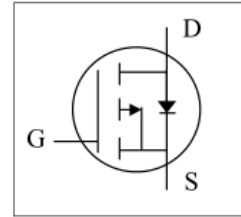


-40V P-Channel Enhancement Mode MOSFET

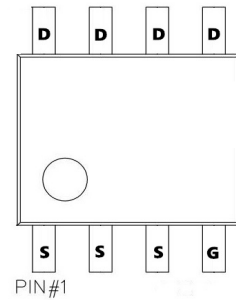
**Description**

The AO4443 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.



**General Features**

$V_{DS} = -40V$   $I_D = -8 A$   
 $R_{DS(ON)} < 37m\Omega @ V_{GS}=10V$



**Application**

- Battery protection
- Load switch
- Uninterruptible power supply

**Absolute Maximum Ratings ( $T_A=25^\circ C$ )**

| Symbol           | Parameter  | Value      | Unit         |
|------------------|--|------------|--------------|
| $V_{DS}$         | Drain-Source Voltage ( $V_{GS}=0V$ )                 | -40        | V            |
| $V_{GS}$         | Gate-Source Voltage ( $V_{DS}=0V$ )                  | $\pm 20$   | V            |
| $I_D$            | Drain Current-Continuous( $T_c=25^\circ C$ )         | -20        | A            |
|                  | Drain Current-Continuous( $T_c=100^\circ C$ )        | -8         | A            |
| $I_{DM (pluse)}$ | (Note 1)<br>Drain Current-Continuous@ Current-Pulsed | -20        | A            |
| $P_D$            | Maximum Power Dissipation( $T_c=25^\circ C$ )        | 37.5       | W            |
|                  | Maximum Power Dissipation( $T_c=100^\circ C$ )       | 19         | W            |
| $T_J, T_{STG}$   | Operating Junction and Storage Temperature Range     | -55 To 175 | $^\circ C$   |
| $R_{JC}$         | Thermal Resistance, Junction-to-Case                 | 4          | $^\circ C/W$ |

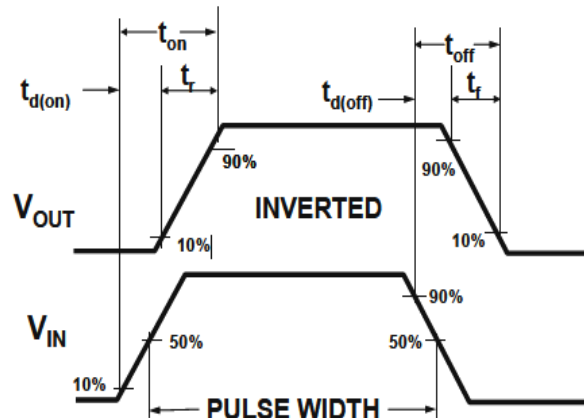
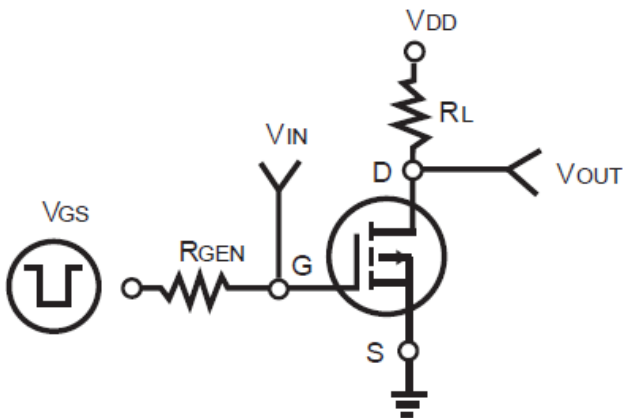
-40V P-Channel Enhancement Mode MOSFET

