

### General Description

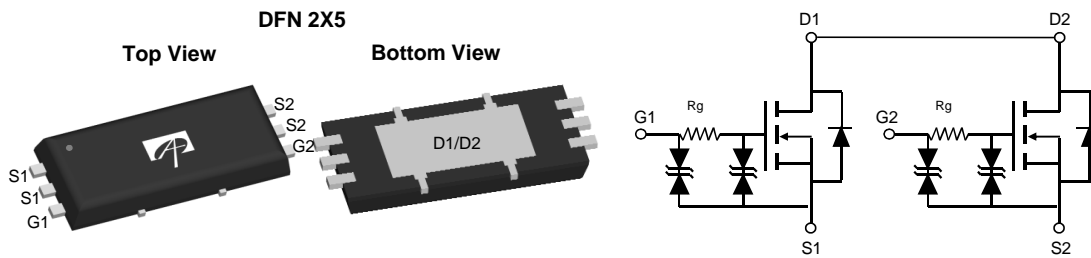
The AON5802B uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V while retaining a 12V  $V_{GS(MAX)}$  rating. It is ESD protected. This device is suitable for use as a uni-directional or bi-directional load switch, facilitated by its common-drain configuration.

### Product Summary

$V_{DS}$	30V
$I_D$ (at $V_{GS}=4.5V$ )	7.2A
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ )	< 19m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=4.0V$ )	< 20m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=3.1V$ )	< 23m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=2.5V$ )	< 30m $\Omega$

### Typical ESD protection

HBM Class 3A



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$	7.2
		$T_C=70^\circ\text{C}$	5.6
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	55	A
Power Dissipation <sup>A</sup>	$P_{DSM}$	$T_A=25^\circ\text{C}$	1.6
		$T_A=70^\circ\text{C}$	1
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

### Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	30	40	$^\circ\text{C/W}$
$t \leq 10\text{s}$				
Maximum Junction-to-Ambient <sup>AC</sup>	$R_{\theta JC}$	4.5	6	$^\circ\text{C/W}$
Steady-State				
Maximum Junction-to-Case	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	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> =±10V			±10	μA
BV <sub>GSO</sub>	Gate-Source Breakdown Voltage	V <sub>DS</sub> =0V, I <sub>G</sub> =±250uA	±12			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.6	1.1	1.5	V
I <sub>D(ON)</sub>	On state drain current	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =5V	55			A
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =7A T <sub>J</sub> =125°C	12	15.5	19	mΩ
		V <sub>GS</sub> =4.0V, I <sub>D</sub> =5A	13	16	20	
		V <sub>GS</sub> =3.1V, I <sub>D</sub> =5A	14	18	23	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =4A	17	23	30	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =7A		32		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1A, V <sub>GS</sub> =0V		0.71	0.9	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current				2.5	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz		920	1150	pF
C <sub>oss</sub>	Output Capacitance			105		pF
C <sub>riss</sub>	Reverse Transfer Capacitance			52		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		1.7	2.5	KΩ
<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> =7A		17.5	24	nC
Q <sub>g(4.5V)</sub>	Total Gate Charge			7.5	10	nC
Q <sub>gs</sub>	Gate Source Charge			2.9		nC
Q <sub>gd</sub>	Gate Drain Charge			2.5		nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =2.1Ω, R <sub>GEN</sub> =3Ω		0.32	0.42	μs
t <sub>r</sub>	Turn-On Rise Time			0.55		μs
t <sub>D(off)</sub>	Turn-Off DelayTime			4.35		μs
t <sub>f</sub>	Turn-Off Fall Time			2.4		μs
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =7A, di/dt=100A/μs		21.6	26	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> =7A, di/dt=100A/μs		10		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. The value in any given application depends on the user's specific board design. The current rating is based on the steady state thermal resistance rating.

