



FCC PART 15.247 TEST REPORT

For

TECNO MOBILE LIMITED

FLAT 39 8/F BLOCK D WAH LOK INDUSTRIAL CENTRE 31-35 SHAN MEI STREET FOTAN NT Hong Kong

FCC ID: 2ADYY-H3-L

Report Type:
Original Report

Report Number: SZ1210707-27715E-00A

Report Date: 2021-08-02
Jacob Kong
Reviewed By: RF Engineer

Prepared By: Bay Area Compliance Laboratories Corp. (Shenzhen) 5F(B-West), 6F, 7F, the 3rd Phase of Wan Li Industrial

Shenzhen, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Building D, Shihua Rd, FuTian Free Trade Zone,

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★".

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.

This report cannot be reproduced except in full, without prior written approval of the Company. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

TABLE OF CONTENTS

GENERAL INFORMATION	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	
OBJECTIVE	
TEST METHODOLOGY	
MEASUREMENT UNCERTAINTY	
SYSTEM TEST CONFIGURATION	
DESCRIPTION OF TEST CONFIGURATION	
EQUIPMENT MODIFICATIONS	
EUT Exercise Software	
DUTY CYCLE	
SUPPORT EQUIPMENT LIST AND DETAILS	
EXTERNAL I/O CABLEBLOCK DIAGRAM OF TEST SETUP	
SUMMARY OF TEST RESULTS	8
TEST EQUIPMENT LIST	9
FCC§15.247 (i), §1.1307 (b) (1) &§2.1093 – RF EXPOSURE	10
APPLICABLE STANDARD	
FCC §15.203 - ANTENNA REQUIREMENT	
APPLICABLE STANDARD	
APPLICABLE STANDARD ANTENNA CONNECTOR CONSTRUCTION	
FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS	
APPLICABLE STANDARD	
EUT SETUP	
EMI TEST RECEIVER SETUP TEST PROCEDURE	
CORRECTED FACTOR & MARGIN CALCULATION	
TEST DATA	
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS	
0 ,0 , ,	
APPLICABLE STANDARD	
EUT SETUPEMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	
TEST PROCEDURE	
CORRECTED AMPLITUDE & MARGIN CALCULATION	
TEST DATA	
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH	
APPLICABLE STANDARD	
TEST PROCEDURE	
Test Data	

FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER	25
APPLICABLE STANDARD	25
Test Procedure	
Test Data	
FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE	26
APPLICABLE STANDARD	26
TEST PROCEDURE	
Test Data	26
FCC §15.247(e) - POWER SPECTRAL DENSITY	27
APPLICABLE STANDARD	
TEST PROCEDURE	27
Test Data	
APPENDIX	28
APPENDIX A: DTS BANDWIDTH	28
APPENDIX B: OCCUPIED CHANNEL BANDWIDTH	
APPENDIX C: MAXIMUM CONDUCTED PEAKOUTPUT POWER	
APPENDIX D: MAXIMUM POWER SPECTRAL DENSITY	
APPENDIX E:BAND EDGE MEASUREMENTS	38
ADDENION F. DUTY CYCLE	20

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Wireless Earphone
Tested Model	H3
Frequency Range	BLE: 2402-2480MHz
Maximum Conducted Peak Power	BLE: 5.34dBm
Modulation Technique	GFSK
Antenna Specification*	-1.6dBi(provided by the applicant)
Voltage Range	DC 3.7V from battery
Date of Test	2021-07-13 to 2021-07-22
Sample number	SZ1210707-27715E-RF -S1 (Assigned by BACL, Shenzhen)
Received date	2021-07-07
Sample/EUT Status	Good condition

Report No.: SZ1210707-27715E-00A

Objective

This report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

And KDB 558074 D01 15.247 Meas Guidance v05r02.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

FCC Part 15.247 Page 4 of 39

Measurement Uncertainty

Parameter		Uncertainty
Occupied Char	nnel Bandwidth	±5%
RF Output Power	with Power meter	±0.73dB
RF conducted test with spectrum		±1.6dB
AC Power Lines Conducted Emissions		±1.95dB
Emissions,	Below 1GHz	±4.75dB
Radiated	Above 1GHz	±4.88dB
Temperature		±1°C
Humidity		±6%
Supply voltages		±0.4%

Report No.: SZ1210707-27715E-00A

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West), 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

FCC Part 15.247 Page 5 of 39

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For BLE mode, 40 channels are provided to testing:

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

Report No.: SZ1210707-27715E-00A

EUT was tested with Channel 0, 19 and 39.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

"BlueSuite.exe" exercise software was used and the power level is default*. The software and power level was provided by the applicant.

