

CEF04N6

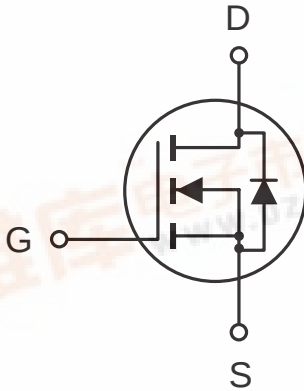
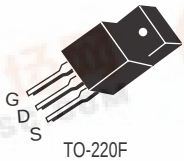


Feb. 2003

N-Channel Logic Level Enhancement Mode Field Effect Transistor

FEATURES

- 600V , 2.5A , $R_{DS(ON)}=2.5\Omega$ @ $V_{GS}=10V$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- TO-220F full-pak for through hole



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	VDS	600	V
Gate-Source Voltage	VGS	±30	V
Drain Current-Continuous -Pulsed	ID	2.5	A
	IDM	10	A
Drain-Source Diode Forward Current	IS	2.5	A
Maximum Power Dissipation @Tc=25°C Derate above 25°C	PD	35	W
		0.28	W/°C
Operating and Storage Temperature Range	TJ, TSTG	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.6	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	65	°C/W



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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE AVALANCHE RATING^a						
Single Pulse Drain-Source Avalanche Energy	E _{AS}	V _{DD} =50V, L=27mH R _G =9.1Ω		500		mJ
Maximum Drain-Source Avalanche Current	I _{AS}			4		A
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	I _{GSS}	V _{GS} = ±30V, V _{DS} = 0V			±100	nA
ON CHARACTERISTICS^a						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2		4	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D = 2A		2.2	2.5	Ω
On-State Drain Current	I _{D(ON)}	V _{GS} = 10V, V _{DS} = 10V	4			A
Forward Transconductance	g _{FS}	V _{DS} = 40V, I _D = 2A		2.8		S
SWITCHING CHARACTERISTICS^b						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =300V, I _D = 4A, V _{GS} = 10V R _{GEN} =25Ω		25	50	ns
Rise Time	t _r			65	120	ns
Turn-Off Delay Time	t _{D(OFF)}			75	150	ns
Fall Time	t _f			65	120	ns
Total Gate Charge	Q _g	V _{DS} =480V, I _D = 4A, V _{GS} =10V		24	31	nC
Gate-Source Charge	Q _{gs}			4		nC
Gate-Drain Charge	Q _{gd}			11		nC

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DYNAMIC CHARACTERISTICS ^b						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} = 0V f =1.0MHz		730		pF
Output Capacitance	C _{OSS}			85		pF
Reverse Transfer Capacitance	C _{RSS}			20		pF
DRAIN-SOURCE DIODE CHARACTERISTICS ^a						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S =2.5A			1.6	V

Notes

a. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2\%$.

b. Guaranteed by design, not subject to production testing.

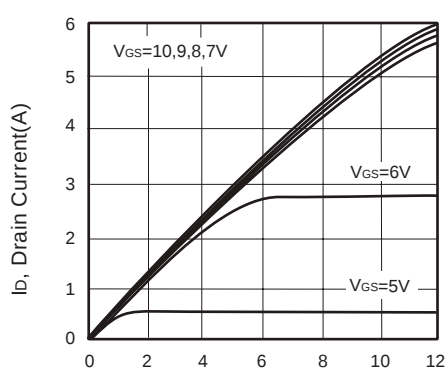


Figure 1. Output Characteristics

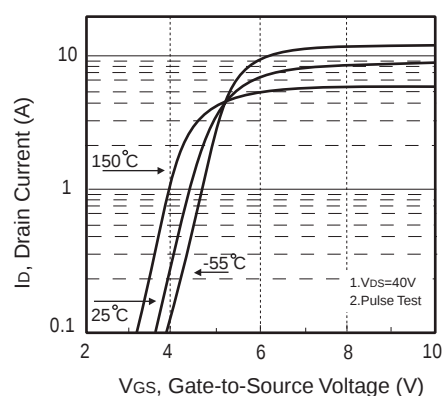


Figure 2. Transfer Characteristics

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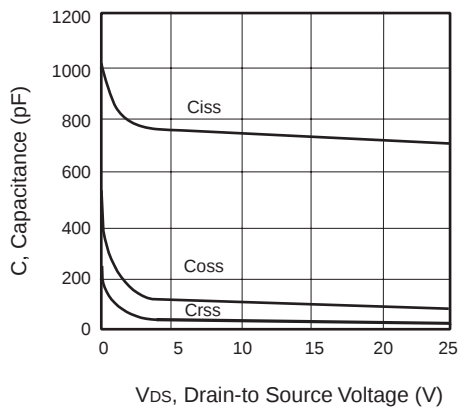


