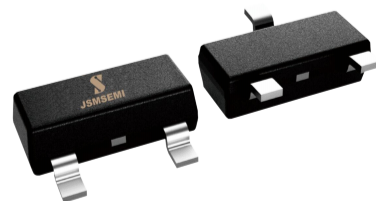


## ■ FEATURE

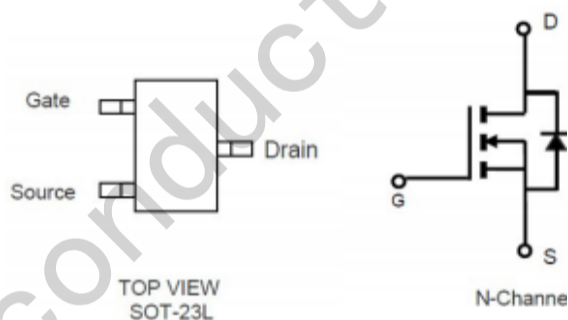
- ◆ 100V/ 3.0 A,  $R_{DS(ON)}=220m\Omega$ (typ.)@ $V_{GS}=4.5V$
- ◆ 100V/ 2.5 A,  $R_{DS(ON)}=280m\Omega$  (typ.)@ $V_{GS}=2.5V$
- ◆ Super high design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and Maximum DC current capability
- ◆ This is a Full RoHS compliance
- ◆ SOT23-3L package design



## ■ DESCRIPTION

The AO3442-JSM is the N-Channel logic enhancement mode power field effect transistor is produced using high cell density advanced trench technology..

This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application, and low in-line power loss are needed in a very small outline surface mount package.



## ■ APPLICATIONS

- ◆ Power Management in Note Book
- ◆ Portable Equipment
- ◆ Battery Powered System

## ■ ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^{\circ}C$ Unless otherwise noted )

| Symbol    | Parameter                                       |                   | Typical        | Unit        |
|-----------|-------------------------------------------------|-------------------|----------------|-------------|
| $V_{DSS}$ | Drain-Source Voltage                            |                   | 100            | V           |
| $V_{GSS}$ | Gate-Source Voltage                             |                   | $\pm 20$       | V           |
| $I_D$     | Continuous Drain Current ( $T_J=150^{\circ}C$ ) | $V_{GS}=4.5V$     | 3.0            | A           |
| $I_{DM}$  | Pulsed Drain Current                            |                   | 10             | A           |
| $I_S$     | Continuous Source Current (Diode Conduction)    |                   | 1              | A           |
| $P_D$     | Power Dissipation                               | $T_A=25^{\circ}C$ | 1.25(SOT23-3L) | W           |
|           |                                                 | $T_A=75^{\circ}C$ | 0.8(SOT23-3L)  |             |
| $T_J$     | Operation Junction Temperature                  |                   | 150            | $^{\circ}C$ |
| $T_{STG}$ | Storage Temperature Range                       |                   | -55~+150       | $^{\circ}C$ |

**Note:** Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
 Absolute maximum ratings are stress rating only and functional device operation is not implied

## ■ THERMAL DATA

| Symbol          | Parameter                              | Min | Typ  | Max | Unit          |
|-----------------|----------------------------------------|-----|------|-----|---------------|
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient |     | 62.5 | 125 | $^{\circ}C/W$ |

