

APPLICATION CERTIFICATION
On Behalf of
ACOUSTMAX INTERNATIONAL CO., LTD

Indoor/Outdoor speaker with Bluetooth

Model No.: BTW248XBK, BTW248XWH, BTW348XBK, BTW548XBK, BTW648XBK,
BTW748XBK, BTW848XBK, BTW948XBK

FCC ID: 2AAIN-BTW248XBK

Prepared for : ACOUSTMAX INTERNATIONAL CO., LTD
Address : Unit D16/F Cheuk Nang Plaza 250 Hennessy Road
Wanchai HongKong, China

Prepared by : ACCURATE TECHNOLOGY CO. LTD
Address : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.
Science & Industry Park, Nanshan, Shenzhen, Guangdong
P.R. China

Tel: (0755) 26503290
Fax: (0755) 26503396

Report Number : ATE2014106
Date of Test : Feb 10-26,2014
Date of Report : Feb 26,2014

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Test Report Certification

Applicant : ACOUSTMAX INTERNATIONAL CO., LTD
Manufacturer : Musilab Electronic(DongGuan) Co.,Ltd
EUT Description : Indoor/Outdoor speaker with Bluetooth
(A) MODEL NO.: BTW248XBK, BTW248XWH, BTW348XBK,
BTW548XBK, BTW648XBK, BTW748XBK, BTW848XBK,
BTW948XBK
(B) Trade Name: Monster
(C) POWER SUPPLY: DC 11.1V (battery) Or AC 120V/60Hz

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.4- 2009

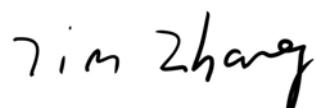
The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY 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 ACCURATE TECHNOLOGY CO. LTD.

Date of Test :

Feb 10-Feb 26, 2014

Prepared by :


(Tim.zhang, Engineer)

Approved & Authorized Signer :


(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

| | | |
|-------------------------|---|--|
| EUT | : | Indoor/Outdoor speaker with Bluetooth |
| Model Number | : | BTW248XBK, BTW248XWH, BTW348XBK, BTW548XBK, BTW648XBK, BTW748XBK, BTW848XBK, BTW948XBK |
| Frequency Band | : | 2402MHz-2480MHz |
| Number of Channels | : | 79 |
| Modulation type | : | GFSK, $\Pi/4$ -DQPSK, 8DPSK |
| Antenna Gain | : | 0dBi |
| Antenna type | : | PCB Antenna |
| Power Supply | : | DC 11.1V Or AC 120V/60Hz |
| Applicant | : | ACOUSTMAX INTERNATIONAL CO., LTD |
| Address | : | Unit D16/F Cheuk Nang Plaza 250 Hennessy Road Wanchai HongKong, China |
| Manufacturer | : | Musilab Electronic(DongGuan) Co.,Ltd |
| Address | : | A2 LinDong 3Road, LinCun, TangXia Town, DongGuan City, GuangDong, China |
| Date of sample received | : | Feb 10, 2014 |
| Date of Test | : | Feb 10-26, 2014 |

| | | |
|----------------------------|---|--|
| EUT | : | Indoor/Outdoor speaker with Bluetooth |
| Model Number | : | BTW248XBK, BTW248XWH, BTW348XBK, BTW548XBK, BTW648XBK, BTW748XBK, BTW848XBK, BTW948XBK |
| 5.8GHz Operation Frequency | : | 5736MHz, 5762MHz, 5814MHz |
| Number of Channels | : | 3 |
| Modulation type | : | QPSK |
| Antenna Gain | : | 3dBi |
| Antenna type | : | PCB Antenna |

1.2.Description of Test Facility

| | |
|---------------|---|
| EMC Lab | : Accredited by TUV Rheinland Shenzhen |
| | Listed by FCC The Registration Number is 752051 |
| | Listed by Industry Canada The Registration Number is 5077A-2 |
| | Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L3193 |
| Name of Firm | : ACCURATE TECHNOLOGY CO. LTD |
| Site Location | : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China |

1.3.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. 11, 2014 | Jan. 10, 2015 |
| EMI Test Receiver | Rohde&Schwarz | ESPI3 | 101526/003 | Jan. 11, 2014 | Jan. 10, 2015 |
| Spectrum Analyzer | Agilent | E7405A | MY45115511 | Jan. 11, 2014 | Jan. 10, 2015 |
| Pre-Amplifier | Rohde&Schwarz | CBLU118354 0-01 | 3791 | Jan. 11, 2014 | Jan. 10, 2015 |
| Loop Antenna | Schwarzbeck | FMZB1516 | 1516131 | Jan. 15, 2014 | Jan. 14, 2015 |
| Bilog Antenna | Schwarzbeck | VULB9163 | 9163-323 | Jan. 15, 2014 | Jan. 14, 2015 |
| Horn Antenna | Schwarzbeck | BBHA9120D | 9120D-655 | Jan. 15, 2014 | Jan. 14, 2015 |
| Horn Antenna | Schwarzbeck | BBHA9120D | 9120D-1067 | Jan. 15, 2014 | Jan. 14, 2015 |
| LISN | Rohde&Schwarz | ESH3-Z5 | 100305 | Jan. 11, 2014 | Jan. 10, 2015 |
| LISN | Schwarzbeck | NSLK8126 | 8126431 | Jan. 11, 2014 | Jan. 10, 2015 |
| Highpass Filter | Wainwright Instruments | WHKX3.6/18 G-10SS | N/A | Jan. 11, 2014 | Jan. 10, 2015 |
| Band Reject Filter | Wainwright Instruments | WRCG2400/2 485-2375/2510 -60/11SS | N/A | Jan. 11, 2014 | Jan. 10, 2015 |

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

EUT

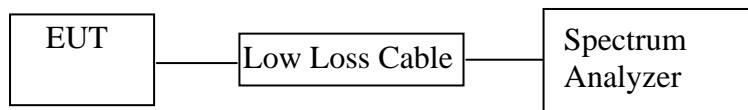
(EUT: Indoor/Outdoor speaker with Bluetooth)

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: Indoor/Outdoor speaker with Bluetooth)

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 30 kHz and VBW to 100 kHz.

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

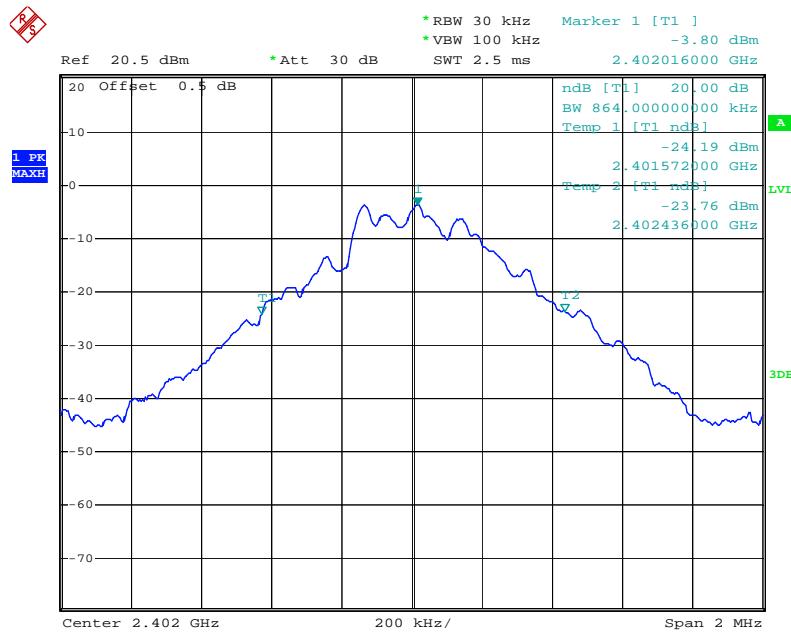
5.6. Test Result

| Channel | Frequency (MHz) | GFSK 20dB Bandwidth (MHz) | $\Pi/4$ -DQPSK 20dB Bandwidth (MHz) | 8DPSK 20dB Bandwidth (MHz) | Result |
|---------|-----------------|---------------------------|-------------------------------------|----------------------------|--------|
| Low | 2402 | 0.864 | 1.220 | 1.208 | Pass |
| Middle | 2441 | 0.872 | 1.220 | 1.212 | Pass |
| High | 2480 | 0.852 | 1.224 | 1.212 | Pass |

The spectrum analyzer plots are attached as below.

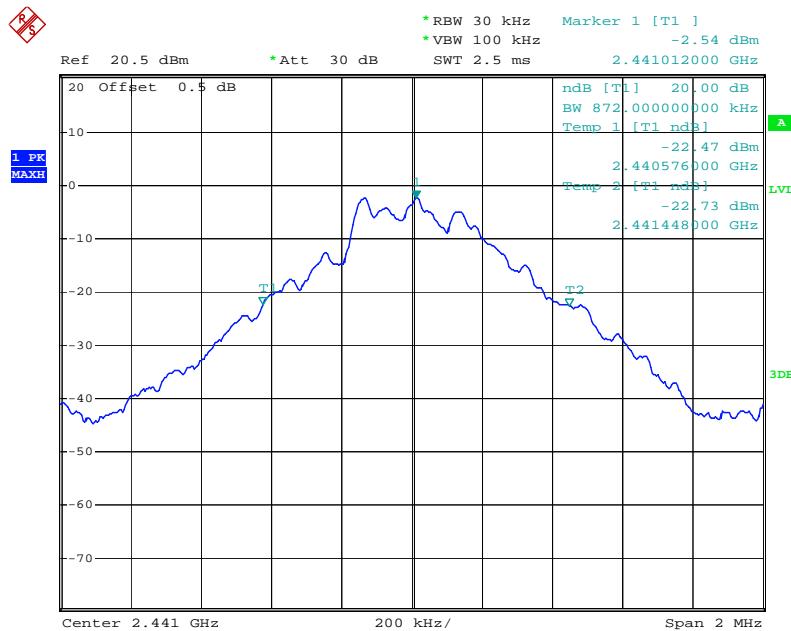
GFSK Mode

Low channel



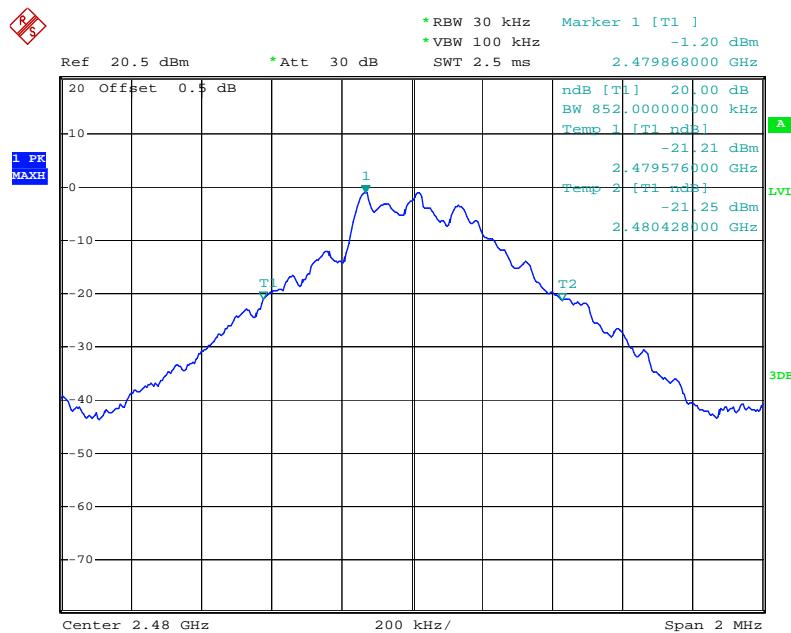
Date: 15.FEB.2014 10:45:55

Middle channel



Date: 15.FEB.2014 10:47:05

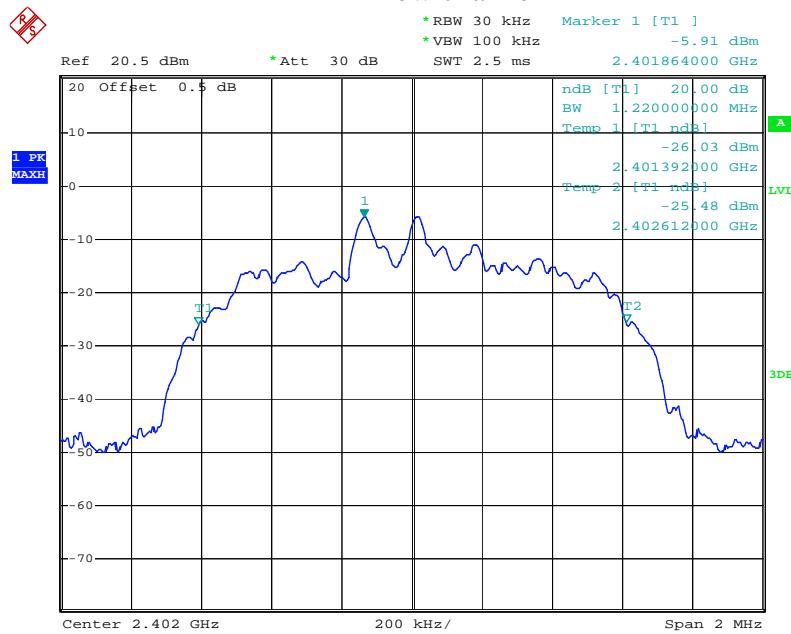
High channel



Date: 15.FEB.2014 10:47:50

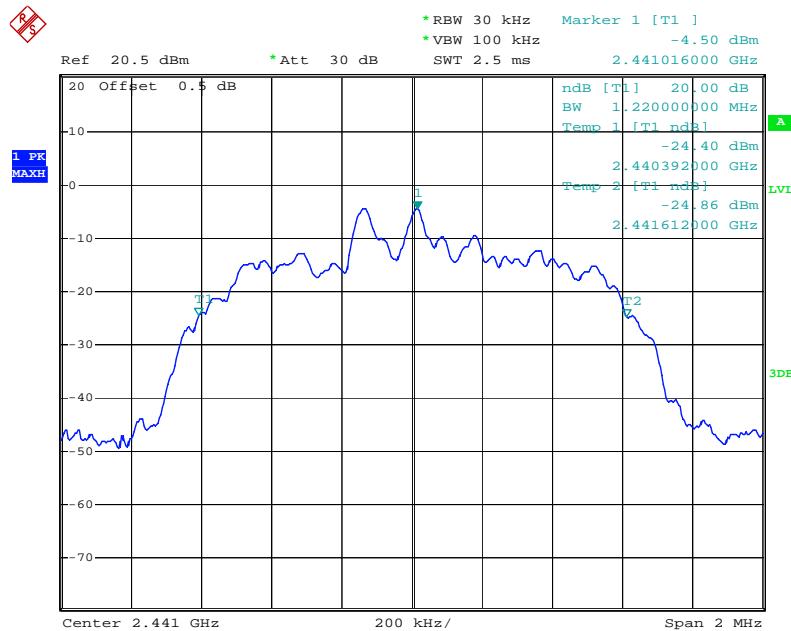
Pi/4-DQPSK Mode

Low channel



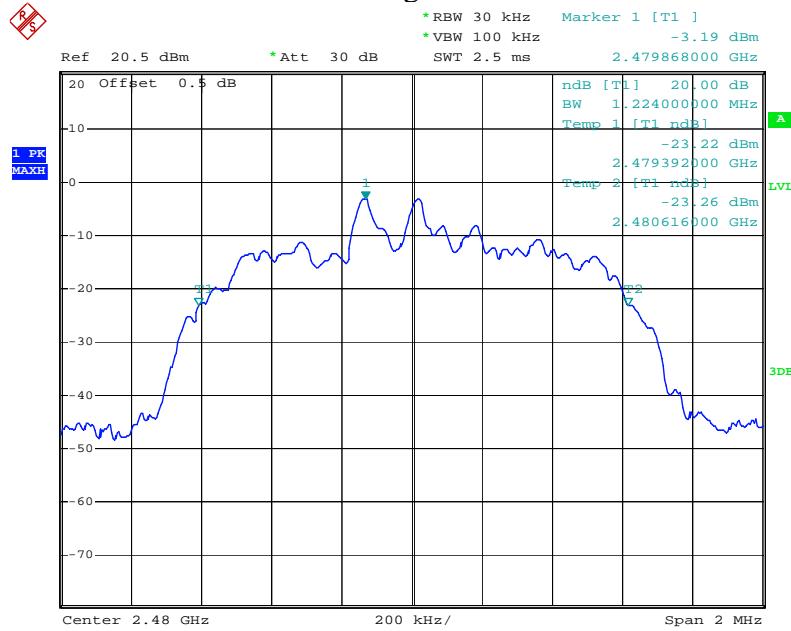
Date: 15.FEB.2014 11:26:57

Middle channel



Date: 15.FEB.2014 11:27:41

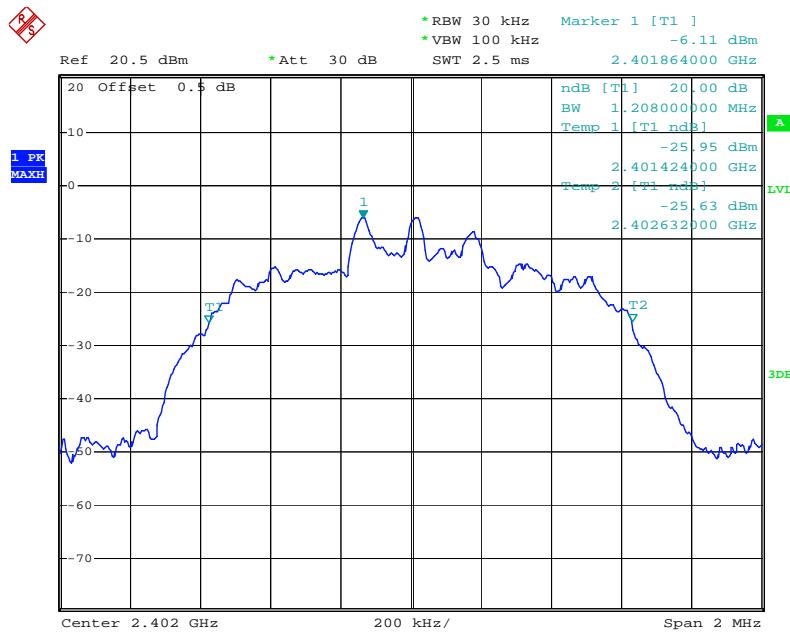
High channel



Date: 15.FEB.2014 11:28:21

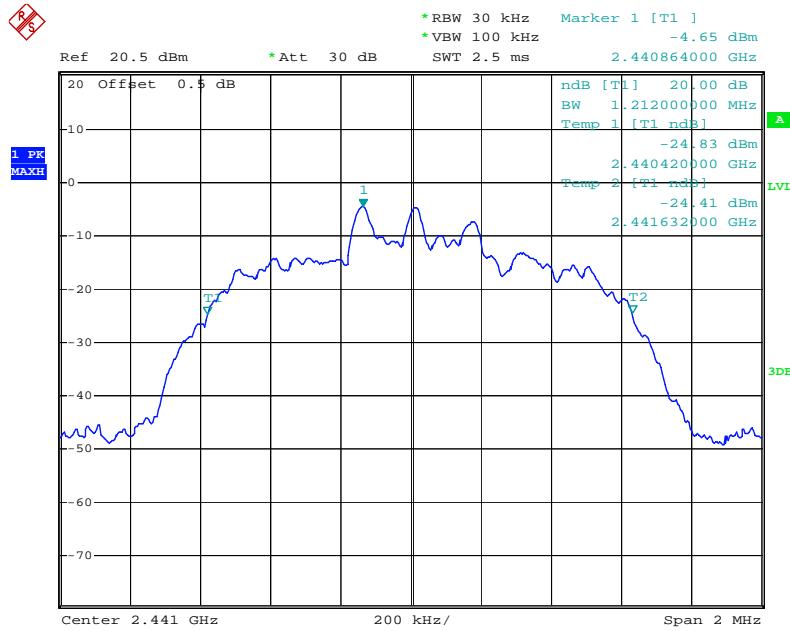
8DPSK Mode

Low channel



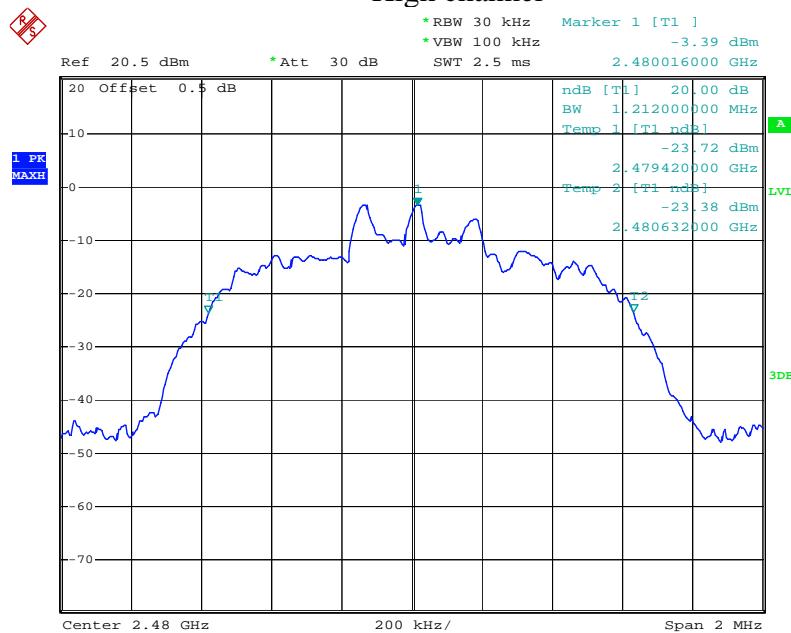
Date: 15.FEB.2014 11:59:20

Middle channel



Date: 15.FEB.2014 11:58:51

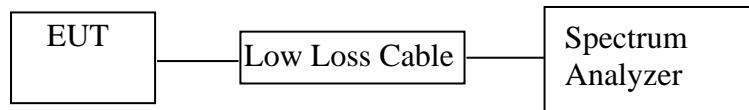
High channel



Date: 15.FEB.2014 11:57:40

6. CARRIER FREQUENCY SEPARATION TEST

6.1. Block Diagram of Test Setup



(EUT: Indoor/Outdoor speaker with Bluetooth)

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 100 kHz and VBW to 300 kHz. Adjust Span to 3 MHz.
- 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 | 1.026 | 25KHz or 20dB bandwidth | PASS |
| | 2403 | | | |
| Middle | 2440 | 1.008 | 25KHz or 20dB bandwidth | PASS |
| | 2441 | | | |
| High | 2479 | 1.002 | 25KHz or 20dB bandwidth | PASS |
| | 2480 | | | |

 $\Pi/4$ -DQPSK

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz) | Result |
|---------|-----------------|-------------------------|-----------------------------|--------|
| Low | 2402 | 1.002 | 25KHz or 2/3*20dB bandwidth | PASS |
| | 2403 | | | |
| Middle | 2440 | 1.020 | 25KHz or 2/3*20dB bandwidth | PASS |
| | 2441 | | | |
| High | 2479 | 1.008 | 25KHz or 2/3*20dB bandwidth | PASS |
| | 2480 | | | |

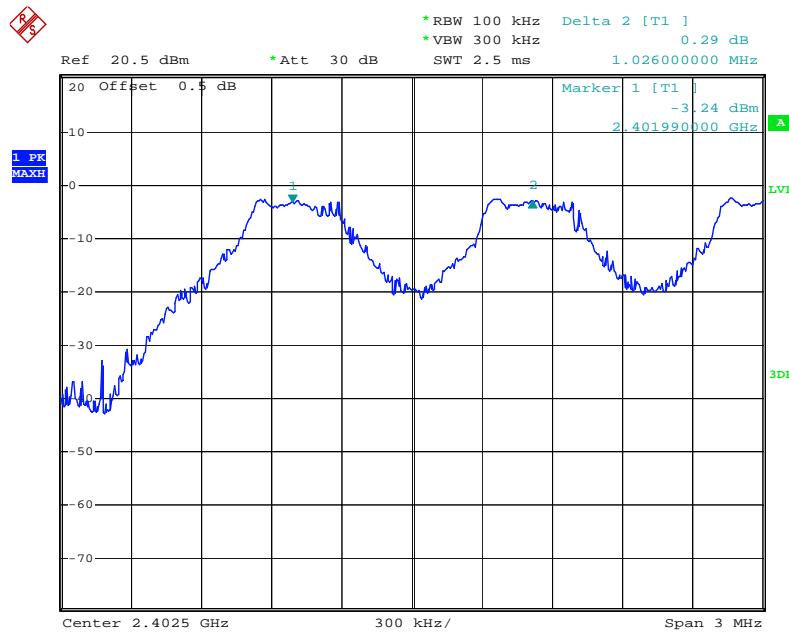
8DPSK

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

The spectrum analyzer plots are attached as below.

