ALPHA & OMEGA SEMICONDUCTOR

# AOS Semiconductor
# Product Reliability Report

## AOZ8001JI, rev 1

**Plastic Encapsulated Device**

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***This AOS product reliability report summarizes the qualification result for AOZ8001JI.***

***Review of the electrical test results confirm that AOZ8001JI pass AOS quality and reliability requirements for product release. The continuous qualification testing and reliability monitoring program ensure that all outgoing products will continue to meet AOS quality and reliability standards.***

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## I. Product Description:

The AOZ8001JI is a transient voltage suppressor array designed to protect high speed data lines from ESD and lightning. The product comes in RoHS compliant, SOT-143 package and is rated over a -40°C to +85°C ambient temperature range.

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| **Absolute Maximum Ratings** | |
|---|---|
| **Parameter** | |
| VP-VN | 6V |
| Peak Pulse Current (Ipp), tp=8/20uS | 5A |
| Peak Power Dissipation (8x20mS@ 25°C) SOT-143 | 50W |
| Storage Temperature ($T_S$) | -65°C to +150°C |
| ESD Rating per IEC61000-4-2, contact (1) | ±12kV |
| ESD Rating per IEC61000-4-2, air (2) | ±15kV |
| ESD Rating per Human Body Model (2) | ±15kV |
| Junction Temperature ($T_j$) | -40°C to +125°C |

Notes:
(1) IEC-61000-4-2 discharge with $C_{Discharge}$=150pF, $R_{Discharge}$=330Ω
(2) Human Body Discharge per MIL-STD-883, Method 3015 $C_{Discharge}$=100pF, $R_{Discharge}$=1.5kΩ

## II. Package and Die Information:

| | |
|---|---|
| **Product ID** | AOZ8001JI |
| **Process** | UMC 0.5um 5/18V 2P3M process |
| **Package Type** | SOT-143 |
| **Die** | UE003A3 (size: 716 x 616 um) |
| **L/F material** | AgCu |
| **Die attach material** | Ablebond 8006NS+84-3J epoxy |
| **Die bond wire** | Au, 1mil |
| **Mold Material** | CEL9220HF13 |
| **Plating Material** | Pure Tin |

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## III. Qualification Tests Requirments

- 3 lots of AOZ8001JI up to 168 hrs of B/I for New Product release.
- 2 lots of package qual testing (PCT, 250 cycles TC) for SOT-143 for package release to manufacturing.

## IV. Qualification Tests Result

| Test Item | Test Condition | Sample Size | Result | Comment |
|---|---|---|---|---|
| Pre-Conditioning | Per JESD 22-A113 85 $C^0$/85%RH, 3 cyc reflow@260 $^0C$ | 3 lots (82 /lot) | pass | Lot 1 (wafer lot# F162T.51-20, marking: 143A), 82 units, passed pre-conditioning. Lot 2 (wafer lot# F162T.51-20, marking: 143B), 82 units, passed pre-conditioning. Lot 3 (wafer lot# F162T.51-20, marking: 143C), 82 units, passed pre-conditioning. |
| HTOL (pkg qual burn-in ) | Per JESD 22-A108_B Vdd=6V Temp = 125 $^0C$ | 3 lots (80 /lot) | pass | Lot 1 (wafer lot# F162T.51-20, marking: 143A), 80 units, passed 500 hrs . Lot 2 (wafer lot# F162T.51-20, marking: 143B), 80 units, passed 500 hrs . Lot 3 (wafer lot# F162T.51-20, marking: 143C), 82 units, passed pre-conditioning. |
| HTOL (new UH_EPI process) | Per JESD 22-A108_B Vdd=6V Temp = 125 $^0C$ | 2 lot (80 /lot) | pass | Qual by extension using AOZ8000C (same die in SOT23 pkg.) Lot 1 (wafer lot# FNG88, marking: AC001), 80 units, passed 500 hrs . Lot 2 (wafer lot# FAYY3.02-3 marking: AB008), 80 units, passed 500 hrs . |
| HAST | '130 +/- 2 $^0C$, 85%RH, 33.3 psi, at VCC min power dissapation | 3 lots (60 /lot) | pass | Lot 1 (wafer lot# F162T.51-20, marking: 143A), 60 units, passed HAST 100 hrs . Lot 2 (wafer lot# F162T.51-20, marking: 143B), 60 units, passed HAST 100 hrs . Lot 3 (wafer lot# F162T.51-20, marking: 143C), 82 units, passed pre-conditioning. |
| Temperature Cycle | '-65 $^0C$ to +150 $^0C$, air to air (2cyc/hr) | 3 lots (82 /lot) | pass | Lot 1 (wafer lot# F162T.51-20, marking: 143A), 82 units, passed TC 500 cycles. Lot 2 (wafer lot# F162T.51-20, marking: 143B), 82 units, passed TC 500 cycles. Lot 3 (wafer lot# F162T.51-20, marking: 143C), 82 units, passed pre-conditioning. |
| Pressure Pot | 121C, 15+/-1 PSIG, RH= 100% | 3 lots (82 /lot) | pass | Lot 1 (wafer lot# F162T.51-20, marking: 143A), 82 units, passed PCT 96 hrs. Lot 2 (wafer lot# F162T.51-20, marking: 143B), 82 units, passed PCT 96 hrs. Lot 3 (wafer lot# F162T.51-20, marking: 143C), 82 units, passed pre-conditioning. |
| ESD Rating | Per IEC-61000-4-2, contact | 3 units | pass | Lot 1 (wafer lot# FAYY3.03-4, marking: 143D), 3 units passed ±12kV |
| ESD Rating | Per IEC-61000-4-2, air | 3 units | pass | Lot 1 (wafer lot# FAYY3.03-4, marking: 143D), 3 units passed ±15kV |
| Latch-up | Per JESD78A | 3 units | pass | Lot 1 (wafer lot# FAYY3.03-4, marking: 143D), 3 units passed Latch-up. |

***The qualification test results confirm that AOZ8001JI pass AOS quality and reliability requirements for product release.***

## V. Quality Assurance Information

Acceptable Quality Level for outgoing inspection: **0.1%** for electrical and visual. Guaranteed Outgoing Defect Rate: **< 50 ppm**
Quality Sample Plan: conform to **Mil-Std-105D**