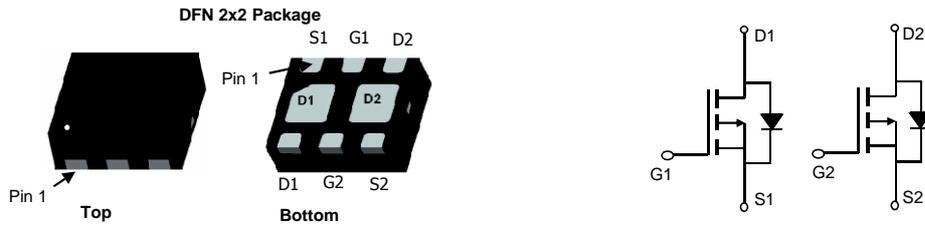


General Description

The AON2803 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltage as low as 1.8V. This device is suitable for use as a load switch or in PWM applications.

Product Summary

V_{DS}	-20V
I_D (at $V_{GS}=-4.5V$)	-3.8A
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	< 70m Ω
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$)	< 90m Ω
$R_{DS(ON)}$ (at $V_{GS}=-1.8V$)	< 115m Ω



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current	I_D	$T_A=25^\circ\text{C}$	-3.8
		$T_A=70^\circ\text{C}$	-3
Pulsed Drain Current ^C	I_{DM}	-20	A
Power Dissipation ^A	P_D	$T_A=25^\circ\text{C}$	1.5
		$T_A=70^\circ\text{C}$	0.95
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 ^A $t \leq 10s$	$R_{\theta JA}$	35	45	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient ^A Steady-State		65	85	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient ^B $t \leq 10s$	$R_{\theta JA}$	120	155	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient ^B Steady-State		175	235	$^\circ\text{C}/\text{W}$

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =-250μA, V _{GS} =0V	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V T _J =55°C			-1 -5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±8V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.4	-0.6	-1	V
I _{D(ON)}	On state drain current	V _{GS} =-4.5V, V _{DS} =-5V	-20			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-3.8A T _J =125°C		58 78	70 94	mΩ
		V _{GS} =-2.5V, I _D =-3A		70	90	mΩ
		V _{GS} =-1.8V, I _D =-2A		85	115	mΩ
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-3.8A		15		S
V _{SD}	Diode Forward Voltage	I _S =-1A, V _{GS} =0V		-0.66	-1	V
I _S	Maximum Body-Diode Continuous Current				-2	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, f=1MHz		560		pF
C _{oss}	Output Capacitance			80		pF
C _{rss}	Reverse Transfer Capacitance			70		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		15	30	Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-3.8A		8.5	12	nC
Q _{gs}	Gate Source Charge			1.2		nC
Q _{gd}	Gate Drain Charge			2.1		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =-4.5V, V _{DS} =-10V, R _L =2.6Ω, R _{GEN} =3Ω		7.2		ns
t _r	Turn-On Rise Time			36		ns
t _{D(off)}	Turn-Off DelayTime			53		ns
t _f	Turn-Off Fall Time			56		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =-3.8A, di/dt=100A/μs		37		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-3.8A, di/dt=100A/μs		27		nC

- A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C. The Power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150° C.
- B: The value of R_{θJA} is measured with the device mounted on a minimum pad board. Copper, in a still air environment with T_A=25° C. The Power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150° C.
- C: The R_{θJA} is the sum of the thermal impedance from junction to case R_{θJC} and case 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 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=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

