Test Report

Verified code: 797680

Report No.: E202209268928-1-G1

Customer:	SINO WEALTH ELECTRONIC LTD.
Address:	No. 3, Lane 767, JinZhong Road, Shanghai China 200335
Sample Name:	Sino Wealth BLE Module
Sample Model:	SH-BLEM18
Receive Sample Date:	Oct.09,2022
Test Date:	Oct.10,2022 ~ Oct.18,2022
Reference Document:	CFR 47, FCC Part 15 Subpart C RADIO FREQUENCY DEVICES:Subpart C—Intentional Radiators
Test Result:	Pass

Prepared by: Chen XiaoCong Reviewed by: Jiang Tao Approved by: Xiao Liang

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-11-04

GUANGZHOU GRG METROLOGY & TEST CO., LTD.
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Statement

1. The report is invalid without "special seal for inspection and testing"; some copies are invalid; The report is invalid if it is altered or missing; The report is invalid without the signature of the person who prepared, reviewed and approved it.

2. The sample information is provided by the client and responsible for its authenticity; The content of the report is only valid for the samples sent this time.

3. When there are reports in both Chinese and English, the Chinese version will prevail when the language problems are inconsistent.

4. If there is any objection concerning the report, please inform us within 15 days from the date of receiving the report.

5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

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TABLE OF CONTENTS

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E202209268928-1	Original Issue	2022-10-20
2.0	E202209268928-1-G1	Update	2022-11-04

Version 2.0:

1. Add conduction emission project on the basis of the original report.
2. This report instead the report E202209268928-1, and from the date of issuance of this report, the report which being replaced become invalid.

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1. TEST RESULT SUMMARY

Technical Requirements		
FCC 47 CFR Part 15 Subpart C 15.247 ANSI C63.10-2013 KDB 558074 D01 15.247 measurement guidance v05r02		
Limit / Severity	**Item**	**Result**
§15.203	Antenna Requirement	Pass
§15.207(a)	Conducted Emission	Pass
§15.247(d)&15.205& 15.209	Radiated Spurious Emission	Pass
§15.247(b)(3)	Maximum Peak Output Power	Pass
§15.247(e)	Power Spectral Density	Pass
§15.247(a)(2)	6dB bandwidth	Pass
§15.247(d)	Conducted band edges and Spurious Emission	Pass
§15.247(d)&15.205& 15.209	Restricted bands of operation	Pass

Note: The antenna is print antenna. The max gain of antenna is 1.2dBi.which accordance 15.203.is considered sufficient to comply with the provisions of this section.

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2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name:	SINO WEALTH ELECTRONIC LTD.
Address:	No. 3, Lane 767, JinZhong Road, Shanghai China 200335

2.2 MANUFACTURER

Name:	SINO WEALTH ELECTRONIC LTD.
Address:	No. 3, Lane 767, JinZhong Road, Shanghai China 200335

2.3 FACTORY

Name:	SINO WEALTH ELECTRONIC LTD.
Address:	No. 3, Lane 767, JinZhong Road, Shanghai China 200335

2.4 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Sino Wealth BLE Module
Model No.:	SH-BLEM18
Adding Model:	/
Trade Name:	/
FCC ID:	2AOT2SH-BLEM18
Power supply:	DC 3.3V 10mA
Frequency Band:	2402-2480MHz
Transmit Power:	GFSK for 1Mbps:0.47dBm GFSK for 2Mbps:0.46dBm
Modulation type:	GFSK
Channel space:	2MHz
Antenna Specification:	Print antenna with 1.2dBi gain (Max.)
Temperature Range:	-40℃~+105℃
Hardware Version:	V1.0
Software Version:	V1.0
Sample No:	E202209268928-0001,E202209268928-0002
Note:	/

2.5 CHANNELLIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
***00**	**2402**	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	***19**	**2440**	29	2460	***39**	**2480**

* is the test frequency

2.6 TEST OPERATION MODE

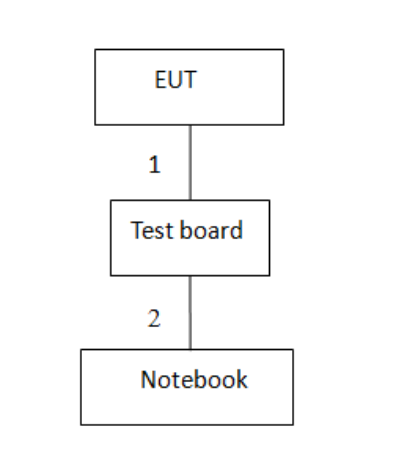
Mode No.	Description of the modes
1	Bluetooth (BLE) fixed frequency transmitting

2.7 LOCAL SUPPORTIVE

Name of equipment	Manufacturer	Model	Serial number	Note
Notebook	DELL	Latitude3490	5GSXKP2	/
Test board	/	/	/	/

No.	Cable Type	Qty.	Shielded Type	Ferrite Core(Qty.)	Length
1	DC cable	1	No	0	Unshielded 0.15m
2	USB extension cable	1	No	0	Unshielded 1m

2.8 CONFIGURATION OF SYSTEM UNDER TEST



Test software:

Software version	Test level
DOGO_VP2.1.8	0

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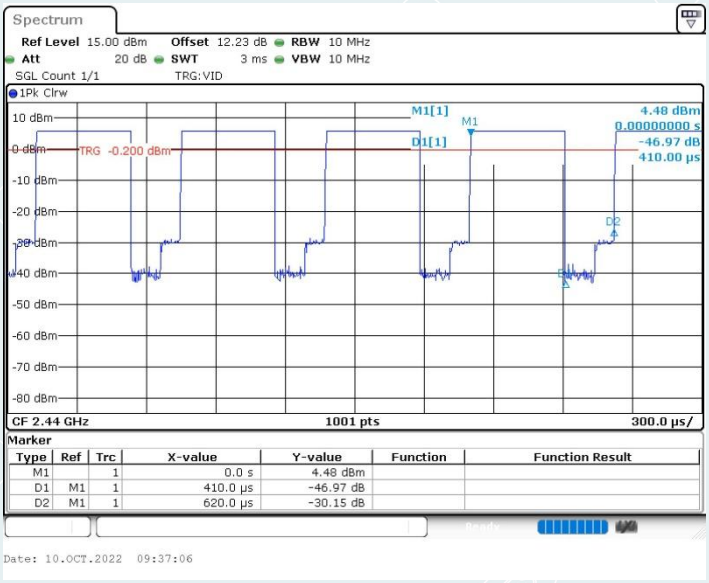
2.9 DUTY CYCLE

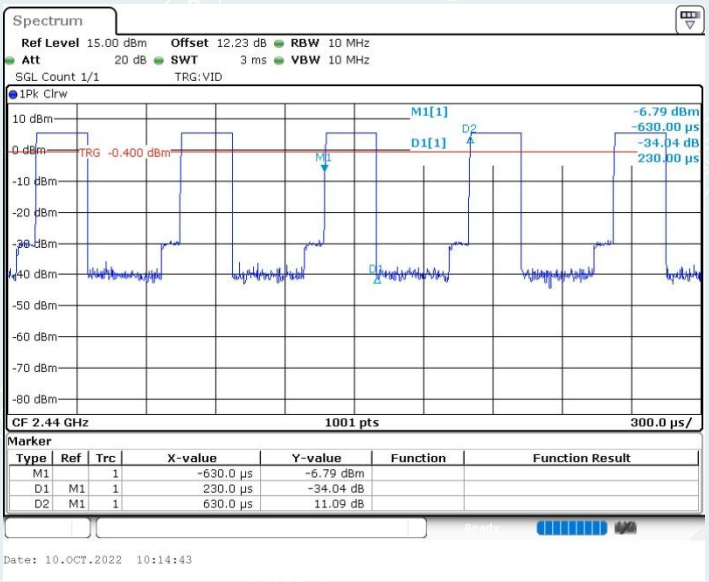
Environment: 23.1℃/52%RH/101.0kPa Voltage: DC 3.3V
Tested By: Qin Tingting Date: 2022-10-10

Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	DC [%]	T [s]
BLE_1M	Ant1	2440	0.41	0.62	66.13	0.00041
BLE_2M	Ant1	2440	0.23	0.63	36.51	0.00023

BLE_1M _2440MHz



BLE_2M _2440MHz



3. LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

Add.:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China
P.C.:	518110
Tel :	0755-61180008
Fax:	0755-61180008

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4. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement		Frequency	Uncertainty
Radiated Emission	Horizontal	9kHz～30MHz	5.1dB[1)]
		30MHz～200MHz	4.5dB[1)]
		200MHz～1000MHz	4.4dB[1)]
		1GHz～18GHz	5.6dB[1)]
		18GHz～26.5GHz	3.7dB[1)]
	Vertical	9kHz～30MHz	5.1dB[1)]
		30MHz～200MHz	4.4dB[1)]
		200MHz～1000MHz	4.5dB[1)]
		1GHz～18GHz	5.6dB[1)]
		18GHz～26.5GHz	3.7dB[1)]
Conduction Emission		150kHz～30MHz	3.4dB[1)]

Note:
[1)] This uncertainty represents an expanded uncertainty expressed at approximately the 95%.
This uncertainty represents an expanded uncertainty factor of *k*=2.