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

| Symbol              | Parameter                        | Conditions   | Min | Typ | Max  | Unit |
|---------------------|----------------------------------|--|-----|-----|------|------|
| BV <sub>DSS</sub>   | Drain-Source Breakdown Voltage   | V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA  | -40 |     |      | V    |
| I <sub>DSS</sub>    | Zero Gate Voltage Drain Current  | V <sub>DS</sub> =-32V, V <sub>GS</sub> =0V   |     |     | -1   | μA   |
| I <sub>GSS</sub>    | Gate-Body Leakage Current        | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V   |     |     | ±100 | nA   |
| V <sub>GS(th)</sub> | Gate Threshold Voltage           | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA                                | -1  | -2  | -3   | V    |
| g <sub>Fs</sub>     | Forward Transconductance         | V <sub>DS</sub> =-5V, I <sub>D</sub> =-10A   |     | 25  |      | S    |
| R <sub>DS(ON)</sub> | Drain-Source On-State Resistance | V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A  |     | 35  | 46   | mΩ   |
|                     |                                  | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A   |     | 42  | 52   | mΩ   |
| C <sub>iss</sub>    | Input Capacitance                | V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, f=1.0MHz                                     |     | 840 |      | pF   |
| C <sub>oss</sub>    | Output Capacitance               |  |     | 92  |      | pF   |
| C <sub>rss</sub>    | Reverse Transfer Capacitance     |  |     | 60  |      | pF   |
| t <sub>d(on)</sub>  | Turn-on Delay Time               | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-20V, R <sub>L</sub> =1.6Ω, R <sub>GEN</sub> =3Ω |     | 5   |      | nS   |
| t <sub>r</sub>      | Turn-on Rise Time                |  |     | 12  |      | nS   |
| t <sub>d(off)</sub> | Turn-Off Delay Time              |  |     | 20  |      | nS   |
| t <sub>f</sub>      | Turn-Off Fall Time               |  |     | 4.5 |      | nS   |
| Q <sub>g</sub>      | Total Gate Charge                | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-20V, I <sub>D</sub> =-15A                       |     | 20  |      | nC   |
| Q <sub>gs</sub>     | Gate-Source Charge               |  |     | 2.5 |      | nC   |
| Q <sub>gd</sub>     | Gate-Drain Charge                |  |     | 4.5 |      | nC   |
| I <sub>SD</sub>     | Source-Drain Current(Body Diode) |  |     |     | -20  | A    |
| V <sub>SD</sub>     | Forward on Voltage               | V <sub>GS</sub> =0V, I <sub>S</sub> =-20A  |     |     | -1.2 | V    |

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

Switch Time Test Circuit and Switching Waveforms:



