SDU/D30N03L

SamHop Microelectronics Corp.

JULY, 2002

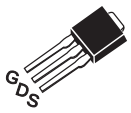
N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mW) TYP
30V	30A	11.5 @ V_{GS} = 10V
		17 @ V_{GS} = 4.5V

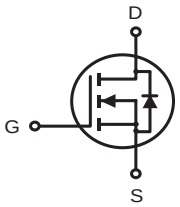
FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- TO-252 and TO-251 Package.

SDU SERIES
TO-252AA(D-PAK)



SDD SERIES
TO-251(I-PAK)



ABSOLUTE MAXIMUM RATINGS (T_C=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 @TJ=125°C	I_D	30	A
-Pulsed [a]	I_{DM}	90	A
Drain-Source Diode Forward Current	I_S	30	A
Maximum Power Dissipation @Tc=25°C	P_D	50	W
Derate above 25°C		0.3	W/°C
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 175	°C
THERMAL CHARACTERISTICS			
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	°C/W

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ELECTRICAL CHARACTERISTICS (T_C=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 = 250uA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V			10	uA
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 = 250uA	1	1.5	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D =15A		11.5	14	m ohm
		V_{GS} = 4.5V, I_D = 12A		17	21	m ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	40			A
Forward Transconductance	g_{FS}	V_{DS} = 10V, I_D = 20A	30			S
DYNAMIC CHARACTERISTICS[b]						
Input Capacitance	C_{ISS}	V_{DD} =15V, V_{GS} = 0V f = 1.0MHz		1200		pF
Output Capacitance	C_{OSS}			530		pF
Reverse Transfer Capacitance	C_{RSS}			150		pF
SWITCHING CHARACTERISTICS[b]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} = 15V, I_D =1A, V_{GS} = 10V, R_{GEN} = 6 ohm		5		ns
Rise Time	t_r			65		ns
Turn-Off Delay Time	$t_{D(OFF)}$			67		ns
Fall time	t_f			90		ns
Total Gate Charge	Q_g	V_{DS} = 15V, I_D = 15A, V_{GS} =10V		34.4		nC
Gate-Source Charge	Q_{gs}			5.1		nC
Gate-Drain Charge	Q_{gd}			7.7		nC

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [a]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is = 25A			1.3	V

