

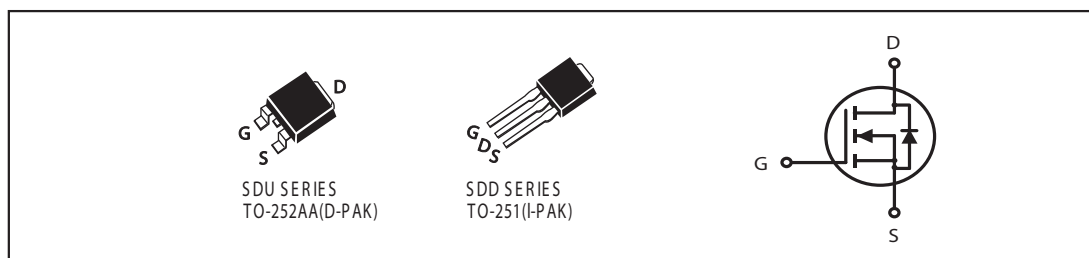
S DU/D50N03L

N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (m Ω) Max
30V	47A	8 @ V _{GS} = 10V
		12 @ V _{GS} = 4.5V

FEATURES

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



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 @ T _J =125°C -Pulsed ^a	I _D	47	A
	I _{DM}	117	A
Drain-Source Diode Forward Current	I _S	50	A
Maximum Power Dissipation @ T _C =25°C	P _D	50	W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to 175	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	R θ JC	3	°C/W
Thermal Resistance, Junction-to-Ambient	R θ JA	50	°C/W

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ELECTRICAL CHARACTERISTICS (Tc=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 =25A		7	8	m ohm
		V _{GS} = 4.5V, I _D = 20A		10	12	m ohm
On-State Drain Current	I _{D(ON)}	V _{DS} = 10V, V _{GS} = 10V	50			A
Forward Transconductance	g _{FS}	V _{DS} = 10V, I _D = 25A		25		S
DYNAMIC CHARACTERISTICS ^b						
Input Capacitance	C _{ISS}	V _{DD} =15V, V _{GS} = 0V f = 1.0MHz		1750		pF
Output Capacitance	C _{OSS}			950		pF
Reverse Transfer Capacitance	C _{RSS}			330		pF
SWITCHING CHARACTERISTICS ^b						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 15V, I _D =1A, V _{GS} = 10V, R _{GEN} = 6 ohm		72		ns
Rise Time	t _r			24		ns
Turn-Off Delay Time	t _{D(OFF)}			14		ns
Fall time	t _f			8		ns
Total Gate Charge	Q _g	V _{DS} = 10V, I _D = 50A,V _{GS} =10V		61.5		nC
		V _{DS} = 10V, I _D = 50A,V _{GS} =4.5V		30.2		nC
Gate-Source Charge	Q _{gs}	V _{DS} = 10V, I _D = 50A, V _{GS} =10V		10.3		nC
Gate-Drain Charge	Q _{gd}			9.7		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 = 25A			1.3	V

