FCC RF Test Report

APPLICANT : Quectel Wireless Solutions Co., Ltd.

EQUIPMENT: Smart LTE Module

BRAND NAME : Quectel

MODEL NAME : SC200E-AU

FCC ID : XMR2024SC200EAU

STANDARD : FCC Part 15 Subpart C §15.247

CLASSIFICATION : (DTS) Digital Transmission System

TEST DATE(S) : Aug. 08, 2024 ~ Nov. 25, 2024

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.

JasonJia

Approved by: Jason Jia





Report No.: FR480203B

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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Report Issued Date : Nov. 29, 2024

: Rev. 01

Report Template No.: BU5-FR15CBT4.0 Version 2.0

Report Version

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR480203B	Rev. 01	Initial issue of report	Nov. 29, 2024

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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.1	-	99% Bandwidth	-	Report only	-
3.2	15.247(b)(3)	Peak Output Power	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	≤ 20dBc	Pass	-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.99 dB at 2483.620 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 6.06 dB at 0.573 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass	-

Conformity Assessment Condition:

- 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/manufacturer 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.

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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				
Brand Name	Quectel			
Model Name	SC200E-AU			
FCC ID	XMR2024SC200EAU			
IMEI/SN Code	Conducted: 866080060008526/866080060008534 Conduction: 866080060008625/866080060008633 Radiation: E1C24AO0D000067			
HW Version	R1.0			
SW Version	SC200EAUDAR12A01			
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	2402 MHz ~ 2480 MHz			
Number of Channels	40			
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)			
Maximum Output Power to Antenna	BLE 1Mbps: 0.36 dBm (0.0011 W)			
99% Occupied Bandwidth	BLE 1Mbps:1.059MHz			
Antenna Type / Gain	Dipole Antenna type with gain 0.2 dBi			
Type of Modulation	Bluetooth LE : GFSK			

Remark: BLE support data rate 1Mbps only.

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1.5 Modification of EUT

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

1.6 Testing Location

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

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Test Firm	Sporton International Inc. (Kunshan)				
	No. 1098, Pengxi North	n Road, Kunshan Econom	ic Development Zone		
Test Site Location	Jiangsu Province 215300 People's Republic of China				
	TEL: +86-512-57900158				
	Sporton Site No.	FCC Designation No.	FCC Test Firm		
Test Site No.	Sporton Site No.	T CC Designation No.	Registration No.		
rest one No.	CO01-KS 03CH08-KS TH01-KS	CN1257	314309		

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	TH01-KS	Tonscend	JS1120-3 test system China_210602	3.3.10
2.	03CH08-KS	AUDIX	E3	210616
3.	CO01-KS	AUDIX	E3	6.2009-8-24

1.8 Applicable Standards

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

- 47 CFR Part 15 Subpart C §15.247
- FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ANSI C63.10-2013

Remark:

- All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

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2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	0	2402	21	2444
	1	2404	22	2446
	2	2406	23	2448
	3	2408	24	2450
	4	2410	25	2452
	5	2412	26	2454
	6	2414	27	2456
	7	2416	28	2458
	8	2418	29	2460
	9	2420	30	2462
2400-2483.5 MHz	10	2422	31	2464
	11	2424	32	2466
	12	2426	33	2468
	13	2428	34	2470
	14	2430	35	2472
	15	2432	36	2474
	16	2434	37	2476
	17	2436	38	2478
	18	2438	39	2480
	19	2440	-	-
	20	2442	-	-

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2.2 Test Mode

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

The following summary table is showing all test modes to demonstrate in compliance with the standard.

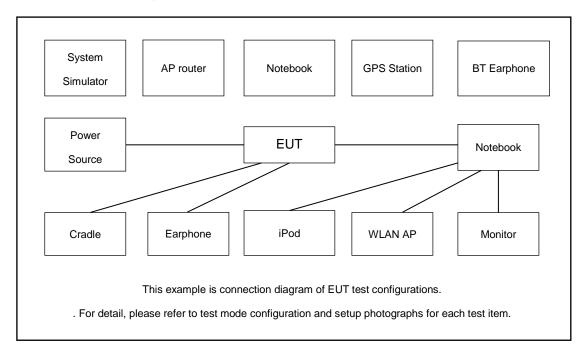
	Summary table of Test Cases
Toot Itam	Data Rate / Modulation
Test Item	Bluetooth – LE / GFSK
Conducted	Mode 1: Bluetooth Tx CH00_2402 MHz_BLE 1Mbps
TCs	Mode 2: Bluetooth Tx CH19_2440 MHz_BLE 1Mbps
ics	Mode 3: Bluetooth Tx CH39_2480 MHz_BLE 1Mbps
	Mode 1: Bluetooth Tx CH00_2402 MHz_BLE 1Mbps
Dedisted	Mode 2: Bluetooth Tx CH19_2440 MHz_BLE 1Mbps
Radiated	Mode 3: Bluetooth Tx CH39_2480 MHz_BLE 1Mbps
TCs	Co-location: Bluetooth-LE 1M_CH39_2480 MHz + 802.11g_ CH11_2462 MHz
	Co-location: Bluetooth-LE 1M_CH39_2480 MHz + LTE Band 7_BW 20M
AC	
Conducted	Mode 1: Bluetooth Link + WLAN Link (5G) + Adapter
Emission	
Remark: For	Radiated Test Cases, The tests were performance with test jig and Adapter.

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2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
2.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
3.	Bluetooth Earphone	Lenovo	thinkplus-BH3	N/A	N/A	N/A
4.	Test Jig	N/A	N/A	N/A	N/A	N/A
5.	Antenna	N/A	N/A	N/A	N/A	N/A
6.	Adapter	N/A	N/A	N/A	N/A	N/A

2.5 EUT Operation Test Setup

For BLE function, the engineering test program was provided and enabled to make EUT continuous transmit.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

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2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss

Offset = RF cable loss

Following shows an offset computation example with cable loss 5.80 dB

 $Offset(dB) = RF \ cable \ loss(dB)$ = 5.80 (dB)

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3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

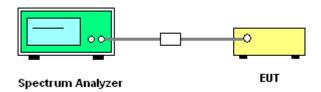
3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.1.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 11.8
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
- 5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1% to 5% of the 99% OBW and the VBW is set to 3 times of the RBW.
- 6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

3.1.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

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3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

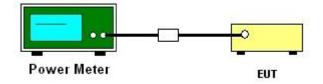
3.2.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.2.3 Test Procedures

- The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.3 PKPM1 Peak power meter or ANSI C63.10-2013 clause 11.9.2.3.1 Method AVGPM method.
- 2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.2.6 Test Result of Average Output Power (Reporting Only)

Please refer to Appendix A.

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3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

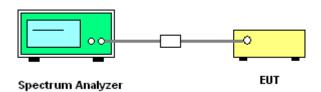
3.3.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.3.3 Test Procedures

- The testing follows Measurement Procedure of ANSI C63.10-2013 clause 11.10.2 Method PKPSD.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
- Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
- 6. Measure and record the results in the test report.
- 7. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

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3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

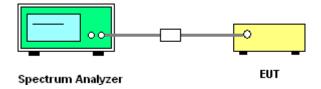
3.4.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.4.3 Test Procedure

- 1. The testing follows ANSI C63.10-2013 clause 11.13
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
- 5. Measure and record the results in the test report.
- 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges Plots

Please refer to Appendix A.

3.4.6 Test Result of Conducted Spurious Emission Plots

Please refer to Appendix A.

