

Figure 5. Gate Threshold Variation with Temperature

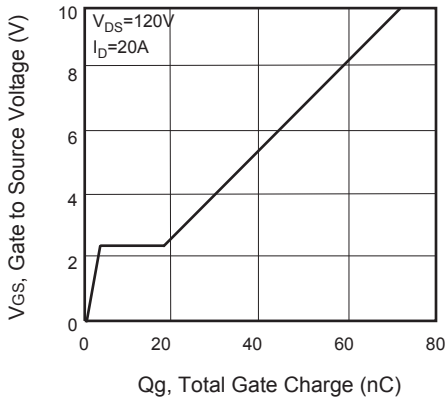Figure 6. Body Diode Forward Voltage Variation with Source Current

Figure 7. Gate Charge

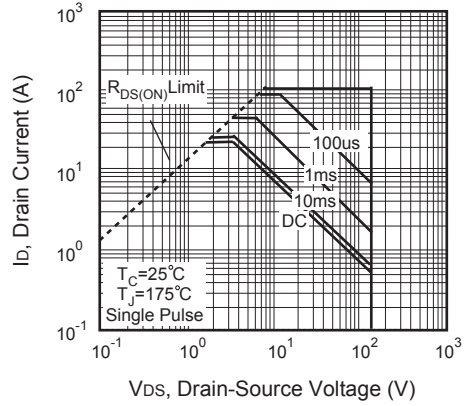

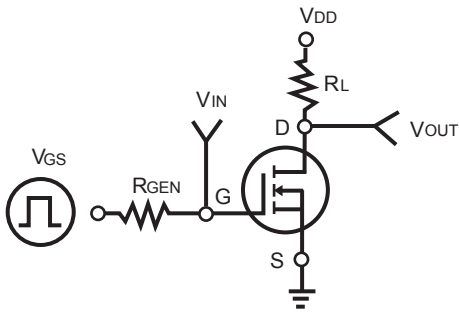**Figure 8. Maximum Safe Operating Area**

Figure 9. Switching Test Circuit

Figure 10. Switching Waveforms

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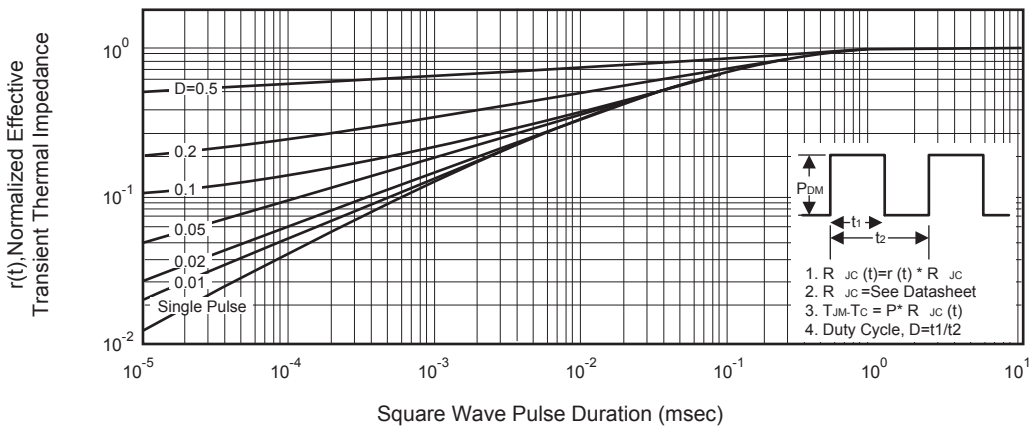3. $T_{JM} - T_C = P * R_{JC}(t)$
4. Duty Cycle, $D = t_1/t_2$

Figure 11. Normalized Thermal Transient Impedance Curve