Measurement	Uncertainty
RF frequency	6.0×10^{-6}
RF power conducted	0.8dB
Occupied channel bandwidth	0.4dB
Unwanted emission, conducted	0.7dB
Humidity	6%
Temperature	2℃

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5. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Conducted Emissions				
EMI TEST RECEIVER	R&S	ESCI	100783	2023-08-28
LISN(EUT)	R&S	ENV216	101543	2023-09-13
Test S/W	EZ	CCS-3A1-CE		
Radiated Spurious Emission&Restricted bands of operation				
Test S/W	EZ	CCS-03A1		
Test Receiver	R&S	ESR7	102444	2023-09-02
Preamplifier	EMEC	EM330	I00426	2023-03-05
Bi-log Antenna	Schwarzbeck	VULB9160	VULB9160-3401	2022-10-27
LoopAntenna	TESEQ	HLA6121	52599	2023-04-02
Spectrum Analyzer	KEYSIGHT	N9010A	MY52221469	2023-06-29
Horn Antenna	Schwarzbeck	BBHA9120D	02143	2022-10-22
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-497	2023-10-14
Amplifier	Tonscend	TAP01018048	AP20E8060075	2023-05-05
Amplifier	Tonscend	TAP184050	AP20E806071	2023-05-05
Test S/W	Tonscend	JS36-RE/2.5.1.5		
6dB Bandwidth&Conducted band edges and Spurious Emission&Power Spectral Density				
Spectrum Analyzer	R&S	FSW43	102072	2023-09-02
BT/WIFI System	Tonscend	JS0806		
Maximum Peak Output Power				
Pulse power sensor	Anritsu	MA2411B	1126150	2023-03-01
Power meter	Anritsu	ML2495A	1204003	2023-02-28

Note: The calibration interval of the above test instruments is 12 months.

6. CONDUCTED EMISSION MEASUREMENT

6.1 LIMITS

Frequency range	Limits (dBμV)	
	Quasi-peak	Average
150kHz～0.5MHz	66～56	56～46
0.5MHz～5MHz	56	46
5MHz～30MHz	60	50

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range of 150kHz to 0.5MHz.

6.2 TEST PROCEDURES

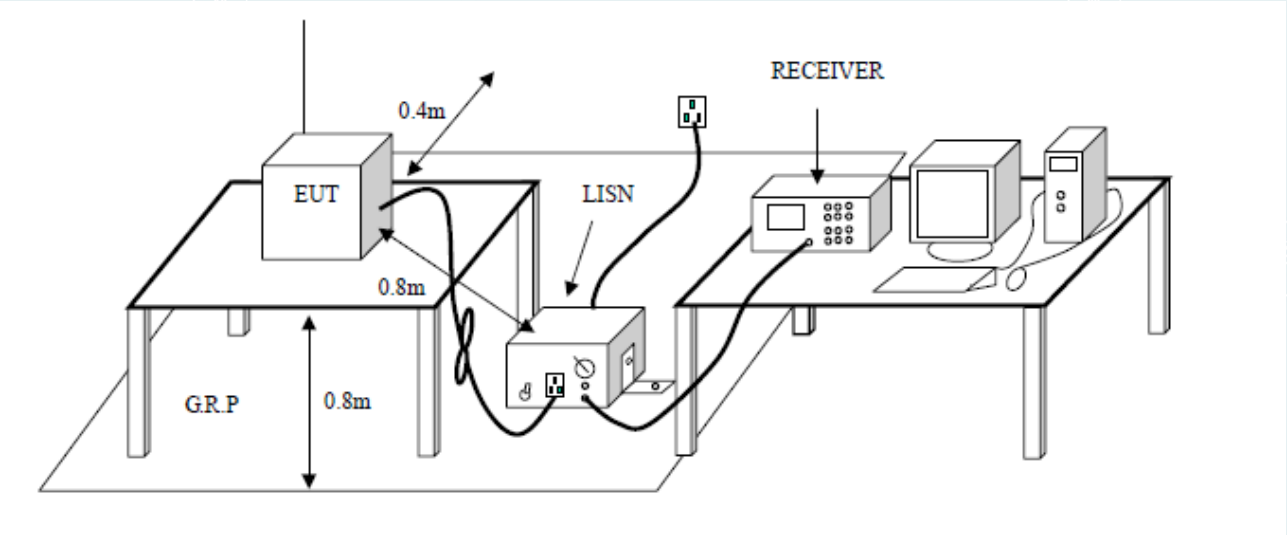
Procedure of Preliminary Test

Test procedures follow ANSI C63.10:2013.
For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). An EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:
– Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:
1) place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or
2) place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane;
– All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane;
– The EUT are placed on the floor that one side of the housings is 40 cm from the vertical reference ground plane and other metallic parts;
– Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.
– I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.
The test mode(s) described in Item 2.6 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.6 producing the highest emission level.The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.

6.3 TEST SETUP



6.4 DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit =Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

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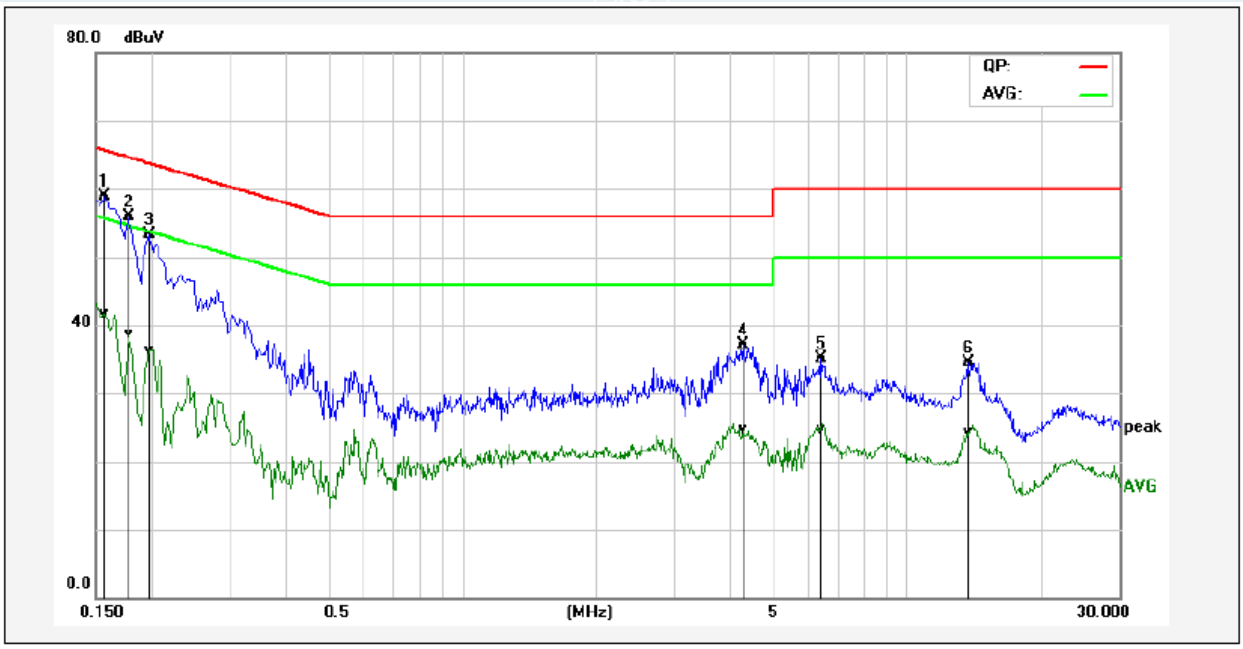
6.5 TEST RESULTS

EUT Name	Sino Wealth BLE Module	**Model**	SH-BLEM18
Environmental Conditions	25.8℃/40%RH/101.0kPa	**Test Mode**	BLE 1M 2402MHz
Tested By	Tang Shenghui	**Line**	L
Tested Date	2022-10-17	**Test Voltage**	AC 120V/ 60Hz

(The chart below shows the highest readings taken from the final data with notebook supply.)



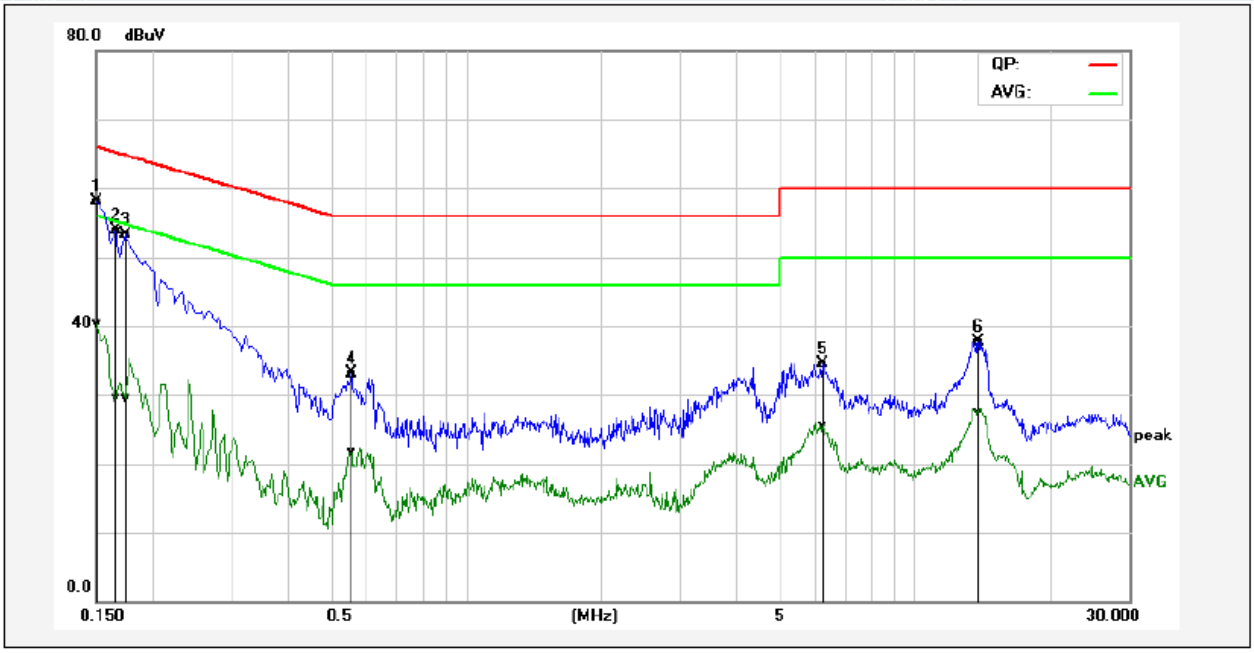
No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.1580	49.19	32.11	9.61	58.80	41.72	65.56	55.57	-6.76	-13.85	Pass
2	0.1780	46.38	29.02	9.60	55.98	38.62	64.57	54.58	-8.59	-15.96	Pass
3	0.1980	43.71	26.72	9.60	53.31	36.32	63.69	53.69	-10.38	-17.37	Pass
4	4.2900	27.44	15.13	9.66	37.10	24.79	56.00	46.00	-18.90	-21.21	Pass
5	6.4060	25.36	14.98	9.68	35.04	24.66	60.00	50.00	-24.96	-25.34	Pass
6	13.7580	24.82	14.64	9.74	34.56	24.38	60.00	50.00	-25.44	-25.62	Pass

