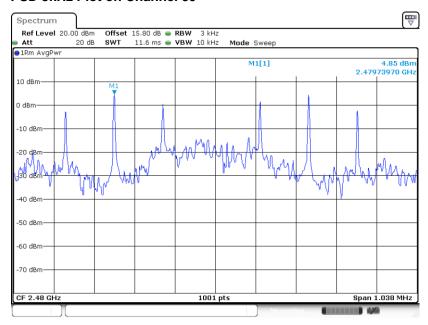
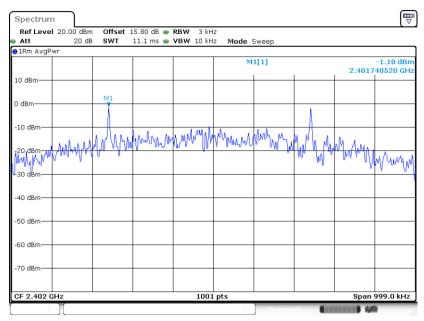
PSD 3kHz Plot on Channel 39



Date: 4.JUN.2023 07:19:58

Bluetooth LE 500Kbps (Ant.2):

PSD 3kHz Plot on Channel 00



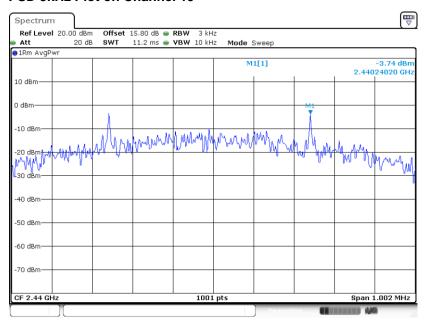
Date: 4.JUN.2023 07:06:24

Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 62 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

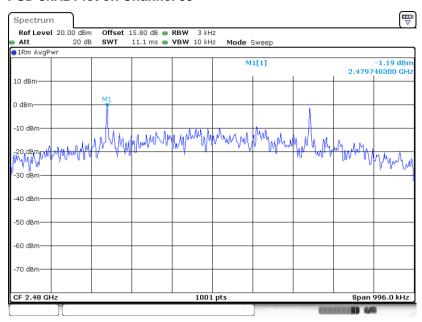
Report No.: FR330811-01A

PSD 3kHz Plot on Channel 19



Date: 4.JUN.2023 07:09:22

PSD 3kHz Plot on Channel 39



Date: 4.JUN.2023 07:11:54

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 63 of 105 Report Issued Date: Nov. 15, 2023 Report Version : Rev. 01

Report No.: FR330811-01A

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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 FCC ID: 2AEUPBHARG091
 F

Page Number : 64 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

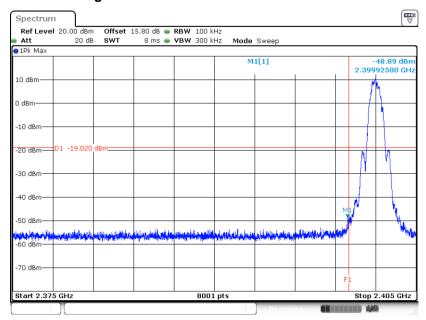
Report Template No.: BU5-FR15CBLE Version 2.0

Report No.: FR330811-01A

3.4.5 Test Result of Conducted Band Edges Plots

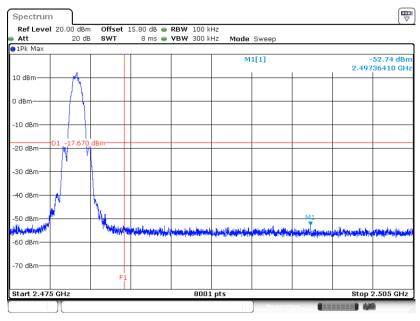
Bluetooth LE 1Mbps (Ant.1):

Low Band Edge Plot on Channel 00



Date: 4.JUN.2023 06:19:46

High Band Edge Plot on Channel 39



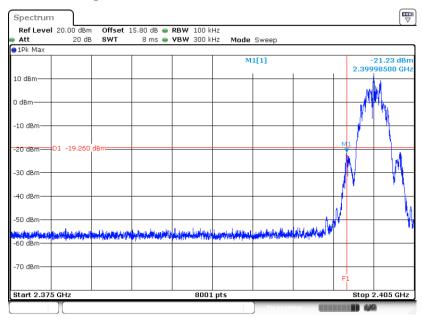
Date: 4.JUN.2023 06:27:02

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 65 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

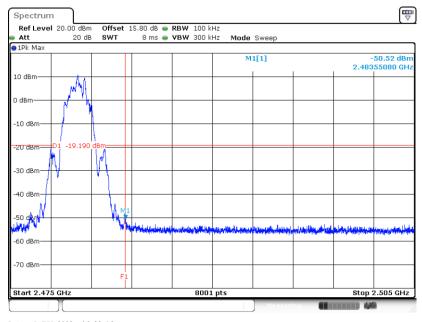
Bluetooth LE 2Mbps (Ant.1):

Low Band Edge Plot on Channel 00



Date: 4.JUN.2023 06:30:36

High Band Edge Plot on Channel 39

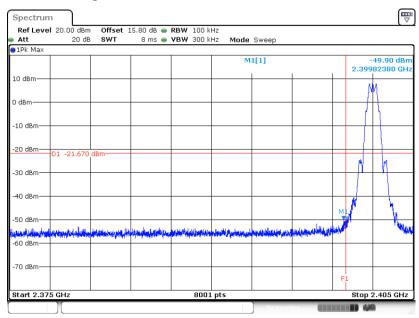


Date: 4.JUN.2023 06:39:18

Report No.: FR330811-01A

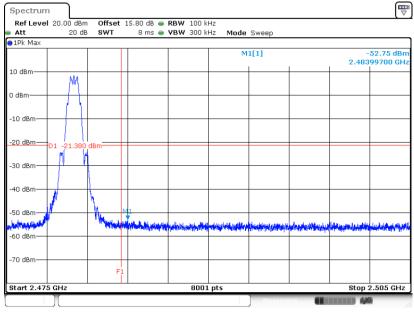
Bluetooth LE 125Kbps (Ant.1):

Low Band Edge Plot on Channel 00



Date: 4.JUN.2023 06:41:15

High Band Edge Plot on Channel 39

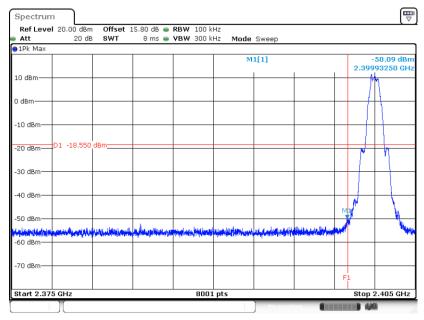


Date: 4.JUN.2023 06:48:35

Report No.: FR330811-01A

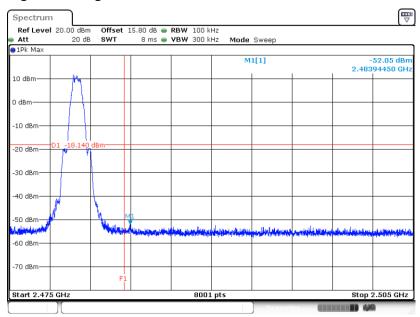
Bluetooth LE 500Kbps (Ant.1):

Low Band Edge Plot on Channel 00



Date: 4.JUN.2023 06:51:19

High Band Edge Plot on Channel 39



Date: 4.JUN.2023 06:56:33

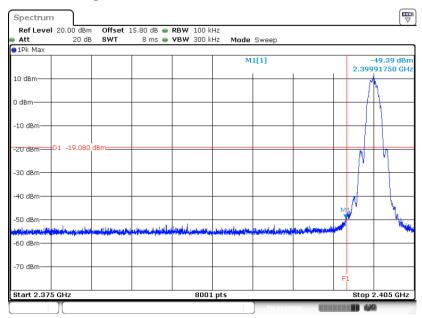
Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 68 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

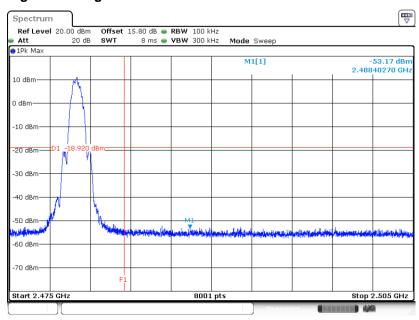
Bluetooth LE 1Mbps (Ant.2):

Low Band Edge Plot on Channel 00



Date: 4.JUN.2023 07:36:37

High Band Edge Plot on Channel 39



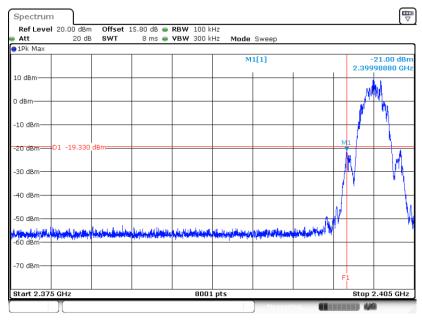
Date: 4.JUN.2023 07:40:51

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 69 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

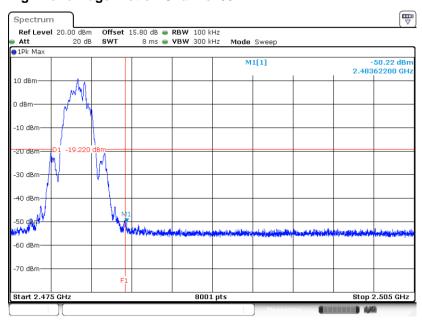
Bluetooth LE 2Mbps (Ant.2):

Low Band Edge Plot on Channel 00



Date: 4.JUN.2023 07:25:49

High Band Edge Plot on Channel 39



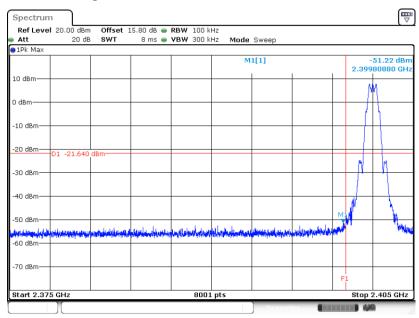
Date: 4.JUN.2023 07:32:22

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 70 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

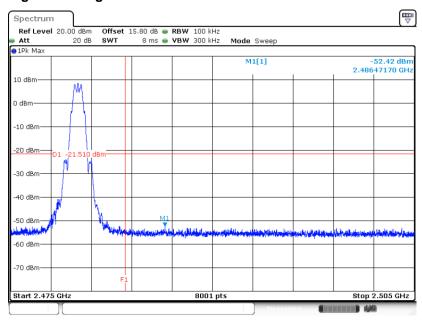
Bluetooth LE 125Kbps (Ant.2):

Low Band Edge Plot on Channel 00



Date: 4.JUN.2023 07:15:26

High Band Edge Plot on Channel 39

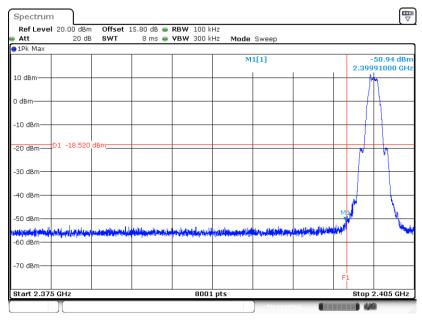


Date: 4.JUN.2023 07:20:37

Report No.: FR330811-01A

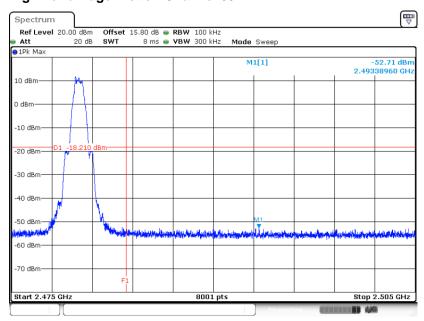
Bluetooth LE 500Kbps (Ant.2):

