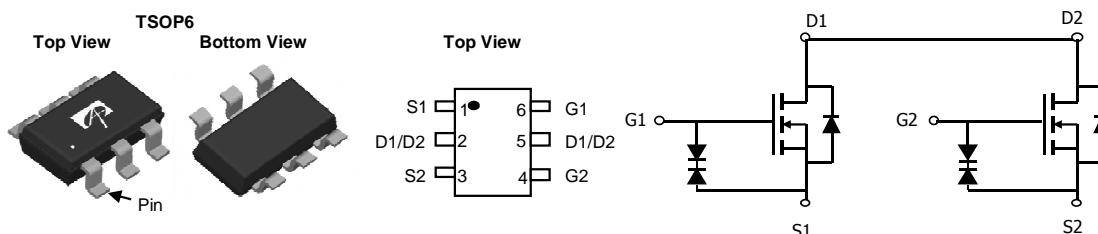


**General Description**

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.

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**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

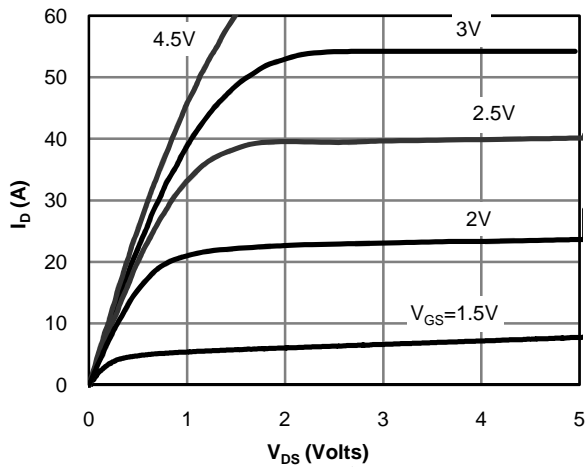


Figure 1: On-Region Characteristics

