

## GL Silicon N-Channel Power MOSFET

### General Description:

The GL150N03AD uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications. The package form is QFN5×6, which accords with the RoHS standard.

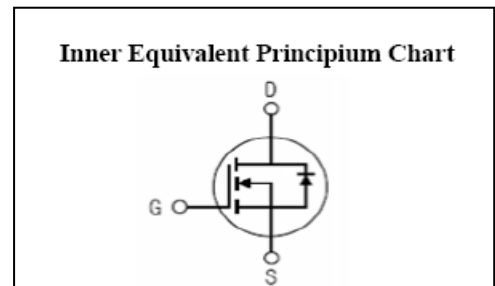
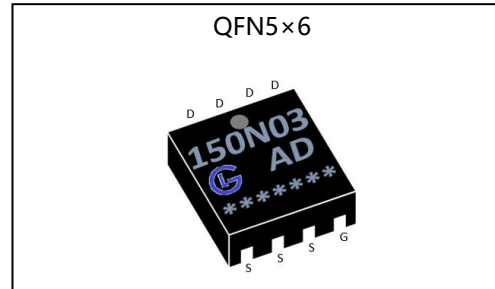
### Features:

- Fast Switching
- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

### Applications:

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

V <sub>DSS</sub>	30	V
I <sub>D</sub>	150	A
P <sub>D</sub>	78	W
R <sub>DS(ON)</sub>	1.9	mΩ



### Absolute (T<sub>c</sub>= 25°C unless otherwise specified):

Symbol	Parameter	Rating	Units
V <sub>DSS</sub>	Drain-to-Source Voltage	30	V
I <sub>D</sub>	Continuous Drain Current	150	A
	Continuous Drain Current T <sub>C</sub> = 100 °C	90	A
I <sub>DM</sub>	Pulsed Drain Current	480	A
V <sub>GS</sub>	Gate-to-Source Voltage	±20	V
P <sub>D</sub>	Power Dissipation	78	W
T <sub>J</sub> , T <sub>stg</sub>	Operating Junction and Storage Temperature Range	175, -55 to 150	°C
T <sub>L</sub>	Maximum Temperature for Soldering	300	°C



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**Electrical Characteristics** (Tc= 25°C unless otherwise specified):

<b>OFF Characteristics</b>						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V <sub>DSS</sub>	Drain to Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	--	--	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Bvdss Temperature Coefficient	I <sub>D</sub> =250uA,Reference25°C	--	0.1	--	V/°C
I <sub>DSS</sub>	Drain to Source Leakage Current	V <sub>DS</sub> =30V,V <sub>GS</sub> = 0V,T <sub>a</sub> =25°C	--	--	1	μA
		V <sub>DS</sub> =24V,V <sub>GS</sub> =0V,T <sub>a</sub> =125°C	--	--	250	
I <sub>GSS(F)</sub>	Gate to Source Forward Leakage	V <sub>GS</sub> = +20V	--	--	1	μA
I <sub>GSS(R)</sub>	Gate to Source Reverse Leakage	V <sub>GS</sub> = -20V	--	--	-1	μA

<b>ON Characteristics</b>						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
R <sub>DS(ON)</sub>	Drain-to-Source On-Resistance	V <sub>GS</sub> = 10V,I <sub>D</sub> =15A	--	1.9	2.5	mΩ
R <sub>DS(ON)</sub>	Drain-to-Source On-Resistance	V <sub>GS</sub> =4.5V,I <sub>D</sub> =12A	--	2.5	3.5	mΩ
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> ,I <sub>D</sub> =250μA	1		3	V
Pulse width tp≤380μs,δ≤2%						

<b>Dynamic Characteristics</b>						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V,I <sub>D</sub> =20A	15	--	--	S
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V,V <sub>DS</sub> =10V f=1.0MHz	--	4000	--	pF
C <sub>oss</sub>	Output Capacitance		--	100	--	
C <sub>rss</sub>	Reverse Transfer Capacitance		--	420	--	