Notes

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

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

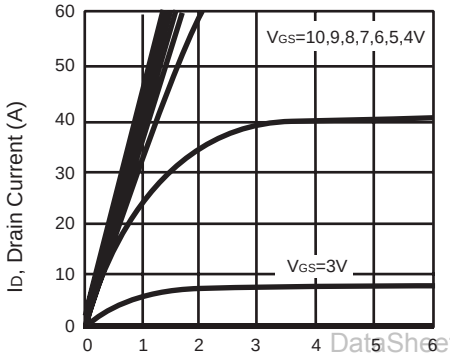

Figure 1. Output Characteristics

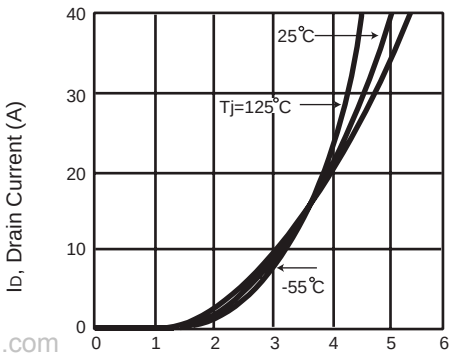

Figure 2. Transfer Characteristics

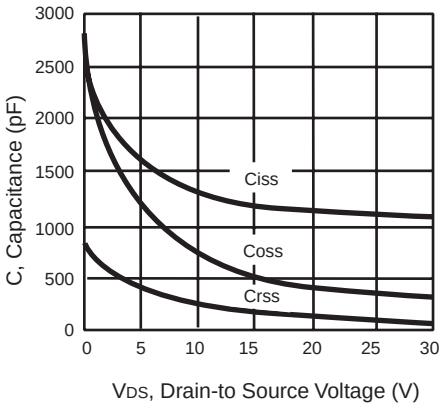

Figure 3. Capacitance

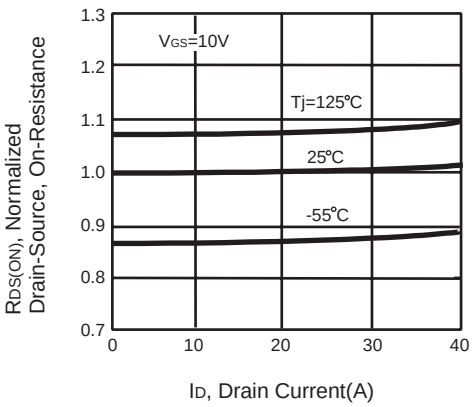

Figure 4. On-Resistance Variation with Drain Current and Temperature

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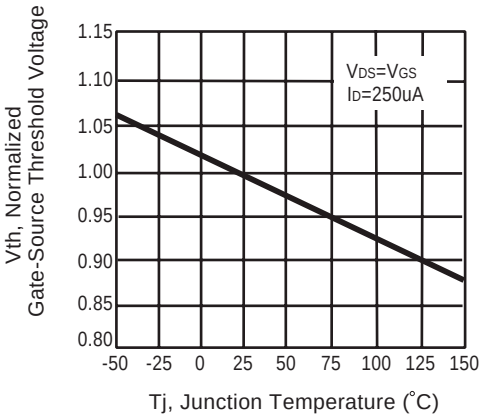

