

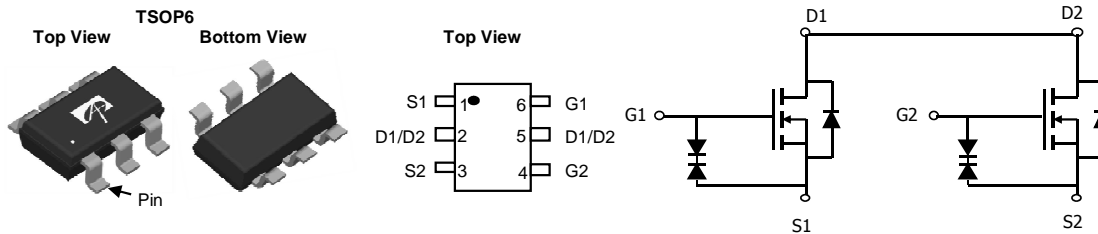


**General Description**

The AO6808 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch. It is ESD protected.

**Product Summary**

$V_{DS} = 20V$   
 $I_D = 6A$   
 $R_{DS(ON)} = 19m\Omega$  (typical) ( $V_{GS} = 4.5V$ )  
 $R_{DS(ON)} = 20m\Omega$  (typical) ( $V_{GS} = 4.0V$ )  
 $R_{DS(ON)} = 21m\Omega$  (typical) ( $V_{GS} = 3.1V$ )  
 $R_{DS(ON)} = 23m\Omega$  (typical) ( $V_{GS} = 2.5V$ )



**Absolute Maximum Ratings  $T_A=25^\circ C$  unless otherwise noted**

Parameter	Symbol	10 Sec	Steady State	Units
Drain-Source Voltage	$V_{DS}$	20		V
Gate-Source Voltage	$V_{GS}$	$\pm 12$		V
Continuous Drain Current <sup>A</sup>	$I_D$	6	4.6	A
$T_A=70^\circ C$		4.6	3.7	
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	60		
Power Dissipation <sup>A</sup>	$P_D$	1.3	0.8	W
		$T_A=70^\circ C$	0.8	
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>	$t \leq 10s$	$R_{\theta JA}$	76	95	$^\circ C/W$
Maximum Junction-to-Ambient <sup>A</sup>	Steady State		118	150	$^\circ C/W$
Maximum Junction-to-Lead <sup>C</sup>	Steady State	$R_{\theta JL}$	54	68	$^\circ C/W$

**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> = ±10V			±10	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	0.5	0.75	1	V
I <sub>D(ON)</sub>	On state drain current	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 5V	60			A
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6.0A T <sub>J</sub> = 125°C	15 21	19 27	23 33	mΩ
		V <sub>GS</sub> = 4.0V, I <sub>D</sub> = 5.5A	15	20	25	
		V <sub>GS</sub> = 3.1V, I <sub>D</sub> = 5A	16	21	27	mΩ
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 2A	17	23	30	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> = 5V, I <sub>D</sub> = 6.0A		34		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> = 1A, V <sub>GS</sub> = 0V		0.65	1	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current				1.3	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 10V, f = 1MHz		620	780	pF
C <sub>OSS</sub>	Output Capacitance			125		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			64		pF
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub> (10V)	Total Gate Charge	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 6A		16.2	21	nC
Q <sub>g</sub> (4.5V)	Total Gate Charge			7.7	10	nC
Q <sub>gs</sub>	Gate Source Charge			1.5		nC
Q <sub>gd</sub>	Gate Drain Charge			2.7		nC
t <sub>D(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 10V, R <sub>L</sub> = 1.7Ω, R <sub>GEN</sub> = 3Ω		236		ns
t <sub>r</sub>	Turn-On Rise Time			448		ns
t <sub>D(off)</sub>	Turn-Off Delay Time			9.5		μs
t <sub>f</sub>	Turn-Off Fall Time			4.1		μs
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> = 6A, di/dt = 100A/μs		25	33	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> = 6A, di/dt = 100A/μs		9		nC

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. 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.

