



**ALPHA & OMEGA**  
SEMICONDUCTOR

**AON4803**

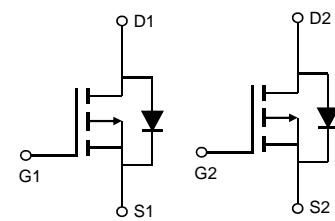
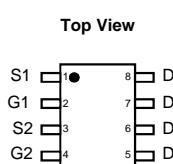
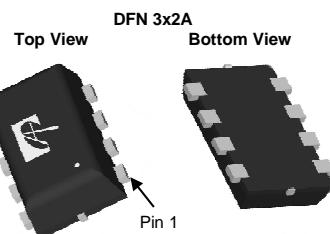
**20V Dual P-Channel MOSFET**

### General Description

The AON4803 combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.

### Product Summary

$V_{DS}$	-20V
$I_D$ (at $V_{GS}=-4.5V$ )	-3.4A
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$ )	< 90mΩ
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$ )	< 120mΩ
$R_{DS(ON)}$ (at $V_{GS}=-1.8V$ )	< 165mΩ



### 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	$V_{GS}$	$\pm 8$	V
Continuous Drain Current <sup>A</sup>	$I_D$	-3.4	A
Continuous Drain Current <sup>B</sup>		-2.7	
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	-15	
Power Dissipation <sup>B</sup>	$P_D$	1.7	W
Power Dissipation <sup>B</sup>		1.1	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C

### Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	51	75	°C/W
Maximum Junction-to-Ambient <sup>A D</sup>		88	110	°C/W
Maximum Junction-to-Lead	$R_{\theta JL}$	28	35	°C/W

**Electrical Characteristics ( $T_J=25^\circ\text{C}$  unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
$\text{BV}_{\text{DSS}}$	Drain-Source Breakdown Voltage	$I_D=-250\mu\text{A}$ , $V_{GS}=0\text{V}$	-20			V
$I_{\text{DSS}}$	Zero Gate Voltage Drain Current	$V_{DS}=-20\text{V}$ , $V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$			-1	$\mu\text{A}$
$I_{\text{GSS}}$	Gate-Body leakage current	$V_{DS}=0\text{V}$ , $V_{GS}=\pm 8\text{V}$			$\pm 100$	nA
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ $I_D=-250\mu\text{A}$	-0.4	-0.65	-1	V
$I_{\text{D(ON)}}$	On state drain current	$V_{GS}=-10\text{V}$ , $V_{DS}=-5\text{V}$	-15			A
$R_{\text{DS(ON)}}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5\text{V}$ , $I_D=-3.4\text{A}$		65	90	$\text{m}\Omega$
		$T_J=125^\circ\text{C}$		90	125	
		$V_{GS}=-2.5\text{V}$ , $I_D=-2.5\text{A}$		80	120	
$g_{\text{FS}}$	Forward Transconductance	$V_{GS}=-1.8\text{V}$ , $I_D=-1.5\text{A}$		100	165	$\text{m}\Omega$
		$V_{DS}=-5\text{V}$ , $I_D=-3.4\text{A}$			12	
		$I_S=-1\text{A}$ , $V_{GS}=0\text{V}$			-0.7	-1
$I_s$	Maximum Body-Diode Continuous Current				-2	A
<b>DYNAMIC PARAMETERS</b>						
$C_{\text{iss}}$	Input Capacitance	$V_{GS}=0\text{V}$ , $V_{DS}=-10\text{V}$ , $f=1\text{MHz}$		560	745	pF
$C_{\text{oss}}$	Output Capacitance			80		pF
$C_{\text{rss}}$	Reverse Transfer Capacitance			70		pF
$R_g$	Gate resistance	$V_{GS}=0\text{V}$ , $V_{DS}=0\text{V}$ , $f=1\text{MHz}$		15	23	$\Omega$
<b>SWITCHING PARAMETERS</b>						
$Q_g$	Total Gate Charge	$V_{GS}=-4.5\text{V}$ , $V_{DS}=-10\text{V}$ , $I_D=-3.4\text{A}$		6.1	8	nC
$Q_{\text{gs}}$	Gate Source Charge			0.6		nC
$Q_{\text{gd}}$	Gate Drain Charge			1.6		nC
$t_{\text{D(on)}}$	Turn-On Delay Time	$V_{GS}=-4.5\text{V}$ , $V_{DS}=-10\text{V}$ , $R_L=2.9\Omega$ , $R_{\text{GEN}}=3\Omega$		10		ns
$t_r$	Turn-On Rise Time			12		ns
$t_{\text{D(off)}}$	Turn-Off Delay Time			44		ns
$t_f$	Turn-Off Fall Time			22		ns
$t_{\text{rr}}$	Body Diode Reverse Recovery Time	$I_F=-3.4\text{A}$ , $dI/dt=100\text{A}/\mu\text{s}$		21		ns
$Q_{\text{rr}}$	Body Diode Reverse Recovery Charge	$I_F=-3.4\text{A}$ , $dI/dt=100\text{A}/\mu\text{s}$		7.5		nC

