FCC RF Test Report

APPLICANT : Luxottica Group S.p.A.

EQUIPMENT: SMART GLASSES

BRAND NAME : Ray-Ban Meta or Ray-Ban MODEL NAME : RW4006, RW4008, RW4009

FCC ID : 2AYOA-4003

STANDARD : FCC Part 15 Subpart C §15.247

CLASSIFICATION : (DTS) Digital Transmission System

TEST DATE(S) : May 22, 2023 ~ Jun. 08, 2023

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.

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.: FR272102-02B

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
FR272102-02B	Rev. 01	Initial issue of report	Jul. 03, 2023
FR272102-02B	Rev. 02	Update Equipment name, Brand name and address of Applicant & Manufacturer	Jul. 26, 2023

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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.1	-	99% Bandwidth	-	Report only	-
3.2	15.247(b)(3)	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	≤ 30dBc	Pass	-
3.5	Radiated Band Edges and Spurious Emission		15.209(a) & 15.247(d)	Pass	Under limit 9.83 dB at 2483.540 MHz
3.6	3.6 15.207 AC Conducted Emission		15.207(a)	Pass	Under limit 19.60 dB at 0.21 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	5.203 & 15.247(b) Pass	

Conformity Assessment Condition:

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or
 in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of
 non-compliance that may potentially occur if measurement uncertainty is taken into account.
- 2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

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

Report No.: FR272102-02B

1 General Description

1.1 Applicant

Luxottica Group S.p.A.

Piazzale Cadorna 3 20123 Milan, Italy

1.2 Manufacturer

Luxottica Group S.p.A.

Piazzale Cadorna 3 20123 Milan, Italy

1.3 Product Feature of Equipment Under Test

Product Feature				
Equipment SMART GLASSES				
Brand Name	Ray-Ban Meta or Ray-Ban			
Model Name	RW4006, RW4008, RW4009			
FCC ID	2AYOA-4003			
SN Code	Conducted: 2q37b1wf3j003b Conduction: 2Q37B1WF3J006G Radiation: 2Q37B1WF3J00BF			
HW Version	EVT2			
SW Version 12/SQ3A. 220605. 009. A1/49757590052300100:userdebu				
EUT Stage Identical Prototype				

Remark:

- 1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
- 2. There are three types of EUT. The manufacturer declares that all the equipment and models share the same radio characteristics and Software/Firmware, the only differences between each of them are color of frames, lenses, and sizes which certainly do not affect the test results. Therefore, the test is mainly performed on the sample 1 as a representative for the others.

Sample	Model Name
Sample 1	RW4006
Sample 2	RW4008
Sample 3	RW4009

3. This device supports four power states, as below,

Power State	Exposure Condition	
۸	Face-Worn	
	Rest-on-Head	
В	Rest-on- Shirt	
D	Pocketing	
С	Pocketing/handheld(in Charging Case)	

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D	Free Space/Off Body
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State C is higher conducted power has assessed to test.

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	Bluetooth LE (1Mbps) : 7.10 dBm (0.0014 W)			
Maximum Output Power to Antenna	Bluetooth LE (2Mbps) : 7.20 dBm (0.0014 W)			
99% Occupied Bandwidth	Bluetooth LE (1Mbps) : 1.023MHz			
99% Occupied Bandwidth	Bluetooth LE (2Mbps) : 2.030MHz			
Antenna Type / Gain	Inverted-F and folded monopole Antenna with gain -0.40 dBi			
Type of Modulation	Bluetooth LE : GFSK			

1.5 Modification of EUT

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

1.6 Testing Location

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					
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.			
iest site No.	CO01-SZ TH01-SZ	CN1256	421272			

Test Firm	Sporton International Inc. (Shenzhen)				
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City Guangdong Province China 518103 TEL: +86-755-33202398				
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.		
root one ree	03CH03-SZ	CN1256	421272		

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1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH03-SZ	AUDIX	E3	6.2009-8-24
2.	CO01-SZ	AUDIX	E3	6.120613b

1.8 Applicable Standards

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

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

Remark:

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

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2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

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

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2.2 Test Mode

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y, Z 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 / GFSK					
Conducted	Mode 1: Bluetooth Tx CH00_2402 MHz					
	Mode 2: Bluetooth Tx CH19_2440 MHz					
TCs	Mode 3: Bluetooth Tx CH39_2480 MHz					
Dedicted	Mode 1: Bluetooth Tx CH00_2402 MHz					
Radiated	Mode 2: Bluetooth Tx CH19_2440 MHz					
TCs	Mode 3: Bluetooth Tx CH39_2480 MHz					
AC						
Conducted	Mode 1: Bluetooth Link + WLAN Link (2.4G) + USB Cable (Type C) + Adapter					
Emission						
Remark: For Radiated Test Cases, The tests were performance with Power Source.						

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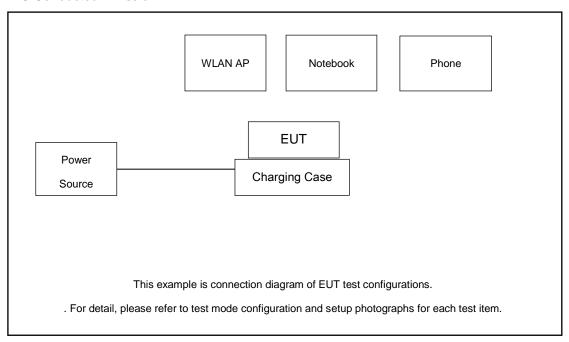
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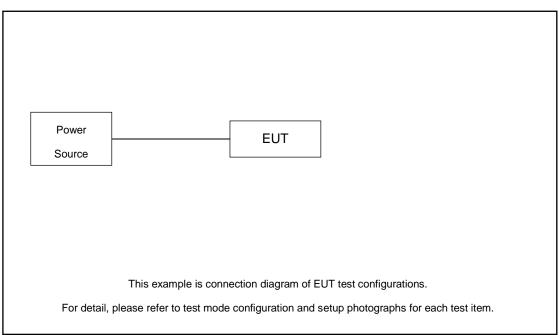
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2.3 Connection Diagram of Test System

AC Conducted Emission:



Radiated Emission:



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2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	Dlink	DIR-820L	KA2IR820LA1	N/A	N/A
2.	Notebook	DELL	Latitude3400	FCC DoC	ΝΙ/Δ	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Phone	Oneplus	NA	NA	NA	N/A
4.	Adapter	N/A	N/A	N/A	N/A	N/A
5.	USB Cable	N/A	N/A	N/A	N/A	N/A

2.5 EUT Operation Test Setup

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

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

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 1.60 dB and 20dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB). = 1.60 + 20 = 21.60 (dB) Report No.: FR272102-02B

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.

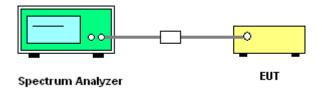
3.1.2 Measuring Instruments

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



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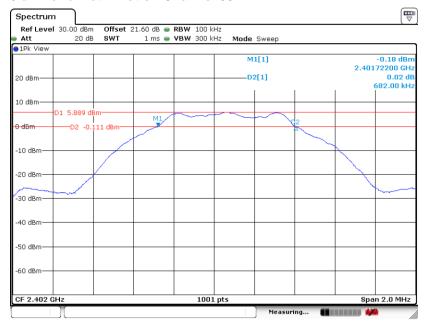
Report No.: FR272102-02B

3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

Bluetooth LE (1Mbps):

6 dB Bandwidth Plot on Channel 00



Date: 24.MAY.2023 19:38:50

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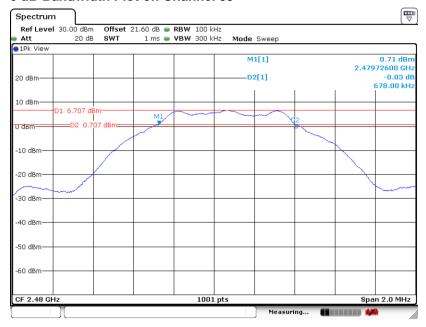
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6 dB Bandwidth Plot on Channel 19



Date: 24.MAY.2023 19:45:26

6 dB Bandwidth Plot on Channel 39



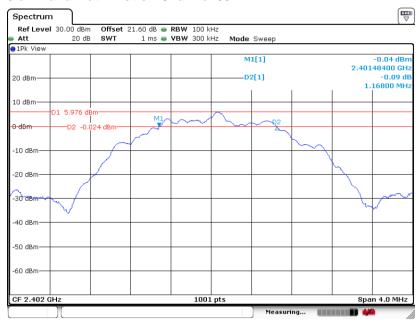
Date: 24.MAY.2023 19:49:09

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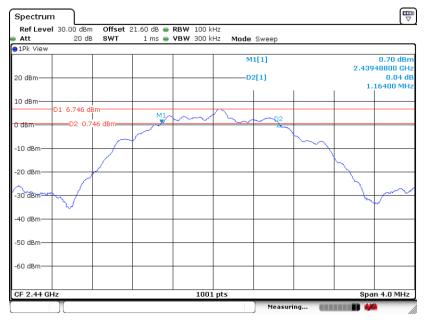
Bluetooth LE (2Mbps):

6 dB Bandwidth Plot on Channel 00



Date: 24.MAY.2023 19:52:52

6 dB Bandwidth Plot on Channel 19



Date: 31.MAY.2023 01:22:48

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6 dB Bandwidth Plot on Channel 39



Date: 24.MAY.2023 20:00:29

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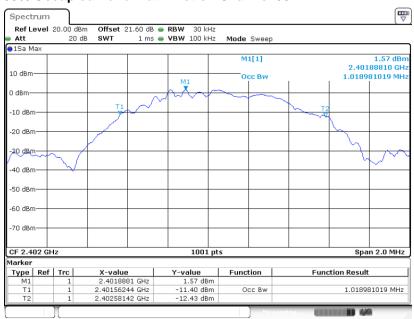
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3.1.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

Bluetooth LE (1Mbps):

