★ Green Device Available
★ Super Low Gate Charge
★ Excellent CdV/dt effect decline
★ Advanced high cell density Trench technology

**Product Summary**

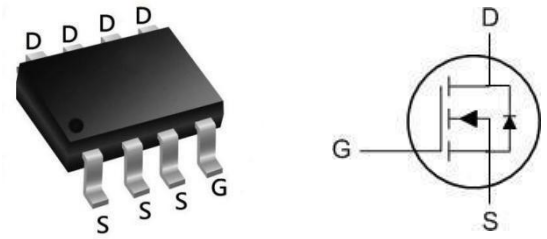
| BVDSS | RDSON | ID |
|---|---|---|
| 30V | 9 mΩ | 13 A |

## Description

The AO4406A is the high cell density trenched N- ch MOSFETs , which provide excellent RDSON and gate charge for most of the synchronous buck converter-applications.

The AO4406A meet the RoHS and Green Product requirement , 100 % EAS guaranteed with full function reliability approved.

## SOP8 Pin Configuration




## Package Marking and Ordering Information

| Product | Package | Marking | Packing | Min Unit Quantity |
|---|---|---|---|---|
| AO4406A | SOP8 | * | 3000PCS/Reel | 3000PCS |

## Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 30 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_A$=25℃ | Continuous Drain Current, $V_{GS}$ @ 10V[1] | 13 | A |
| $I_D$@$T_A$=70℃ | Continuous Drain Current, $V_{GS}$ @ 10V[1] | 7.6 | A |
| $I_{DM}$ | Pulsed Drain Current[2] | 55 | A |
| EAS | Single Pulse Avalanche Energy[3] | 33 | mJ |
| $I_{AS}$ | Avalanche Current | 20 | A |
| $P_D$@$T_A$=25℃ | Total Power Dissipation[4] | 5 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |

## Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient [1] | --- | 85 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case[1] | --- | 25 | ℃/W |

## Electrical Characteristics ($T_J$=25℃ unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| **Off Characteristic** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250μA | 30 | - | - | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=30V, $V_{GS}$=0V, | - | - | 1.0 | μA |
| $I_{GSS}$ | Gate to Body Leakage Current | $V_{DS}$=0V, $V_{GS}$=±20V | - | - | ±100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1.0 | 1.5 | 2.5 | V |
| $R_{DS(on)}$ | Static Drain-Source on-Resistance note3 | $V_{GS}$=10V, $I_D$=13A | - | 9 | 11.5 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=10A | - | 12 | 15.5 | |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | VGS=0V, DS=15V, f=1MHz | 610 | - | 910 | pF |
| $C_{oss}$ | Output Capacitance | | 88 | - | 160 | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | 40 | - | 100 | pF |
| $Q_g$ | Total Gate Charge | $V_{DS}$=15V, $I_D$=6A, $V_{GS}$=10V | - | 19 | - | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 6.3 | - | nC |
| $Q_{gd}$ | Gate-Drain(“Miller”) Charge | | - | 4.5 | - | nC |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DS}$=15V, $I_D$=13A, $R_{GEN}$=3Ω, $V_{GS}$=10V | - | 6 | - | ns |
| $t_r$ | Turn-on Rise Time | | - | 5 | - | ns |
| $t_{d(off)}$ | Turn-off Delay Time | | - | 25 | - | ns |
| $t_f$ | Turn-off Fall Time | | - | 7 | - | ns |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| $I_S$ | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 13 | A |
| $I_{SM}$ | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 52 | A |
| $V_{SD}$ | Drain to Source Diode Forward Voltage | $V_{GS}$=0V, $I_S$=13A | - | - | 1.2 | V |
| trr | Body Diode Reverse Recovery Time | $I_F$=13A,dI/dt=100A/μs | - | 7 | - | ns |
| Qrr | Body Diode Reverse Recovery Charge | | - | 6.3 | - | nC |

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: $T_J$=25℃, $V_{GS}$=15V, $R_G$=25Ω, L=0.5mH, $I_{AS}$=11.5A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

.