<b>Resistive Switching Characteristics</b>						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> =10V,I <sub>D</sub> =25A V <sub>GS</sub> =5V,R <sub>G</sub> =1.8Ω	--	7	--	ns
t <sub>r</sub>	Rise Time		--	18	--	
t <sub>d(OFF)</sub>	Turn-Off Delay Time		--	30	--	
t <sub>f</sub>	Fall Time		--	17	--	
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> =10V, I <sub>D</sub> =25A V <sub>GS</sub> =10V	--	28	--	nC
Q <sub>gs</sub>	Gate to Source Charge		--	7	--	
Q <sub>gd</sub>	Gate to Drain ( "Miller" )Charge		--	6.8	--	

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Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$I_S$	Continuous Source Current (Body Diode)		--	--	120	A
$I_{SM}$	Maximum Pulsed Current (Body Diode)		--	--	240	A
$V_{SD}$	Diode Forward Voltage	$I_S=12A, V_{GS}=0V$	--	--	1.5	V
$t_{rr}$	Reverse Recovery Time	$I_S=10A, T_j = 25^\circ C$	--	30	--	ns
$Q_{rr}$	Reverse Recovery Charge	$dI_F/dt=100A/us, V_{GS}=0V$	--	44	--	nC

Pulse width  $t_p \leq 380\mu s, \delta \leq 2\%$

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case	1.6	$^\circ C/W$

<sup>a1</sup>: Repetitive rating; pulse width limited by maximum junction temperature

### Test Circuit and Waveform

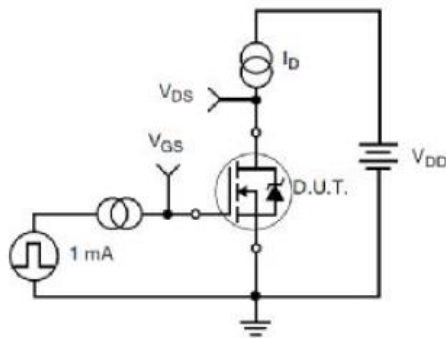


Figure 17. Gate Charge Test Circuit

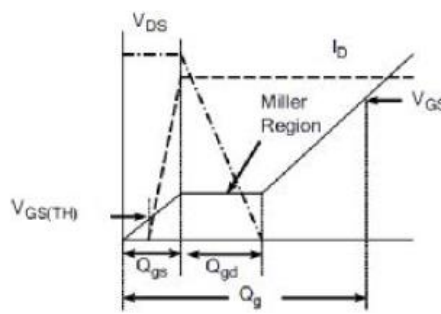


Figure 18. Gate Charge Waveform

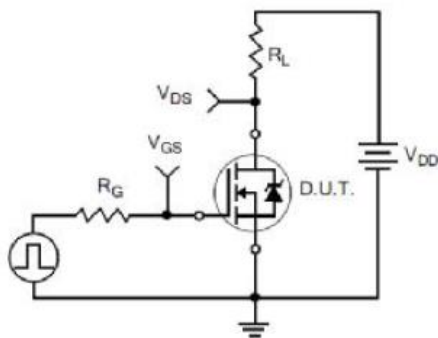


Figure 19. Resistive Switching Test Circuit

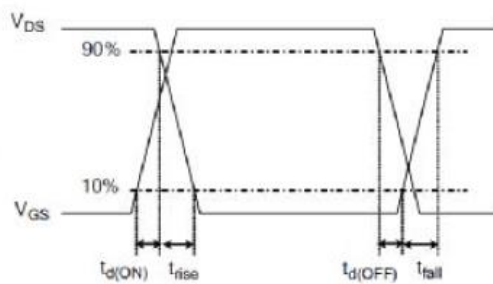


Figure 20. Resistive Switching Waveforms



Characteristics Curve:

