

APPLICATION CERTIFICATION FCC Part 15C  
On Behalf of  
CLEVER BRIGHT INTERNATIONAL (H.K.) LTD.

RUGGED WIRELESS SPEAKER  
Model No.: CB-335088B, MI-SPB15

FCC ID: 2AD42-CB-335088B

Prepared for : CLEVER BRIGHT INTERNATIONAL (H.K.) LTD.  
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Report No. : ATE20160944  
Date of Test : May 19, 2016--Jun 08, 2016  
Date of Report : Jun 07, 2016

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## Test Report Certification

Applicant : CLEVER BRIGHT INTERNATIONAL (H.K.) LTD  
Manufacturer : CLEVER BRIGHT INTERNATIONAL (H.K.) LTD  
EUT Description : RUGGED WIRELESS SPEAKER  
(A) MODEL NO.: CB-335088B, MI-SPB15  
(B) TRADE NAME.: N/A  
(C) Input Voltage: DC 5V

Measurement Procedure Used:

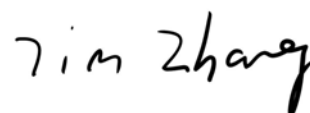
**FCC Rules and Regulations Part 15 Subpart C Section 15.247**  
**ANSI C63.10: 2013**

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 : May 19, 2016--Jun 07, 2016  
Date of Report: Jun 08, 2016

Prepared by :



( Tim.zhang, Engineer)

Approved & Authorized Signer :



(Sean Liu, Manager)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

|                         |   |                                                                                    |
|-------------------------|---|------------------------------------------------------------------------------------|
| EUT                     | : | RUGGED WIRELESS SPEAKER                                                            |
| Model Number            | : | CB-335088B, MI-SPB15                                                               |
| Bluetooth version       | : | BT 3.0 mode                                                                        |
| Frequency Range         | : | 2402MHz-2480MHz                                                                    |
| Number of Channels      | : | 79                                                                                 |
| Antenna Gain            | : | 0dBi                                                                               |
| Antenna type            | : | PCB Antenna                                                                        |
| Trade Name              | : | N/A                                                                                |
| Input                   | : | DC 5V USB                                                                          |
| Modulation mode         | : | GFSK, $\pi/4$ DQPSK, 8DPSK                                                         |
| Applicant               | : | CLEVER BRIGHT INTERNATIONAL (H.K.) LTD                                             |
| Address                 | : | Rm 1701, Zhuoyue Building, Fuhua Yi Rd., Futian Central Zone, Shenzhen, P.R.China. |
| Manufacturer            | : | CLEVER BRIGHT INTERNATIONAL (H.K.) LTD                                             |
| Address                 | : | Rm 1701, Zhuoyue Building, Fuhua Yi Rd., Futian Central Zone, Shenzhen, P.R.China. |
| Date of sample received | : | May 19, 2016                                                                       |
| Date of Test            | : | May 19, 2016--Jun 07, 2016                                                         |

### 1.2. Accessory and Auxiliary Equipment

|    |                      |
|----|----------------------|
| PC | Manufacturer: LENOVO |
|    | M/N: 4290-RT8        |
|    | S/N: R9-FW93G 11/08  |

### 1.3. 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

### 1.4. Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 3.08dB, k=2  
(9kHz-30MHz)

Radiated emission expanded uncertainty = 4.42dB, k=2  
(30MHz-1000MHz)

Radiated emission expanded uncertainty = 4.06dB, k=2  
(Above 1GHz)

## 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. 10, 2016    | Jan. 09, 2017    |
| EMI Test Receiver  | Rohde&Schwarz             | ESPI3                                   | 101526/003 | Jan. 10, 2016    | Jan. 09, 2017    |
| Spectrum Analyzer  | Agilent                   | E7405A                                  | MY45115511 | Jan. 10, 2016    | Jan. 09, 2017    |
| Pre-Amplifier      | Rohde&Schwarz             | CBLU118354<br>0-01                      | 3791       | Jan. 10, 2016    | Jan. 09, 2017    |
| Loop Antenna       | Schwarzbeck               | FMZB1516                                | 1516131    | Jan. 14, 2016    | Jan. 13, 2017    |
| Bilog Antenna      | Schwarzbeck               | VULB9163                                | 9163-323   | Jan. 14, 2016    | Jan. 13, 2017    |
| Horn Antenna       | Schwarzbeck               | BBHA9120D                               | 9120D-655  | Jan. 14, 2016    | Jan. 12, 2017    |
| Horn Antenna       | Schwarzbeck               | BBHA9170                                | 9170-359   | Jan. 14, 2016    | Jan. 13, 2017    |
| LISN               | Rohde&Schwarz             | ESH3-Z5                                 | 100305     | Jan. 10, 2016    | Jan. 09, 2017    |
| LISN               | Schwarzbeck               | NSLK8126                                | 8126431    | Jan. 10, 2016    | Jan. 09, 2017    |
| Highpass Filter    | Wainwright<br>Instruments | WHKX3.6/18<br>G-10SS                    | N/A        | Jan. 10, 2016    | Jan. 09, 2017    |
| Band Reject Filter | Wainwright<br>Instruments | WRCG2400/2<br>485-2375/2510<br>-60/11SS | N/A        | Jan. 10, 2016    | Jan. 09, 2017    |