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3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

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3.5.3 Test Procedures

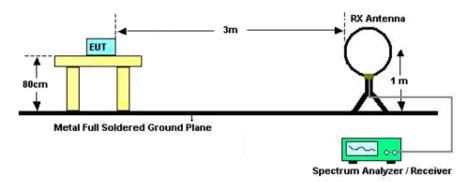
- 1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
- 2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
- 3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
- The EUT was set 3 meters from the interference receiving antenna, which was mounted on the 4. top of a variable height antenna tower.
- 5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
- 6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
- For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than 7. peak limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \ge 1$ GHz for peak measurement. For average measurement:
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

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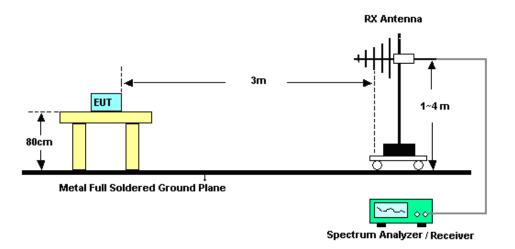
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3.5.4 Test Setup

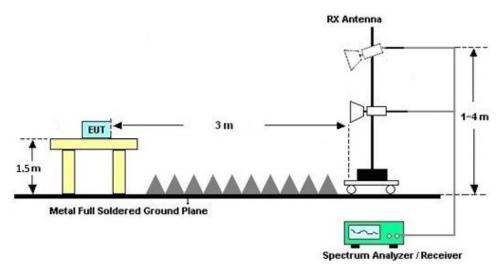
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

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There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.5.7 Duty Cycle

Please refer to Appendix D.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)

Please refer to Appendix C

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3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Eroquency of emission (MUz)	Conducted	limit (dΒμV)
Frequency of emission (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

^{*}Decreases with the logarithm of the frequency.

3.6.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.6.3 Test Procedures

- 1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- 2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- 3. All the support units are connecting to the other LISN.
- 4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- 5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- 6. Both sides of AC line were checked for maximum conducted interference.
- 7. The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

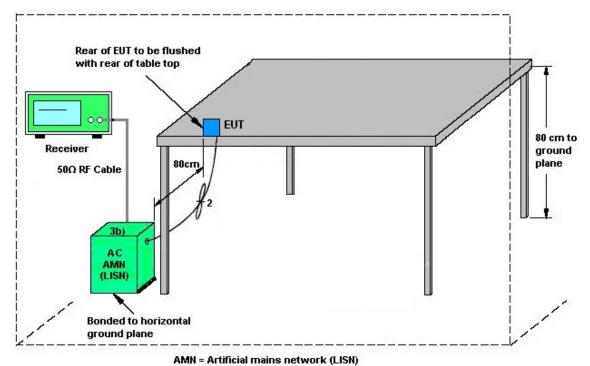
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3.6.4 Test Setup



AMN = Artificial mains network (Lisk)
AE = Associated equipment

EUT = Equipment under test

ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

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3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

Non-standard antenna connector is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

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4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV30	101338	10Hz~30GHz	Jan. 05, 2024	Aug. 08, 2024	Jan. 04, 2025	Conducted (TH01-KS)
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 11, 2023	Aug. 08, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GH z	Jan. 02, 2024	Aug. 08, 2024	Jan. 01, 2025	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY564000 23	3Hz~8.5GHz;M ax 30dBm	Jan. 02, 2024	Nov. 25, 2024	Jan. 01, 2025	Radiation (03CH08-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY574410 79	10Hz-44GHz	Oct. 09, 2024	Nov. 25, 2024	Oct. 08, 2025	Radiation (03CH08-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 08, 2024	Nov. 25, 2024	Sep. 07, 2025	Radiation (03CH08-KS)
Bilog Antenna	TESEQ	CBL 6111D	59915	30MHz-1GHz	Aug. 18, 2024	Nov. 25, 2024	Aug.17, 2025	Radiation (03CH08-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00240138	1GHz~18GHz	Jul. 06, 2024	Nov. 25, 2024	Jul. 05, 2025	Radiation (03CH08-KS)
high gain Amplifier	EM	EM01G18GA	060845	1Ghz-18Ghz	Jan. 03, 2024	Nov. 25, 2024	Jan. 02, 2025	Radiation (03CH08-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 27, 2024	Nov. 25, 2024	Jan. 26, 2025	Radiation (03CH08-KS)
Amplifier	SONOMA	310N	413741	9KHz-1GHz	Jan. 02, 2024	Nov. 25, 2024	Jan. 01, 2025	Radiation (03CH08-KS)
Amplifier	Keysight	83017A	MY532704 17	500MHz~26.5G Hz	Oct. 09, 2024	Nov. 25, 2024	Oct. 08, 2025	Radiation (03CH08-KS)
Amplifier	EM	EM18G40GG A	060728	18~40GHz	Jan. 02, 2024	Nov. 25, 2024	Jan. 01, 2025	Radiation (03CH08-KS)
AC Power Source	Chroma	61601	616010002 473	N/A	NCR	Nov. 25, 2024	NCR	Radiation (03CH08-KS)
Turn Table	EM	EM 1000-T	N/A	0~360 degree	NCR	Nov. 25, 2024	NCR	Radiation (03CH08-KS)
Antenna Mast	EM	EM 1000-A	N/A	1 m~4 m	NCR	Nov. 25, 2024	NCR	Radiation (03CH08-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr 18, 2024	Nov. 25, 2024	Apr 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Aug. 20, 2024	Nov. 25, 2024	Aug. 19, 2025	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	Nov. 25, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	AC 0V~300V, 45Hz~1000Hz	Oct. 09, 2024	Nov. 25, 2024	Oct. 8, 2025	Conduction (CO01-KS)

NCR: No Calibration Required

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5 Measurement Uncertainty

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 Conducted Measurement

Conducted Spurious Emission & Bandedge	±2.26 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.46 dB
Conducted Power Spectral Density	±0.88 dB
Frequency	±0.4 Hz

Uncertainty of AC Conducted Emission Measurement (0.15 MHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence	2.84dB	
of 95% (U = 2Uc(y))	2.04UB	

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence	3,30dB
of 95% (U = 2Uc(y))	3.30db

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

Measuring Uncertainty for a Level of Confidence	6.04dB
of 95% (U = 2Uc(y))	0.04ub

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence	5.26dB	
of 95% (U = 2Uc(y))	3.20UB	

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence	5.40dB
of 95% (U = 2Uc(y))	5.40dB

----- THE END -----

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Appendix A. Conducted Test Results

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Ambient Condition: $25\ ^{\circ}$ C, $45\ ^{\circ}$ RH

Test Date: 2024/8/08 Test Engineer: Jiang Jun

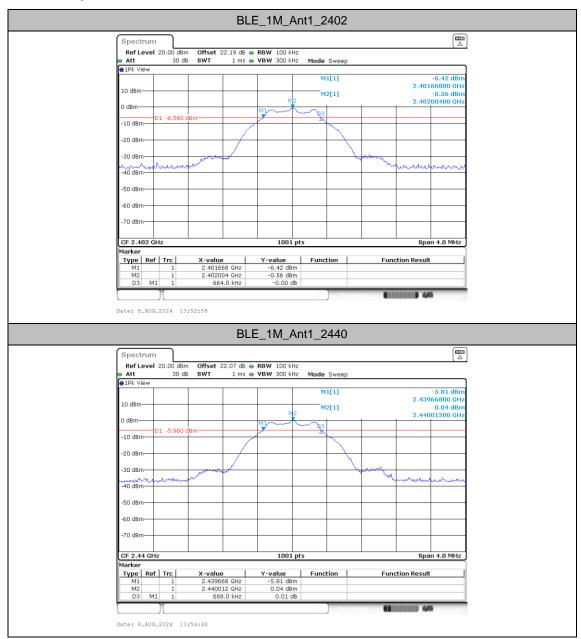
DTS Bandwidth

Test Result

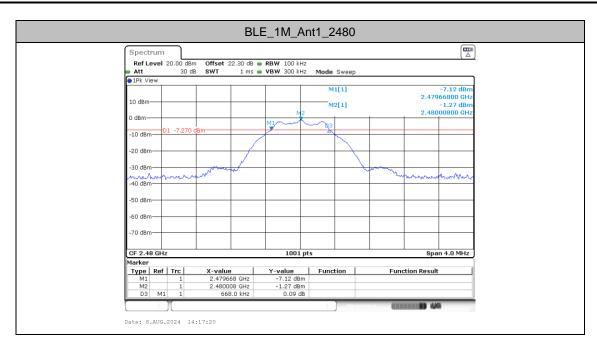
TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
	2402	0.66	2401.67	2402.33	0.5	PASS	
BLE_1M	Ant1	2440	0.67	2439.67	2440.34	0.5	PASS
		2480	0.67	2479.67	2480.34	0.5	PASS