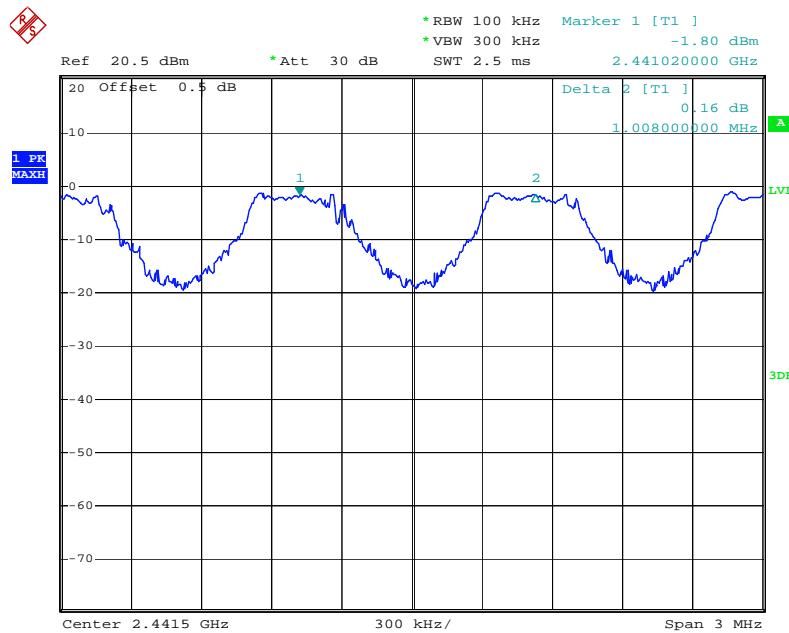
GFSK Mode

Low channel



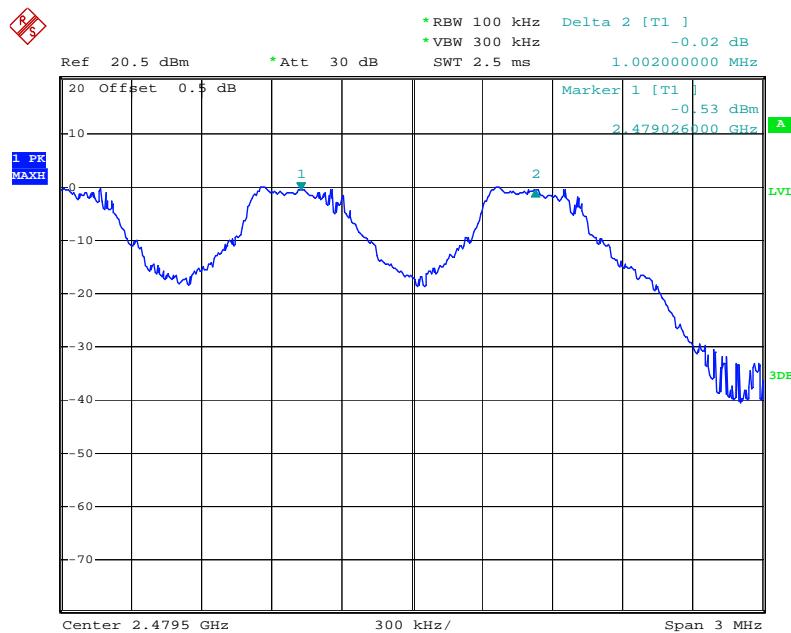
Date: 15.FEB.2014 10:54:13

Middle channel



Date: 15.FEB.2014 10:57:17

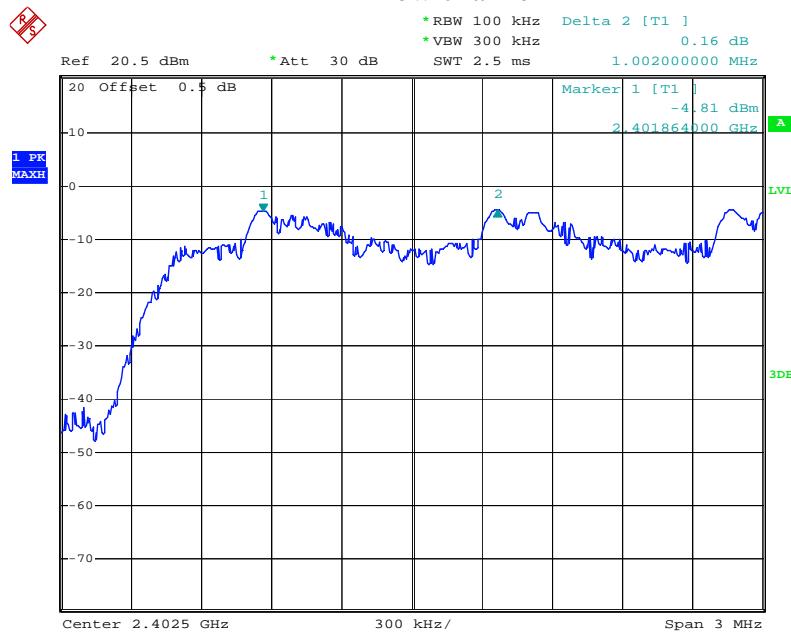
High channel



Date: 15.FEB.2014 10:59:28

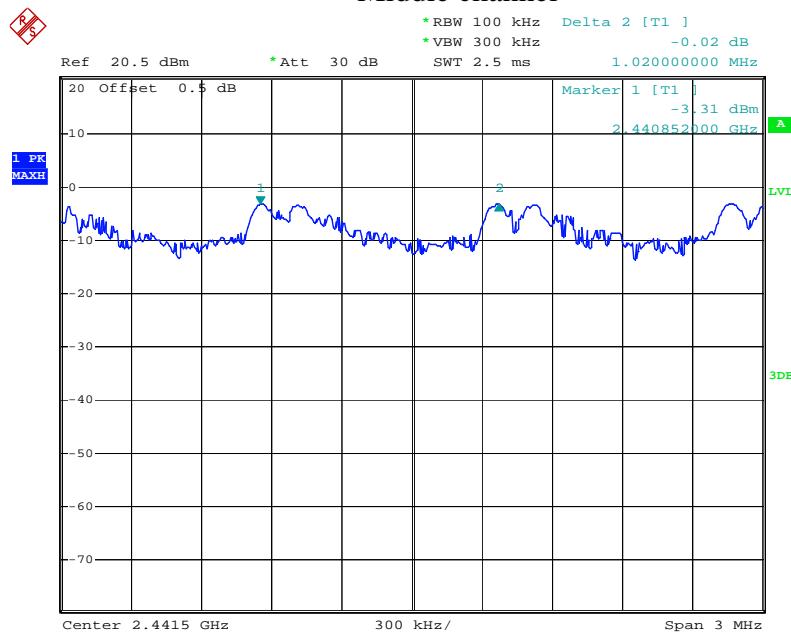
Pi/4-DQPSK Mode

Low channel



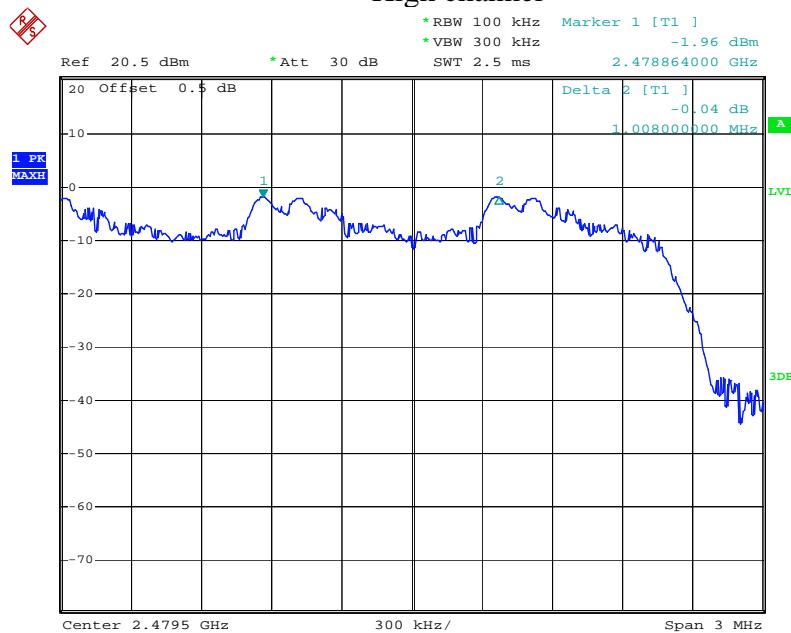
Date: 15.FEB.2014 11:35:25

Middle channel



Date: 15.FEB.2014 11:38:12

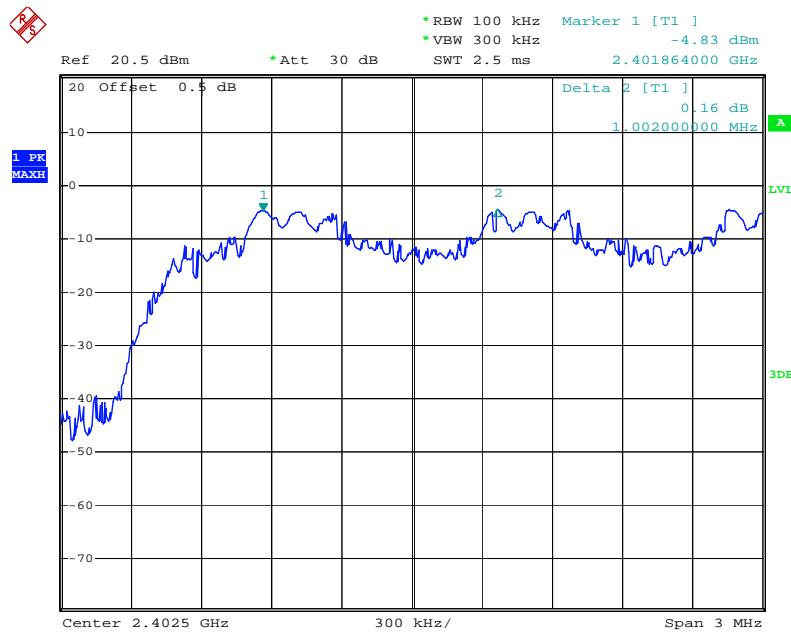
High channel



Date: 15.FEB.2014 11:41:06

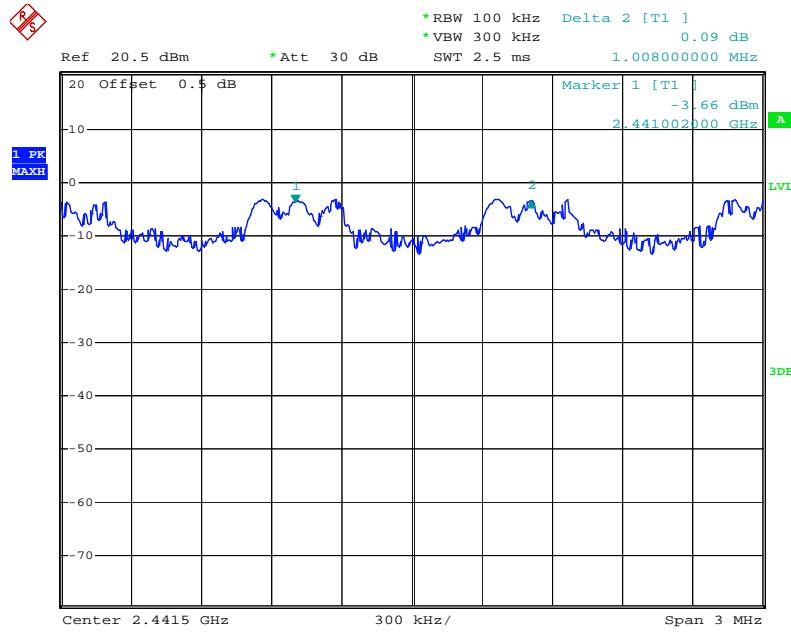
8DPSK Mode

Low channel



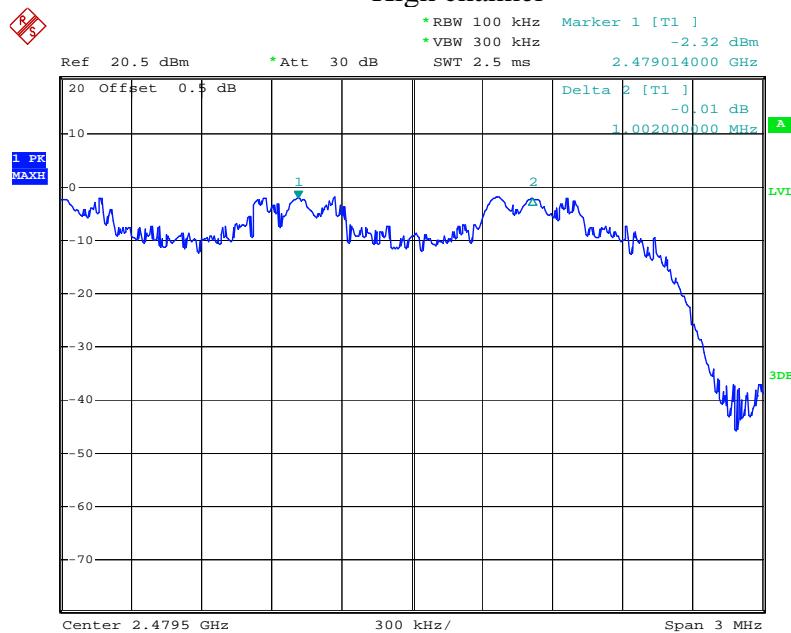
Date: 15.FEB.2014 12:05:40

Middle channel



Date: 15.FEB.2014 12:07:53

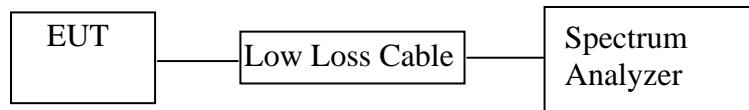
High channel



Date: 15.FEB.2014 12:09:58

7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Block Diagram of Test Setup



(EUT: Indoor/Outdoor speaker with Bluetooth)

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.

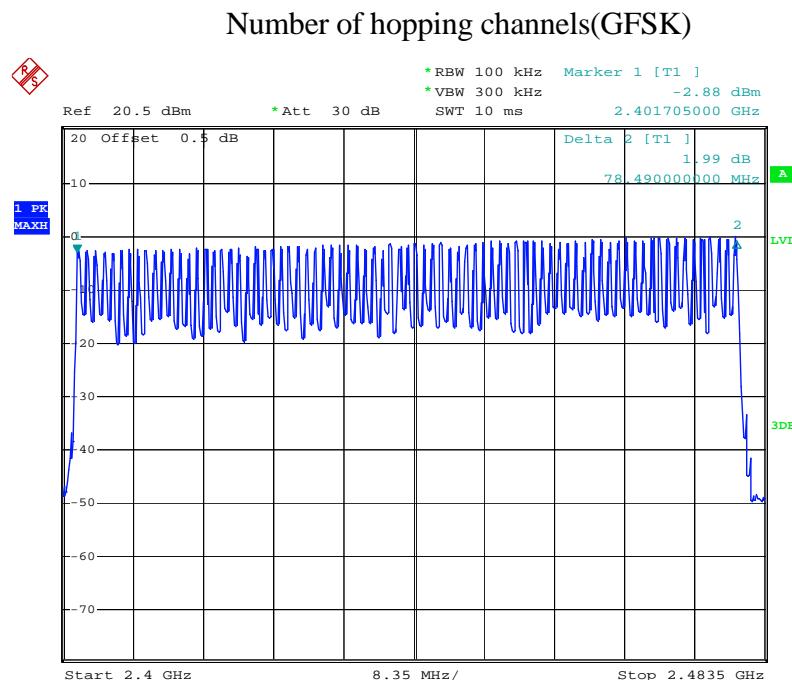
7.5.2. Set the spectrum analyzer as Span=83.5MHz, RBW=100 kHz, VBW=300 kHz.

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

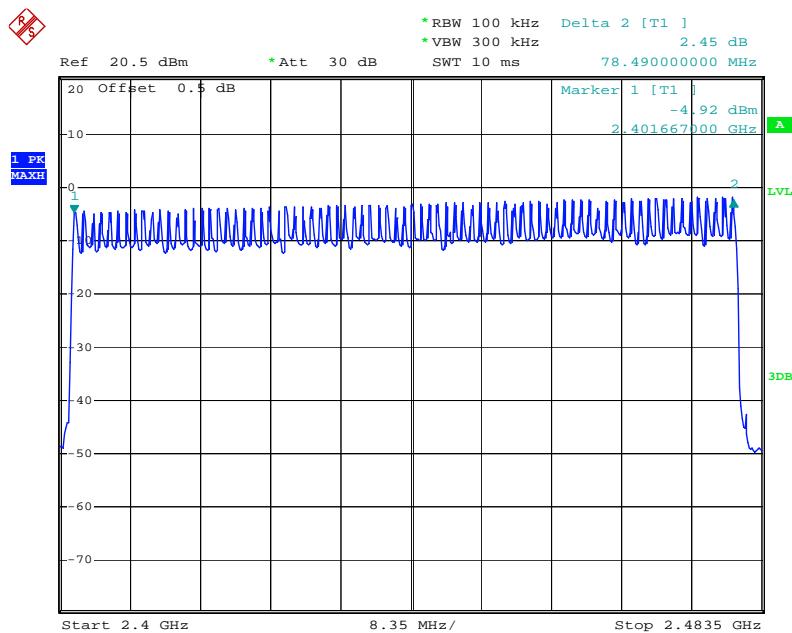
7.6. Test Result

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

The spectrum analyzer plots are attached as below.

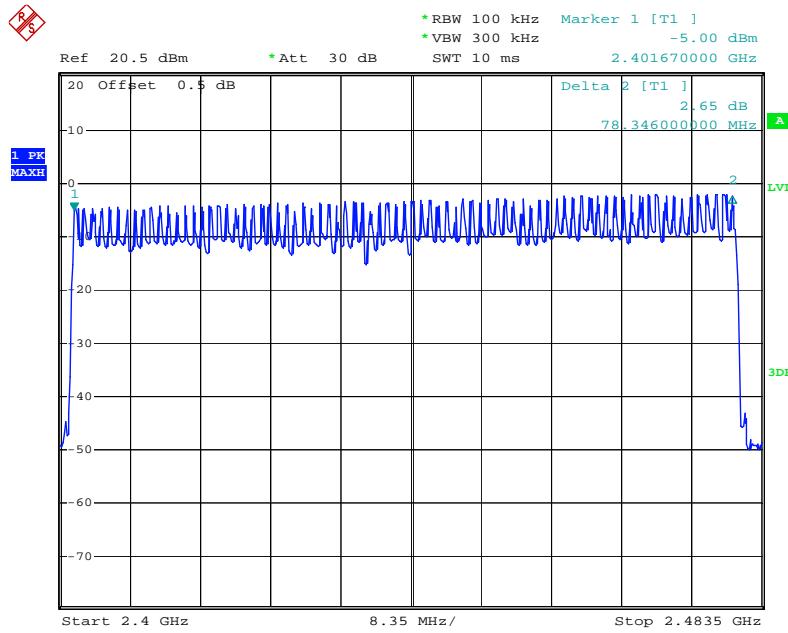


Date: 15.FEB.2014 11:01:42

Number of hopping channels($\Pi/4$ -DQPSK)

Date: 15.FEB.2014 11:43:49

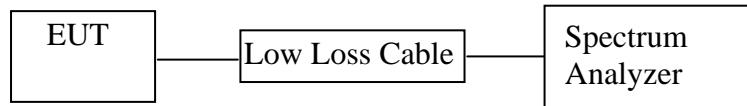
Number of hopping channels(8DPSK)



Date: 15.FEB.2014 12:11:51

8. DWELL TIME TEST

8.1. Block Diagram of Test Setup



(EUT: Indoor/Outdoor speaker with Bluetooth)

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 | 0.415 | 132.80 | 400 |
| | 2441 | 0.410 | 131.20 | 400 |
| | 2480 | 0.415 | 132.80 | 400 |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2*79)) \times 31.6$ | | | | |
| DH3 | 2402 | 1.680 | 268.80 | 400 |
| | 2441 | 1.695 | 271.20 | 400 |
| | 2480 | 1.680 | 268.80 | 400 |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4*79)) \times 31.6$ | | | | |
| DH5 | 2402 | 2.960 | 315.73 | 400 |
| | 2441 | 2.960 | 315.73 | 400 |
| | 2480 | 2.960 | 315.73 | 400 |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6*79)) \times 31.6$ | | | | |

$\Pi/4$ -DQPSK

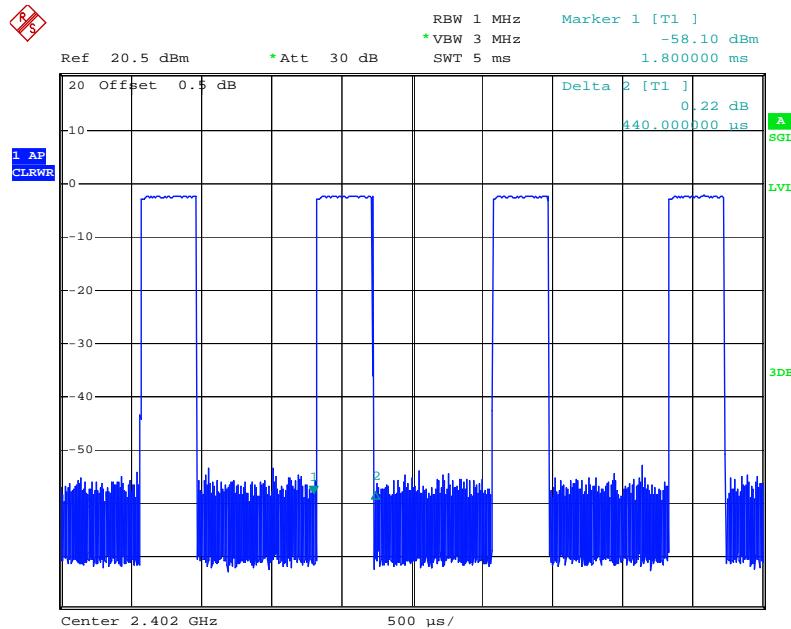
| Mode | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|--|-------------------------|-----------------|-----------------|------------|
| DH1 | 2402 | 0.450 | 144.00 | 400 |
| | 2441 | 0.450 | 144.00 | 400 |
| | 2480 | 0.440 | 140.80 | 400 |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2*79)) \times 31.6$ | | | | |
| DH3 | 2402 | 1.740 | 278.40 | 400 |
| | 2441 | 1.740 | 278.40 | 400 |
| | 2480 | 1.720 | 275.20 | 400 |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4*79)) \times 31.6$ | | | | |
| DH5 | 2402 | 2.970 | 316.80 | 400 |
| | 2441 | 2.970 | 316.80 | 400 |
| | 2480 | 2.970 | 316.80 | 400 |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6*79)) \times 31.6$ | | | | |

8DPSK Mode

| Mode | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|--|-------------------------|-----------------|-----------------|------------|
| DH1 | 2402 | 0.440 | 140.80 | 400 |
| | 2441 | 0.440 | 140.80 | 400 |
| | 2480 | 0.440 | 140.80 | 400 |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2*79)) \times 31.6$ | | | | |
| DH3 | 2402 | 1.680 | 268.80 | 400 |
| | 2441 | 1.720 | 275.20 | 400 |
| | 2480 | 1.700 | 272.00 | 400 |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4*79)) \times 31.6$ | | | | |
| DH5 | 2402 | 3.000 | 320.00 | 400 |
| | 2441 | 3.000 | 320.00 | 400 |
| | 2480 | 3.030 | 323.20 | 400 |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6*79)) \times 31.6$ | | | | |

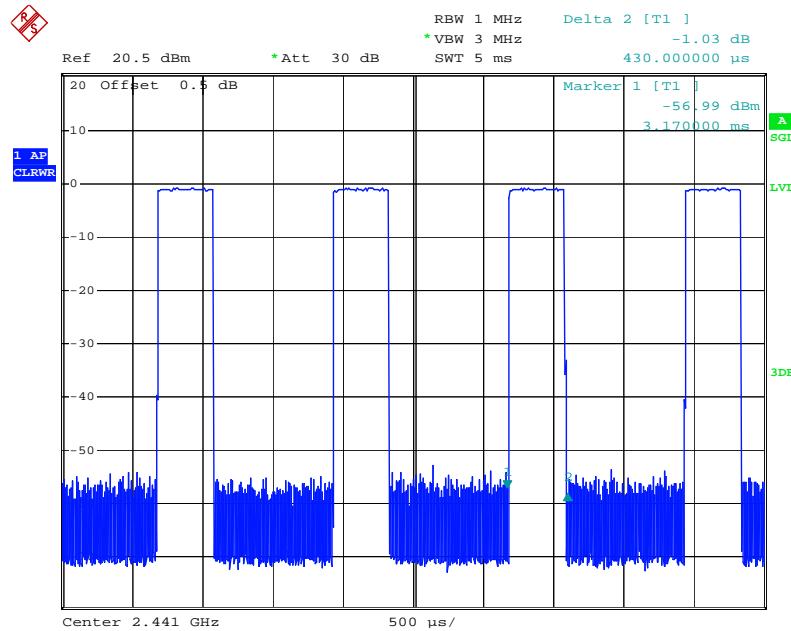
The spectrum analyzer plots are attached as below.

