AOS Semiconductor
Product Reliability Report

AOW20C60, rev A

Plastic Encapsulated Device

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This AOS product reliability report summarizes the qualification result for AOW20C60. 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 AOW20C60 passes AOS quality and reliability requirements.

Table of Contents:

I. Product Description:

The AOW20C60 is fabricated using an advanced high voltage MOSFET process that is designed to deliver high levels of performance and robustness in popular AC-DC applications. By providing low $R_{DS(on)}$, Ciss and Crss along with guaranteed avalanche capability this parts can be adopted quickly into new and existing offline power supply designs.

Details refer to the datasheet.

II. Die / Package Information:

	AOW20C60
Process	Standard sub-micron 600V N-Channel MOSFET
Package Type	TO262
Lead Frame	Bare Cu
Die Attach	Soft solder
Bonding	Al wire
Mold Material	Epoxy resin with silica filler
Moisture Level	Up to Level 1

III. Result of Reliability Stress for AOW20C60

Test Item	Test Condition	Time Point	Lot Attribution	Total Sample size	Number of Failures	Reference Standard
MSL Precondition	168hr 85°c /85%RH +3 cycle reflow@260°c	-	12 lots	2541pcs	0	JESD22-A113
HTGB	Temp = 150°c , Vgs=100% of Vgsmax	168hrs 500 hrs 1000 hrs	2 lots 3 lots 6 lots	847pcs 77 pcs / lot	0	JESD22-A108
HTRB	Temp = 150°c , Vds=80% of Vdsmax	168hrs 500 hrs 1000 hrs	2 lots 3 lots 6 lots	847pcs 77 pcs / lot	0	JESD22-A108
HAST	130°c , 85%RH, 33.3 psi, Vgs = 100% of Vgs max	96 hrs	9 lots (Note A*)	693pcs 77 pcs / lot	0	JESD22-A110
Pressure Pot	121°c , 29.7psi, RH=100%	96 hrs	12 lots (Note A*)	924pcs 77 pcs / lot	0	JESD22-A102
Temperature Cycle	-65°c to 150°c , air to air,	250 / 500 cycles	12 lots (Note A*)	924pcs 77 pcs / lot	0	JESD22-A104

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

IV. Reliability Evaluation

FIT rate (per billion): 2.92
MTTF = 39075 years

The presentation of FIT rate for the individual product reliability is restricted by the actual burn-in sample size of the selected product (AOW20C60). Failure Rate Determination is based on JEDEC Standard JESD 85. FIT means one failure per billion hours.

Failure Rate (FIT) = Chi^2 x 10^9 **/ [**2 (N) (H) (Af)**]**
= 1.83 x 10^9 **/ [**2x (4x77x168 +6x77x500 +12x77x1000) x259**]** = 2.92
MTTF = 10^9 / FIT = 3.42 x 10^{8}hrs = 39075 years

Chi² = 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** [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