Low Band Edge Plot on Channel 00



Date: 4.JUN.2023 07:07:02

High Band Edge Plot on Channel 39



Date: 4.JUN.2023 07:12:33

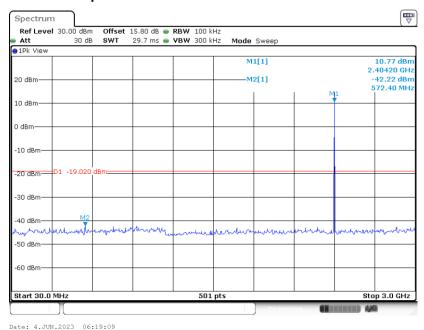
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 72 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

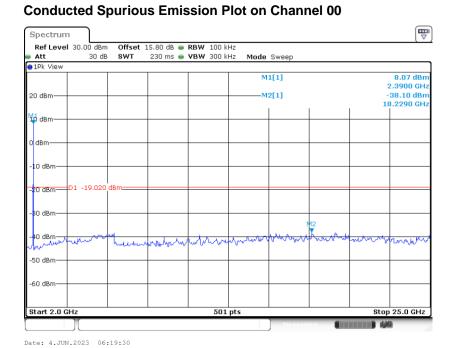
Report No.: FR330811-01A

3.4.6 Test Result of Conducted Spurious Emission Plots

Bluetooth LE 1Mbps (Ant.1):

Conducted Spurious Emission Plot on Channel 00

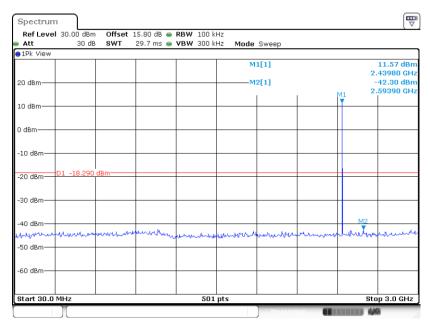




Sporton International Inc. (Kunshan)

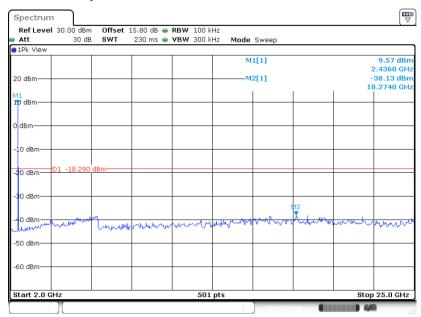
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 73 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 06:22:48

Conducted Spurious Emission Plot on Channel 19

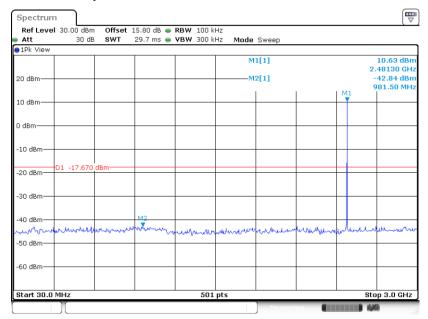


Date: 4.JUN.2023 06:23:09

Sporton International Inc. (Kunshan)

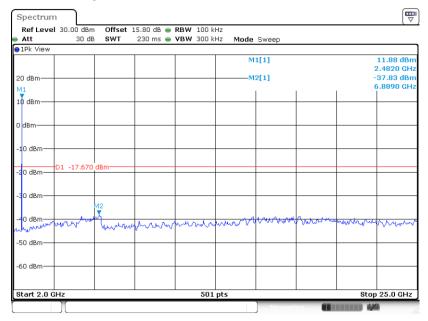
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 74 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 06:25:19

Conducted Spurious Emission Plot on Channel 39



Date: 4.JUN.2023 06:25:39

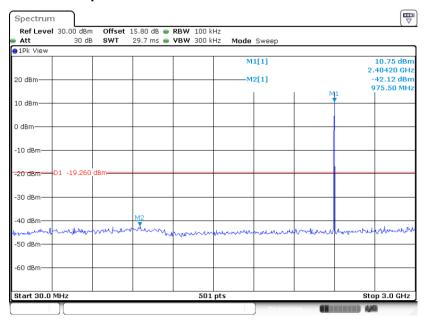
Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 75 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

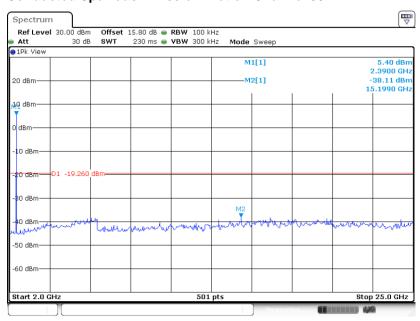
Bluetooth LE 2Mbps (Ant.1):

Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 06:29:44

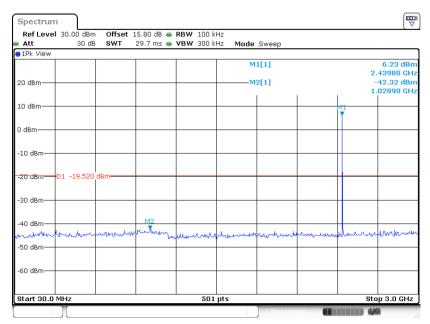
Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 06:30:04

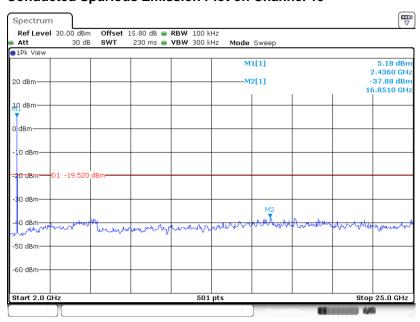
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 76 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 06:32:25

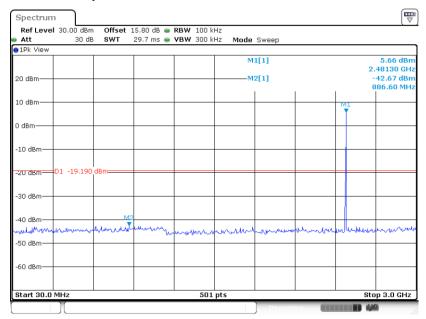
Conducted Spurious Emission Plot on Channel 19



Date: 4.JUN.2023 06:32:45

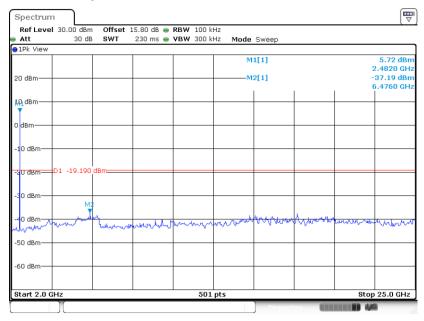
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 77 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 06:34:54

Conducted Spurious Emission Plot on Channel 39



Date: 4.JUN.2023 06:35:15

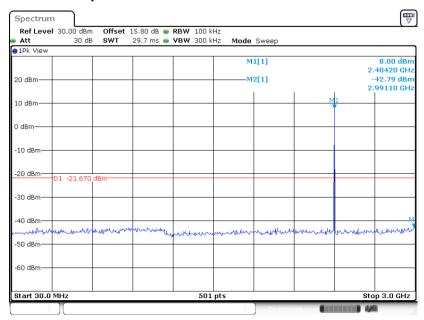
Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 78 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

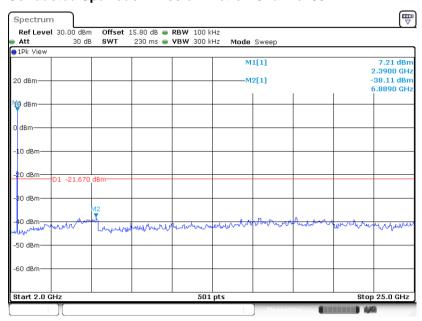
Bluetooth LE 125Kbps (Ant.1):

Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 06:41:36

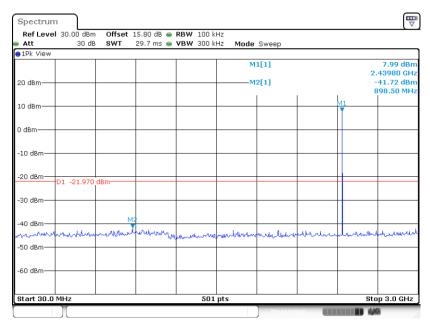
Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 06:41:57

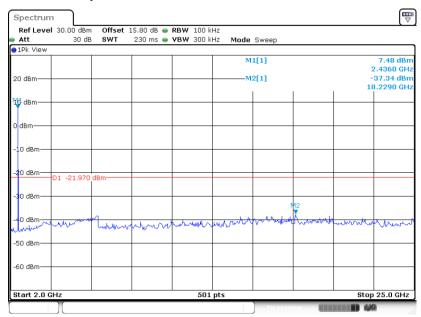
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 79 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 06:44:33

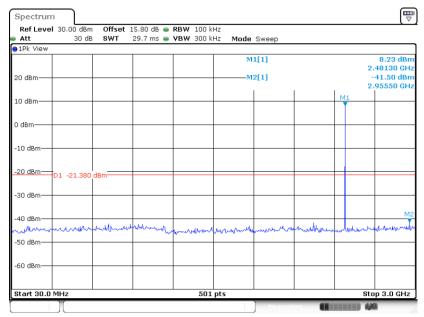
Conducted Spurious Emission Plot on Channel 19



Date: 4.JUN.2023 06:44:53

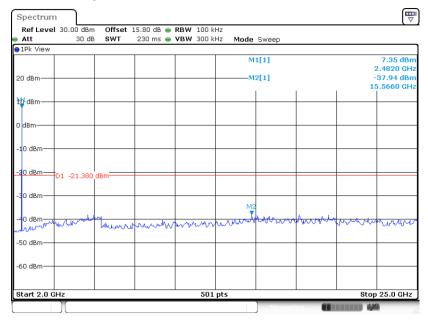
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 80 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 06:47:0

Conducted Spurious Emission Plot on Channel 39



Date: 4.JUN.2023 06:47:21

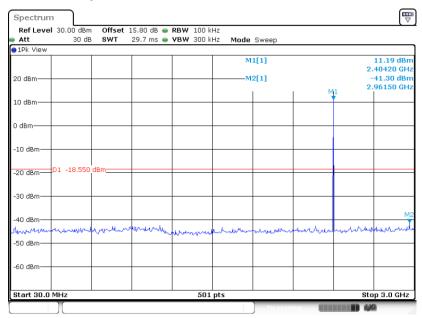
Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 81 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

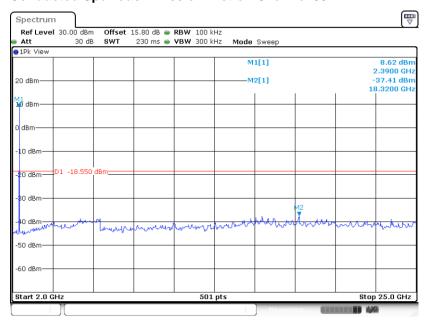
Bluetooth LE 500Kbps (Ant.1):

Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 06:51:41

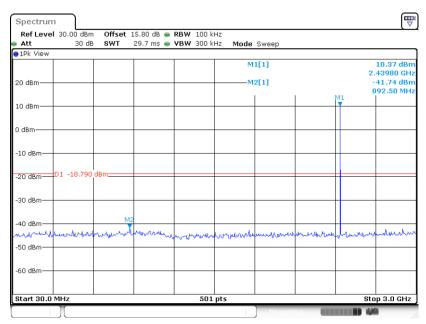
Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 06:52:01

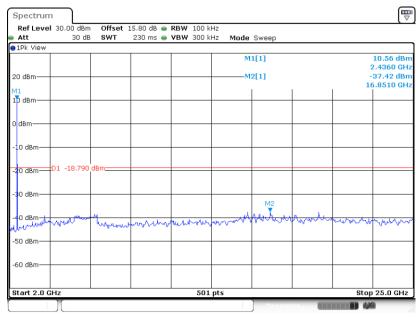
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 82 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 06:53:58

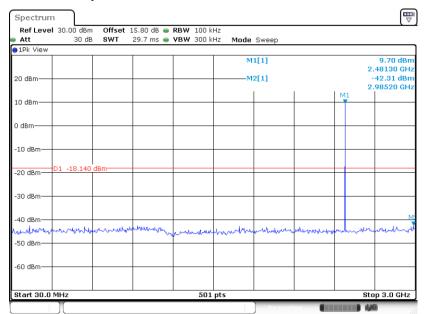
Conducted Spurious Emission Plot on Channel 19



