

TEST REPORT

Product Name : E-BIKE

Brand Mark : HONBIKE

Model No. : HF01

FCC ID : 2A3DV-HF01CD04

Report Number : BLA-EMC-202110-A2102

Date of Sample Receipt: 2021/10/13

Date of Test : 2021/10/27 to 2021/11/2

Date of Issue : 2021/11/2

Test Standard: 47 CFR Part 15, Subpart C 15.247

Test Result : Pass

Josu Blue Zhong Prepared for:

HONBIKE INC

16192 Coastal Highway, city of Lewes, County of Sussex,state of Delaware 19958

Prepared by:

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.
Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District,
Shenzhen, Guangdong Province, China

TEL: +86-755-23059481

Compiled by:

Approved by:

Review by:

Date:







Page 2 of60

REPORT REVISE RECORD

Version No. Date		Description	
00 2021/11/2		Original	





TABLE OF CONTENTS

1	TE	ST SUMMARY	5
2	GE	NERAL INFORMATION	6
3	GE	NERAL DESCRIPTION OF E.U.T	6
4	TE	ST ENVIRONMENT	7
5		ST MODE	
		EASUREMENT UNCERTAINTY	
6			
7		SCRIPTION OF SUPPORT UNIT	
8	LA	BORATORY LOCATION	8
9	TE	ST INSTRUMENTS LIST	9
10	СО	ONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)	12
	10.1	LIMITS	
	10.2	BLOCK DIAGRAM OF TEST SETUP	
	10.3	PROCEDURE	12
	10.4	TEST DATA	14
11	СО	ONDUCTED BAND EDGES MEASUREMENT	16
	11.1	LIMITS	16
	11.2	BLOCK DIAGRAM OF TEST SETUP	
	11.3	TEST DATA	17
12	AN	ITENNA REQUIREMENT	18
	12.1	CONCLUSION	18
		DIATED SPURIOUS EMISSIONS	
	13.1	LIMITS	
	13.2	BLOCK DIAGRAM OF TEST SETUP	
	13.3 13.4	PROCEDURETEST DATA	_
14	RA	DIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS	30
	14.1	LIMITS	
	14.2	BLOCK DIAGRAM OF TEST SETUP	
	14.3	PROCEDURE	
	14.4	TEST Data	33



sport ivo	DLA-LIVIO-202 10-A2 102
	Page 4 of60

15 CC	ONDUCTED SPURIOUS EMISSIONS	37
15.1	LIMITS	37
15.2	BLOCK DIAGRAM OF TEST SETUP	37
15.3	TEST DATA	38
16 PC	OWER SPECTRUM DENSITY	39
16.1	LIMITS	39
16.2	BLOCK DIAGRAM OF TEST SETUP	39
16.3	TEST DATA	39
17 CC	ONDUCTED PEAK OUTPUT POWER	
17.1	LIMITS	40
17.2	BLOCK DIAGRAM OF TEST SETUP	
17.3	TEST DATA	41
18 MI	NIMUM 6DB BANDWIDTH	42
18.1	LIMITS	
18.2	BLOCK DIAGRAM OF TEST SETUP	42
18.3	TEST DATA	
19 AF	PENDIX	43
APPEN	DIX A: PHOTOGRAPHS OF TEST SETUP	58
APPEN	DIX B: PHOTOGRAPHS OF EUT	60



Page 5 of 60

1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.5	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass



Page 6 of 60

2 GENERAL INFORMATION

Applicant	HONBIKE INC	
Address	16192 Coastal Highway, city of Lewes, County of Sussex,state of Delaware 19958	
Manufacturer	HONBIKE INC	
Address	16192 Coastal Highway, city of Lewes, County of Sussex,state of Delaware 19958	
Factory	HONBIKE INC	
Address	16192 Coastal Highway, city of Lewes, County of Sussex,state of Delaware 19958	
Product Name	E-BIKE	
Test Model No.	HF01	

3 GENERAL DESCRIPTION OF E.U.T.

Hardware Version	N/A	
Software Version	N/A	
Operation Frequency:	2402MHz-2480MHz	
Modulation Type:	GFSK	
Channel Spacing:	2MHz	
Number of Channels:	40	
Antenna Type:	PCB Antenna	
Antenna Gain:	0dBi(Provided by the applicant)	



Page 7 of 60

4 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	25°C	DC3.3V

5 TEST MODE

TEST MODE	TEST MODE DESCRIPTION	
TX	Keep the EUT in transmitting mode	
Remark:Only the data of the worst mode would be recorded in this report.		

6 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)	
Radiated Emission(9kHz-30MHz)	±4.34dB	
Radiated Emission(30Mz-1000MHz)	±4.24dB	
Radiated Emission(1GHz-18GHz)	±4.68dB	
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB	

Parameter	Expanded Uncertainty (Confidence of 95%)	
Occupied Channel Bandwidth	±5 %	
RF output power, conducted	±1.5 dB	
Power Spectral Density, conducted	±3.0 dB	
Unwanted Emissions, conducted	±3.0 dB	
Temperature	±3 °C	
Supply voltages	±3 %	
Time	±5 %	
Radiated Emission (30MHz ~ 1000MHz)	±4.35 dB	
Radiated Emission (1GHz ~ 18GHz)	±4.44 dB	



Page 8 of 60

DESCRIPTION OF SUPPORT UNIT

Device Type	Manufacturer	Model Name	Serial No.	Remark
N/A	N/A	N/A	N/A	N/A

LABORATORY LOCATION 8

All tests were performed at:

BlueAsia of Technical Services(Shenzhen) Co., Ltd.

Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province,

China

Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

No tests were sub-contracted.



Page 9 of 60

9 TEST INSTRUMENTS LIST

Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)						
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due	
Shield room	SKET	833	N/A	2020/11/25	2023/11/24	
Receiver	R&S	ESPI3	101082	2021/10/12	2022/10/11	
LISN	R&S	ENV216	3560.6550.15	2021/10/12	2022/10/11	
LISN	AT	AT166-2	AKK1806000003	2021/10/12	2022/10/11	
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A	

Test Equipment Of Conducted Band Edges Measurement						
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due	
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11	
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11	
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11	
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11	

Test Equipment Of	Test Equipment Of Radiated Spurious Emissions					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due	
Chamber	SKET	966	N/A	2020/11/10	2023/11/9	
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11	
Receiver	R&S	ESR7	101199	2021/10/12	2022/10/11	
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2020/9/26	2022/9/25	
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	2020/9/26	2022/9/25	



Page 10 of60

Amplifier	SKET	PA-000318G-45	N/A	2021/10/16	2022/10/15
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2020/9/26	2022/9/25
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

Test Equipment Of	Test Equipment Of Radiated Emissions which fall in the restricted bands				
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Chamber	SKET	966	N/A	2020/11/10	2023/11/9
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Receiver	R&S	ESR7	101199	2021/10/12	2022/10/11
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2020/9/26	2022/9/25
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	2020/9/26	2022/9/25
Amplifier	SKET	PA-000318G-45	N/A	2021/10/16	2022/10/15
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2020/9/26	2022/9/25
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

Test Equipment Of Conducted Spurious Emissions					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11



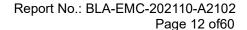
Page 11 of60

Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

Test Equipment Of Power Spectrum Density					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

Test Equipment Of Conducted Peak Output Power					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

Test Equipment Of Minimum 6dB Bandwidth					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11





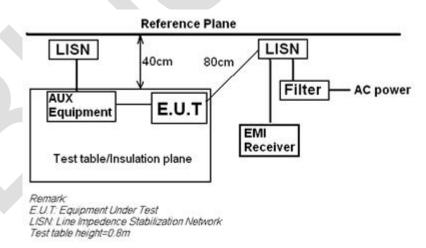
10 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)

Test Standard	47 CFR Part 15, Subpart C 15.247			
Test Method	ANSI C63.10 (2013) Section 6.2			
Test Mode (Pre-Scan)	Transmitting mode			
Test Mode (Final Test)	Transmitting mode			
Tester	Jozu			
Temperature	25℃			
Humidity	60%			

10.1 LIMITS

Frequency of	Conducted	limit(dBµV)			
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.					

10.2 BLOCK DIAGRAM OF TEST SETUP



10.3 PROCEDURE

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.



Page 13 of 60

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

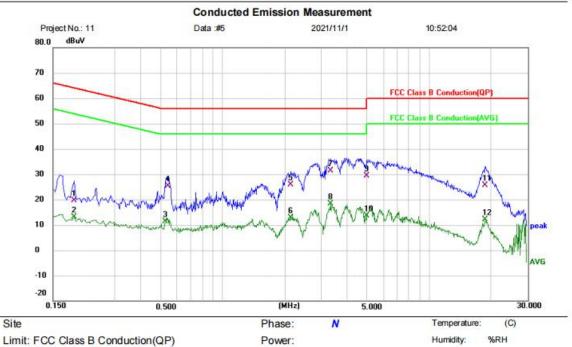
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor



10.4 TEST DATA

[TestMode: Transmitting mode]; [Line: Neutral]; [Power:AC120V/60Hz]



EUT: E-BIKE M/N: HF01(CD04) Mode: BLE mode

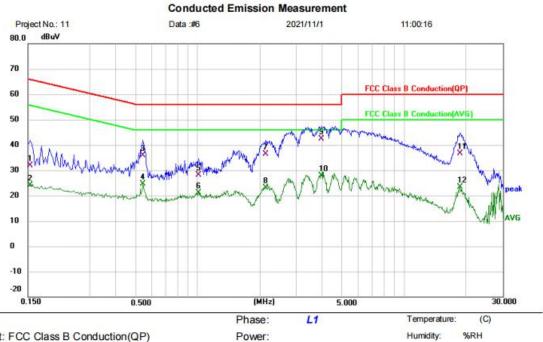
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1900	9.53	10.13	19.66	64.04	-44.38	QP	
2		0.1900	2.98	10.13	13.11	54.04	-40.93	AVG	
3		0.5299	1.52	9.79	11.31	46.00	-34.69	AVG	
4		0.5420	15.68	9.79	25.47	56.00	-30.53	QP	
5		2.1340	16.04	9.86	25.90	56.00	-30.10	QP	
6		2.1340	3.14	9.86	13.00	46.00	-33.00	AVG	
7	*	3.3260	21.60	9.90	31.50	56.00	-24.50	QP	
8		3.3260	8.49	9.90	18.39	46.00	-27.61	AVG	
9		4.9940	19.50	9.95	29.45	56.00	-26.55	QP	
10		4.9940	3.80	9.95	13.75	46.00	-32.25	AVG	
11		18.6540	15.17	10.40	25.57	60.00	-34.43	QP	
12		18.6540	1.77	10.40	12.17	50.00	-37.83	AVG	

*:Maximum data x:Over limit !:over margin (Reference Only



[TestMode: BT]; [Line: Line] [Power:AC120V/60Hz]



Limit: FCC Class B Conduction(QP)

EUT: E-BIKE M/N: HF01(CD04) Mode: BLE mode

Note:

