



## Description

The AO4805-HXY uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications.

## General Features

$V_{DS} = -30V, I_D = -8.5A$

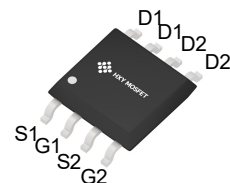
$R_{DS(ON)} < 18m @ V_{GS} = -10V$

$R_{DS(ON)} < 28m @ V_{GS} = -4.5V$

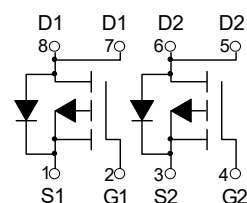
## Application

PWM application

Load switch



SOP-8  
(SOIC-8)



Dual P-Channel MOSFET

## Package Marking and Ordering Information

| Product ID | Pack          | Marking   | Qty(PCS) |
|------------|---------------|-----------|----------|
| AO4805-HXY | SOP-8(SOIC-8) | 4805 XXXX | 3000     |

## Absolute Maximum Ratings ( $T_A = 25^\circ C$ unless otherwise noted)

| Symbol          | Parameter                                        | Limit      | Unit         |
|-----------------|--------------------------------------------------|------------|--------------|
| $V_{DS}$        | Drain-Source Voltage                             | -30        | V            |
| $V_{GS}$        | Gate-Source Voltage                              | $\pm 20$   | V            |
| $I_D$           | Drain Current-Continuous                         | -8.5       | A            |
| $I_{DM}$        | Drain Current-Pulsed (Note 1)                    | -26        | A            |
| $P_D$           | Maximum Power Dissipation                        | 1.5        | W            |
| $T_J, T_{STG}$  | Operating Junction and Storage Temperature Range | -55 To 150 | $^\circ C$   |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient (Note 2) | 85         | $^\circ C/W$ |



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

| Symbol                       | Parameter                                      | Conditions                                                     | Min. | Typ.   | Max.      | Unit                |
|------------------------------|------------------------------------------------|----------------------------------------------------------------|------|--------|-----------|---------------------|
| $BV_{DSS}$                   | Drain-Source Breakdown Voltage                 | $V_{GS}=0V$ , $I_D=-250\mu A$                                  | -30  | ---    | ---       | V                   |
| $\Delta BV_{DSS}/\Delta T_J$ | $BV_{DSS}$ Temperature Coefficient             | Reference to $25^\circ\text{C}$ , $I_D=-1mA$                   | ---  | -0.022 | ---       | $V/^\circ\text{C}$  |
| $R_{DS(ON)}$                 | Static Drain-Source On-Resistance <sup>2</sup> | $V_{GS}=-10V$ , $I_D=-6A$                                      | ---  | 14     | 18        | $m\Omega$           |
|                              |                                                | $V_{GS}=-4.5V$ , $I_D=-4A$                                     | ---  | 22     | 28        |                     |
| $V_{GS(th)}$                 | Gate Threshold Voltage                         | $V_{GS}=V_{DS}$ , $I_D=-250\mu A$                              | -1.0 | ---    | -2.5      | V                   |
| $\Delta V_{GS(th)}$          | $V_{GS(th)}$ Temperature Coefficient           |                                                                | ---  | 4.6    | ---       | $mV/^\circ\text{C}$ |
| $I_{DSS}$                    | Drain-Source Leakage Current                   | $V_{DS}=-24V$ , $V_{GS}=0V$ , $T_J=25^\circ\text{C}$           | ---  | ---    | -1        | $\mu A$             |
|                              |                                                | $V_{DS}=-24V$ , $V_{GS}=0V$ , $T_J=55^\circ\text{C}$           | ---  | ---    | -5        |                     |
| $I_{GSS}$                    | Gate-Source Leakage Current                    | $V_{GS}=\pm 20V$ , $V_{DS}=0V$                                 | ---  | ---    | $\pm 100$ | nA                  |
| $g_{fs}$                     | Forward Transconductance                       | $V_{DS}=-5V$ , $I_D=-6A$                                       | ---  | 17     | ---       | S                   |
| $R_g$                        | Gate Resistance                                | $V_{DS}=0V$ , $V_{GS}=0V$ , $f=1MHz$                           | ---  | 13     | ---       | $\Omega$            |
| $Q_g$                        | Total Gate Charge (-4.5V)                      | $V_{DS}=-15V$ , $V_{GS}=-4.5V$ , $I_D=-6A$                     | ---  | 12.6   | ---       | nC                  |
| $Q_{gs}$                     | Gate-Source Charge                             |                                                                | ---  | 4.8    | ---       |                     |
| $Q_{gd}$                     | Gate-Drain Charge                              |                                                                | ---  | 4.8    | ---       |                     |
| $T_{d(on)}$                  | Turn-On Delay Time                             | $V_{DD}=-15V$ , $V_{GS}=-10V$ , $R_G=3.3\Omega$ ,<br>$I_D=-6A$ | ---  | 4.6    | ---       | ns                  |
| $T_r$                        | Rise Time                                      |                                                                | ---  | 14.8   | ---       |                     |
| $T_{d(off)}$                 | Turn-Off Delay Time                            |                                                                | ---  | 41     | ---       |                     |
| $T_f$                        | Fall Time                                      |                                                                | ---  | 19.6   | ---       |                     |
| $C_{iss}$                    | Input Capacitance                              | $V_{DS}=-15V$ , $V_{GS}=0V$ , $f=1MHz$                         | ---  | 1345   | ---       | pF                  |
| $C_{oss}$                    | Output Capacitance                             |                                                                | ---  | 194    | ---       |                     |
| $C_{rss}$                    | Reverse Transfer Capacitance                   |                                                                | ---  | 158    | ---       |                     |