Duty cycle

Test Result Compliant. Please refer to the Appendix.

FCC Part 15.247 Page 6 of 39

Support Equipment List and Details

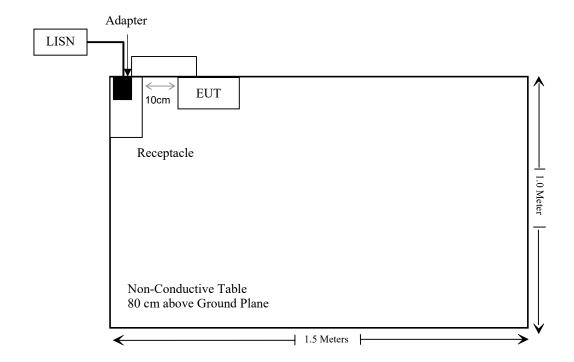
Manufacturer	Description	Model	Serial Number
Dongguan Aohai Power Technology Co.,Ltd.	Adapter	A8-501000	A1906034835

Report No.: SZ1210707-27715E-00A

External I/O Cable

Cable Description	Length (m)	From Port	То
Un-shielding Detachable USB Cable	0.2	EUT	Adapter

Block Diagram of Test Setup



FCC Part 15.247 Page 7 of 39

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1)& §2.1093	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliant
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliant
§15.247(b)(3)	Maximum Conducted Output Power	Compliant
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliant
§15.247(e)	Power Spectral Density	Compliant

Report No.: SZ1210707-27715E-00A

FCC Part 15.247 Page 8 of 39

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
	Condu	ıcted Emission [Date	Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2021/07/07	2022/07/06
Rohde & Schwarz	LISN	ENV216	101613	2021/07/07	2022/07/06
Rohde & Schwarz	Transient Limitor	ESH3Z2	DE25985	2020/11/29	2021/11/28
Unknown	CE Cable	CE Cable	UF A210B-1- 0720-504504	2020/11/29	2021/11/28
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
	Radia	ated Emission T	'est		
R&S	EMI Test Receiver	ESR3	102455	2021/07/06	2022/07/05
Sonoma instrument	Pre-amplifier	310 N	186238	2020/08/04	2021/08/03
Sunol Sciences	Broadband Antenna	ЈВ1	A040904-2	2020/12/22	2023/12/21
Unknown	Cable 2	RF Cable 2	F-03-EM197	2020/11/29	2021/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2020/11/29	2021/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10.00	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2021/07/06	2022/07/05
COM-POWER	Pre-amplifier	PA-122	181919	2020/11/29	2021/11/28
Quinstar	Amplifier	QLW- 18405536-J0	15964001002	2020/11/28	2021/11/27
Sunol Sciences	Horn Antenna	3115	9107-3694	2021/01/15	2024/01/14
Insulted Wire Inc.	RF Cable	SPS-2503- 3150	02222010	2020/11/29	2021/11/28
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2020/11/29	2021/11/28
SNSD	Band Reject filter	BSF2402- 2480MN- 0898-001	2.4G filter	2021/04/20	2022/04/20
Ducommun Technolagies	Horn antenna	ARH-4223- 02	1007726-02 1304	2020/12/06	2023/12/05
		Conducted Tes		Ī	,
Tonscend Corporation	RF control Unit	JS0806-2	19D8060154	2021/07/06	2022/07/05
Rohde & Schwarz	Signal and Spectrum Analyzer	FSV40	101473	2021/07/06	2022/07/05

Report No.: SZ1210707-27715E-00A

FCC Part 15.247 Page 9 of 39

^{*} Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§15.247 (i), §1.1307 (b) (1) &§2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

Report No.: SZ1210707-27715E-00A

According to KDB 447498 D01 General RF Exposure Guidance

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances \leq 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] \cdot [$\sqrt{f(GHz)}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- 1. f(GHz) is the RF channel transmit frequency in GHz.
- 2. Power and distance are rounded to the nearest mW and mm before calculation.
- 3. The result is rounded to one decimal place for comparison.
- 4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

For worst case:

Frequency	Maximum Tune-up power		Calculated Distance	Calculated	Threshold	SAR Test
(MHz)	(dBm)	(mW)	(mm)	Value	(1-g SAR)	Exclusion
2402-2480	5.5	3.55	5	1.1	3.0	Yes

Result: No Standalone SAR test is required

FCC Part 15.247 Page 10 of 39

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, 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 permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

