

Spot Check Evaluation

APPLICANT : Quectel Wireless Solutions Co., Ltd.
EQUIPMENT : 5G Sub-6 GHz LGA Module
BRAND NAME : Quectel
MODEL NAME : RG500L-LA
FCC ID : XMR2023RG500LLA
STANDARD : 47 CFR Part 2, 24(E), 27(L), 27(M), 27(Q), 96

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (Kunshan)

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China**



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
2D0201-01	Rev. 01	Initial issue of report	Jul. 10, 2023

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1 General Description

1.1 Applicant

Quectel Wireless Solutions Co., Ltd.

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China

1.2 Manufacturer

Quectel Wireless Solutions Co., Ltd.

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	5G Sub-6 GHz LGA Module
Brand Name	Quectel
Model Name	RG500L-LA
FCC ID	XMR2023RG500LLA
IMEI Code	Conducted: 863221060013834 Radiation: 863221060013578
HW Version	R1.0
SW Version	RG500LLA00AAR01A05E8_OCPU
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Modification of EUT

No modifications are made to the EUT during all test items.

1.5 Testing Site

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH04-KS TH01-KS	CN1257	314309

1.6 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24al

1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC KDB 484596 D01 Referencing Test Data v01
- 47 CFR Part 2, 24(E), 27(L), 27(M), 27(Q), 96
- ANSI C63.26-2015



2 Re-use of Measured Data

2.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: RG500L-LA, FCC ID: XMR2023RG500LLA) is electrically identical to the reference device (Model: RG500L-NA, FCC ID: XMR2023RG500LNA) for the portions of the circuitry corresponding to the data being re-used. Based on their similarity, the FCC Part 24, 27 (equipment class: PCB) and FCC Part 96 (equipment class: CBE) reuse the original model's result and do spot-check, following the FCC KDB 484596 D01 Referencing Test Data v01.

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID: XMR2023RG500LLA .

2.2 Model Difference Information

The **main** difference between FCC ID: XMR2023RG500LNA and FCC ID: XMR2023RG500LLA is as below:

- Remove LTE B12/13/14/17/25/26/29/30/38/41/46/48/71 and 5G NR n12/n25/n38/n41/n48/n71/n77.
- Add WCDMA Band II/IV/V.

Other differences and all the details of similarity and difference can be found in the confidential documents (RG500L-LA_Operational Description of Product Equality Declaration).



2.3 Reference detail Section:

Rule Part	Equipment Class	Frequency Band (MHz)	Reference FCC ID (Parent)	Type Grant/Permissive Change	Reference Title	FCC ID Filling (Variant)	Report Title/Section
24, 27, 96,	PCB (LTE)	B2/4/7/66 ULCA 7C/66B/66C	XMR2023RG500LNA	Original Grant	FG2D0201A FG2D0201B	XMR2023RG500LLA	All sections applicable
	PCB (LTE)	B42 ULCA B42C	XMR2023RG500LNA	Original Grant	FG2D0201F	XMR2023RG500LLA	All sections applicable
	PCB (NR)	n2/n7/n66	XMR2023RG500LNA	Original Grant	FG2D0201I FG2D0201J	XMR2023RG500LLA	All sections applicable
	PCB (NR)	n78 (Part 27Q)	XMR2023RG500LNA	Original Grant	FG2D0201N	XMR2023RG500LLA	All sections applicable
	CBE (NR)	n78 (Part96)	XMR2023RG500LNA	Original Grant	FG2D0201K FG230326001	XMR2023RG500LLA	All sections applicable

2.4 Spot Check Verification Data Section

Conducted power test and radiated spurious emission test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model.

All test procedures follow the related section of parent report.

Summary for power and RSE spot check for each rule entry and technology is listed as below:

Test Item	Mode	XMR2023RG500LNA Parent Worst mode Test Result	XMR2023RG500LLA Variant Check Test Result	Difference (dB)
Conducted Power (dBm)	LTE Band 2	22.76	22.73	0.03
	LTE Band 4	22.68	22.62	0.06
	LTE Band 7	22.45	22.26	0.19
	LTE Band 66	23.16	22.84	0.32
	LTE Band 7C	22.96	22.65	0.31
	LTE Band 66B	23.15	22.64	0.51
	LTE Band 66C	23.05	22.91	0.14
	LTE B42	22.65	22.13	0.52
	LTE B42C	22.06	22.01	0.05
	5GNR n2	23.97	23.80	0.17
	5GNR n7	24.28	24.21	0.07
	5GNR n66	23.75	23.61	0.14
	5GNR n78(Part27Q)	26.24	26.13	0.11
	5GNR n78 UL MIMO (Part27Q)	25.75	25.40	0.35
	5GNR n78(Part96)	26.55	26.26	0.29
	5GNR n78 UL MIMO (Part96)	22.56	22.43	0.13



Test Item	Mode	XMR2023RG500LNA Parent Worst mode Test Result	XMR2023RG500LLA Variant Check Test Result	Difference (dB)
Radiated Spurious Emission (dBm)	LTE Band 7	-11.75	-17.09	5.34
	ENDC_5A_n7	-11.62	-26.74	15.12

Conclusion:

Radiated spurious emission test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model.

Based on the spot check test result, the test data from the original model is representative for the variant model. The power level and RSE spot check are shown within expected level compliant to limit line.

We are using power and ERP/EIRP measurements from the original parent model reports to list on the grant.

The same Part 96 EUD mechanism/software is used in the variant. Hence, there is no spot check data for Part 96 EUD hand-shaking mechanism.

We confirm that the test data reuse policy of FCC KDB 484596 D01 Referencing Test Data v01 has been followed and the test data as referenced from the parent model report represents compliance with new FCC ID.



3 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 12, 2022	Jun. 29, 2023	Oct. 11, 2023	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz~44G,MAX 30dB	Oct. 12, 2022	Jul. 03, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 16, 2022	Jul. 03, 2023	Oct. 15, 2023	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz~1GHz	Apr. 09, 2023	Jul. 03, 2023	Apr. 08, 2024	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1284	1GHz~18GHz	Oct. 16, 2022	Jul. 03, 2023	Oct. 15, 2023	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 08, 2023	Jul. 03, 2023	Jan. 07, 2024	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz~1GHz	Jul. 11, 2022	Jul. 03, 2023	Jul. 10, 2023	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GG A	060728	18~40GHz	Jan. 05, 2023	Jul. 03, 2023	Jan. 04, 2024	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz~18Ghz	Oct. 12, 2022	Jul. 03, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz~18Ghz	Oct. 12, 2022	Jul. 03, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jul. 03, 2023	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jul. 03, 2023	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jul. 03, 2023	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required.

4 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	± 0.46 dB

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.82dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.56dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.54dB
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-THE END-