

### General Description

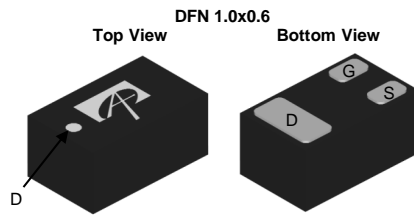
The AON1605 utilize advanced trench MOSFET technology in small DFN 1.0 x 0.6 package. This device is ideal for load switch applications.

### Product Summary

$V_{DS}$	-20V
$I_D$ (at $V_{GS}=-4.5V$ )	-0.7A
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$ )	< 710m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$ )	< 930m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-1.8V$ )	< 1250m $\Omega$

### Typical ESD protection

HBM Class 1C



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	V
Continuous Drain Current <sup>E</sup>	$I_D$	$T_A=25^{\circ}C$	-0.7
		$T_A=70^{\circ}C$	-0.55
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	-2	A
Power Dissipation <sup>A</sup>	$P_D$	$T_A=25^{\circ}C$	0.9
		$T_A=70^{\circ}C$	0.55
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^{\circ}C$

### Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	80	100	$^{\circ}C/W$
$t \leq 10s$				
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	110	140	$^{\circ}C/W$
Steady-State				
Maximum Junction-to-Ambient <sup>B</sup>	$R_{\theta JA}$	200	245	$^{\circ}C/W$
$t \leq 10s$				
Maximum Junction-to-Ambient <sup>B</sup>	$R_{\theta JA}$	280	340	$^{\circ}C/W$
Steady-State				

**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	-20			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-20V, 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> =±8V			±10	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.4	-0.7	-1.1	V
I <sub>D(ON)</sub>	On state drain current	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-5V	-2			A
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-0.4A T <sub>J</sub> =125°C		590	710	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-0.3A		745	930	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-0.2A		955	1250	mΩ
		V <sub>GS</sub> =-1.5V, I <sub>D</sub> =-0.1A		1115		mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-0.4A		1		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =-0.4A, V <sub>GS</sub> =0V		-0.85	-1.2	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current <sup>E</sup>				-0.7	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-10V, f=1MHz		50		pF
C <sub>oss</sub>	Output Capacitance			12		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			7.5		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		45		Ω
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-0.4A		0.75		nC
Q <sub>gs</sub>	Gate Source Charge			0.15		nC
Q <sub>gd</sub>	Gate Drain Charge			0.2		nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, R <sub>L</sub> =25Ω, R <sub>GEN</sub> =3Ω		6		ns
t <sub>r</sub>	Turn-On Rise Time			5		ns
t <sub>D(off)</sub>	Turn-Off DelayTime			22		ns
t <sub>f</sub>	Turn-Off Fall Time			8		ns

A: The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25° C. The Power dissipation P<sub>DSM</sub> is based on R<sub>θJA</sub> and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150° C may be used if the PCB allows it to.

B: The value of R<sub>θJA</sub> is measured with the device mounted on FR-4 minimum pad board, in a still air environment with T<sub>A</sub>=25° C. The Power dissipation P<sub>DSM</sub> is based on R<sub>θJA</sub> and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150° C may be used if the PCB allows it to.

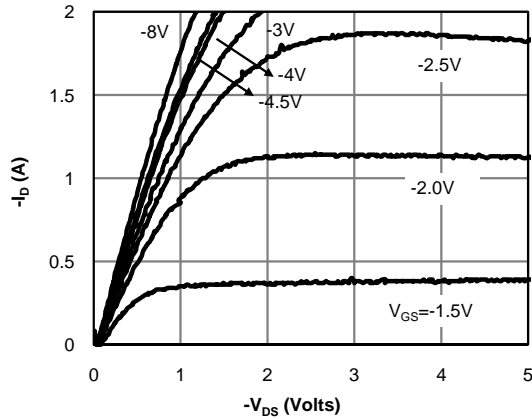
C: The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

D: 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.

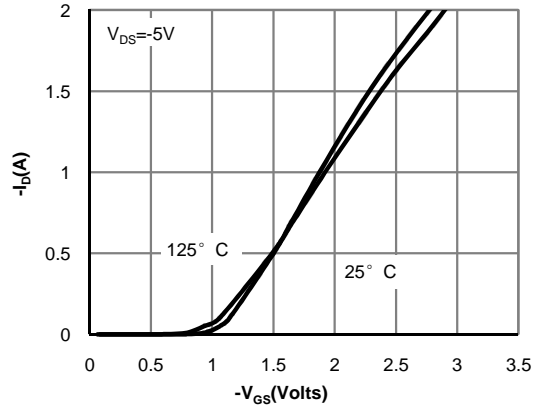
E: The maximum current limited by package.