Date: 4.JUN.2023 06:54:18

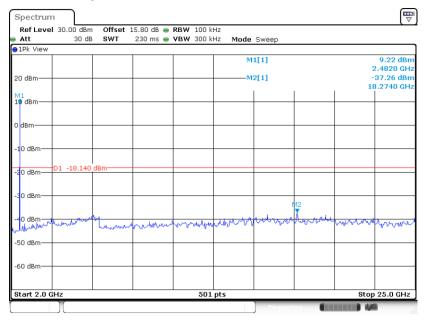
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 83 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 06:56:54

Conducted Spurious Emission Plot on Channel 39



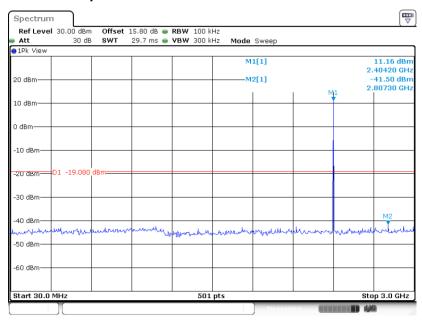
Date: 4.JUN.2023 06:57:14

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 84 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

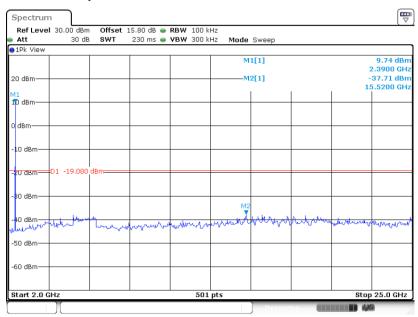
Bluetooth LE 1Mbps (Ant.2):

Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 07:34:54

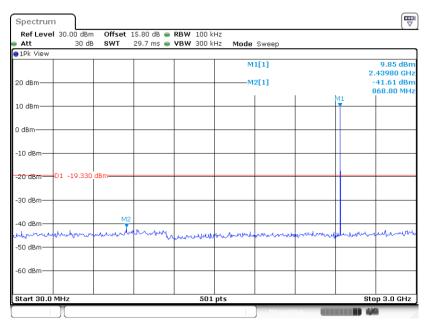
Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 07:35:15

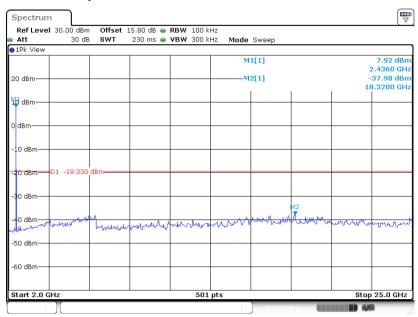
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 85 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 07:38:29

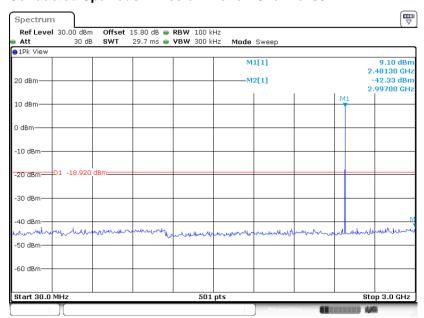
Conducted Spurious Emission Plot on Channel 19



Date: 4.JUN.2023 07:38:49

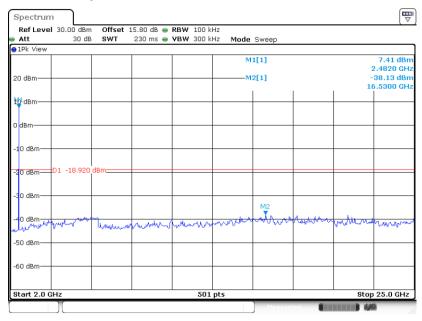
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 86 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 07:41:12

Conducted Spurious Emission Plot on Channel 39



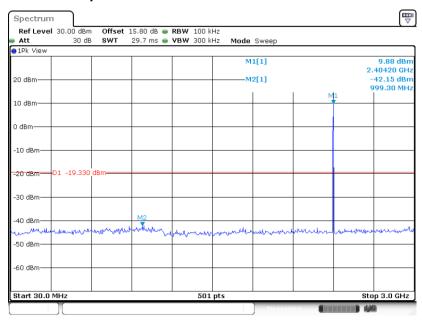
Date: 4.JUN.2023 07:41:32

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 87 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

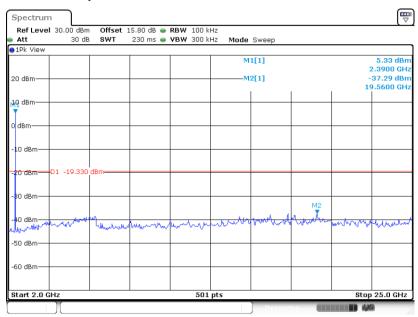
Bluetooth LE 2Mbps (Ant.2):

Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 07:24:56

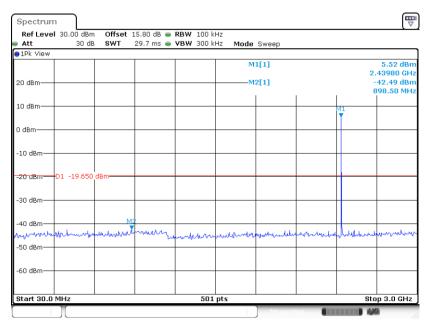
Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 07:25:17

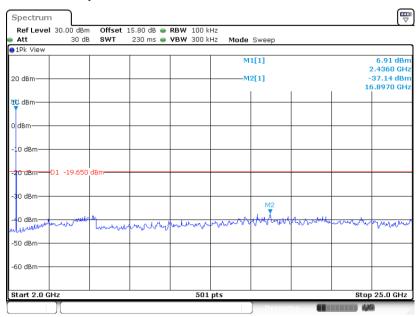
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 88 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 07:27:33

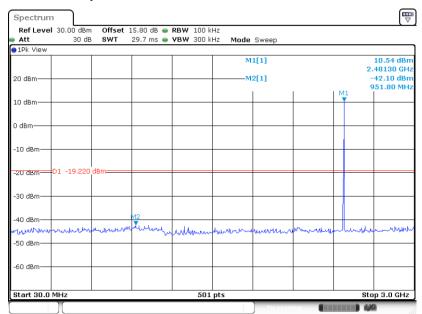
Conducted Spurious Emission Plot on Channel 19



Date: 4.JUN.2023 07:27:54

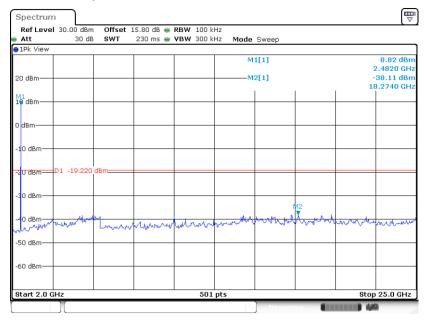
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 89 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 07:30:07

Conducted Spurious Emission Plot on Channel 39



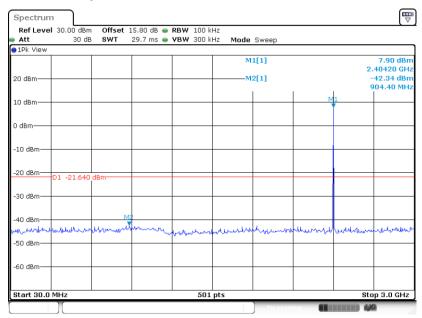
Date: 4.JUN.2023 07:30:27

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 90 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

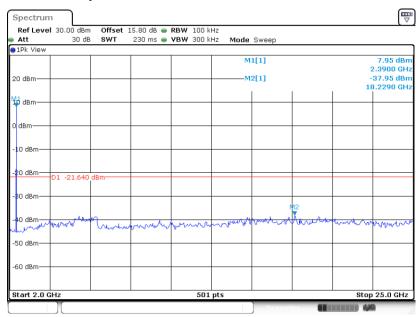
Bluetooth LE 125Kbps (Ant.2):

Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 07:15:47

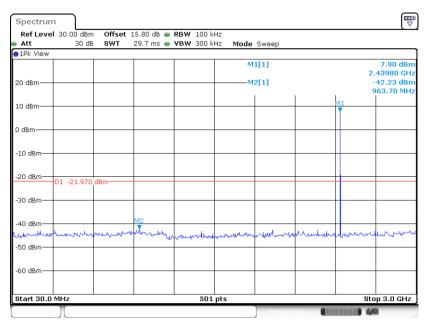
Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 07:16:07

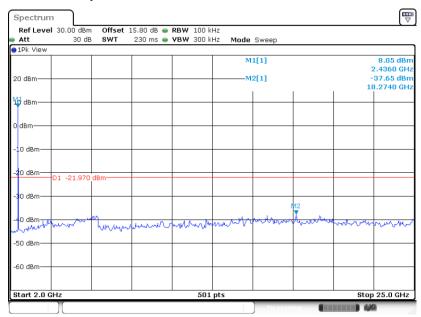
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 91 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 07:18:07

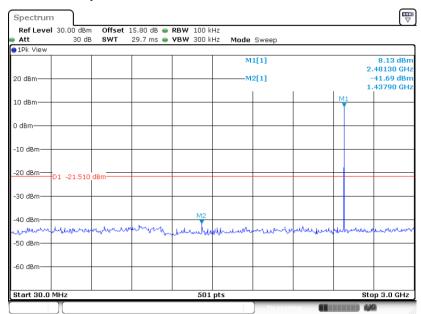
Conducted Spurious Emission Plot on Channel 19



Date: 4.JUN.2023 07:18:28

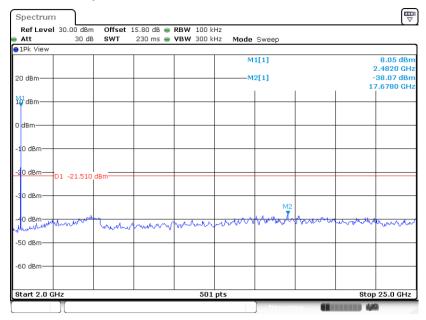
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 92 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 07:20:58

Conducted Spurious Emission Plot on Channel 39



Date: 4.JUN.2023 07:21:18

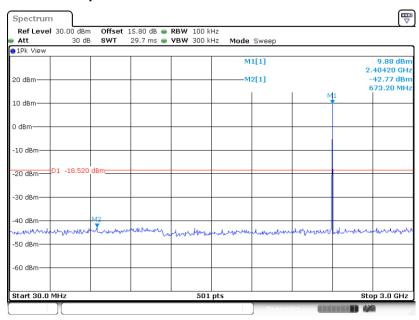
Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 93 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

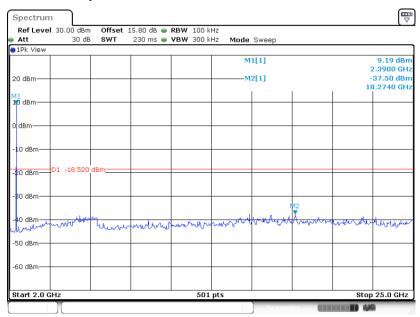
Bluetooth LE 500Kbps (Ant.2):

Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 07:07:23

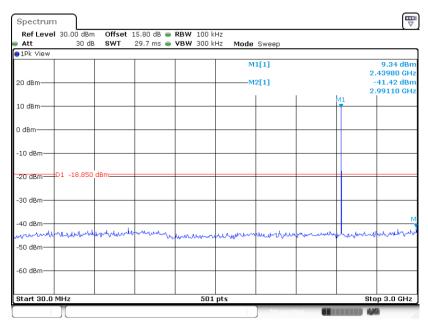
Conducted Spurious Emission Plot on Channel 00



