Shenzhen Huatongwei International Inspection Co.,Ltd.
Huatongwei Building, keji'nan 12th Road, High-Tech Industrial Park, Nanshan District,
Shenzhen, Guangdong, China.
Phone:86-755-26715499 E-mail: cs@szhtw.com.cn Website:http://www.szhtw.com.cn

TEST REPORT

Report Reference No. ..... :	**CHTEW19110024R1**	Report verification:
Project No. ..... :	**SHT2301044201EW**	
FCC ID ..... :	**2ATTZ-SUNBEAM-F1**	
Applicant's name ..... :	**Basic,Inc.**	
Address ..... :	17688 County Road 558,Memphis, Missouri, 63555,United States	
Test item description ..... :	**Basic Feature Phone**	
Trade Mark ..... :	Sunbeam	
Model/Type reference ..... :	F1	
Listed Model(s) ..... :	-	
Standard ..... :	**FCC CFR Title 47 Part 15 Subpart C Section 15.247**	
Date of receipt of test sample ..... :	Jan. 30, 2023	
Date of testing ..... :	Jan. 31, 2023- Feb. 09, 2023	
Date of issue ..... :	Feb. 10, 2023	
Result ..... :	**PASS**	

Compiled by (Position+Printed name+Signature) :	File administrators Silvia Li	Silvia Li
Supervised by (Position+Printed name+Signature) :	Project Engineer Caspar Chen	Caspar Chen
Approved by (Position+Printed name+Signature) :	RF Manager Hans Hu	Hans HU

Testing Laboratory Name ..... :	**Shenzhen Huatongwei International Inspection Co., Ltd.**
Address ..... :	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Contents

1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:
FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

ANSI C63.10:2013: American National Standard for Testing Unlicensed Wireless Devices

KDB 558074 D01 15.247 Meas Guidance v05r02: Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating under Section 15.247 of The FCC Rules

1.2. Report version

Revision No.	Date of issue	Description
N/A	2019-11-05	Original
R1	2023-02-10	Updated address,battery, PCB board, updated USB port, antenna shape and adapter changed,make difference test on Conducted Emissions, Restricted band (radiated) and Radiated Spurious Emission, based on report No. CHTEW19110024

2. TEST DESCRIPTION

Test Item	FCC Rule	Result	Test Engineer
Antenna requirement	15.203/15.247(c)	PASS	Kang Yang
Line Conducted Emissions (AC Main)	15.207	PASS	Kang Yang
Conducted Peak Output Power	15.247(b)(3)	PASS	JiongSheng.Feng
Power Spectral Density	15.247(e)	PASS	JiongSheng.Feng
6dB Bandwidth	15.247(a)(2)	PASS	JiongSheng.Feng
Restricted band	15.247(d)/15.205	PASS	Xu Yang
Spurious Emissions	15.247(d)/15.209	PASS	Xu Yang

Note: The measurement uncertainty is not included in the test result.

3. SUMMARY

3.1. Client Information

Applicant:	Basic,Inc.
Address:	17688 County Road 558,Memphis, Missouri, 63555,United States
Manufacturer:	Basic,Inc.
Address:	17688 County Road 558,Memphis, Missouri, 63555,United States

3.2. Product Description

Name of EUT:	Basic Feature Phone
Trade Mark:	Sunbeam
Model No.:	F1
Listed Model(s):	-
IMEI:	Conducted: 359863101000287 Radiated: 359863101000163
Power supply:	DC 3.8V
Adapter information:	Model:EE-0501500 Input: 100-240Va.c., 50/60Hz, 0.5A Output: 5.0Vd.c.,1.5A
Hardware version:	QS3912_MAINPCB_V1.0
Software version:	Sunbeam_F1V_V1.0
Bluetooth	
Version:	Supported BT4.1+BLE
Modulation:	GFSK
Operation frequency:	2402MHz~2480MHz
Channel number:	40
Channel separation:	2MHz
Antenna type:	FPC Antenna
Antenna gain:	-0.76dBi

3.3. Operation state

➢ **Test frequency list**

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

Channel	Frequency (MHz)
00	2402
01	2404
⋮	⋮
19	2440
⋮	⋮
38	2478
39	2480

➢ **Test mode**

For RF test items
The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%).
For AC power line conducted emissions:
The EUT was set to connect with the Bluetooth instrument under large package sizes transmission.
For Radiated suprious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit(duty cycle>98%). The EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data Recorded in the report.

3.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- ● - supplied by the manufacturer
- ○ - supplied by the lab

	/	Manufacturer:	/
		Model No.:	/
	/	Manufacturer:	/
		Model No.:	/

3.5. Modifications

No modifications were implemented to meet testing criteria.

4. TEST ENVIRONMENT

4.1. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.	
Laboratory Location	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China	
Connect information:	Tel: 86-755-26715499 E-mail: cs@szhtw.com.cn http://www.szhtw.com.cn	
Qualifications	Type	Accreditation Number
	FCC	762235

4.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

4.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1” and TR-100028-02 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2” and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd. quality system according to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Here after the best measurement capability for Shenzhen Huatongwei International Inspection Co., Ltd. is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.63 dB	(1)
Conducted spurious emissions 9kHz~40GHz	0.63 dB	(1)
Conducted Disturbance 150kHz~30MHz	3.35 dB	(1)
Radiated Emissions below 1GHz	4.54dB for 30MHz-1GHz	(1)
Radiated Emissions above 1GHz	5.10dB for above 1GHz	(1)
Occupied Bandwidth	69 Hz	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

4.4. Equipments Used during the Test

● Conducted Emission							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Shielded Room	Albatross projects	HTWE0114	N/A	N/A	2018/09/28	2023/09/27
●	EMI Test Receiver	R&S	HTWE0111	ESCI	101247	2019/10/26	2020/10/25
●	Artificial Mains	SCHWARZBECK	HTWE0113	NNLK 8121	573	2019/10/23	2020/10/22
●	Pulse Limiter	R&S	HTWE0033	ESH3-Z2	100499	2019/10/23	2020/10/22
●	RF Connection Cable	HUBER+SUHNER	HTWE0113-02	ENVIROFLEX_142	EF-NM-BNCM-2M	2019/10/23	2020/10/22
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-6th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0127	SAC-3m-02	C11121	2018/09/30	2023/09/29
●	EMI Test Receiver	R&S	HTWE0099	ESCI	100900	2022/08/30	2023/08/29
●	Loop Antenna	R&S	HTWE0546	HFH2-Z2E	101073	2021/05/25	2024/05/24
●	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0547	VULB9163	945	2022/05/23	2025/05/22
●	Pre-Amplifer	SCHWARZBECK	HTWE0295	BBV 9742	N/A	2022/11/04	2023/11/03
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-01	N/A	N/A	2022/02/25	2023/02/24
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-02	SUCOFLEX104	501184/4	2022/02/25	2023/02/24
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-7th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	C11121	2018/09/27	2023/09/26
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2022/08/25	2023/08/24
●	Horn Antenna	ETS	HTWE0548	3117	240120	2022/05/20	2025/05/19
●	Horn Antenna	STEATITE	HTWE0549	QMS-00880	25661	2022/05/20	2025/05/19
●	Pre-amplifier	CD	HTWE0071	PAP-0102	12004	2022/11/04	2023/11/03
●	Broadband Pre-amplifier	SCHWARZBECK	HTWE0201	BBV 9718	9718-248	2022/02/28	2023/02/27
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-01	6m 18GHz S Serisa	N/A	2022/02/25	2023/02/24
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-02	6m 3GHz RG Serisa	N/A	2022/02/25	2023/02/24
●	RF Connection Cable	HUBER+SUHNER	HTWE0119-05	6m 3GHz RG Serisa	N/A	2022/02/25	2023/02/24
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-04	6m 3GHz RG Serisa	N/A	2022/02/25	2023/02/24
●	Test Software	Audix	N/A	E3	N/A	N/A	N/A