99% Occupied Bandwidth Plot on Channel 00



Date: 24.MAY.2023 19:40:15

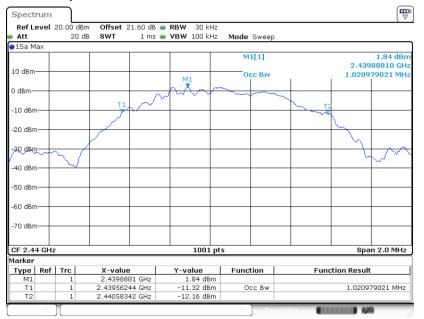
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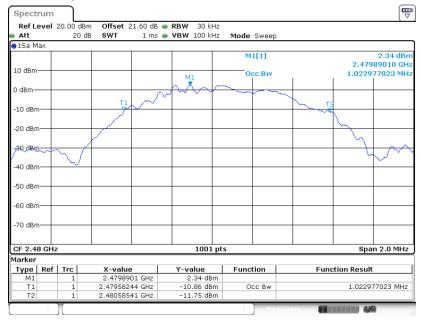
FCC RF Test Report

99% Occupied Bandwidth Plot on Channel 19



Date: 24.MAY.2023 19:45:37

99% Occupied Bandwidth Plot on Channel 39



Date: 24.MAY.2023 19:49:20

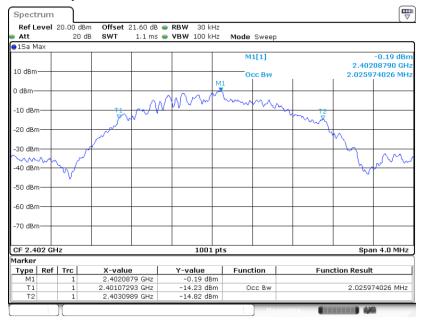
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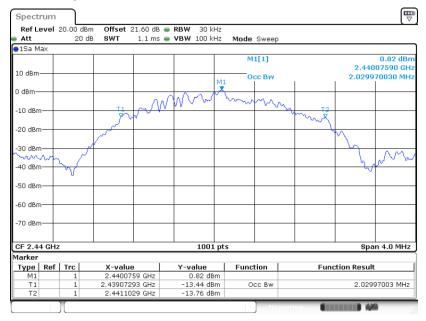
Bluetooth LE (2Mbps):

99% Occupied Bandwidth Plot on Channel 00



Date: 24.MAY.2023 19:53:10

99% Occupied Bandwidth Plot on Channel 19



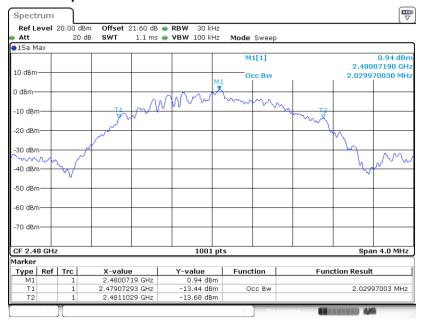
Date: 31.MAY.2023 01:23:26

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Date: 24.MAY.2023 20:00:15

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

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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 output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the 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.

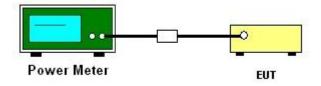
3.2.2 Measuring Instruments

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 Average Output Power

Please refer to Appendix A.

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3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

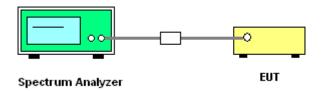
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

- The testing follows Measurement Procedure of ANSI C63.10-2013 clause 11.10.2 Method PKPSD.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
- 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 30dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

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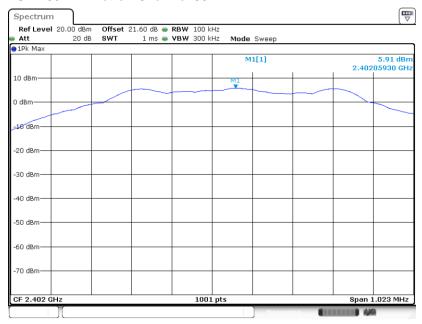
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3.3.6 Test Result of Power Spectral Density Plots (100kHz)

Bluetooth LE (1Mbps):

PSD 100kHz Plot on Channel 00



Date: 24.MAY.2023 19:39:57

PSD 100kHz Plot on Channel 19



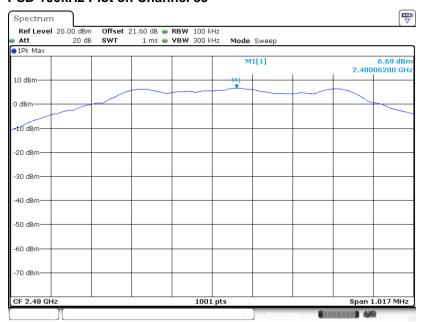
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PSD 100kHz Plot on Channel 39



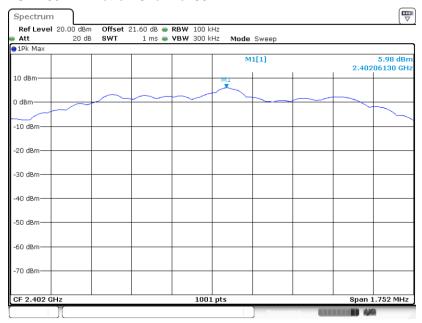
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TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AYOA-4003 Page Number : 24 of 48
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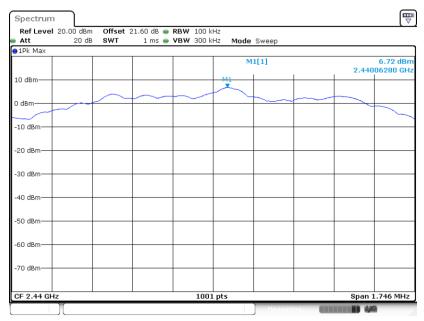
Bluetooth LE (2Mbps):

PSD 100kHz Plot on Channel 00



Date: 24.MAY.2023 19:55:51

PSD 100kHz Plot on Channel 19



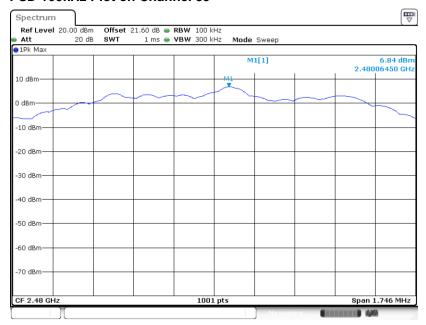
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PSD 100kHz Plot on Channel 39



Date: 24.MAY.2023 20:01:03

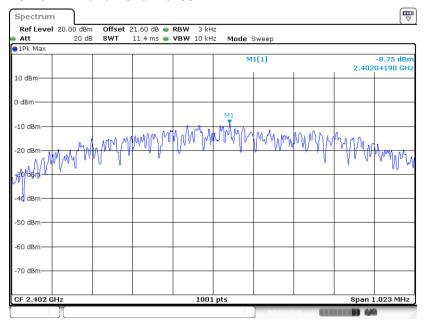
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AYOA-4003 Page Number : 26 of 48
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3.3.7 Test Result of Power Spectral Density Plots (3kHz)

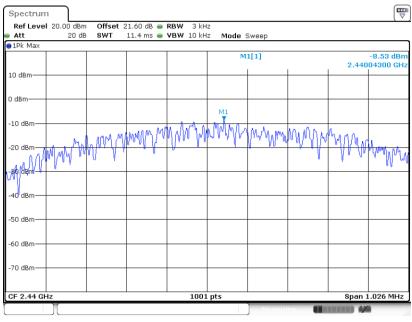
Bluetooth LE (1Mbps):

PSD 3kHz Plot on Channel 00



Date: 24.MAY.2023 19:39:25

PSD 3kHz Plot on Channel 19



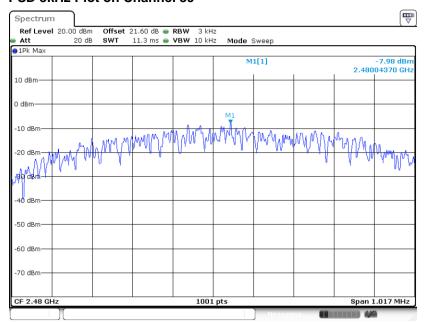
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PSD 3kHz Plot on Channel 39



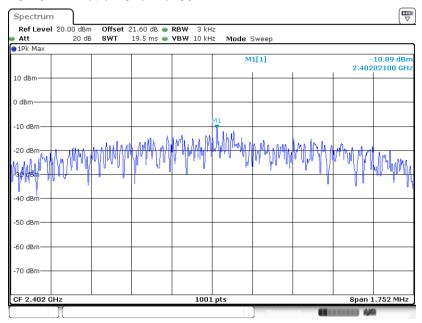
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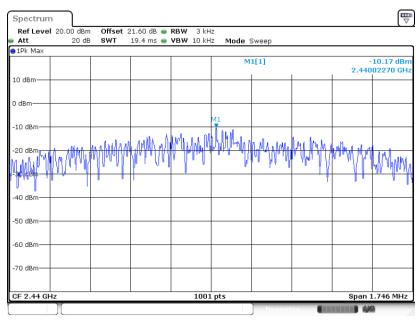
Bluetooth LE (2Mbps):

PSD 3kHz Plot on Channel 00



Date: 24.MAY.2023 19:54:37

PSD 3kHz Plot on Channel 19



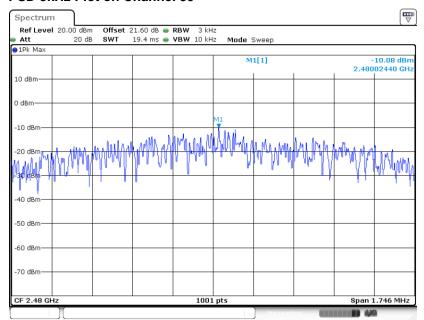
Date: 31.MAY.2023 01:23:43

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PSD 3kHz Plot on Channel 39



Date: 24.MAY.2023 20:00:42

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3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 30 dB down from the highest emission level within the authorized band.