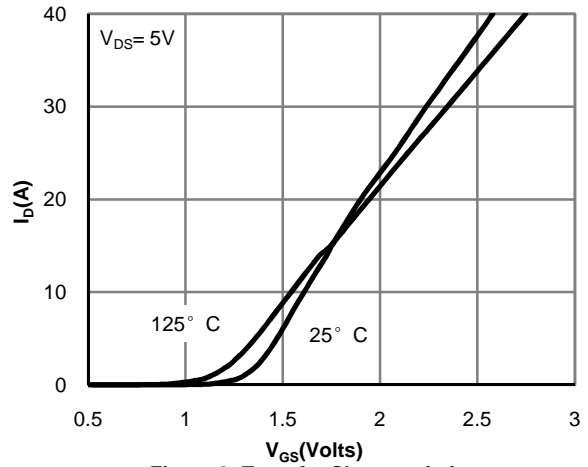


Figure 2: Transfer Characteristics

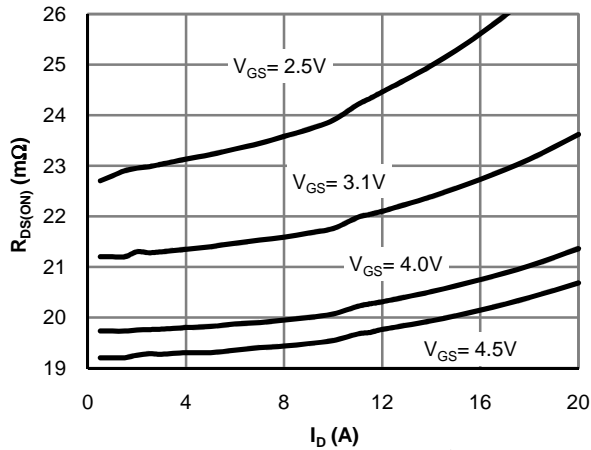


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

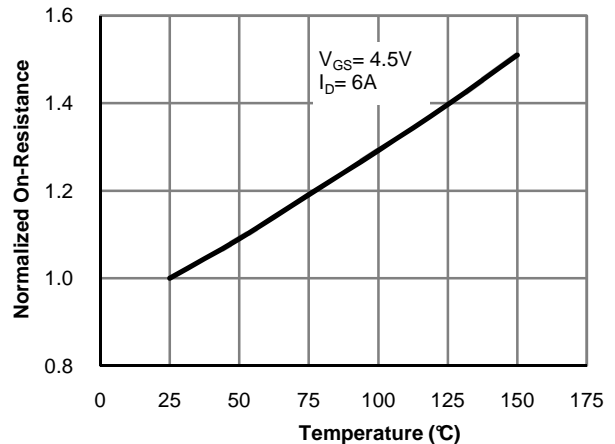


Figure 4: On-Resistance vs. Junction Temperature

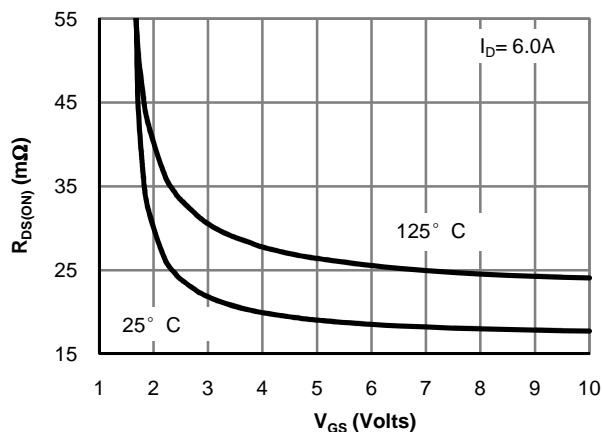


Figure 5: On-Resistance vs. Gate-Source Voltage

