FCC RF Test Report

APPLICANT : Xiaomi Communications Co., Ltd.

EQUIPMENT: Tablet Computer

BRAND NAME : Xiaomi

MODEL NAME : 24091RPADG FCC ID : 2AFZZ1RPADG

STANDARD : FCC Part 15 Subpart C §15.247

CLASSIFICATION : (DSS) Spread Spectrum Transmitter

TEST DATE(S) : Nov. 06, 2024 ~ Nov. 09, 2024

We, Sporton International Inc. (ShenZhen), 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.

This report contains data that were produced under subcontract by Sporton International Inc. (KunShan)

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



Approved by: Jason Jia





Report No.: FR480902-02A

Sporton International Inc. (ShenZhen)

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055

People's Republic of China

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 1 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

TABLE OF CONTENTS

RE'	VISIO	N HISTORY	3
SU	MMAR	RY OF TEST RESULT	4
1	GEN	ERAL DESCRIPTION	5
	1.1	Applicant	5
	1.2	Manufacturer	5
	1.3	Product Feature of Equipment Under Test	5
	1.4	Product Specification of Equipment Under Test	5
	1.5	Modification of EUT	6
	1.6	Testing Location	6
	1.7	Test Software	_
	1.8	Applicable Standards	7
2	TEST	CONFIGURATION OF EQUIPMENT UNDER TEST	8
	2.1	Carrier Frequency Channel	8
	2.2	Test Mode	
	2.3	Connection Diagram of Test System	10
	2.4	EUT Operation Test Setup	10
	2.5	Measurement Results Explanation Example	
3	TEST	RESULT	11
	3.1	Output Power Measurement	
	3.2	Conducted Band Edges Measurement	13
	3.3	Conducted Spurious Emission Measurement	14
	3.4	Radiated Band Edges and Spurious Emission Measurement	15
	3.5	Antenna Requirements	19
4	LIST	OF MEASURING EQUIPMENT	20
5	MEAS	SUREMENT UNCERTAINTY	21
		IX A. CONDUCTED TEST RESULTS	
AP	PEND	IX B. RADIATED SPURIOUS EMISSION	
AP	PEND	IX C. DUTY CYCLE PLOTS	
AP	PEND	IX D. SETUP PHOTOGRAPHS	

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 2 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No. : FR480902-02A

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR480902-02A	Rev. 01	Initial issue of report	Dec. 02, 2024

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 3 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01
Report Template No.: BU5-FR15CBT Version 2.0

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
-	15.247(a)(1)	Number of Channels	≥ 15Chs	Not Required	-
-	15.247(a)(1)	Hopping Channel Separation	≥ 2/3 of 20dB BW	Not Required	-
_	15.247(a)(1)	Dwell Time of Each Channel	≤ 0.4sec in 31.6sec period	Not Required	-
-	15.247(a)(1)	20dB Bandwidth	-	Report only	-
-	-	99% Bandwidth	-	Report only	-
3.1	15.247(b)(1)	Peak Output Power	≤ 125 mW	Pass	-
3.2	15.247(d)	Conducted Band Edges	≤ 20dBc	Pass	-
3.3	15.247(d)	Conducted Spurious Emission	≤ 20dBc	Pass	-
3.4	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 11.08 dB at 41.640 MHz
-	15.207	AC Conducted Emission	15.207(a)	Not Required	-
3.5	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass	-

Remark:

- 1. Not required means after assessing, test items are not necessary to carry out.
- 2. This is a variant report for 24091RPADG, the difference is to add a 2.4 GHz filter. Based on the similarity between current and previous project, only the related test cases from original test report (Sporton Report Number FR480902A) were verified for the differences.

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.

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 4 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

1 General Description

1.1 Applicant

Xiaomi Communications Co., Ltd.

#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

1.2 Manufacturer

Xiaomi Communications Co., Ltd.

#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

1.3 Product Feature of Equipment Under Test

Product Feature				
Equipment	Tablet Computer			
Brand Name	Xiaomi			
Model Name 24091RPADG				
FCC ID	2AFZZ1RPADG			
SN Code	Conducted: 49eb418e Radiation: 9P439K000030			
HW Version	135100O81			
SW Version	Xiaomi HyperOS 2.0			
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	79			
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78			
Maximum Output Power to Antenna	<ant0> Bluetooth EDR (3Mbps): 14.90 dBm (0.0309 W) <ant2> Bluetooth EDR (3Mbps): 14.60 dBm (0.0288 W) <mimo ant0+2=""> Bluetooth BR(1Mbps): 13.90 dBm (0.0245 W)</mimo></ant2></ant0>			
Antenna Type / Gain	<ant0>: PIFA Antenna with gain -3.8 dBi <ant2>: Resonant Cavity Antenna with gain -1.57 dBi</ant2></ant0>			
Type of Modulation	Bluetooth BR (1Mbps) : GFSK Bluetooth EDR (2Mbps) :π/4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK			

Note: the Bluetooth ANT 0 & ANT 2 can transmit simultaneously, they are correlated, the directional gain for power is selected the maximum gain among ANT 0 / ANT 2.

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TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 5 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

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.