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Test Graphs



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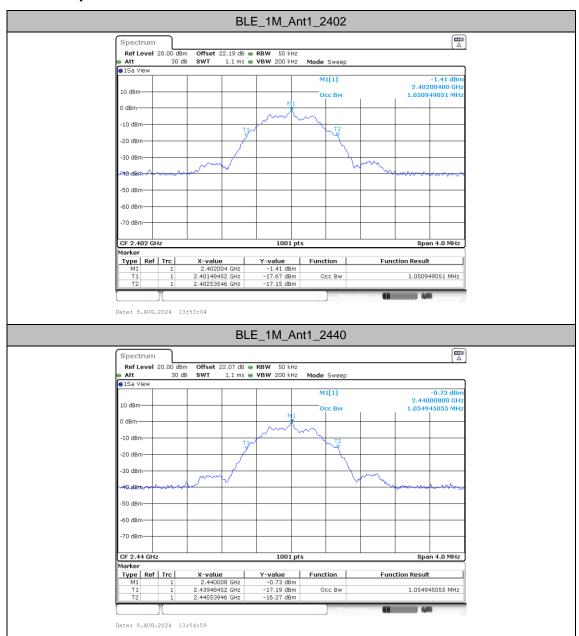
Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2402	1.051	2401.4845	2402.5355		
BLE_1M	Ant1	2440	1.055	2439.4845	2440.5395		
		2480	1.059	2479.4805	2480.5395		

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Test Graphs



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Maximum conducted output power

Test Result Peak

TestMode	Antenna	CH.	Peak Conducted Power (dBm)	Conducted Power Limit	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit	Pass/Fail
		0	0.08	30.00	0.2	0.28	36.00	Pass
BLE1M	Ant1	19	0.36	30.00	0.2	0.56	36.00	Pass
		39	-1.08	30.00	0.2	-0.88	36.00	Pass

Test Result Average

TestMode	Antenna	CH.	Duty Factor (dB)	Average Conducted Power (dBm)
BLE1M		0	2.04	-0.50
	Ant1	19	19 2.04 -0	-0.14
		39	2.04	-1.68

Maximum power spectral density

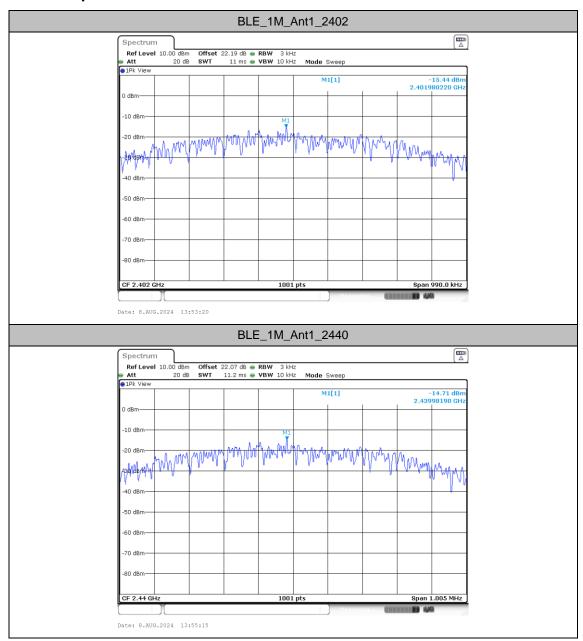
Test Result

TestMode	Antenna	Freq(MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
		2402	-15.44	≤8.00	PASS
BLE_1M	BLE_1M Ant1	2440	-14.71	≤8.00	PASS
	2480	-16.03	≤8.00	PASS	

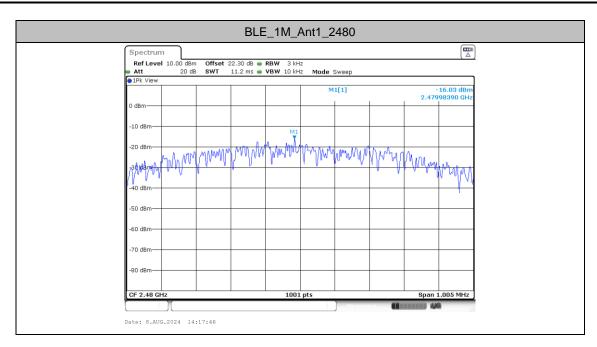
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Test Graphs



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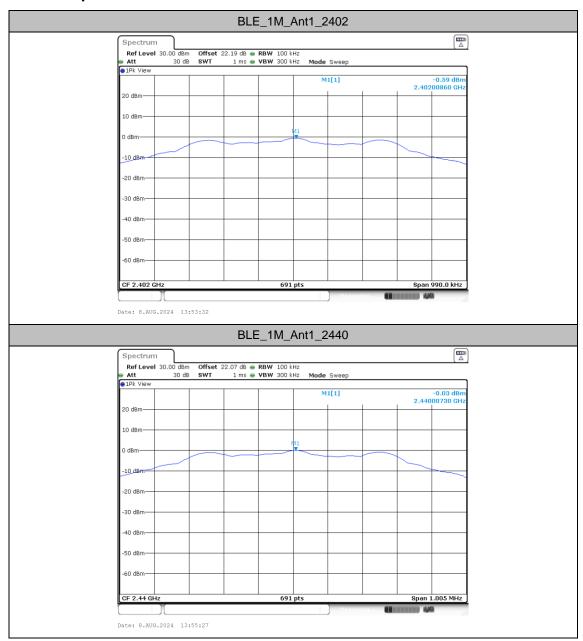
Reference level measurement

Test Result

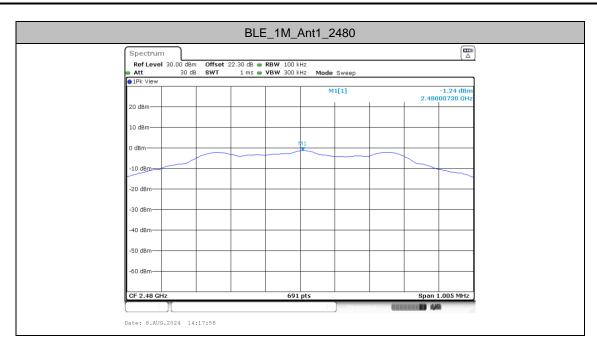
TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm/100KHz]
BLE_1M	Ant1	2402	2402.01	-0.59
		2440	2440.01	-0.03
		2480	2480.01	-1.24