DH1 Low channel



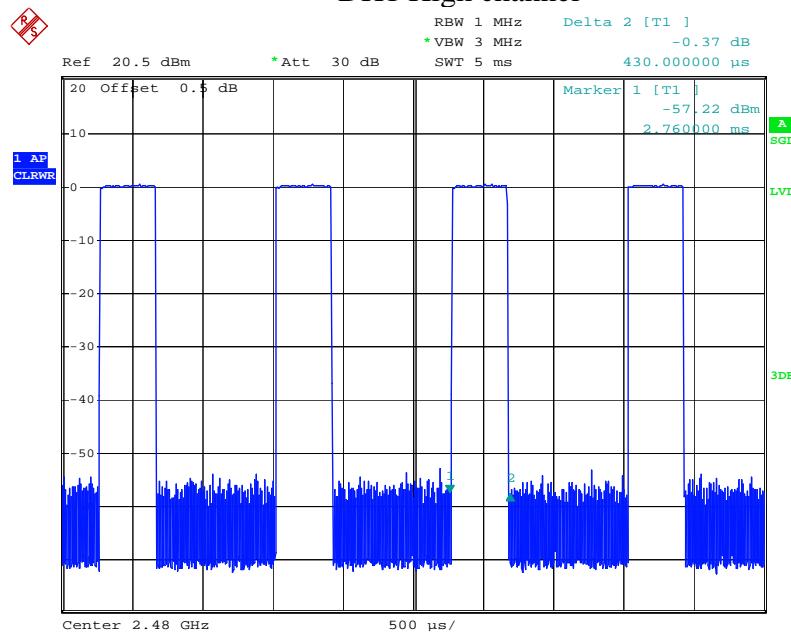
Date: 15.FEB.2014 11:10:36

DH1 Middle channel



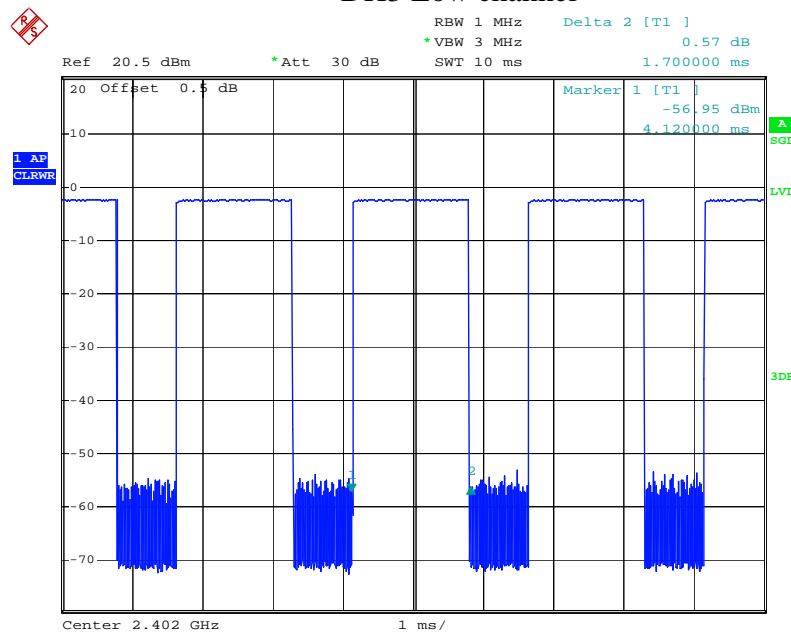
Date: 15.FEB.2014 11:09:47

DH1 High channel



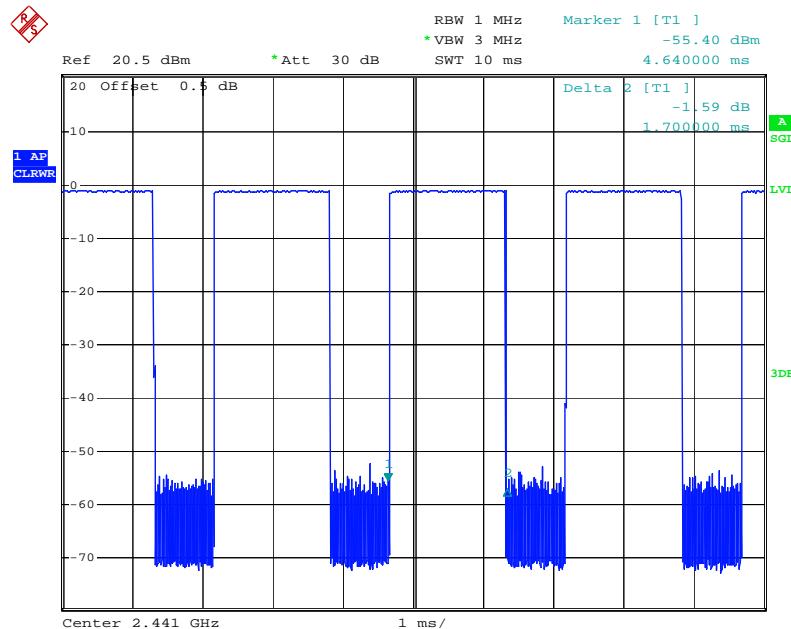
Date: 15.FEB.2014 11:08:41

DH3 Low channel



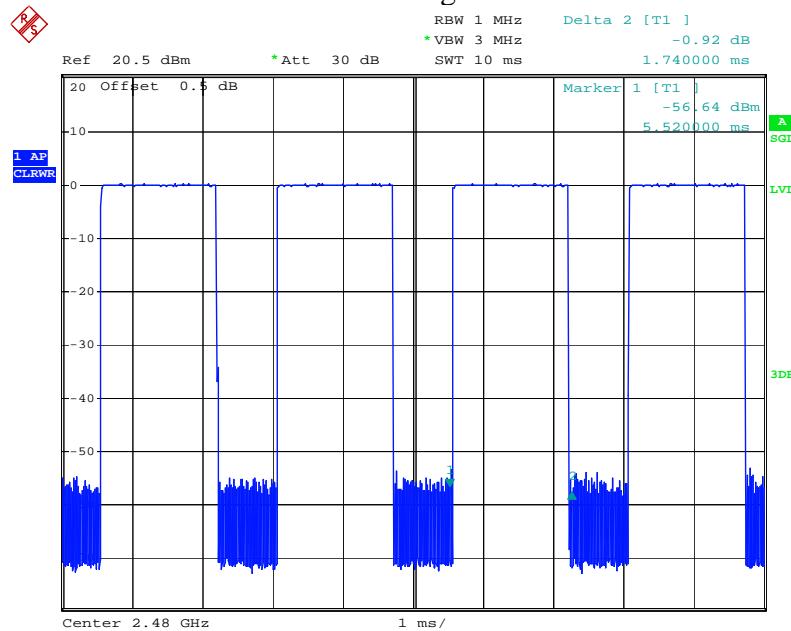
Date: 15.FEB.2014 11:11:25

DH3 Middle channel



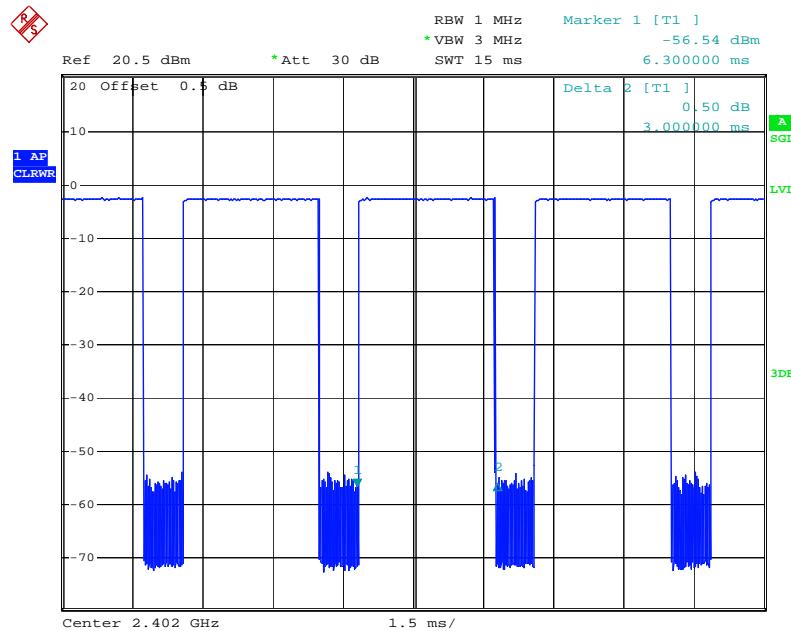
Date: 15.FEB.2014 11:12:04

DH3 High channel



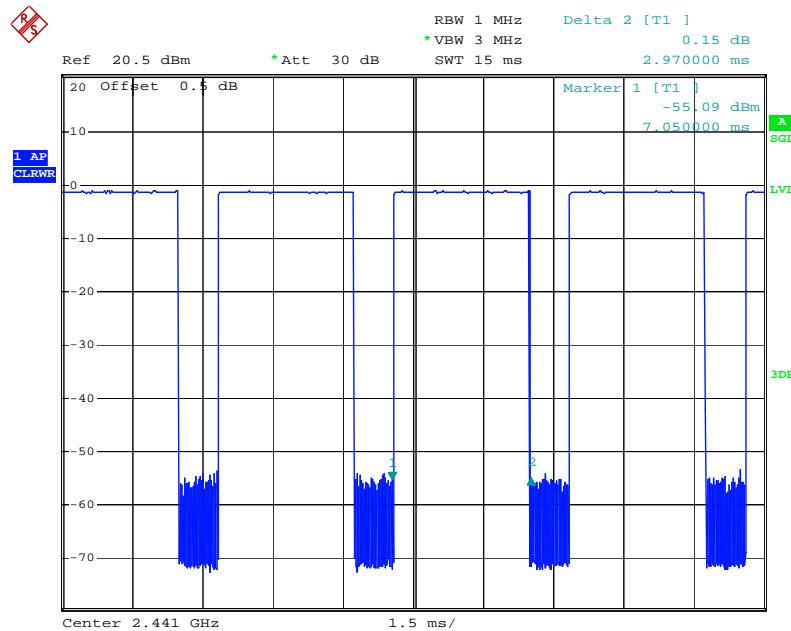
Date: 15.FEB.2014 11:13:19

DH5 Low channel



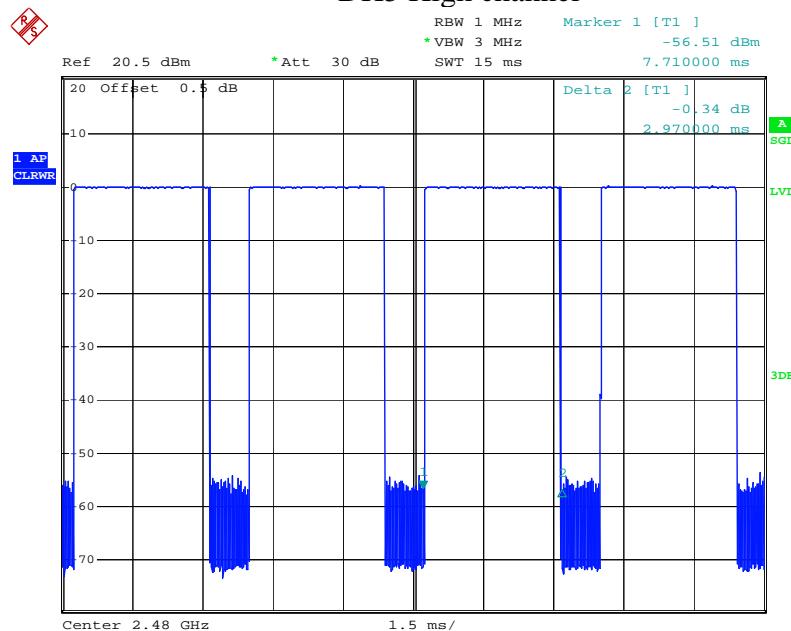
Date: 15.FEB.2014 11:15:28

DH5 Middle channel



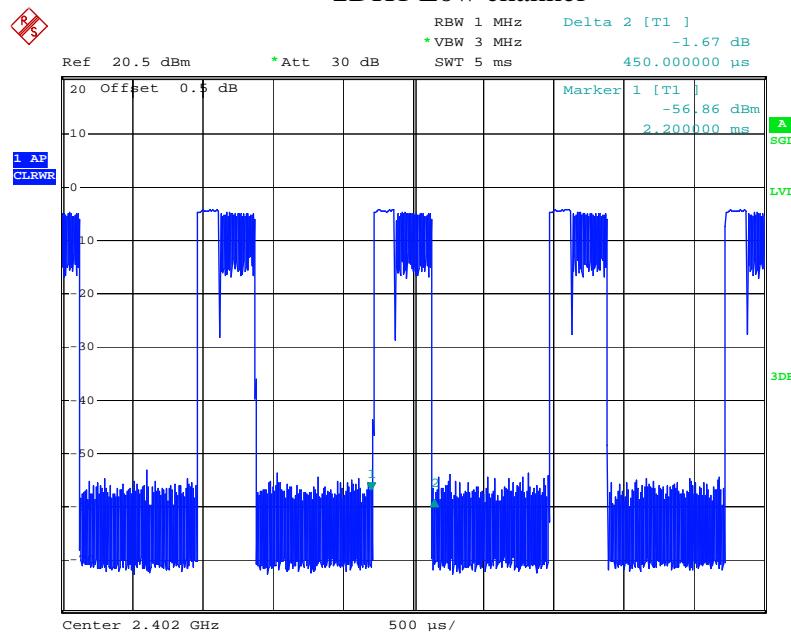
Date: 15.FEB.2014 11:14:50

DH5 High channel



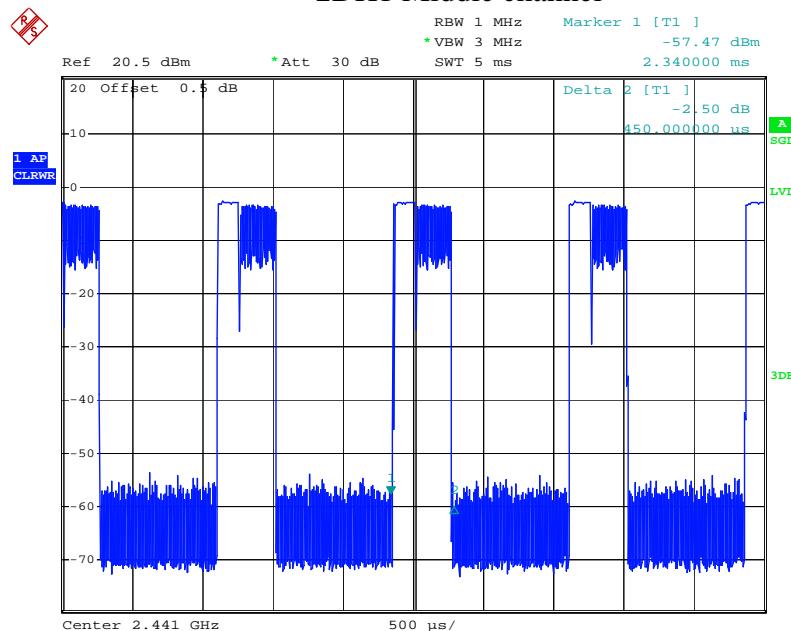
Date: 15.FEB.2014 11:14:09

2DH1 Low channel



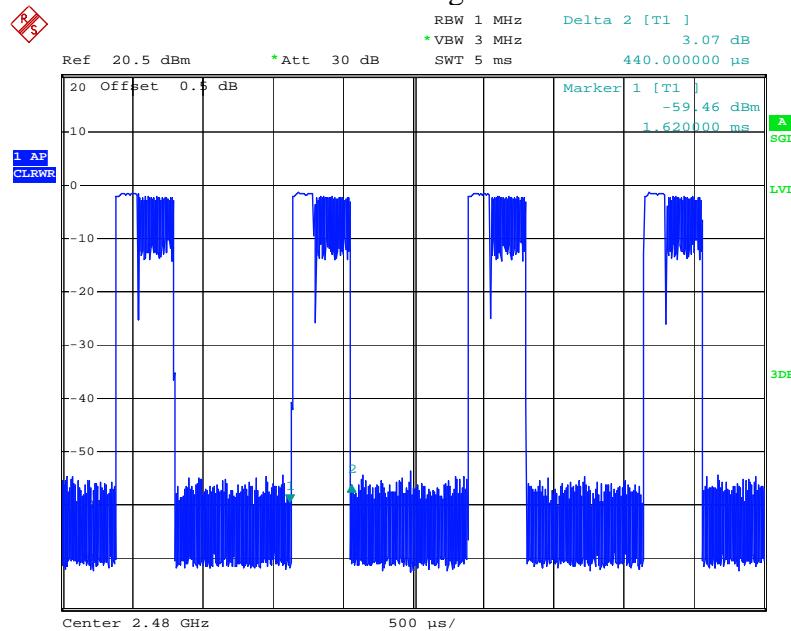
Date: 15.FEB.2014 11:48:30

2DH1 Middle channel



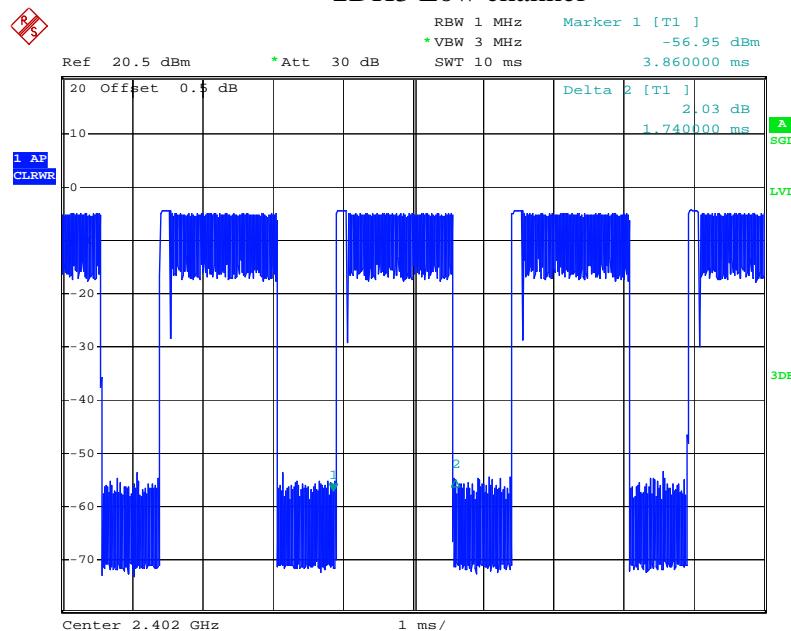
Date: 15.FEB.2014 11:49:10

2DH1 High channel



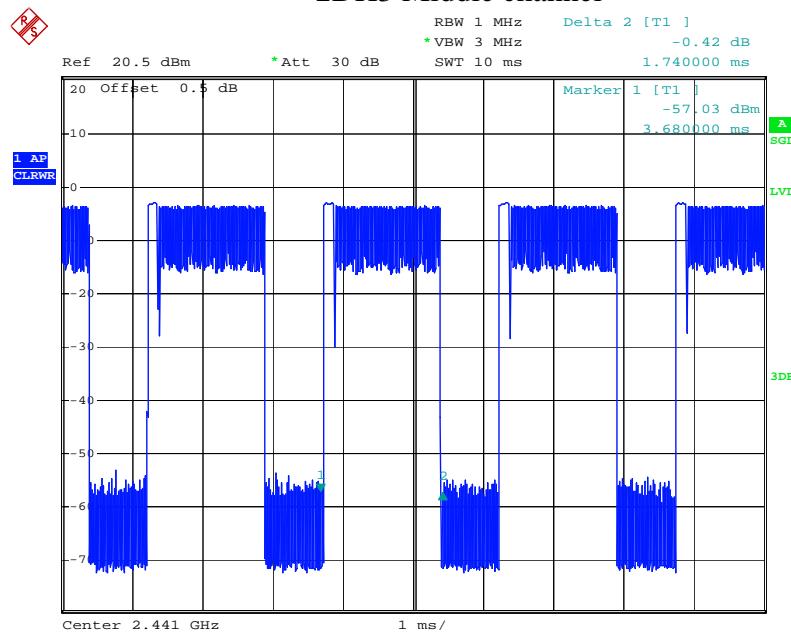
Date: 15.FEB.2014 11:49:46

2DH3 Low channel



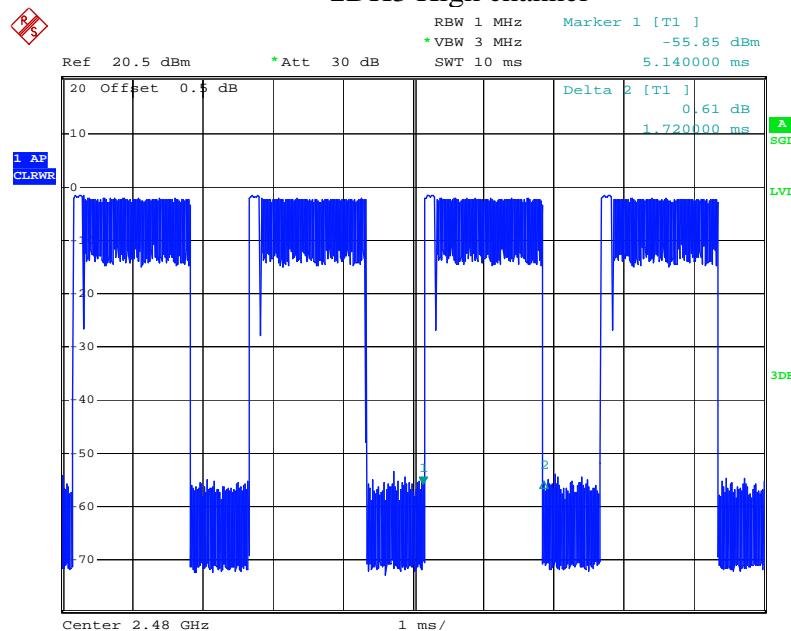
Date: 15.FEB.2014 11:53:08

2DH3 Middle channel



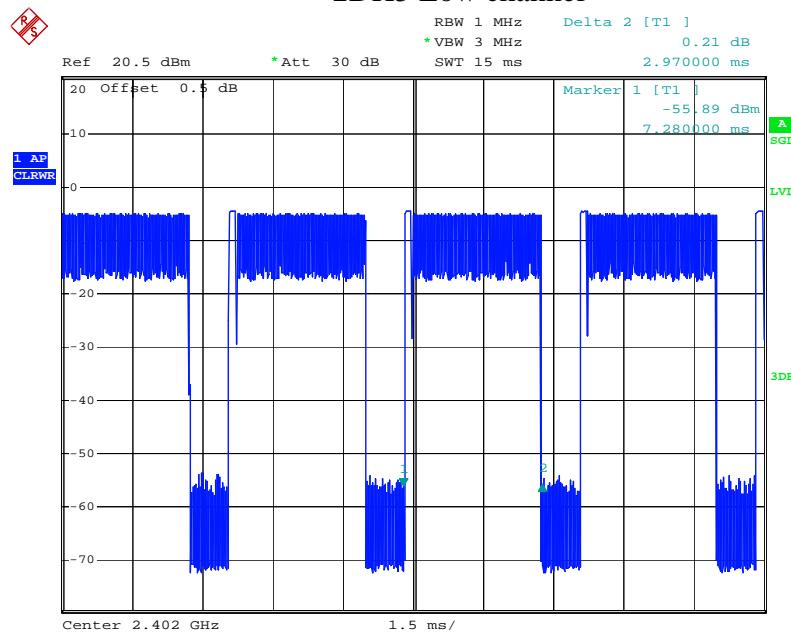
Date: 15.FEB.2014 11:52:02

2DH3 High channel



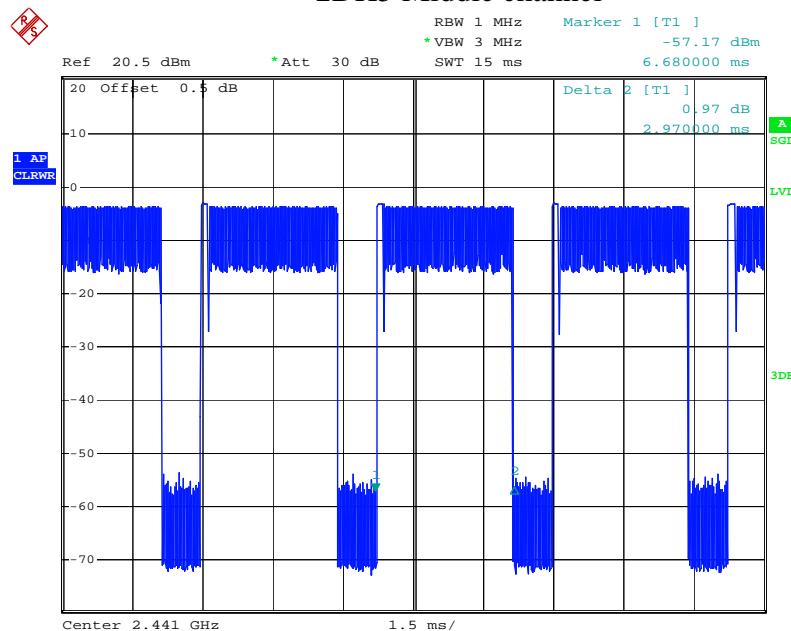
Date: 15.FEB.2014 11:51:25

2DH5 Low channel



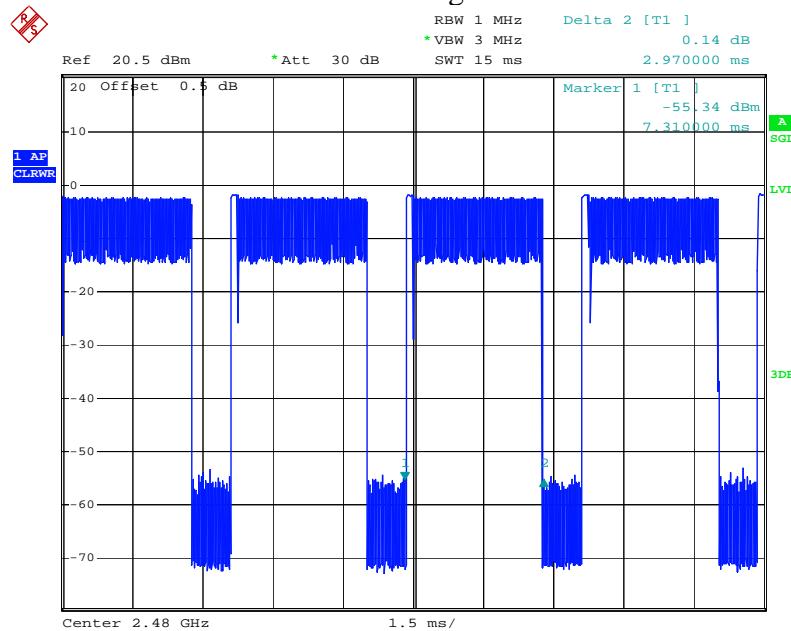
Date: 15.FEB.2014 11:54:10

2DH5 Middle channel



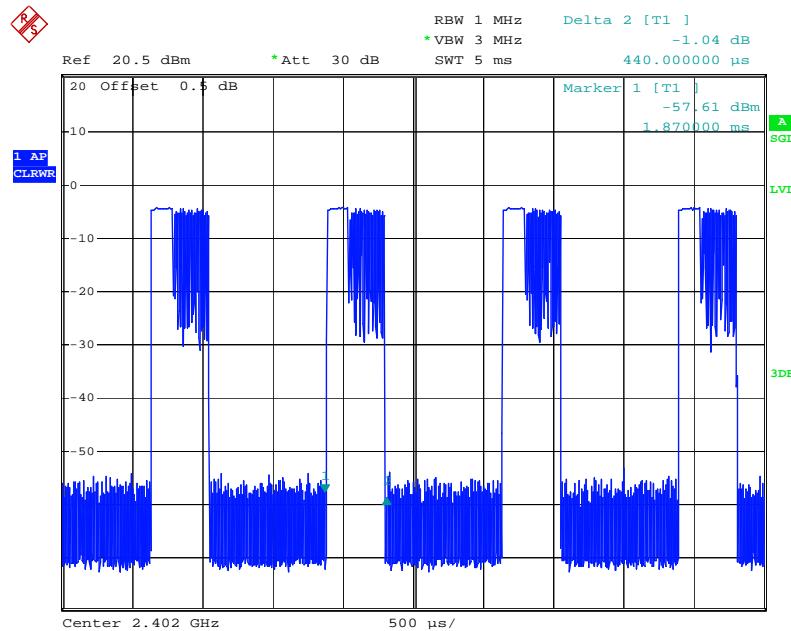
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2DH5 High channel



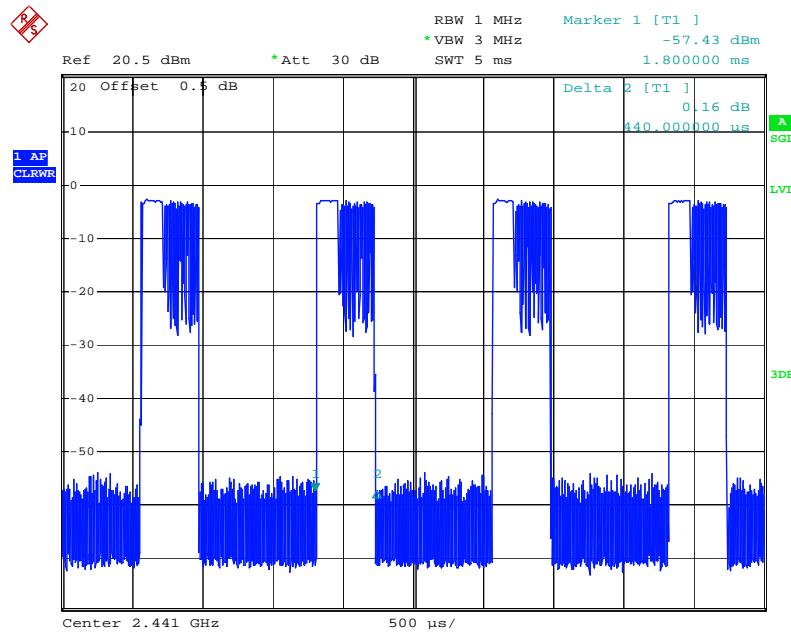
Date: 15.FEB.2014 11:56:02

3DH1 Low channel



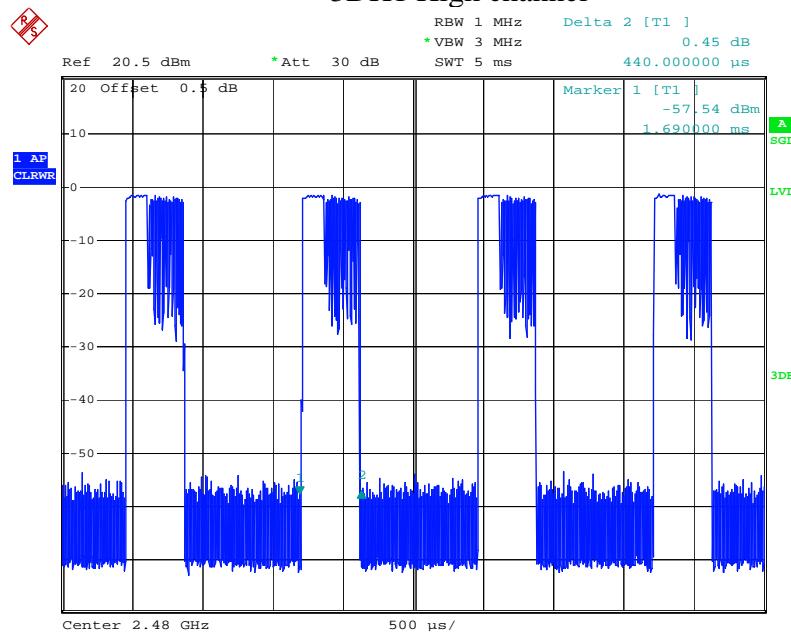
Date: 15.FEB.2014 12:13:17

3DH1 Middle channel



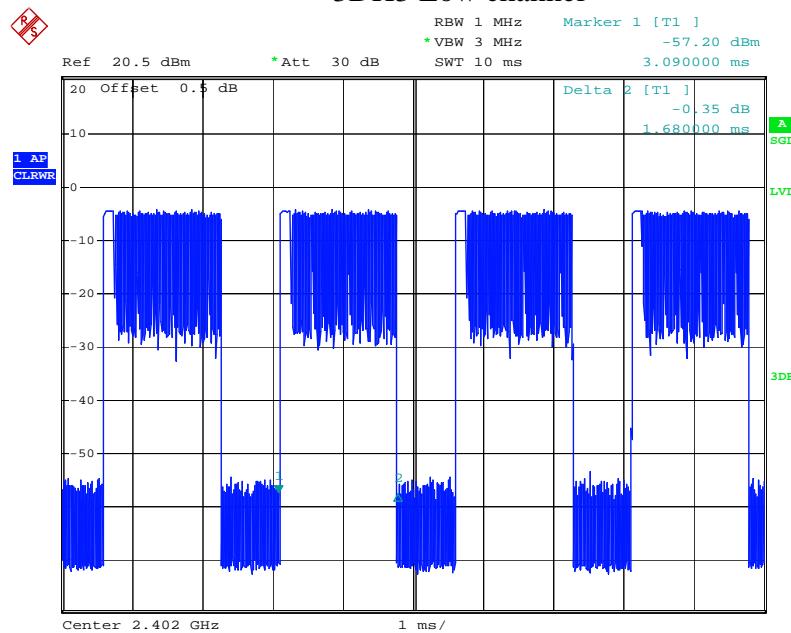
Date: 15.FEB.2014 12:13:56

3DH1 High channel



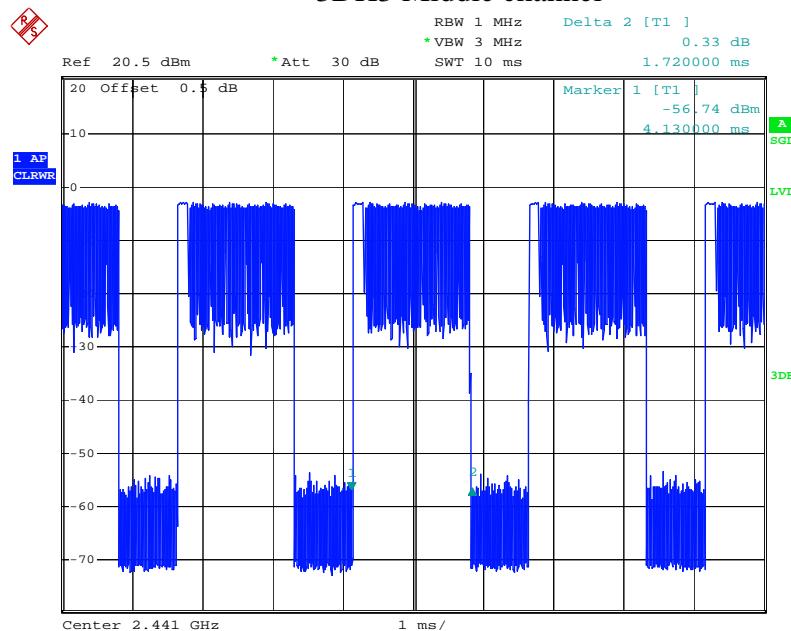
Date: 15.FEB.2014 12:14:38

3DH3 Low channel



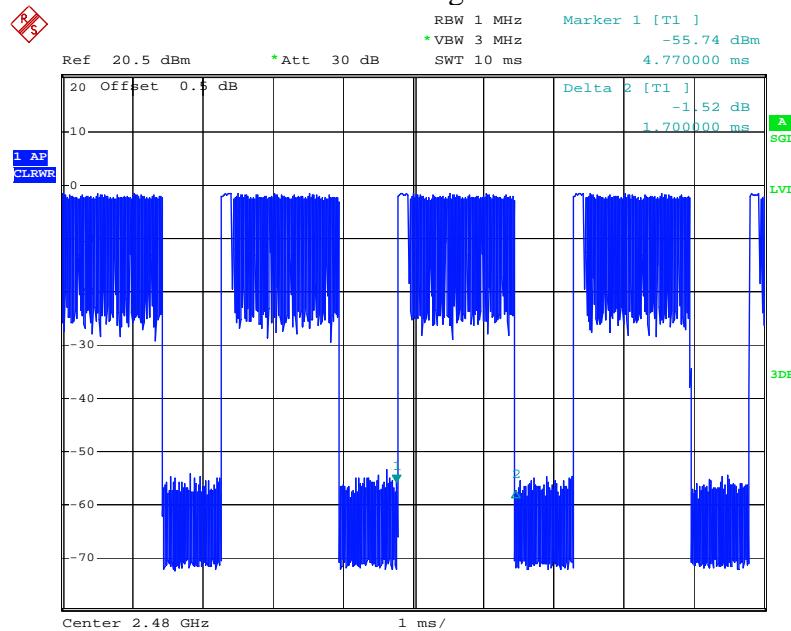
Date: 15.FEB.2014 12:16:30

3DH3 Middle channel



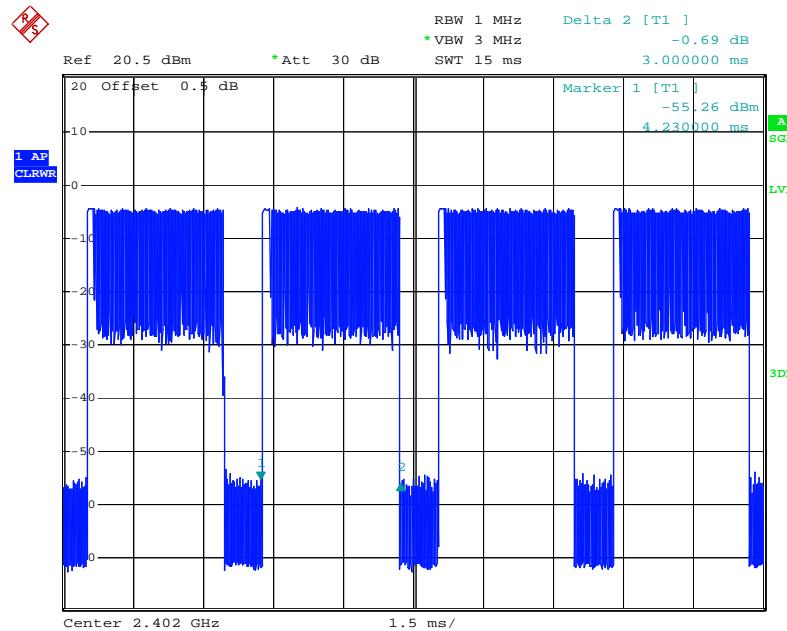
Date: 15.FEB.2014 12:15:54

3DH3 High channel



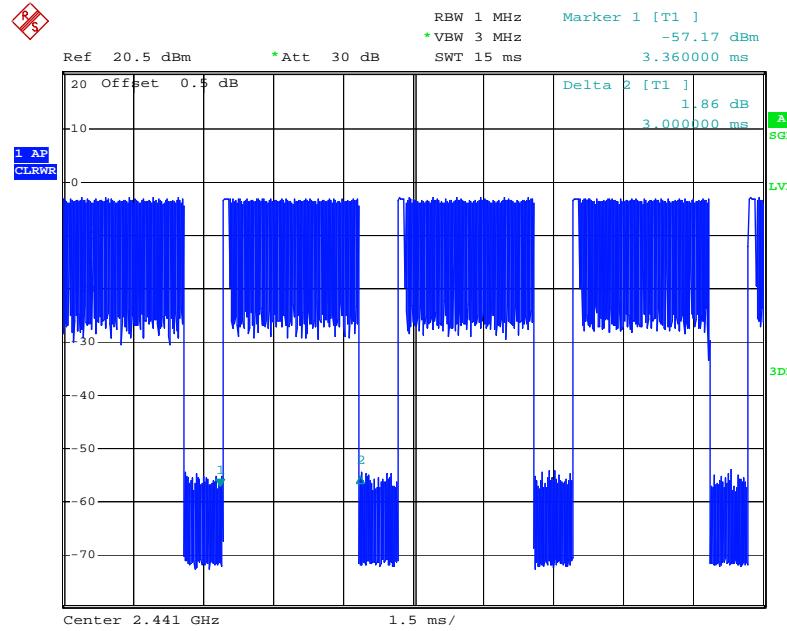
Date: 15.FEB.2014 12:15:22

3DH5 Low channel



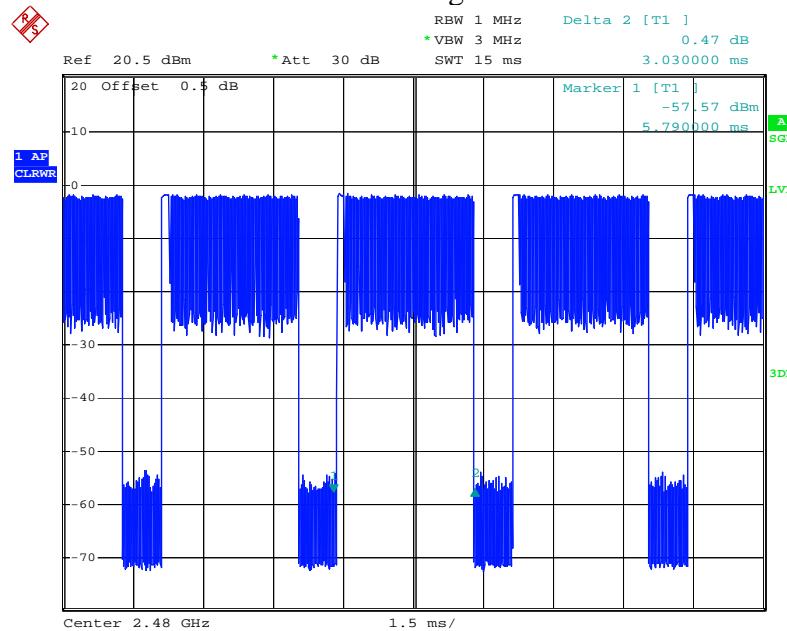
Date: 15.FEB.2014 12:17:04

3DH5 Middle channel



Date: 15.FEB.2014 12:17:45

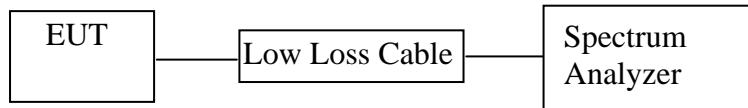
3DH5 High channel



Date: 15.FEB.2014 12:18:21

9. MAXIMUM PEAK OUTPUT POWER TEST

9.1. Block Diagram of Test Setup



(EUT: Indoor/Outdoor speaker with Bluetooth)

