



**N-Ch100V Fast Switching MOSFETs**

**Electrical Characteristics (T<sub>J</sub> = 25°C, unless otherwise noted)**

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
<b>Static Characteristics</b>							
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	100	-	-	V	
Gate-body Leakage current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	-	-	±100	nA	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	T <sub>J</sub> = 25°C	-	-	1	μA
			T <sub>J</sub> = 100°C	-	-	100	
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.2	1.8	2.5	V	
Drain-Source on-Resistance <sup>2</sup>	R <sub>DSON</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A	-	4.5	6	mΩ	
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 15A	-	6.6	9		
<b>Dynamic Characteristics</b>							
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1MHz	-	4400	-	pF	
Output Capacitance	C <sub>oss</sub>		-	645	-		
Reverse Transfer Capacitance	C <sub>rss</sub>		-	20	-		
<b>Switching Characteristics</b>							
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz	-	1.7	-	Ω	
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V, I <sub>D</sub> = 20A	-	75	-	nC	
Gate-Source Charge	Q <sub>gs</sub>		-	17	-		
Gate-Drain Charge	Q <sub>gd</sub>		-	13	-		
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V, R <sub>G</sub> = 3Ω, I <sub>D</sub> = 20A	-	15.4	-	ns	
Rise Time	t <sub>r</sub>		-	13	-		
Turn-off Delay Time	t <sub>d(off)</sub>		-	34	-		
Fall Time	t <sub>f</sub>		-	6.2	-		
<b>Drain-Source Body Diode Characteristics</b>							
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	I <sub>F</sub> = 20A, V <sub>GS</sub> = 0V	-	-	1.2	V	
Continuous Source Current <sup>1,5</sup>	I <sub>S</sub>	V <sub>G</sub> = V <sub>D</sub> = 0V, Force Current	-	-	95	A	
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 20A, di/dt = 100A/μs	-	55	-	ns	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	101	-	nC	

Notes:

1. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub> = 150°C.
2. The EAS data shows Max. rating. The test condition is V<sub>DD</sub> = 25V, V<sub>GS</sub> = 10V, L = 0.4mH, I<sub>AS</sub> = 40A
3. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