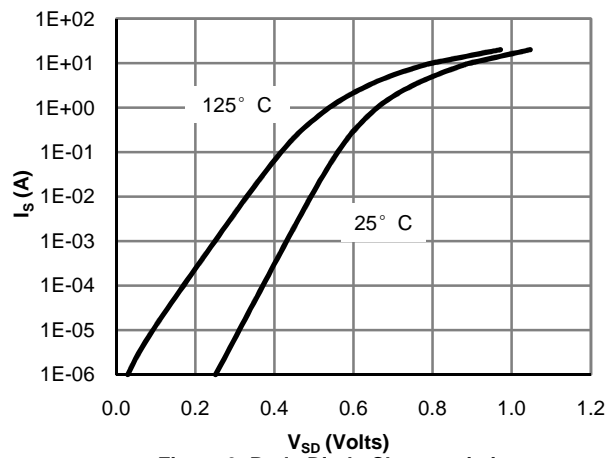
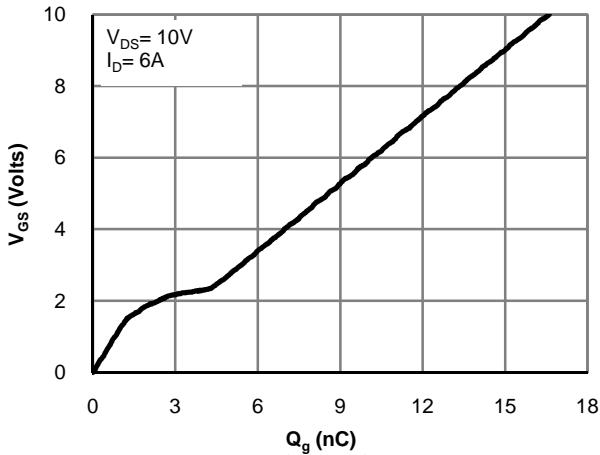
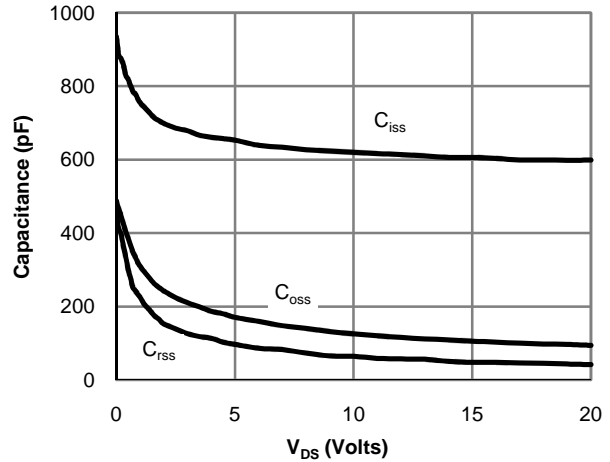
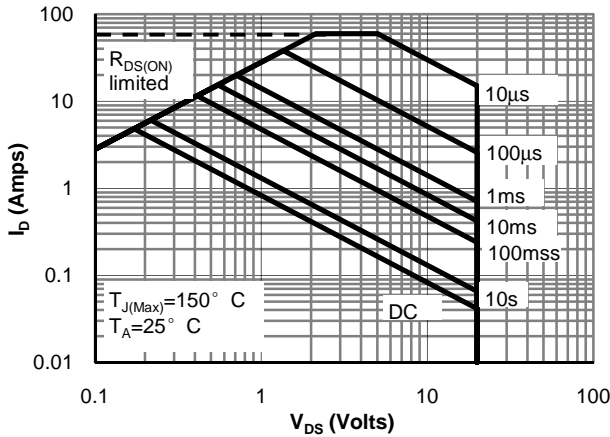
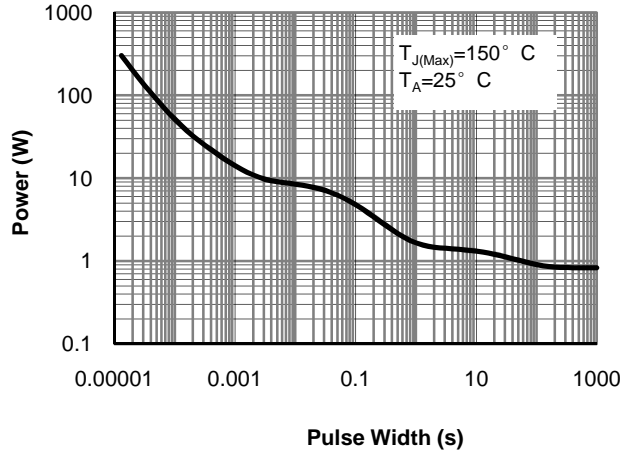
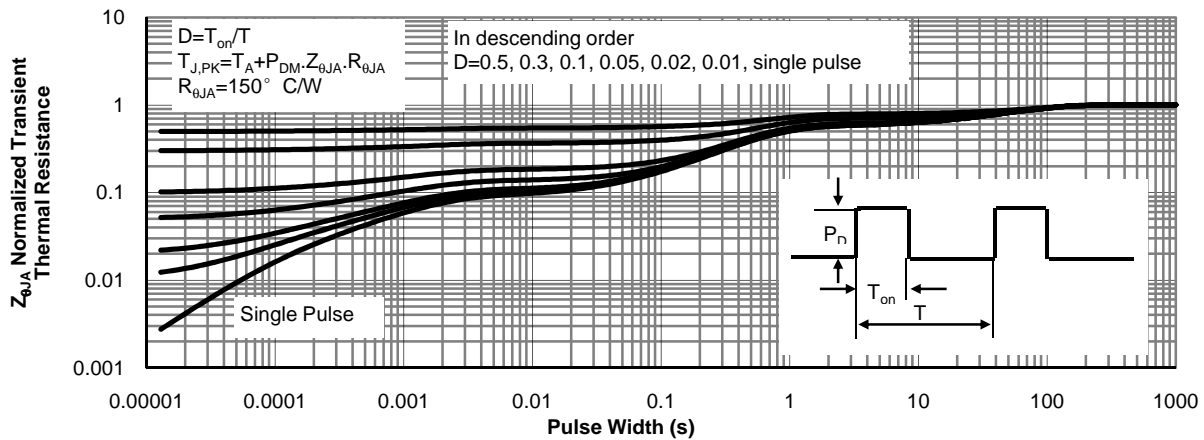
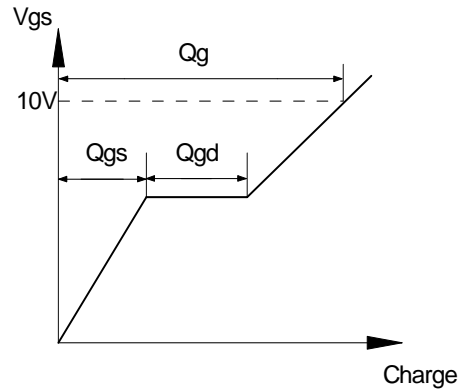
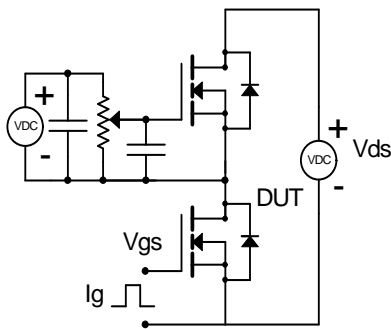