Site

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1539	21.67	10.11	31.78	65.79	-34.01	QP	
2	0.1539	13.94	10.11	24.05	55.79	-31.74	AVG	
3	0.5420	25.93	9.87	35.80	56.00	-20.20	QP	
4	0.5420	14.66	9.87	24.53	46.00	-21.47	AVG	
5	1.0060	18.15	9.92	28.07	56.00	-27.93	QP	
6	1.0060	11.16	9.92	21.08	46.00	-24.92	AVG	
7	2.1380	26.34	9.94	36.28	56.00	-19.72	QP	
8	2.1380	13.17	9.94	23.11	46.00	-22.89	AVG	
9 *	3.9660	32.55	9.88	42.43	56.00	-13.57	QP	
10	3.9660	17.99	9.88	27.87	46.00	-18.13	AVG	
11	18.6460	26.24	10.42	36.66	60.00	-23.34	QP	
12	18.6460	12.95	10.42	23.37	50.00	-26.63	AVG	

*:Maximum data x:Over limit (Reference Only !:over margin



Page 16 of 60

11 CONDUCTED BAND EDGES MEASUREMENT

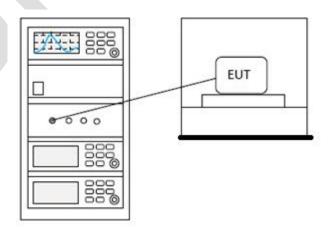
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

11.1 LIMITS

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

11.2 BLOCK DIAGRAM OF TEST SETUP





Page 17 of 60

11.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details





Page 18 of 60

12 ANTENNA REQUIREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	N/A

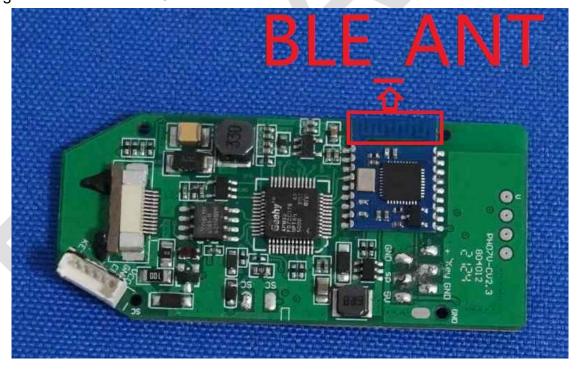
12.1 CONCLUSION

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.





Page 19 of 60

13 RADIATED SPURIOUS EMISSIONS

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.4,6.5,6.6
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

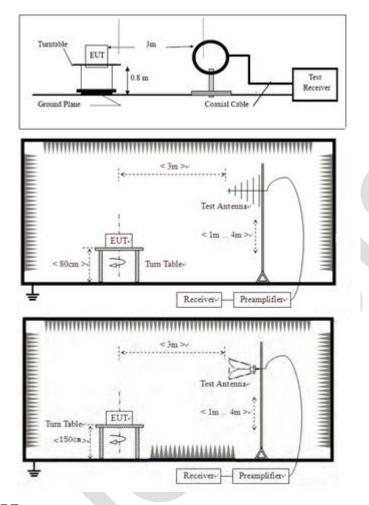
13.1 LIMITS

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.



13.2 BLOCK DIAGRAM OF TEST SETUP



13.3 PROCEDURE

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.



Page 21 of60

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

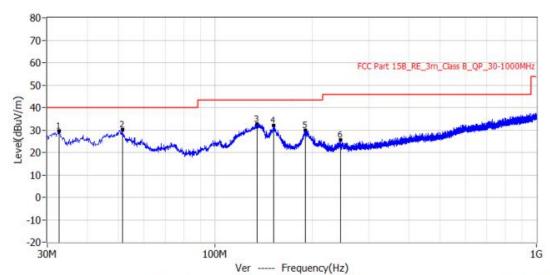
- 3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. fundamental frequency is blocked by filter, and only spurious emission is shown.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



13.4 TEST DATA

[TestMode: TX mode (SE) below 1G]; [Polarity: Vertical]

Test Lab: BlueAsia EMC Lab (RE #1)	Project: BLA-EMC-202110-A21	
EUT: E-BIKE	Test Engineer: Charlie	
M/N: HF01(CD04)	Temperature:	
S/N:	Humidity:	
Test Mode: TX mode	Test Voltage:	
Note:	Test Data: 2021-10-27 10:09:00	

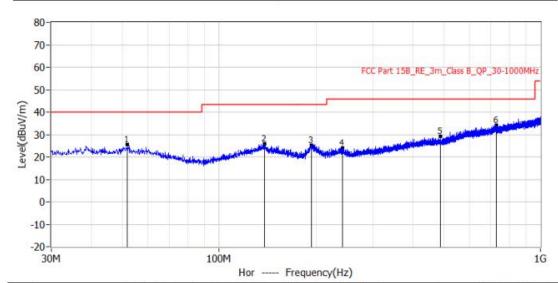


Limit Level Delta Reading Factor Height Angle No. Frequency Detector Polar dBuV/m dBuV/m dB dBuV dB/m cm deg 1* 32.668MHz 6.5 22.9 QP Ver 29.4 -10.6 100.0 110.0 40.0 2* 51.340MHz 40.0 -9.9 6.3 23.8 QP Ver 100.0 114.0 30.1 3* 134.881MHz 43.5 32.7 -10.89.2 23.5 QP Ver 100.0 101.0 4* 8.6 151.614MHz 43.5 32.1 -11.4 23.5 QP Ver 100.0 86.0 -13.8 Ver 5* 190.293MHz 43.5 29.7 8.7 21.0 QP 100.0 13.0 245.825MHz 46.0 25.4 -20.6 2.6 22.8 QP Ver 100.0 13.0