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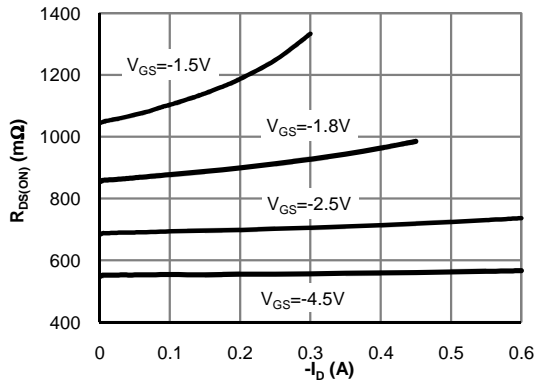
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



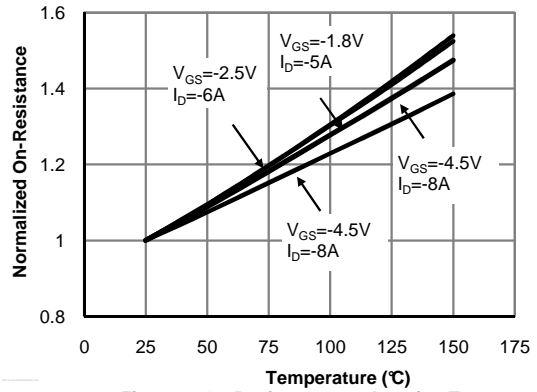
**Figure 1: On-Region Characteristics (Note E)**



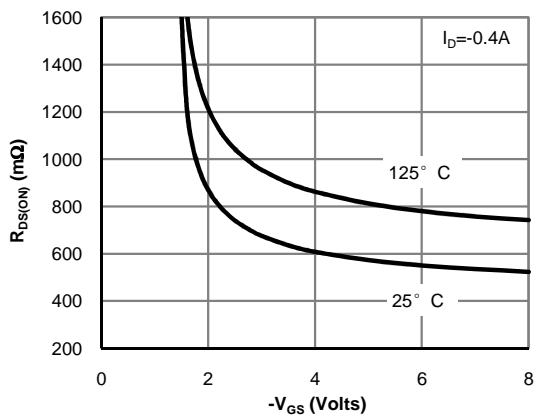
**Figure 2: Transfer Characteristics (Note E)**



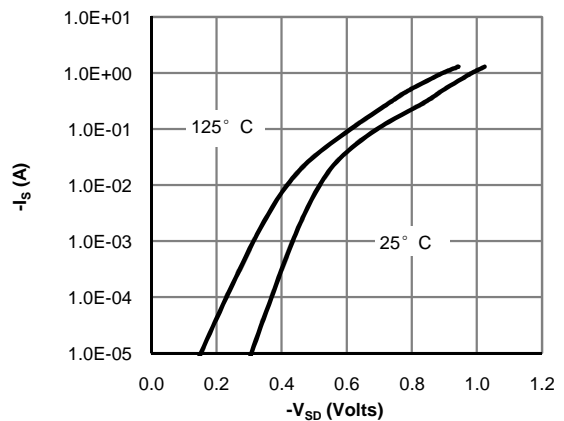
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)**



