FCC Part 15C Test Report

FCC ID: 2AHP5BLP

Product Name:	**Mobile trolley speaker**
Trademark:	**BLACKMORE**
Model Name :	**BLP-7210BT**
Prepared For : Address :	**Guangzhou Hanxiang Electronic and Technology Co., Ltd.** NO.10, Bangsheng 2 Road, Jinghu Avenue, Xinhua Town, Huadu District, Guangzhou, Guangdong, China.
Prepared By : Address :	**Shenzhen BCTC Technology Co., Ltd.** No.101,Yousong Road,Longhua New District, Shenzhen,China
Test Date:	**Mar. 09 – Mar. 16, 2016**
Date of Report :	**Mar. 16, 2016**
Report No.:	**BCTC-160302250E**

VERIFICATION OF COMPLIANCE

Applicant's name ..... :	**Guangzhou Hanxiang Electronic and Technology Co., Ltd.**
Address..... :	NO.10, Bangsheng 2 Road, Jinghu Avenue, Xinhua Town, Huadu District, Guangzhou, Guangdong, China.
Manufacture's Name..... :	**Guangzhou Hanxiang Electronic and Technology Co., Ltd.**
Address..... :	NO.10, Bangsheng 2 Road, Jinghu Avenue, Xinhua Town, Huadu District, Guangzhou, Guangdong, China.

Product description

Product name.....:	Mobile trolley speaker
Trademark:	BLACKMORE
Model Name:	BLP-7210BT
Test procedure	FCC Part15.249
Standards	ANSI C63.10-2013

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Test Result.....: **Pass**

Testing Engineer : Eric Yang

(Eric Yang)

Technical Manager : Sophie Lee

(Sophia Lee)

Authorized Signatory : Carson. Zhang

SHENZHEN BCTC TECHNOLOGY CO., LTD. APPROVED

(Carson. Zhang)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.249) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.249	Fundamental &Radiated Spurious Emission Measurement	PASS	
15.249	Bandwidth	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen BCTC Technology Co., Ltd.
Add.:No.101,Yousong Road,Longhua New District, Shenzhen,China
FCC Registration No.:187086

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Mobile trolley speaker
Trade Name	BLACKMORE
Model Name	BLP-7210BT
Serial Model	N/A
Model Difference	N/A
Product Description	Operation Frequency: 2402~2480 MHz Modulation Type: GFSK, PI/4 DPSK, 8DPSK Bit Rate of Transmitter 1/2/3M Number Of Channel 79CH Antenna Designation: Please see Note 3. Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Channel List	Please refer to the Note 2.
Power	AC120V/60Hz
Connecting I/O Port(s)	Please refer to the User's Manual
hardware version	--
Software version	--
Serial number	--

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2.

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	11	2413	38	2441
02	2403	12	2414	39	2441
03	2404	13	2415	40	2442
~	~	~	~	~	~
09	2411	19	2421	77	2479
10	2412	20	2422	78	2480

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	PCB Antenna	N/A	0	

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

For Conducted & Radiated Emission		
Final Test Mode	Description	
Mode 1	CH01	GFSK, PI/4 DPSK 8DPSK
Mode 2	CH39	
Mode 3	CH78	
Mode 4	Normal Link	

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) Fully-charged battery is used during the test

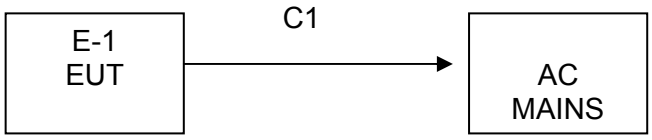
2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Frequency	2402 MHz	2441 MHz	2480 MHz
Channel	Low	Middle	High

2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Emission Test



2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Mobile trolley speaker	BLACKMORE	BLP-7210BT	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C1	NO Shielded	NO	0.8M	AC Line

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	1166.5950K03-101165-ha	2015.06.05	2016.06.05	1 year
2	LISN	R&S	NSLK8126	8126466	2015.08.24	2016.08.23	1 year
3	LISN	R&S	NSLK8126	8126487	2015.08.24	2016.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2015.06.05	2016.06.05	1 year
5	RF cables	R&S	R204	R20X	2015.06.05	2016.06.05	1 year

Radiation test, Band-edge test and 20db bandwith test quipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2015.06.05	2016.06.05	1 year
2	Test Receiver	R&S	ESPI	101318	2015.06.05	2016.06.05	1 year
3	Bilog Antenna	R&S	VULB 9168	VULB9168-438	2015.06.05	2016.06.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.06.05	2016.06.05	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2015.06.05	2016.06.05	1 year
6	Horn Antenna	R&S	HF906	10027	2015.06.05	2016.06.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2015.06.05	2016.06.05	1 year
8	Amplifier	R&S	BBV9743	9743-019	2014.12.22	2015.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2015.06.05	2016.06.05	1 year
10	RF cables	R&S	R203	R20X	2015.06.05	2016.06.05	1 year
11	Antenna connector	Florida RFLabs	Lab-Fle	RF 01#	2015.06.05	2016.06.05	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quas -peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

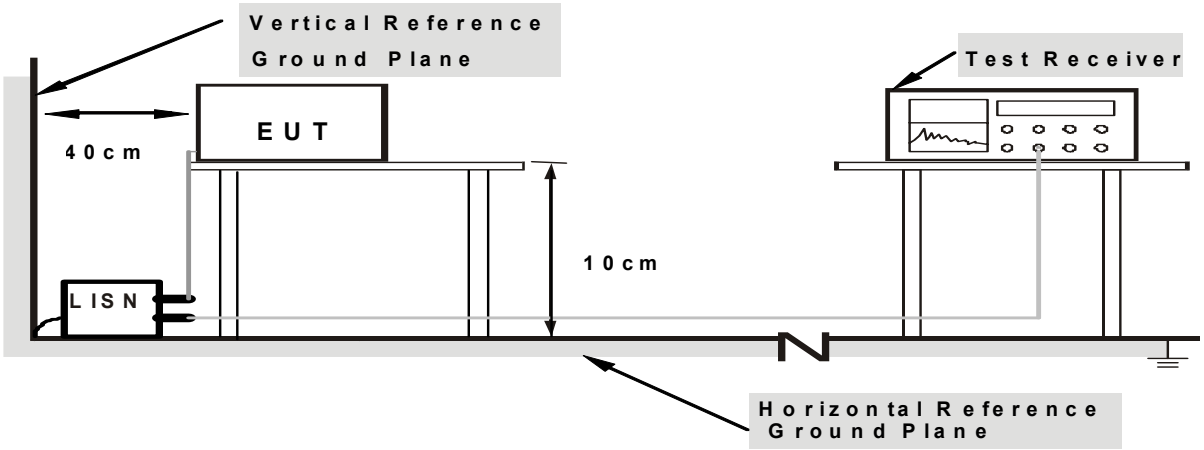
3.1.2 TEST PROCEDURE

a. The EUT was placed 0.1 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

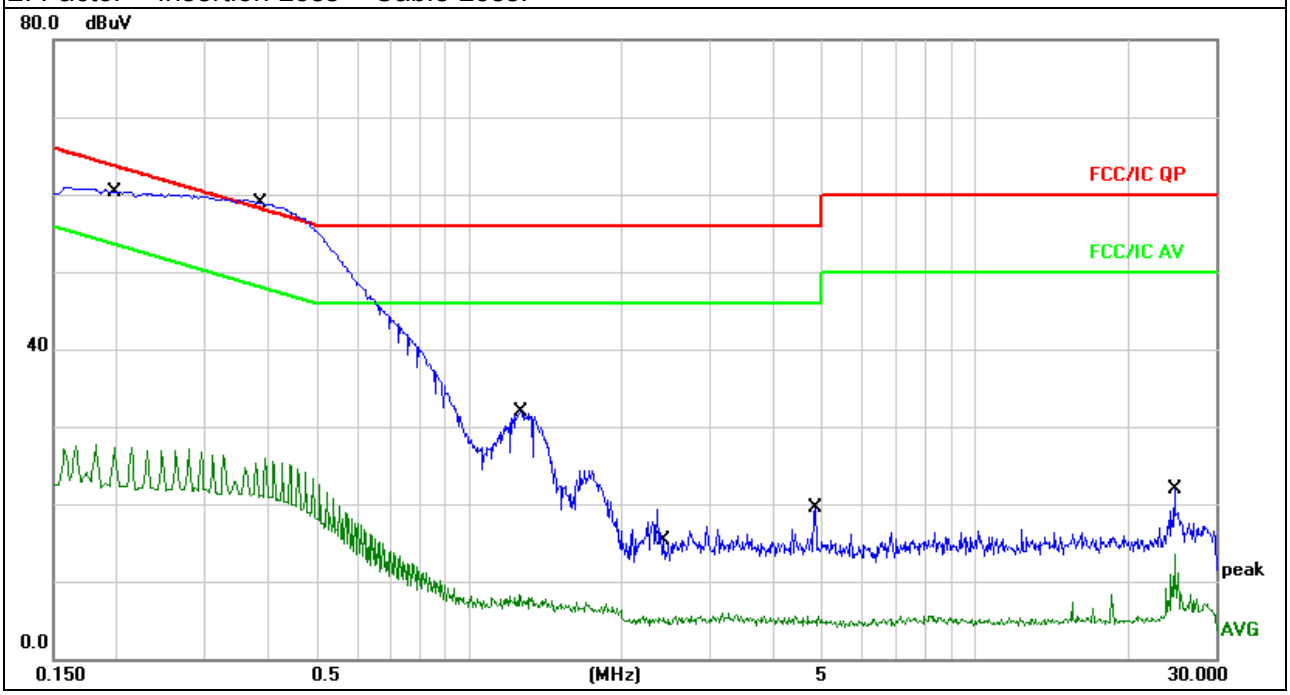
We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