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Test Graphs



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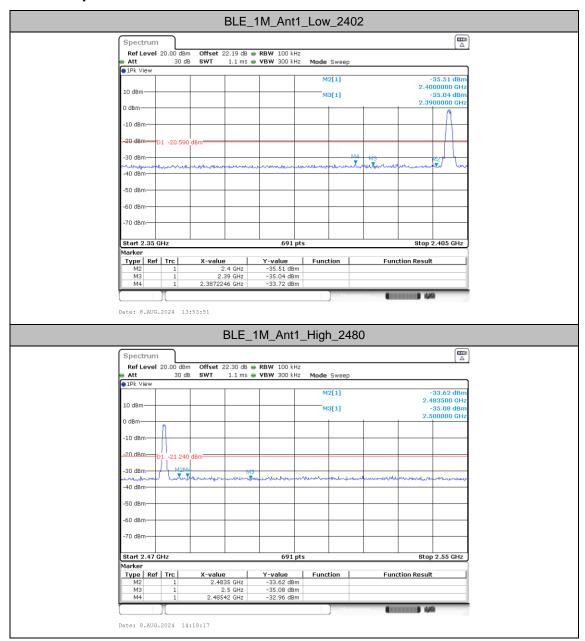
Band edge measurements

Test Result

	TestMode	lode Antenna Ch		Freq(MHz)	RefLevel[dBm /100KHz]	Result[dBm /100KHz]	Limit[dBm /100KHz]	Verdict
	-0.59	-33.72	≤-20.59	PASS				
	DLE_IIVI	Ant1	High	2480	-1.24	-32.96	≤-21.24	PASS

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Test Graphs



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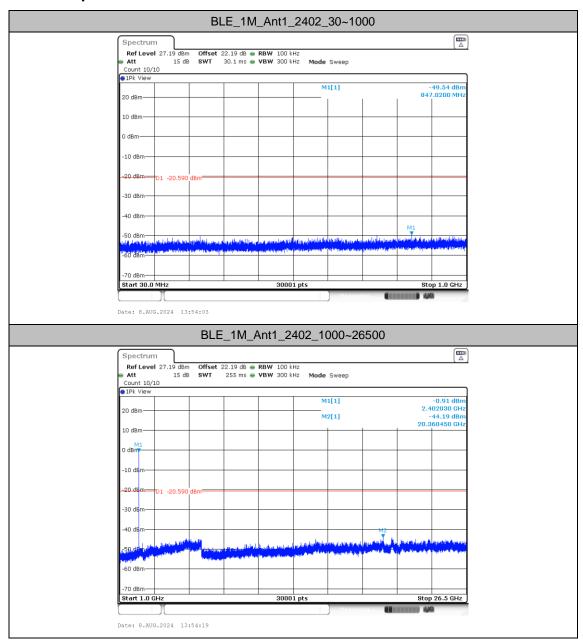
Conducted Spurious Emission

Test Result

To at Marda	Antonna	(_/__\	FreqRange	RefLevel	Result	Limit	Verdict	
TestMode	Antenna	Freq(MHz)	[MHz]	[dBm/100KHz]	[dBm/100KHz]	[dBm/100KHz]	verdict	
		2402	30~1000	-0.59	-49.54	≤-20.59	PASS	
		2402	1000~26500	-0.59	-44.19	≤-20.59	PASS	
DIE 4M	Ant1	2440	30~1000	-0.03	-49.84	≤-20.03	PASS	
BLE_1M	Anti	2440	1000~26500	-0.03	-44.38	≤-20.03	PASS	
		2480	30~1000	-1.24	-49.98	≤-21.24	PASS	
		Z 4 6U	1000~26500	-1.24	-43.62	≤-21.24	PASS	

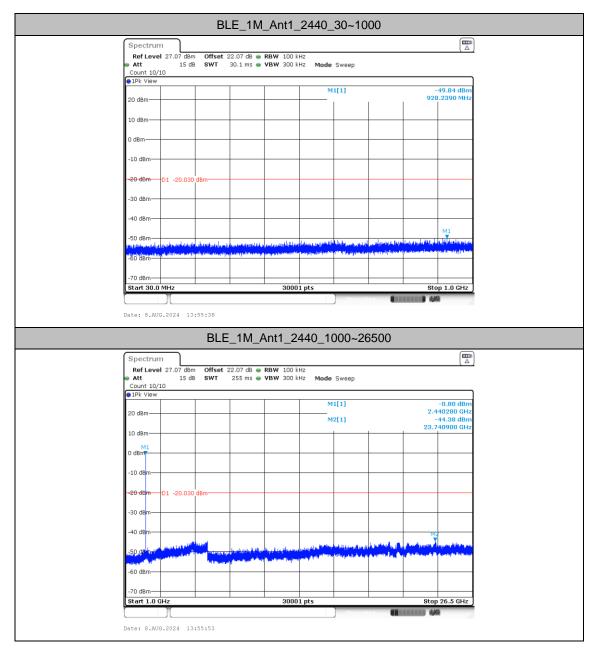
TEL: +86-512-57900158 FCC ID: XMR2024SC200EAU Page Number : A15 of A18

Test Graphs

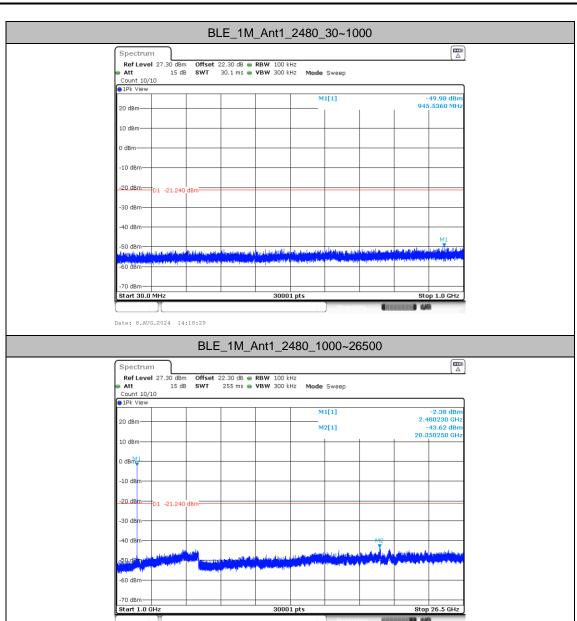


TEL: +86-512-57900158 FCC ID: XMR2024SC200EAU





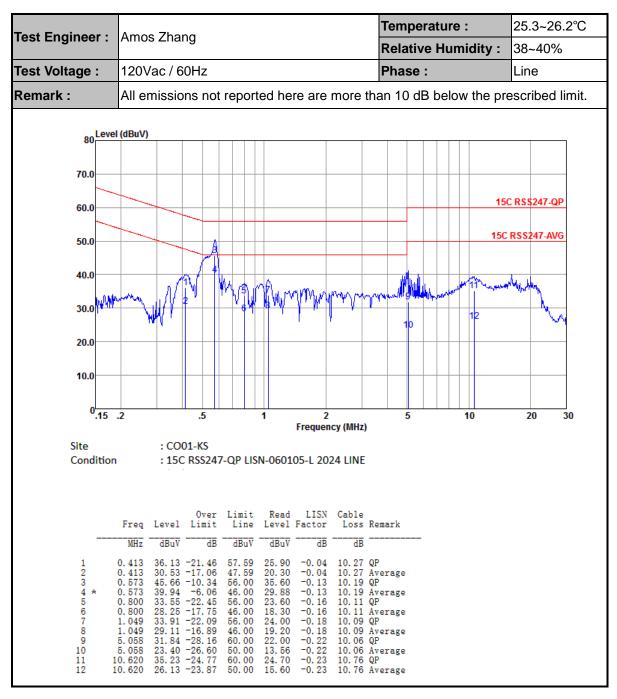
TEL: +86-512-57900158 FCC ID: XMR2024SC200EAU