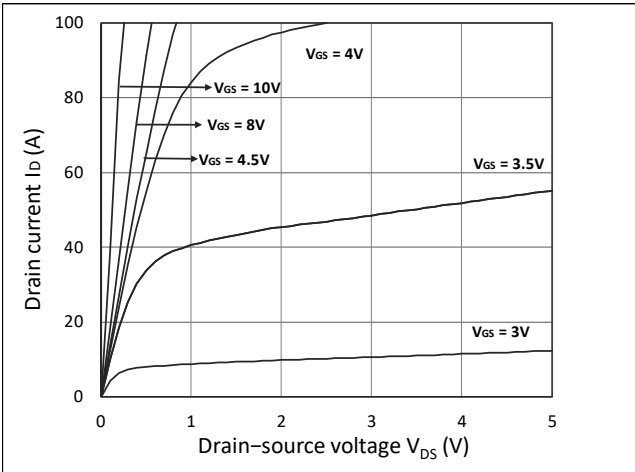


Figure 1. Output Characteristics

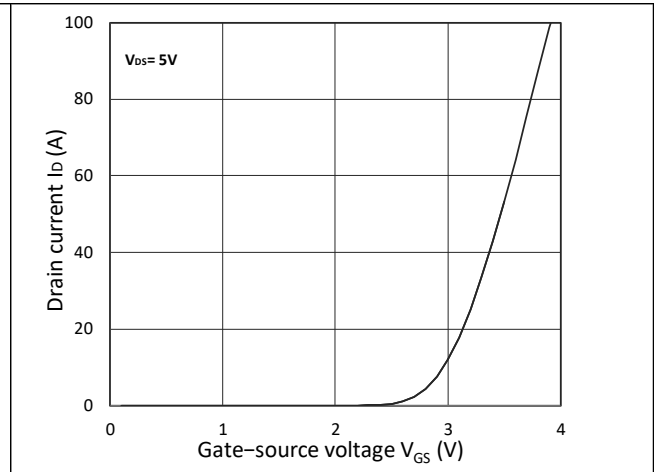


Figure 2. Transfer Characteristics

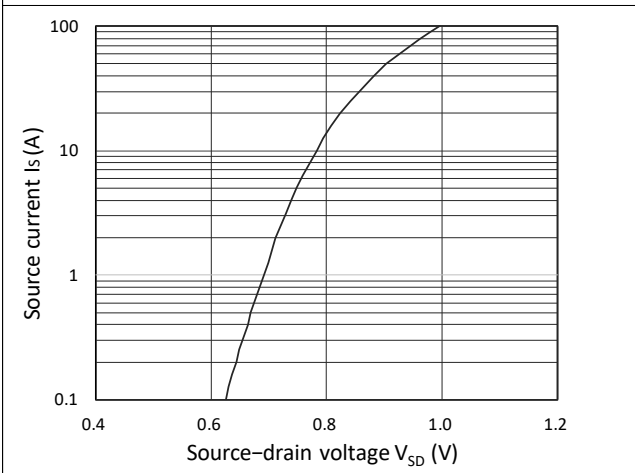


Figure 3. Forward Characteristics of Reverse

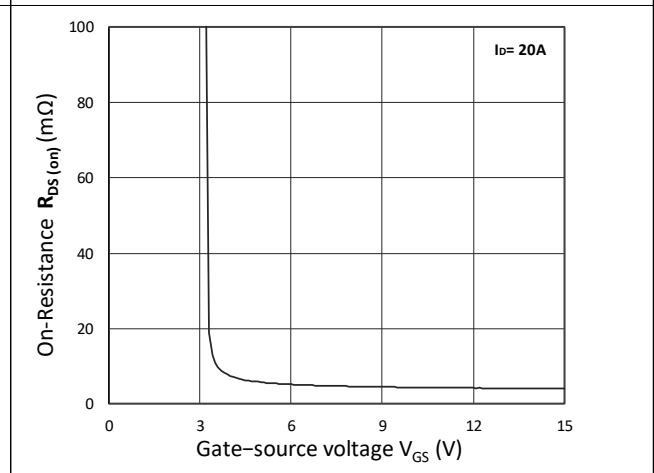


Figure 4.  $R_{DS(on)}$  vs.  $V_{GS}$