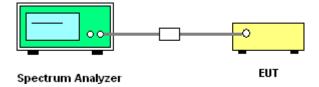
3.4.2 Measuring Instruments

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



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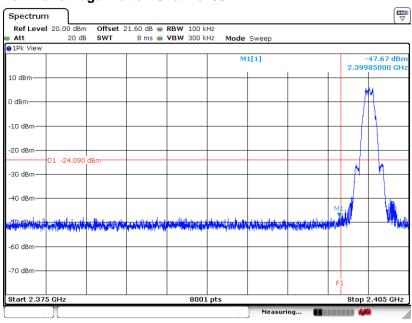
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AYOA-4003 Page Number : 31 of 48
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3.4.5 Test Result of Conducted Band Edges Plots

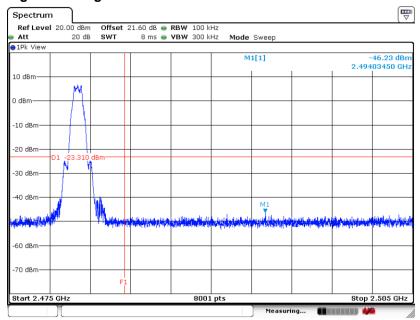
Bluetooth LE (1Mbps):

Low Band Edge Plot on Channel 00



Date: 24.MAY.2023 19:40:31

High Band Edge Plot on Channel 39



Date: 24.MAY.2023 19:50:02

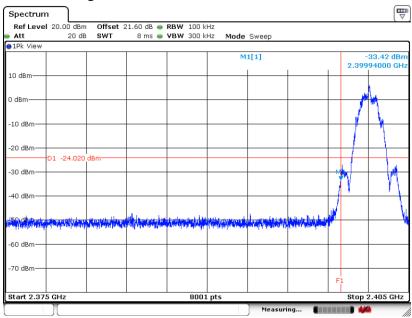
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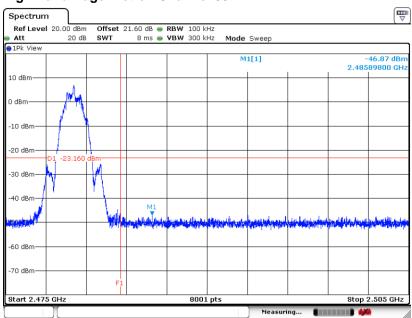
Bluetooth LE (2Mbps):

Low Band Edge Plot on Channel 00



Date: 24.MAY.2023 19:56:48

High Band Edge Plot on Channel 39



Date: 24.MAY.2023 20:01:59

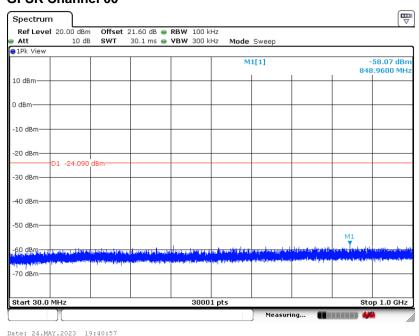
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AYOA-4003 Page Number : 33 of 48
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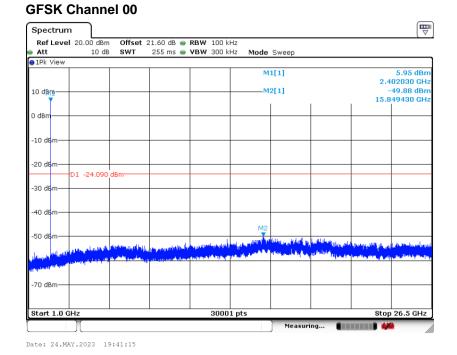
3.4.6 Test Result of Conducted Spurious Emission Plots

Bluetooth LE (1Mbps):

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



Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

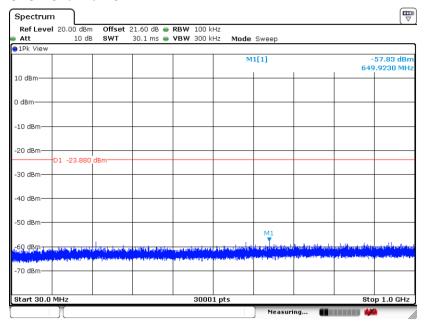


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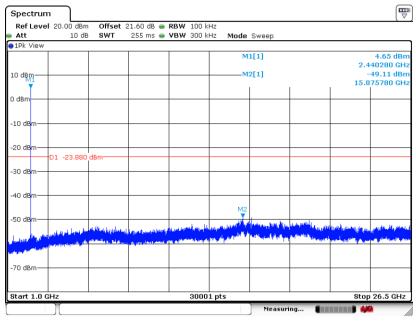
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Conducted Spurious Emission Plot on Bluetooth LE 1Mbps GFSK Channel 19



Date: 24.MAY.2023 19:46:41

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



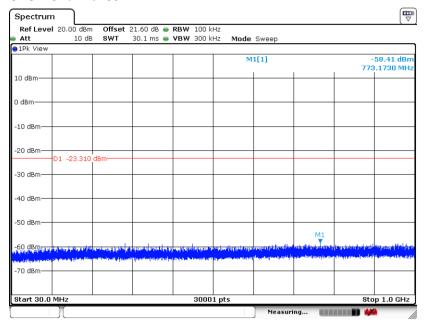
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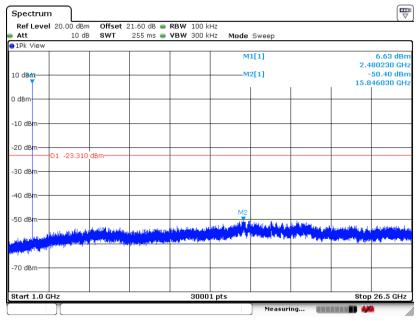
Report No.: FR272102-02B

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



Date: 24.MAY.2023 19:51:08

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



Date: 24.MAY.2023 19:51:25

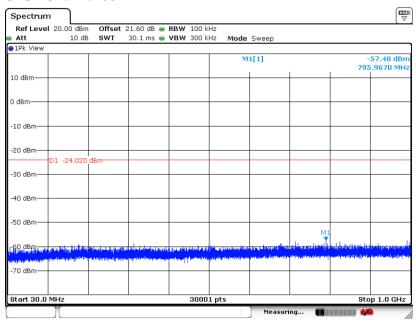
Sporton International Inc. (ShenZhen)

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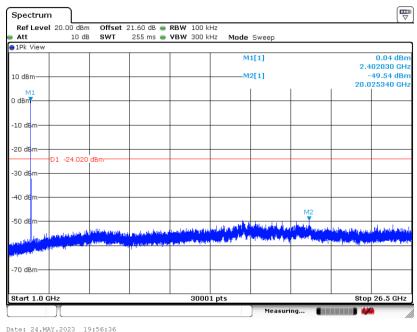
Bluetooth LE (2Mbps):

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



Date: 24.MAY.2023 19:56:19

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

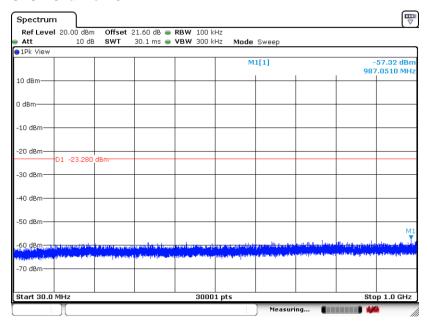


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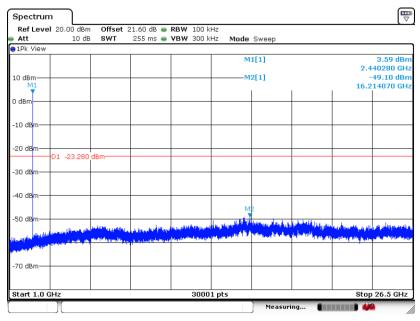
Report No.: FR272102-02B

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



Date: 31.MAY.2023 01:24:43

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



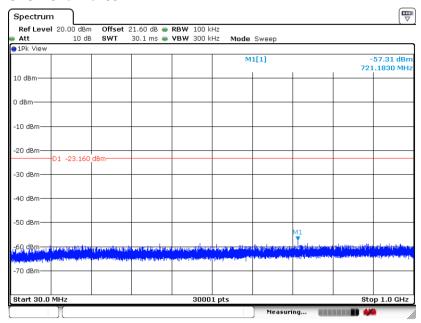
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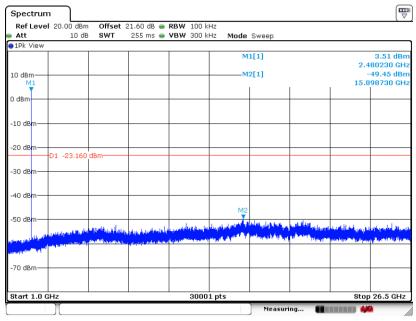
Report No.: FR272102-02B

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



Date: 24.MAY.2023 20:01:32

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



Date: 24.MAY.2023 20:01:47

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3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

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

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

3.5.2 Measuring Instruments

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

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3.5.3 Test Procedures

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

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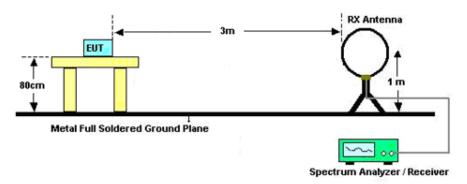
FAX: +86-755-8637-9595 FCC ID: 2AYOA-4003 Report Template No.: BU5-FR15CBT4.0 Version 2.0

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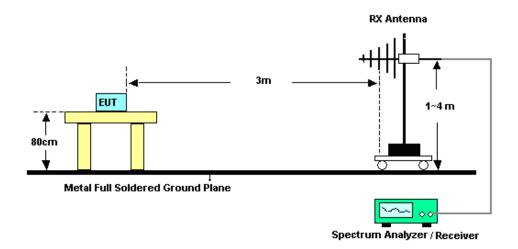
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3.5.4 Test Setup

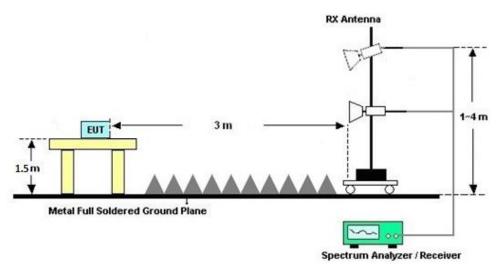
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

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

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.5.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix C.

