



## **GR5525 Reliability Report**

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## Preface

### Purpose

This document introduces GR5525 family reliability qualification results, to help users know this product's reliability performance.

### Audience

This document is intended for:

- GR5525 user
- GR5525 hardware developer

### Release Notes

This document is the initial release of *GR5525 Reliability Report*, corresponding to GR5525 System-on-Chip (SoC) series.

### Revision History

Version	Date	Description
1.0	2023-10-09	Initial release

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## 1 Introduction

The Goodix GR5525 family is a single-mode, low-power Bluetooth 5.3 System-on-Chip (SoC). 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 Test requirements

<b>Reference Standard</b>	ESDA/JEDEC JS-001
<b>Test Parameter</b>	I-V curve/Function test
<b>Model</b>	Human body model
<b>Test Conditions</b>	RP = 1.5 k $\Omega$ , C = 100 pF Power to power (+/-) IO to power (+/-) IO to IO (+/-)
<b>Sample Size</b>	3 units per mode
<b>Accept Criteria</b>	0 fail

Table 2-2 Test results

Test Point	Result
$\pm 2000$ V/Class 2	PASS

### 2.2 Electrostatic Discharge: Charged Device Model (CDM)

Table 2-3 Test requirements

<b>Reference Standard</b>	ESDA/JEDEC JS-002
<b>Test Parameter</b>	I-V curve/Function test
<b>Model</b>	Charged device model
<b>Test Conditions</b>	RP = 0 $\Omega$ , C = 0 pF All pins (+/-) to common ground
<b>Sample Size</b>	3 units per mode
<b>Accept Criteria</b>	0 fail

Table 2-4 Test results

Test Point	Result
$\pm 500$ V/Class C2a	PASS

### 2.3 Latch Up (LU)

Table 2-5 Test requirements

Reference Standard	JESD-78
Test Parameter	I-V curve/Function test
Model	Current/Voltage trigger
Test Conditions	I trigger/Over voltage, Class I
Sample Size	3 units per mode
Accept Criteria	0 fail

Table 2-6 Test results

Test Point	Result
±200 mA	PASS
1.5*VCCmax	PASS

## 2.4 High Temperature Operating Life Test (HTOL)

Table 2-7 Test requirements

Reference Standard	JESD22-A108
Test Parameter	Function test
Model	Arrhenius model for temperature acceleration factor and voltage $AF = \exp [\gamma_v * (V_{stress} - V_{op})] * \exp \left[ \frac{Ea}{K} \left( \frac{1}{T_{op}} - \frac{1}{T_{stress}} \right) \right]$
Test Conditions	125°C, 1000 hrs., VCCmax
Sample Size	77 units x 3 lots
Accept Criteria	0 fail

Table 2-8 Test results

Time Point	Result		
	Lot 1	Lot 2	Lot 3
168 hrs.	PASS	PASS	PASS
500 hrs.	PASS	PASS	PASS
1000 hrs.	PASS	PASS	PASS

## 2.5 Pre-Conditioning (Pre-Con)

Table 2-9 Test requirements

Reference Standard	JESD22-A113
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<b>Test Parameter</b>	Function test/Appearance inspection
<b>Model</b>	None
<b>Test Conditions</b>	Baking 125°C 24 hrs., soaking 30°C/60% RH 192 hrs., 3x reflow
<b>Sample Size</b>	75 units x 1 lot
<b>Accept Criteria</b>	0 fail

Table 2-10 Test results

<b>Time Point</b>	<b>Result</b>
	<b>Lot 1</b>
Pre-con over.	PASS

## 2.6 Temperature Cycling Test (TCT)

Table 2-11 Test requirements

<b>Reference Standard</b>	JESD22-A104
<b>Test Parameter</b>	Function test/Appearance inspection
<b>Model</b>	None
<b>Test Conditions</b>	-65°C to 150°C, 500 cycles
<b>Sample Size</b>	25 units x 1 lot
<b>Accept Criteria</b>	0 fail

Table 2-12 Test results

<b>Time Point</b>	<b>Result</b>
	<b>Lot 1</b>
500 cycles	PASS

## 2.7 Highly Accelerated Temperature and Humidity Stress Test (HAST)

Table 2-13 Test requirements

<b>Reference Standard</b>	JESD22-A118
<b>Test Parameter</b>	Function test/Appearance inspection
<b>Model</b>	None
<b>Test Conditions</b>	130°C, 85% RH, VCCmax, 96 hrs.
<b>Sample Size</b>	25 units x 1 lot
<b>Accept Criteria</b>	0 fail



Table 2-14 Test results

Time Point	Result
	Lot 1
96 hrs.	PASS

## 2.8 Unbiased Highly Accelerated Temperature and Humidity Stress Test (UHAST)

Table 2-15 Test requirements

Reference Standard	JESD22-A118
Test Parameter	Function test/Appearance inspection
Model	None
Test Conditions	130°C, 85% RH, 96 hrs.
Sample Size	25 units x 1 lot
Accept Criteria	0 fail

Table 2-16 Test results

Time Point	Result
	Lot 1
96 hrs.	PASS

## 2.9 High Temperature Storage Test (HTST)

Table 2-17 Test requirements

Reference Standard	JESD22-A103
Test Parameter	Function test/Appearance inspection
Model	None
Test Conditions	150°C, 1000 hrs.
Sample Size	25 units x 1 lot
Accept Criteria	0 fail

Table 2-18 Test results

Time Point	Result
	Lot 1
500 hrs.	PASS
1000 hrs.	PASS