FCC RF Test Report

APPLICANT : Weifang GoerTek Electronics Co.,Ltd.

EQUIPMENT : SRH-SA1

BRAND NAME : SONY

MODEL NAME : SRH-SA1

FCC ID : SZGSRHSA1

STANDARD : FCC Part 15 Subpart C §15.247

CLASSIFICATION : (DTS) Digital Transmission System

TEST DATE(S) : Jul. 16, 2024 ~ Jul. 19, 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.: FR420222-02

Sporton International Inc. (Kunshan)

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

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 1 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

TABLE OF CONTENTS

RE	VISIO	N HISTORY	3
SUI	MMAF	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	5
	1.6	Testing Location	6
	1.7	Test Software	6
	1.8	Applicable Standards	6
2	TEST	CONFIGURATION OF EQUIPMENT UNDER TEST	7
	2.1	Carrier Frequency Channel	7
	2.2	Test Mode	8
	2.3	Connection Diagram of Test System	9
	2.4	EUT Operation Test Setup	10
	2.5	Measurement Results Explanation Example	10
3	TEST	「RESULT	11
	3.1	6dB and 99% Bandwidth Measurement	11
	3.2	Output Power Measurement	22
	3.3	Power Spectral Density Measurement	23
	3.4	Conducted Band Edges and Spurious Emission Measurement	34
	3.5	Radiated Band Edges and Spurious Emission Measurement	47
	3.6	AC Conducted Emission Measurement	51
	3.7	Antenna Requirements	53
4	LIST	OF MEASURING EQUIPMENT	54
5	MEA	SUREMENT UNCERTAINTY	55
API	PEND	IX A. CONDUCTED TEST RESULTS	
API	PEND	IX B. AC CONDUCTED EMISSION TEST RESULT	
API	PEND	IX C. RADIATED SPURIOUS EMISSION	
ΔΡΙ	PFND	IX D. DUTY CYCLE PLOTS	

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 2 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR420222-02	Rev. 01	Initial issue of report	Jul. 24, 2024

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

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	15.247(a)(2) 6dB Bandwidth		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 4.40 dB at 7320.00 MHz
3.6 15.207		AC Conducted Emission	15.207(a)	Pass	Under limit 28.05 dB at 4.647 MHz
3.7 15.203 & 15.247(b) Antenna Requirement 1		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.

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 4 of 55

Report Issued Date : Jul. 24, 2024

Report Version : Rev. 01

Report No.: FR420222-02

1 General Description

1.1 Applicant

Weifang GoerTek Electronics Co.,Ltd.

Gaoxin 2 Road, Free Trade Zone, Weifang, Shandong, 261205, P.R. China

1.2 Manufacturer

Sony Corporation

1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan

1.3 Product Feature of Equipment Under Test

Product Feature				
Equipment	SRH-SA1			
Brand Name	SONY			
Model Name	SRH-SA1			
FCC ID	SZGSRHSA1			
	Conducted: VDZJB0DVT22017			
SN Code	Conduction: VLZJA0DVT10005			
	Radiation: VDZJB0DVT22001			
HW Version	V03			
SW Version	V29.0			
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	BLE: 40 Channel (37 hopping + 3 advertising channel) nRF: 40 Channel			
Maximum Output Power to Antenna	BLE 1Mbps: 4.64 dBm (0.0029 W) BLE 2Mbps: 4.51 dBm (0.0028 W) nRF 2Mbps: 4.64 dBm (0.0029 W)			
99% Occupied Bandwidth	BLE 1Mbps:1.04MHz BLE 2Mbps:2.05MHz nRF 2Mbps: 2.05 MHz			
Antenna Type / Gain	LDS Antenna with gain -5.98 dBi			
Type of Modulation	GFSK			

1.5 Modification of EUT

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

 Sporton International Inc. (Kunshan)
 Page Number
 : 5 of 55

 TEL: +86-512-57900158
 Report Issued Date
 : Jul. 24, 2024

 FCC ID: SZGSRHSA1
 Report Version
 : Rev. 01

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

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.

Test Firm	Sporton International Inc. (Kunshan)				
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL: +86-512-57900158				
	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.		
Test Site No.	CO01-KS 03CH08-KS TH01-KS	CN1257	314309		

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	TH01-KS	SPORTON	FCC 15C-15E Test Tools Ver10.0_210607	10.0
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.

 Sporton International Inc. (Kunshan)
 Page Number
 : 6 of 55

 TEL: +86-512-57900158
 Report Issued Date
 : Jul. 24, 2024

 FCC ID: SZGSRHSA1
 Report Version
 : Rev. 01

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

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	-	-

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 7 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

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 (X 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.

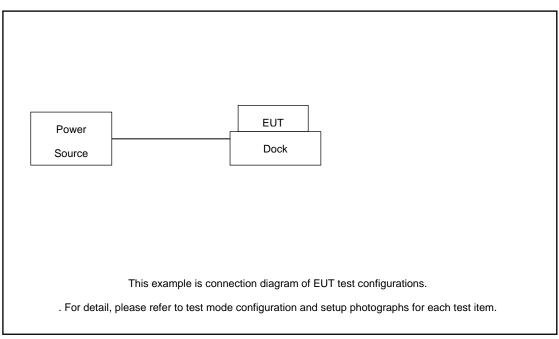
	Summary table of Test Cases					
Test Item	Data Rate / Modulation					
rest item	Bluetooth LE/nRF / GFSK					
	Mode 1: Bluetooth LE Tx CH00_2402 MHz					
	Mode 2: Bluetooth LE Tx CH19_2440 MHz					
Conducted	Mode 3: Bluetooth LE Tx CH39_2480 MHz					
TCs	Mode 4: nRF TX CH00_2402 MHz					
	Mode 5: nRF TX CH19_2440 MHz					
	Mode 6: nRF TX CH39_2480 MHz					
	Mode 1: Bluetooth LE Tx CH00_2402 MHz					
	Mode 2: Bluetooth LE Tx CH19_2440 MHz					
Radiated	Mode 3: Bluetooth LE Tx CH39_2480 MHz					
TCs	Mode 4: nRF TX CH00_2402 MHz					
	Mode 5: nRF TX CH19_2440 MHz					
	Mode 6: nRF TX CH39_2480 MHz					
AC	AC					
Conducted	Mode 1: nRF Link + USB Cable2 (Charging From Dock)					
Emission						

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 8 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

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

2.3 Connection Diagram of Test System

AC Conducted Emission:



For radiated emission:

EUT

This example is connection diagram of EUT test configurations.

For detail, please refer to test mode configuration and setup photographs for each test item.

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 9 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

2.4 Support Unit used in test configuration and system

Item	Equipment	Model Name	FCC ID	Data Cable	Power Cord
1.	Dock	SRH-SA3	SZGSRHSA3	N/A	N/A
2.	USB Cable	N/A	N/A	N/A	N/A
3.	Adapter	N/A	N/A	N/A	N/A

2.5 EUT Operation Test Setup

For BLE/NRF 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 HMD under large package sizes transmission.

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 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 5.8 dB

 $Offset(dB) = RF \ cable \ loss(dB).$ = 5.8 (dB)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 10 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No.: FR420222-02

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.

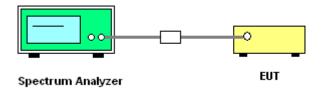
3.1.2 Measuring Instruments

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



Sporton International Inc. (Kunshan)
TEL: +86-512-57900158

FCC ID: SZGSRHSA1

Page Number : 11 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

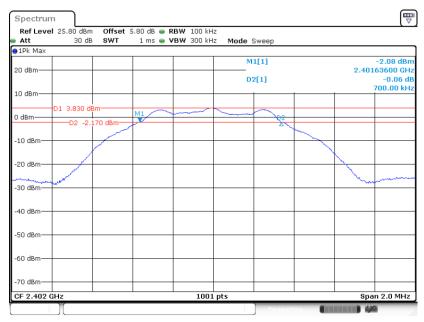
Report No.: FR420222-02

3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

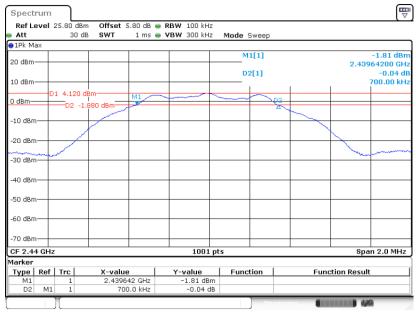
BLE 1Mbps

6 dB Bandwidth Plot on Channel 00



Date: 17.JUL.2024 02:07:46

6 dB Bandwidth Plot on Channel 19



Date: 17.JUL.2024 02:10:12

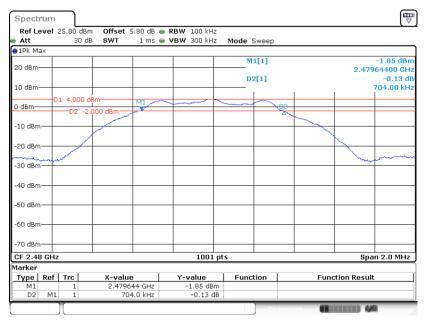
Sporton International Inc. (Kunshan)

Page Number : 12 of 55 TEL: +86-512-57900158 Report Issued Date: Jul. 24, 2024 FCC ID: SZGSRHSA1 Report Version : Rev. 01

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

FCC RF Test Report

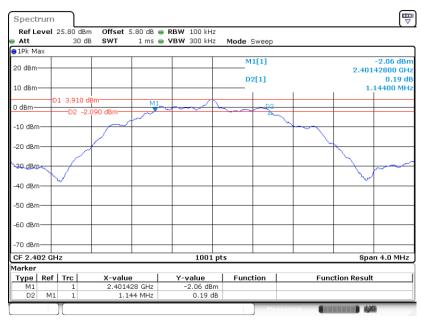
6 dB Bandwidth Plot on Channel 39



Date: 17.JUL.2024 02:12:13

BLE 2Mbps

6 dB Bandwidth Plot on Channel 00

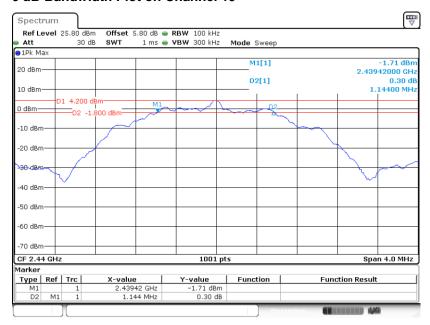


Date: 17.JUL.2024 02:16:48

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 13 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

