Reliability Report

1179-00

AS12XX

Product Family

(AS1257, AS1228, AS1260, AS1230)

March 02, 2011

Akros Silicon

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INTRODUCTION

AS11XX product family is fabricated at Telefunken, Germany with Pb-free package assembly at SPEL, India. This report will provide the Reliability and MSL (level 1) qualification results.

PROCEDURE

The following environmental reliability stress tests have been performed

a) External visual examination @ 40X
b) Temperature cycle (-40°C to +60°C, 5 cycles)
c) Stabilization bake (125°C, 24 hours)
d) C-Mode Scanning Acoustic Microscopy (CSAM)
e) Moisture soak (85 °C / 85 % RH, 168 hours)
f) Solder reflow (260°C, 3 cycles)
g) C-Mode Scanning Acoustic Microscopy (CSAM)
h) Electrical Test
i) Unbiased HAST (130°C; 85% RH, 96 hours, 168-hrs.)
j) Temperature Cycling (-65°C to 150°C, 500 cycles)
k) High Temperature Storage (150°C, 1000 hours)
l) C-Mode Scanning Acoustic Microscopy (CSAM)
m) Electrical Test

Conclusion

The AS1135 product successfully passed all Quality and Reliability Standards requirements with MSL-1 package rating.

Manufacturing information

Description/Function	Highly integrated CMOS solution for Power over Ethernet (PoE)
Process	0.8µ CMOS
Fabrication	Telefunken, Germany
Assembly	SPEL, India
Test	SPEL, India

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Package information

Package Type	20 Lead QFN (5x5 mm, 0.65mm pitch)
Lead Frame	Copper – C196
Lead Finish	100% Matte Tin
Die Attach	Silver Epoxy - CRM1066C
Bond Wire	1.0 mil Gold (Au)
Mold Material	EME G770HC
Mark	Laser Mark
Moisture Sensitivity Level (MSL)	Level 1
Theta JA	31°C/W

Die Information

Die Material	Si
Passivation	Polyimide
Interconnect	AlSiCu
Isolation Dielectric	BPSG

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Die Reliability Test Results

Stress Test	Reference Standard	Stress Condition & Duration	Elect.Test Quantity	Elect.Test Result
Operating Life Test	JESD22-A108	125°C, 168 Hrs, 48V, 5.5V	77	Pass
		125°C, 500 Hrs, 48V, 5.5V	77	Pass
		125°C, 1000 Hrs, 48V, 5.5V	77	Pass
High Temp Storage	JESD22-A103	150°C, 1000 Hrs	75	Pass
ESD (HBM)	JESD22-A114	±2500V	3	Pass
ESD (CDM)	JESD22-C101C	±500V	3	Pass
Latch-Up	JESD 78A	±100mA	6	Pass

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Package Reliability Test Results

Stress Test	Reference Standard	Stress Condition & Duration	Elect.Test Quantity	Elect.Test Result
Preconditioning	JESD22-A113F LEVEL 1	External Visual - 40X Temperature Cycle -40°C to +60°C, 5 Cycles Bake 125°C, 24 Hrs Moisture soak 85°C/85% RH, 168 Hrs IR reflow 260°C, 3 Cycles.	152	Pass
Un-Bias HAST	JESD22-A118	130°C; 85% RH, 96 Hrs, 168 Hrs	77	Pass
Temperature Cycle	JESD22-A104D	-65°C to 150°C, 500 cycles	75	Pass
High Temp Storage	JESD22-A103C	150°C, 1000 Hrs	75	Pass

FIT Evaluation

Activation Energy (*Ea*)	0.5eV
Operating/Stress ambient temp. (*Ta/Ts*)	55°C / 100°C
Acceleration Factor (*AF)*	118
Device Hours	166,666,666 Dev. hrs
FIT Rate	6

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