SamHop Microelectronics Corp.

2N7002E

August , 2002

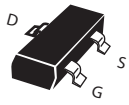
N-Channel Enhancement Mode Field Effect Transistor

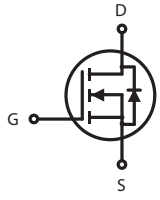
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (Ω) Max
60V	0. 25A	3.0 @ V_{GS} = 10V
		4.0 @ V_{GS} = 5V

FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- SOT-23 package.

SOT-23





ABSOLUTE MAXIMUM RATINGS (T_A=25 °C unless otherwise

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℃	I_D	250	mA
-Pulsed [b]	I_{DM}	1.0	A
Drain-Source Diode Forward Current [a]	I_S	250	mA
Maximum Power Dissipation [a]	P_D	200	mW
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient [a]	R_{thJA}	625	°C/W

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

Parameter	Symbol	Condition	Min	Typ[C]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=10uA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	uA
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=250uA	1	2.0	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=250mA			3.0	ohm
		V_{GS}=5V, I_D=50mA			4.0	ohm
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			mS
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}=25V, V_{GS}=0V f=1.0MHz		19	50	pF
Output Capacitance	C_{OSS}			10	25	pF
Reverse Transfer Capacitance	C_{RSS}			3	5	pF
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=30V, I_D=100mA, V_{GS}=10V, R_{GEN}=10 ohm		7.5	20	ns
Rise Time	t_r			6		ns
Turn-Off Delay Time	$t_{D(OFF)}$			7.5	20	ns
Fall Time	t_f			3		ns

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

Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is = 115mA		0.76	1.5	V

Notes

a.Surface Mounted on FR4 Board, t≤10sec.

b.Pulse Test:Pulse Width≤300 us, Duty Cycle ≤2%.