3.1.6 TEST RESULTS

EUT：	Mobile trolley speaker	Model Name. ：	BLP-7210BT
Temperature：	26℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	AC120V/60Hz	Test Mode：	Mode 4

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1980	50.31	10.06	60.37	63.69	-3.32	QP
0.1980	17.16	10.06	27.22	53.69	-26.47	AVG
0.3860	43.00	10.10	53.10	58.15	-5.05	QP
0.3860	15.78	10.10	25.88	48.15	-22.27	AVG
1.2500	21.68	10.17	31.85	56.00	-24.15	QP
1.2500	-1.91	10.17	8.26	46.00	-37.74	AVG
2.4260	4.60	10.18	14.78	56.00	-41.22	QP
2.4260	-4.85	10.18	5.33	46.00	-40.67	AVG
4.8220	8.75	10.15	18.90	56.00	-37.10	QP
4.8220	-4.58	10.15	5.57	46.00	-40.43	AVG
24.8819	8.74	10.20	18.94	60.00	-41.06	QP
24.8819	3.26	10.20	13.46	50.00	-36.54	AVG

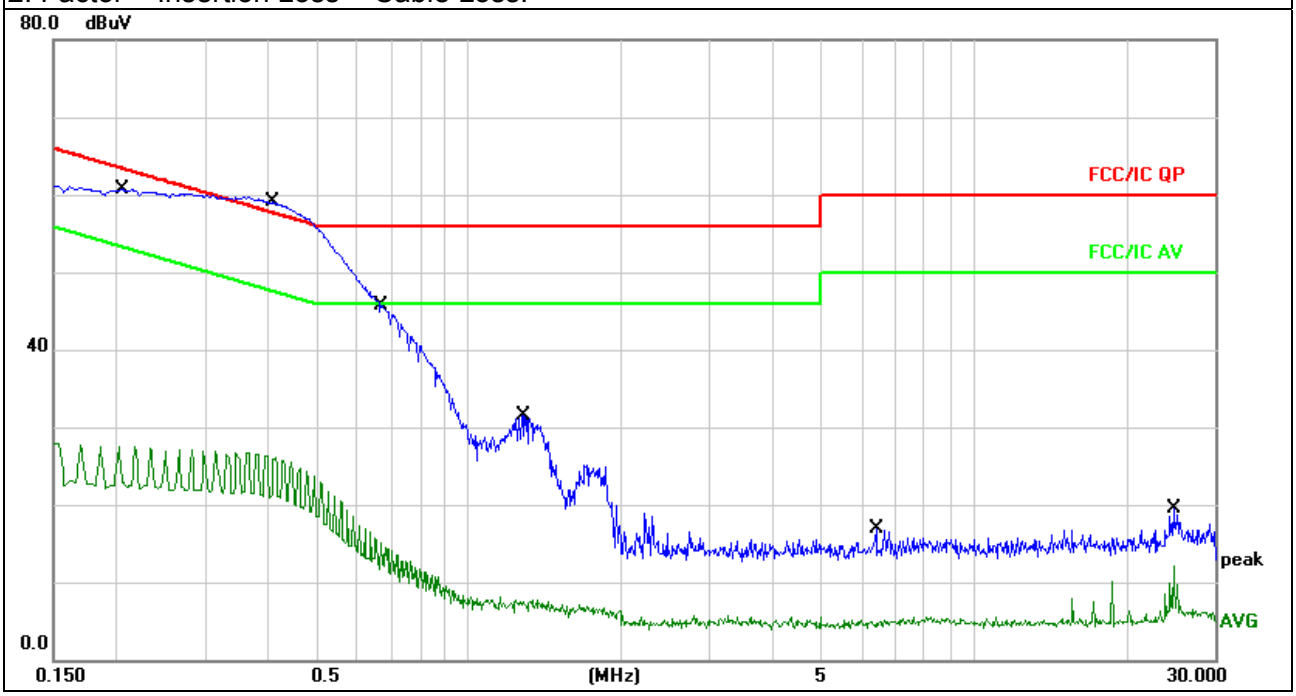
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Mobile trolley speaker	Model Name. ：	BLP-7210BT
Temperature：	26℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	AC120V/60Hz	Test Mode：	Mode 4

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.2060	49.57	10.07	59.64	63.36	-3.72	QP
0.2060	12.77	10.07	22.84	53.36	-30.52	AVG
0.4100	42.94	10.11	53.05	57.65	-4.60	QP
0.4100	15.74	10.11	25.85	47.65	-21.80	AVG
0.6820	35.12	10.13	45.25	56.00	-10.75	QP
0.6820	4.35	10.13	14.48	46.00	-31.52	AVG
1.2780	21.35	10.17	31.52	56.00	-24.48	QP
1.2780	-2.81	10.17	7.36	46.00	-38.64	AVG
6.4140	6.84	10.09	16.93	60.00	-43.07	QP
6.4140	-5.79	10.09	4.30	50.00	-45.70	AVG
24.8779	9.38	10.20	19.58	60.00	-40.42	QP
24.8779	-3.56	10.20	6.64	50.00	-43.36	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

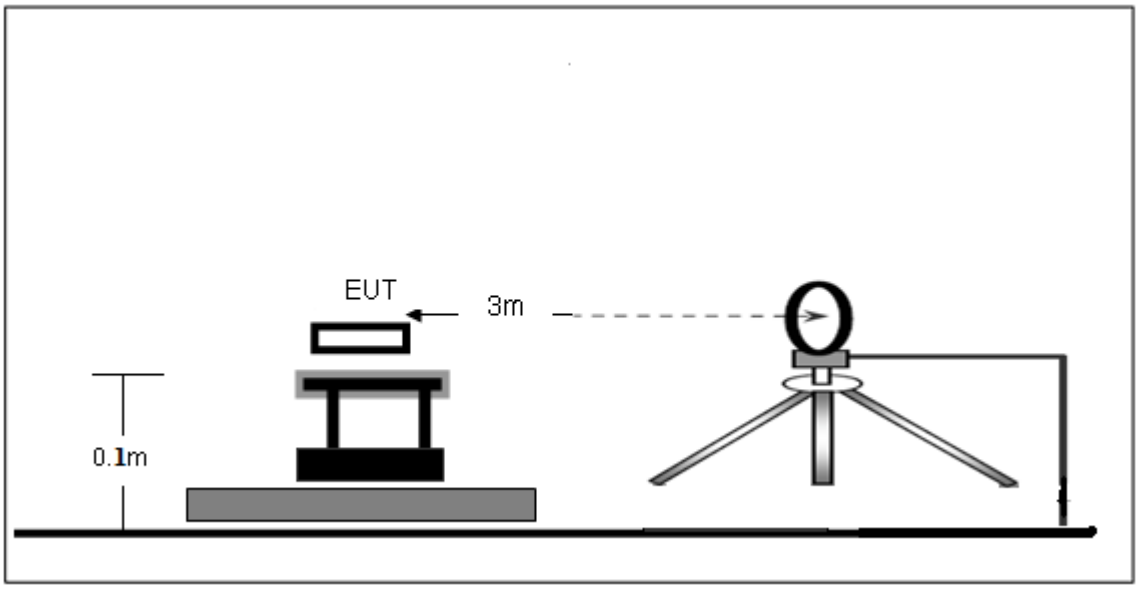
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.1 meters above the ground at a 3 meter chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.1 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.
g. For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
Note:
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