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3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

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

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

3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

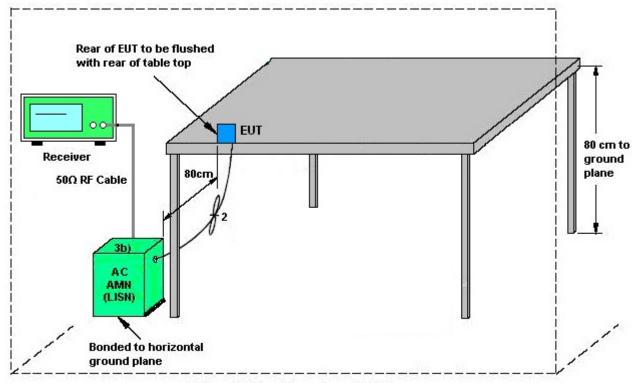
- 1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- 2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- 3. All the support units are connecting to the other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

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3.6.4 Test Setup



AMN = Artificial mains network (LISN)

AE = Associated equipment

EUT = Equipment under test

ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

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3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Anti-Replacement Construction

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.

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4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 06, 2023	May 24, 2023~ May 31, 2023	Apr. 05, 2024	Conducted (TH01-SZ)
Pulse Power Senor	Anritsu	MA2411B	1339473	30MHz~40GHz	Dec. 27, 2022	May 24, 2023~ May 31, 2023	Dec. 26, 2023	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1542004	50MHz Bandwidth	Dec. 27, 2022	May 24, 2023~ May 31, 2023	Dec. 26, 2023	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY544500 83	20Hz~8.4GHz	Apr. 04, 2023	May 22, 2023~ Jun. 08, 2023	Apr. 03, 2024	Radiation (03CH03-SZ)
EXA Spectrum Anaiyzer	KEYSIGHT	N9010A	MY551502 46	10Hz~44GHz;	Apr. 04, 2023	May 22, 2023~ Jun. 08, 2023	Apr. 03, 2024	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jul. 28, 2022	May 22, 2023~ Jun. 08, 2023	Jul. 27, 2024	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz-2GHz	Aug. 09, 2022	May 22, 2023~ Jun. 08, 2023	Aug. 08, 2023	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBE CK	BBHA9120D	9120D-135 5	1GHz~18GHz	Apr. 08, 2023	May 22, 2023~ Jun. 08, 2023	Apr. 07, 2024	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35- HG	1871923	18GHz~40GHz	Jul. 06, 2022	May 22, 2023~ Jun. 08, 2023	Jul. 05, 2023	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 08, 2023	May 22, 2023~ Jun. 08, 2023	Apr. 07, 2024	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 19, 2022	May 22, 2023~ Jun. 08, 2023	Oct. 18, 2023	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P- R	1943528	1GHz~18GHz	Oct. 19, 2022	May 22, 2023~ Jun. 08, 2023	Oct. 18, 2023	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY395013 02	500MHz~26.5G Hz	Dec. 26, 2022	May 22, 2023~ Jun. 08, 2023	Dec. 25, 2023	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010002 729	1 N/A	Nov. 10, 2022	May 22, 2023~ Jun. 08, 2023	Nov. 09, 2023	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	May 22, 2023~ Jun. 08, 2023	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	May 22, 2023~ Jun. 08, 2023	NCR	Radiation (03CH03-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jul. 07, 2022	Jun. 07, 2023	Jul. 06, 2023	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Sep. 15, 2022	Jun. 07, 2023	Sep. 14, 2023	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 17, 2022	Jun. 07, 2023	Oct. 16, 2023	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000 891	100Vac~250Vac	Jul. 07, 2022	Jun. 07, 2023	Jul. 06, 2023	Conduction (CO01-SZ)

NCR: No Calibration Required

Sporton International Inc. (ShenZhen)

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5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty			
Conducted Power	±1.34 dB			
Conducted Emissions	±1.34 dB			
Occupied Channel Bandwidth	±0.13 %			
Conducted Power Spectral Density	±1.32 dB			

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence	2.7.10
of 95% (U = 2Uc(y))	2.7dB

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

1		
	Measuring Uncertainty for a Level of Confidence	5.0dB
	of 95% (U = 2Uc(y))	5.UGB

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.9dB
---------------------------------------------------------------------	-------

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence	5.0dB		
of 95% (U = 2Uc(y))	3.00B		

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

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Appendix A. Conducted Test Results

Sporton International Inc. (ShenZhen)

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Report Number : FR272102-02B

Test Engineer:	Chen Ran	Temperature:	24~26	°C
Test Date:	2023/5/24~2023/5/31	Relative Humidity:	50~53	%

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	1.019	0.682	0.50	Pass
BLE	1Mbps	1	19	2440	1.021	0.684	0.50	Pass
BLE	1Mbps	1	39	2480	1.023	0.678	0.50	Pass

TEST RESULTS DATA Average Power Table

Mod.	Data Rate	N⊤x	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	2.04	6.70	30.00	-0.40	6.30	36.00	Pass
BLE	1Mbps	1	19	2440	2.04	6.80	30.00	-0.40	6.40	36.00	Pass
BLE	1Mbps	1	39	2480	2.04	7.10	30.00	-0.40	6.70	36.00	Pass

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	5.91	-8.75	-0.40	8.00	Pass
BLE	1Mbps	1	19	2440	6.12	-8.53	-0.40	8.00	Pass
BLE	1Mbps	1	39	2480	6.69	-7.98	-0.40	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.

Report Number : FR272102-02B

Test Engineer:	Chen Ran	Temperature:	24~26	°C
Test Date:	2023/5/24~2023/5/31	Relative Humidity:	50~53	%

TEST RESULTS DATA 6dB and 99% Occupied Bandwidth

Mod	d.	Data Rate	N⊤x	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BL	E 2	2Mbps	1	0	2402	2.026	1.168	0.50	Pass
BL	E 2	2Mbps	1	19	2440	2.030	1.164	0.50	Pass
BLI	E 2	2Mbps	1	39	2480	2.030	1.164	0.50	Pass

TEST RESULTS DATA Average Power Table

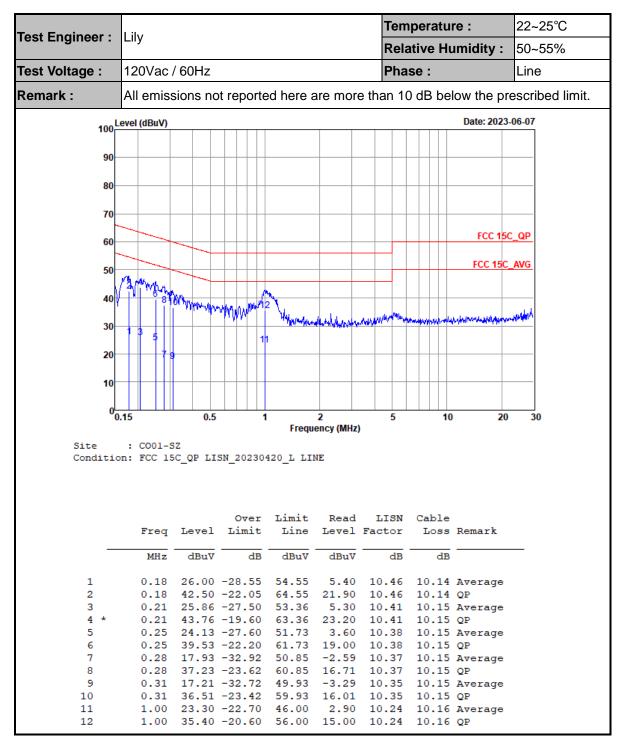
Mod.	Data Rate	N⊤x	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	2Mbps	1	0	2402	4.86	6.80	30.00	-0.40	6.40	36.00	Pass
BLE	2Mbps	1	19	2440	4.86	6.90	30.00	-0.40	6.50	36.00	Pass
BLE	2Mbps	1	39	2480	4.86	7.20	30.00	-0.40	6.80	36.00	Pass

TEST RESULTS DATA Peak Power Density

Mod.	Data Rate	N⊤x	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	5.98	-10.89	-0.40	8.00	Pass
BLE	2Mbps	1	19	2440	6.72	-10.17	-0.40	8.00	Pass
BLE	2Mbps	1	39	2480	6.84	-10.08	-0.40	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.