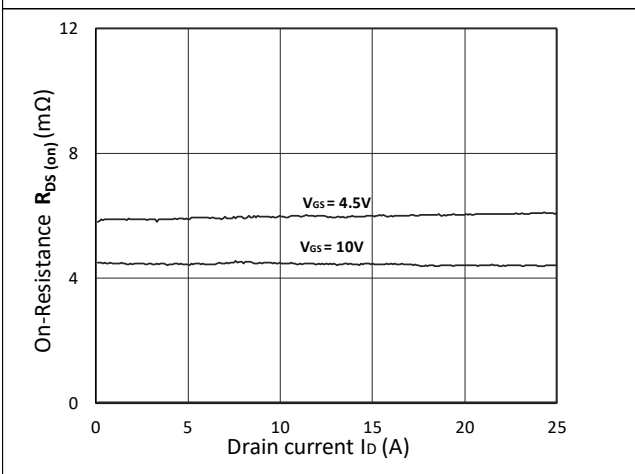


Figure 5.  $R_{DS(on)}$  vs.  $I_D$

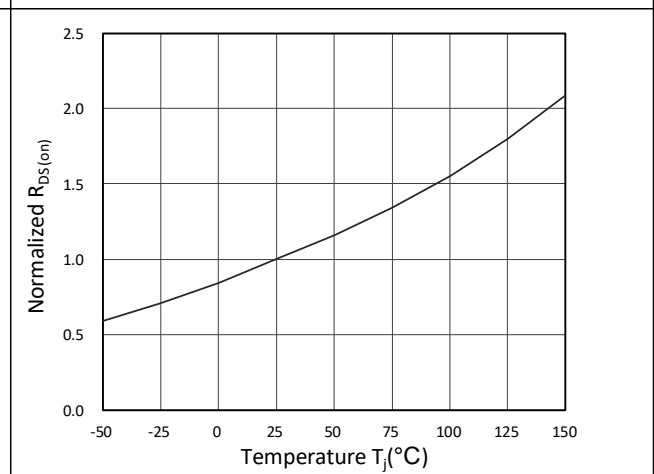


Figure 6. Normalized  $R_{DS(on)}$  vs. Temperature

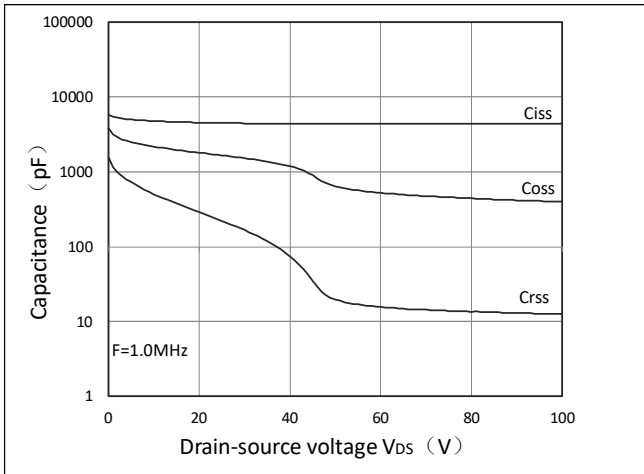


Figure 7. Capacitance Characteristics

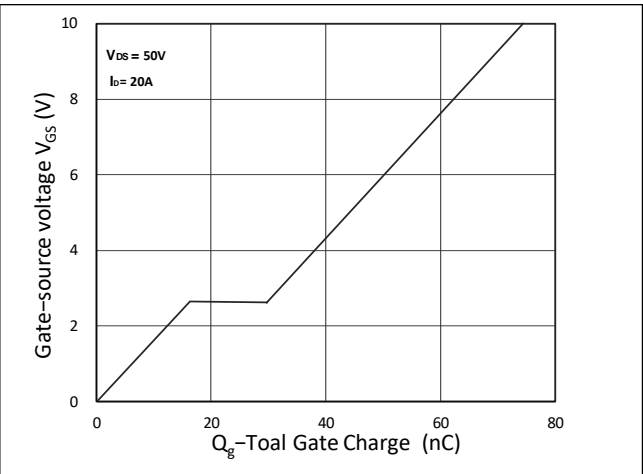


Figure 8. Gate Charge Characteristics