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

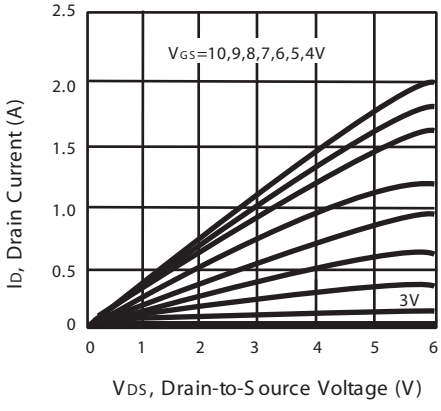

Figure 1. Output Characteristics

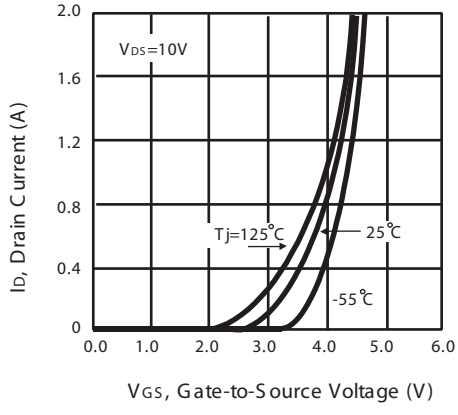

Figure 2. Transfer Characteristics

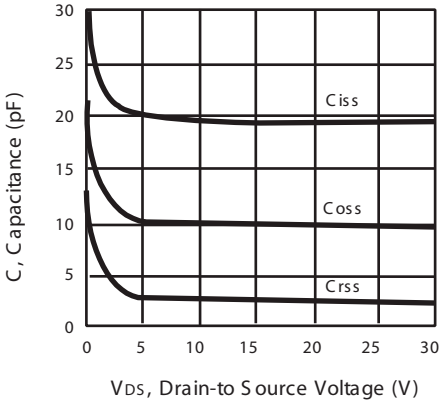

Figure 3. Capacitance

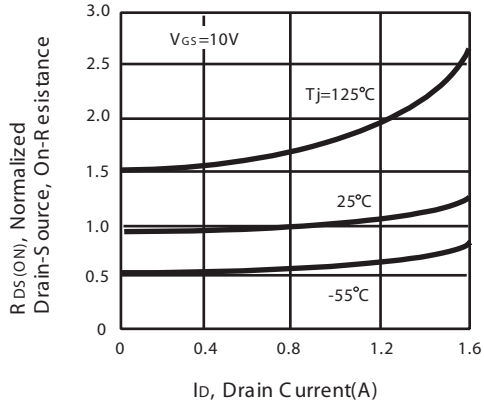

Figure 4. On-Resistance Variation with Drain Current and Temperature

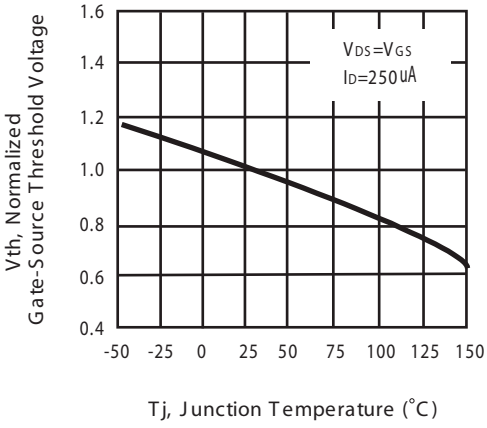

Figure 5. Gate Threshold Variation with Temperature

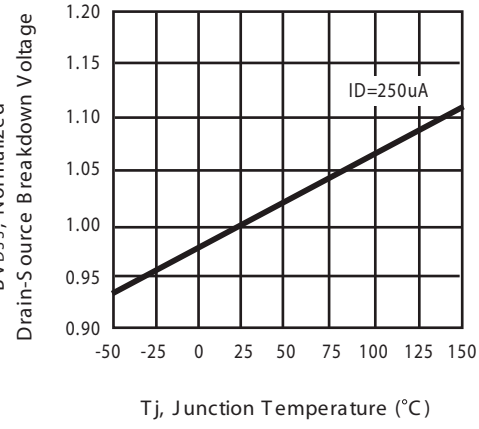

Figure 6. Breakdown Voltage Variation with Temperature

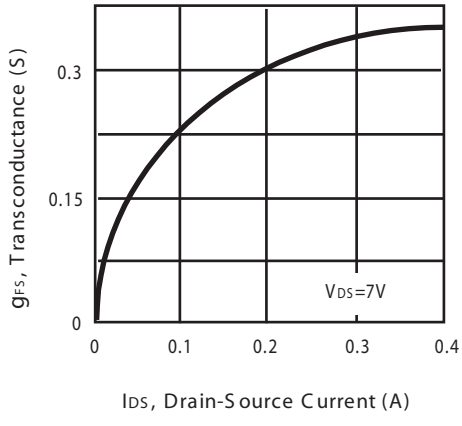

