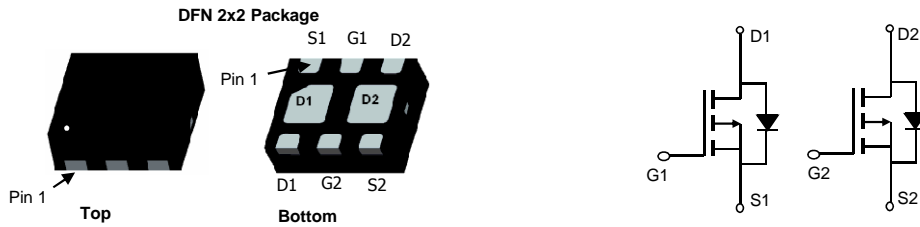


General Description

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 $T_A=25^\circ C$ 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	$T_A=25^\circ C$	-3.8
		$T_A=70^\circ C$	-3
Pulsed Drain Current ^C	I_{DM}	-20	A
Power Dissipation ^A	P_D	$T_A=25^\circ C$	1.5
		$T_A=70^\circ C$	0.95
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 ^A $t \leq 10s$	$R_{\theta JA}$	35	45	$^\circ C/W$
Maximum Junction-to-Ambient ^A Steady-State		65	85	$^\circ C/W$
Maximum Junction-to-Ambient ^B $t \leq 10s$	$R_{\theta JA}$	120	155	$^\circ C/W$
Maximum Junction-to-Ambient ^B Steady-State		175	235	$^\circ C/W$

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	
		V _{GS} =-1.8V, I _D =-2A		85	115	
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.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