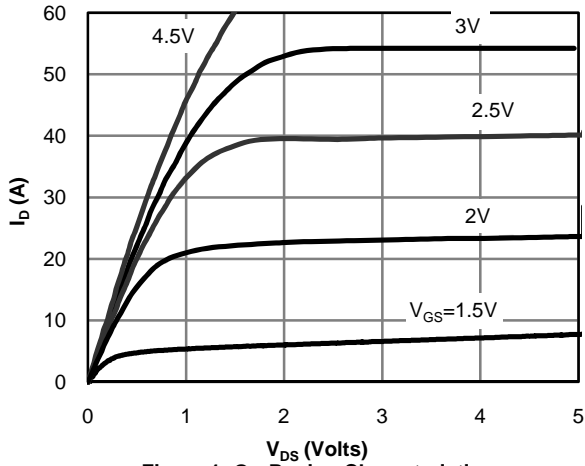
C: The R<sub>θJA</sub> is the sum of the thermal impedance from junction to lead R<sub>θJL</sub> and lead to ambient.

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

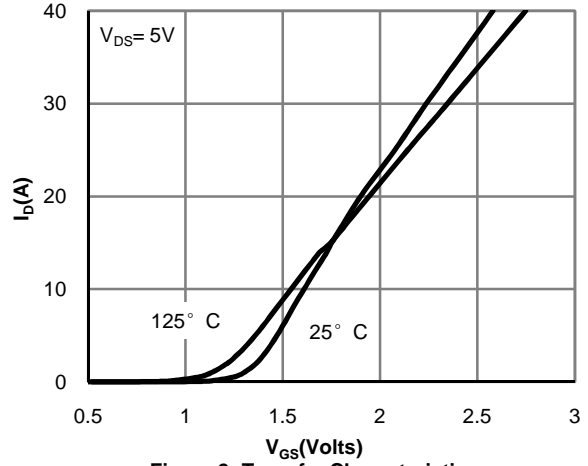
E: These tests are performed with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub> = 25° C. The SOA curve provides a single pulse rating.

THIS PRODUCT HAS BEEN DESIGNED AND QUALIFIED FOR THE CONSUMER MARKET. APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED. AOS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS. AOS RESERVES THE RIGHT TO IMPROVE PRODUCT DESIGN, FUNCTIONS AND RELIABILITY WITHOUT NOTICE.

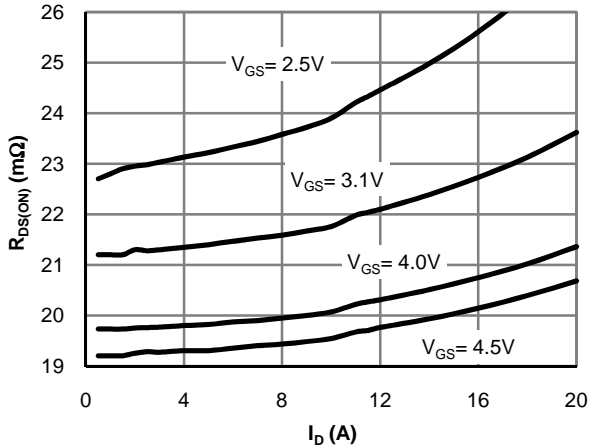
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