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 1MHz and VBW to 3MHz for GFSK mode

9.5.3. Set RBW of spectrum analyzer to 3MHz and VBW to 3MHz for other mode

9.5.4. 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 | -2.09/0.0006 | 30 / 1.0 |
| Middle | 2441 | -0.72/0.0008 | 30 / 1.0 |
| High | 2480 | 0.50/0.0011 | 30 / 1.0 |

$\Pi/4$ -DQPSK Mode

| Channel | Frequency (MHz) | Peak Output Power (dBm/W) | Limits dBm / W |
|---------|-----------------|---------------------------|----------------|
| Low | 2402 | -3.95/0.0004 | 21 / 0.125 |
| Middle | 2441 | -2.53/0.0006 | 21 / 0.125 |
| High | 2480 | -1.27/0.0007 | 21 / 0.125 |

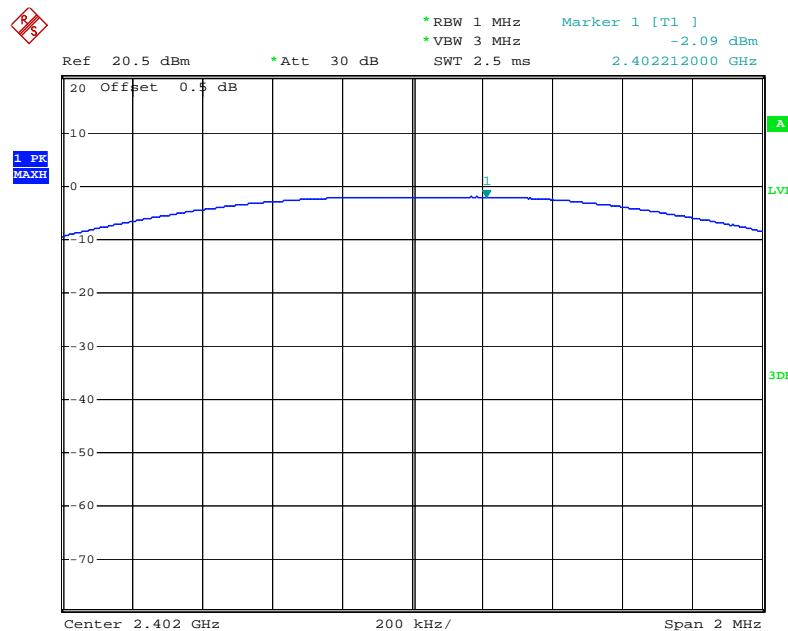
8DPSK Mode

| Channel | Frequency (MHz) | Peak Output Power (dBm/W) | Limits dBm / W |
|---------|-----------------|---------------------------|----------------|
| Low | 2402 | -3.83/0.0004 | 21 / 0.125 |
| Middle | 2441 | -2.43/0.0006 | 21 / 0.125 |
| High | 2480 | -1.17/0.0008 | 21 / 0.125 |

The spectrum analyzer plots are attached as below.

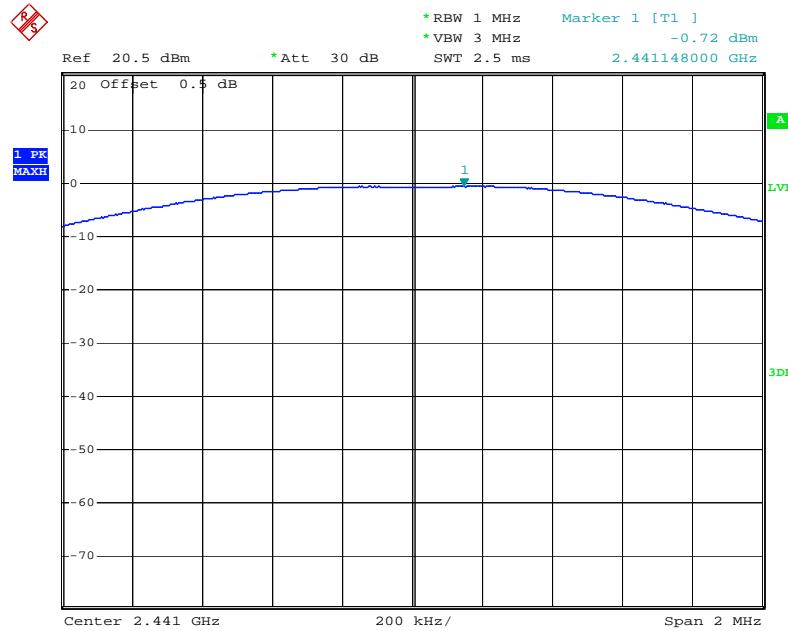
GFSK Mode

Low channel



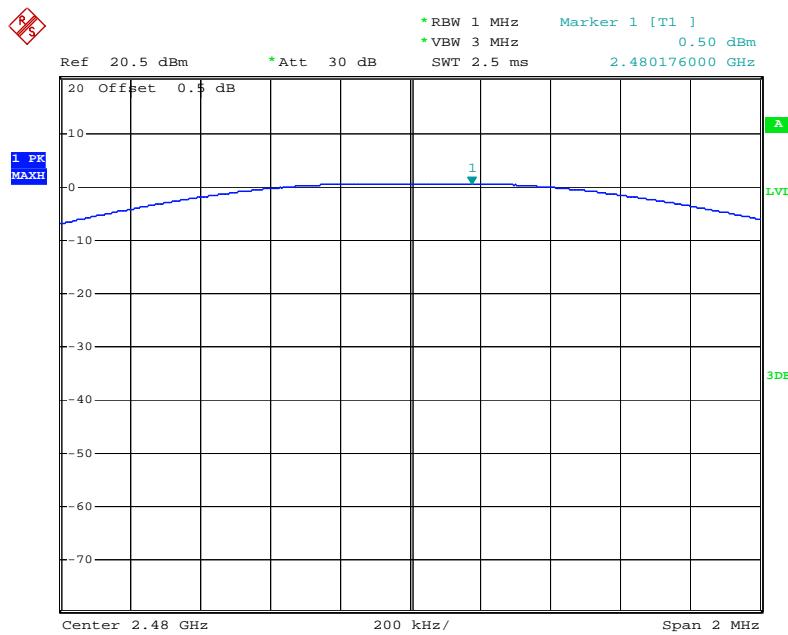
Date: 15.FEB.2014 11:03:05

Middle channel



Date: 15.FEB.2014 11:03:42

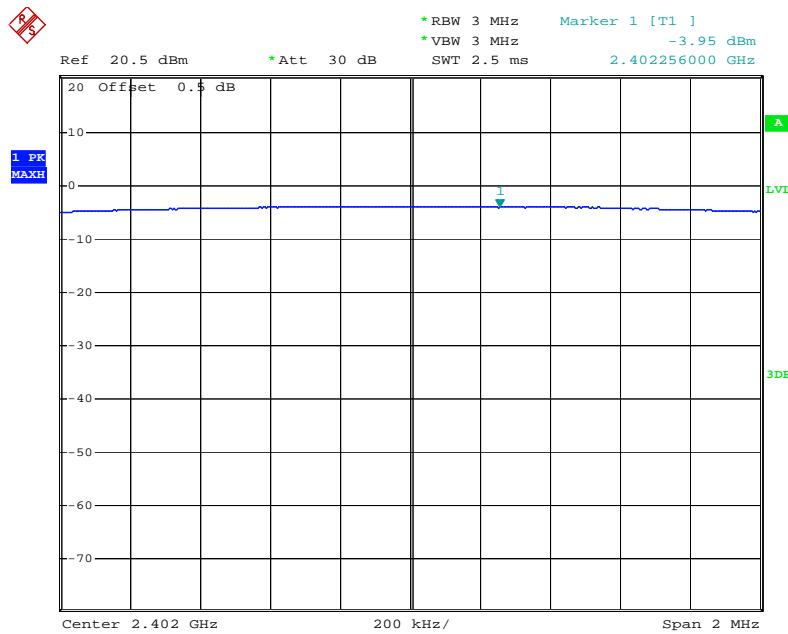
High channel



Date: 15.FEB.2014 11:04:17

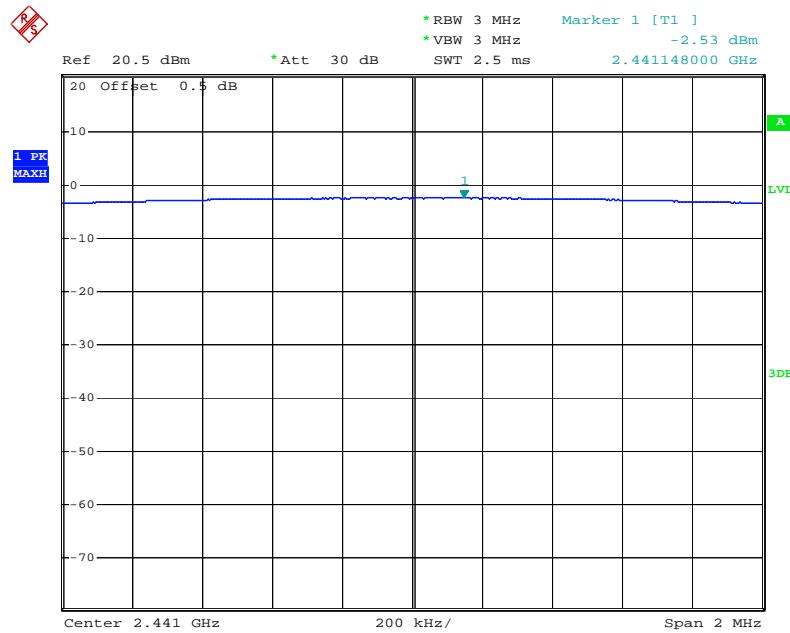
Pi/4-DQPSK Mode

Low channel



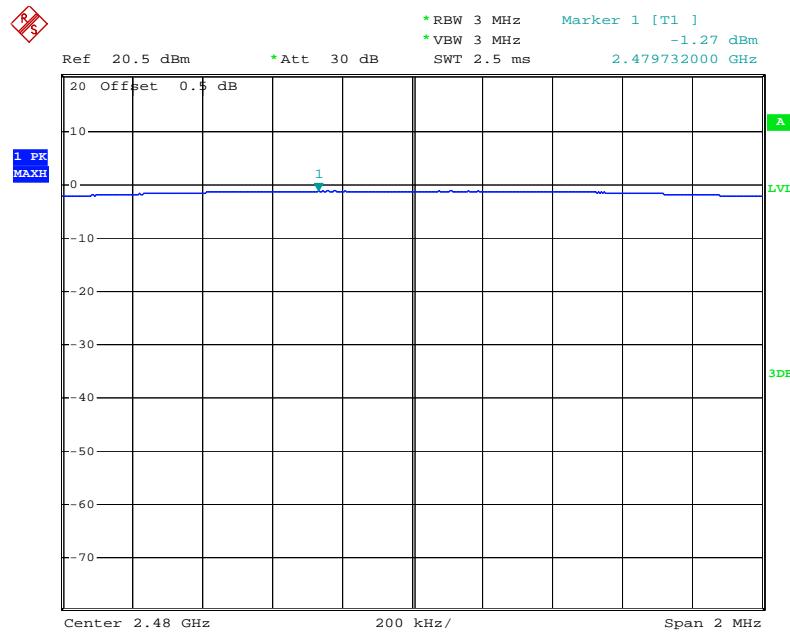
Date: 15.FEB.2014 11:46:13

Middle channel



Date: 15.FEB.2014 11:45:42

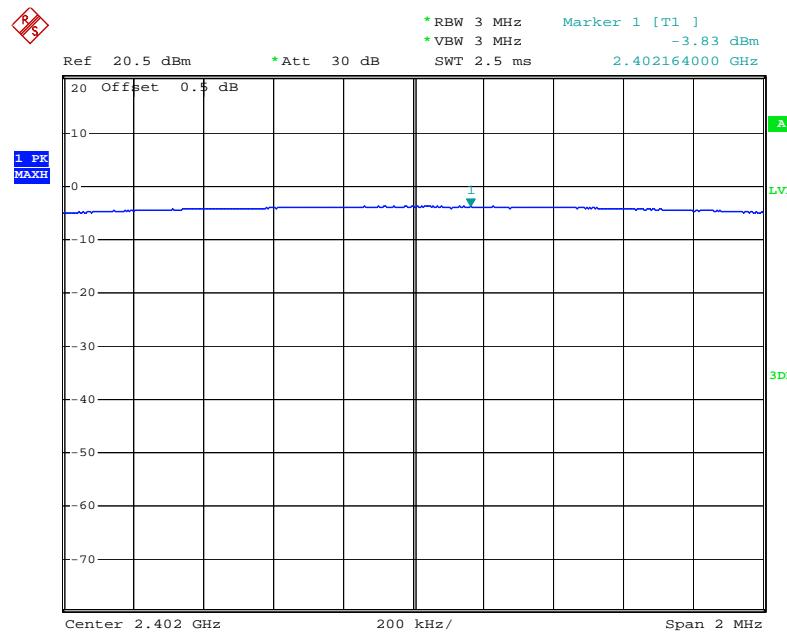
High channel



Date: 15.FEB.2014 11:45:02

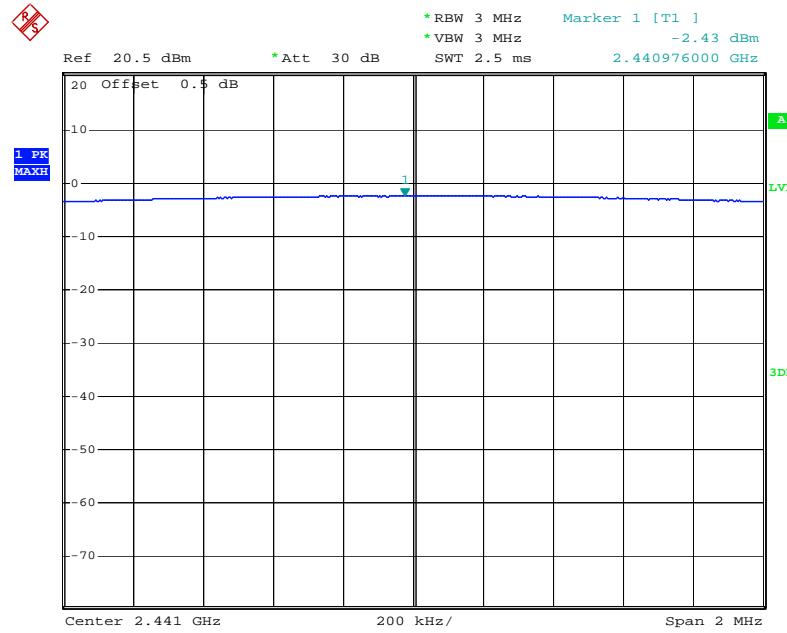
8DPSK Mode

Low channel



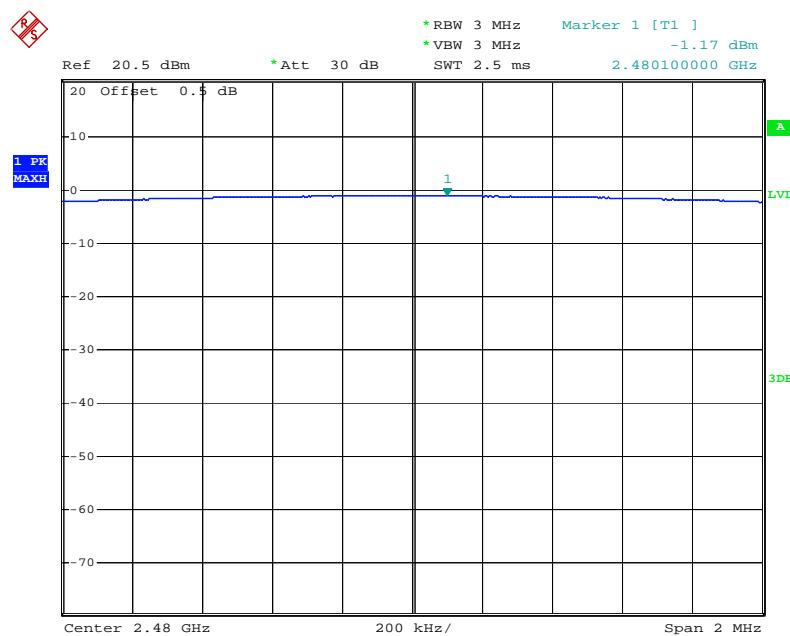
Date: 15.FEB.2014 12:02:45

Middle channel



Date: 15.FEB.2014 12:02:24

High channel

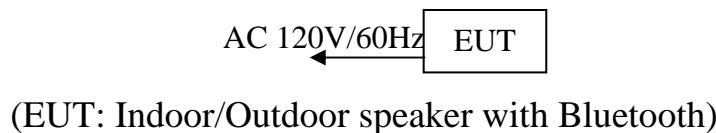


Date: 15.FEB.2014 12:02:03

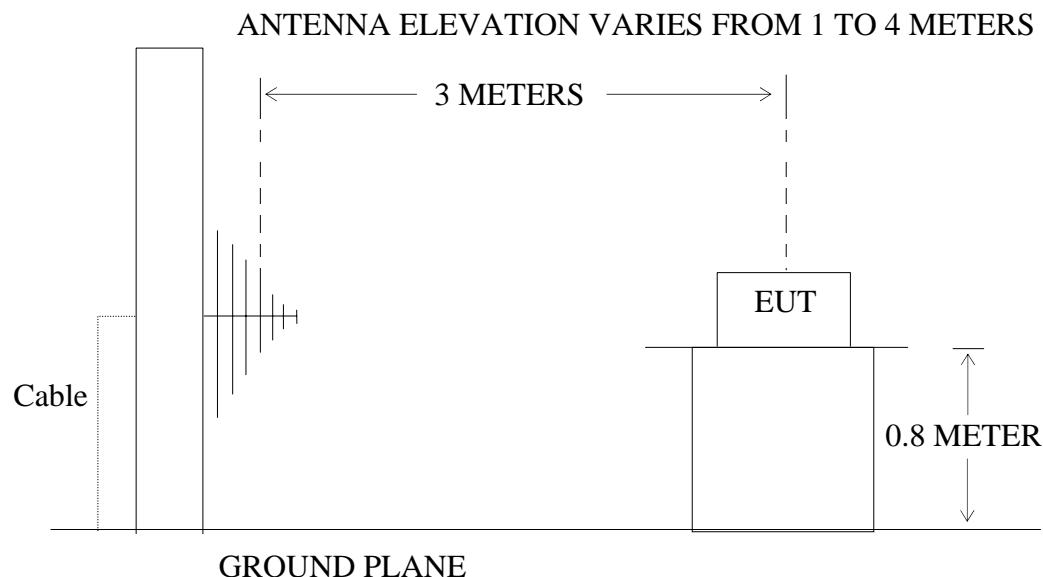
10.RADIATED EMISSION TEST

10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and simulators



10.1.2.Anechoic Chamber Test Setup Diagram



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.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. 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 bilog 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 interface cables must be manipulated according to ANSI C63.4- 2009 on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120 KHz in 30-1000MHz. and set at 1MHz in above 1000MHz.

The frequency range from 30MHz to 25000MHz is checked.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

10.6.The Field Strength of Radiation Emission Measurement Results

Note: 1.We tested GFSK mode, $\Pi/4$ -DQPSK Mode & 8QPSK mode and recorded the worst case data (GFSK mode) for all test mode.

2. The 18-25GHz emissions are not reported, because the levels are too low against the limit.

Below 1GHz



ACCURATE TECHNOLOGY CO., LTD.

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.: alen #3475

Polarization: Horizontal

Standard: FCC 15.247 3M Radiated

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/14/

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

Time: 8/43/12

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

Mode: TX 2402MHz

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 208.5803 | 60.32 | -20.03 | 40.29 | 43.50 | -3.21 | QP | | | |
| 2 | 261.0583 | 58.02 | -19.08 | 38.94 | 46.00 | -7.06 | QP | | | |
| 3 | 295.1469 | 57.56 | -17.95 | 39.61 | 46.00 | -6.39 | QP | | | |



ACCURATE TECHNOLOGY CO., LTD.

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.: alen #3476

Polarization: Vertical

Standard: FCC 15.247 3M Radiated

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/14/

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

Time: 8/44/05

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

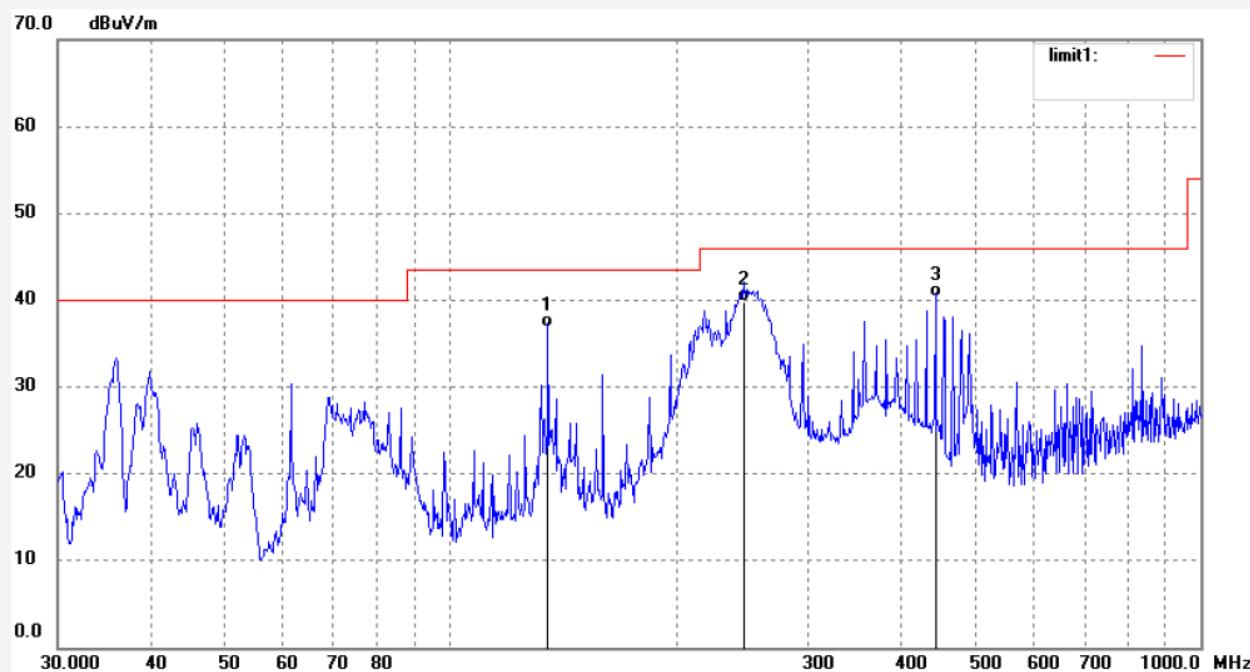
Mode: TX 2402MHz

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 135.0319 | 60.07 | -23.27 | 36.80 | 43.50 | -6.70 | QP | | | |
| 2 | 245.9509 | 59.56 | -19.76 | 39.80 | 46.00 | -6.20 | QP | | | |
| 3 | 443.2943 | 55.19 | -14.83 | 40.36 | 46.00 | -5.64 | QP | | | |



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Fax:+86-0755-26503396

Job No.: alen #3478

Polarization: Horizontal

Standard: FCC 15.247 3M Radiated

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/14/

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

Time: 8/45/37

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

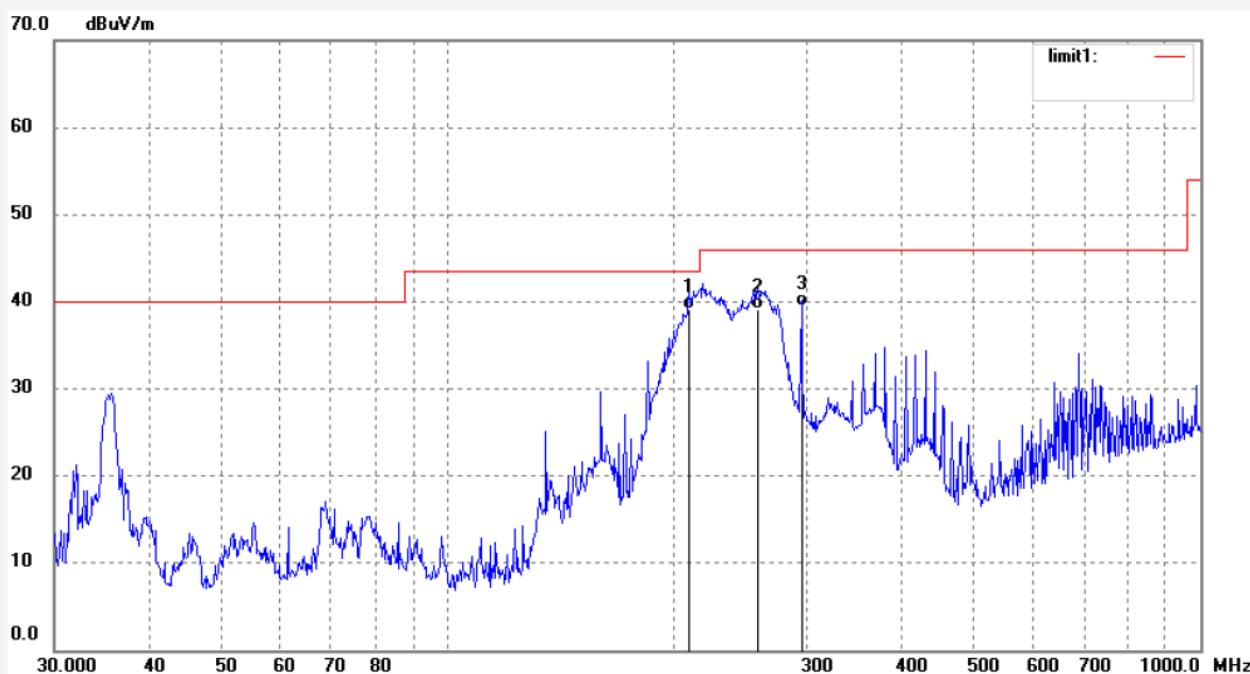
Mode: TX 2441MHz

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 209.3129 | 59.14 | -20.02 | 39.12 | 43.50 | -4.38 | QP | | | |
| 2 | 258.3264 | 58.36 | -19.25 | 39.11 | 46.00 | -6.89 | QP | | | |
| 3 | 295.1469 | 57.46 | -17.95 | 39.51 | 46.00 | -6.49 | QP | | | |



