



# **GS1578A/GS9078A**

## **Reliability Qualification Report**

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## Revision History

| Version | ECR    | Date      | Modifications / Changes                                      |
|---------|--------|-----------|--|
| 3       | 157021 | Sept 2011 | Added Crolles as a qualified fab. Corrected typo in table 1. |
| 2       | 154579 | July 2010 | Revised package qualification data                           |
| 1       | 148171 | Oct 2007  | Data added   |
| 0       | -      | June 2005 | Initial release  |

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# 1 Device Specifics

## 1.1 Manufacturing Summary

Table 1.: Manufacturing Summary

|                               |  |
|-------------------------------|--|
| <b>Genum Device Codes</b>     | GS1578A<br>GS9078A   |
| <b>Silicon Fab Technology</b> | STMicroelectronics 0.35 $\mu$ m SiGe BiCMOS6G (Phoenix, Crolles) |
| <b>Package Assembly</b>       | Unisem   |
| <b>Package Type</b>           | 16 QFN, 4x4 mm, 0.65 mm pitch                                    |

## 1.2 Product Information

The GS1578A and GS9078A devices are Genum designed products manufactured using ST Microelectronics BiCMOS6G process and packaged at Unisem in 4x4 mm 16 QFN lead free packages.

## 1.3 Process Qualification

The ST Microelectronics BiCMOS6G silicon technology qualification reports are stored in GenDoc IDs #30346 and 31816. The Unisem "Pb-free Green" package qualification report is stored in Gendoc #35573.

## 1.4 Product Qualification Approach

The GS1578A and GS9078A products use the same die as the GS1528A. The GS1528A uses an SOIC package. The operating die temperature for the GS1578A and GS9078A is lower than the GS1528A due to the superior thermal performance of the QFN package. Therefore HTOL qualification is bridged to the GS1528A.

Package qualification is bridged to the GS2975A which uses a die from the same fab process as the GS1578A/GS9078A in a larger 9x9 mm 64 QFN package. The larger package for the GS2975A allows bridging to the smaller package used with the GS1578A/GS9078A.

The STMicroelectronics Crolles fab was qualified for the GS1578A and GS9078A in 2011. The product reliability qualification report is available in Gendoc ID #57207.

## 2 Reliability Qualification Stresses

### 2.1 Environmental Tests

Table 2.: Environmental Tests

| Stress                          | Conditions  | Duration    | Qualification Vehicle | Sample Size | Failures |
|---------------------------------|---|-------------|-----------------------|-------------|----------|
| High Temperature Operating Life | JESD22-A108<br>$T_j \geq 125^\circ\text{C}$ , $V_{cc} \geq V_{ccmax}$ | 1000 hours  | GS1528A               | 70          | 0        |
| Temperature Cycling             | JESD22-A104<br>MSL Preconditioning,<br>-55°C to +125°C (Condition B)  | 1000 cycles | GS2975A               | 25          | 0        |
| Temperature and Humidity Bias   | JESD22-A101<br>MSL Preconditioning,<br>85°C/85% RH                    | 1000 hours  | GS2975A               | 25          | 0        |
| High Temperature Storage        | JESD22-A103<br>150 °C   | 1000 hours  | GS2975A               | 25          | 0        |
| Pressure Cook Test              | JESD22-A102<br>MSL Preconditioning,<br>121°C, 100% RH, 29.7 Psi       | 96 hours    | GS2975A               | 25          | 0        |
| Moisture Sensitivity Level      | J-STD-020<br>MSL3, Tmax=260°C   |             | GS2975A               | 75          | 0        |

## 2.2 Electrostatic Discharge and Latch Up Tests

**Table 3.:** Electrostatic Discharge and Latch Up Tests

| Stress                   | Conditions   | Qualification Vehicle | Stress Level | Sample Size | Failures |
|--------------------------|--|-----------------------|--------------|-------------|----------|
| Human Body Model ESD     | JEDEC22-A114   | GS1528A               | 4 kV         | 3           | 0        |
| Machine Model ESD        | JESD22-A115  | GS1528A               | 100 V        | 3           | 0        |
| Charged Device Model ESD | JESD22-C101  | GS1528A               | 500 V        | 3           | 0        |
|                          | JESD78   | GS1528A               | 70°C         | 3           | 0        |
| Latch Up                 | V <sub>cc</sub> =5.25 V; +/- 200 mA<br>Level II, Class A |                       |              |             |          |

### 3 Conclusion

Reliability qualification of the GS1578A and GS9078A is complete. The products are considered fit for sale and customer use.

## DOCUMENT IDENTIFICATION

### RELIABILITY REPORT

The product is in production. Gennum reserves the right to make changes to the product at any time without notice to improve reliability, function or design, in order to provide the best product possible.

## CAUTION

ELECTROSTATIC SENSITIVE DEVICES  
DO NOT OPEN PACKAGES OR HANDLE EXCEPT  
AT A STATIC-FREE WORKSTATION



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