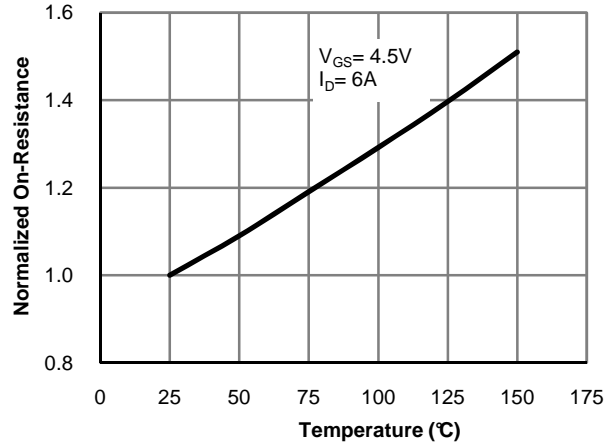
**Figure 1: On-Region Characteristics**



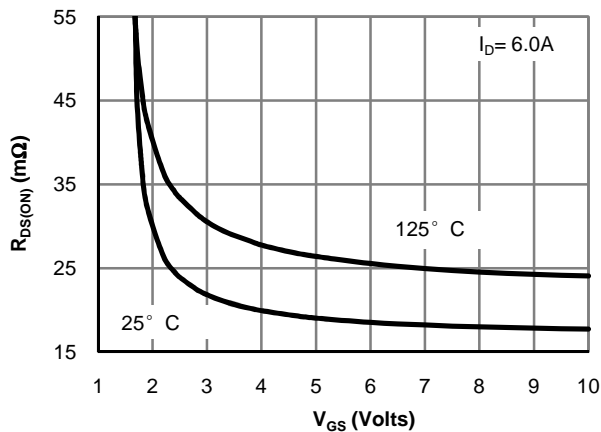
**Figure 2: Transfer Characteristics**



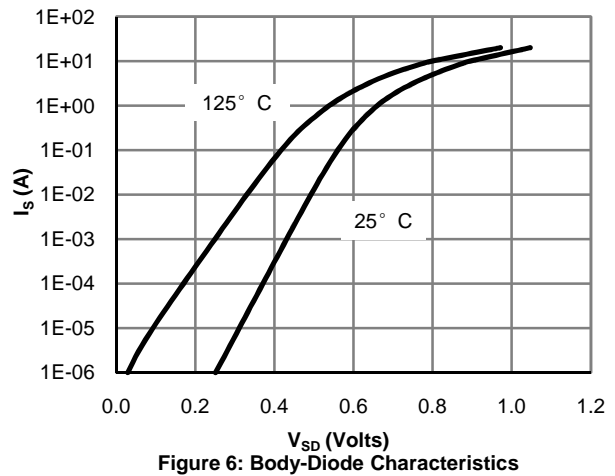
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**