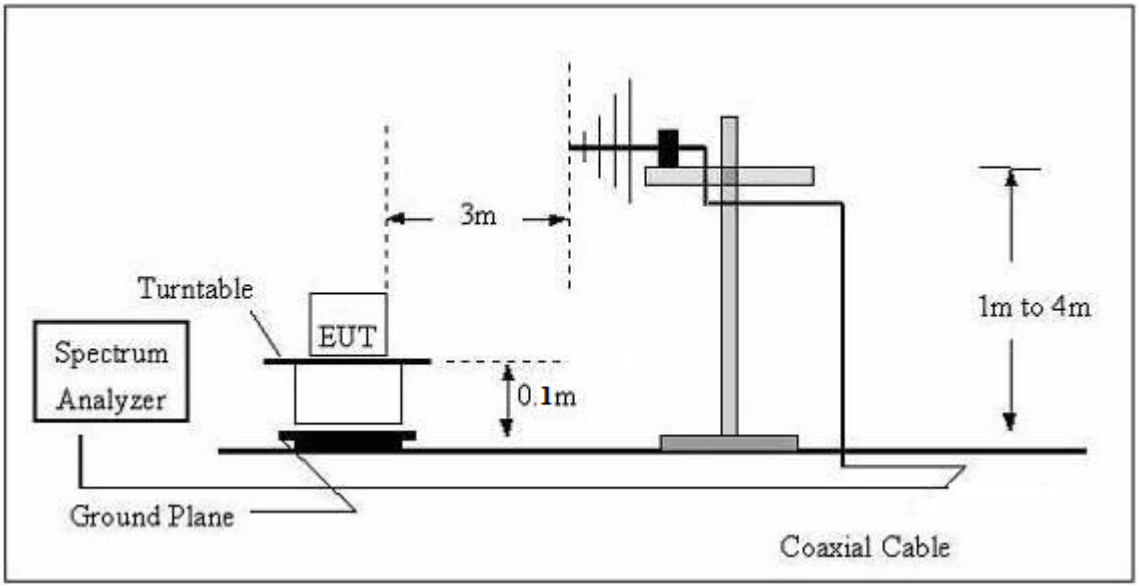
No deviation

3.2.4 TEST SETUP

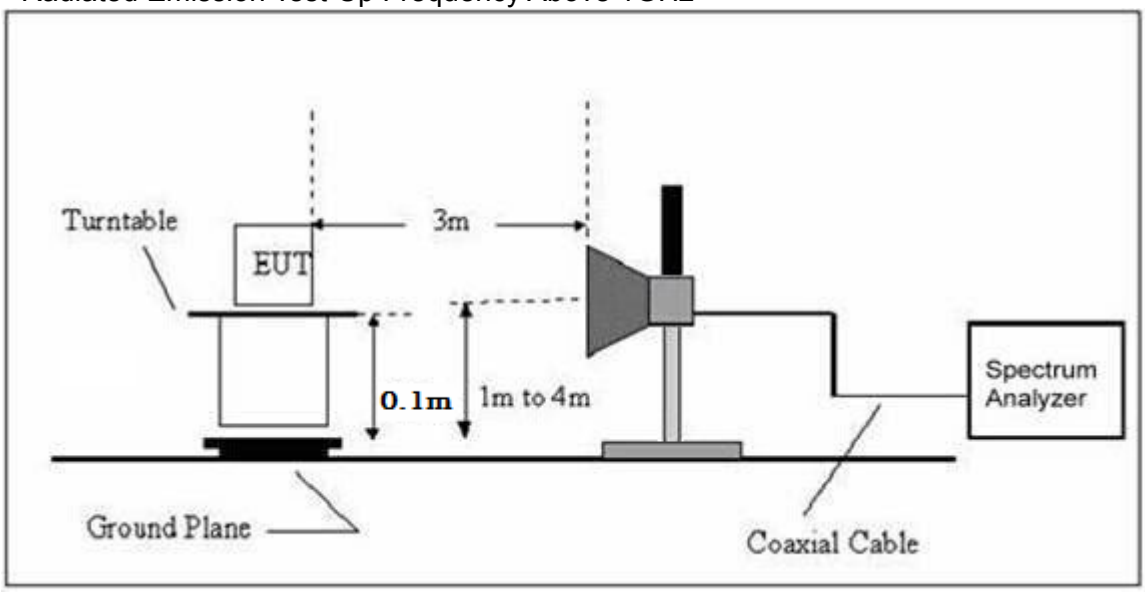
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS

Radiated Spurious Emission (Below 30MHz)

EUT：	Mobile trolley speaker	Model Name ：	BLP-7210BT
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Polarization :	---
Test Voltage ：	DC12V		
Test Mode ：	Normal Link		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

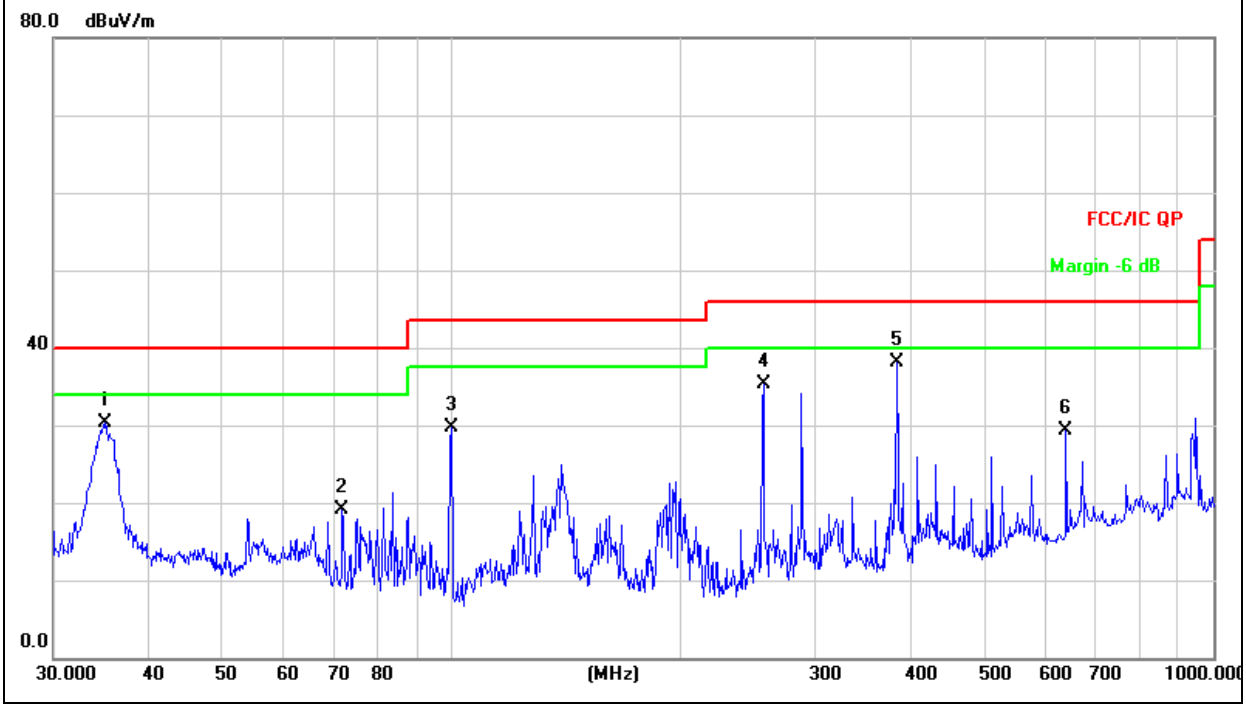
Radiated Spurious Emission (Between 30MHz – 1GHz)

We pretest AC 120V and DC12V, the worst voltage was AC 120V and the data recording in the report.

EUT：	Mobile trolley speaker	Model Name ：	BLP-7210BT
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Horizontal
Test Voltage ：	AC120V/60Hz		
Test Mode ： (Worst)	Normal Link		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
35.1278	38.80	-8.51	30.29	40.00	-9.71	QP
71.8320	34.22	-15.19	19.03	40.00	-20.97	QP
99.8777	46.13	-16.49	29.64	43.50	-13.86	QP
256.5211	49.23	-14.01	35.22	46.00	-10.78	QP
383.9318	48.58	-10.57	38.01	46.00	-7.99	QP
640.6110	34.61	-5.25	29.36	46.00	-16.64	QP

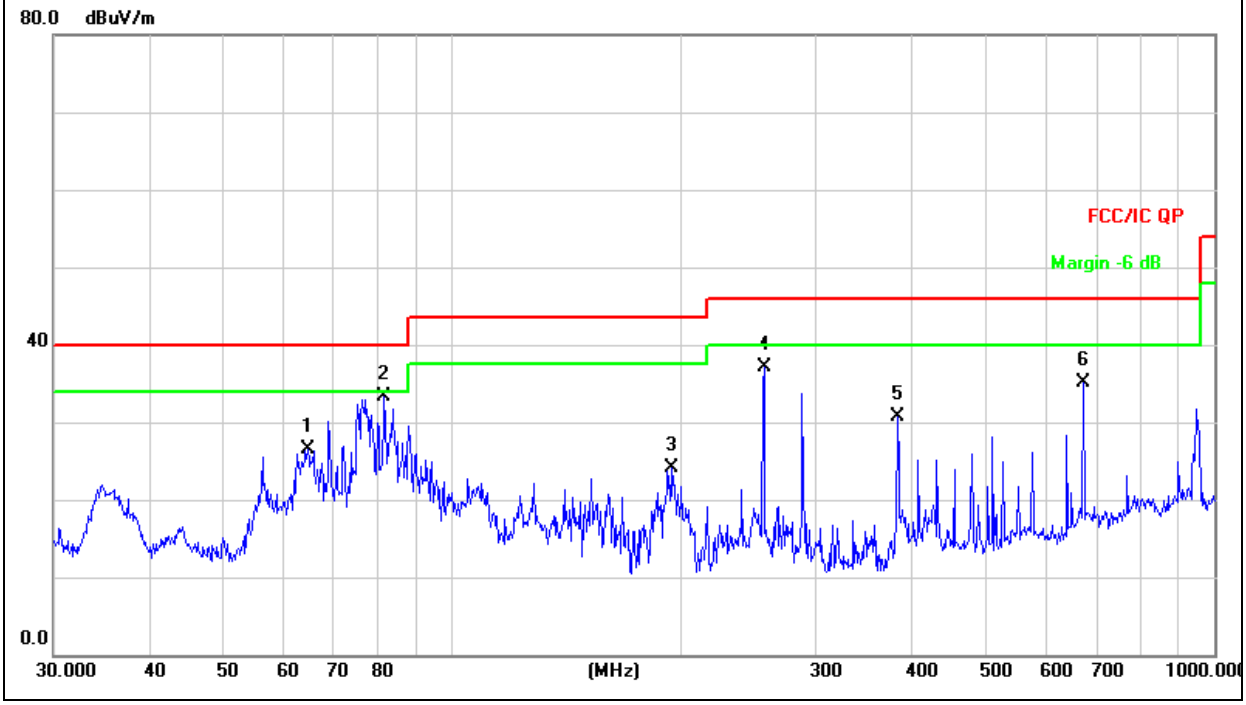
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
All interfaces was connected, and BT TX mode was link.



EUT：	Mobile trolley speaker	Model Name ：	BLP-7210BT
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Vertical
Test Voltage ：	AC120V/60Hz		
Test Mode ： (Worst)	Normal Link		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
64.6594	38.86	-12.45	26.41	40.00	-13.59	QP
81.4970	51.50	-18.11	33.39	40.00	-6.61	QP
193.7728	39.82	-15.81	24.01	43.50	-19.49	QP
256.5211	51.03	-14.01	37.02	46.00	-8.98	QP
383.9318	41.31	-10.57	30.74	46.00	-15.26	QP
672.8444	39.92	-4.80	35.12	46.00	-10.88	QP

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
All interfaces was connected, and BT TX mode was link.



