ALPHA & OMEGA SEMICONDUCTOR

AOS Semiconductor
Product AEC Qualification Report

AOMU66414Q, rev A

Plastic Encapsulated Device

ALPHA & OMEGA Semiconductor, Inc

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Mar, 2018

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This AOS product report summarizes the AEC qualification result for AOMU66414Q. 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 AOMU66414Q passes AOS quality and AEC qualification 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 Failure	Reference Standard
HTGB	Temp = 175℃ , Vgs=100% of Vgsmax	168 / 500 / 1000 hrs	231pcs	0	AEC-Q101
HTRB	Temp = 175℃ , Vds=100% of Vdsmax	168 / 500 / 1000 hrs	231pcs	0	AEC-Q101
MSL Precondition	168hr 85℃ / 85%RH + 3 cycle reflow@260℃ (MSL 1)	-	924 pcs	0	AEC-Q101
HAST	130℃ , 85%RH, 33.3 psi, Vds = 80% of Vdsmax	96 hrs	231 pcs	0	AEC-Q101
Pressure Pot	121℃ , 29.7psi, RH=100%	96 hrs	231 pcs	0	AEC-Q101
Temperature Cycle	-65℃ to 150℃ , air to air,	250 / 500 / 1000 cycles	231 pcs	0	AEC-Q101
Intermittent Operational Life (IOL)	∆ Tj = 100℃	15000 cycles	231 pcs	0	AEC Q101
Parametic Verification (PV)	Datasheet	-	75 pcs	0	AEC Q101
ESD Characterization (ESD)	Follow AEC Q101	-	90 pcs	0	AEC Q101
D.P.A (DPA)	Follow AEC Q101	-	12 pcs	0	AEC Q101
Physical Dimension (PD)	Follow AEC Q101	-	30 pcs	0	AEC Q101
Solderability (SD)	Follow AEC Q101	-	10 pcs	0	AEC Q101
Wire Bond Strength (WBS)	Follow AEC Q101	-	22pcs	0	AEC Q101
Bond Shear (BS)	Follow AEC Q101	-	22 pcs	0	AEC Q101

Die Shear (DS)	Follow AEC Q101	-	22 pcs	0	AEC Q101
UIS	Follow AEC Q101	-	15 pcs	0	AEC Q101
Dielectric Integrity (DI)	Follow AEC Q101	-	15 pcs	0	AEC Q101

*** Note:** The reliability test items meet the requirements of AEC-Q101
****Note:** The reliability data presents total of available generic data up to the published date.

II. Reliability Evaluation

FIT rate (per billion): 2.61
MTTF = 43670 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)**] =** 2.61
MTTF = 10^9 / FIT =43670 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	125 deg C	150 deg C	175 deg C
Af	**758**	**256**	**95**	**38**	**9.74**	**2.91**	**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