

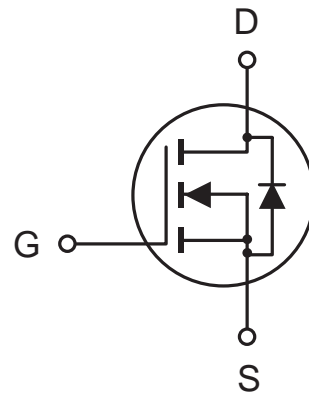
CED71A3/CEU71A3

Dec. 2002

N-Channel Logic Level Enhancement Mode Field Effect Transistor

FEATURES

- 30V , 65A , $R_{DS(ON)}=10m\Omega$ @ $V_{GS}=10V$.
 $R_{DS(ON)}=14m\Omega$ @ $V_{GS}=5.0V$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- TO-252 & TO-251 package.



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ABSOLUTE MAXIMUM RATINGS (Tc=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous -Pulsed	I _D	65	A
	I _{DM}	100	A
Drain-Source Diode Forward Current	I _S	65	A
Maximum Power Dissipation @T _c =25°C Derate above 25°C	P _D	69	W
		0.56	W/°C
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	R _{θJC}	1.8	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	40	°C/W

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ELECTRICAL CHARACTERISTICS (Tc=25°C unless otherwise noted)

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Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V			1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
ON CHARACTERISTICS^a						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1		3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 15A		8.5	10	mΩ
		V _{GS} = 5.0V, I _D = 13A		11.5	14	mΩ
On-State Drain Current	I _{D(ON)}	V _{GS} = 10V, V _{DS} = 5V	65			A
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 12A		26		S
DYNAMIC CHARACTERISTICS^b						
Input Capacitance	C _{ISS}	V _{DS} = 15V, V _{GS} = 0V f = 1.0MHz		2152		pF
Output Capacitance	C _{OSS}			965		pF
Reverse Transfer Capacitance	C _{RSS}			234		pF
SWITCHING CHARACTERISTICS^b						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 15V, I _D = 1A, V _{GS} = 10V, R _{GEN} = 6Ω		30	60	ns
Rise Time	t _r			63	110	ns
Turn-Off Delay Time	t _{D(OFF)}			73	130	ns
Fall Time	t _f			59	100	ns
Total Gate Charge	Q _g	V _{DS} = 10V, I _D = 15A, V _{GS} = 10V		55	67	nC
Gate-Source Charge	Q _{gs}			9		nC
Gate-Drain Charge	Q _{gd}			18		nC

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ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS ^a						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_s = 2.3A$		0.9	1.3	V