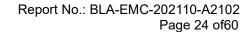


[TestMode: TX mode (SE) below 1G]; [Polarity: Horizontal]

Test Lab: BlueAsia EMC Lab (RE #1)	Project: BLA-EMC-202110-A21	
EUT: E-BIKE	Test Engineer: Charlie	
M/N: HF01(CD04)	Temperature:	
S/N:	Humidity:	
Test Mode: TX mode	Test Voltage:	
Note:	Test Data: 2021-10-27 10:12:01	



No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar	Height cm	Angle deg
1*	51.704MHz	40.0	25.4	-14.6	1.6	23.8	QP	Hor	100.0	180.0
2*	138.640MHz	43.5	25.8	-17.7	2.2	23.6	QP	Hor	100.0	142.0
3*	193.930MHz	43.5	25.3	-18.2	4.4	20.9	QP	Hor	100.0	318.0
4*	242.066MHz	46.0	24.0	-22.0	1.2	22.8	QP	Hor	100.0	252.0
5*	487.234MHz	46.0	29.2	-16.8	0.9	28.3	QP	Hor	100.0	0.0
6*	729.128MHz	46.0	34.2	-11.8	1.6	32.6	QP	Hor	100.0	211.0



Humidity:

(C)

%RH



[TestMode: TX high channel]; [Polarity: Horizontal]

Radiated Emission Measurement Project No.: RE Data:#5 2021/10/27 16:48:26 dBuV/m 80.0 FCC Part15 (PK) 70 60 FCC Part 5 (AV) 50 30 20 10 0.0 10400.00 11575.00 12750.00 1000.000 2175.00 3350.00 4525.00 5700.00 8050.00 9225.00

Polarization: Horizontal

Limit: FCC Part15 (PK)

EUT: E-BIKE M/N: HF01(CD04) Mode: TX-H

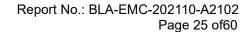
Site

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment	
1		3831.750	42.27	7.25	49.52	74.00	-24.48	peak		
2		4924.000	39.56	3.46	43.02	74.00	-30.98	peak		
3		7386.000	39.22	6.68	45.90	74.00	-28.10	peak		
4		8167.500	41.20	8.17	49.37	74.00	-24.63	peak		
5		9848.000	36.88	9.88	46.76	74.00	-27.24	peak		
6	*	11763.000	39.55	11.63	51.18	74.00	-22.82	peak		

Power:

*:Maximum data x:Over limit !:over margin (Reference Only

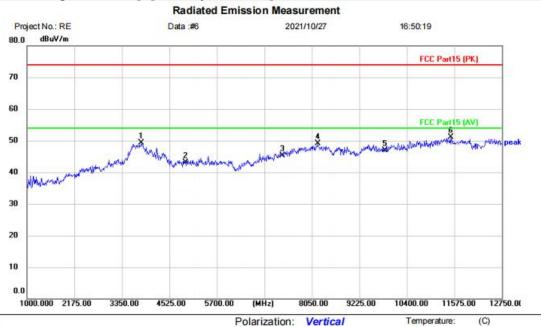


Humidity:

%RH



[TestMode: TX high channel]; [Polarity: Vertical]



Limit: FCC Part15 (PK)

EUT: E-BIKE M/N: HF01(CD04) Mode: TX-H

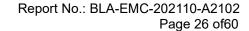
Note:

Site

No.	Mk.	Freq.	Reading Level	Correct	Measure- ment	Limit	Over			
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment	
1		3831.750	42.09	7.25	49.34	74.00	-24.66	peak		
2		4924.000	39.61	3.46	43.07	74.00	-30.93	peak		
3		7311.000	38.91	6.37	45.28	74.00	-28.72	peak		
4		8191.000	40.82	8.20	49.02	74.00	-24.98	peak		
5		9848.000	36.99	9.88	46.87	74.00	-27.13	peak		
6	*	11492.750	39.13	11.90	51.03	74.00	-22.97	peak		

Power:

*:Maximum data x:Over limit !:over margin (Reference Only



Humidity:

(C)

%RH



[TestMode: TX mid channel]; [Polarity: Horizontal]

Radiated Emission Measurement Project No.: RE Data:#7 2021/10/27 17:44:37 dBuV/m 80.0 FCC Part15 (PK) 70 60 50 40 30 20 10 0.0 10400.00 11575.00 12750.00 1000.000 2175.00 3350.00 4525.00 5700.00 8050.00 9225.00

Polarization: Horizontal

Limit: FCC Part15 (PK)

EUT: E-BIKE M/N: HF01(CD04) Mode: TX-M

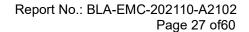
Site

Note:

No.	Mk.	Freq.	Reading Level	Correct	Measure- ment	Limit	Over			
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment	
1		3855.250	42.69	6.97	49.66	74.00	-24.34	peak		
2		4874.000	40.38	3.39	43.77	74.00	-30.23	peak		
3		7311.000	38.63	6.37	45.00	74.00	-29.00	peak		
4		7967.750	41.77	7.90	49.67	74.00	-24.33	peak		
5		9748.000	38.08	9.59	47.67	74.00	-26.33	peak		
6	*	11293.000	40.27	11.91	52.18	74.00	-21.82	peak		

Power:

*:Maximum data x:Over limit !:over margin (Reference Only



Humidity:

(C)

%RH



[TestMode: TX mid channel]; [Polarity: Vertical]