**ELECTRICAL CHARACTERISTICS**( $V_{DD}=2.75V$ ,  $T_A=25^{\circ}C$  Unless otherwise noted)

| Symbol               | Parameter                       | Condition                                                                                                         | Min | Typ | Max  | Unit |
|----------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------|-----|-----|------|------|
| Static Parameters    |                                 |                                                                                                                   |     |     |      |      |
| V <sub>(BR)DSS</sub> | Drain-Source Breakdown Voltage  | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA                                                                        | 100 |     |      | V    |
| V <sub>GS(th)</sub>  | Gate Threshold Voltage          | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA                                                          | 1.0 |     | 2.5  | V    |
| I <sub>GSS</sub>     | Gate Leakage Current            | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                                                                        |     |     | ±100 | nA   |
| I <sub>DSS</sub>     | Zero Gate Voltage Drain Current | V <sub>DS</sub> =80V, V <sub>GS</sub> =0                                                                          |     |     | 1    | uA   |
|                      |                                 | V <sub>DS</sub> =80V, V <sub>GS</sub> =0<br>T <sub>J</sub> =85℃                                                   |     |     | 5    |      |
| I <sub>D(ON)</sub>   | On=State Drain Current          | V <sub>DS</sub> ≥5V, V <sub>GS</sub> =4.5V                                                                        | 1.5 |     |      | A    |
| R <sub>DS(ON)</sub>  | Drain-Source On-Resistance      | V <sub>GS</sub> =10V, I <sub>D</sub> =3.0A                                                                        |     | 220 | 350  | mΩ   |
|                      |                                 | V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.5A                                                                       |     | 280 | 400  |      |
| G <sub>fs</sub>      | Forward Transconductance        | V <sub>DS</sub> =5V, I <sub>D</sub> =1.0A                                                                         |     | 10  |      | S    |
| Source-Drain Diode   |                                 |                                                                                                                   |     |     |      |      |
| V <sub>SD</sub>      | Diode Forward Voltage           | I <sub>S</sub> =1.0A, V <sub>GS</sub> =0V                                                                         |     | 0.8 | 1.0  | V    |
| Dynamic Parameters   |                                 |                                                                                                                   |     |     |      |      |
| Q <sub>g</sub>       | Total Gate Charge               | V <sub>DS</sub> =50V<br>V <sub>GS</sub> =4.5V<br>I <sub>D</sub> =1.0A                                             |     | 2.1 | 3.9  | nC   |
| Q <sub>gs</sub>      | Gate-Source Charge              |                                                                                                                   |     | 0.6 |      |      |
| Q <sub>gd</sub>      | Gate-Drain Charge               |                                                                                                                   |     | 0.8 |      |      |
| C <sub>iss</sub>     | Input Capacitance               | V <sub>DS</sub> =50V<br>V <sub>GS</sub> =0V<br>f=1MHz                                                             |     | 295 |      | pF   |
| C <sub>oss</sub>     | Output Capacitance              |                                                                                                                   |     | 40  |      |      |
| C <sub>rss</sub>     | Reverse Transfer Capacitance    |                                                                                                                   |     | 15  |      |      |
| T <sub>d(on)</sub>   | Turn-On Time                    | V <sub>DS</sub> =50V<br>R <sub>L</sub> =10Ω<br>I <sub>D</sub> =1A<br>V <sub>GEN</sub> =4.5V<br>R <sub>G</sub> =6Ω |     | 3.6 |      | nS   |
| T <sub>r</sub>       |                                 |                                                                                                                   |     | 3.5 |      |      |
| T <sub>d(off)</sub>  | Turn-Off Time                   |                                                                                                                   |     | 32  |      |      |
| T <sub>f</sub>       |                                 |                                                                                                                   |     | 3   |      |      |

**Note: 1. Pulse test: pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$**

**2.Static parameters are based on package level with recommended wire bonding**

■ TYPICAL CHARACTERISTICS (25°C Unless Note)

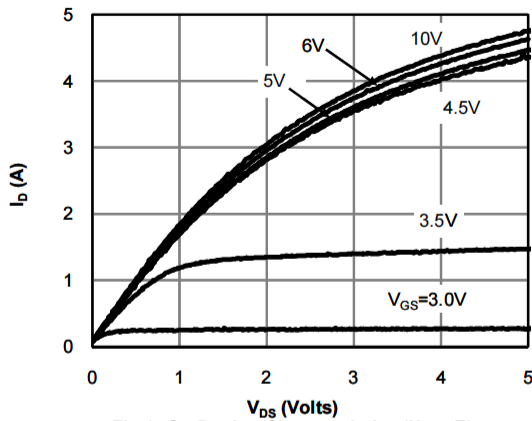


Fig 1: On-Region Characteristics (Note E)

