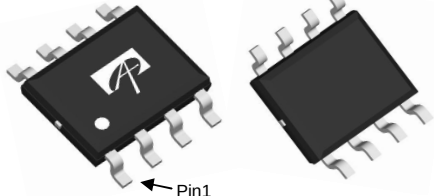
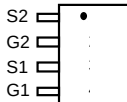


 ALPHA & OMEGA SEMICONDUCTOR		AO4805 30V Dual P-Channel MOSFET																																							
General Description The AO4805 combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.		Product Summary V_{DS} I_D (at $V_{GS}=-20V$) $R_{DS(ON)}$ (at $V_{GS}=-20V$) $R_{DS(ON)}$ (at $V_{GS}=-10V$) -30V -9A < 15mΩ < 18mΩ 100% UIS Tested 100% R_g Tested 																																							
SOIC-8 Top View Bottom View  Pin1 Top View  D2 D2 D1 D1 G1 G1 S1 S1 D1 D2 G2 S2																																									
Absolute Maximum Ratings $T_A=25^{\circ}C$ unless otherwise noted <table><tr><th>Parameter</th><th>Symbol</th><th>Maximum</th><th>Units</th></tr><tr><td>Drain-Source Voltage</td><td>V_{DS}</td><td>-30</td><td>V</td></tr><tr><td>Gate-Source Voltage</td><td>V_{GS}</td><td>± 25</td><td>V</td></tr><tr><td rowspan="2">Continuous Drain Current</td><td rowspan="2">I_D</td><td>-9</td><td rowspan="2">A</td></tr><tr><td>-7</td></tr><tr><td>Pulsed Drain Current ^C</td><td>I_{DM}</td><td>-50</td><td></td></tr><tr><td>Avalanche Current ^C</td><td>I_{AS}, I_{AR}</td><td>33</td><td>A</td></tr><tr><td>Avalanche energy $L=0.1mH$ ^C</td><td>E_{AS}, E_{AR}</td><td>54</td><td>mJ</td></tr><tr><td rowspan="2">Power Dissipation ^B</td><td rowspan="2">P_D</td><td>2</td><td rowspan="2">W</td></tr><tr><td>1.3</td></tr><tr><td>Junction and Storage Temperature Range</td><td>T_J, T_{STG}</td><td>-55 to 150</td><td>$^{\circ}C$</td></tr></table>				Parameter	Symbol	Maximum	Units	Drain-Source Voltage	V_{DS}	-30	V	Gate-Source Voltage	V_{GS}	± 25	V	Continuous Drain Current	I_D	-9	A	-7	Pulsed Drain Current ^C	I_{DM}	-50		Avalanche Current ^C	I_{AS}, I_{AR}	33	A	Avalanche energy $L=0.1mH$ ^C	E_{AS}, E_{AR}	54	mJ	Power Dissipation ^B	P_D	2	W	1.3	Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}C$
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Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D=-250\mu\text{A}$, $V_{GS}=0\text{V}$	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-30\text{V}$, $V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$			-1 -5	μA
I_{GSS}	Gate-Body leakage current	$V_{DS}=0\text{V}$, $V_{GS}=\pm 25\text{V}$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-1.7	-2.3	-2.8	V
$I_{D(ON)}$	On state drain current	$V_{GS}=-10\text{V}$, $V_{DS}=-5\text{V}$	-50			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-20\text{V}$, $I_D=-9\text{A}$		10	15	$\text{m}\Omega$
		$V_{GS}=-10\text{V}$, $I_D=-8\text{A}$ $T_J=125^\circ\text{C}$		12 13	18 20	$\text{m}\Omega$
		$V_{GS}=-4.5\text{V}$, $I_D=-5\text{A}$		29		$\text{m}\Omega$
g_{FS}	Forward Transconductance	$V_{DS}=-5\text{V}$, $I_D=-9\text{A}$		27		S
V_{SD}	Diode Forward Voltage	$I_S=-1\text{A}$, $V_{GS}=0\text{V}$		-0.7	-1	V
I_S	Maximum Body-Diode Continuous Current				-2.5	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}$, $V_{DS}=-15\text{V}$, $f=1\text{MHz}$		2060	2600	pF
C_{oss}	Output Capacitance			370		pF
C_{rss}	Reverse Transfer Capacitance			295		pF
R_g	Gate resistance	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1\text{MHz}$	1.2	2.4	3.6	Ω
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	$V_{GS}=-10\text{V}$, $V_{DS}=-15\text{V}$, $I_D=-9\text{A}$		30	39	nC
Q_{gs}	Gate Source Charge			4.6		nC
Q_{gd}	Gate Drain Charge			10		nC
$t_{D(on)}$	Turn-On DelayTime	$V_{GS}=-10\text{V}$, $V_{DS}=-15\text{V}$, $R_L=1.67\Omega$, $R_{GEN}=3\Omega$		11		ns
t_r	Turn-On Rise Time			9.4		ns
$t_{D(off)}$	Turn-Off DelayTime			24		ns
t_f	Turn-Off Fall Time			12		ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=-9\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$		30	40	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=-9\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$		22		nC