Radiated Emission Measurement Project No.: RE Data:#8 2021/10/27 17:46:34 dBuV/m 80.0 FCC Part15 (PK) 70 60 FCC Part 5 (AV) 50 30 20 10 0.0 10400.00 11575.00 12750.00 1000.000 2175.00 3350.00 4525.00 5700.00 9225.00

Polarization: Vertical

Limit: FCC Part15 (PK)

EUT: E-BIKE M/N: HF01(CD04) Mode: TX-M

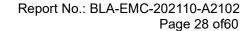
Note:

Site

No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment	
1	3867.000	43.13	6.82	49.95	74.00	-24.05	peak		
2	4874.000	40.69	3.39	44.08	74.00	-29.92	peak		
3	7311.000	38.69	6.37	45.06	74.00	-28.94	peak		
4	7826.750	42.22	7.73	49.95	74.00	-24.05	peak		
5	9748.000	38.17	9.59	47.76	74.00	-26.24	peak		
6 *	11704.250	39.51	11.79	51.30	74.00	-22.70	peak		

Power:

*:Maximum data x:Over limit !:over margin (Reference Only



Humidity:

(C)

%RH



[TestMode: TX low channel]; [Polarity: Horizontal]

Radiated Emission Measurement Project No.: RE Data:#9 2021/10/27 17:51:50 dBuV/m 80.0 FCC Part15 (PK) 70 60 50 40 30 20 10 0.0 10400.00 11575.00 12750.00 1000.000 2175.00 3350.00 4525.00 5700.00 8050.00 9225.00

Polarization: Horizontal

Limit: FCC Part15 (PK)

EUT: E-BIKE M/N: HF01(CD04) Mode: TX-L

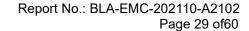
Site

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment	
1		3867.000	42.54	6.82	49.36	74.00	-24.64	peak		
2		4824.000	39.40	3.62	43.02	74.00	-30.98	peak		
3		7326.000	39.54	6.44	45.98	74.00	-28.02	peak		
4		8179.250	41.39	8.18	49.57	74.00	-24.43	peak		
5		9648.000	38.17	9.37	47.54	74.00	-26.46	peak		
6	*	11316.500	39.97	11.88	51.85	74.00	-22.15	peak		

Power:

*:Maximum data x:Over limit !:over margin (Reference Only

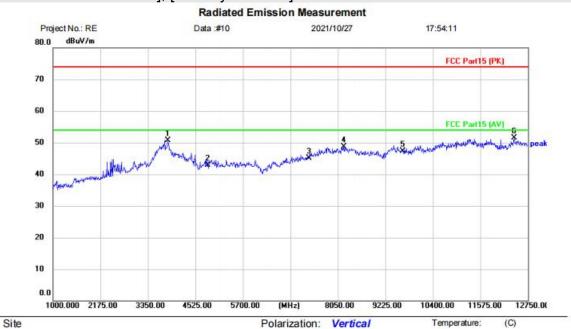


Humidity:

%RH



[TestMode: TX low channel]; [Polarity: Vertical]



Limit: FCC Part15 (PK)

EUT: E-BIKE M/N: HF01(CD04) Mode: TX-L

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		3843.500	43.59	7.12	50.71	74.00	-23.29	peak	
2		4824.000	39.37	3.62	42.99	74.00	-31.01	peak	
3		7326.000	38.66	6.44	45.10	74.00	-28.90	peak	
4		8202.750	40.41	8.21	48.62	74.00	-25.38	peak	
5		9648.000	38.03	9.37	47.40	74.00	-26.60	peak	
6	*	12409.250	39.63	11.80	51.43	74.00	-22.57	peak	

Power:

*:Maximum data x:Over limit !:over margin (Reference Only



Page 30 of 60

14 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.10.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

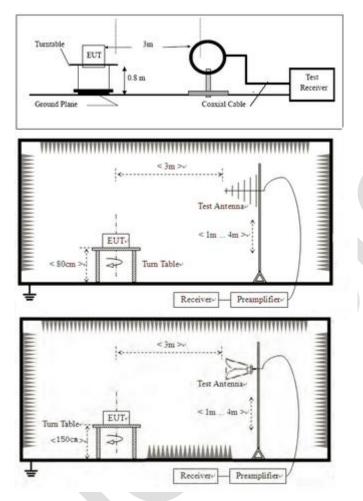
14.1 LIMITS

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.



14.2 BLOCK DIAGRAM OF TEST SETUP



14.3 PROCEDURE

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.



Page 32 of 60

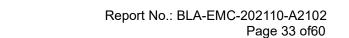
h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

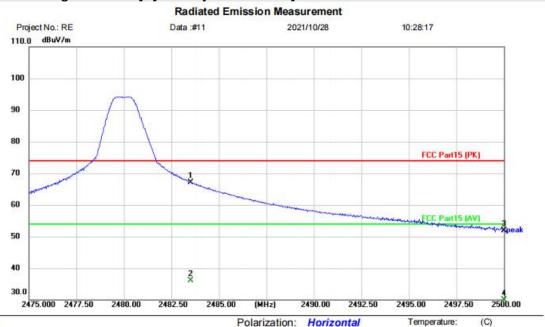
Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.