Date: 8.AUG.2024 14:18:45

TEL: +86-512-57900158 FCC ID: XMR2024SC200EAU

Appendix B. AC Conducted Emission Test Results



TEL: +86-512-57900158 FCC ID: XMR2024SC200EAU

25.3~26.2°C Temperature: Test Engineer: Amos Zhang **Relative Humidity:** 38~40% Test Voltage: 120Vac / 60Hz Phase: Neutral Remark: All emissions not reported here are more than 10 dB below the prescribed limit. 80 Level (dBuV) 70.0 15C RSS247-QP 60.0 15C RSS247-AVG 50.0 40.0 30.0 20.0 10.0 0.15 .2 20 5 10 2 30 Frequency (MHz) Site : CO01-KS Condition : 15C RSS247-QP LISN-060105-N 2024 NEUTRAL Over Limit Read LISN Cable Line Level Factor Loss Remark Freq Level Limit dBuV dBuV dBuV dB MHz dB dB 29. 96 -26. 04 19. 96 -26. 04 30. 95 -25. 05 20. 35 -25. 65 32. 63 -23. 17 26. 40 -29. 60 17. 70 -28. 30 34. 36 -25. 64 23. 36 -26. 64 23. 96 -26. 04 56.00 46.00 56.00 46.00 56.00 -0. 15 -0. 15 -0. 15 -0. 15 -0. 16 19.89 9.89 20.90 10.22 QP 10.22 Average 10.20 QP 0.510 10.30 22.60 12.80 0.541 0.576 10.20 10.19 46. 00 56. 00 46. 00 50. 00 50. 00 -0. 16 -0. 18 -0. 18 0.576 10.19 Average 16. 49 7. 79 24. 51 13. 51 10.09 QP 1, 178 Average -0. 21 -0. 21 -0. 27 -0. 27 10.06 QP 10.06 Average 5. 139 5. 139 10 452 50.00

Note:

- 1. Level($dB\mu V$) = Read Level($dB\mu V$) + LISN Factor(dB) + Cable Loss(dB)
- 2. Over Limit(dB) = Level(dB μ V) Limit Line(dB μ V)

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Appendix C Radiated Spurious Emission Test Data

Toot Engineer :	Koi Ji	Relative Humidity :	51 ~ 53%
Test Engineer :	KOI JI	Temperature :	25.2 ~ 26.5℃

Radiated Spurious Emission Test Modes

Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 4	2400-2483.5	1	Bluetooth-LE	00	2402	1Mbps	-	-
Mode 5	2400-2483.5	1	Bluetooth-LE	19	2440	1Mbps -		-
Mode 6	2400-2483.5	1	Bluetooth-LE	39	2480	1Mbps	-	-
Mode	2400-2483.5	1	Bluetooth-LE_GSFK	39	2480	1Mbps	-	-
21	2400-2483.5	1	802.11g	11	2462	6Mbps	-	-
Mode	2400-2483.5	1	Bluetooth-LE_GSFK	39	2480	1Mbps	-	-
22			Part 27M LTE	Band 7 -BW	20M			

Summary of each worse mode

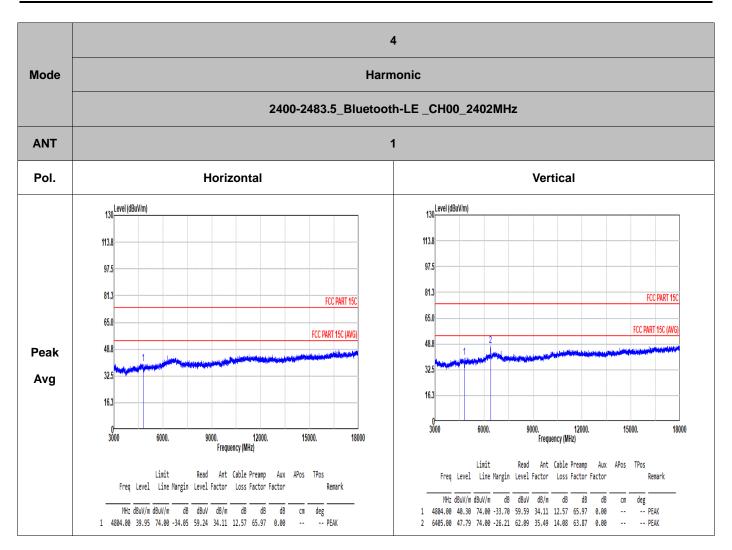
Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
4	Bluetooth-LE	00	2364.08	43.71	54.00	-10.29	Н	AVERAGE	Pass	Band Edge
4	Bluetooth-LE	00	6405.00	47.79	74.00	-26.21	V	PEAK	Pass	Harmonic
5	Bluetooth-LE	19	-	-	-	-	-	-	-	Band Edge
5	Bluetooth-LE	19	7044.00	48.58	74.00	-25.42	V	PEAK	Pass	Harmonic
6	Bluetooth-LE	39	2483.68	44.75	54.00	-9.25	V	AVERAGE	Pass	Band Edge
6	Bluetooth-LE	39	6613.00	47.11	74.00	-26.89	V	PEAK	Pass	Harmonic
	Bluetooth-LE_GSFK	39	2483.62	72.01	74.00	-1.99	V	PEAK	Pass	Band Edge
21	Bluetooth-LE_GSFK	39	4920.00	42.72	74.00	-31.28	V	PEAK	Pass	Harmonic
21	802.11g	11	2484.76	70.37	74.00	-3.63	V	PEAK	Pass	Band Edge
	802.11g	11	7386.00	42.79	74.00	-31.21	V	PEAK	Pass	Harmonic
22	Bluetooth-LE_GSFK	39	2498.62	41.76	54.00	-12.24	V	AVERAGE	Pass	Band Edge
	Bluetooth-LE_GSFK	39	7440.00	42.86	74.00	-31.14	٧	PEAK	Pass	Harmonic

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Sporton International Inc. (Kunshan)

Mode **Band Edge** 2400-2483.5_Bluetooth-LE _CH00_2402MHz **ANT** Pol. Horizontal **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 FCC PART 150 65.0 65.0 **Peak** 32.5 32.5 16.3 16.3 1000 2310 2362. 2388. Frequency (MHz) 2336. 2440 1400. 0. 2200. Frequency (MHz) 3000 Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB MHz dBuV/m dBuV/m dB dBuV dB/m dB dB cm deg cm deg 1 2372.14 55.53 74.00 -18.47 40.16 32.03 8.03 30.69 6.00 1 2402.00 94.41 ----- 78.82 32.20 8.07 30.68 6.00 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 FCC PART 15C (AVG FCC PART 15C (AVG Avg 32.5 32.5 16.3 16.3 2310 1000 2440 2336. 2362. 2388. 2414. 1400. 2600. 3000 Frequency (MHz) Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB deg CM CM 1 2402.00 93.42 ----- 77.83 32.20 8.07 30.68 6.00 137 AVERAGE 1 2364.08 43.71 54.00 -10.29 28.42 31.98 8.01 30.70 6.00 100 137 AVERAGE

