

### General Description

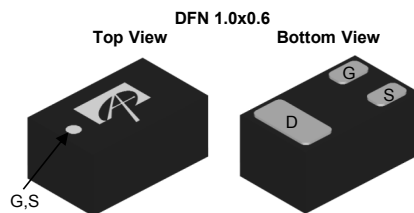
The AON1606 utilize advanced trench MOSFET technology in small DFN 1.0 x 0.6 package. This device is ideal for load switch applications.

### Product Summary

$V_{DS}$	20V
$I_D$ (at $V_{GS}=4.5V$ )	0.7A
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ )	< 275m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=2.5V$ )	< 335m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=1.8V$ )	< 390m $\Omega$

### 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>	$I_D$	$T_A=25^\circ C$	A
		$T_A=70^\circ C$	
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	2.8	A
Power Dissipation <sup>A</sup>	$P_D$	$T_A=25^\circ C$	W
		$T_A=70^\circ C$	
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	$^\circ C/W$
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	110	140	$^\circ C/W$
Maximum Junction-to-Ambient <sup>B</sup>	$R_{\theta JA}$	200	245	$^\circ C/W$
Maximum Junction-to-Ambient <sup>B</sup>	$R_{\theta JA}$	280	340	$^\circ C/W$

**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	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	0.3	0.65	1.0	V
I <sub>D(ON)</sub>	On state drain current	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =5V	2.8			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		225	275	mΩ
				313	380	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.3A		265	335	mΩ
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.2A		300	390	mΩ
	V <sub>GS</sub> =1.5V, I <sub>D</sub> =0.1A		355		mΩ	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =0.4A		2		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =0.4A, V <sub>GS</sub> =0V		0.75	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		62.5		pF
C <sub>oss</sub>	Output Capacitance			12.5		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			9		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		5.5		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		0.85		nC
Q <sub>gs</sub>	Gate Source Charge			0.1		nC
Q <sub>gd</sub>	Gate Drain Charge			0.25		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		2		ns
t <sub>r</sub>	Turn-On Rise Time			4		ns
t <sub>D(off)</sub>	Turn-Off DelayTime			18		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.

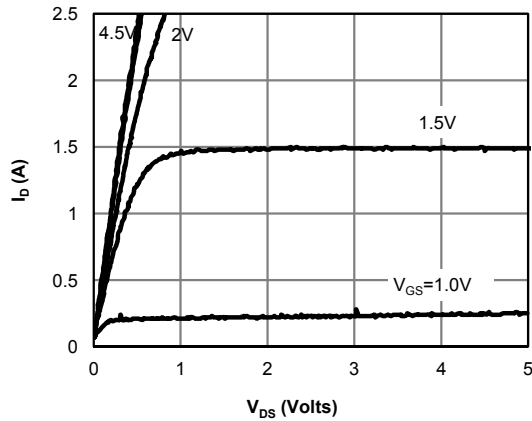
C: The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

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.

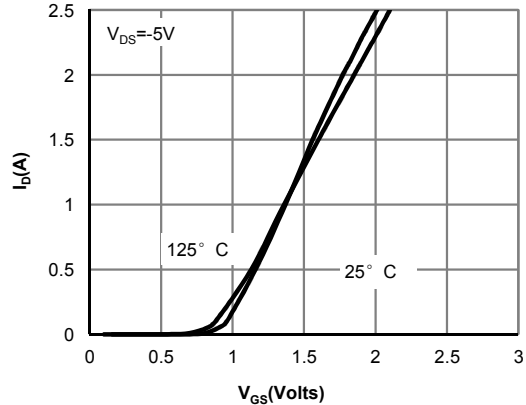
E: The maximum current limited by package.