- A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 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 $T_{J(MAX)}=150^\circ\text{C}$, using $\leq 10\text{s}$ junction-to-ambient thermal resistance.
- C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ\text{C}$.
- D. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ 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^2 FR-4 board with 2oz. Copper, assuming a maximum junction temperature of $T_{J(MAX)}=150^\circ\text{C}$. The SOA curve provides a single pulse rating.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

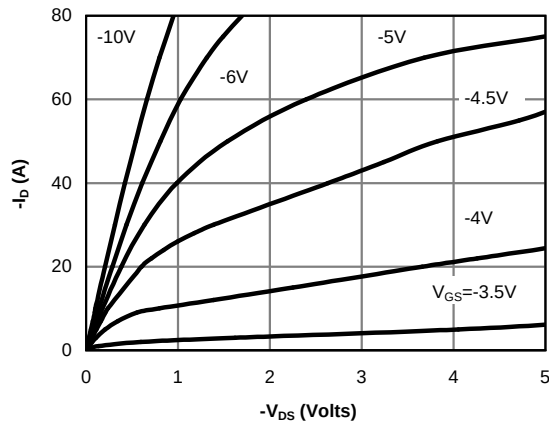


Fig 1: On-Region Characteristics (Note E)

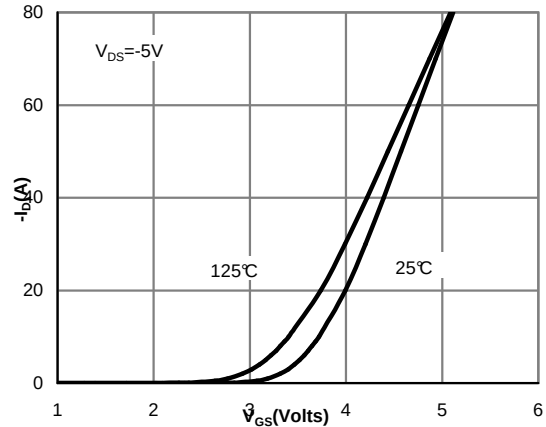


Figure 2: Transfer Characteristics (Note E)

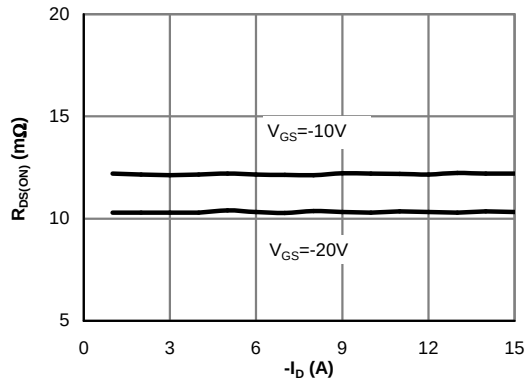


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

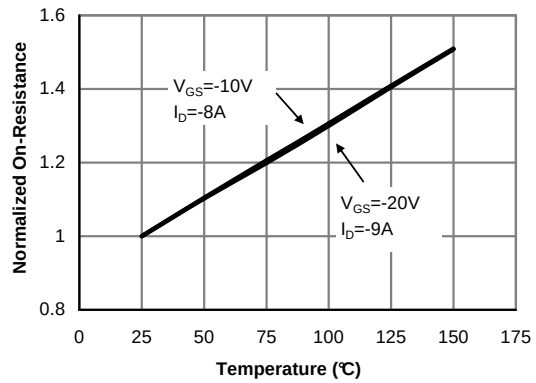


Figure 4: On-Resistance vs. Junction Temperature (Note E)