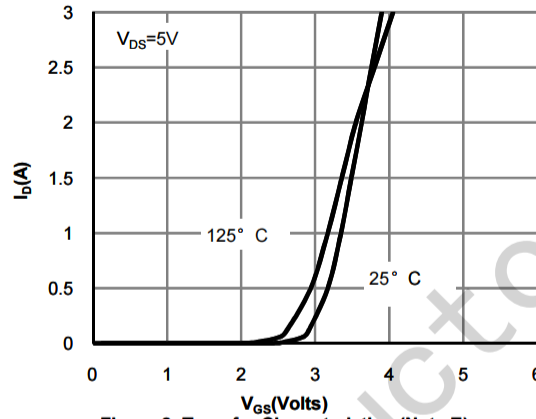


Figure 2: Transfer Characteristics (Note E)

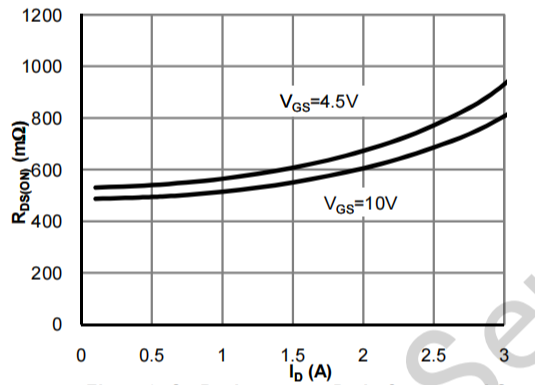


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

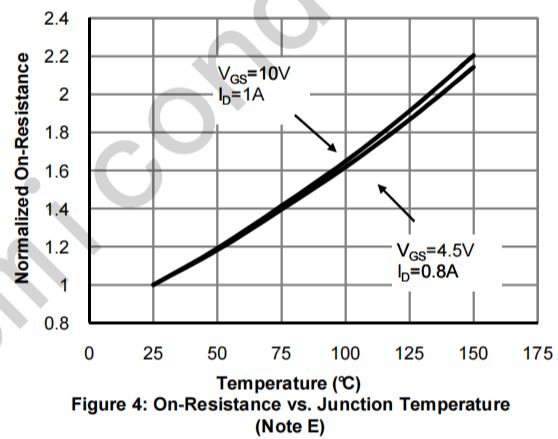


Figure 4: On-Resistance vs. Junction Temperature (Note E)

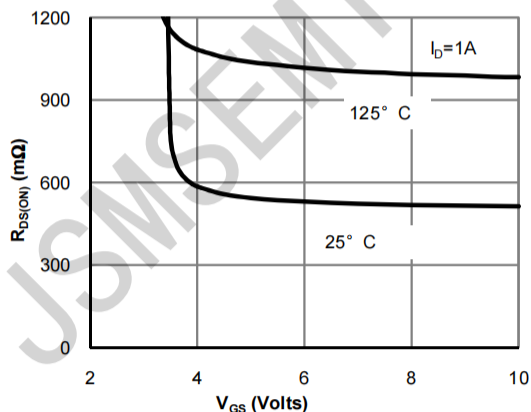


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

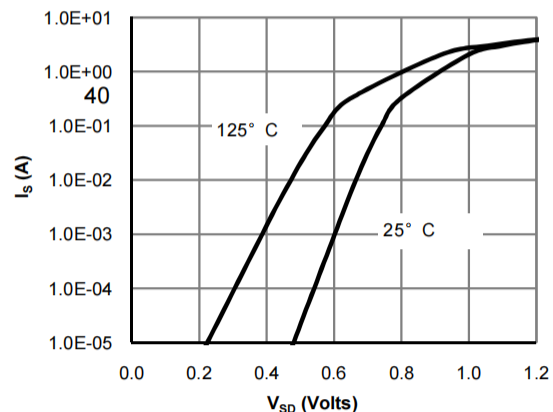


Figure 6: Body-Diode Characteristics (Note E)

■ TYPICAL CHARACTERISTICS (continuous)