Report No.: FR480902-02A

Test Firm	Sporton International Inc. (Kunshan)					
	No. 1098, Pengxi North	o. 1098, Pengxi North Road, Kunshan Economic 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.	rec besignation No.	Registration No.			
	03CH08-KS	CN1257	314309			

Note: Test data subcontracted: Radiation test case in section 3.4 of this report

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (Shenzhen)						
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595						
	Sporton Site No.	FCC Designation No.	FCC Test Firm				
Test Site No.	Sporton Site No.	i co besignation No.	Registration No.				
	TH01-SZ	CN1256	421272				

1.7 Test Software

Item	n Site	Manufacturer	Name	Version
1.	03CH08-KS	AUDIX	E3	210616

 Sporton International Inc. (ShenZhen)
 Page Number
 : 6 of 21

 TEL: +86-755-8637-9589
 Report Issued Date
 : Dec. 02, 2024

 FAX: +86-755-8637-9595
 Report Version
 : Rev. 01

FCC ID: 2AFZZ1RPADG Report Template No.: BU5-FR15CBT Version 2.0

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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TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 7 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report Template No.: BU5-FR15CBT Version 2.0

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	0	2402	27	2429	54	2456
	1	2403	28	2430	55	2457
	2	2404	29	2431	56	2458
	3	2405	30	2432	57	2459
	4	2406	31	2433	58	2460
	5	2407	32	2434	59	2461
	6	2408	33	2435	60	2462
	7	2409	34	2436	61	2463
	8	2410	35	2437	62	2464
	9	2411	36	2438	63	2465
	10	2412	37	2439	64	2466
	11	2413	38	2440	65	2467
	12	2414	39	2441	66	2468
2400-2483.5 MHz	13	2415	40	2442	67	2469
	14	2416	41	2443	68	2470
	15	2417	42	2444	69	2471
	16	2418	43	2445	70	2472
	17	2419	44	2446	71	2473
	18	2420	45	2447	72	2474
	19	2421	46	2448	73	2475
	20	2422	47	2449	74	2476
	21	2423	48	2450	75	2477
	22	2424	49	2451	76	2478
	23	2425	50	2452	77	2479
	24	2426	51	2453	78	2480
	25	2427	52	2454	-	-
	26	2428	53	2455	-	-

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TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 8 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

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 (Z plane) were recorded in this report, and the worst mode of radiated spurious emissions is Bluetooth 3Mbps mode, and recorded in this report.

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

Summary table of Test Cases							
		Data Rate / Modulation					
Test Item	Bluetooth BR 1Mbps	Bluetooth EDR 2Mbps	Bluetooth EDR 3Mbps				
	GFSK	π/4-DQPSK	8-DPSK				
Conducted	Mode 1: CH00_2402 MHz	Mode 4: CH00_2402 MHz	Mode 7: CH00_2402 MHz				
Test Cases	Mode 2: CH39_2441 MHz	Mode 5: CH39_2441 MHz	Mode 8: CH39_2441 MHz				
Test Cases	Mode 3: CH78_2480 MHz	Mode 6: CH78_2480 MHz	Mode 9: CH78_2480 MHz				
Radiated Bluetooth EDR 3Mbps 8-DPSK							
Test Cases		Mode 1: CH78_2480 MHz					

Remark:

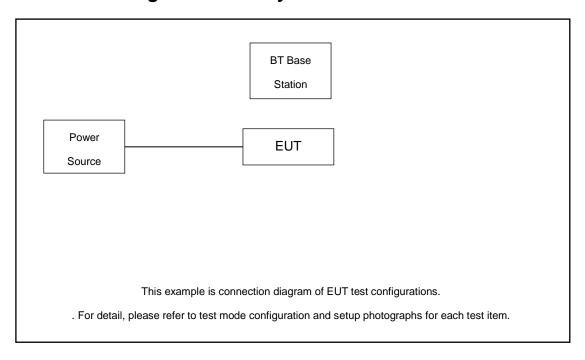
- 1. For radiated test cases, the worst mode data rate 3Mbps was reported only, because this data rate has the highest RF output power at preliminary tests, and no other significantly frequencies found in conducted spurious emission.
- 2. For Radiated Test Cases, The tests were performed with Adapter and USB Cable.

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TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 9 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

2.3 Connection Diagram of Test System



2.4 EUT Operation Test Setup

For Bluetooth function, the engineering test program was provided and enabled to make EUT connect with Bluetooth base station to continuous transmit.

2.5 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 and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 2.04 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).
=
$$2.04 + 10 = 12.04$$
 (dB)

Report Version : Rev. 01
Report Template No.: BU5-FR15CBT Version 2.0

Report Issued Date: Dec. 02, 2024

: 10 of 21

Page Number

3 Test Result

3.1 Output Power Measurement

3.1.1 Limit of Output Power

The maximum peak conducted output power of the intentional radiator shall not exceed the following: For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts. The power limit for 1Mbps, 2Mbps, 3Mbps and AFH modes are 0.125 watts.

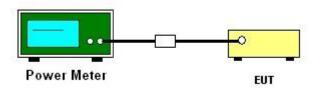
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 7.8.5.
- 1. 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.
- 2. Set to the maximum power setting and enable the EUT transmit continuously.
- 3. Measure the conducted output power with cable loss and record the results in the test report.
- 4. Measure and record the results in the test report.