● RF Conducted Method						
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Signal and spectrum Analyzer	R&S	FSV40	100048	2019/10/26	2020/10/25
●	Spectrum Analyzer	Agilent	N9020A	MY50510187	2019/10/26	2020/10/25
●	Test software	Tonscend	JS1120-2(WIFI)	N/A	N/A	N/A

5. TEST CONDITIONS AND RESULTS

5.1. Antenna Requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

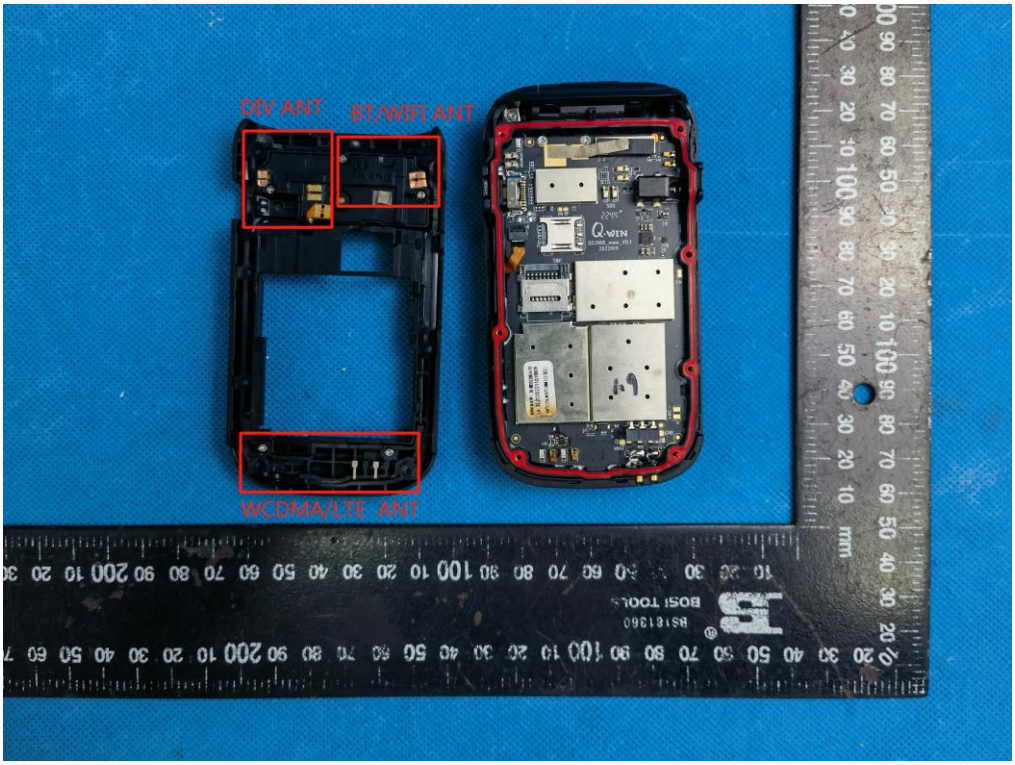
FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

The directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



5.2. Conducted Emissions (AC Main)

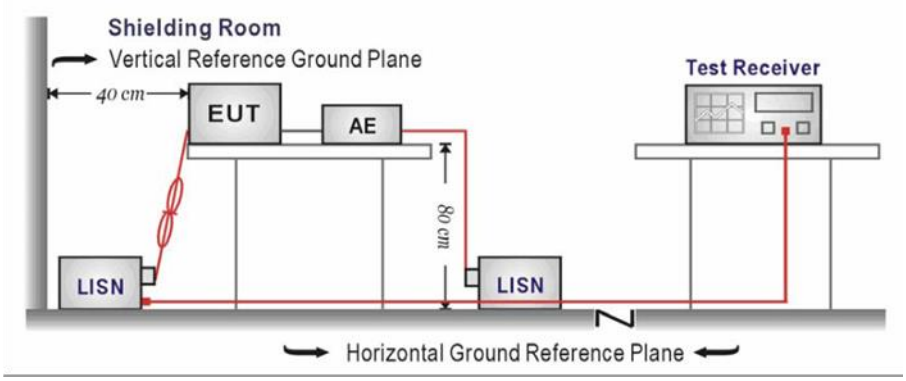
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	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.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST MODE:

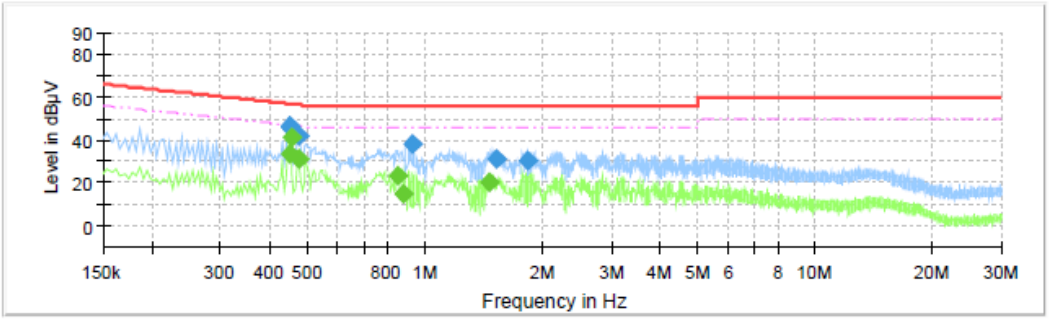
Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Note:
1) Transd = Cable lose + Pulse Limiter Factor + Artificial Mains Factor
2) Margin = Limit - Level

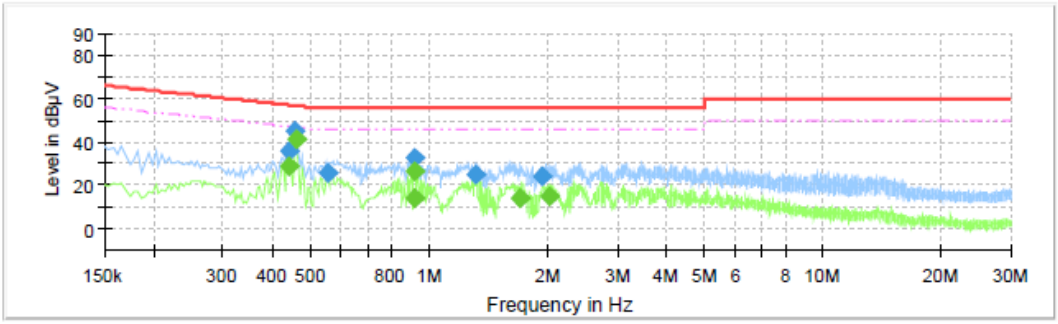
Test Line:	L



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.451500	46.03	---	56.85	10.81	L1	10.2
0.452500	46.80	---	56.83	10.03	L1	10.2
0.452500	---	33.45	46.83	13.38	L1	10.2
0.455500	---	40.82	46.77	5.95	L1	10.2
0.475500	41.80	---	56.42	14.61	L1	10.2
0.475500	---	30.76	46.42	15.65	L1	10.2
0.855500	---	23.12	46.00	22.88	L1	10.3
0.879500	---	15.00	46.00	31.00	L1	10.3
0.927500	38.37	---	56.00	17.63	L1	10.3
1.467500	---	20.38	46.00	25.62	L1	10.3
1.519500	30.76	---	56.00	25.24	L1	10.3
1.831500	30.45	---	56.00	25.55	L1	10.3