Appendix B. AC Conducted Emission Test Results



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AYOA-4003

Temperature: 22~25°C Test Engineer: Lily Relative Humidity: 50~55% Test Voltage: 120Vac / 60Hz Phase: Neutral Remark: All emissions not reported here are more than 10 dB below the prescribed limit. 100 Level (dBuV) Date: 2023-06-07 90 80 70 FCC 15C_QP 60 50 30 10 0<mark>0.15</mark> 0.5 10 20 30 Frequency (MHz) Site : CO01-SZ Condition: FCC 15C_QP LISN_20230420_N NEUTRAL Over Limit Read LISN Cable Freq Level Limit Line Level Factor Loss Remark dBuV dB dBuV dBuV dB MHz dB 0.15 26.39 -29.61 56.00 5.80 10.46 10.13 Average 0.15 43.49 -22.51 66.00 22.90 10.46 10.13 QP 24.56 -30.30 54.86 4.00 42.66 -22.20 64.86 22.10 3 0.17 4.00 10.42 10.14 Average 4 0.17 10.42 10.14 QP 0.21 27.50 -25.90 53.40 7.00 10.35 10.15 Average 6 * 0.21 43.60 -19.80 63.40 23.10 10.35 10.15 QP 0.26 23.87 -27.51 51.38 3.40 10.32 10.15 Ave 10.15 Average

0.26 38.47 -22.91 61.38 18.00 10.32 10.15 OP

0.99 35.90 -20.10 56.00 15.50 10.24 10.16 QP

36.53 -22.91 59.44 16.10 23.50 -22.50 46.00 3.10

0.33 20.13 -29.31 49.44 -0.30 10.27 10.16 Average

10.27

3.10 10.24 10.16 Average

Note:

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

0.33

0.99

8

10

11

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AYOA-4003 10.16 QP

Appendix C. Radiated Spurious Emission

Test Engineer: Reid Huang	Relative Humidity :	48~49%	
rest Engineer:	Reid Huang	Temperature :	24~25℃

Radiated Spurious Emission Test Modes

Mode	Band (MHz)	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 4	2400-2483.5	Bluetooth LE	0	2402	1Mbps	-	-
Mode 5	2400-2483.5	Bluetooth LE	19	2440	1Mbps	-	-
Mode 6	2400-2483.5	Bluetooth LE	39	2480	1Mbps	-	-
Mode 7	2400-2483.5	Bluetooth LE	0	2402	2Mbps	-	-
Mode 8	2400-2483.5	Bluetooth LE	19	2440	2Mbps	-	-
Mode 9	2400-2483.5	Bluetooth LE	39	2480	2Mbps	-	-
Mode 46	-	Bluetooth LE	39	2480	-	-	LF

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Summary of each worse mode

Mode	Modulation	Ch.	Freq.	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
	Bluetooth LE	0	2337.23	42.56	54.00	-11.44	٧	AVERAGE	Pass	Band Edge
4	Bluetooth LE	0	4804.00	44.99	74.00	-29.01	V	Peak	Pass	Harmonic
	Bluetooth LE	19	2489.92	42.55	54.00	-11.45	V	AVERAGE	Pass	Band Edge
5	Bluetooth LE	19	4880.00	46.70	74.00	-27.30	V	Peak	Pass	Harmonic
6	Bluetooth LE	39	2498.02	42.56	54.00	-11.44	V	AVERAGE	Pass	Band Edge
0	Bluetooth LE	39	7440.00	45.92	74.00	-28.08	Н	Peak	Pass	Harmonic
7	Bluetooth LE	0	2354.07	43.96	54.00	-10.04	V	AVERAGE	Pass	Band Edge
,	Bluetooth LE	0	4804.00	44.66	74.00	-29.34	Н	Peak	Pass	Harmonic
8	Bluetooth LE	19	2483.56	43.91	54.00	-10.09	Н	AVERAGE	Pass	Band Edge
0	Bluetooth LE	19	4880.00	46.83	74.00	-27.17	V	Peak	Pass	Harmonic

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Summary of each worse mode

Mode	Modulation	Ch.	Freq.	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
9	Bluetooth LE	39	2483.54	44.17	54.00	-9.83	Н	AVERAGE	Pass	Band Edge
9	Bluetooth LE	39	7440.00	46.92	74.00	-27.08	Н	Peak	Pass	Harmonic
46	2M	39	30.97	25.56	46	-14.44	Н	AVERAGE	Pass	LF

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Mode **Band Edge** 2400-2483.5_Bluetooth LE_CH0_2402MHz **ANT** 1 Pol. Horizontal **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81. 81.3 PEAK_74 65.0 65.0 32.5 32.5 16.3 16.3 Peak 2346.8 2365.2 Frequency (MHz) 1000 1800. 2200. Frequency (MHz) : 03CH03-SZ Site : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 HORIZONTAL Condition: PEAK_74 3m ANT3117_0057 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz : 4 : RBW:1000.000kHz VBW:3000.000kHz Setting : default
Plane : Y with accessories Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz | dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 | 2385.35 | 53.14 | 74.00 | -20.86 | 49.82 | 32.20 | 4.79 | 33.67 | 400 | 43 | PEAK MHz dBuV/m dBuV/m dBuV/m dBuV dB/m dB dB cm 1 2402.00 86.27 ----- 82.87 32.25 4.81 33.66 400 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 81.3 81.3 65.0 65.0 AVG_5 48.8 48.8 32.5 32.5 Avg 2310 1000 1800. 2200. Frequency (MHz) 2328.4 2346.8 2365.2 Frequency (MHz) 2383.6 1400. 2600. 3000 Site : 03CH03-SZ Condition: AVG_54 3m ANT3117_0057 HORIZONTAL : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 HORIZONTAL : RBW:1000.000kHz VBW:3.000kHz : 4 : RBW:1000.000kHz VBW:3.000kHz : 4 Setting : default
Plane : Y with accessories
: #12 2Q37B1WF3J00BF Setting : default
Plane : Y with accessories : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos
Freq Level Line (dB) Level Factor Loss Factor Remark Limit Margin Read Ant Cable Preamp APos TPos
Freq Level Line (dB) Level Factor Loss Factor Remark

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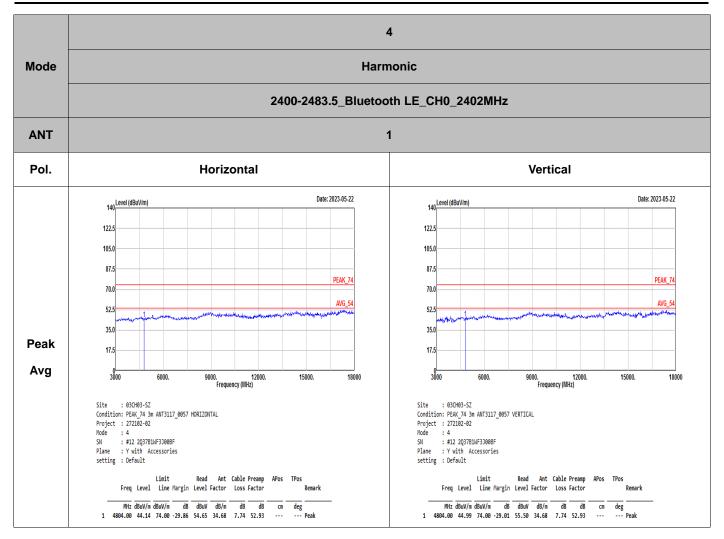
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| MHz dBuV/m dBuV/m | dBuV | dBuV | dB/m | dB | dB | cm | deg | | 1 2385.16 | 41.68 | 54.00 -12.32 | 38.36 | 32.20 | 4.79 | 33.67 | 400 | 43 AVERAGE

Mode **Band Edge** 2400-2483.5_Bluetooth LE_CH0_2402MHz **ANT** 1 Pol. Vertical **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81. 81.3 PEAK_74 65.0 65.0 32.5 32.5 16.3 16.3 Peak 2346.8 2365.2 Frequency (MHz) 1000 1800. 2200. Frequency (MHz) 2328.4 : 03CH03-SZ Site : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 VERTICAL Condition: PEAK_74 3m ANT3117_0057 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz : 4 : RBW:1000.000kHz VBW:3000.000kHz Setting : default
Plane : Y with accessories Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz | dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 | 2402.00 | 83.74 ----- 80.34 | 32.25 | 4.81 | 33.66 | 333 | 196 | PEAK Date: 2023-05-22 130 Level (dBuV/m) 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 AVG_5 48.8 48.8 32.5 32.5 16.3 Avg 2310 2346.8 2365.2 Frequency (MHz) 1000 2328.4 2383.6 2402 1400. 1800. 2200. Frequency (MHz) 2600. 3000 Site : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 VERTICAL Site : 03CH03-SZ Condition: AVG_54 3m ANT3117_0057 VERTICAL : RBW:1000.000kHz VBW:3.000kHz : 4 : RBW:1000.000kHz VBW:3.000kHz : 4 Setting : default
Plane : Y with accessories Setting : default
Plane : Y with accessories : #12 2Q37B1WF3J00BF : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark | MHz dBuV/m dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | | 1 2340.64 | 43.38 | 74.00 -30.62 | 40.24 | 32.09 | 4.75 | 33.70 | 333 | 196 AVERAGE | MHz dBuV/m dBuV/m | dBuV dB/m dB dB cm deg | 1 2402.00 82.78 ----- 79.38 32.25 4.81 33.66 333 196 AVERAGE

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5 Mode Band Edge - L 2400-2483.5_Bluetooth LE_CH19_2440MHz **ANT** 1 Pol. Horizontal **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81. 81.3 PEAK_74 65.0 65.0 32.5 32.5 16.3 16.3 Peak 2362. 2388. Frequency (MHz) 1000 1800. 2200. Frequency (MHz) : 03CH03-SZ Site : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 HORIZONTAL Condition: PEAK_74 3m ANT3117_0057 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz : 5 : RBW:1000.000kHz VBW:3000.000kHz Setting : default
Plane : Y with accessories Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz | dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 | 2440.00 | 87.55 ----- | 83.99 | 32.34 | 4.86 | 33.64 | 200 | 200 | PEAK 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 81.3 81.3 65.0 65.0 AVG_5 48.8 48.8 32.5 32.5 Avg 2310 2362. 2388. Frequency (MHz) 1000 2336. 2414. 1400. 1800. 2200. Frequency (MHz) 2600. 3000 Site : 03CH03-SZ Condition: AVG_54 3m ANT3117_0057 HORIZONTAL : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 HORIZONTAL : RBW:1000.000kHz VBW:3.000kHz : 5 : RBW:1000.000kHz VBW:3.000kHz : 5 Setting : default
Plane : Y with accessories Setting : default
Plane : Y with accessories
: #12 2Q37B1WF3J00BF : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos
Freq Level Line (dB) Level Factor Loss Factor Remark Limit Margin Read Ant Cable Preamp APos TPos
Freq Level Line (dB) Level Factor Loss Factor Remark | MHz dBuV/m dBuV/m | dBuV | dBuV | dB/m | dB | dB | cm | deg | | 1 2365.64 | 41.68 | 54.00 -12.32 | 38.44 | 32.15 | 4.77 | 33.68 | 200 | 200 | AVERAGE | MHz dBuV/m dBuV/m | dBuV dB/m dB dB cm deg | 1 2440.00 86.65 ----- 83.09 32.34 4.86 33.64 200 200 AVERAGE

