

APPLICATION CERTIFICATION FCC Part 15C

On Behalf of

DGL Group LTD.

Bluetooth Speaker
Model No.: HY-BBL

FCC ID: 2AANZHY-BBL

Prepared for : DGL Group LTD.
Address : 195 Raritan Center Parkway, Edison, New Jersey, United States

Prepared by : Shenzhen Accurate Technology Co., Ltd.
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Report No. : ATE20172415
Date of Test : December 1-December 2, 2017
Date of Report : December 4, 2017

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Test Report Certification

Applicant : DGL Group LTD.
Manufacturer : China Etech Groups Ltd
EUT Description : Bluetooth Speaker
Model No. : HY-BBL
(Please refer to the detailed description about coverage models on page 5)
Trade Name : HYPE

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247: 2017
ANSI C63.10: 2013

The device described above is tested by Shenzhen Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test : December 1-December 2, 2017
Date of Report : December 4, 2017

Prepared by :

Star Yang
(Star Yang, Engineer)

Approved & Authorized Signer :

Sean Liu
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Model Number	:	HY-BBL, HY-BBL-BLK, HY-BBL-BLU, HY-BBL-RED, HY-BBL-PNK, HY-BBL-GRN, HY-BBL-YLW, HY-BBL-WHT, HY-BBL-PRP, HY-BBL-GRY, HY-BBL-ASST, HY-BBL-AST2, HY-BBL-AST3, HY-BBL-GLD, HY-BBL-SLV, HY-BBL-MTL (Note: Above series are identical in schematic, structure and critical components except for model name. So we prepare HY-BBL for test only.)
Bluetooth version	:	V 4.2
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain(Max)	:	0dBi
Antenna type	:	PCB antenna
Adapter Input Voltage	:	DC 3.7V (Powered by Lithium battery) or DC 5V (Powered by USB port)
Modulation mode	:	GFSK, $\pi/4$ DQPSK
Applicant	:	DGL Group LTD.
Address	:	195 Raritan Center Parkway, Edison, New Jersey, United States
Manufacturer	:	China Etech Groups Ltd
Address	:	Room 3A15, Floor 4, Block C, BaoYuan HuaFeng Headquater, Economy Building, Xixiang Road, Baoan District, Shenzhen

1.2. Accessory and Auxiliary Equipment

AC/DC Power Adapter (provided by laboratory)	:	Model: TEKA006-0501500UKU
		Input: 100-240V~50/60Hz 0.3A
		Output: DC 5V/1A

1.3. Description of Test Facility

EMC Lab	:	Recognition of accreditation by Federal Communications Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358 Listed by Innovation, Science and Economic Development Canada (ISED) The Registration Number is 5077A-2 Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193 Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Name of Firm	:	Shenzhen Accurate Technology Co., Ltd.
Site Location	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

1.4. Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 07, 2017	1 Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 07, 2017	1 Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 07, 2017	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 07, 2017	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 13, 2017	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 13, 2017	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 13, 2017	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 13, 2017	1 Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 07, 2017	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 07, 2017	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18 G-10SS	N/A	Jan. 07, 2017	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 07, 2017	1 Year

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: Transmitting mode

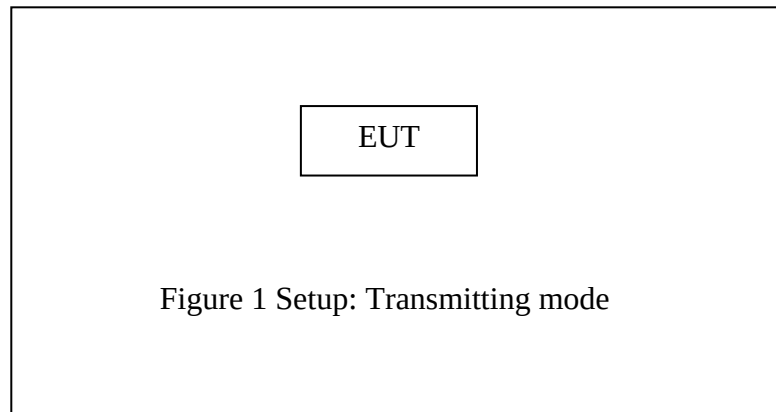
Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

3.2.Configuration and peripherals

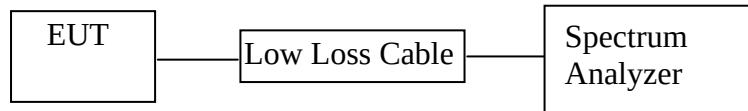


4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission Test	Compliant
Section 15.247(a)(1)	20dB Bandwidth Test	Compliant
Section 15.247(a)(1)	Carrier Frequency Separation Test	Compliant
Section 15.247(a)(1)(iii)	Number Of Hopping Frequency Test	Compliant
Section 15.247(a)(1)(iii)	Dwell Time Test	Compliant
Section 15.247(b)(1)	Maximum Peak Output Power Test	Compliant
Section 15.247(d) Section 15.209	Radiated Emission Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1. Block Diagram of Test Setup



(EUT: Bluetooth Speaker)

5.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

5.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.4. Operating Condition of EUT

5.4.1. Setup the EUT and simulator as shown as Section 5.1.

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

5.5. Test Procedure

5.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

5.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.

5.5.3. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

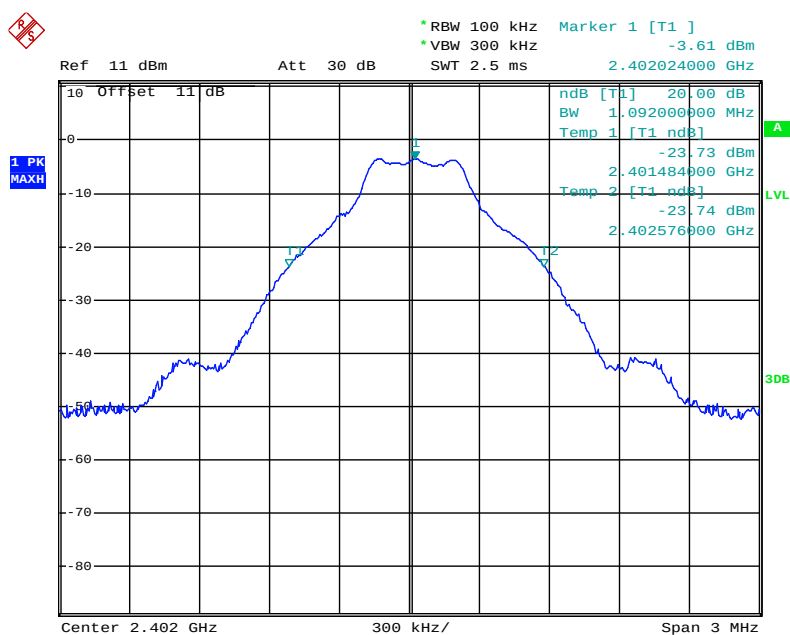
5.6.Test Result

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	$\Pi/4$ -DQPSK 20dB Bandwidth (MHz)	Result
Low	2402	1.092	1.368	Pass
Middle	2441	1.086	1.356	Pass
High	2480	1.092	1.368	Pass

The spectrum analyzer plots are attached as below.

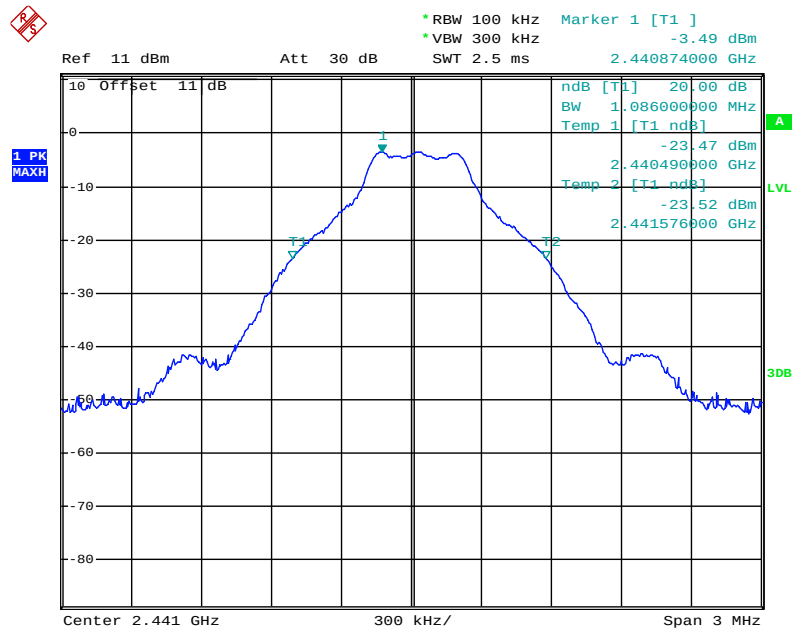
GFSK Mode

Low channel



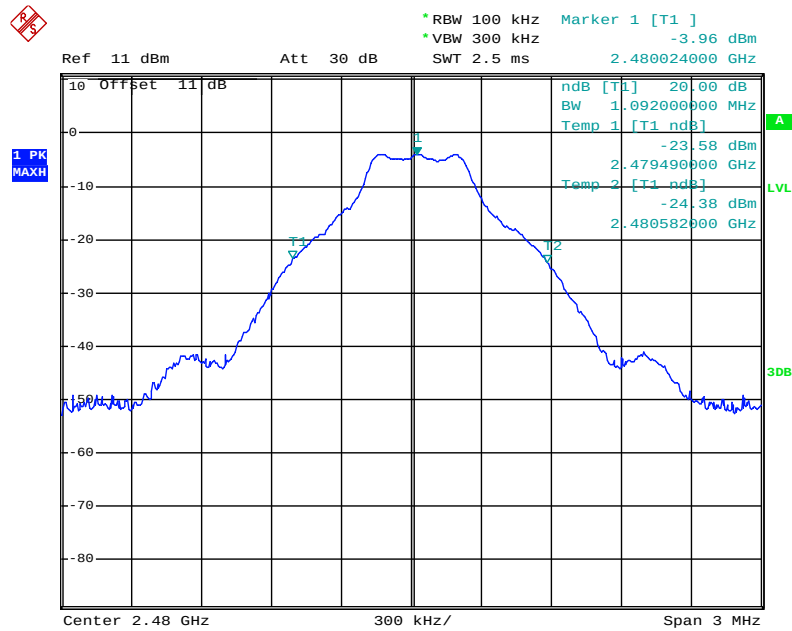
Date: 1.DEC.2017 15:05:50

Middle channel



Date: 1.DEC.2017 15:08:02

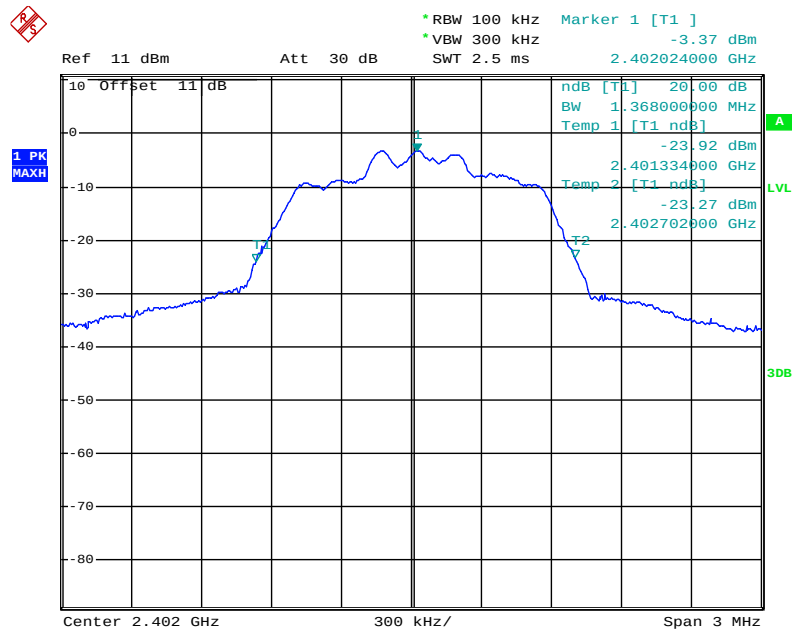
High channel



Date: 1.DEC.2017 15:09:32

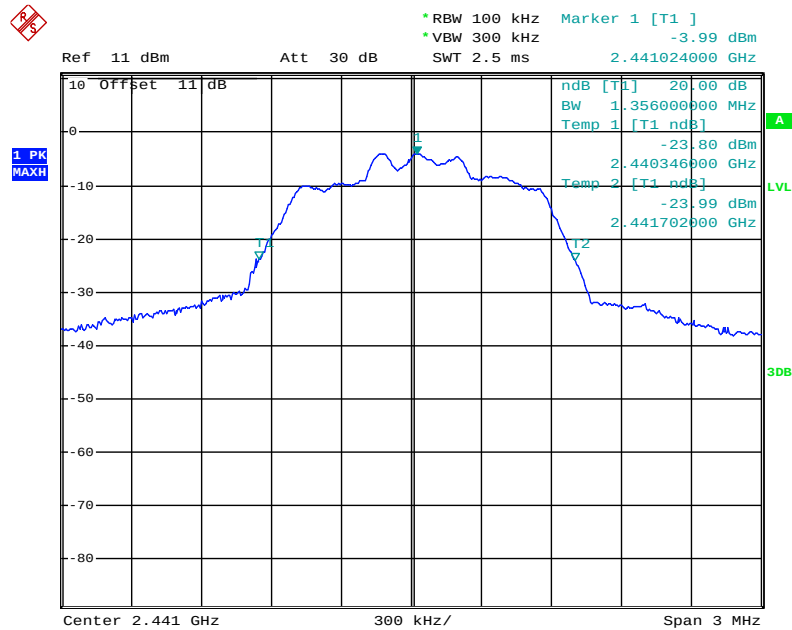
Π/4-DQPSK Mode

Low channel



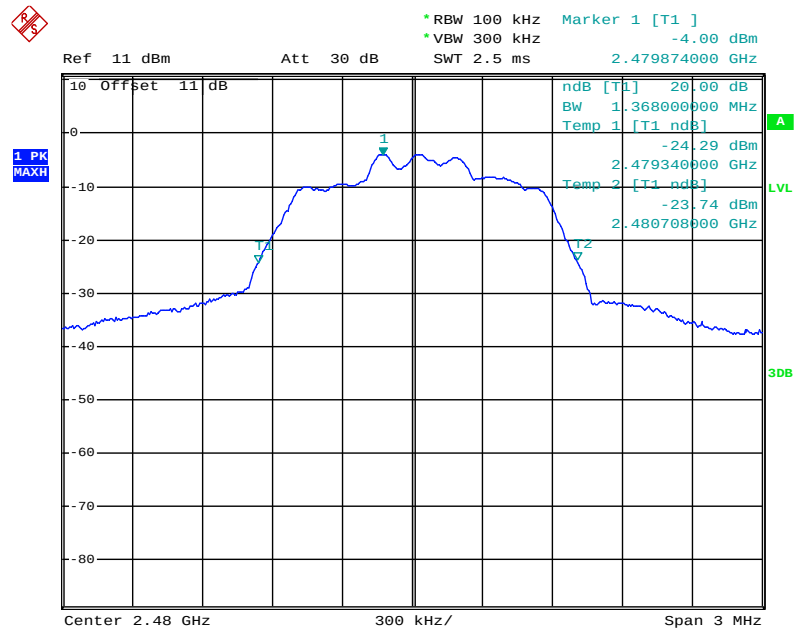
Date: 1.DEC.2017 15:13:24

Middle channel



Date: 1.DEC.2017 15:12:14

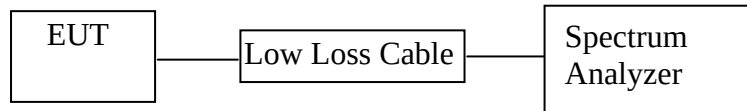
High channel



Date: 1.DEC.2017 15:10:28

6. CARRIER FREQUENCY SEPARATION TEST

6.1. Block Diagram of Test Setup



(EUT: Bluetooth Speaker)

6.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

6.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

6.5. Test Procedure

6.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

6.5.2. Set RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz. Adjust Span to 2MHz.

6.5.3. Set the adjacent channel of the EUT Maxhold another trace.

6.5.4. Measurement the channel separation

6.6. Test Result

GFSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.002	25KHz or 2/3*20dB bandwidth	PASS
	2403			
Middle	2440	1.002	25KHz or 2/3*20dB bandwidth	PASS
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	PASS
	2480			

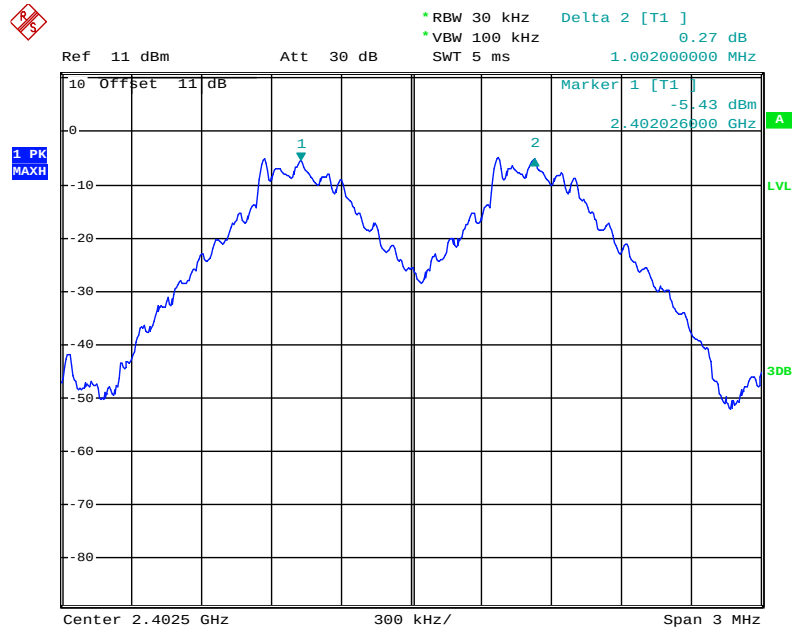
Π/4-DQPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.008	25KHz or 2/3*20dB bandwidth	PASS
	2403			
Middle	2440	1.002	25KHz or 2/3*20dB bandwidth	PASS
	2441			
High	2479	1.008	25KHz or 2/3*20dB bandwidth	PASS
	2480			

The spectrum analyzer plots are attached as below.