Test Line:	N



Final Result

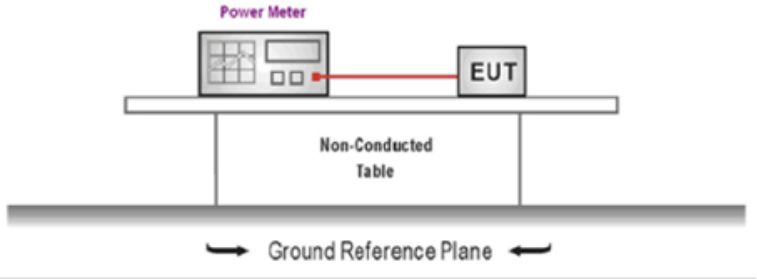
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.439500	35.58	---	57.07	21.49	N	10.2
0.439500	---	28.51	47.07	18.56	N	10.2
0.455500	45.03	---	56.77	11.74	N	10.2
0.459500	---	41.31	46.70	5.40	N	10.2
0.555500	25.48	---	56.00	30.52	N	10.2
0.915500	---	26.50	46.00	19.50	N	10.3
0.915500	32.64	---	56.00	23.36	N	10.3
0.919500	---	13.73	46.00	32.27	N	10.3
1.315500	24.77	---	56.00	31.23	N	10.3
1.699500	---	14.12	46.00	31.88	N	10.3
1.935500	24.04	---	56.00	31.96	N	10.3
2.019500	---	14.64	46.00	31.36	N	10.3

5.3. Conducted Peak Output Power

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3): 30 dBm

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10: 2013 and KDB 558074 D01 for compliance to FCC 47 CFR 15.247 requirements.
2. The maximum peak conducted output power may be measured using a broadband peak RF power meter.
3. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.
4. Record the measurement data.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Type	Channel	Peak Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
BT-BLE	00	2.34	2.30	≤30.00	Pass
	19	0.78	0.76		
	39	1.67	1.65		

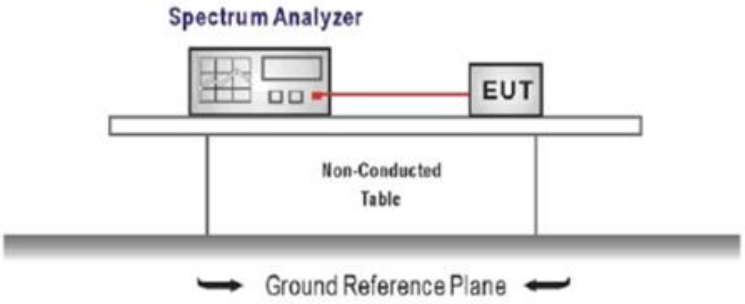
5.4. Power Spectral Density

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e):

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.

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input,
2. Configure the spectrum analyzer as shown below:
   Center frequency=DTS channel center frequency
   Span =1.5 times the DTS bandwidth
   RBW = 3 kHz ≤ RBW ≤ 100 kHz, VBW ≥ 3 × RBW
   Sweep time = auto couple
   Detector = peak
   Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. Use the peak marker function to determine the maximum amplitude level within the RBW.
5. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST MODE:

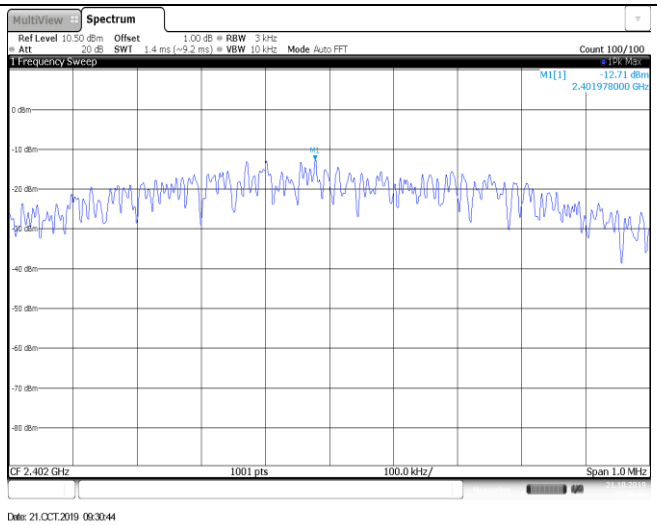
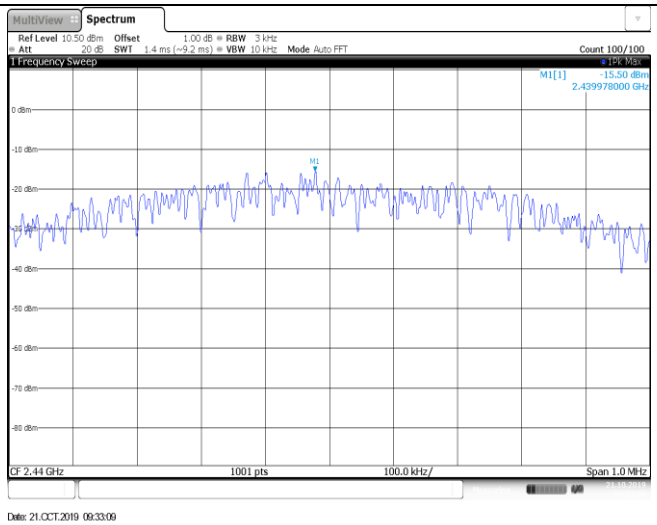
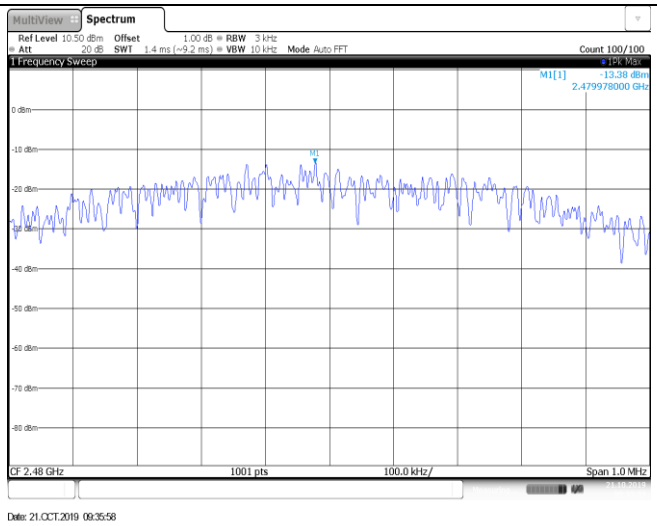
Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Type	Channel	Power Spectral Density(dBm/3KHz)	Limit (dBm/3KHz)	Result
BT-BLE	00	-12.71	≤8.00	Pass
	19	-15.50		
	39	-13.38		

Test plot as follows:

CH00	
CH19	
CH39	

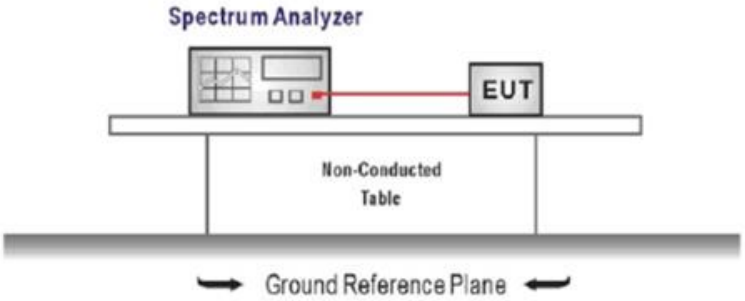
5.5. 6dB bandwidth

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2):

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).
   Center Frequency =DTS channel center frequency
   Span=2 x DTS bandwidth
   RBW = 100 kHz, VBW ≥ 3 × RBW
   Sweep time= auto couple
   Detector = Peak
   Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission, and record the pertinent measurements.