14.4 TEST DATA

[TestMode: TX high channel]; [Polarity: Horizontal]



Site

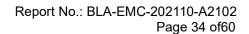
Note:

Limit: FCC Part15 (PK)

EUT: E-BIKE M/N: HF01(CD04) Mode: TX-H Power: Humidity: %RH

No.	Mk.	Freq.	Reading Level	Correct	Measure- ment	Limit	Over			
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	2483.500	70.93	-3.84	67.09	74.00	-6.91	peak		
2		2483.500	40.01	-3.84	36.17	54.00	-17.83	AVG		
3		2500.000	55.71	-3.78	51.93	74.00	-22.07	peak		
4		2500.000	31.48	-3.78	27.70	54.00	-26.30	AVG		

*:Maximum data x:Over limit !:over margin (Reference Only



Humidity:

(C)

%RH



[TestMode: TX high channel]; [Polarity: Vertical]

Radiated Emission Measurement Project No.: RE Data :#12 2021/10/28 10:34:08 100.0 dBuV/m 90 80 FCC Part15 (PK) 70 60 FCC Part 15 (AV) 50 40 2 30 20.0 2500.00 2475.000 2477.50 2480.00 2482.50 2485.00 2492.50

Polarization: Vertical

Site Limit: FCC Part15 (PK)

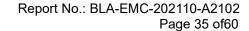
EUT: E-BIKE
M/N: HF01(CD04)
Mode: TX-H

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	2483.500	67.65	-3.84	63.81	74.00	-10.19	peak		
2		2483.500	35.18	-3.84	31.34	54.00	-22.66	AVG		
3		2500.000	54.35	-3.78	50.57	74.00	-23.43	peak		
4		2500.000	34.85	-3.78	31.07	54.00	-22.93	AVG		

Power:

*:Maximum data x:Over limit !:over margin (Reference Only



Humidity:

(C)

%RH



[TestMode: TX low channel]; [Polarity: Horizontal]

Radiated Emission Measurement Project No.: RE Data :#13 2021/10/28 10:45:14 100.0 dBuV/m 90 80 FCC Part15 (PK) 70 60 50 always a few of the contract of the few of the few of the set of t 30 20.0 2408.00 2310.000 2319.80 2329.60 2339.40 2349.20 2368.80 2378.60 2398.20

Polarization: Horizontal

Limit: FCC Part15 (PK)

EUT: E-BIKE
M/N: HF01(CD04)
Mode: TX-L

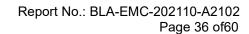
Note:

Site

No. M	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment		Over			
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment	
1		2310.000	44.05	-4.61	39.44	74.00	-34.56	peak		
2	*	2390.000	56.52	-4.27	52.25	74.00	-21.75	peak		

Power:

*:Maximum data x:Over limit !:over margin (Reference Only



2408.00

(C)

%RH



[TestMode: TX low channel]; [Polarity: Vertical]

Radiated Emission Measurement Project No.: RE Data :#14 2021/10/28 10:47:29 100.0 dBuV/m 90 80 FCC Part 5 (PK) 70 40 30 20.0

(MHz)

Power:

Polarization: Vertical

2378.60

Temperature:

Humidity:

Site Limit: FCC Part15 (PK)

2310.000 2319.80

2329.60

2339.40

2349.20

EUT: E-BIKE M/N: HF01(CD04) Mode: TX-L

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment	
1		2310.000	52.83	-4.61	48.22	74.00	-25.78	peak		
2	*	2390,000	54.93	-4.27	50.66	74.00	-23.34	peak		

*:Maximum data x:Over limit !:over margin (Reference Only



Page 37 of 60

15 CONDUCTED SPURIOUS EMISSIONS

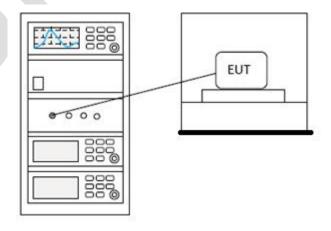
Test Standard	47 CFR Part 15, Subpart C 15.247				
Test Method	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11				
Test Mode (Pre-Scan)	TX				
Test Mode (Final Test)	TX				
Tester	Jozu				
Temperature	25℃				
Humidity	60%				

15.1 LIMITS

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

15.2 BLOCK DIAGRAM OF TEST SETUP





Page 38 of 60

15.3 TEST DATA





Page 39 of 60

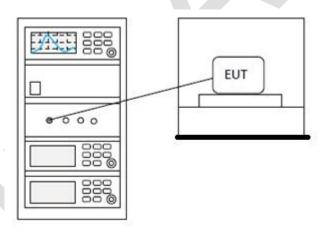
16 POWER SPECTRUM DENSITY

Test Standard	47 CFR Part 15, Subpart C 15.247				
Test Method	ANSI C63.10 (2013) Section 11.10.2				
Test Mode (Pre-Scan)	TX				
Test Mode (Final Test)	TX				
Tester	Jozu				
Temperature	25℃				
Humidity	60%				

16.1 LIMITS

Limit: | ≤8dBm in any 3 kHz band during any time interval of continuous transmission

16.2 BLOCK DIAGRAM OF TEST SETUP



16.3 TEST DATA



Page 40 of 60

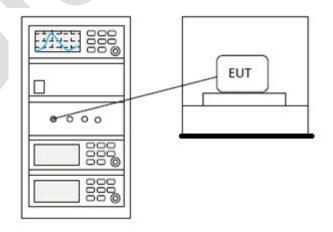
17 CONDUCTED PEAK OUTPUT POWER

Test Standard	47 CFR Part 15, Subpart C 15.247				
Test Method	ANSI C63.10 (2013) Section 7.8.5				
Test Mode (Pre-Scan)	TX				
Test Mode (Final Test)	TX				
Tester	Jozu				
Temperature	25℃				
Humidity	60%				