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Notes

- a. Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

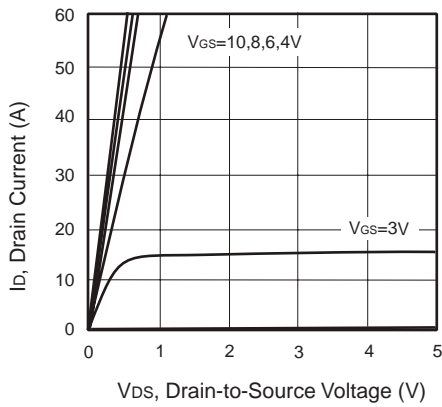


Figure 1. Output Characteristics

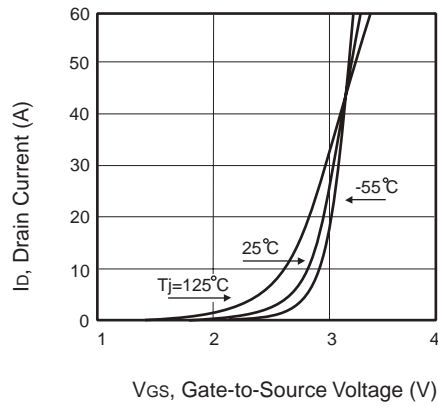


Figure 2. Transfer Characteristics

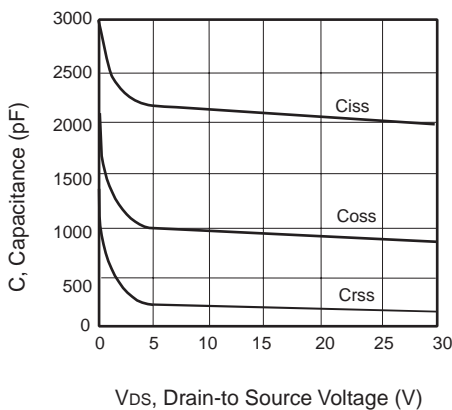


Figure 3. Capacitance

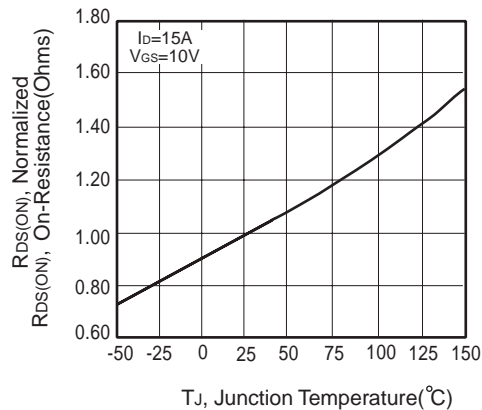


Figure 4. On-Resistance Variation with Temperature

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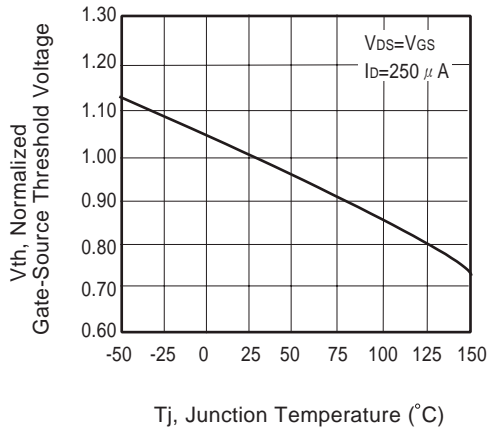