TEST MODE:

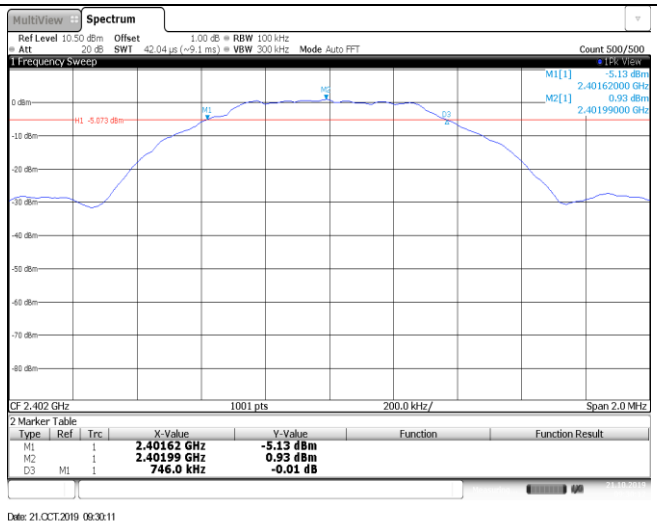
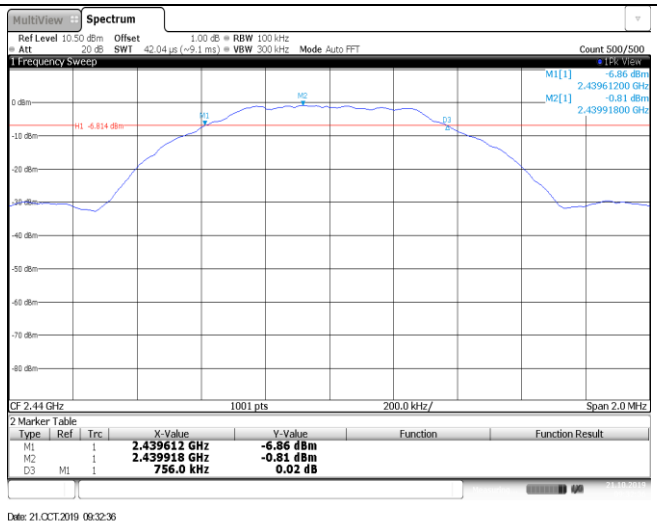
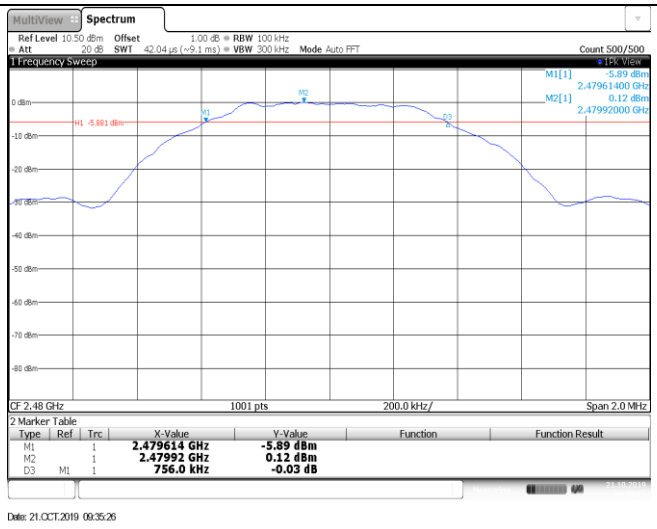
Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Type	Channel	6dB Bandwidth(lHz)	Limit (kHz)	Result
BT-BLE	00	746.00	≥500	Pass
	19	756.00		
	39	756.00		

Test plot as follows:

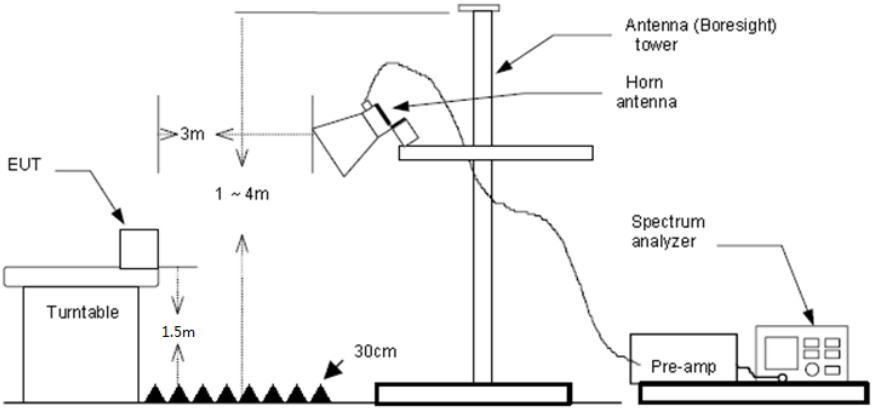
CH00	
CH19	
CH39	

5.6. Restricted band

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, Radiated Emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the Radiated Emissions limits specified in §15.209(a) (see §15.205(c)).

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. Thisis repeated for both horizontal and vertical polarization of the antenna. In order to find themaximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:
   RBW=1MHz, VBW=3MHz Peak detector for Peak value.
   RBW=1MHz, VBW=3MHz RMS detector for Average value.

TEST MODE:
Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Note:
1) Final level= Read level + Factor
2) The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.

Test channel	CH00	Polarity	Horizontal

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2310.00	42.66	31.62	3.92	42.24	35.96	74.00	-38.04	Peak
2	2390.03	42.91	32.02	3.97	42.21	36.69	74.00	-37.31	Peak

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2310.00	31.39	31.62	3.92	42.24	24.69	54.00	-29.31	Average
2	2390.03	31.64	32.02	3.97	42.21	25.42	54.00	-28.58	Average

Test channel	CH00	Polarity	Vertical

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2310.00	42.46	31.62	3.92	42.24	35.76	74.00	-38.24	Peak
2	2390.03	42.64	32.02	3.97	42.21	36.42	74.00	-37.58	Peak

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2310.00	31.59	31.62	3.92	42.24	24.89	54.00	-29.11	Average
2	2390.03	31.84	32.02	3.97	42.21	25.62	54.00	-28.38	Average

Test channel	CH39	Polarity	Horizontal

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2483.50	54.00	32.70	4.04	42.14	48.60	54.00	-5.40	Average
2	2500.00	31.22	32.80	4.05	42.12	25.95	54.00	-28.05	Average

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2483.52	57.11	32.70	4.04	42.14	51.71	74.00	-22.29	Peak
2	2500.00	42.54	32.80	4.05	42.12	37.27	74.00	-36.73	Peak

Test channel	CH39	Polarity	Vertical

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2483.50	54.15	32.70	4.04	42.14	48.75	54.00	-5.25	Average
2	2500.00	31.26	32.80	4.05	42.12	25.99	54.00	-28.01	Average

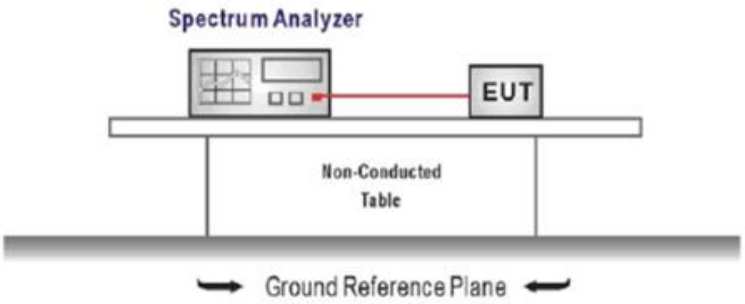
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2483.50	57.52	32.70	4.04	42.14	52.12	74.00	-21.88	Peak
2	2500.00	42.55	32.80	4.05	42.12	37.28	74.00	-36.72	Peak