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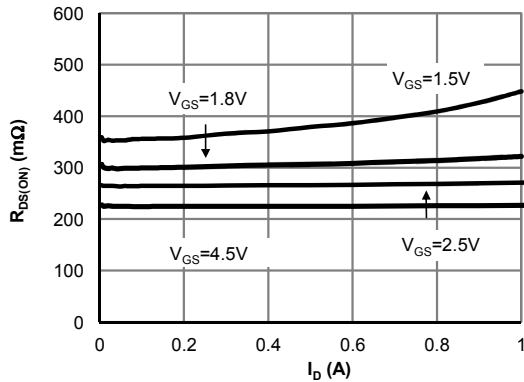
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



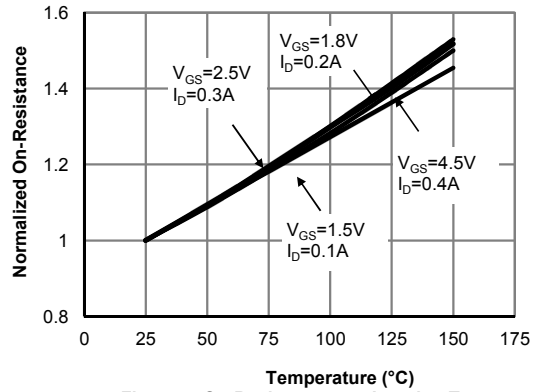
**Figure 1: On-Region Characteristics (Note E)**



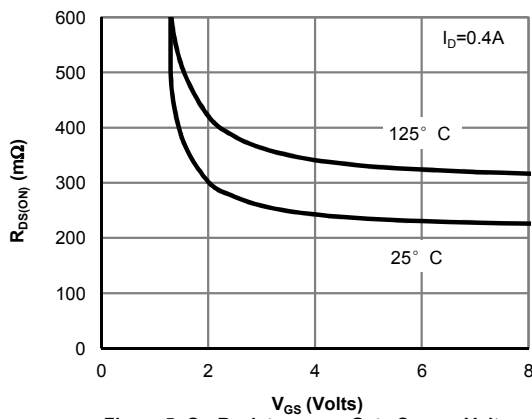
**Figure 2: Transfer Characteristics (Note E)**



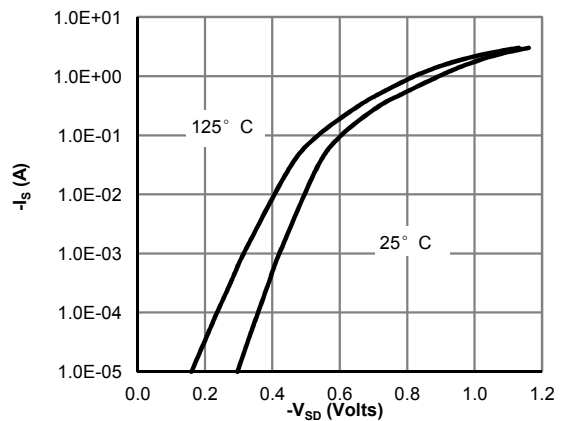
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)**