Radiated Spurious Emission (1GHz to 10th harmonics)
GFSK

	Freq.	Receiver Reading	Detector	Polar	Corrected Factor	Emission Level	Limit	Result
	(MHz)	(dBμV)	(PK/QP/Ave)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	
Lower Channel 2402MHz	2402.00	102.65	PK	H	1.31	103.96	114.00	Pass
	2402.00	88.25	Ave	H	1.31	89.56	94.00	Pass
	4804.00	55.52	PK	H	-1.06	54.46	74.00	Pass
	4804.00	45.57	Ave	H	-1.06	44.51	54.00	Pass
	2402.00	102.36	PK	V	1.31	103.67	114.00	Pass
	2402.00	88.75	Ave	V	1.31	90.06	94.00	Pass
	4804.00	54.68	PK	V	-1.06	53.62	74.00	Pass
	4804.00	45.37	Ave	V	-1.06	44.31	54.00	Pass
Middle Channel 2441MHz	2441.00	102.77	PK	H	0.85	103.62	114.00	Pass
	2441.00	88.32	Ave	H	0.85	89.17	94.00	Pass
	4880.00	57.23	PK	H	-0.62	56.61	74.00	Pass
	4880.00	48.33	Ave	H	-0.62	47.71	54.00	Pass
	2441.00	103.22	PK	V	0.85	104.07	114.00	Pass
	2441.00	87.27	Ave	V	0.85	88.12	94.00	Pass
	4880.00	56.86	PK	V	-0.62	56.24	74.00	Pass
	4880.00	48.04	Ave	V	-0.62	47.42	54.00	Pass
Upper Channel 2480MHz	2480.00	103.61	PK	H	0.53	104.14	114.00	Pass
	2480.00	87.87	Ave	H	0.53	88.4	94.00	Pass
	4960.00	57.52	PK	H	-0.24	57.28	74.00	Pass
	4960.00	48.63	Ave	H	-0.24	48.39	54.00	Pass
	2480.00	103.24	PK	V	0.53	103.77	114.00	Pass
	2480.00	88.24	Ave	V	0.53	88.77	94.00	Pass
	4960.00	57.28	PK	V	-0.24	57.04	74.00	Pass
	4960.00	47.32	Ave	V	-0.24	47.08	54.00	Pass

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Meter Reading + Factor
Margin = Emission Level - Limit
Other harmonics emissions are lower than 20dB below the allowable limit.

PI/4 DPSK

	Freq. (MHz)	Receiver Reading (dBμV)	Detector (PK/QP/Ave)	Polar (H/V)	Corrected Factor (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Result
Lower Channel 2402MHz	2402.00	101.59	PK	H	1.31	102.90	114.00	Pass
	2402.00	87.59	Ave	H	1.31	88.90	94.00	Pass
	4804.00	56.84	PK	H	-1.06	55.78	74.00	Pass
	4804.00	48.00	Ave	H	-1.06	46.94	54.00	Pass
	2402.00	100.52	PK	V	1.31	101.83	114.00	Pass
	2402.00	86.88	Ave	V	1.31	88.19	94.00	Pass
	4804.00	57.84	PK	V	-1.06	56.78	74.00	Pass
	4804.00	46.52	Ave	V	-1.06	45.46	54.00	Pass
Middle Channel 2441MHz	2441.00	101.45	PK	H	0.85	102.30	114.00	Pass
	2441.00	87.13	Ave	H	0.85	87.98	94.00	Pass
	4882.00	53.72	PK	H	-0.62	53.10	74.00	Pass
	4882.00	43.05	Ave	H	-0.62	42.43	54.00	Pass
	2441.00	101.36	PK	V	0.85	102.21	114.00	Pass
	2441.00	86.52	Ave	V	0.85	87.37	94.00	Pass
	4882.00	54.61	PK	V	-0.62	53.99	74.00	Pass
	4882.00	44.10	Ave	V	-0.62	43.48	54.00	Pass
Upper Channel 2480MHz	2480.00	101.66	PK	H	0.53	102.19	114.00	Pass
	2480.00	87.20	Ave	H	0.53	87.73	94.00	Pass
	4960.00	51.87	PK	H	-0.24	51.63	74.00	Pass
	4960.00	42.95	Ave	H	-0.24	42.71	54.00	Pass
	2480.00	100.81	PK	V	0.53	101.34	114.00	Pass
	2480.00	86.49	Ave	V	0.53	87.02	94.00	Pass
	4960.00	54.02	PK	V	-0.24	53.78	74.00	Pass
	4960.00	43.15	Ave	V	-0.24	42.91	54.00	Pass

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Meter Reading + Factor
Margin = Emission Level - Limit
Other harmonics emissions are lower than 20dB below the allowable limit.

8DPSK

	Freq.	Receiver Reading	Detector	Polar	Corrected Factor	Emission Level	Limit	Result
	(MHz)	(dBμV)	(PK/QP/Ave)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	
Lower Channel 2402MHz	2402.00	102.33	PK	H	1.31	103.64	114.00	Pass
	2402.00	88.23	Ave	H	1.31	89.54	94.00	Pass
	4804.00	57.25	PK	H	-1.06	56.19	74.00	Pass
	4804.00	48.34	Ave	H	-1.06	47.28	54.00	Pass
	2402.00	101.26	PK	V	1.31	102.57	114.00	Pass
	2402.00	87.51	Ave	V	1.31	88.82	94.00	Pass
	4804.00	58.26	PK	V	-1.06	57.20	74.00	Pass
	4804.00	46.86	Ave	V	-1.06	45.80	54.00	Pass
Middle Channel 2441MHz	2441.00	102.18	PK	H	0.85	103.03	114.00	Pass
	2441.00	87.76	Ave	H	0.85	88.61	94.00	Pass
	4882.00	54.11	PK	H	-0.62	53.49	74.00	Pass
	4882.00	43.35	Ave	H	-0.62	42.73	54.00	Pass
	2441.00	102.09	PK	V	0.85	102.94	114.00	Pass
	2441.00	87.15	Ave	V	0.85	88.00	94.00	Pass
	4882.00	55.01	PK	V	-0.62	54.39	74.00	Pass
	4882.00	44.42	Ave	V	-0.62	43.80	54.00	Pass
Upper Channel 2480MHz	2480.00	102.40	PK	H	0.53	102.93	114.00	Pass
	2480.00	87.84	Ave	H	0.53	88.37	94.00	Pass
	4960.00	52.24	PK	H	-0.24	52.00	74.00	Pass
	4960.00	43.25	Ave	H	-0.24	43.01	54.00	Pass
	2480.00	101.55	PK	V	0.53	102.08	114.00	Pass
	2480.00	87.12	Ave	V	0.53	87.65	94.00	Pass
	4960.00	54.42	PK	V	-0.24	54.18	74.00	Pass
	4960.00	43.46	Ave	V	-0.24	43.22	54.00	Pass

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Meter Reading + Factor
Margin = Emission Level - Limit
Other harmonics emissions are lower than 20dB below the allowable limit.

4. BANDWIDTH TEST

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.249) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.249	Bandwidth	(20dB bandwidth)	2400-2483.5	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	100KHz
VB	≥RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

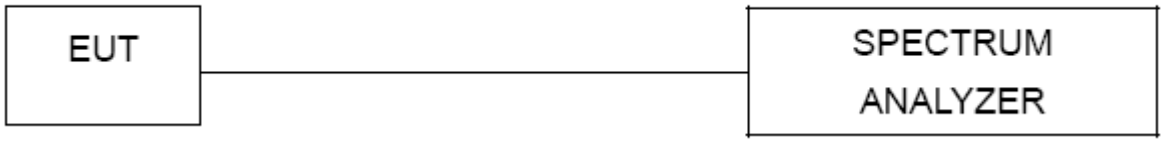
4.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW≥ RBW, Sweep time = Auto.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

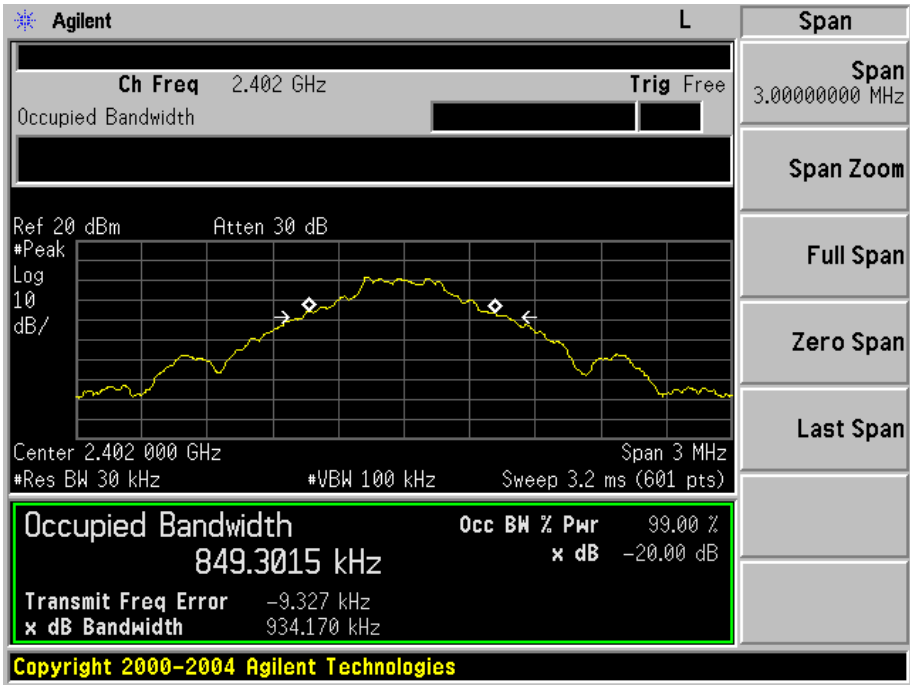
4.1.5 TEST RESULTS

EUT：	Mobile trolley speaker	Model Name ：	BLP-7210BT
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	AC120V/60Hz
Test Mode ：	CH01 / CH20 /CH78		