3.1.4 Test Setup



Page Number : 11 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

3.1.5 Test Result of Peak Output Power

<SISO_ANT0>

DH	CH.	NTX	Peak Power	Power Limit (dBm)	Test
υп		CH. NIX	(dBm)	Power Limit (dbin)	Result
3DH5	78	1	14.90	20.97	Pass

<SISO_ANT2>

2DH	CH.	NTX	Peak Power	Power Limit (dBm)	Test
2011		. NIX	(dBm)	Fower Limit (ubin)	Result
3DH5	39	1	14.60	20.97	Pass

<MIMO ANT0+2>

3DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
DH5	0	MIMO	13.90	20.97	Pass

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 12 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No. : FR480902-02A

3.2 Conducted Band Edges Measurement

3.2.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

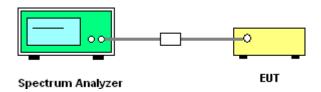
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 7.8.6.
- 2. Set to the maximum power setting and enable the EUT transmit continuously.
- Set RBW = 100kHz, VBW = 300kHz. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.
- 4. Enable hopping function of the EUT and then repeat step 2. and 3.
- 5. Measure and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Conducted Band Edges

Please refer to Appendix A.

3.2.6 Test Result of Conducted Hopping Mode Band Edges

Please refer to Appendix A.

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TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 13 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

3.3 Conducted Spurious Emission Measurement

3.3.1 Limit of Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

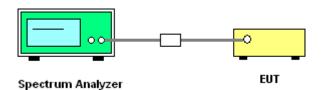
3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedure

- 1. The testing follows ANSI C63.10-2013 clause 7.8.8.
- 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. Set RBW = 100 kHz, VBW = 300kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
- 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.

3.3.4 Test Setup



3.3.5 Test Result of Conducted Spurious Emission

Please refer to Appendix A.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 14 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

3.4 Radiated Band Edges and Spurious Emission Measurement

3.4.1 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. 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

3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 15 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

3.4.3 Test Procedures

- 1. 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.
- 2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- 3. For each suspected emission, 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 to comply with the guidelines.
- 4. Set to the maximum power setting and enable the EUT transmit continuously.
- 5. 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, RBW=1MHz for f>1GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
 - (3) For average measurement: use duty cycle correction factor method per 15.35(c).

Duty cycle = On time/100 milliseconds

On time = $N_1*L_1+N_2*L_2+...+N_{n-1}*LN_{n-1}+N_n*L_n$

Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.

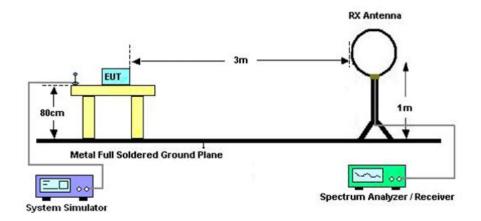
Average Emission Level = Peak Emission Level + 20*log(Duty cycle)

- 6. Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor = Level
- 7. 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.
- 8. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than 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.

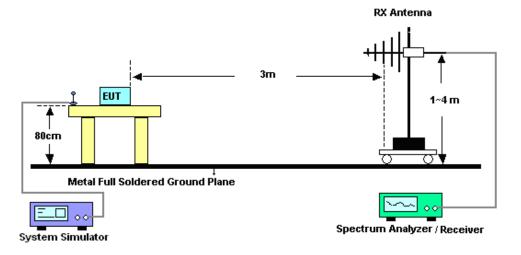
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (-24.79dB) derived from 20log (dwell time/100ms). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

3.4.4 Test Setup

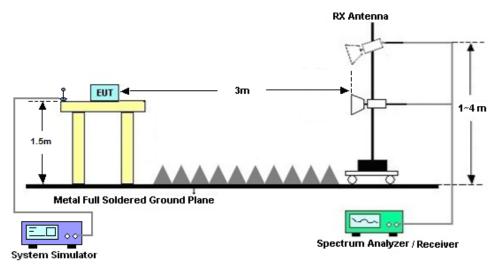
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 17 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

3.4.5 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.

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

3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

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

Please refer to Appendix B.

3.4.8 Duty cycle correction factor for average measurement

Please refer to Appendix C.

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TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 18 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

3.5 Antenna Requirements

3.5.1 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.

