



SamHop Microelectronics Corp.

July 05,2006

STU/D420S

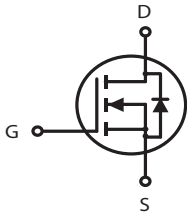
N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

VDSS	ID	RDS(ON) (mΩ) Max
40V	24A	24 @ VGS = 10V
		30 @ VGS = 4.5V

FEATURES

- Super high dense cell design for low RDS(ON).
- Rugged and reliable.
- TO-252 and TO-251 Package.



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	VDS	40	V
Gate-Source Voltage	VGS	±20	V
Drain Current-Continuous ^a @ Tc=25°C -Pulsed ^b	ID	24	A
	IDM	75	A
Drain-Source Diode Forward Current	IS	8	A
Maximum Power Dissipation @ Tc=25°C	PD	50	W
Operating and Storage Temperature Range	TJ, TSTG	-55 to 175	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	RθJC	3	°C/W
Thermal Resistance, Junction-to-Ambient	RθJA	50	°C/W

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ELECTRICAL CHARACTERISTICS (T_C=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 =250uA	40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =32V, V _{GS} =0V			1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±10	uA
ON CHARACTERISTICS ^a						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D = 250uA	1	1.9	3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A		17	24	m ohm
		V _{GS} =4.5V, I _D = 8A		23.5	30	m ohm
On-State Drain Current	I _{D(ON)}	V _{DS} = 10V, V _{GS} = 10V	30			A
Forward Transconductance	g _{FS}	V _{DS} = 10V, I _D = 10A		16		S
DYNAMIC CHARACTERISTICS ^b						
Input Capacitance	C _{ISS}	V _{DS} =15V, V _{GS} = 0V f =1.0MHz		750		pF
Output Capacitance	C _{OSS}			110		pF
Reverse Transfer Capacitance	C _{RSS}			65		pF
Gate resistance	R _g	V _{GS} =0V, V _{DS} = 0V, f=1.0MHz		3		ohm
SWITCHING CHARACTERISTICS ^b						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 15V I _D = 1 A V _{GS} = 10V R _{GEN} = 3 ohm		13		ns
Rise Time	t _r			10		ns
Turn-Off Delay Time	t _{D(OFF)}			37		ns
Fall Time	t _f			12		ns
Total Gate Charge	Q _g	V _{DS} =20V, I _D =10A, V _{GS} =10V		15		nC
		V _{DS} =20V, I _D =10A, V _{GS} =4.5V		7		nC
Gate-Source Charge	Q _{gs}	V _{DS} =20V, I _D = 10A V _{GS} =10V		2.5		nC
Gate-Drain Charge	Q _{gd}			4		nC

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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, I _S = 8A		0.84	1.3	V

Notes

- a.Pulse Test:Pulse Width ≤ 300us, Duty Cycle ≤ 2%.
- b.Guaranteed by design, not subject to production testing.