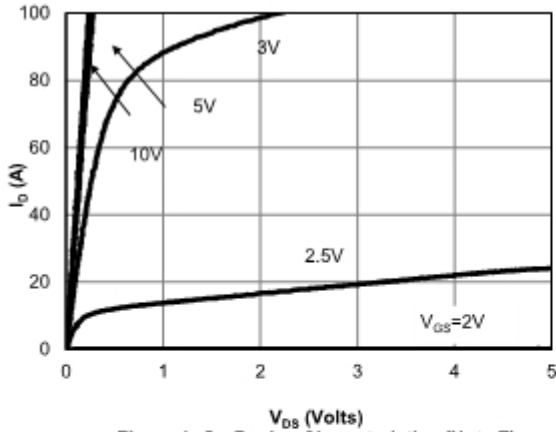


Figure 1: On-Region Characteristics (Note E)

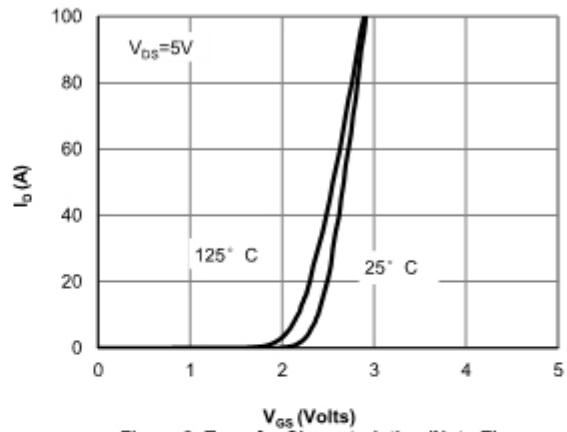


Figure 2: Transfer Characteristics (Note E)

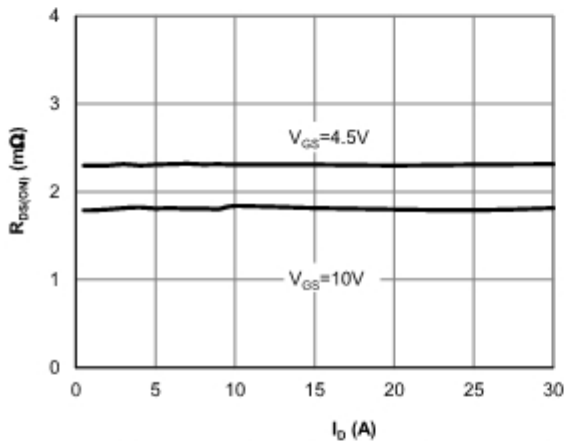


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

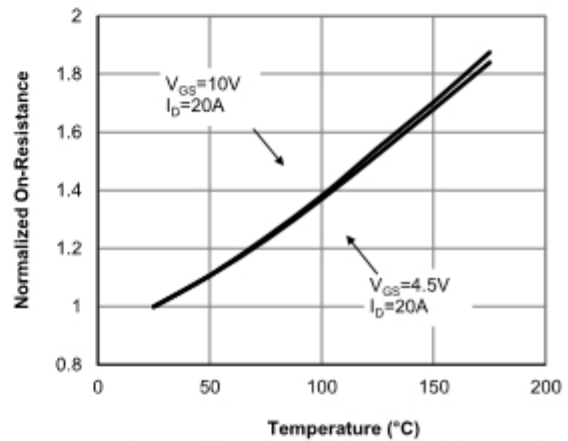


Figure 4: On-Resistance vs. Junction Temperature (Note E)