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

Job No.: alen #3477

Polarization: Vertical

Standard: FCC 15.247 3M Radiated

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/14/

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

Time: 8/44/48

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

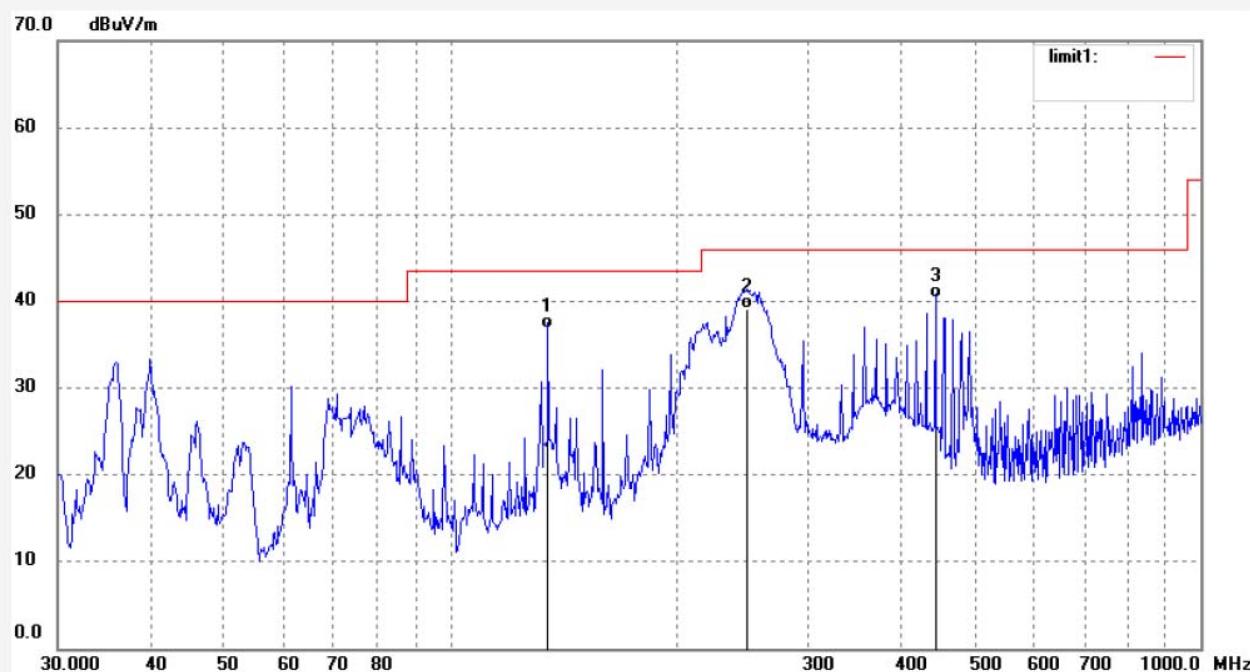
Mode: TX 2441MHz

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 135.0319 | 60.15 | -23.27 | 36.88 | 43.50 | -6.62 | QP | | | |
| 2 | 248.5519 | 58.78 | -19.74 | 39.04 | 46.00 | -6.96 | QP | | | |
| 3 | 443.2943 | 55.24 | -14.83 | 40.41 | 46.00 | -5.59 | QP | | | |



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

Job No.: alen #3479

Polarization: Horizontal

Standard: FCC 15.247 3M Radiated

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/14/

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

Time: 8/46/43

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

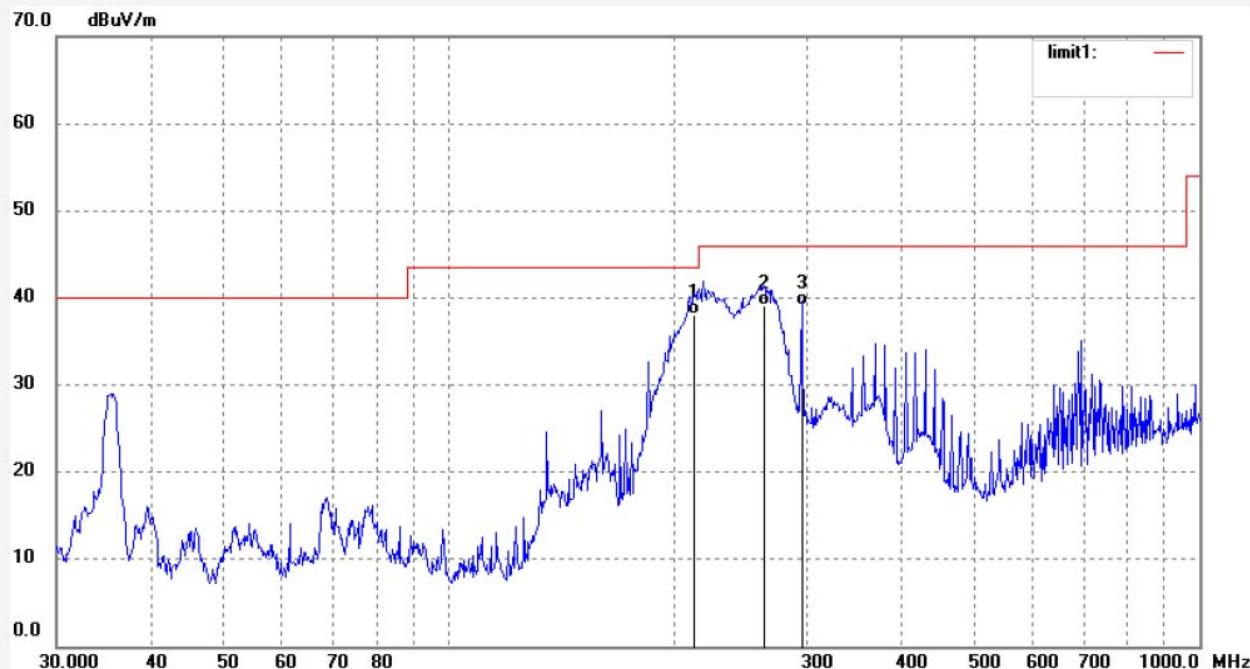
Mode: TX 2480MHz

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 212.2695 | 58.10 | -20.00 | 38.10 | 43.50 | -5.40 | QP | | | |
| 2 | 262.8955 | 58.01 | -18.98 | 39.03 | 46.00 | -6.97 | QP | | | |
| 3 | 295.1469 | 57.07 | -17.95 | 39.12 | 46.00 | -6.88 | QP | | | |



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

Job No.: alen #3480

Polarization: Vertical

Standard: FCC 15.247 3M Radiated

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/14/

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

Time: 8/47/36

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

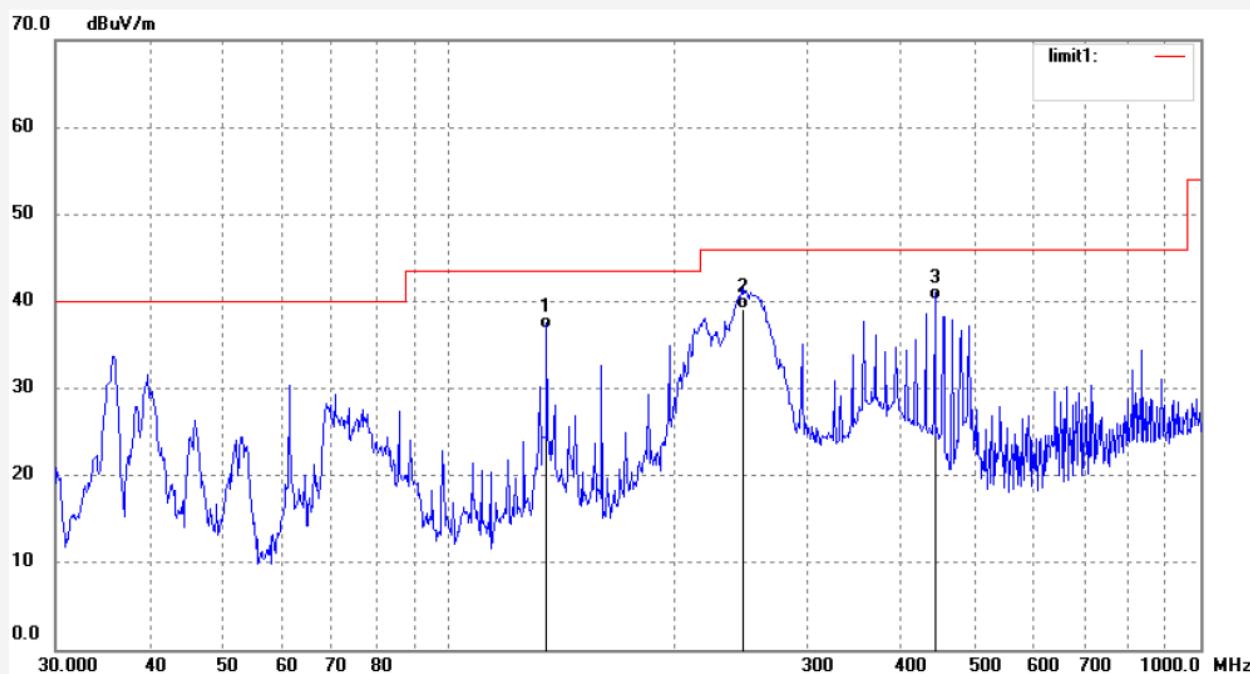
Mode: TX 2480MHz

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 135.0319 | 60.09 | -23.27 | 36.82 | 43.50 | -6.68 | QP | | | |
| 2 | 245.9509 | 58.89 | -19.76 | 39.13 | 46.00 | -6.87 | QP | | | |
| 3 | 443.2943 | 55.05 | -14.83 | 40.22 | 46.00 | -5.78 | QP | | | |

Above 1GHz



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Fax:+86-0755-26503396

Job No.: alen #3483

Polarization: Horizontal

Standard: FCC 15.247 3M Radiated

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

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

Time: 8/36/36

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

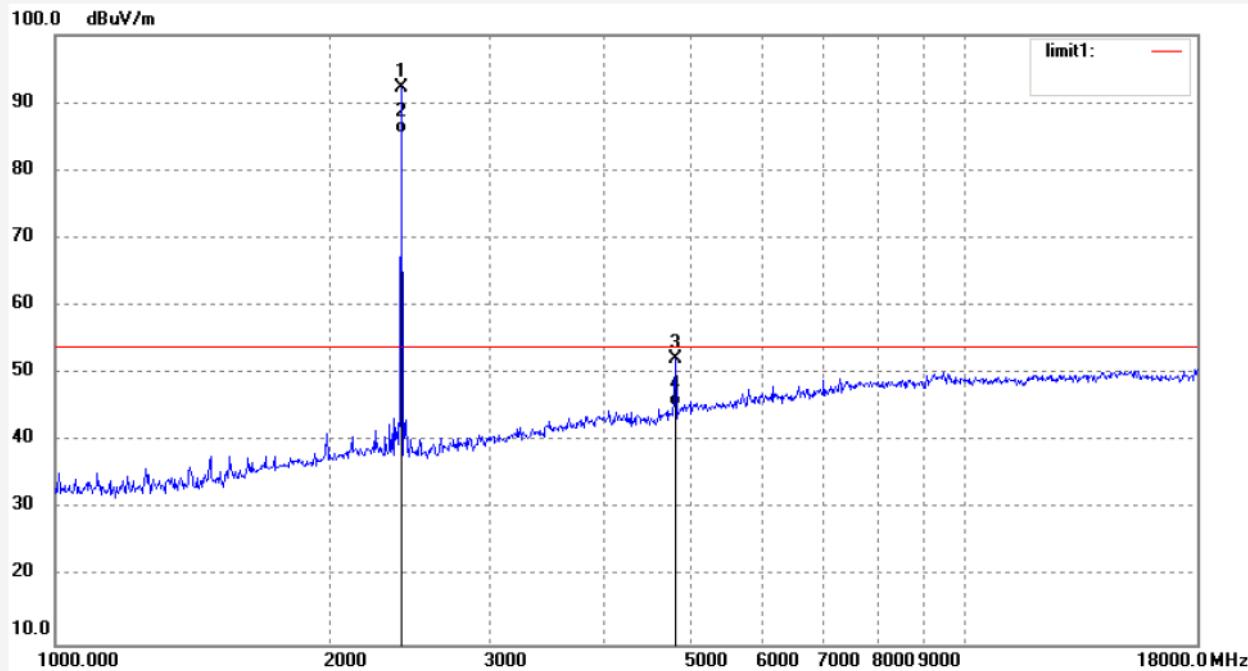
Mode: TX 2402MHz

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2402.053 | 98.94 | -6.76 | 92.18 | | | peak | | | |
| 2 | 2402.053 | 92.21 | -6.76 | 85.45 | | | AVG | | | |
| 3 | 4804.110 | 53.75 | -1.59 | 52.16 | 74.00 | -21.84 | peak | | | |
| 4 | 4804.110 | 46.75 | -1.59 | 45.16 | 54.00 | -8.84 | AVG | | | |



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

Job No.: alen #3484

Polarization: Vertical

Standard: FCC 15.247 3M Radiated

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

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

Time: 8/38/40

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

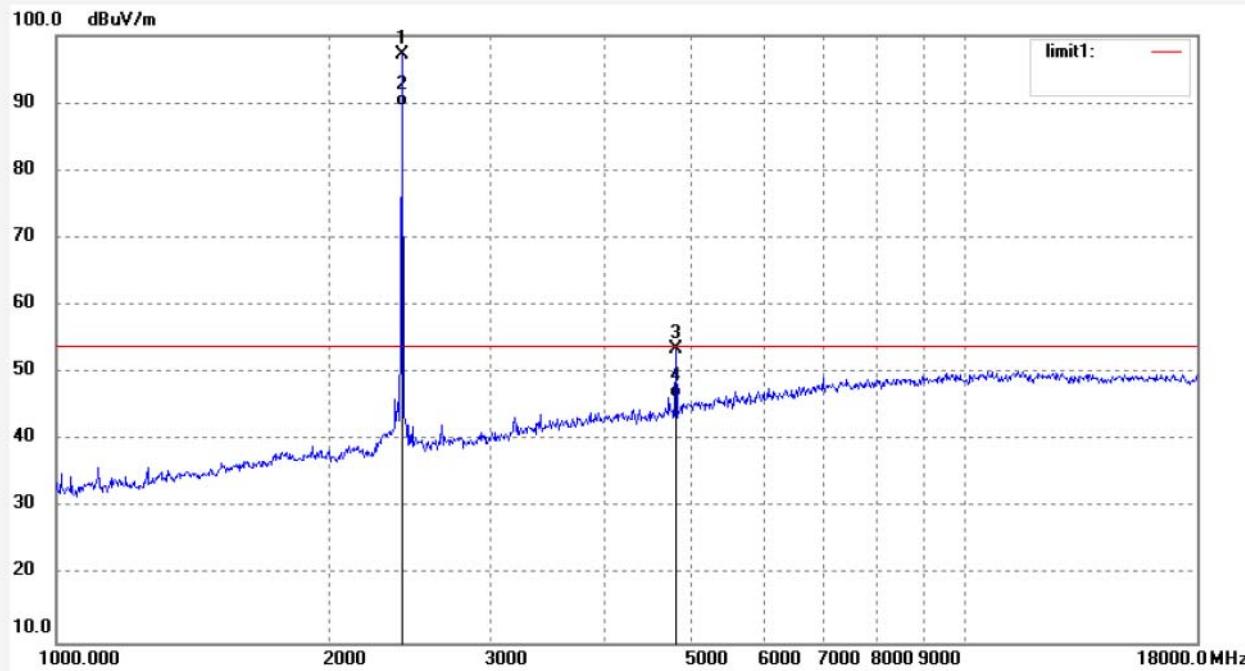
Mode: TX 2402MHz

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2402.053 | 103.99 | -6.76 | 97.23 | | | peak | | | |
| 2 | 2402.053 | 96.28 | -6.76 | 89.52 | | | AVG | | | |
| 3 | 4804.110 | 55.04 | -1.59 | 53.45 | 74.00 | -20.55 | peak | | | |
| 4 | 4804.110 | 47.83 | -1.59 | 46.24 | 54.00 | -7.76 | AVG | | | |



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

Job No.: alen #3486

Polarization: Horizontal

Standard: FCC 15.247 3M Radiated

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

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

Time: 8/43/07

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

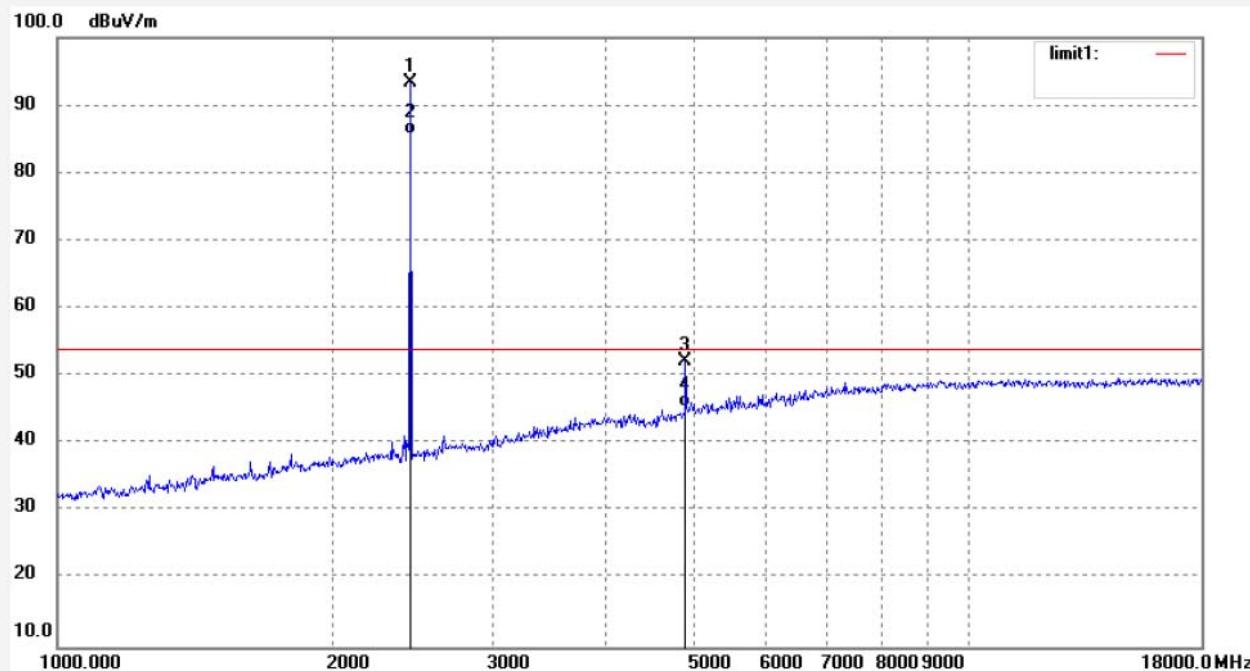
Mode: TX 2441MHz

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2441.051 | 99.97 | -6.64 | 93.33 | | | peak | | | |
| 2 | 2441.051 | 92.45 | -6.64 | 85.81 | | | AVG | | | |
| 3 | 4882.151 | 53.53 | -1.33 | 52.20 | 74.00 | -21.80 | peak | | | |
| 4 | 4882.151 | 46.69 | -1.33 | 45.36 | 54.00 | -8.64 | AVG | | | |



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Science & Industry Park,Nanshan Shenzhen,P.R.China

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

Job No.: alen #3485

Polarization: Vertical

Standard: FCC 15.247 3M Radiated

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

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

Time: 8/40/57

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

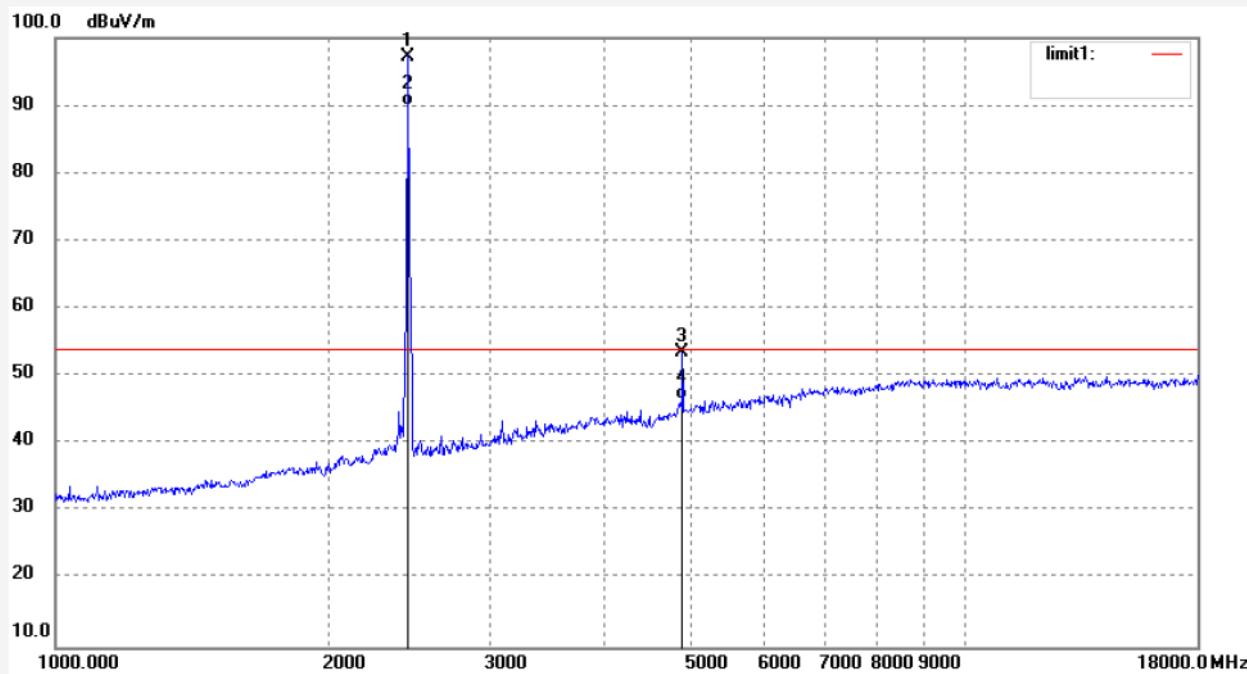
Mode: TX 2441MHz

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1 | 2441.051 | 103.94 | -6.64 | 97.30 | | | peak | | | |
| 2 | 2441.051 | 96.54 | -6.64 | 89.90 | | | AVG | | | |
| 3 | 4882.151 | 54.97 | -1.33 | 53.64 | 74.00 | -20.36 | peak | | | |
| 4 | 4882.151 | 47.80 | -1.33 | 46.47 | 54.00 | -7.53 | AVG | | | |

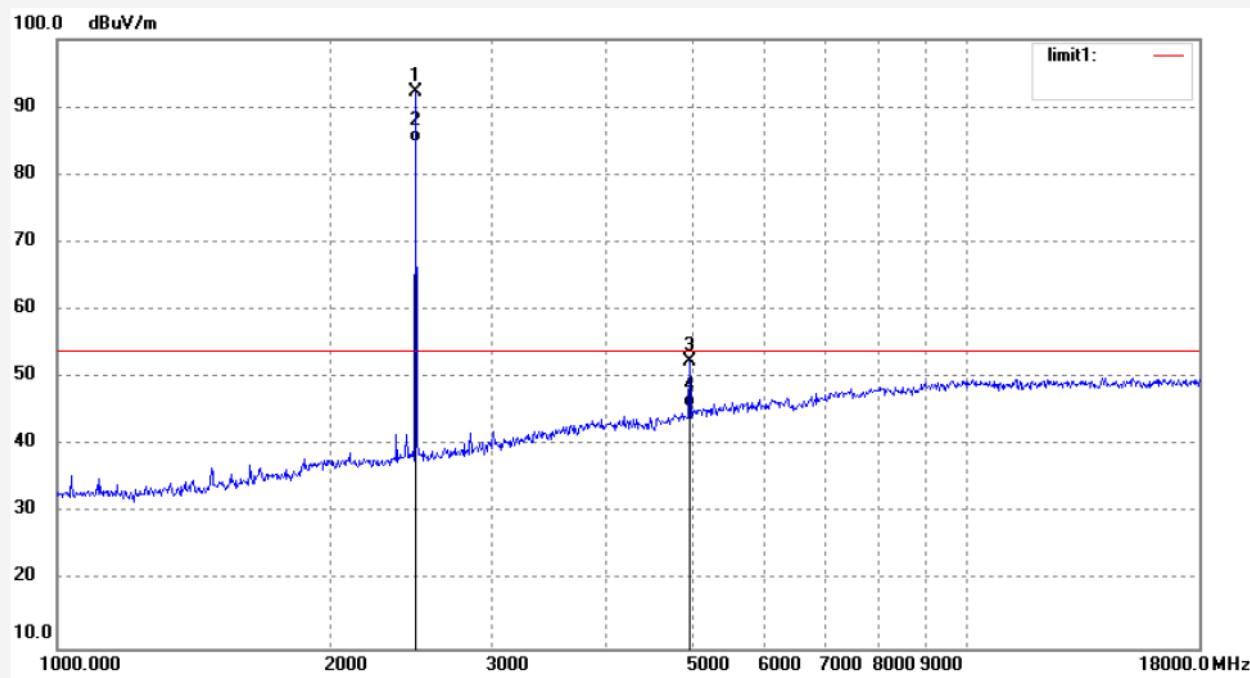


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Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

| | |
|--|----------------------------|
| Job No.: alen #3487 | Polarization: Horizontal |
| Standard: FCC 15.247 3M Radiated | Power Source: AC 120V/60Hz |
| Test item: Radiation Test | Date: 14/02/15/ |
| Temp.(C)/Hum.(%) 25 C / 55 % | Time: 8/44/55 |
| EUT: Indoor/outdoor speaker with bluetooth | Engineer Signature: |
| Mode: TX 2480MHz | Distance: 3m |
| Model: BTW248XBK | |
| Manufacturer: Musilab | |
| Note: Report No:ATE20140106 | |



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1 | 2480.310 | 98.89 | -6.56 | 92.33 | | | peak | | | |
| 2 | 2480.310 | 91.32 | -6.56 | 84.76 | | | AVG | | | |
| 3 | 4960.307 | 53.64 | -1.12 | 52.52 | 74.00 | -21.48 | peak | | | |
| 4 | 4960.307 | 46.78 | -1.12 | 45.66 | 54.00 | -8.34 | AVG | | | |



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Fax:+86-0755-26503396

Job No.: alen #3488

Polarization: Vertical

Standard: FCC 15.247 3M Radiated

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

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

Time: 8/47/05

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

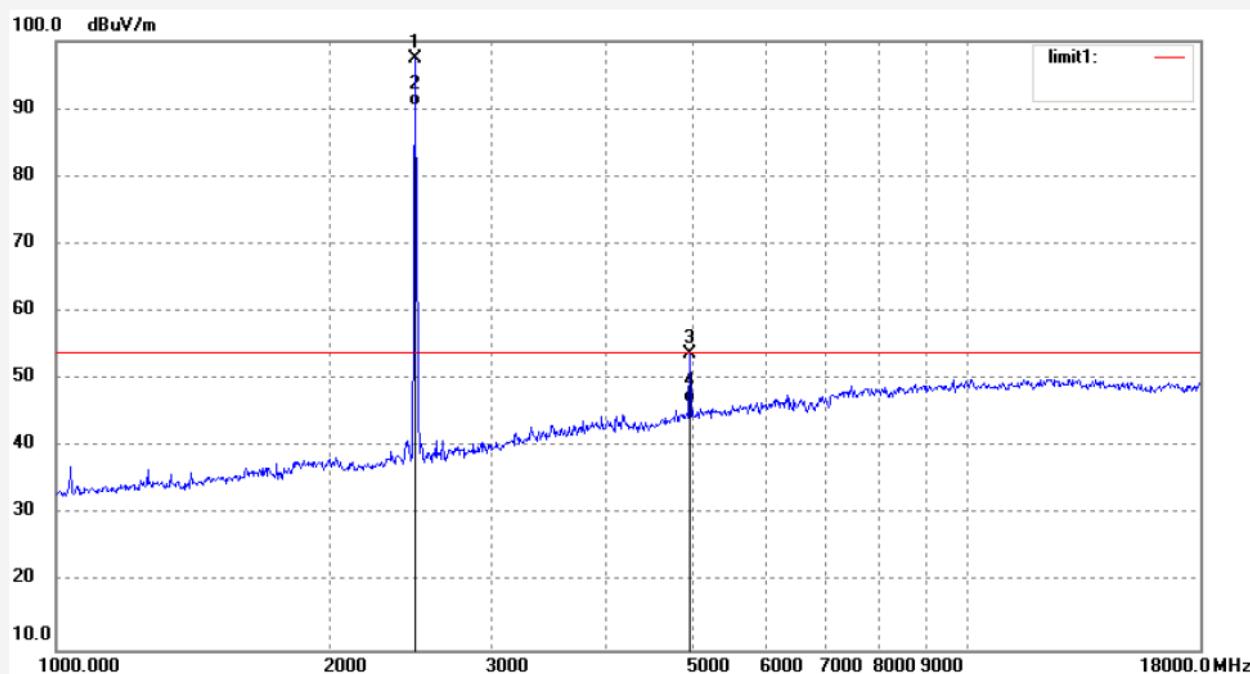
Mode: TX 2480MHz

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

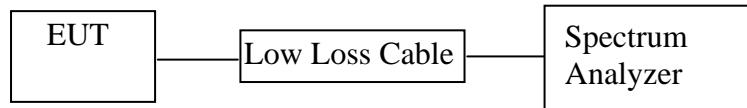
Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2480.310 | 104.03 | -6.56 | 97.47 | | | peak | | | |
| 2 | 2480.310 | 96.89 | -6.56 | 90.33 | | | AVG | | | |
| 3 | 4960.307 | 54.79 | -1.12 | 53.67 | 74.00 | -20.33 | peak | | | |
| 4 | 4960.307 | 47.74 | -1.12 | 46.62 | 54.00 | -7.38 | AVG | | | |

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: Indoor/Outdoor speaker with Bluetooth)

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.