REMARKS: *L = Live Line*

Pre-scan all mode and recorded the worst case results in this report (TX-Low Channel(1Mbps))

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	25.8℃/40%RH/101.0kPa	Test Mode	BLE 1M 2402MHz
Tested By	Tang Shenghui	Line	N
Tested Date	2022-10-17	Test Voltage	AC 120V/ 60Hz

(The chart below shows the highest readings taken from the final data with notebook supply.)



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.1516	48.52	30.75	9.60	58.12	40.35	65.91	55.91	-7.79	-15.56	Pass
2	0.1660	44.37	19.90	9.60	53.97	29.50	65.15	55.16	-11.18	-25.66	Pass
3	0.1740	43.61	19.81	9.60	53.21	29.41	64.76	54.77	-11.55	-25.36	Pass
4	0.5580	23.51	12.16	9.59	33.10	21.75	56.00	46.00	-22.90	-24.25	Pass
5	6.2420	24.73	15.91	9.68	34.41	25.59	60.00	50.00	-25.59	-24.41	Pass
6	13.9060	27.97	17.67	9.80	37.77	27.47	60.00	50.00	-22.23	-22.53	Pass

REMARKS: *N = Neutral Line.*

Pre-scan all mode and recorded the worst case results in this report (TX-Low Channel(1Mbps))

7. RADIATED SPURIOUS EMISSIONS

7.1 LIMITS

In any 100kHz 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 20dB below that in the 100kHz 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 30dB instead of 20dB. Attenuation below the general limits specified in §15.209(a) is not required.

Frequency (MHz)	Quasi-peak(μV/m)	Measurement distance(m)	Quasi-peak(dBμV/m)@distance 3m
0.009-0.490	2400/F(kHz)	300	128.5~93.8
0.490-1.705	24000/F(kHz)	30	73.8~63
1.705-30.0	30	30	69.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

NOTE:

(1) The emission limits for the ranges 9-90kHz and 110-490kHz are based on measurements employing a linear average detector.

(2) The lower limit shall apply at the transition frequencies.

(3) Above 18GHz test distance is 1m, so the Peak Limit=74+20*log(3/1)=83.54 (dBμV/m). The Avg Limit=54+20*log(3/1)=63.54 (dBμV/m).

7.2 TEST PROCEDURES

1) Sequence of testing 9kHz to 30MHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna height is 1.0 meter.

--- The antenna is polarized X,Y and Z.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the pre measurement the software maximizes by rotating the turntable

position (0 °to 360 °) and by rotating the elevation axes (0 °to 360 °).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QP detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement and the limit will be stored.

2) Sequence of testing 30MHz to 1GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 4 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of pre measurement the software maximize the peaks by changing turntable rotates from 0 °to 360 °and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1GHz to 18GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 4 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of pre measurement the software maximize the peaks by changing turntable rotates from 0 °to 360 °and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18GHz
Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Pre measurement:

--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the pre measurements with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement and the limit will be stored.

NOTE:
(a).The frequency from 9kHz to 150kHz, Set RBW=300Hz(for Peak & AVG), VBW=300Hz(for Peak & AVG). The frequency from 150kHz to 30MHz, Set RBW=9kHz, VBW=9kHz, (for QP Detector).
(b).The frequency from 30MHz to 1GHz, Set RBW=120kHz, VBW=300kHz, (for QP Detector).
(c).The frequency above 1GHz, for Peak detector: Set RBW=1MHz,VBW=3MHz.
(d). The frequency above 1GHz, for Avg detector: Set RBW=1MHz,if the EUT is configured to transmit with duty cycle ≥98%, set VBW≤RBW/100 (i.e.,10kHz) but not less than 10 Hz. If the EUT duty cycle is ＜98%，set VBW≥1/T, Where T is defined in section 2.9.