Report No.: SZ1210707-27715E-00A

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has one internal antenna arrangement, which was permanently attached and the antenna gain is -1.6dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

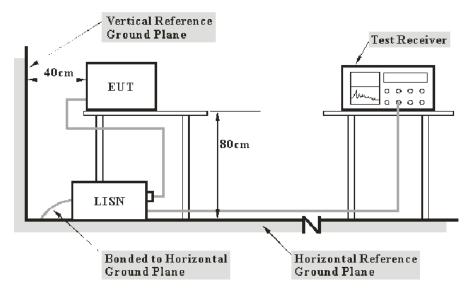
FCC Part 15.247 Page 11 of 39

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

EUT Setup



Report No.: SZ1210707-27715E-00A

Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMIN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

FCC Part 15.247 Page 12 of 39

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Report No.: SZ1210707-27715E-00A

Margin = Limit – Corrected Amplitude

Test Data

Environmental Conditions

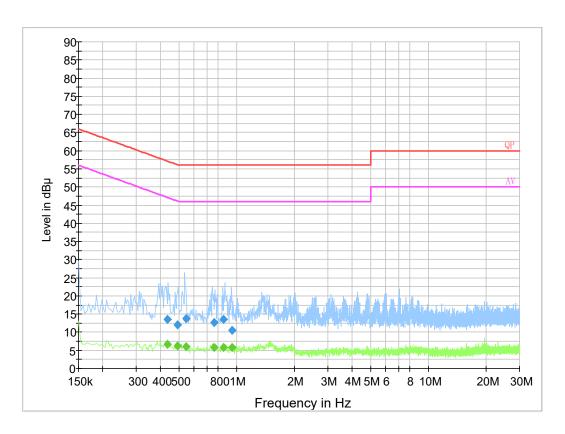
Temperature:	26 °C
Relative Humidity:	66 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2021-07-17.

EUT operation mode: Charging

FCC Part 15.247 Page 13 of 39

AC 120V/60 Hz, Line



Report No.: SZ1210707-27715E-00A

Final Result 1

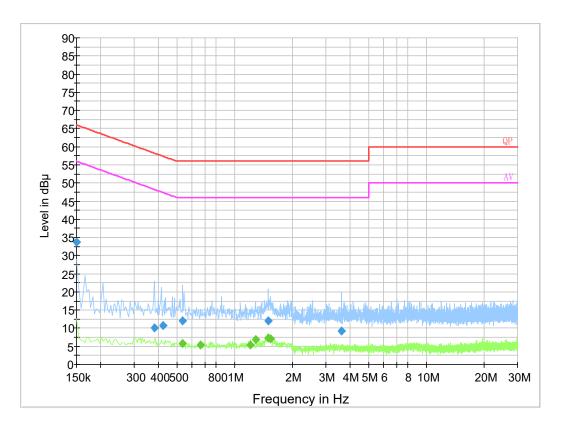
Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.435370	13.4	9.000	L1	19.8	43.7	57.1
0.490530	12.0	9.000	L1	19.8	44.2	56.2
0.546070	13.7	9.000	L1	19.8	42.3	56.0
0.761250	12.7	9.000	L1	19.8	43.3	56.0
0.856950	13.4	9.000	L1	19.8	42.6	56.0
0.951870	10.5	9.000	L1	19.8	45.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.435370	6.6	9.000	L1	19.8	40.5	47.1
0.490530	6.3	9.000	L1	19.8	39.9	46.2
0.546070	6.1	9.000	L1	19.8	39.9	46.0
0.761250	5.8	9.000	L1	19.8	40.2	46.0
0.856950	5.9	9.000	L1	19.8	40.1	46.0
0.951870	5.7	9.000	L1	19.8	40.3	46.0

FCC Part 15.247 Page 14 of 39

AC 120V/60 Hz, Neutral



Report No.: SZ1210707-27715E-00A

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	33.6	9.000	N	19.8	32.4	66.0
0.384270	10.1	9.000	N	19.8	48.1	58.2
0.424270	10.7	9.000	N	19.8	46.7	57.4
0.537930	12.1	9.000	N	19.8	43.9	56.0
1.495470	12.1	9.000	N	19.8	43.9	56.0
3.603910	9.3	9.000	N	19.9	46.7	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.534000	5.7	9.000	N	19.8	40.3	46.0
0.662000	5.4	9.000	N	19.8	40.6	46.0
1.214000	5.3	9.000	N	19.8	40.7	46.0
1.286000	6.8	9.000	N	19.8	39.2	46.0
1.494000	7.4	9.000	N	19.8	38.6	46.0
1.546000	7.1	9.000	N	19.8	38.9	46.0