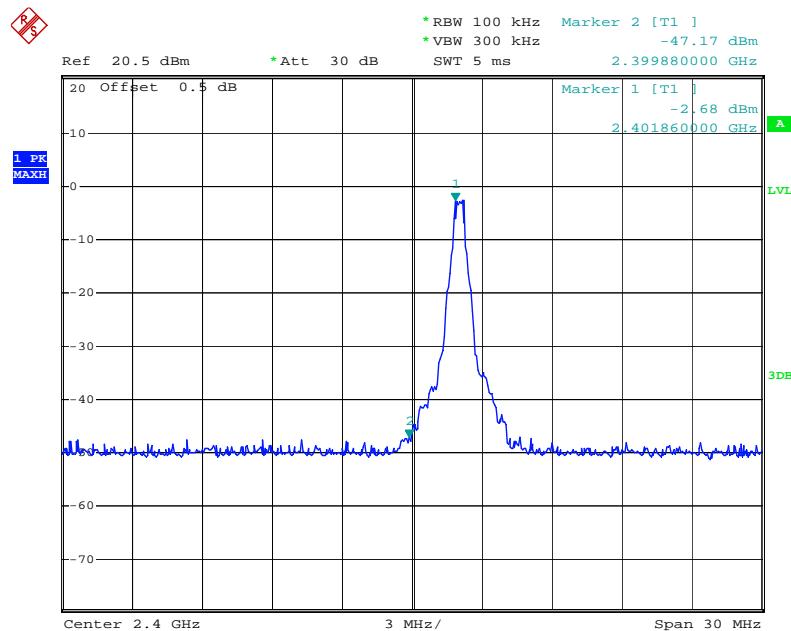
11.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

11.5.3. The band edges was measured and recorded.

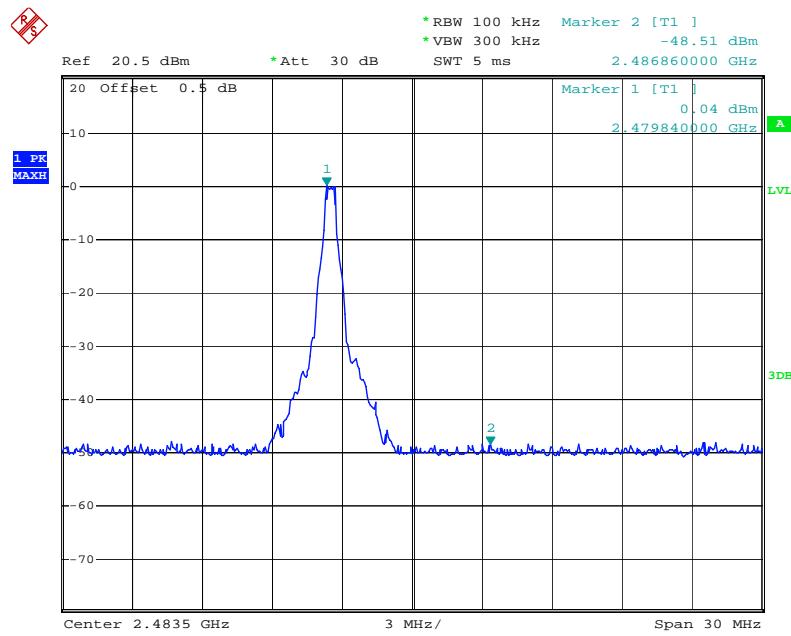
11.6. Test Result

| Frequency (MHz) | Result of Band Edge (dBc) | Limit of Band Edge (dBc) |
|--------------------|------------------------------|-----------------------------|
| GFSK | | |
| 2399.880 | 44.49 | > 20dBc |
| 2486.860 | 48.55 | > 20dBc |
| Π/4-DQPSK Mode | | |
| 2399.520 | 44.06 | > 20dBc |
| 2490.400 | 46.58 | > 20dBc |
| 8DPSK | | |
| 2398.920 | 43.27 | > 20dBc |
| 2485.300 | 46.71 | > 20dBc |

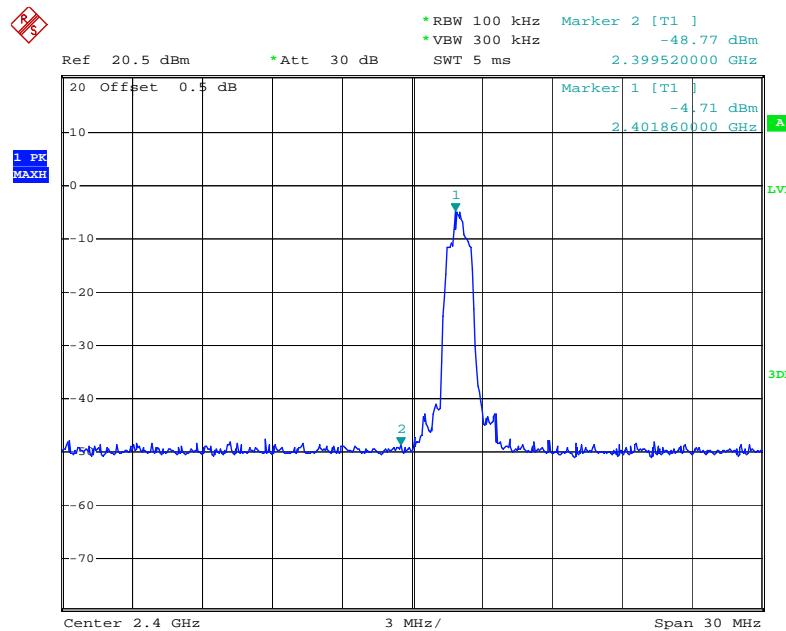
GFSK



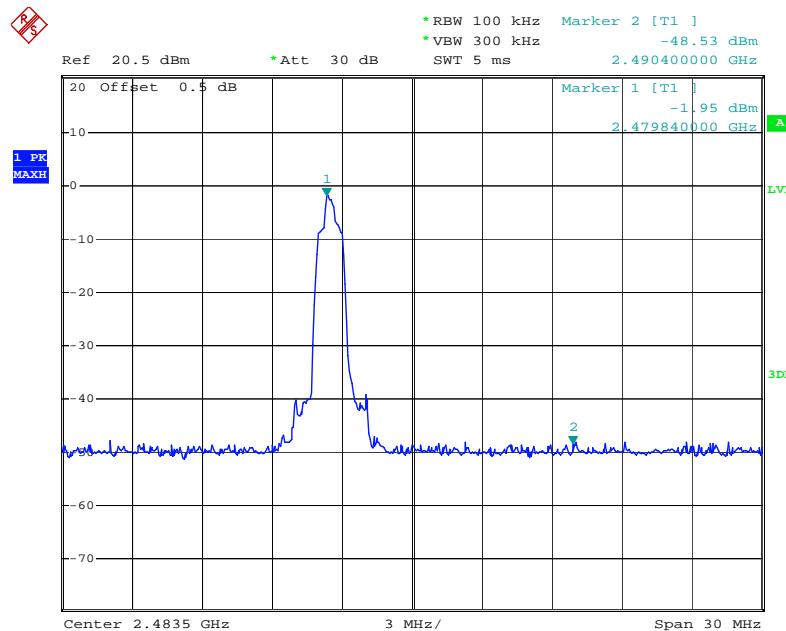
Date: 15.FEB.2014 10:50:53



Date: 15.FEB.2014 10:49:57

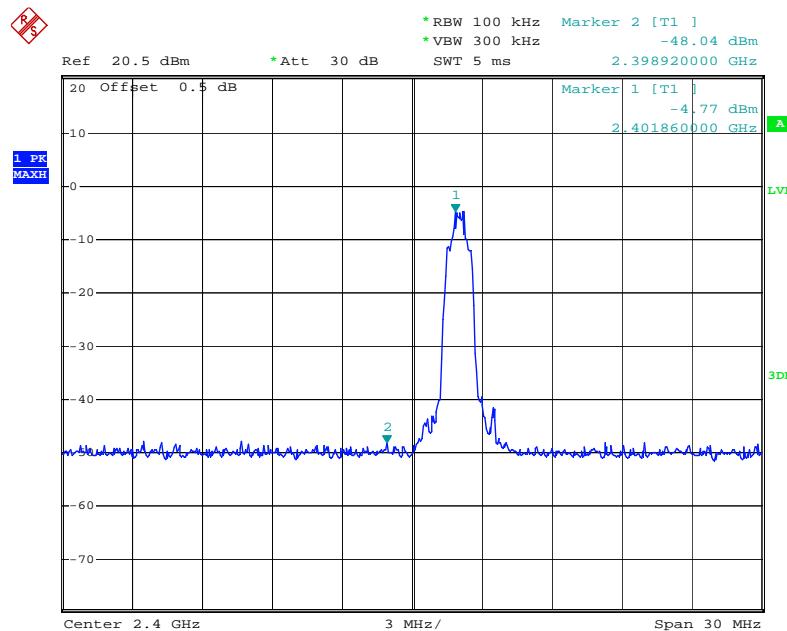
$\Pi/4$ -DQPSK Mode

Date: 15.FEB.2014 11:31:41

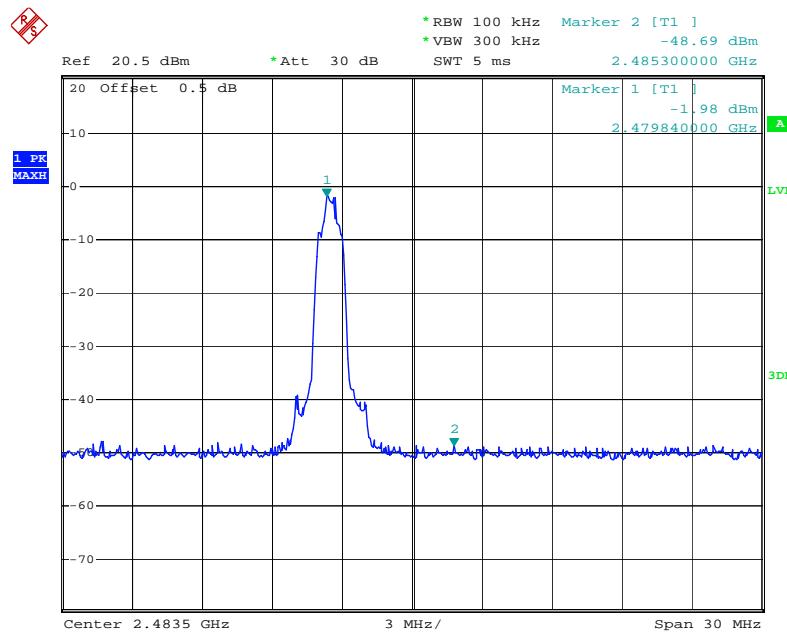


Date: 15.FEB.2014 11:32:27

8DPSK



Date: 15.FEB.2014 12:00:02



Date: 15.FEB.2014 12:00:45

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.

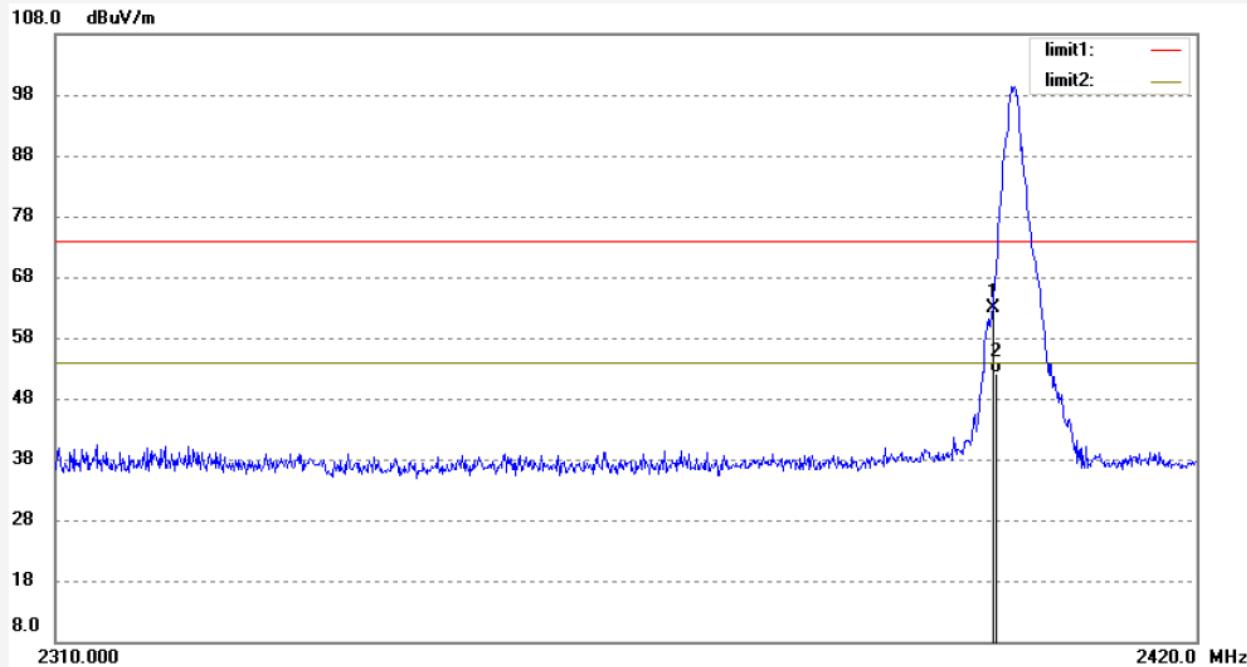
Non-hopping mode**ACCURATE TECHNOLOGY CO., LTD.**F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

| | | | |
|-------------------|---------------------------------------|---------------------|--------------|
| Job No.: | Ricky #182 | Polarization: | Horizontal |
| Standard: | FCC 15C PK | Power Source: | AC 120V/60Hz |
| Test item: | Radiation Test | Date: | 14/02/15/ |
| Temp.(C)/Hum.(%) | 23 C / 49 % | Time: | 12:48:42 |
| EUT: | Indoor/outdoor speaker with bluetooth | Engineer Signature: | Ricky |
| Mode: | TX 2402MHz(GFSK) | Distance: | 3m |
| Model: | BTW248XBK | | |
| Manufacturer: | Musilab | | |
| Note: | Report No:ATE20140106 | | |



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2400.000 | 70.45 | -7.46 | 62.99 | 74.00 | -11.01 | peak | | | |
| 2 | 2400.000 | 59.69 | -7.46 | 52.23 | 54.00 | -1.77 | AVG | | | |

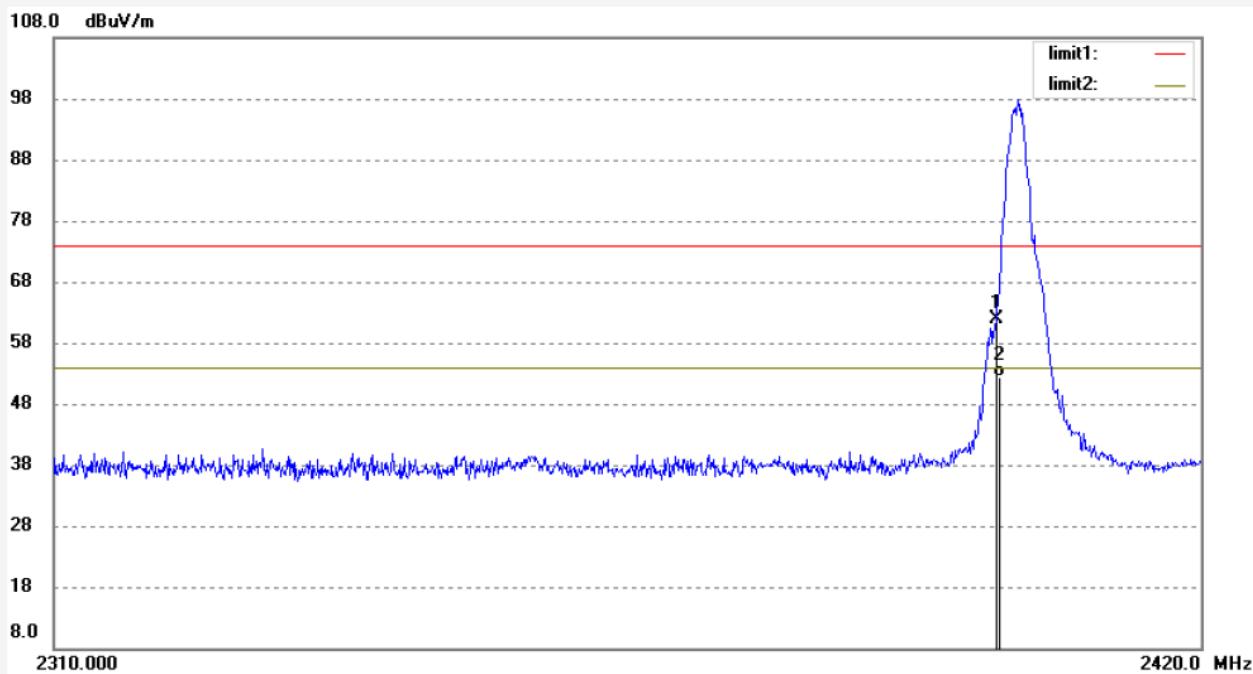


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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

| | | | |
|-----------------------------|---------------------------------------|---------------------|--------------|
| Job No.: | Ricky #181 | Polarization: | Vertical |
| Standard: | FCC 15C PK | Power Source: | AC 120V/60Hz |
| Test item: | Radiation Test | Date: | 14/02/15/ |
| Temp.(C)/Hum.(%) | 23 C / 49 % | Time: | 12/46/01 |
| EUT: | Indoor/outdoor speaker with bluetooth | Engineer Signature: | Ricky |
| Mode: | TX 2402MHz(GFSK) | Distance: | 3m |
| Model: | BTW248XBK | | |
| Manufacturer: | Musilab | | |
| Note: Report No:ATE20140106 | | | |



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2400.000 | 69.22 | -7.46 | 61.76 | 74.00 | -12.24 | peak | | | |
| 2 | 2400.000 | 59.91 | -7.46 | 52.45 | 54.00 | -1.55 | AVG | | | |



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Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Ricky #183

Polarization: Horizontal

Standard: FCC 15C PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

Temp.(C)/Hum.(%) 23 C / 49 %

Time: 12/50/11

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature: Ricky

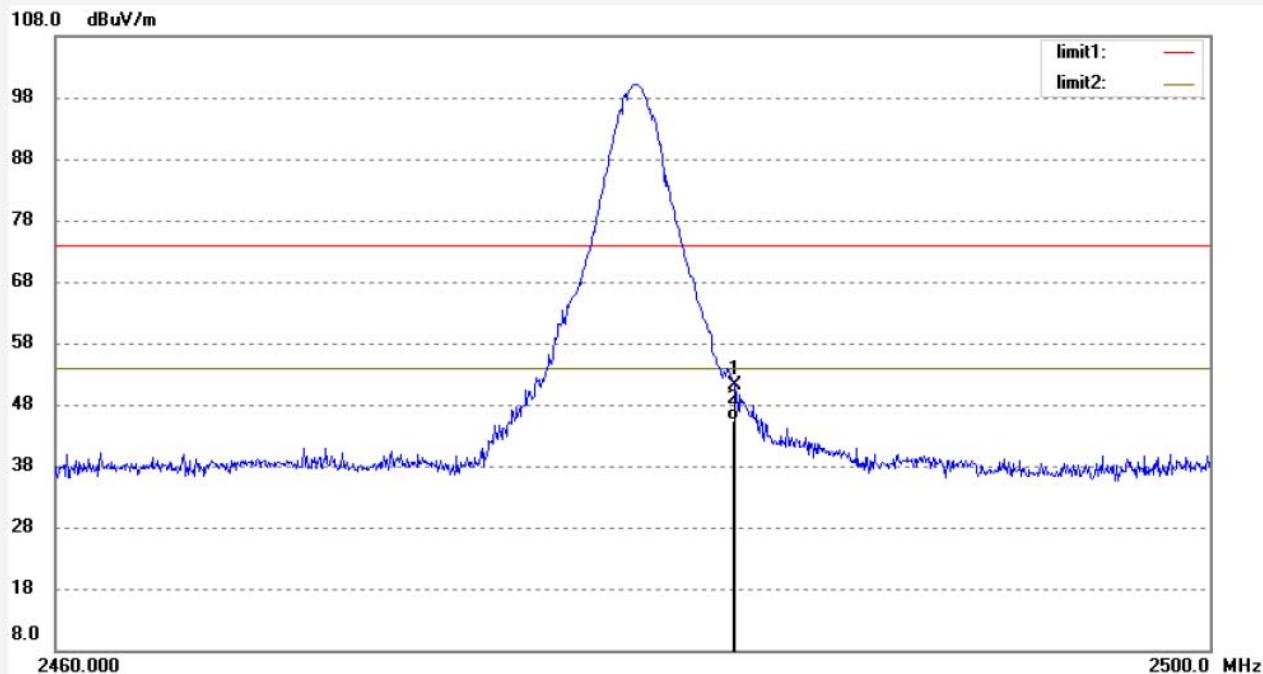
Mode: TX 2480MHz(GFSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2483.529 | 58.57 | -7.37 | 51.20 | 74.00 | -22.80 | peak | | | |
| 2 | 2483.529 | 52.63 | -7.37 | 45.26 | 54.00 | -8.74 | AVG | | | |



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Fax:+86-0755-26503396

Job No.: Ricky #184

Polarization: Vertical

Standard: FCC 15C PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

Temp.(C)/Hum.(%) 23 C / 49 %

Time: 12/54/15

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature: Ricky

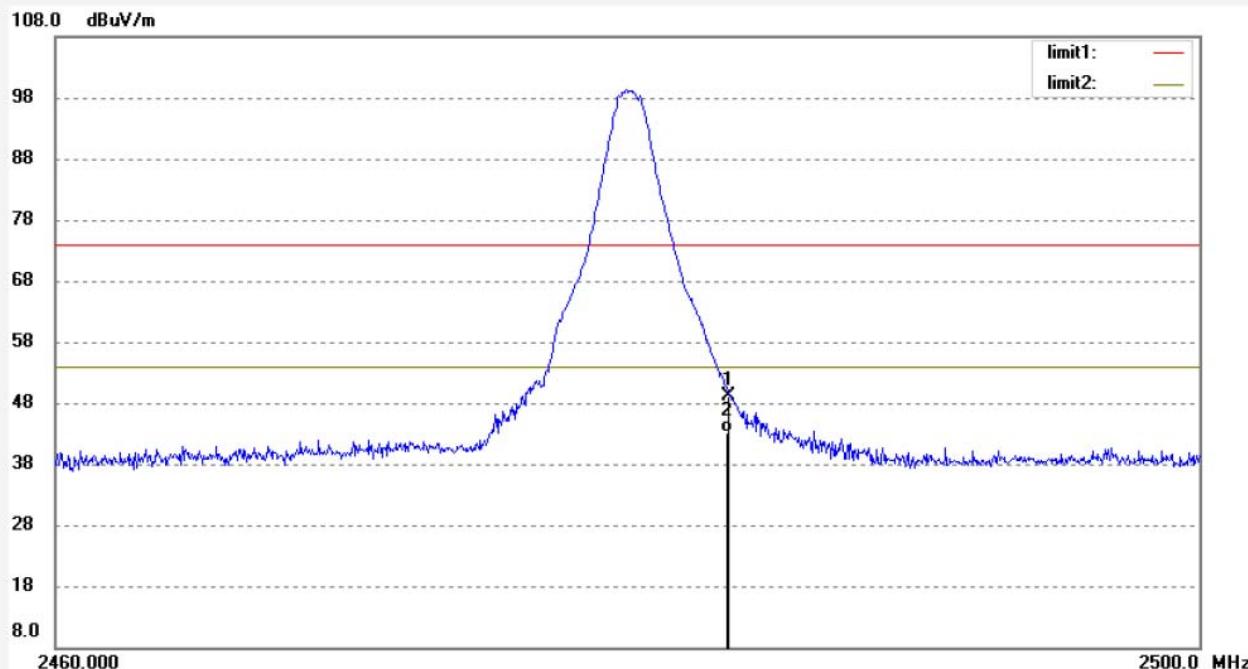
Mode: TX 2480MHz(GFSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2483.529 | 56.48 | -7.37 | 49.11 | 74.00 | -24.89 | peak | | | |
| 2 | 2483.529 | 50.52 | -7.37 | 43.15 | 54.00 | -10.85 | AVG | | | |

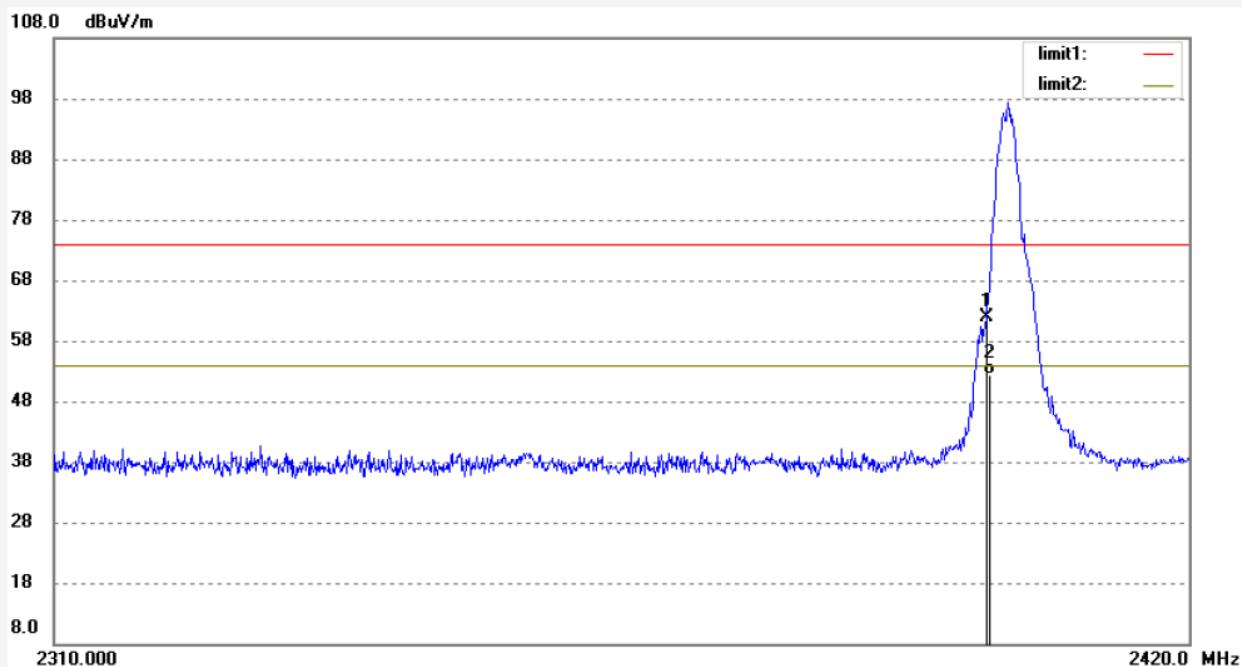


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Site: 2# Chamber
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Fax:+86-0755-26503396

| | |
|--|----------------------------|
| Job No.: Ricky #185 | Polarization: Vertical |
| Standard: FCC 15C PK | Power Source: AC 120V/60Hz |
| Test item: Radiation Test | Date: 14/02/15/ |
| Temp.(C)/Hum.(%) 23 C / 49 % | Time: 12/56/01 |
| EUT: Indoor/outdoor speaker with bluetooth | Engineer Signature: Ricky |
| Mode: TX 2402MHz(PI/4DQPSK) | Distance: 3m |
| Model: BTW248XBK | |
| Manufacturer: Musilab | |
| Note: Report No:ATE20140106 | |



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1 | 2400.000 | 69.31 | -7.46 | 61.85 | 74.00 | -12.15 | peak | | | |
| 2 | 2400.000 | 59.88 | -7.46 | 52.42 | 54.00 | -1.58 | AVG | | | |



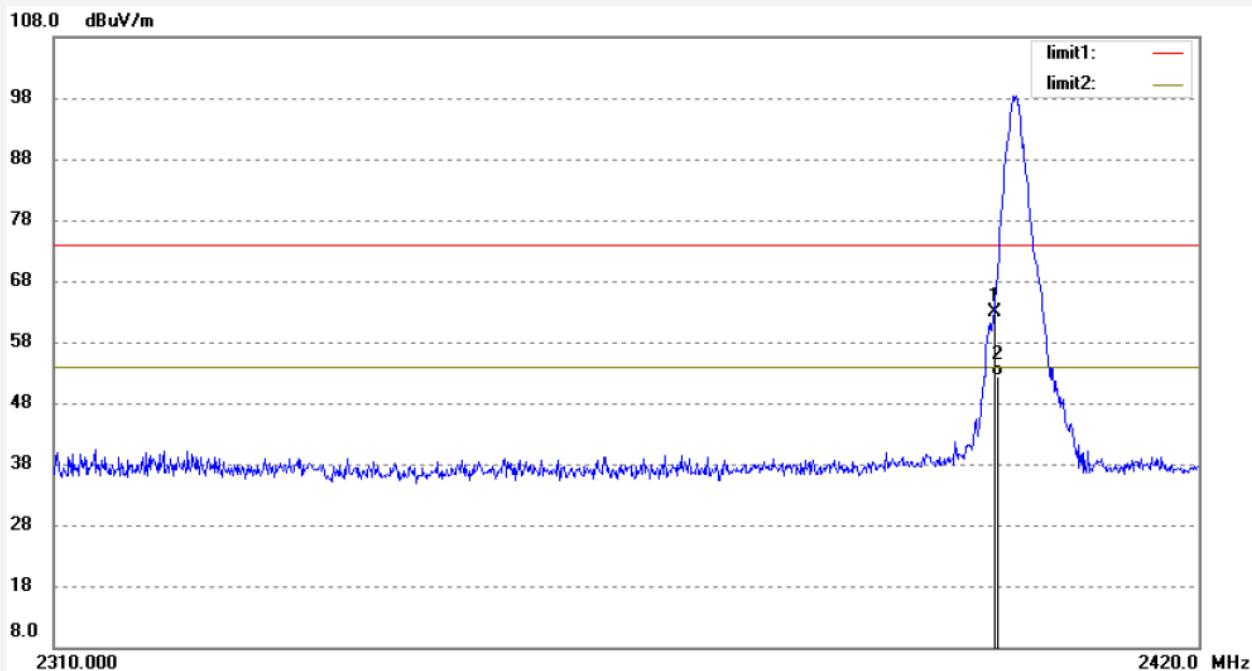
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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

| | |
|--|----------------------------|
| Job No.: Ricky #186 | Polarization: Horizontal |
| Standard: FCC 15C PK | Power Source: AC 120V/60Hz |
| Test item: Radiation Test | Date: 14/02/15/ |
| Temp.(C)/Hum.(%) 23 C / 49 % | Time: 12/57/18 |
| EUT: Indoor/outdoor speaker with bluetooth | Engineer Signature: Ricky |
| Mode: TX 2402MHz(PI/4DQPSK) | Distance: 3m |
| Model: BTW248XBK | |
| Manufacturer: Musilab | |