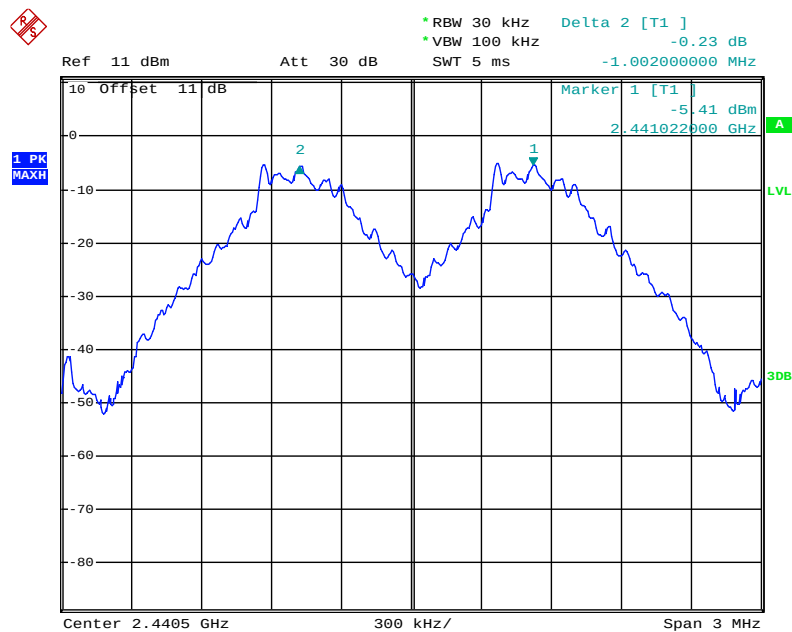
GFSK Mode

Low channel



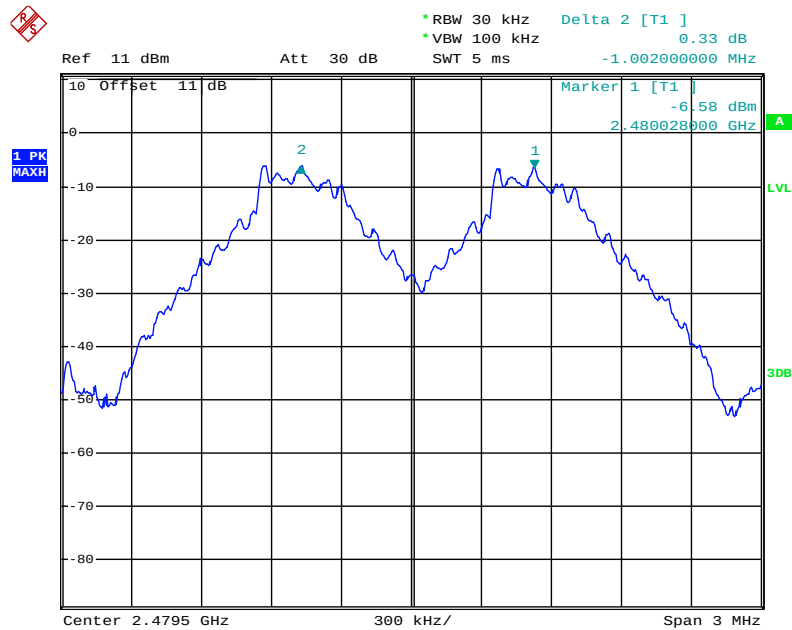
Date: 1.DEC.2017 15:43:05

Middle channel



Date: 1.DEC.2017 15:40:40

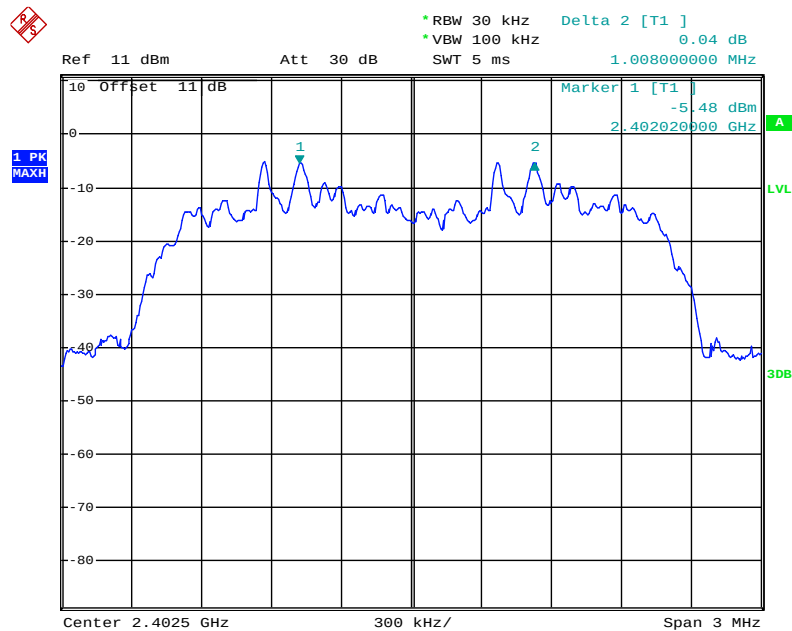
High channel



Date: 1.DEC.2017 15:38:54

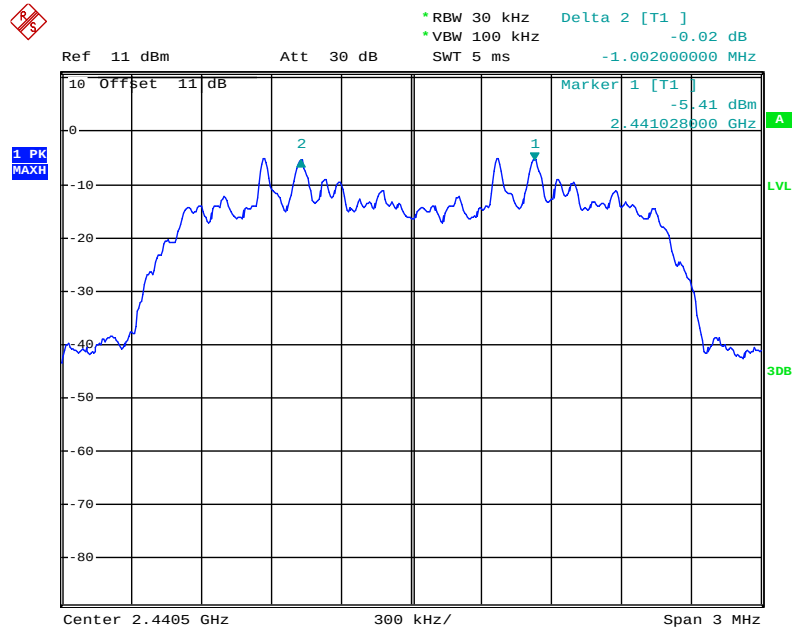
II/4-DQPSK Mode

Low channel



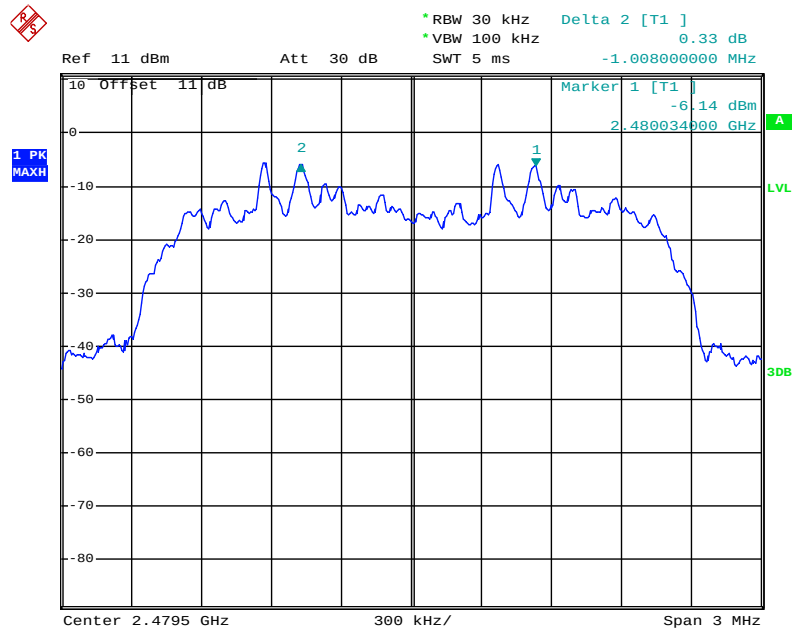
Date: 1.DEC.2017 15:33:30

Middle channel



Date: 1.DEC.2017 15:35:34

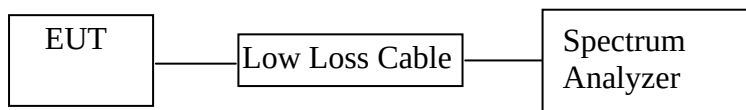
High channel



Date: 1.DEC.2017 15:37:35

7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Block Diagram of Test Setup



(EUT: Bluetooth Speaker)

7.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX (Hopping on) modes measure it.

7.5. Test Procedure

7.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

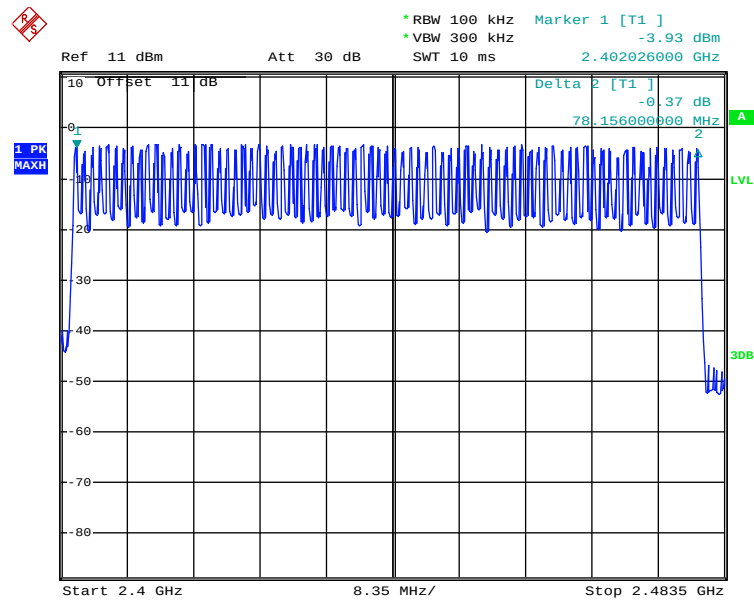
7.5.2. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz.

7.5.3. Max hold, view and count how many channel in the band.

7.6.Test Result

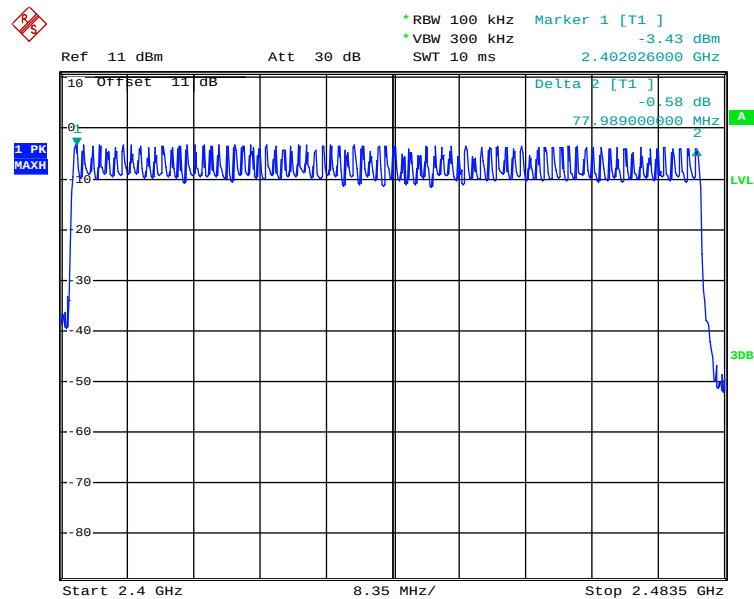
Total number of hopping channel	Measurement result(CH)	Limit(CH)
	79	≥ 15

Number of hopping channels(GFSK)



Date: 1.DEC.2017 15:47:19

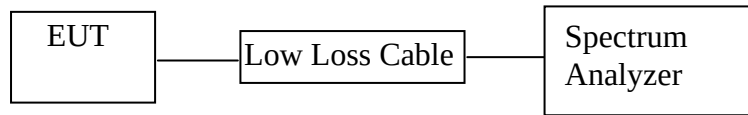
Number of hopping channels(Π/4-DQPSK)



Date: 1.DEC.2017 15:51:05

8. DWELL TIME TEST

8.1. Block Diagram of Test Setup



(EUT: Bluetooth Speaker)

8.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.4. Operating Condition of EUT

8.4.1. Setup the EUT and simulator as shown as Section 8.1.

8.4.2. Turn on the power of all equipment.

8.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

8.5. Test Procedure

8.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

8.5.2. Set center frequency of spectrum analyzer = operating frequency.

8.5.3. Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz, Adjust Sweep=5ms, 10ms, 15ms. Get the pulse time.

8.5.4. Repeat above procedures until all frequency measured were complete.

8.6. Test Result

GFSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.410	131.20	400
	2441	0.410	131.20	400
	2480	0.410	131.20	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2402	1.690	270.40	400
	2441	1.690	270.40	400
	2480	1.670	267.20	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2402	2.930	312.53	400
	2441	2.930	312.53	400
	2480	2.930	312.53	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

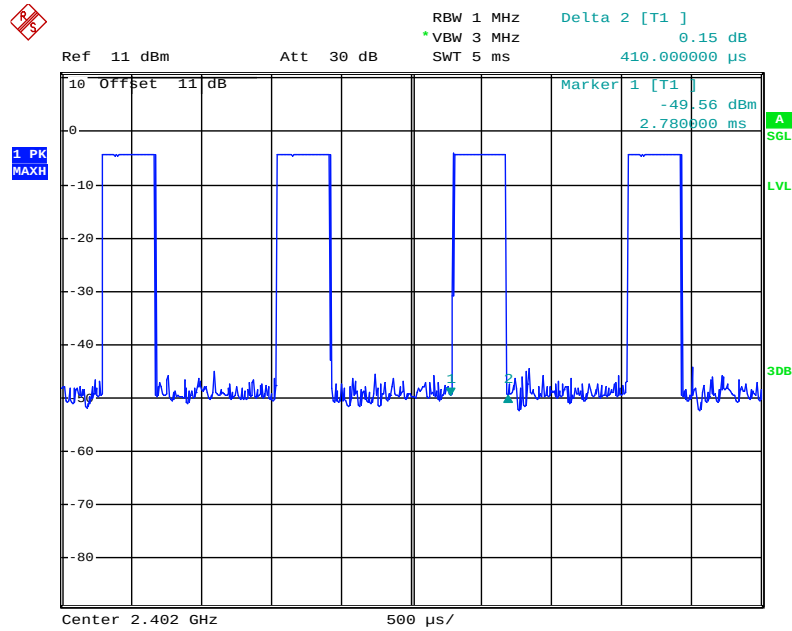
II/4-DQPSK

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.410	131.20	400
	2441	0.420	134.40	400
	2480	0.410	131.20	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2402	1.670	267.20	400
	2441	1.690	270.40	400
	2480	1.690	270.40	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2402	2.920	311.47	400
	2441	2.920	311.47	400
	2480	2.950	314.67	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

The spectrum analyzer plots are attached as below.