FCC Part 15.247 Page 15 of 39

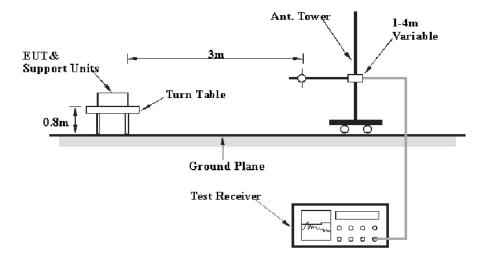
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

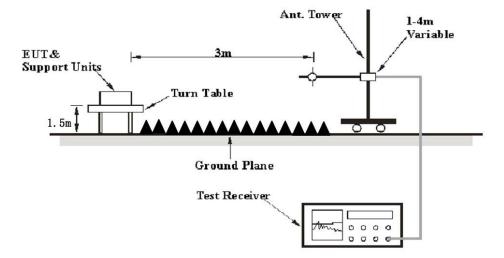
EUT Setup

Below 1 GHz:



Report No.: SZ1210707-27715E-00A

Above 1GHz:



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

FCC Part 15.247 Page 16 of 39

EMI Test Receiver & Spectrum Analyzer Setup

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
	1MHz	3 MHz	/	PK
Above 1 GHz	1MHz	10 Hz Note 1	/	Average
	1MHz	>1/T Note 2	/	Average

Report No.: SZ1210707-27715E-00A

Note 1: when duty cycle is no less than 98% Note 2: when duty cycle is less than 98%

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Data

Environmental Conditions

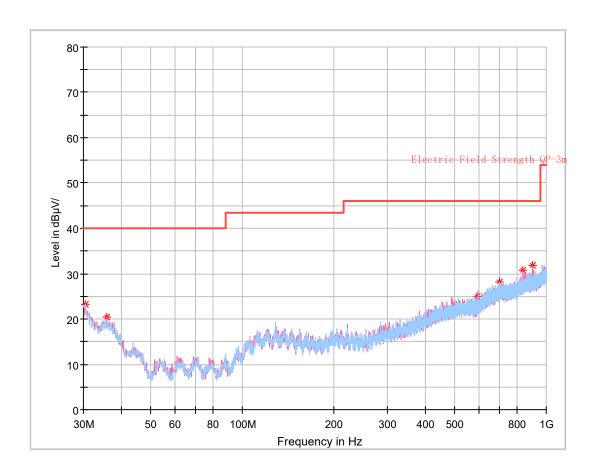
Temperature:	26~27.8 °C
Relative Humidity:	51~56 %
ATM Pressure:	101.0 kPa

The testing was performed by Cloud Yun on 2021-07-13 for below 1GHz and Coco Liu on 2021-07-22 for above 1GHz.

EUT operation mode: Transmitting

FCC Part 15.247 Page 17 of 39

30 MHz~1 GHz: (*BT link*)



Report No.: SZ1210707-27715E-00A

Critical Freqs

Cittedi	_1 1 0 4 5						
Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.363750	23.33	40.00	16.67	100.0	Н	238.0	-3.8
35.820000	20.36	40.00	19.64	200.0	V	201.0	-7.8
590.29625	25.02	46.00	20.98	200.0	V	332.0	-4.5
704.15000	28.14	46.00	17.86	300.0	Н	86.0	-1.5
837.76750	30.66	46.00	15.34	300.0	V	215.0	0.0
902.51500	31.74	46.00	14.26	100.0	V	47.0	1.0

FCC Part 15.247 Page 18 of 39

1 GHz-25 GHz:

Емодионом	Re	ceiver	Turntable	Rx An	tenna	Corrected	Corrected	Limit	Margin
Frequency (MHz)	Reading (dBµV)	PK/QP/Ave.	Degree	Height (m)	Polar (H/V)	Factor (dB/m)	Amplitude (dBμV/m)	(dBµV/m)	(dB)
			Low Cl	hannel(2	402ME	Iz)			
2372.11	28.94	PK	90	1.5	Н	31.87	60.81	74	13.19
2372.11	16.18	Ave.	90	1.5	Н	31.87	48.05	54	5.95
2491.06	28.85	PK	162	2.2	Н	32.13	60.98	74	13.02
2491.06	16.23	Ave.	162	2.2	Н	32.13	48.36	54	5.64
4804.00	44.02	PK	359	1.7	Н	5.40	49.42	74	24.58
4804.00	30.33	Ave.	359	1.7	Н	5.40	35.73	54	18.27
	Middle Channel(2440MHz)								
4880.00	43.73	PK	71	1.9	Н	6.43	50.16	74	23.84
4880.00	30.21	Ave.	71	1.9	Н	6.43	36.64	54	17.36
			High Cl	nannel(2	480 MI	Hz)			
2362.50	29.31	PK	160	1.5	Н	31.87	61.18	74	12.82
2362.50	16.2	Ave.	160	1.5	Н	31.87	48.07	54	5.93
2494.88	29.65	PK	88	1.6	Н	32.13	61.78	74	12.22
2494.88	16.37	Ave.	88	1.6	Н	32.13	48.50	54	5.50
4960.00	44.17	PK	184	2.4	Н	6.95	51.12	74	22.88
4960.00	30.9	Ave.	184	2.4	Н	6.95	37.85	54	16.15