3.5.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.5.3 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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TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 19 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	Keysight	N9038A	MY564000 23	3Hz~8.5GHz;M ax 30dBm	Jan. 02, 2024	Nov. 09, 2024	Jan. 01, 2025	Radiation (03CH08-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY574410 79	10Hz-44GHz	Oct. 09, 2024	Nov. 09, 2024	Oct. 08, 2025	Radiation (03CH08-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 08, 2024	Nov. 09, 2024	Sep. 07, 2025	Radiation (03CH08-KS)
Bilog Antenna	TESEQ	CBL 6111D	59915	30MHz-1GHz	Aug. 18, 2024	Nov. 09, 2024	Aug.17, 2025	Radiation (03CH08-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00240138	1GHz~18GHz	Jul. 06, 2024	Nov. 09, 2024	Jul. 05, 2025	Radiation (03CH08-KS)
high gain Amplifier	EM	EM01G18GA	060845	1Ghz-18Ghz	Jan. 03, 2024	Nov. 09, 2024	Jan. 02, 2025	Radiation (03CH08-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 27, 2024	Nov. 09, 2024	Jan. 26, 2025	Radiation (03CH08-KS)
Amplifier	SONOMA	310N	413741	9KHz-1GHz	Jan. 02, 2024	Nov. 09, 2024	Jan. 01, 2025	Radiation (03CH08-KS)
Amplifier	Keysight	83017A	MY532704 17	500MHz~26.5G Hz	Oct. 09, 2024	Nov. 09, 2024	Oct. 08, 2025	Radiation (03CH08-KS)
Amplifier	EM	EM18G40GG A	060728	18~40GHz	Jan. 02, 2024	Nov. 09, 2024	Jan. 01, 2025	Radiation (03CH08-KS)
AC Power Source	Chroma	61601	616010002 473	N/A	NCR	Nov. 09, 2024	NCR	Radiation (03CH08-KS)
Turn Table	EM	EM 1000-T	N/A	0~360 degree	NCR	Nov. 09, 2024	NCR	Radiation (03CH08-KS)
Antenna Mast	EM	EM 1000-A	N/A	1 m~4 m	NCR	Nov. 09, 2024	NCR	Radiation (03CH08-KS)
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 09, 2024	Nov. 06, 2024	Apr. 08, 2025	Conducted (TH01-SZ)
Pulse Power Senor	Anritsu	MA2411B	1339473	30MHz~40GHz	Dec. 29, 2023	Nov. 06, 2024	Dec. 28, 2024	Conducted (TH01-SZ)
Thermo meter	Anymetre	JR593	#7	- 10℃ ~ 50℃ 10%RH~99%R H	Apr. 09, 2024	Nov. 06, 2024	Apr. 08, 2025	Conducted (TH01-SZ)

NCR: No Calibration Required

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 20 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

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

Test Item	Uncertainty
Conducted Spurious Emission & Bandedge	±1.34 dB
Occupied Channel Bandwidth	±0.012 MHz
Conducted Power	±1.34 dB
Conducted Power Spectral Density	±1.32 dB
Frequency	±1.3 Hz

<u>Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)</u>

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

<u>Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)</u>

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

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

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

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

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

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

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TEL: +86-755-8637-9589

FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : 21 of 21
Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No.: FR480902-02A

Appendix A. Conducted Test Results

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number

: A1 of A1



Ambient Condition: $\underline{24\text{-}26}$ $^{\circ}\text{C}$, $\underline{45\text{-}55}$ %RH

Test Date: 2024.11.6 Test Engineer: Chen ZhiQiang

<BT SISO mode>

Band edge measurements

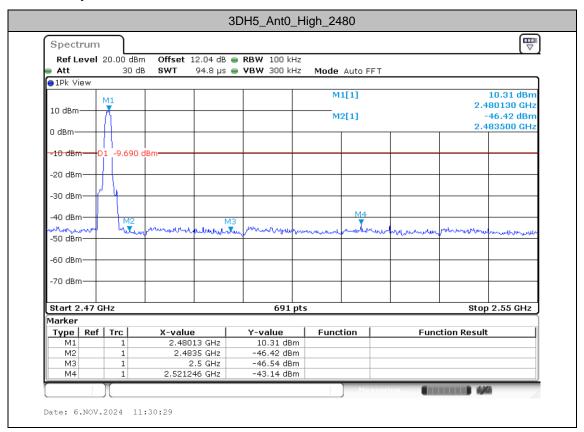
Test Result

TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
3DHE	Ant0	High	2480	10.31	-43.14	≤-9.69	PASS
3DH5	Ant2	High	Hop_2480	9.31	-44.48	≤-10.69	PASS

Sporton International Inc. (ShenZhen)

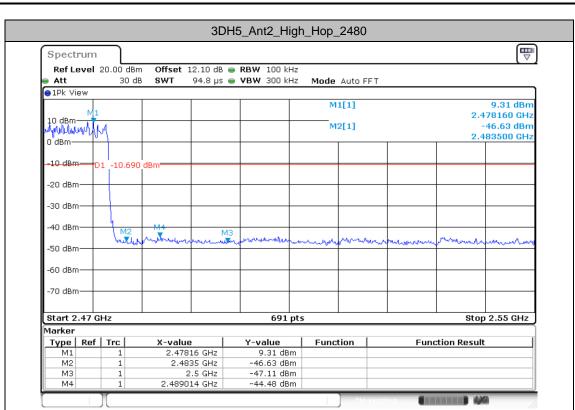
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Page Number : A1-1 of 8

Test Graphs



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG : A1-2 of 8

Date: 6.NOV.2024 11:36:14



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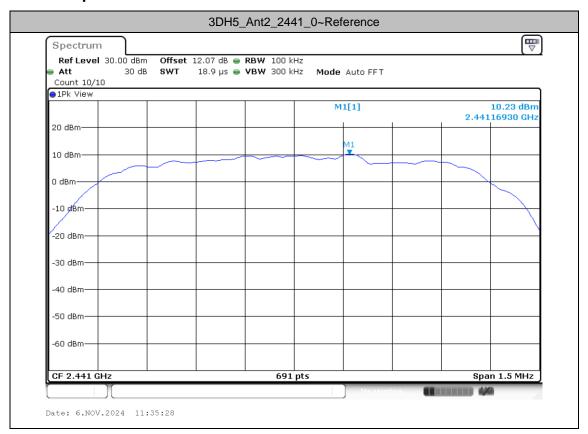
Conducted Spurious Emission