Notes

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

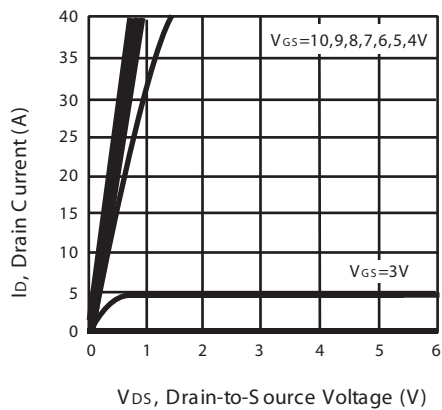


Figure 1. Output Characteristics

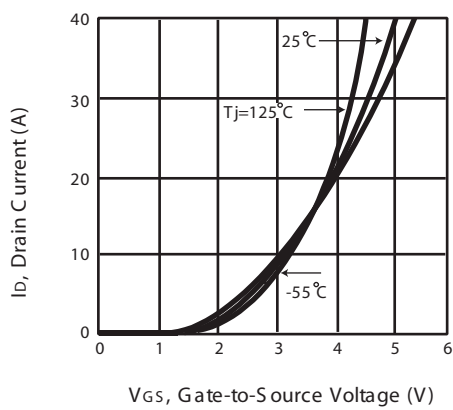


Figure 2. Transfer Characteristics

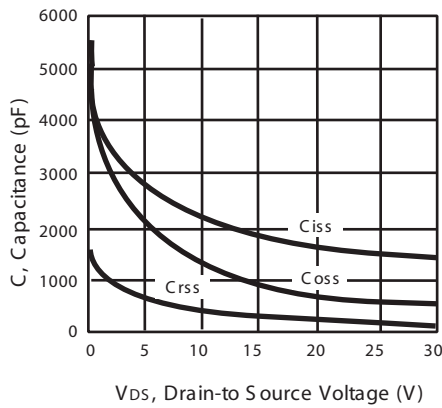


Figure 3. Capacitance

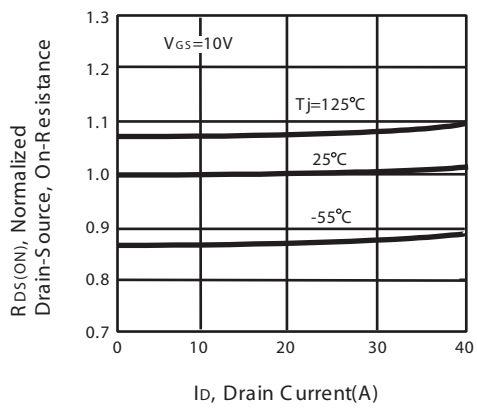


Figure 4. On-Resistance Variation with Drain Current and Temperature

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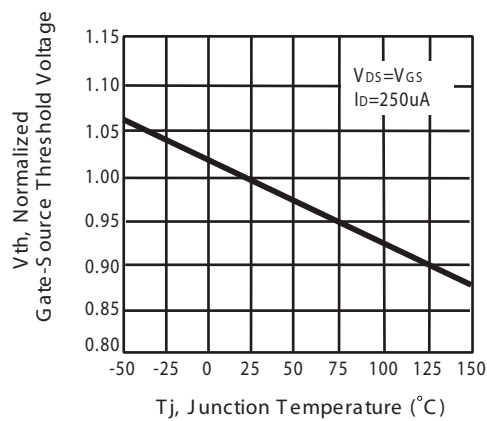