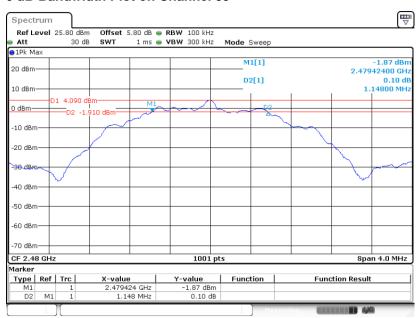
Report No.: FR420222-02

6 dB Bandwidth Plot on Channel 19



Date: 17.JUL.2024 02:19:43

6 dB Bandwidth Plot on Channel 39



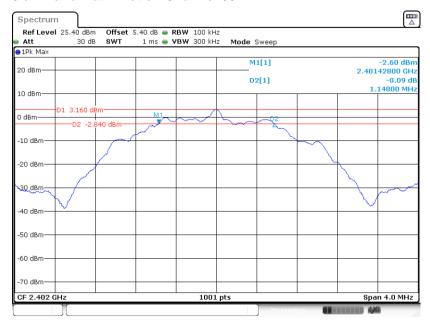
Date: 17.JUL.2024 02:22:24

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 14 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No.: FR420222-02

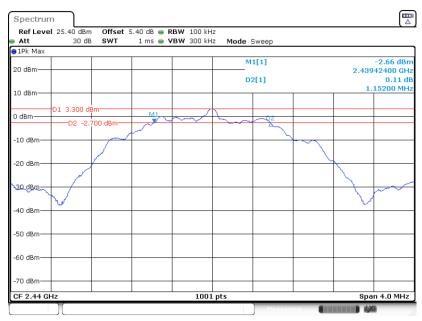
NRF 2Mbps

6 dB Bandwidth Plot on Channel 00



Date: 17.JUL.2024 14:52:32

6 dB Bandwidth Plot on Channel 19

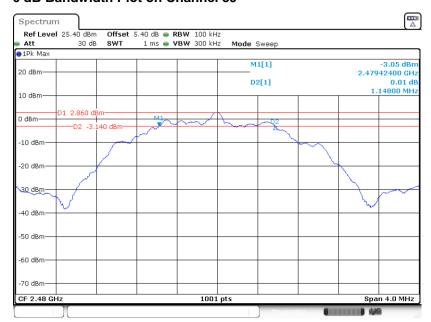


Date: 17.JUL.2024 14:58:07

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 15 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

6 dB Bandwidth Plot on Channel 39



Date: 17.JUL.2024 15:00:26

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 16 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

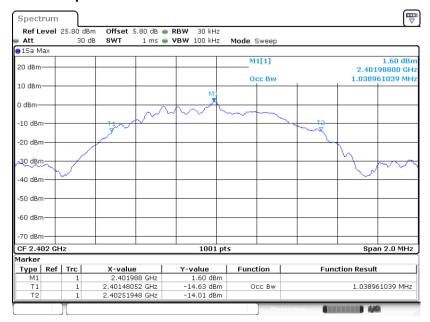
Report No. : FR420222-02

3.1.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

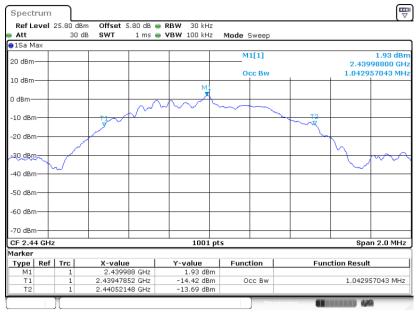
BLE 1Mbps

99% Occupied Bandwidth Plot on Channel 00



Date: 17.JUL.2024 02:09:33

99% Occupied Bandwidth Plot on Channel 19



Date: 17.JUL.2024 02:11:39

Sporton International Inc. (Kunshan)

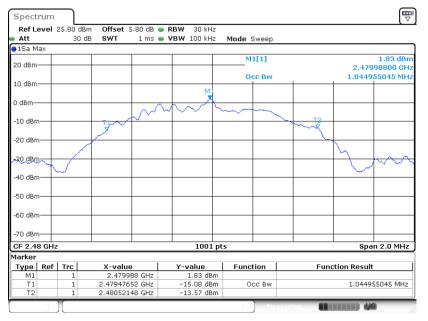
TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 17 of 55

Report Issued Date : Jul. 24, 2024

Report Version : Rev. 01

Report No.: FR420222-02

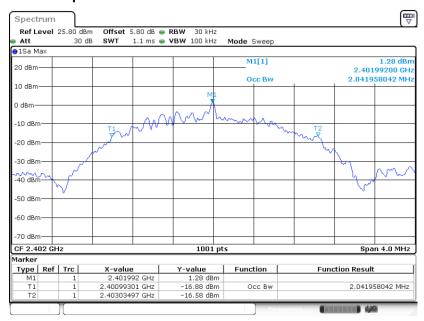
99% Occupied Bandwidth Plot on Channel 39



Date: 17.JUL.2024 02:14:00

BLE 2Mbps

99% Occupied Bandwidth Plot on Channel 00



Date: 17.JUL.2024 02:18:35

FCC ID: SZGSRHSA1

Sporton International Inc. (Kunshan) Page Number TEL: +86-512-57900158

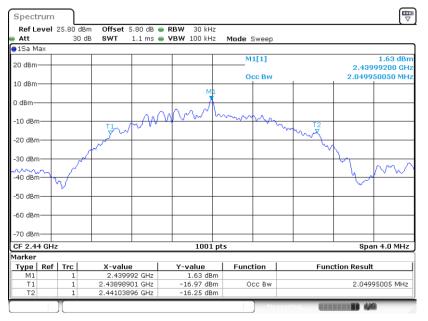
Report Issued Date: Jul. 24, 2024 : Rev. 01 Report Version

: 18 of 55

Report No.: FR420222-02

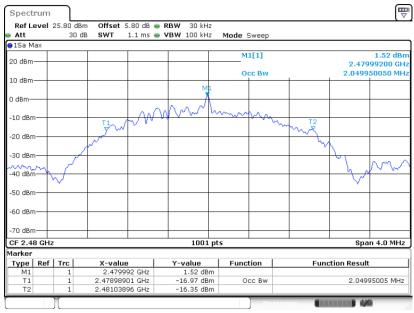
FCC RF Test Report

99% Occupied Bandwidth Plot on Channel 19



Date: 17.JUL.2024 02:21:11

99% Occupied Bandwidth Plot on Channel 39



Date: 17.JUL.2024 02:24:11

Sporton International Inc. (Kunshan)

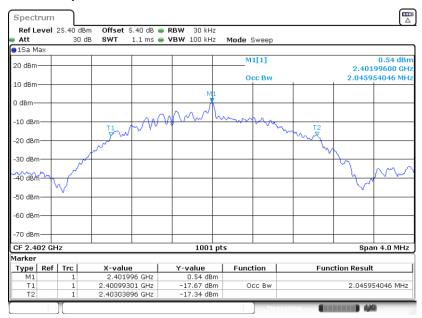
TEL: +86-512-57900158 FCC ID: SZGSRHSA1

Page Number : 19 of 55 Report Issued Date: Jul. 24, 2024 : Rev. 01 Report Version

Report No.: FR420222-02

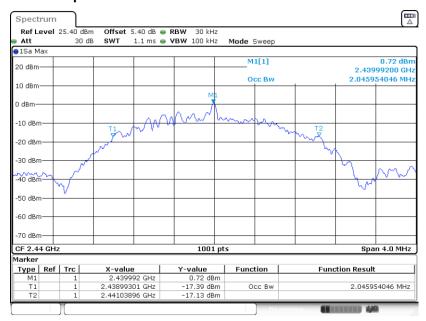
NRF 2Mbps

99% Occupied Bandwidth Plot on Channel 00



Date: 17.JUL.2024 14:54:19

99% Occupied Bandwidth Plot on Channel 19



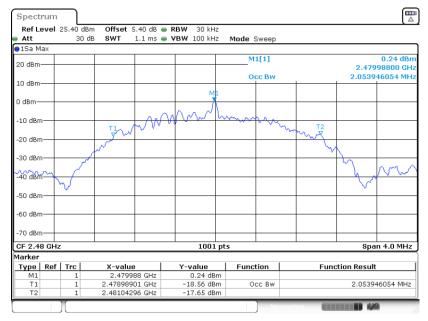
Date: 17.JUL.2024 14:59:35

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 20 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No.: FR420222-02

99% Occupied Bandwidth Plot on Channel 39



Date: 17.JUL.2024 15:02:12

Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 21 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

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.

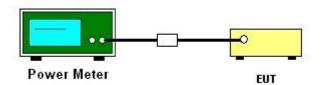
3.2.2 Measuring Instruments

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.

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.

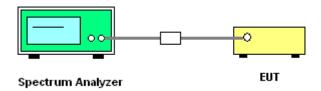
3.3.2 Measuring Instruments

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)
- 5. 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.

Sporton International Inc. (Kunshan)

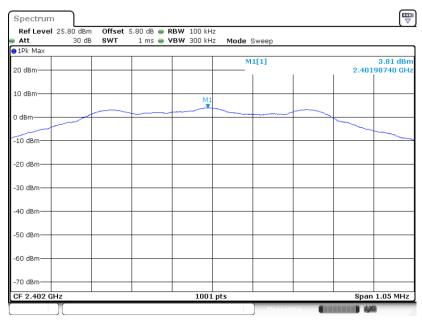
TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 23 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No.: FR420222-02

3.3.6 Test Result of Power Spectral Density Plots (100kHz)

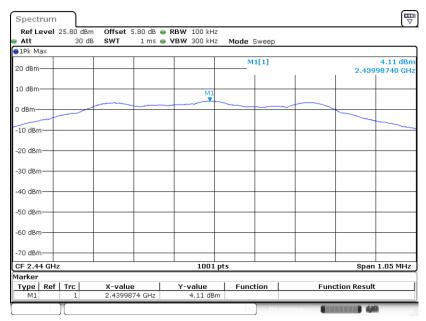
BLE 1Mbps

PSD 100kHz Plot on Channel 00



Date: 17.JUL.2024 02:08:24

PSD 100kHz Plot on Channel 19



Date: 17.JUL.2024 02:10:49

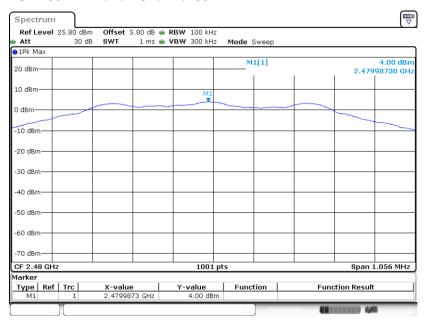
Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 24 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No.: FR420222-02