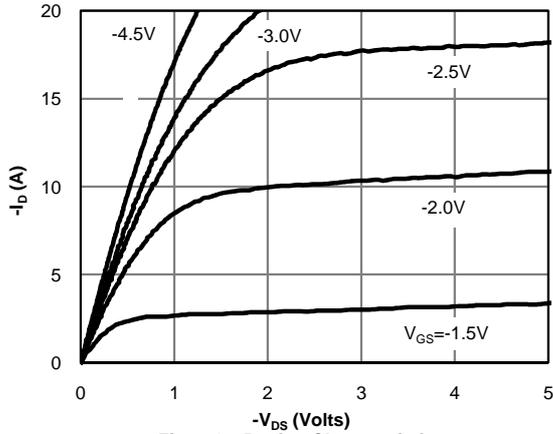


Fig 1: On-Region Characteristics

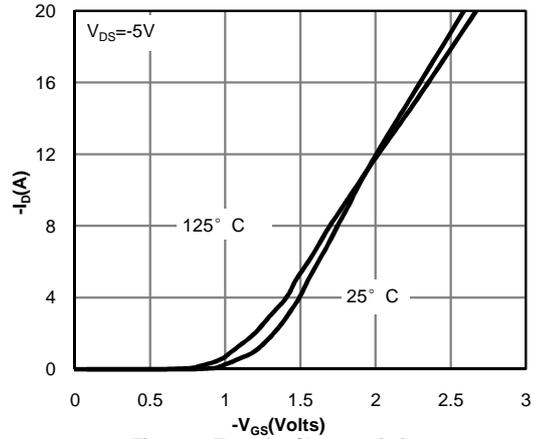


Figure 2: Transfer Characteristics

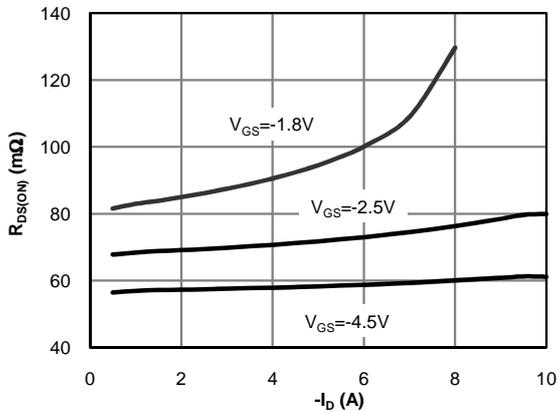


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

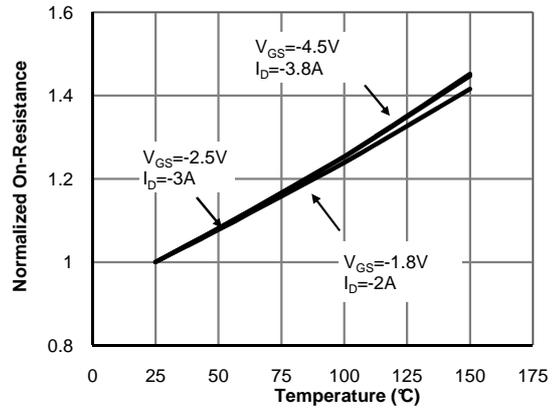


Figure 4: On-Resistance vs. Junction Temperature

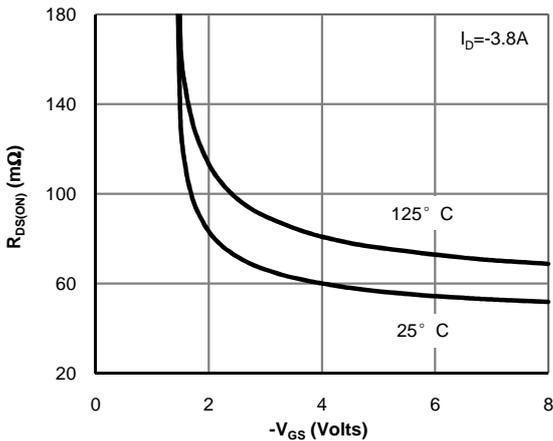


Figure 5: On-Resistance vs. Gate-Source Voltage

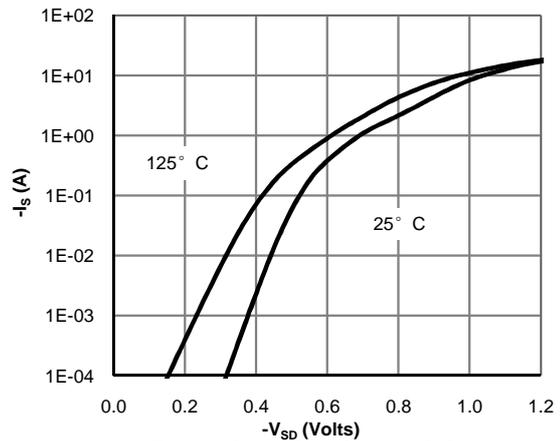


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