Figure 5. Gate Threshold Variation with Temperature

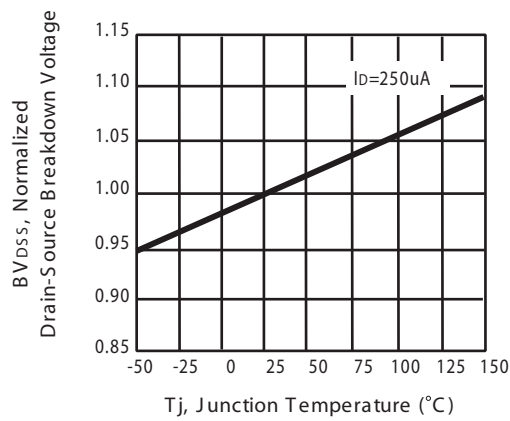


Figure 6. Breakdown Voltage Variation with Temperature

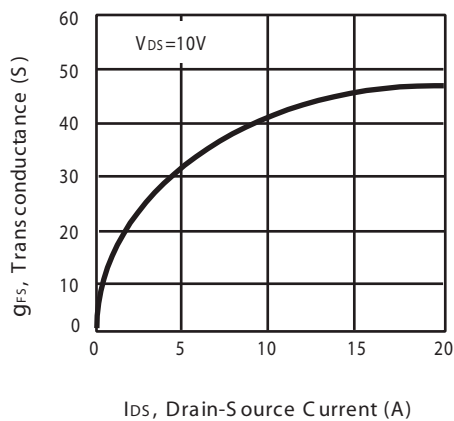


Figure 7. Transconductance Variation with Drain Current

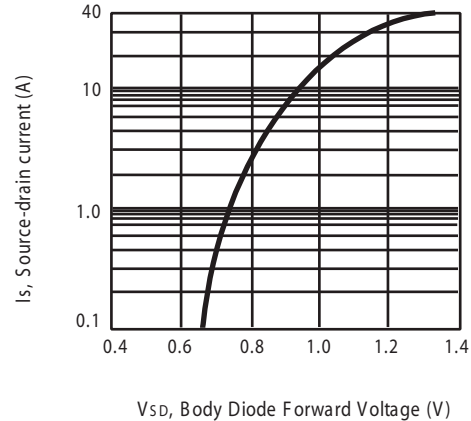


Figure 8. Body Diode Forward Voltage Variation with Source Current

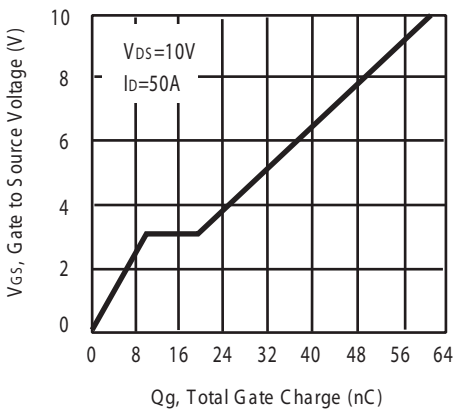


Figure 9. Gate Charge

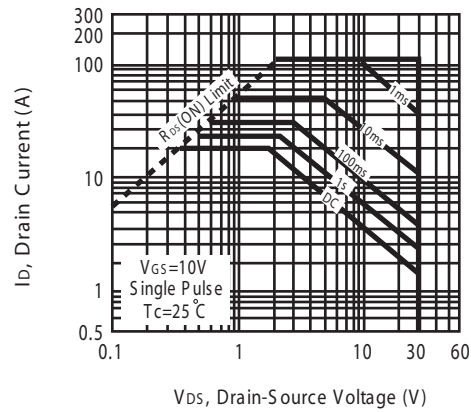


Figure 10. Maximum Safe Operating Area

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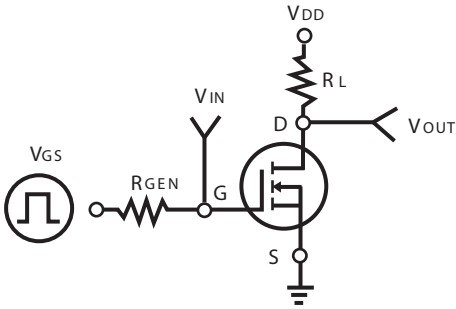


Figure 11. S switching Test Circuit

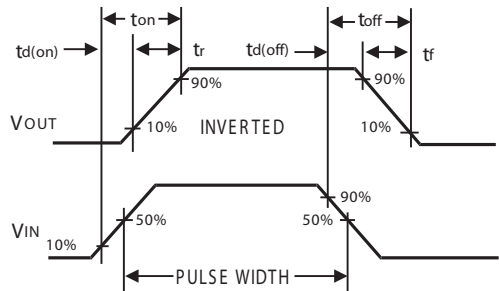


Figure 12. S switching Waveforms

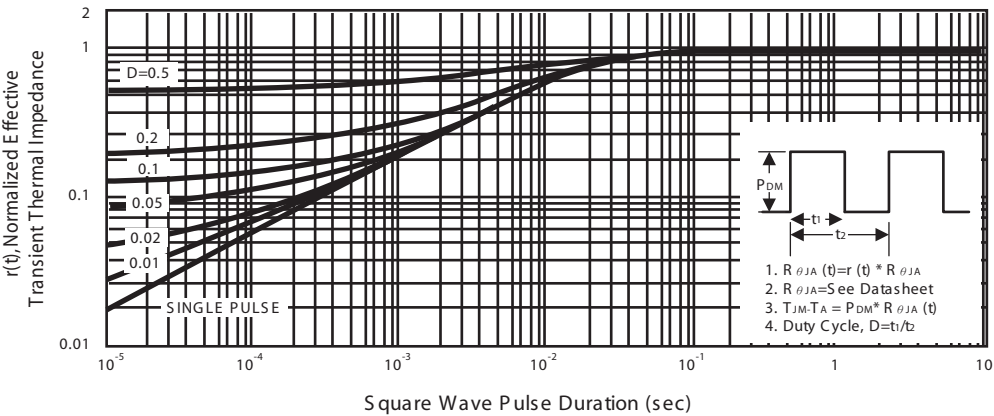


Figure 13. Normalized Thermal Transient Impedance Curve

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