### Diode Characteristics

| Symbol   | Parameter                                | Conditions                                              | Min. | Typ. | Max. | Unit |
|----------|------------------------------------------|---------------------------------------------------------|------|------|------|------|
| $I_S$    | Continuous Source Current <sup>1,5</sup> | $V_G=V_D=0V$ , Force Current                            | ---  | ---  | -6.5 | A    |
| $I_{SM}$ | Pulsed Source Current <sup>2,5</sup>     |                                                         | ---  | ---  | -26  | A    |
| $V_{SD}$ | Diode Forward Voltage <sup>2</sup>       | $V_{GS}=0V$ , $I_S=-1A$ , $T_J=25^\circ\text{C}$        | ---  | ---  | -1.2 | V    |
| $t_{rr}$ | Reverse Recovery Time                    | $I_F=-6A$ , $dI/dt=100A/\mu s$ , $T_J=25^\circ\text{C}$ | ---  | 16.3 | ---  | nS   |
| $Q_{rr}$ | Reverse Recovery Charge                  |                                                         | ---  | 5.9  | ---  | nC   |

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is  $V_{DD}=-25V$ ,  $V_{GS}=-10V$ ,  $L=0.1mH$ ,  $I_{AS}=-38A$
- 4.The power dissipation is limited by  $150^\circ\text{C}$  junction temperature
- 5.The data is theoretically the same as  $I_D$  and  $I_{DM}$ , in real applications , should be limited by total power dissipation.