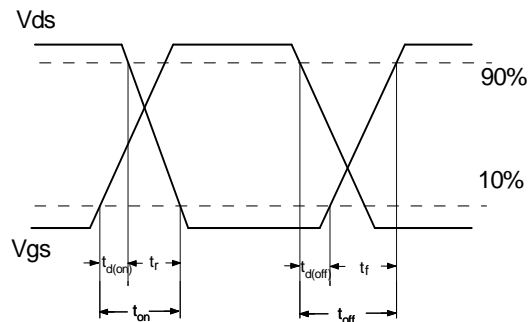
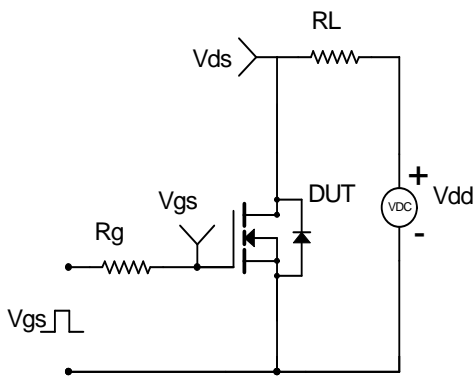
Figure 6: Body-Diode Characteristics

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

**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)**

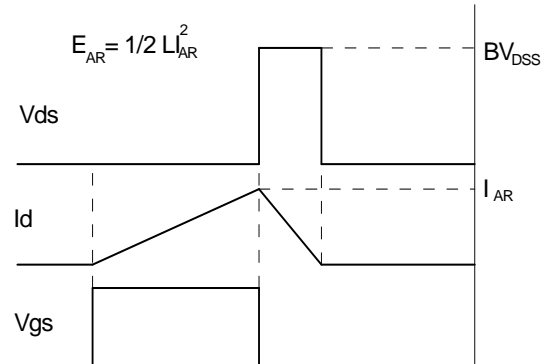
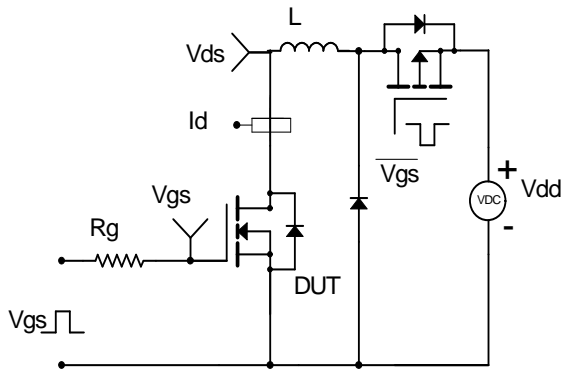
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms



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



### Diode Recovery Test Circuit & Waveforms

