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Alpha & Omega Semiconductor Product Reliability Report

AOZ8S305BLS-04, rev A

Plastic Encapsulated Device

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This AOS product reliability report summarizes the qualification result for AOZ8S305BLS-04. 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 AOZ8S305BLS-04 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.

I. 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=100% of VRWMmax	168 / 500 / 1000 hours	231 pcs	0	JESD22-A108
Precondition (Note A)	168hr 85°C / 85%RH + 3 cycle reflow@260°C	-	924 pcs	0	JESD22-A113
HAST	130°C , 85%RH, 33.3 psia, Vdd = 80% of VRWMmax	96 hours	231 pcs	0	JESD22-A110
Autoclave	121°C , 29.7psia, RH=100%	96 hours	231 pcs	0	JESD22-A102
Temperature Cycle	-65°C to 150°C , air to air	1000 cycles	231 pcs	0	JESD22-A104
HTSL	Temp = 150°C	1000 hours	231 pcs	0	JESD22-A103

Note: The reliability data presents total of available generic data up to the published date.
Note A: MSL (Moisture Sensitivity Level) 1 based on J-STD-020

II. Reliability Evaluation

FIT rate (per billion): 15.26
MTTF = 7480 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.

Failure Rate = Chi^2 x 10^9 **/ [**2 (N) (H) (Af)**] =** 15.26
MTTF = 10^9 / FIT = 7480 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)
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	259	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 X 10^{-5}eV / K