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 : (DTS) Digital Transmission System

TEST DATE(S) : Oct. 26, 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.

JasonJia

Approved by: Jason Jia





Report No.: FR480902-02B

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)

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR480902-02B	Rev. 01	Initial issue of report	Dec. 02, 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	-
-	-	99% Bandwidth	-	Not Required	-
3.2	15.247(b)(3)	Peak Output Power	≤ 30dBm	Pass	-
-	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Not Required	-
3.3	15.247(d)	Conducted Band Edges and Spurious Emission	≤ 30dBc	Pass	-
3.4	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 8.92 dB at 2486.92 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 FR480902B) 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.

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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

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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: 6287b57e 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	40			
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)			
Maximum Output Power to Antenna (Average Power)	<siso_ant0> BLE 125Kbps: 5.55 dBm (0.0036 W) BLE 2Mbps: 5.52 dBm (0.0036 W) <siso_ant2> BLE 125Kbps: 5.62 dBm (0.0036 W) BLE 2Mbps: 5.79 dBm (0.0038 W)</siso_ant2></siso_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 LE : GFSK			

Note:

- 1. BLE ANT 0 & ANT 2 can't transmit simultaneously.
- For BLE 125Kbps/500Kbps/1Mbps, they are same modulation and transmit bandwidth, thus only full test BLE 125Kbps to cover BLE 500Kbps/1Mbps by referred to the highest output power.
- 3. BLE 2Mbps does not support the three primary advertising channels (CH00/12/39).

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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 Road, Kunshan Economic Development Zone				
Test Site Location	Jiangsu Province 215300 People's Republic of China				
	TEL: +86-512-57900158				
	Sporton Sito No	ECC Designation No.	FCC Test Firm		
Test Site No.	Sporton Site No.	FCC Designation 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.	oporton one no.	1 00 Designation No.	Registration No.				
	TH01-SZ	CN1256	421272				

1.7 Test Software

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

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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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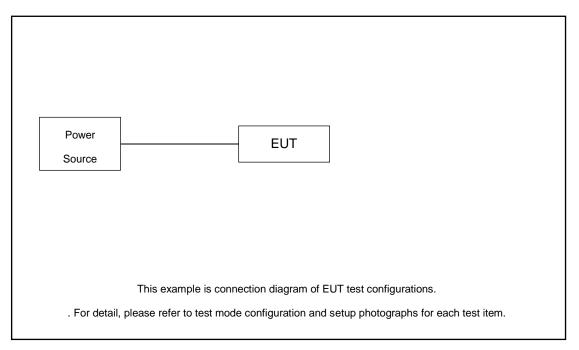
2.2 Test Mode

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 (Z plane) were 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					
Tool Hom	Data Rate / Modulation				
Test Item	Bluetooth – LE / GFSK				
Conducted	Mode 1: Bluetooth Tx CH39_2480 MHz_BLE 125Kbps				
TCs	Mode 2: Bluetooth Tx CH38_2478 MHz_BLE 2Mbps				
Radiated	Made 1. Diveteeth Tv CH29, 2479 MHz, DLC 2Mbps				
TCs Mode 1: Bluetooth Tx CH38_2478 MHz_BLE 2Mbps					
Remark: For Radiated Test Cases, The tests were performed with Adapter and USB Cable.					

2.3 Connection Diagram of Test System



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2.4 EUT Operation Test Setup

For BLE function, the engineering test program was provided and enabled to make EUT 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)

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3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

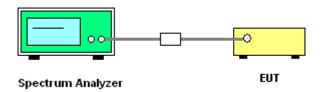
3.1.2 Measuring Instruments

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. 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.

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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.

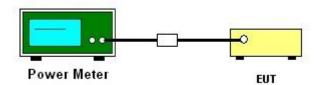
3.2.2 Measuring Instruments

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



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3.2.5 Test Result of Average Output Power

<SISO_ANT0>

Mode	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
BLE 125kbps	39	1	5.55	30.00	Pass

Mode	CH. NT	CH. NTX	Peak Power	Power Limit (dBm)	Test
			(dBm)		Result
BLE 2Mbps	38	1	5.52	30.00	Pass

<SISO_ANT2>

Mode	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
BLE 125kbps	39	1	5.62	30.00	Pass

Mode	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
BLE 2Mbps	38	1	5.79	30.00	Pass

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3.3 Conducted Band Edges and Spurious Emission Measurement

3.3.1 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.