A. The value of  $R_{\text{QJA}}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

B. The power dissipation  $P_D$  is based on  $T_{J(\text{MAX})}=150^\circ\text{C}$ , using  $\leqslant 10\text{s}$  junction-to-ambient thermal resistance.

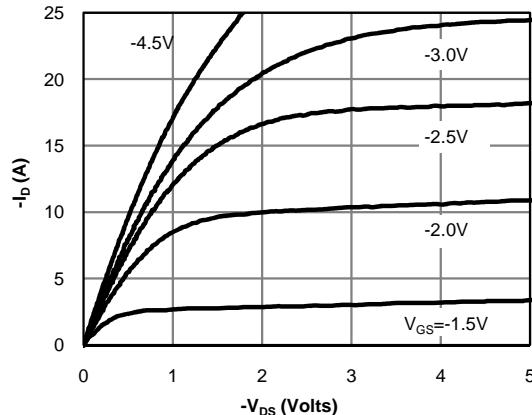
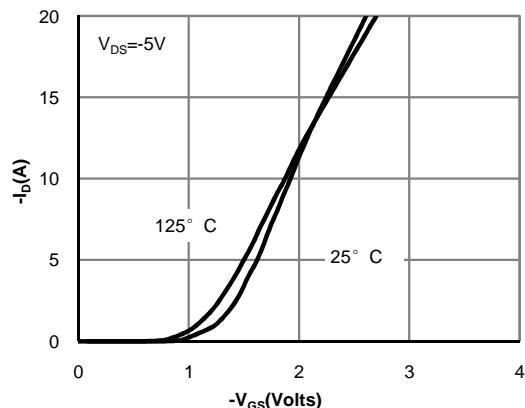
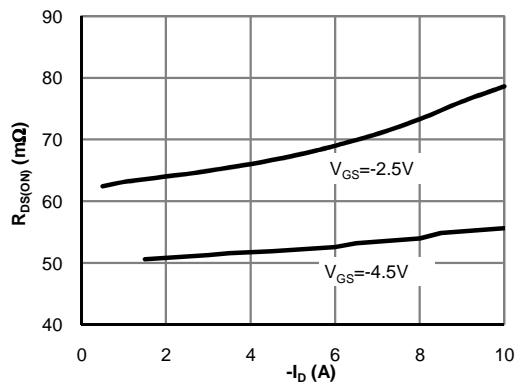
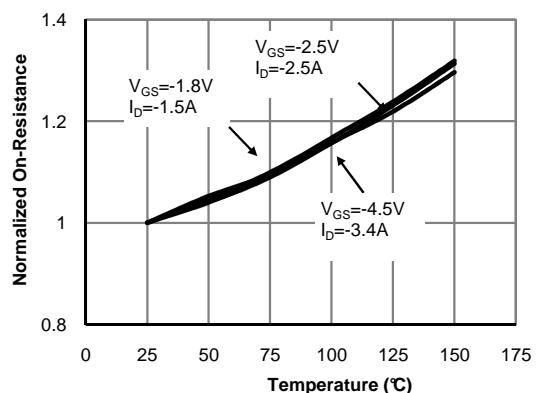
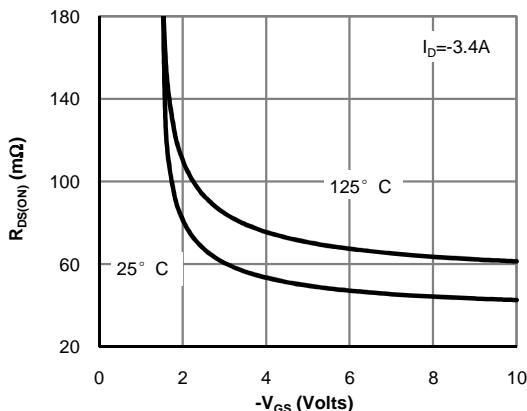
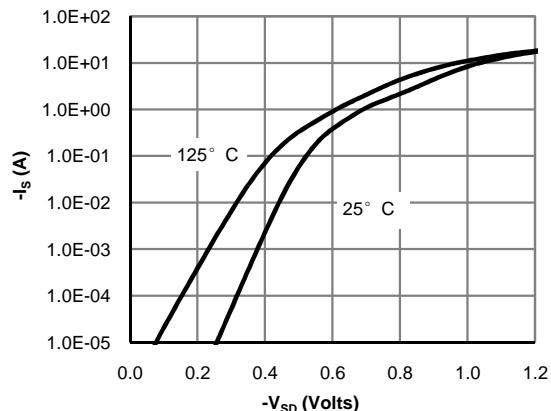
C. Repetitive rating, pulse width limited by junction temperature  $T_{J(\text{MAX})}=150^\circ\text{C}$ . Ratings are based on low frequency and duty cycles to keep initial  $T_J=25^\circ\text{C}$ .