FCC RF Test Report

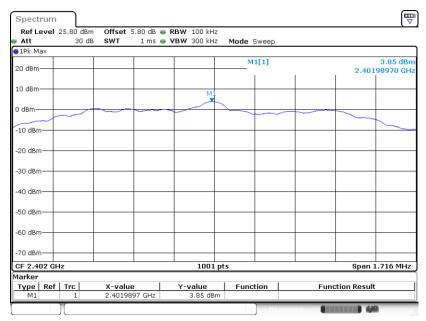
PSD 100kHz Plot on Channel 39



Date: 17.JUL.2024 02:12:51

BLE 2Mbps

PSD 100kHz Plot on Channel 00



Date: 17.JUL.2024 02:17:26

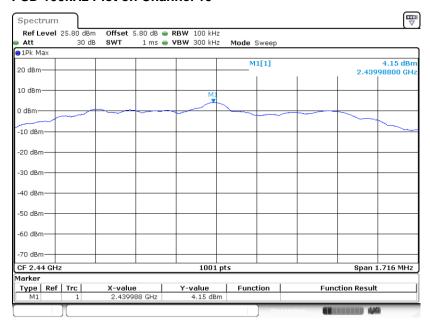
Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1

Page Number : 25 of 55 Report Issued Date: Jul. 24, 2024 Report Version : Rev. 01

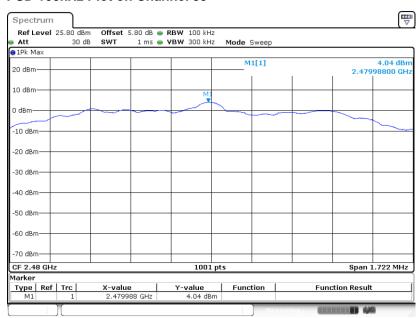
Report No.: FR420222-02

PSD 100kHz Plot on Channel 19



Date: 17.JUL.2024 02:20:21

PSD 100kHz Plot on Channel 39



Date: 17.JUL.2024 02:23:02

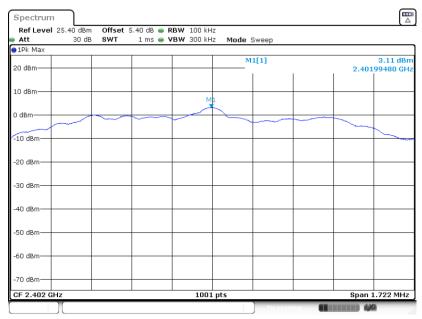
TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 26 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02



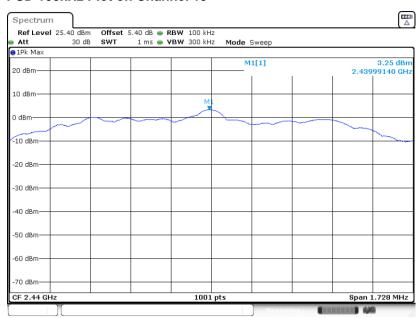
NRF 2Mbps

PSD 100kHz Plot on Channel 00



Date: 17.JUL.2024 14:53:10

PSD 100kHz Plot on Channel 19



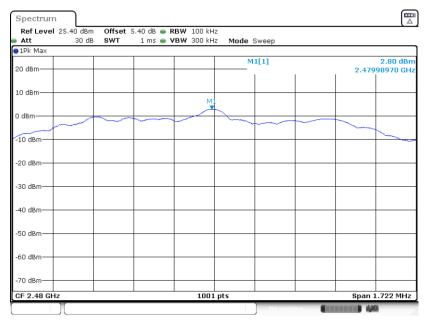
Date: 17.JUL.2024 14:58:45

TEL: +86-512-57900158 FCC ID: SZGSRHSA1

Page Number : 27 of 55 Report Issued Date: Jul. 24, 2024 Report Version : Rev. 01

Report No. : FR420222-02

PSD 100kHz Plot on Channel 39



Date: 17.JUL.2024 15:01:03

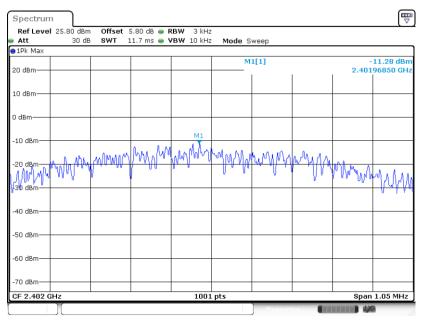
TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 28 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

3.3.7 Test Result of Power Spectral Density Plots (3kHz)

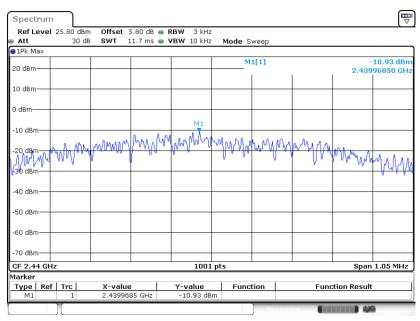
BLE 1Mbps

PSD 3kHz Plot on Channel 00



Date: 17.JUL.2024 02:08:05

PSD 3kHz Plot on Channel 19



Date: 17.JUL.2024 02:10:31

 Sporton International Inc. (Kunshan)
 Page Number
 : 29 of 55

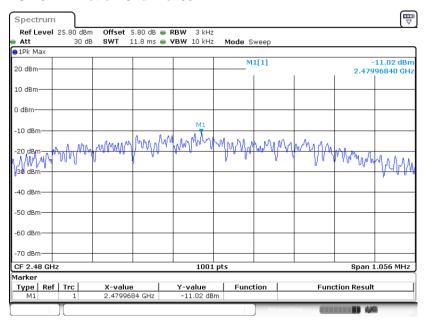
 TEL: +86-512-57900158
 Report Issued Date
 : Jul. 24, 2024

 FCC ID: SZGSRHSA1
 Report Version
 : Rev. 01

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

FCC RF Test Report

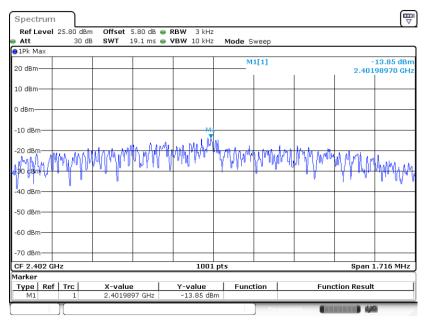
PSD 3kHz Plot on Channel 39



Date: 17.JUL.2024 02:12:32

BLE 2Mbps

PSD 3kHz Plot on Channel 00



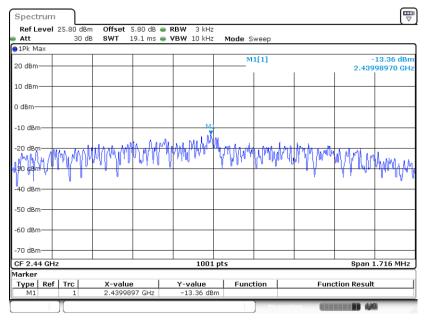
Date: 17.JUL.2024 02:17:07

Sporton International Inc. (Kunshan) Page Number : 30 of 55 TEL: +86-512-57900158 Report Issued Date: Jul. 24, 2024 FCC ID: SZGSRHSA1 Report Version : Rev. 01

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

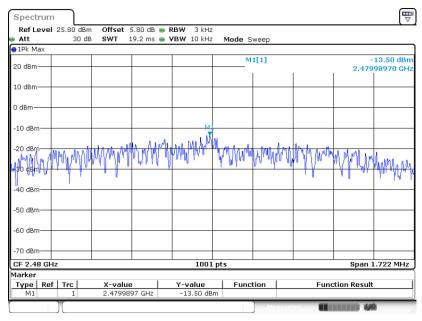
Report No. : FR420222-02

PSD 3kHz Plot on Channel 19



Date: 17.JUL.2024 02:20:02

PSD 3kHz Plot on Channel 39

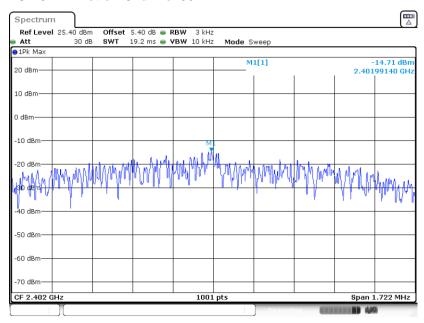


Date: 17.JUL.2024 02:22:43

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 31 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

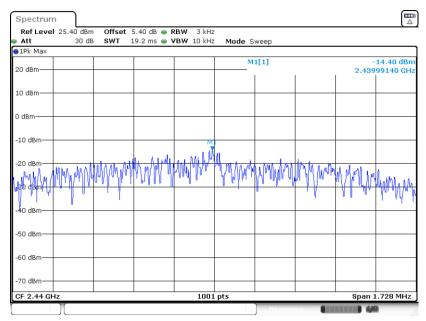
NRF 2Mbps

PSD 3kHz Plot on Channel 00



Date: 17.JUL.2024 14:52:51

PSD 3kHz Plot on Channel 19

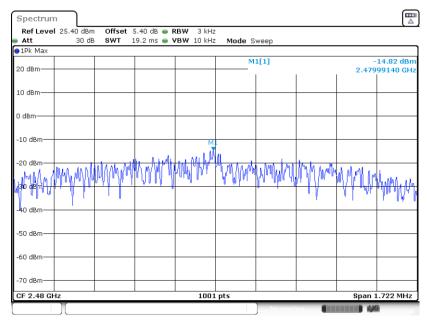


Date: 17.JUL.2024 14:58:26

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 32 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

PSD 3kHz Plot on Channel 39



Date: 17.JUL.2024 15:00:45

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 33 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

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.