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5 Band Edge - R Mode 2400-2483.5_Bluetooth LE_CH19_2440MHz **ANT** 1 Pol. Horizontal **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 113.8 97.5 81.3 PEAK_BE_74 65.0 32.5 16.3 Peak **Blank** 2452. 2464. 2476. Frequency (MHz) Site : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz : 5 Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor 130 Level (dBuV/m) Date: 2023-05-22 113.8 97.5 81.3 65.0 AVG_BE_5 48.8 32.5 Avg **Blank** 2440 2464. 2476. Frequency (MHz) 2488. 2452. 2500 Site : 03CH03-5Z Condition: AVG_BE_54 3m ANT3117_0057 HORIZONTAL : RBN:1000.000kHz VBN:3.000kHz Mode : 5 Setting : default
Plane : Y with accessories
: #12 2Q3781WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos
Freq Level Line (dB) Level Factor Loss Factor Remark | MHz dBuV/m dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | | 1 2497.96 | 42.35 | 54.00 -11.65 | 38.52 | 32.49 | 4.94 | 33.60 | 200 | 200 AVERAGE

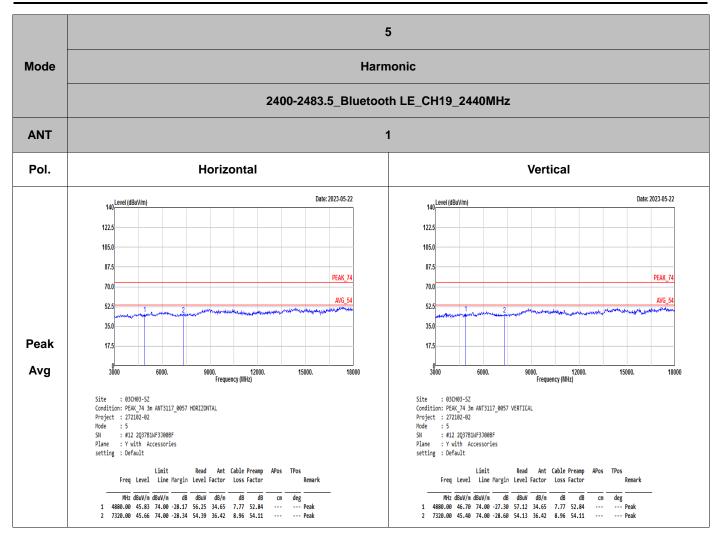
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5 Mode Band Edge - L 2400-2483.5_Bluetooth LE_CH19_2440MHz **ANT** 1 Pol. Vertical **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81. 81.3 PEAK_74 65.0 65.0 32.5 32.5 16.3 16.3 Peak 2362. 2388. Frequency (MHz) 1000 1800. 2200. Frequency (MHz) : 03CH03-SZ Site : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 VERTICAL Condition: PEAK_74 3m ANT3117_0057 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz : 5 : RBW:1000.000kHz VBW:3000.000kHz Setting : default
Plane : Y with accessories Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz | dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 | 2440.00 | 84.05 | | 80.49 | 32.34 | 4.86 | 33.64 | 310 | 188 | PEAK 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 81.3 81.3 65.0 65.0 AVG_5 32.5 32.5 Avg 2310 2362. 2388. Frequency (MHz) 1000 1800. 2200. Frequency (MHz) 2336. 2414. 1400. 2600. 3000 Site : 03CH03-SZ Condition: AVG_54 3m ANT3117_0057 VERTICAL : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 VERTICAL : RBW:1000.000kHz VBW:3.000kHz : 5 : RBW:1000.000kHz VBW:3.000kHz : 5 Setting : default
Plane : Y with accessories Setting : default
Plane : Y with accessories
: #12 2Q37B1WF3J00BF : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark MHz dBuV/m dBuV/m dBuV/m dBuV dB/m dB dB cm deg
1 2337.17 42.24 54.00 -11.76 39.12 32.08 4.74 33.70 310 188 Peak | MHz dBuV/m dBuV/m | dBuV dB/m dB dB cm deg | 1 2440.00 83.43 ----- 79.87 32.34 4.86 33.64 310 188 AVERAGE

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	5	
Mode	Band Edge	·R
	2400-2483.5_Bluetooth LE	_CH19_2440MHz
ANT	1	
Pol.	Vertical	Fundamental
	130	
	113.8	
	97.5	
	81.3 PEAK BE 74	
	48.8	
	32.5	
Peak	163	Blank
	2440 2452. 2464, 2476. 2488. 2500 Frequency (MHz)	
	Site	
	130_Evel (dBuV/m) Date: 2023-05-22	
	113.8	
	97.5	
	81.3	
	65.0 AVG_BE_54	
	32.5	
Avg	16.3	Blank
Avg	0 240 2452. 2464. 2476. 2488. 2500 Frequency (MHz)	Blank
	Site : 03CH03-5Z Condition: AVG_BE_54 3m ANT3117_0057 VERTICAL : RBN:1000.000kHz VBN:3.000kHz Mode : 5 Setting : default Plane : Y with accessories : #12 2Q3781NF33000F	
	Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark	
	MHz dBuV/m dBuV/m dBuV dB/m dB dB cm deg 1 2489.92 42.55 54.00 -11.45 38.76 32.47 4.93 33.61 310 188 AVERAGE	

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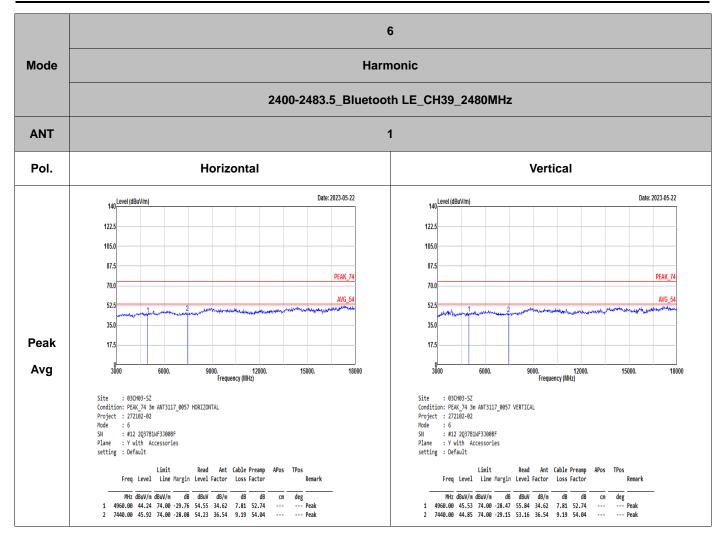
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AYOA-4003

Mode **Band Edge** 2400-2483.5_Bluetooth LE_CH39_2480MHz **ANT** 1 Pol. Horizontal **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 48.8 32.5 32.5 16.3 16.3 Peak 2480 2488. Frequency (MHz) 1000 1800. Frequency (MHz) 2484. 2492. 2496. 2500 1400. 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 HORIZONTAL Condition: PEAK_74 3m ANT3117_0057 HORIZONTAL Mode : 6 Setting : default
Plane : Y with accessories Setting : default Plane : Y with accessories Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark Remark | MHz dBuV/m dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 | 2480.00 | 85.43 ----- | 81.67 | 32.45 | 4.92 | 33.61 | 300 | 239 | PEAK Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 65.0 65.0 32.5 325 16.3 16.3 Avg 1000 2480 2488. 2492. Frequency (MHz) 1800. 2200. Frequency (MHz) 2484. 2496. 2500 1400. 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 HORIZONTAL Condition: AVG_54 3m ANT3117_0057 HORIZONTAL Mode : 6 Setting : default Mode : 6 Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF Plane : Y with accessories : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz dBuV/m dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | | 1 2495.78 | 42.22 | 54.00 -11.78 | 38.39 | 32.49 | 4.94 | 33.60 | 300 | 239 | AVERAGE | MHz dBuV/m dBuV/m dBuV/m dBuV dB/m dB dB cm deg | 1 2480.00 84.76 ------ 81.00 32.45 4.92 33.61 300 239 AVERAGE

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Mode **Band Edge** 2400-2483.5_Bluetooth LE_CH39_2480MHz **ANT** 1 Pol. Vertical **Fundamental** Date: 2023-05-23 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 48.8 32.5 32.5 16.3 16.3 Peak 2480 2488. Frequency (MHz) 1000 1800. Frequency (MHz) 2484. 2492. 2496. 2500 1400. 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 VERTICAL Condition: PEAK_74 3m ANT3117_0057 VERTICAL Mode : 6 Mode : 6 Setting : default
Plane : Y with accessories Setting : default Plane : Y with accessories Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark Remark | MHz dBuV/m dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 | 2480.00 | 87.44 ----- | 83.68 | 32.45 | 4.92 | 33.61 | 255 | 198 PEAK Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) 113.8 113.8 97.5 97.5 81.3 65.0 65.0 32.5 325 16.3 16.3 Avg 1000 2480 2488. 2492. Frequency (MHz) 1800. 2200. Frequency (MHz) 2484. 2496. 2500 1400. 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 VERTICAL Condition: AVG_54 3m ANT3117_0057 VERTICAL Mode : 6 Setting : default Mode : 6 Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF Plane : Y with accessories : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz dBuV/m dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | | 1 2498.02 | 42.56 | 54.00 -11.44 | 38.73 | 32.49 | 4.94 | 33.60 | 255 | 198 AVERAGE | MHz dBuV/m dBuV/m dBuV/m dBuV dB/m dB dB cm deg | 1 2480.00 86.53 ----- 82.77 32.45 4.92 33.61 255 198 AVERAGE