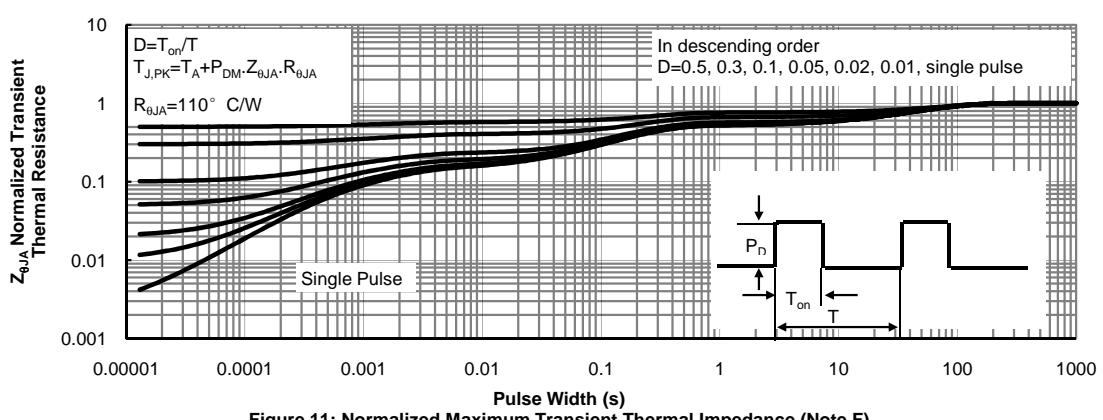
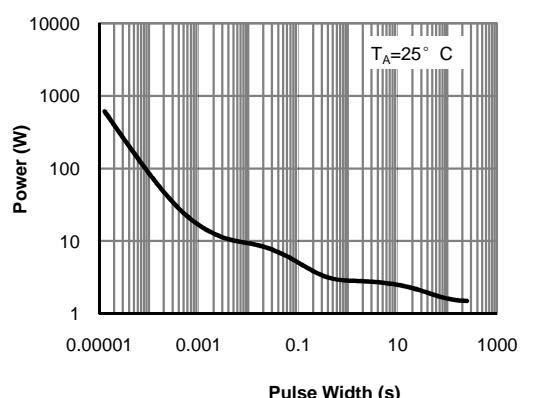
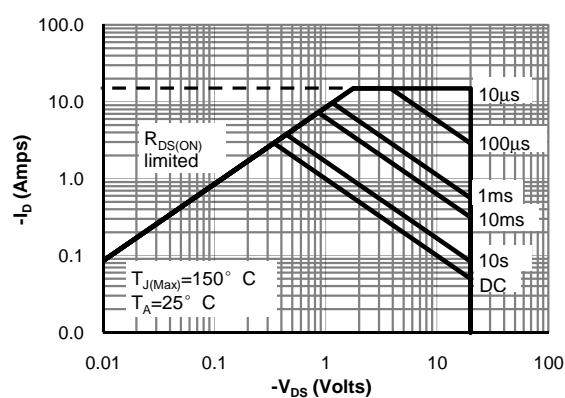
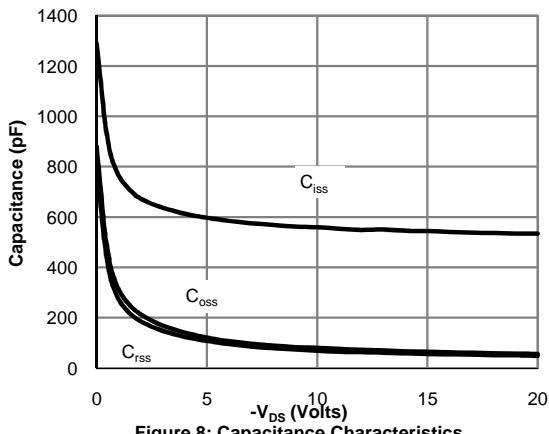
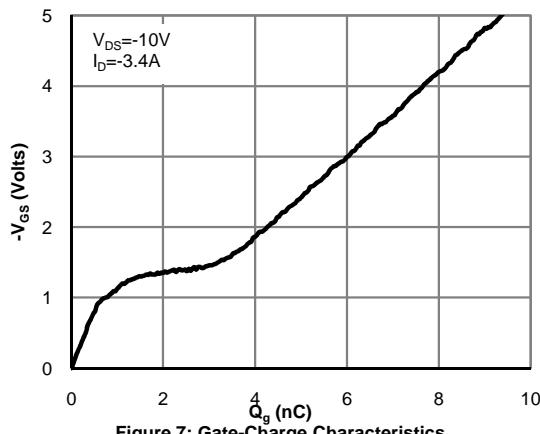
D. The  $R_{\text{QJA}}$  is the sum of the thermal impedance from junction to lead  $R_{\text{QJL}}$  and lead to ambient.