Figure 5. Gate Threshold Variation with Temperature

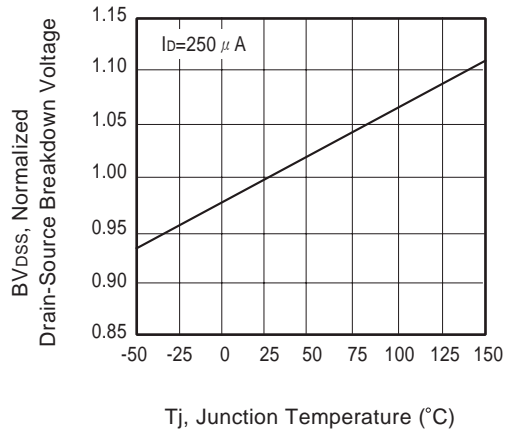


Figure 6. Breakdown Voltage Variation with Temperature

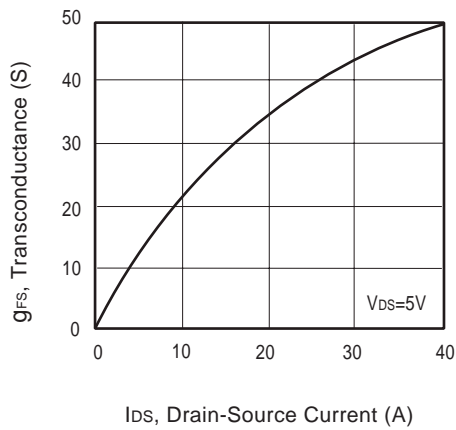


Figure 7. Transconductance Variation with Drain Current

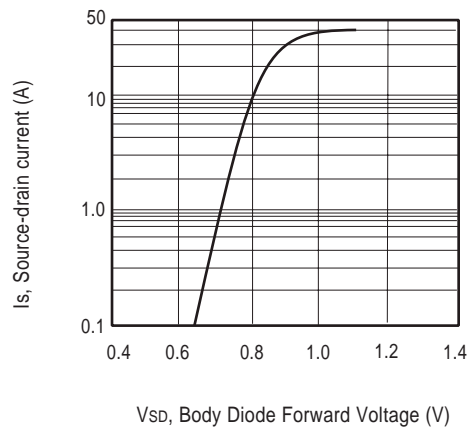


Figure 8. Body Diode Forward Voltage Variation with Source Current

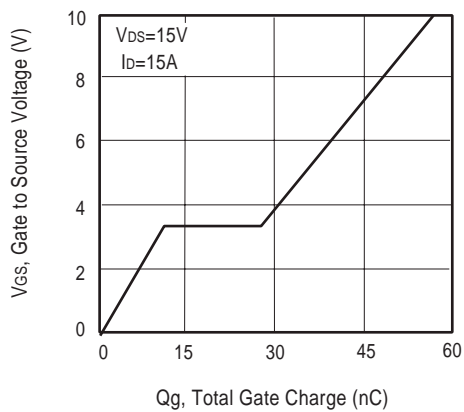


Figure 9. Gate Charge

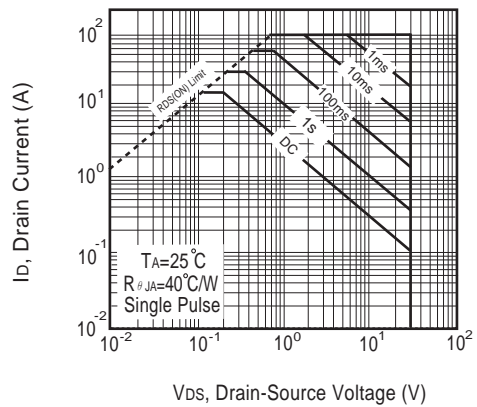


Figure 10. Maximum Safe Operating Area

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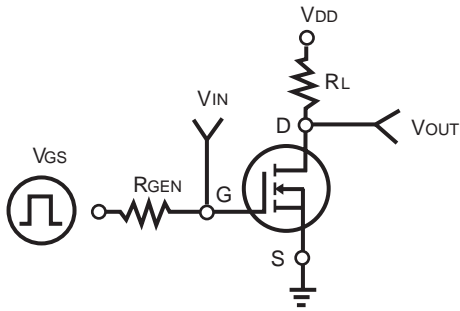


Figure 11. Switching Test Circuit

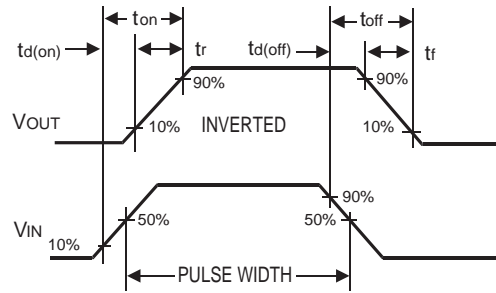


Figure 12. Switching Waveforms

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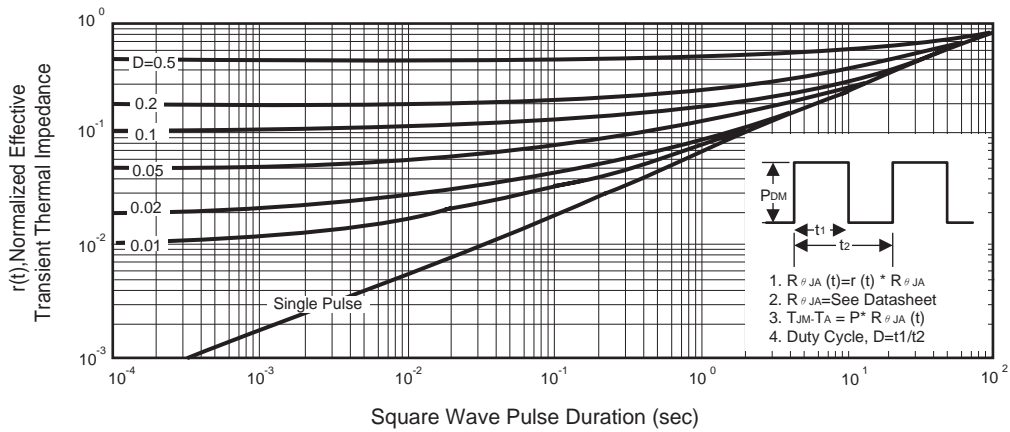


Figure 13. Normalized Thermal Transient Impedance Curve