



FCC RF Test Report

APPLICANT : Quectel Wireless Solutions Co., Ltd.
EQUIPMENT : Smart LTE Module with Wi-Fi & Bluetooth
BRAND NAME : Quectel
MODEL NAME : SC20-AX
FCC ID : XMR202201SC20AX
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure
TEST DATE(S) : Jan. 06, 2022 ~ Jan. 21, 2022

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

Reviewed by: Jason Jia / Supervisor

Alex Wang

Approved by: Alex Wang / Manager



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TABLE OF CONTENTS

REVISION HISTORY.....	3
1 GENERAL DESCRIPTION	4
1.1 Applicant.....	4
1.2 Manufacturer.....	4
1.3 Product Feature of Equipment Under Test.....	4
1.4 Product Specification of Equipment Under Test.....	4
1.5 Modification of EUT	4
1.6 Re-use of Measured Data	5
2 LIST OF MEASURING EQUIPMENT	7
3 UNCERTAINTY OF EVALUATION	8
APPENDIX A. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR1D2404D	Rev. 01	Initial issue of report	Feb. 14, 2022



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	Smart LTE Module with Wi-Fi & Bluetooth
Brand Name	Quectel
Model Name	SC20-AX
FCC ID	XMR202201SC20AX
HW Version	R1.0
SW Version	SC20AXPAR09A05
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 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5700 MHz
Antenna Type / Gain	<5180 MHz ~ 5240 MHz> External Antenna with gain -0.67 dBi <5260 MHz ~ 5320 MHz> External Antenna with gain -0.19 dBi <5500 MHz ~ 5700 MHz> External Antenna with gain 1.28 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

Note: WLAN operation in 5600 MHz ~ 5650 MHz is notched.

1.5 Modification of EUT

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

1.6 Re-use of Measured Data

1.6.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: SC20-AX, FCC ID: XMR202201SC20AX) is electrically identical to the reference device (Model: SC20-AL, FCC ID: XMR201911SC20AL) for the portions of the circuitry corresponding to the data being re-used. Based on their similarity, the FCC Part 15E (equipment class: NII)) reuse the original model's result and do spot-check, following the FCC KDB 484596 D01 v01.

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID: XMR202201SC20AX.

1.6.2 Difference Section

The **main** difference between FCC ID: XMR201911SC20AL and FCC ID: XMR202201SC20AX is as below:

- SC20-AX uses MCP memory while SC20-AL uses EMCP memory, so the layout of memory part is different
- SC20-AX added U1007 to optimize the Tx performance of B13
- U1502 changed the WiFi 2.4G SAW package size

Other differences and all the details of similarity and difference can be found in the confidential documents (SC20-AX_Operational Description of Product Equality Declaration).

1.6.3 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
15E	U-NII-1	5150~5250	XMR201911SC20AL	Original Grant	FR9N1435D	XMR202201SC20AX	All sections applicable
	U-NII-2A	5250~5350	XMR201911SC20AL	Original Grant	FR9N1435D	XMR202201SC20AX	All sections applicable
	U-NII-2C	5470~5725	XMR201911SC20AL	Original Grant	FR9N1435D	XMR202201SC20AX	All sections applicable



1.6.4 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

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

Test Item	Mode	XMR201911SC20AL Parent Worst Result	XMR202201SC20AX Variant Check Result	Difference (dB)
Conducted Power (dBm)	11a, 5.2GHz	12.90	12.80	0.1
	11n HT20, 5.2GHz	13.8	13.44	0.36
	11n HT40, 5.2GHz	12.98	12.79	0.19
	11a, 5.3GHz	13.13	12.83	0.3
	11n HT20, 5.3GHz	13.91	13.54	0.37
	11n HT40, 5.3GHz	13.20	12.93	0.27
	11a, 5.5GHz	12.93	12.76	0.17
	11n HT20, 5.5GHz	13.15	12.76	0.39
	11n HT40, 5.5GHz	12.31	12.12	0.19

Test Item	Mode	XMR201911SC20AL Parent Worst Result	XMR202201SC20AX Variant Check Result	Difference (dB)
Radiated Spurious Emission (dBm)	11a(n40)_Tx_Ch102	50.73	42.49	8.24

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.

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.



2 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. 14, 2021	Jan. 21, 2022	Oct. 13, 2022	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 05, 2022	Jan. 21, 2022	Jan. 04, 2023	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 05, 2022	Jan. 21, 2022	Jan. 04, 2023	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY57290151	3Hz~8.5GHz; Max 30dBm	Jul. 12, 2021	Jan. 06, 2022	Jul. 11, 2022	Radiation (03CH04-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz~44G, MAX 30dB	Apr.13, 2021	Jan. 06, 2022	Apr. 12, 2022	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 30, 2021	Jan. 06, 2022	Oct. 29, 2022	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz~1GHz	May 30, 2021	Jan. 06, 2022	May 29, 2022	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1356	1GHz~18GHz	Apr. 18, 2021	Jan. 06, 2022	Apr. 17, 2022	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2022	Jan. 06, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	Burgeon	BPA-530	102219	0.01MHz~3000MHz	Nov. 01, 2021	Jan. 06, 2022	Oct. 31, 2022	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2022	Jan. 06, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	2025788	1Ghz-18Ghz	Jul. 30, 2021	Jan. 06, 2022	Jul. 29, 2022	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct. 12, 2021	Jan. 06, 2022	Oct. 11, 2022	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jan. 06, 2022	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jan. 06, 2022	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jan. 06, 2022	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required



3 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. 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 Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1dB
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