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

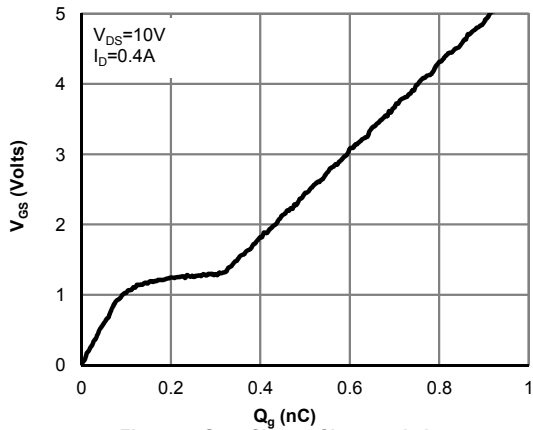


**Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)**

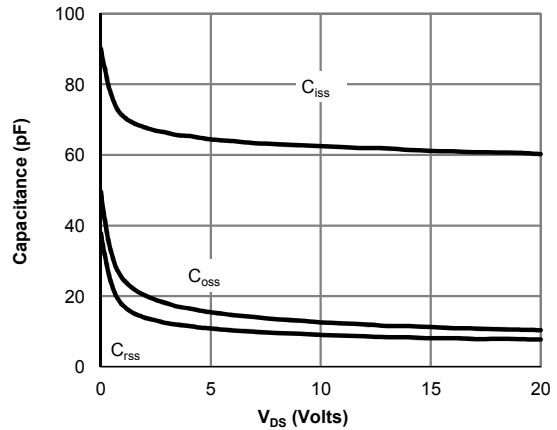


**Figure 6: Body-Diode Characteristics (Note E)**

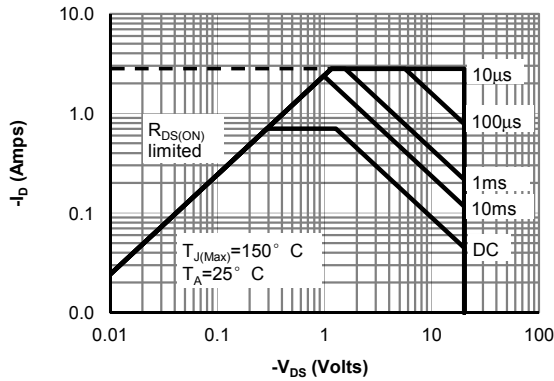
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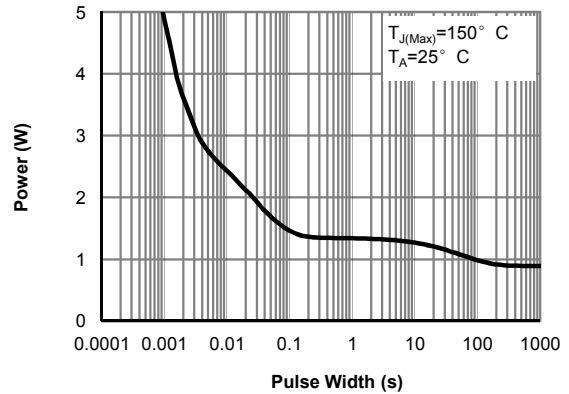
**Figure 7: Gate-Charge Characteristics**



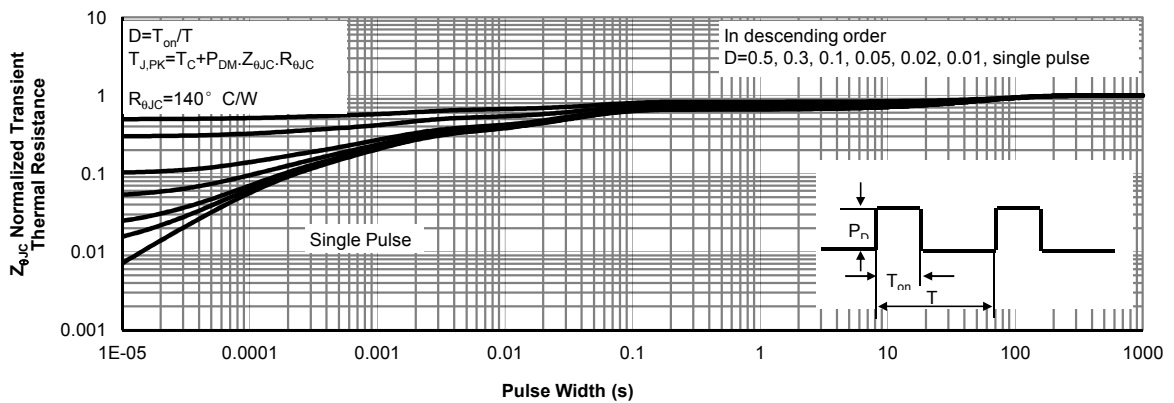
**Figure 8: Capacitance Characteristics**



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

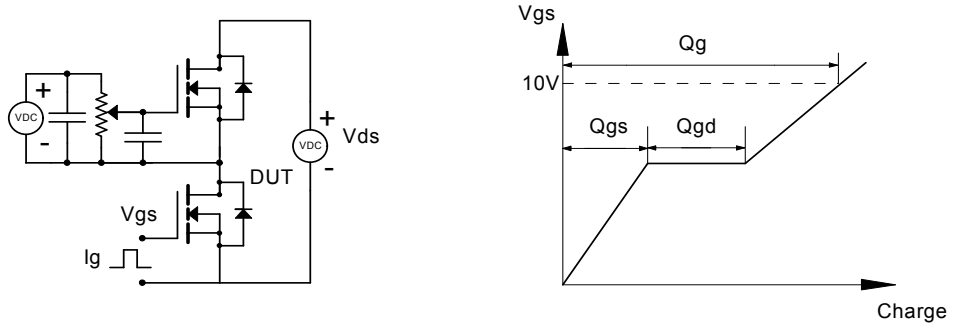


**Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note B)**



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

**Gate Charge Test Circuit & Waveform**



**Resistive Switching Test Circuit & Waveforms**

