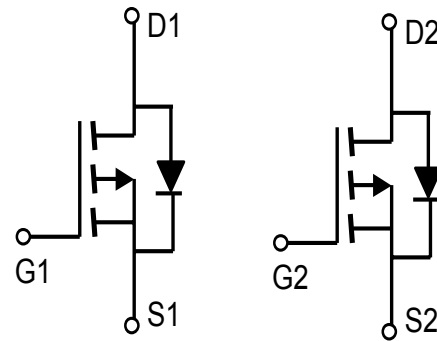


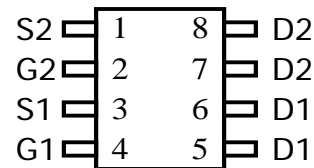
General Description

The AO4805 uses advanced trench technology to provide excellent $R_{DS(ON)}$, and ultra-low low gate charge with a 25V gate rating. This device is suitable for use as a load switch or in PWM applications.



Features

- V_{DS} (V) = -30V
- I_D = -9A
- $R_{DS(ON)} < 15m\Omega$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 19m\Omega$ ($V_{GS} = 4.5V$)



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

| Parameter | Symbol | Maximum | Units |
|--|----------------|------------------------|------------------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ^A | I_D | $T_A=25^\circ\text{C}$ | -8 |
| | | $T_A=70^\circ\text{C}$ | -6.9 |
| Pulsed Drain Current ^B | I_{DM} | -40 | A |
| Power Dissipation ^A | P_D | $T_A=25^\circ\text{C}$ | 2 |
| | | $T_A=70^\circ\text{C}$ | 1.44 |
| 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 | $R_{\theta JA}$ | $t \leq 10s$ | 50 | $^\circ\text{C/W}$ |
| Maximum Junction-to-Ambient ^A | | Steady-State | 73 | 110 |
| Maximum Junction-to-Lead ^C | $R_{\theta JL}$ | 31 | 40 | $^\circ\text{C/W}$ |

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---------------------|---------------------------------------|---|-----|-------|----------|-------|
| BV _{DSS} | Drain-Source Breakdown Voltage | I _D =-250μA, V _{GS} =0V | -30 | | | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =-24V, V _{GS} =0V T _J =55°C | | | -1 -5 | μA |
| I _{GSS} | Gate-Body leakage current | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} I _D =-250μA | -1 | -1.5 | -2.5 | V |
| I _{D(ON)} | On state drain current | V _{GS} =-10V, V _{DS} =-5V | 40 | | | A |
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} =-10V, I _D =-8A | | 12 | 15 | mΩ |
| | | V _{GS} =-4.5V, I _D =-5A | | 16 | 19 | mΩ |
| g _{FS} | Forward Transconductance | V _{DS} =-5V, I _D =-8A | 16 | 21 | | S |
| V _{SD} | Diode Forward Voltage | I _S =-1A, V _{GS} =0V | | -0.75 | -1 | V |
| I _S | Maximum Body-Diode Continuous Current | | | | -2.6 | A |
| C _{iss} | Input Capacitance | V _{GS} =0V, V _{DS} =-15V, f=1MHz | | 2076 | | pF |
| C _{oss} | Output Capacitance | | | 503 | | pF |
| C _{rss} | Reverse Transfer Capacitance | | | 302 | | pF |
| R _g | Gate resistance | V _{GS} =0V, V _{DS} =0V, f=1MHz | | 2 | | Ω |
| Q _g | Total Gate Charge | V _{GS} =-10V, V _{DS} =-15V, I _D =-8A | | 39 | | nC |
| Q _{gs} | Gate Source Charge | | | 8 | | nC |
| Q _{gd} | Gate Drain Charge | | | 11.4 | | nC |
| t _{D(on)} | Turn-On DelayTime | V _{GS} =-10V, V _{DS} =-15V, R _L =1.8Ω, R _{GEN} =3Ω | | 12.7 | | ns |
| t _r | Turn-On Rise Time | | | 7 | | ns |
| t _{D(off)} | Turn-Off DelayTime | | | 25.2 | | ns |
| t _f | Turn-Off Fall Time | | | 12 | | ns |
| t _{rr} | Body Diode Reverse Recovery Time | I _F =-8A, dI/dt=100A/μs | | 32 | | ns |
| Q _{rr} | Body Diode Reverse Recovery Charge | I _F =-8A, dI/dt=100A/μs | | 26 | | 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 value in any a given application depends on the user's specific board design. The current rating is based on the t≤ 10s thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