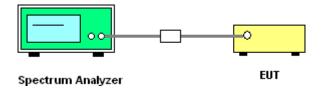
3.3.2 Measuring Instruments

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

3.3.3 Test 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.

3.3.4 Test Setup



3.3.5 Test Result of Conducted Band Edges Plots

Please refer to Appendix A.

3.3.6 Test Result of Conducted Spurious Emission Plots

Please refer to Appendix A.

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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. 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

3.4.2 Measuring Instruments

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

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3.4.3 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.

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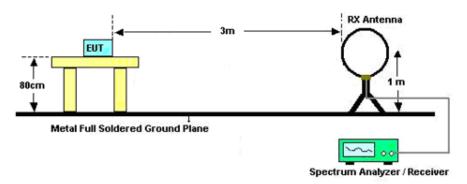
- 3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
- The EUT was set 3 meters from the interference receiving antenna, which was mounted on the 4. top of a variable height antenna tower.
- 5. Corrected Reading: 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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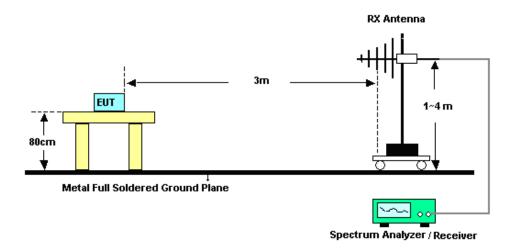
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3.4.4 Test Setup

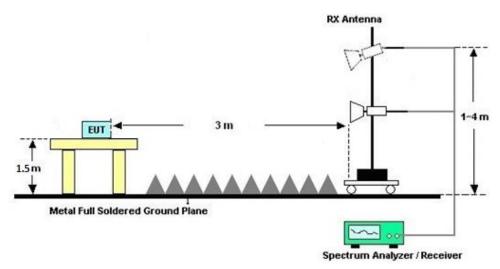
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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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.

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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.

3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

3.4.7 Duty Cycle

Please refer to Appendix C.

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

Please refer to Appendix B.

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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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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	Oct. 26, 2024	Apr. 08, 2025	Conducted (TH01-SZ)
Pulse Power Senor	Anritsu	MA2411B	1339473	30MHz~40GHz	Dec. 29, 2023	Oct. 26, 2024	Dec. 28, 2024	Conducted (TH01-SZ)
Thermo meter	Anymetre	JR593	#7	- 10℃ ~ 50℃ 10%RH~99%R H	Apr. 09, 2024	Oct. 26, 2024	Apr. 08, 2025	Conducted (TH01-SZ)

NCR: No Calibration Required

Sporton International Inc. (ShenZhen)

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Report Issued Date : Dec. 02, 2024
Report Version : Rev. 01

Report No. : FR480902-02B

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.

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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

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

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

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

Measuring Uncertainty for a Level of Confidence	C 0.4 -J.D.
of 95% (U = 2Uc(y))	6.04 dB

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

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

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

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

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

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Appendix A. Conducted Test Results

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Ambient Condition: <u>24-26</u> °C, <u>45-55</u> %RH

Test Date: 2024.10.26 Test Engineer: Chen ZhiQiang

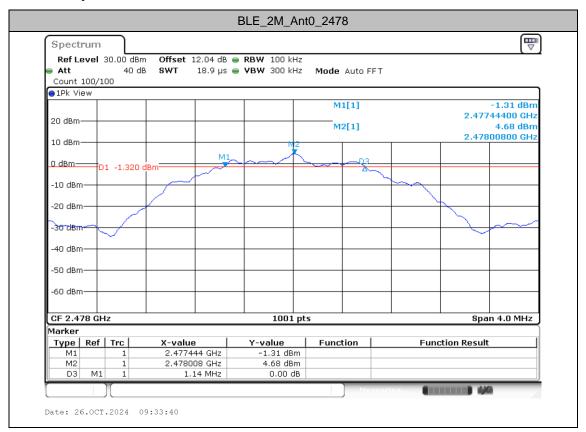
DTS Bandwidth

Test Result

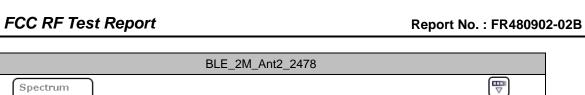
TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DIE 2M	Ant0	2478	1.14	2477.44	2478.58	0.5	PASS
BLE_2M	Ant2	2478	1.15	2477.44	2478.58	0.5	PASS
DI E 1051/	Ant0	2480	0.61	2479.70	2480.31	0.5	PASS
BLE_125K	Ant2	2480	0.60	2479.70	2480.31	0.5	PASS