Mode **Band Edge** 2400-2483.5_Bluetooth-LE _CH00_2402MHz **ANT** Pol. Vertical **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 FCC PART 150 65.0 65.0 **Peak** 32.5 16.3 16.3 1000 2310 2362. 2388. Frequency (MHz) 2336. 2440 1400. 0. 2200. Frequency (MHz) 3000 Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB MHz dBuV/m dBuV/m dB dBuV dB/m dB dB cm deg cm deg 1 2310.91 54.62 74.00 -19.38 39.51 31.90 7.93 30.72 6.00 1 2402.00 96.12 ----- 80.53 32.20 8.07 30.68 6.00 292 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 FCC PART 15C (AVG FCC PART 15C (AVG Avg 32.5 32.5 16.3 16.3 2310 1000 2440 2336. 2362. 2388. 2414. 1400. 2600. 3000 Frequency (MHz) Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB deg CM deg CM 1 2389.17 43.64 54.00 -10.36 28.14 32.14 8.05 30.69 6.00 1 2402.00 95.05 ----- 79.46 32.20 8.07 30.68 6.00 18 AVERAGE 18 AVERAGE 292



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5 Mode Harmonic 2400-2483.5_Bluetooth-LE _CH19_2440MHz **ANT** Pol. Horizontal Vertical 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 FCC PART 150 65.0 65.0 FCC PART 15C (AVG FCC PART 15C (AVG 48.8 48.8 **Peak** 32.5 32.5 Avg 16.3 16.3 0 3000 15000. 6000. 18000 0 3000 6000. 12000. 15000. 18000 Frequency (MHz) Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark Freq Level Line Margin Level Factor Loss Factor Factor MHz dBuV/m dBuV/m dB dBuV dB/m dB -- PEAK -- PEAK deg -- PEAK MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB 1 4880.00 39.70 74.00 -34.30 58.95 34.14 12.47 65.86 0.00 CM 1 4880.00 40.15 74.00 -33.85 59.40 34.14 12.47 65.86 0.00 2 7044.00 48.58 74.00 -25.42 62.85 35.59 14.49 64.35 0.00

-- PEAK

2 7320.00 42.47 74.00 -31.53 57.19 35.76 14.72 65.20 0.00

3 7320.00 41.72 74.00 -32.28 56.44 35.76 14.72 65.20 0.00

-- PEAK

Report No.: FR480203B 6 Mode **Band Edge** 2400-2483.5_Bluetooth-LE _CH39_2480MHz **ANT** Pol. Horizontal **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 FCC PART 150 65.0 65.0 **Peak** 32.5 32.5 16.3 16.3 1000 2440 4. 2476. Frequency (MHz) 2452. 2500 1400. 0. 2200. Frequency (MHz) 3000 Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB MHz dBuV/m dBuV/m dB dBuV dB/m dB dB cm deg cm deg 1 2487.04 56.26 74.00 -17.74 40.30 32.37 8.24 30.65 6.00 1 2480.00 95.04 ----- 79.11 32.36 8.23 30.66 6.00 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 FCC PART 15C (AVG) FCC PART 15C (AVG Avg 32.5 32.5 16.3 16.3 0<u>—</u> 2440 1000 2452. 2476. 2488. 2500 1400. 2600. 3000 Frequency (MHz) Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos

Remark

deg

CM

dB

Freq Level Line Margin Level Factor Loss Factor Factor

1 2485.12 44.30 54.00 -9.70 28.34 32.37 8.24 30.65 6.00 106 135 AVERAGE

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB

Freq Level Line Margin Level Factor Loss Factor Factor

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB

1 2480.00 94.05 ----- 78.12 32.36 8.23 30.66 6.00

cm deg

Remark

135 AVERAGE

Report No.: FR480203B 6 Mode **Band Edge** 2400-2483.5_Bluetooth-LE _CH39_2480MHz **ANT** Pol. Vertical **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 FCC PART 150 65.0 65.0 **Peak** 32.5 32.5 16.3 16.3 1000 2440 4. 2476. Frequency (MHz) 2452. 2500 1400. 0. 2200. Frequency (MHz) 3000 Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB MHz dBuV/m dBuV/m dB dBuV dB/m dB dB cm deg cm deg 1 2483.68 55.09 74.00 -18.91 39.14 32.37 8.23 30.65 6.00 1 2480.00 97.66 ----- 81.73 32.36 8.23 30.66 6.00 273 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 FCC PART 15C (AVG) FCC PART 15C (AVG Avg 32.5 32.5 16.3 16.3 0<u>—</u> 2440 1000 2452. 2476. 2488. 2500 1400. 2600. 3000

Limit

Freq Level Line Margin Level Factor Loss Factor Factor

1 2483.68 44.75 54.00 -9.25 28.80 32.37 8.23 30.65 6.00 273 19 AVERAGE

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB

Frequency (MHz)

Read Ant Cable Preamp Aux APos TPos

dB

cm deg

Remark

Freq Level Line Margin Level Factor Loss Factor Factor

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB

1 2480.00 96.75 ----- 80.82 32.36 8.23 30.66 6.00

Limit

Frequency (MHz)

Read Ant Cable Preamp Aux APos TPos

Remark

19 AVERAGE

deg

CM

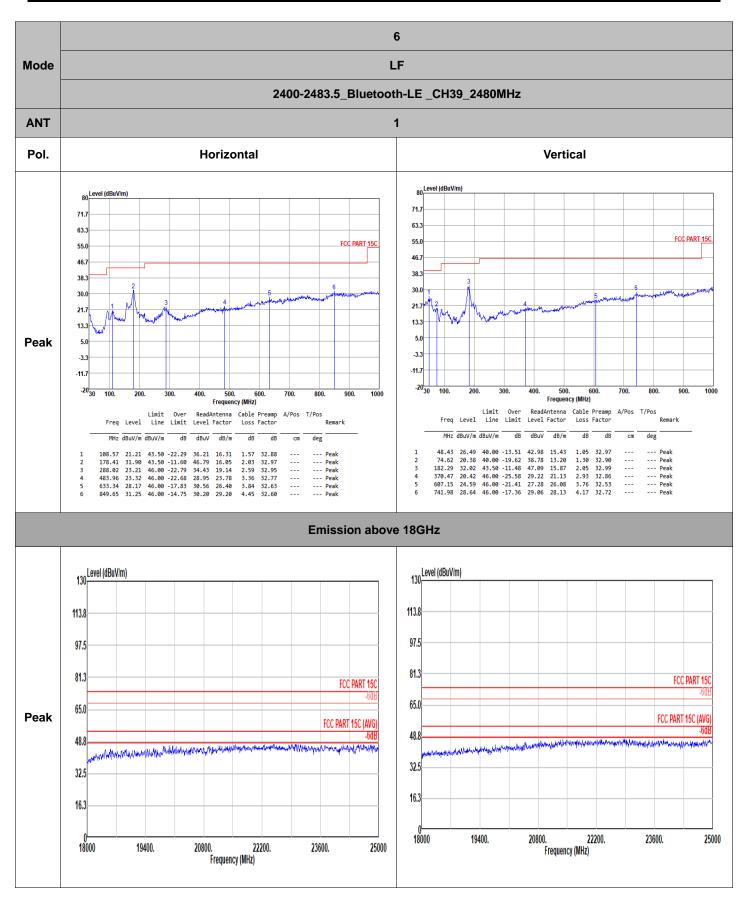
6 Mode Harmonic 2400-2483.5_Bluetooth-LE _CH39_2480MHz **ANT** Pol. Horizontal Vertical 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 FCC PART 15C (AVG FCC PART 15C (AVG 48.8 48.8 **Peak** 32.5 32.5 Avg 16.3 16.3 0 3000 15000. 6000. 18000 0 3000 6000. 12000. 15000. 18000 Frequency (MHz) Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark Freq Level Line Margin Level Factor Loss Factor Factor MHz dBuV/m dBuV/m dB dBuV dB/m dB -- PEAK -- PEAK deg -- PEAK MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB 1 4960.00 40.90 74.00 -33.10 60.33 33.94 12.38 65.75 0.00 CM 1 4960.00 39.70 74.00 -34.30 59.13 33.94 12.38 65.75 0.00 2 6613.00 47.11 74.00 -26.89 60.19 35.55 14.27 62.90 0.00