Report No.: SZ1210707-27715E-00A

Note:

 $Corrected\ Factor = Antenna\ factor\ (RX) + Cable\ Loss - Amplifier\ Factor$

Corrected Amplitude = Corrected Factor + Reading

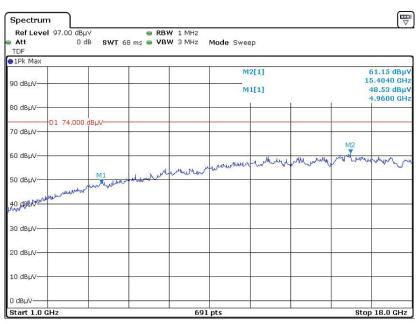
Margin = Limit - Corrected. Amplitude

The other spurious emission which is 20dB to the limit was not recorded.

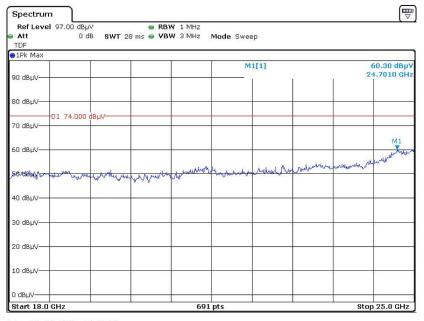
FCC Part 15.247 Page 19 of 39

Pre-scan with high channel Horizontal

Report No.: SZ1210707-27715E-00A



Date: 22.JUL.2021 13:00:34

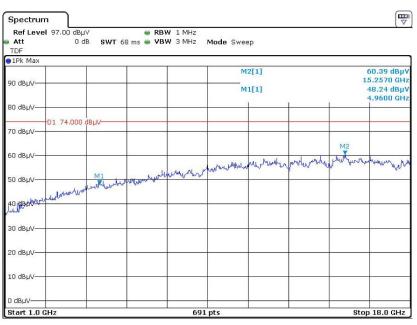


Date: 22.JUL.2021 13:45:18

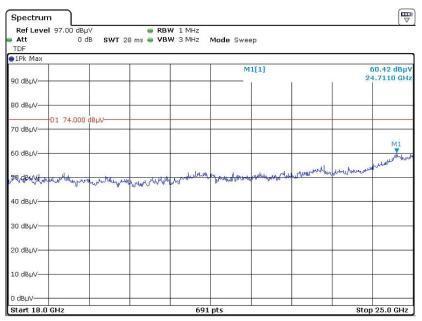
FCC Part 15.247 Page 20 of 39

Vertical

Report No.: SZ1210707-27715E-00A



Date: 22.JUL.2021 13:10:14

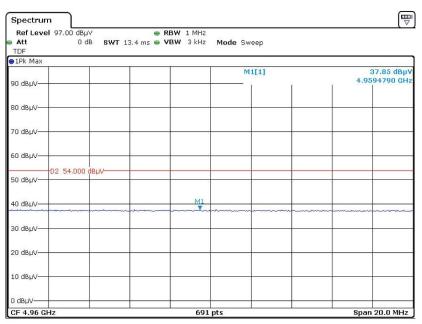


Date: 22.JUL.2021 13:55:45

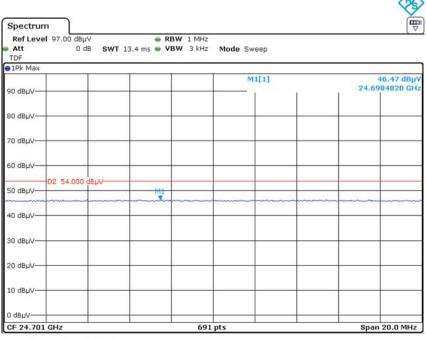
FCC Part 15.247 Page 21 of 39

Average Horizontal

Report No.: SZ1210707-27715E-00A



Date: 22.JUL.2021 13:05:21

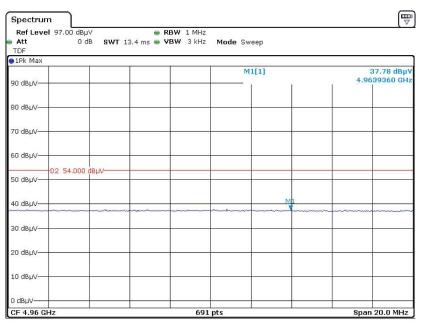


Date: 22.JUL.2021 13:50:39

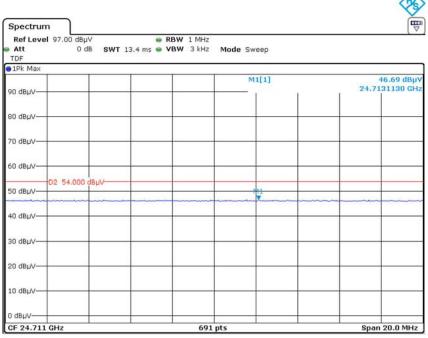
FCC Part 15.247 Page 22 of 39

Vertical

Report No.: SZ1210707-27715E-00A



Date: 22.JUL.2021 13:15:22



Date: 22.JUL.2021 13:59:10

FCC Part 15.247 Page 23 of 39

FCC $\S15.247(a)$ (2) – 6 dB EMISSION BANDWIDTH

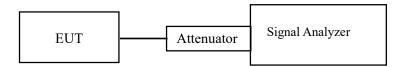
Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Report No.: SZ1210707-27715E-00A

Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- 3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
- 4. Repeat above procedures until all frequencies measured were complete.



Test Data

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Bravos Zhao on 2021-07-20.

EUT operation mode: Transmitting

Test Result Compliant. Please refer to the Appendix.

FCC Part 15.247 Page 24 of 39

FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

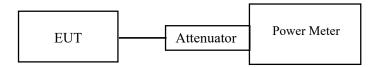
Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Report No.: SZ1210707-27715E-00A

Test Procedure

- 1. Place the EUT on a bench and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
- 3. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	22°C
Relative Humidity:	56%
ATM Pressure:	101.0 kPa

The testing was performed by Bravos Zhao on 2021-07-20.

EUT operation mode: Transmitting

Test Result Compliant. Please refer to the Appendix.

FCC Part 15.247 Page 25 of 39

FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

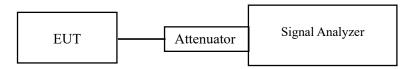
Report No.: SZ1210707-27715E-00A

Applicable Standard

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)).

Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- 3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- 5. Repeat above procedures until all measured frequencies were complete.



Test Data

Environmental Conditions

Temperature:	22°C
Relative Humidity:	56%
ATM Pressure:	101.0 kPa

The testing was performed by Bravos Zhao on 2021-07-20.

EUT operation mode: Transmitting

Test Result Compliant. Please refer to the Appendix.

FCC Part 15.247 Page 26 of 39

FCC §15.247(e) - POWER SPECTRAL DENSITY

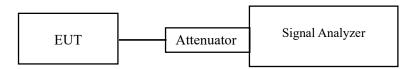
Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Report No.: SZ1210707-27715E-00A

Test Procedure

- 1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
- 2. Set the RBW to: $3kHz \le RBW \le 100 \text{ kHz}$.
- 3. Set the VBW $> 3 \times RBW$.
- 4. Set the span to 1.5 times the DTS bandwidth.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level within the RBW.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



Test Data

Environmental Conditions

Temperature:	22°C
Relative Humidity:	56%
ATM Pressure:	101.0 kPa

The testing was performed by Bravos Zhao on 2021-07-20.

EUT operation mode: Transmitting

Test Result Compliant. Please refer to the Appendix.