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

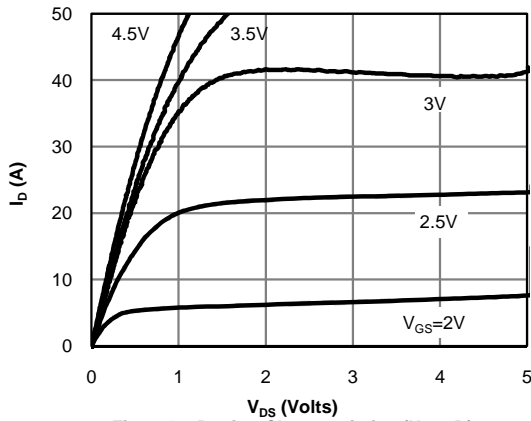
C: The R<sub>θJA</sub> is the sum of the thermal impedance from junction to lead R<sub>θJL</sub> and lead to ambient.

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

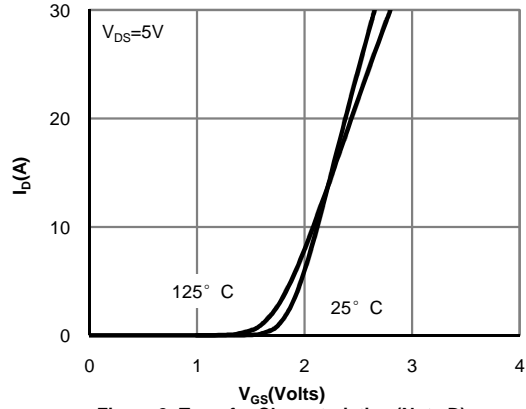
E: These tests are performed with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25° C. The SOA curve provides a single pulse rating.

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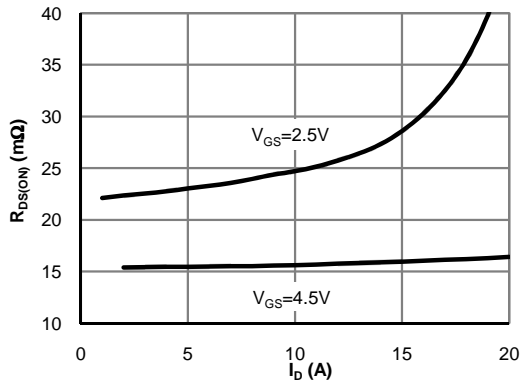
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



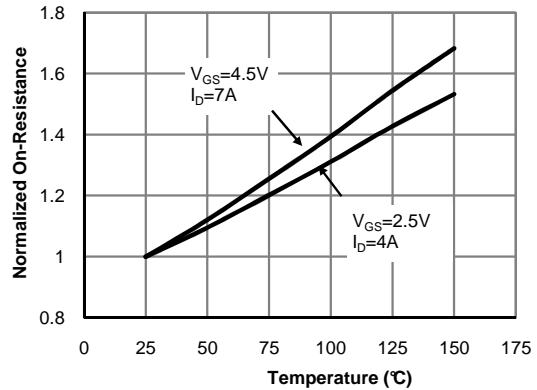
**Fig 1: On-Region Characteristics (Note D)**



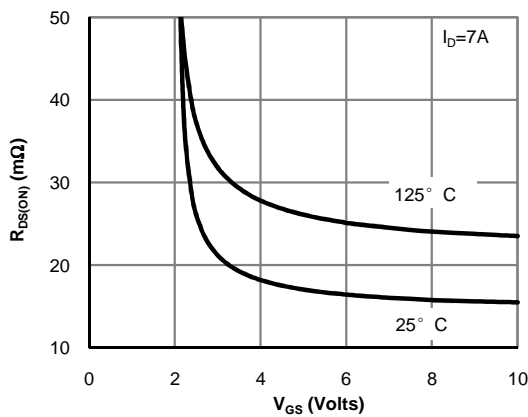
**Figure 2: Transfer Characteristics (Note D)**



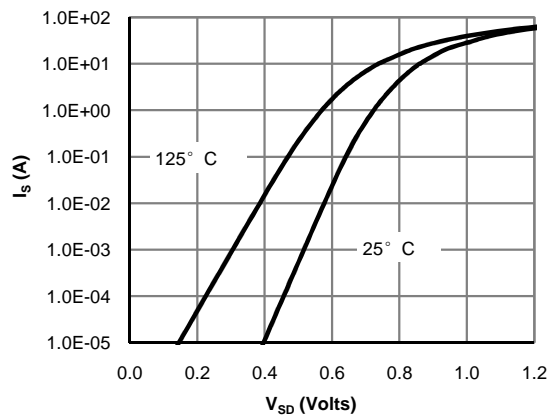
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note D)**



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

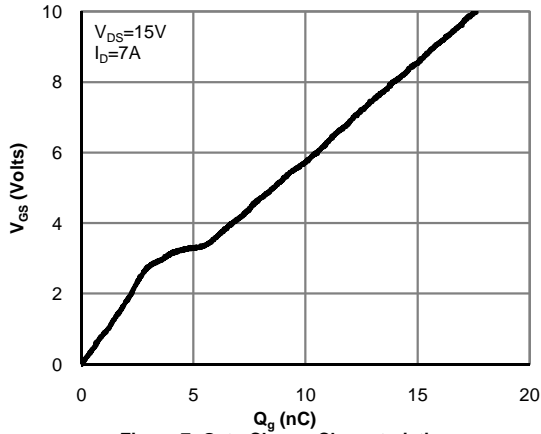


**Figure 5: On-Resistance vs. Gate-Source Voltage (Note D)**

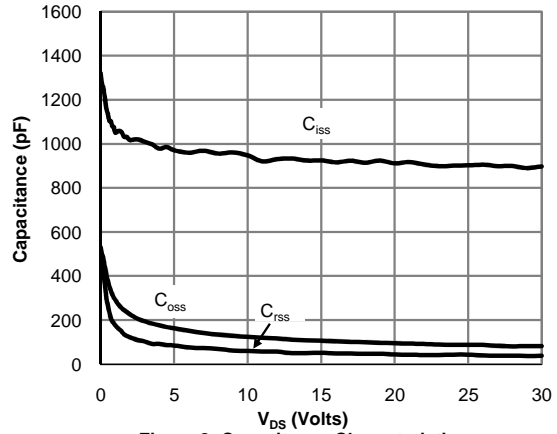


**Figure 6: Body-Diode Characteristics (Note D)**

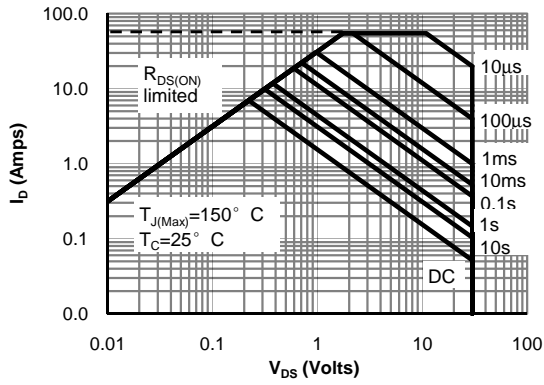
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



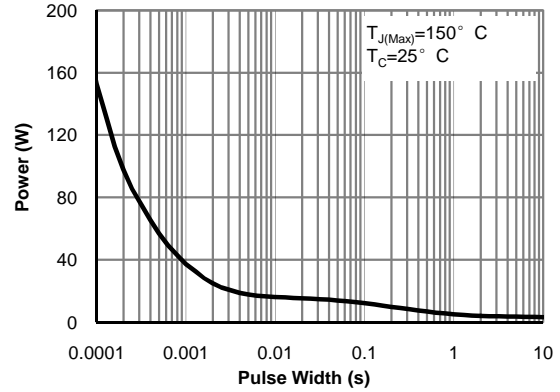
**Figure 7: Gate-Charge Characteristics**



