



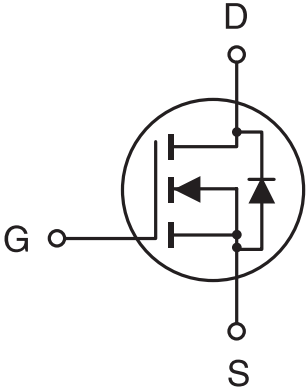
CET453N

March 1998

N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- 30V , 8A , $R_{DS(ON)}=28m\Omega$ @ $V_{GS}=10V$.
 $R_{DS(ON)}=42m\Omega$ @ $V_{GS}=4.5V$.
- High dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- SOT-223 Package.



SOT-223



SOT-223 (J23Z)

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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}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous ^a @ $T_J=125^\circ\text{C}$ -Pulsed ^b	I _D	±8	A
	I _{DM}	±15	A
Drain-Source Diode Forward Current ^a	I _S	2.3	A
Maximum Power Dissipation ^a	P _D	3	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-65 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R _{θJA}	42	°C/W
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ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

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} =24V, V _{GS} =0V			1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D = 250μA	1	1.6	3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =8A		22	28	mΩ
		V _{GS} =4.5V, I _D =6.7A		33	42	mΩ
On-State Drain Current	I _{D(ON)}	V _{DS} =5V, V _{GS} =10V	15			A
Forward Transconductance	g _{FS}	V _{DS} =15V, I _D =8A	6	14		S
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C _{ISS}	V _{DS} = 15V, V _{GS} = 0V f = 1.0MHz		707	920	pF
Output Capacitance	C _{OSS}			355	460	pF
Reverse Transfer Capacitance	C _{RSS}			89	120	pF
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =25V, I _D = 1A, V _{GEN} =10V, R _{GEN} = 6Ω		10	15	ns
Rise Time	t _r			20	35	ns
Turn-Off Delay Time	t _{D(OFF)}			40	50	ns
Fall time	t _f			35	50	ns
Total Gate Charge	Q _g	V _{DS} =15V, I _D = 8A, V _{GS} =10V		22	35	nC
Gate-Source Charge	Q _{gs}			4		nC
Gate-Drain Charge	Q _{gd}			3		nC

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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}	$V_{GS} = 0V, I_S = 8A$		0.8	1.3	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.