## Typical Characteristics

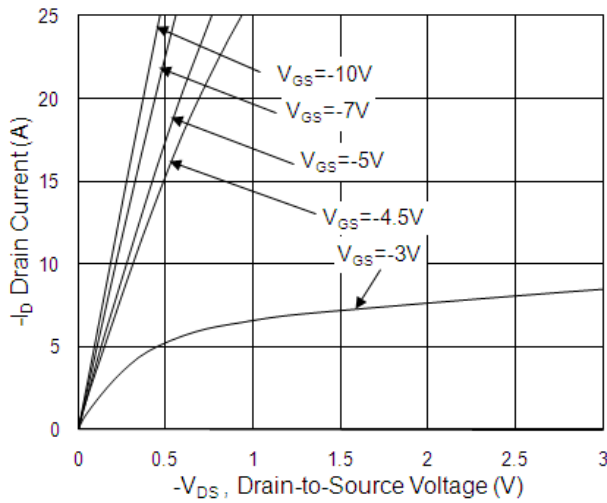


Fig.1 Typical Output Characteristics

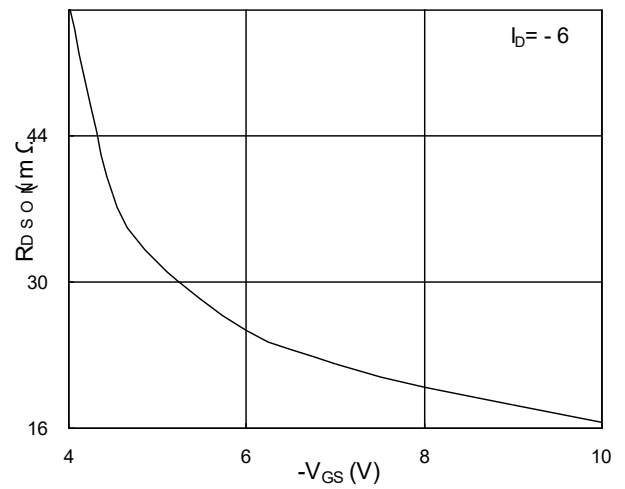


Fig.2 On-Resistance v.s Gate-Source

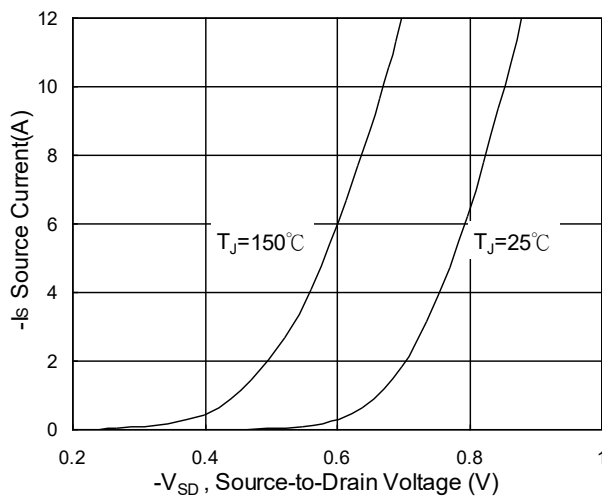


Fig.3 Forward Characteristics of Reverse

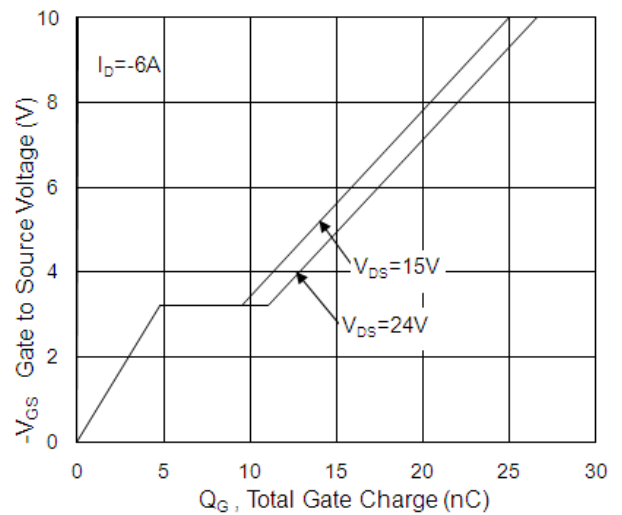


Fig.4 Gate-Charge Characteristics

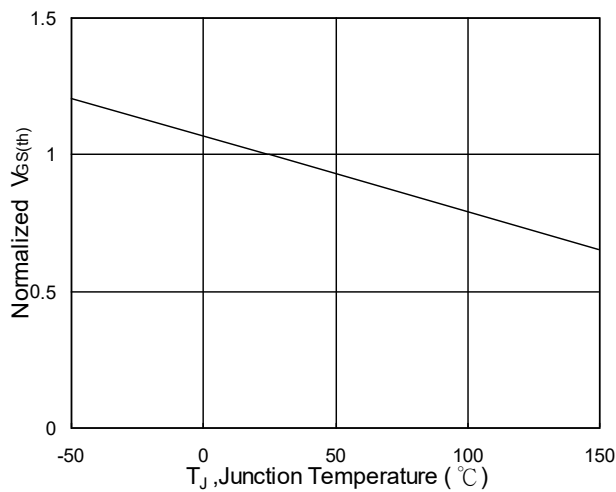


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

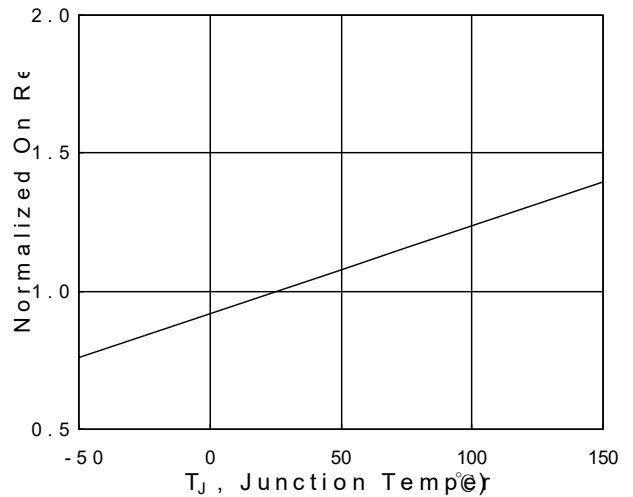


Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$

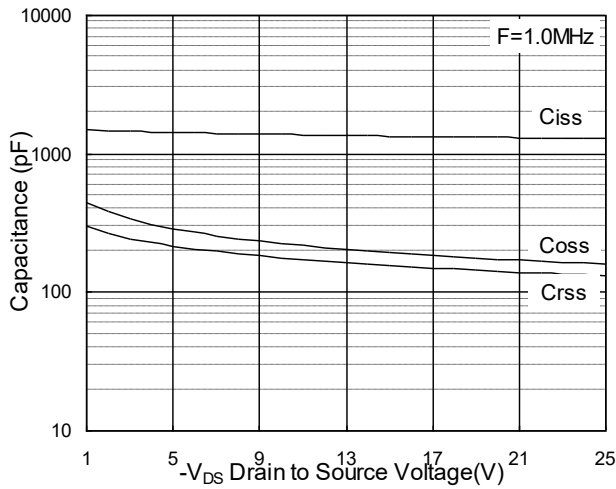