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

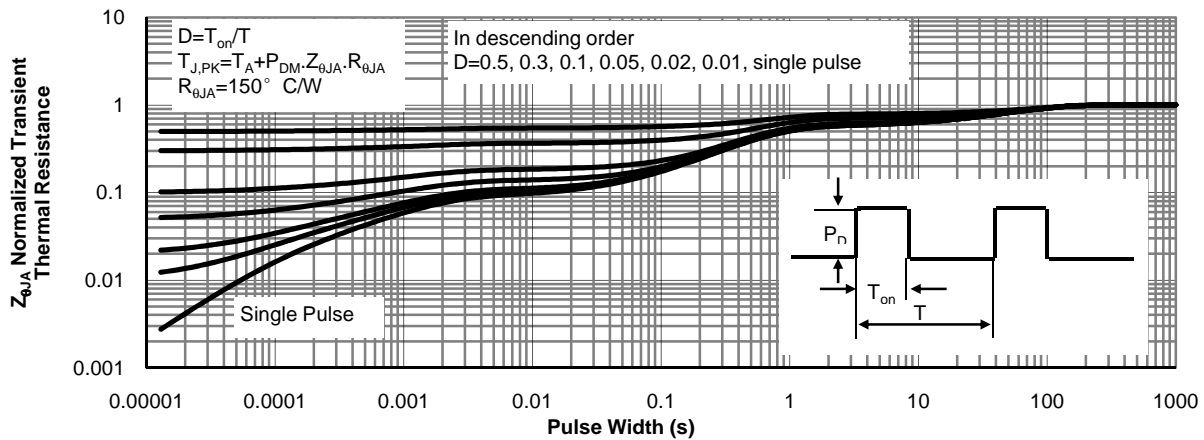
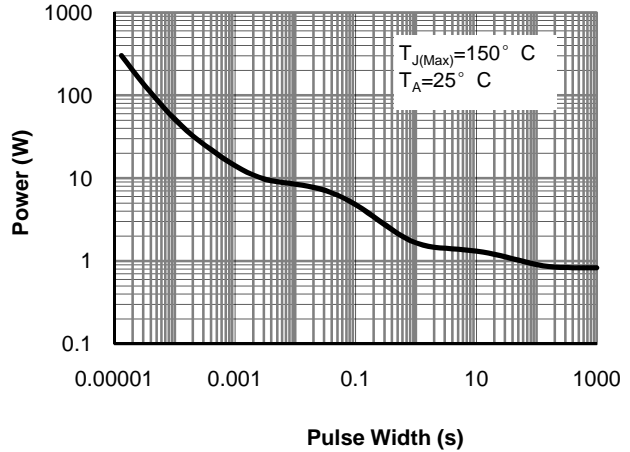
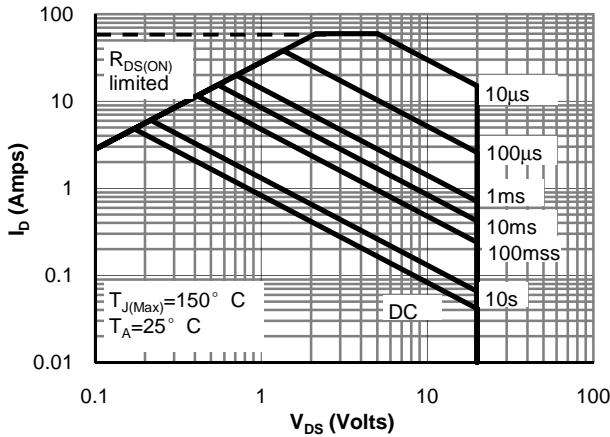
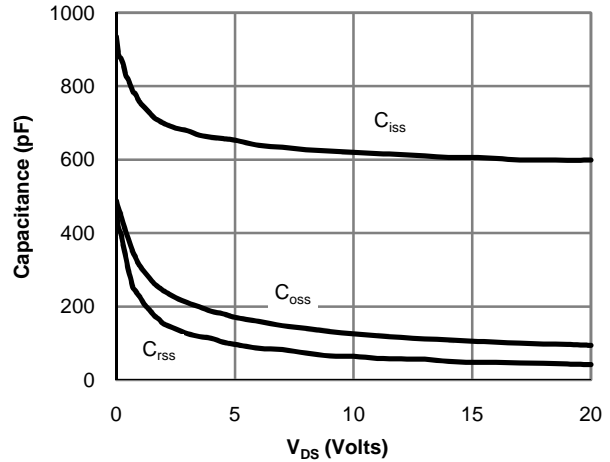
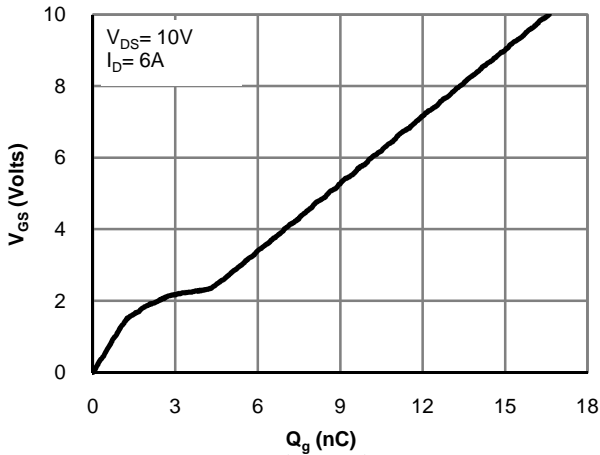