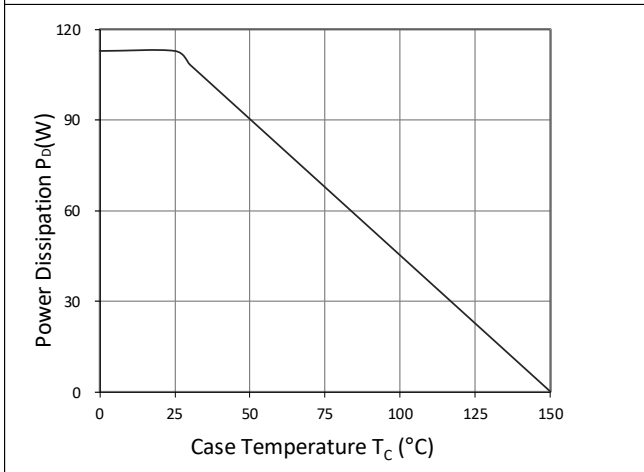


Figure 9. Power Dissipation

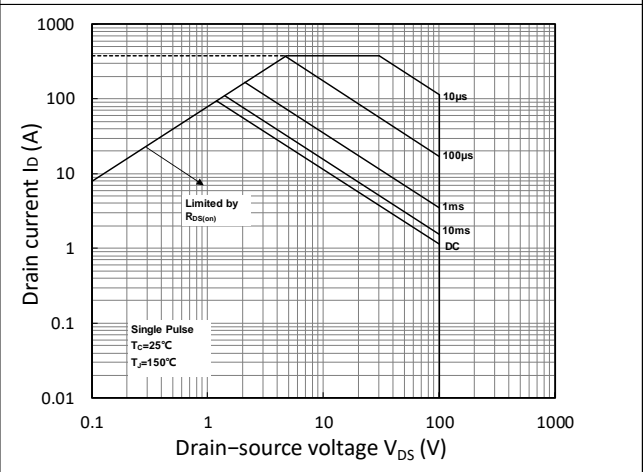


Figure 10. Safe Operating Area

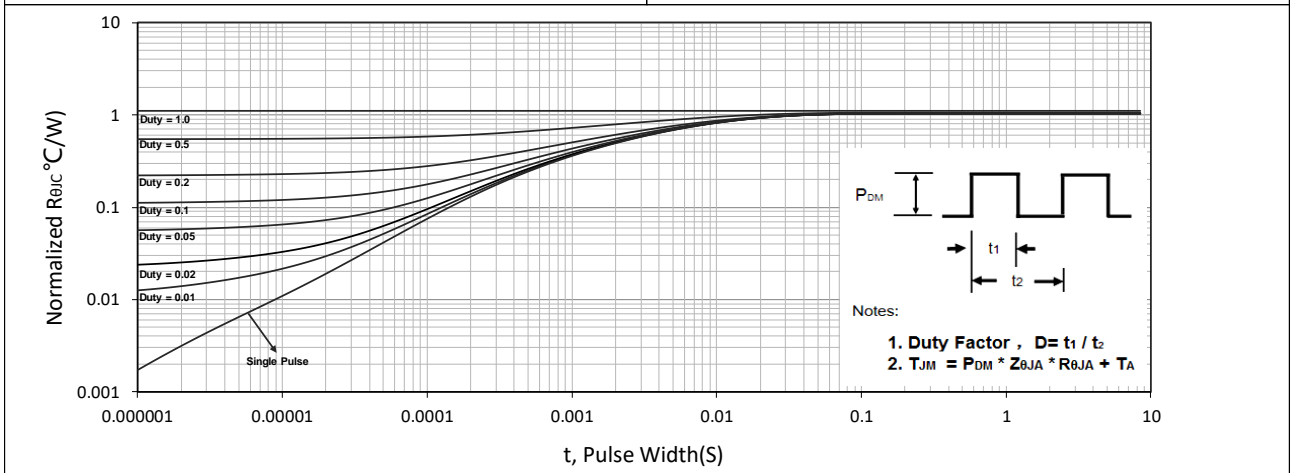


Figure 11. Normalized Maximum Transient Thermal Impedance

Test circuits and waveforms

Test Circuit

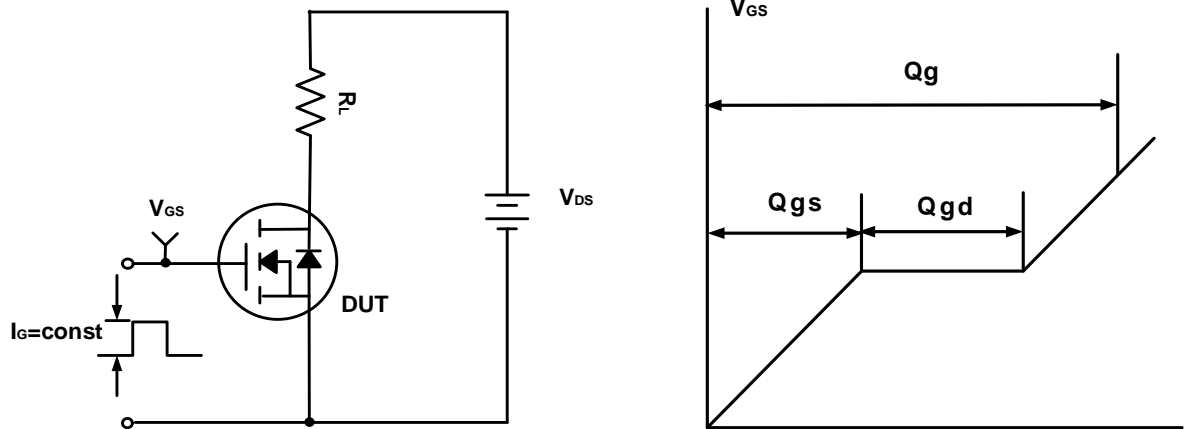


