



**THE DATASHEET OF  
AON2707**



### General Description

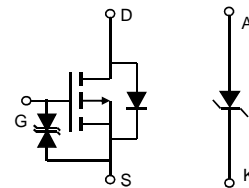
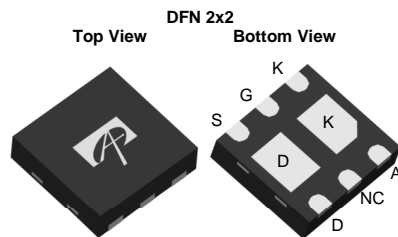
The AON2707 uses advanced trench technology to provide excellent  $R_{DS(ON)}$  and low gate charge. A Schottky diode is provided to facilitate the implementation of a bidirectional blocking switch, or for DC-DC conversion applications.

### Product Summary

$V_{DS}$	-30V
$I_D$ (at $V_{GS}=-10V$ )	-4A
$R_{DS(ON)}$ (at $V_{GS}=-10V$ )	< 117m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$ )	< 138m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$ )	< 193m $\Omega$

### Typical ESD protection **HBM Class 2**

$V_{KA}$	20V
$I_F$	2A
$V_F$ (at $I_F=1A$ )	<0.45V



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

Parameter	Symbol	MOSFET	Schottky	Units
Drain-Source Voltage	$V_{DS}$	-30		V
Gate-Source Voltage	$V_{GS}$	$\pm 12$		V
Continuous Drain Current <sup>A</sup>	$I_D$	$T_A=25^\circ\text{C}$	-4	A
		$T_A=70^\circ\text{C}$	-3	
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	-15		
Schottky reverse voltage	$V_{KA}$		20	V
Continuous Forward Current <sup>A</sup>	$I_F$	$T_A=25^\circ\text{C}$	2.5	A
		$T_A=70^\circ\text{C}$	1.5	
Pulsed Forward Current <sup>B</sup>	$I_{FM}$		15	
Power Dissipation <sup>A</sup>	$P_D$	$T_A=25^\circ\text{C}$	2.8	W
		$T_A=70^\circ\text{C}$	1.8	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	-55 to 150	$^\circ\text{C}$

### Thermal Characteristics

Parameter: MOSFET	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup> $t \leq 10s$	$R_{\theta JA}$	35	45	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient <sup>A</sup> Steady-State		65	85	$^\circ\text{C}/\text{W}$
Parameter: Schottky				
Maximum Junction-to-Ambient <sup>A</sup> $t \leq 10s$	$R_{\theta JA}$	36	47	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient <sup>A</sup> Steady-State		67	87	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0V	-30			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C			-1 -5	μA
I <sub>GSS</sub>	Gate-Body leakage current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±10	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.7	-1.05	-1.5	V
I <sub>D(ON)</sub>	On state drain current	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-5V	-15			A
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-4A T <sub>J</sub> =125°C		97 138	117 165	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2A		110	138	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1A		148	193	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-4A		9		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V		-0.8	-1	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current				-3.2	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz		305		pF
C <sub>oss</sub>	Output Capacitance			42		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			26		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		8.5	17	Ω
<b>SWITCHING PARAMETERS</b>						
Q <sub>g(10V)</sub>	Total Gate Charge	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-4A		6.8	12	nC
Q <sub>g(4.5V)</sub>	Total Gate Charge			3.2	6	nC
Q <sub>gs</sub>	Gate Source Charge			0.75		nC
Q <sub>gd</sub>	Gate Drain Charge			1.2		nC
t <sub>D(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =3.75Ω, R <sub>GEN</sub> =3Ω		6.0		ns
t <sub>r</sub>	Turn-On Rise Time			5		ns
t <sub>D(off)</sub>	Turn-Off Delay Time			21		ns
t <sub>f</sub>	Turn-Off Fall Time			6.5		ns
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =-4A, dI/dt=100A/μs		15		ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> =-4A, dI/dt=100A/μs		6		nC
<b>SCHOTTKY PARAMETERS</b>						
V <sub>F</sub>	Forward Voltage Drop	I <sub>F</sub> =1A		0.4	0.45	V
I <sub>rm</sub>	Maximum reverse leakage current	V <sub>R</sub> =5V			0.05	mA
		V <sub>R</sub> =5V, T <sub>J</sub> =125°C			10	
I <sub>rm</sub>	Maximum reverse leakage current	V <sub>R</sub> =16V			0.1	mA
		V <sub>R</sub> =16V, T <sub>J</sub> =125°C			20	
C <sub>T</sub>	Junction Capacitance	V <sub>R</sub> =10V		34		pF
t <sub>rr</sub>	Schottky Reverse Recovery Time	I <sub>F</sub> =1A, dI/dt=100A/μs		11	14	ns
Q <sub>rr</sub>	Schottky Reverse Recovery Charge	I <sub>F</sub> =1A, dI/dt=100A/μs		0.8		nC