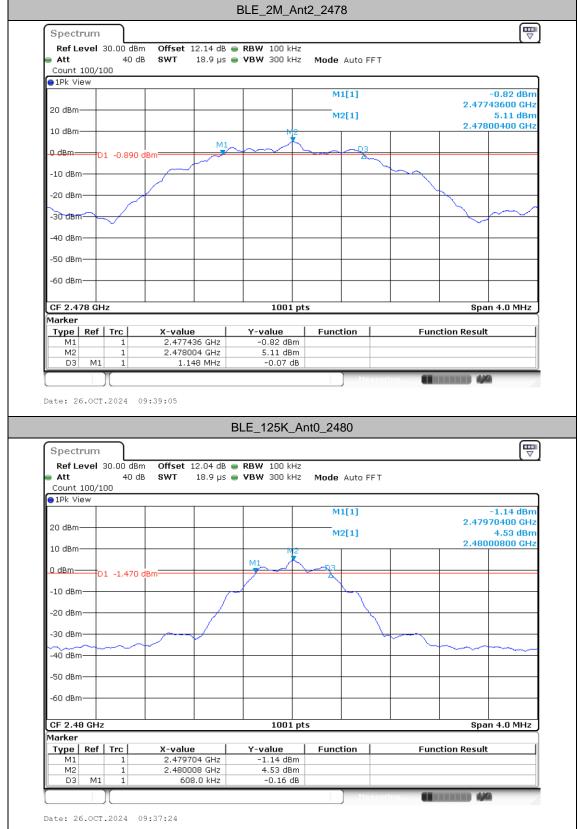
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG : A1 of A18

Test Graphs



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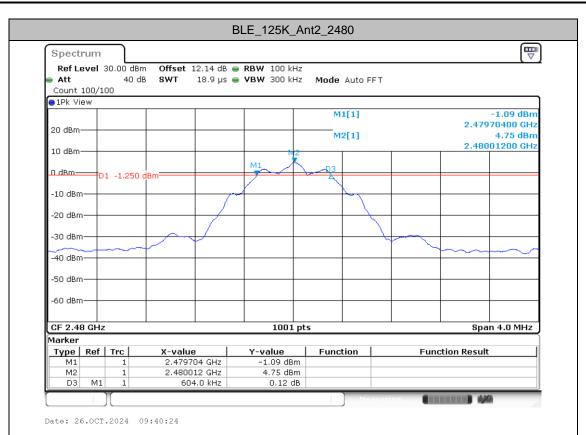


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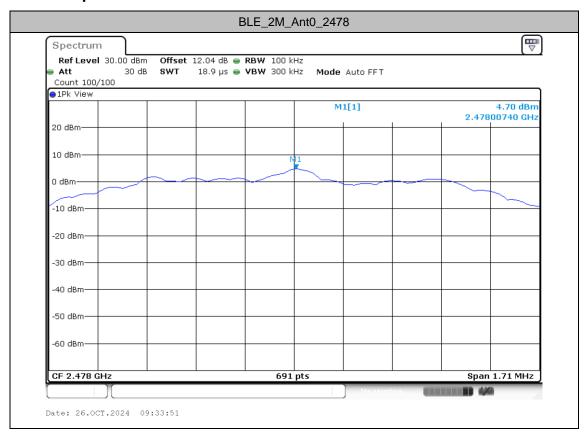
Reference level measurement

Test Result

TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm/100KHz]
BLE_2M	Ant0	2478	2478.01	4.70
	Ant2	2478	2478.01	5.11
DI E 405K	Ant0	2480	2480.01	4.72
BLE_125K	Ant2	2480	2480.01	4.79

