



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

**AO8803/L,** rev C

**Plastic Encapsulated Device**

**ALPHA & OMEGA Semiconductor, Inc**

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

This AOS product reliability report summarizes the qualification result for AO8803/L. 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 AO8803/L passes AOS quality and reliability requirements. The released product will be categorized by the process family and be monitored on a quarterly basis for continuously improving the product quality.

## Table of Contents:

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

## I. Product Description:

The AO8803/L uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications. It is ESD protected.

- RoHS Compliant
- AO8803L is Halogen Free

Detailed information refers to datasheet.

## II. Die / Package Information:

	<b>AO8803/L</b>
<b>Process</b>	Standard sub-micron
<b>Package Type</b>	Low voltage N+P channel, dual die
<b>Lead Frame</b>	TSSOP8
<b>Die Attach</b>	Copper
<b>Bonding Wire</b>	Silver epoxy
<b>Mold Material</b>	Au wire
<b>MSL (moisture sensitive level)</b>	Epoxy resin with silica filler
	Level 1 based on J-STD-020

**Note** \* based on information provided by assembler and mold compound supplier

### III. Result of Reliability Stress for AO8803/L

Test Item	Test Condition	Time Point	Lot Attribution	Total Sample size	Number of Failures	Standard
MSL Precondition	168hr 85°C /85%RH +3 cycle reflow@260°C	-	4 lots	550pcs	0	JESD22-A113
HTGB	Temp = 150 °c, Vgs=100% of Vgsmax	168hrs 500 hrs 1000 hrs	3 lots	231pcs  77pcs / lot	0	JESD22-A108
HTRB	Temp = 150 °c, Vds=80% of Vdsmax	168hrs 500 hrs 1000 hrs	3 lots	231pcs  77pcs / lot	0	JESD22-A108
HAST	130 +/- 2°C, 85%RH, 33.3 psi, Vgs = 80% of Vgs max	100 hrs	3 lots	165pcs  55pcs / lot	0	JESD22-A110
Pressure Pot	121°C, 29.7psi, RH=100%	96 hrs	4 lots	220pcs  55pcs / lot	0	JESD22-A102
Temperature Cycle	-65°C to 150°C, air to air	250 / 500 cycles	3 lots	165pcs  55pcs / lot	0	JESD22-A104

### IV. Reliability Evaluation

**FIT rate (per billion): 15**

**MTTF = 7435 years**

The presentation of FIT rate for the individual product reliability is restricted by the actual burn-in sample size of the selected product (AO8803/L). Failure Rate Determination is based on JEDEC Standard JESD 85. FIT means one failure per billion hours.

$$\text{Failure Rate} = \text{Chi}^2 \times 10^9 / [2 (N) (H) (Af)] = 1.83 \times 10^9 / [2 \times (3 \times 2 \times 77) \times (500) \times 258] = 15$$

$$\text{MTTF} = 10^9 / \text{FIT} = 6.51 \times 10^7 \text{ hrs} = 7435 \text{ years}$$

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

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

**H** = Duration of HTRB/HTGB testing

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

Acceleration Factor [Af] = **Exp**<sup>[Ea / k (1/Tj u - 1/Tj s)]</sup>

**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	<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