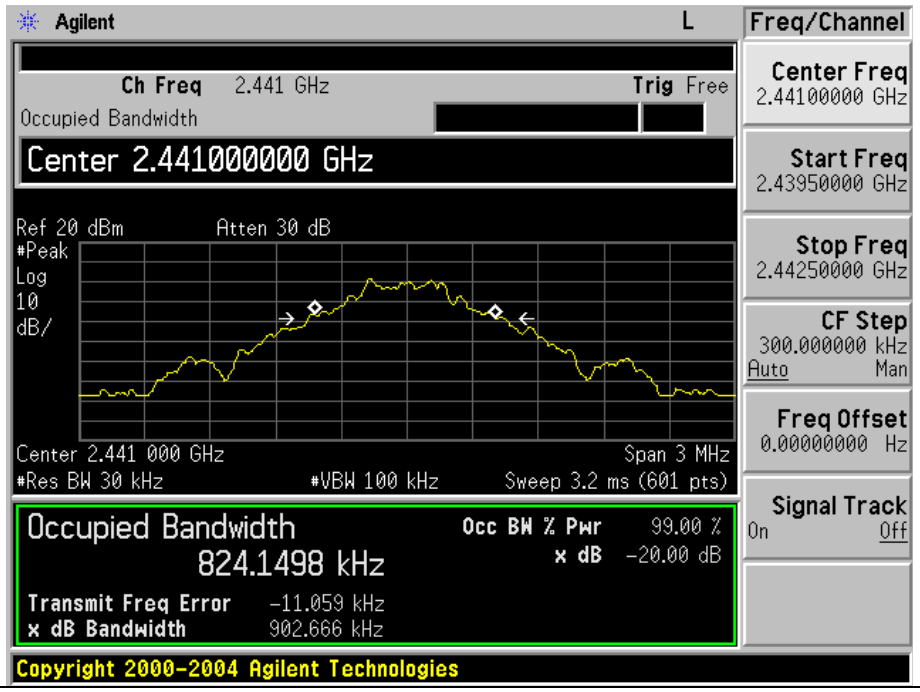
	Frequency	20dB Bandwidth (MHz)	Result
GFSK	2402 MHz	0.934	**PASS**
	2441 MHz	0.903	**PASS**
	2480 MHz	0.903	**PASS**
PI/4 DPSK	2402 MHz	1.119	**PASS**
	2441 MHz	1.157	**PASS**
	2480 MHz	1.119	**PASS**
8DPSK	2402 MHz	1.297	**PASS**
	2441 MHz	1.297	**PASS**
	2480 MHz	1.296	**PASS**

GFSK

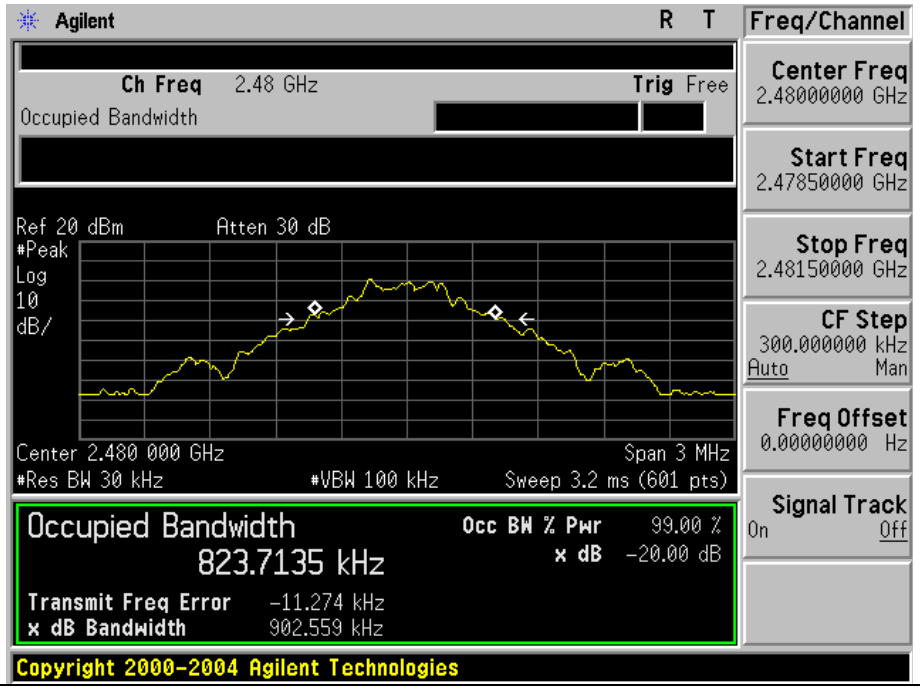
CH01



CH20

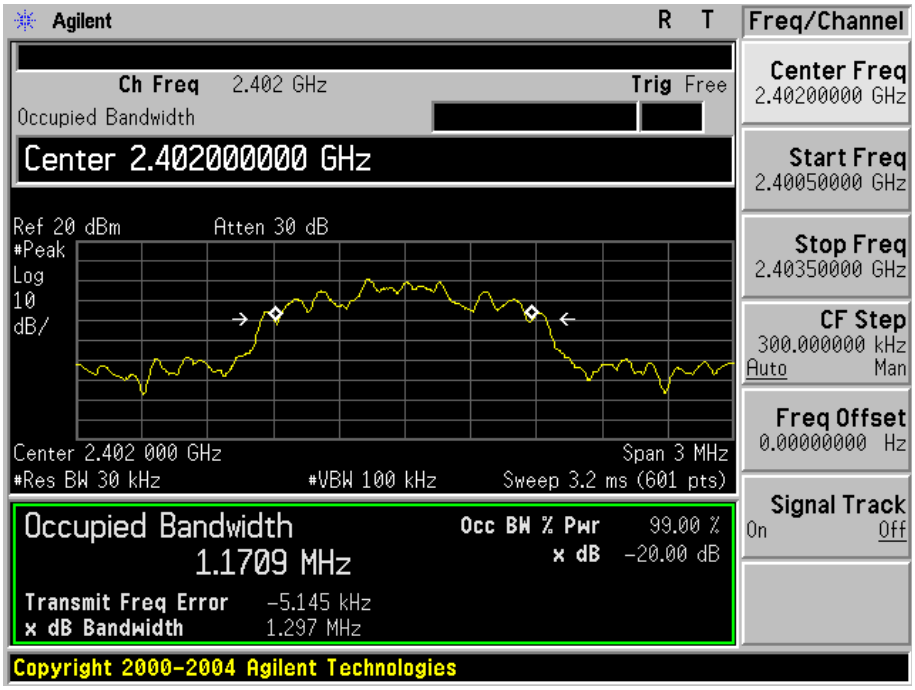

Agilent
L
Freq/Channel
Ch Freq 2.441 GHz
Trig Free
Occupied Bandwidth
Center 2.441000000 GHz
Center Freq
2.44100000 GHz
Start Freq
2.43950000 GHz
Stop Freq
2.44250000 GHz
CF Step
300.000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Center 2.441 000 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 3.2 ms (601 pts)
Occupied Bandwidth
824.1498 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error -11.059 kHz
x dB Bandwidth 902.666 kHz
Copyright 2000-2004 Agilent Technologies

CH78

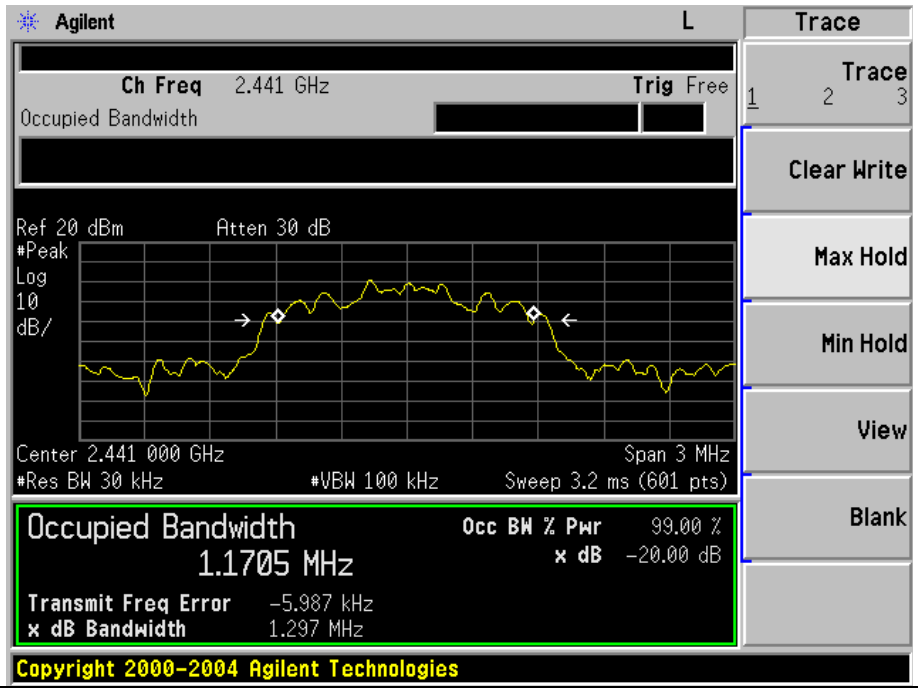

Agilent
R T
Freq/Channel
Ch Freq 2.48 GHz
Trig Free
Occupied Bandwidth
Center Freq
2.48000000 GHz
Start Freq
2.47850000 GHz
Stop Freq
2.48150000 GHz
CF Step
300.000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Center 2.480 000 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 3.2 ms (601 pts)
Occupied Bandwidth
823.7135 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error -11.274 kHz
x dB Bandwidth 902.559 kHz
Copyright 2000-2004 Agilent Technologies

