AOS Semiconductor
Product Reliability Report

AOV20S60, rev A

Plastic Encapsulated Device

ALPHA & OMEGA Semiconductor, Inc

www.aosmd.com

This AOS product reliability report summarizes the qualification result for AOV20S60. 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 AOV20S60 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:

The AOV20S60 has been fabricated using the advanced αMOS^{TM} high voltage process that is designed to deliver high levels of performance and robustness in switching applications.
By providing low $R_{DS(on)}$, Qg and E_{OSS} along with guaranteed avalanche capability this part can be adopted quickly into new and existing offline power supply designs.

Details refer to the datasheet.

II. Die / Package Information:

	AOV20S60
Process	Standard sub-micron 600V αMOS^{TM} Power Transistor
Package Type	DFN8x8
Lead Frame	Bare Cu
Die Attach	Solder Paste
Bond	Au wire
Mold Material	Epoxy resin with silica filler
Moisture Level	Level 3

III. Reliability Stress Test Summary and Results

Test Item	Test Condition	Time Point	Total Sample Size	Number of Failures	Reference Standard
HTGB	Temp = 150°C , Vgs=100% of Vgsmax	168 / 500 / 1000 hours	539 pcs	0	JESD22-A108
HTRB	Temp = 150°C , Vds=80% of Vdsmax	168 / 500 / 1000 hours	539 pcs	0	JESD22-A108
MSL Precondition	192hr 30°C / 60%RH + 3 cycle reflow@260°C (MSL 3)	-	2541 pcs	0	JESD22-A113
HAST	130°C , 85%RH, 33.3 psi, Vds = 80% of Vdsmax	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
HTSL	Temp = 150°C	1000 hrs	462 pcs	0	JESD22-A103

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

IV. Reliability Evaluation

FIT rate (per billion): 3.82
MTTF = 29919 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 = $Chi^2 \times 10^9$ **/ [**2 (N) (H) (Af)**] =** 3.82
MTTF = 10^9 / FIT = 29919 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