Figure 7. Transconductance Variation with Drain Current

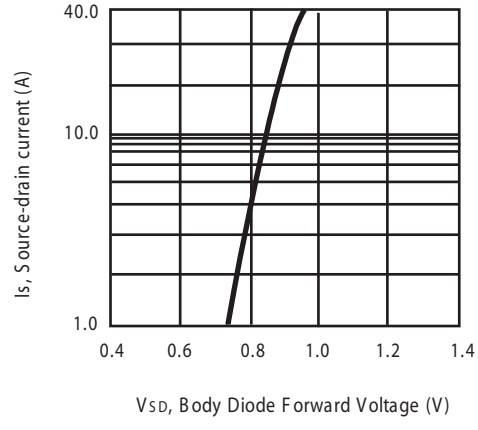

Figure 8. Body Diode Forward Voltage Variation with Source Current

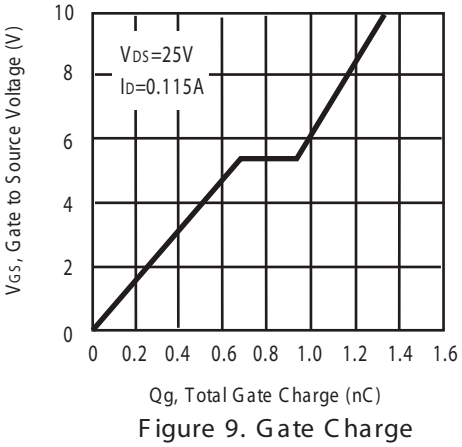

Figure 9. Gate Charge

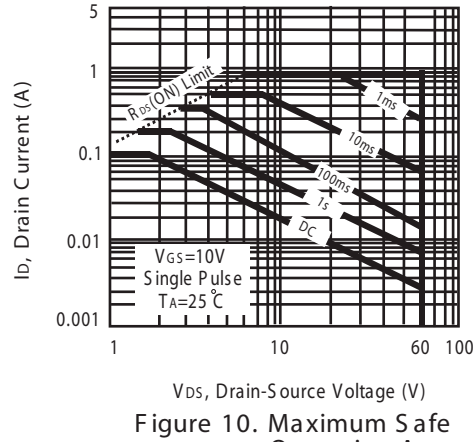

Figure 10. Maximum Safe Operating Area

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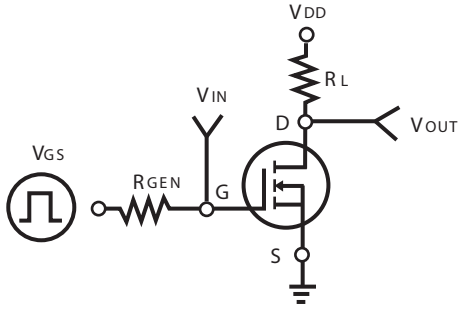

Figure 11. Switching Test Circuit

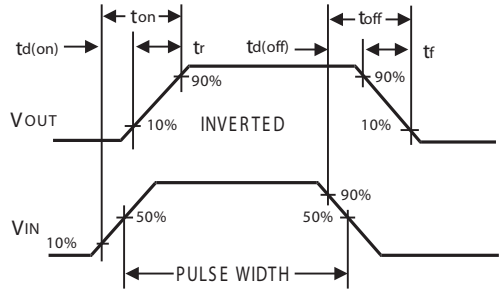

Figure 12. Switching Waveforms

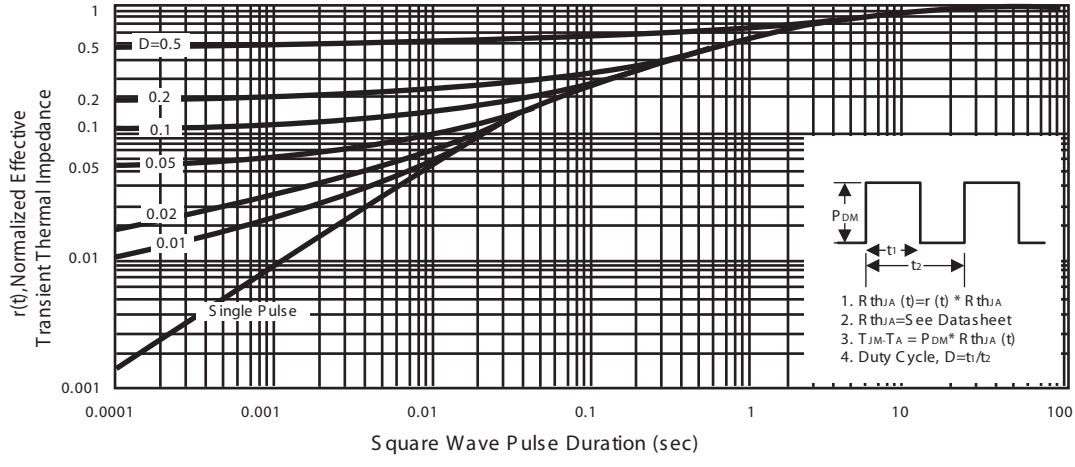

Figure 13. Normalized Thermal Transient Impedance Curve