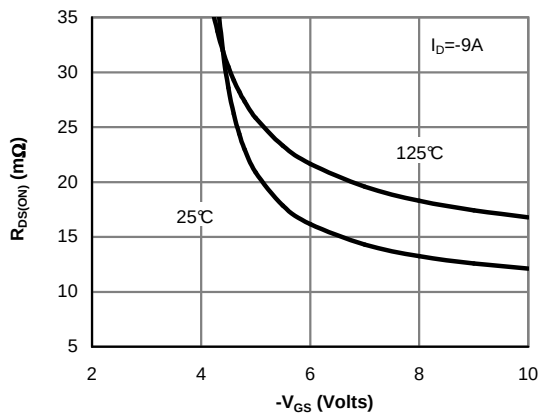


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

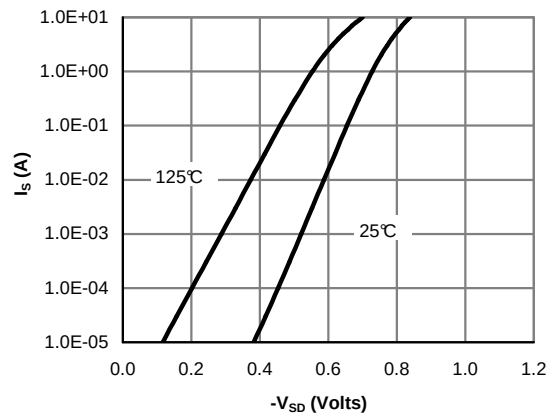


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

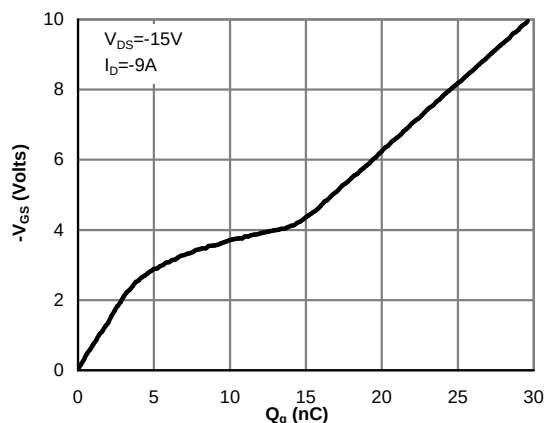


Figure 7: Gate-Charge Characteristics

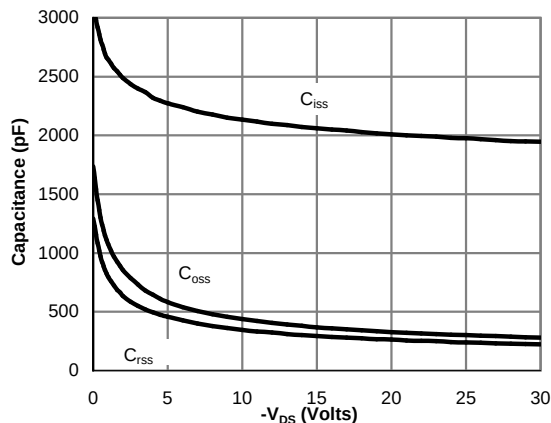


Figure 8: Capacitance Characteristics

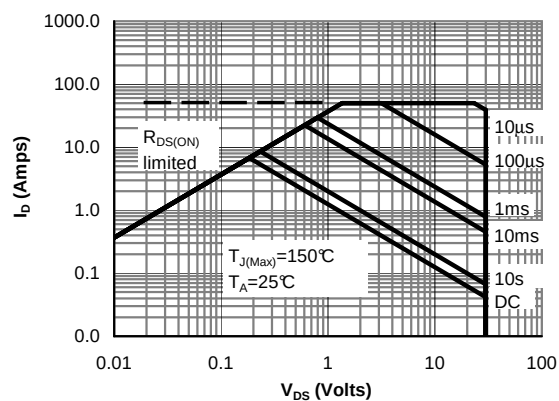