Test Result

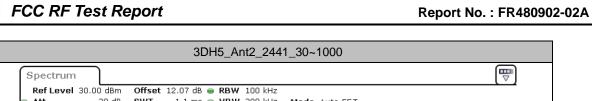
TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
		2441	Reference	10.23	10.23		PASS
3DH5	Ant2		30~1000	10.23	-45.36	≤-9.77	PASS
			1000~26500	10.23	-36.18	≤-9.77	PASS
	Ant0	2480	Reference	10.21	10.21		PASS
			30~1000	10.21	-45.26	≤-9.79	PASS
			1000~26500	10.21	-35.83	≤-9.79	PASS

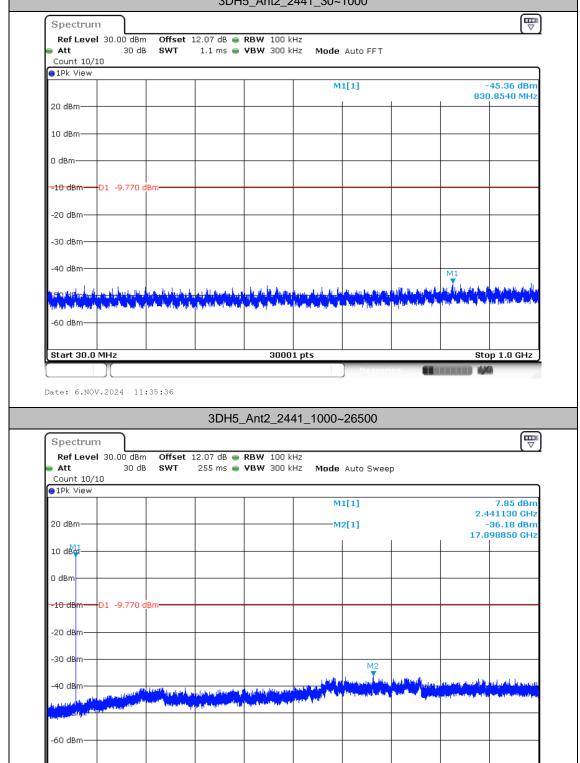
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Test Graphs



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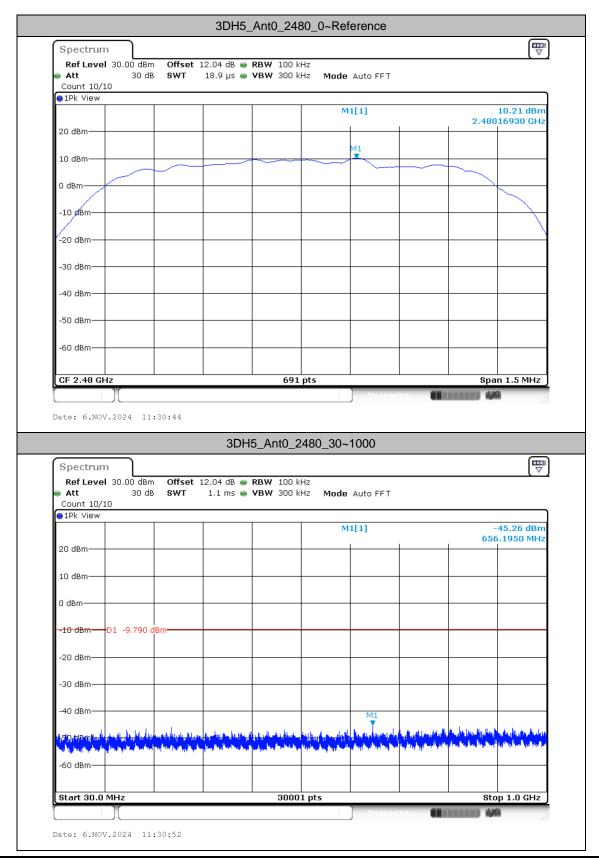
30001 pts