A: The value of R<sub>θJA</sub> is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25° C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

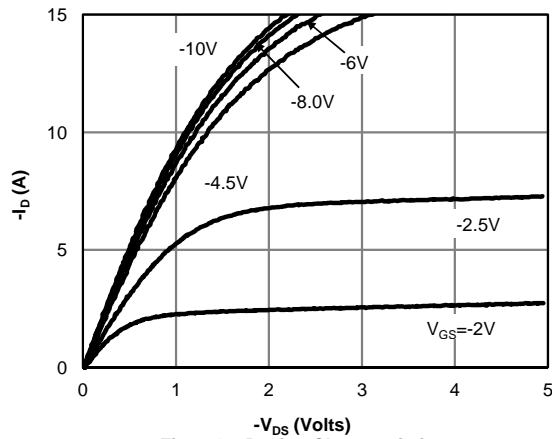
C: The R<sub>θJA</sub> is the sum of the thermal impedance from junction to lead R<sub>θJL</sub> and lead to ambient.

D: The static characteristics in Figures 1 to 6 are obtained using <300 ms pulses, duty cycle 0.5% max.

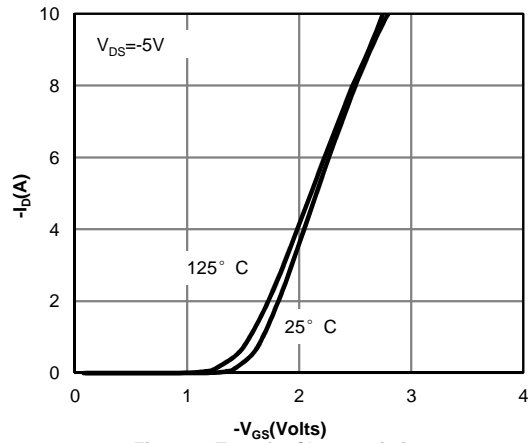
E: These tests are performed with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25° C. The SOA curve provides a single pulse rating.

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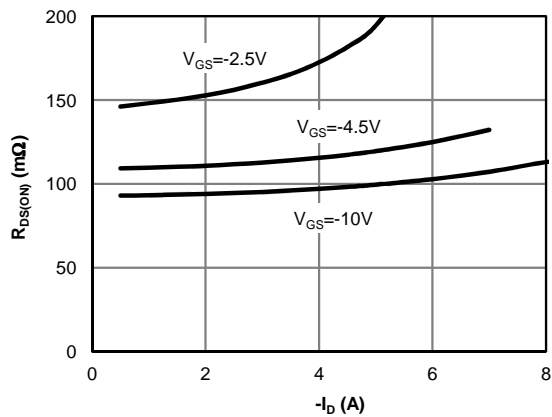
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