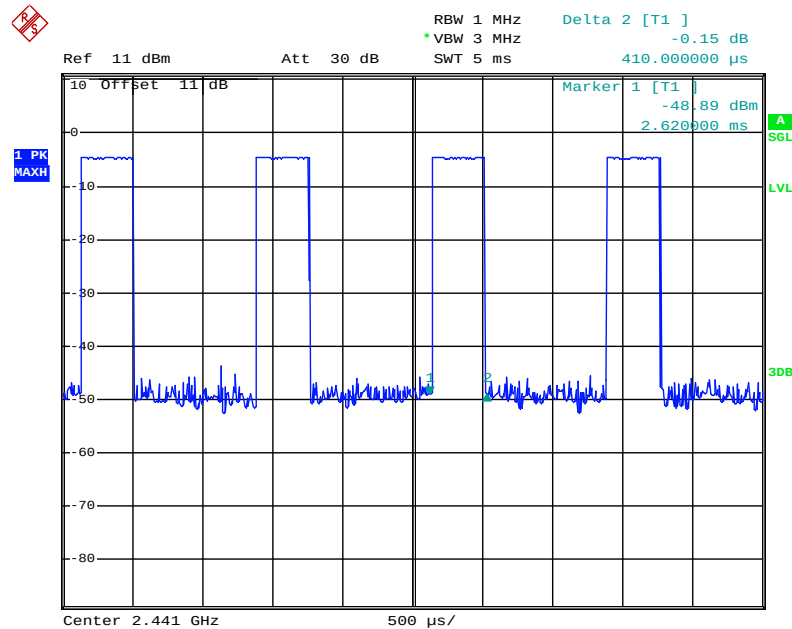
GFSK Mode

DH1 Low channel



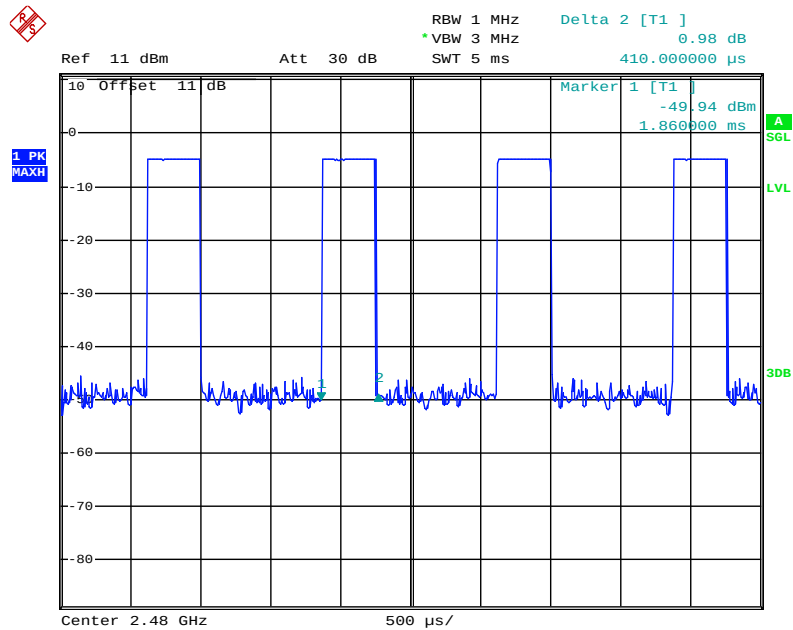
Date: 1.DEC.2017 15:53:14

DH1 Middle channel



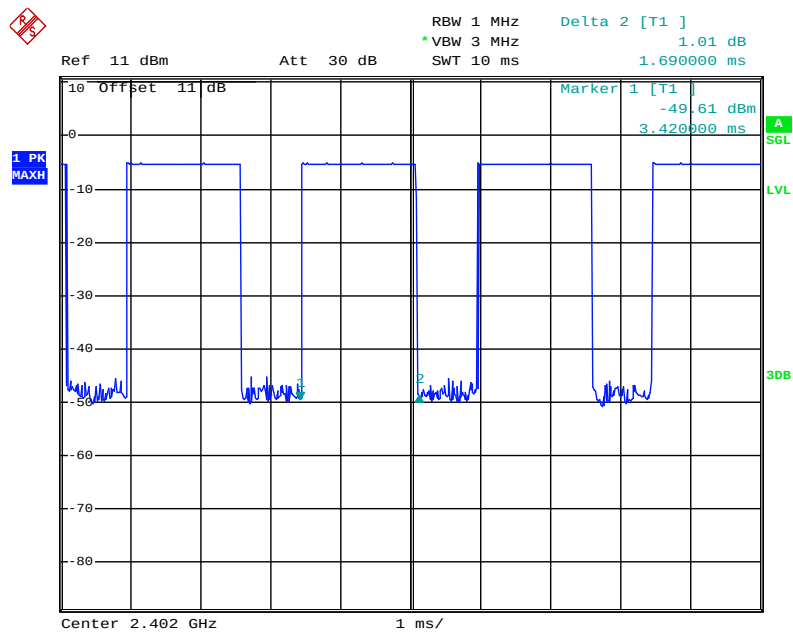
Date: 1.DEC.2017 15:54:10

DH1 High channel



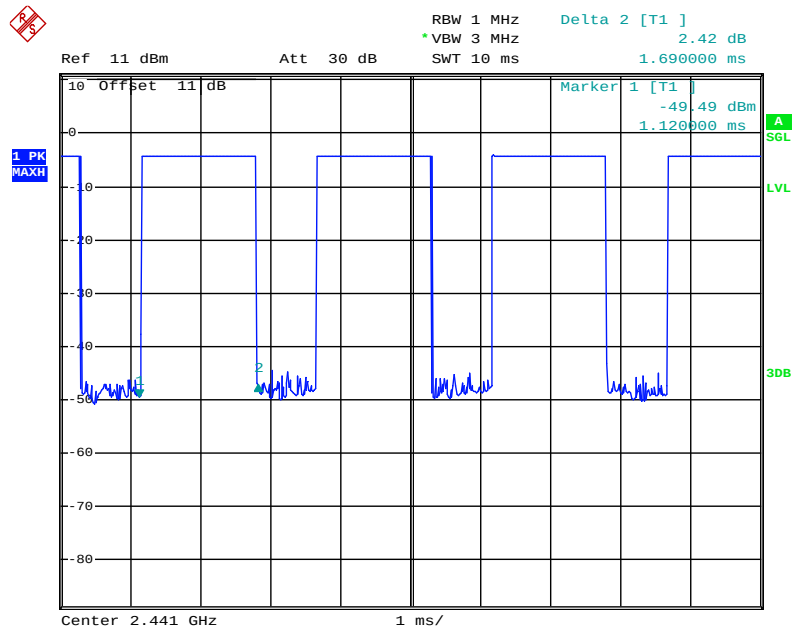
Date: 1.DEC.2017 15:55:37

DH3 Low channel



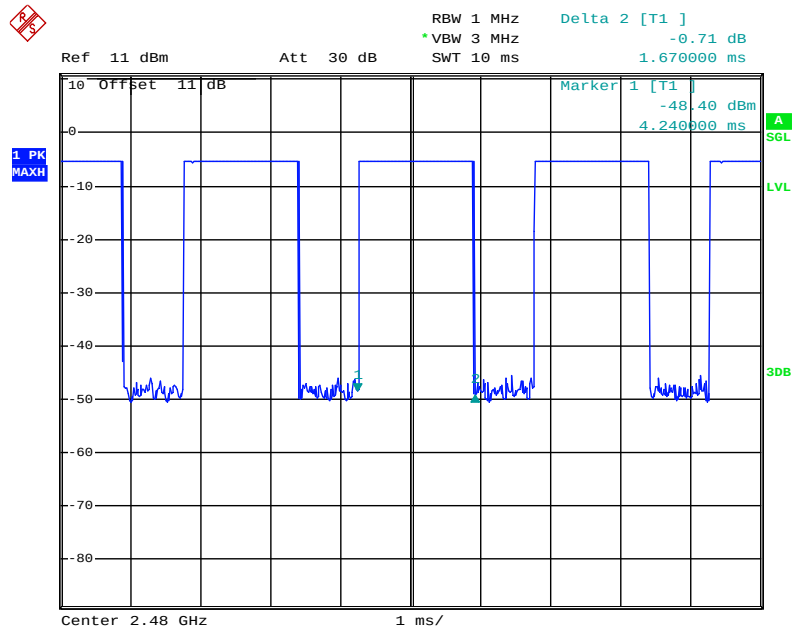
Date: 1.DEC.2017 15:56:41

DH3 Middle channel



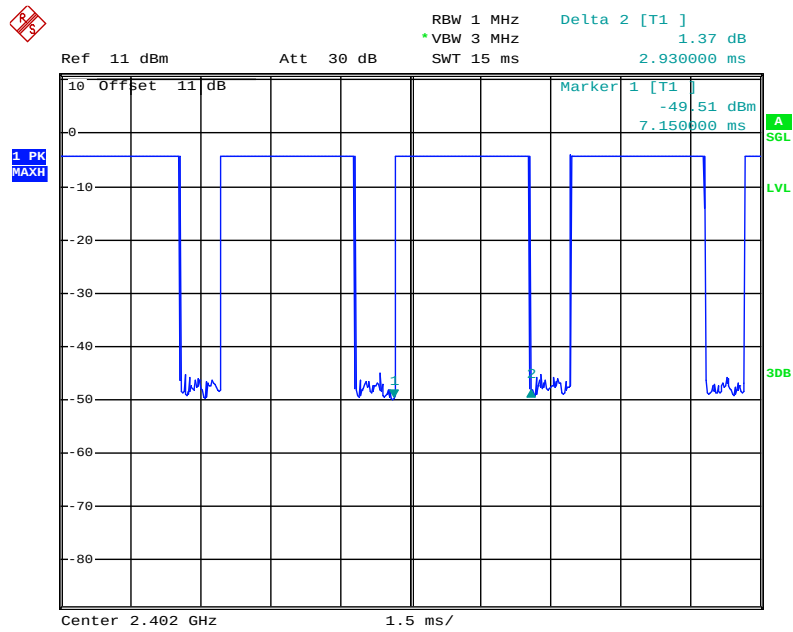
Date: 1.DEC.2017 15:58:04

DH3 High channel



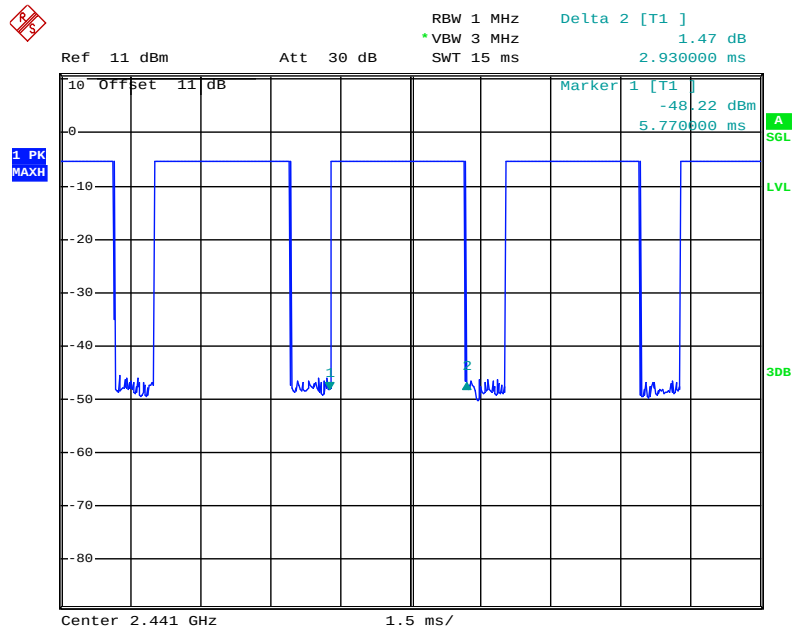
Date: 1.DEC.2017 15:59:06

DH5 Low channel



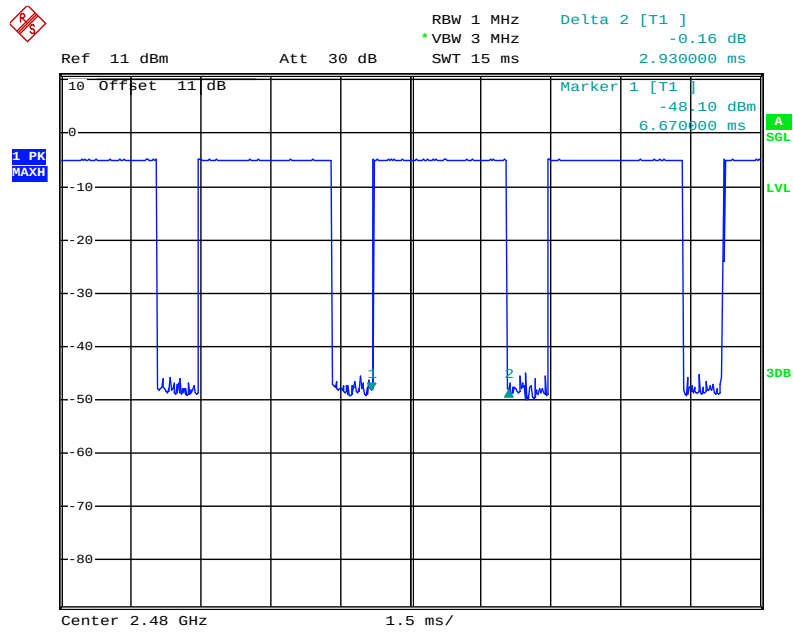
Date: 1.DEC.2017 15:59:58

DH5 Middle channel



Date: 1.DEC.2017 16:01:35

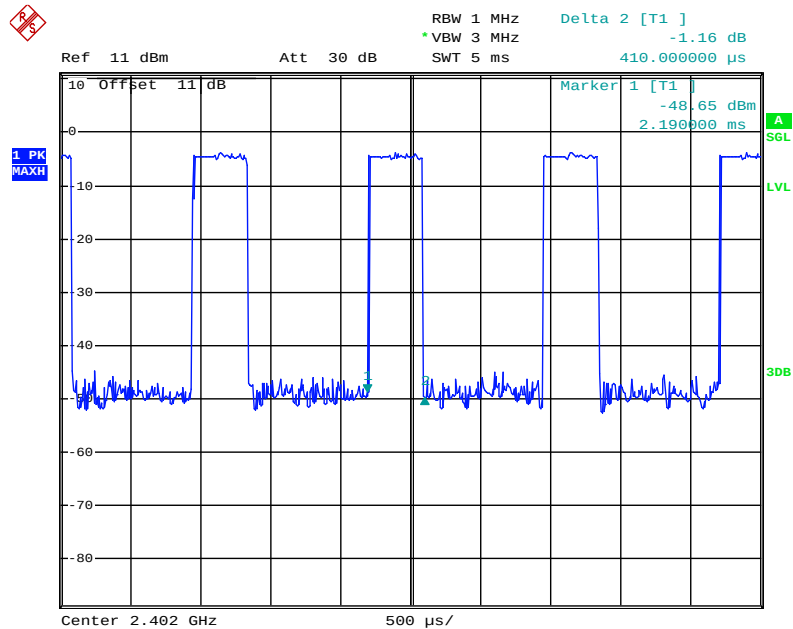
DH5 High channel



Date: 1.DEC.2017 16:02:16

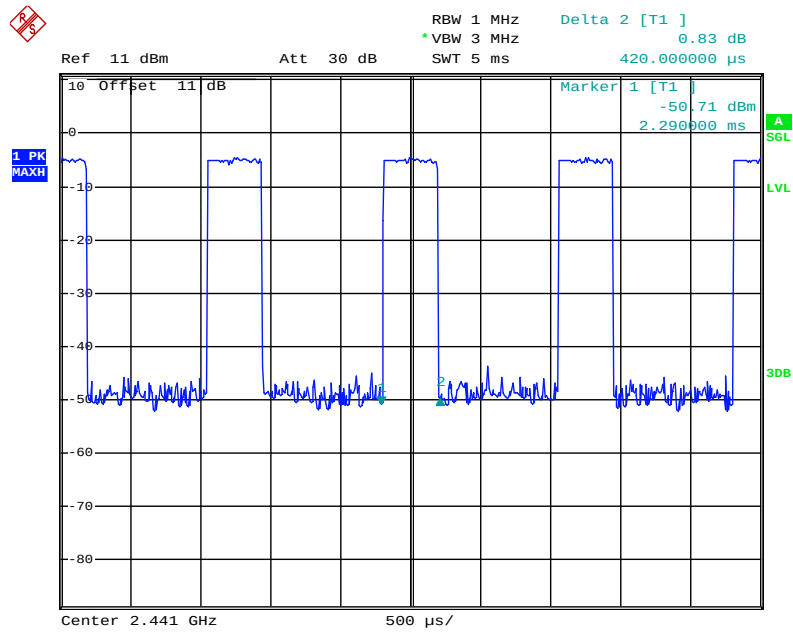
Π/4-DQPSK

2DH1 Low channel



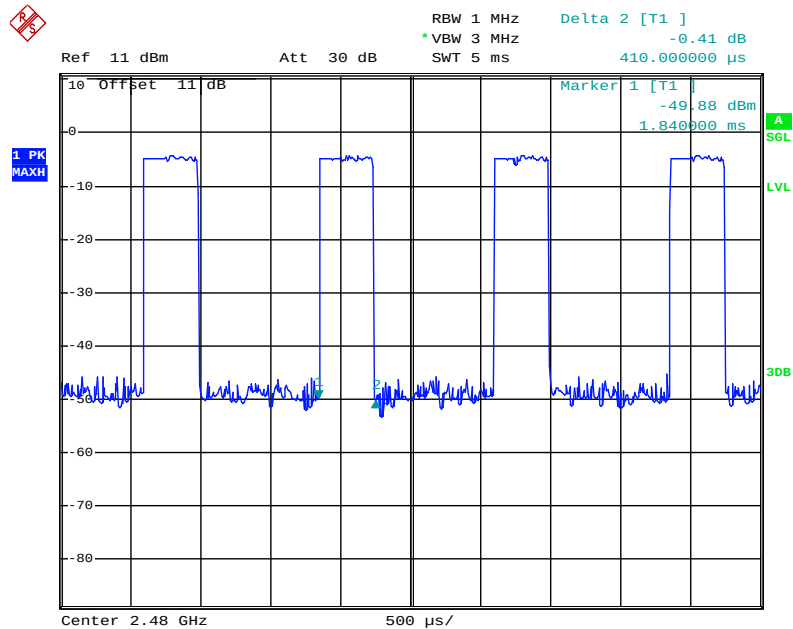
Date: 1.DEC.2017 16:03:48

2DH1 Middle channel



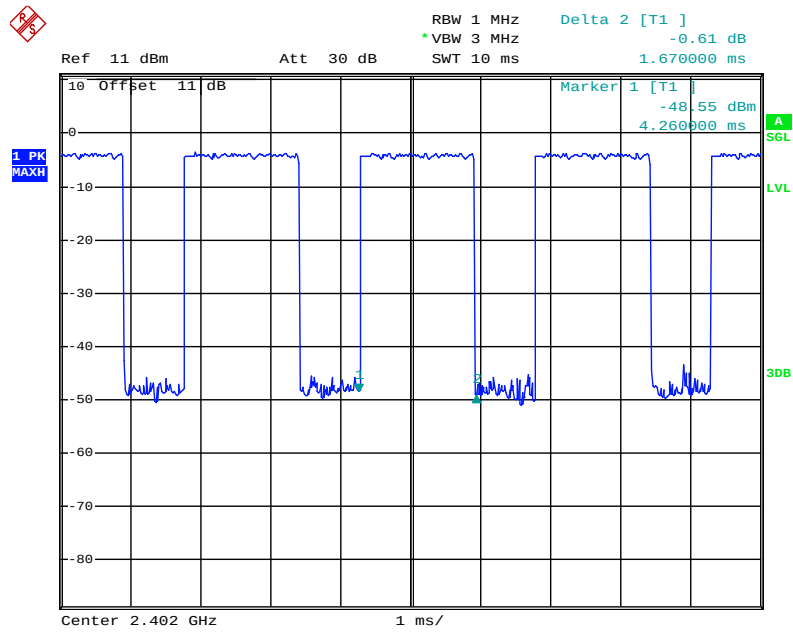
Date: 1.DEC.2017 16:05:07

2DH1 High channel



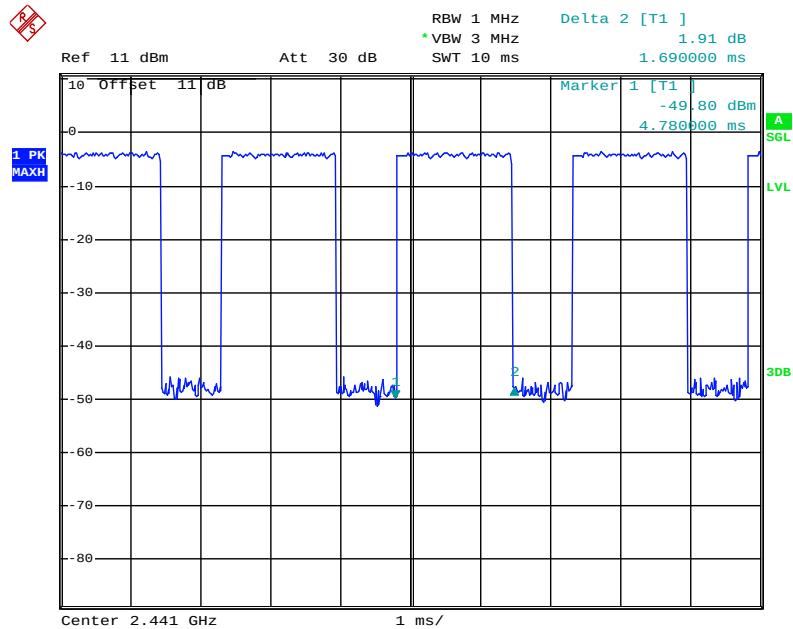
Date: 1.DEC.2017 16:05:52

2DH3 Low channel



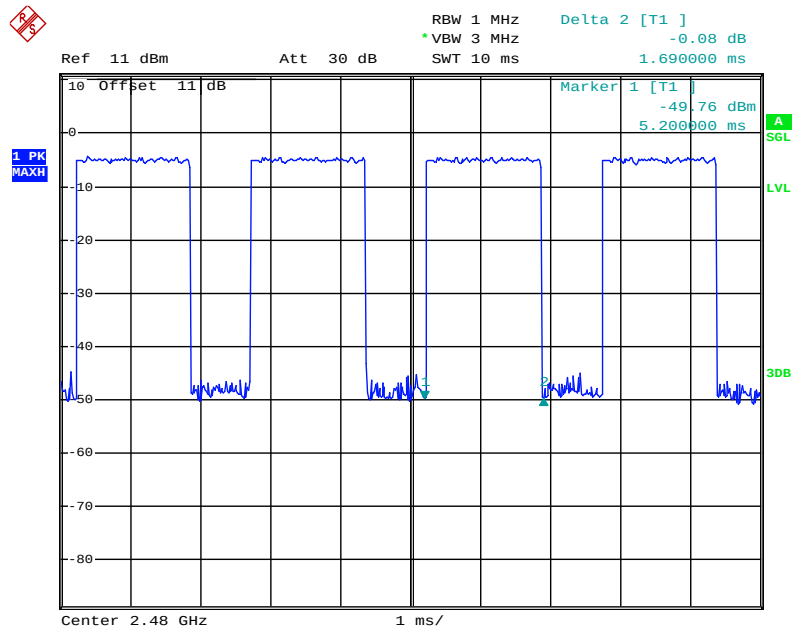
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2DH3 Middle channel



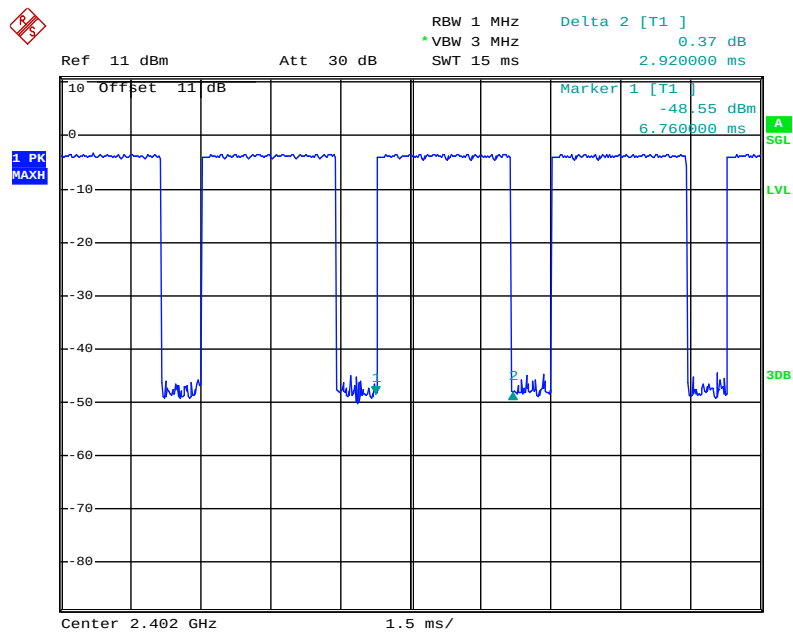
Date: 1.DEC.2017 16:08:23

2DH3 High channel



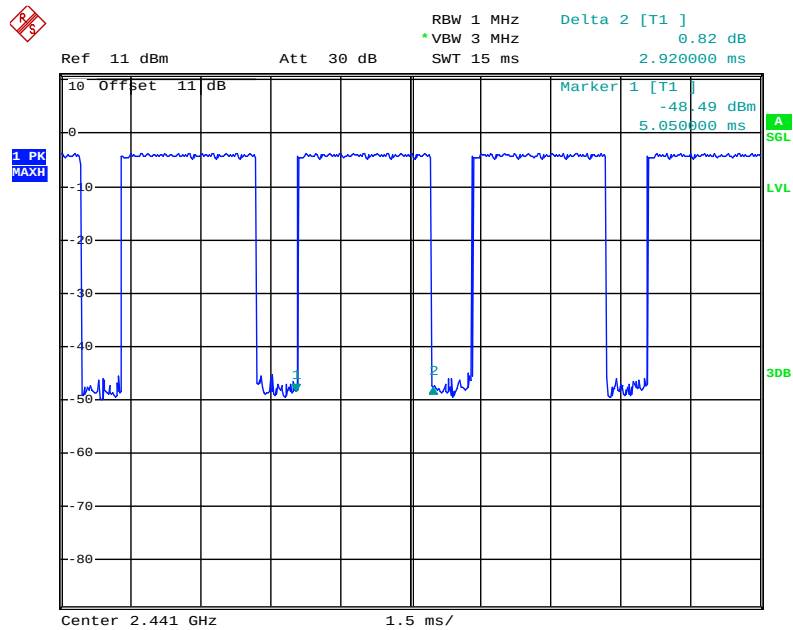
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2DH5 Low channel



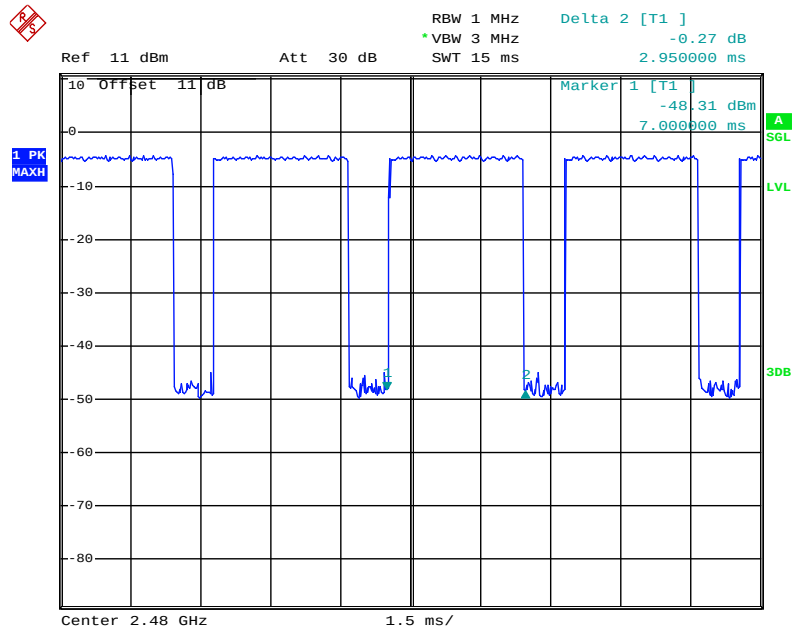
Date: 1.DEC.2017 16:10:00

2DH5 Middle channel



Date: 1.DEC.2017 16:10:59

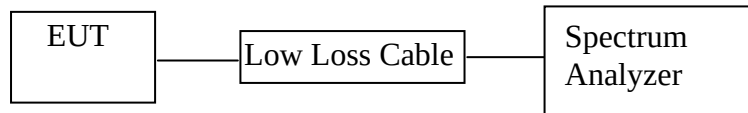
2DH5 High channel



Date: 1.DEC.2017 16:11:49

9. MAXIMUM PEAK OUTPUT POWER TEST

9.1. Block Diagram of Test Setup



(EUT: Bluetooth Speaker)

9.2. The Requirement For Section 15.247(b)(1)

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

9.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.4. Operating Condition of EUT

9.4.1. Setup the EUT and simulator as shown as Section 9.1.

9.4.2. Turn on the power of all equipment.

9.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

9.5. Test Procedure

9.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

9.5.2. Set RBW of spectrum analyzer to 3MHz and VBW to 3MHz.

9.5.3. Measurement the maximum peak output power.

9.6.Test Result

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-3.83/0.0004	21 / 0.125
Middle	2441	-3.96/0.0004	21 / 0.125
High	2480	-4.12/0.0004	21 / 0.125

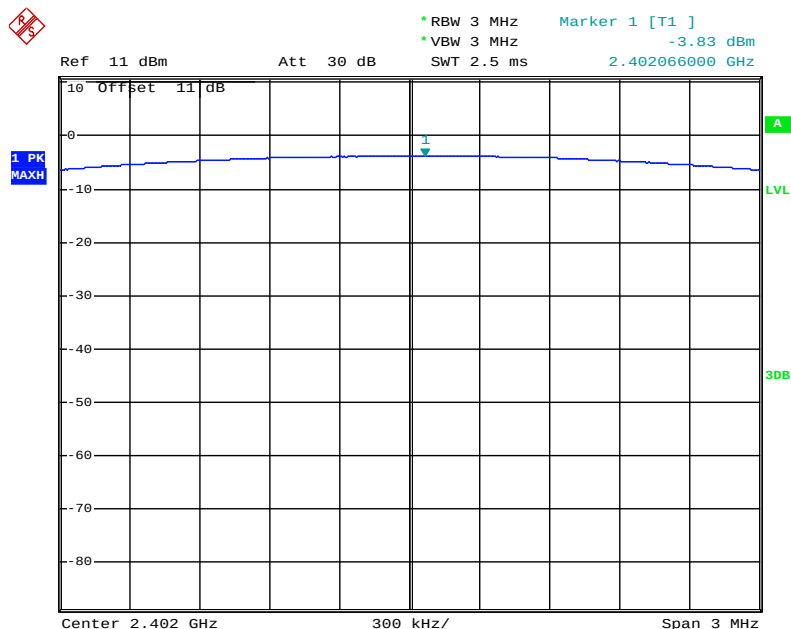
II/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-2.30/0.0006	21 / 0.125
Middle	2441	-2.35/0.0006	21 / 0.125
High	2480	-2.76/0.0005	21 / 0.125

The spectrum analyzer plots are attached as below.

