



**ALPHA & OMEGA**  
SEMICONDUCTOR

***AOS Semiconductor***  
***Product Reliability Report***

**AOZ8808DI-05, rev A**

**Plastic Encapsulated Device**

**ALPHA & OMEGA Semiconductor, Inc**

**[www.aosmd.com](http://www.aosmd.com)**

***This AOS product reliability report summarizes the qualification result for AOZ8808DI-05. Review of the electrical test results confirm that AOZ8808DI-05 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 Tests Result
- IV. Reliability Evaluation

### **I. Product Description:**

The AOZ8808DI-05 is a transient voltage suppressor array designed to protect high speed data lines such as HDMI, USB 3.0, MDDI, SATA, and Gigabit Ethernet from damaging ESD events.

- ROHS compliant
- Halogen free

Details please refer to the datasheet.

### **II. Package and Die Information:**

<b>Product ID</b>	AOZ8808DI-05
<b>Process</b>	HV047A1
<b>Package Type</b>	DFN2.5x1.0
<b>Lead Frame</b>	Cu, NiPbAu
<b>Die attach material</b>	8290
<b>Die bond wire</b>	Au, 1 mil
<b>MSL level</b>	Up to Level 1

### III. Qualification Tests Result

Test Item	Test Condition	Test Duration	Sample Size	Standard
Pre-Conditioning	168hrs @85 °C /85%RH+3 cyc reflow@260°C	-	3 lots (Sum of TC,PCT and HAST)	JESD22-A113
HTRB	Vdd= 80%Vbr max. Temp = 150°C	168hrs 500hrs	4 lots  77pcs /lot	JESD22-A108
Temperature Cycle	'-65 °C to +150 °C, air to air (2cyc/hr)	500cycles	3 lots  77pcs /lot	JESD22-A110
Pressure Pot	121°C, 29.7psi, RH= 100%	96hrs	3 lots  77pcs /lot	JESD22-A102
HAST	'130 +/- 2°C, 85%RH, 33.3 psi, at VCC min power dissipation.	100hrs	3 lot  55pcs /lot	JESD22-A104

### IV. Reliability Evaluation

**FIT rate (per billion): 23**

**MTTF = 4957 years**

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

$$\text{Failure Rate} = \text{Chi}^2 \times 10^9 / [2 (N) (H) (Af)] = 1.83 \times 10^9 / [2 \times 4 \times 77 \times 500 \times 258] = 23$$

$$\text{MTTF} = 10^9 / \text{FIT} = 4.34 \times 10^7 \text{hrs} = 4957 \text{ years}$$

**Chi<sup>2</sup>** = Chi Squared Distribution, determined by the number of failures and confidence interval

**N** = Total Number of units from HTRB tests

**H** = Duration of HTRB testing

**Af** = Acceleration Factor from Test to Use Conditions (Ea = 0.7eV and Tuse = 55°C)

$$\text{Acceleration Factor [Af]} = \text{Exp} [Ea / k (1/Tj u - 1/Tj s)]$$

**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
<b>Af</b>	<b>258</b>	<b>87</b>	<b>32</b>	<b>13</b>	<b>5.64</b>	<b>2.59</b>	<b>1</b>

**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 X 10<sup>-5</sup>eV / K