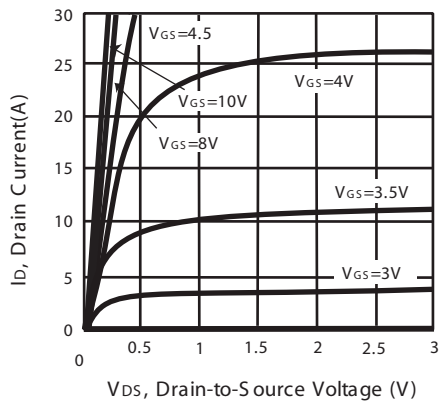


Figure 1. Output Characteristics

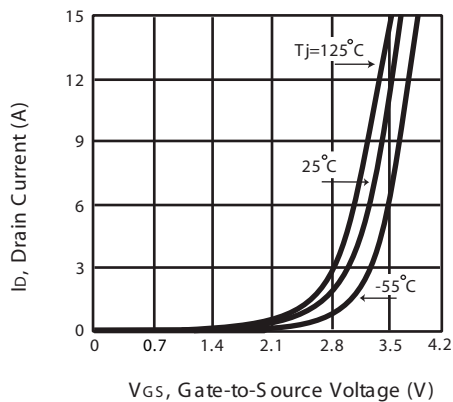


Figure 2. Transfer Characteristics

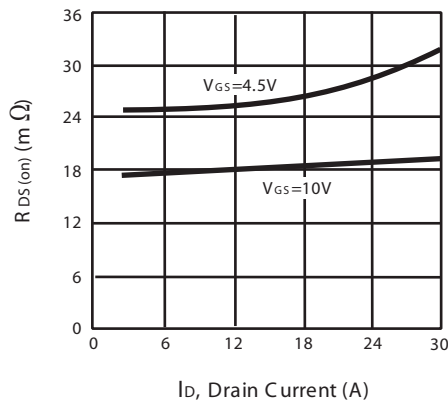


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

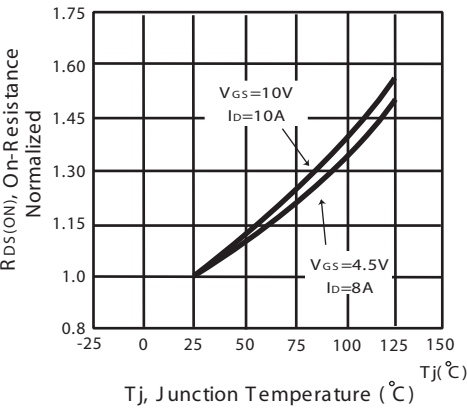


Figure 4. On-Resistance Variation with Drain Current and Temperature

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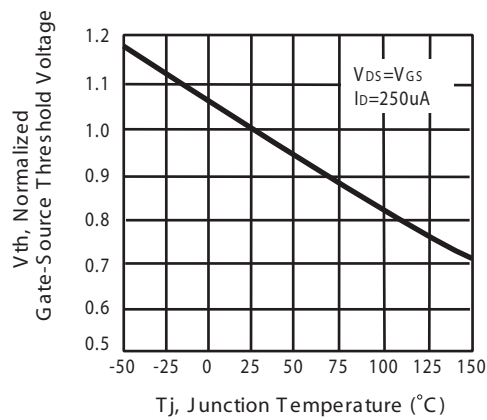


Figure 5. Gate Threshold Variation with Temperature

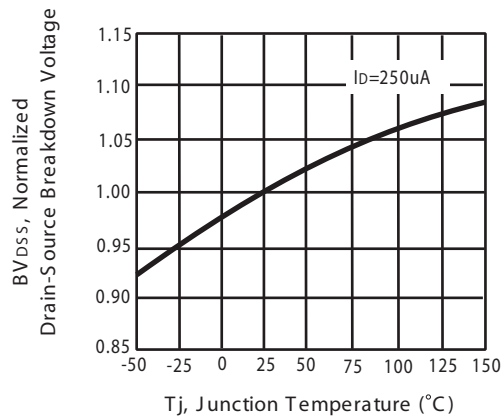


Figure 6. Breakdown Voltage Variation with Temperature

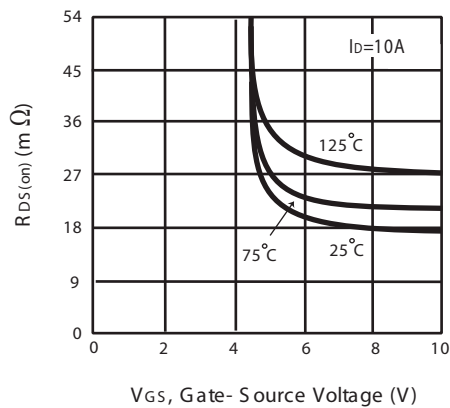


Figure 7. On-Resistance vs. Gate-Source Voltage

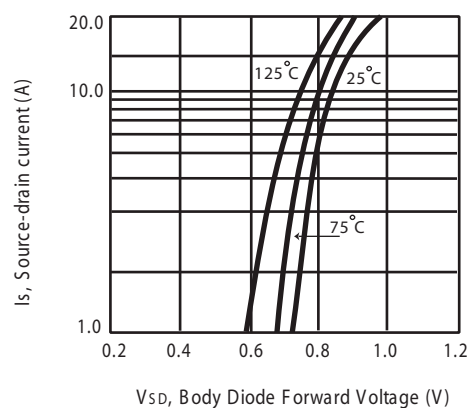


Figure 8. Body Diode Forward Voltage Variation with Source Current

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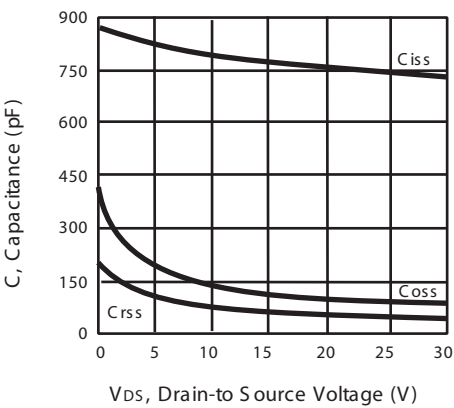