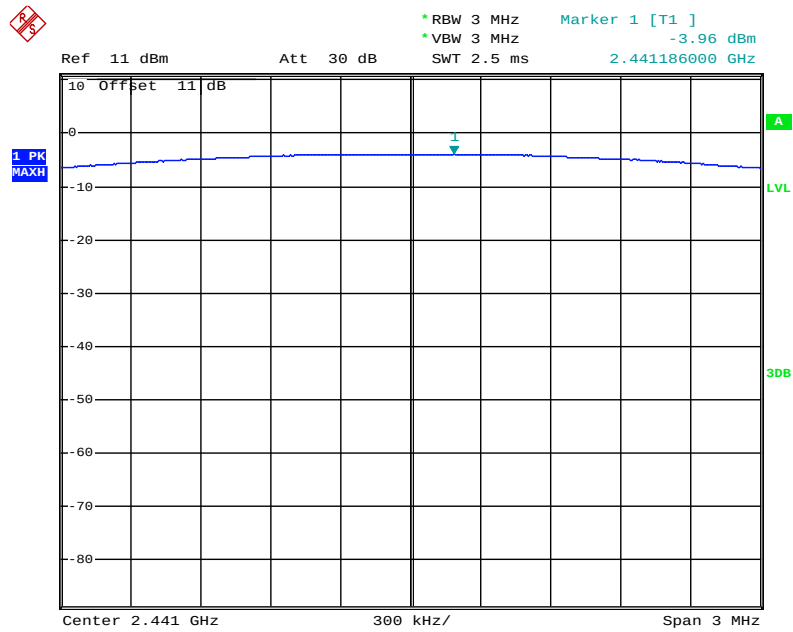
GFSK Mode

Low channel



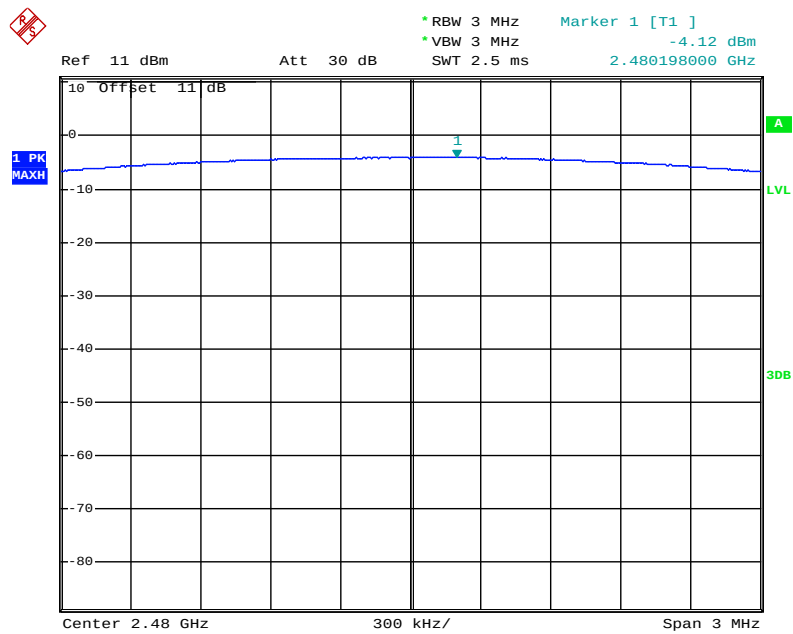
Date: 1.DEC.2017 15:22:45

Middle channel



Date: 1.DEC.2017 15:21:54

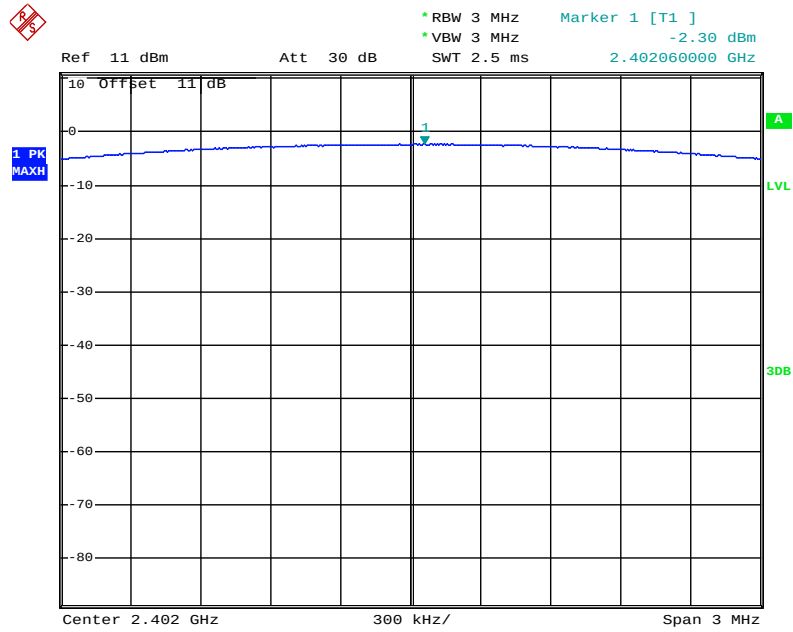
High channel



Date: 1.DEC.2017 15:19:57

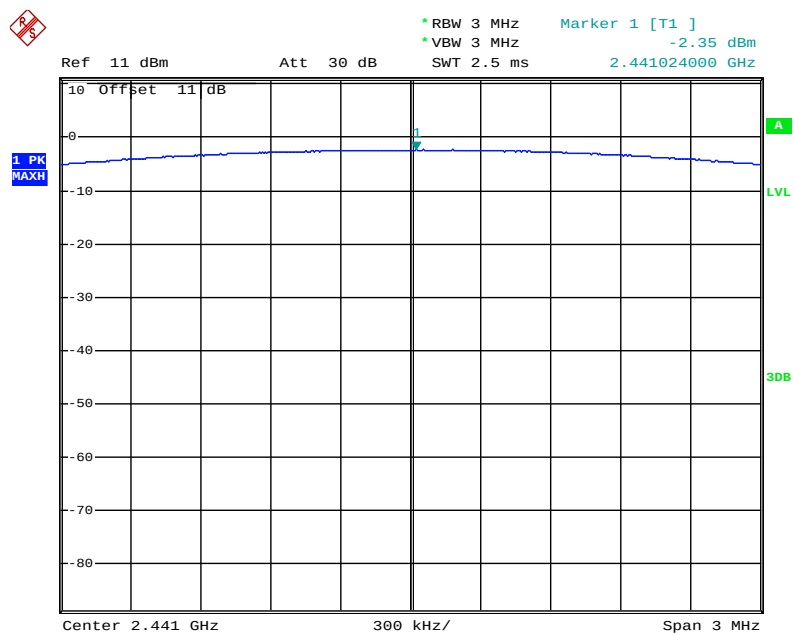
Π/4-DQPSK Mode

Low channel



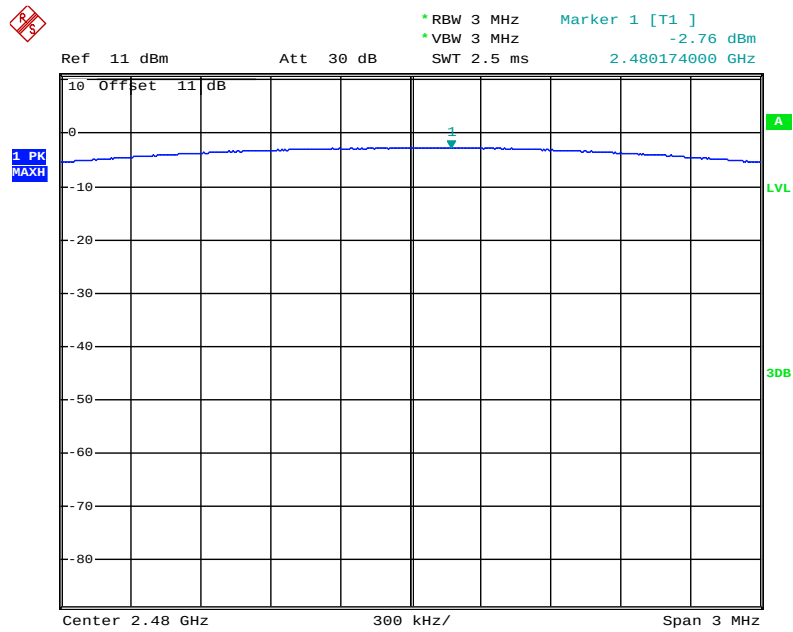
Date: 1.DEC.2017 15:14:54

Middle channel



Date: 1.DEC.2017 15:16:17

High channel

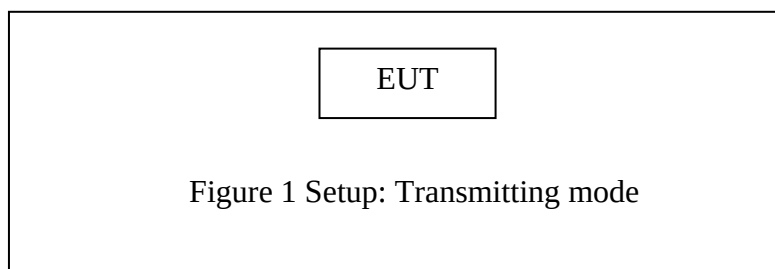


Date: 1.DEC.2017 15:17:28

10.RADIATED EMISSION TEST

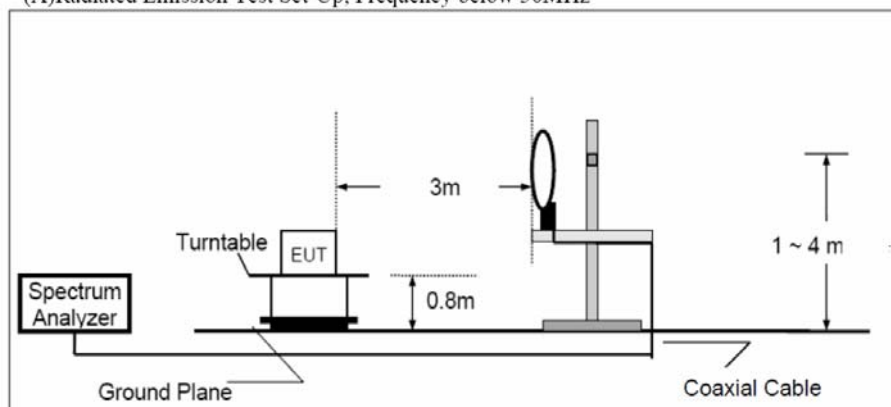
10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and peripherals

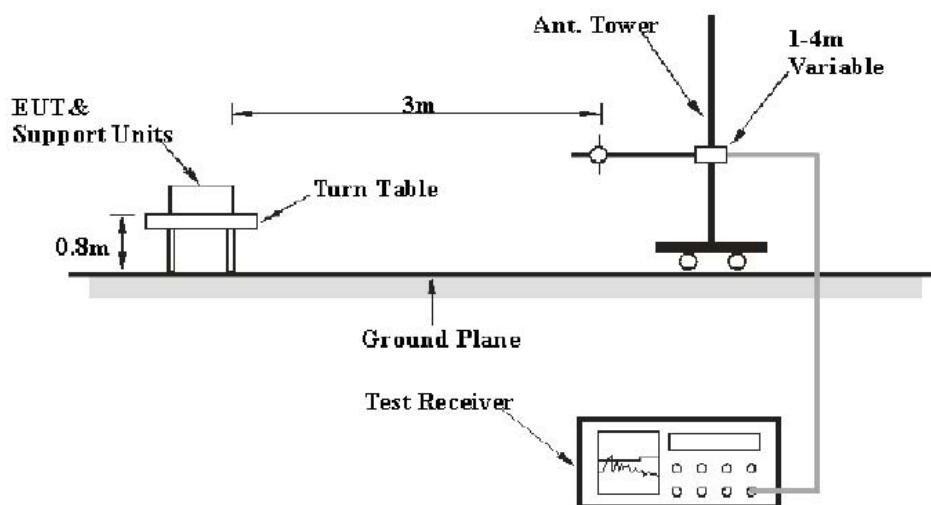


10.1.2.Semi-Anechoic Chamber Test Setup Diagram

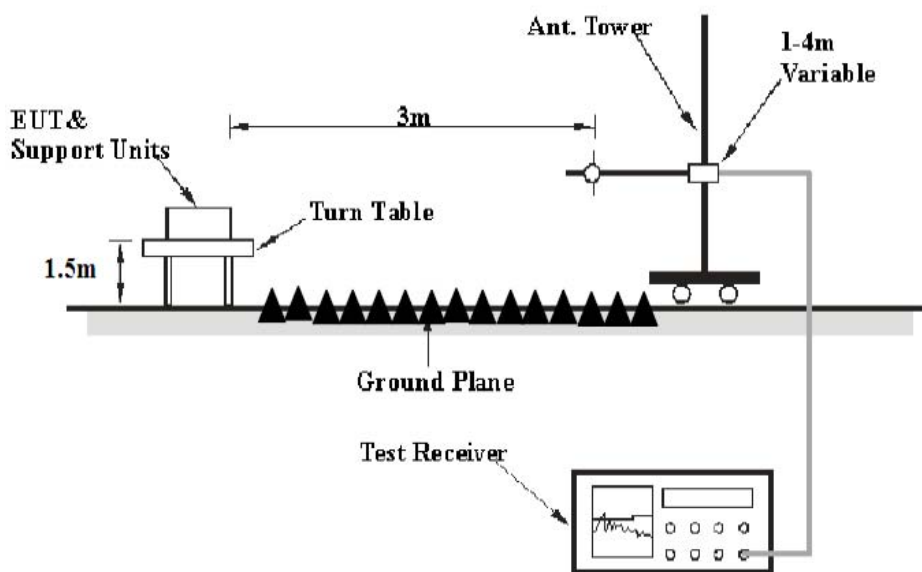
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



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



(C) Radiated Emission Test Set-Up, Frequency above 1GHz



10.2.The Limit For Section 15.247(d)

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, 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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510

²Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

10.4.Configuration of EUT on Measurement

The equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.5. Operating Condition of EUT

10.5.1. Setup the EUT and simulator as shown as Section 10.1.

10.5.2. Turn on the power of all equipment.

10.5.3. Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

10.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground (Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground (Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

10.7.Data Sample

Frequency (MHz)	Reading (dB μ v)	Factor (dB/m)	Result (dB μ v/m)	Limit (dB μ v/m)	Margin (dB)	Remark
X.XX	48.69	-13.35	35.34	46	-10.66	QP

Frequency(MHz) = Emission frequency in MHz

Reading(dB μ v) = Uncorrected Analyzer/Receiver reading

Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain

Result(dB μ v/m) = Reading(dB μ v) + Factor(dB/m)

Limit (dB μ v/m) = Limit stated in standard

Margin (dB) = Result(dB μ v/m) - Limit (dB μ v/m)

QP = Quasi-peak Reading

Calculation Formula:

Margin(dB) = Result (dB μ V/m)–Limit(dB μ V/m)

Result(dB μ V/m)= Reading(dB μ V)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

10.8.The Field Strength of Radiation Emission Measurement Results

PASS.

Note: 1.We tested GFSK mode, $\Pi/4$ -DQPSK Mode and recorded the worst case data

(GFSK mode) for all test mode.

2. The test frequency is from 30MHz to 25GHz, The 18-25GHz emissions are not reported, because the levels are too low against the limit.

Below 1GHz



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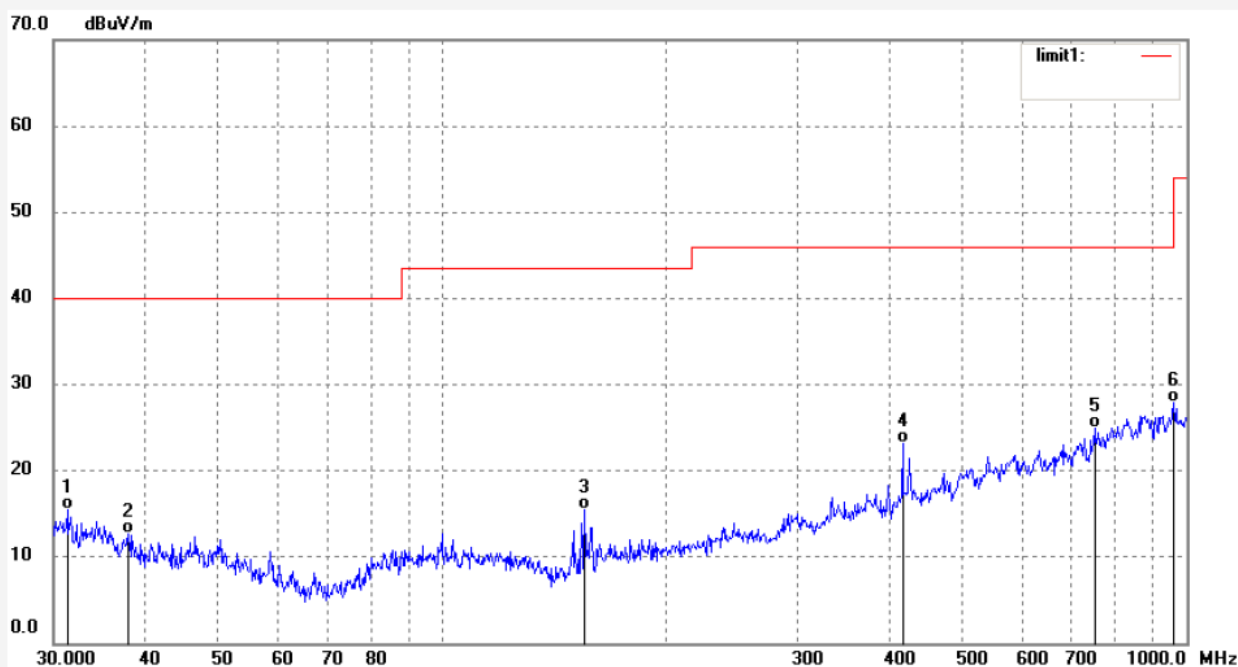
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #1210
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2402MHz(GFSK)
Model: HY-BBL
Manufacturer: China Etech Groups Ltd

Polarization: Horizontal
Power Source: DC 3.7V
Date: 17/12/02/
Time: 8/40/19
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	31.2919	37.04	-21.48	15.56	40.00	-24.44	QP	100	107	
2	37.8297	35.89	-23.25	12.64	40.00	-27.36	QP	100	59	
3	155.3305	42.64	-27.08	15.56	43.50	-27.94	QP	100	269	
4	415.4486	41.22	-18.07	23.15	46.00	-22.85	QP	100	300	
5	752.3148	36.39	-11.50	24.89	46.00	-21.11	QP	100	173	
6	962.0879	35.70	-7.84	27.86	54.00	-26.14	QP	100	225	



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Job No.: STAR2017 #1211

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2402MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Vertical

Power Source: DC 3.7V

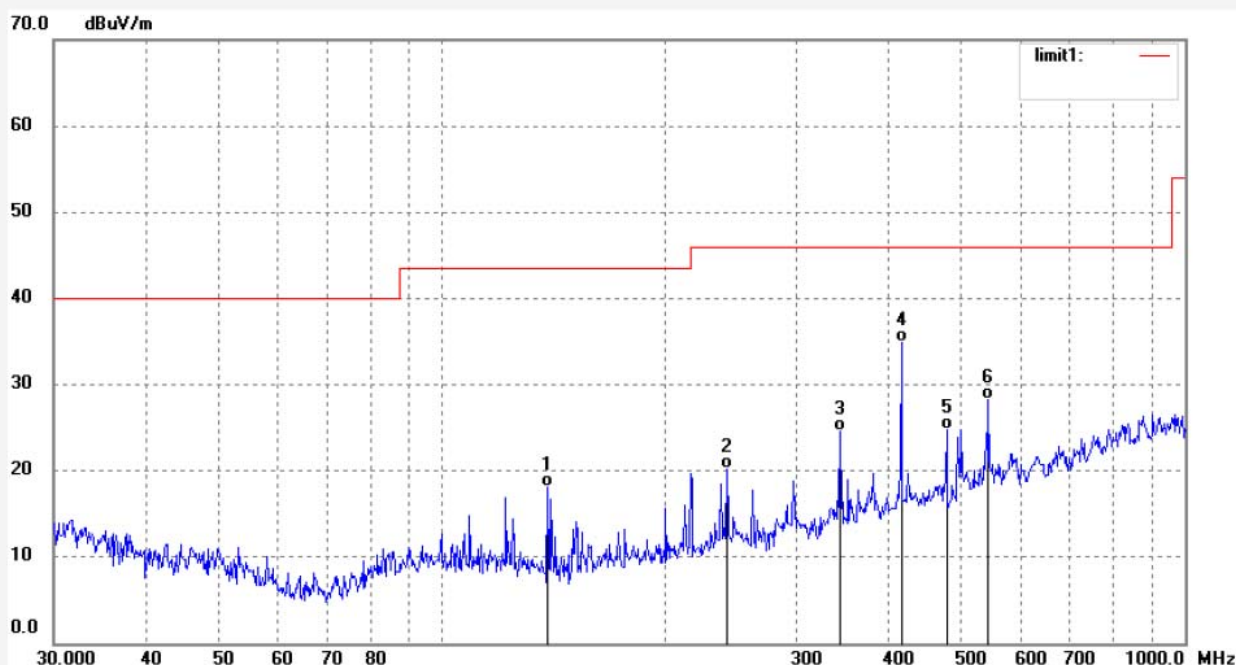
Date: 17/12/02/

Time: 8/41/00

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	138.8120	45.25	-27.14	18.11	43.50	-25.39	QP	100	147	
2	241.8377	43.42	-23.29	20.13	46.00	-25.87	QP	100	92	
3	343.6506	44.55	-19.88	24.67	46.00	-21.33	QP	100	200	
4	415.4486	52.97	-18.07	34.90	46.00	-11.10	QP	100	133	
5	478.1394	41.62	-16.83	24.79	46.00	-21.21	QP	100	106	
6	544.5202	43.18	-14.84	28.34	46.00	-17.66	QP	100	137	



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Fax:+86-0755-26503396

Job No.: STAR2017 #1213

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2441MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Horizontal

Power Source: DC 3.7V

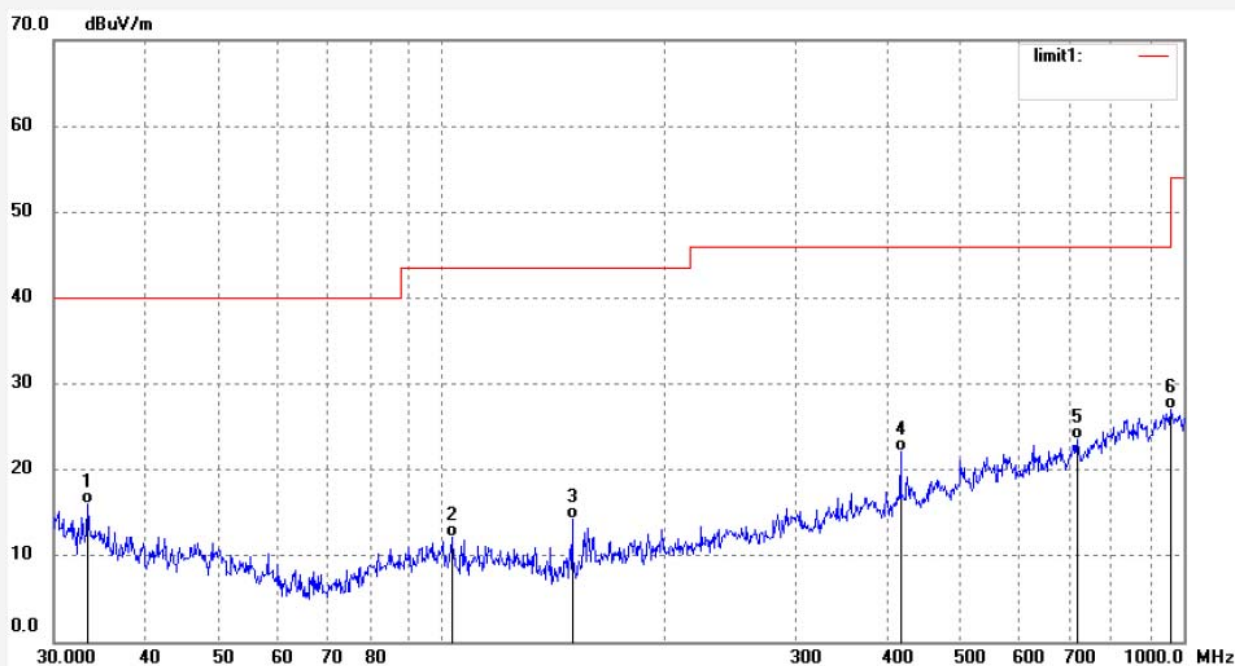
Date: 17/12/02/

Time: 8/43/37

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.3348	37.85	-21.90	15.95	40.00	-24.05	QP	200	111	
2	103.3353	37.58	-25.40	12.18	43.50	-31.32	QP	200	149	
3	149.9676	41.39	-27.15	14.24	43.50	-29.26	QP	200	236	
4	415.4485	40.26	-18.07	22.19	46.00	-23.81	QP	200	201	
5	718.7246	35.73	-12.18	23.55	46.00	-22.45	QP	200	324	
6	962.0878	34.91	-7.84	27.07	54.00	-26.93	QP	200	52	



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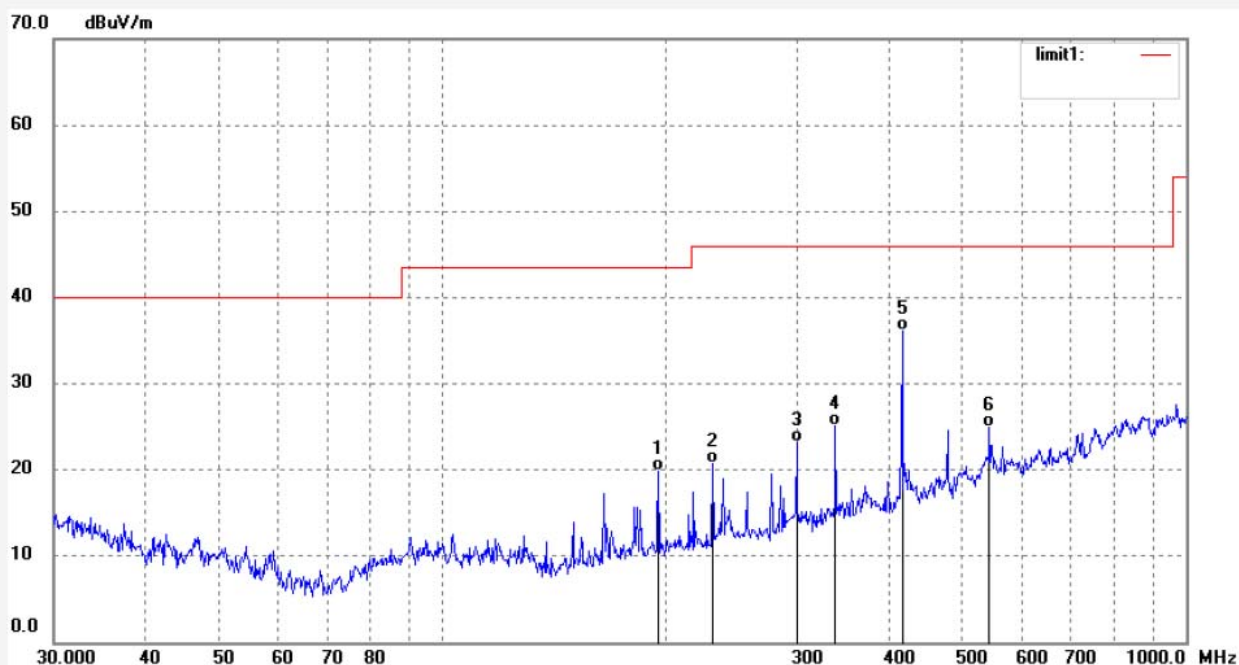
F1,Bldg.A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #1212
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2441MHz(GFSK)
Model: HY-BBL
Manufacturer: China Etech Groups Ltd