## Typical Performance Characteristics

**Figure1:** Output Characteristics

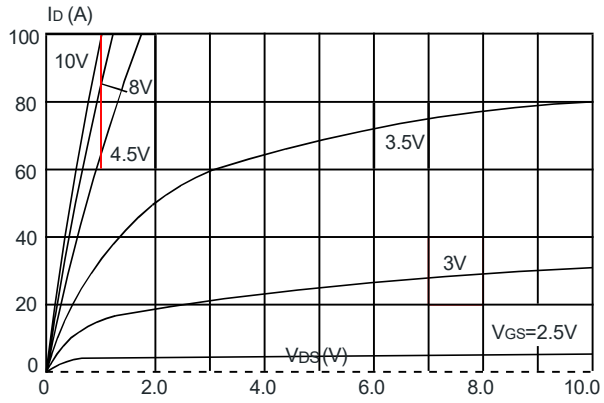



**Figure 2:** Typical Transfer Characteristics

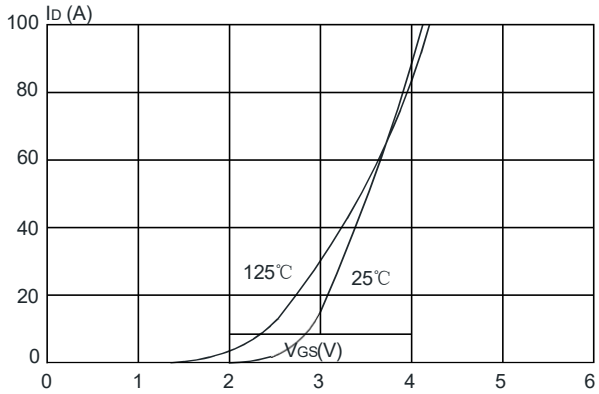



**Figure 3:**On-resistance vs. Drain Current

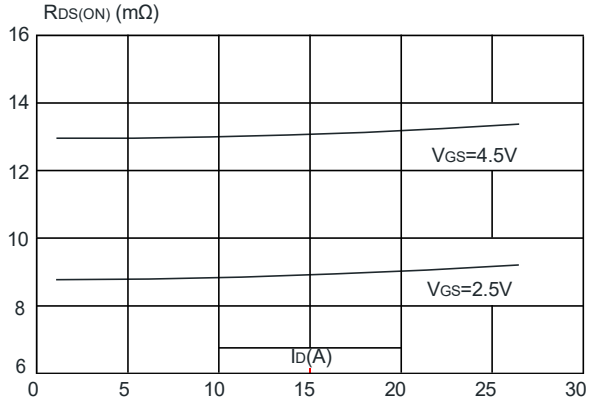



**Figure 4**: Body Diode Characteristics

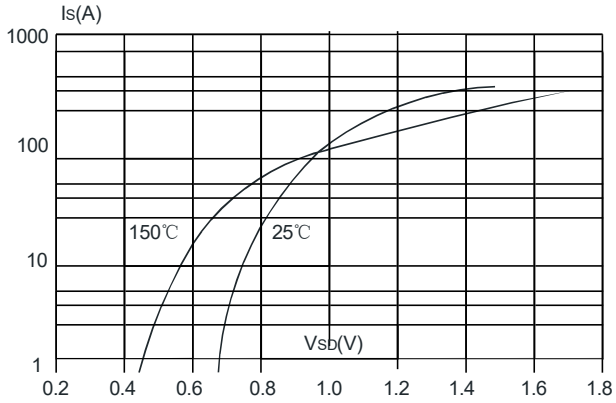