FCC Part 15.247 Page 27 of 39

APPENDIX

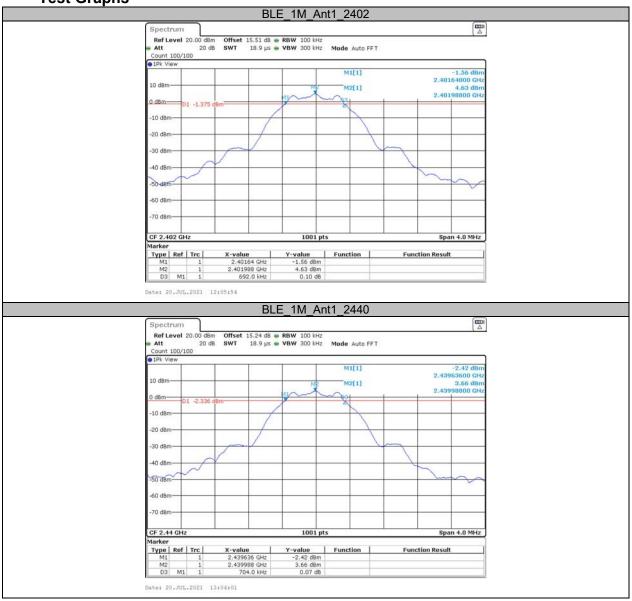
Appendix A: DTS Bandwidth Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	Limit[MHz]	Verdict
	Ant1	2402	0.692	0.5	PASS
BLE_1M		2440	0.704	0.5	PASS
		2480	0.708	0.5	PASS

Report No.: SZ1210707-27715E-00A

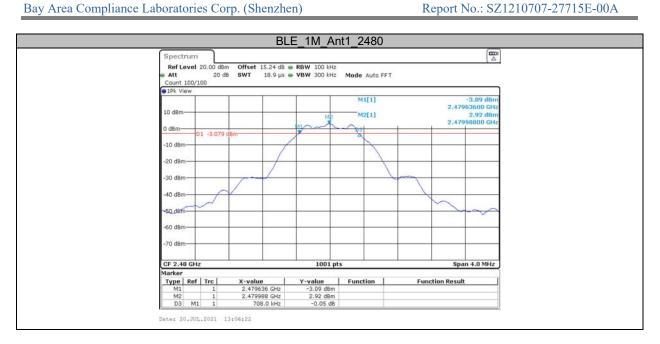
FCC Part 15.247 Page 28 of 39

Test Graphs



Report No.: SZ1210707-27715E-00A

FCC Part 15.247 Page 29 of 39



FCC Part 15.247 Page 30 of 39

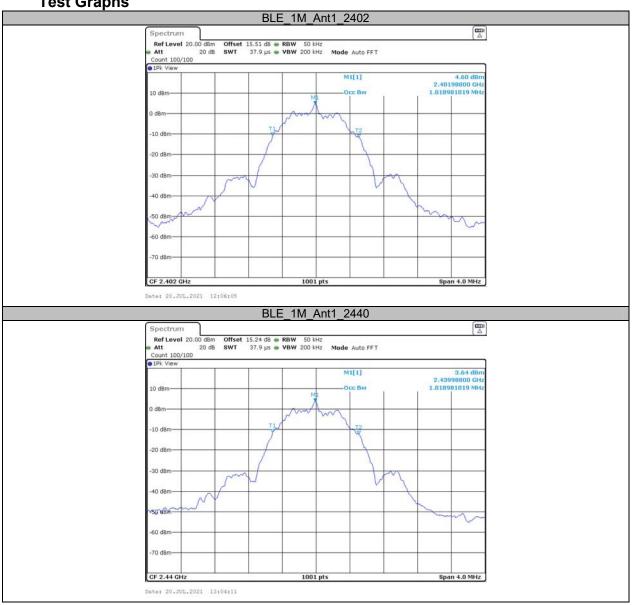
Appendix B: Occupied Channel Bandwidth Test Result

TestMode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
		2402	1.019		PASS
BLE_1M	Ant1	2440	1.019		PASS
		2480	1.019		PASS

Report No.: SZ1210707-27715E-00A

FCC Part 15.247 Page 31 of 39

Test Graphs



Report No.: SZ1210707-27715E-00A

FCC Part 15.247 Page 32 of 39



FCC Part 15.247 Page 33 of 39

Appendix C: Maximum conducted Peakoutput power Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
	Ant1	2402	5.34	≤30	PASS
BLE_1M		2440	4.70	≤30	PASS
		2480	4.10	≤30	PASS