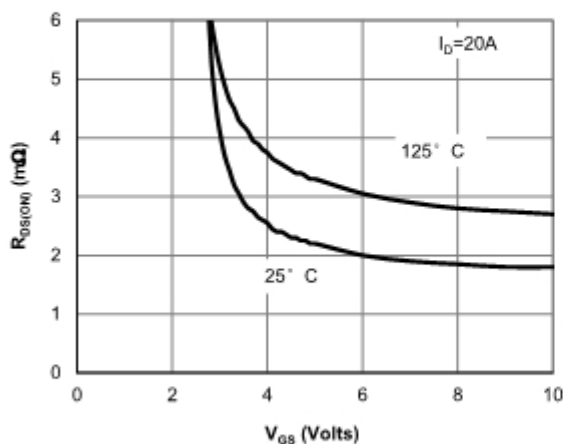


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

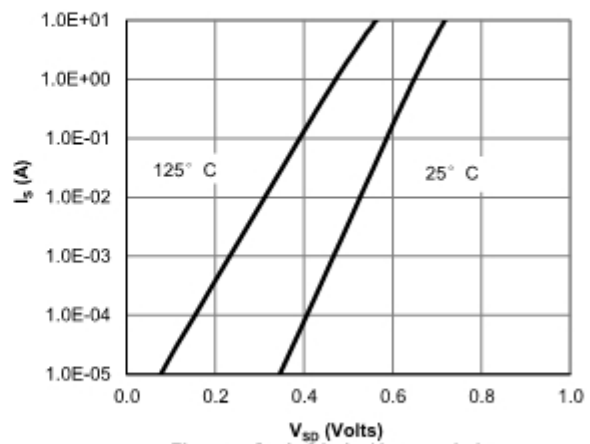


Figure 6: Body-Diode Characteristics (Note E)



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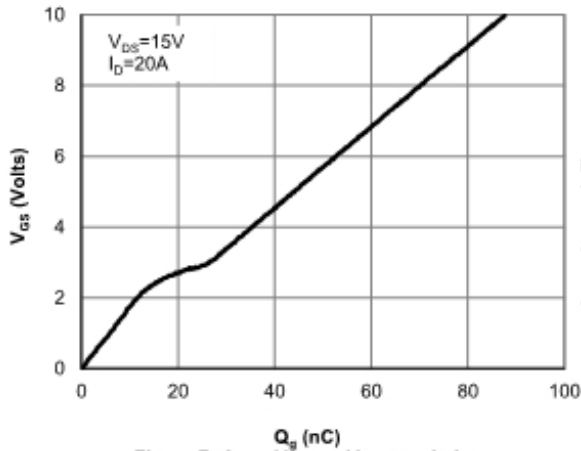


