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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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### General Description

- Trench Power AlphaSGT™ technology
- Low  $R_{DS(ON)}$
- Low Gate Charge
- Optimized for fast-switching applications

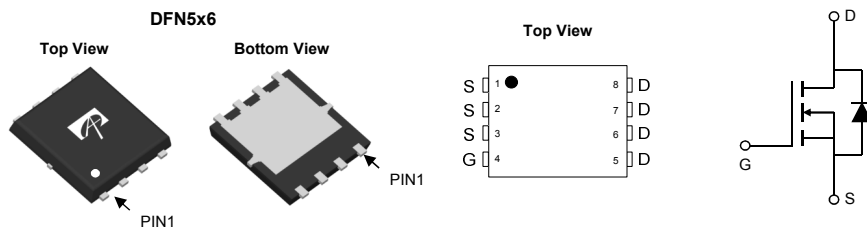
### Applications

- Synchronous Rectification in DC/DC and AC/DC Converters
- Industrial and Motor Drive applications

### Product Summary

$V_{DS}$	45V
$I_D$ (at $V_{GS}=10V$ )	100A
$R_{DS(ON)}$ (at $V_{GS}=10V$ )	< 1.15m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ )	< 1.85m $\Omega$

100% UIS Tested  
 100% Rg Tested



Orderable Part Number	Package Type	Form	Minimum Order Quantity
AON6152	DFN 5x6	Tape & Reel	3000

### Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	45	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>G</sup>	$I_D$	$T_C=25^\circ\text{C}$	100
		$T_C=100^\circ\text{C}$	100
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	400	A
Continuous Drain Current	$I_{DSM}$	$T_A=25^\circ\text{C}$	58
		$T_A=70^\circ\text{C}$	47
Avalanche Current <sup>C</sup>	$I_{AS}$	60	A
Avalanche energy $L=0.3\text{mH}$ <sup>C</sup>	$E_{AS}$	540	mJ
$V_{DS}$ Spike <sup>I</sup>	$V_{SPIKE}$	54	V
Power Dissipation <sup>B</sup>	$P_D$	$T_C=25^\circ\text{C}$	208
		$T_C=100^\circ\text{C}$	83
Power Dissipation <sup>A</sup>	$P_{DSM}$	$T_A=25^\circ\text{C}$	7.3
		$T_A=70^\circ\text{C}$	4.7
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

### Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	14	17	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient <sup>A,D</sup>		Steady-State	40	50
Maximum Junction-to-Case	$R_{\theta JC}$	0.45	0.6	$^\circ\text{C}/\text{W}$

Electrical Characteristics ( $T_J=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	45			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=45\text{V}$ , $V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$			1 5	$\mu\text{A}$
$I_{GSS}$	Gate-Body leakage current	$V_{DS}=0\text{V}$ , $V_{GS}=\pm 20\text{V}$			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	1.3	1.8	2.3	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$ , $I_D=20\text{A}$ $T_J=125^\circ\text{C}$		0.9	1.15	m $\Omega$
		$V_{GS}=4.5\text{V}$ , $I_D=20\text{A}$		1.5	1.9	
$g_{FS}$	Forward Transconductance	$V_{DS}=5\text{V}$ , $I_D=20\text{A}$		100		S
$V_{SD}$	Diode Forward Voltage	$I_S=1\text{A}$ , $V_{GS}=0\text{V}$		0.66	1	V
$I_S$	Maximum Body-Diode Continuous Current <sup>G</sup>				100	A
<b>DYNAMIC PARAMETERS</b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0\text{V}$ , $V_{DS}=22.5\text{V}$ , $f=1\text{MHz}$	6800	8500	10200	pF
$C_{oss}$	Output Capacitance		780	1120	1460	pF
$C_{riss}$	Reverse Transfer Capacitance		25	90	155	pF
$R_g$	Gate resistance	$f=1\text{MHz}$	0.6	1.2	1.8	$\Omega$
<b>SWITCHING PARAMETERS</b>						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=10\text{V}$ , $V_{DS}=22.5\text{V}$ , $I_D=20\text{A}$		110	155	nC
$Q_g(4.5\text{V})$	Total Gate Charge			48	70	nC
$Q_{gs}$	Gate Source Charge			24		nC
$Q_{gd}$	Gate Drain Charge			7.5		nC
$t_{D(on)}$	Turn-On Delay Time	$V_{GS}=10\text{V}$ , $V_{DS}=22.5\text{V}$ , $R_L=1.125\Omega$ , $R_{GEN}=3\Omega$		16		ns
$t_r$	Turn-On Rise Time			6		ns
$t_{D(off)}$	Turn-Off Delay Time			75		ns
$t_f$	Turn-Off Fall Time			6.5		ns
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F=20\text{A}$ , $dI/dt=400\text{A}/\mu\text{s}$		25		ns
$Q_{rr}$	Body Diode Reverse Recovery Charge	$I_F=20\text{A}$ , $dI/dt=400\text{A}/\mu\text{s}$		74		nC

A. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The Power dissipation  $P_{DSM}$  is based on  $R_{\theta JA} \leq 10\text{s}$  and the maximum allowed junction temperature of  $150^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

B. The power dissipation  $P_D$  is based on  $T_{J(MAX)}=150^\circ\text{C}$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Single pulse width limited by junction temperature  $T_{J(MAX)}=150^\circ\text{C}$ .

D. The  $R_{\theta JA}$  is the sum of the thermal impedance from junction to case  $R_{\theta JC}$  and case to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using  $<300\mu\text{s}$  pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of  $T_{J(MAX)}=150^\circ\text{C}$ . The SOA curve provides a single pulse rating.

G. The maximum current rating is package limited.

H. These tests are performed with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ .

I. The spike duty cycle 5% max in every frequency period, limited by junction temperature  $T_{J(MAX)}=125^\circ\text{C}$ .

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

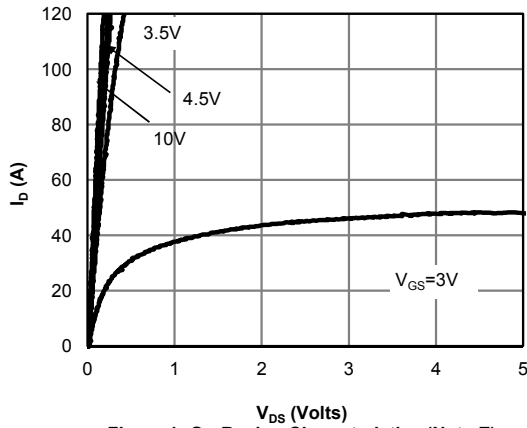


Figure 1: On-Region Characteristics (Note E)

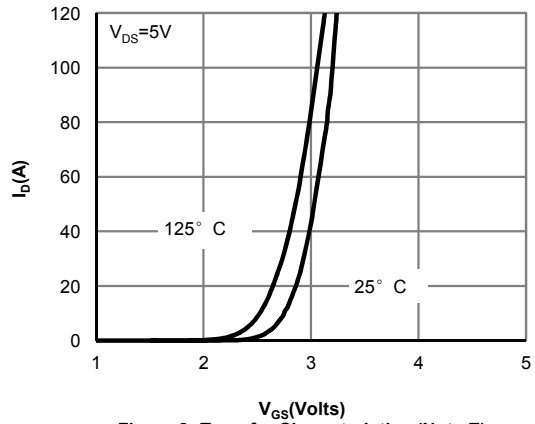


Figure 2: Transfer Characteristics (Note E)