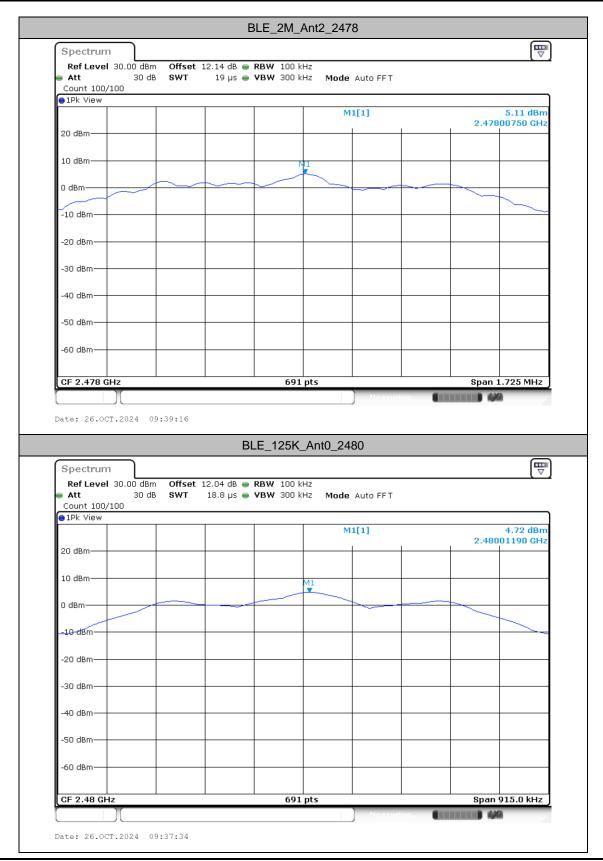
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG

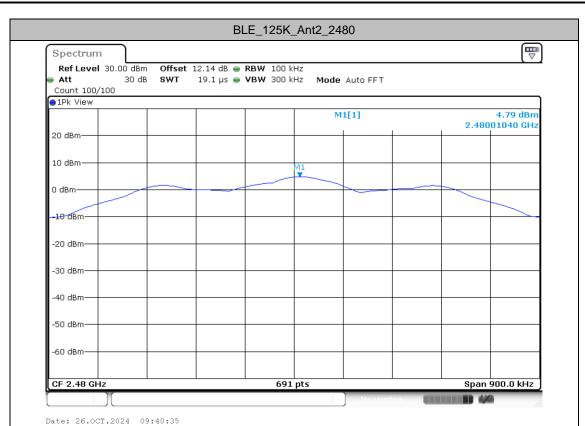
Test Graphs



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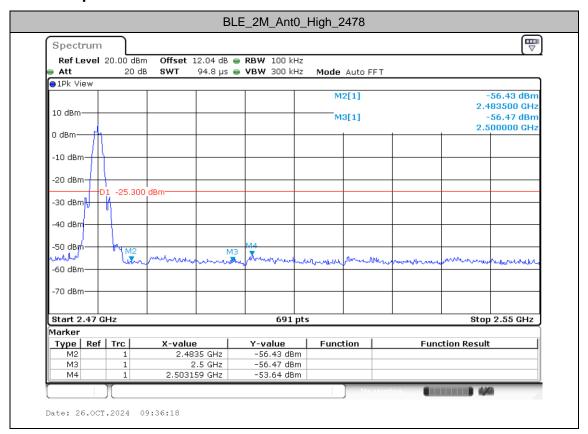
Band edge measurements

Test Result

TestMo	Anten	ChNa	Freq(M	RefLevel[dBm/10	Result[dBm/100	Limit[dBm/100	Verdi
de	na	me	Hz)	0KHz]	KHz]	KHz]	ct
BLE 2M	Ant0	High	2478	4.70	-53.64	≤-25.3	PASS
DLE_ZIVI	Ant2	High	2478	5.11	-53.44	≤-24.89	PASS
BLE_12	Ant0	High	2480	4.72	-53.86	≤-25.28	PASS
5K	Ant2	High	2480	4.79	-52.91	≤-25.21	PASS

