MT7975 Qualification Report

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Specifications are subject to change without notice.

Summary

MT7975 for WiFi_Client(RF) product passed MediaTek product reliability qualification tests.

This report documents the successful completion of the reliability qualification requirements for release of MT7975.

This product qualification report consists of the assessments below:

1. HTOL
2. ESD (HBM, CDM)
3. Latch-up
4. Package reliability qualification results

1. Purpose

This document is written for the release of MediaTek MT7975 for WiFi_Client(RF) product, where all required qualification items and specifications are determined by R&D, PE (Product Engineering) and QA.

2. Scope

This document covers product qualification test items, requirements and conclusions for MediaTek MT7975 product.

3. Responsibility

MediaTek whose product is being qualified has the responsibility to perform the requisite qualification tests which adhere to standard requirements and specifications. The qualification requirements may be reduced for a derivative product, where the parent product had already been fully qualified.

4. Chip/Device Information

MT7975 product information is as below:

Package/Assembly	
Available Package	DR-SQFN 111L
Package Family	DR-QFN
Body Size (mm)	10.5 x 9 x 0.9
Moisture Sensitivity Level	3
Maximum Peak Reflow (°C)	260 +5/-0

5. Product Qualification Tests

This product qualification consisted of reliability tests on High Temperature Operation Life, Electrostatic Discharge, Latch-up and package reliability tests. Test samples comprised representative samples with three nonconsecutive lots from the qualification family.

5.1 High Temperature Operation Life (HTOL)

Table 1 – HTOL Test Result Summary

Test	Condition	Specification	Sample Size	Q'ty Rejects	MTBF
HTOL	Tj ≧125°C Applied Voltage: V_{cc} max for core & IO, Equiv. to 10 yrs lifetime	JESD22-A108	77 units x 3 lots	0	2705yrs

5.2 Electrostatic Discharge (ESD)

The tables below describe the ESD test requirements and associated test results conducted on this product. MediaTek measures ESD results using stringent test procedures based on the specifications listed in the table below. Any comparison with another supplier's results should ensure that the same ESD test procedures have been used.

Table 2 – ESD Test Result Summary

Test	Conditions	Specification	Sample Size	Test Results
HBM	25±5°C, 55±10%RH 1000V~3000V(±), Step: 500 V(±)	JS-001-2017	Each condition x 3 units	- All pins pass ≧2000V (excluded RF/HSS pins) - RF/HSS pins pass ≧1000V
CDM	25±5°C, 55±10%RH 250V(+), 250V(-) 500V(+), 500V(-)	JS-002-2018	Each condition x 3 units	- All pins pass ±500V. (excluded RF/HSS pins) - RF/HSS pins pass ±250V

5.3 Latch-up

Table 3 – Latch-up Test Result Summary

Test	Level	Conditions	Specification	Sample Size	Test Results
Latch-up	Class I	Trigger Current:100mA Overvoltage:1.5* V_{cc} max	JEDEC EIA/JESD78	Each condition x 3 units	Pass

5.4 Package reliability qualification results

Table 4 – Package Reliability Test Result Summary

Test	Conditions	Specification	Package	Sample Size	Q'ty Rejects
Pre-condition Moisture Sensitivity Level (MSL)	Level 3, 260°C reflow	J-STD-020	DR-QFN	75 units x 3 lots	0
Unbiased High Accelerated Stress	130°C/85%RH, 230 kPa, 96 hrs	JEDEC JESD22-A118	DR-QFN	25 units x 3 lots	0
Temperature Cycling	-65°C /+150°C, 1000 cycles	JEDEC JESD22-A104	DR-QFN	25 units x 3 lots	0
High Temperature Storage	150°C, 1000hrs	JEDEC JESD22-A103	DR-QFN	25 units x 3 lots	0
Biased High Accelerated Stress	130°C/ 85%RH, 96hrs, Applied Voltage: V_{cc} max for core & IO	JESD22-A110	DR-QFN	25 units x 3 lots	0

Biased High Accelerated Stress or Temperature and Humidity Bias, Unbiased High Accelerated Stress and Temperature Cycling Test's Samples were subjected to preconditioning (per J-STD-020 Level 3) prior to the start of the stress test. Level 1/3/4 preconditioning consists of the following:
- Baking: 24 hrs @ 125ºC;
- Unbiased Soaking: 192 hrs @30ºC, 60%RH;
or 52hrs @60ºC, 60%RH; (Accelerated equivalent to 30C/60%RH 192 hrs)
- Reflow: 3 passes through an oven with a peak temperature of 260+5/-0ºC.