C. The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

D. The static characteristics in Figures 1 to 6,12,14 are obtained using 80μs 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.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

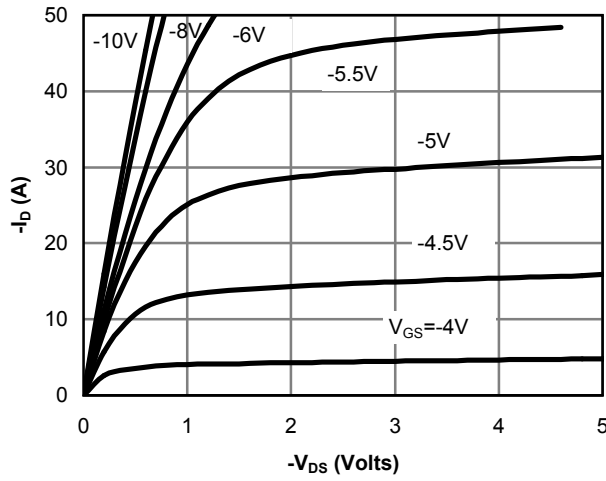


Fig 1: On-Region Characteristics

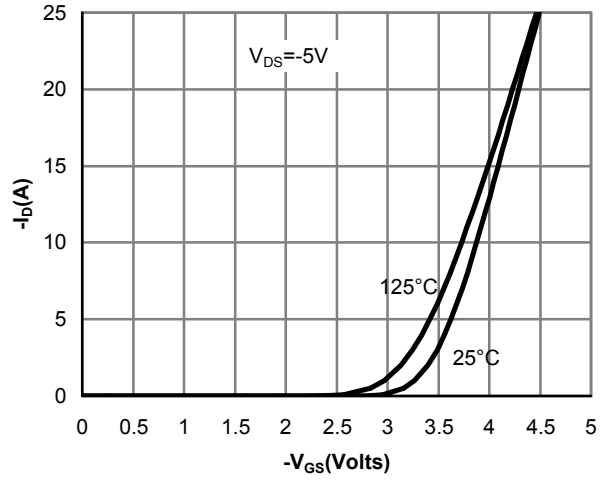


Figure 2: Transfer Characteristics

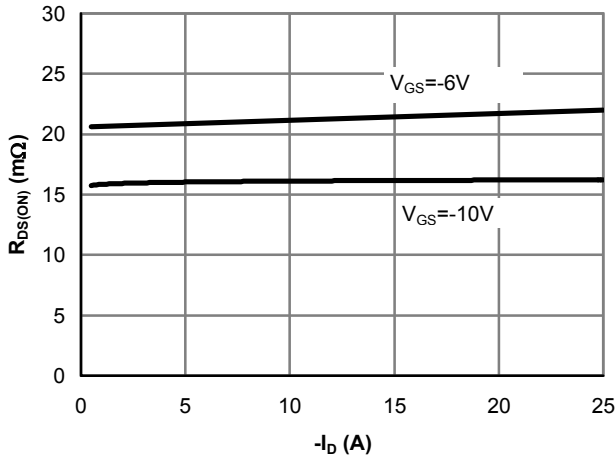


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