Figure 7: Gate-Charge Characteristics

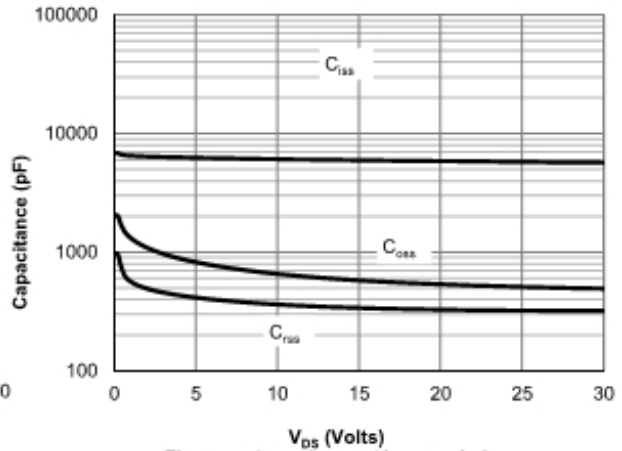


Figure 8: Capacitance Characteristics

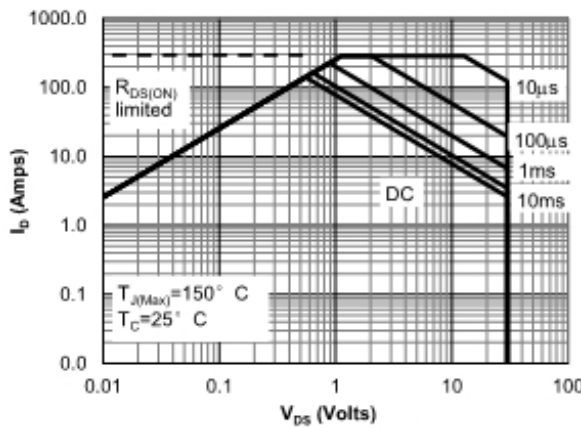


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

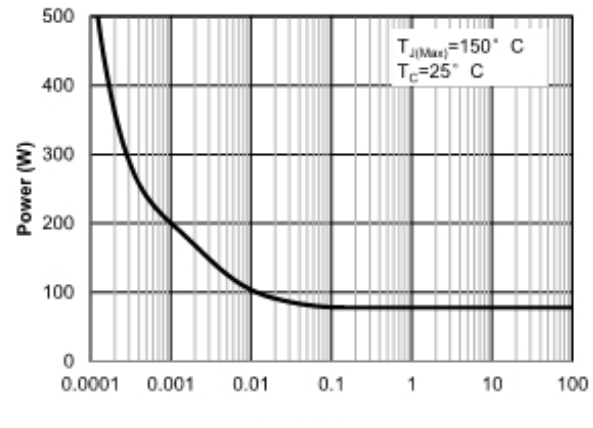


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

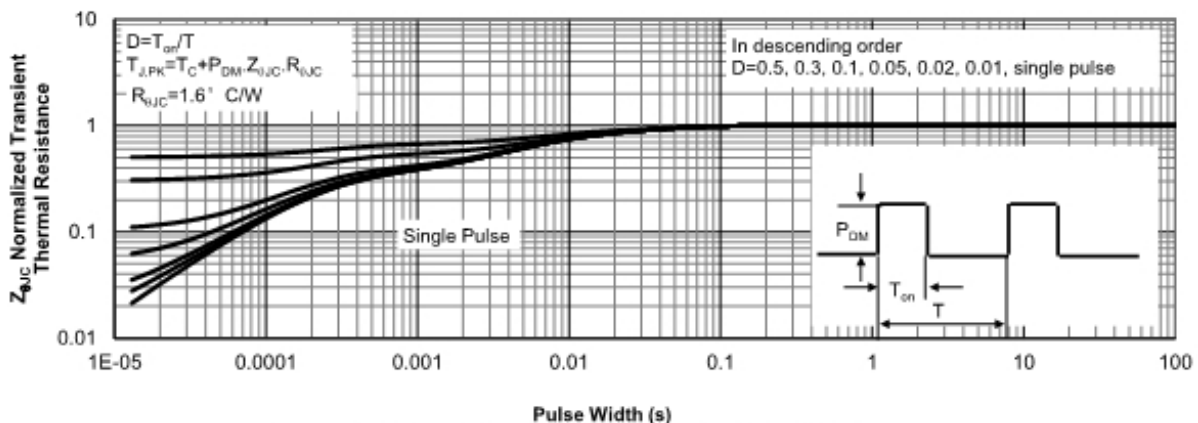


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)



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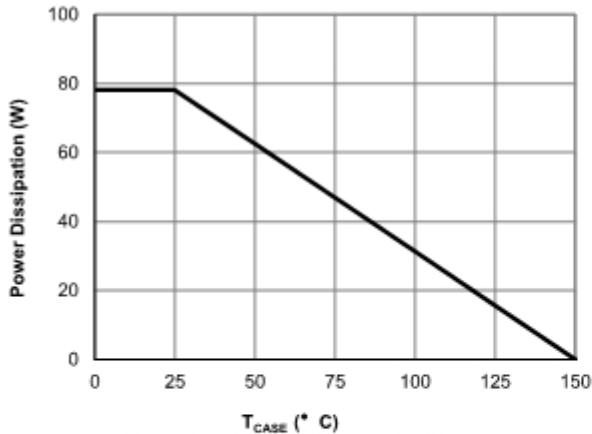


Figure 12: Power De-rating (Note F)