Report No.: SZ1210707-27715E-00A

FCC Part 15.247 Page 34 of 39

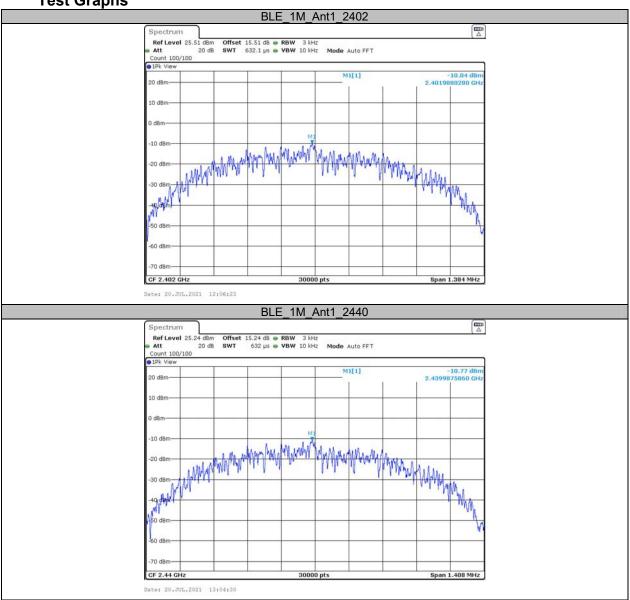
Appendix D: Maximum power spectral density Test Result

	TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
	BLE_1M	Ant1	2402	-10.04	≤8	PASS
			2440	-10.77	≤8	PASS
			2480	-11.60	≤8	PASS

Report No.: SZ1210707-27715E-00A

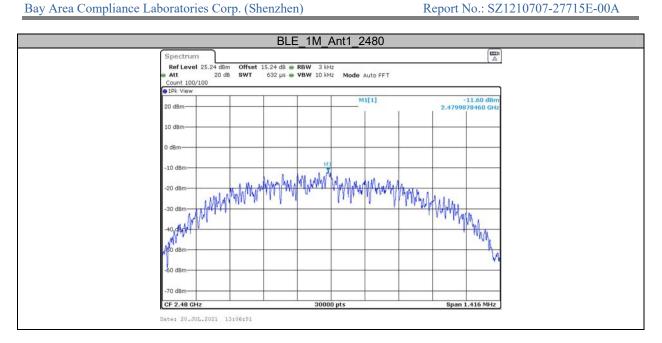
FCC Part 15.247 Page 35 of 39

Test Graphs



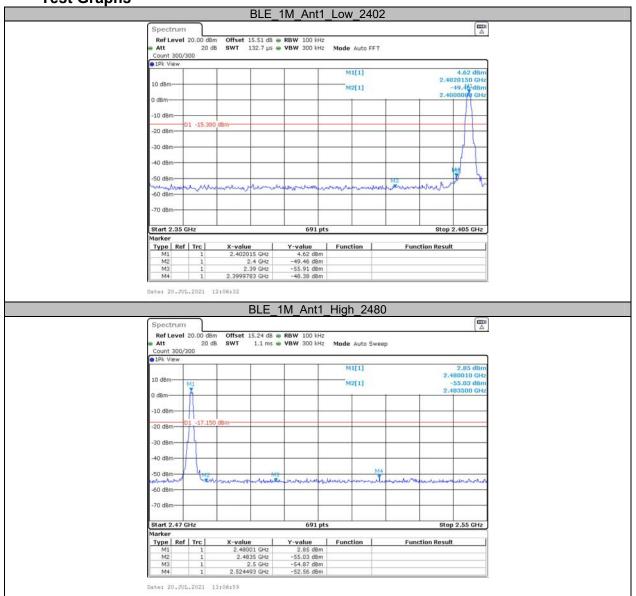
Report No.: SZ1210707-27715E-00A

FCC Part 15.247 Page 36 of 39



FCC Part 15.247 Page 37 of 39

Appendix E:Band edge measurements Test Graphs



Report No.: SZ1210707-27715E-00A

FCC Part 15.247 Page 38 of 39

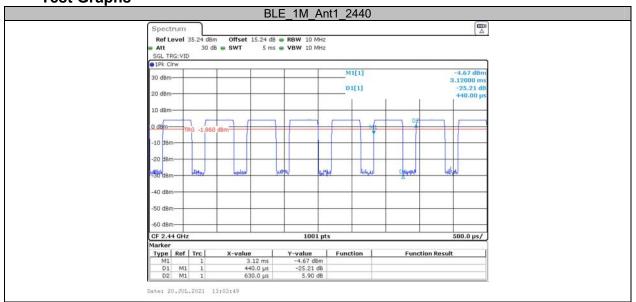
Appendix F: Duty Cycle

Test Result

TestMode	Antenna	Channel	TransmissionDuration [ms]	Transmission Period [ms]	Duty Cycle [%]
BLE_1M	Ant1	2440	0.44	0.63	69.84

Report No.: SZ1210707-27715E-00A

Test Graphs



***** END OF REPORT *****

FCC Part 15.247 Page 39 of 39