Polarization: Vertical
Power Source: DC 3.7V
Date: 17/12/02/
Time: 8/42/48
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	195.1830	44.53	-24.74	19.79	43.50	-23.71	QP	200	102	
2	231.0398	44.42	-23.70	20.72	46.00	-25.28	QP	200	360	
3	299.6440	44.81	-21.56	23.25	46.00	-22.75	QP	200	244	
4	337.6660	45.34	-20.15	25.19	46.00	-20.81	QP	200	191	
5	415.4485	54.25	-18.07	36.18	46.00	-9.82	QP	200	46	
6	544.5202	39.73	-14.84	24.89	46.00	-21.11	QP	200	128	



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Fax:+86-0755-26503396

Job No.: STAR2017 #1214

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2480MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Horizontal

Power Source: DC 3.7V

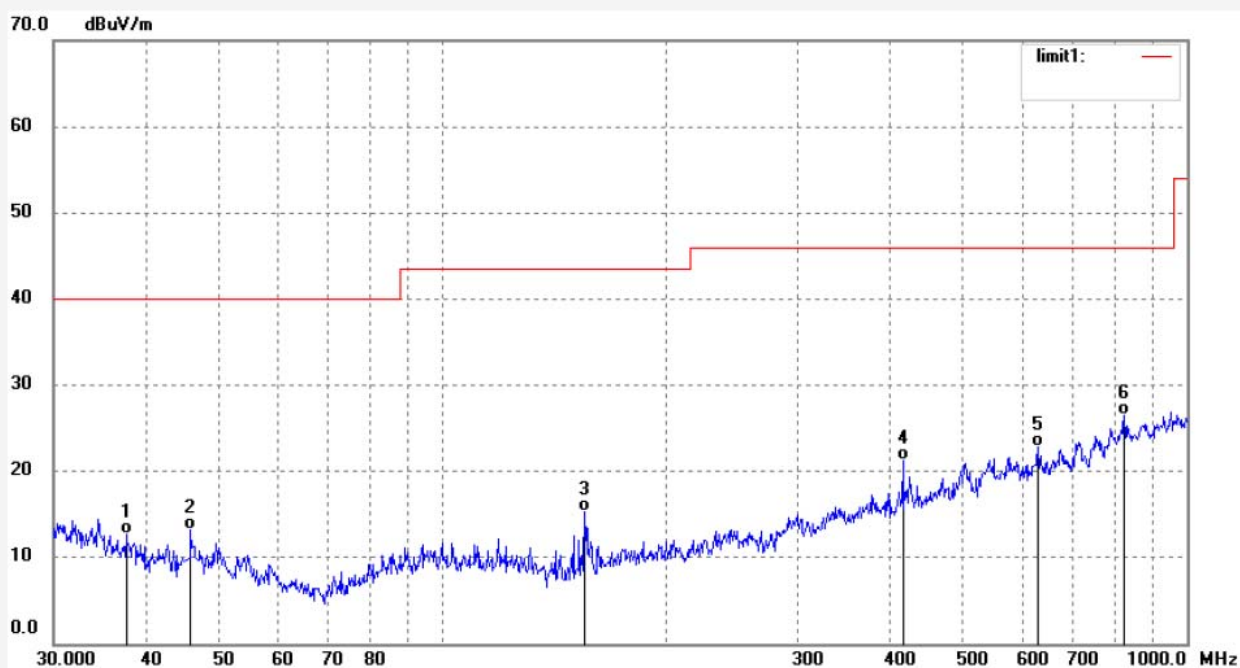
Date: 17/12/02/

Time: 8/44/17

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	37.5647	35.76	-23.15	12.61	40.00	-27.39	QP	100	64	
2	45.8943	38.01	-24.75	13.26	40.00	-26.74	QP	100	137	
3	155.3305	42.46	-27.08	15.38	43.50	-28.12	QP	100	156	
4	415.4485	39.38	-18.07	21.31	46.00	-24.69	QP	100	154	
5	631.1070	36.36	-13.58	22.78	46.00	-23.22	QP	100	223	
6	824.2781	36.03	-9.60	26.43	46.00	-19.57	QP	100	172	



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: STAR2017 #1215

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2480MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Vertical

Power Source: DC 3.7V

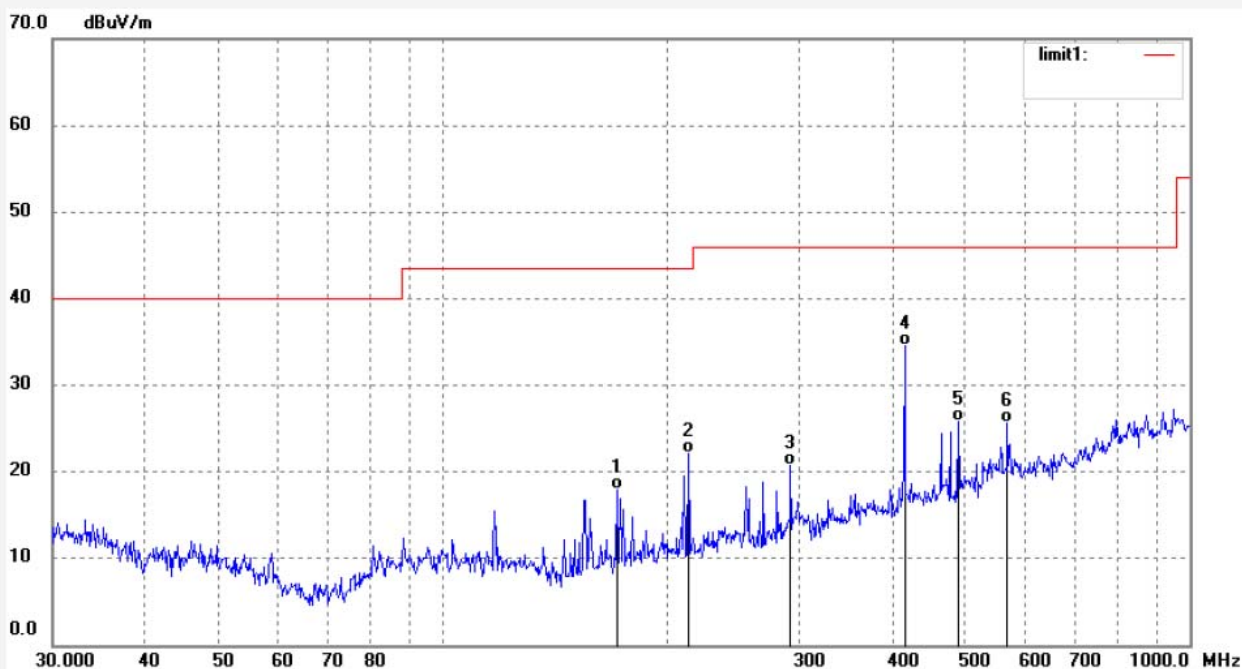
Date: 17/12/02/

Time: 8/45/14

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	171.3890	43.75	-25.80	17.95	43.50	-25.55	QP	100	69	
2	213.1035	46.61	-24.39	22.22	43.50	-21.28	QP	100	103	
3	292.3643	42.59	-21.88	20.71	46.00	-25.29	QP	100	144	
4	415.4486	52.67	-18.07	34.60	46.00	-11.40	QP	100	166	
5	490.0451	42.44	-16.60	25.84	46.00	-20.16	QP	100	185	
6	569.9688	40.02	-14.36	25.66	46.00	-20.34	QP	100	209	

Above 1GHz



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Job No.: STAR2017 #1217

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2402MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Horizontal

Power Source: DC 3.7V

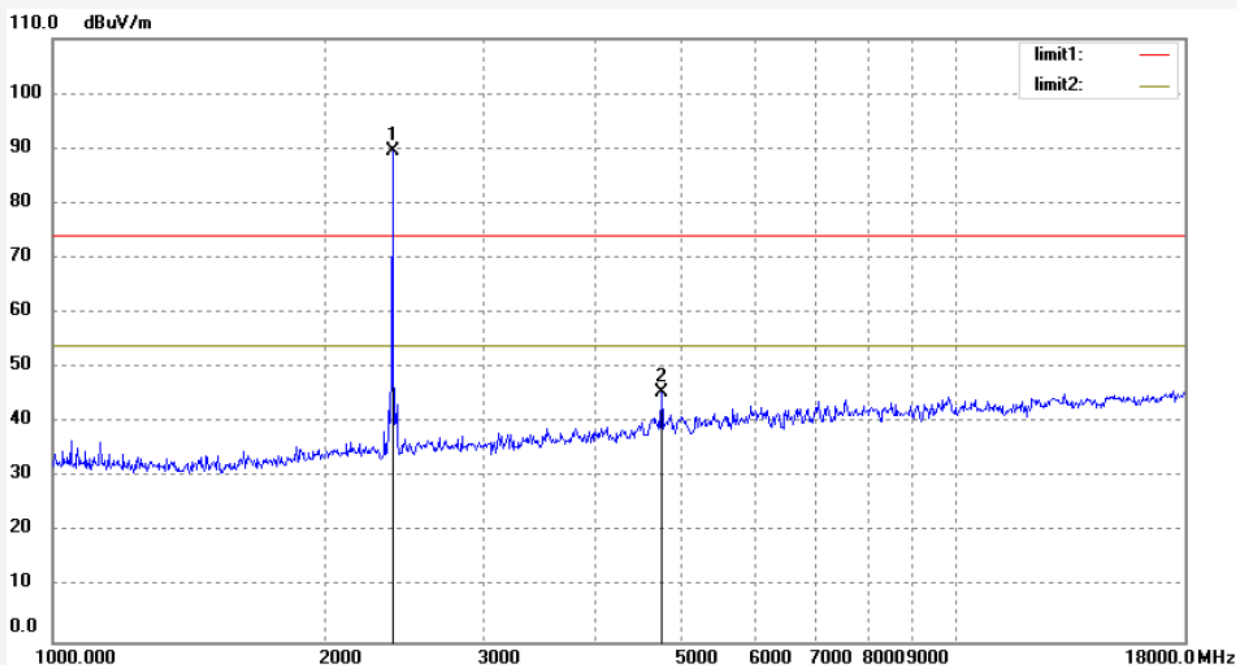
Date: 17/12/02/

Time: 9/07/37

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.019	95.96	-6.37	89.59			peak	200	332	
2	4804.057	44.82	0.70	45.52	74.00	-28.48	peak	200	149	



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Job No.: STAR2017 #1216

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2402MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Vertical

Power Source: DC 3.7V

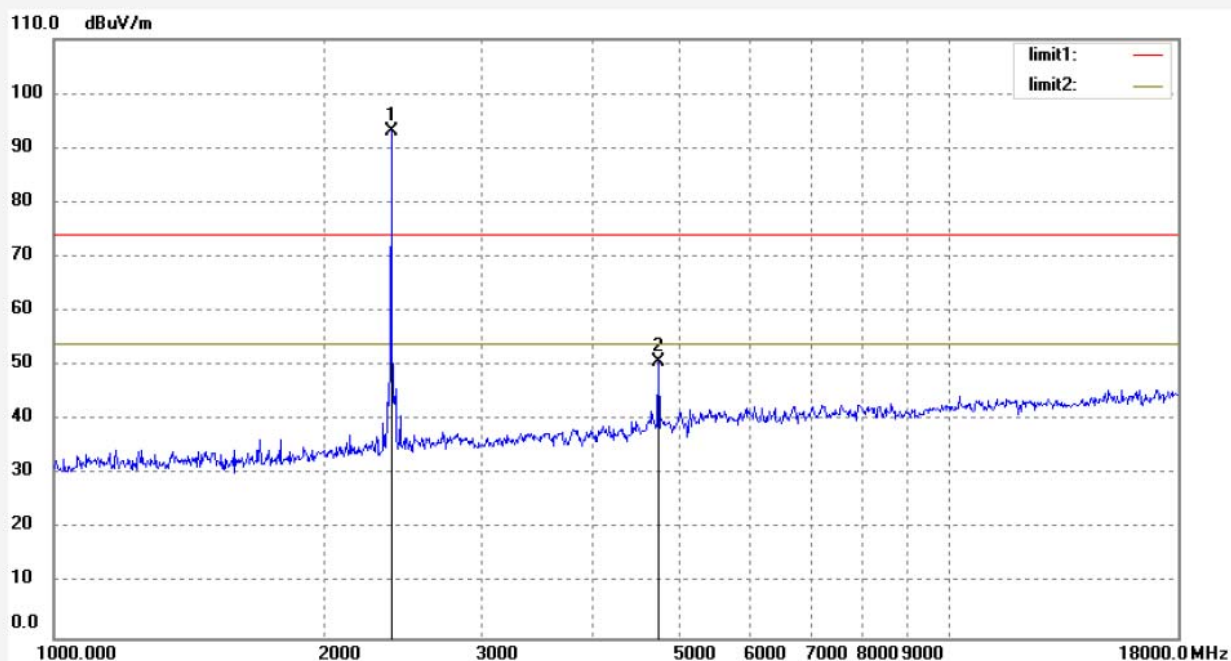
Date: 17/12/02/

Time: 9/06/13

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.019	99.46	-6.37	93.09			peak	150	267	
2	4804.057	50.00	0.70	50.70	74.00	-23.30	peak	150	301	



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Job No.: STAR2017 #1218

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2441MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Horizontal

Power Source: DC 3.7V

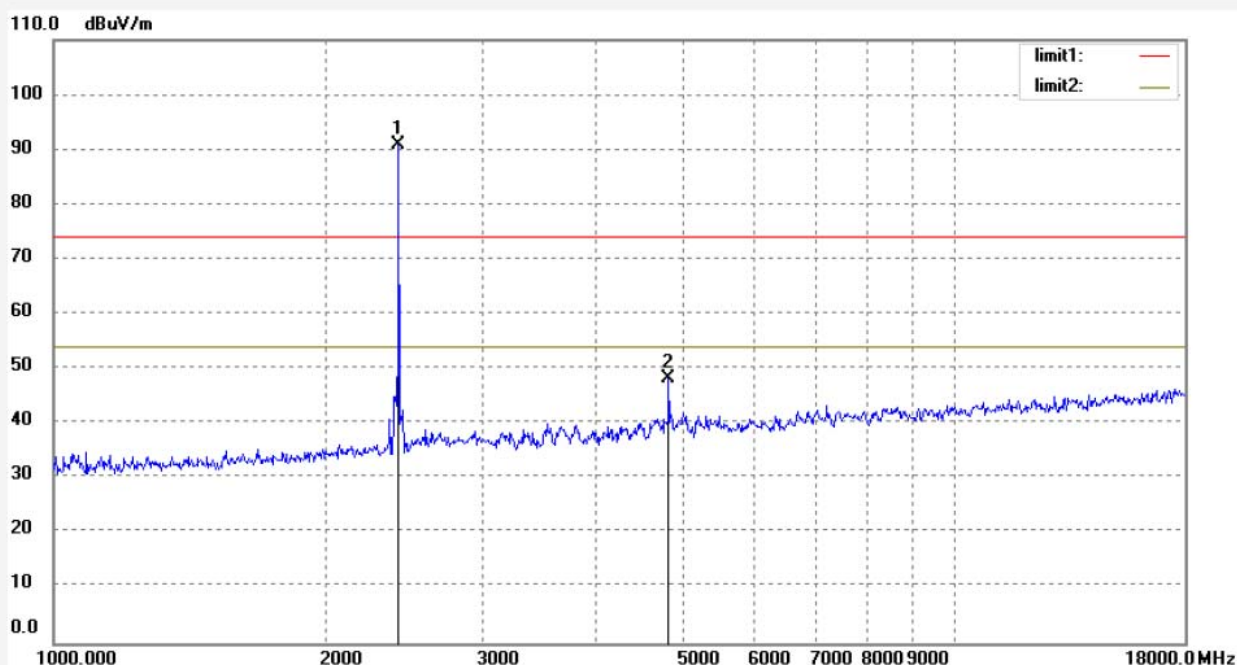
Date: 17/12/02/

Time: 9/09/54

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.021	97.17	-6.20	90.97			peak	200	61	
2	4882.024	47.29	1.07	48.36	74.00	-25.64	peak	200	148	



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Job No.: STAR2017 #1219

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2441MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Vertical

Power Source: DC 3.7V

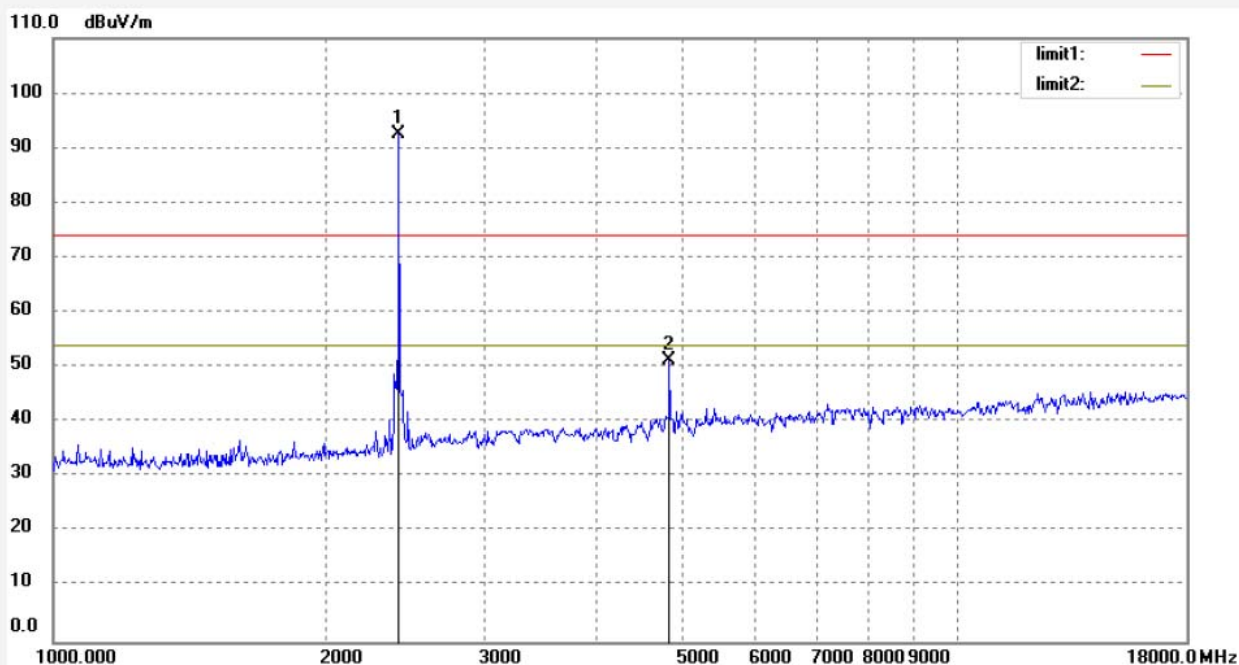
Date: 17/12/02/

Time: 9/11/20

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.021	98.71	-6.20	92.51			peak	150	55	
2	4882.024	50.20	1.07	51.27	74.00	-22.73	peak	150	169	



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Job No.: STAR2017 #1221

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2480MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Horizontal

Power Source: DC 3.7V

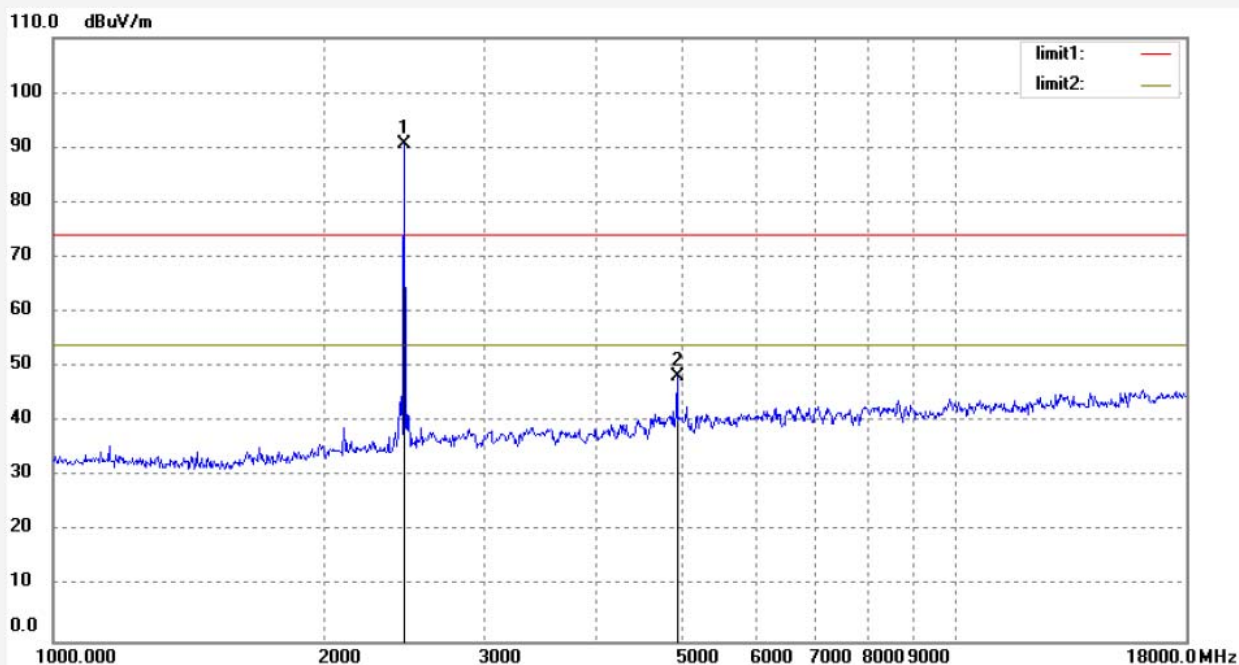
Date: 17/12/02/

Time: 9/14/59

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.034	96.52	-6.04	90.48			peak	200	178	
2	4960.044	46.84	1.50	48.34	74.00	-25.66	peak	200	211	



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Job No.: STAR2017 #1220

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2480MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Vertical

Power Source: DC 3.7V

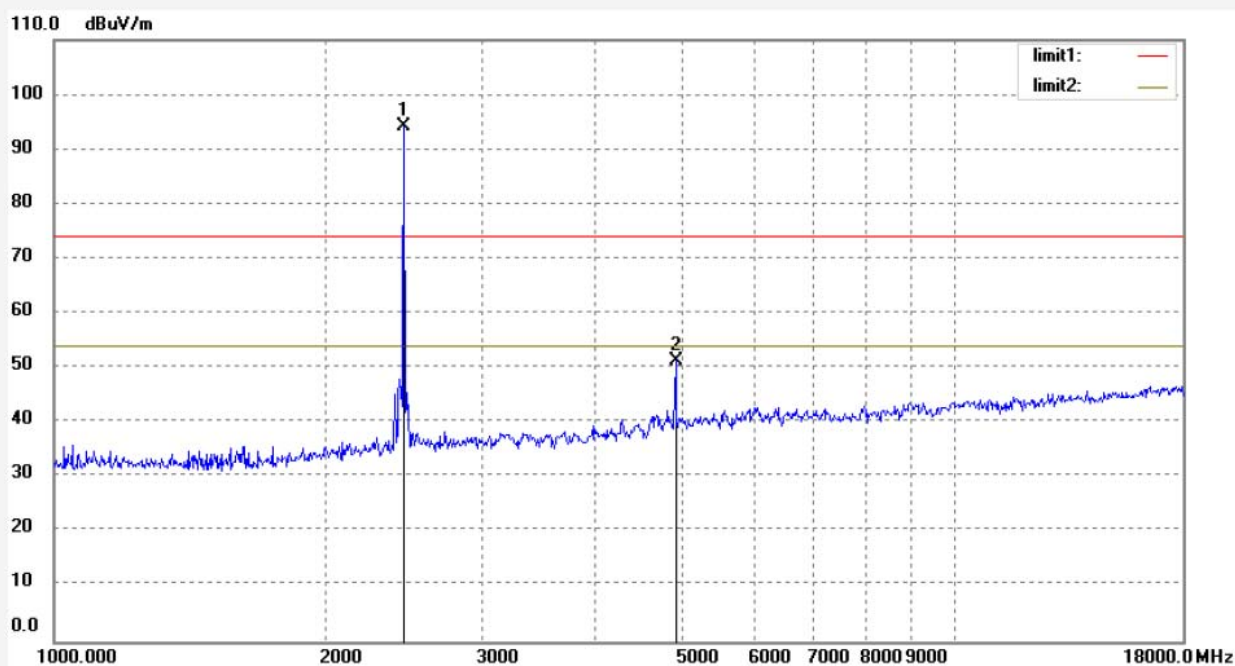
Date: 17/12/02/

Time: 9/12/53

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.034	100.16	-6.04	94.12			peak	150	200	
2	4960.044	49.78	1.50	51.28	74.00	-22.72	peak	150	199	

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: Bluetooth Speaker)

11.2.The Requirement For Section 15.247(d)

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, 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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

11.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

11.4.Operating Condition of EUT

11.4.1.Setup the EUT and simulator as shown as Section 11.1.