Date: 4.JUN.2023 07:07:44

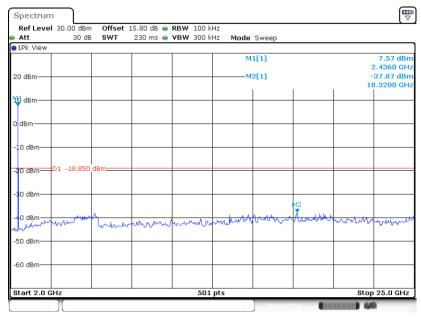
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 94 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 07:10:02

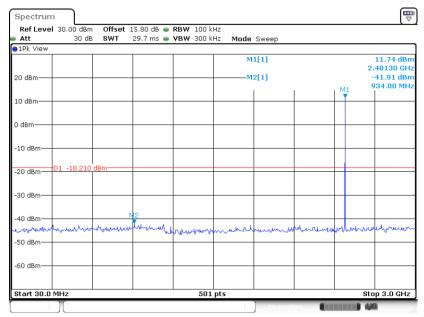
Conducted Spurious Emission Plot on Channel 19



Date: 4.JUN.2023 07:10:23

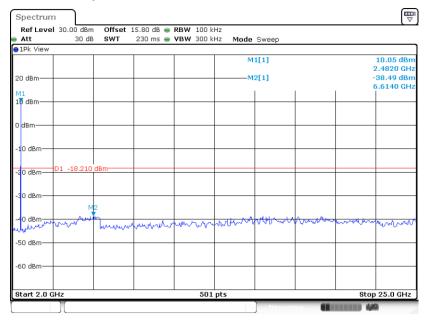
TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 95 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A



Date: 4.JUN.2023 07:12:54

Conducted Spurious Emission Plot on Channel 39



Date: 4.JUN.2023 07:13:14

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 96 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

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: 2AEUPBHARG091 Page Number : 97 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

3.5.3 Test Procedures

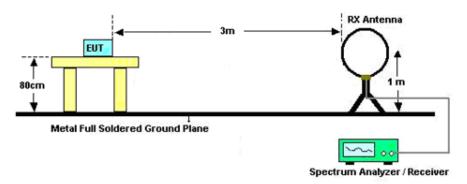
- 1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
- 2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get 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
- 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: 98 of 105TEL: +86-512-57900158Report Issued Date: Nov. 15, 2023FCC ID: 2AEUPBHARG091Report Version: Rev. 01

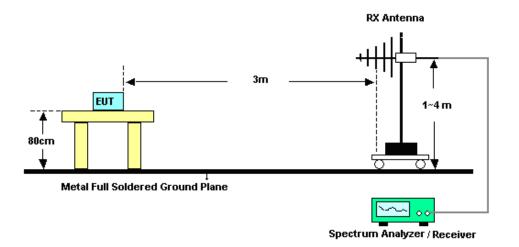
Report Template No.: BU5-FR15CBLE Version 2.0

3.5.4 Test Setup

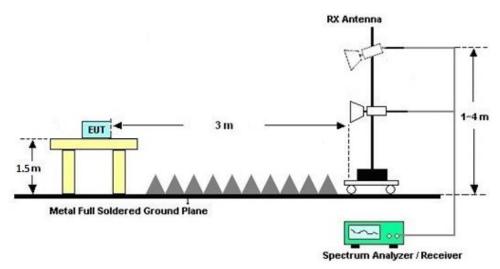
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



Sporton International Inc. (Kunshan)

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 99 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

Report Template No.: BU5-FR15CBLE Version 2.0

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.: FR330811-01A

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: 100 of 105TEL: +86-512-57900158Report Issued Date: Nov. 15, 2023FCC ID: 2AEUPBHARG091Report Version: Rev. 01

Report Template No.: BU5-FR15CBLE Version 2.0

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 (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.

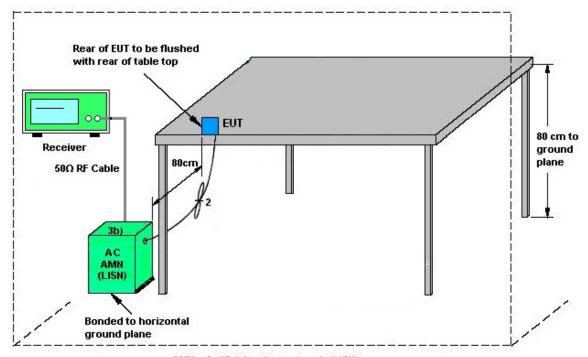
3.6.3 Test Procedures

- 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.

Sporton International Inc. (Kunshan)Page Number: 101 of 105TEL: +86-512-57900158Report Issued Date: Nov. 15, 2023FCC ID: 2AEUPBHARG091Report Version: Rev. 01

Report Template No.: BU5-FR15CBLE Version 2.0

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.

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091 Page Number : 102 of 105
Report Issued Date : Nov. 15, 2023
Report Version : Rev. 01

Report No.: FR330811-01A

Report Template No.: BU5-FR15CBLE Version 2.0

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) Page Number TEL: +86-512-57900158 Report Issued Date: Nov. 15, 2023

FCC ID: 2AEUPBHARG091

Report Version : Rev. 01 Report Template No.: BU5-FR15CBLE Version 2.0

: 103 of 105

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. 12, 2022	Apr. 07, 2023~ Jun. 04, 2023	Oct. 11, 2023	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GH z	Jan. 05, 2023	Apr. 07, 2023~ Jun. 04, 2023	Jan. 04, 2024	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 05, 2023	Apr. 07, 2023~ Jun. 04, 2023	Jan. 04, 2024	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY564000 23	3Hz~8.5GHz;M ax 30dBm	Jan. 05, 2023	Aug. 28, 2023	Jan. 04, 2024	Radiation (03CH08-KS)
Spectrum Analyzer	R&S	FSV40	101932	10kHz~40GHz; Max 30dBm	Oct. 12, 2022	Aug. 28, 2023	Oct. 11, 2023	Radiation (03CH08-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 22, 2022	Aug. 28, 2023	Sep. 21, 2023	Radiation (03CH08-KS)
Bilog Antenna	TESEQ& VGT	CBL 61110	59915	30MHz-1GHz	Aug. 12, 2023	Aug. 28, 2023	Aug. 11, 2024	Radiation (03CH08-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Mar. 18, 2023	Aug. 28, 2023	Mar. 17, 2024	Radiation (03CH08-KS)
high gain Amplifier	EM	EM01G18GA	060845	1Ghz-18Ghz	Jan. 05, 2023	Aug. 28, 2023	Jan. 04, 2024	Radiation (03CH08-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 08, 2023	Aug. 28, 2023	Jan. 07, 2024	Radiation (03CH08-KS)
Amplifier	SONOMA	310N	413741	9KHz-1GHz	Jan. 05, 2023	Aug. 28, 2023	Jan. 04, 2024	Radiation (03CH08-KS)
Amplifier	EM	EM01G18GA	060834	1Ghz-18Ghz	Oct. 12, 2022	Aug. 28, 2023	Oct. 11, 2023	Radiation (03CH08-KS)
Amplifier	MITEQ	EM18G40GG A	060728	18~40GHz	Jan. 05, 2023	Aug. 28, 2023	Jan. 04, 2024	Radiation (03CH08-KS)
AC Power Source	Chroma	61601	616010002 473	N/A	NCR	Aug. 28, 2023	NCR	Radiation (03CH08-KS)
Turn Table	EM	EM 1000-T	N/A	0~360 degree	NCR	Aug. 28, 2023	NCR	Radiation (03CH08-KS)
Antenna Mast	EM	EM 1000-A	N/A	1 m~4 m	NCR	Aug. 28, 2023	NCR	Radiation (03CH08-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 24, 2022	May 08, 2023	May 23, 2023	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2022	May 08, 2023	Oct. 12, 2023	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	May 24, 2022	May 08, 2023	May 23, 2023	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2022	May 08, 2023	Oct. 11, 2023	Conduction (CO01-KS)

NCR: No Calibration Required

Sporton International Inc. (Kunshan)

Page Number : 104 of 105 TEL: +86-512-57900158 Report Issued Date: Nov. 15, 2023 FCC ID: 2AEUPBHARG091 Report Version : Rev. 01

Report Template No.: BU5-FR15CBLE 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

Test Item	Uncertainty				
Conducted Power	±0.46 dB				
Conducted Emissions	±2.26 dB				
Occupied Channel Bandwidth	±0.1 %				
Conducted Power Spectral Density	±0.88 dB				

<u>Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)</u>

Measuring Uncertainty for a Level of Confidence	2.94dB
of 95% (U = 2Uc(y))	2.94ub

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

Measuring Uncertainty for a Level of Confidence	6,28dB
of 95% (U = 2Uc(y))	0.20UB

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

Measuring Uncertainty for a Level of Confidence	4.90dB
of 95% (U = 2Uc(y))	4.90db

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

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

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

 Sporton International Inc. (Kunshan)
 Page Number
 : 105 of 105

 TEL: +86-512-57900158
 Report Issued Date
 : Nov. 15, 2023

 FCC ID: 2AEUPBHARG091
 Report Version
 : Rev. 01

Report Template No.: BU5-FR15CBLE Version 2.0

Appendix A. Conducted Test Results

TEL: +86-512-57900158 FCC ID: 2AEUPBHARG091

Bluetooth Low Energy(BLE 1M-Ant.1)

Test Engineer:	Long Wu	Temperature:	20~26	°C
Test Date:	2023.4.7~2023.6.4	Relative Humidity:	40~51	%

TEST RESULTS DATA 6dB and 99% Occupied Bandwidth

N	Лod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
I	BLE	1Mbps	1	0	2402	1.037	0.650	0.50	Pass
I	BLE	1Mbps	1	19	2440	1.035	0.646	0.50	Pass
I	BLE	1Mbps	1	39	2480	1.035	0.632	0.50	Pass

TEST RESULTS DATA Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	2.14	13.57	1.90	15.47	36.00	Pass
BLE	1Mbps	1	19	2440	2.14	14.21	1.90	16.11	36.00	Pass
BLE	1Mbps	1	39	2480	2.14	13.68	1.90	15.58	36.00	Pass

	Setting
	12
	13
Г	13

TEST RESULTS DATA Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Average PSD (dBm /3kHz)	DG (dBi)	Average PSD Limit (dBm /3kHz)	Pass/Fail
BLE	1Mbps	1	0	2402	10.98	0.47	1.90	8.00	Pass
BLE	1Mbps	1	19	2440	11.71	0.95	1.90	8.00	Pass
BLE	1Mbps	1	39	2480	12.33	2.71	1.90	8.00	Pass

Bluetooth Low Energy(BLE AM-Ant.1)

Test Engineer:	Long Wu	Temperature:	20~26	°C
Test Date:	2023.4.7~2023.6.4	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	2.046	1.108	0.50	Pass
Ī	BLE	2Mbps	1	19	2440	2.046	1.108	0.50	Pass
	BLE	2Mbps	1	39	2480	2.046	1.112	0.50	Pass

TEST RESULTS DATA Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	2Mbps	1	0	2402	2.41	12.57	1.90	14.47	36.00	Pass
BLE	2Mbps	1	19	2440	2.41	13.05	1.90	14.95	36.00	Pass
BLE	2Mbps	1	39	2480	2.41	12.64	1.90	14.54	36.00	Pass

Setting
12
12
12

TEST RESULTS DATA Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Average PSD (dBm /3kHz)	DG (dBi)	Average PSD Limit (dBm /3kHz)	Pass/Fail
BLE	2Mbps	1	0	2402	10.74	1.36	1.90	8.00	Pass
BLE	2Mbps	1	19	2440	10.48	1.86	1.90	8.00	Pass
BLE	2Mbps	1	39	2480	10.81	1.33	1.90	8.00	Pass

Bluetooth Low Energy(BLE 125K-Ant.1)

Test Engineer:	Long Wu	Temperature:	20~26	°C
Test Date:	2023.4.7~2023.6.4	Relative Humidity:	40~51	%

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	125K	1	0	2402	1.047	0.694	0.50	Pass
BLE	125K	1	19	2440	1.047	0.696	0.50	Pass
BLE	125K	1	39	2480	1.047	0.690	0.50	Pass

TEST RESULTS DATA Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	125K	1	0	2402	0.83	12.51	1.90	14.41	36.00	Pass
BLE	125K	1	19	2440	0.83	13.18	1.90	15.08	36.00	Pass
BLE	125K	1	39	2480	0.83	12.74	1.90	14.64	36.00	Pass