17.1 LIMITS

Frequency range(MHz)	Output power of the intentional radiator(watt)		
	1 for ≥50 hopping channels		
902-928	0.25 for 25≤ hopping channels <50		
	1 for digital modulation		
	1 for ≥75 non-overlapping hopping channels		
2400-2483.5	0.125 for all other frequency hopping systems		
	1 for digital modulation		
5505 5050	1 for frequency hopping systems and digital		
5725-5850	modulation		

17.2 BLOCK DIAGRAM OF TEST SETUP





Page 41 of60

17.3 TEST DATA





Page 42 of 60

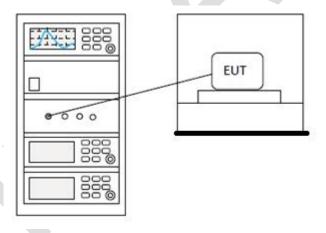
18 MINIMUM 6DB BANDWIDTH

Test Standard	47 CFR Part 15, Subpart C 15.247				
Test Method	ANSI C63.10 (2013) Section 11.8.1				
Test Mode (Pre-Scan)	TX				
Test Mode (Final Test)	TX				
Tester	Jozu				
Temperature	25℃				
Humidity	60%				

18.1 LIMITS

Limit:	≥500 kHz			
1311111100	_500 K112			I

18.2 BLOCK DIAGRAM OF TEST SETUP



18.3 TEST DATA



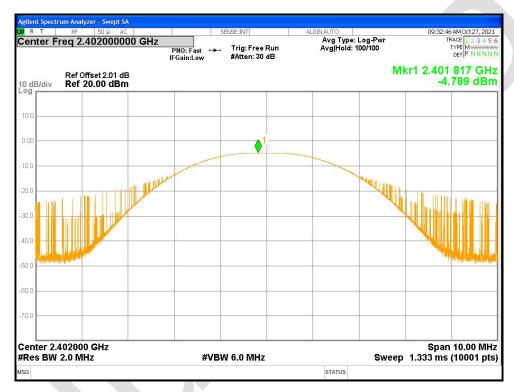
Page 43 of 60

19 APPENDIX

Maximum Conducted Output Power

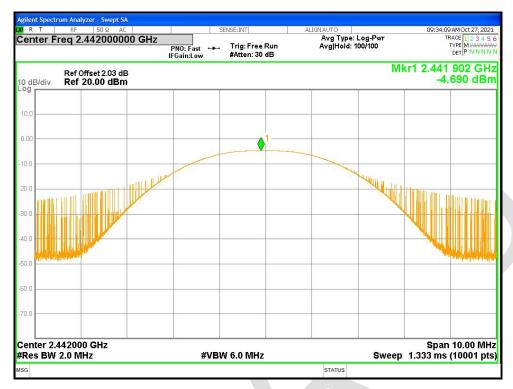
Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE	2402	Ant1	-4.789	30	Pass
NVNT	BLE	2442	Ant1	-4.69	30	Pass
NVNT	BLE	2480	Ant1	-5.472	30	Pass

Power NVNT BLE 2402MHz Ant1

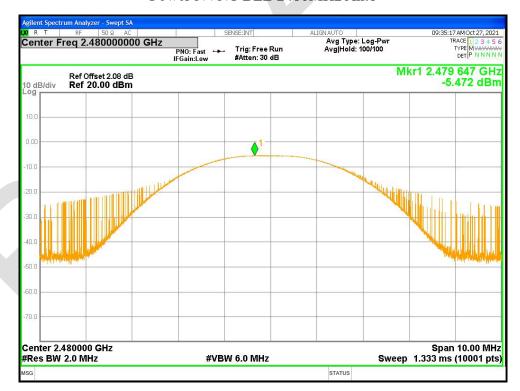


Power NVNT BLE 2442MHz Ant1





Power NVNT BLE 2480MHz Ant1





Page 45 of 60

-6dB Bandwidth

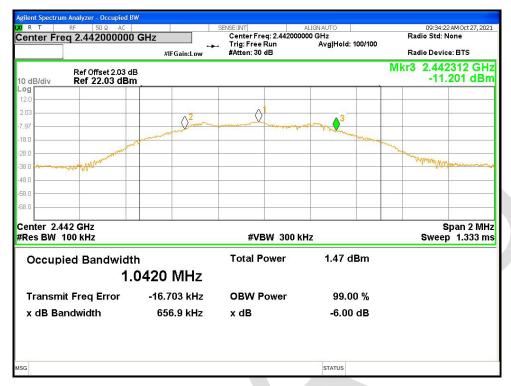
Condition	Mode	Frequency	Antenna	-6 dB Bandwidth	Limit -6 dB	Verdict
		(MHz)		(MHz)	Bandwidth (MHz)	
NVNT	BLE	2402	Ant1	0.657	0.5	Pass
NVNT	BLE	2442	Ant1	0.657	0.5	Pass
NVNT	BLE	2480	Ant1	0.681	0.5	Pass

-6dB Bandwidth NVNT BLE 2402MHz Ant1



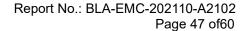
-6dB Bandwidth NVNT BLE 2442MHz Ant1





-6dB Bandwidth NVNT BLE 2480MHz Ant1







Occupied Channel Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE	2402	Ant1	1.024020921
NVNT	BLE	2442	Ant1	1.02406785
NVNT	BLE	2480	Ant1	1.019082531