5.7. Band edge and Spurious Emissions (conducted)

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Establish a reference level by using the following procedure
   Center frequency=DTS channel center frequency
   The span = 1.5 times the DTS bandwidth.
   RBW = 100 kHz, VBW ≥ 3 x RBW
   Detector = peak, Sweep time = auto couple, Trace mode = max hold
   Allow trace to fully stabilize
   Use the peak marker function to determine the maximum PSD level

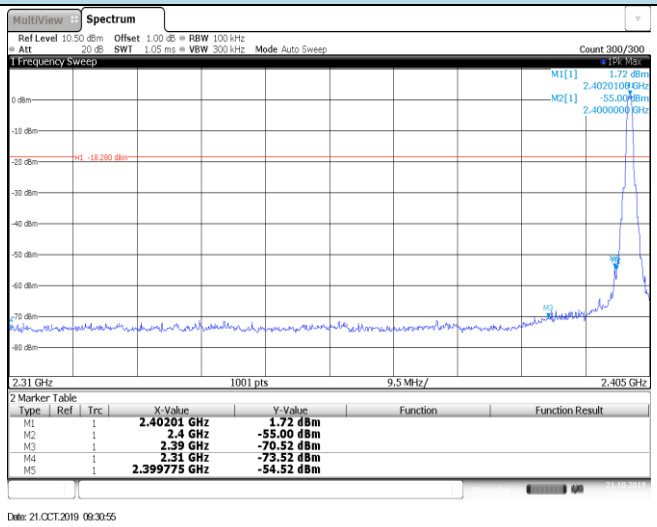
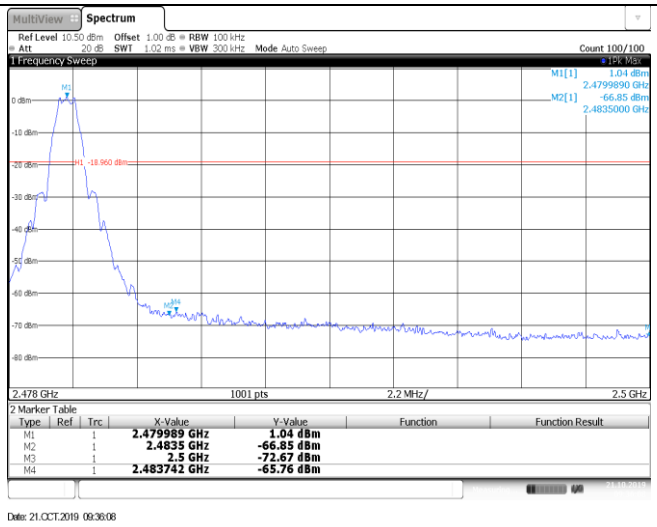
   Note that the channel found to contain the maximum PSD level can be used to establish the reference level.
3. Emission level measurement
   Set the center frequency and span to encompass frequency range to be measured
   RBW = 100 kHz, VBW ≥ 3 x RBW
   Detector = peak, Sweep time = auto couple, Trace mode = max hold
   Allow trace to fully stabilize
   Use the peak marker function to determine the maximum amplitude level.
4. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
5. Ensure that the amplitude of all unwanted emission outside of the authorized frequency band excluding restricted frequency bands) are attenuated by at least the minimum requirements specified (at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz). Report the three highest emission relative to the limit.

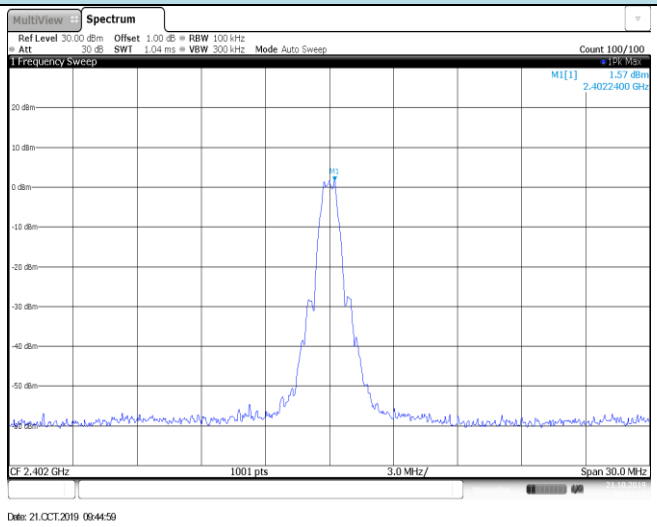
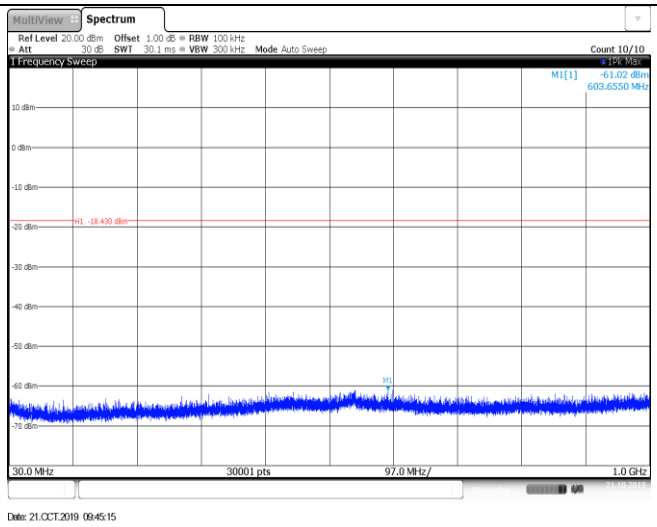
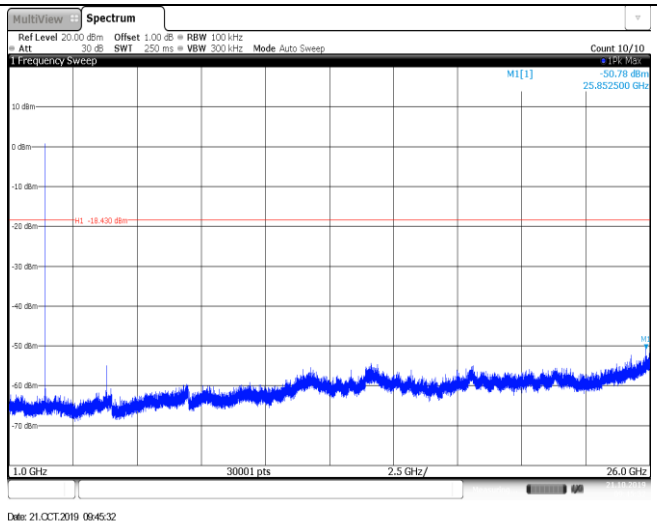
TEST MODE:

