



ALPHA & OMEGA
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AOS Semiconductor Product Reliability Report

AOZ8802ADI, rev D

Plastic Encapsulated Device

ALPHA & OMEGA Semiconductor, Inc

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This AOS product reliability report summarizes the qualification result for AOZ8802ADI. Accelerated environmental tests are performed on a specific sample size, and then followed by electrical test at end point. Review of final electrical test result confirms that AOZ8802ADI passes AOS quality and reliability requirements. The released product will be categorized by the process family and be routine monitored for continuously improving the product quality.

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I. Product Description:

The AOZ8802A is a transient voltage suppressor array designed to protect high speed data lines such as HDMI, MDDI, USB, SATA, and Gigabit Ethernet from damaging ESD events. This device incorporates four surge rated, low capacitance steering diodes and a TVS in a single package. During transient conditions, the steering diodes direct the transient to either the positive side of the power supply line or to ground. The AOZ8802A comes in a RoHS compliant and Halogen Free 1.6mm x 1.0mm x 0.55mm DFN-6 package

Details refer to the datasheet.

II. Die / Package Information:

	AOZ8802ADI
Process	Standard sub-micron Ultra-Low Capacitance TVS Diode
Package Type	DFN1.6x1.0 6L
Lead Frame	Bare Cu
Die Attach	Ag Epoxy
Bonding	Au wire
Mold Material	Epoxy resin with silica filler
Moisture Level	Up to Level 1

III. Reliability Stress Test Summary and Results

Test Item	Test Condition	Time Point	Total Sample size	Number of Failures	Reference Standard
HTRB	Temp = 150°C , Vdd=80% of Vbrmax	168 / 500 / 1000 hours	924 pcs	0	JESD22-A108
MSL Precondition	168hr 85°C/85%RH + 3 cycle reflow @260°C (MSL 1)	-	2079 pcs	0	JESD22-A113
HAST	130°C , 85%RH, 33.3 psi, Vdd = 80% of Vbrmax	96 hours	693 pcs	0	JESD22-A110
Autoclave	121°C , 29.7psi, RH=100%	96 hours	693 pcs	0	JESD22-A102
Temperature Cycle	-65°C to 150°C , air to air,	250 / 500 cycles	693 pcs	0	JESD22-A104

Note: The reliability data presents total of available generic data up to the published date.

IV. Reliability Evaluation

FIT rate (per billion): 7.04

MTTF = 16216 years

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

$$\text{Failure Rate} = \text{Chi}^2 \times 10^9 / [2 (N) (H) (Af)] = 7.04$$

$$\text{MTTF} = 10^9 / \text{FIT} = 16216 \text{ years}$$

Chi² = Chi Squared Distribution, determined by the number of failures and confidence interval

N = Total Number of units from burn-in tests

H = Duration of burn-in 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
Af	259	87	32	13	5.64	2.59	1

k = Boltzmann's constant, 8.617164 X 10⁻⁵eV / K

Tj s = Stressed junction temperature in degree (Kelvin), $K = C+273.16$
Tj u =The use junction temperature in degree (Kelvin), $K = C+273.16$