-- PEAK

2 7440.00 43.27 74.00 -30.73 58.12 35.80 14.92 65.57 0.00

3 7440.00 42.79 74.00 -31.21 57.64 35.80 14.92 65.57 0.00

-- PEAK



21 Mode Band Edge - L 2400-2483.5_Bluetooth-LE_GSFK_CH39_2480MHz **ANT** Pol. Horizontal **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 97.5 97.5 81.3 81.3 FCC PART 15C 65.0 48.8 48.8 **Peak** 32.5 32.5 16.3 16.3 1000 1400. 1800. 2200. 2600. 3000 2440 +. 2476. Frequency (MHz) 2452. 2488. 2500 Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB CM deg MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB 1 2462.00 103.97 ----- 95.23 32.42 7.22 36.90 6.00 cm deg 176 Peak 100 1 2484.34 67.11 74.00 -6.89 58.23 32.47 7.26 36.85 6.00 100 176 PEAK 2 2480.00 91.02 ----- 82.17 32.46 7.25 36.86 6.00 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 FCC PART 15C (AVG FCC PART 15C (AVG) 48.8 48.8 Avg 32.5 32.5 16.3 16.3 1000 3000 1400. 1800. 2200. 2440 Frequency (MHz) 2452. 2464. 2476. 2488. 2500 Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg MHz dBuV/m dBuV/m dB dBuV dB/m dB dB 1 2462.00 94.32 ----- 85.58 32.42 7.22 36.90 6.00 dB deg 176 AVERAGE CM 100

1 2483.50 48.68 54.00 -5.32 39.80 32.47 7.26 36.85 6.00 100 176 AVERAGE

TEL: +86-512-57900158 FCC ID: XMR2024SC200EAU 2 2480.00 90.09 ----- 81.24 32.46 7.25 36.86 6.00

100

176 AVERAGE

Report No.: FR480203B 21 Band Edge - L Mode 2400-2483.5_Bluetooth-LE_GSFK_CH39_2480MHz **ANT** Pol. Vertical **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 97.5 97.5 81.3 81.3 65.0 48.8 **Peak** 32.5 32.5 16.3 16.3 1000 1400. 2200. 2600. 3000 2440 2452. 4. 2476. Frequency (MHz) 2500 Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB CM deg MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB 1 2462.00 104.03 ----- 95.29 32.42 7.22 36.90 6.00 cm deg 360 Peak 272 1 2483.62 72.01 74.00 -1.99 63.13 32.47 7.26 36.85 6.00 272 360 PEAK 2 2480.00 94.15 ----- 85.30 32.46 7.25 36.86 6.00 360 Peak 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 81.3 81.3 65.0 FCC PART 15C (AV FCC PART 15C (AVG 48.8 Avg 32.5 32.5 16.3 16.3 1000 1400. 3000 1800. 2600. 0<u>—</u> 2440 Frequency (MHz) 2452. 2476. 2488. 2500 Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor

Remark

deg

CM

dB

Freq Level Line Margin Level Factor Loss Factor Factor

1 2483.86 51.65 54.00 -2.35 42.77 32.47 7.26 36.85 6.00 272 360 AVERAGE

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB

TEL: +86-512-57900158 FCC ID: XMR2024SC200EAU MHz dBuV/m dBuV/m dB dBuV dB/m dB dB

1 2462.00 94.27 ----- 85.53 32.42 7.22 36.90 6.00 272

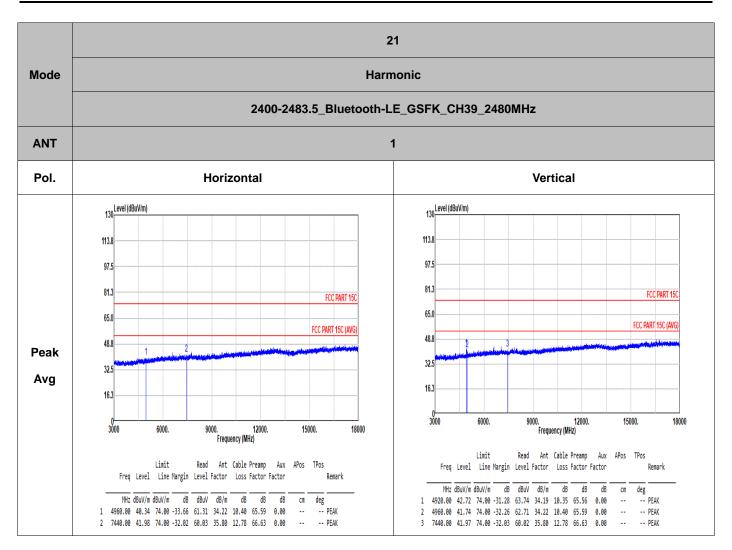
2 2480.00 93.18 ----- 84.33 32.46 7.25 36.86 6.00 272

cm deg

360 AVERAGE

360 AVERAGE

dB



TEL: +86-512-57900158 FCC ID: XMR2024SC200EAU

Report No.: FR480203B 21 Mode **Band Edge** 2400-2483.5_802.11g_CH11_2462MHz **ANT** Pol. Horizontal **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 97.5 97.5 81.3 81.3 65.0 48.8 **Peak** 32.5 32.5 16.3 16.3 1000 1400. 2200. 2600. 3000 2440 2452. 4. 2476. Frequency (MHz) 2500 Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB CM deg MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB 1 2462.00 104.12 ----- 95.36 32.43 7.22 36.89 6.00 174 PEAK cm deg 101 1 2484.34 67.65 74.00 -6.35 58.77 32.47 7.26 36.85 6.00 101 174 PEAK 2 2480.00 90.80 ----- 81.95 32.46 7.25 36.86 6.00 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 81.3 81.3 65.0 FCC PART 15C (AV FCC PART 15C (AVG 48.8 Avg 32.5 32.5 16.3 16.3 1000 1400. 3000 1800. 2600. 0<u>—</u> 2440 Frequency (MHz) 2452. 2476. 2488. 2500 Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos

Limit

Freq Level Line Margin Level Factor Loss Factor Factor

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB

1 2484.46 49.74 54.00 -4.26 40.86 32.47 7.26 36.85 6.00

Read Ant Cable Preamp Aux APos TPos

dB

Remark

deg

101 174 AVERAGE

CM

Freq Level Line Margin Level Factor Loss Factor Factor

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB

1 2462.00 91.90 ----- 83.16 32.42 7.22 36.90 6.00

2 2480.00 89.54 ----- 80.69 32.46 7.25 36.86 6.00 101

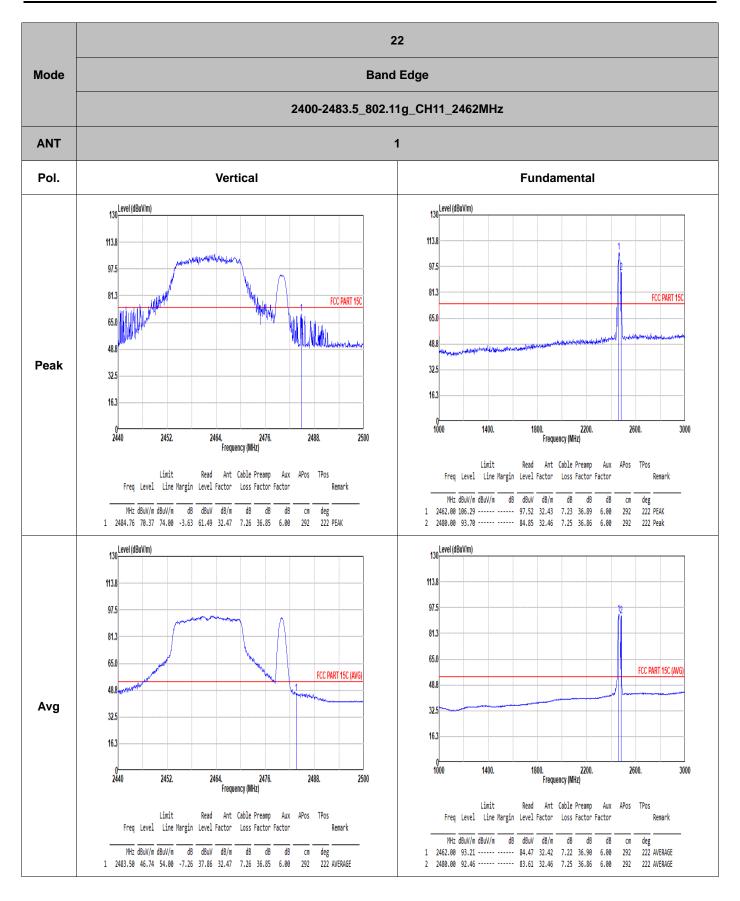
101

174 AVERAGE

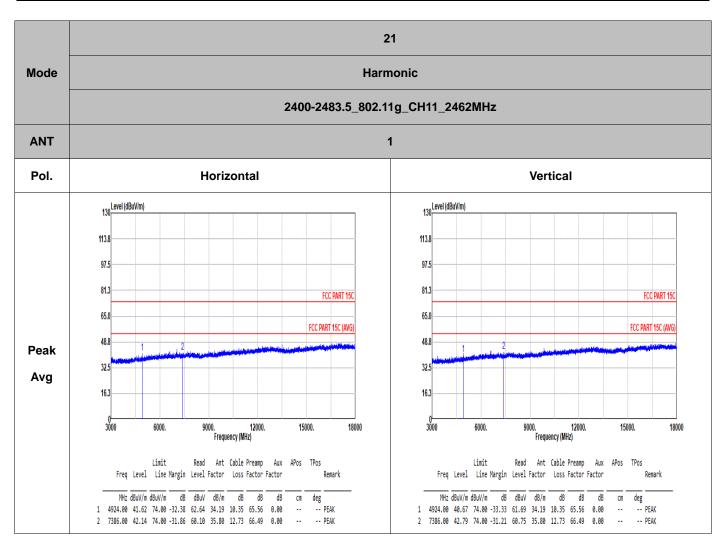
174 AVERAGE

dB cm deg

SPORTON LAB.	FCC RF Test Report

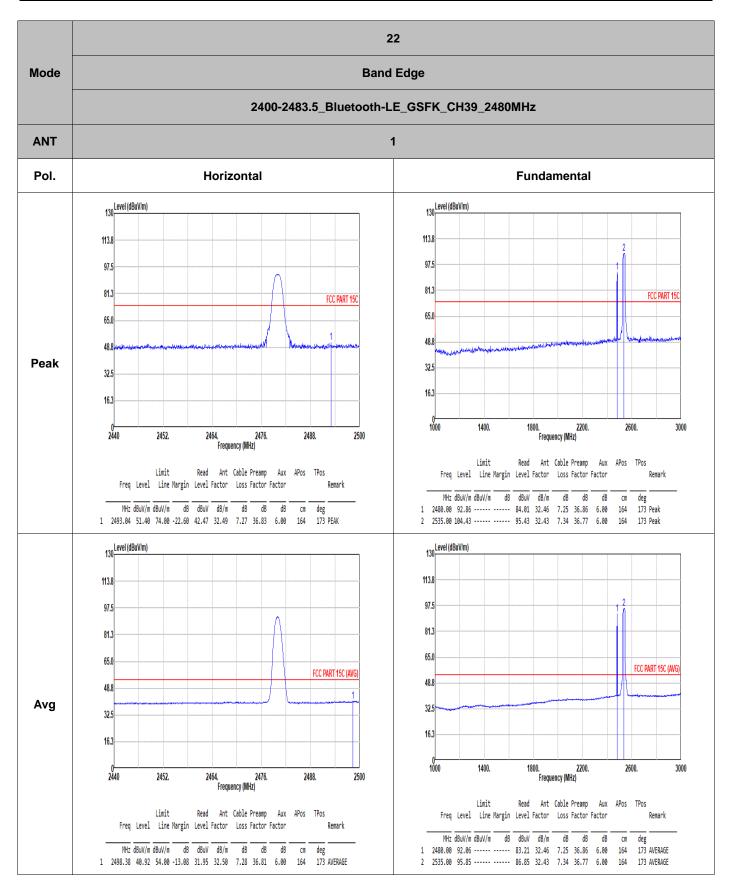


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FCC RF Test Report



TEL: +86-512-57900158 FCC ID: XMR2024SC200EAU

Report No.: FR480203B 23 Mode **Band Edge** 2400-2483.5_Bluetooth-LE_GSFK_CH39_2480MHz **ANT** Pol. Vertical **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 97.5 97.5 81.3 81.3 FCC PART 150 65.0 65.0 48.8 **Peak** 32.5 32.5 16.3 16.3 1000 1400. 2200. 2600. 3000 2440 4. 2476. Frequency (MHz) 2452. 2500 Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB CM deg MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB 1 2480.00 94.46 ----- 85.61 32.46 7.25 36.86 6.00 173 Peak cm deg 232 1 2483.50 52.69 74.00 -21.31 43.81 32.47 7.26 36.85 6.00 232 173 PEAK 2 2535.00 110.01 ----- 101.01 32.43 7.34 36.77 6.00 232 173 Peak 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 81.3 81.3 65.0 65.0 FCC PART 15C (AV FCC PART 15C (AVG 48.8 Avg 32.5 32.5 16.3 16.3 1000 1400. 3000 1800. 2600. 2440 Frequency (MHz) 2452. 2476. 2488. 2500 Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor

Remark

deg

232 173 AVERAGE

CM

dB

Freq Level Line Margin Level Factor Loss Factor Factor

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB

1 2498.62 41.76 54.00 -12.24 32.79 32.50 7.28 36.81 6.00

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB

1 2480.00 93.46 ----- 84.61 32.46 7.25 36.86 6.00 232

2 2535.00 100.48 ----- 91.48 32.43 7.34 36.77 6.00 232

cm deg

173 AVERAGE

173 AVERAGE

dB

22 Mode Harmonic 2400-2483.5_Bluetooth-LE_GSFK_CH39_2480MHz **ANT** Pol. Horizontal Vertical 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 97.5 97.5 81.3 81.3 65.0 65.0 FCC PART 15C (AVG) FCC PART 15C (AVG 48.8 48.8 **Peak** 32.5 32.5 Avg 16.3 16.3 0 3000 3000 6000. 12000. 15000. 18000 6000. 12000. 15000. 18000 Frequency (MHz) Frequency (MHz) Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor cm deg deg -- PEAK MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB MHz dBuV/m dBuV/m dB dBuV dB/m dB dB CM 1 4960.00 40.25 74.00 -33.75 61.22 34.22 10.40 65.59 0.00 1 4960.00 41.32 74.00 -32.68 62.29 34.22 10.40 65.59 0.00 2 7440.00 42.85 74.00 -31.15 60.90 35.80 12.78 66.63 0.00 2 7440.00 42.86 74.00 -31.14 60.91 35.80 12.78 66.63 0.00 -- PEAK -- PEAK

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Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
Bluetooth LE 1Mbps	62.50	0.391	2.556	2.7KHz

Bluetooth LE 1Mbps