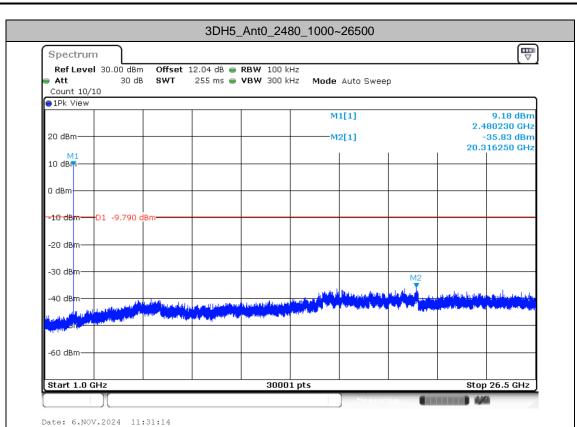
Start 1.0 GHz

Date: 6.Nov.2024 11:35:58

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG Stop 26.5 GHz







<BT MIMO mode>

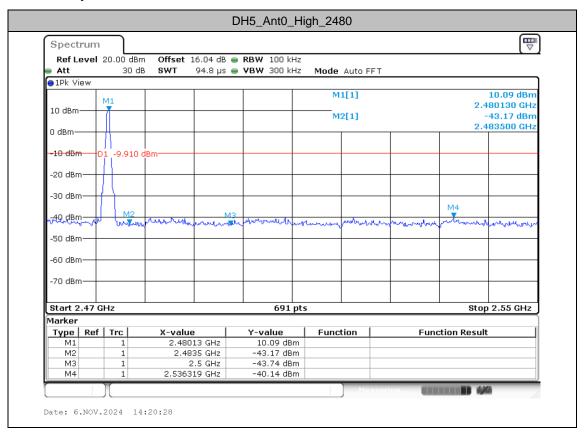
Band edge measurements

Test Result

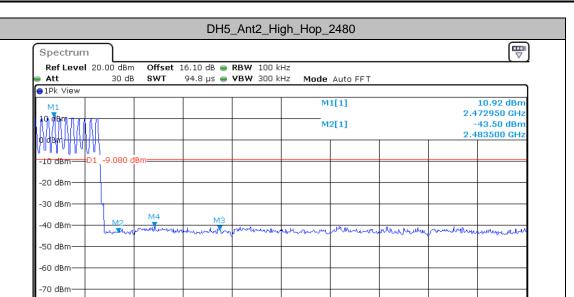
TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant0	High	2480	10.09	-40.14	≤-9.91	PASS
טחט	Ant2	High	Hop_2480	10.92	-40.63	≤-9.08	PASS

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Test Graphs



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Stop 2.55 GHz Start 2.47 GHz 691 pts Marker Type | Ref | Trc | Function **Function Result** X-value Y-value 2.47295 GHz 10.92 dBm 2.4835 GHz М2 -43.50 dBm 2.5 GHz 2.489362 GHz МЗ -42.35 dBm -40.63 dBm Μ4 Date: 6.NOV.2024 14:21:43

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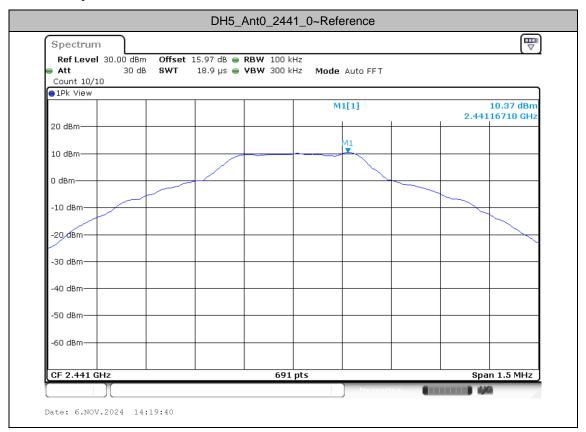
Conducted Spurious Emission

Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
		2441	Reference	10.37	10.37		PASS
DH5 -	Ant0		30~1000	10.37	-41.71	≤-9.63	PASS
			1000~26500	10.37	-32.24	≤-9.63	PASS
	Ant2	2441	Reference	10.37	10.37		PASS
			30~1000	10.37	-41.66	≤-9.63	PASS
			1000~26500	10.37	-32.49	≤-9.63	PASS

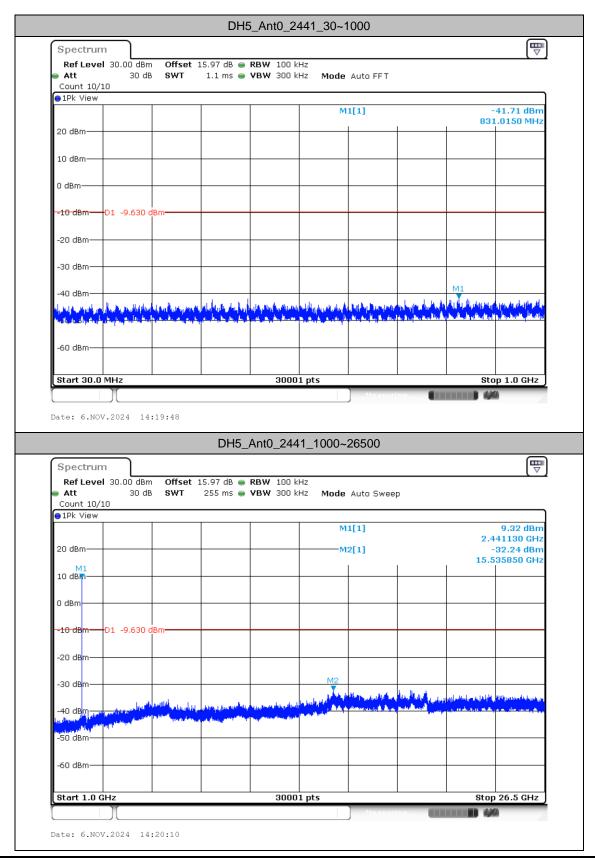
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG

Test Graphs

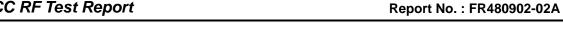


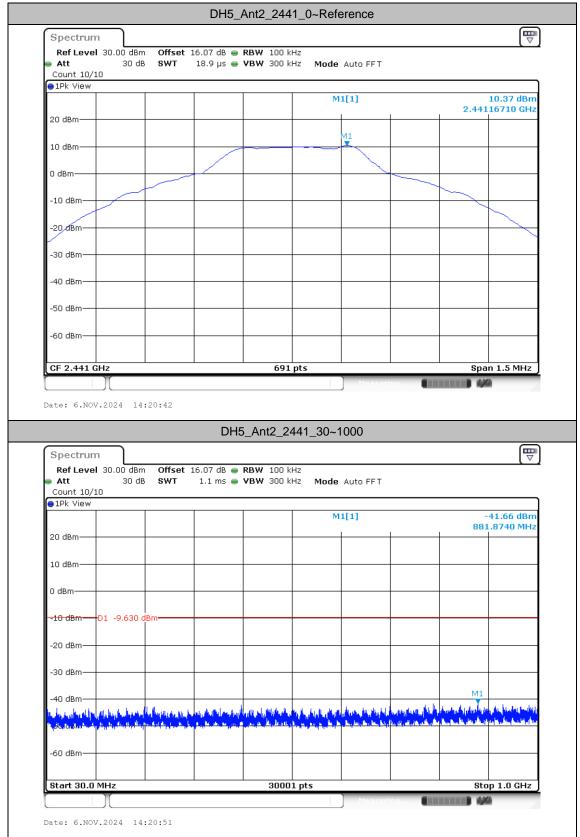
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG : A2-5 of 8

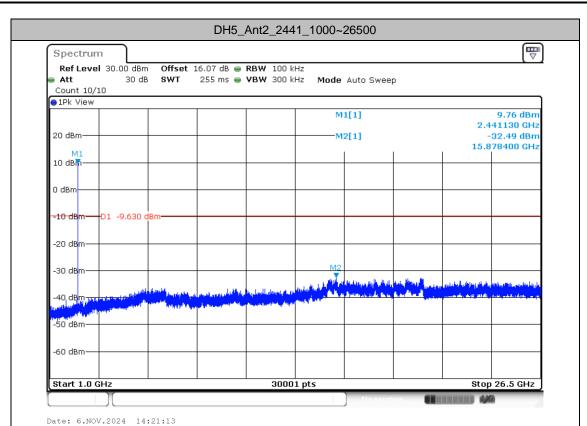




Page Number : A2-6 of 8







: A2-8 of 8

Appendix B. Radiated Spurious Emission Test Data

Test Engineer :	Koi Ji	Relative Humidity :	51-52%	
		Temperature :	20.9-21.4℃	

Report No.: FR480902-02A

Radiated Spurious Emission Test Modes

Mode	Band (MHz)	Antenna	Modulation	Channel Frequency		Data Rate	RU	Remark
Mode 1	2400-2483.5	0	Bluetooth BR_GFSK	78	2480	1Mbps	-	-

Summary of each worse mode

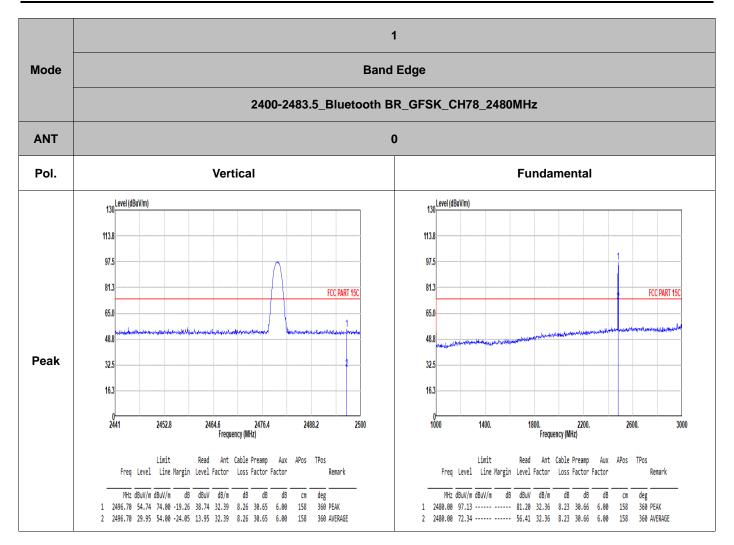
Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
1	Bluetooth BR_GFSK	78	2496.70	54.74	74.00	-19.26	٧	PEAK	Pass	Band Edge
1	Bluetooth BR_GFSK	78	7440.00	43.64	74.00	-30.36	Н	PEAK	Pass	Harmonic

