



AS16XX


**Reliability Report
(1149-00)**

**AS16XX
Product Family
(AS1602)**

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INTRODUCTION

AS16xx product family is fabricated at 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) Biased HAST (130°C; 85% RH, 3.6V, 96 hours, 168-hrs.)
- k) Temperature Cycling (-65°C to 150°C, 500 cycles)
- l) High Temperature Storage (150°C, 1000 hours)
- m) C-Mode Scanning Acoustic Microscopy (CSAM)
- n) Electrical Test

Conclusion

The AS16xx products successfully passed all Quality and Reliability Standards requirements with MSL-1 package rating.

Manufacturing information

| | |
|-----------------------------|--|
| Description/Function | Highly integrated CMOS solution for Common Mode (CM) noise suppression & Transient voltage protection in Ethernet applications |
| Process | 0.18μ CMOS |
| Fabrication | Global Foundries, Singapore |
| Assembly | SPEL, India |
| Test | SPEL, India |

Package information

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|---|--------------------------|
| Package Type | 16 Lead QSOP (150 mil) |
| Lead Frame | Copper – C195 |
| Lead Finish | 100% Matte Tin |
| Die Attach | Silver Epoxy - CRM1076NS |
| Bond Wire | 0.9 mil Gold |
| Mold Material | EME G600 |
| Mark | Laser Mark |
| Moisture Sensitivity Level (MSL) | Level 1 |
| Theta JA | 35C/W |

Die Information

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|-----------------------------|--|
| Die Material | Si |
| Passivation | Si ₃ N ₄ (Silicon Nitride) |
| Interconnect | Al |
| Isolation Dielectric | FETOS |
| | |

Die Reliability Test Results

| Stress Test | Reference Standard | Stress Condition & Duration | Elect. Test Quantity | Elect. Test Result |
|---------------------|--------------------|-----------------------------|----------------------|--------------------|
| Operating Life Test | JESD22-A108 | 125°C, 500 Hrs, 3.6V | 79 | Pass |
| | | 125°C, 1000 Hrs, 3.6V | 79 | Pass |
| High Temp Storage | JESD22-A103 | 150°C: 168, 500 & 1000 Hrs | 77 | Pass |
| ESD (HBM) | JESD22-A114 | ±8000V | 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 | 167 | 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, 168 Hrs | 45 | Pass |
| Temp Cycle | JESD22-A104D | -65°C to 150°C, 500 cycles | 77 | Pass |
| High Temp Storage | JESD22-A103C | 150°C: 168, 500 & 1000 Hrs | 77 | Pass |
| Biased HAST | JESD22 A110; MSL-1 | 130°C; 85% RH, 96 Hrs, 168 Hrs. 3.6V | 45 | Pass |

FIT Evaluation

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| Activation Energy (E_a) | 0.5eV |
| Operating/Stress ambient temp. (T_a/T_s) | 55°C / 125°C |
| Acceleration Factor (AF) | 78 |
| Device Hours | 237000 |
| FIT Rate | 43 |