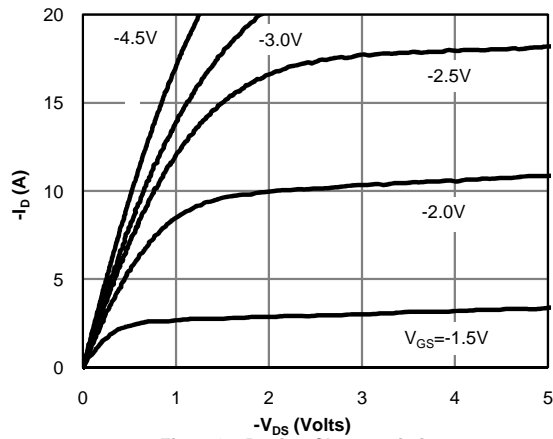


Fig 1: On-Region Characteristics

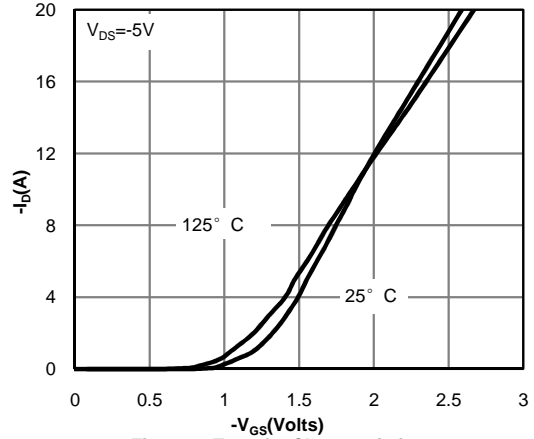


Figure 2: Transfer Characteristics

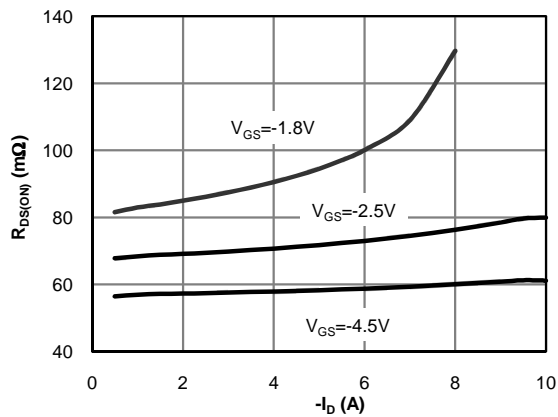


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

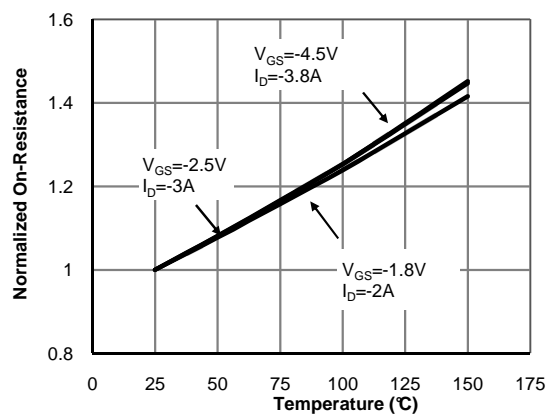


Figure 4: On-Resistance vs. Junction Temperature

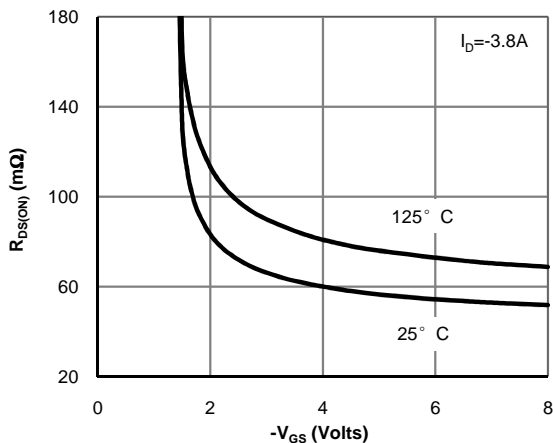


Figure 5: On-Resistance vs. Gate-Source Voltage

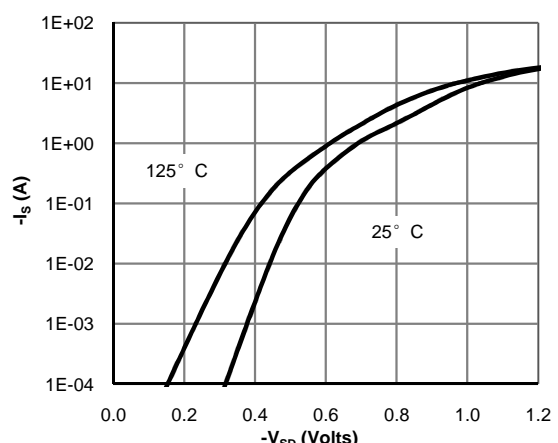


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

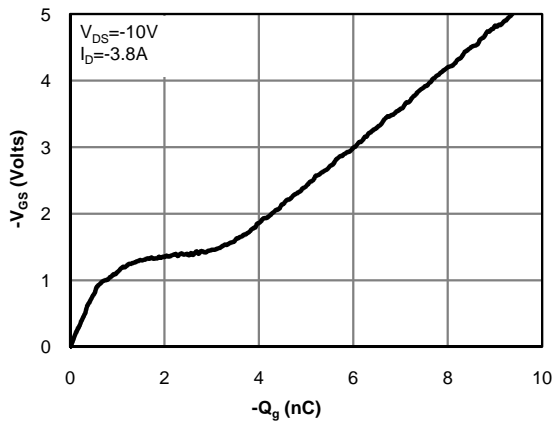


Figure 7: Gate-Charge Characteristics

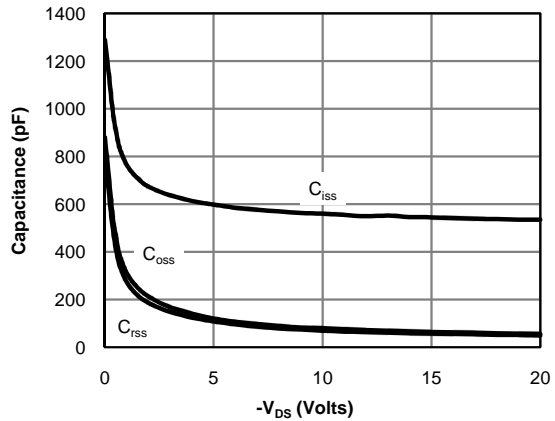


