

CEK7000A

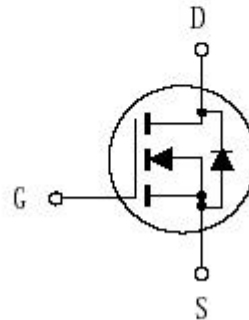
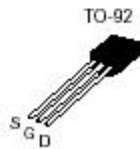


March 1998

N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- ◆ 60V , 0.4A , $R_{DS(on)}=2\ \Omega$ @ $V_{GS}=10V$,
 $R_{DS(on)}=3\ \Omega$ @ $V_{GS}=5V$.
- ◆ High dense cell design for low $R_{DS(on)}$.
- ◆ Rugged and reliable.
- ◆ TO-92 Package.



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ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ^a @ $T_J=125^\circ\text{C}$ -Pulsed ^b	I_D	400	mA
	I_{DM}	2000	mA
Drain-Source Diode Forward Current ^a	I_S	400	mA
Maximum Power Dissipation ^a	P_D	400	mW
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	$R_{\theta JA}$	313	$^\circ\text{C}/\text{W}$
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ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0V, I_D = 10\mu A$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$			1	μA
Gate-Body Leakage	I_{SS}	$V_{DS} = \pm 20V, V_{GS} = 0V$			± 100	nA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	2.0	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 500mA$		1.4	2.0	Ω
		$V_{GS} = 5V, I_D = 75mA$		2.3	3.0	Ω
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 7V, V_{GS} = 10V$	500			mA
Forward Transconductance	g_{FS}	$V_{DS} = 7V, I_D = 200mA$	80	190		mS
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C_{ISS}	$V_{DS} = 25V, V_{GS} = 0V$ $f = 1.0MHz$		37		pF
Output Capacitance	C_{OSS}			28		pF
Reverse Transfer Capacitance	C_{RSS}			12		pF
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	$t_{D(on)}$	$V_{DD} = 30V,$ $I_D = 200mA,$ $V_{GS(on)} = 10V,$ $R_{GS(on)} = 25\Omega$		25	30	ns
Rise Time	t_r			15	20	ns
Turn-Off Delay Time	$t_{D(off)}$			75	100	ns
Fall Time	t_f			10	20	ns

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 11.5mA$		0.7	1.5	V

Notes

- a. Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.
- b. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2\%$.
- c. Guaranteed by design, not subject to production testing.

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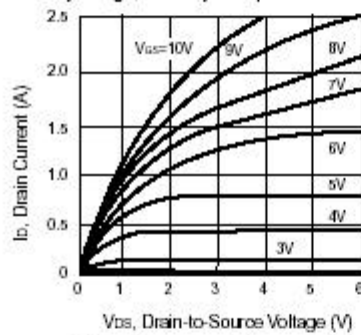


Figure 1. Output Characteristics

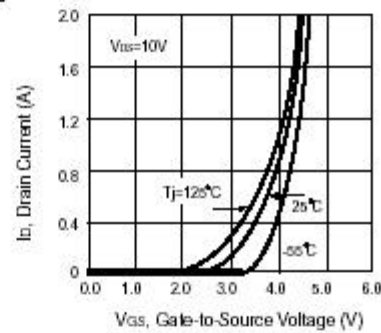


Figure 2. Transfer Characteristics

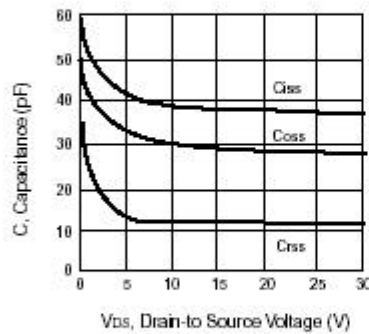


Figure 3. Capacitance

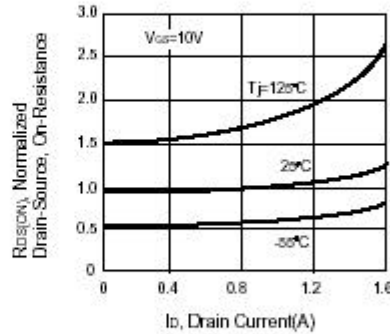


Figure 4. On-Resistance Variation with Drain Current and Temperature

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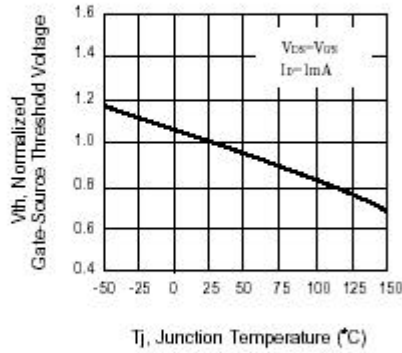