Figure A. Gate Charge Test Circuit & Waveforms

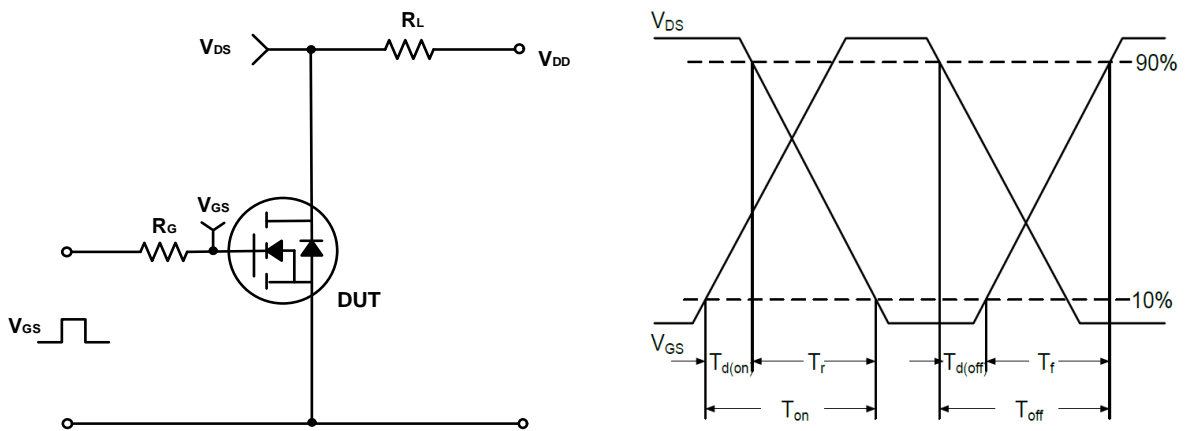


Figure B. Switching Test Circuit & Waveforms

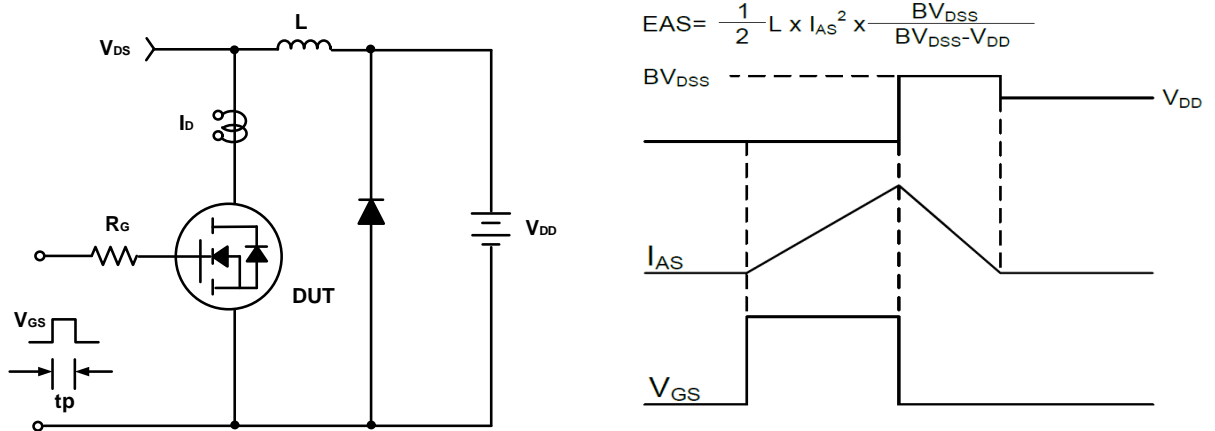


Figure C. Unclamped Inductive Switching Circuit & Waveforms

3DFNDJH 0HFKDQ'LFQO /DWD

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