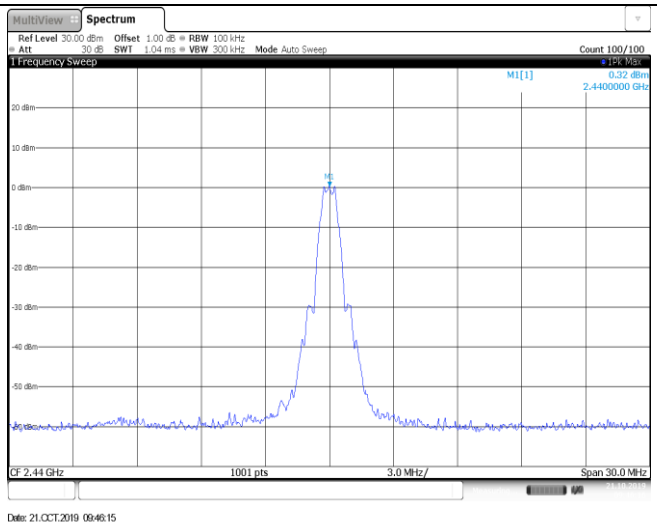
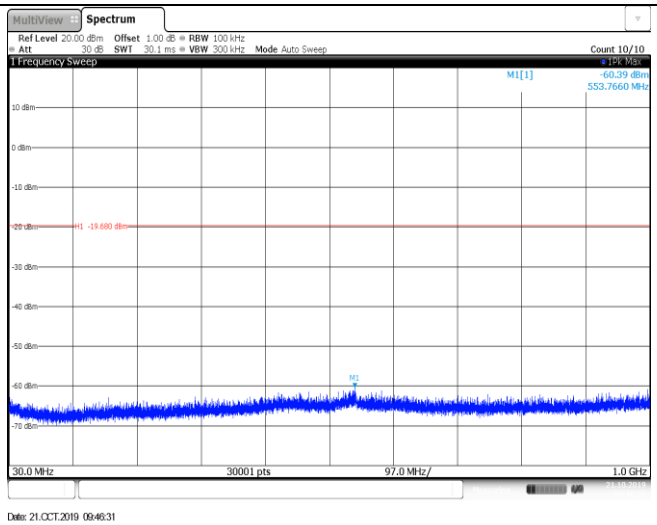
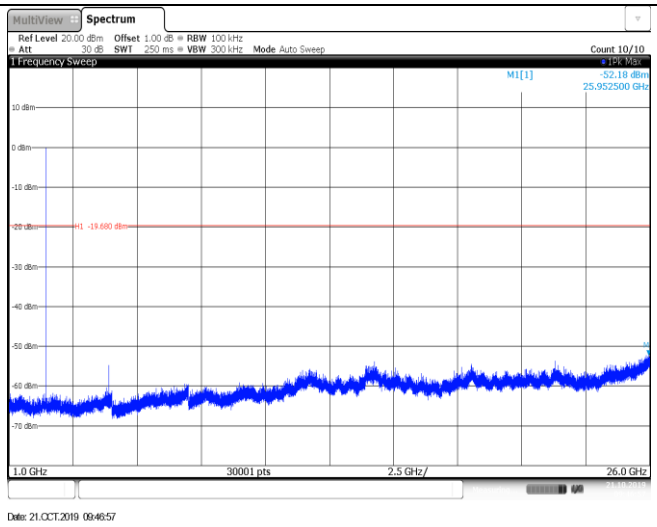
Please refer to the clause 3.3

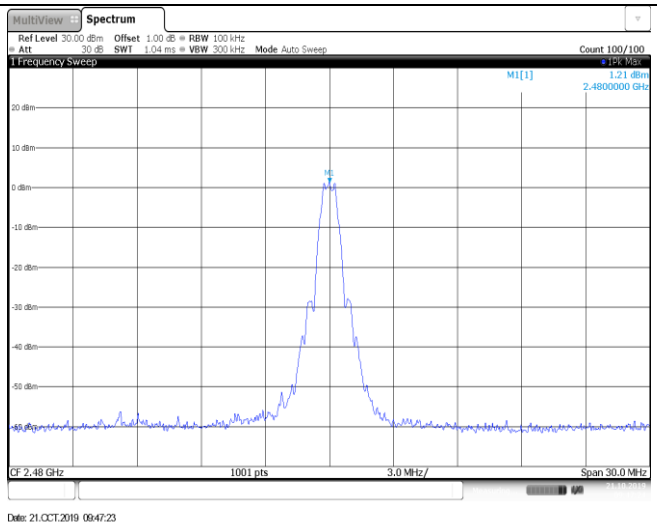
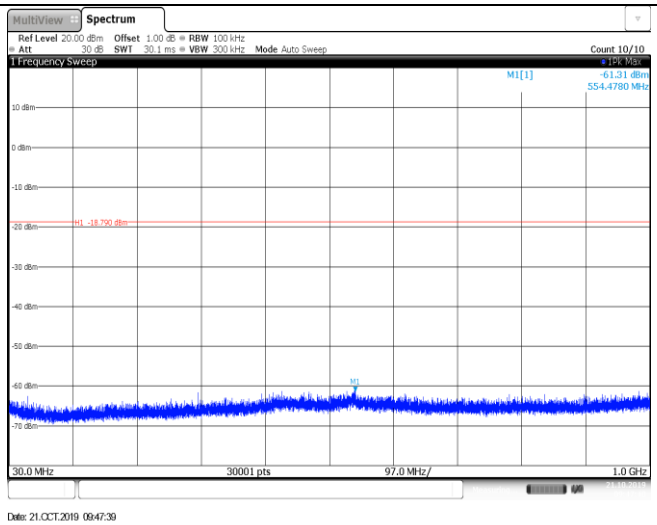
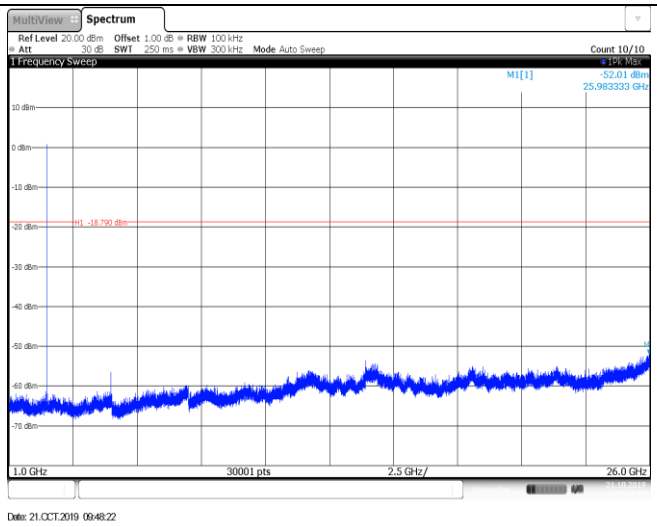
TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Test Item:	Band edge
CH00	
CH39	

Test Item:	SE
CH00 Reference level	
CH00 30MHz~1000MHz	
CH00 1GHz~26GHz	

CH19 Reference level	
CH19 30MHz~1000MHz	
CH19 1GHz~26GHz	

CH39 Reference level	
CH39 30MHz~1000MHz	
CH39 1GHz~26GHz	

5.8. Spurious Emissions (radiated)

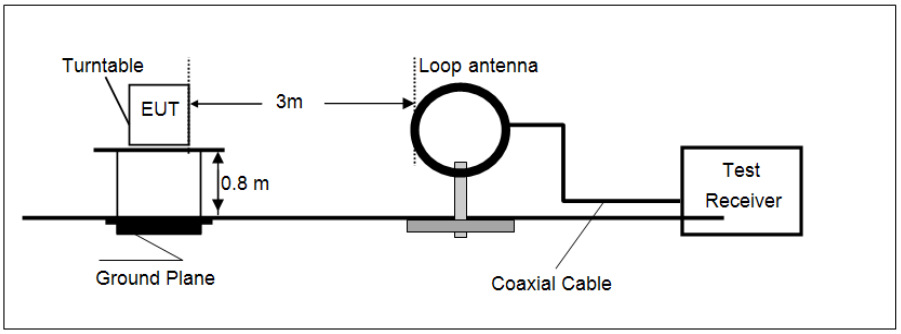
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.209

