AOS Semiconductor
Product Reliability Report

AOZ8001KIL, rev A

Plastic Encapsulated Device

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This AOS product reliability report summarizes the qualification result for AOZ8001KIL.

Review of the electrical test results confirm that AOZ8001KIL 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.

Table of Contents:

I. Product Description
II. Package and Die information
III. Qualification Test Requirements
IV. Qualification Tests Result
V. Reliability Evaluation

I. Product Description:

The AOZ8001KIL is a transient voltage suppressor array to protect high speed data lines from ESD and lightning.

Absolute Maximum Ratings	
Parameter	
VP-VN	6v
Peak Pulse Current (Ipp), tp=8/20uS	5A
Storage Temperature (T_S)	-65℃ to +150℃
ESD Rating per IEC61000-4-2, contact (1)	±8kV
ESD Rating per IEC61000-4-2, air (2)	±15kV
ESD Rating per Human Body Model (2)	±15kV
Junction Temperature (T_j)	-40℃ to +85℃

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	AOZ8001KIL
Process	HHNEC HV003A1
Package Type	SC89A
Lead Frame	Cu
Die attach material	8006NS
Die bond wire	Au, 1 mil
Mold Material	E670CB
MSL level	Up to Level 1

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III. Qualification Tests Requirements

- 2 lots of AOZ8001KIL up to 500 hrs of HTOL for New Product release.
- 3 lots of package qual testing (PCT, 500 cycles TC, HAST) for package release to manufacturing.

IV. Qualification Tests Result

Test Item	Test Condition	Sample Size	Result	Comment
Pre-Conditioning	Per JESD 22-A113 168hrs @85 ℃ /85%RH+3 cyc reflow@260℃	3 lots	pass	
HTOL	Per JESD 22-A108_B Vdd= 6v Temp = 125℃	2 lots (80 /lot)	pass	
Temperature Cycle	'-65 ℃ to +150 ℃, air to air (2cyc/hr)	3 lots (82 /lot)	pass	
Pressure Pot	121℃, 29.7psi, RH= 100%	3 lots (82 /lot)	pass	
HAST	'130 +/- 2℃, 85%RH, 33.3 psi, at VCC min power dissipation.	3 lots (60 /lot)	pass	
ESD Rating	Per IEC-61000-4-2, contact	3 lots (5 /lot)	pass	±8kV contact
ESD Rating	Per IEC-61000-4-2, air discharge	3 lots (5 /lot)	pass	±15kV contact
Lightning Surge rating	Per IEC-61000-4-5	3 lots (5 /lot)	pass	5A surge

The qualification test results confirm that AOZ8001KIL pass AOS quality and reliability requirements for product release.

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V. Reliability Evaluation

FIT rate (per billion): 44
MTTF = 2575 years

The presentation of FIT rate for the individual product reliability is restricted by the actual burn-in sample size of the selected product. Failure Rate Determination is based on JEDEC Standard JESD 85. FIT means one failure per billion device hours.

Failure Rate = $Chi^2 \times 10^9$ **/ [**2 (N) (H) (Af)**]** = 1.83×10^9 / **[**2x2x80x500x258**]** = 44
MTTF = 10^9 / FIT = 2.26×10^7 hrs= 2575 years

Chi² = Chi Squared Distribution, determined by the number of failures and confidence interval
N = Total Number of units from HTRB and HTGB tests
H = Duration of HTRB/HTGB testing
Af = Acceleration Factor from Test to Use Conditions (Ea = 0.7eV and Tuse = 55℃)
Acceleration Factor [**Af**] = **Exp** [Ea / **k** (1/Tj u – 1/Tj s)]
Acceleration Factor ratio list:

	55 deg C	70 deg C	85 deg C	100 deg C	115 deg C	130 deg C	150 deg C
Af	**258**	**87**	**32**	**13**	**5.64**	**2.59**	**1**

Tj s = Stressed junction temperature in degree (Kelvin), K = C+273.16
Tj u =The use junction temperature in degree (Kelvin), K = C+273.16
k = Boltzmann's constant, 8.617164×10^{-5} eV / K