**Figure 5:** Gate Charge Characteristics

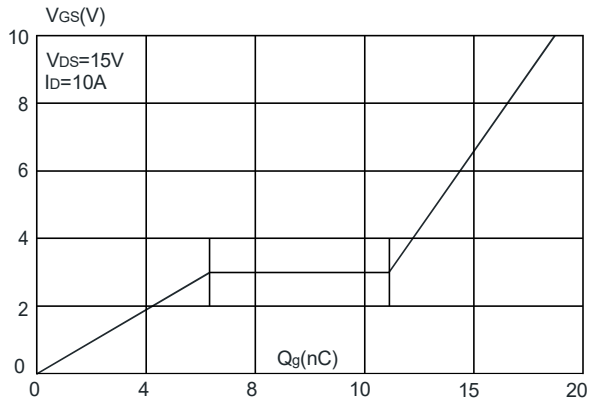



**Figure 6:** Capacitance Characteristics

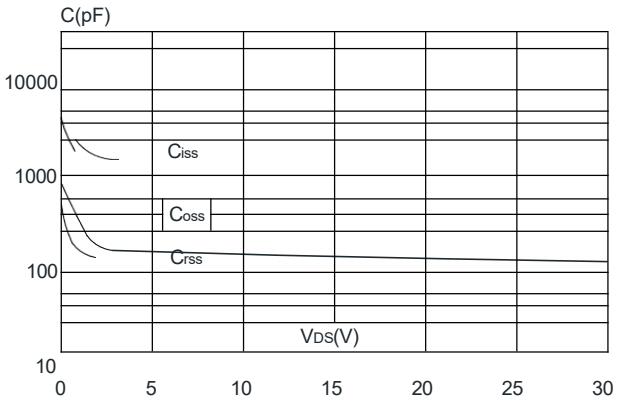


**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature

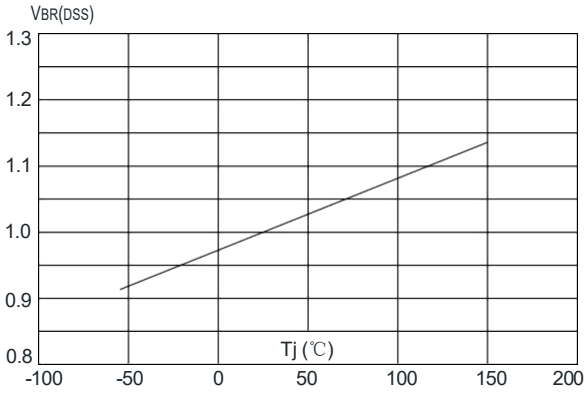



**Figure 8:** Normalized on Resistance vs. Junction Temperature

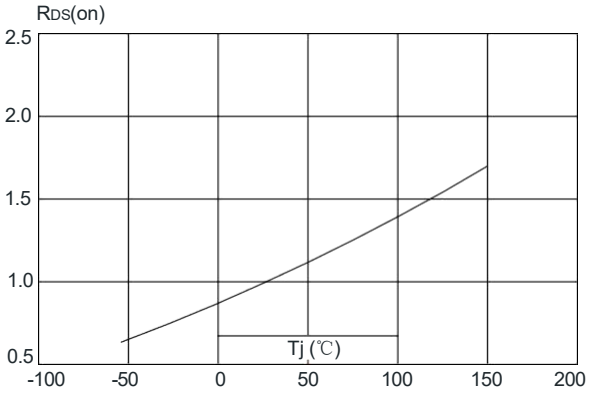