8DPSK

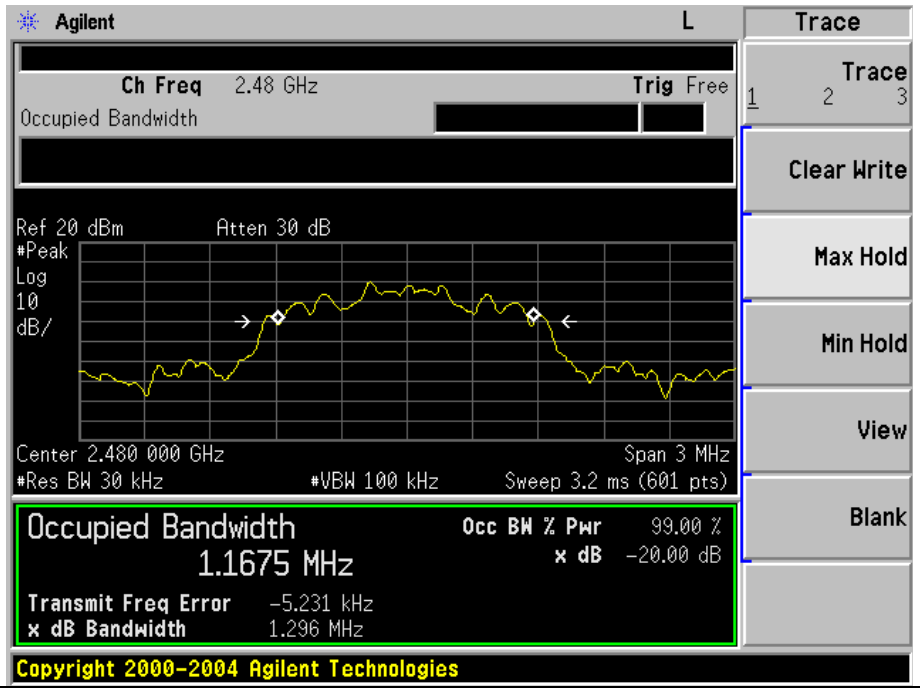
CH01



CH20



CH78


Agilent
L
Trace
Ch Freq 2.48 GHz
Trig Free
Occupied Bandwidth
Trace
1 2 3
Clear Write
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Max Hold
Min Hold
View
Center 2.480 000 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 3.2 ms (601 pts)
Blank
Occupied Bandwidth
1.1675 MHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error -5.231 kHz
x dB Bandwidth 1.296 MHz
Copyright 2000-2004 Agilent Technologies

5. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

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

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.1 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.1 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.
g. For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
Note:
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

5.1 DEVIATION FROM STANDARD

No deviation.

5.2 EUT OPERATION CONDITIONS

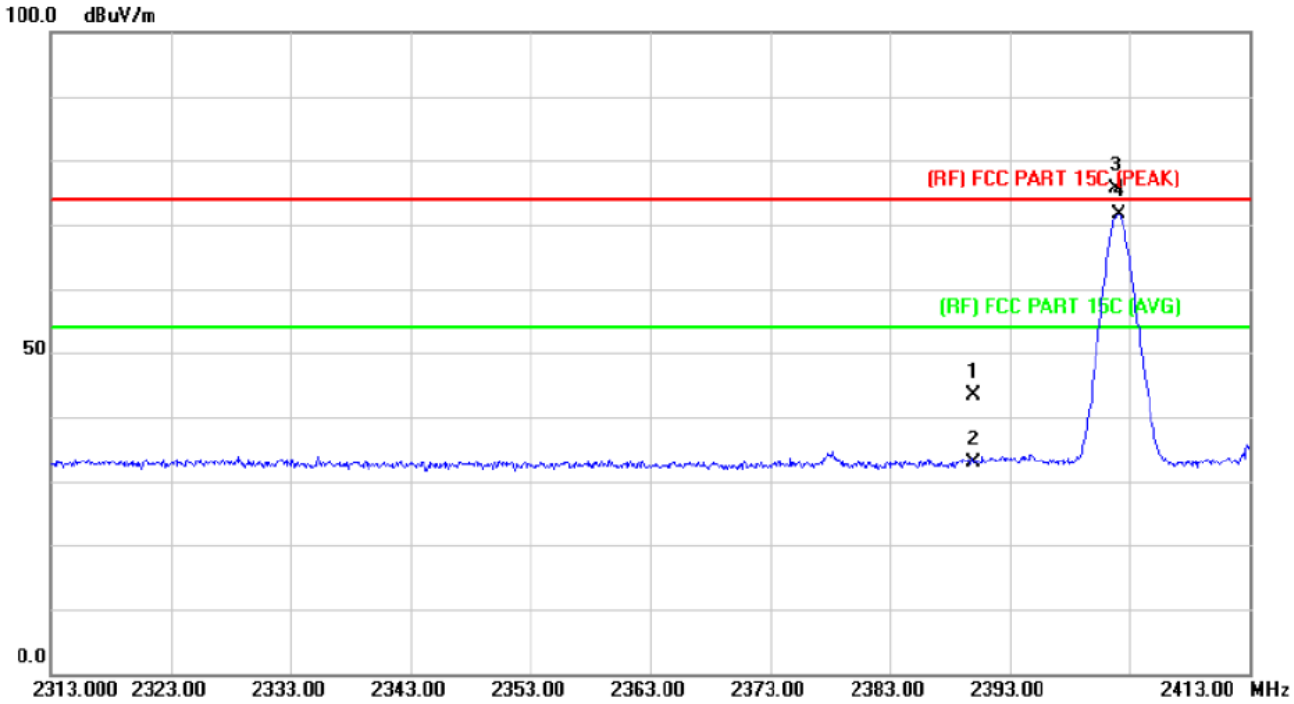
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.3 TEST RESULTS

EUT：	**Mobile trolley speaker**	Model Name ：	**BLP-7210BT**
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	AC120V/60Hz
Test Mode ：	CH01/ CH78		

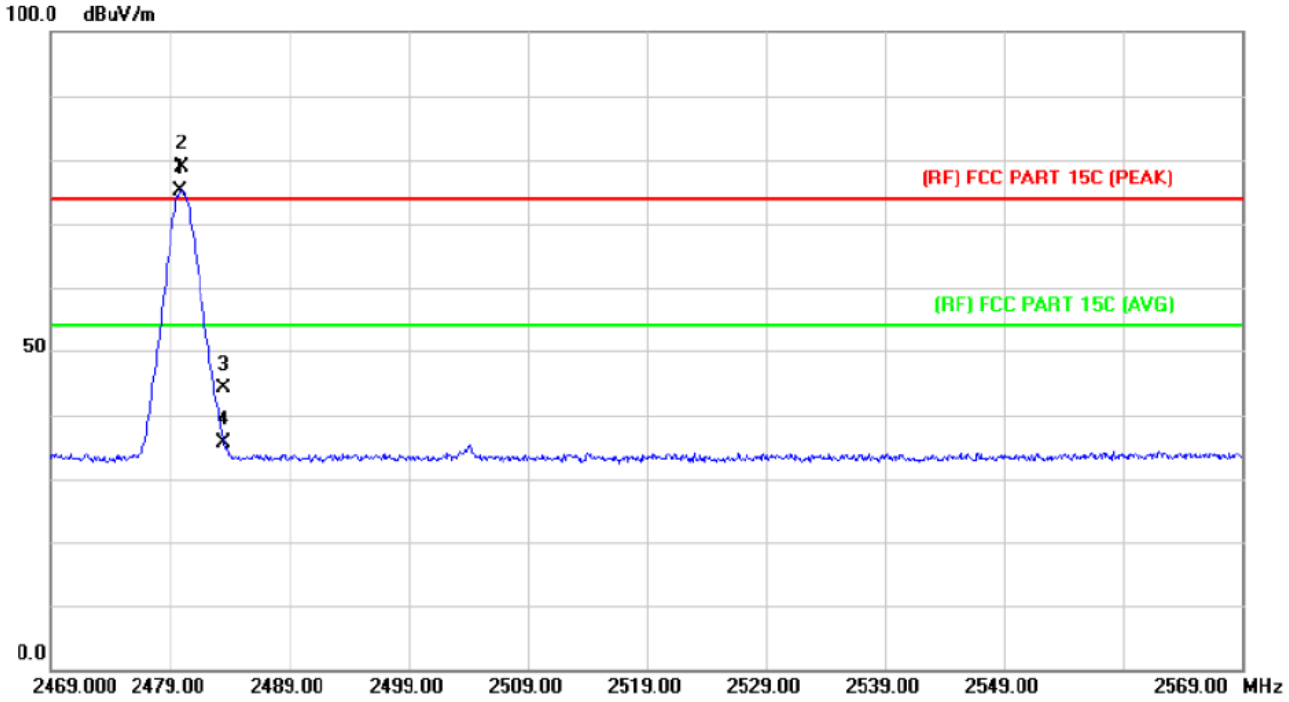
The worst mode was unhopping for GFSK.

