



SEMTECH

GENNUM PRODUCTS

GS2989/GS2988

Reliability Qualification Report

Revision History

Version	ECR	Date	Modifications / Changes
3	ECO-010597	Dec 2012	Updated Report Format
2	155549	Dec 2010	Added THB qualification data
1	153114	Nov 2009	Completion of reliability qualification
0	152835	Oct 2009	New document

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1 Device Specifics

1.1 Manufacturing Summary

Table 1.: Manufacturing Summary

Gennum Device Codes	GS2989/GS2988
Silicon Fab Technology	Jazz Semiconductor 0.18 μm , SiGe120 SBC18HA
Package Assembly	Unisem
Package Type	16 QFN, 4x4 mm, 0.65 mm pitch

1.2 Product Information

The GS2989 is a high-speed BiCMOS integrated circuit designed to drive one to four 75 Ω coaxial cables. The GS2988 is a high-speed BiCMOS integrated circuit designed to drive one to two 75 Ω coaxial cables. The GS2989 and GS2988 may drive data rates up to 2.97Gb/s and provides two selectable slew rates in order to achieve compliance to SMPTE 424M, SMPTE 292M and SMPTE 259M.

The GS2989 and GS2988 can be powered from either a 3.3V or a 2.5V supply. The GS2989 and GS2988 are Pb-free, and the encapsulation compound does not contain halogenated flame retardant. This component and all homogeneous subcomponents are RoHS compliant.

The devices shall be fully functional and shall meet all operational specifications over the ambient temperature range -40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$.

1.3 Process Qualification

The die is manufactured by Jazz using the SiGe120 SBC18HX process. The Jazz process qualification report has been accepted and is stored in GenDoc ID#34874. The product is packaged at Unisem in a 16 pin QFN package. The Unisem package process qualification report is stored in GenDoc ID#49722.

1.4 Product Qualification Approach

The GS2989 and GS2988 contain the same die, the GS2988 product has a reduced feature set relative to the GS2989. Qualification results obtained with the GS2989 are representative of the GS2988 reliability.

The GS2984 contains a die from the same fab process in the same QFN package as the GS2989 and GS2988, a number of package stresses have been bridged to the GS2984 qualification. Biased temperature and humidity were bridged to the GS2985 which uses a die from the same fab process as the GS2988/GS2989 in a larger 9x9 mm 64 QFN package.

The die in the GS2988 package is shifted from the centre of the die paddle; temperature cycling was performed on the GS2988 to confirm the reliability of the shifted die configuration.

Details of the tests performed and bridged qualification tests are presented on the next page.

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 $T_j \geq 125^\circ\text{C}$, $V_{cc} \geq V_{ccmax}$	1000 hours	GS2989	77	0
Temperature Cycling	JESD22-A104	1000 cycles	GS2984	80	0
	MSL Preconditioning, -55°C to +125°C (Condition B)		GS2988	25	0
Temperature and Humidity Biased	JESD22-A101 MSL Preconditioning, 85°C/85% RH	1000 hours	GS2985	25	0
Temperature and Humidity Unbiased	JESD22-A101 MSL Preconditioning, 85°C/85% RH	1000 hours	GS2984	25	0
High Temperature Storage	JESD22-A103 150 °C	1000 hours	GS2984	80	0
Moisture Sensitivity Level	J-STD-020 MSL3, Tmax=260°C		GS2984	105	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	GS2989	2.5 kV	3	0
Machine Model ESD	JESD22-A115	GS2989	200 V	3	0
Charged Device Model ESD	JESD22-C101	GS2989	1.5 kV	3	0
	JESD78	GS2989	25°C	6	0
Latch Up	V _{cc} =3.5 V, 5.25 V; +/- 100 mA		85°C	6	0
	Level II, Class A				

3 Conclusion

Reliability qualification of the GS2989 and GS2988 are complete. The products are considered fit for sale and customer use.