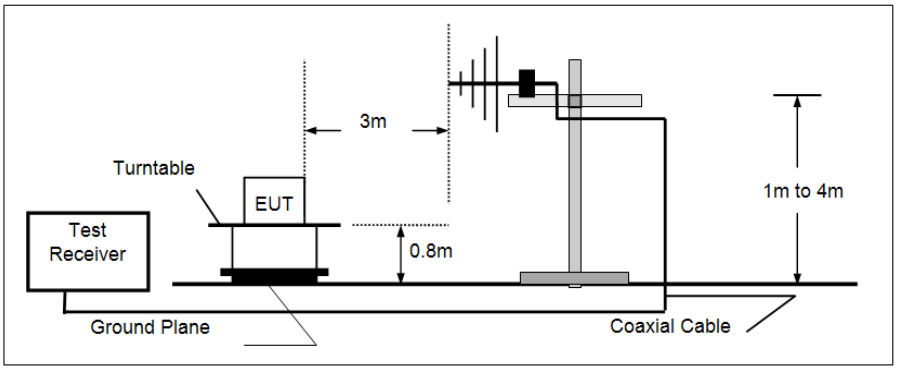
Frequency	Limit (dBuV/m @3m)	Value
30MHz~88MHz	40.00	Quasi-peak
88MHz~216MHz	43.50	Quasi-peak
216MHz~960MHz	46.00	Quasi-peak
960MHz~1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

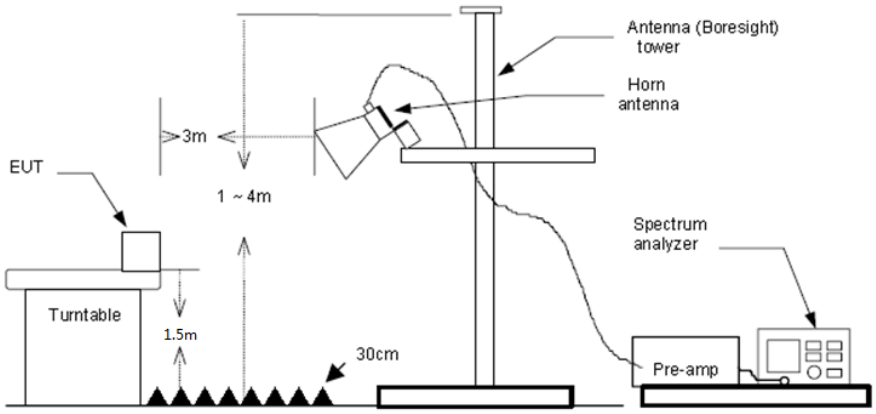
- 9 kHz ~ 30 MHz



- 30 MHz ~ 1 GHz



- Above 1 GHz



TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Below 1 GHz:
   RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
   If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
   (3) From 1 GHz to 10^{th} harmonic:
   RBW=1MHz, VBW=3MHz Peak detector for Peak value.
   RBW=1MHz, VBW=3MHz RMS detector for Average value.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

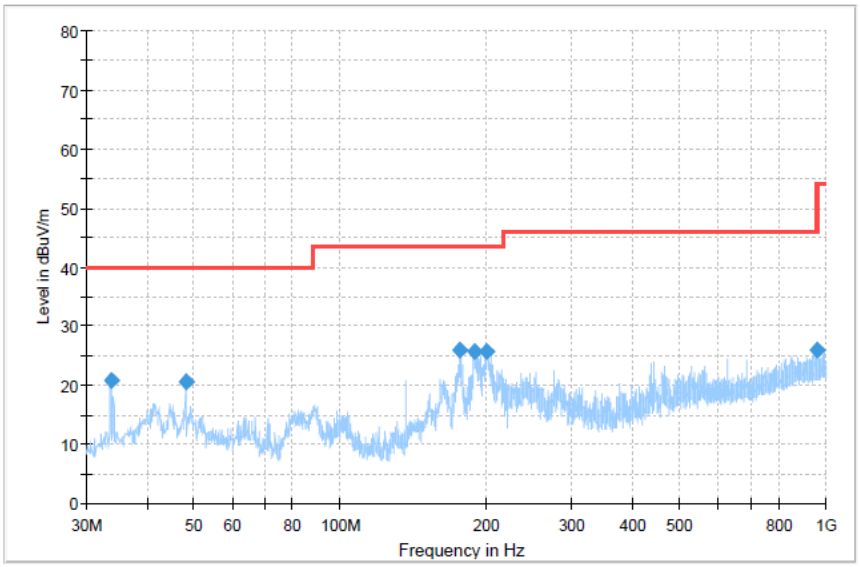
Note:
1) Above 1GHz Final Level =Receiver Read level + Factor
2) The emission levels of other frequencies are very lower than the limit and not show in test report.

- **9 kHz ~ 30 MHz**
  The EUT was pre-scanned the frequency band (9 kHz ~ 30 MHz), found the radiated level lower than the limit, so don't show on the report.

- **30 MHz ~ 1000 MHz**
  Have pre-scan all modulation mode, found the BT-BLE mode CH39 which it was worst case, so only the worst case's data on the test report.

➢ **30 MHz ~ 1 GHz**

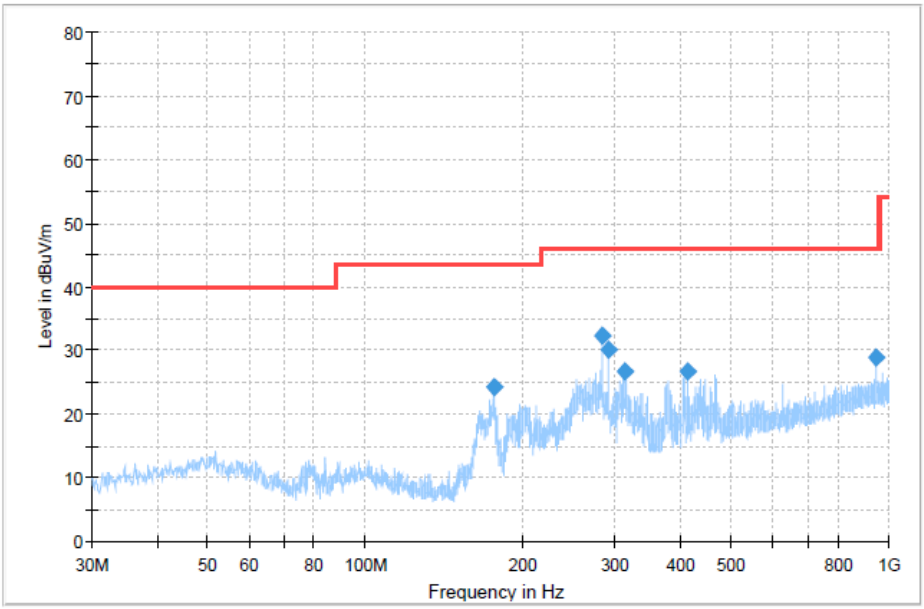
Polarization:	Vertical



Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.758750	20.69	40.00	19.31	100.0	V	156.0	-10.6
48.066250	20.64	40.00	19.36	100.0	V	197.0	-8.2
176.106250	25.96	43.50	17.54	100.0	V	0.0	-11.6
188.837500	25.79	43.50	17.71	100.0	V	0.0	-10.6
200.356250	25.69	43.50	17.81	100.0	V	0.0	-9.2
959.502500	26.05	46.00	19.95	100.0	V	0.0	4.6

Polarization:	Horizontal



Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
175.742500	24.29	43.50	19.21	100.0	H	319.0	-11.6
282.563750	32.36	46.00	13.64	100.0	H	0.0	-7.3
291.657500	30.19	46.00	15.81	100.0	H	0.0	-7.0
313.725000	26.79	46.00	19.21	100.0	H	11.0	-5.9
413.392500	26.55	46.00	19.45	100.0	H	257.0	-2.9
945.316250	28.88	46.00	17.12	100.0	H	0.0	4.5

For 1 GHz ~ 25 GHz

Test channel	CH00	Polarity	Horizontal

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	3192.37	41.56	34.19	4.58	41.88	38.45	74.00	-35.55	Peak
2	5151.68	38.13	34.20	5.85	40.78	37.40	74.00	-36.60	Peak
3	8420.00	36.82	35.80	7.65	40.33	39.94	74.00	-34.06	Peak
4	12429.54	34.57	38.79	9.36	39.79	42.93	74.00	-31.07	Peak