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Test Graphs



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FCC RF Test Report Report No.: FR480902-02B BLE_2M_Ant2_High_2478 Spectrum Ref Level 20.00 dBm Offset 12.14 dB
RBW 100 kHz Att 20 dB SWT 94.8 μs 🅌 **VBW** 300 kHz Mode Auto FFT 1Pk View -56.72 dBm 2.483500 GHz M2[1] 10 dBm M3[1] -54.59 dBm 2.500000 GHz 0 dBm -10 dBm -20 dBm -24.890 dBm 40 dBm -50 dB∱ -60 dBm -70 dBm-Stop 2.55 GHz Start 2.47 GHz 691 pts Marker Type | Ref | Trc | Function **Function Result** X-value Y-value -56.72 dBm -54.59 dBm 2.4835 GHz МЗ 2.5 GHz 2.504667 GHz Μ4 -53.44 dBm Date: 26.0CT.2024 09:39:27 BLE_125K_Ant0_High_2480 Spectrum Ref Level 20.00 dBm Offset 12.04 dB
RBW 100 kHz Att 20 dB SWT 94.8 μs 🎃 **VBW** 300 kHz Mode Auto FFT ●1Pk View M2[1] -56.38 dBm 2.483500 GHz 10 dBm M3[1] -57.31 dBm 2.500000 GHz 0 dBm -10 dBm -20 dBm -25.280 -30 dBm -40 dBm -50 dBm -60 dBm--70 dBm-Start 2.47 GHz 691 pts Stop 2.55 GHz Marker

> **Y-value** -56.38 dBm

-57.31 dBm

-53.86 dBm

Function

Sporton International Inc. (ShenZhen)

МЗ

Μ4

Type | Ref | Trc

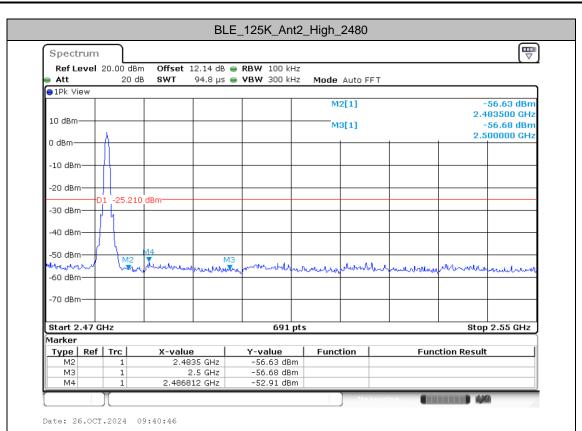
Date: 26.0CT.2024 09:37:46

X-value 2.4835 GHz

2.5 GHz

2.519739 GHz

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



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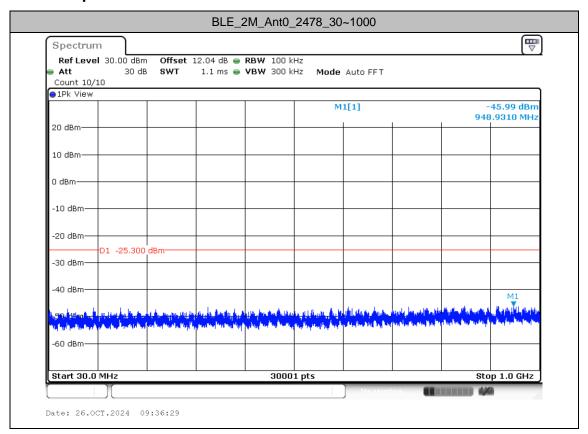
Conducted Spurious Emission

Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel	Result	Limit [dBm/100KHz]	Verdict
			[1411 12]	[dDIII/100IXI12]	[dDIII/100IXI12]	[dDIII/100IXI12]	
	Ant0	2478	30~1000	4.70	-45.99	≤-25.3	PASS
BLE 2M	Anto	2476	1000~26500	4.70	-35.76	≤-25.3	PASS
DLE_ZIVI	Ant2	2478	30~1000	5.11	-45.38	≤-24.89	PASS
			1000~26500	5.11	-35.48	≤-24.89	PASS
	AntO	2480	30~1000	4.72	-45.99	≤-25.28	PASS
DI E 105K	Ant0	2400	1000~26500	4.72	-36.01		PASS
BLE_125K	Ant2	2400	30~1000	4.79	-45.74	≤-25.21	PASS
	AIIIZ	2480	1000~26500	4.79	-36.33	≤-25.21	PASS