Figure 3. Capacitance

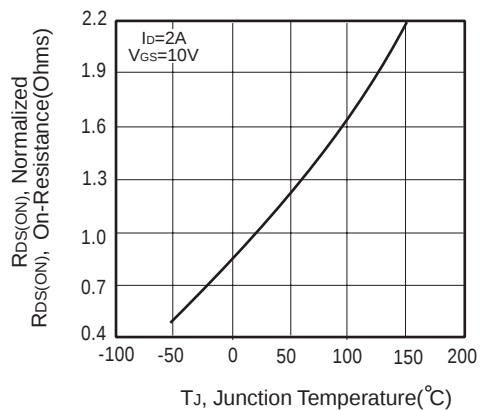


Figure 4. On-Resistance Variation with Temperature

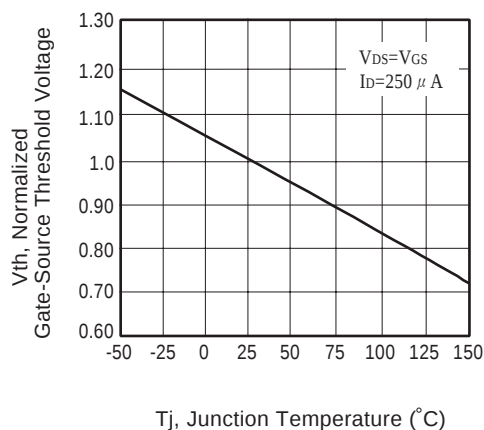


Figure 5. Gate Threshold Variation with Temperature

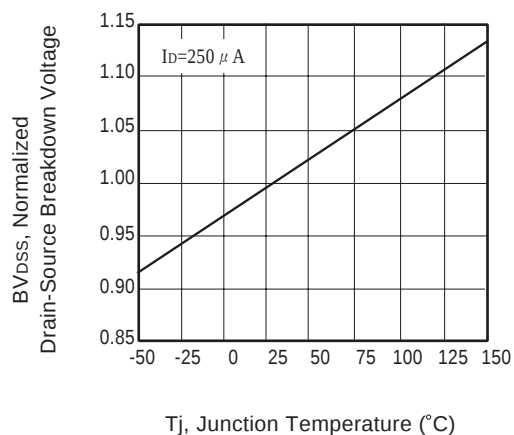


Figure 6. Breakdown Voltage Variation with Temperature

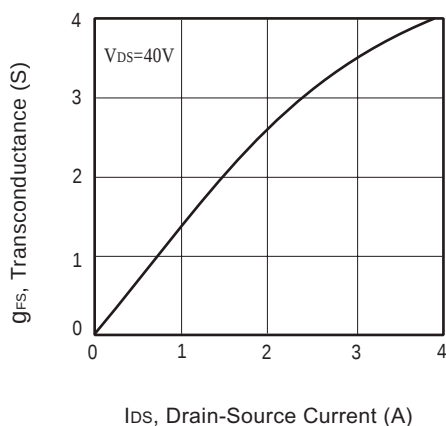


Figure 7. Transconductance Variation with Drain Current

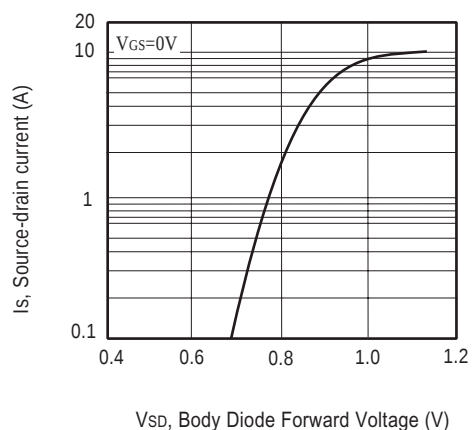