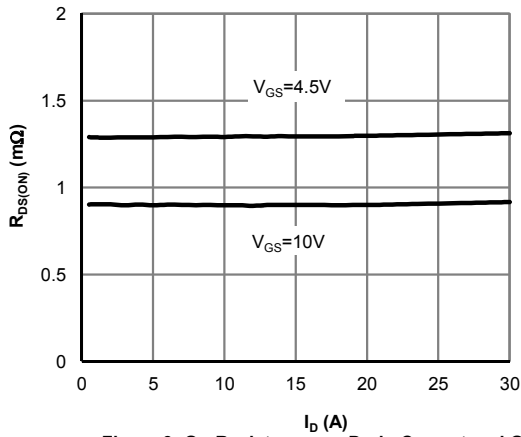


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

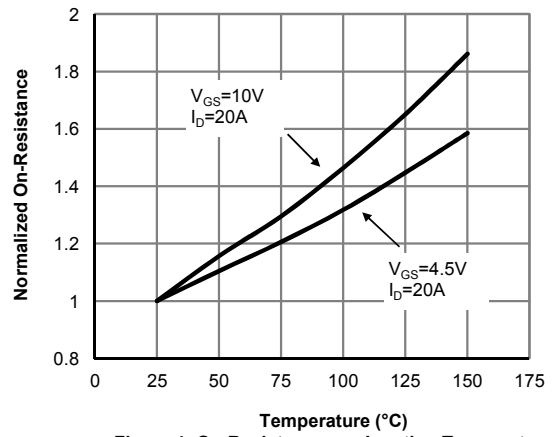


Figure 4: On-Resistance vs. Junction Temperature (Note E)

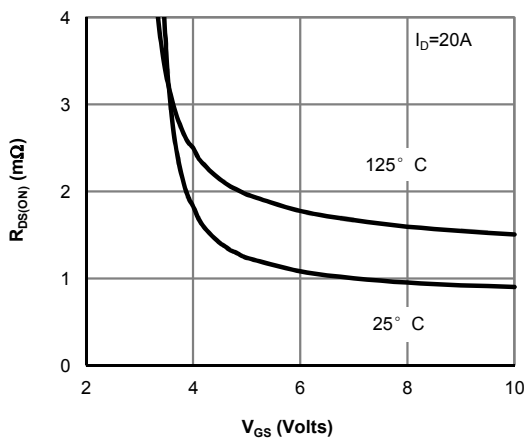


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

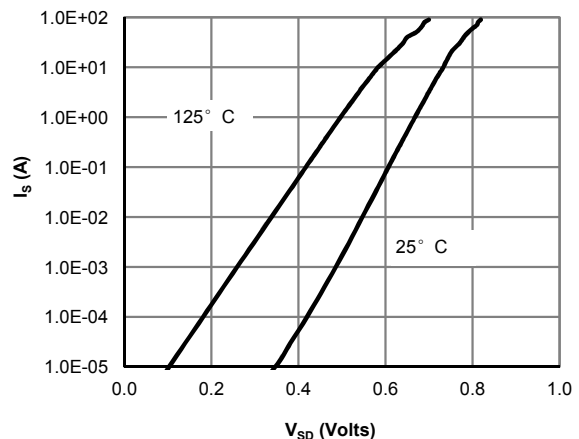


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

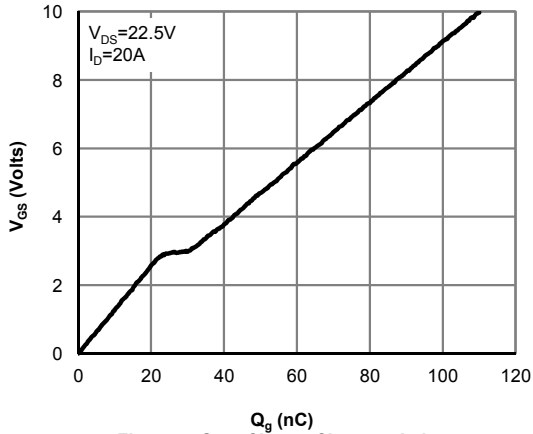


Figure 7: Gate-Charge Characteristics

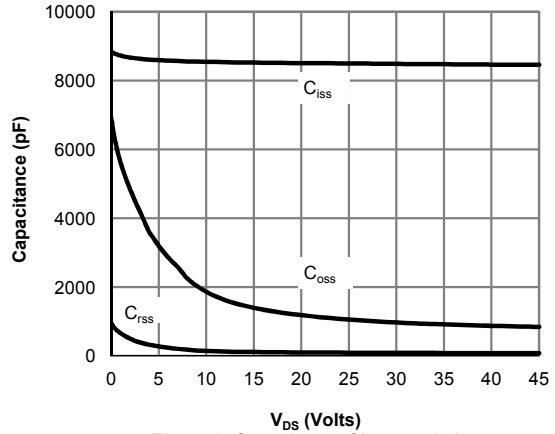


Figure 8: Capacitance Characteristics

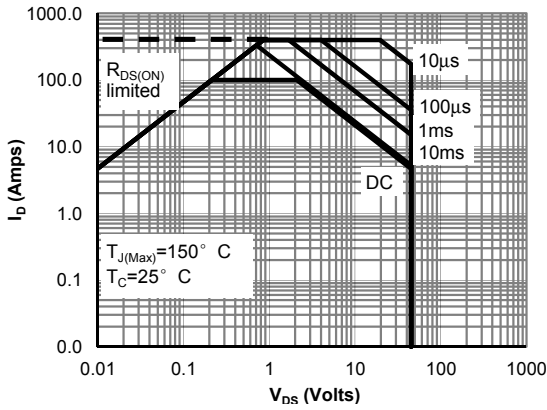


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

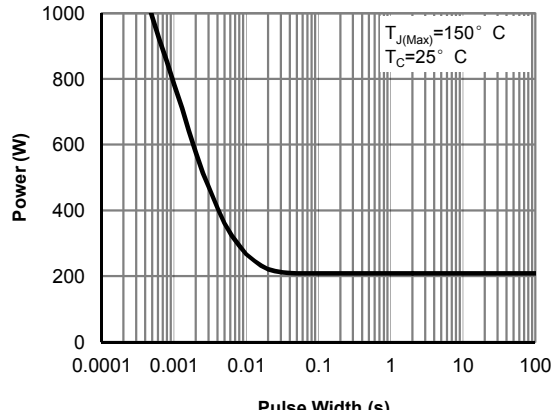


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

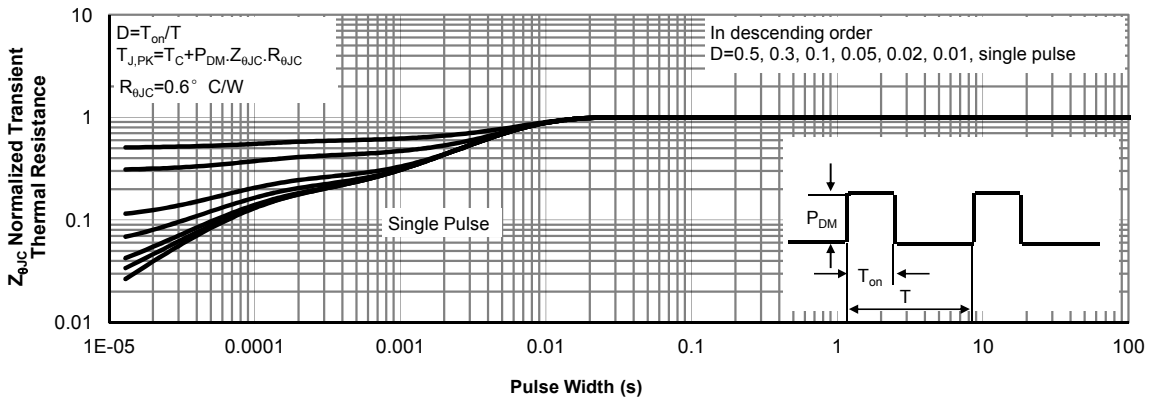


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

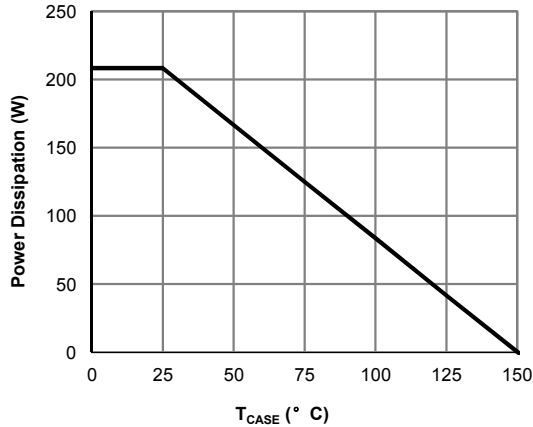


Figure 12: Power De-rating (Note F)

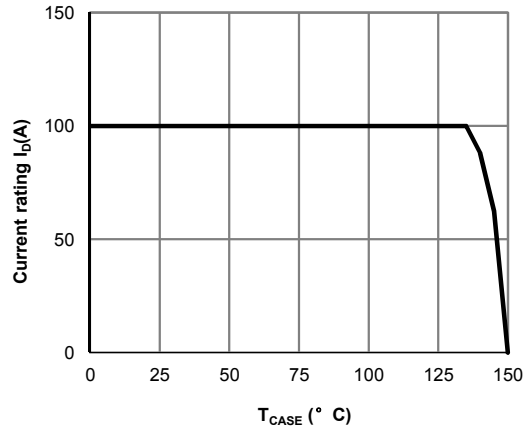


Figure 13: Current De-rating (Note F)

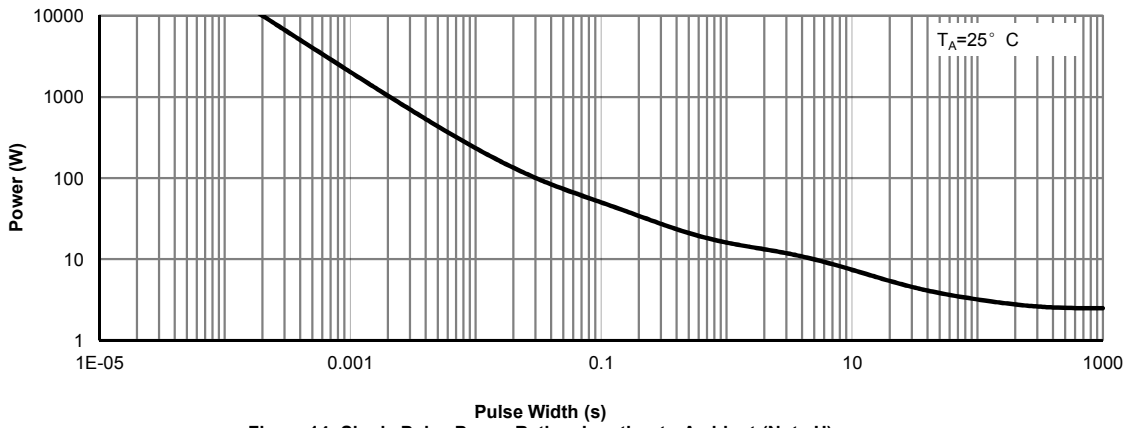


Figure 14: Single Pulse Power Rating Junction-to-Ambient (Note H)

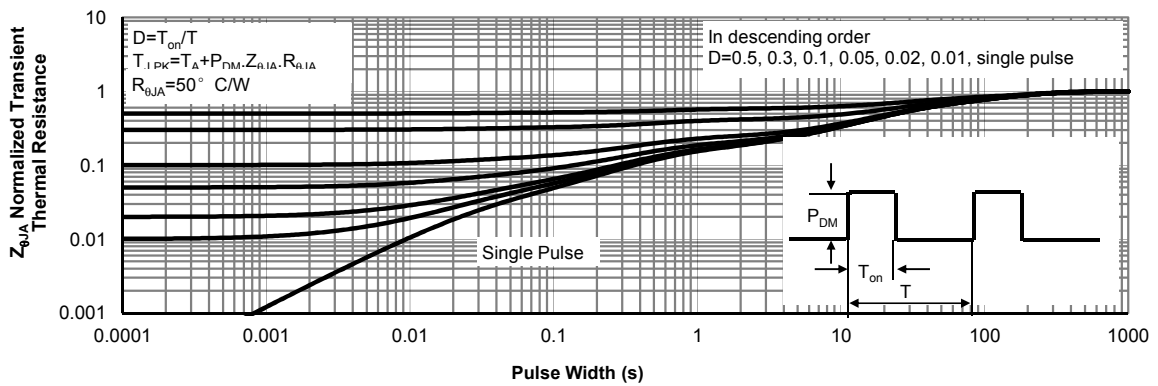
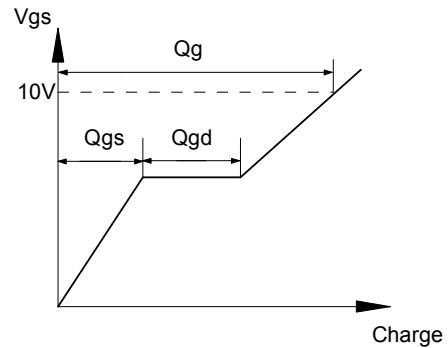
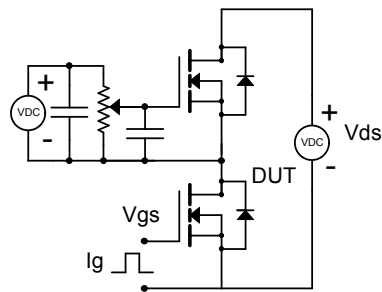
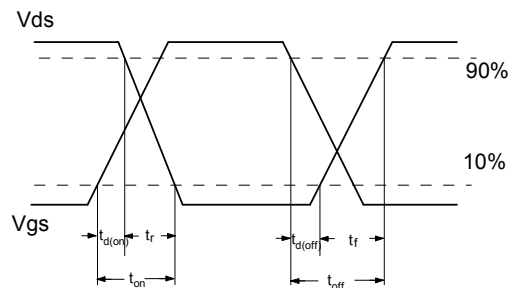
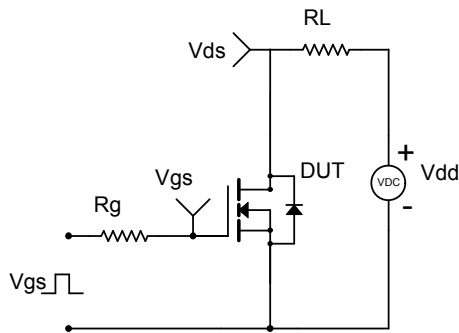


Figure 15: Normalized Maximum Transient Thermal Impedance (Note H)

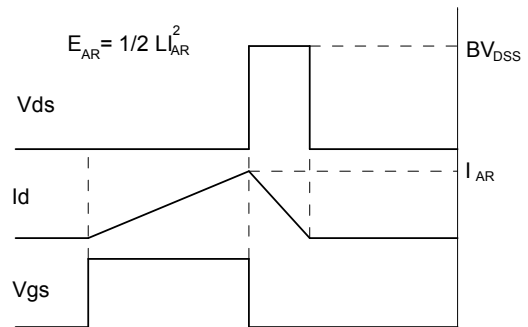
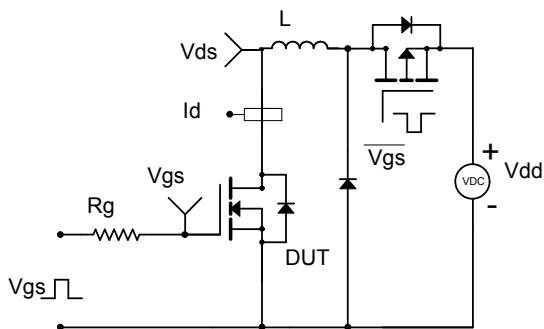
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