11.4.2.Turn on the power of all equipment.

11.4.3.Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

11.5. Test Procedure

11.5.1. The transmitter output was connected to the spectrum analyzer via a low loss cable.

11.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

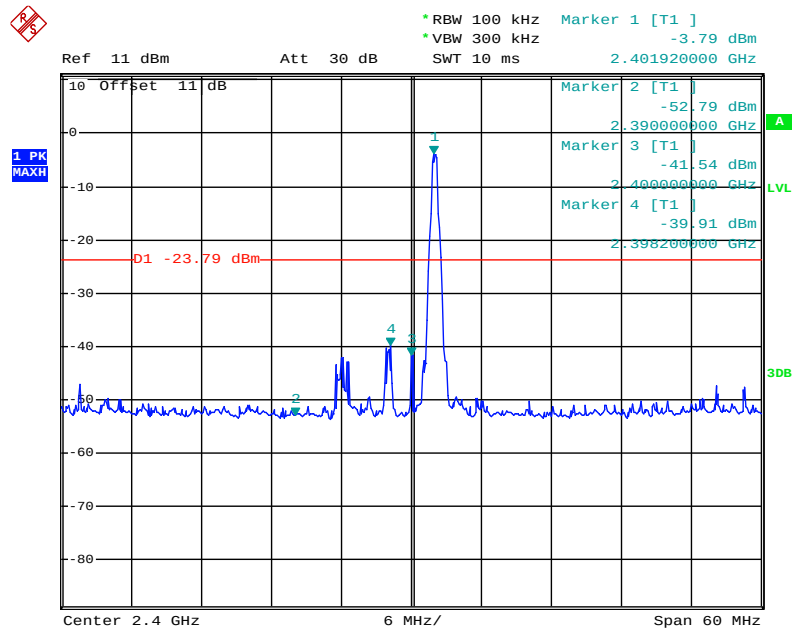
11.5.3. The band edges were measured and recorded.

11.6. Test Result

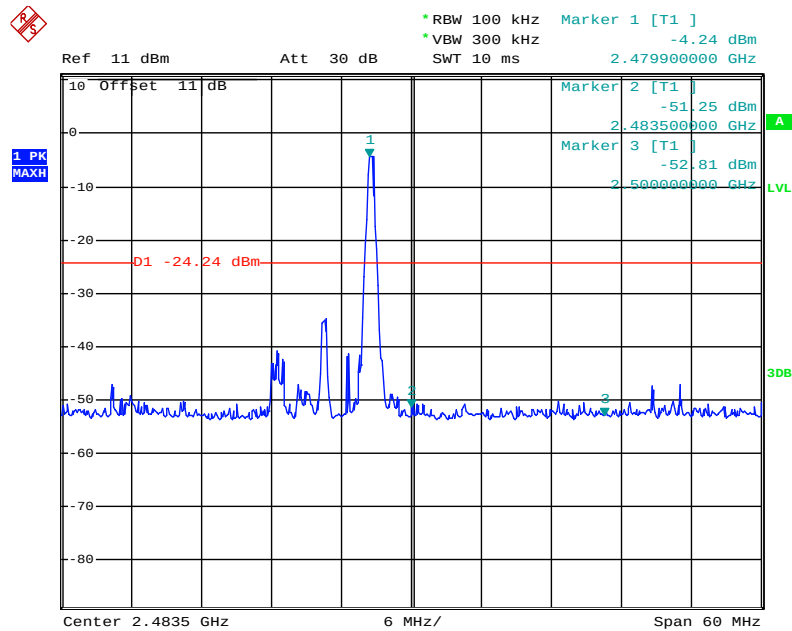
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
GFSK Mode		
2400.00	37.75	> 20dBc
2483.50	47.01	> 20dBc
Π/4-DQPSK Mode		
2400.00	31.78	> 20dBc
2483.50	47.09	> 20dBc

The spectrum analyzer plots are attached as below.

GFSK Mode

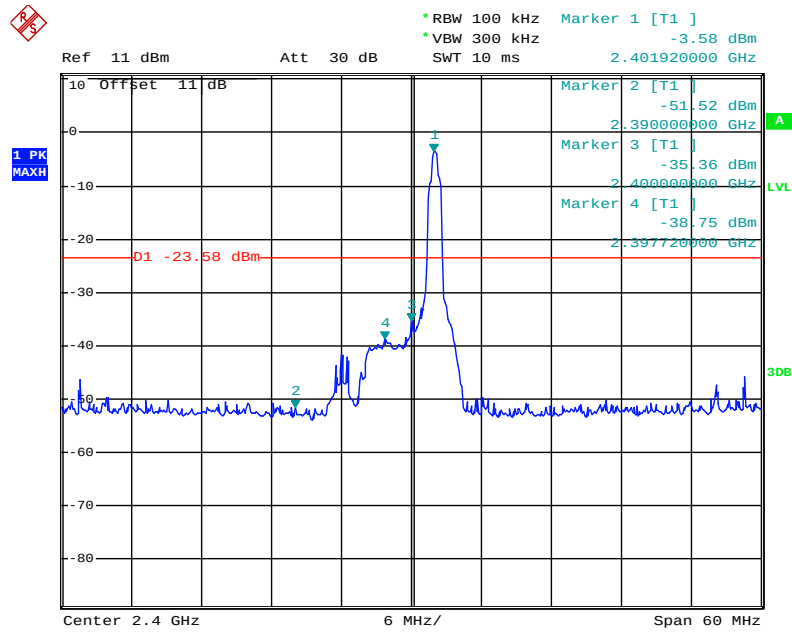


Date: 1.DEC.2017 15:26:01

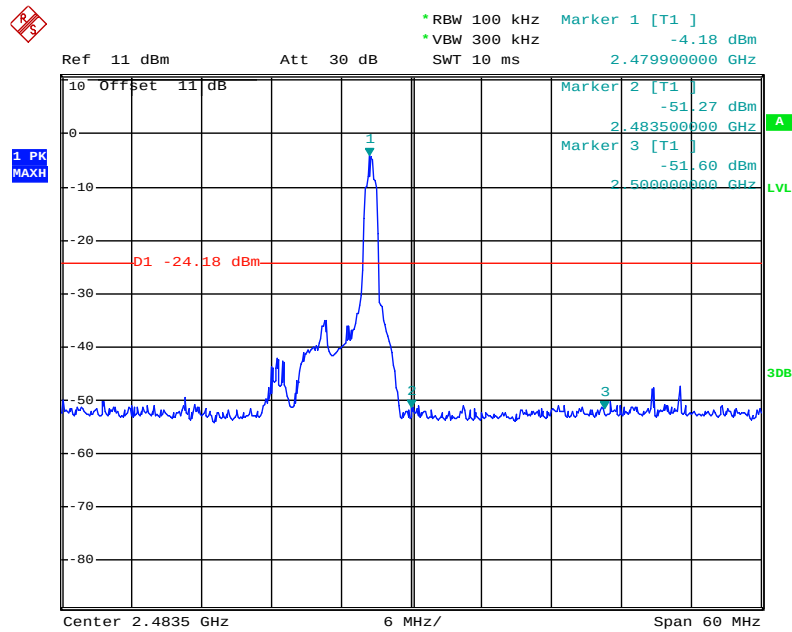


Date: 1.DEC.2017 15:28:08

Π/4-DQPSK Mode



Date: 1.DEC.2017 15:30:55



Date: 1.DEC.2017 15:29:24

Radiated Band Edge Result

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

3. Display the measurement of peak values.

Test Procedure:

The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

Let the EUT work in TX (Hopping off, Hopping on) modes measure it.

We select 2402MHz, 2480MHz TX frequency to transmit(Hopping off mode).

We select 2402-2480MHz TX frequency to transmit(Hopping on mode).

During the radiated emission test, the spectrum analyzer was set with the following configurations:

- 1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
- 2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- 3.All modes of operation were investigated and the worst-case emissions are reported.

Non-hopping mode



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Job No.: STAR2017 #1223

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2402MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Horizontal

Power Source: DC 3.7V

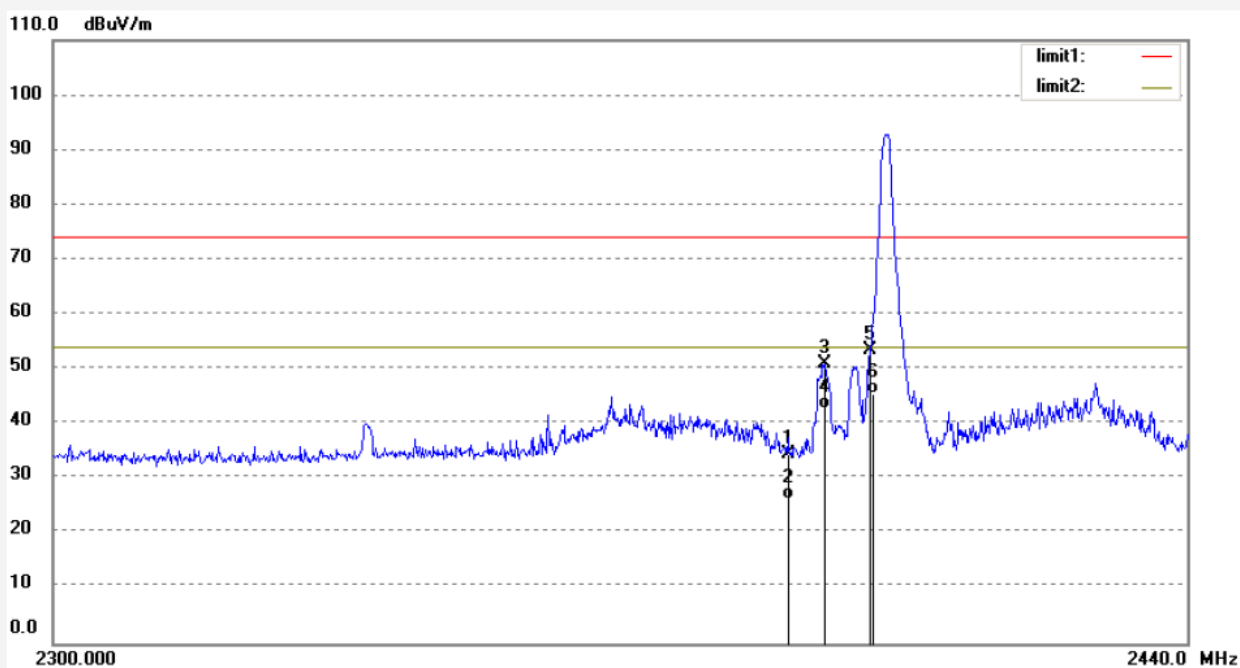
Date: 2017/12/02

Time: 13:39:06

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	40.95	-6.32	34.63	74.00	-39.37	peak	200	117	
2	2390.000	32.64	-6.32	26.32	54.00	-27.68	AVG	200	169	
3	2394.348	57.21	-6.29	50.92	74.00	-23.08	peak	200	185	
4	2394.348	49.06	-6.29	42.77	54.00	-11.23	AVG	200	206	
5	2400.000	59.84	-6.27	53.57	74.00	-20.43	peak	200	112	
6	2400.000	51.77	-6.27	45.50	54.00	-8.50	AVG	200	121	

Note: Average measurement with peak detection at No.2&4



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Job No.: STAR2017 #1222

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2402MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Vertical

Power Source: DC 3.7V

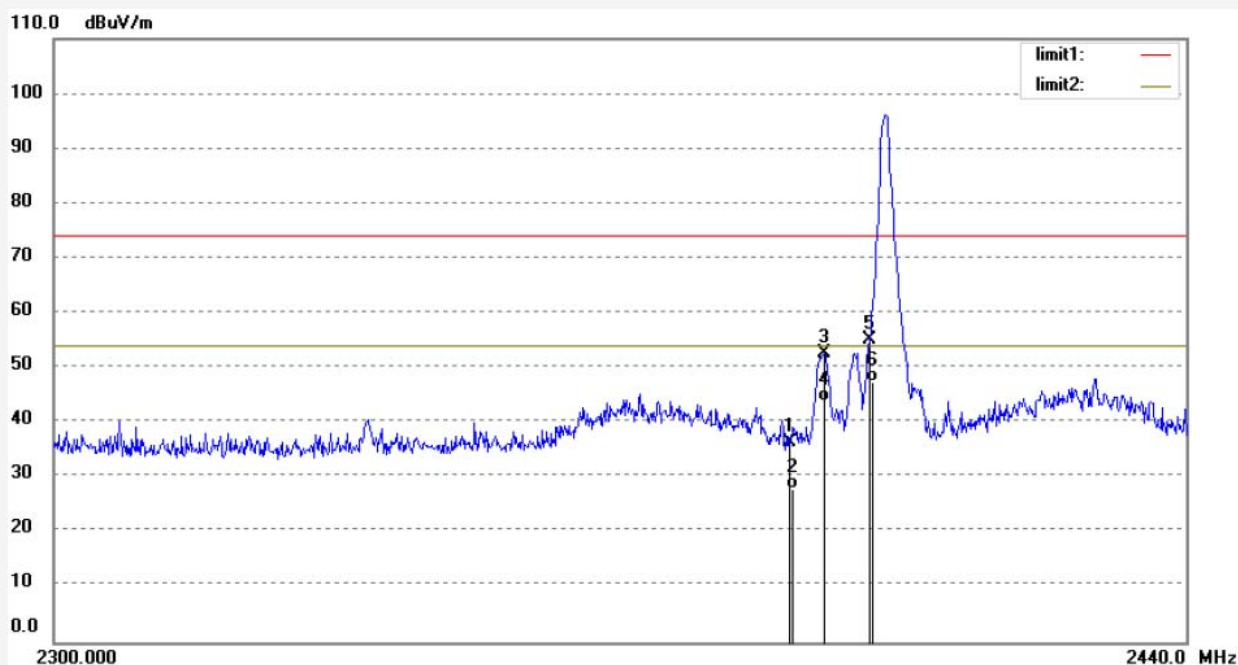
Date: 2017/12/02

Time: 13:37:50

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	42.66	-6.32	36.34	74.00	-37.66	peak	150	206	
2	2390.000	34.14	-6.32	27.82	54.00	-26.18	AVG	150	144	
3	2394.348	59.02	-6.29	52.73	74.00	-21.27	peak	150	99	
4	2394.348	50.25	-6.29	43.96	54.00	-10.04	AVG	150	102	
5	2400.000	61.42	-6.27	55.15	74.00	-18.85	peak	150	115	
6	2400.000	53.69	-6.27	47.42	54.00	-6.58	AVG	150	225	

Note: Average measurement with peak detection at No.2&4



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Job No.: STAR2017 #1224

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2480MHz(GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Horizontal

Power Source: DC 3.7V

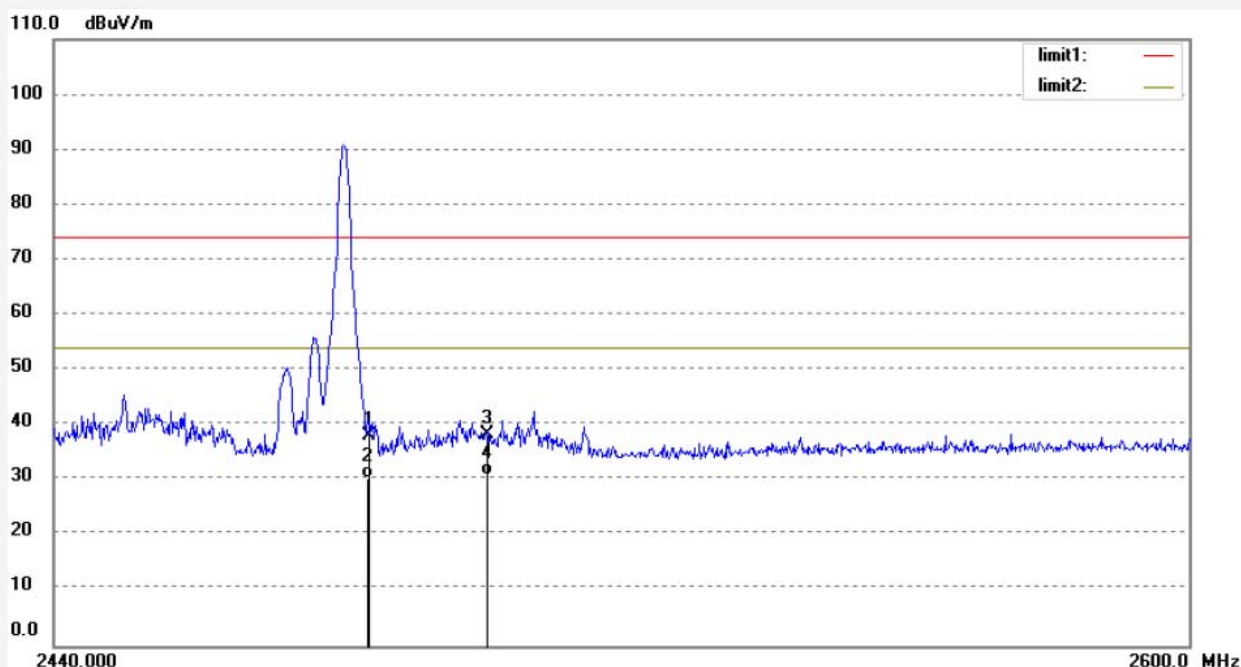
Date: 2017/12/02

Time: 13:40:51

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	44.04	-5.89	38.15	74.00	-35.85	peak	200	73	
2	2483.500	36.21	-5.89	30.32	54.00	-23.68	AVG	200	90	
3	2500.000	44.05	-5.81	38.24	74.00	-35.76	peak	200	111	
4	2500.000	36.67	-5.81	30.86	54.00	-23.14	AVG	200	307	

Note: Average measurement with peak detection at No.2&4



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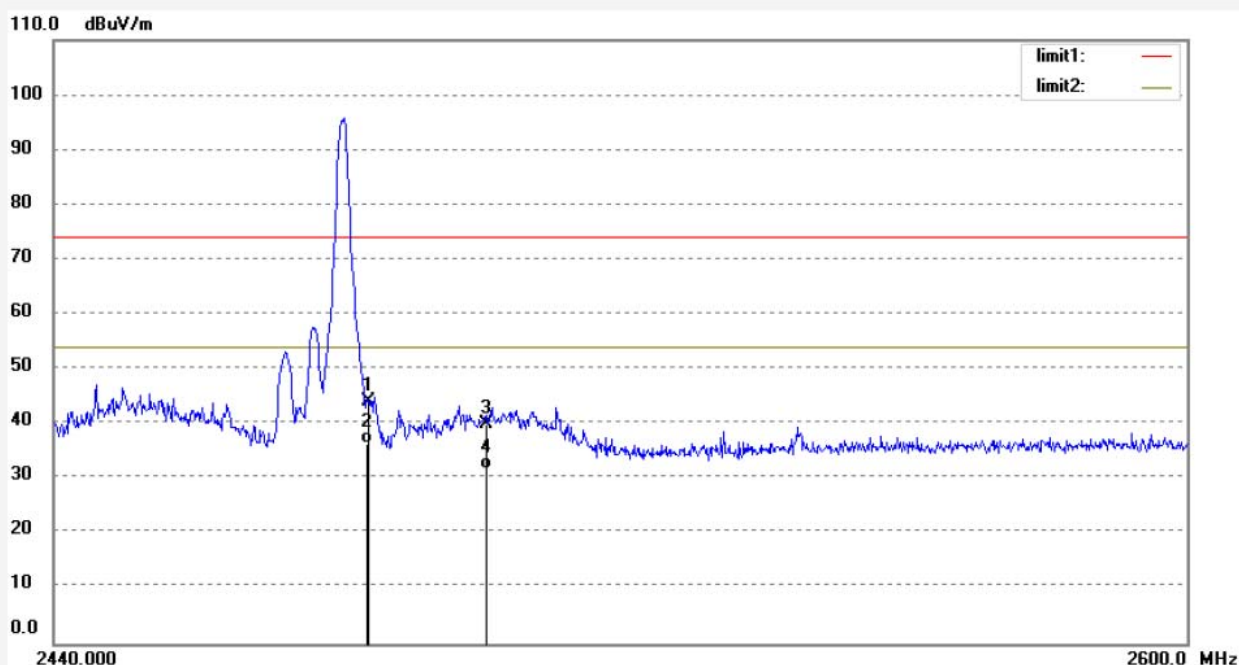
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
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Site: 1# Chamber
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Job No.: STAR2017 #1225
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2480MHz(GFSK)
Model: HY-BBL
Manufacturer: China Etech Groups Ltd

Polarization: Vertical
Power Source: DC 3.7V
Date: 2017/12/02
Time: 13:41:57
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	50.07	-5.89	44.18	74.00	-29.82	peak	150	155	
2	2483.500	42.38	-5.89	36.49	54.00	-17.51	AVG	150	146	
3	2500.000	45.75	-5.81	39.94	74.00	-34.06	peak	150	234	
4	2500.000	37.51	-5.81	31.70	54.00	-22.30	AVG	150	209	

Note: Average measurement with peak detection at No.2&4



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Job No.: STAR2017 #1228

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2402MHz(Π/4-DQPSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Horizontal