Figure 5. Gate Threshold Variation with Temperature

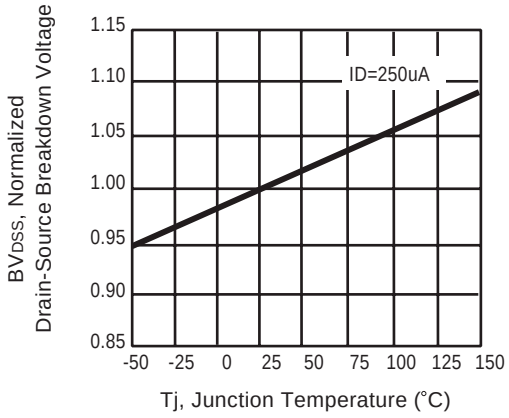

Figure 6. Breakdown Voltage Variation with Temperature

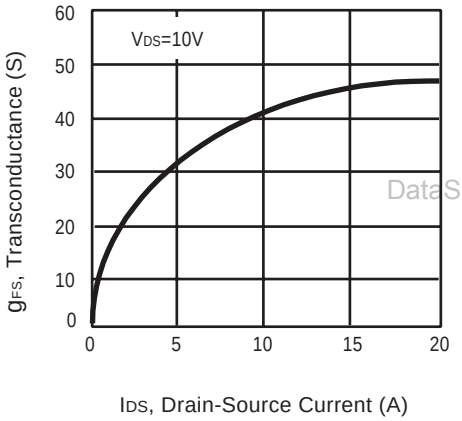

Figure 7. Transconductance Variation with Drain Current

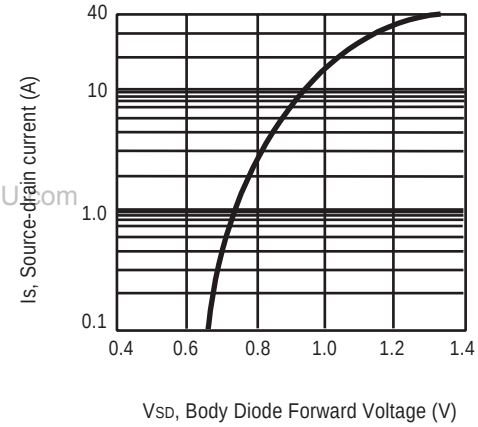

Figure 8. Body Diode Forward Voltage Variation with Source Current

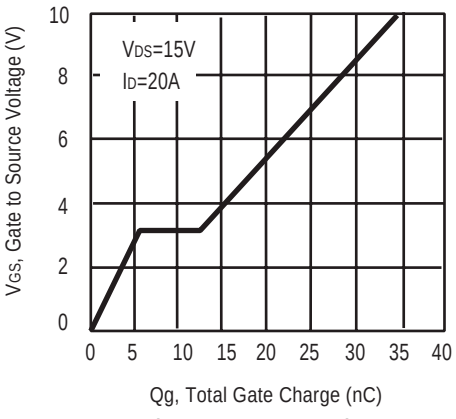

Figure 9. Gate Charge

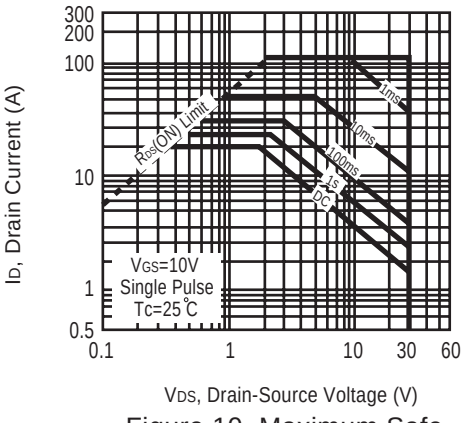

Figure 10. Maximum Safe Operating Area

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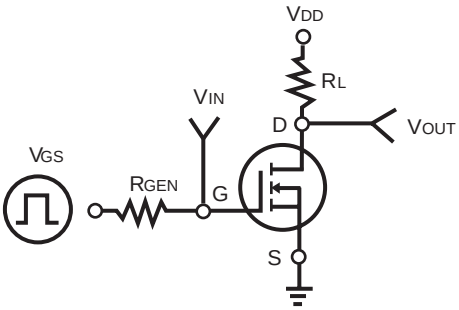

Figure 11. Switching Test Circuit

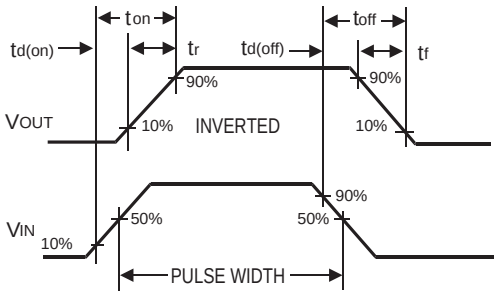

Figure 12. Switching Waveforms

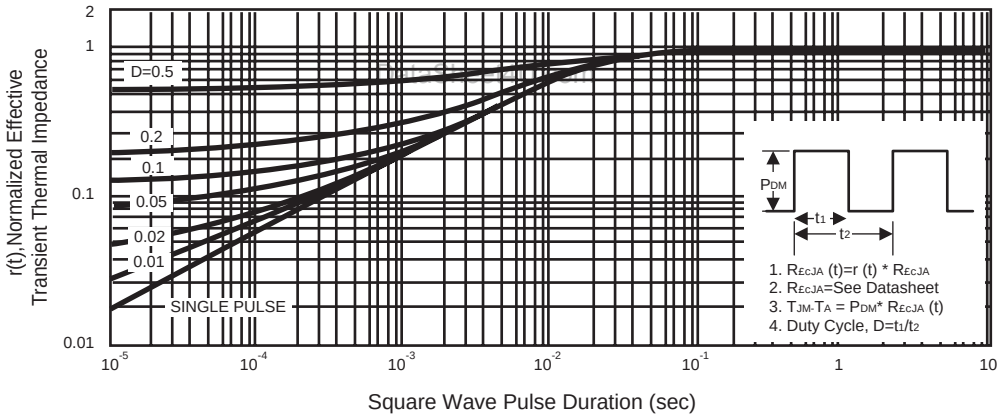

Figure 13. Normalized Thermal Transient Impedance Curve