7.3 TEST SETUP

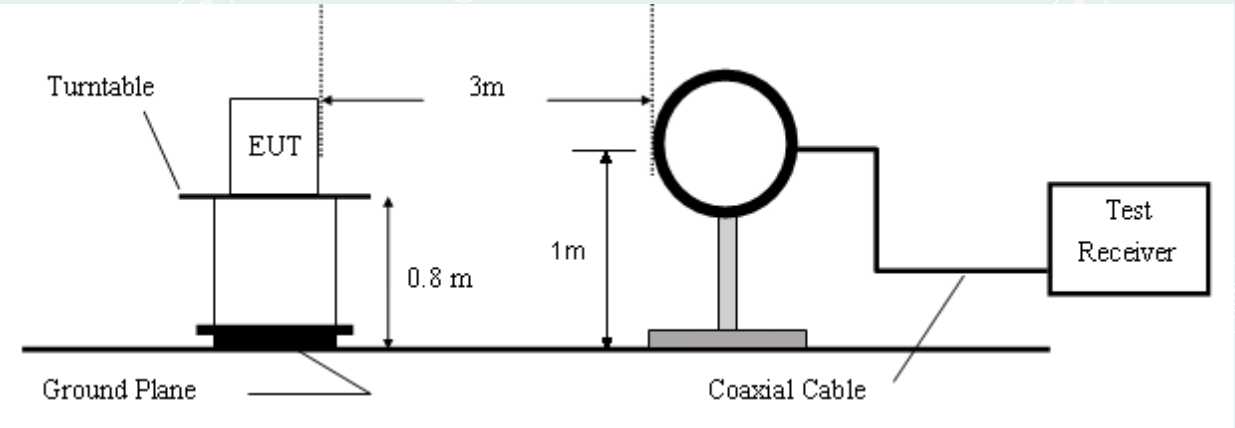


Figure 1. 9kHz to 30MHz radiated emissions test configuration

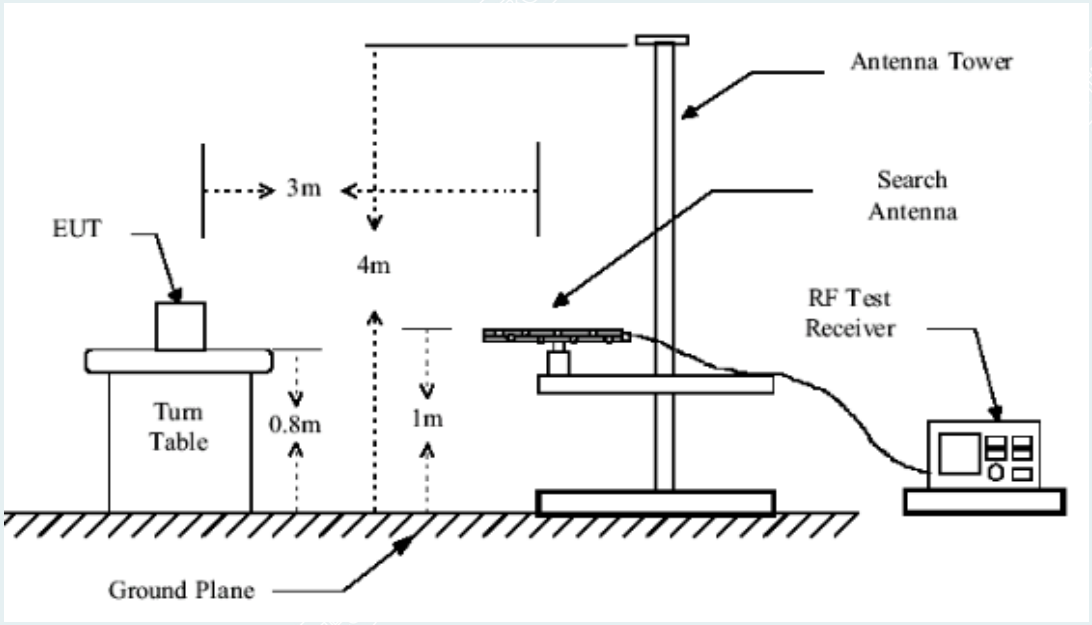


Figure 2. 30MHz to 1GHz radiated emissions test configuration

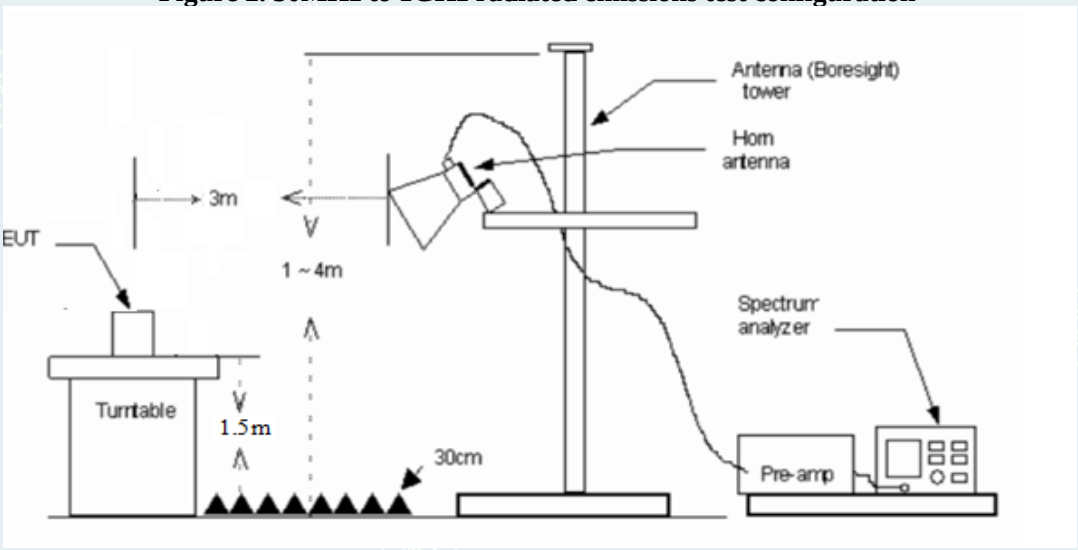


Figure 3. 1GHz to 18GHz radiated emissions test configuration

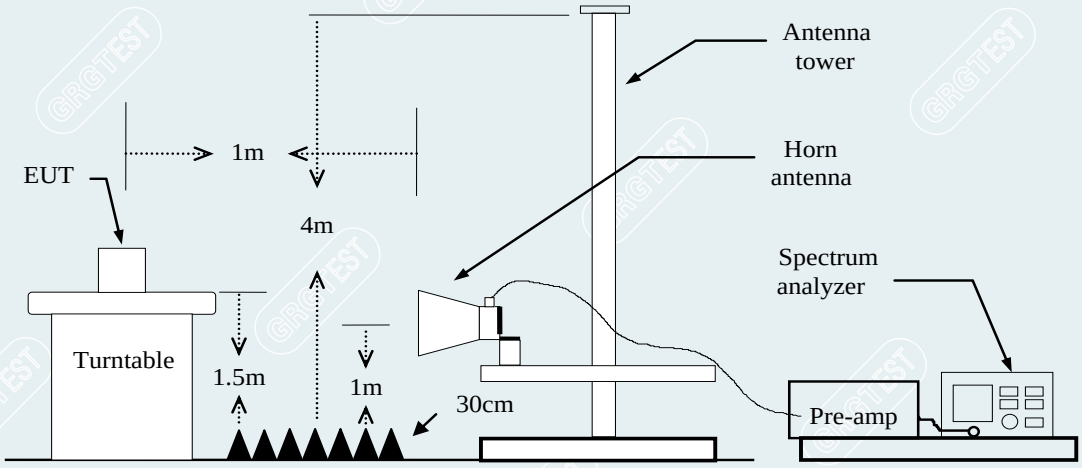


Figure 4. 18GHz to 26.5GHz radiated emissions test configuration

7.4 DATA SAMPLE

30MHz to 1GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	37.06	-15.48	21.58	40.00	-18.42	QP	Vertical

1GHz to 18GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	65.45	-11.12	54.33	74.00	-19.67	Peak	Vertical
xxx	xxx	63.00	-11.12	51.88	54.00	-2.12	AVG	Vertical

Above 18GHz

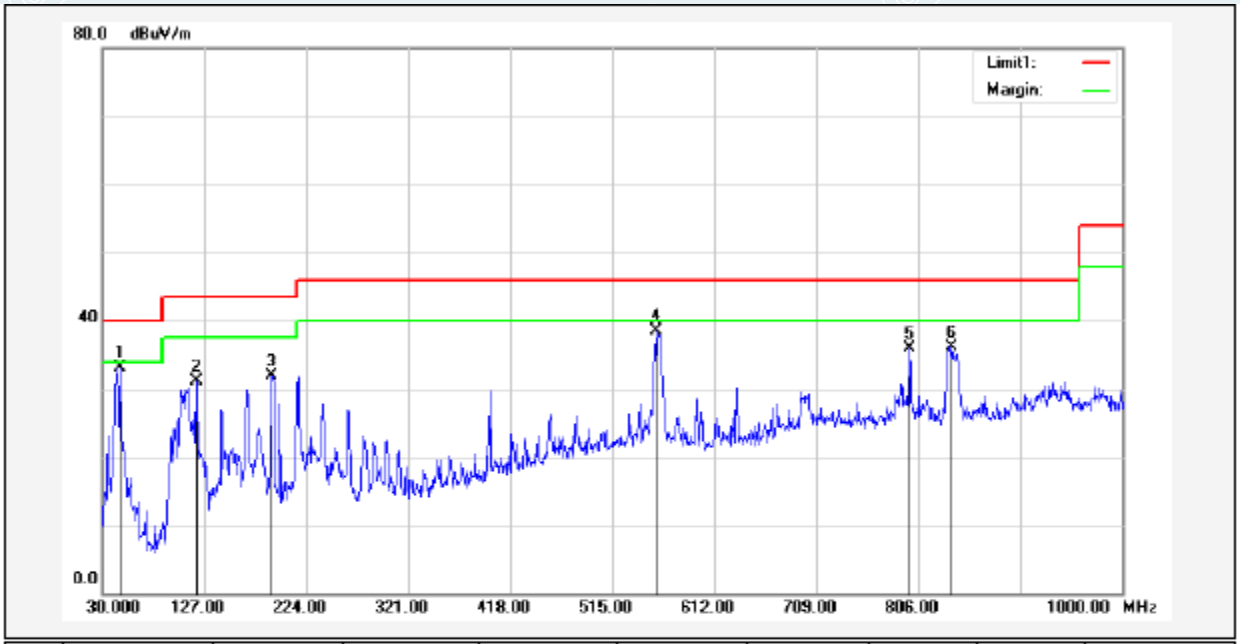
No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	68.86	57.66	-11.20	83.54	25.88	peak	Vertical
xxx	xxx	68.89	-11.20	57.69	63.54	5.85	AVG	Vertical

Frequency (MHz)	= Emission frequency in MHz
Ant.Pol. (H/V)	= Antenna polarization
Reading (dBuV)	= Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m)	= Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m)	= Reading (dBuV) + Correction Factor (dB/m)
Limit (dBuV/m)	= Limit stated in standard
Margin (dB)	= Remark Result (dBuV/m) – Limit (dBuV/m)
Peak	= Peak Reading
QP	= Quasi-peak Reading
AVG	= Average Reading

7.5 TEST RESULTS

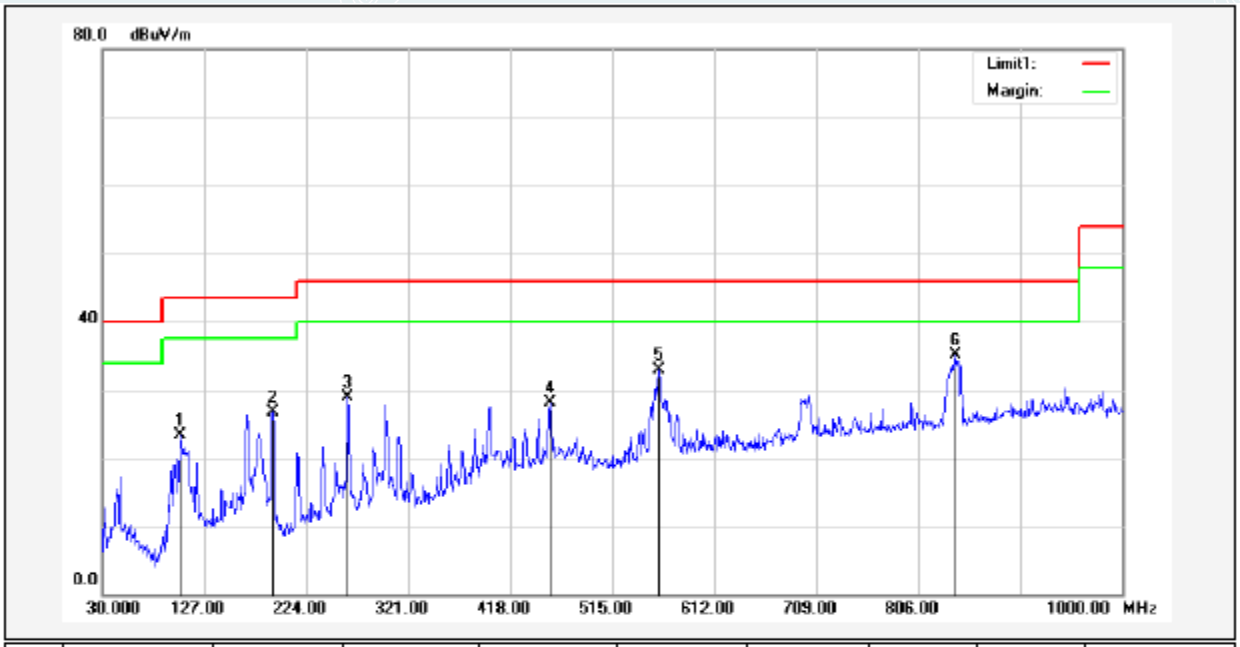
Below 1GHz

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_1M (2402MHz)	Polarity	Vertical
Tested By	Huang Xinlong	Tested Date	2022-10-17