Figure 8. Body Diode Forward Voltage Variation with Source Current

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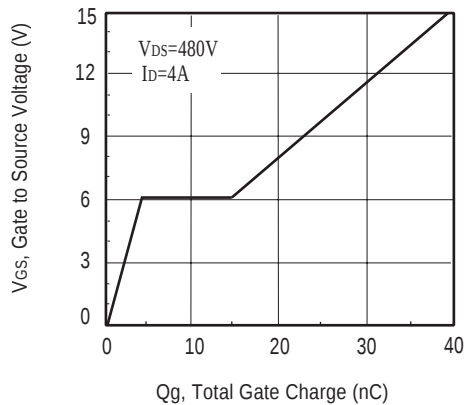


Figure 9. Gate Charge

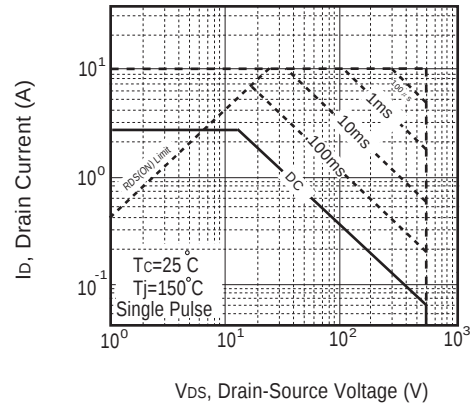


Figure 10. Maximum Safe Operating Area

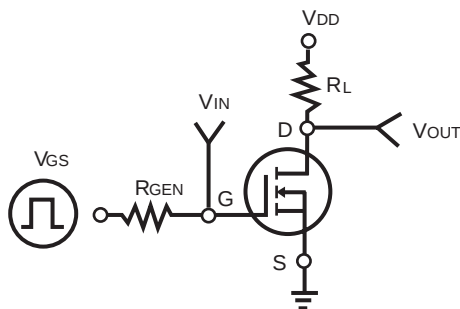


Figure 11. Switching Test Circuit

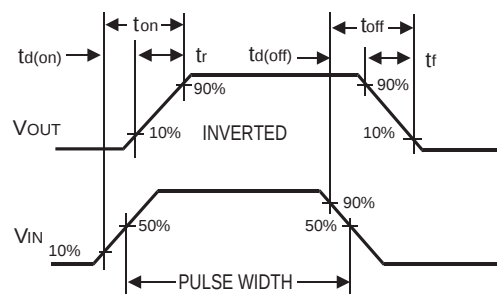


Figure 12. Switching Waveforms

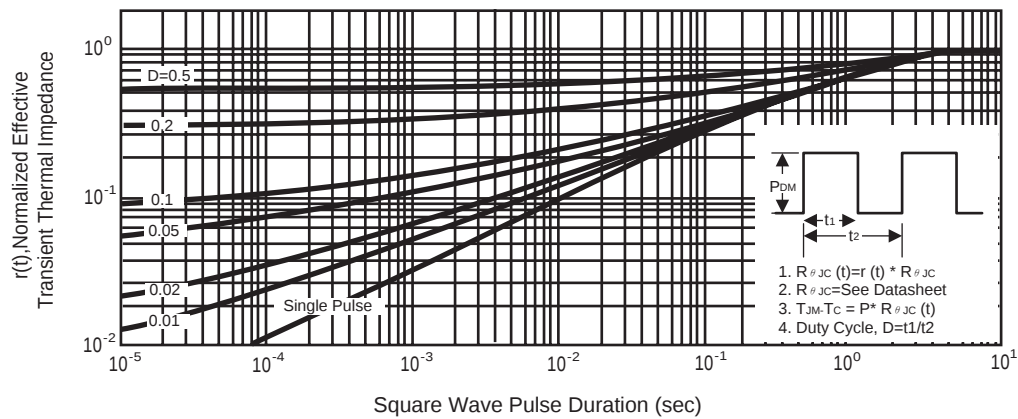


Figure 13. Normalized Thermal Transient Impedance Curve