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2400.000 | 70.46 | -7.46 | 63.00 | 74.00 | -11.00 | peak | | | |
| 2 | 2400.000 | 59.77 | -7.46 | 52.31 | 54.00 | -1.69 | AVG | | | |



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Site: 2# Chamber
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Fax:+86-0755-26503396

Job No.: Ricky #187

Polarization: Horizontal

Standard: FCC 15C PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

Temp.(C)/Hum.(%) 23 C / 49 %

Time: 12/59/22

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature: Ricky

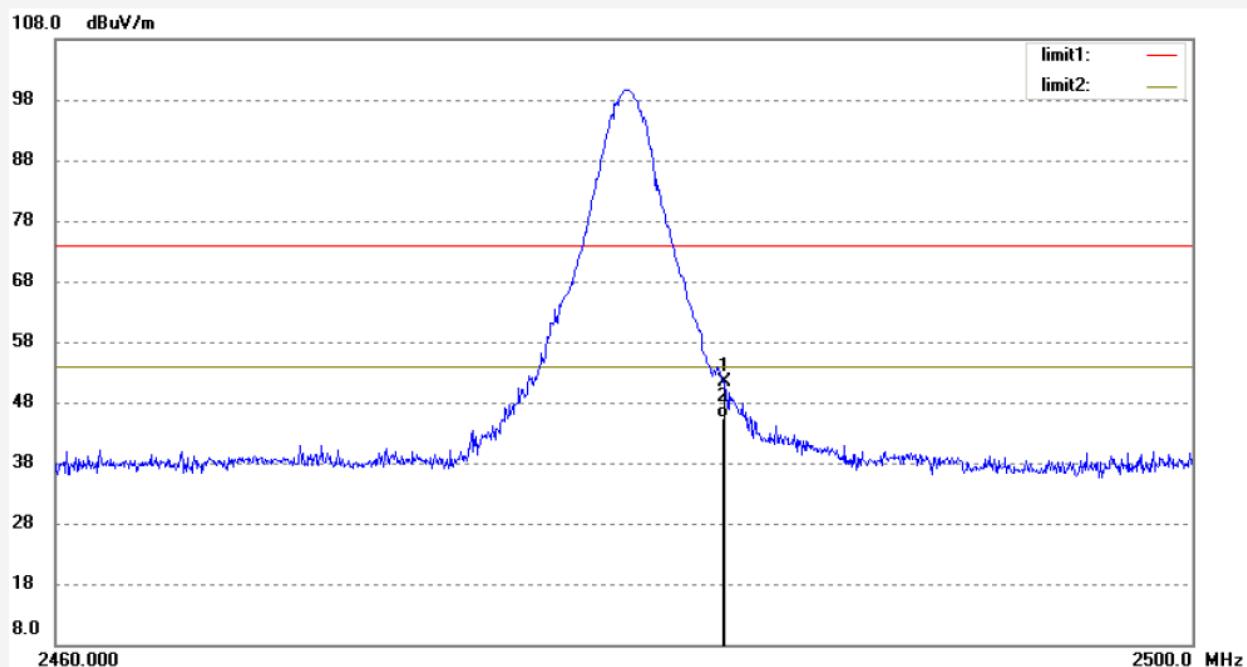
Mode: TX 2480MHz(PI/4DQPSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1 | 2483.529 | 58.66 | -7.37 | 51.29 | 74.00 | -22.71 | peak | | | |
| 2 | 2483.529 | 52.79 | -7.37 | 45.42 | 54.00 | -8.58 | AVG | | | |



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Site: 2# Chamber
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Fax:+86-0755-26503396

Job No.: Ricky #188

Polarization: Vertical

Standard: FCC 15C PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

Temp.(C)/Hum.(%) 23 C / 49 %

Time: 13/01/20

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature: Ricky

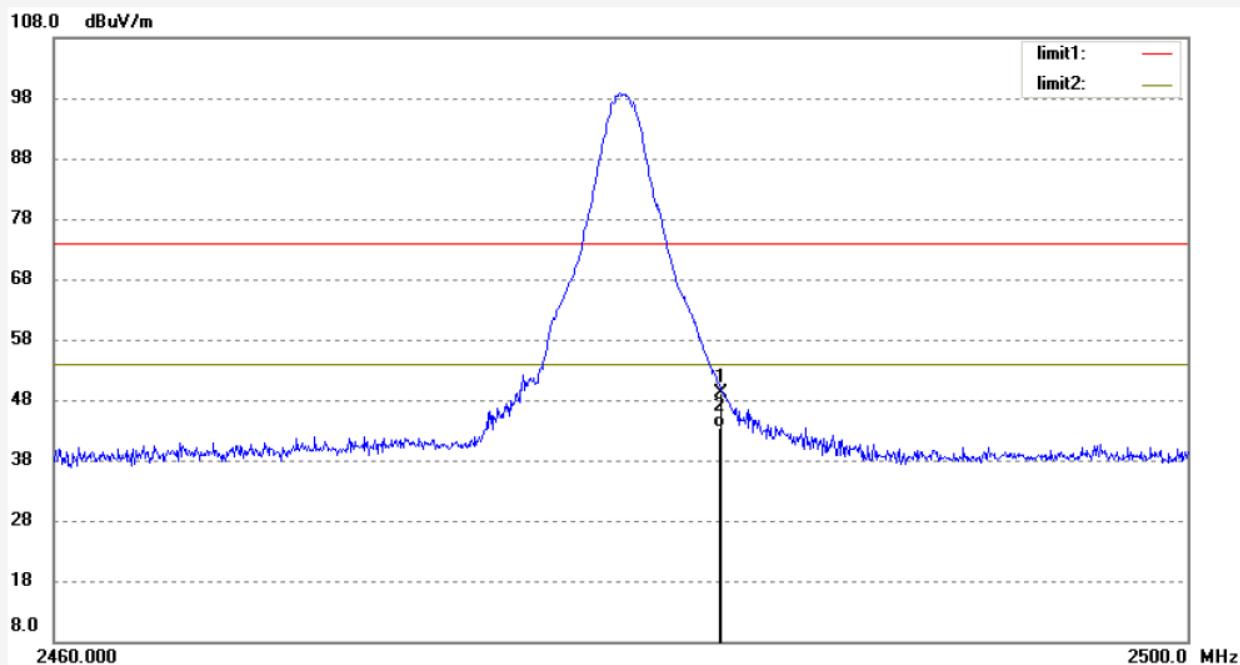
Mode: TX 2480MHz(PI/4DQPSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1 | 2483.529 | 56.56 | -7.37 | 49.19 | 74.00 | -24.81 | peak | | | |
| 2 | 2483.529 | 50.67 | -7.37 | 43.30 | 54.00 | -10.70 | AVG | | | |

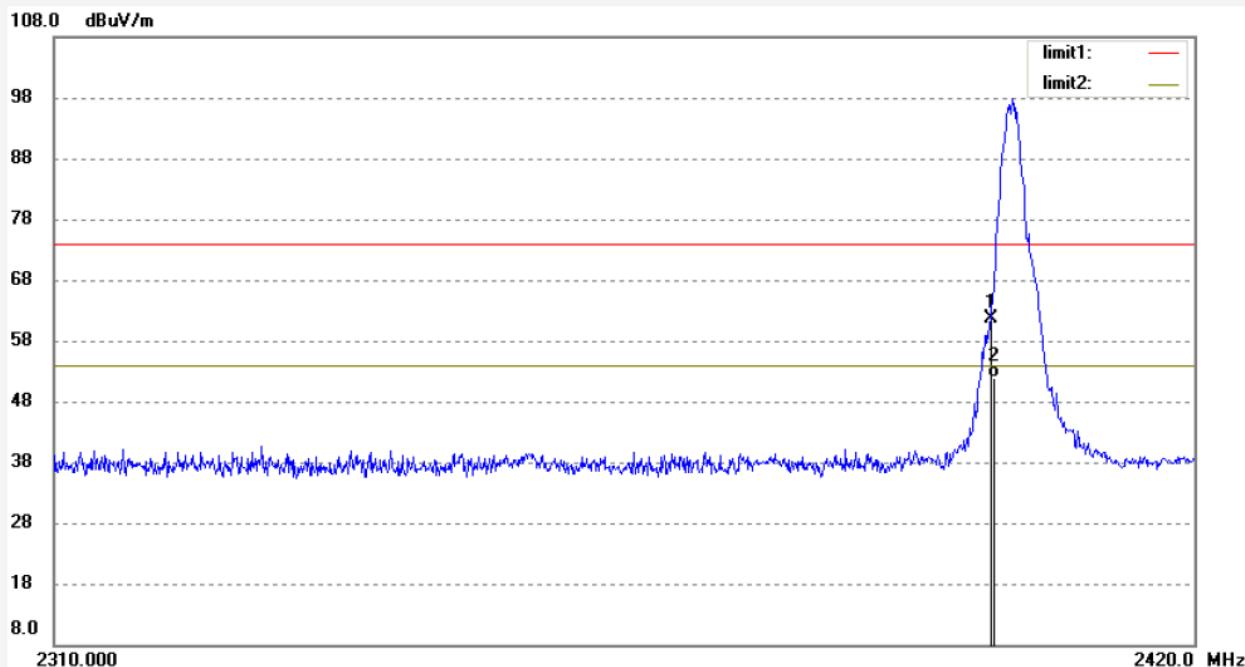


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Site: 2# Chamber
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Fax:+86-0755-26503396

| | | | |
|-------------------|---------------------------------------|---------------------|--------------|
| Job No.: | Ricky #189 | Polarization: | Vertical |
| Standard: | FCC 15C PK | Power Source: | AC 120V/60Hz |
| Test item: | Radiation Test | Date: | 14/02/15/ |
| Temp.(C)/Hum.(%) | 23 C / 49 % | Time: | 13/03/35 |
| EUT: | Indoor/outdoor speaker with bluetooth | Engineer Signature: | Ricky |
| Mode: | TX 2402MHz(8QPSK) | Distance: | 3m |
| Model: | BTW248XBK | | |
| Manufacturer: | Musilab | | |
| Note: | Report No:ATE20140106 | | |



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2400.000 | 69.03 | -7.46 | 61.57 | 74.00 | -12.43 | peak | | | |
| 2 | 2400.000 | 59.35 | -7.46 | 51.89 | 54.00 | -2.11 | AVG | | | |



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Site: 2# Chamber
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Fax:+86-0755-26503396

Job No.: Ricky #190

Polarization: Horizontal

Standard: FCC 15C PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

Temp.(C)/Hum.(%) 23 C / 49 %

Time: 13/04/57

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature: Ricky

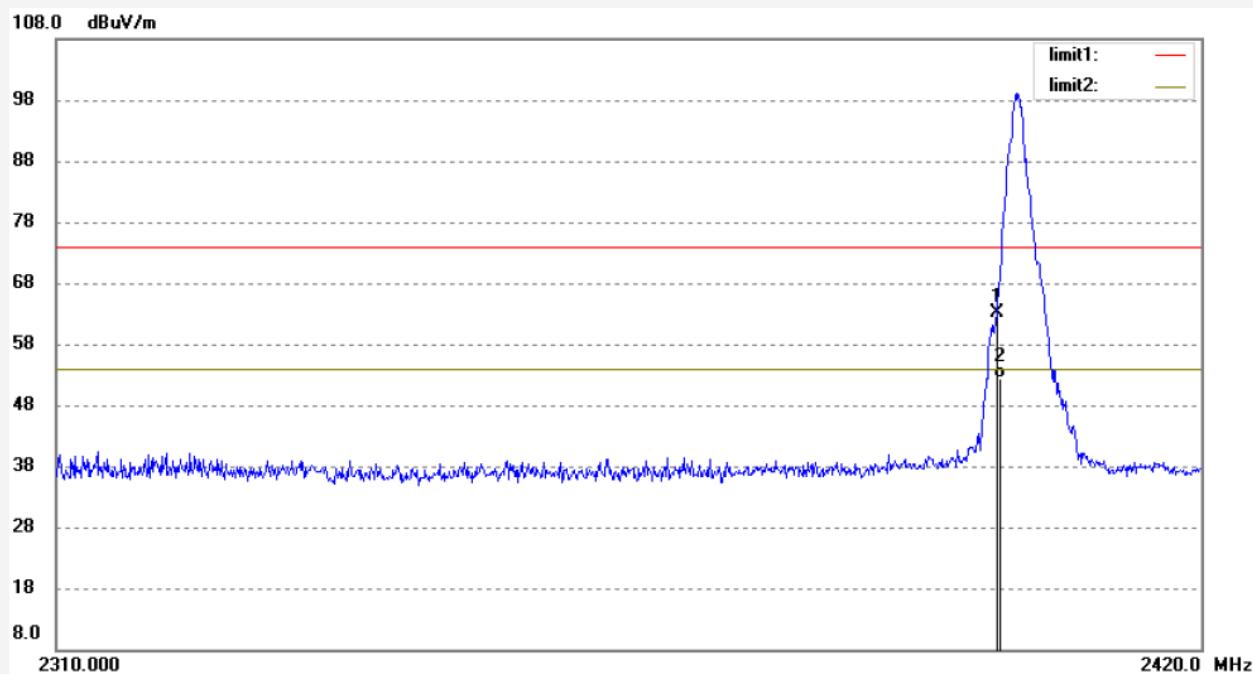
Mode: TX 2402MHz(8QPSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2400.000 | 70.56 | -7.46 | 63.10 | 74.00 | -10.90 | peak | | | |
| 2 | 2400.000 | 59.72 | -7.46 | 52.26 | 54.00 | -1.74 | AVG | | | |



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Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Ricky #191

Polarization: Horizontal

Standard: FCC 15C PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

Temp.(C)/Hum.(%) 23 C / 49 %

Time: 13/06/19

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature: Ricky

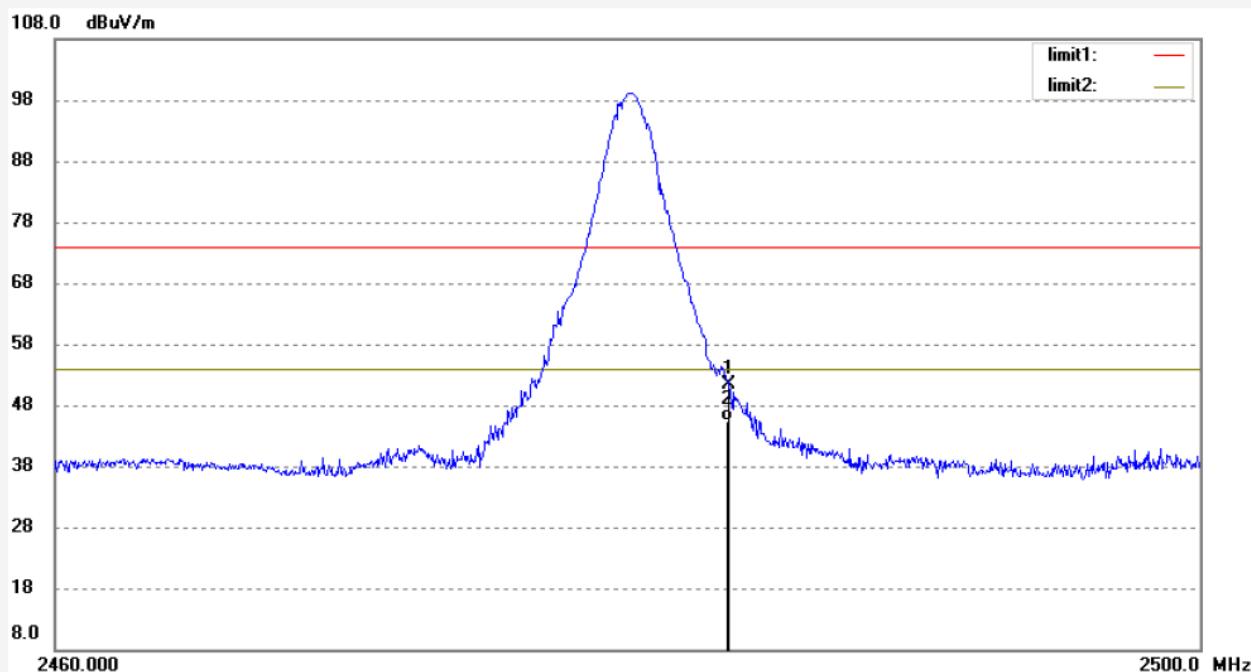
Mode: TX 2480MHz(8QPSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2483.529 | 58.67 | -7.37 | 51.30 | 74.00 | -22.70 | peak | | | |
| 2 | 2483.529 | 52.81 | -7.37 | 45.44 | 54.00 | -8.56 | AVG | | | |



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Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Ricky #192

Polarization: Vertical

Standard: FCC 15C PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

Temp.(C)/Hum.(%) 23 C / 49 %

Time: 13/09/55

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature: Ricky

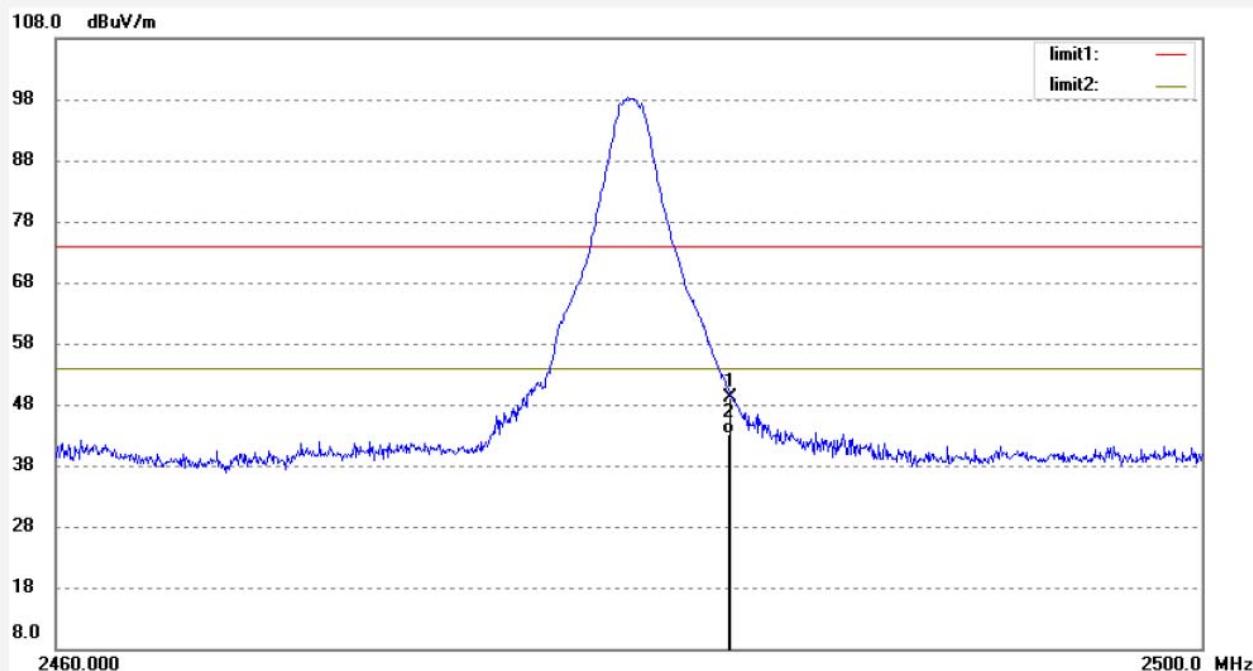
Mode: TX 2480MHz(8QPSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2483.529 | 56.44 | -7.37 | 49.07 | 74.00 | -24.93 | peak | | | |
| 2 | 2483.529 | 50.62 | -7.37 | 43.25 | 54.00 | -10.75 | AVG | | | |

Hopping mode



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Fax:+86-0755-26503396

Job No.: STAR #3027

Polarization: Horizontal

Standard: FCC PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

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

Time: 11/22/51

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

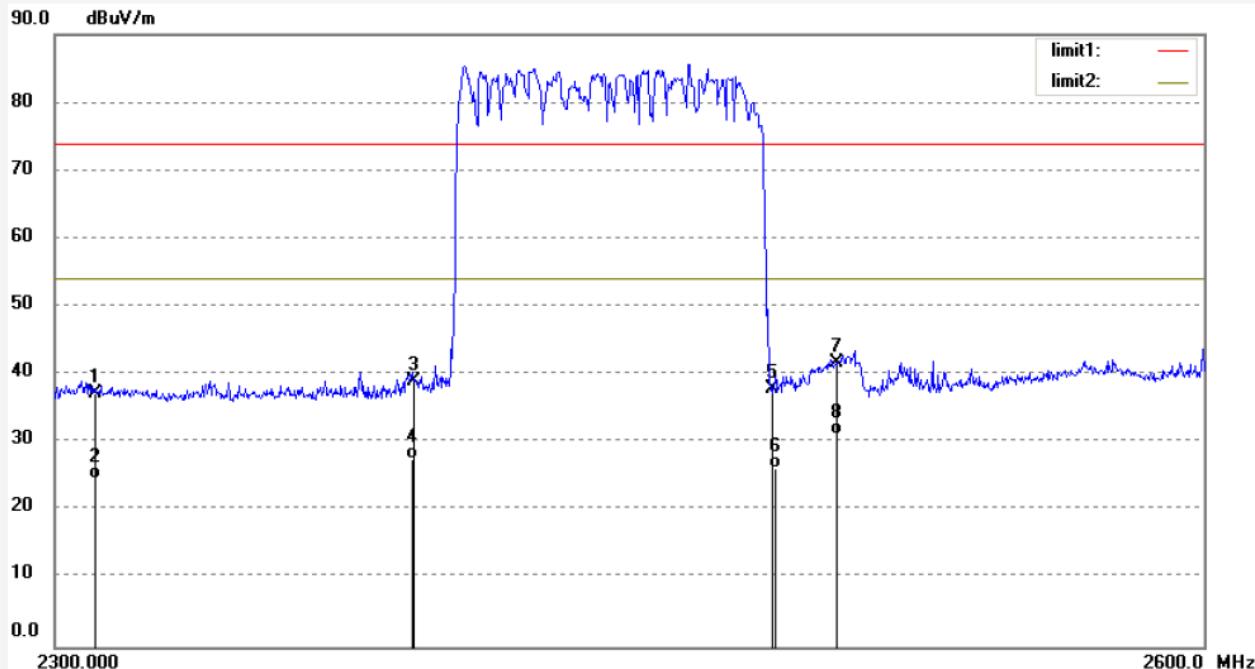
Mode: HOPPING (GFSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2310.000 | 44.18 | -6.99 | 37.19 | 74.00 | -36.81 | peak | | | |
| 2 | 2310.000 | 31.58 | -6.99 | 24.59 | 54.00 | -29.41 | AVG | | | |
| 3 | 2390.000 | 45.89 | -6.78 | 39.11 | 74.00 | -34.89 | peak | | | |
| 4 | 2390.000 | 34.25 | -6.78 | 27.47 | 54.00 | -26.53 | AVG | | | |
| 5 | 2483.500 | 44.36 | -6.54 | 37.82 | 74.00 | -36.18 | peak | | | |
| 6 | 2483.500 | 32.69 | -6.54 | 26.15 | 54.00 | -27.85 | AVG | | | |
| 7 | 2500.000 | 48.29 | -6.50 | 41.79 | 74.00 | -32.21 | peak | | | |
| 8 | 2500.000 | 37.66 | -6.50 | 31.16 | 54.00 | -22.84 | AVG | | | |



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

Job No.: STAR #3028

Polarization: Vertical

Standard: FCC PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

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

Time: 11/25/42

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

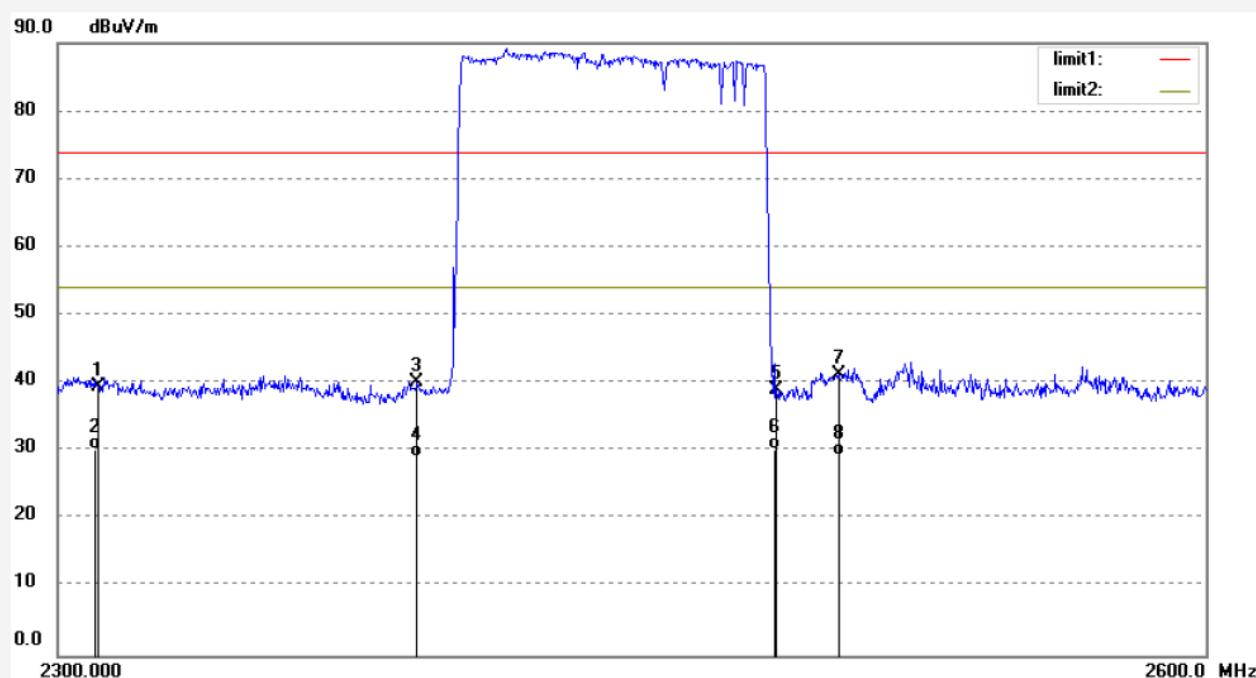
Mode: HOPPING (GFSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2310.000 | 46.43 | -6.99 | 39.44 | 74.00 | -34.56 | peak | | | |
| 2 | 2310.000 | 37.25 | -6.99 | 30.26 | 54.00 | -23.74 | AVG | | | |
| 3 | 2390.000 | 46.86 | -6.78 | 40.08 | 74.00 | -33.92 | peak | | | |
| 4 | 2390.000 | 35.86 | -6.78 | 29.08 | 54.00 | -24.92 | AVG | | | |
| 5 | 2483.500 | 45.50 | -6.54 | 38.96 | 74.00 | -35.04 | peak | | | |
| 6 | 2483.500 | 36.87 | -6.54 | 30.33 | 54.00 | -23.67 | AVG | | | |
| 7 | 2500.000 | 47.78 | -6.50 | 41.28 | 74.00 | -32.72 | peak | | | |
| 8 | 2500.000 | 35.88 | -6.50 | 29.38 | 54.00 | -24.62 | AVG | | | |