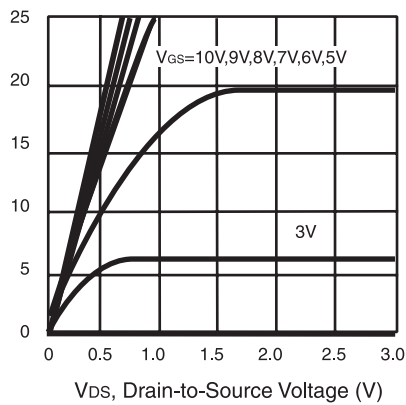


Figure 1. Output Characteristics

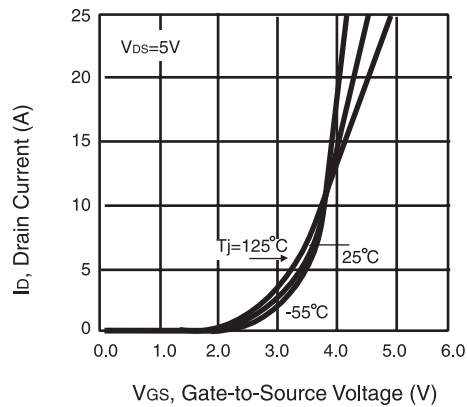


Figure 2. Transfer Characteristics

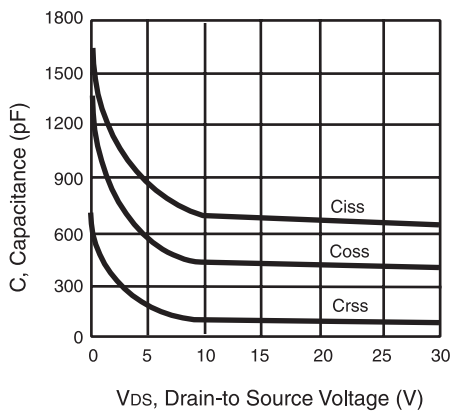


Figure 3. Capacitance

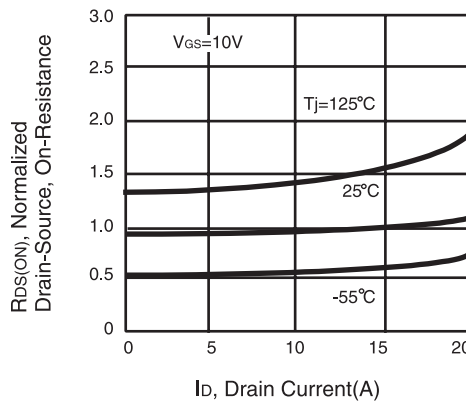


Figure 4. On-Resistance Variation with Drain Current and Temperature

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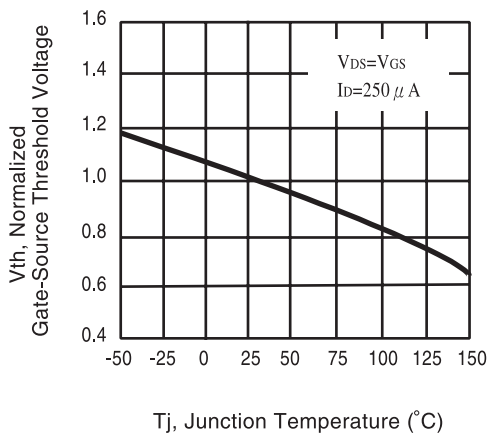


Figure 5. Gate Threshold Variation with Temperature

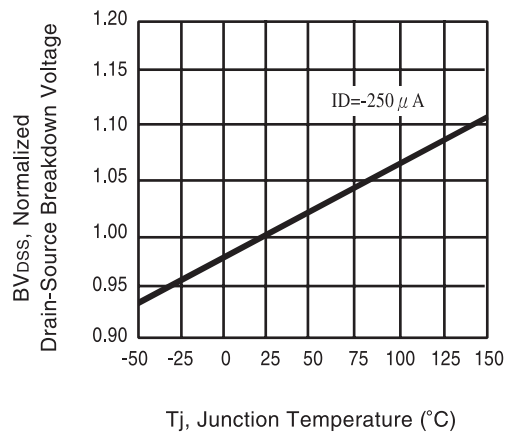


Figure 6. Breakdown Voltage Variation with Temperature

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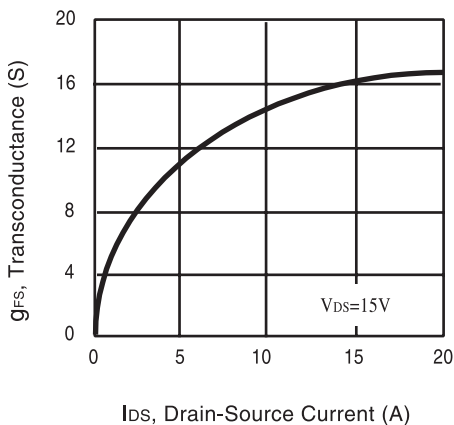