Figure 5. Gate Threshold Voltage with Temperature

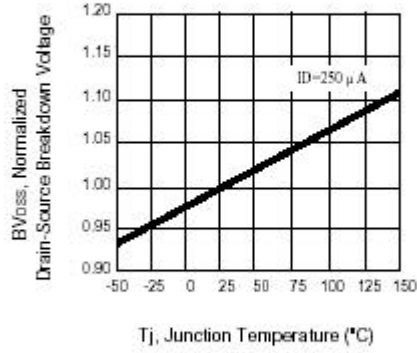


Figure 6. Breakdown Voltage Variation with Temperature

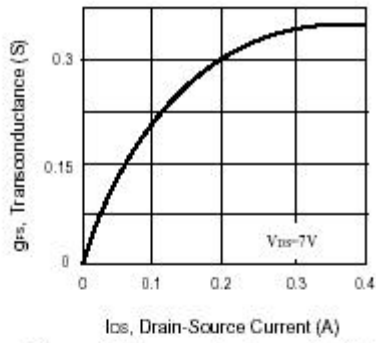


Figure 7. Transconductance Variation with Drain Current

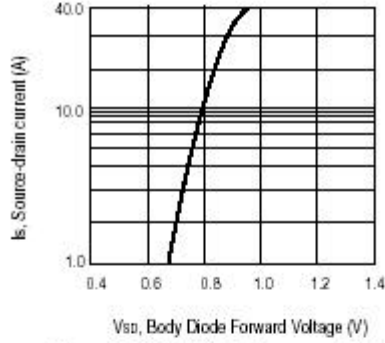


Figure 8. Body Diode Forward Voltage Variation with Source Current

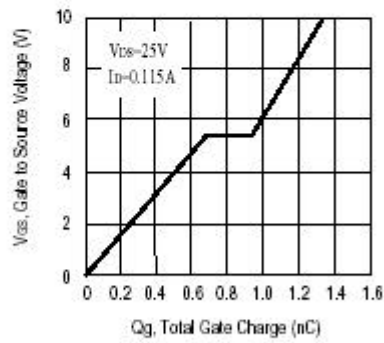


Figure 9. Gate Charge

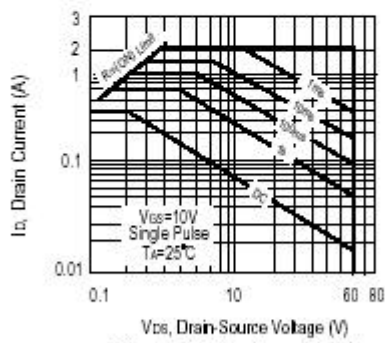


Figure 10. Maximum Safe Operating Area

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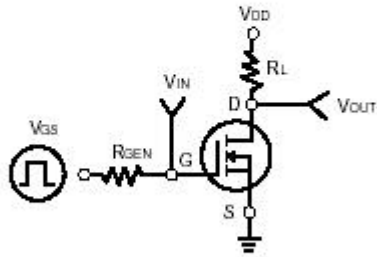


Figure 11. Switching Test Circuit

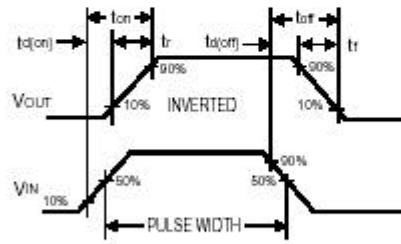


Figure 12. Switching Waveforms

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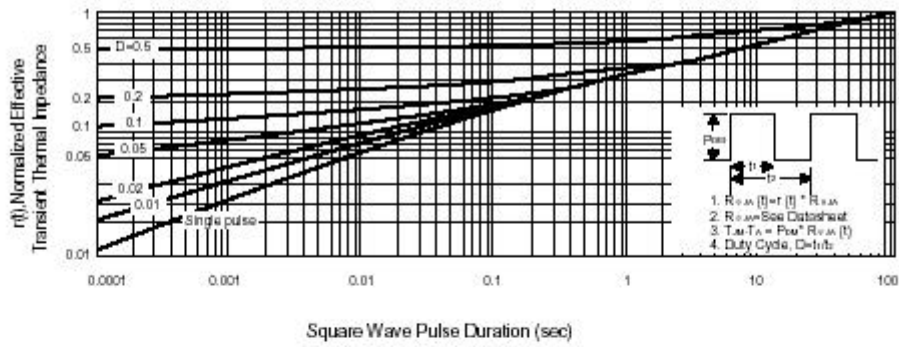


Figure 13. Normalized Thermal Transient Impedance Curve