Setting
12
12
12

TEST RESULTS DATA Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Average PSD (dBm /3kHz)	DG (dBi)	Average PSD Limit (dBm /3kHz)	Pass/Fail
BLE	125K	1	0	2402	8.33	4.84	1.90	8.00	Pass
BLE	125K	1	19	2440	8.03	4.64	1.90	8.00	Pass
BLE	125K	1	39	2480	8.62	4.82	1.90	8.00	Pass

Bluetooth Low Energy(BLE 500K-Ant.1)

Test Engineer:	Long Wu	Temperature:	20~26	°C
Test Date:	2023.4.7~2023.6.4	Relative Humidity:	40~51	%

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	500K	1	0	2402	1.021	0.668	0.50	Pass
BLE	500K	1	19	2440	1.023	0.668	0.50	Pass
BLE	500K	1	39	2480	1.019	0.664	0.50	Pass

TEST RESULTS DATA Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	500K	1	0	2402	2.49	12.73	1.90	14.63	36.00	Pass
BLE	500K	1	19	2440	2.49	12.82	1.90	14.72	36.00	Pass
BLE	500K	1	39	2480	2.49	12.84	1.90	14.74	36.00	Pass

Setting
12
12
12

TEST RESULTS DATA Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Average PSD (dBm /3kHz)	DG (dBi)	Average PSD Limit (dBm /3kHz)	Pass/Fail
BLE	500K	1	0	2402	11.45	-4.14	1.90	8.00	Pass
BLE	500K	1	19	2440	11.21	-3.80	1.90	8.00	Pass
BLE	500K	1	39	2480	11.86	-1.48	1.90	8.00	Pass

Bluetooth Low Energy(BLE 1M-Ant.2)

Test Engineer:	Long Wu	Temperature:	20~26	°C
Test Date:	2023.4.7~2023.6.4	Relative Humidity:	40~51	%

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	1.035	0.650	0.50	Pass
BLE	1Mbps	1	19	2440	1.035	0.650	0.50	Pass
BLE	1Mbps	1	39	2480	1.035	0.648	0.50	Pass

TEST RESULTS DATA Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	2.12	13.50	2.20	15.70	36.00	Pass
BLE	1Mbps	1	19	2440	2.12	13.03	2.20	15.23	36.00	Pass
BLE	1Mbps	1	39	2480	2.12	13.61	2.20	15.81	36.00	Pass

Setting
12
13
13

TEST RESULTS DATA Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Average PSD (dBm /3kHz)	DG (dBi)	Average PSD Limit (dBm /3kHz)	Pass/Fail
BLE	1Mbps	1	0	2402	10.92	0.74	2.20	8.00	Pass
BLE	1Mbps	1	19	2440	10.67	1.24	2.20	8.00	Pass
BLE	1Mbps	1	39	2480	11.08	1.52	2.20	8.00	Pass

Bluetooth Low Energy(BLE 2M-Ant.2)

Test Engineer:	Long Wu	Temperature:	20~26	°C
Test Date:	2023.4.7~2023.6.4	Relative Humidity:	40~51	%

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	2.046	1.112	0.50	Pass
BLE	2Mbps	1	19	2440	2.046	1.112	0.50	Pass
BLE	2Mbps	1	39	2480	2.046	1.112	0.50	Pass

TEST RESULTS DATA Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	2Mbps	1	0	2402	2.43	12.49	2.20	14.69	36.00	Pass
BLE	2Mbps	1	19	2440	2.43	13.20	2.20	15.40	36.00	Pass
BLE	2Mbps	1	39	2480	2.43	12.67	2.20	14.87	36.00	Pass

Setting
12
12
12

TEST RESULTS DATA Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Average PSD (dBm /3kHz)	DG (dBi)	Average PSD Limit (dBm /3kHz)	Pass/Fail
BLE	2Mbps	1	0	2402	10.67	3.78	2.20	8.00	Pass
BLE	2Mbps	1	19	2440	10.35	3.28	2.20	8.00	Pass
BLE	2Mbps	1	39	2480	10.78	4.03	2.20	8.00	Pass

Bluetooth Low Energy(BLE 125K-Ant.2)

Test Engineer:	Long Wu	Temperature:	20~26	°C
Test Date:	2023.4.7~2023.6.4	Relative Humidity:	40~51	%

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	125K	1	0	2402	1.049	0.696	0.50	Pass
BLE	125K	1	19	2440	1.049	0.696	0.50	Pass
BLE	125K	1	39	2480	1.049	0.692	0.50	Pass

TEST RESULTS DATA Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	125K	1	0	2402	0.87	12.51	2.20	14.71	36.00	Pass
BLE	125K	1	19	2440	0.87	13.00	2.20	15.20	36.00	Pass
BLE	125K	1	39	2480	0.87	12.58	2.20	14.78	36.00	Pass

Setting
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TEST RESULTS DATA Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Average PSD (dBm /3kHz)	DG (dBi)	Average PSD Limit (dBm /3kHz)	Pass/Fail
BLE	125K	1	0	2402	8.36	4.44	2.20	8.00	Pass
BLE	125K	1	19	2440	8.03	4.00	2.20	8.00	Pass
BLE	125K	1	39	2480	8.49	4.85	2.20	8.00	Pass

Bluetooth Low Energy(BLE 500K-Ant.2)

Test Engineer:	Long Wu	Temperature:	20~26	°C
Test Date:	2023.4.7~2023.6.4	Relative Humidity:	40~51	%

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	500K	1	0	2402	1.021	0.666	0.50	Pass
BLE	500K	1	19	2440	1.023	0.668	0.50	Pass
BLE	500K	1	39	2480	1.021	0.664	0.50	Pass

TEST RESULTS DATA Average Power Table

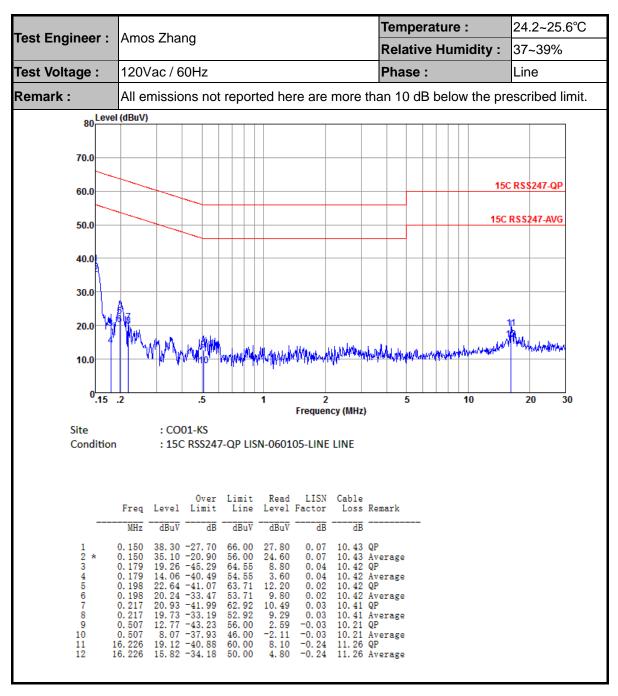
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	500K	1	0	2402	2.49	13.00	2.20	15.20	36.00	Pass
BLE	500K	1	19	2440	2.49	12.68	2.20	14.88	36.00	Pass
BLE	500K	1	39	2480	2.49	13.05	2.20	15.25	36.00	Pass

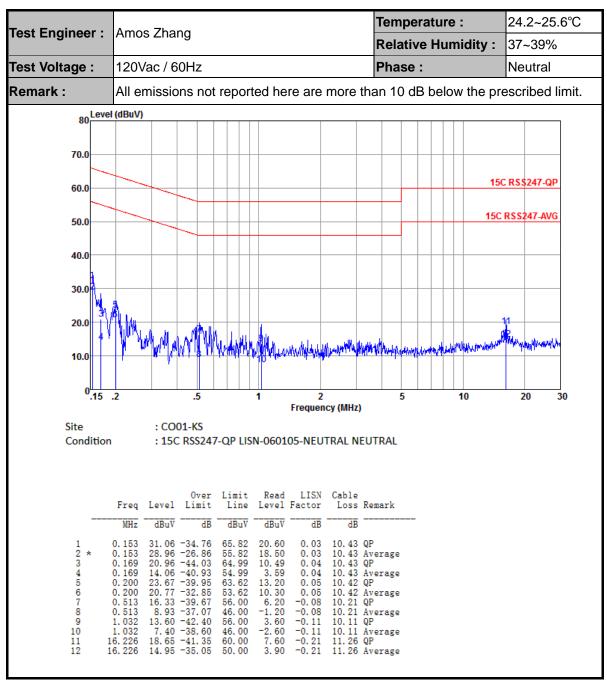
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TEST RESULTS DATA Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Average PSD (dBm /3kHz)	DG (dBi)	Average PSD Limit (dBm /3kHz)	Pass/Fail
BLE	500K	1	0	2402	11.48	-1.18	2.20	8.00	Pass
BLE	500K	1	19	2440	11.15	-3.74	2.20	8.00	Pass
BLE	500K	1	39	2480	11.79	-1.19	2.20	8.00	Pass

Appendix B. AC Conducted Emission Test Results





Note:

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



Appendix C. Radiated Spurious Emission

Test Engineer :	Koi li	Relative Humidity :	41~42%
	Koi Ji	Temperature :	22~23℃

Radiated Spurious Emission Test Modes

Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency	Data Rate	Remark
Mode 1	2400-2483.5	1	Bluetooth-LE_GSFK	00	2402	1Mbps	-
Mode 2	2400-2483.5	1	Bluetooth-LE_GSFK	19	2440	1Mbps	-
Mode 3	2400-2483.5	1	Bluetooth-LE_GSFK	39	2480	1Mbps	-
Mode 4	2400-2483.5	1	Bluetooth-LE_GSFK	00	2402	2Mbps	-
Mode 5	2400-2483.5	1	Bluetooth-LE_GSFK	19	2440	2Mbps	-
Mode 6	2400-2483.5	1	Bluetooth-LE_GSFK	39	2480	2Mbps	-
Mode 7	2400-2483.5	1	Bluetooth-LE_GSFK	00	2402	125kbps	-
Mode 8	2400-2483.5	1	Bluetooth-LE_GSFK	19	2440	125kbps	-
Mode 9	2400-2483.5	1	Bluetooth-LE_GSFK	39	2480	125kbps	-
Mode 10	2400-2483.5	1	Bluetooth-LE_GSFK	00	2402	500kbps	-
Mode 11	2400-2483.5	1	Bluetooth-LE_GSFK	19	2440	500kbps	-
Mode 12	2400-2483.5	1	Bluetooth-LE_GSFK	39	2480	500kbps	-
Mode 13	2400-2483.5	2	Bluetooth-LE_GSFK	00	2402	1Mbps	-
Mode 14	2400-2483.5	2	Bluetooth-LE_GSFK	19	2440	1Mbps	-
Mode 15	2400-2483.5	2	Bluetooth-LE_GSFK	39	2480	1Mbps	-
Mode 16	2400-2483.5	2	Bluetooth-LE_GSFK	00	2402	2Mbps	-
Mode 17	2400-2483.5	2	Bluetooth-LE_GSFK	19	2440	2Mbps	-
Mode 18	2400-2483.5	2	Bluetooth-LE_GSFK	39	2480	2Mbps	-
Mode 19	2400-2483.5	2	Bluetooth-LE_GSFK	00	2402	125kbps	-
Mode 20	2400-2483.5	2	Bluetooth-LE_GSFK	19	2440	125kbps	-
Mode 21	2400-2483.5	2	Bluetooth-LE_GSFK	39	2480	125kbps	-
Mode 22	2400-2483.5	2	Bluetooth-LE_GSFK	00	2402	500kbps	-
Mode 23	2400-2483.5	2	Bluetooth-LE_GSFK	19	2440	500kbps	-
Mode 24	2400-2483.5	2	Bluetooth-LE_GSFK	39	2480	500kbps	-
Mode 21	2400-2483.5	2	Bluetooth-LE_GSFK	39	2480	125kbps	LF

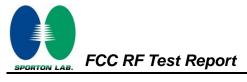
Sporton International Inc. (Kunshan)
TEL: +86-512-57900158
FCC ID: 2AEUPBHARG091