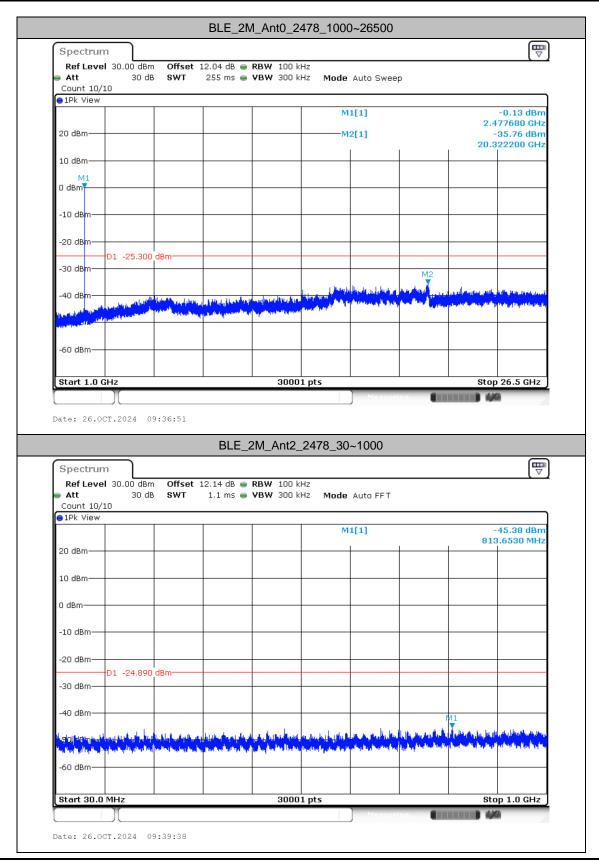
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG

Test Graphs

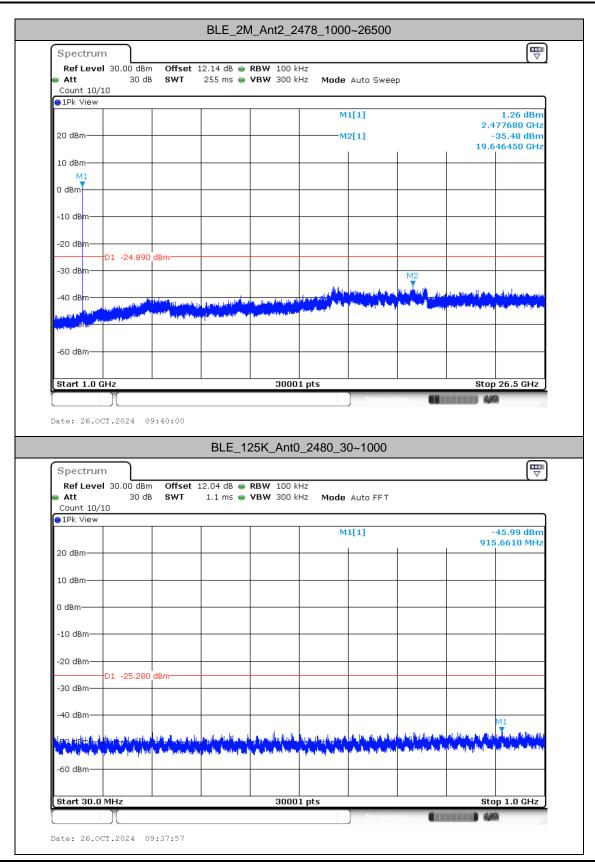


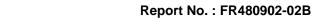
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG : A14 of A18

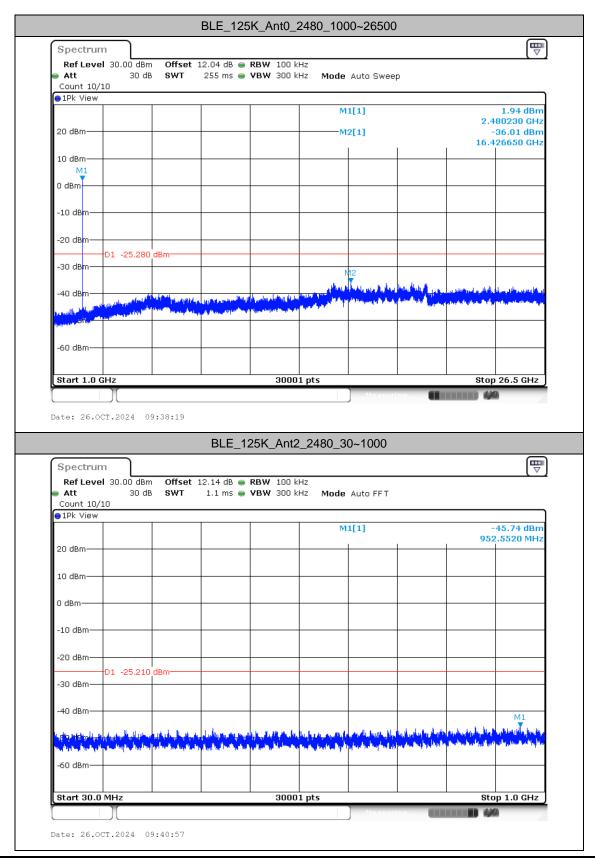








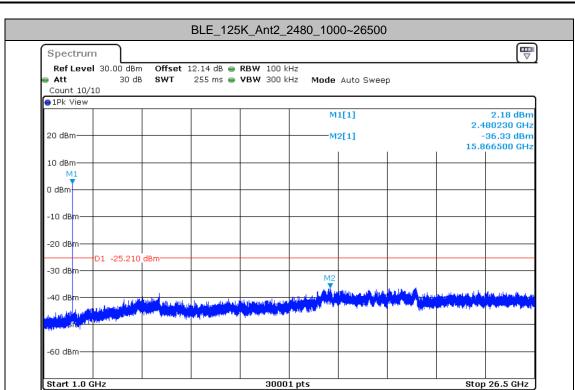




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Date: 26.0CT.2024 09:41:19



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Appendix B. Radiated Spurious Emission Test Data

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

Report No.: FR480902-02B

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Radiated Spurious Emission Test Modes

Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 1	2400-2483.5	0	Bluetooth-LE	38	2478	2Mbps	-	-

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-LE	38	2486.92	45.08	54.00	-8.92	V	AVERAGE	Pass	Band Edge
1	Bluetooth-LE	38	7434.00	42.65	74.00	-31.35	Н	PEAK	Pass	Harmonic

Sporton International Inc. (ShenZhen) Page Number

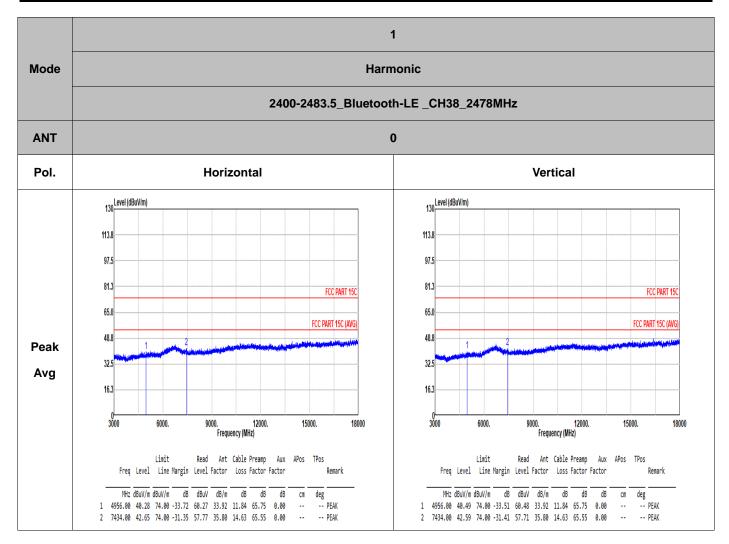
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG

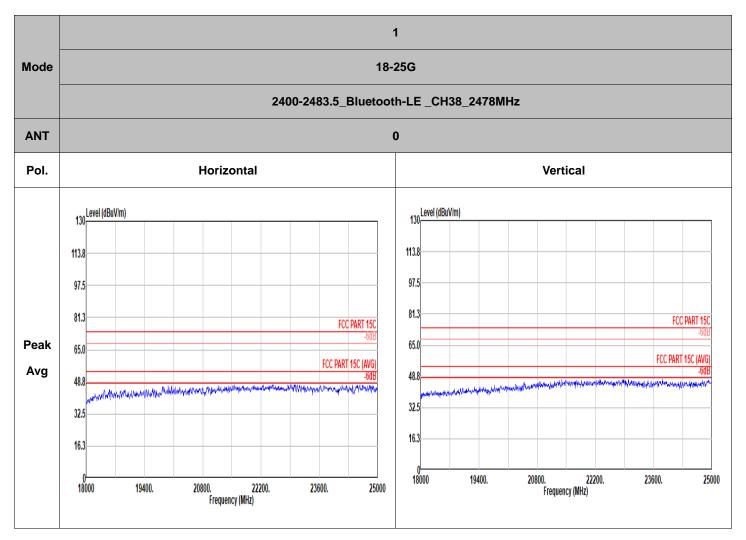
1 Mode **Band Edge** 2400-2483.5_Bluetooth-LE _CH38_2478MHz 0 **ANT** Pol. Horizontal **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 FCC PART 15C FCC PART 150 65.0 65.0 48.8 **Peak** 32.5 32.5 16.3 16.3 2440 1000 2452. 2464. 2476. 2488. 2500 1400. 2600. 3000 1800. 2200. 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 MHz dBuV/m dBuV/m dB dBuV dB/m MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB dB dB deg dB deg 1 2484.70 54.97 74.00 -19.03 39.01 32.37 8.24 30.65 6.00 311 1 2478.00 98.51 ----- 82.59 32.36 8.22 30.66 6.00 311 130 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 0<u>—</u> 2440 1000 2452. 2488. 2500 1400. 1800. 2200. 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 cm deg 1 2497.18 44.70 54.00 -9.30 28.70 32.39 8.26 30.65 6.00 311 69 AVERAGE 1 2478.00 96.65 ----- 80.73 32.36 8.22 30.66 6.00 311

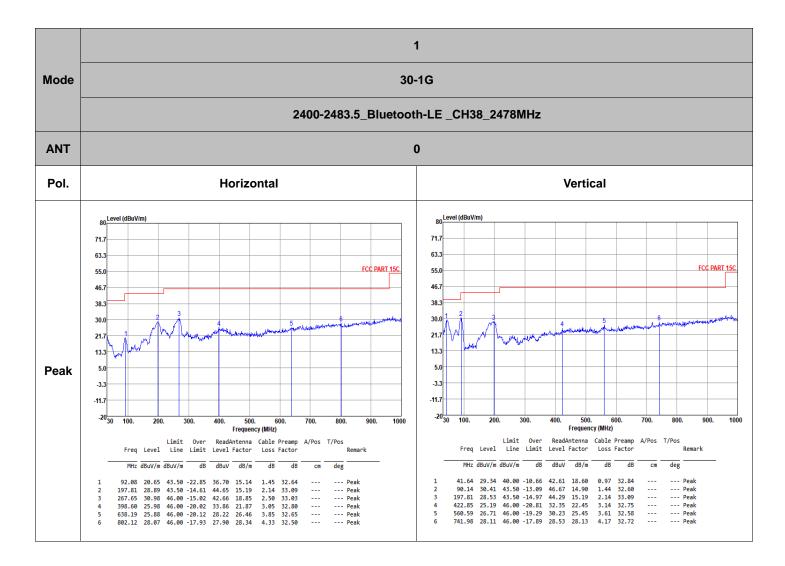
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AFZZ1RPADG

1 Mode **Band Edge** 2400-2483.5_Bluetooth-LE _CH38_2478MHz 0 **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 FCC PART 150 65.0 65.0 48.8 48.8 **Peak** 32.5 32.5 16.3 16.3 2440 1000 2452. 2464. 2476. 2488. 2500 1400. 1800. 2600. 3000 2200. 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 MHz dBuV/m dBuV/m dB dBuV dB/m MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB dB dB deg dB deg 1 2491.06 55.59 74.00 -18.41 39.61 32.38 8.25 30.65 6.00 159 1 2478.00 98.38 ----- 82.46 32.36 8.22 30.66 6.00 159 130 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 0<u>—</u> 2440 1000 2452. 2488. 2500 1400. 1800. 2200. 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 cm deg 1 2486.92 45.08 54.00 -8.92 29.12 32.37 8.24 30.65 6.00 159 360 AVERAGE 1 2478.00 96.57 ----- 80.65 32.36 8.22 30.66 6.00 159

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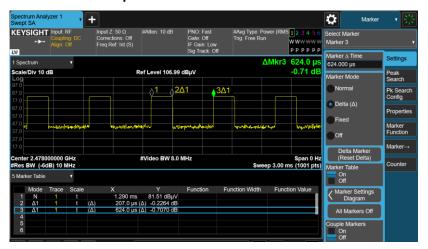




Appendix C. Duty Cycle Plots

Antenna	nna Band		T(ms)	1/T(kHz)	VBW Setting
0	Bluetooth LE 2Mbps	33.17	0.207	4.831	5.1kHZ

Bluetooth LE 2Mbps



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