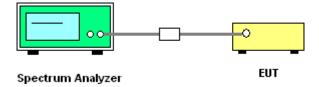
3.4.2 Measuring Instruments

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



 Sporton International Inc. (Kunshan)
 Page Number
 : 34 of 55

 TEL: +86-512-57900158
 Report Issued Date
 : Jul. 24, 2024

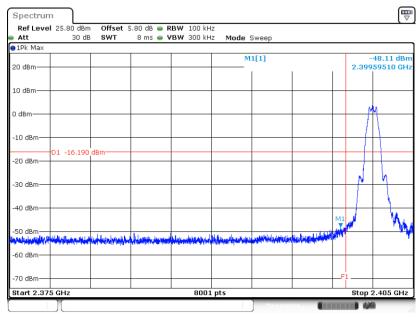
 FCC ID: SZGSRHSA1
 Report Version
 : Rev. 01

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

3.4.5 Test Result of Conducted Band Edges Plots

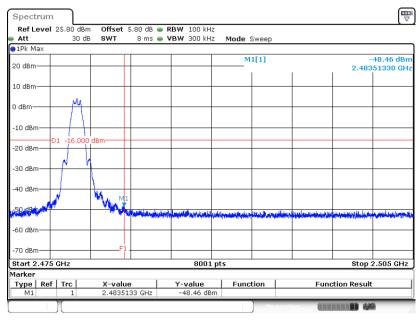
BLE 1Mbps

Low Band Edge Plot on Channel 00



Date: 17.JUL.2024 02:08:43

High Band Edge Plot on Channel 39



Date: 17.JUL.2024 02:13:10

Sporton International Inc. (Kunshan) TEL: +86-512-57900158

FCC ID: SZGSRHSA1

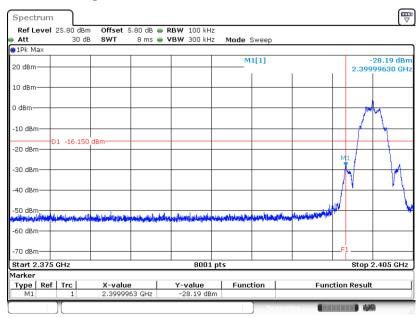
Page Number : 35 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

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



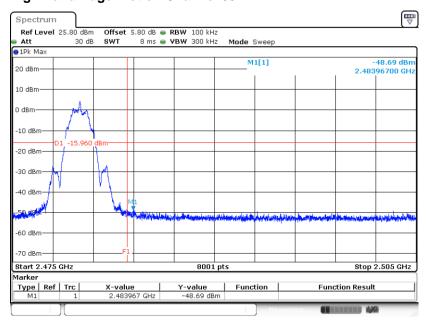
BLE 2Mbps

Low Band Edge Plot on Channel 00



Date: 17.JUL.2024 02:17:45

High Band Edge Plot on Channel 39



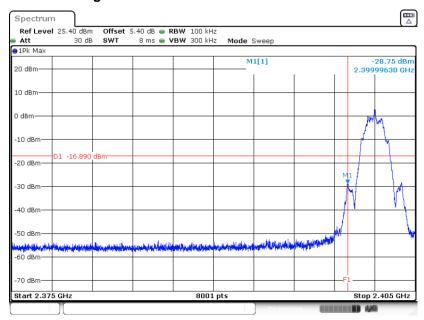
Date: 17.JUL.2024 02:23:21

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 36 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

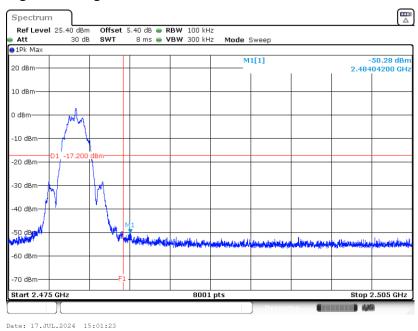
NRF 2Mbps

Low Band Edge Plot on Channel 00



Date: 17.JUL.2024 14:53:29

High Band Edge Plot on Channel 39

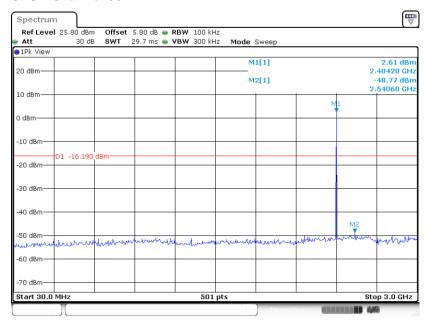


TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 37 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

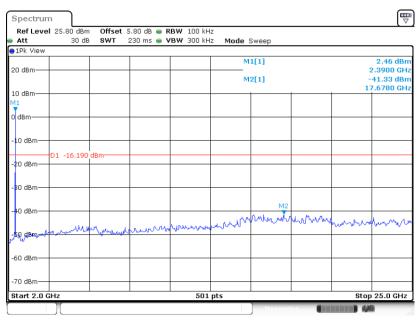
3.4.6 Test Result of Conducted Spurious Emission Plots

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps GFSK Channel 00



Date: 17.JUL.2024 02:09:04

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps GFSK Channel 00



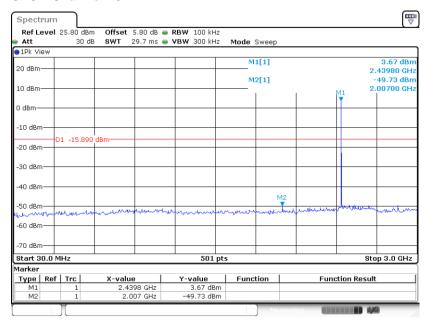
Date: 17.JUL.2024 02:09:24

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 38 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

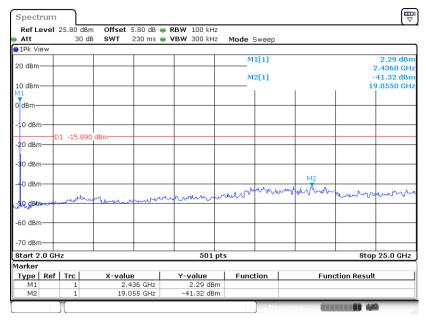
Report No.: FR420222-02

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps GFSK Channel 19



Date: 17.JUL.2024 02:11:11

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps GFSK Channel 19



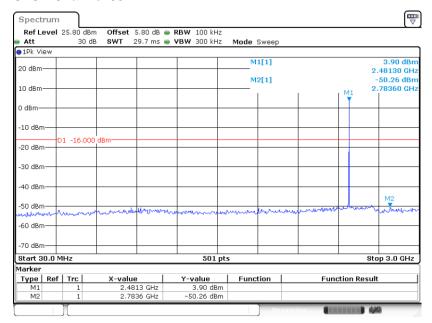
Date: 17.JUL.2024 02:11:30

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 39 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

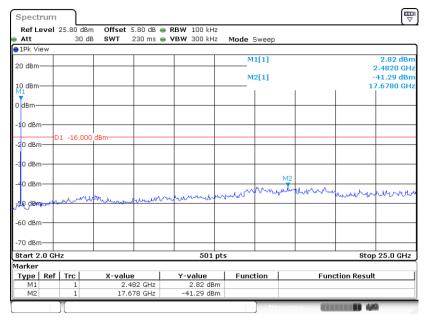
Report No.: FR420222-02

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps GFSK Channel 39



Date: 17.JUL.2024 02:13:31

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps GFSK Channel 39



Date: 17.JUL.2024 02:13:51

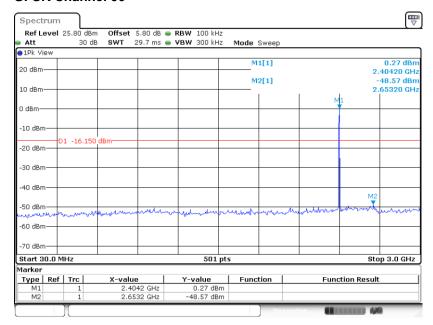
 Sporton International Inc. (Kunshan)
 Page Number
 : 40 of 55

 TEL: +86-512-57900158
 Report Issued Date
 : Jul. 24, 2024

 FCC ID: SZGSRHSA1
 Report Version
 : Rev. 01

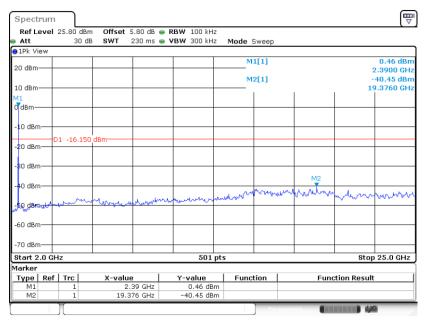
Report Template No.: BU5-FR15CBT4.0 Version 2.0

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 00



Date: 17.JUL.2024 02:18:06

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 00



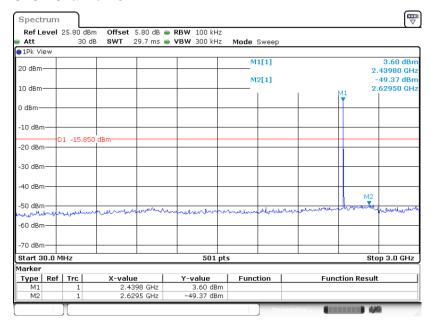
Date: 17.JUL.2024 02:18:26

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 41 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

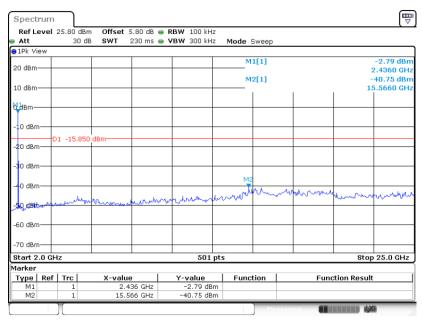
Report No.: FR420222-02

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 19



Date: 17.JUL.2024 02:20:42

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 19



Date: 17.JUL.2024 02:21:02

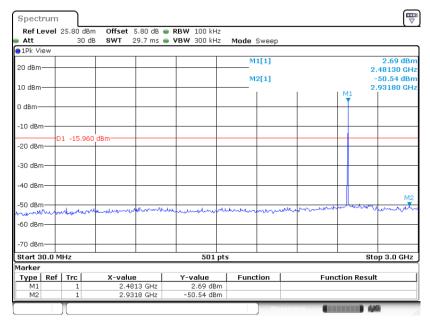
 Sporton International Inc. (Kunshan)
 Page Number
 : 42 of 55

 TEL: +86-512-57900158
 Report Issued Date
 : Jul. 24, 2024

 FCC ID: SZGSRHSA1
 Report Version
 : Rev. 01

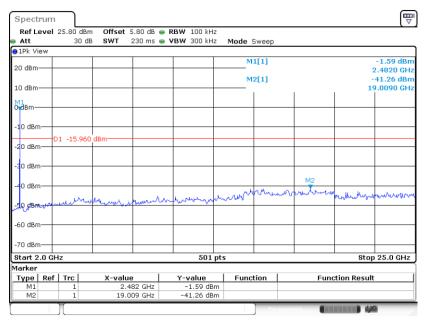
Report Template No.: BU5-FR15CBT4.0 Version 2.0

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 39



Date: 17.JUL.2024 02:23:42

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 39



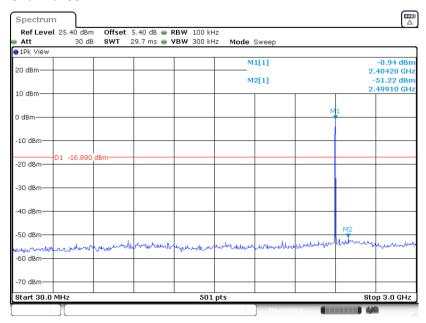
Date: 17.JUL.2024 02:24:02

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 43 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