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Power Dissipation

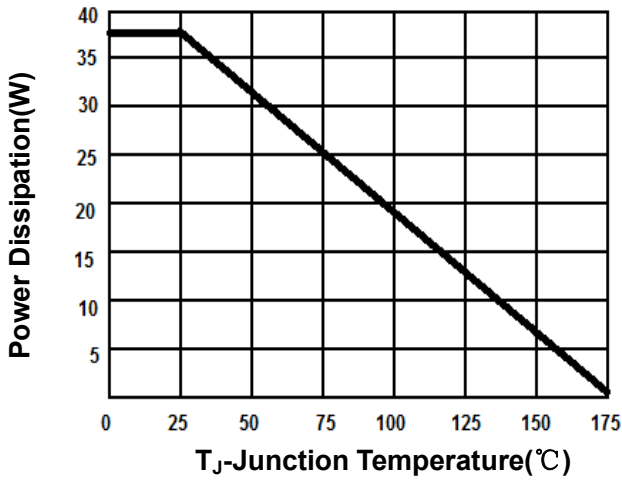


Figure2. Drain Current

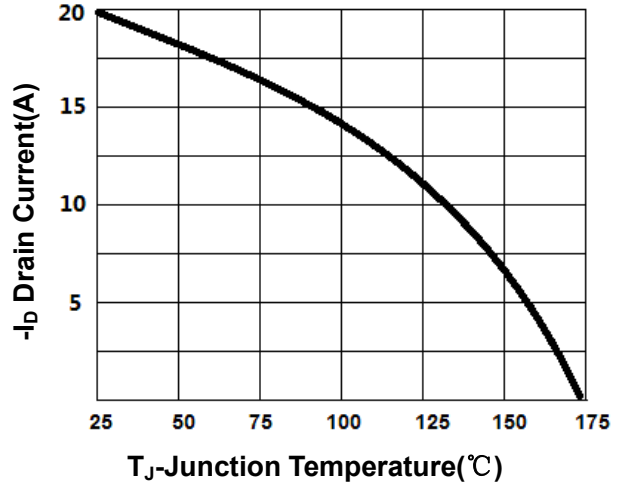


Figure3. Output Characteristics

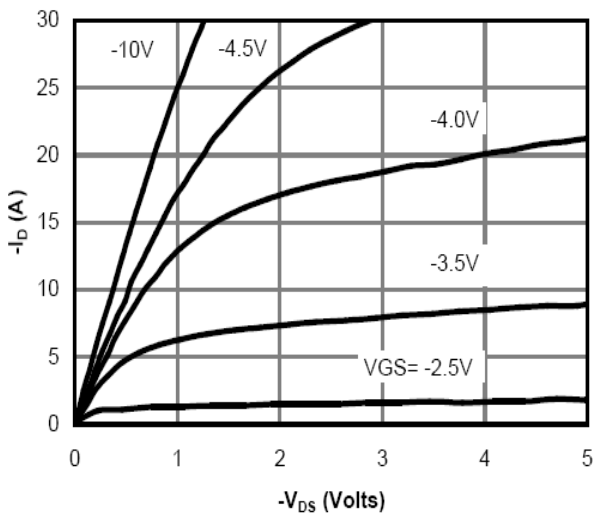
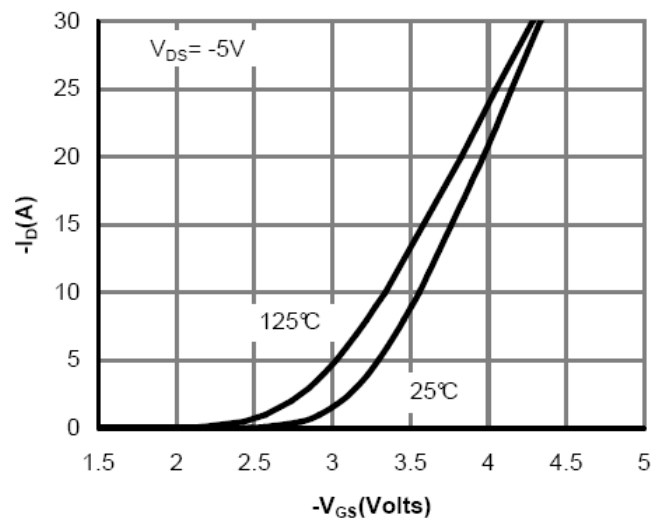