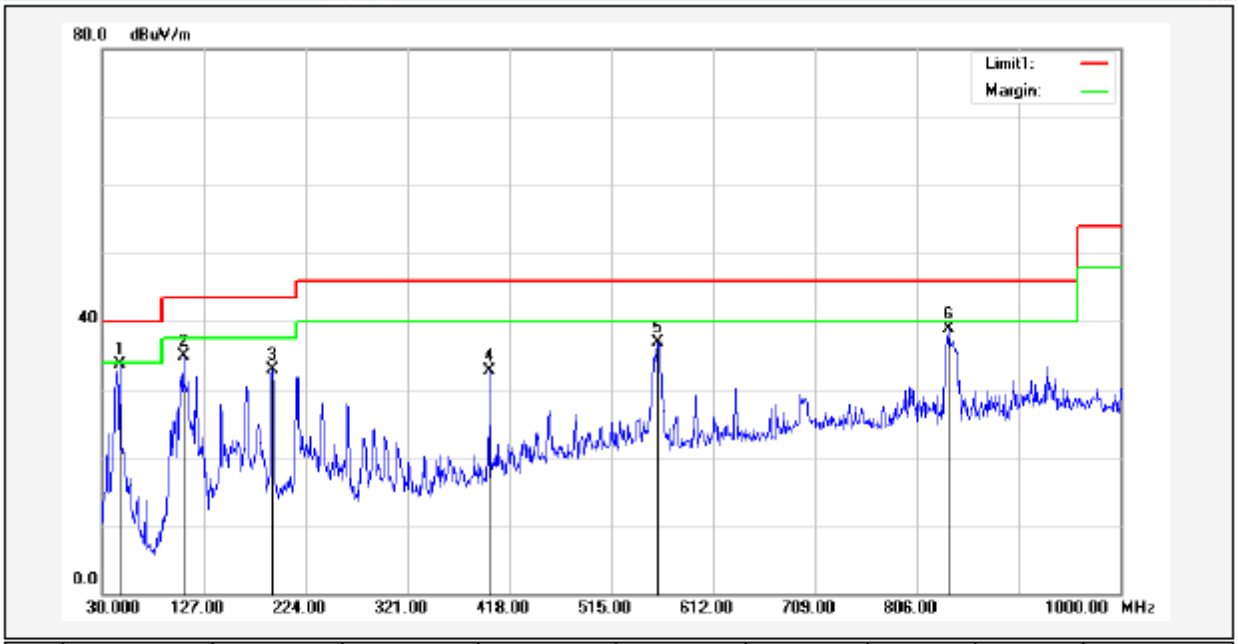
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	47.4600	60.06	-26.99	33.07	40.00	-6.93	102	100	QP
2	119.2400	58.29	-27.25	31.04	43.50	-12.46	333	100	QP
3	191.0200	59.01	-27.01	32.00	43.50	-11.50	6	100	QP
4	556.7100	54.96	-16.41	38.55	46.00	-7.45	344	100	QP
5	797.2700	47.48	-11.56	35.92	46.00	-10.08	302	100	QP
6	838.0100	47.25	-11.07	36.18	46.00	-9.82	308	100	QP

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_1M (2402MHz)	Polarity	Horizontal
Tested By	Huang Xinlong	Tested Date	2022-10-17



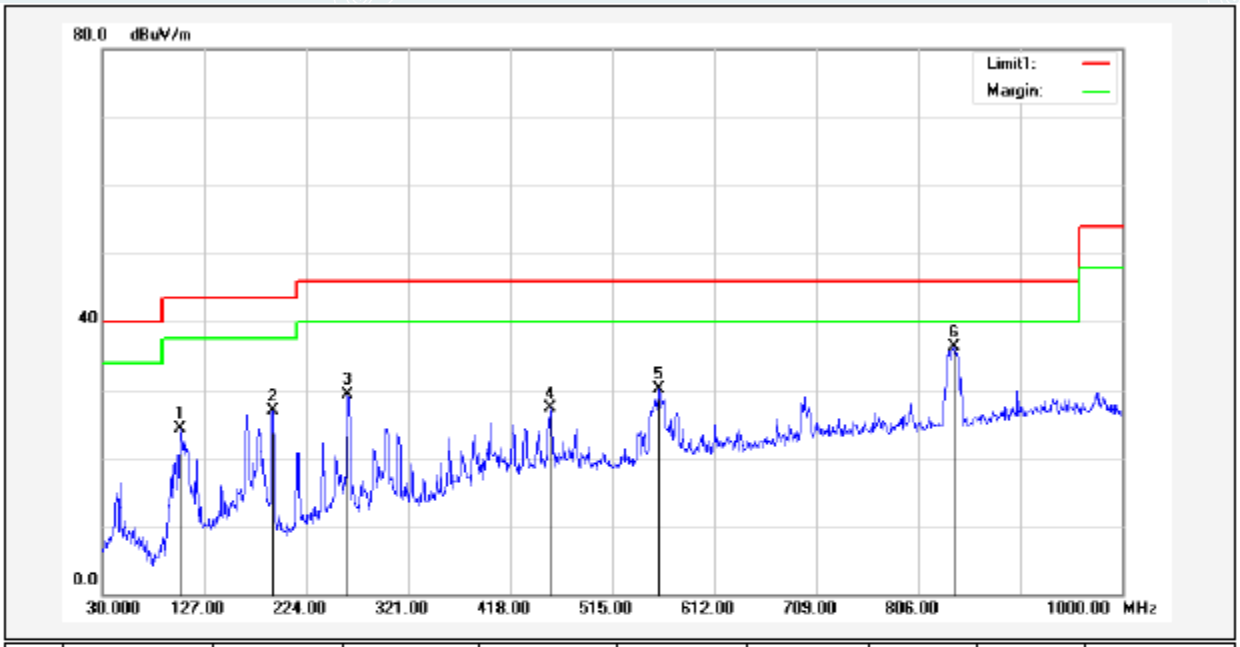
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	104.6900	51.86	-28.62	23.24	43.50	-20.26	123	300	QP
2	191.9900	53.71	-27.10	26.61	43.50	-16.89	101	100	QP
3	263.7700	53.78	-24.86	28.92	46.00	-17.08	159	100	QP
4	455.8300	46.70	-18.65	28.05	46.00	-17.95	62	200	QP
5	559.6200	49.19	-16.32	32.87	46.00	-13.13	99	200	QP
6*	841.8900	46.03	-11.01	35.02	46.00	-10.98	358	100	QP

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_1M (2440MHz)	Polarity	Vertical
Tested By	Huang Xinlong	Tested Date	2022-10-17



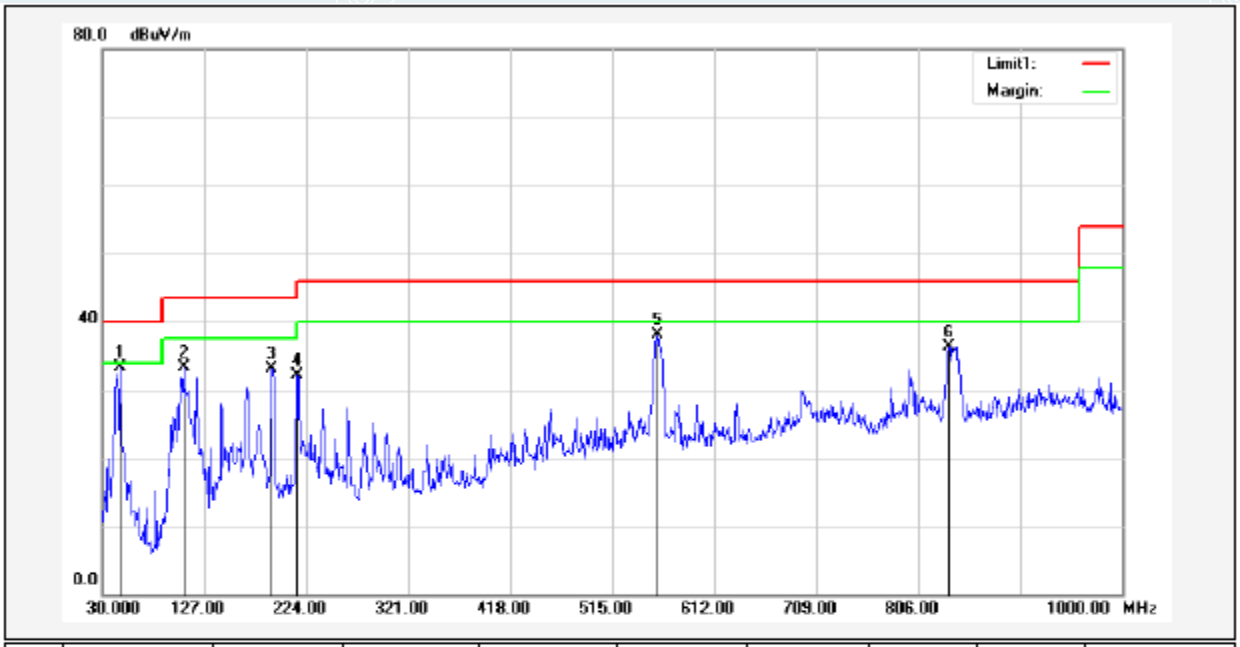
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	47.4600	60.70	-26.99	33.71	40.00	-6.29	76	100	QP
2	107.6000	63.10	-28.23	34.87	43.50	-8.63	199	100	QP
3	191.9900	59.91	-27.10	32.81	43.50	-10.69	11	100	QP
4	399.5700	53.29	-20.51	32.78	46.00	-13.22	5	100	QP
5	559.6200	53.21	-16.32	36.89	46.00	-9.11	341	100	QP
6	836.0700	49.94	-11.08	38.86	46.00	-7.14	314	100	QP