Power Source: DC 3.7V

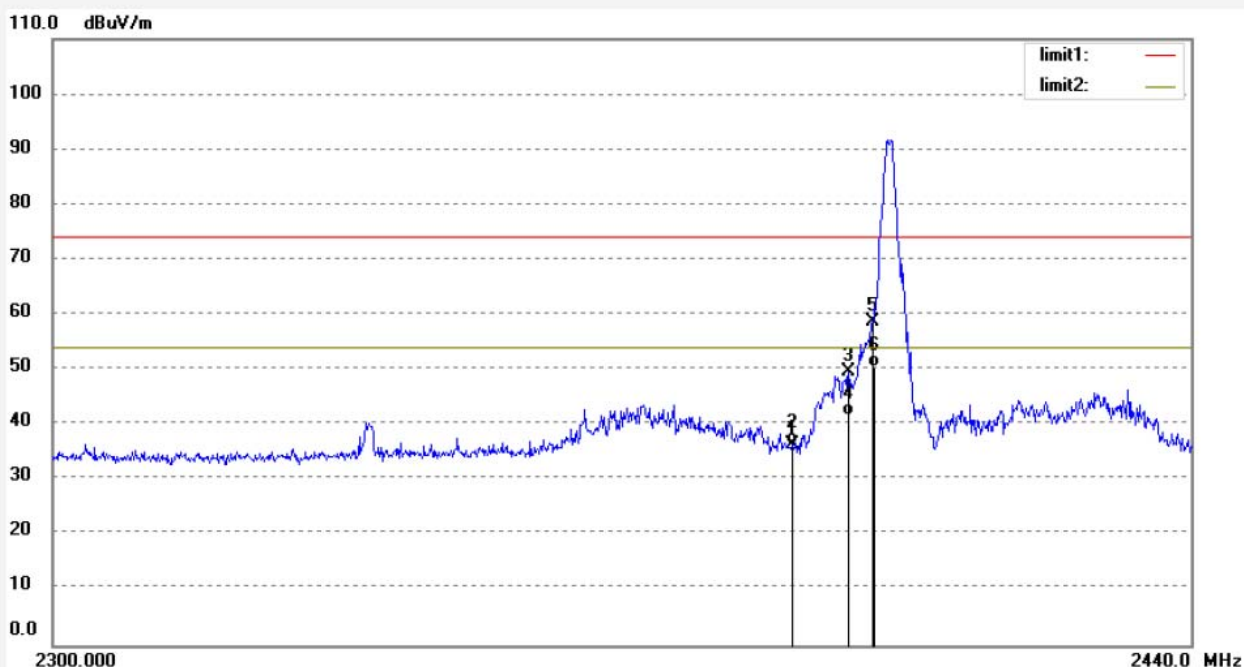
Date: 2017/12/02

Time: 13:47:57

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	42.81	-6.32	36.49	74.00	-37.51	peak	200	45	
2	2390.000	42.81	-6.32	36.49	54.00	-17.51	AVG	200	67	
3	2397.043	55.90	-6.29	49.61	74.00	-24.39	peak	200	106	
4	2397.043	47.84	-6.29	41.55	54.00	-12.45	AVG	200	168	
5	2400.000	64.88	-6.27	58.61	74.00	-15.39	peak	200	174	
6	2400.000	56.65	-6.27	50.38	54.00	-3.62	AVG	200	263	

Note: Average measurement with peak detection at No.2&4



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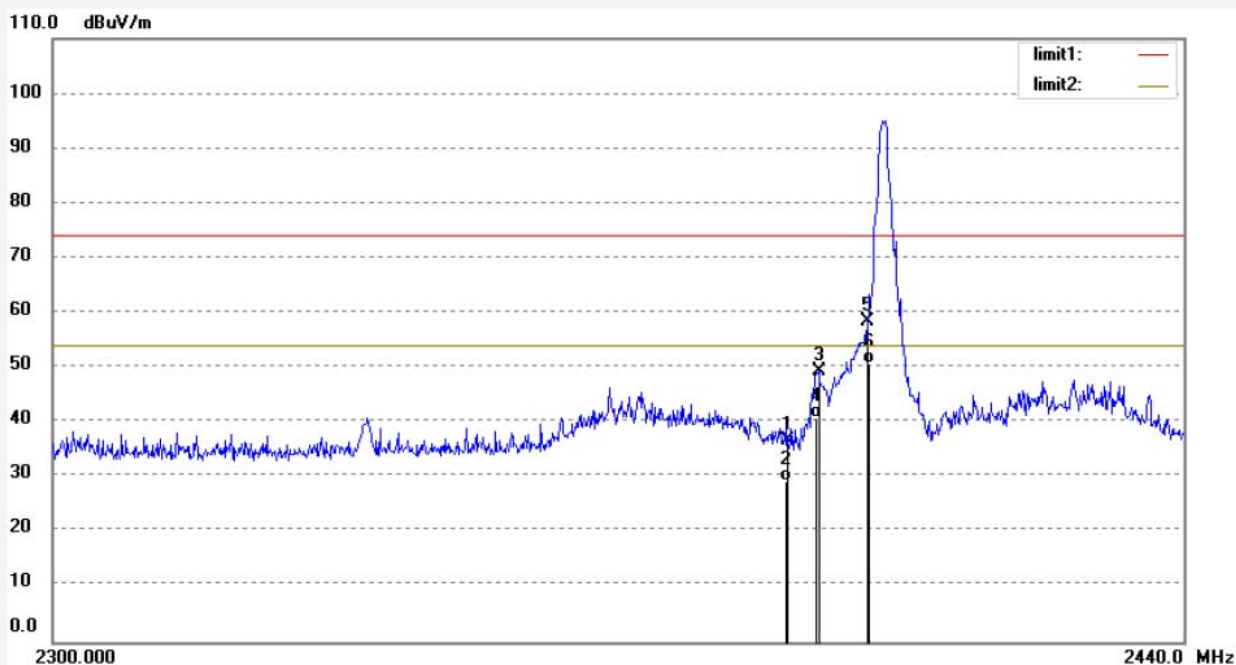
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
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Job No.: STAR2017 #1229
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2402MHz(π /4-DQPSK)
Model: HY-BBL
Manufacturer: China Etech Groups Ltd

Polarization: Vertical
Power Source: DC 3.7V
Date: 2017/12/02
Time: 13:50:07
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	43.17	-6.32	36.85	74.00	-37.15	peak	150	265	
2	2390.000	35.62	-6.32	29.30	54.00	-24.70	AVG	150	241	
3	2393.923	55.53	-6.30	49.23	74.00	-24.77	peak	150	143	
4	2393.923	47.26	-6.30	40.96	54.00	-13.04	AVG	150	200	
5	2400.000	64.58	-6.27	58.31	74.00	-15.69	peak	150	177	
6	2400.000	57.00	-6.27	50.73	54.00	-3.27	AVG	150	32	

Note: Average measurement with peak detection at No.2&4



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Job No.: STAR2017 #1227

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2480MHz(Π/4-DQPSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Horizontal

Power Source: DC 3.7V

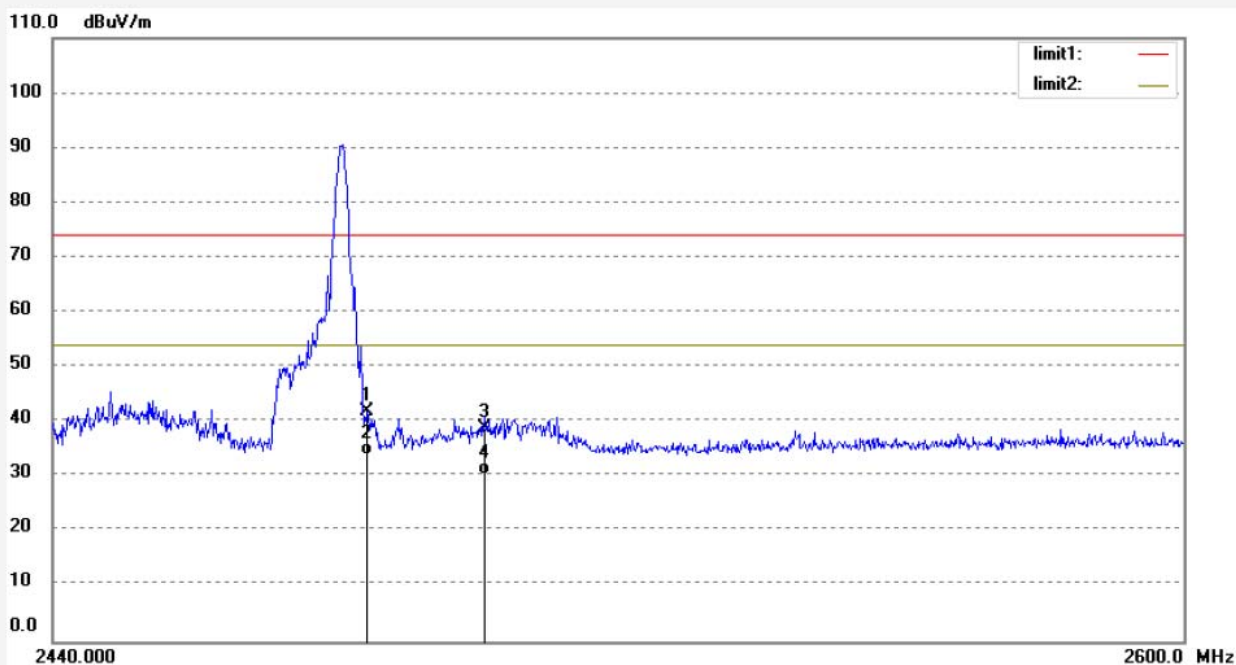
Date: 2017/12/02

Time: 13:45:39

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	47.94	-5.89	42.05	74.00	-31.95	peak	200	96	
2	2483.500	39.99	-5.89	34.10	54.00	-19.90	AVG	200	138	
3	2500.000	44.69	-5.81	38.88	74.00	-35.12	peak	200	142	
4	2500.000	36.21	-5.81	30.40	54.00	-23.60	AVG	200	228	

Note: Average measurement with peak detection at No.2&4



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Site: 1# Chamber

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Job No.: STAR2017 #1226

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: TX 2480MHz(Π/4-DQPSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Vertical

Power Source: DC 3.7V

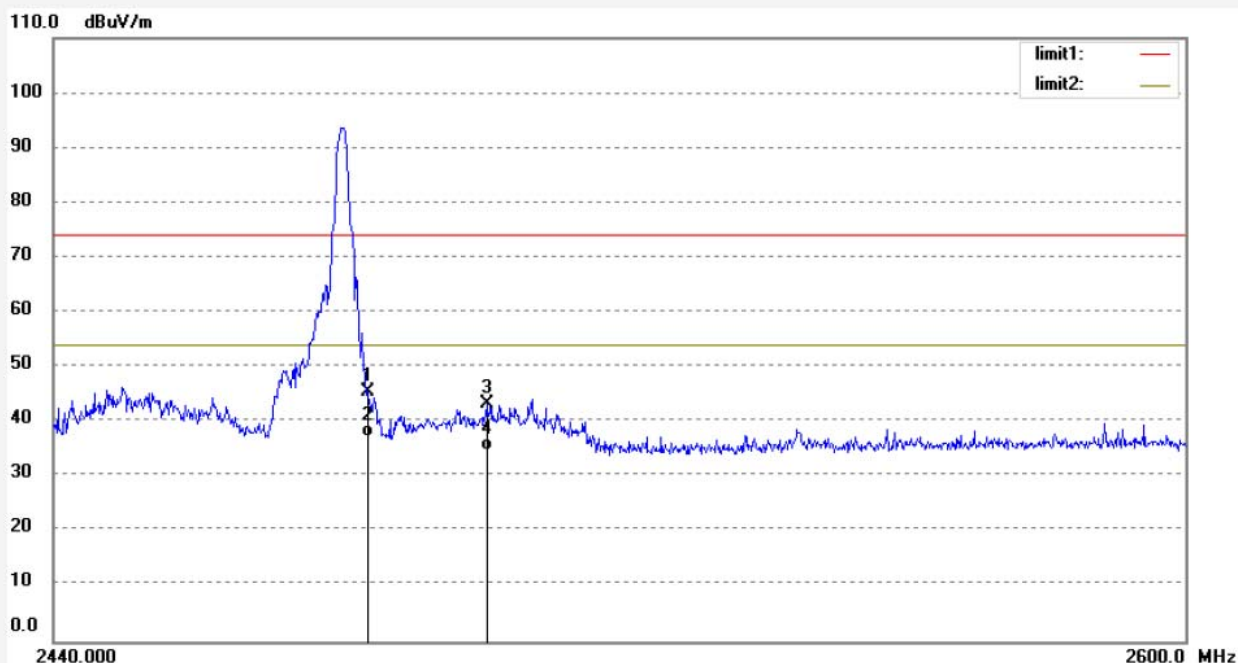
Date: 2017/12/02

Time: 13:43:46

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	51.51	-5.89	45.62	74.00	-28.38	peak	150	117	
2	2483.500	43.22	-5.89	37.33	54.00	-16.67	AVG	150	273	
3	2500.000	49.06	-5.81	43.25	74.00	-30.75	peak	150	206	
4	2500.000	40.58	-5.81	34.77	54.00	-19.23	AVG	150	199	

Note: Average measurement with peak detection at No.2&4

Hopping mode



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Job No.: STAR2017 #1231

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: Hopping (GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Horizontal

Power Source: DC 3.7V

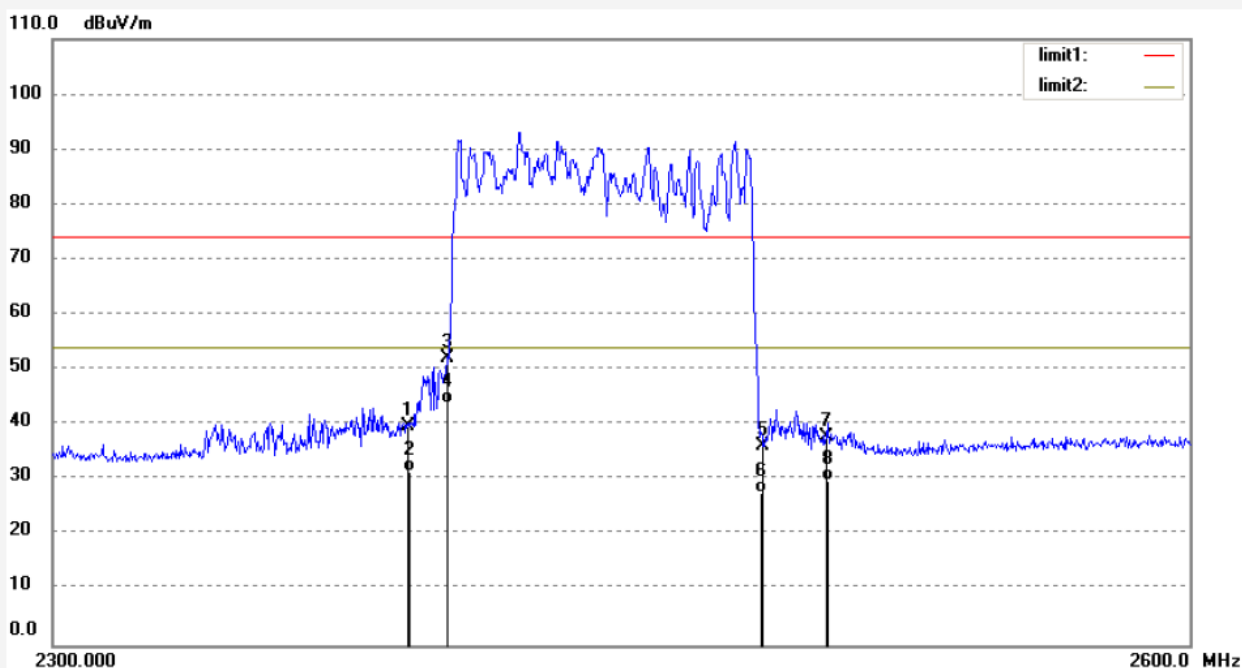
Date: 2017/12/02

Time: 14:00:22

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	45.96	-6.32	39.64	74.00	-34.36	peak	200	88	
2	2390.000	37.69	-6.32	31.37	54.00	-22.63	AVG	200	112	
3	2400.000	58.46	-6.27	52.19	74.00	-21.81	peak	200	133	
4	2400.000	50.04	-6.27	43.77	54.00	-10.23	AVG	200	45	
5	2483.500	42.09	-5.89	36.20	74.00	-37.80	peak	200	94	
6	2483.500	33.61	-5.89	27.72	54.00	-26.28	AVG	200	108	
7	2500.000	43.72	-5.81	37.91	74.00	-36.09	peak	200	177	
8	2500.000	35.58	-5.81	29.77	54.00	-24.23	AVG	200	196	

Note: Average measurement with peak detection at No.2&4&6&8



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Job No.: STAR2017 #1230

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Speaker

Mode: Hopping (GFSK)

Model: HY-BBL

Manufacturer: China Etech Groups Ltd

Polarization: Vertical

Power Source: DC 3.7V

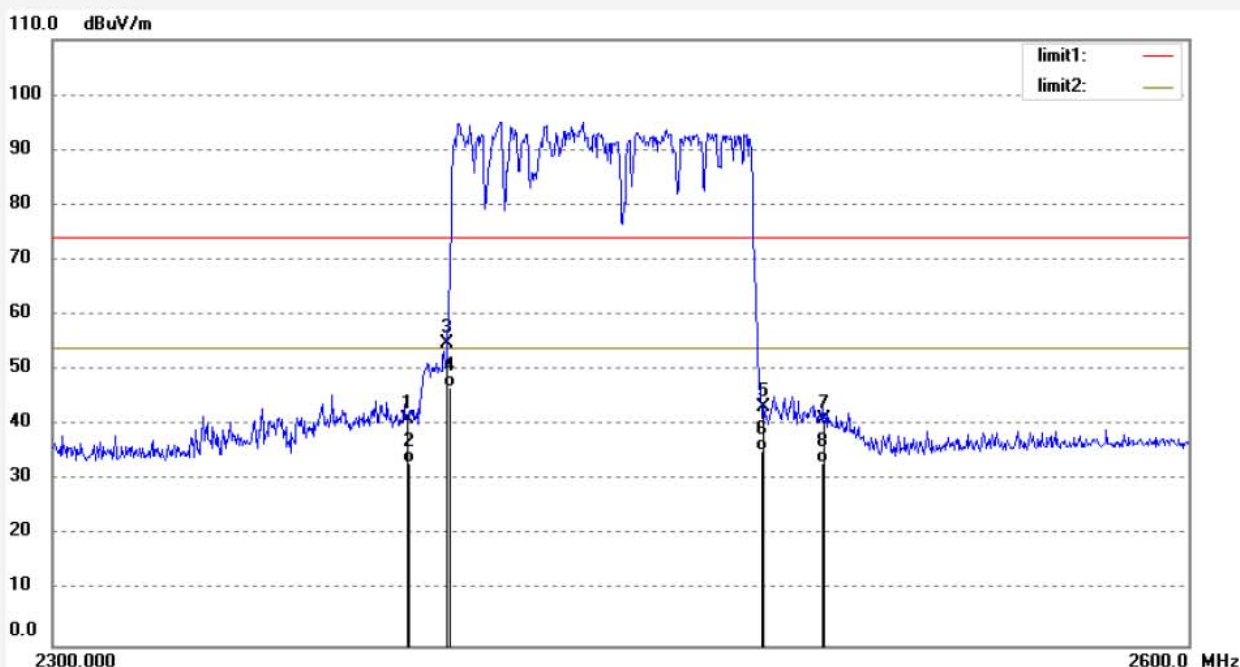
Date: 2017/12/02

Time: 13:56:47

Engineer Signature: star

Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	47.35	-6.32	41.03	74.00	-32.97	peak	150	67	
2	2390.000	39.47	-6.32	33.15	54.00	-20.85	AVG	150	114	
3	2400.000	61.08	-6.27	54.81	74.00	-19.19	peak	150	109	
4	2400.000	53.24	-6.27	46.97	54.00	-7.03	AVG	150	203	
5	2483.500	49.16	-5.89	43.27	74.00	-30.73	peak	150	79	
6	2483.500	41.29	-5.89	35.40	54.00	-18.60	AVG	150	133	
7	2500.000	46.92	-5.81	41.11	74.00	-32.89	peak	150	175	
8	2500.000	38.84	-5.81	33.03	54.00	-20.97	AVG	150	180	

Note: Average measurement with peak detection at No.2&4&6&8



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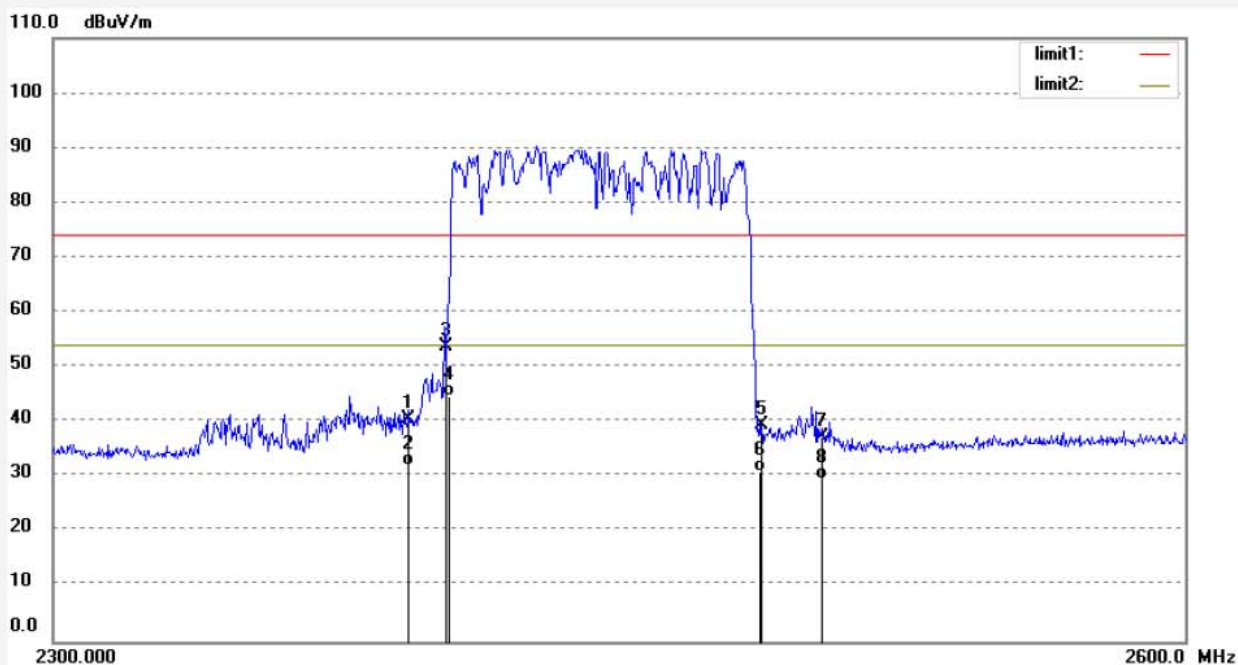
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #1232
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: Hopping (π/4-DQPSK)
Model: HY-BBL
Manufacturer: China Etech Groups Ltd

Polarization: Horizontal
Power Source: DC 3.7V
Date: 2017/12/02
Time: 14:04:01
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	46.81	-6.32	40.49	74.00	-33.51	peak	200	291	
2	2390.000	38.44	-6.32	32.12	54.00	-21.88	AVG	200	244	
3	2400.000	59.99	-6.27	53.72	74.00	-20.28	peak	200	25	
4	2400.000	51.07	-6.27	44.80	54.00	-9.20	AVG	200	68	
5	2483.500	45.25	-5.89	39.36	74.00	-34.64	peak	200	110	
6	2483.500	36.92	-5.89	31.03	54.00	-22.97	AVG	200	95	
7	2500.000	43.08	-5.81	37.27	74.00	-36.73	peak	200	118	
8	2500.000	35.36	-5.81	29.55	54.00	-24.45	AVG	200	72	