Figure4. Transfer Characteristics



-40V P-Channel Enhancement Mode MOSFET

Figure5. Capacitance

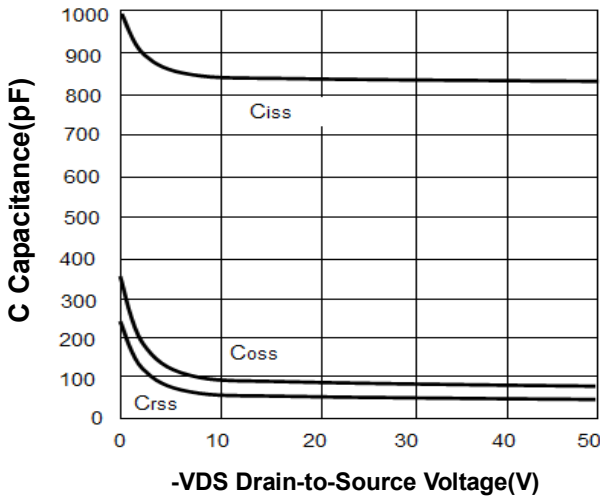


Figure6.  $R_{DS(ON)}$  vs Junction Temperature

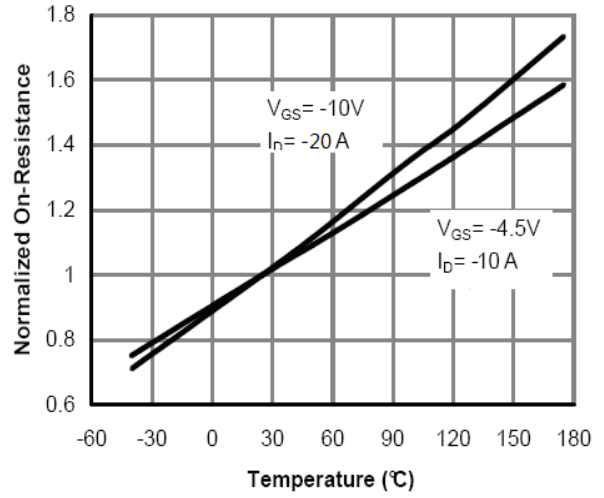


Figure7.  $V_{GS(th)}$  vs Junction Temperature

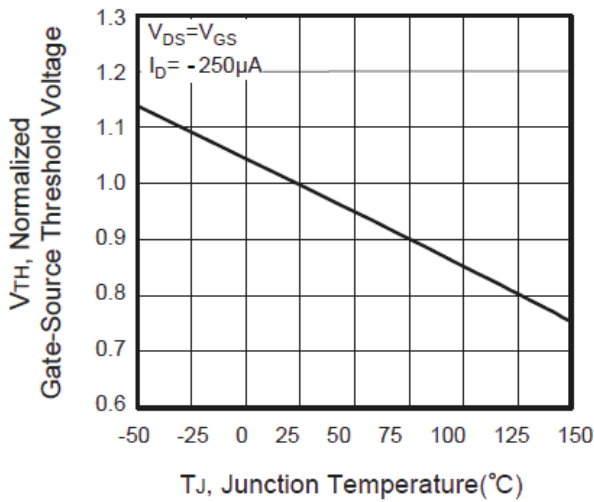


Figure8. Gate Charge Waveforms

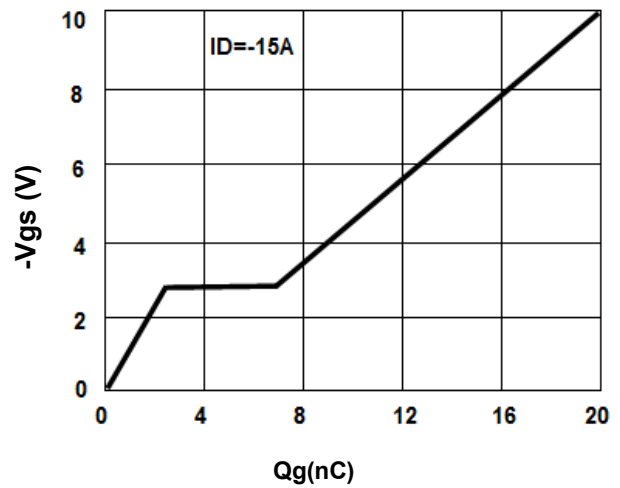
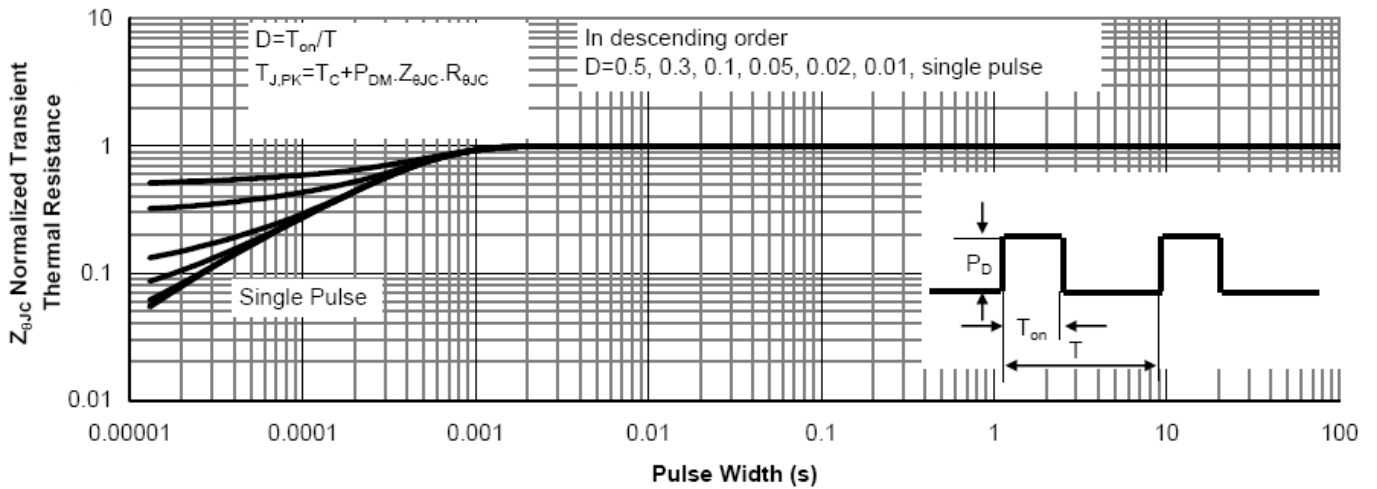
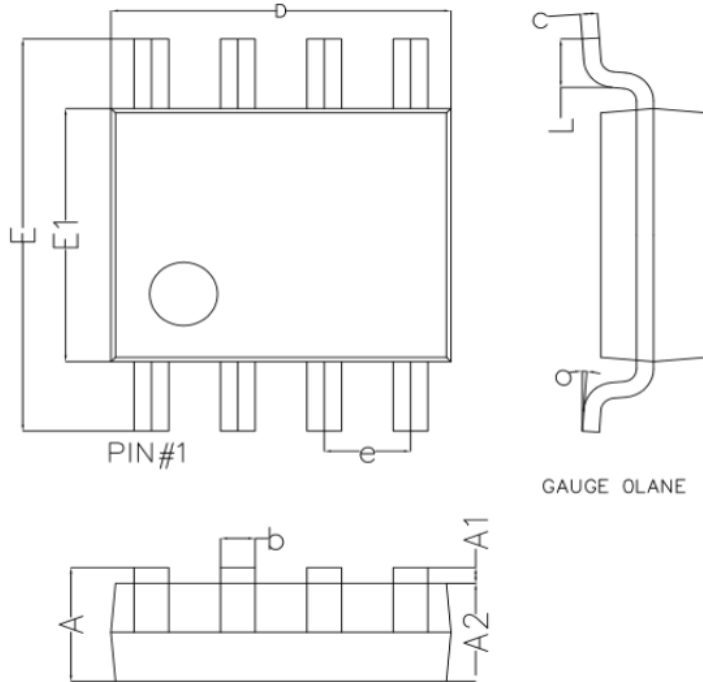


Figure9. Normalized Maximum Transient Thermal Impedance

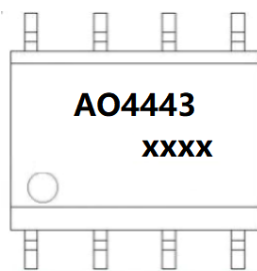


SOP8 Package outline



| Symbol | Dim in mm   |       |        |
|--------|-------------|-------|--------|
|        | Min         | Nor   | Max    |
| A      | 1.350       | 1.550 | 1.750  |
| A1     | 0.100       | 0.175 | 0.250  |
| A2     | 1.350       | 1.450 | 1.550  |
| b      | 0.330       | 0.420 | 0.510  |
| c      | 0.170       | 0.210 | 0.250  |
| D      | 4.800       | 4.900 | 5.000  |
| e      | 1.270 (BSC) |       |        |
| E      | 5.800       | 6.000 | 6.200  |
| E1     | 3.800       | 3.900 | 4.000  |
| L      | 0.400       | 0.835 | 1.2700 |
| o      | 0°          | 4°    | 8°     |

Marking



("xxxx"代表年份周期)