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_1M (2440MHz)	Polarity	Horizontal
Tested By	Huang Xinlong	Tested Date	2022-10-17



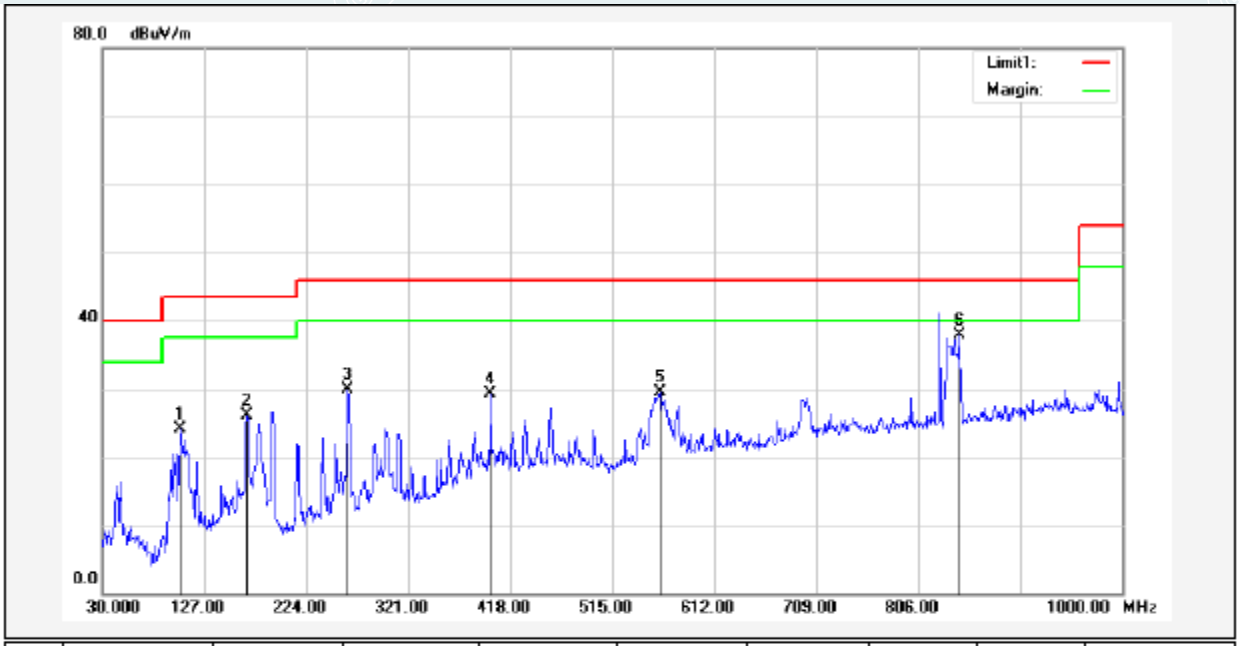
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	104.6900	52.96	-28.62	24.34	43.50	-19.16	109	300	QP
2	191.9900	54.03	-27.10	26.93	43.50	-16.57	90	100	QP
3	262.8000	54.21	-24.90	29.31	46.00	-16.69	165	100	QP
4	455.8300	46.03	-18.65	27.38	46.00	-18.62	59	200	QP
5	559.6200	46.51	-16.32	30.19	46.00	-15.81	284	200	QP
6*	839.9500	47.27	-11.04	36.23	46.00	-9.77	0	105	QP

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_1M (2480MHz)	Polarity	Vertical
Tested By	Huang Xinlong	Tested Date	2022-10-17



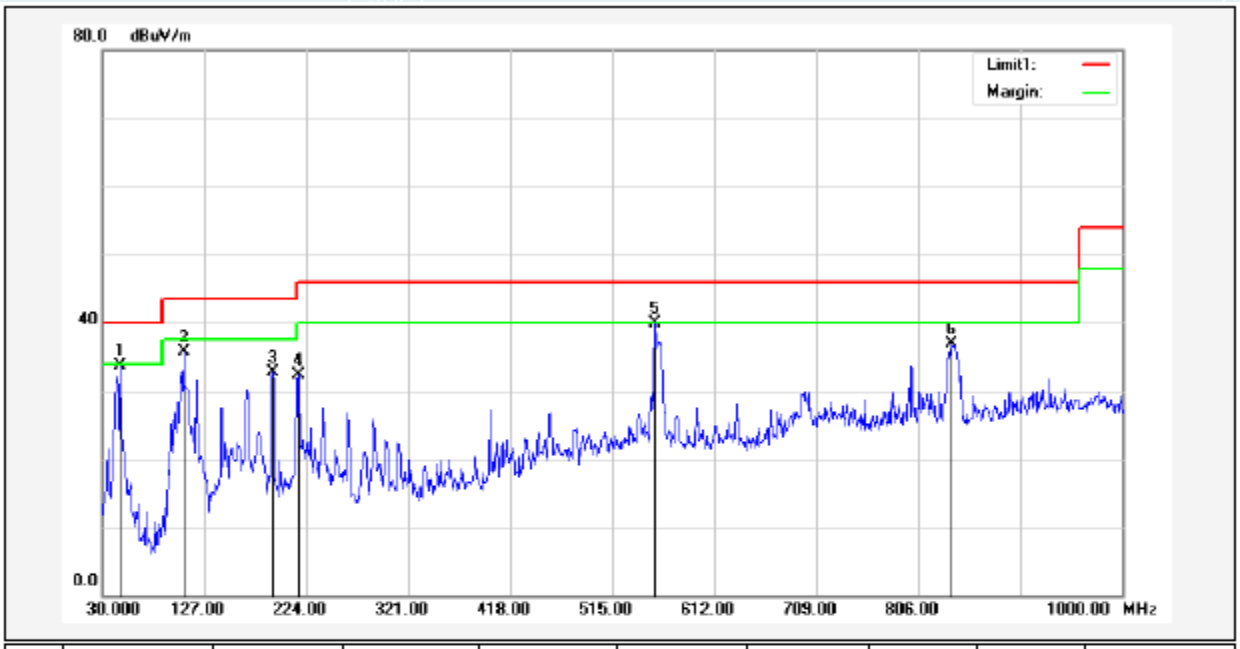
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	47.4600	60.35	-26.99	33.36	40.00	-6.64	35	100	QP
2	107.6000	61.62	-28.23	33.39	43.50	-10.11	270	100	QP
3	191.0200	60.09	-27.01	33.08	43.50	-10.42	6	100	QP
4	215.2700	59.02	-27.01	32.01	43.50	-11.49	358	100	QP
5	558.6500	54.37	-16.35	38.02	46.00	-7.98	18	100	QP
6	835.1000	47.50	-11.10	36.40	46.00	-9.60	328	100	QP

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_1M (2480MHz)	Polarity	Horizontal
Tested By	Huang Xinlong	Tested Date	2022-10-17



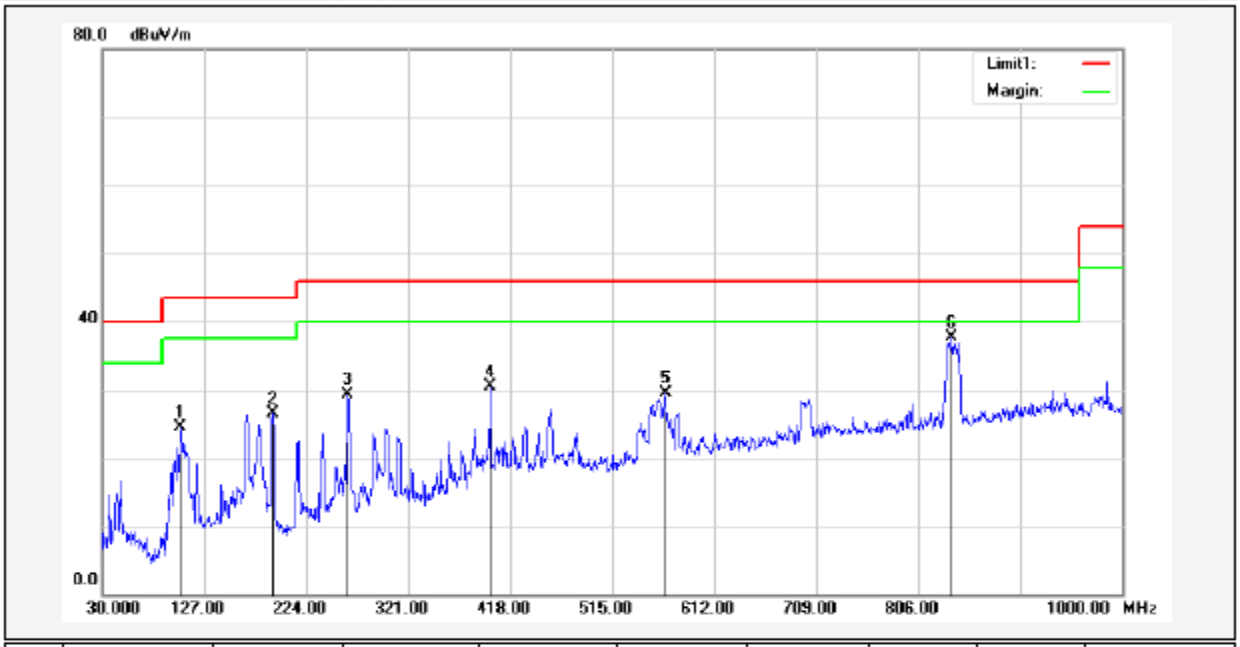
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	104.6900	52.64	-28.62	24.02	43.50	-19.48	111	400	QP
2	167.7400	51.35	-25.20	26.15	43.50	-17.35	119	200	QP
3	263.7700	54.72	-24.86	29.86	46.00	-16.14	146	100	QP
4	399.5700	49.85	-20.51	29.34	46.00	-16.66	360	248	QP
5	560.5900	45.77	-16.28	29.49	46.00	-16.51	117	200	QP
6*	844.8000	48.79	-10.97	37.82	46.00	-8.18	0	134	QP