**Figure 9:** Maximum Safe Operating Area

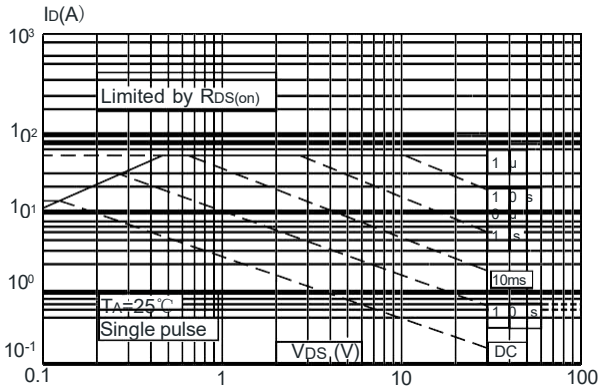



**Figure 10:** Maximum Continuous Drain Current vs. Ambient Temperature

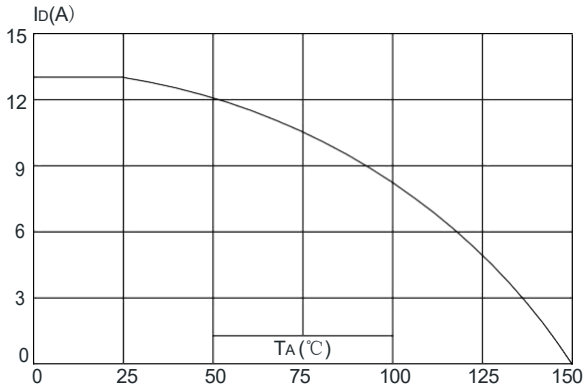
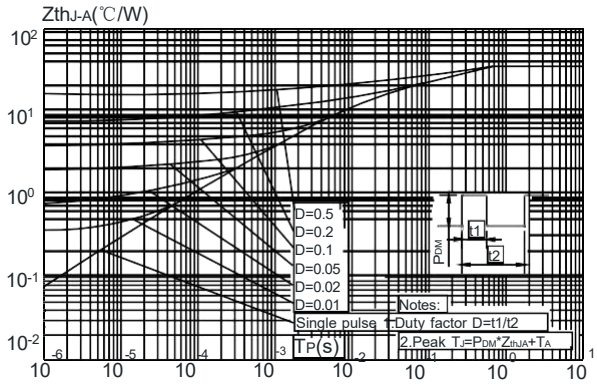
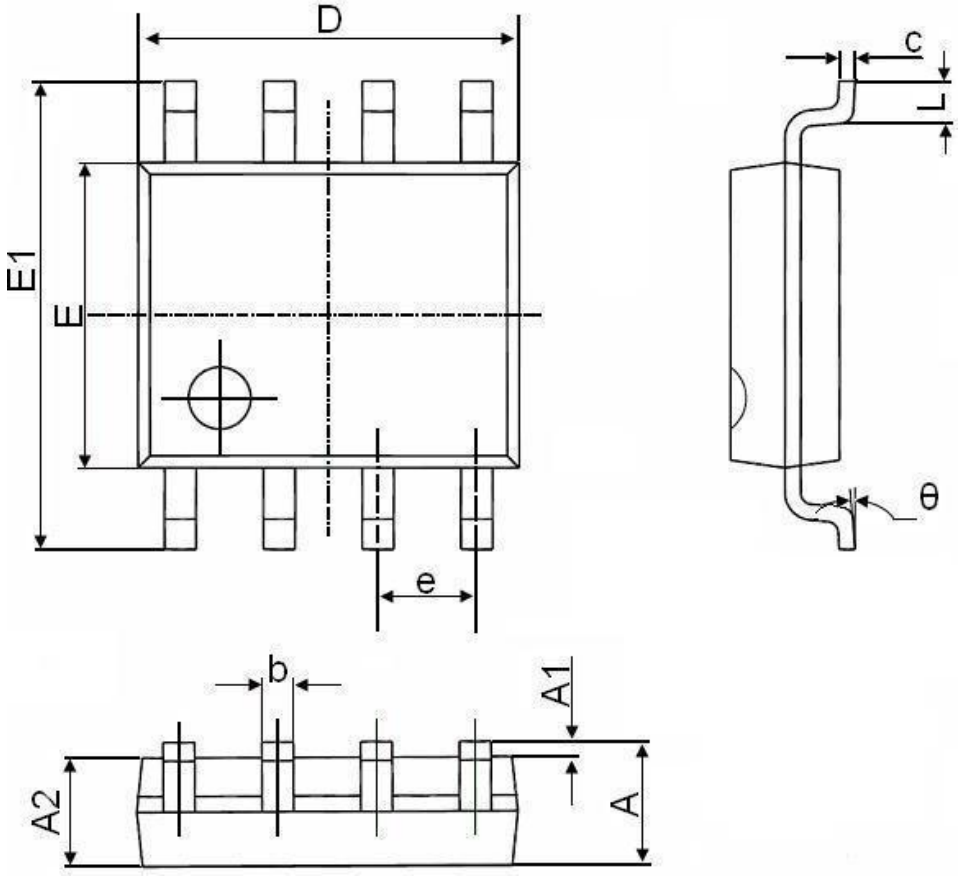



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



## SOP-8 Package Information




| 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° |