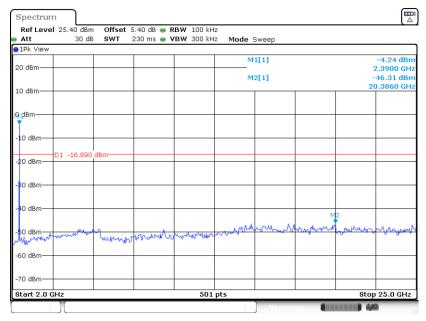
Report No.: FR420222-02

Conducted Spurious Emission Plot on NRF 2Mbps GFSK Channel 00



Date: 17.JUL.2024 14:53:50

Conducted Spurious Emission Plot on NRF 2Mbps GFSK Channel 00



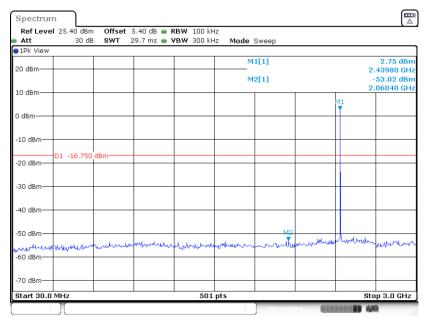
Date: 17.JUL.2024 14:54:10

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 44 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

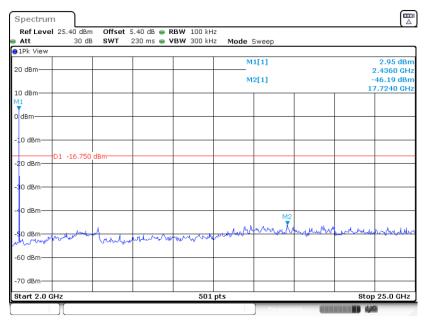
Report No.: FR420222-02

Conducted Spurious Emission Plot on NRF 2Mbps GFSK Channel 19



Date: 17.JUL.2024 14:59:06

Conducted Spurious Emission Plot on NRF 2Mbps GFSK Channel 19



Date: 17.JUL.2024 14:59:26

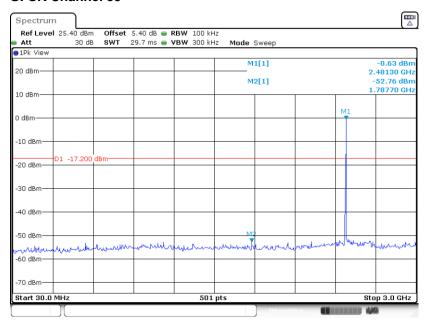
Sporton International Inc. (Kunshan)
TEL: +86-512-57900158

FCC ID: SZGSRHSA1

Page Number : 45 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

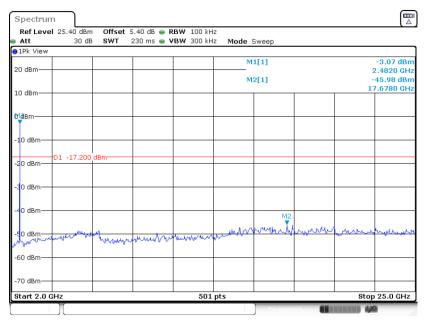
Report No. : FR420222-02

Conducted Spurious Emission Plot on NRF 2Mbps GFSK Channel 39



Date: 17.JUL.2024 15:01:43

Conducted Spurious Emission Plot on NRF 2Mbps GFSK Channel 39



Date: 17.JUL.2024 15:02:03

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 46 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

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.

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 47 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No.: FR420222-02

3.5.3 Test Procedures

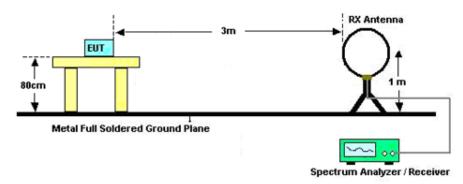
- 1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
- 2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get 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.
- 4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the 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.
- 7. 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.
- 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.

Sporton International Inc. (Kunshan)Page Number: 48 of 55TEL: +86-512-57900158Report Issued Date: Jul. 24, 2024FCC ID: SZGSRHSA1Report Version: Rev. 01

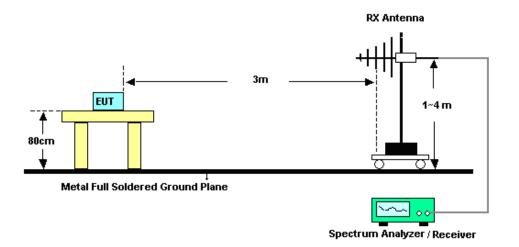
Report Template No.: BU5-FR15CBT4.0 Version 2.0

3.5.4 Test Setup

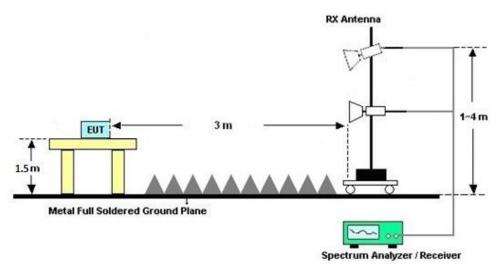
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 49 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

Report No. : FR420222-02

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.

Report No.: FR420222-02

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.

 Sporton International Inc. (Kunshan)
 Page Number
 : 50 of 55

 TEL: +86-512-57900158
 Report Issued Date
 : Jul. 24, 2024

 FCC ID: SZGSRHSA1
 Report Version
 : Rev. 01

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.

Fraguency of emission (MUz)	Conducted limit (dBμV)			
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.

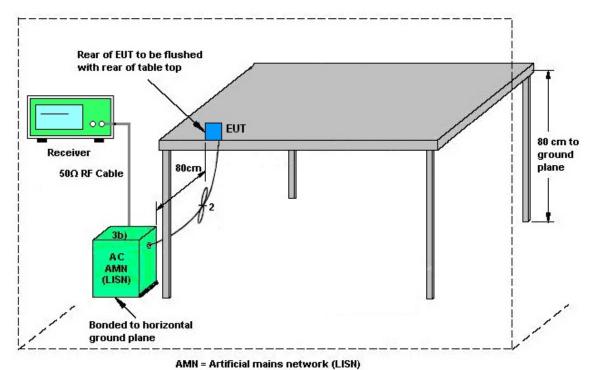
 Sporton International Inc. (Kunshan)
 Page Number
 : 51 of 55

 TEL: +86-512-57900158
 Report Issued Date
 : Jul. 24, 2024

 FCC ID: SZGSRHSA1
 Report Version
 : Rev. 01

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

3.6.4 Test Setup



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.

TEL: +86-512-57900158 FCC ID: SZGSRHSA1

Page Number : 52 of 55 Report Issued Date: Jul. 24, 2024 Report Version : Rev. 01

Report No. : FR420222-02

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

An embedded-in antenna design 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.

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 Page Number : 53 of 55
Report Issued Date : Jul. 24, 2024
Report Version : Rev. 01

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

List of Measuring Equipment 4

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 11, 2023	Jul. 17, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GH z	Jan. 02, 2024	Jul. 17, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2024	Jul. 17, 2024	Jan. 01, 2025	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY564000 23	3Hz~8.5GHz;M ax 30dBm	Jan. 04, 2024	Jul. 16, 2024	Jan. 03, 2025	Radiation (03CH08-KS)
Spectrum Analyzer	R&S	FSV40	101932	10kHz~40GHz; Max 30dBm	Oct. 10, 2023	Jul. 16, 2024	Oct. 09, 2024	Radiation (03CH08-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Oct. 10, 2023	Jul. 16, 2024	Oct. 09, 2024	Radiation (03CH08-KS)
Bilog Antenna	TESEQ& VGT	CBL 61110	59915	30MHz-1GHz	Aug. 12, 2023	Jul. 16, 2024	Aug. 11, 2024	Radiation (03CH08-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Mar. 01, 2024	Jul. 16, 2024	Feb. 28, 2025	Radiation (03CH08-KS)
high gain Amplifier	EM	EM01G18GA	060845	1Ghz-18Ghz	Jan. 05, 2024	Jul. 16, 2024	Jan. 04, 2025	Radiation (03CH08-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2024	Jul. 16, 2024	Jan. 04, 2025	Radiation (03CH08-KS)
Amplifier	SONOMA	310N	413741	9KHz-1GHz	Jan. 05, 2024	Jul. 16, 2024	Jan. 04, 2025	Radiation (03CH08-KS)
Amplifier	EM	EM01G18GA	060834	1Ghz-18Ghz	Oct. 10, 2023	Jul. 16, 2024	Oct. 09, 2024	Radiation (03CH08-KS)
Amplifier	MITEQ	EM18G40GG A	060728	18~40GHz	Jan. 04, 2024	Jul. 16, 2024	Jan. 03, 2025	Radiation (03CH08-KS)
AC Power Source	Chroma	61601	616010002 473	N/A	NCR	Jul. 16, 2024	NCR	Radiation (03CH08-KS)
Turn Table	EM	EM 1000-T	N/A	0~360 degree	NCR	Jul. 16, 2024	NCR	Radiation (03CH08-KS)
Antenna Mast	EM	EM 1000-A	N/A	1 m~4 m	NCR	Jul. 16, 2024	NCR	Radiation (03CH08-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 18, 2024	Jul. 19, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	Jul. 19, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	Jul. 19, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	Jul. 19, 2024	Oct. 10, 2024	Conduction (CO01-KS)

Report No. : FR420222-02

NCR: No Calibration Required

Sporton International Inc. (Kunshan)

Page Number : 54 of 55 TEL: +86-512-57900158 Report Issued Date: Jul. 24, 2024 FCC ID: SZGSRHSA1 Report Version : Rev. 01 Report Template No.: BU5-FR15CBT4.0 Version 2.0

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	±2.22 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.50 dB
Conducted Power Spectral Density	±0.90 dB
Frequency	±0.4 Hz

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

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

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

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

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

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 db	

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

Measuring Uncertainty for a Level of Confidence	5.04 dB
of 95% (U = 2Uc(y))	5.04 GB

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

 Sporton International Inc. (Kunshan)
 Page Number
 : 55 of 55

 TEL: +86-512-57900158
 Report Issued Date
 : Jul. 24, 2024

 FCC ID: SZGSRHSA1
 Report Version
 : Rev. 01

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

Appendix A. Conducted Test Results

TEL: +86-512-57900158 FCC ID: SZGSRHSA1

Report Number: FR420222-02

Bluetooth Low Energy

Test Engineer:	Jacob Zhang	Temperature:	20~26	°C
Test Date:	2024/7/17	Relative Humidity:	40~51	%

BLE1M-Ant1

TEST RESULTS DATA 6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE	1Mbps	1	0	2402	1.04	0.70	0.50	Pass
BLE	1Mbps	1	19	2440	1.04	0.70	0.50	Pass
BLE	1Mbps	1	39	2480	1.04	0.70	0.50	Pass

TEST RESULTS DATA Peak Power Table

reak rower rable

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	4.64	30.00	-5.98	-1.34	36.00	Pass
BLE	1Mbps	1	19	2440	4.62	30.00	-5.98	-1.36	36.00	Pass
BLE	1Mbps	1	39	2480	4.48	30.00	-5.98	-1.50	36.00	Pass

TEST RESULTS DATA Average Power Table (Reporting Only)

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
BLE	1Mbps	1	0	2402	2.04	4.36
BLE	1Mbps	1	19	2440	2.04	4.45
BLE	1Mbps	1	39	2480	2.04	4.38

TEST RESULTS DATA Peak Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE	1Mbps	1	0	2402	3.81	-11.28	-5.98	8.00	Pass
BLE	1Mbps	1	19	2440	4.11	-10.93	-5.98	8.00	Pass
BLE	1Mbps	1	39	2480	4.00	-11.02	-5.98	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 20dBc limit.