OBW NVNT BLE 2402MHz Ant1



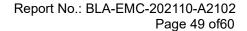
OBW NVNT BLE 2442MHz Ant1





OBW NVNT BLE 2480MHz Ant1



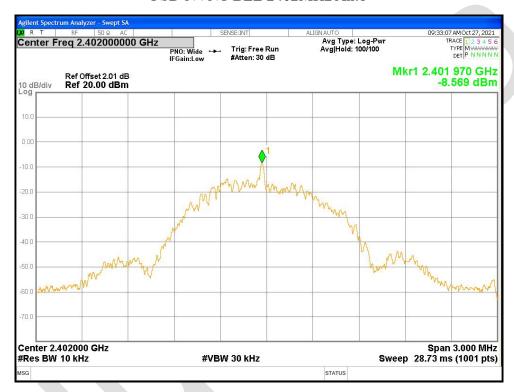




Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	BLE	2402	Ant1	-8.569	8	Pass
NVNT	BLE	2442	Ant1	-8.553	8	Pass
NVNT	BLE	2480	Ant1	-9.098	8	Pass

PSD NVNT BLE 2402MHz Ant1



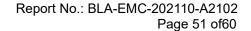
PSD NVNT BLE 2442MHz Ant1





PSD NVNT BLE 2480MHz Ant1







Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant1	-49.92	-30	Pass
NVNT	BLE	2480	Ant1	-42.62	-30	Pass

Band Edge NVNT BLE 2402MHz Ant1 Ref



Band Edge NVNT BLE 2402MHz Ant1 Emission





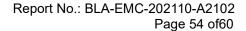
Band Edge NVNT BLE 2480MHz Ant1 Ref



Band Edge NVNT BLE 2480MHz Ant1 Emission









Conducted RF Spurious Emission

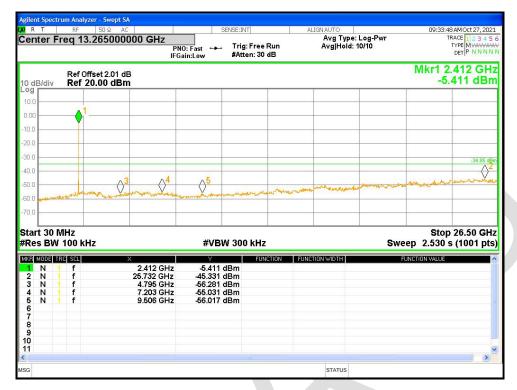
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant1	-40.48	-30	Pass
NVNT	BLE	2442	Ant1	-40.63	-30	Pass
NVNT	BLE	2480	Ant1	-39.12	-30	Pass

Tx. Spurious NVNT BLE 2402MHz Ant1 Ref



Tx. Spurious NVNT BLE 2402MHz Ant1 Emission



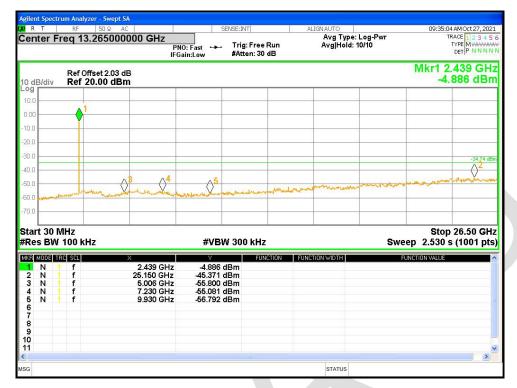


Tx. Spurious NVNT BLE 2442MHz Ant1 Ref



Tx. Spurious NVNT BLE 2442MHz Ant1 Emission



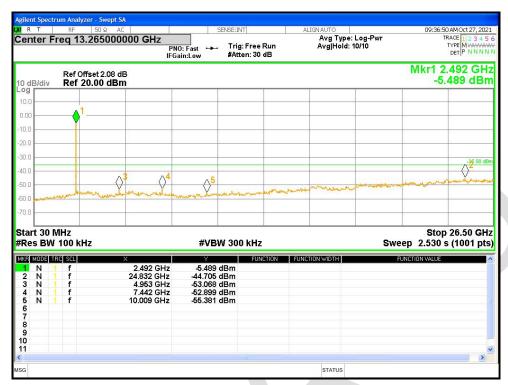


Tx. Spurious NVNT BLE 2480MHz Ant1 Ref



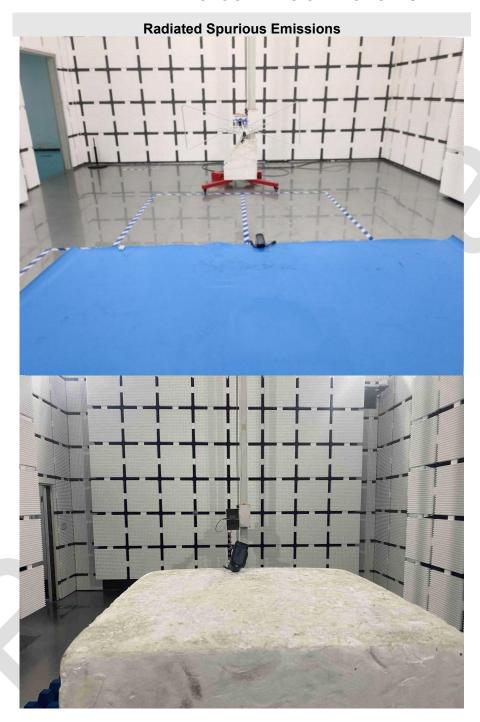
Tx. Spurious NVNT BLE 2480MHz Ant1 Emission







APPENDIX A: PHOTOGRAPHS OF TEST SETUP











Page 60 of 60

APPENDIX B: PHOTOGRAPHS OF EUT

Reference to the test report No. BLA-EMC-202110-A2101

----END OF REPORT----

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of BlueAsia, this report can't be reproduced except in full.