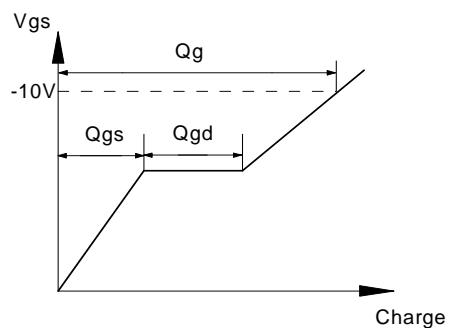
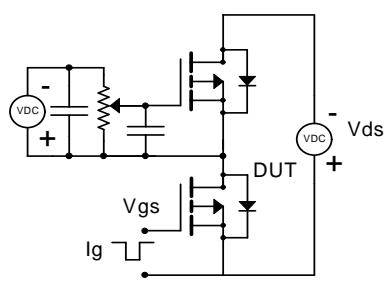
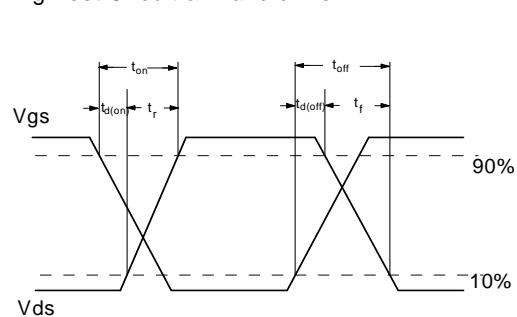
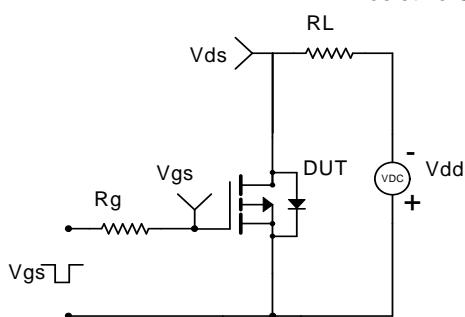
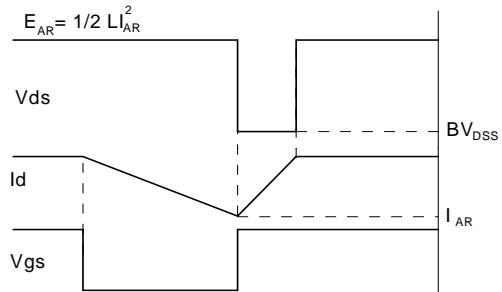
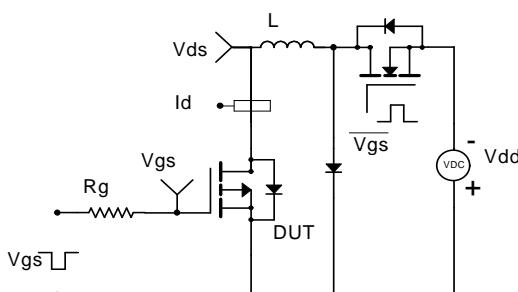
E. The static characteristics in Figures 1 to 6 are obtained using  $<300\mu\text{s}$  pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, assuming a maximum junction temperature of  $T_{J(\text{MAX})}=150^\circ\text{C}$ . The SOA curve provides a single pulse rating.

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**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

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

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

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

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

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

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

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**


**Gate Charge Test Circuit & Waveform**

**Resistive Switching Test Circuit & Waveforms**

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

**Diode Recovery Test Circuit & Waveforms**