Summary of each worse mode

Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
1	Bluetooth-LE_GSFK	00	2349.78	45.96	54.00	-8.04	V	AVERAGE	Pass	Band Edge
	Bluetooth-LE_GSFK	00	4804.00	42.55	74.00	-31.45	Н	PEAK	Pass	Harmonic
2	Bluetooth-LE_GSFK	19	-	-	-	-	-	-	-	Band Edge
	Bluetooth-LE_GSFK	19	7320.00	42.30	74.00	-31.70	V	PEAK	Pass	Harmonic
	Bluetooth-LE_GSFK	39	2483.86	46.98	54.00	-7.02	V	AVERAGE	Pass	Band Edge
3	Bluetooth-LE_GSFK	39	4960.00	45.39	74.00	-28.61	Н	PEAK	Pass	Harmonic
4	Bluetooth-LE_GSFK	00	2377.47	45.88	54.00	-8.12	V	AVERAGE	Pass	Band Edge
4	Bluetooth-LE_GSFK	00	4804.00	42.29	74.00	-31.71	Н	PEAK	Pass	Harmonic
_	Bluetooth-LE_GSFK	19	-	-	-	-	-	-	-	Band Edge
5	Bluetooth-LE_GSFK	19	7320.00	43.19	74.00	-30.81	V	PEAK	Pass	Harmonic
6	Bluetooth-LE_GSFK	39	2483.50	49.65	54.00	-4.35	V	AVERAGE	Pass	Band Edge
	Bluetooth-LE_GSFK	39	4960.00	44.49	74.00	-29.51	Н	PEAK	Pass	Harmonic
7	Bluetooth-LE_GSFK	00	2387.87	45.04	54.00	-8.96	V	AVERAGE	Pass	Band Edge
7	Bluetooth-LE_GSFK	00	4804.00	40.91	74.00	-33.09	V	PEAK	Pass	Harmonic
	Bluetooth-LE_GSFK	19	-	-	-	-	-	-	-	Band Edge
8	Bluetooth-LE_GSFK	19	7320.00	42.33	74.00	-31.67	V	PEAK	Pass	Harmonic
	Bluetooth-LE_GSFK	39	2484.34	45.96	54.00	-8.04	V	AVERAGE	Pass	Band Edge
9	Bluetooth-LE_GSFK	39	7440.00	42.60	74.00	-31.40	V	PEAK	Pass	Harmonic
10	Bluetooth-LE_GSFK	00	2378.90	45.36	54.00	-8.64	V	AVERAGE	Pass	Band Edge
	Bluetooth-LE_GSFK	00	4804.00	39.76	74.00	-34.24	V	PEAK	Pass	Harmonic
11	Bluetooth-LE_GSFK	19	-	-	-	-	-	-	-	Band Edge
	Bluetooth-LE_GSFK	19	7320.00	41.97	74.00	-32.03	V	PEAK	Pass	Harmonic

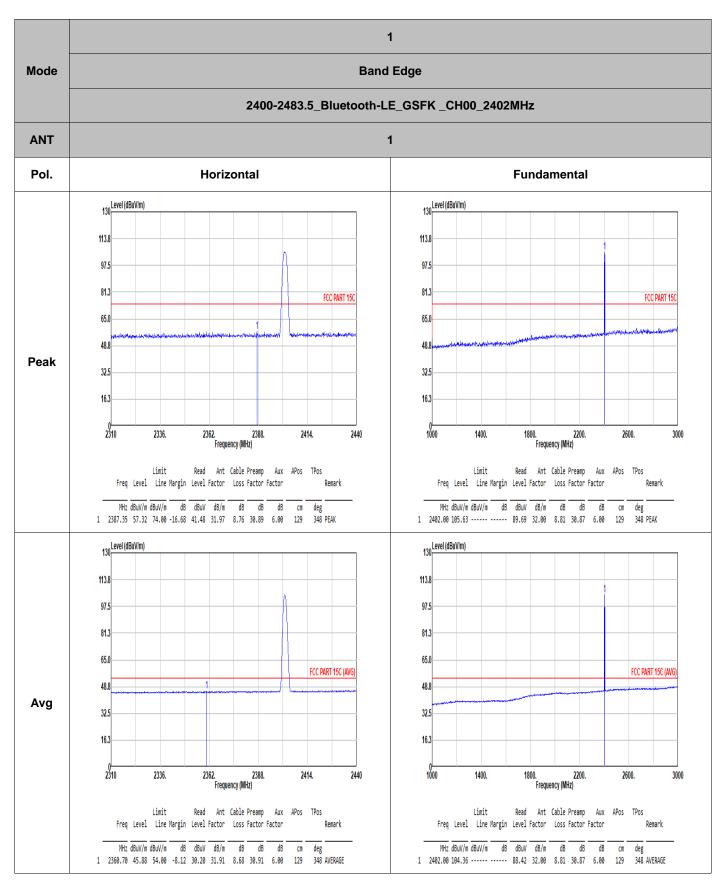




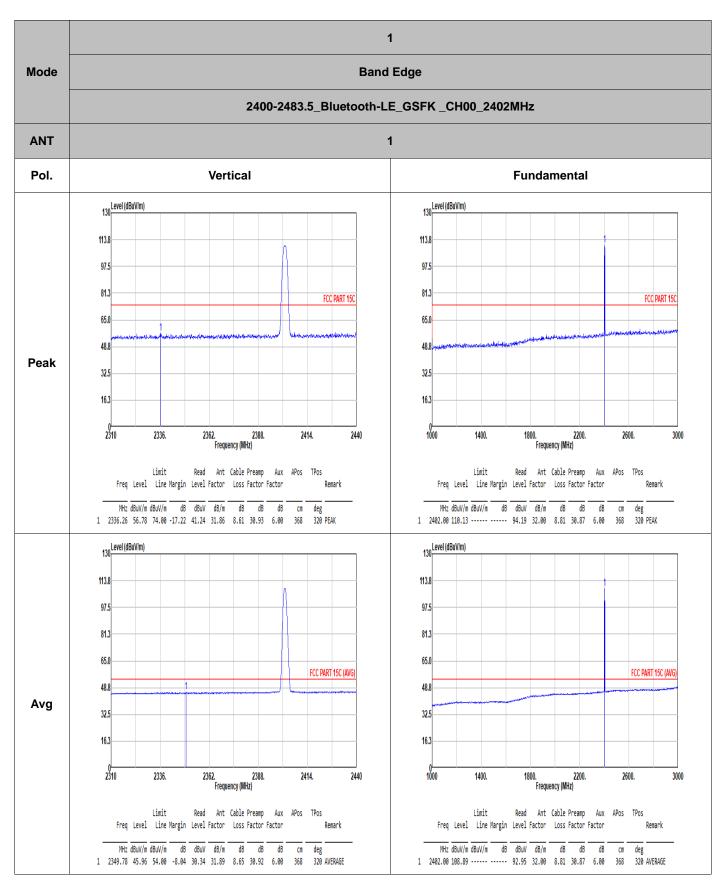
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12	Bluetooth-LE_GSFK	39	2484.10	46.43	54.00	-7.57	V	AVERAGE	Pass	Band Edge
	Bluetooth-LE_GSFK	39	7440.00	42.40	74.00	-31.60	Н	PEAK	Pass	Harmonic
13	Bluetooth-LE_GSFK	00	2377.47	46.11	54.00	-7.89	Н	AVERAGE	Pass	Band Edge
13	Bluetooth-LE_GSFK	00	4804.00	41.89	74.00	-32.11	V	PEAK	Pass	Harmonic
4.4	Bluetooth-LE_GSFK	19	-	-	-	-	-	-	-	Band Edge
14	Bluetooth-LE_GSFK	19	7320.00	42.50	74.00	-31.50	V	PEAK	Pass	Harmonic
15	Bluetooth-LE_GSFK	39	2483.56	47.23	54.00	-6.77	V	AVERAGE	Pass	Band Edge
15	Bluetooth-LE_GSFK	39	7440.00	42.82	74.00	-31.18	V	PEAK	Pass	Harmonic
16	Bluetooth-LE_GSFK	00	2380.59	45.37	54.00	-8.63	Н	AVERAGE	Pass	Band Edge
16	Bluetooth-LE_GSFK	00	4804.00	42.02	74.00	-31.98	Н	PEAK	Pass	Harmonic
4.7	Bluetooth-LE_GSFK	19	-	-	-	-	-	-	-	Band Edge
17	Bluetooth-LE_GSFK	19	7320.00	43.27	74.00	-30.73	V	PEAK	Pass	Harmonic
40	Bluetooth-LE_GSFK	39	2483.50	49.22	54.00	-4.78	V	AVERAGE	Pass	Band Edge
18	Bluetooth-LE_GSFK	39	7440.00	43.31	74.00	-30.69	Н	PEAK	Pass	Harmonic
40	Bluetooth-LE_GSFK	00	2383.06	45.43	54.00	-8.57	Н	AVERAGE	Pass	Band Edge
19	Bluetooth-LE_GSFK	00	4804.00	41.35	74.00	-32.65	V	PEAK	Pass	Harmonic
20	Bluetooth-LE_GSFK	19	-	-	-	-	-	-	-	Band Edge
20	Bluetooth-LE_GSFK	19	7320.00	43.15	74.00	-30.85	Н	PEAK	Pass	Harmonic
21	Bluetooth-LE_GSFK	39	2483.50	50.44	54.00	-3.56	Н	AVERAGE	Pass	Band Edge
	Bluetooth-LE_GSFK	39	7440.00	42.15	74.00	-31.85	Н	PEAK	Pass	Harmonic
22	Bluetooth-LE_GSFK	00	2376.69	45.38	54.00	-8.62	Н	AVERAGE	Pass	Band Edge
	Bluetooth-LE_GSFK	00	4804.00	41.58	74.00	-32.42	V	PEAK	Pass	Harmonic

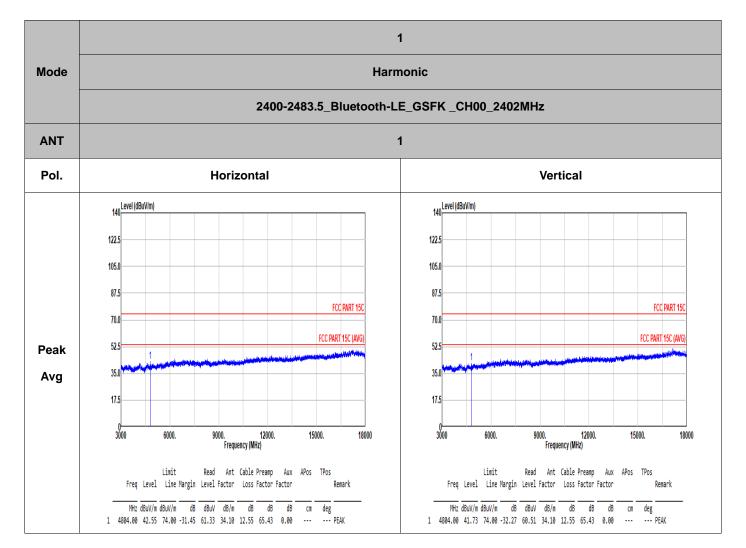
Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
23	Bluetooth-LE_GSFK	19	-	-	-	-	-	-	-	Band Edge
	Bluetooth-LE_GSFK	19	7320.00	42.83	74.00	-31.17	Н	PEAK	Pass	Harmonic
24	Bluetooth-LE_GSFK	39	2483.98	46.73	54.00	-7.27	Н	AVERAGE	Pass	Band Edge
	Bluetooth-LE_GSFK	39	7440.00	42.69	74.00	-31.31	Н	PEAK	Pass	Harmonic
21	Bluetooth-LE_GSFK	39	54.25	31.57	40.00	-8.43	V	PEAK	Pass	LF