Test channel	CH00	Polarity	Vertical

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	3283.02	41.73	32.87	4.65	41.86	37.39	74.00	-36.61	Peak
2	5925.86	36.90	35.00	6.32	39.94	38.28	74.00	-35.72	Peak
3	7961.43	38.76	35.80	7.52	40.33	41.75	74.00	-32.25	Peak
4	12024.96	34.25	38.71	9.31	40.49	41.78	74.00	-32.22	Peak

Test channel	CH19	Polarity	Horizontal

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	4181.16	42.69	33.56	5.24	41.47	40.02	74.00	-33.98	Peak
2	5821.21	43.96	34.74	6.26	40.38	44.58	74.00	-29.42	Peak
3	9884.60	37.76	37.08	8.27	40.06	43.05	74.00	-30.95	Peak
4	10453.95	37.76	37.47	8.52	39.67	44.08	74.00	-29.92	Peak

Test channel	CH19	Polarity	Vertical

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	3200.50	40.39	34.39	4.59	41.87	37.50	74.00	-36.50	Peak
2	5762.24	39.03	34.59	6.22	40.50	39.34	74.00	-34.66	Peak
3	8904.99	36.64	36.10	8.19	39.87	41.06	74.00	-32.94	Peak
4	12241.14	34.29	38.75	9.34	40.13	42.25	74.00	-31.75	Peak

Test channel	CH39	Polarity	Horizontal

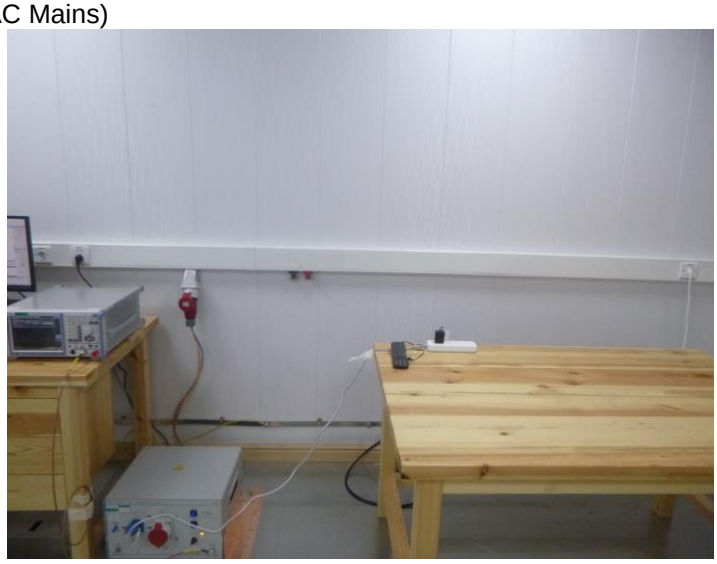
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	3200.50	41.27	34.39	4.59	41.87	38.38	74.00	-35.62	Peak
2	5836.04	38.20	34.77	6.27	40.32	38.92	74.00	-35.08	Peak
3	7319.96	37.06	36.00	7.17	41.02	39.21	74.00	-34.79	Peak
4	11428.08	35.56	38.14	8.94	40.18	42.46	74.00	-31.54	Peak

Test channel	CH39	Polarity	Vertical

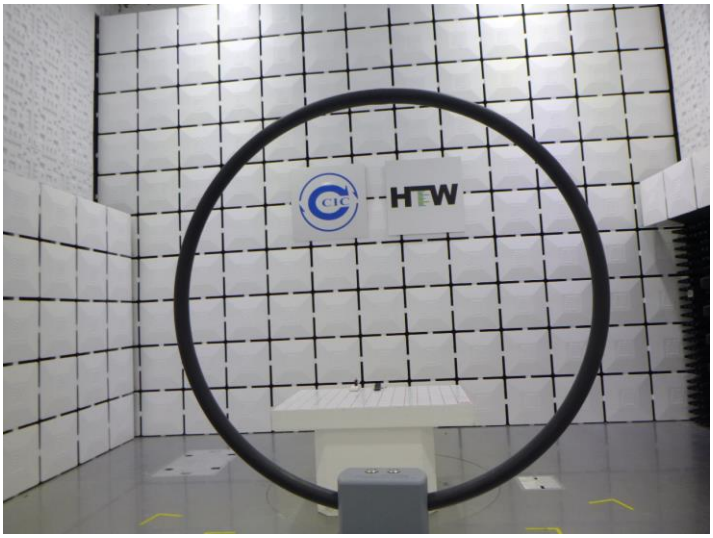
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	3192.37	40.69	34.19	4.58	41.88	37.58	74.00	-36.42	Peak
2	4641.12	38.98	34.10	5.50	41.11	37.47	74.00	-36.53	Peak
3	6992.14	38.03	35.88	6.99	41.09	39.81	74.00	-34.19	Peak
4	10427.37	34.99	37.46	8.52	39.59	41.38	74.00	-32.62	Peak

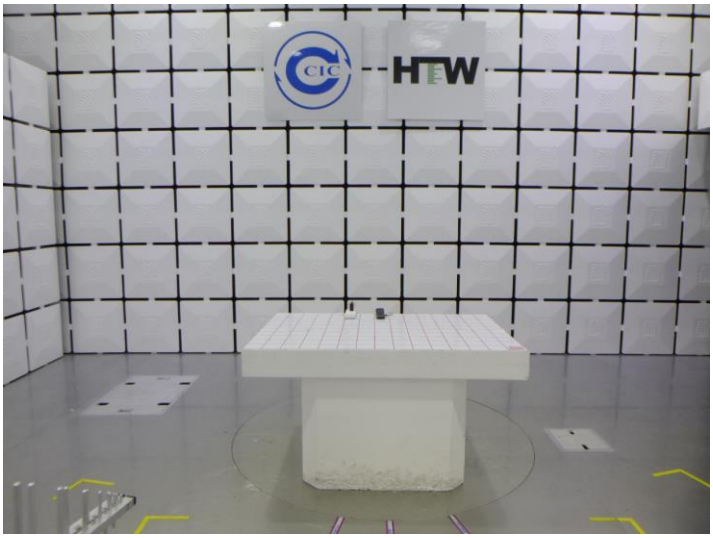
6. TEST SETUP PHOTOS

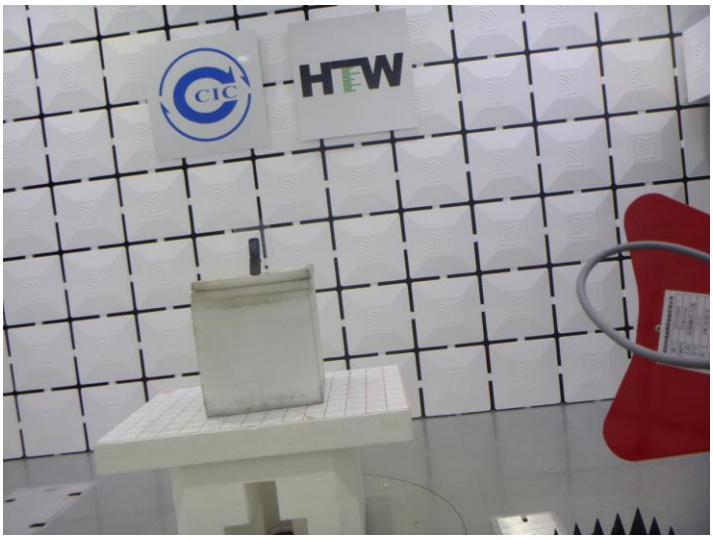
Conducted Emissions (AC Mains)



Radiated Emissions







7. EXTERANAL AND INTERNAL PHOTOS

Reference to the test report No. CHTEW19110021R1

--------End of Report--------