**Figure 5: On-Resistance vs. Gate-Source Voltage**

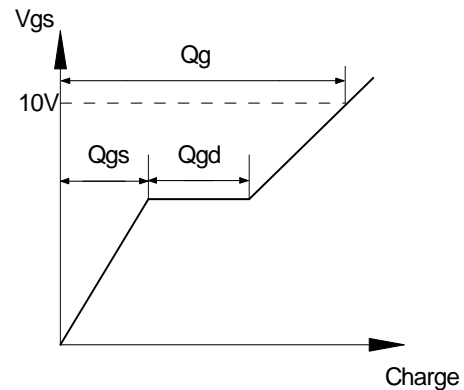
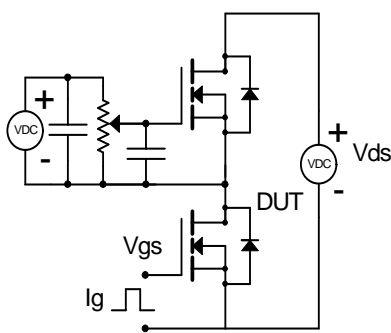


**Figure 6: Body-Diode Characteristics**

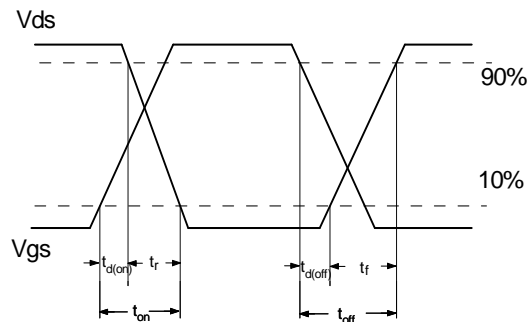
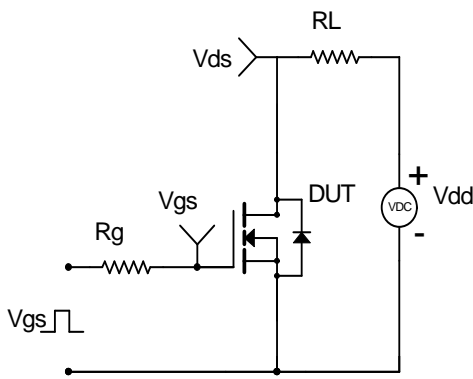
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



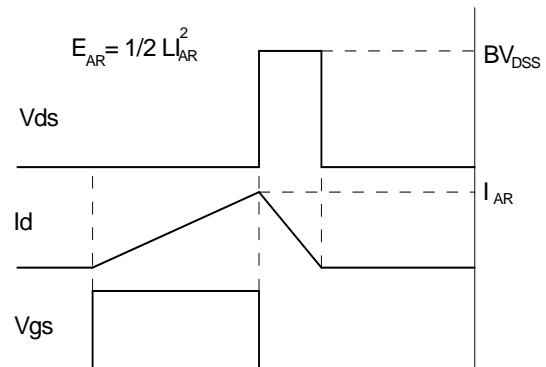
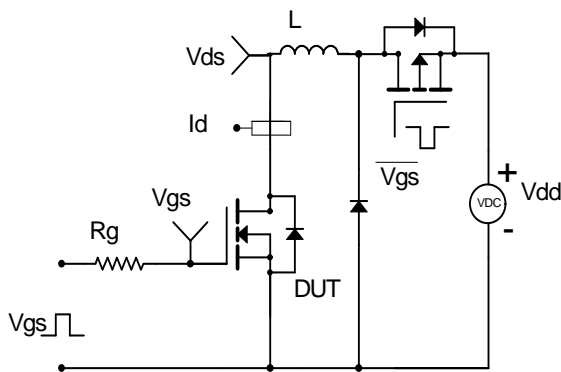
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms



### Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



### Diode Recovery Test Circuit & Waveforms

