GH3011 Reliability Report

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Revision History

Version	Date	Description
1.0	2019-08-07	Initial release.

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1 Overview

GH3011 is a heart rate sensor. This report aims to provide a detailed description of the methods used to verify that the product under test meets Goodix stringent quality and reliability requirements. Each test is described and the results are presented. The evaluations done for this qualification are included in the following sections.

2 Reliability Test Items and Results

2.1 Electrostatic Discharge: Human Body Model (HBM)

Table 2-1 Human Body Model Test Requirements

Reference Standard	ESDA/JEDEC JS-001-2017
Test Parameter	I-V Curve / Function Test
Model	Human Body Model
Test Conditions	RP=1.5 kΩ,C=100 pF
Sample Size	3 ea. per mode
Criteria	Pass / Fail = 0 / 1

Table 2-2 Test Results

HBM Sensitivity	Class	All Pin Combination
+/-2000 V	2	Power to Power (+/-) IO to Power (+/-) IO to IO (+/-)

2.2 Electrostatic Discharge: Charged Device Model (CDM)

Table 2-3 Charged Device Model Test Requirements

Reference Standard	ESDA/JEDEC JS-002-2014
Test Parameter	I-V Curve / Function Test
Model	Charged Device Model
Test Conditions	RP=0 Ω,C=0 pF
Sample Size	3 ea. per mode
Criteria	Pass / Fail = 0 / 1

Table 2-4 Test Results

CDM Sensitivity	Class	Pin Combination
+/-1000 V	C3	All pin (+/-) to common ground

2.3 Latch Up (LU)

Table 2-5 Latch Up Test Requirements

Reference Standard	JESD-78D
Test Parameter	I-V Curve / Function Test
Model	Current / Voltage Trigger
Test Conditions	+/-200 mA Trigger / Over Voltage
Sample Size	3 ea. per mode
Criteria	Pass / Fail = 0 / 1

Table 2-6 Test Results

Test Result	**Class**
I Trigger	I
Over Voltage Test	

2.4 High Temperature Operating Life Test (HTOL)

Table 2-7 High Temperature Operating Life Test Requirements

Reference Standard	JESD22-A108D
Test Parameter	Function Test
Model	Arrhenius model for temperature acceleration factor and voltage $$\mathrm{AF} = \exp[\beta * (V_{stress} - V_{op})] * \exp\left[\frac{Ea}{K}\left(\frac{1}{T_{op}} - \frac{1}{T_{stress}}\right)\right]$$
Test Conditions	125 °C, 1000 hrs., VCCmax
Sample Size	77
Criteria	Pass / Fail = 0 / 1

Table 2-8 Test Results

Time Point	168 hrs.	500 hrs.	1000 hrs.
Result	PASS	PASS	PASS

2.5 Pre-Conditioning (Pre-Con)

Table 2-9 Pre-Conditioning Test Requirements

Reference Standard	JESD22-A113F
Test Parameter	Function Test / Appearance Inspection
Model	None
Test Conditions	3x reflow, 30°C/60% RH, 192 hrs.
Sample Size	154
Criteria	Pass / Fail = 0 / 1

Table 2-10 Test Results

Time Point	Pre-Con Over
Result	PASS

2.6 Temperature Cycling Test (TCT)

Table 2-11 Temperature Cycling Test Requirements

Reference Standard	JESD22-A104E
Test Parameter	Function Test / Appearance Inspection
Model	None
Test Conditions	-40 °C to 85 °C, 500 cycles
Sample Size	77
Criteria	Pass / Fail=0 / 1

Table 2-12 Test Results

Time Point	200 cycles	500 cycles
Result	PASS	PASS

2.7 Unbiased Highly Accelerated Temperature and Humidity Stress Test (UHAST)

Table 2-13 Unbiased Highly Accelerated Temperature and Humidity Stress Test Requirements

Reference Standard	JESD22-A110D
Test Parameter	Function Test / Appearance Inspection
Model	None
Test Conditions	130 °C, 85% RH, 96 hrs.
Sample Size	77
Criteria	Pass / Fail=0 / 1

Table 2-14 Test Results

Time Point	96 hrs.
Result	PASS

2.8 High Temperature Storage Test (HTST)

Table 2-15 High Temperature Storage Test Requirements

Reference Standard	JESD22-A103C
Test Parameter	Function Test
Model	None
Test Conditions	125 °C, 500 hrs.
Sample Size	77
Criteria	Pass / Fail=0 / 1

Table 2-16 Test Results

Time Point	200hrs.	500hrs.
Result	PASS	PASS