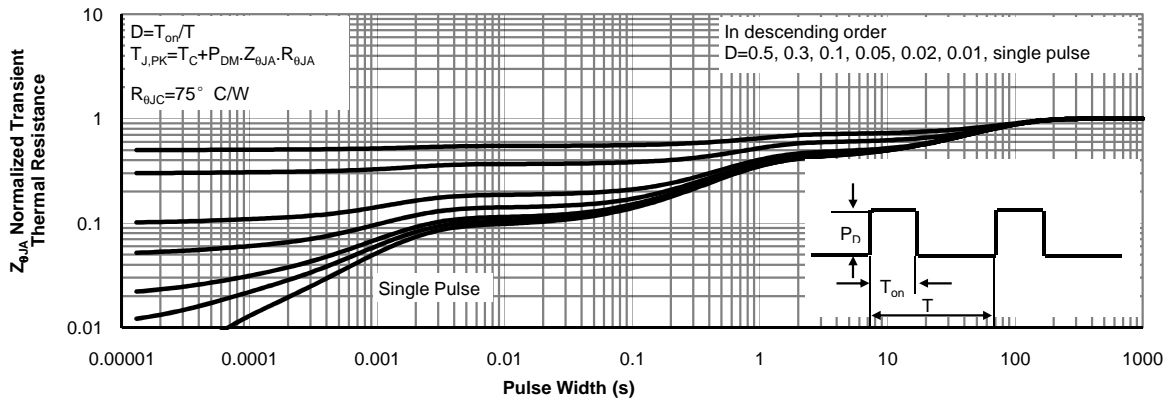
**Figure 8: Capacitance Characteristics**



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

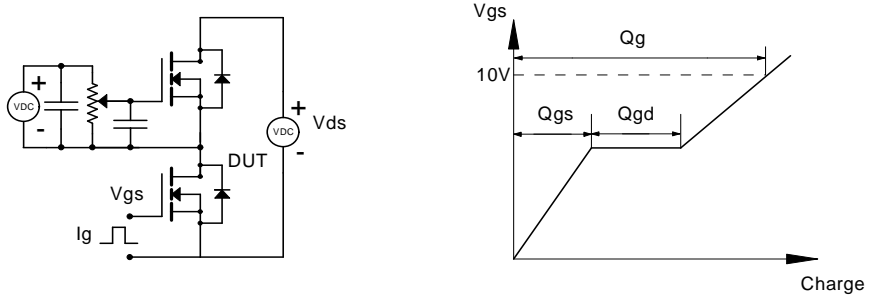


**Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)**

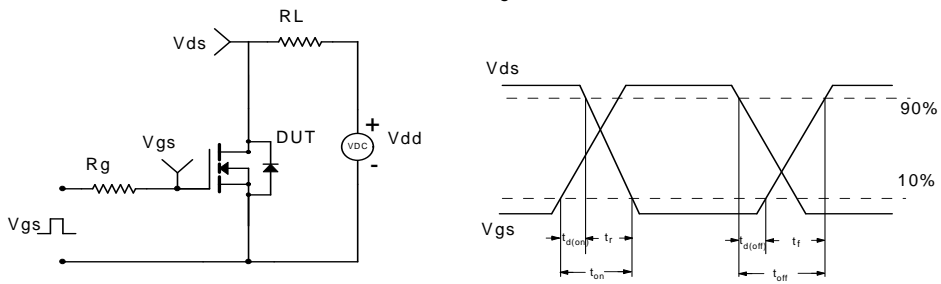


**Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)**

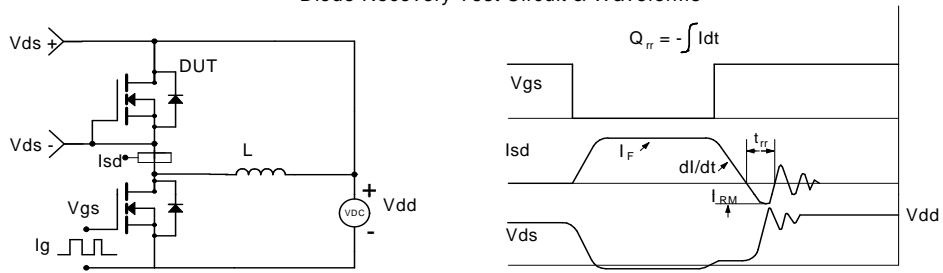
**Gate Charge Test Circuit & Waveform**



**Resistive Switching Test Circuit & Waveforms**



**Diode Recovery Test Circuit & Waveforms**



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