



AOS Semiconductor Product Reliability Report

AOD2922, rev A

Plastic Encapsulated Device

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www.aosmd.com

This AOS product reliability report summarizes the qualification result for AOD2922. 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 AOD2922 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.

Table of Contents:

- I. Product Description
- II. Package and Die information
- III. Reliability Stress Test Summary and Results
- IV. Reliability Evaluation

I. Product Description:

- Latest Trench Power AlphaMOS (α MOS MV) technology
- Very Low $R_{DS(ON)}$
- Low Gate Charge
- Optimized for fast-switching applications
- RoHS and Halogen-Free Compliant

Details refer to the datasheet.

II. Die / Package Information:

	AOD2922
Process	Standard sub-micron 100V N-Channel AlphaMOS
Package Type	TO252
Lead Frame	Bare Cu
Die Attach	Soft solder
Bond	Al & Cu 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
MSL Precondition	168hr 85°C / 85%RH + 3 cycle reflow @260°C (MSL 1)	-	3003pcs	0	JESD22-A113
HTGB	Temp = 150°C , Vgs=100% of Vgsmax	168 / 500 / 1000 hrs	539pcs	0	JESD22-A108
HTRB	Temp = 150°C , Vds=80% of Vdsmax	168 / 500 / 1000 hrs	539pcs	0	JESD22-A108
HAST	130°C , 85%RH, 33.3 psi, Vds = 80% of Vdsmax before arcing (typically ≤42V)	96 hrs	924 pcs	0	JESD22-A110
Pressure Pot	121°C , 29.7psi, RH=100%	96 hrs	924 pcs	0	JESD22-A102
Temperature Cycle	-65°C to 150°C , air to air,	250 / 500 cycles	1155 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): 4.90

MTTF = 23277 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.

$$\text{Failure Rate} = \text{Chi}^2 \times 10^9 / [2 (N) (H) (Af)] = 4.90$$

$$\text{MTTF} = 10^9 / \text{FIT} = 23277 \text{ years}$$

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

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 10⁻⁵eV / K