Figure 8: Capacitance Characteristics

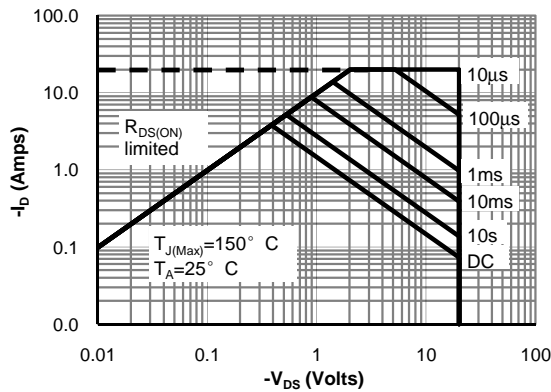


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

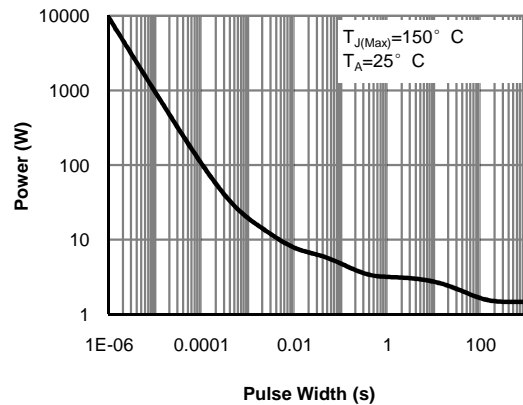


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

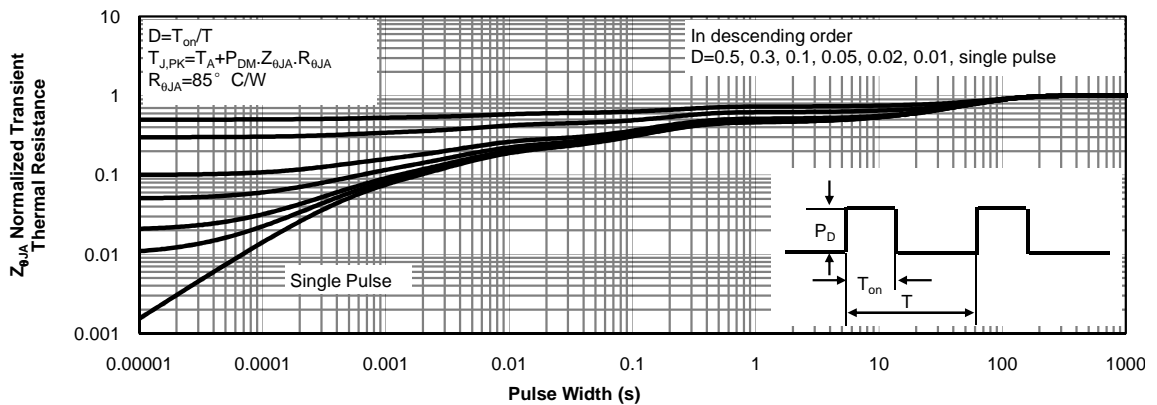
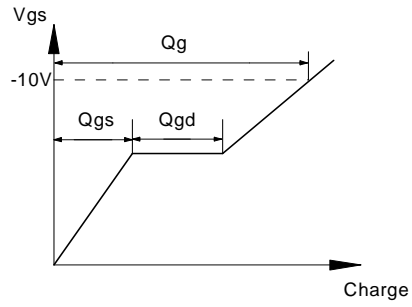
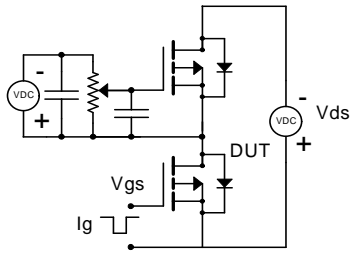
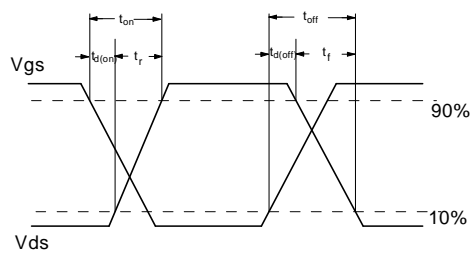
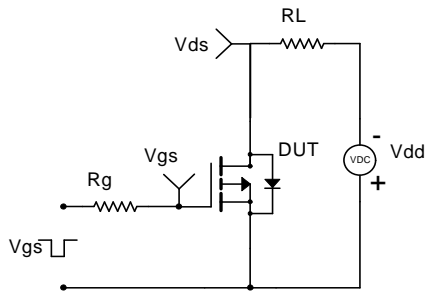


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

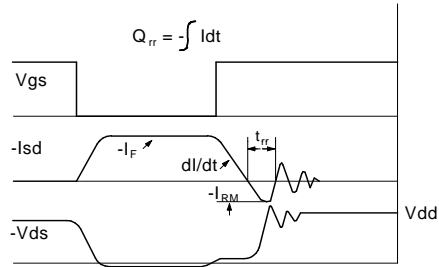
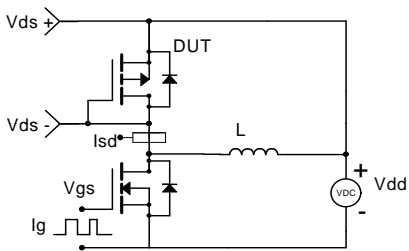
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



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