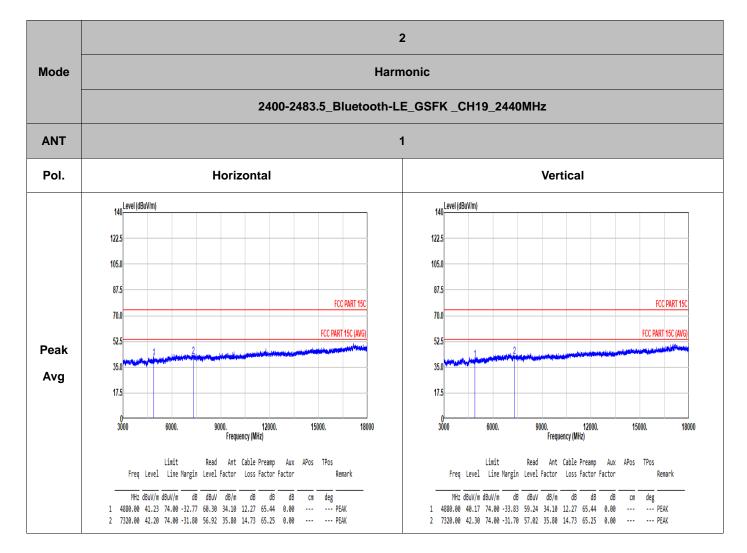




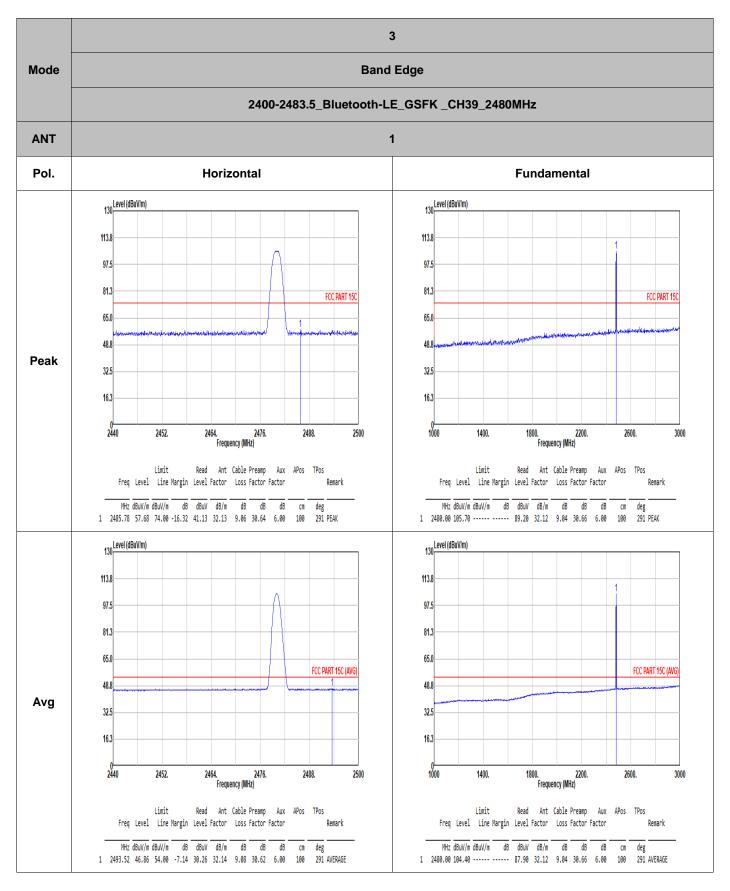




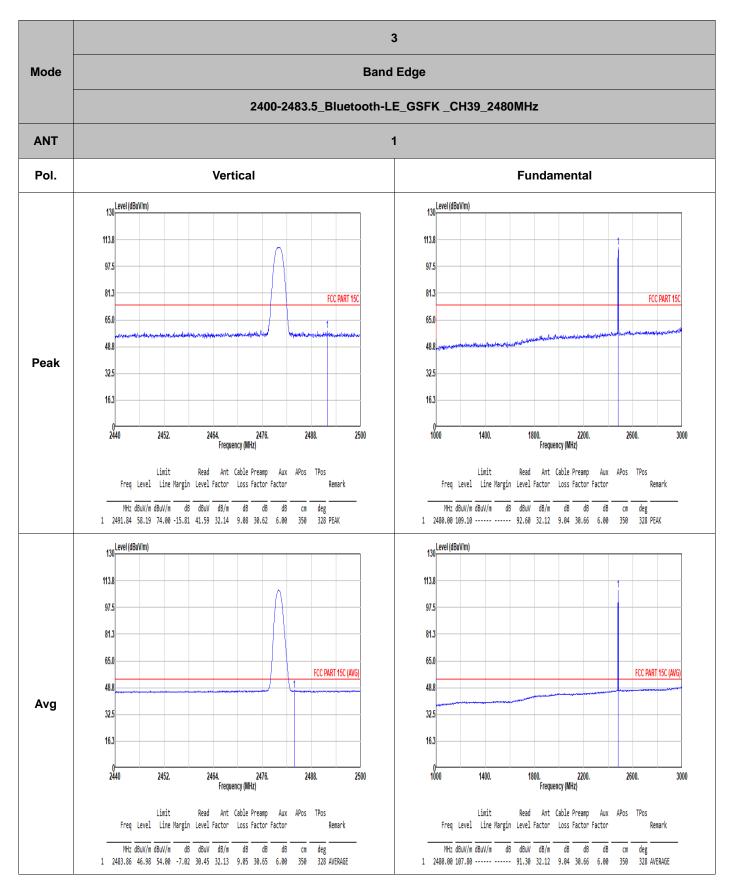


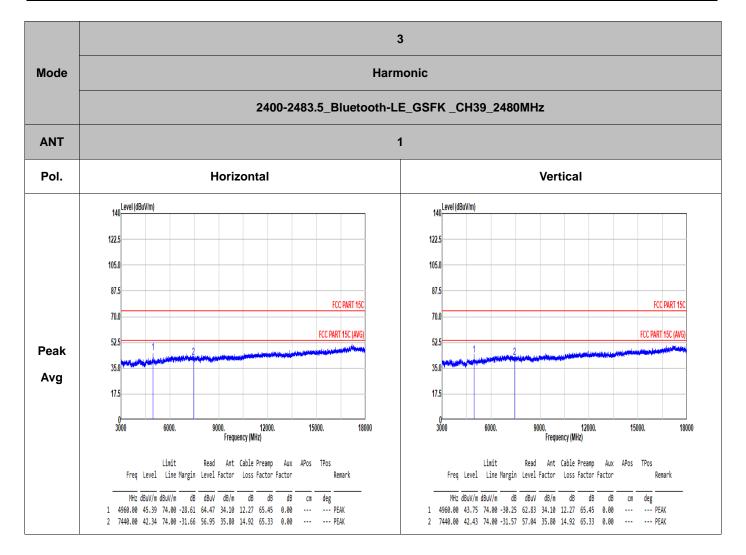




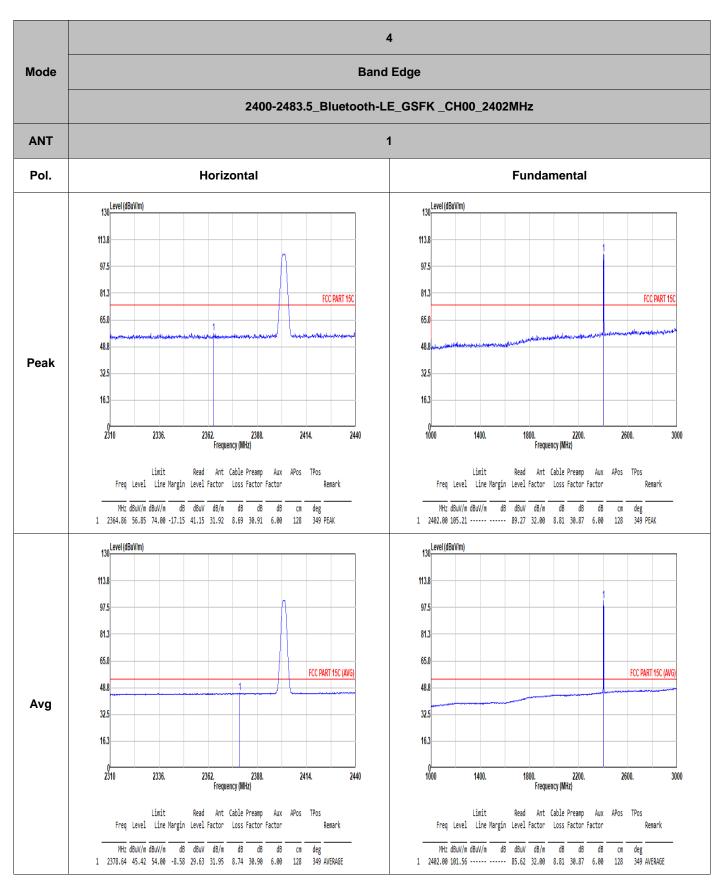


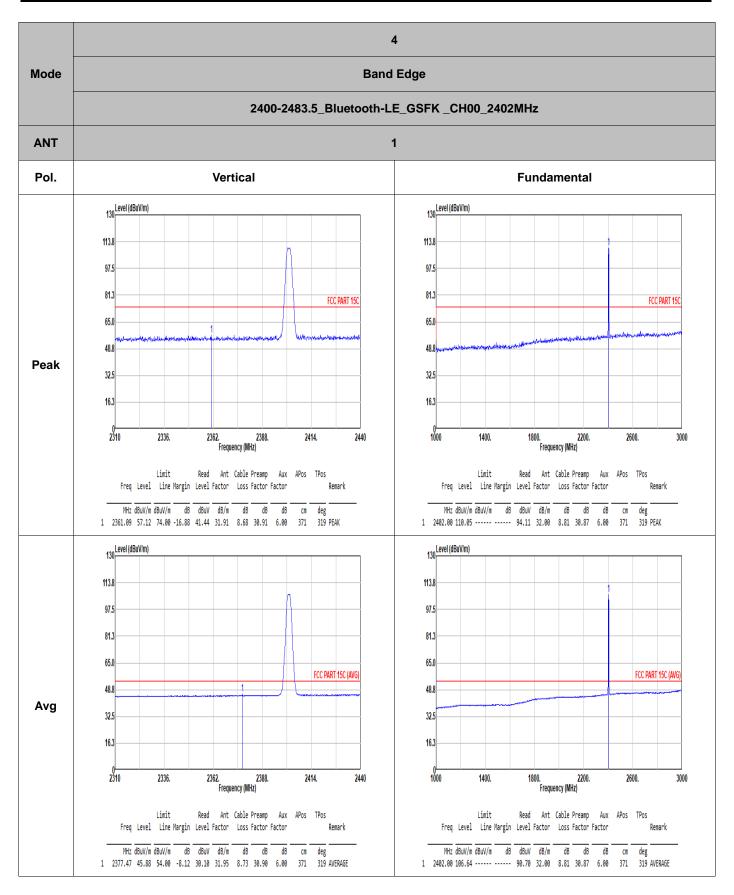


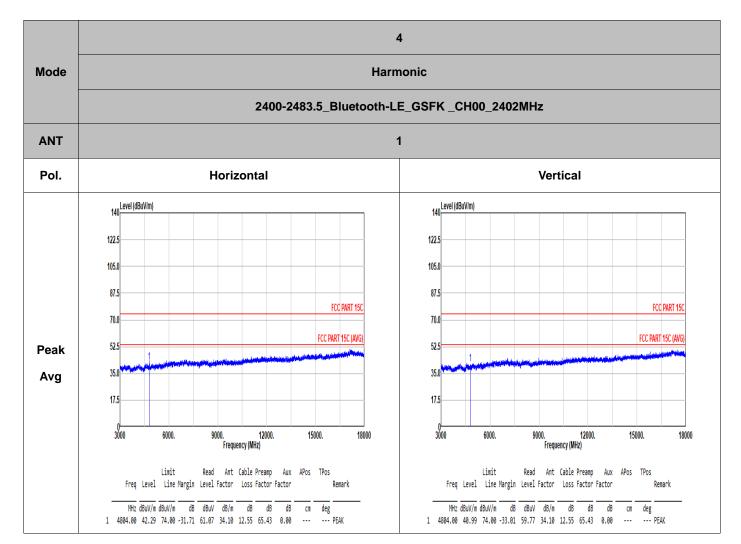




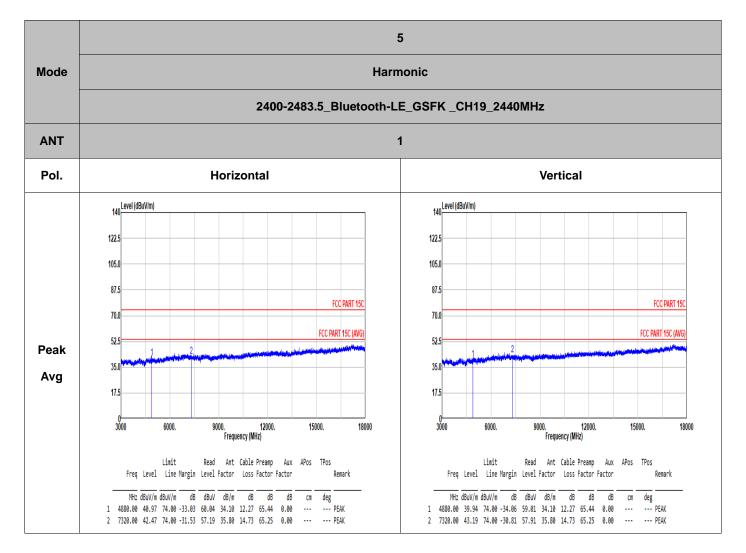




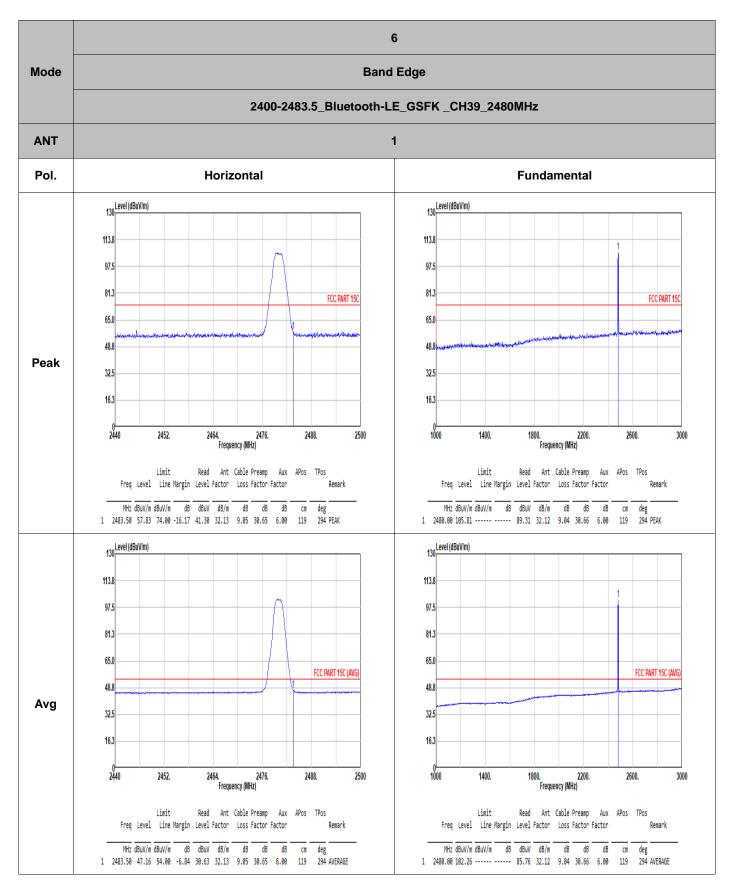