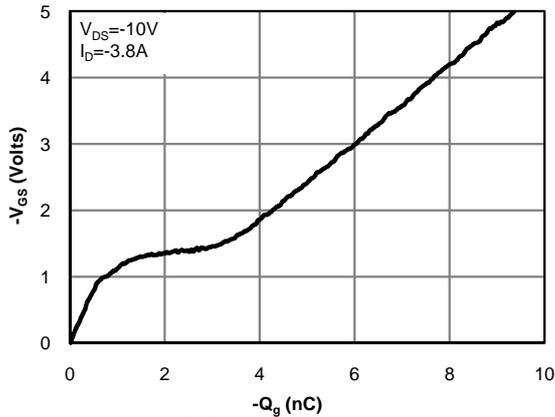


Figure 7: Gate-Charge Characteristics

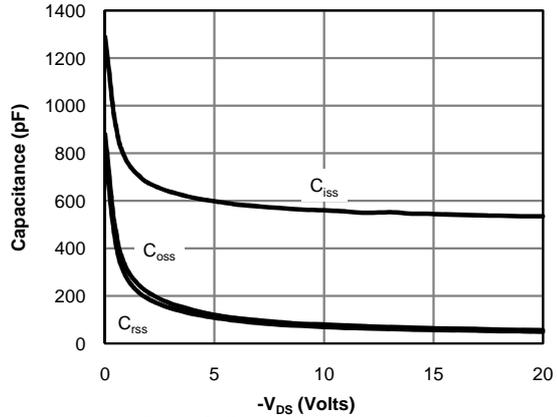


Figure 8: Capacitance Characteristics

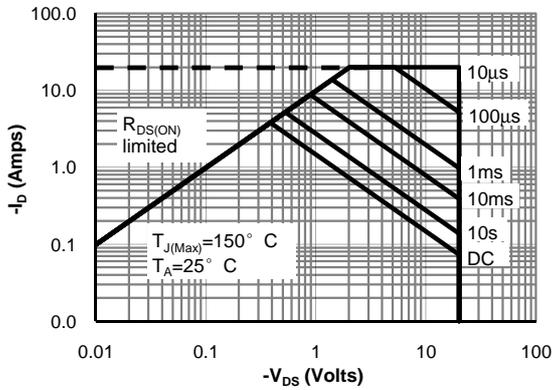


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

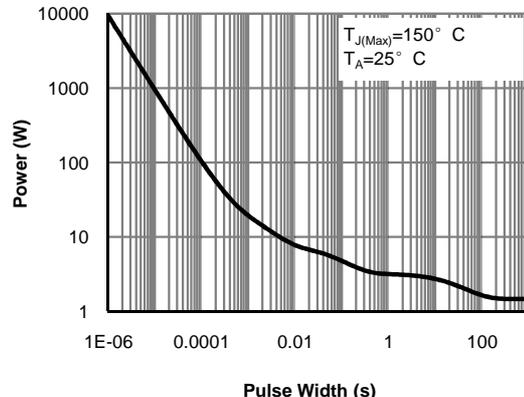


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

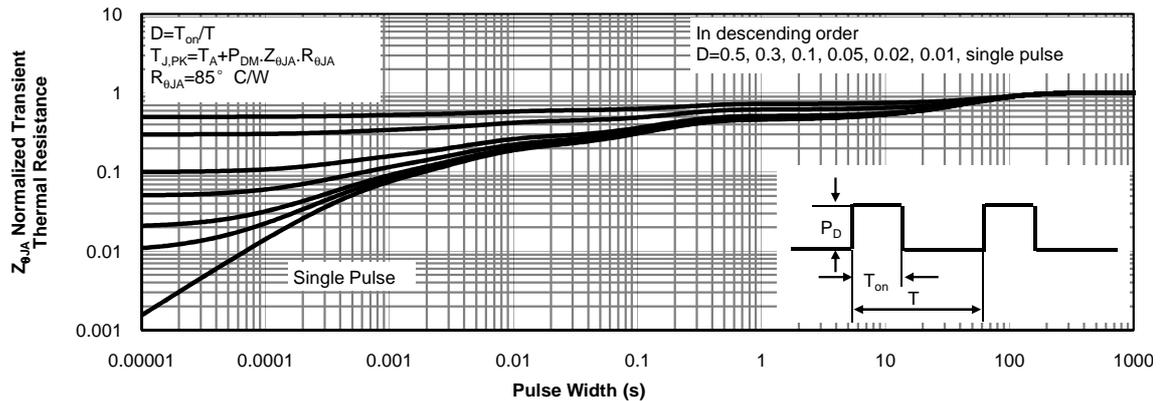
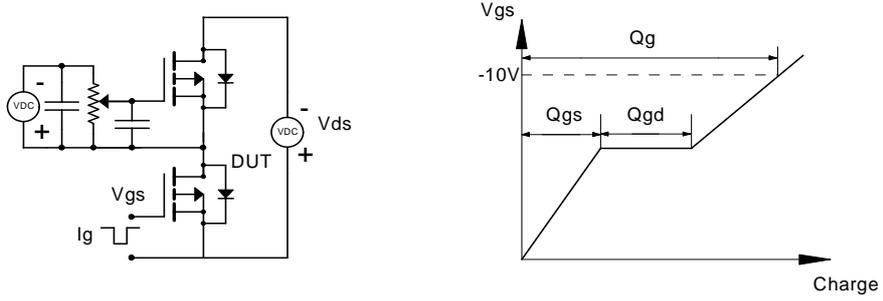
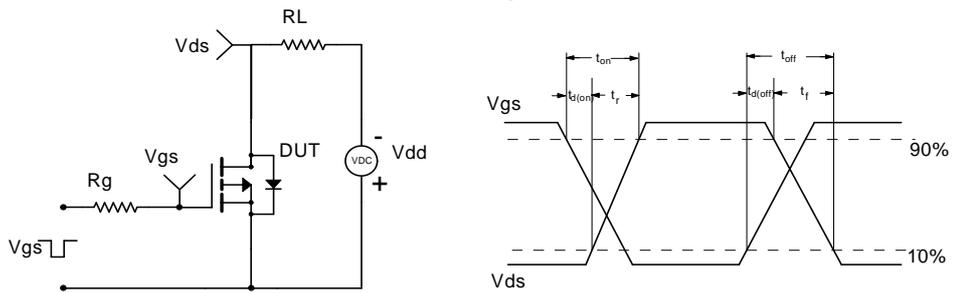


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