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

Job No.: STAR #3029

Polarization: Vertical

Standard: FCC PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

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

Time: 11/28/17

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

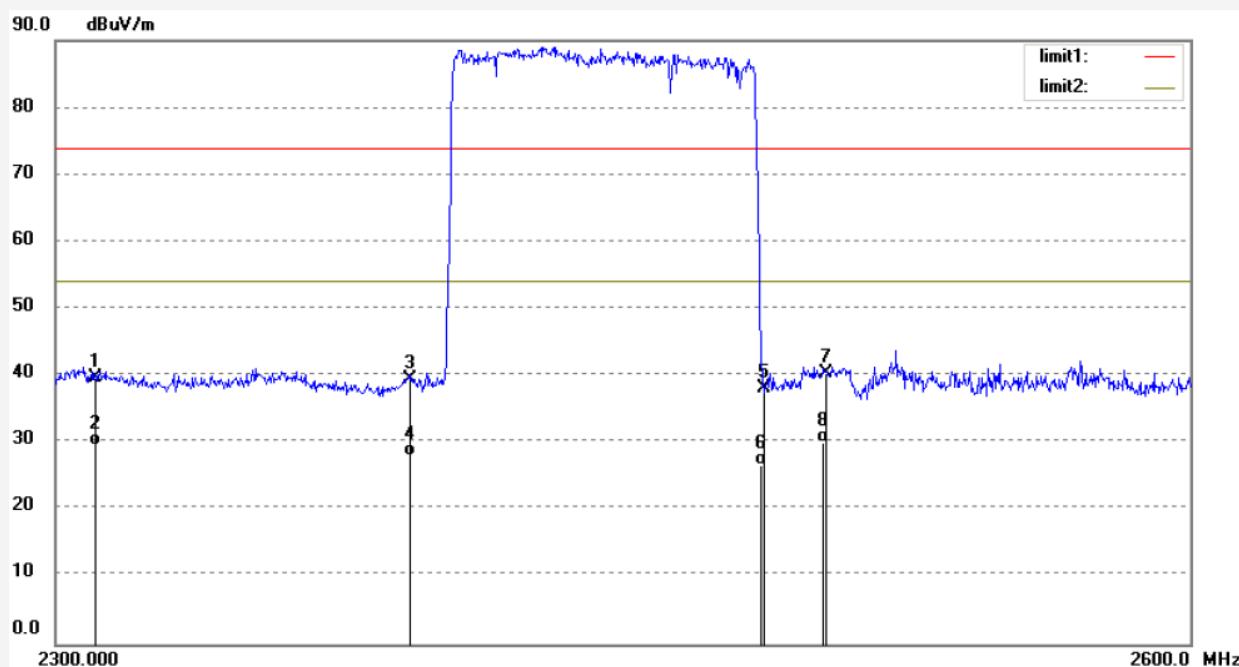
Mode: HOPPING (PI/4DQPSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1 | 2310.000 | 46.75 | -6.99 | 39.76 | 74.00 | -34.24 | peak | | | |
| 2 | 2310.000 | 36.55 | -6.99 | 29.56 | 54.00 | -24.44 | AVG | | | |
| 3 | 2390.000 | 46.28 | -6.78 | 39.50 | 74.00 | -34.50 | peak | | | |
| 4 | 2390.000 | 34.89 | -6.78 | 28.11 | 54.00 | -25.89 | AVG | | | |
| 5 | 2483.500 | 44.59 | -6.54 | 38.05 | 74.00 | -35.95 | peak | | | |
| 6 | 2483.500 | 33.24 | -6.54 | 26.70 | 54.00 | -27.30 | AVG | | | |
| 7 | 2500.000 | 46.93 | -6.50 | 40.43 | 74.00 | -33.57 | peak | | | |
| 8 | 2500.000 | 36.43 | -6.50 | 29.93 | 54.00 | -24.07 | AVG | | | |



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

Job No.: STAR #3030

Polarization: Horizontal

Standard: FCC PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

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

Time: 11/31/16

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

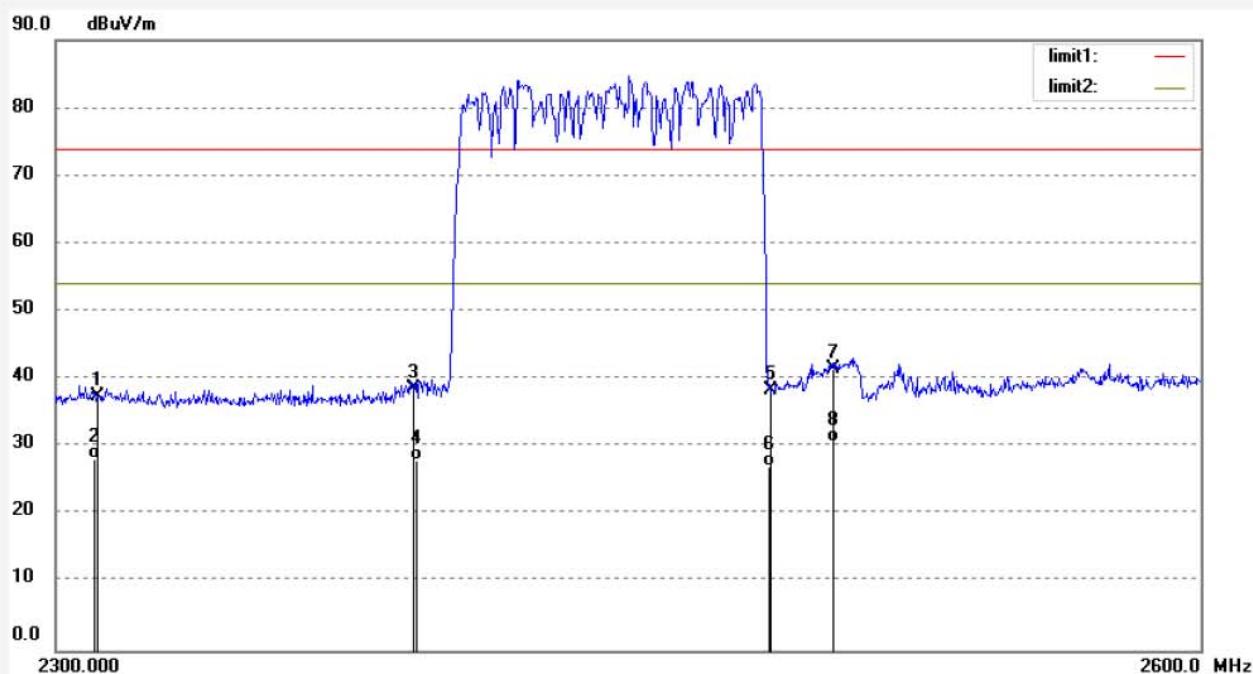
Mode: HOPPING (PI/4DQPSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1 | 2310.000 | 44.36 | -6.99 | 37.37 | 74.00 | -36.63 | peak | | | |
| 2 | 2310.000 | 35.24 | -6.99 | 28.25 | 54.00 | -25.75 | AVG | | | |
| 3 | 2390.000 | 45.45 | -6.78 | 38.67 | 74.00 | -35.33 | peak | | | |
| 4 | 2390.000 | 34.80 | -6.78 | 28.02 | 54.00 | -25.98 | AVG | | | |
| 5 | 2483.500 | 44.82 | -6.54 | 38.28 | 74.00 | -35.72 | peak | | | |
| 6 | 2483.500 | 33.58 | -6.54 | 27.04 | 54.00 | -26.96 | AVG | | | |
| 7 | 2500.000 | 48.09 | -6.50 | 41.59 | 74.00 | -32.41 | peak | | | |
| 8 | 2500.000 | 37.32 | -6.50 | 30.82 | 54.00 | -23.18 | AVG | | | |

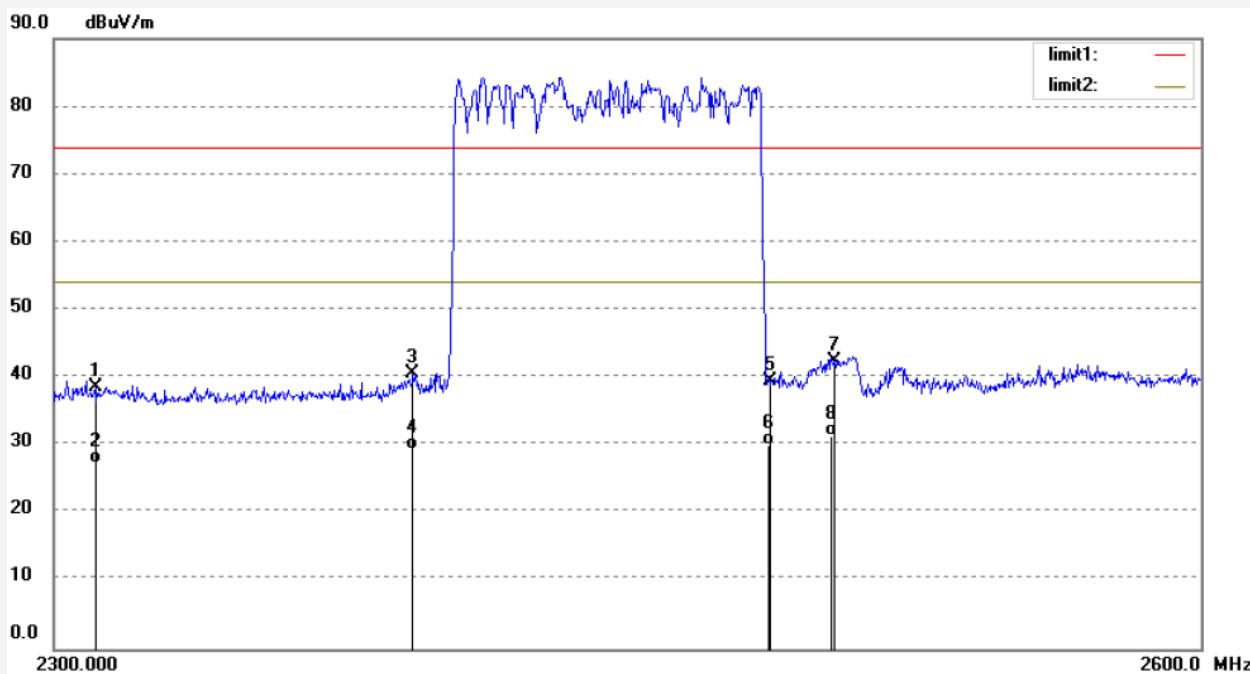


ACCURATE TECHNOLOGY CO., LTD.

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.: | STAR #3031 | Polarization: | Horizontal |
| Standard: | FCC PK | Power Source: | AC 120V/60Hz |
| Test item: | Radiation Test | Date: | 14/02/15/ |
| Temp.(C)/Hum.(%) | 25 C / 55 % | Time: | 11/36/34 |
| EUT: | Indoor/outdoor speaker with bluetooth | Engineer Signature: | |
| Mode: | HOPPING (8QPSK) | Distance: | 3m |
| Model: | BTW248XBK | | |
| Manufacturer: | Musilab | | |
| Note: | Report No:ATE20140106 | | |



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1 | 2310.000 | 45.68 | -6.99 | 38.69 | 74.00 | -35.31 | peak | | | |
| 2 | 2310.000 | 34.29 | -6.99 | 27.30 | 54.00 | -26.70 | AVG | | | |
| 3 | 2390.000 | 47.42 | -6.78 | 40.64 | 74.00 | -33.36 | peak | | | |
| 4 | 2390.000 | 36.10 | -6.78 | 29.32 | 54.00 | -24.68 | AVG | | | |
| 5 | 2483.500 | 45.92 | -6.54 | 39.38 | 74.00 | -34.62 | peak | | | |
| 6 | 2483.500 | 36.61 | -6.54 | 30.07 | 54.00 | -23.93 | AVG | | | |
| 7 | 2500.000 | 48.96 | -6.50 | 42.46 | 74.00 | -31.54 | peak | | | |
| 8 | 2500.000 | 37.88 | -6.50 | 31.38 | 54.00 | -22.62 | AVG | | | |



ACCURATE TECHNOLOGY CO., LTD.

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.: STAR #3032

Polarization: Vertical

Standard: FCC PK

Power Source: AC 120V/60Hz

Test item: Radiation Test

Date: 14/02/15/

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

Time: 11/39/37

EUT: Indoor/outdoor speaker with bluetooth

Engineer Signature:

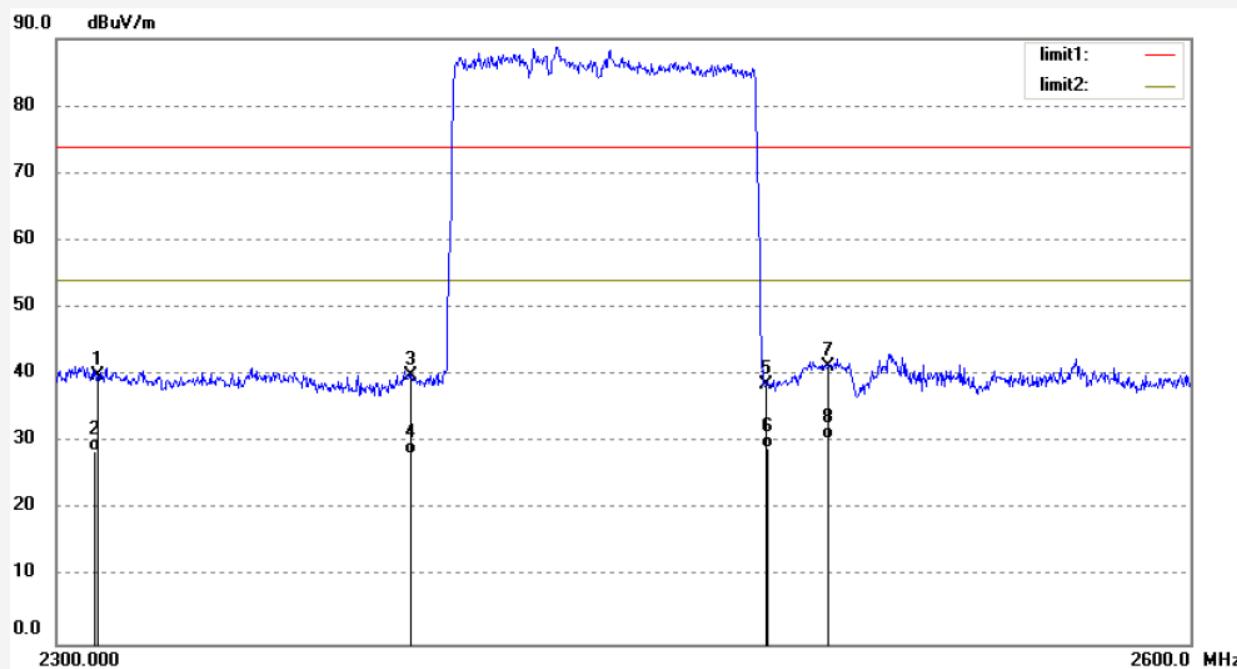
Mode: HOPPING (8QPSK)

Distance: 3m

Model: BTW248XBK

Manufacturer: Musilab

Note: Report No:ATE20140106

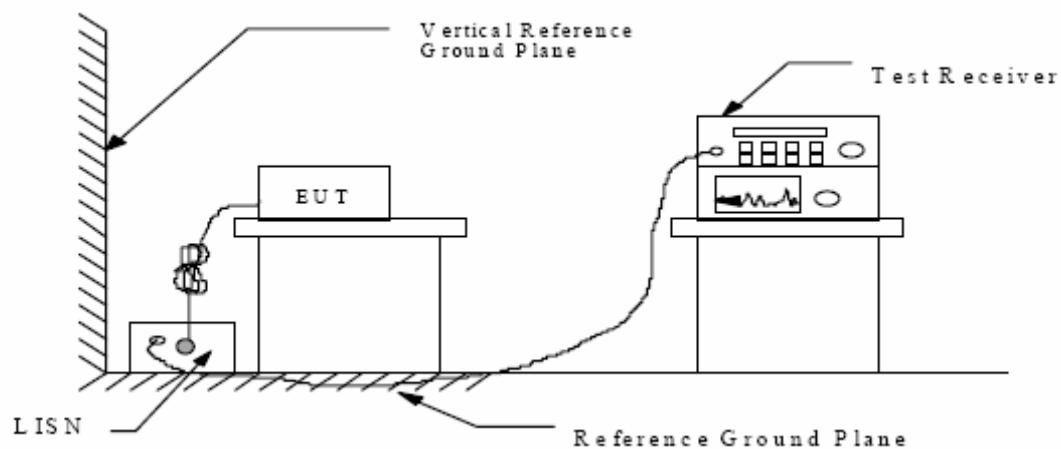


| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1 | 2310.000 | 46.88 | -6.99 | 39.89 | 74.00 | -34.11 | peak | | | |
| 2 | 2310.000 | 35.60 | -6.99 | 28.61 | 54.00 | -25.39 | AVG | | | |
| 3 | 2390.000 | 46.74 | -6.78 | 39.96 | 74.00 | -34.04 | peak | | | |
| 4 | 2390.000 | 35.10 | -6.78 | 28.32 | 54.00 | -25.68 | AVG | | | |
| 5 | 2483.500 | 45.21 | -6.54 | 38.67 | 74.00 | -35.33 | peak | | | |
| 6 | 2483.500 | 35.66 | -6.54 | 29.12 | 54.00 | -24.88 | AVG | | | |
| 7 | 2500.000 | 47.76 | -6.50 | 41.26 | 74.00 | -32.74 | peak | | | |
| 8 | 2500.000 | 36.91 | -6.50 | 30.41 | 54.00 | -23.59 | AVG | | | |

12.AC POWER LINE CONDUCTED EMISSION FOR FCC PART 15 SECTION 15.207(A)

12.1.Block Diagram of Test Setup

12.1.1.Shielding Room Test Setup Diagram



12.2.The Emission Limit

12.2.1.Conducted Emission Measurement Limits According to Section 15.207(a)

| 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 |

* Decreases with the logarithm of the frequency.

12.3.Configuration of EUT on Measurement

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

12.4.Operating Condition of EUT

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

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in Test mode 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 C63.4- 2009 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

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

12.6.Power Line Conducted Emission Measurement Results

PASS.

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

| Test mode : BT Operation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------|--------------|---------------------|--------------|----------|------|-----|--|------------------|---------------------|--------------|---------------------|--------------|----------|------|----|----------|-------|------|----|------|----|----|-----|----------|-------|------|----|------|----|----|-----|----------|-------|------|----|------|----|----|-----|
| <i>MEASUREMENT RESULT: "A-0210-V02_fin"</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2/10/2014 4:18PM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><thead><tr><th>Frequency MHz</th><th>Level dBμV</th><th>Transd dB</th><th>Limit dBμV</th><th>Margin dB</th><th>Detector</th><th>Line</th><th>PE</th></tr></thead><tbody><tr><td>0.182408</td><td>54.70</td><td>10.5</td><td>64</td><td>9.7</td><td>QP</td><td>L1</td><td>GND</td></tr><tr><td>0.449637</td><td>44.20</td><td>10.7</td><td>57</td><td>12.7</td><td>QP</td><td>L1</td><td>GND</td></tr><tr><td>0.886326</td><td>35.90</td><td>10.8</td><td>56</td><td>20.1</td><td>QP</td><td>L1</td><td>GND</td></tr></tbody></table> | | | | | | | | | Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE | 0.182408 | 54.70 | 10.5 | 64 | 9.7 | QP | L1 | GND | 0.449637 | 44.20 | 10.7 | 57 | 12.7 | QP | L1 | GND | 0.886326 | 35.90 | 10.8 | 56 | 20.1 | QP | L1 | GND |
| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.182408 | 54.70 | 10.5 | 64 | 9.7 | QP | L1 | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.449637 | 44.20 | 10.7 | 57 | 12.7 | QP | L1 | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.886326 | 35.90 | 10.8 | 56 | 20.1 | QP | L1 | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>MEASUREMENT RESULT: "A-0210-V02_fin2"</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2/10/2014 4:18PM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><thead><tr><th>Frequency MHz</th><th>Level dBμV</th><th>Transd dB</th><th>Limit dBμV</th><th>Margin dB</th><th>Detector</th><th>Line</th><th>PE</th></tr></thead><tbody><tr><td>0.183137</td><td>38.50</td><td>10.5</td><td>54</td><td>15.8</td><td>AV</td><td>L1</td><td>GND</td></tr><tr><td>0.889871</td><td>30.10</td><td>10.8</td><td>46</td><td>15.9</td><td>AV</td><td>L1</td><td>GND</td></tr><tr><td>7.806690</td><td>26.50</td><td>11.2</td><td>50</td><td>23.5</td><td>AV</td><td>L1</td><td>GND</td></tr></tbody></table> | | | | | | | | | Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE | 0.183137 | 38.50 | 10.5 | 54 | 15.8 | AV | L1 | GND | 0.889871 | 30.10 | 10.8 | 46 | 15.9 | AV | L1 | GND | 7.806690 | 26.50 | 11.2 | 50 | 23.5 | AV | L1 | GND |
| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.183137 | 38.50 | 10.5 | 54 | 15.8 | AV | L1 | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.889871 | 30.10 | 10.8 | 46 | 15.9 | AV | L1 | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7.806690 | 26.50 | 11.2 | 50 | 23.5 | AV | L1 | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>MEASUREMENT RESULT: "A-0210-V01_fin"</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2/10/2014 4:14PM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><thead><tr><th>Frequency MHz</th><th>Level dBμV</th><th>Transd dB</th><th>Limit dBμV</th><th>Margin dB</th><th>Detector</th><th>Line</th><th>PE</th></tr></thead><tbody><tr><td>0.179518</td><td>55.30</td><td>10.5</td><td>65</td><td>9.2</td><td>QP</td><td>N</td><td>GND</td></tr><tr><td>1.181465</td><td>37.10</td><td>10.9</td><td>56</td><td>18.9</td><td>QP</td><td>N</td><td>GND</td></tr><tr><td>6.217923</td><td>28.30</td><td>11.2</td><td>60</td><td>31.7</td><td>QP</td><td>N</td><td>GND</td></tr></tbody></table> | | | | | | | | | Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE | 0.179518 | 55.30 | 10.5 | 65 | 9.2 | QP | N | GND | 1.181465 | 37.10 | 10.9 | 56 | 18.9 | QP | N | GND | 6.217923 | 28.30 | 11.2 | 60 | 31.7 | QP | N | GND |
| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.179518 | 55.30 | 10.5 | 65 | 9.2 | QP | N | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.181465 | 37.10 | 10.9 | 56 | 18.9 | QP | N | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6.217923 | 28.30 | 11.2 | 60 | 31.7 | QP | N | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>MEASUREMENT RESULT: "A-0210-V01_fin2"</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2/10/2014 4:14PM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><thead><tr><th>Frequency MHz</th><th>Level dBμV</th><th>Transd dB</th><th>Limit dBμV</th><th>Margin dB</th><th>Detector</th><th>Line</th><th>PE</th></tr></thead><tbody><tr><td>0.182408</td><td>38.90</td><td>10.5</td><td>54</td><td>15.5</td><td>AV</td><td>N</td><td>GND</td></tr><tr><td>0.886326</td><td>29.00</td><td>10.8</td><td>46</td><td>17.0</td><td>AV</td><td>N</td><td>GND</td></tr><tr><td>6.217923</td><td>24.30</td><td>11.2</td><td>50</td><td>25.7</td><td>AV</td><td>N</td><td>GND</td></tr></tbody></table> | | | | | | | | | Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE | 0.182408 | 38.90 | 10.5 | 54 | 15.5 | AV | N | GND | 0.886326 | 29.00 | 10.8 | 46 | 17.0 | AV | N | GND | 6.217923 | 24.30 | 11.2 | 50 | 25.7 | AV | N | GND |
| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.182408 | 38.90 | 10.5 | 54 | 15.5 | AV | N | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.886326 | 29.00 | 10.8 | 46 | 17.0 | AV | N | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6.217923 | 24.30 | 11.2 | 50 | 25.7 | AV | N | GND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are attached as below.

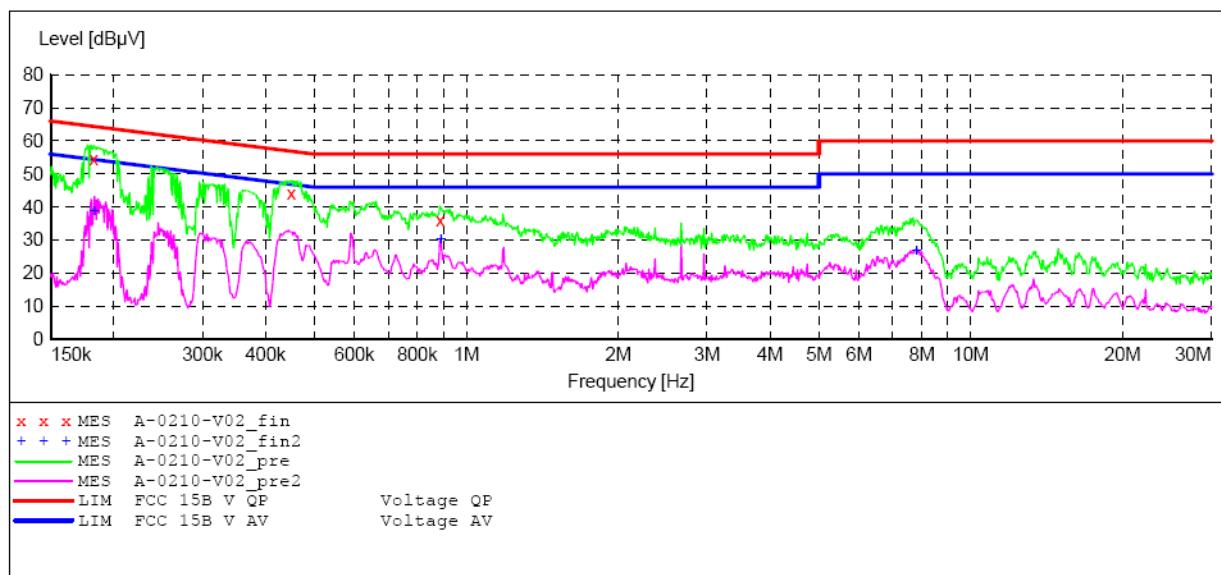
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15

EUT: Indoor/outdoor speaker with bluetooth M/N:BTW248XBK
 Manufacturer: Musilab
 Operating Condition: BT Operation
 Test Site: 1#Shielding Room
 Operator: Alen
 Test Specification: L 120V/60Hz
 Comment: Report No.:ATE20140106
 Start of Test: 2/10/2014 / 4:15:17PM

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average

**MEASUREMENT RESULT: "A-0210-V02_fin"**

2/10/2014 4:18PM

| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE |
|------------------|---------------------|--------------|---------------------|--------------|----------|------|-----|
| 0.182408 | 54.70 | 10.5 | 64 | 9.7 | QP | L1 | GND |
| 0.449637 | 44.20 | 10.7 | 57 | 12.7 | QP | L1 | GND |
| 0.886326 | 35.90 | 10.8 | 56 | 20.1 | QP | L1 | GND |

MEASUREMENT RESULT: "A-0210-V02_fin2"

2/10/2014 4:18PM

| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE |
|------------------|---------------------|--------------|---------------------|--------------|----------|------|-----|
| 0.183137 | 38.50 | 10.5 | 54 | 15.8 | AV | L1 | GND |
| 0.889871 | 30.10 | 10.8 | 46 | 15.9 | AV | L1 | GND |
| 7.806690 | 26.50 | 11.2 | 50 | 23.5 | AV | L1 | GND |

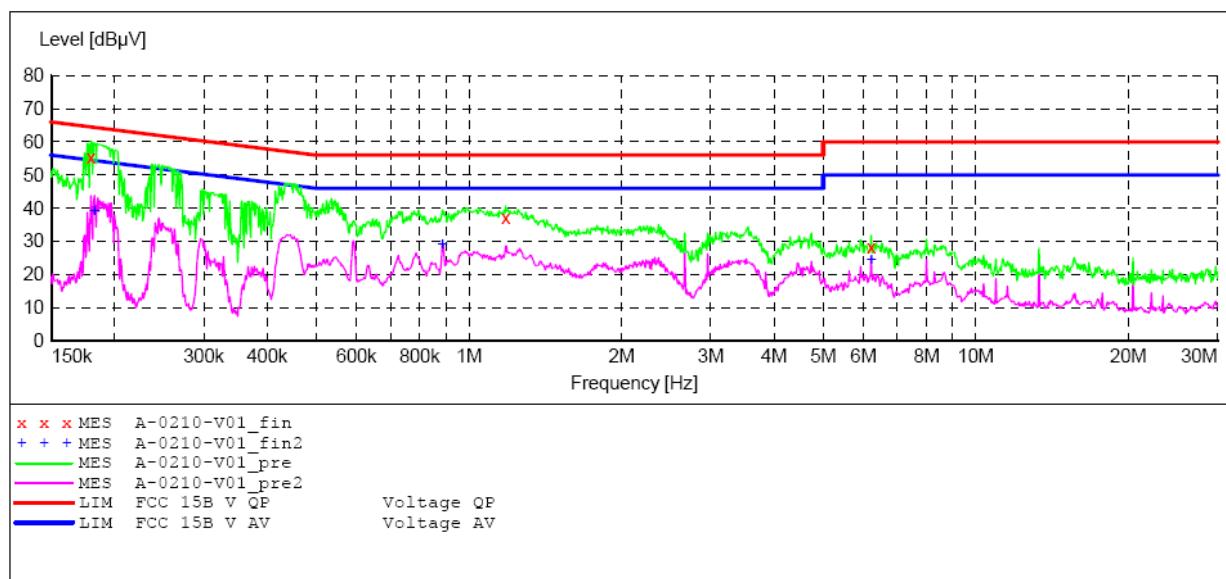
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15

EUT: Indoor/outdoor speaker with bluetooth M/N:BTW248XBK
 Manufacturer: Musilab
 Operating Condition: BT Operation
 Test Site: 1#Shielding Room
 Operator: ALEN
 Test Specification: N 120V/60Hz
 Comment: Report No.:ATE20140106
 Start of Test: 2/10/2014 / 4:11:45PM

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average

**MEASUREMENT RESULT: "A-0210-V01_fin"**

2/10/2014 4:14PM

| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE |
|------------------|---------------------|--------------|---------------------|--------------|----------|------|-----|
| 0.179518 | 55.30 | 10.5 | 65 | 9.2 | QP | N | GND |
| 1.181465 | 37.10 | 10.9 | 56 | 18.9 | QP | N | GND |
| 6.217923 | 28.30 | 11.2 | 60 | 31.7 | QP | N | GND |

MEASUREMENT RESULT: "A-0210-V01_fin2"

2/10/2014 4:14PM

| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Detector | Line | PE |
|------------------|---------------------|--------------|---------------------|--------------|----------|------|-----|
| 0.182408 | 38.90 | 10.5 | 54 | 15.5 | AV | N | GND |
| 0.886326 | 29.00 | 10.8 | 46 | 17.0 | AV | N | GND |
| 6.217923 | 24.30 | 11.2 | 50 | 25.7 | AV | N | 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

The antenna is PCB Layout antenna, no consideration of replacement. Therefore, the equipment complies with the antenna requirement of Section 15.203.