Report Number : FR420222-02

Bluetooth Low Energy

Test Engineer:	Jacob Zhang	Temperature:	20~26	°C
Test Date:	2024/7/17	Relative Humidity:	40~51	%

BLE2M-Ant1

TEST RESULTS DATA 6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE	2Mbps	1	0	2402	2.04	1.14	0.50	Pass
BLE	2Mbps	1	19	2440	2.05	1.14	0.50	Pass
BLE	2Mbps	1	39	2480	2.05	1.15	0.50	Pass

TEST RESULTS DATA Peak Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	2Mbps	1	0	2402	4.48	30.00	-5.98	-1.50	36.00	Pass
BLE	2Mbps	1	19	2440	4.51	30.00	-5.98	-1.47	36.00	Pass
BLE	2Mbps	1	39	2480	4.46	30.00	-5.98	-1.52	36.00	Pass

TEST RESULTS DATA Average Power Table (Reporting Only)

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
BLE	2Mbps	1	0	2402	4.80	4.46
BLE	2Mbps	1	19	2440	4.80	4.47
BLE	2Mbps	1	39	2480	4.80	4.22

TEST RESULTS DATA Peak Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE	2Mbps	1	0	2402	3.85	-13.85	-5.98	8.00	Pass
BLE	2Mbps	1	19	2440	4.15	-13.36	-5.98	8.00	Pass
BLE	2Mbps	1	39	2480	4.04	-13.50	-5.98	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 20dBc limit.

Report Number : FR420222-02

Bluetooth Low Energy

Test Engineer:	Jacob Zhang	Temperature:	20~26	°C
Test Date:	2024/7/17	Relative Humidity:	40~51	%

NRF2M-Ant1 TEST RESULTS DATA 6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
NRF	2Mbps	1	0	2402	2.05	1.15	0.50	Pass
NRF	2Mbps	1	19	2440	2.05	1.15	0.50	Pass
NRF	2Mbps	1	39	2480	2.05	1.15	0.50	Pass

TEST RESULTS DATA Peak Power Table

Mod.	Data Rate	NTX	СН.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
NRF	2Mbps	1	0	2402	4.58	30.00	-5.98	-1.40	36.00	Pass
NRF	2Mbps	1	19	2440	4.64	30.00	-5.98	-1.34	36.00	Pass
NRF	2Mbps	1	39	2480	4.54	30.00	-5.98	-1.44	36.00	Pass

TEST RESULTS DATA Average Power Table (Reporting Only)

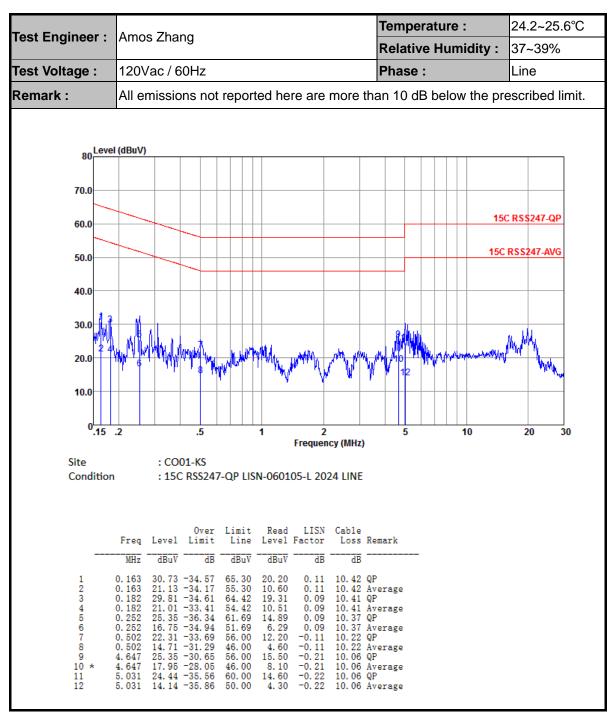
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
NRF	2Mbps	1	0	2402	5.22	4.47
NRF	2Mbps	1	19	2440	5.22	4.49
NRF	2Mbps	1	39	2480	5.22	4.46

TEST RESULTS DATA Peak Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
NRF	2Mbps	1	0	2402	3.11	-14.71	-5.98	8.00	Pass
NRF	2Mbps	1	19	2440	3.25	-14.40	-5.98	8.00	Pass
NRF	2Mbps	1	39	2480	2.80	-14.82	-5.98	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 20dBc limit.

Appendix B. AC Conducted Emission Test Results



CC RF Test Report No.: FR420222-02

Foot Engineer	Amos Zhang							Te	Temperature : Relative Humidity :				24.2~25.6°C 37~39% Neutral	
est Engineer :								Re						
est Voltage :	120Vac / 60Hz						Pł	Phase :						
Remark :	All en	nissio	ns not	repor	ted he	re are	more	than	han 10 dB below the pr				escribed limit.	
80 Level	l (dBuV)													
80														
70.0														
												150	C RSS247	-QP
60.0														
50.0												15C	RSS247-	AVG
40.0														
40.0														
30.0	11												plak.	
20.0		MA	M.	المليا	ed .		ألماسيا				1	Margarith.	TWAT THE	
20.0	\ \ \ \ \ \ \	ן אוייין	8,744	4 ₀₀ yanya y	"MYWA	MANAN MANAN	MINIMAN	r de l'Anglier de la company	'' ₁ '	יולטאיניווי	welgh ₍₁₇₎	Alexandra .	12	MACH
10.0														
0	Щ													
°.15	.2		.5		1	2 Frequen	cy (MHz))	5		1	0	20	30
Site		: CO0		7 00 110	N 0001	OF N 20	24 NEU	ITDAI						
Condition		: 15C	K55247	/-QP LIS	N-0601	.05-N 20	24 NEU	IIKAL						
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remar	k					
	MHz	dBuV	₫B	<u>dBuV</u>	dBuV	dB	dB							
			-34. 34 -33. 94	65. 08 55. 08	20. 20 10. 60		10. 42 10. 42		100					
3 4	0. 204 0. 204	31. 12 19. 82	-32. 33 -33. 63	63. 45 53. 45	20.60 9.30	0. 11 0. 11	10. 41 10. 41	QP Avera	_					
6	0. 224	14.05	-38.61	52.66	18. 80 3. 60	0.06 0.06	10.39 10.39	QP Avera						
8 *	0. 507 0. 507 4. 952	14.67	-31. 33	46.00	4.60	-0. 15 -0. 15 -0. 21	10.22	Avera	ige					
10 11 2	4. 952 0. 594	13. 45 21. 59	-32.55 -38.41	46.00 60.00	3.60 10.59	-0. 21 -0. 37	10.06 11.37	Avera QP	_					
12 2	0.594	13. 79	-36. 21	50.00	2. 79	-0.37	11. 37	Avera	ige					

Note:

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

TEL: +86-512-57900158 FCC ID: SZGSRHSA1

Appendix C. Radiated Spurious Emission Test Data

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

Radiated Spurious Emission Test Modes

Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 1	2400-2483.5	1	NRF	00	2402	2Mbps	-	-
Mode 2	2400-2483.5	1	NRF	19	2440	2Mbps	-	-
Mode 3	2400-2483.5	1	NRF	39	2480	2Mbps	-	-
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	-	-

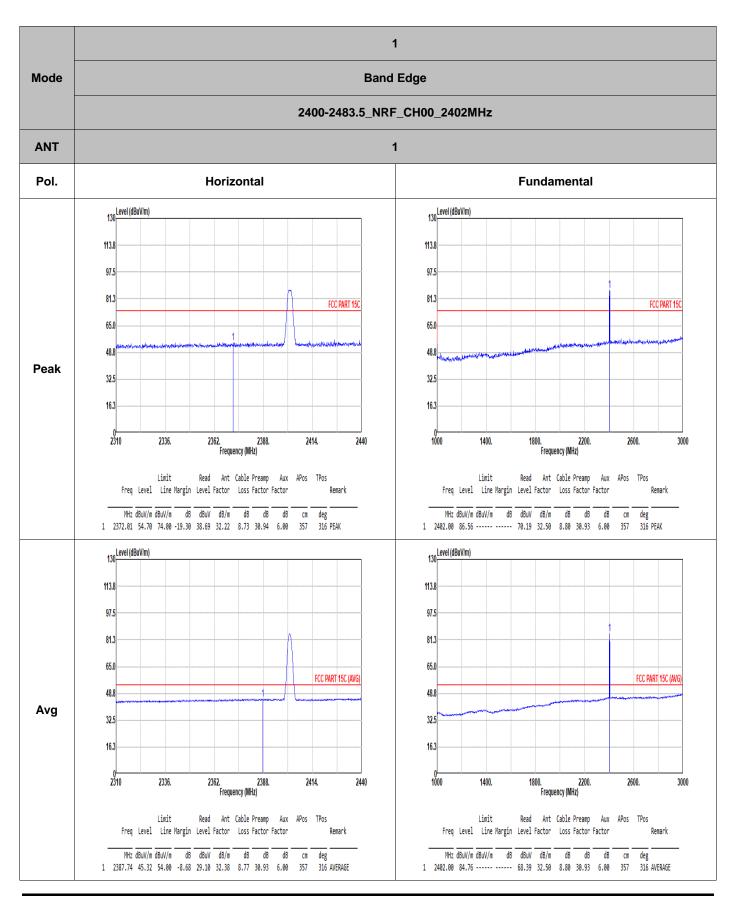
Remark: For BLE 2M and nRF mode, the whole testing have assessed only nRF to cover BLE 2M by referring to the higher output power.