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_2M (2402MHz)	Polarity	Vertical
Tested By	Huang Xinlong	Tested Date	2022-10-17



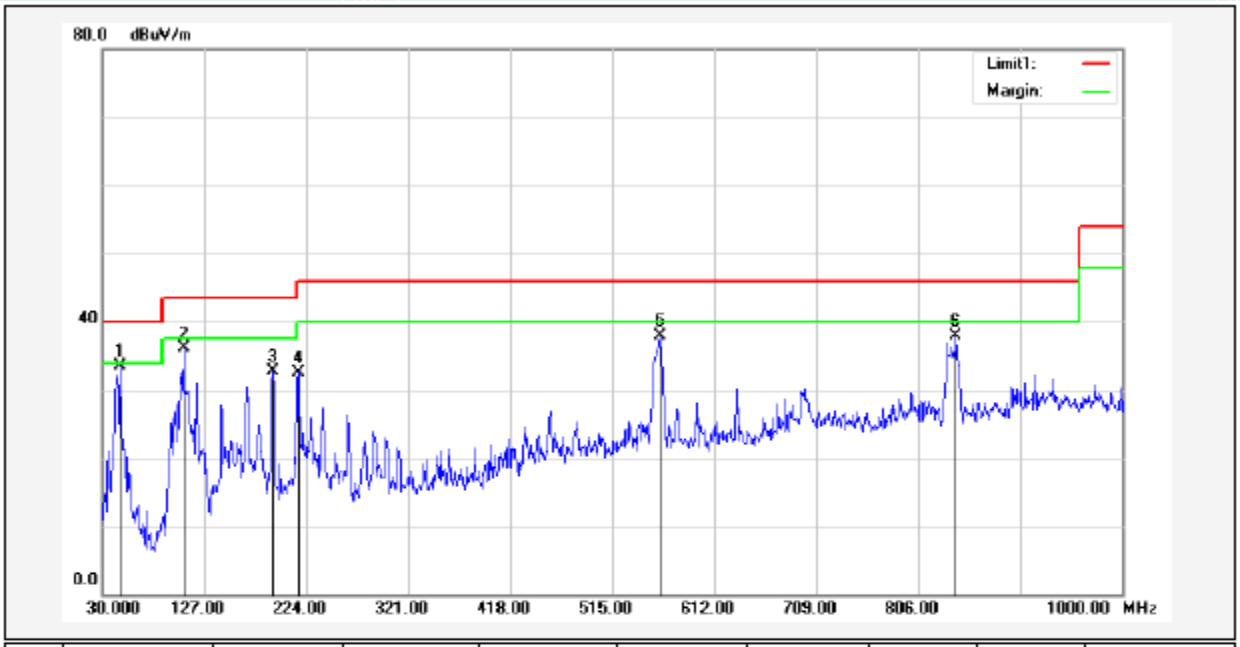
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	47.4600	60.68	-26.99	33.69	40.00	-6.31	82	100	QP
2	107.6000	63.86	-28.23	35.63	43.50	-7.87	132	100	QP
3	191.9900	59.81	-27.10	32.71	43.50	-10.79	15	100	QP
4	216.2400	59.23	-26.96	32.27	46.00	-13.73	357	100	QP
5*	555.7400	56.42	-16.44	39.98	46.00	-6.02	360	103	QP
6	837.0400	48.00	-11.07	36.93	46.00	-9.07	302	100	QP

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_2M (2402MHz)	Polarity	Horizontal
Tested By	Huang Xinlong	Tested Date	2022-10-17



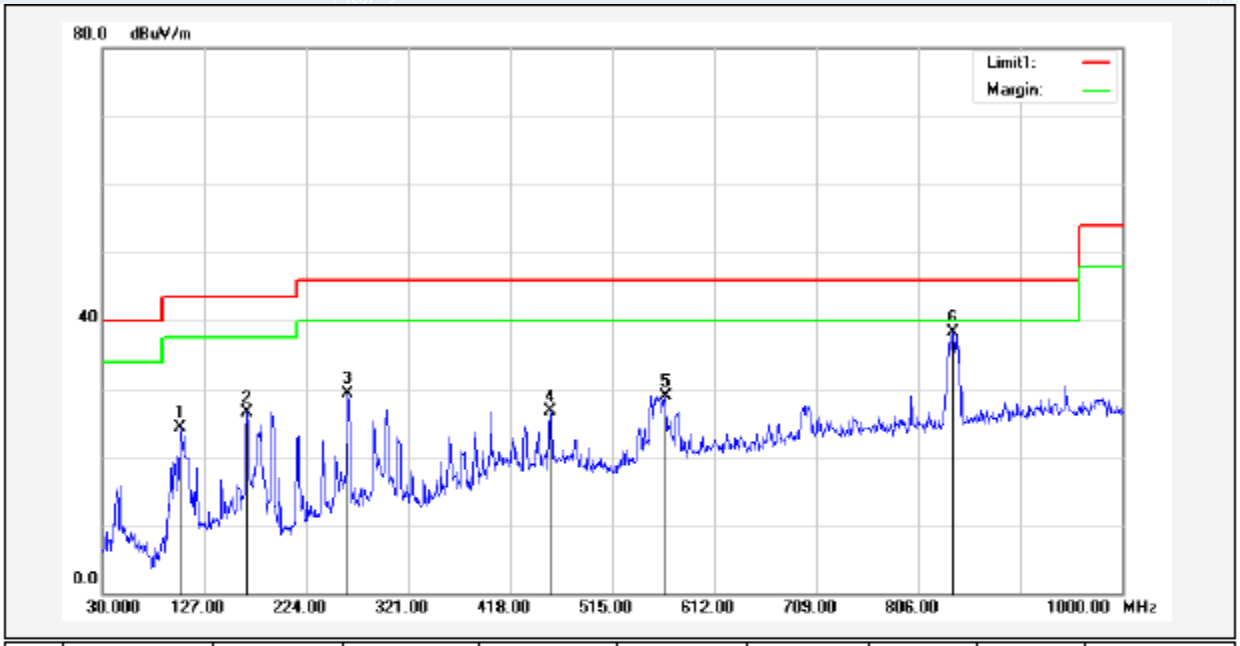
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	104.6900	53.07	-28.62	24.45	43.50	-19.05	127	200	QP
2	191.9900	53.55	-27.10	26.45	43.50	-17.05	105	100	QP
3	263.7700	54.11	-24.86	29.25	46.00	-16.75	148	100	QP
4	399.5700	51.00	-20.51	30.49	46.00	-15.51	146	100	QP
5	565.4400	45.55	-16.14	29.41	46.00	-16.59	254	200	QP
6*	838.0100	48.77	-11.07	37.70	46.00	-8.30	6	100	QP

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_2M (2440MHz)	Polarity	Vertical
Tested By	Huang Xinlong	Tested Date	2022-10-17