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

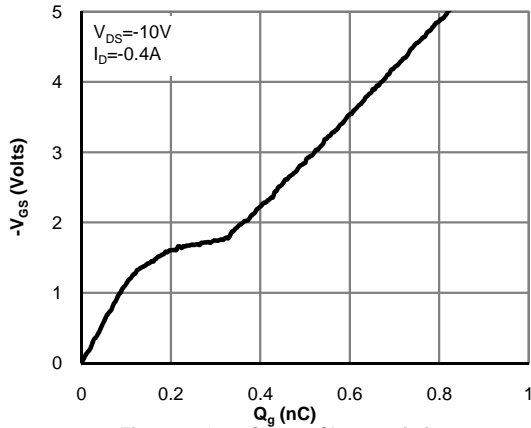


**Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)**

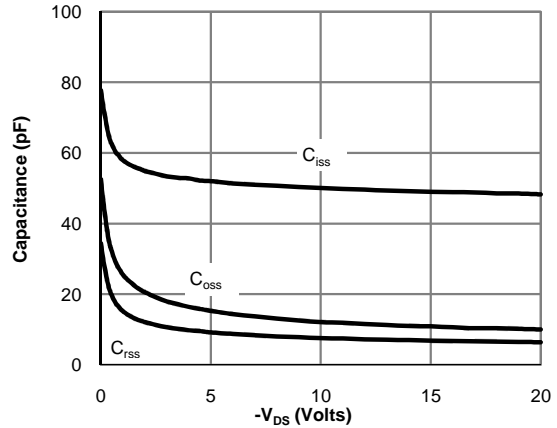


**Figure 6: Body-Diode Characteristics (Note E)**

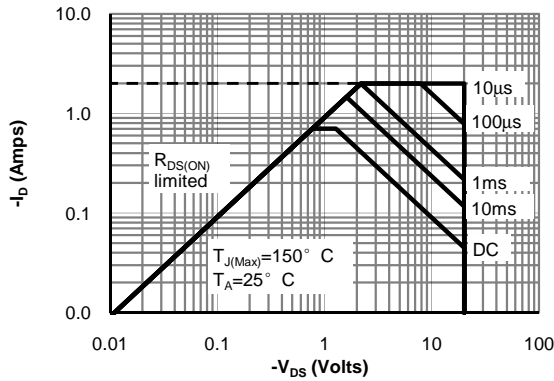
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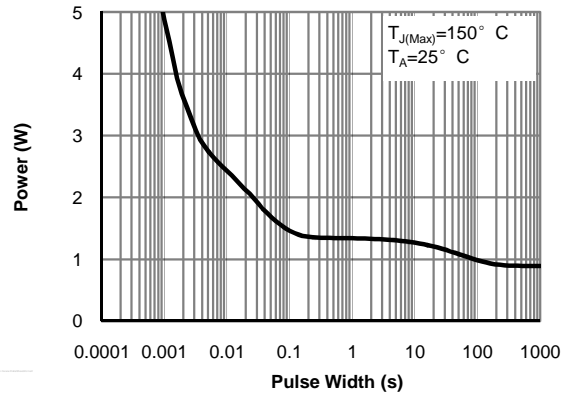
**Figure 7: Gate-Charge Characteristics**



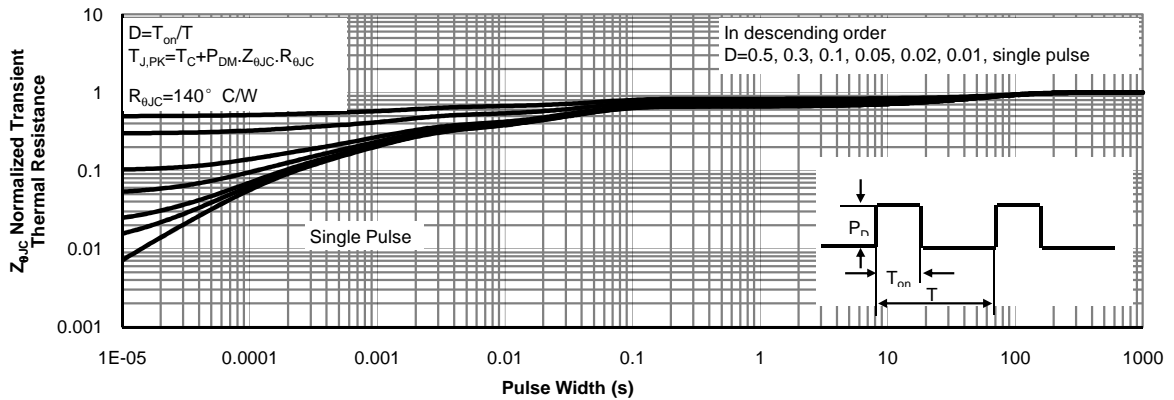
**Figure 8: Capacitance Characteristics**



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

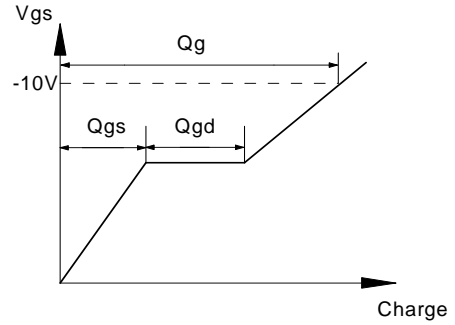
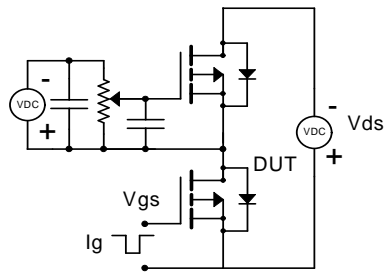


**Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note B)**



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

**Gate Charge Test Circuit & Waveform**



**Resistive Switching Test Circuit & Waveforms**