GFSK:



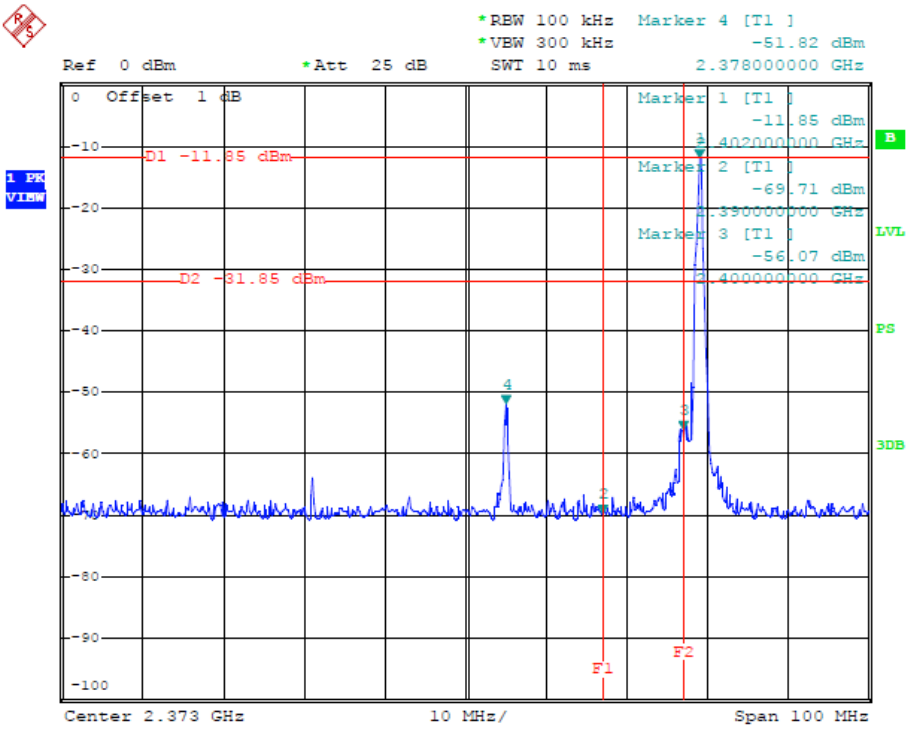
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	42.70	0.77	43.47	74.00	-30.53	peak
2		2390.000	32.13	0.77	32.90	54.00	-21.10	AVG
3	X	2401.900	74.86	0.82	75.68	Fundamental Frequency		peak
4	*	2402.100	70.70	0.82	71.52	Fundamental Frequency		AVG

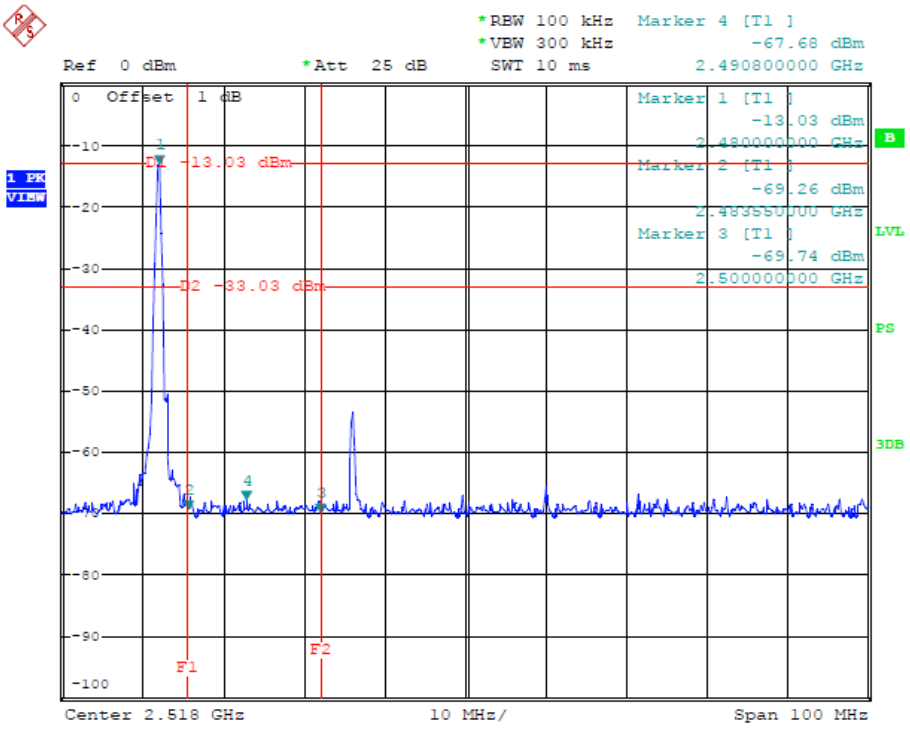
Emission Level= Read Level+ Correct Factor



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2479.900	73.98	1.15	75.13	Fundamental Frequency		AVG
2	X	2480.000	77.80	1.15	78.95	Fundamental Frequency		peak
3		2483.500	42.85	1.17	44.02	74.00	-29.98	peak
4		2483.500	34.49	1.17	35.66	54.00	-18.34	AVG

Emission Level= Read Level+ Correct Factor


*RBW 100 kHz
*VBW 300 kHz
SWT 10 ms
Marker 4 [T1]
-51.82 dBm
2.378000000 GHz
Ref 0 dBm
*Att 25 dB
0 Offset 1 dB
Marker 1 [T1]
-11.85 dBm
2.402000000 GHz
Marker 2 [T1]
-69.71 dBm
2.390000000 GHz
Marker 3 [T1]
-56.07 dBm
2.400000000 GHz
D1 -11.85 dBm
D2 -31.85 dBm
1 PK VIEW
B
LVL
PS
3DB
F1
F2
Center 2.373 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 300 kHz
SWT 10 ms
Marker 4 [T1]
-67.68 dBm
2.490800000 GHz
Ref 0 dBm
*Att 25 dB
0 Offset 1 dB
Marker 1 [T1]
-13.03 dBm
2.480000000 GHz
Marker 2 [T1]
-69.26 dBm
2.483550000 GHz
Marker 3 [T1]
-69.74 dBm
2.500000000 GHz
D1 -13.03 dBm
D2 -33.03 dBm
1 PK VIEW
B
LVL
PS
3DB
F1
F2
Center 2.518 GHz
10 MHz/
Span 100 MHz

6. ANTENNA REQUIREMENT

6.1 STANDARD REQUIREMENT

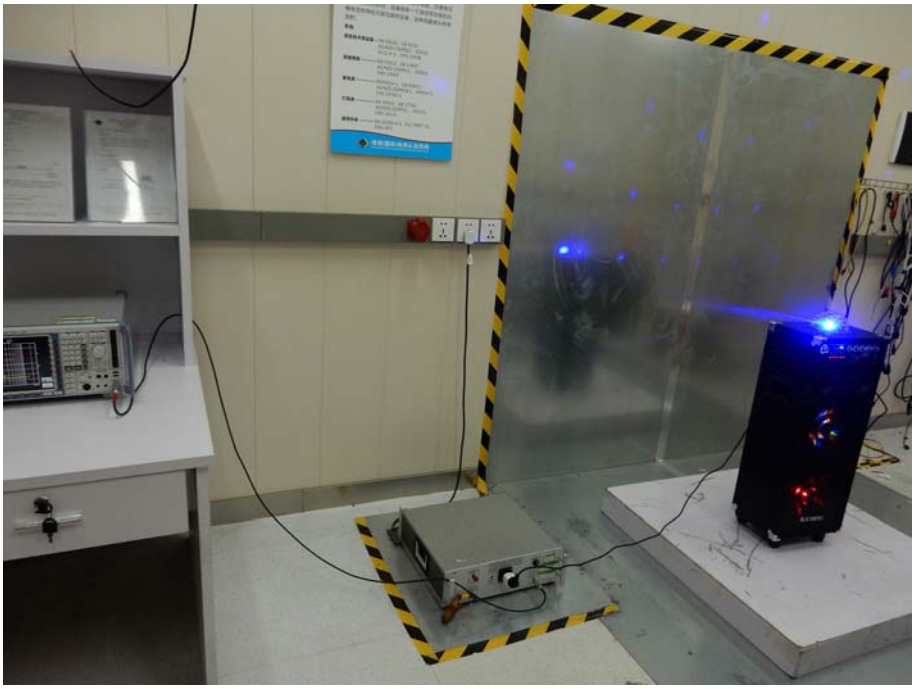
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

6.2 EUT ANTENNA

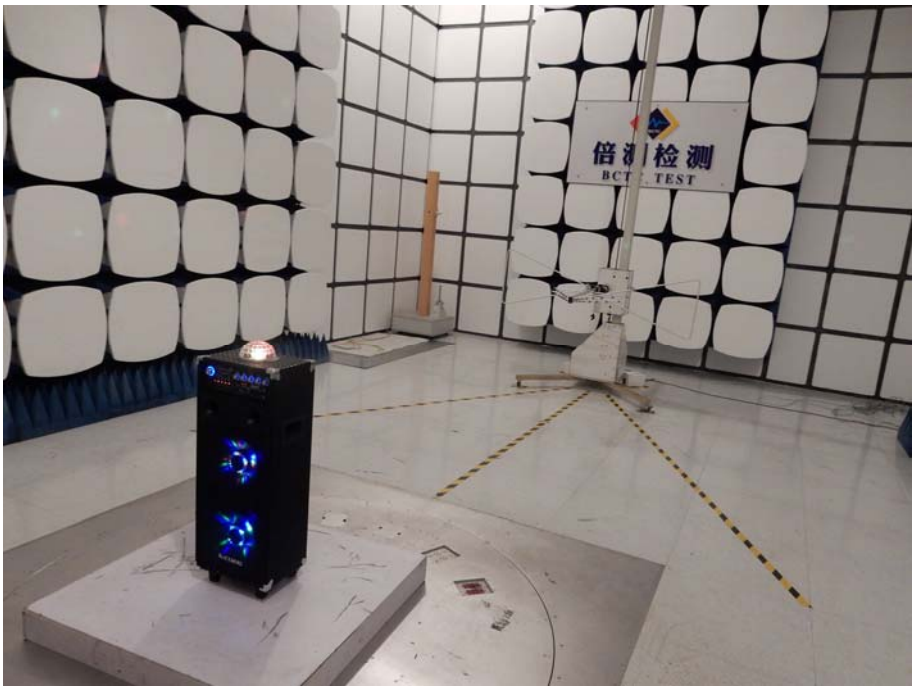
The EUT antenna is PCB antenna. It complies with the standard requirement.