Figure 9. Capacitance

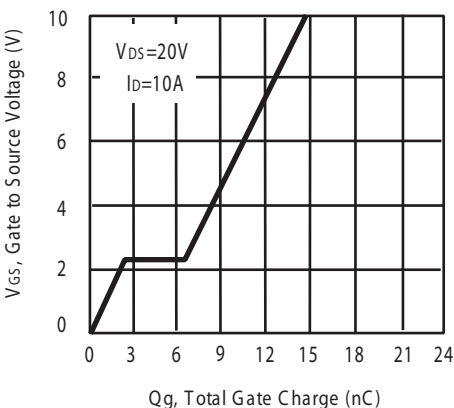


Figure 10. Gate Charge

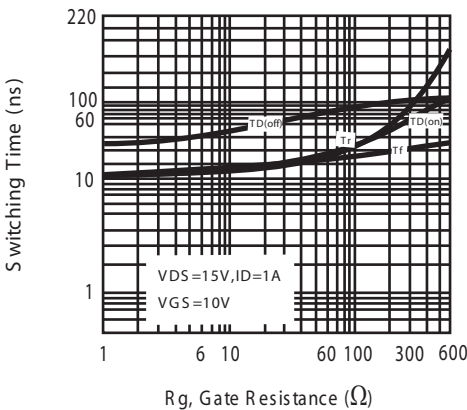


Figure 11. switching characteristics

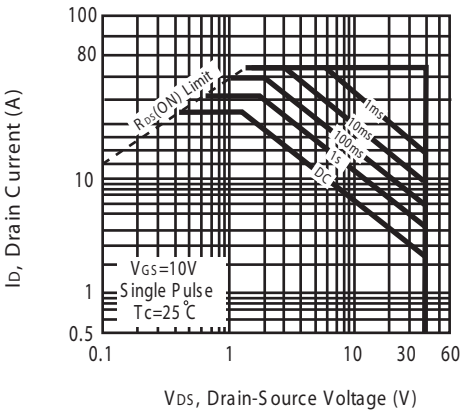


Figure 12. Maximum Safe Operating Area

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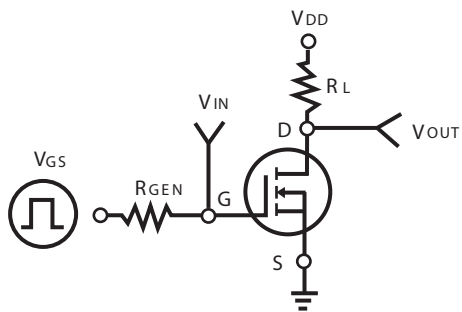


Figure 11. Switching Test Circuit

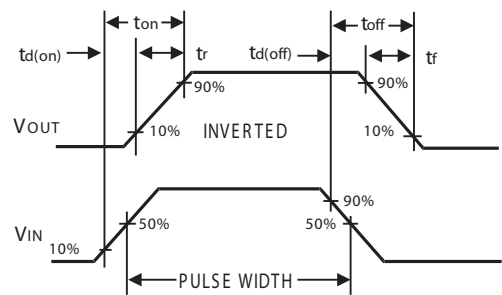


Figure 12. Switching Waveforms

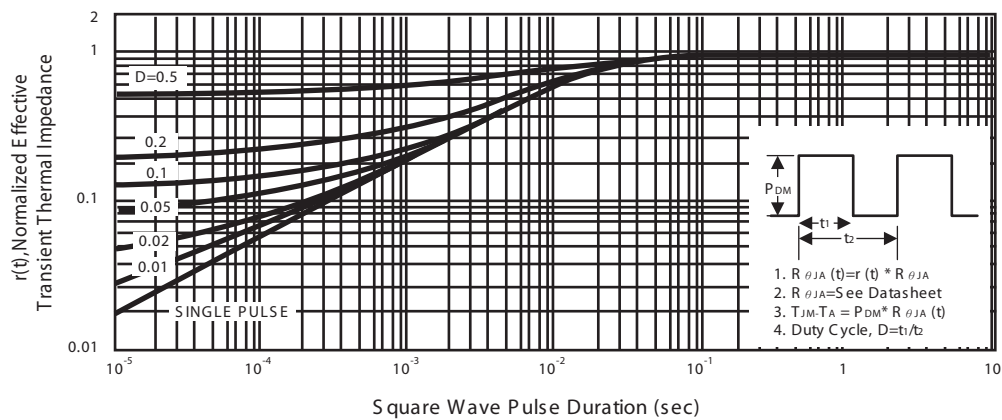


Figure 13. Normalized Thermal Transient Impedance Curve