Fig.7 Capacitance

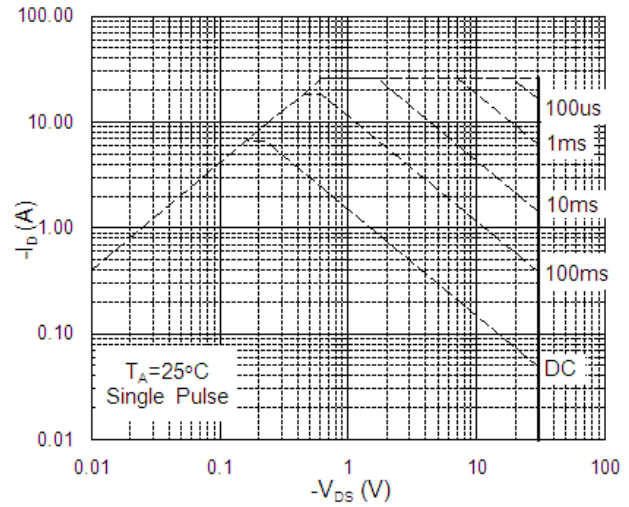


Fig.8 Safe Operating Area

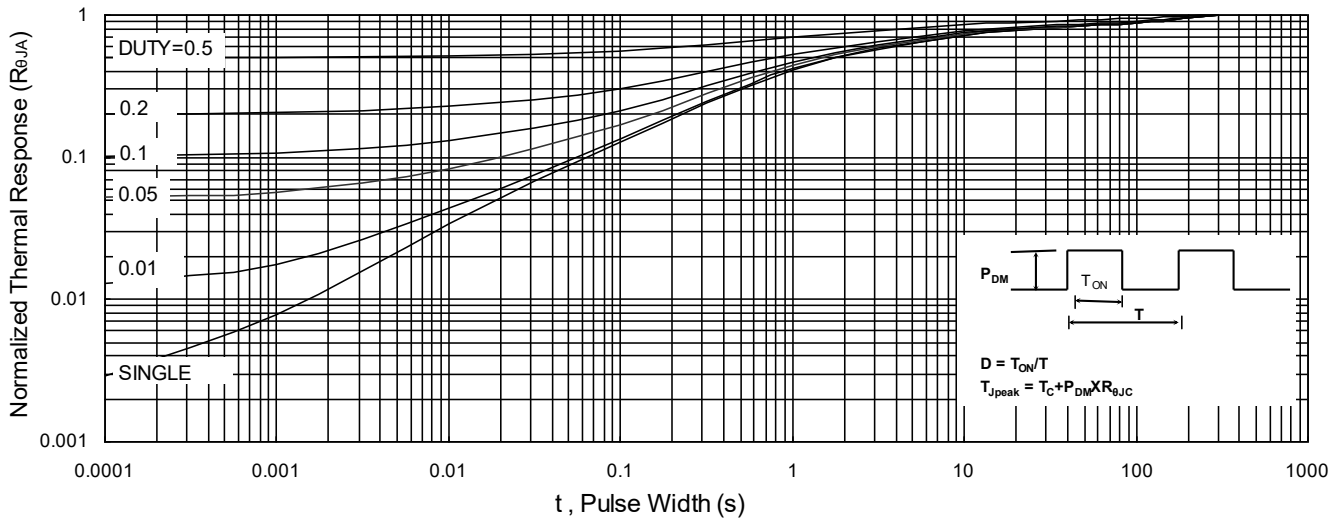


Fig.9 Normalized Maximum Transient Thermal Impedance

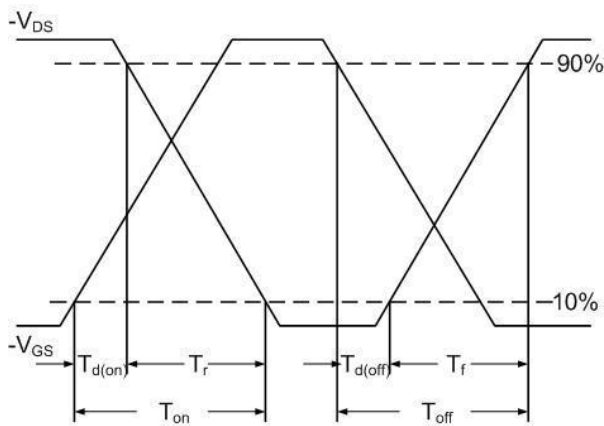


Fig.10 Switching Time Waveform

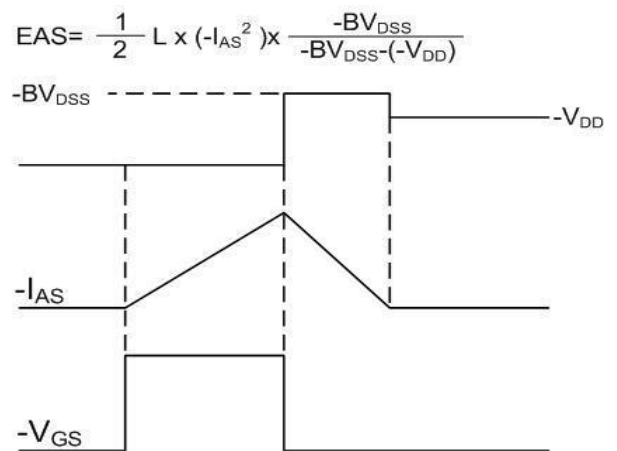


Fig.11 Unclamped Inductive Switching Waveform



## SOP-8(SOIC-8) Package Outline Dimensions



| 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 | 0.007                | 0.010 |
| D      | 4.800                     | 5.000 | 0.189                | 0.197 |
| e      | 1.270 (BSC)               |       | 0.050 (BSC)          |       |
| E      | 5.800                     | 6.200 | 0.228                | 0.244 |
| E1     | 3.800                     | 4.000 | 0.150                | 0.157 |
| L      | 0.400                     | 1.270 | 0.016                | 0.050 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |



Note:  
1. Controlling dimension; in millimeters.  
2. General tolerance:  $\pm 0.05\text{mm}$ .  
3. The pad layout is for reference purposes only.



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