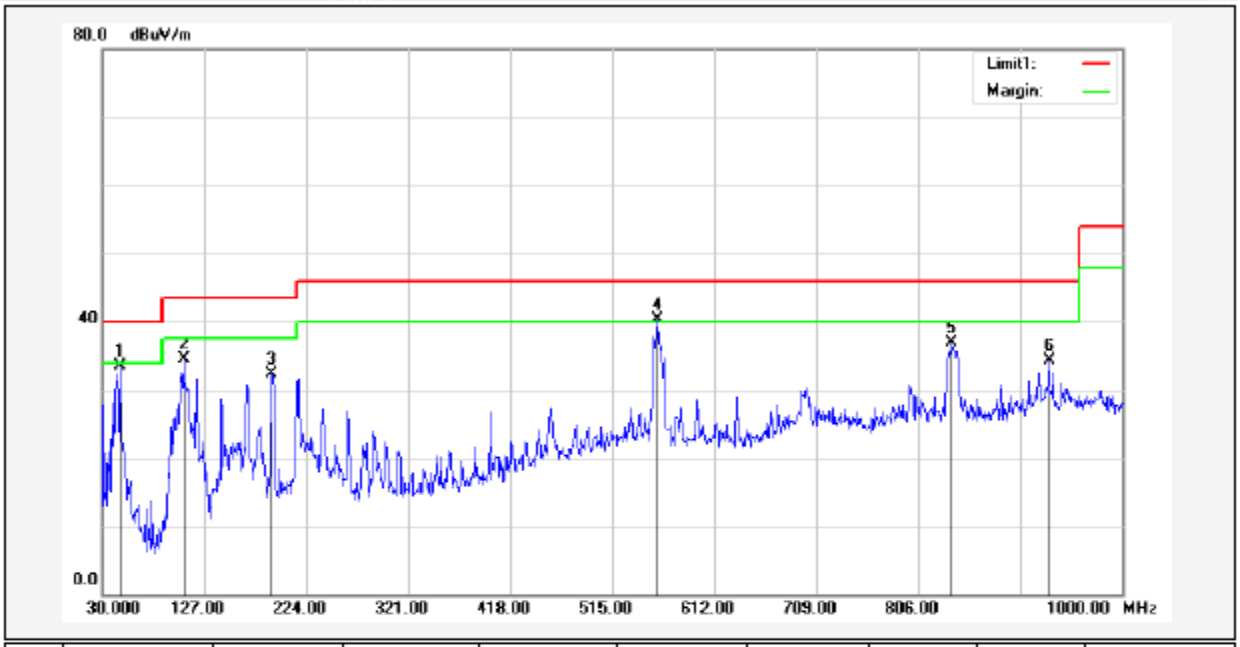
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	47.4600	60.59	-26.99	33.60	40.00	-6.40	358	100	QP
2	107.6000	64.40	-28.23	36.17	43.50	-7.33	68	100	QP
3	191.9900	59.71	-27.10	32.61	43.50	-10.89	26	100	QP
4	216.2400	59.56	-26.96	32.60	46.00	-13.40	235	100	QP
5	560.5900	54.24	-16.28	37.96	46.00	-8.04	342	100	QP
6	841.8900	48.95	-11.01	37.94	46.00	-8.06	301	100	QP

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_2M (2440MHz)	Polarity	Horizontal
Tested By	Huang Xinlong	Tested Date	2022-10-17



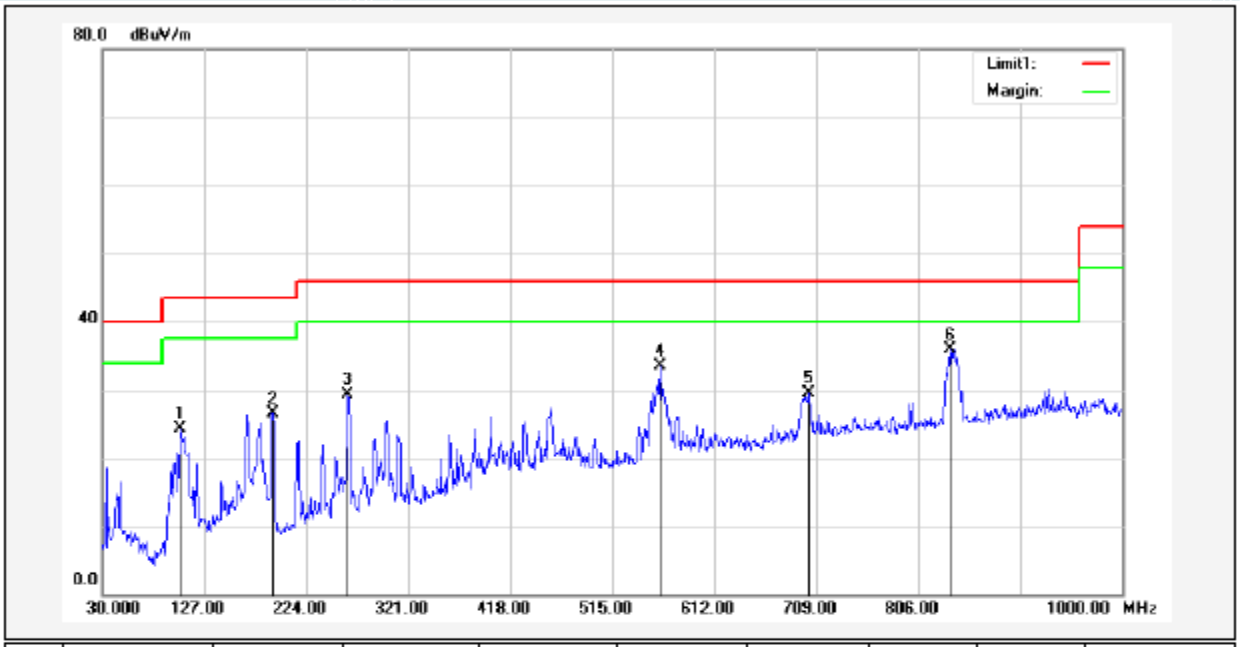
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	104.6900	53.02	-28.62	24.40	43.50	-19.10	117	200	QP
2	167.7400	51.69	-25.20	26.49	43.50	-17.01	128	200	QP
3	263.7700	54.07	-24.86	29.21	46.00	-16.79	145	100	QP
4	455.8300	45.34	-18.65	26.69	46.00	-19.31	69	200	QP
5	565.4400	45.03	-16.14	28.89	46.00	-17.11	277	200	QP
6*	838.9800	49.42	-11.05	38.37	46.00	-7.63	360	143	QP

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_2M (2480MHz)	Polarity	Vertical
Tested By	Huang Xinlong	Tested Date	2022-10-17



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	47.4600	60.56	-26.99	33.57	40.00	-6.43	360	109	QP
2	107.6000	62.75	-28.23	34.52	43.50	-8.98	288	100	QP
3	191.0200	59.24	-27.01	32.23	43.50	-11.27	30	100	QP
4*	558.6500	56.65	-16.35	40.30	46.00	-5.70	347	100	QP
5	838.0100	48.01	-11.07	36.94	46.00	-9.06	288	100	QP
6	930.1600	44.02	-9.69	34.33	46.00	-11.67	28	100	QP

EUT Name	Sino Wealth BLE Module	Model	SH-BLEM18
Environmental Conditions	24.2℃/41%RH/101.0kPa	Test Voltage	DC 3.3V
Test Mode	TX/ BLE_2M (2480MHz)	Polarity	Horizontal
Tested By	Huang Xinlong	Tested Date	2022-10-17



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	104.6900	53.01	-28.62	24.39	43.50	-19.11	105	200	QP
2	191.9900	53.67	-27.10	26.57	43.50	-16.93	117	100	QP
3	263.7700	54.25	-24.86	29.39	46.00	-16.61	166	100	QP
4	560.5900	49.86	-16.28	33.58	46.00	-12.42	102	200	QP
5	701.2400	42.77	-13.29	29.48	46.00	-16.52	358	200	QP
6*	836.0700	46.94	-11.08	35.86	46.00	-10.14	360	102	QP

Remark:

1 No emission found between lowest internal used/generated frequency to 30MHz.

2 Radiated emissions measured in frequency range from 9kHz to 1GHz were made with an instrument using Quasi-peak detector mode.

3 The IF bandwidth of Receiver between 30MHz to 1GHz was 120kHz.

1GHz-18GHz:

Mode: TX/ BLE_1M
Lowest Frequency (2402MHz)
Environment: 25.1℃/51%RH/101.0kPa/101.0kPa Voltage: DC 3.3V
Tested By:Zhang Zishan Date: 2022-10-11

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1119.2	70.11	44.80	-25.31	74.00	29.20	200	267	Horizontal
2	1294.4	63.17	40.51	-22.66	74.00	33.49	100	282	Horizontal
3	2840.4	60.09	43.58	-16.51	74.00	30.42	100	244	Horizontal
4	4795.5	56.57	44.45	-12.12	74.00	29.55	100	97	Horizontal
5	5901	55.75	46.79	-8.96	74.00	27.21	200	134	Horizontal
6	7206	53.62	49.69	-3.93	74.00	24.31	100	46	Horizontal
7	1119.8	59.06	33.76	-25.30	54.00	20.24	200	267	Horizontal
8	1275.6	53.51	31.17	-22.34	54.00	22.83	100	282	Horizontal
9	2840.6	50.34	33.83	-16.51	54.00	20.17	100	244	Horizontal
10	4806	48.46	36.38	-12.08	54.00	17.62	100	97	Horizontal
11	5916	43.98	34.80	-9.18	54.00	19.20	200	96	Horizontal
12	7207.5	47.05	43.13	-3.92	54.00	10.87	100	46	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1121	72.66	49.71	-22.95	74.00	24.29	100	290	Vertical
2	1466	67.94	45.55	-22.39	74.00	28.45	200	276	Vertical
3	1991	68.47	47.72	-20.75	74.00	26.28	100	266	Vertical
4	2657.2	64.75	46.98	-17.77	74.00	27.02	200	263	Vertical
5	4795.5	56.81	44.39	-12.42	74.00	29.61	200	182	Vertical
6	7206	55.68	52.62	-3.06	74.00	21.38	100	320	Vertical
7	1114.6	60.23	37.49	-22.74	54.00	16.51	200	290	Vertical
8	1451.4	53.03	31.11	-21.92	54.00	22.89	100	266	Vertical
9	1997.2	55.04	34.48	-20.56	54.00	19.52	100	266	Vertical
10	2657	52.74	34.97	-17.77	54.00	19.03	200	263	Vertical
11	4806	47.60	35.23	-12.37	54.00	18.77	200	15	Vertical
12	7207.5	47.04	43.99	-3.05	54.00	10.01	100	320	Vertical