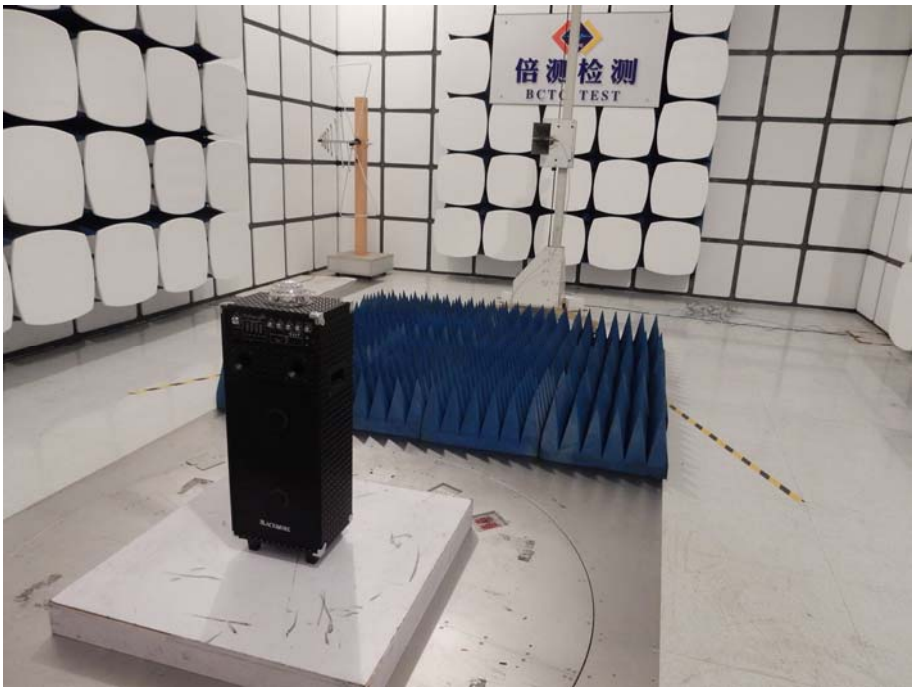
7. EUT TEST PHOTO

Conducted Measurement Photos

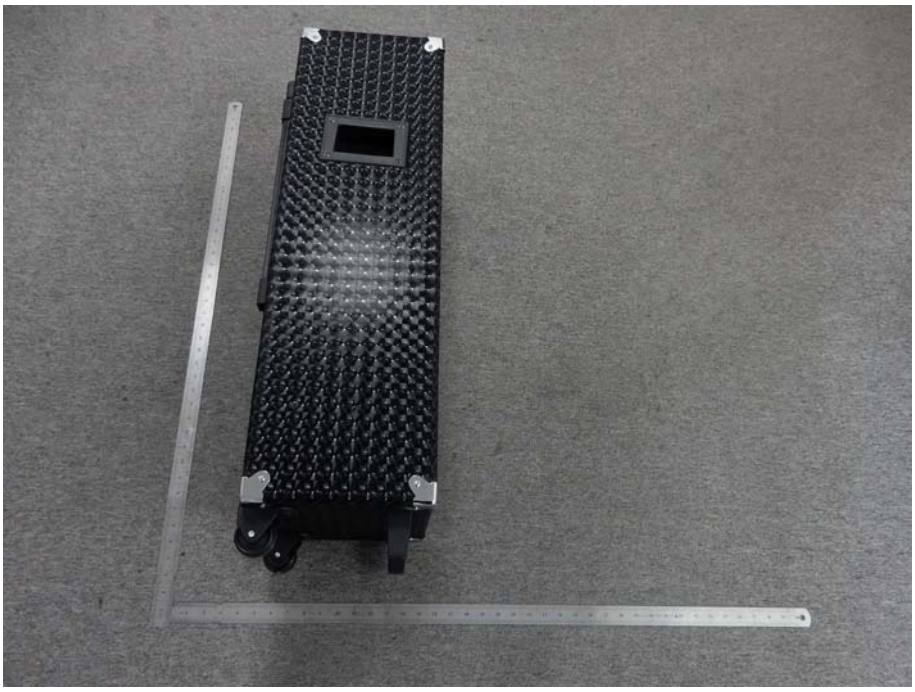


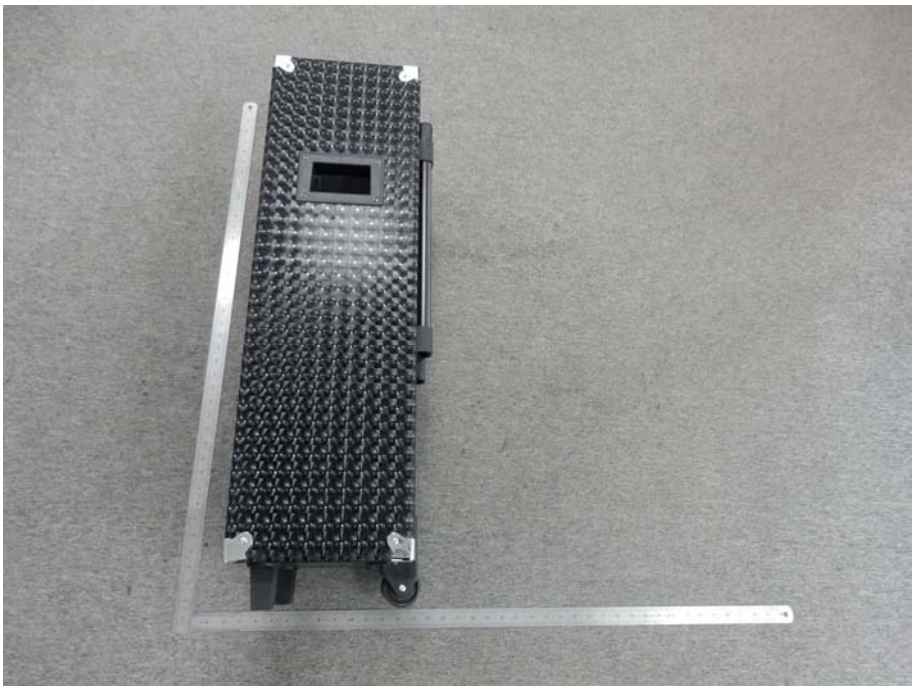
Radiated Measurement Photos

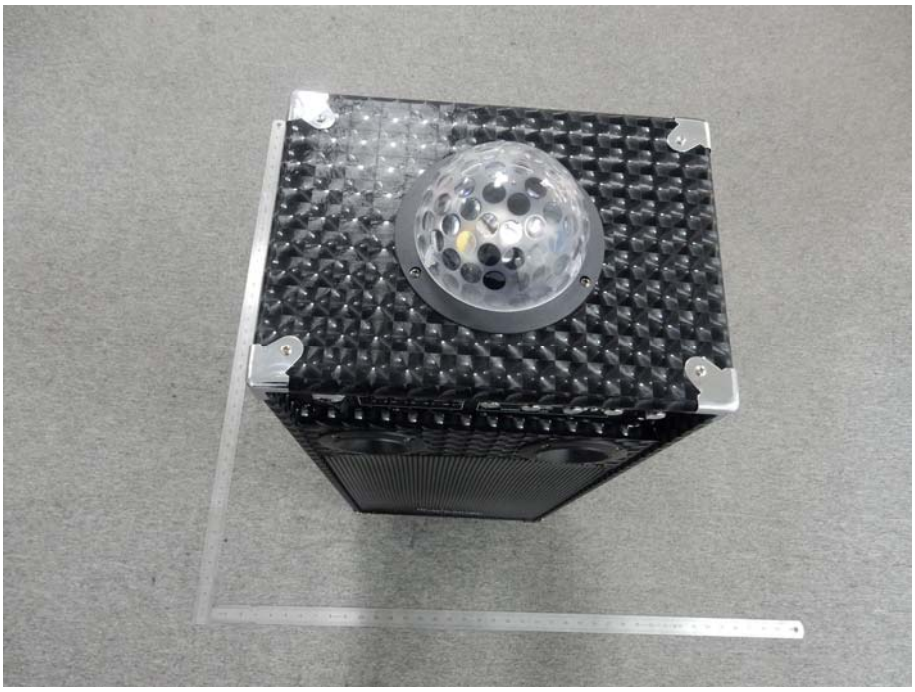




8. PHOTOS OF THE EUT







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