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

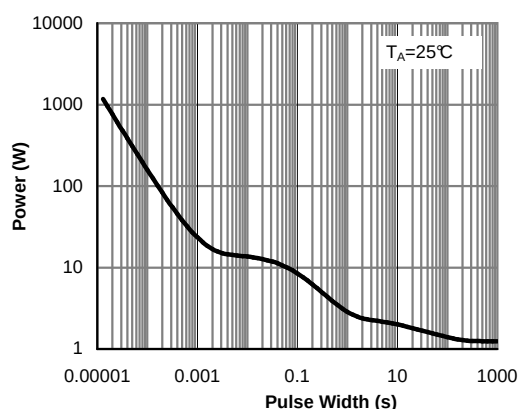


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

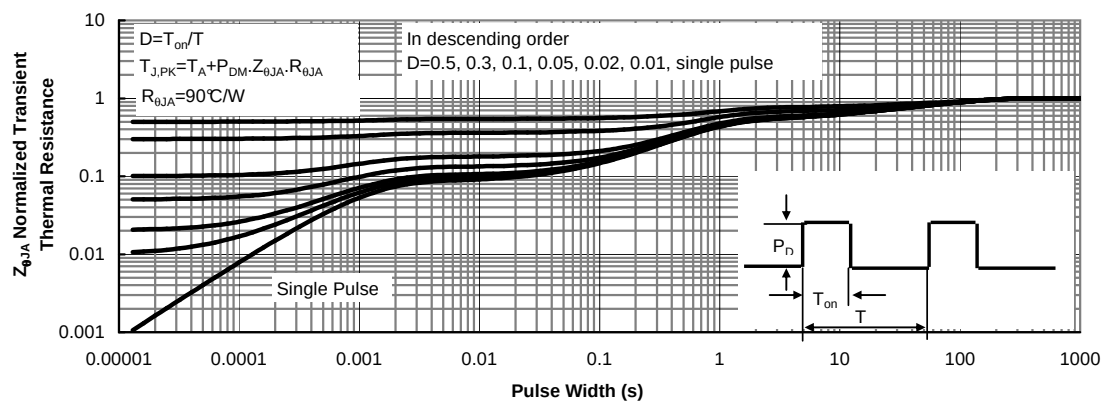
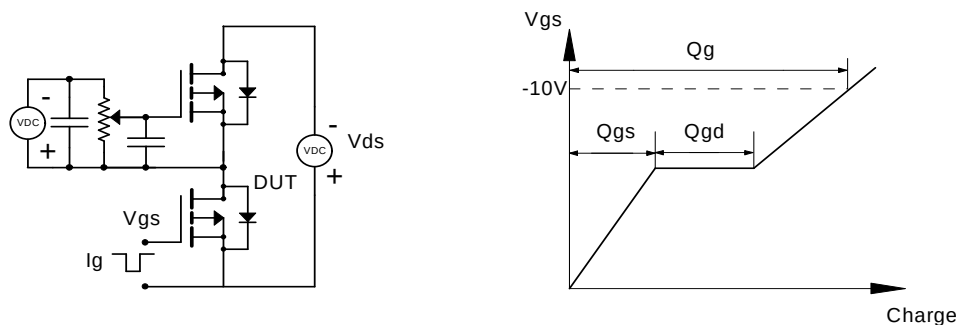
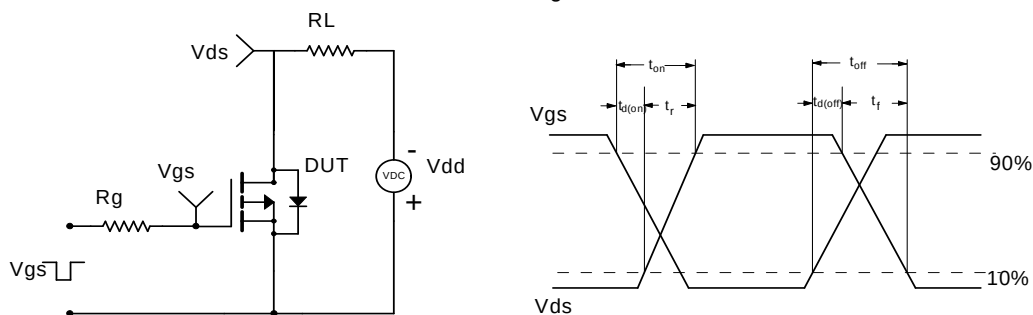


Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)

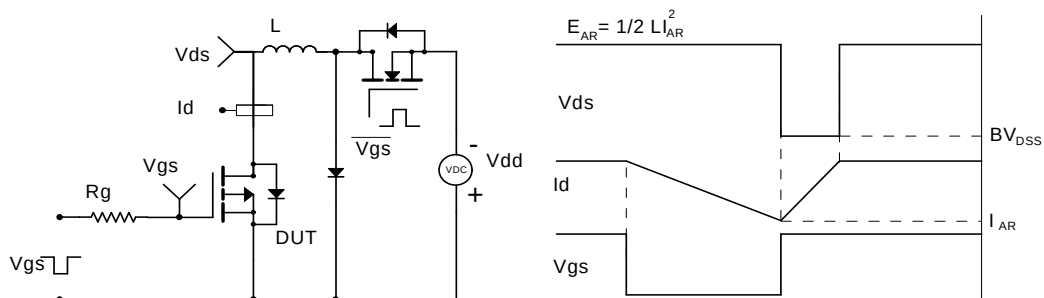
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