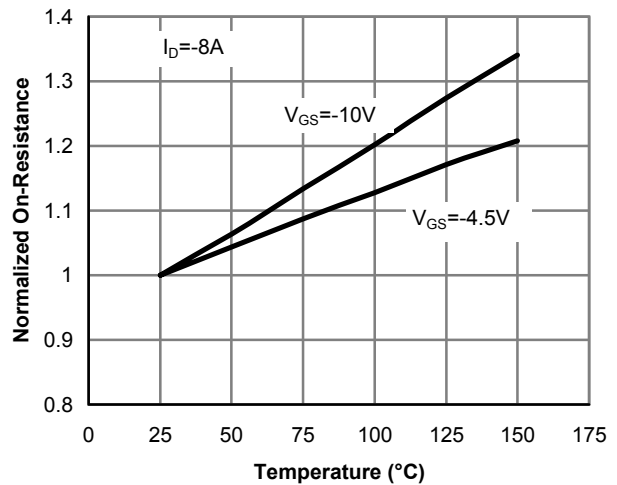


Figure 4: On-Resistance vs. Junction Temperature

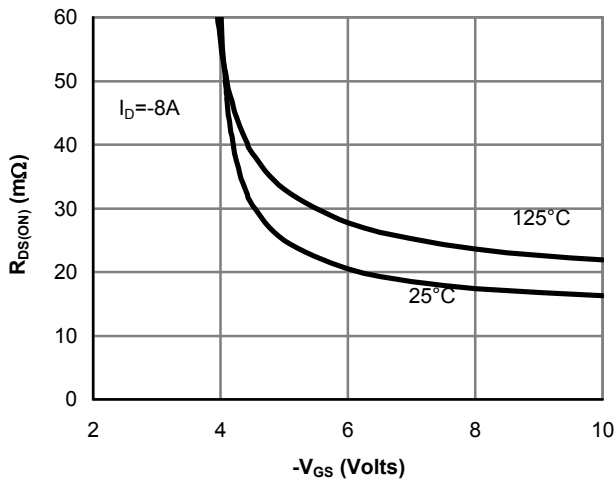


Figure 5: On-Resistance vs. Gate-Source Voltage

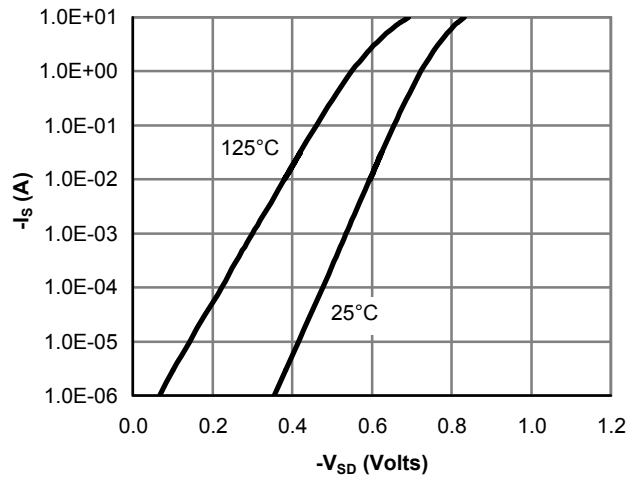


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

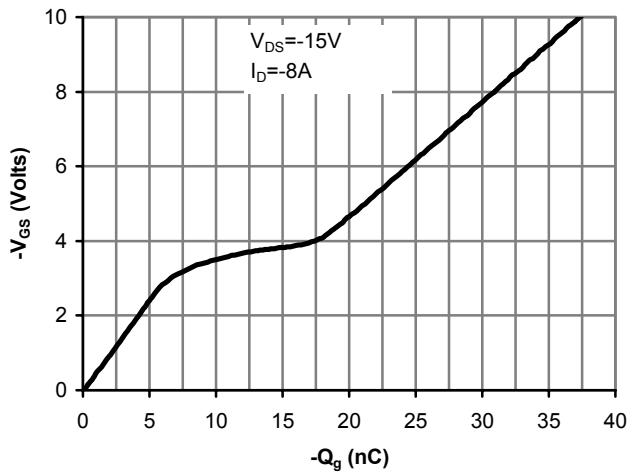


Figure 7: Gate-Charge Characteristics

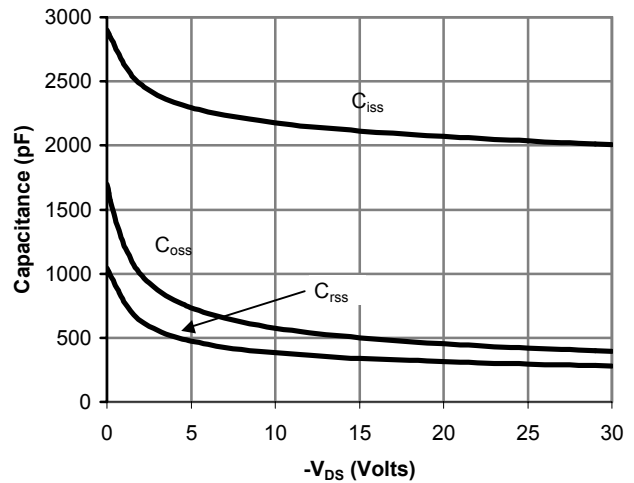


Figure 8: Capacitance Characteristics

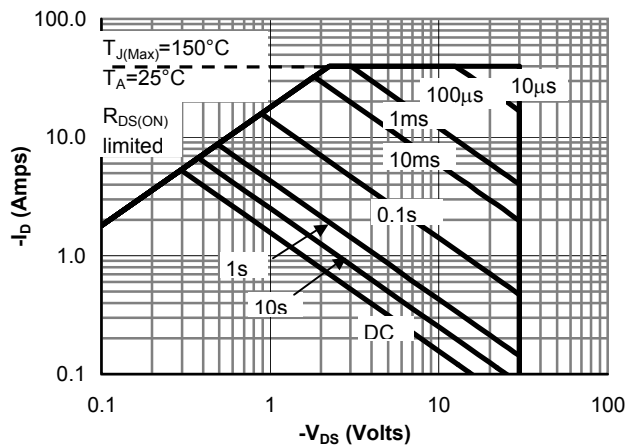