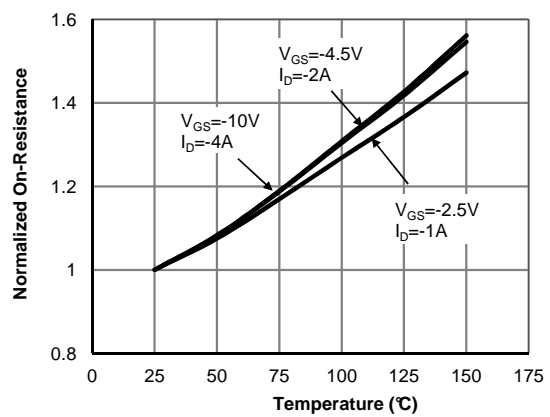
**Fig 1: On-Region Characteristics**



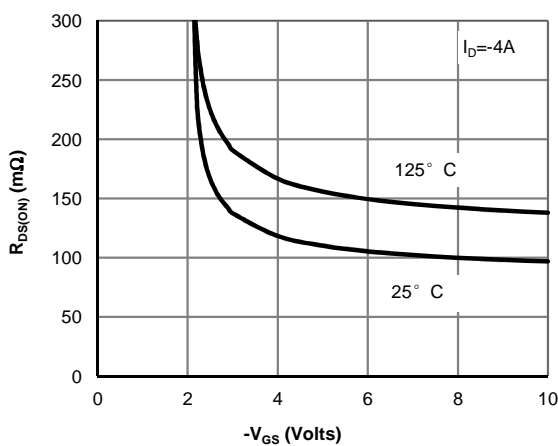
**Figure 2: Transfer Characteristics**



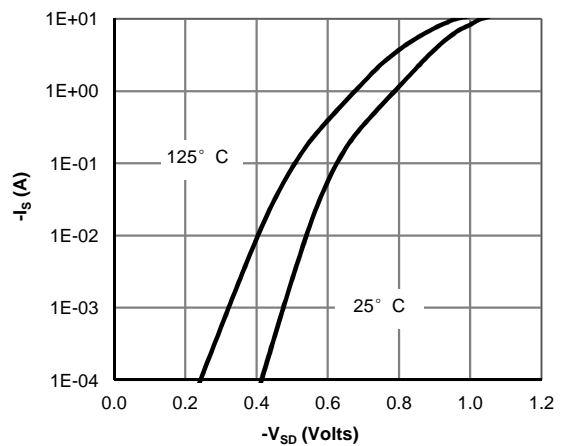
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**



**Figure 4: On-Resistance vs. Junction Temperature**

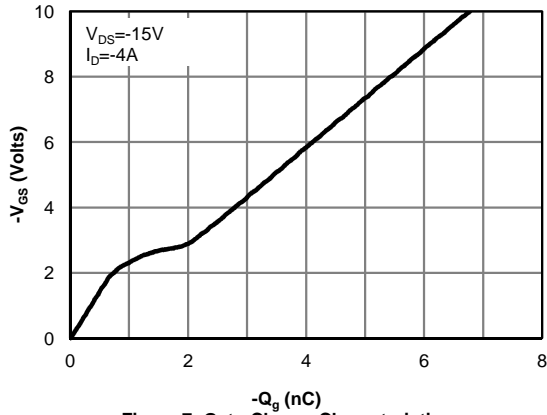


**Figure 5: On-Resistance vs. Gate-Source Voltage**

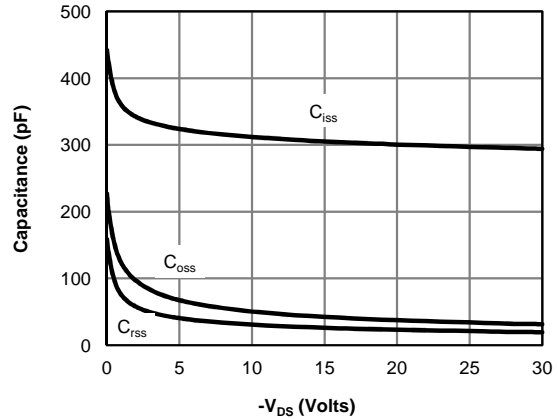


**Figure 6: Body-Diode Characteristics**

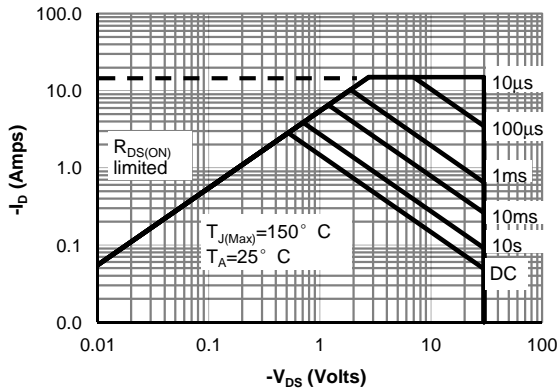
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



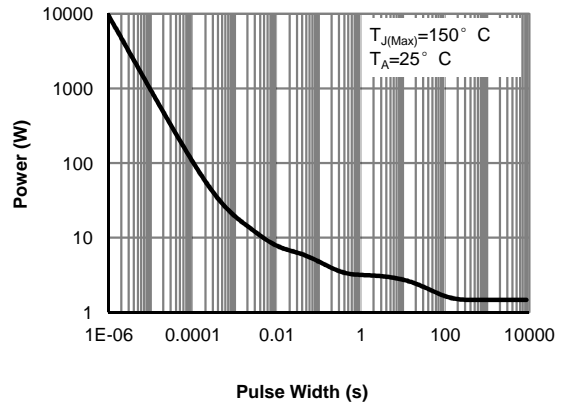
**Figure 7: Gate-Charge Characteristics**