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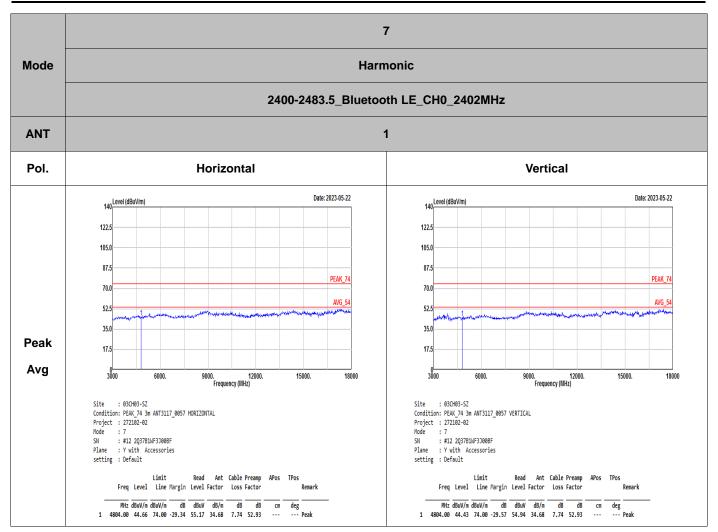
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: 2AYOA-4003

Mode **Band Edge** 2400-2483.5_Bluetooth LE_CH0_2402MHz **ANT** 1 Pol. Horizontal **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 32.5 32.5 16.3 16.3 Peak 2310 2346.8 2 Frequency (MHz) 1000 1800. Frequency (MHz) 2328.4 2365.2 2383.6 2402 1400. 2200. 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 HORIZONTAL Condition: PEAK_74 3m ANT3117_0057 HORIZONTAL Mode : 7 Mode : 7 Setting : default Setting : default Plane : Y with accessories Plane : Y with accessories Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark Remark | MHz | dBuV/m | dBuV | dBuV | dB/m | dB | dB | cm | | 1 | 2382.40 | 53.35 | 74.00 | -20.65 | 50.04 | 32.19 | 4.79 | 33.67 | 300 | 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 32.5 32.5 16.3 16.3 Avg 2310 1000 2346.8 2365.2 Frequency (MHz) 1800. 2200. Frequency (MHz) 2328.4 2383.6 2402 1400. 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 HORIZONTAL Condition: AVG_54 3m ANT3117_0057 HORIZONTAL Mode : 7 Setting : default Mode : 7 Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF Plane : Y with accessories : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz dBuV/m dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | | 1 2382.68 | 43.25 | 54.00 -10.75 | 39.94 | 32.19 | 4.79 | 33.67 | 300 | 0 AVERAGE | MHz | dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | 1 | 2402.00 | 70.46 | 54.00 | 16.46 | 67.06 | 32.25 | 4.81 | 33.66 | 300 |

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Mode **Band Edge** 2400-2483.5_Bluetooth LE_CH0_2402MHz **ANT** 1 Pol. Vertical **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 32.5 32.5 16.3 16.3 Peak 2310 2346.8 2 Frequency (MHz) 1000 2328.4 2365.2 2383.6 2402 1400. 1800. 2200. Frequency (MHz) 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 VERTICAL Condition: PEAK_74 3m ANT3117_0057 VERTICAL Mode : 7 Mode : 7 Setting : default Setting : default Plane : Y with accessories Plane : Y with accessories Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark Remark | MHz dBuV/m dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 2402.00 91.21 ----- 87.81 32.25 4.81 33.66 400 204 PEAK 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 32.5 325 16.3 16.3 Avg 1000 2310 2346.8 2365.2 Frequency (MHz) 1800. 2200. Frequency (MHz) 2328.4 2383.6 2402 1400. 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 VERTICAL Condition: AVG_54 3m ANT3117_0057 VERTICAL Mode : 7 Setting : default Mode : 7 Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF Plane : Y with accessories : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz dBuV/m dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 2354.07 43.96 54.00 -10.04 40.77 32.12 4.76 33.69 400 204 AVERAGE | MHz dBuV/m dBuV/m dBuV/m dBuV dB/m dB dB cm deg | 1 2402.00 89.55 ----- 86.15 32.25 4.81 33.66 400 204 AVERAGE

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8 Band Edge - L Mode 2400-2483.5_Bluetooth LE_CH19_2440MHz **ANT** 1 Pol. Horizontal **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 32.5 32.5 16.3 16.3 Peak 2310 1000 1800. Frequency (MHz) 2362. Frequency (MHz) 2336. 2388. 2414 2440 1400. 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 HORIZONTAL Condition: PEAK_74 3m ANT3117_0057 HORIZONTAL Mode : 8 Setting : default
Plane : Y with accessories Setting : default Plane : Y with accessories Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark Remark | MHz dBuV/m dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 | 2440.00 | 81.19 | ---- | 77.63 | 32.34 | 4.86 | 33.64 | 184 | 360 PEAK 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 32.5 32.5 16.3 16.3 Avg 2310 1000 2362. 2388. Frequency (MHz) 1800. 2200. Frequency (MHz) 2336. 2414. 2440 1400. 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 HORIZONTAL Condition: AVG_54 3m ANT3117_0057 HORIZONTAL Mode : 8 Setting : default Mode : 8 Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF Plane : Y with accessories : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz dBuV/m dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | | 1 2354.20 43.41 54.00 -10.59 | 40.22 32.12 4.76 33.69 184 360 AVERAGE MHz dBuV/m dBuV/m dBuV/m dBuV dB/m dB dB cm deg
1 2440.00 79.73 ----- 76.17 32.34 4.86 33.64 184 360 AVERAGE

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8 Band Edge - R Mode 2400-2483.5_Bluetooth LE_CH19_2440MHz **ANT** 1 Pol. Horizontal **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 113.8 97.5 81.3 65.0 32.5 16.3 Peak **Blank** 0<u>---</u> 2440 2452. 2464. 2476. Frequency (MHz) 2488. 2500 : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 HORIZONTAL Mode : 8
Setting : default
Plane : Y with accessories
: #12 2Q3781NF3J008F Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark 130 Level (dBuV/m) Date: 2023-05-22 113.8 97.5 65.0 32.5 16.3 Avg **Blank** 2440 2464. 2476. Frequency (MHz) 2488. 2452. 2500 : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 HORIZONTAL Mode : 8
Setting : default
Plane : Y with accessories
: #12 2037B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos
Freq Level Line (dB) Level Factor Loss Factor Remark | MHz dBuV/m dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 2483.56 43.91 54.00 -10.09 40.14 32.46 4.92 33.61 184 360 AVERAGE

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8 Band Edge - L Mode 2400-2483.5_Bluetooth LE_CH19_2440MHz **ANT** 1 Pol. Vertical **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 32.5 32.5 16.3 16.3 Peak 2310 2362. Frequency (MHz) 1000 2336. 2388. 2414 2440 1400. 1800. 2200. Frequency (MHz) 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 VERTICAL Condition: PEAK_74 3m ANT3117_0057 VERTICAL Mode : 8 Mode : 8 Setting : default
Plane : Y with accessories Setting : default Plane : Y with accessories Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark Remark | MHz dBuV/m dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 | 2440.00 | 90.71 ----- | 87.15 | 32.34 | 4.86 | 33.64 | 400 | 226 PEAK 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81.3 81.3 65.0 65.0 32.5 325 16.3 16.3 Avg 2310 1000 2362. 2388. Frequency (MHz) 1800. 2200. Frequency (MHz) 2336. 2414. 2440 1400. 2600. 3000 : 03CH03-SZ : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 VERTICAL Condition: AVG_54 3m ANT3117_0057 VERTICAL Mode : 8
Setting : default
Plane : Y with accessories
: #12 2037B1WF3J00BF Mode : 8 Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz dBuV/m dBuV/m | dBuV | dBuV | dB/m | dB | dB | cm | deg | | 1 2368.76 43.18 54.00 -10.82 39.93 32.16 4.77 33.68 400 226 AVERAGE | MHz dBuV/m dBuV/m dBuV/m dBuV dB/m dB dB cm deg | 1 2440.00 88.15 ----- 84.59 32.34 4.86 33.64 400 226 AVERAGE

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8 Band Edge - R Mode 2400-2483.5_Bluetooth LE_CH19_2440MHz **ANT** 1 Pol. Vertical **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 113.8 97.5 81.3 65.0 32.5 16.3 Peak **Blank** 0<u>---</u> 2440 2452. 2464. 2476. Frequency (MHz) 2488. 2500 : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 VERTICAL Mode : 8
Setting : default
Plane : Y with accessories
: #12 2Q3781NF3J008F Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark 130 Level (dBuV/m) Date: 2023-05-22 113.8 97.5 81.3 65.0 32.5 16.3 Avg **Blank** 2440 2464. 2476. Frequency (MHz) 2452. 2488. 2500 : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 VERTICAL Mode : 8
Setting : default
Plane : Y with accessories
: #12 2037B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos
Freq Level Line (dB) Level Factor Loss Factor Remark | MHz dBuV/m dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 2496.88 | 43.57 | 54.00 -10.43 | 39.74 | 32.49 | 4.94 | 33.60 | 400 | 226 AVERAGE

8 Mode Harmonic 2400-2483.5_Bluetooth LE_CH19_2440MHz **ANT** 1 Pol. Horizontal Vertical 140 Level (dBuV/m) Date: 2023-05-22 Date: 2023-05-22 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 87.5 PEAK_74 PEAK 74 70.0 52.5 52.5 35.0 35.0 **Peak** 17.5 17.5 Avg 3000 3000 9000. 12000. Frequency (MHz) 9000. 12000. Frequency (MHz) 6000. 15000. 18000 6000. 15000. 18000 Site : 03CH03-5Z
Condition: PEAK_74 3m ANT3117_0057 VERTICAL
Project : 272102-02
Mode : 8
SN : ±12_203781MF31000F
Plane : Z with Accessories
setting : Default Limit Read Ant Cable Preamp APos TPos Freq Level Line Margin Level Factor Loss Factor Limit Read Ant Cable Preamp APos TPos
Freq Level Line Margin Level Factor Loss Factor MHz dBuV/m dBuV/m dB dBuV dB/m | MHz | d8uV/m | dBuV/m | d8 | d8uV | d8uN | d8 | d8 | cm | deg | d8uN | dB dB