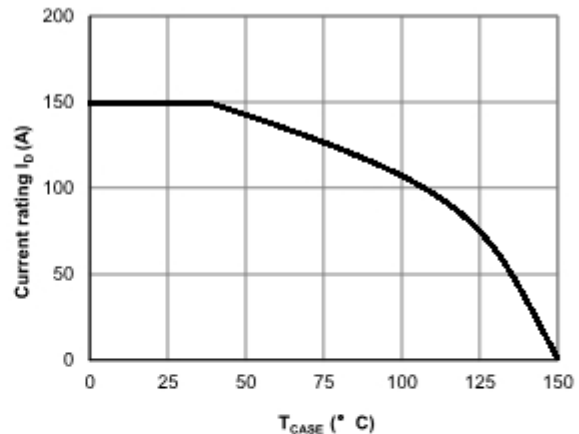


Figure 13: Current De-rating (Note F)

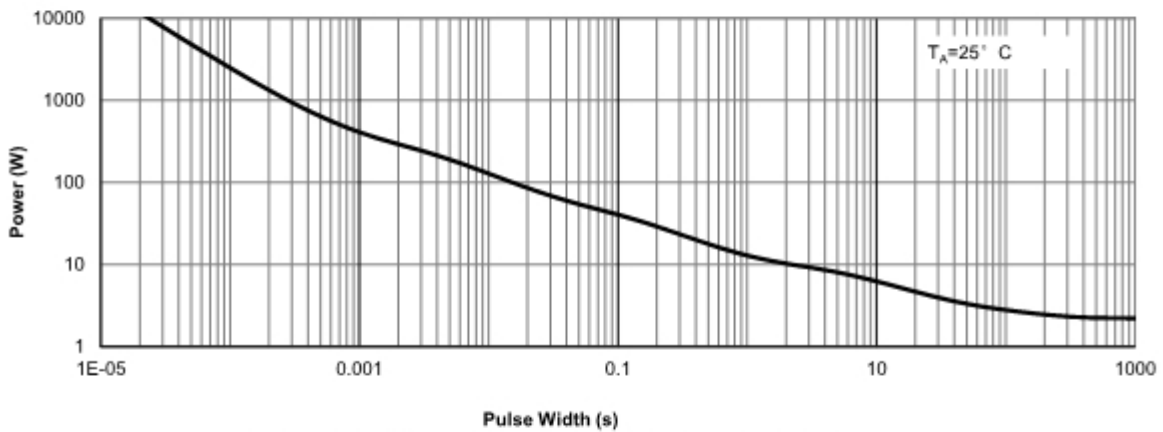


Figure 14: Single Pulse Power Rating Junction-to-Ambient (Note H)

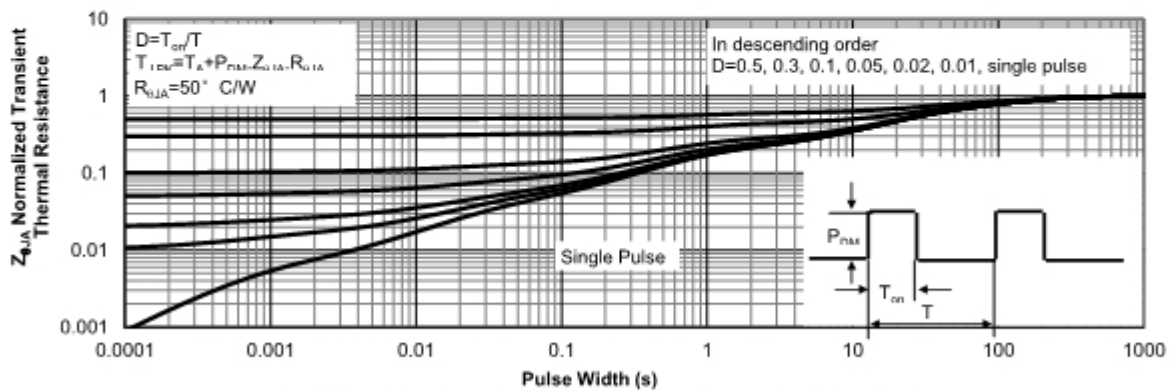


Figure 15: Normalized Maximum Transient Thermal Impedance (Note H)

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