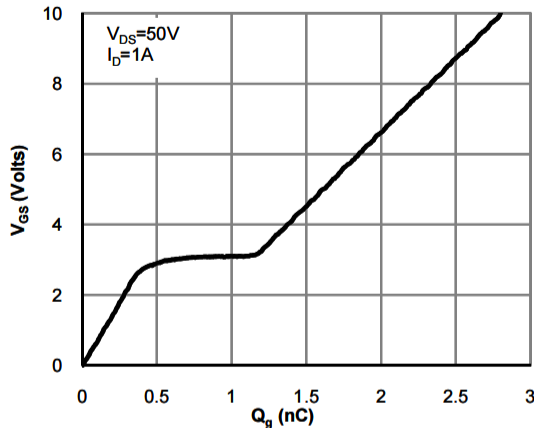


Figure 7: Gate-Charge Characteristics

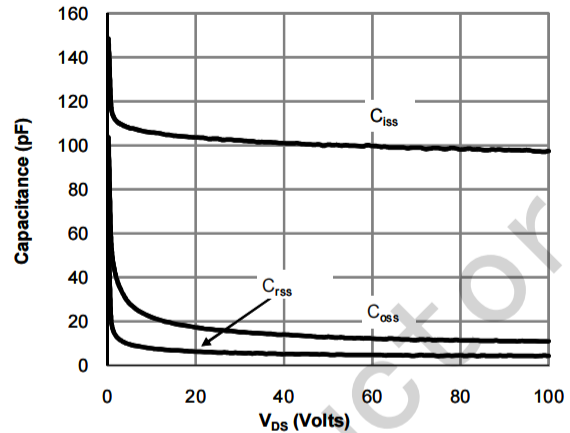


Figure 8: Capacitance Characteristics

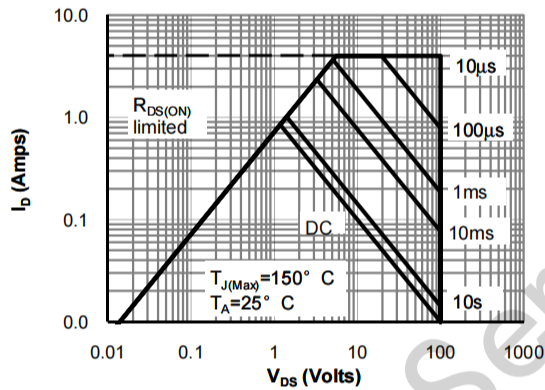


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

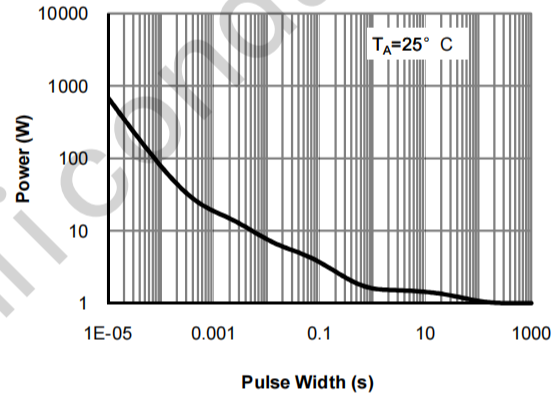


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

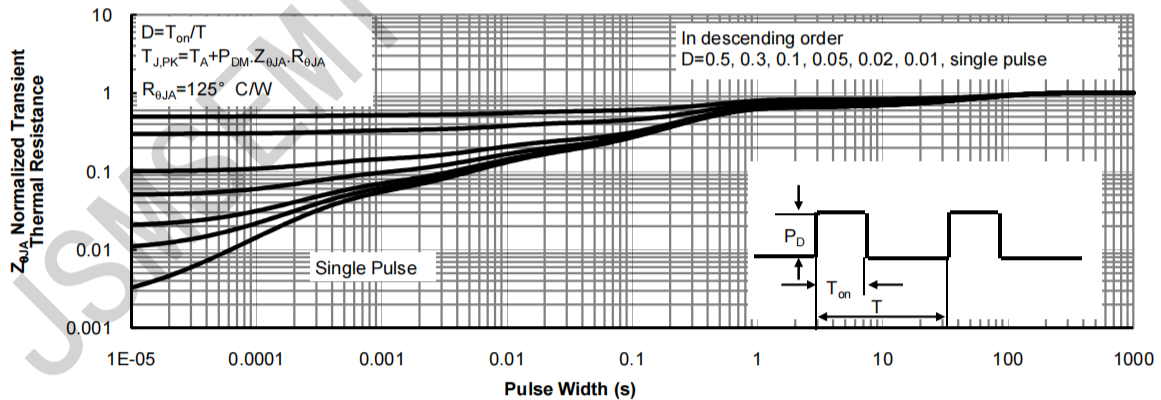
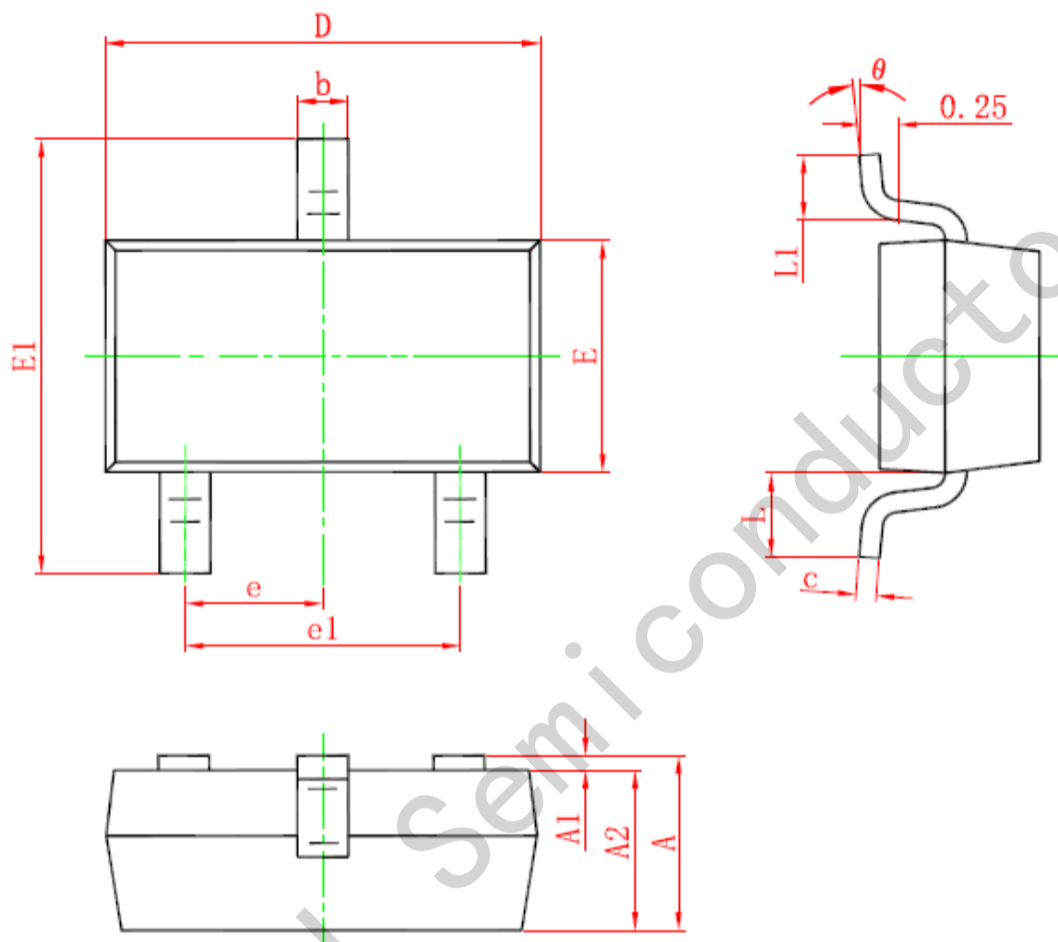


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

■ SOT23 PACKAGE OUTLINE DIMENSIONS



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min.                      | Max.  | Min.                 | Max.  |
| A        | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1       | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2       | 0.900                     | 1.050 | 0.035                | 0.041 |
| b        | 0.300                     | 0.500 | 0.012                | 0.020 |
| c        | 0.080                     | 0.150 | 0.003                | 0.006 |
| D        | 2.800                     | 3.000 | 0.110                | 0.118 |
| E        | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1       | 2.250                     | 2.550 | 0.089                | 0.100 |
| e        | 0.950 TYP.                |       | 0.037 TYP.           |       |
| e1       | 1.800                     | 2.000 | 0.071                | 0.079 |
| L        | 0.550 REF.                |       | 0.022 REF.           |       |
| L1       | 0.300                     | 0.500 | 0.012                | 0.020 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |