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# AON2803

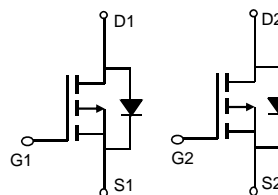
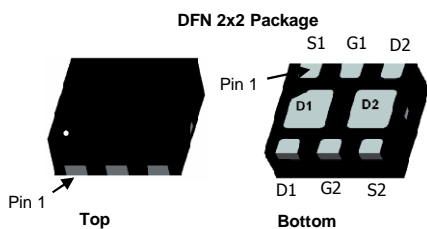
## 20V Dual P-Channel MOSFET

### 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 $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$ )	< 90m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-1.8V$ )	< 115m $\Omega$



### 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	$V_{GS}$	$\pm 8$	V
Continuous Drain Current	$I_D$	$T_A=25^\circ C$	-3.8
		$T_A=70^\circ C$	-3
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	-20	A
Power Dissipation <sup>A</sup>	$P_D$	$T_A=25^\circ C$	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 <sup>A</sup> $t \leq 10s$	$R_{\theta JA}$	35	45	$^\circ C/W$
Maximum Junction-to-Ambient <sup>A</sup> Steady-State		65	85	$^\circ C/W$
Maximum Junction-to-Ambient <sup>B</sup> $t \leq 10s$	$R_{\theta JA}$	120	155	$^\circ C/W$
Maximum Junction-to-Ambient <sup>B</sup> Steady-State		175	235	$^\circ C/W$

**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> =±8V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.4	-0.6	-1	V
I <sub>D(ON)</sub>	On state drain current	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-5V	-20			A
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.8A T <sub>J</sub> =125°C		58 78	70 94	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3A		70	90	mΩ
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2A		85	115	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-3.8A		15		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V		-0.66	-1	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current				-2	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-10V, f=1MHz		560		pF
C <sub>oss</sub>	Output Capacitance			80		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			70		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		15	30	Ω
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-3.8A		8.5	12	nC
Q <sub>gs</sub>	Gate Source Charge			1.2		nC
Q <sub>gd</sub>	Gate Drain Charge			2.1		nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, R <sub>L</sub> =2.6Ω, R <sub>GEN</sub> =3Ω		7.2		ns
t <sub>r</sub>	Turn-On Rise Time			36		ns
t <sub>D(off)</sub>	Turn-Off DelayTime			53		ns
t <sub>f</sub>	Turn-Off Fall Time			56		ns
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =-3.8A, di/dt=100A/μs		37		ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> =-3.8A, di/dt=100A/μs		27		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 Power dissipation P<sub>DSM</sub> is based on R<sub>θJA</sub> and the maximum allowed junction temperature of 150° C.

B: The value of R<sub>θJA</sub> is measured with the device mounted on a minimum pad board. Copper, in a still air environment with T<sub>A</sub>=25° C. The Power dissipation P<sub>DSM</sub> is based on R<sub>θJA</sub> and the maximum allowed junction temperature of 150° C.

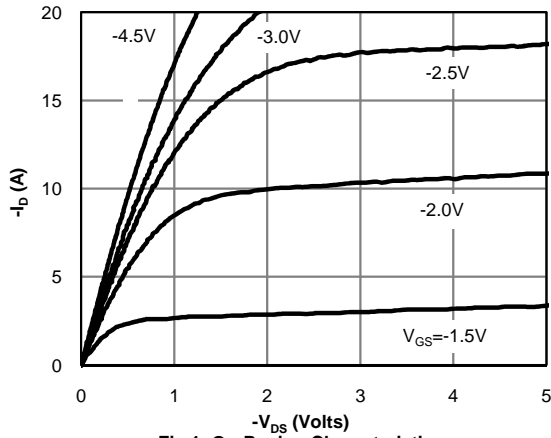
C: The R<sub>θJA</sub> is the sum of the thermal impedance from junction to case R<sub>θJC</sub> and case to ambient.

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

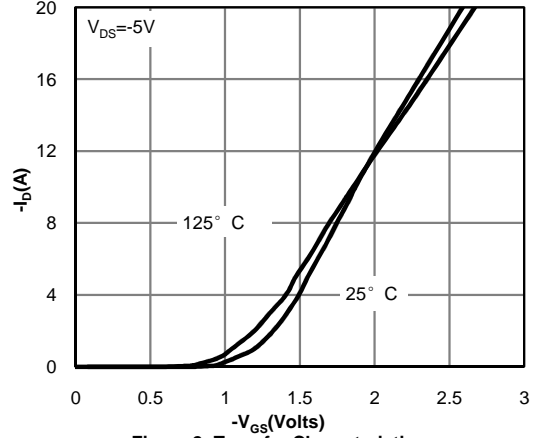
E: These tests are performed with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25° C. The SOA curve provides a single pulse rating.

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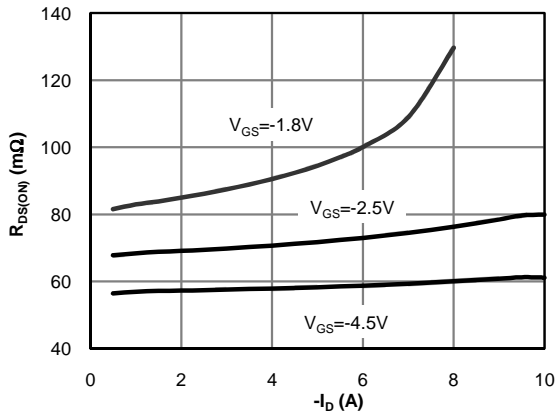
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



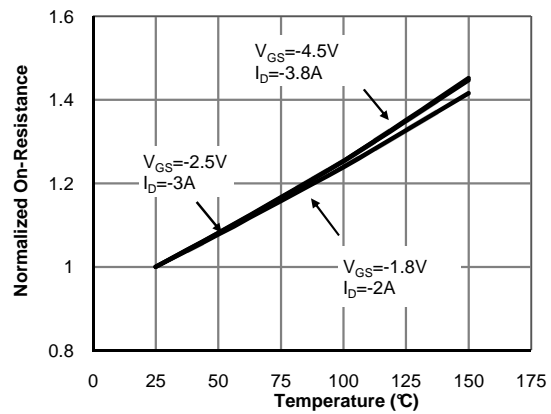
**Fig 1: On-Region Characteristics**



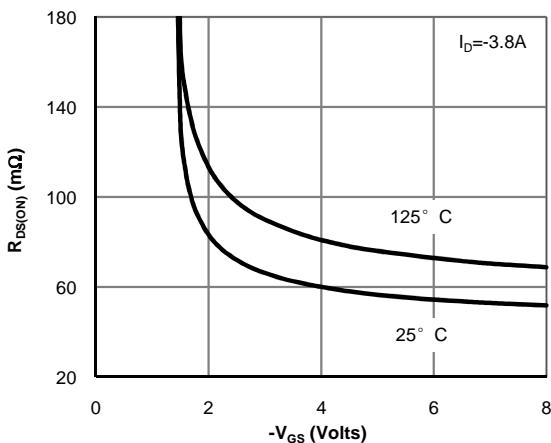
**Figure 2: Transfer Characteristics**



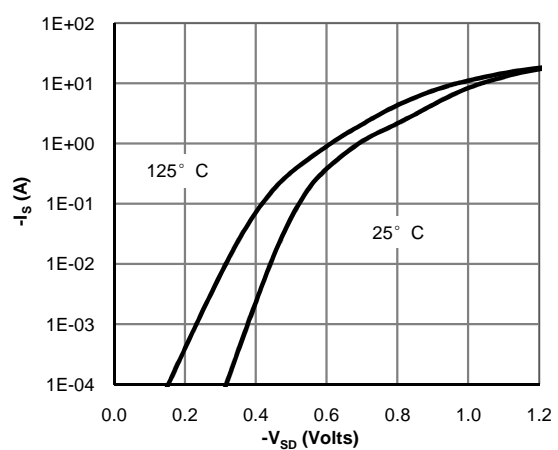
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**