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

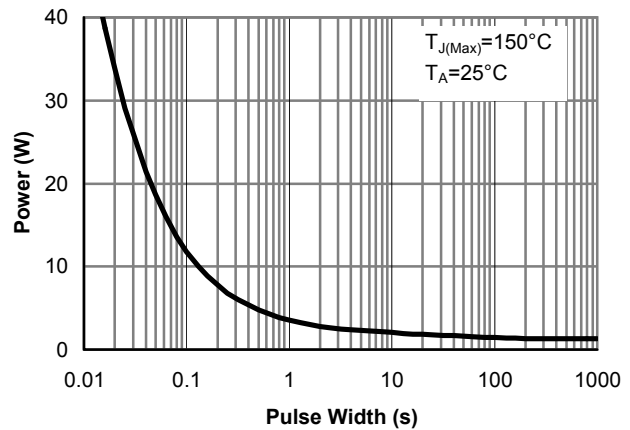


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

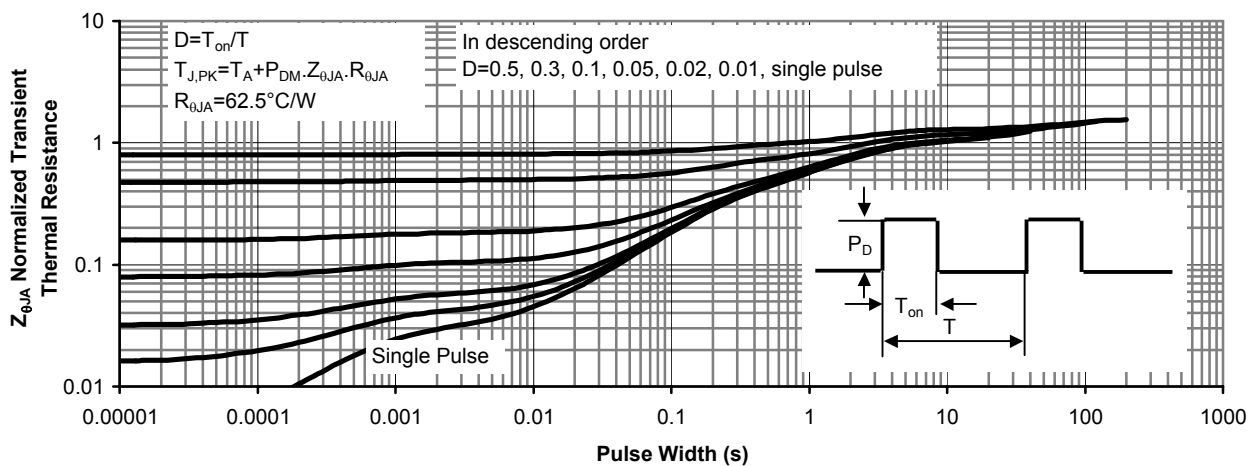
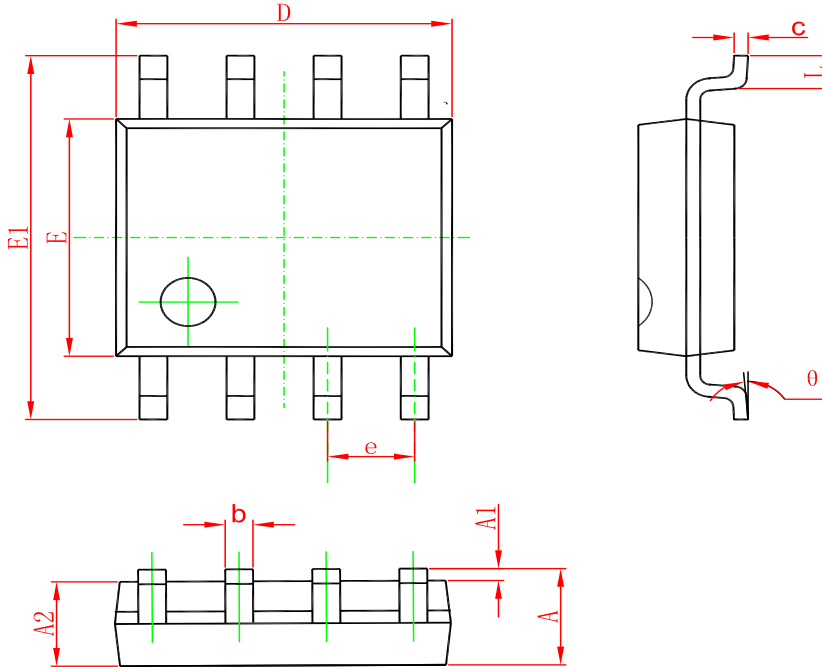


Figure 11: Normalized Maximum Transient Thermal Impedance

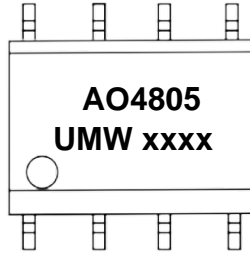
PACKAGE OUTLINE DIMENSIONS

SOP-8



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.100 | 0.250 | 0.004 | 0.010 |
| A2 | 1.350 | 1.550 | 0.053 | 0.061 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.170 | 0.250 | 0.006 | 0.010 |
| D | 4.700 | 5.100 | 0.185 | 0.200 |
| E | 3.800 | 4.000 | 0.150 | 0.157 |
| E1 | 5.800 | 6.200 | 0.228 | 0.244 |
| e | 1.270(BSC) | | 0.050(BSC) | |
| L | 0.400 | 1.270 | 0.016 | 0.050 |
| θ | 0° | 8° | 0° | 8° |

Marking



("xxxx"代表年份周期)

Ordering information

| Order code | Package | Baseqty | Deliverymode |
|------------|---------|---------|---------------|
| UMW AO4805 | SOP-8 | 3000 | Tape and reel |