



# **SEMTECH**

GENNUM PRODUCTS

**GS12070**

**Reliability Qualification Report**

# Revision History

Version	ECO	Date	Modifications / Changes
0	ECO-034060	Nov 2016	New document

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# 1 Device Specifics

## 1.1 Manufacturing Summary

Table 1. Manufacturing Summary

<b>Semtech Device Codes</b>	GS12070
<b>Silicon Fab Technology</b>	Global Foundries 40nm LP CMOS
<b>Assembly House</b>	AMKOR
<b>Package Type</b>	196 BGA, 12mm x12 mm, 0.8 mm pitch

## 1.2 Product Information

The GS12070 is highly configurable UHD-SDI Gearbox which performs multiplexing and de-multiplexing necessary to facilitate conversions between SMPTE ST 425-3 and/or ST 425-5 (multi-link 3G-SDI) Interface and SMPTE ST 2081-1 (6G UHD-SDI) and/or ST 2082-1 (12G UHD-SDI) Interfaces. The Gearbox also supports conversion between 4 x HD-SDI and 6Gb/s SDI..

The GS12070 is Pb-free, and the encapsulation compound does not contain halogenated flame retardant. This component and all homogeneous subcomponents are RoHS compliant.

## 1.3 Process Qualification

The GS12070 is manufactured in Global Foundries 40nm LP CMOS process. The Global Foundries qualification report is accepted and is on file.

## 1.4 Product Qualification Approach

Due to its new architecture design and packaging it is recommended the execution of the Life Tests. ESD and LU, as well as full package qualification.

For life testing, a proxy qualification vehicle was chosen to execute the stress. The differences between the proxy qualification vehicle and the GS12070 have been reviewed. All HTOL results will be bridged to this proxy qualification vehicle, as results from this stress are considered representative and equivalent to GS12070.

Detailed descriptions of the qualification can be found in the table below.

## 2 Reliability Qualification Stresses

### 2.1 Environmental Tests

**Table 2.** Environmental Tests

Stress	Conditions	Duration	Qualification Vehicle	Sample Size	Result
High Temperature Operating Life	JESD22-A108 $T_j \geq 125^\circ\text{C}$ , $V_{cc} = 1.4 \times V_{dd}$	1000 hours	GS12070 Proxy Qual Vehicle	1344 (>3 lots)	Pass 1000hrs
Temperature Cycling	JESD22-A104 MSL Preconditioning, -55°C to +125°C (Condition B)	700 cycles	GS12070	25 each from 3 lots	Pass 700cyc
Temperature Humidity Bias (THB)	JESD22-A110 MSL Preconditioning, 85°C, 85% R.H., $V_{ccmax}$	1000 hours	GS12070	25 each from 3 lots	Pass 1000hrs
High Temperature Storage	JESD22-A103 150 °C	1000 hours	GS12070	25 each from 3 lots	Pass 1000hrs
Unbiased Highly Accelerated Stress Test (U-HAST)	JESD22-A110 MSL Preconditioning, 110°C, 85% R.H	264 hours	GS12070	25 each from 3 lots	Pass 264hrs
Moisture Sensitivity Level	J-STD-020 MSL3, $T_{max}=260^\circ\text{C}$ Preconditioning	MSL3 w/ CSAM	GS12070	32pcs + 225 Precon	Pass MSL3

## 2.2 Electrostatic Discharge and Latch Up Tests

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

Stress	Conditions	Qualification Vehicle	Stress Level	Sample Size	Result
Human Body Model ESD	JESD22-A114	GS12070	500V, 1000V	3	Pass 1KV
Charged Device Model ESD	JESD22-C101	GS12070	250V, 500V	3	Pass 250V
Latch Up	JESD78	GS12070	25°C	3	Pass
	V <sub>cc</sub> =1.5Vmax; +/- 100 mA Level II, Class A		85°C	3	Pass



### **3 Conclusion**

The GS12070 product has passed reliability testing and considered suitable for production.