**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**

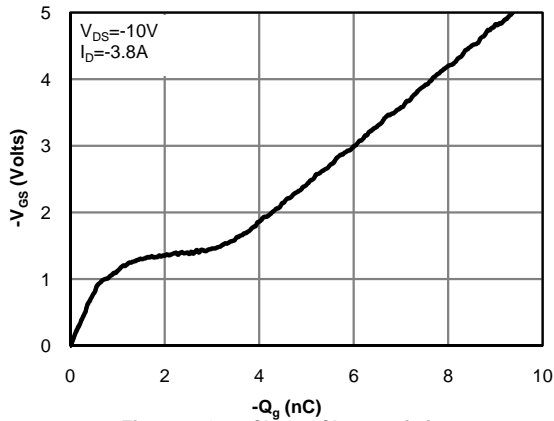


Figure 7: Gate-Charge Characteristics

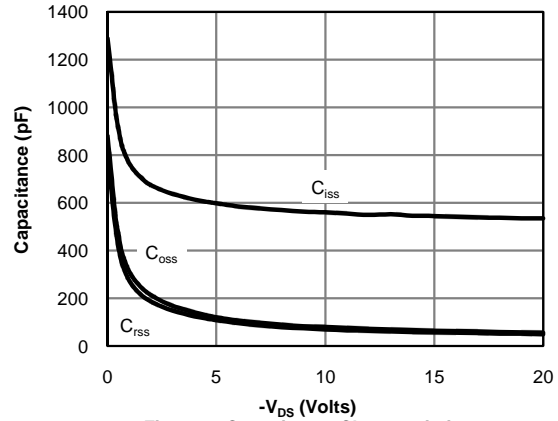


Figure 8: Capacitance Characteristics

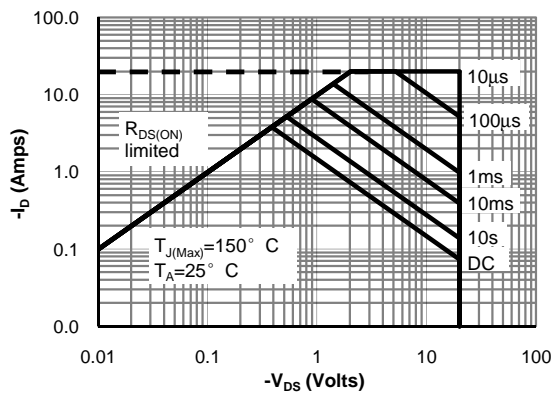


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

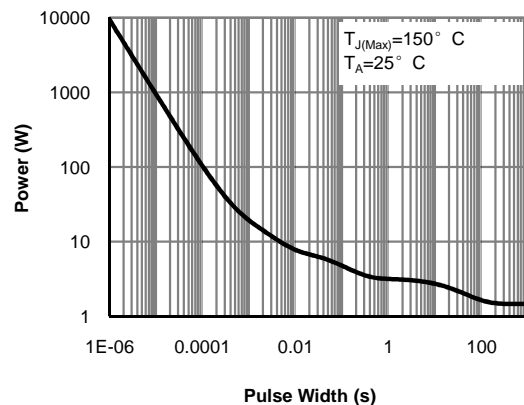


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

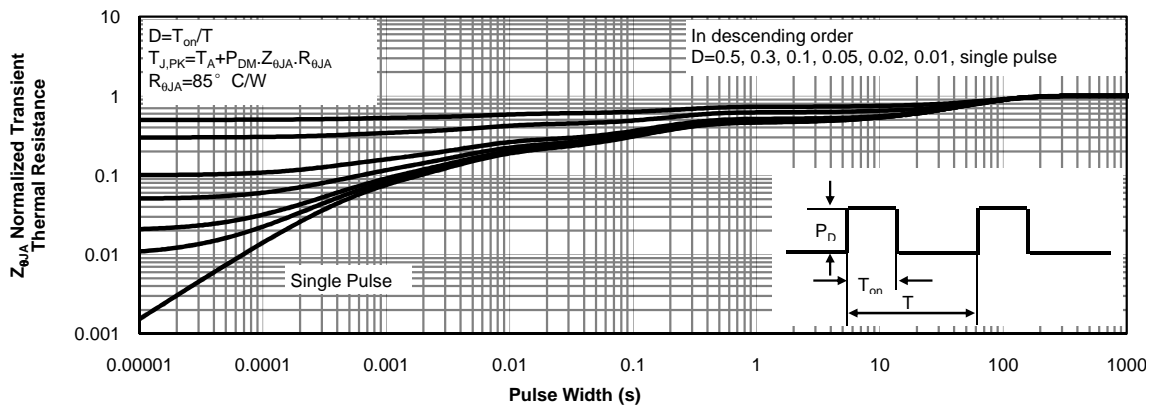
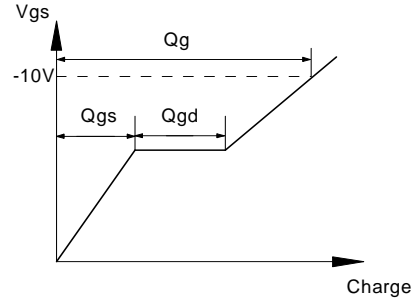
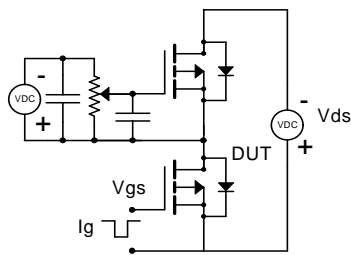
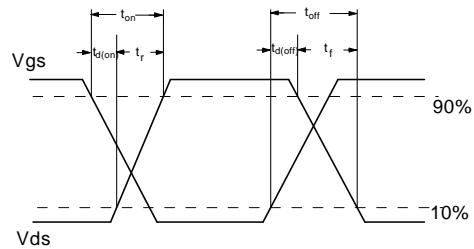
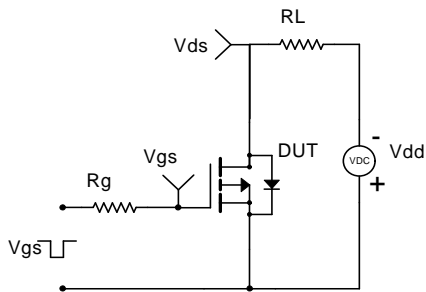


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

**Gate Charge Test Circuit & Waveform**



**Resistive Switching Test Circuit & Waveforms**



**Diode Recovery Test Circuit & Waveforms**

