



AS14XX

Reliability Report

1169-00

AS14XX

(AS1424, AS1434, AS1444, AS1454)

October 8, 2010

Akros Silicon

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INTRODUCTION

AS14xx product family is fabricated at Telefunken, Germany and Global Foundries, Singapore 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)
- j) Temperature Cycling (-65°C to 150°C, 500 cycles)
- k) High Temperature Storage (150°C, 1000 hours)
- l) Biased HAST (110°C; 85% RH, 164 hours)
- m) C-Mode Scanning Acoustic Microscopy (CSAM)
- n) Electrical Test

Conclusion

The AS14xx products successfully passed all Quality and Reliability Standards requirements with MSL-1 package rating.

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Manufacturing information

Description/Function	Digital Power PoD PD Controller
Process	0.13 μ , 0.18 μ & 0.8 μ CMOS
Fabrication	Telefunken, Germany
	Global Foundries, Singapore
Assembly	SPEL, India
Test	SPEL, India

Package information

Package Type	64 Lead QFN (9x9 mm, 0.4mm pitch)
Lead Frame	Copper – C194
Lead Finish	100% Tin
Die Attach	Conductive Epoxy - CRM 1076
Bond Wire	1.2 mil Gold (Au)
Mold Material	Sumitomo G770 Series
Mark	Laser Mark
Moisture Sensitivity Level (MSL)	Level 1
Theta JA	23°C/W

Die Information

Die material	Si
Passivation	Silicon Nitride (Si ₃ N ₄)
Interconnect	Al
Isolation Dielectric	Silicon Dioxide (SiO ₂)

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	25	Pass
ESD (HBM)	JESD22-A114	±2000V	3	Pass
ESD (CDM)	JESD22-C101C	±500V	3	Pass
Latch-Up	JESD 78A	85°C, ±200mA	6	Pass

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	95	Pass
		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.		
Un-Biased HAST	JESD22-A118	130°C; 85% RH, 96 Hrs	25	Pass
Temperature Cycle	JESD22-A104D	-65°C to 150°C, 500 cycles	25	Pass
High Temp Storage	JESD22-A103C	150°C, 1000 Hrs	25	Pass
Biased HAST	JESD22 A110; MSL-1	110°C; 85% RH, 164 Hrs	45	Pass

FIT Evaluation

Activation Energy (E_a)	0.8eV
Operating/Stress ambient temp. (T_a/T_s)	50°C / 125°C
Acceleration Factor (AF)	221
Device Hours	188000 Dev. hrs
FIT Rate	22