Figure 7. Transconductance Variation with Drain Current

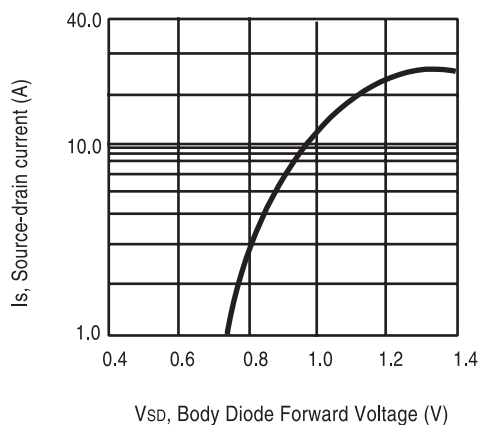


Figure 8. Body Diode Forward Voltage Variation with Source Current

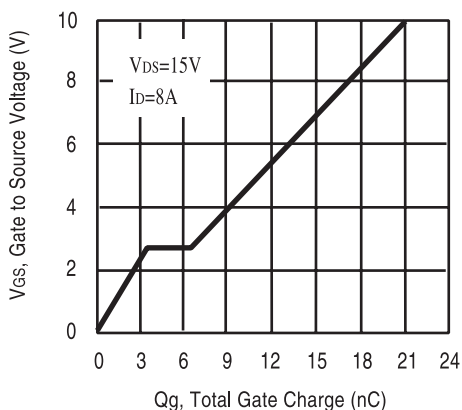


Figure 9. Gate Charge

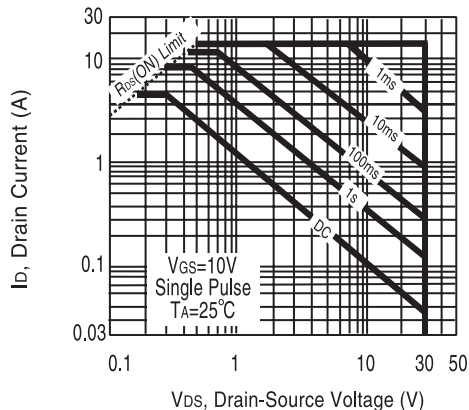


Figure 10. Maximum Safe Operating Area

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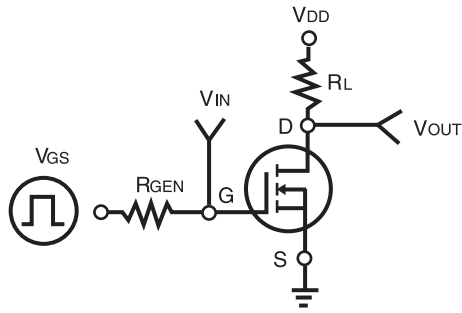


Figure 11. Switching Test Circuit

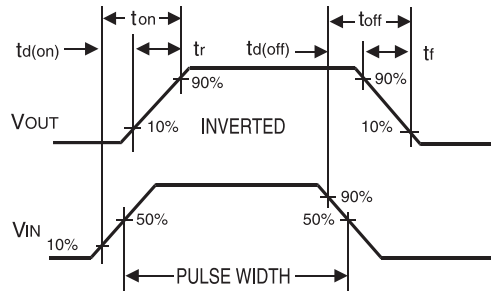


Figure 12. Switching Waveforms

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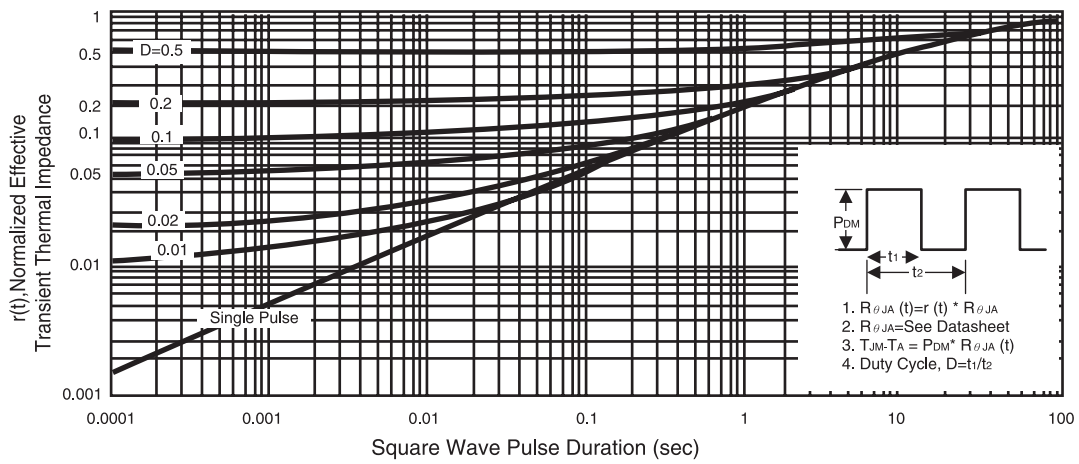


Figure 13. Normalized Thermal Transient Impedance Curve



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