Summary of each worse mode

Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
1	NRF	00	2387.74	45.32	54.00	-8.68	Н	AVERAGE	Pass	Band Edge
1	NRF	00	4804.00	41.98	74.00	-32.02	Н	PEAK	Pass	Harmonic
2	NRF	19	-	-	-	-	-	-	-	Band Edge
2	NRF	19	7320.00	47.04	74.00	-26.96	Н	PEAK	Pass	Harmonic
3	NRF	39	2498.32	45.45	54.00	-8.55	V	AVERAGE	Pass	Band Edge
3	NRF	39	7440.00	38.69	54.00	-15.31	Н	AVERAGE	Pass	Harmonic
4	Bluetooth-LE	00	2386.57	44.45	54.00	-9.55	Н	AVERAGE	Pass	Band Edge
4	Bluetooth-LE	00	7206.00	53.92	62.73	-8.81	Н	PEAK	Pass	Harmonic
5	Bluetooth-LE	19	-	-	-	-	-	-	-	Band Edge
5	Bluetooth-LE	19	7320.00	49.60	54.00	-4.40	Н	AVERAGE	Pass	Harmonic
6	Bluetooth-LE	39	2489.08	44.28	54.00	-9.72	Н	AVERAGE	Pass	Band Edge
6	Bluetooth-LE	39	7440.00	47.02	54.00	-6.98	V	AVERAGE	Pass	Harmonic

Sporton International Inc. (Kunshan)
TEL: +86-512-57900158
FCC ID: SZGSRHSA1

CC RF Test Report No.: FR420222-02



TEL: +86-512-57900158 FCC ID: SZGSRHSA1

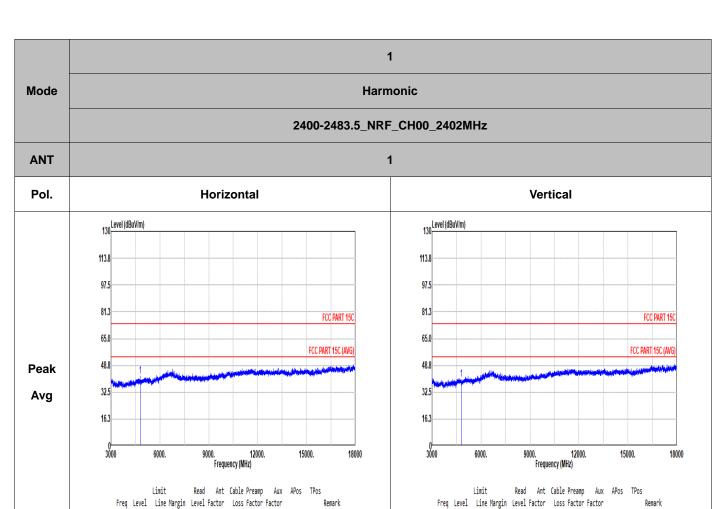
1 Mode **Band Edge** 2400-2483.5_NRF_CH00_2402MHz **ANT** 1 Pol. Vertical **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 **Peak** 32.5 32.5 16.3 16.3 2310 1000 52. 2388. Frequency (MHz) 2336. 2414. 2440 1400. 2600. 3000 Frequency (MHz) Limit Limit Read Ant Cable Preamp Aux APos TPos 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 cm deg MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2381.37 55.48 74.00 -18.52 39.34 32.31 8.76 30.93 6.00 107 51 PEAK 1 2402.00 86.14 ----- 69.77 32.50 8.80 30.93 6.00 107 51 PEAK 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 Avg 32.5 32.5 16.3 16.3 2310 52. 2388. Frequency (MHz) 1000 0, 2200. Frequency (MHz) 3000 Limit Limit Read Ant Cable Preamp Aux APos TPos 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 cm deg

1 2387.74 45.30 54.00 -8.70 29.08 32.38 8.77 30.93 6.00 107 51 AVERAGE

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg

1 2402.00 84.33 ----- 67.96 32.50 8.80 30.93 6.00 107 51 AVERAGE



| MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | dB | dB | dB | cm | deg | | 1 | 4804.00 | 41.98 | 74.00 | -32.02 | 61.19 | 34.19 | 12.57 | 65.97 | 0.00 | -- | -- PEAK

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 MHz dBuV/m dBuV/m dB dB dB dB dB cm deg 1 4804.00 40.44 74.00 -33.56 59.65 34.19 12.57 65.97 0.00 -- -- PEAK

2 Mode Harmonic 2400-2483.5_NRF_CH19_2440MHz 1 **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 15C FCC PART 150 65.0 65.0 FCC PART 15C (AVG) FCC PART 15C (AVG) 48.8 48.8 Peak Avg 9000. Frequency (MHz) 3000 9000. 12000. Frequency (MHz) 18000 6000. 12000. 18000 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 cm deg -- -- PEAK MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB 1 4880.00 40.23 74.00 -33.77 59.40 34.22 12.47 65.86 0.00 --1 4880.00 39.93 74.00 -34.07 59.10 34.22 12.47 65.86 0.00 -- PEAK

2 7320.00 47.04 74.00 -26.96 61.76 35.76 14.72 65.20 0.00 --

2 7320.00 44.96 74.00 -29.04 59.68 35.76 14.72 65.20 0.00

3 Mode **Band Edge** 2400-2483.5_NRF_CH39_2480MHz **ANT** 1 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 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. 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 dB dB dB MHz dBuV/m dBuV/m dB dBuV dB/m dB dB deg dB 1 2496.46 55.34 74.00 -18.66 39.27 32.21 8.83 30.97 6.00 100 123 PEAK 1 2480.00 87.36 ----- 71.23 32.28 8.82 30.97 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 0<u>—</u> 2440 1000 2452. 2488. 2500 1400. 1800. 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 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 cm deg 1 2487.34 45.21 54.00 -8.79 29.10 32.25 8.83 30.97 6.00 100 123 AVERAGE 1 2480.00 85.51 ----- 69.38 32.28 8.82 30.97 6.00 100 123 AVERAGE

3 Mode **Band Edge** 2400-2483.5_NRF_CH39_2480MHz **ANT** 1 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 **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 dB dB dB MHz dBuV/m dBuV/m dB dBuV dB/m dB dB deg dB deg 1 2492.74 54.97 74.00 -19.03 38.88 32.23 8.83 30.97 6.00 262 360 PEAK 1 2480.00 83.14 ----- 67.01 32.28 8.82 30.97 6.00 262 130 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 Avg 32.5 32.5 16.3 16.3 0<u>—</u> 2440 1000 2452. 2488. 2500 1400. 1800. 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 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 cm deg

1 2498.32 45.45 54.00 -8.55 29.39 32.21 8.83 30.98 6.00 262 360 AVERAGE

1 2480.00 81.22 ----- 65.09 32.28 8.82 30.97 6.00 262 360 AVERAGE

3 Mode Harmonic 2400-2483.5_NRF_CH39_2480MHz 1 **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 **Peak** 32.5 32.5 Avg 16.3 16.3 9000. Frequency (MHz) 3000 3000 6000. 12000. 15000. 18000 6000. 12000. 15000. 18000 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 deg -- PEAK 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 cm 1 4960.00 41.46 74.00 -32.54 60.43 34.40 12.38 65.75 0.00 1 4960.00 41.58 74.00 -32.42 60.55 34.40 12.38 65.75 0.00 2 7440.00 49.60 74.00 -24.40 64.43 35.82 14.92 65.57 0.00 101 278 PEAK 2 7440.00 46.10 74.00 -27.90 60.93 35.82 14.92 65.57 0.00 360 PEAK

278 AVERAGE

3 7440.00 38.69 54.00 -15.31 53.51 35.82 14.92 65.56 0.00 101

TEL: +86-512-57900158 FCC ID: SZGSRHSA1 3 7440.00 34.71 54.00 -19.29 49.53 35.82 14.92 65.56 0.00

360 AVERAGE

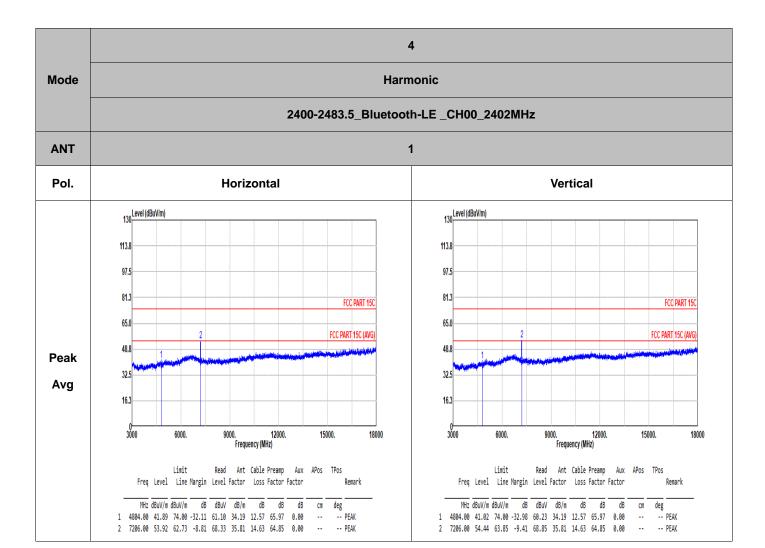
3 Mode LF 2400-2483.5_NRF_CH39_2480MHz **ANT** 1 Pol. Horizontal Vertical 80 Level (dBuV/m) 71.7 71.7 63.3 FCC PART 15C 55.0 55.0 46.7 38.3 38.3 30.0 30.0 21.7 13.3 13.3 **Peak** 5.0 -3.3 -11.7 -11.7 -20^L30 -20¹30 100. 900. 200. 500. 800. 100. 1000 Frequency (MHz) Frequency (MHz) Limit ReadAntenna Cable Preamp Line Level Factor Loss Factor Over Limit ReadAntenna Cable Preamp A/Pos T/Pos
Freq Level Limit Line Level Factor Loss Factor Remark Freq Level Limit dB dBuV/m dB/m cm deg dB dBuV/m 150.28 25.37 -18.13 43.50 39.36 16.96 309.36 23.77 -22.23 46.00 34.44 19.55 466.50 23.16 -22.84 46.00 29.16 23.43 552.83 26.69 -19.31 46.00 39.35 25.34 696.39 27.04 -18.96 46.00 29.10 26.69 845.77 32.00 -14.00 46.00 31.02 29.13 39.70 28.42 -11.58 40.00 48.68 19.60 156.10 28.69 -14.81 43.50 42.73 16.90 311.30 24.16 -21.84 46.00 34.77 19.60 55.74 26.37 -19.63 46.00 29.8 25.38 716.76 27.39 -18.61 46.00 28.79 27.27 877.78 30.86 -15.14 46.00 29.61 29.26 --- Peak --- Peak --- Peak --- Peak --- Peak 1.85 32.80 --- Peak 32.80 32.84 32.90 32.59 32.77 32.54 1.85 32.80 2.68 32.90 3.30 32.73 3.59 32.59 4.04 32.79 4.44 32.59 1.90 2.69 3.60 4.10 4.53 ---**Emission above 18GHz** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 97.5 97.5 81.3 FCC PART 150 FCC PART 15C 65.0 65.0 Peak FCC PART 15C (AVG FCC PART 15C (AVG 48.8 32.5 32.5 16.3 16.3 18000 19400. 23600. 18000 20800. 22200. 25000 19400. 20800. 22200. 23600. 25000 Frequency (MHz) Frequency (MHz)