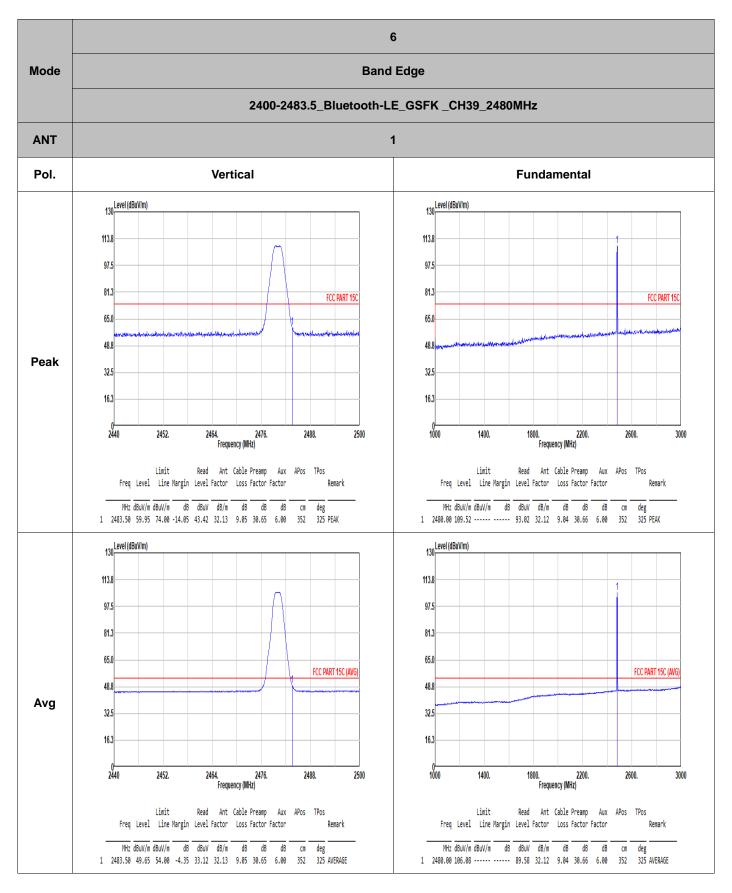
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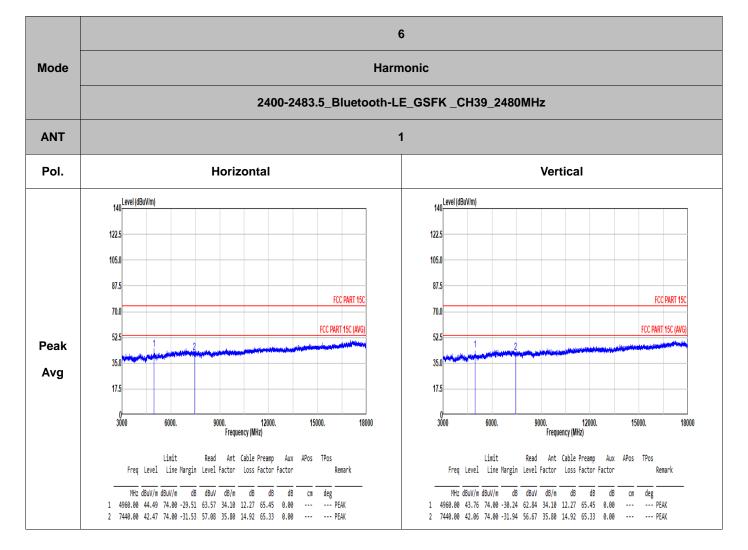




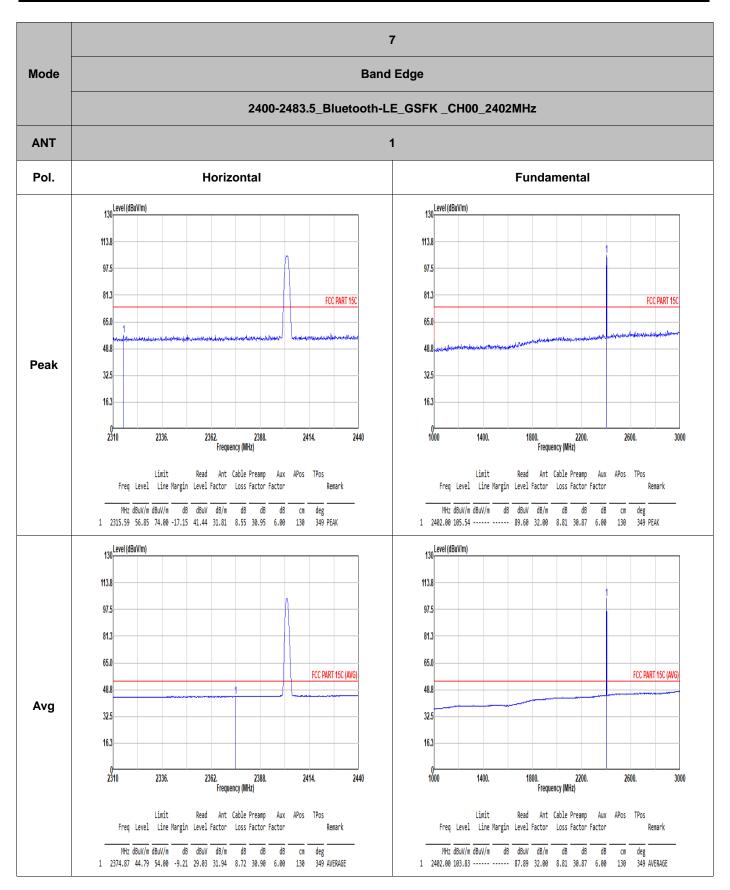




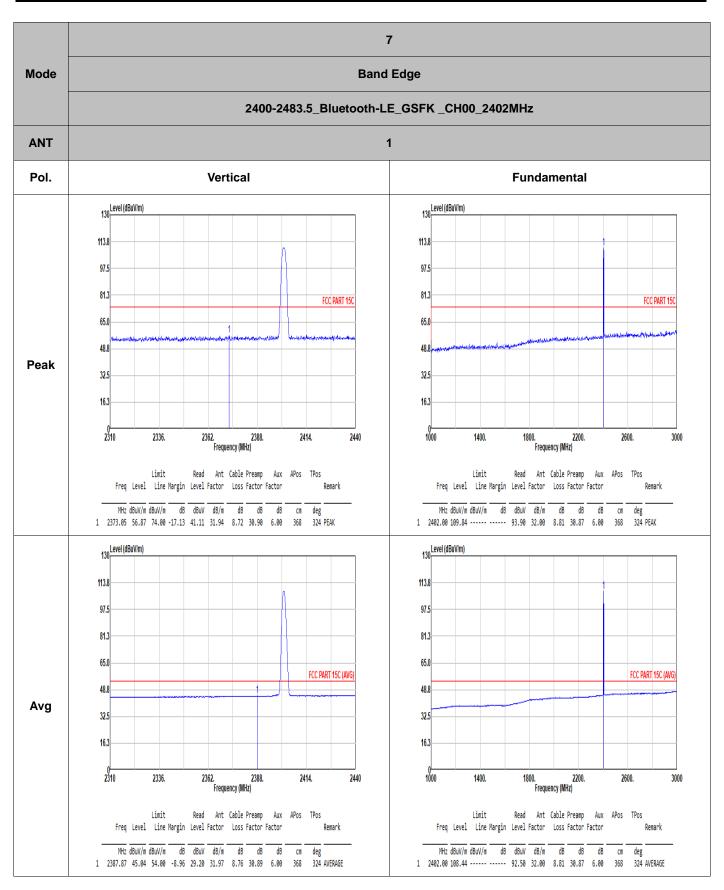
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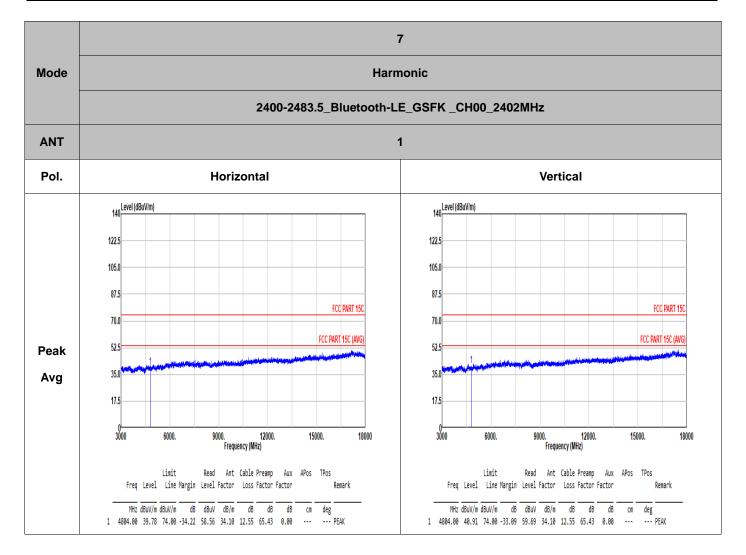












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