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**