Mode **Band Edge** 2400-2483.5_Bluetooth-LE _CH00_2402MHz **ANT** 1 Pol. Horizontal **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 Peak 32.5 32.5 16.3 16.3 2310 1000 2336. 2414. 2440 1400. 2600. 3000 Frequency (MHz) Frequency (MHz) Limit Limit Read Ant Cable Preamp Aux APos TPos 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 cm deg cm deg 1 2355.11 54.89 74.00 -19.11 39.09 32.05 8.69 30.94 6.00 128 242 PEAK 1 2402.00 88.51 ----- 72.14 32.50 8.80 30.93 6.00 128 242 PEAK 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 Avg 32.5 32.5 16.3 16.3 2310 52. 2388. Frequency (MHz) 1000 3000 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 dB dB dB cm deg MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg

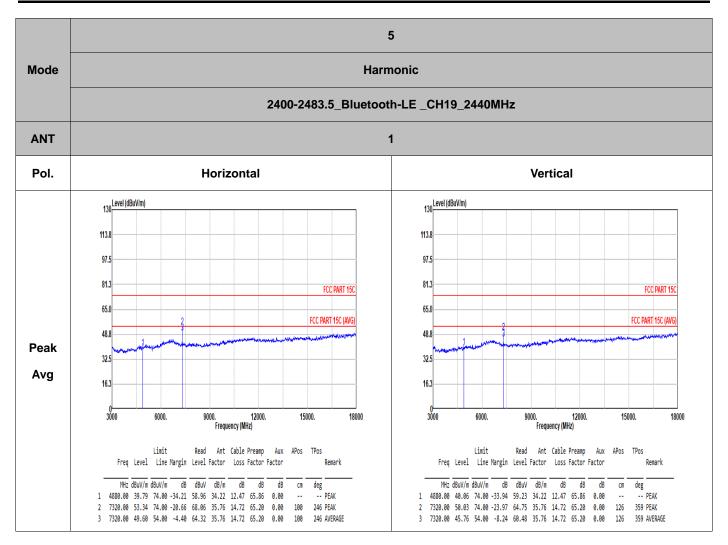
1 2386.57 44.45 54.00 -9.55 28.24 32.37 8.77 30.93 6.00 128 242 AVERAGE

1 2402.00 87.53 ----- 71.16 32.50 8.80 30.93 6.00 128 242 AVERAGE

Mode **Band Edge** 2400-2483.5_Bluetooth-LE _CH00_2402MHz **ANT** 1 Pol. Vertical **Fundamental** 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 65.0 Peak 32.5 32.5 16.3 16.3 2310 1000 2336. 2414. 2440 1400. 2600. 3000 Frequency (MHz) Frequency (MHz) Limit Limit Read Ant Cable Preamp Aux APos TPos 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 cm deg MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2333.14 54.61 74.00 -19.39 39.08 31.83 8.64 30.94 6.00 394 327 PEAK 394 327 PEAK 1 2402.00 84.35 ----- 67.98 32.50 8.80 30.93 6.00 130 Level (dBuV/m) 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 Avg 32.5 32.5 16.3 16.3 2310 52. 2388. Frequency (MHz) 1000 3000 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 dB dB dB cm deg MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2387.74 44.28 54.00 -9.72 28.06 32.38 8.77 30.93 6.00 394 327 AVERAGE 1 2402.00 83.38 ----- 67.01 32.50 8.80 30.93 6.00 394 327 AVERAGE



TEL: +86-512-57900158 FCC ID: SZGSRHSA1

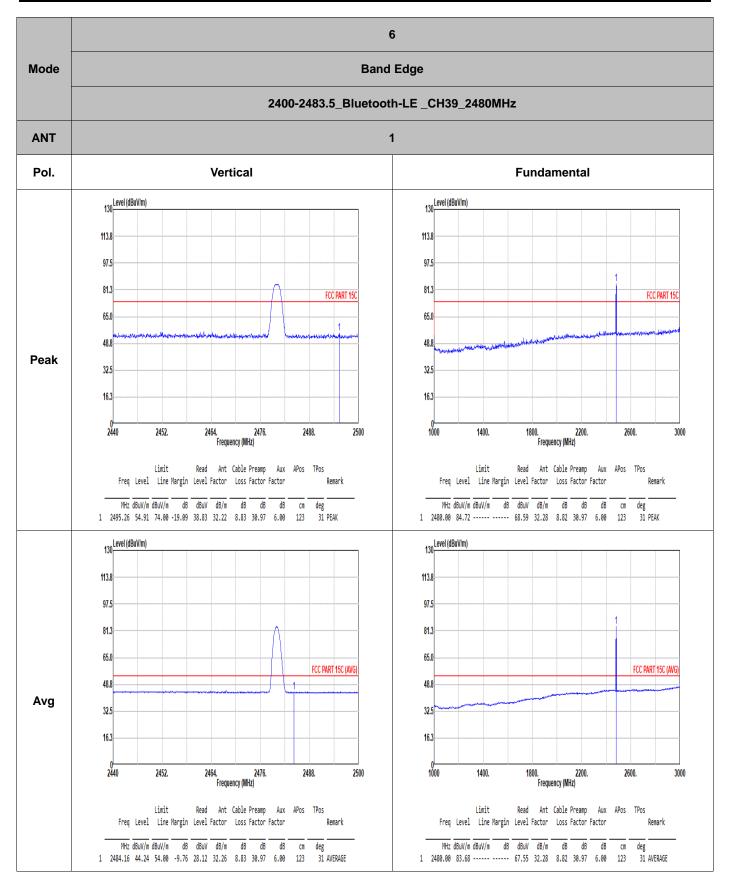


TEL: +86-512-57900158 FCC ID: SZGSRHSA1

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 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 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 dB dB MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB deg dB 1 2491.72 55.81 74.00 -18.19 39.72 32.23 8.83 30.97 6.00 155 268 PEAK 1 2480.00 86.98 ----- 70.85 32.28 8.82 30.97 6.00 155 130 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. 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 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 cm deg 1 2489.08 44.28 54.00 -9.72 28.18 32.24 8.83 30.97 6.00 155 268 AVERAGE 1 2480.00 86.04 ----- 69.91 32.28 8.82 30.97 6.00 155 268 AVERAGE

TEL: +86-512-57900158 FCC ID: SZGSRHSA1

CC RF Test Report No.: FR420222-02



TEL: +86-512-57900158 FCC ID: SZGSRHSA1

6 Mode Harmonic 2400-2483.5_Bluetooth-LE _CH39_2480MHz 1 **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 **Peak** 32.5 32.5 Avg 16.3 16.3 3000 9000. Frequency (MHz) 3000 6000. 12000. 15000. 18000 6000. 12000. 15000. 18000 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 deg -- PEAK 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 cm 1 4960.00 41.57 74.00 -32.43 60.54 34.40 12.38 65.75 0.00 1 4960.00 40.43 74.00 -33.57 59.40 34.40 12.38 65.75 0.00 2 7440.00 53.16 74.00 -20.84 67.99 35.82 14.92 65.57 0.00 106 2 7440.00 53.07 74.00 -20.93 67.90 35.82 14.92 65.57 0.00 276 163 PEAK 169 PEAK 3 7440.00 47.01 54.00 -6.99 61.84 35.82 14.92 65.57 0.00 106 169 AVERAGE 3 7440.00 47.02 54.00 -6.98 61.85 35.82 14.92 65.57 0.00 163 AVERAGE

TEL: +86-512-57900158 FCC ID: SZGSRHSA1

5 Mode LF 2400-2483.5_Bluetooth-LE _CH19_2440MHz **ANT** 1 Pol. Horizontal Vertical 80 Level (dBuV/m) 80 Level (dBuV/m) 71.7 71.7 63.3 63.3 FCC PART 150 55.0 55.0 38.3 30.0 30.0 21.7 13.3 13.3 5.0 **Peak** -3.3 -11.7 -20¹30 700. 100. 200. 300. 500. 600. 700. 800. 900. 1000 Frequency (MHz) Frequency (MHz) Over Limit ReadAntenna Cable Preamp Freq Level Limit Line Level Factor Loss Factor ReadAntenna Cable Preamp A/Pos T/Pos Over Limit Freq Level Limit Line Level Factor Loss Factor Remark MHz dBuV/m dB dBuV/m dBuV dB dB/m dB dBuV/m deg
 41.64
 30.60
 -9.40
 40.00
 43.87
 18.60

 135.73
 29.05
 -14.45
 43.50
 43.15
 16.96

 182.29
 29.11
 -14.39
 43.50
 44.18
 15.87

 323.91
 23.98
 -22.02
 46.00
 34.21
 19.93

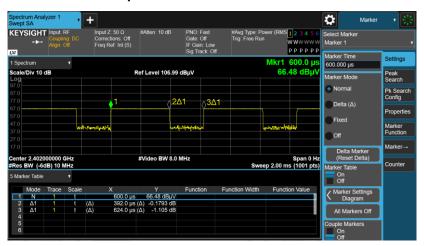
 710.94
 28.67
 -17.33
 46.00
 30.30
 27.07

 868.08
 29.90
 -16.10
 46.00
 28.72
 29.24
 32.84 32.83 32.99 32.90 32.78 89.17 27.92 -15.58 43.50 44.35 14.78 137.67 27.86 -15.64 43.50 41.90 17.00 296.75 22.69 -23.31 46.00 33.71 19.26 409.27 26.14 -19.86 46.00 33.70 22.13 729.37 30.54 -15.46 46.00 31.45 27.70 935.01 30.70 -15.30 46.00 28.64 29.75 0.97 32.84 1.77 32.83 2.05 32.99 2.74 32.90 4.08 32.78 4.50 32.56 --- Peak
--- Peak
--- Peak
--- Peak
--- Peak
--- Peak 1.79 2.63 3.09 4.13 4.67 32.83 32.91 32.78 32.74 32.36 ---**Emission above 18GHz** 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 Peak FCC PART 15C (AVG 32.5 32.5 16.3 16.3 18000 18000 19400. 22200. 25000 19400. 20800. 22200. 23600. 25000 Frequency (MHz) Frequency (MHz)

Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
Bluetooth LE 1Mbps	62.82	0.392	2.551	2.7KHz
NRF 2Mbps	33.23	0.208	4.808	5.1KHz

Bluetooth LE 1Mbps



NRF 2Mbps