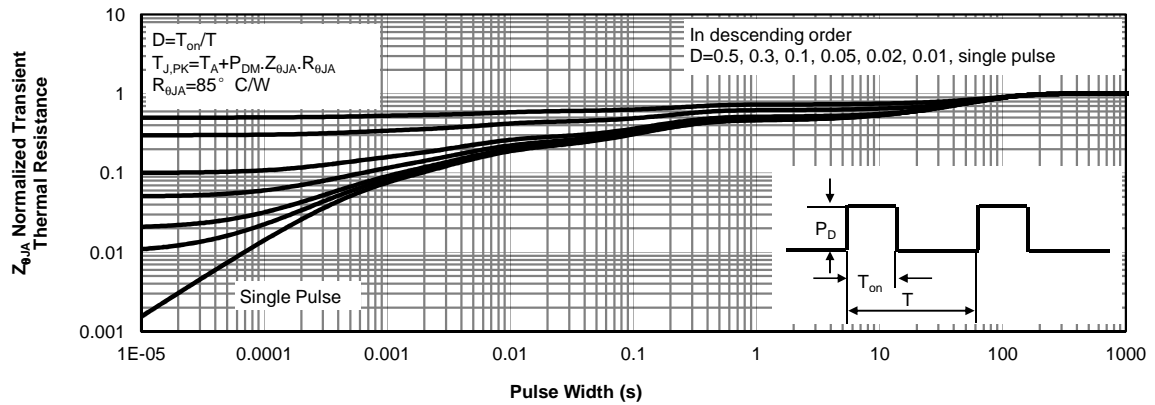
**Figure 8: Capacitance Characteristics**



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



**Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)**



**Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)**

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

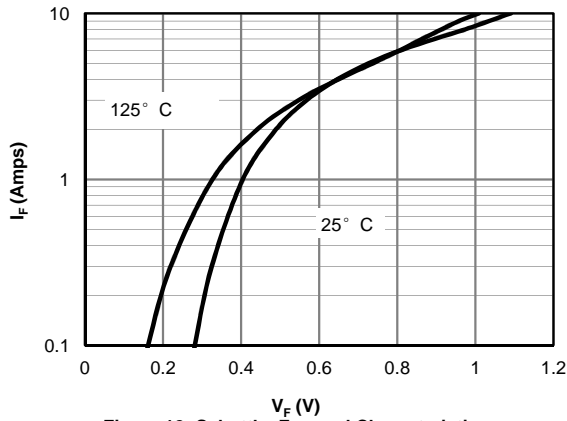


Figure 12: Schottky Forward Characteristics

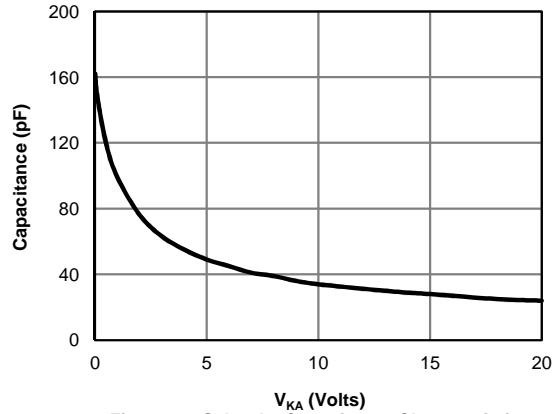


Figure 13: Schottky Capacitance Characteristics

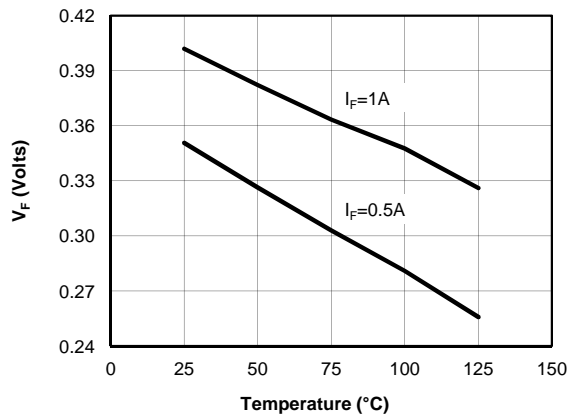


Figure 14: Schottky Forward Drop vs. Junction Temperature

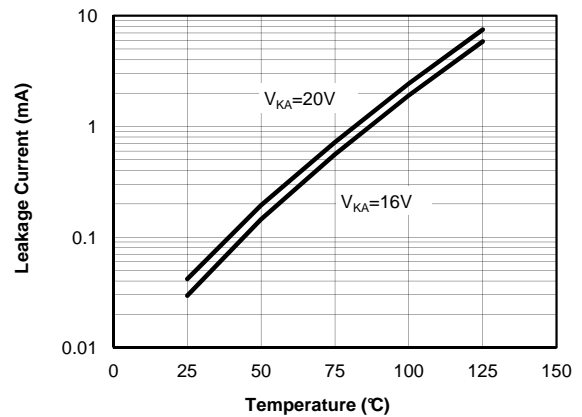


Figure 15: Schottky Leakage Current vs. Junction Temperature

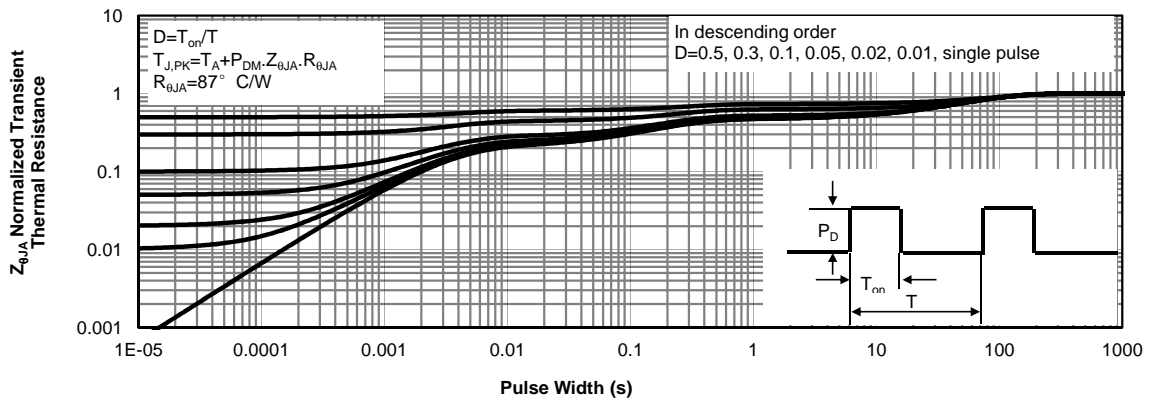
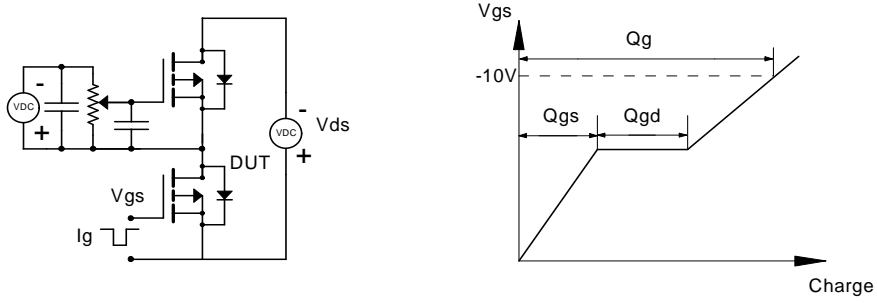
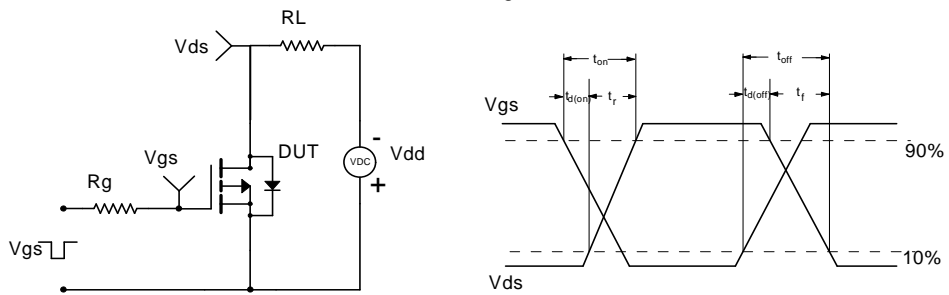


Figure 16: Schottky Normalized Maximum Transient Thermal Impedance (Note E)

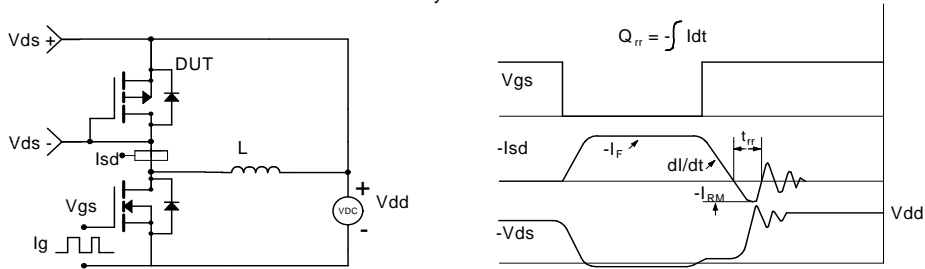
**Gate Charge Test Circuit & Waveform**



**Resistive Switching Test Circuit & Waveforms**



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