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Mode **Band Edge** 2400-2483.5_Bluetooth LE_CH39_2480MHz **ANT** 1 Pol. Horizontal **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 81. 81.3 PEAK_74 PEAK BE 74 65.0 65.0 32.5 32.5 16.3 16.3 Peak 2488. 2492. Frequency (MHz) 1000 1800. 2200. Frequency (MHz) 2484. : 03CH03-SZ Site Condition: PEAK_BE_74 3m ANT3117_0057 HORIZONTAL Condition: PEAK_74 3m ANT3117_0057 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz : 9 : RBW:1000.000kHz VBW:3000.000kHz Setting : default
Plane : Y with accessories Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz | dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 | 2483.54 | 57.34 | 74.00 | -16.66 | 53.57 | 32.46 | 4.92 | 33.61 | 101 | 99 | PEAK | MHz | dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | 1 | 2480.00 | 93.07 ----- 89.31 | 32.45 | 4.92 | 33.61 | 101 | 99 | PEAK 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 81.3 81.3 65.0 65.0 AVG_BE_5 AVG_54 48.8 48.8 32.5 32.5 Avg 2480 1000 1800. 2200. Frequency (MHz) 2484. 2488. 2492. Frequency (MHz) 2496. 1400. 2600. 3000 2500 : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 HORIZONTAL Condition: AVG_54 3m ANT3117_0057 HORIZONTAL : RBW:1000.000kHz VBW:10.000kHz : 9 : RBW:1000.000kHz VBW:10.000kHz : 9 Setting : default
Plane : Y with accessories
: #12 2Q37B1WF3J00BF Setting : default
Plane : Y with accessories : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos
Freq Level Line (dB) Level Factor Loss Factor Remark Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark | MHz dBuV/m dBuV/m | dBuV | dBuV | dB/m | dB | dB | cm | deg | | 1 2483.54 | 44.17 | 54.00 | -9.83 | 40.40 | 32.46 | 4.92 | 33.61 | 101 | 99 | AVERAGE | MHz dBuV/m dBuV/m | dBuV dB/m dB dB cm deg | 1 2480.00 91.48 ----- 87.72 32.45 4.92 33.61 101 99 AVERAGE

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Mode **Band Edge** 2400-2483.5_Bluetooth LE_CH39_2480MHz **ANT** 1 Pol. Vertical **Fundamental** 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 97.5 81. 81.3 PEAK_74 PEAK BE 74 65.0 65.0 32.5 32.5 16.3 16.3 Peak 2488. 2492. Frequency (MHz) 1000 1800. 2200. Frequency (MHz) 2484. : 03CH03-SZ Site : 03CH03-SZ Condition: PEAK_BE_74 3m ANT3117_0057 VERTICAL Condition: PEAK_74 3m ANT3117_0057 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz : RBW:1000.000kHz VBW:3000.000kHz Setting : default
Plane : Y with accessories Setting : default Plane : Y with accessories : #12 2Q37B1WF3J00BF : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor | MHz | dBuV/m | dBuV/m | dBuV MHz dBuV/m dBuV/m dBuV dB/m dB dB
 MHz
 dBuV/m
 dBuV/m
 dBuV /m
 dBuV
 dBuV
 dB /m
 dB
 dB
 cm

 1
 2480.00
 88.27
 74.00
 14.27
 84.51
 32.45
 4.92
 33.61
 100
 130 Level (dBuV/m) Date: 2023-05-22 130 Level (dBuV/m) Date: 2023-05-22 113.8 113.8 97.5 81.3 81.3 65.0 65.0 AVG_BE_5 AVG_54 48.8 48.8 32.5 32.5 Avg 2480 1000 2484. 2488. 2492. Frequency (MHz) 2496. 1400. 1800. 2200. Frequency (MHz) 2600. 3000 2500 Site : 03CH03-SZ Condition: AVG_54 3m ANT3117_0057 VERTICAL : 03CH03-SZ Condition: AVG_BE_54 3m ANT3117_0057 VERTICAL : RBW:1000.000kHz VBW:10.000kHz : 9 : RBW:1000.000kHz VBW:10.000kHz : 9 Setting : default
Plane : Y with accessories
: #12 2Q37B1WF3J00BF Setting : default
Plane : Y with accessories : #12 2Q37B1WF3J00BF Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Limit Margin Read Ant Cable Preamp APos TPos
Freq Level Line (dB) Level Factor Loss Factor Remark

| MHz | dBuV/m | dBuV/m | dBuW | dB/m | dB | dB | cm | 1 | 2480.00 | 86.90 | 54.00 | 32.90 | 83.14 | 32.45 | 4.92 | 33.61 | 100

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| MHz dBuV/m dBuV/m | dBuV | dBuV | dB/m | dB | dB | cm | deg | | 1 2490.64 | 44.08 | 54.00 | -9.92 | 40.28 | 32.48 | 4.93 | 33.61 | 100 | 4 AVERAGE

9 Mode Harmonic 2400-2483.5_Bluetooth LE_CH39_2480MHz **ANT** 1 Pol. Horizontal Vertical Date: 2023-05-22 Date: 2023-05-22 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 87.5 PEAK_74 70.0 70.0 AVG_54 52.5 52.5 35.0 35.0 Peak 17.5 17.5 3000 3000 7600. 12200. 16800. Frequency (MHz) 21400. 26000 7600. 12200. 16800. Frequency (MHz) 21400. 26000 Avg Site : 03CH03-5Z
Condition: PEAK_74 3m ANT3117_0057 HORIZONTAL
: RBN:1000.000KHz VBN:3000.000KHz SNT:Auto DET:Positive : 03CH03-SZ Condition: PEAK_74 3m ANT3117_0057 VERTICAL
: RBN:1000.000kHz VBN:3000.000kHz SNT:Auto DET:Positive Project : 272102-02 Project : 272102-02 Mode : 9
SN : #12 2Q37B1WF3J00BF
Plane : Y with Accessories
setting : Default Mode : 9
SN : #12 2Q37B1WF3J00BF
Plane : Y with Accessories
setting : Default Limit Margin Read Ant Cable Preamp APos TPos
Freq Level Line (dB) Level Factor Loss Factor Remark Limit Margin Read Ant Cable Preamp APos TPos Freq Level Line (dB) Level Factor Loss Factor Remark MHz dBuV/m dBuV/m | MHz | dBuV/m | dBuV/m | dBuV/m | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 4960.00 | 46.53 | 74.00 - 27.47 | 56.84 | 34.62 | 7.81 | 52.74 | --- | --- | Peak | |
| 2 | 7440.00 | 45.85 | 74.00 - 28.15 | 54.16 | 36.54 | 9.19 | 54.64 | --- | --- | Peak | | dBuV dB/m
 WHz
 dBuV/m
 dBuV/m
 dBuV/m
 dBuV/m
 dBuV
 dB m
 dB
 dB
 cm
 deg

 1
 4960.00
 44.24
 74.00 - 29.76
 54.55
 34.62
 7.81
 52.74
 -- -- Peak

 2
 7440.00
 46.92
 74.00 - 27.08
 55.23
 36.54
 9.19
 54.04
 -- -- Peak

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46 LF Bluetooth LE_2Mbps_CH39_2480MHz Horizontal Vertical Data: 2 Date: 2023-06-08 70.0 40.0 30.0 30.0 Frequency (MHz) Frequency (MHz)

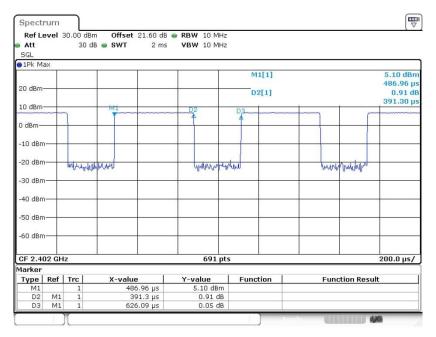
- 03CH03-SZ
- FCC CLASS-B 3m LF_ANT35408 HORIZONTAL
- 46
- Default
- 2 with Accessories
- #26 203TB2DF47004P
- Over Limit ReadAntenna Cable Preamp A/Pos T/Pos
Freq Level Limit Line Level Factor Loss Factor Remark 1 03CH03-SZ
FCC CLASS-B 3m LF_ANT35408 VERTICAL
46
Default
Z with Accessories
#26 2Q37B2DF47004P
Over Limit ReadAntenna Cable Preamp A/Pos T/Pos
Freq Level Limit Line Level Factor Loss Factor Remark MHz dBuV/m dB dBuV/m dBuV dB/m dB dB MHz dBuV/m dB dBuV/m dBuV dB/m dB dB 38.77 25.55 14.44 40.00 32.48 24.37 0.54 31.83 13.83 13.80 13.60 17.30 6.44 44 41.80 60 31.70 1.60 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17.80 17. 30.00 24.22 -15.78 40.00 30.69 24.90 265.71 23.90 -22.10 46.00 33.84 19.53 484.93 31.17 -14.83 46.00 36.22 23.49 517.91 30.50 -15.50 46.00 34.99 23.97 655.65 28.09 -17.91 46.00 34.92 24.97 799.21 32.61 -13.39 46.00 34.18 26.39 0.53 31.90 1.70 31.17 2.29 30.83 2.38 30.84 2.66 30.94 2.94 30.90

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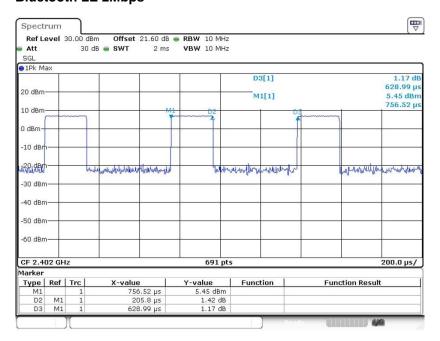
Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
Bluetooth LE 1Mbps	62.50	0.391	2.556	3kHz
Bluetooth LE 2Mbps	32.72	0.206	4.859	10kHz

Bluetooth LE 1Mbps



Bluetooth LE 2Mbps



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