Note: Average measurement with peak detection at No.2&4&6&8



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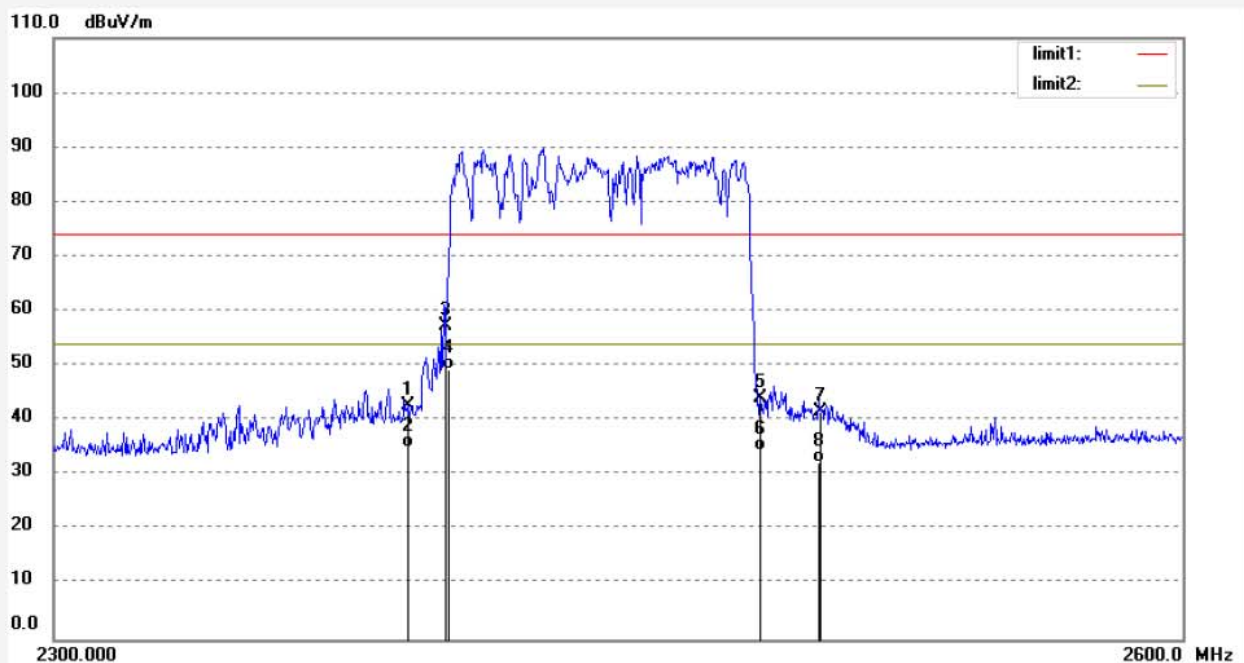
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
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Job No.: STAR2017 #1233
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: Hopping (π/4-DQPSK)
Model: HY-BBL
Manufacturer: China Etech Groups Ltd

Polarization: Vertical
Power Source: DC 3.7V
Date: 2017/12/02
Time: 14:07:58
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20172415



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	49.05	-6.32	42.73	74.00	-31.27	peak	150	33	
2	2390.000	41.25	-6.32	34.93	54.00	-19.07	AVG	150	47	
3	2400.000	63.51	-6.27	57.24	74.00	-16.76	peak	150	244	
4	2400.000	55.62	-6.27	49.35	54.00	-4.65	AVG	150	263	
5	2483.500	49.94	-5.89	44.05	74.00	-29.95	peak	150	311	
6	2483.500	40.43	-5.89	34.54	54.00	-19.46	AVG	150	297	
7	2500.000	47.50	-5.81	41.69	74.00	-32.31	peak	150	168	
8	2500.000	38.10	-5.81	32.29	54.00	-21.71	AVG	150	201	

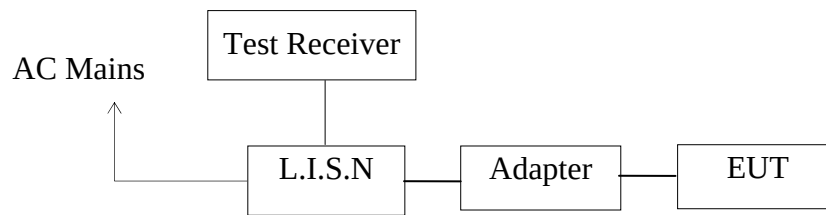
Note: Average measurement with peak detection at No.2&4&6&8

12.AC POWER LINE CONDUCTED EMISSION FOR FCC PART

15 SECTION 15.207(A)

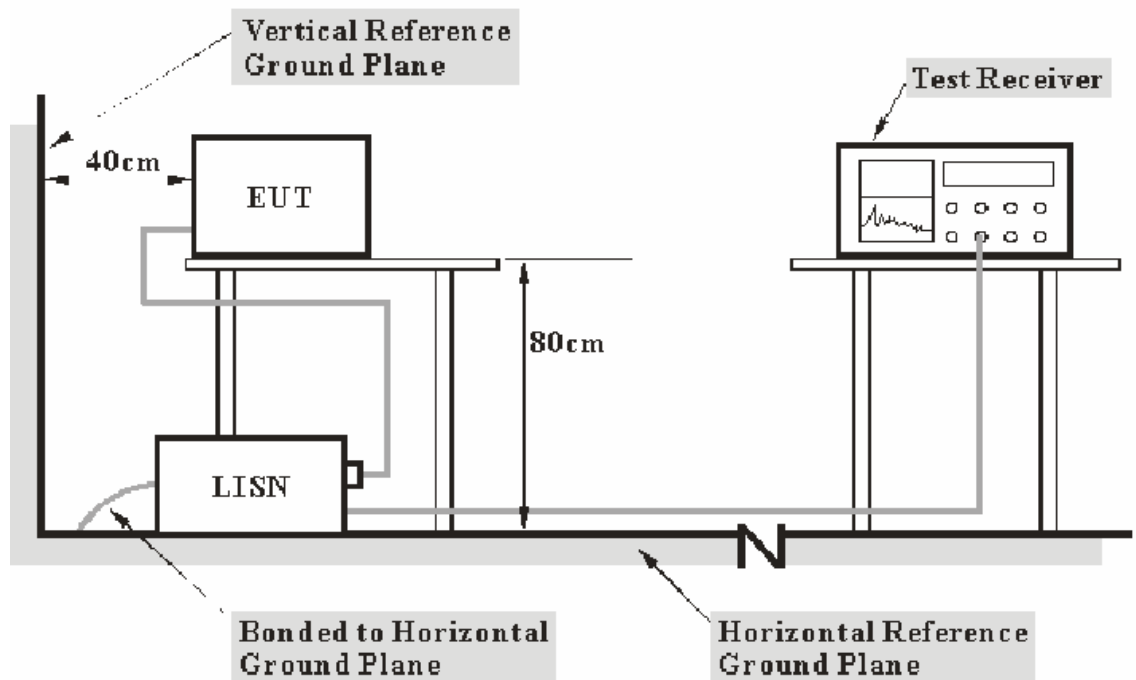
12.1.Block Diagram of Test Setup

12.1.1.Block diagram of connection between the EUT and simulators



(EUT: Bluetooth Speaker)

12.1.2.Test System Setup



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

12.2.Power Line Conducted Emission Measurement Limits

Frequency (MHz)	Limit dB(μ V)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0
NOTE1: The lower limit shall apply at the transition frequencies.		
NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

12.3.Configuration of EUT on Measurement

The equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

12.4.Operating Condition of EUT

12.4.1.Setup the EUT and simulator as shown as Section 12.1.

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in test mode and measure it.

12.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Measurement. The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

12.6.Data Sample

Frequency (MHz)	Transducer value (dB)	QuasiPeak Level (dBμV)	Average Level (dBμV)	QuasiPeak Limit (dBμV)	Average Limit (dBμV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	10.5	51.1	34.2	56.0	46.0	4.9	11.8	Pass

Frequency(MHz) = Emission frequency in MHz

Transducer value(dB) = Insertion loss of LISN + Cable Loss

Level(dBμV) = Quasi-peak Reading/Average Reading + Transducer value

Limit (dBμV) = Limit stated in standard

Margin = Limit (dBμV) - Level (dBμV)

Calculation Formula:

Margin = Limit (dBμV) - Level (dBμV)

12.7.Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150kHz to 30MHz is checked.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.
Emissions attenuated more than 20 dB below the permissible value are not reported.

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

The spectral diagrams are attached as below.

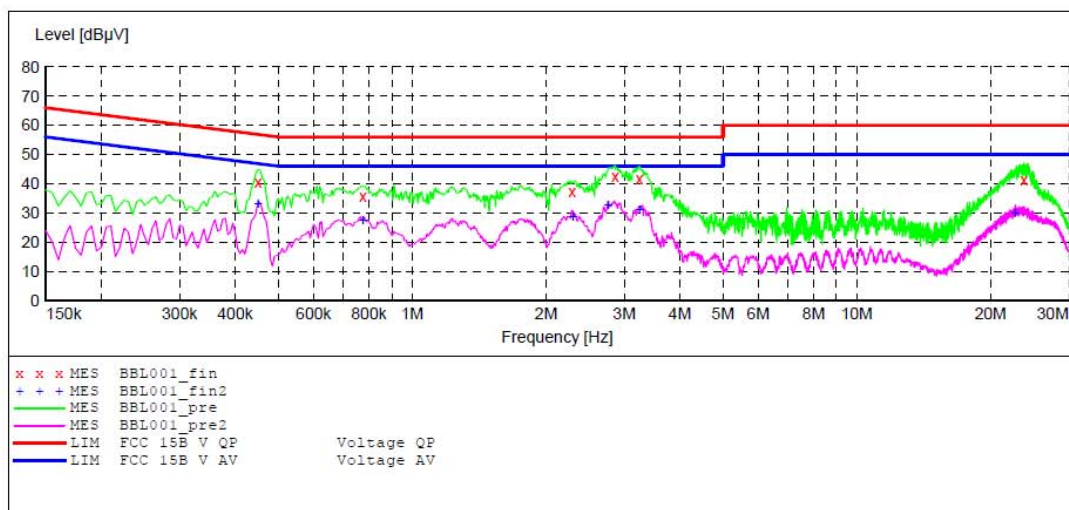
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Bluetooth Speaker M/N:HY-BBL
 Manufacturer: China Etech Groups Ltd
 Operating Condition: Charging
 Test Site: 1#Shielding Room
 Operator: Star
 Test Specification: L 240V/60Hz
 Comment: Report No.:ATE20172415
 Start of Test: 12/2/2017 / 9:24:58AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "BBL001_fin"

12/2/2017 9:28AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.450000	40.50	10.7	57	16.4	QP	L1	GND
0.775000	35.50	10.8	56	20.5	QP	L1	GND
2.290000	37.10	11.0	56	18.9	QP	L1	GND
2.860000	42.40	11.0	56	13.6	QP	L1	GND
3.240000	41.60	11.1	56	14.4	QP	L1	GND
23.770000	41.40	11.5	60	18.6	QP	L1	GND

MEASUREMENT RESULT: "BBL001_fin2"

12/2/2017 9:28AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.450000	33.20	10.7	47	13.7	AV	L1	GND
0.775000	27.70	10.8	46	18.3	AV	L1	GND
2.300000	28.90	11.0	46	17.1	AV	L1	GND
2.760000	32.80	11.0	46	13.2	AV	L1	GND
3.240000	31.20	11.1	46	14.8	AV	L1	GND
22.705000	30.20	11.4	50	19.8	AV	L1	GND

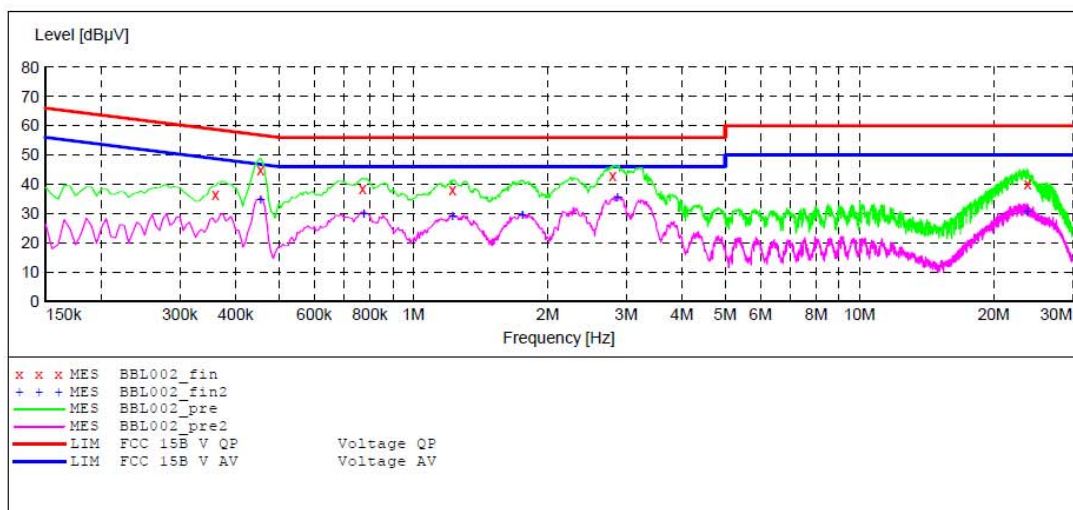
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Bluetooth Speaker M/N:HY-BBL
 Manufacturer: China Etech Groups Ltd
 Operating Condition: Charging
 Test Site: 1#Shielding Room
 Operator: Star
 Test Specification: N 240V/60Hz
 Comment: Report No.:ATE20172415
 Start of Test: 12/2/2017 / 9:32:48AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "BBL002_fin"

12/2/2017 9:33AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.360000	36.60	10.6	59	22.1	QP	N	GND
0.455000	45.00	10.7	57	11.8	QP	N	GND
0.770000	38.60	10.8	56	17.4	QP	N	GND
1.225000	38.10	10.9	56	17.9	QP	N	GND
2.800000	42.90	11.0	56	13.1	QP	N	GND
23.800000	40.20	11.5	60	19.8	QP	N	GND

MEASUREMENT RESULT: "BBL002_fin2"

12/2/2017 9:33AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.455000	34.90	10.7	47	11.9	AV	N	GND
0.775000	30.00	10.8	46	16.0	AV	N	GND
1.225000	29.30	10.9	46	16.7	AV	N	GND
1.755000	29.50	11.0	46	16.5	AV	N	GND
2.870000	35.70	11.0	46	10.3	AV	N	GND
23.770000	30.80	11.5	50	19.2	AV	N	GND

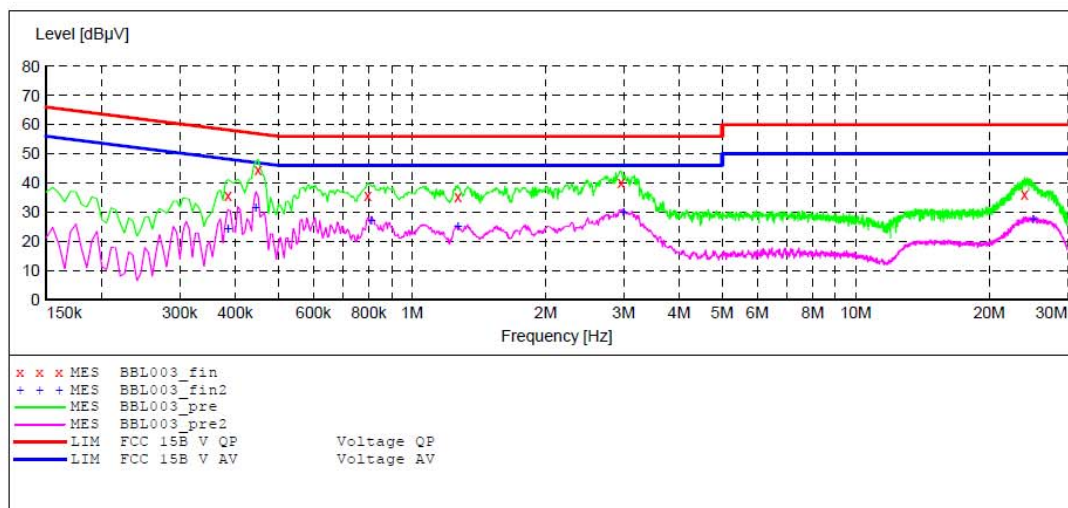
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Bluetooth Speaker M/N:HY-BBL
 Manufacturer: China Etech Groups Ltd
 Operating Condition: Charging
 Test Site: 1#Shielding Room
 Operator: Star
 Test Specification: N 120V/60Hz
 Comment: Report No.:ATE20172415
 Start of Test: 12/2/2017 / 9:34:24AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "BBL003_fin"

12/2/2017 9:38AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.385000	35.50	10.7	58	22.7	QP	N	GND
0.450000	44.40	10.7	57	12.5	QP	N	GND
0.795000	35.70	10.8	56	20.3	QP	N	GND
1.270000	35.20	10.9	56	20.8	QP	N	GND
2.960000	39.90	11.1	56	16.1	QP	N	GND
23.995000	36.10	11.5	60	23.9	QP	N	GND

MEASUREMENT RESULT: "BBL003_fin2"

12/2/2017 9:38AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.385000	24.30	10.7	48	23.9	AV	N	GND
0.445000	31.50	10.7	47	15.5	AV	N	GND
0.810000	27.40	10.8	46	18.6	AV	N	GND
1.270000	25.20	10.9	46	20.8	AV	N	GND
3.000000	30.10	11.1	46	15.9	AV	N	GND
25.120000	27.50	11.5	50	22.5	AV	N	GND

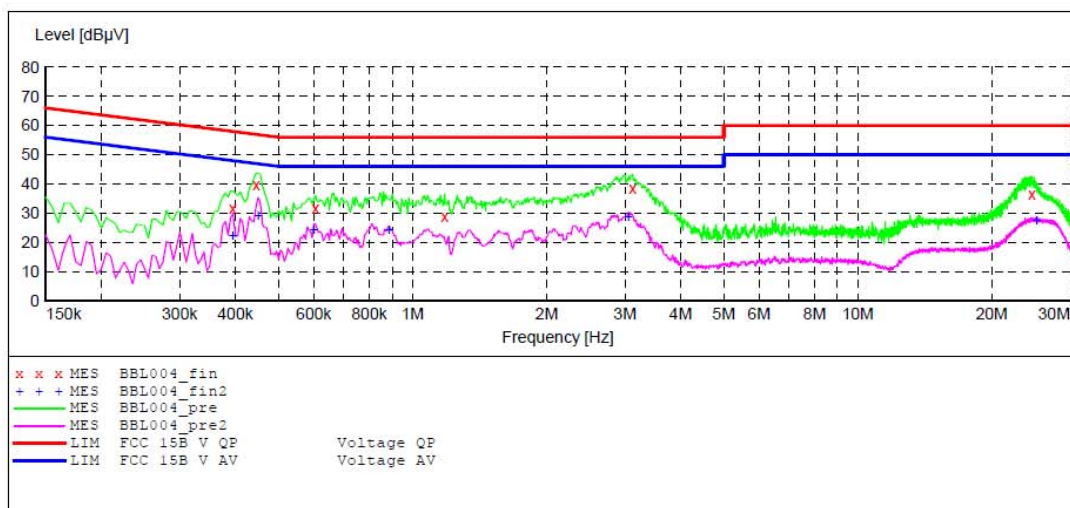
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Bluetooth Speaker M/N:HY-BBL
 Manufacturer: China Etech Groups Ltd
 Operating Condition: Charging
 Test Site: 1#Shielding Room
 Operator: Star
 Test Specification: L 120V/60Hz
 Comment: Report No.:ATE20172415
 Start of Test: 12/2/2017 / 9:39:16AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "BBL004_fin"

12/2/2017 9:42AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.395000	31.50	10.7	58	26.5	QP	L1	GND
0.445000	39.50	10.7	57	17.5	QP	L1	GND
0.605000	31.60	10.7	56	24.4	QP	L1	GND
1.180000	28.90	10.9	56	27.1	QP	L1	GND
3.120000	38.60	11.1	56	17.4	QP	L1	GND
24.595000	36.50	11.5	60	23.5	QP	L1	GND

MEASUREMENT RESULT: "BBL004_fin2"

12/2/2017 9:42AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.395000	22.30	10.7	48	25.7	AV	L1	GND
0.450000	29.20	10.7	47	17.7	AV	L1	GND
0.600000	24.40	10.7	46	21.6	AV	L1	GND
0.885000	24.30	10.8	46	21.7	AV	L1	GND
3.050000	28.80	11.1	46	17.2	AV	L1	GND
25.225000	27.60	11.5	50	22.4	AV	L1	GND

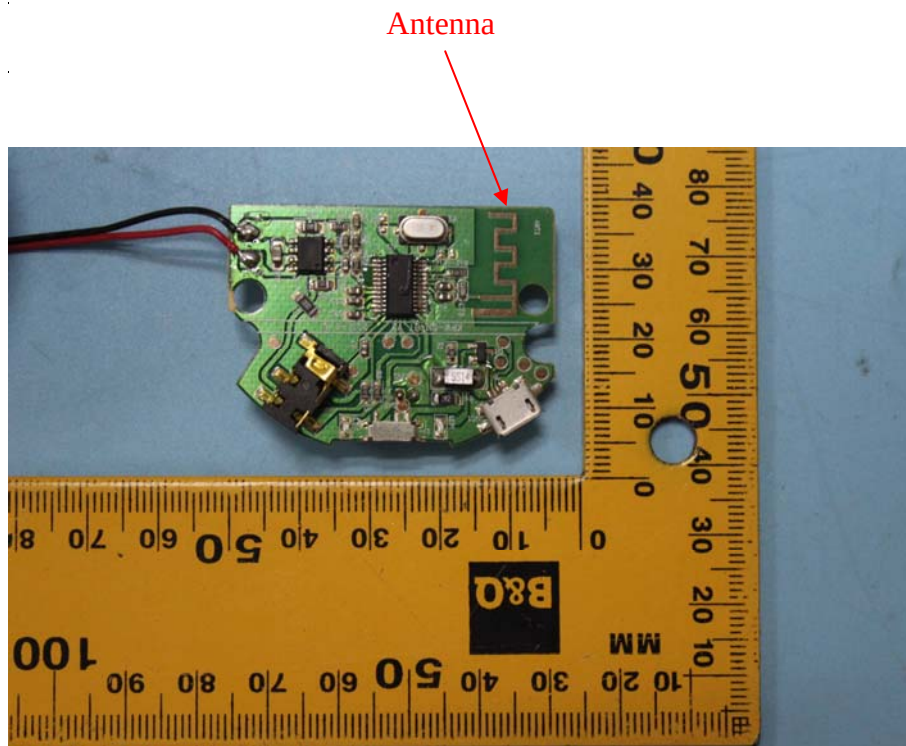
13.ANTENNA REQUIREMENT

13.1.The Requirement

According to 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.

13.2.Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Max Antenna gain of EUT is 0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



******* End of Test Report *******