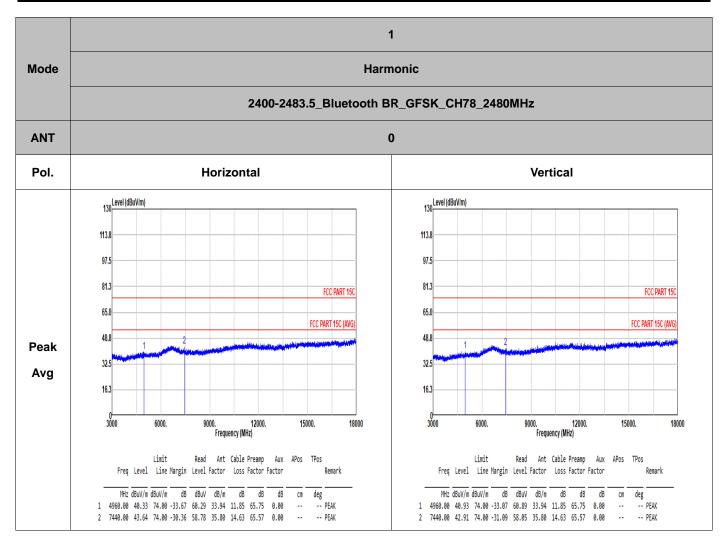
Sporton International Inc. (ShenZhen) Page Number : B1 of B6

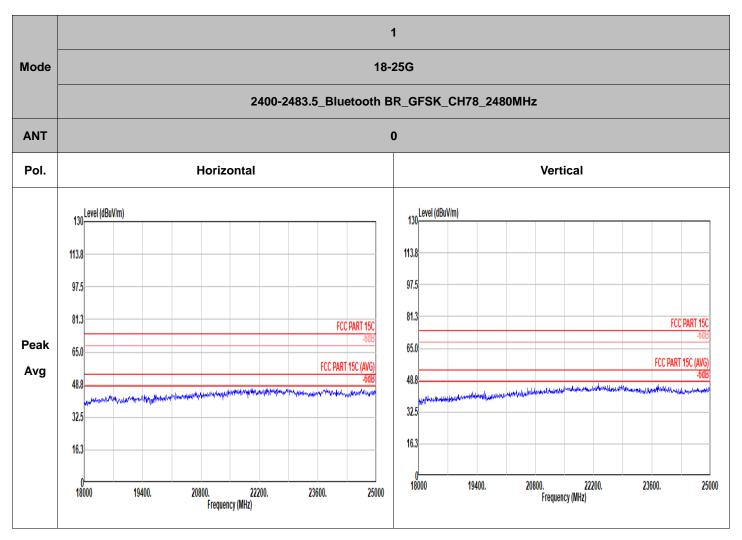
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG

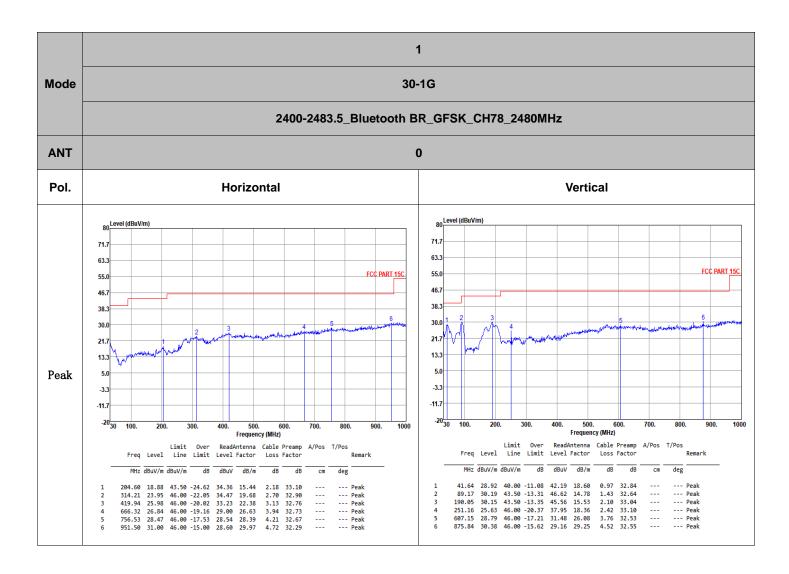
1 Mode **Band Edge** 2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz 0 **ANT** Pol. Horizontal **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 FCC PART 15C FCC PART 15C 65.0 65.0 48.8 **Peak** 32.5 32.5 16.3 2476.4 Frequency (MHz) 2441 1000 0, 2200. Frequency (MHz) 2452.8 2500 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 MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB 1 2485.96 54.73 74.00 -19.27 38.77 32.37 8.24 30.65 6.00 71 PEAK 1 2480.00 96.69 ----- 80.76 32.36 8.23 30.66 6.00 309 71 PEAK 2 2485.96 29.94 54.00 -24.06 13.98 32.37 8.24 30.65 6.00 309 71 AVERAGE 2 2480.00 71.90 ----- 55.97 32.36 8.23 30.66 6.00 309 71 AVERAGE

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG







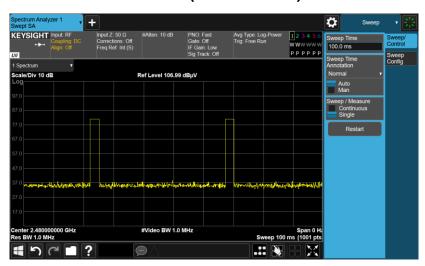


Appendix C. Duty Cycle Plots

DH5 on time (One Pulse) Plot



DH5 on time (Count Pulses) Plot



Note:

- 1. Worst case Duty cycle = on time/100 milliseconds = $2 \times 2.88 / 100 = 5.76 \%$
- 2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
- 3. DH5 has the highest duty cycle worst case and is reported.

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