### 3. OPERATION OF EUT DURING TESTING

#### 3.1.Operating Mode

The mode is used: Transmitting mode

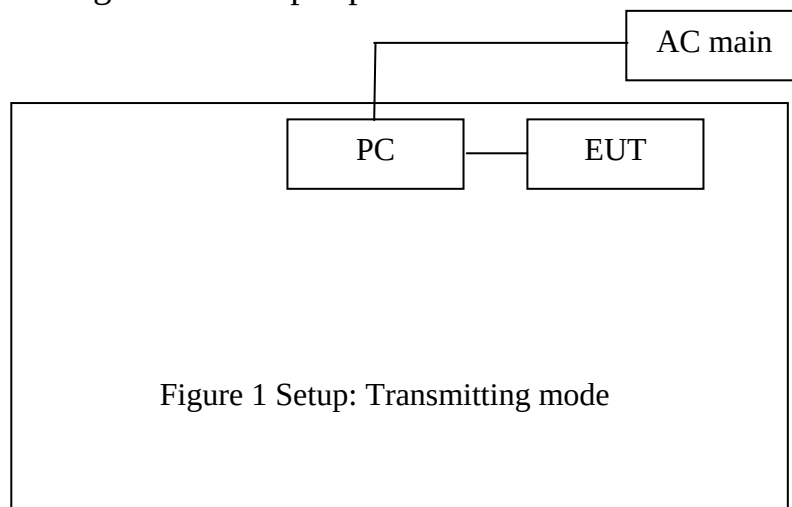
Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

#### 3.2.Configuration and peripherals



#### 4. TEST PROCEDURES AND RESULTS

| FCC Rules                           | Description of Test               | Result    |
|-------------------------------------|-----------------------------------|-----------|
| Section 15.207                      | Conducted Emission Test           | Compliant |
| Section 15.247(a)(1)                | 20dB Bandwidth Test               | Compliant |
| Section 15.247(a)(1)                | Carrier Frequency Separation Test | Compliant |
| Section 15.247(a)(1)(iii)           | Number Of Hopping Frequency Test  | Compliant |
| Section 15.247(a)(1)(iii)           | Dwell Time Test                   | Compliant |
| Section 15.247(b)(1)                | Maximum Peak Output Power Test    | Compliant |
| Section 15.247(d)<br>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: RUGGED WIRELESS SPEAKER)

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

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

### 5.3. EUT Configuration on Measurement

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

### 5.4. Operating Condition of EUT

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

5.4.2. Turn on the power of all equipment.

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

### 5.5. Test Procedure

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

5.5.2. Set RBW of spectrum analyzer to 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.

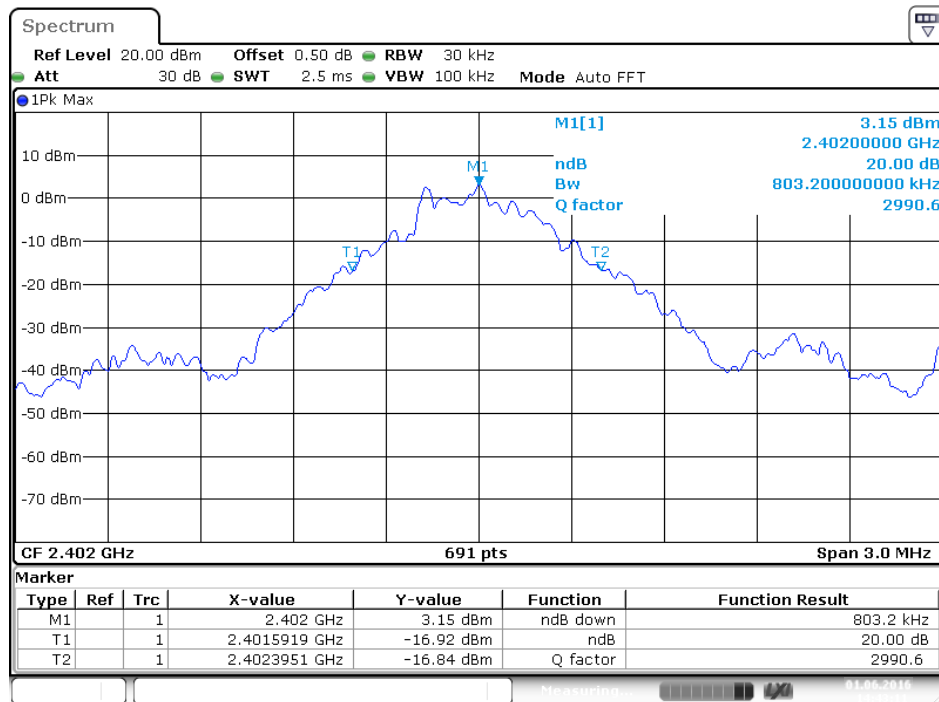
## 5.6.Test Result

| Channel | Frequency<br>(MHz) | GFSK<br>20dB Bandwidth<br>(MHz) | $\Pi/4$ -DQPSK<br>20dB Bandwidth<br>(MHz) | 8DPSK<br>20dB Bandwidth<br>(MHz) | Result |
|---------|--------------------|---------------------------------|-------------------------------------------|----------------------------------|--------|
| Low     | 2402               | 0.803                           | 1.220                                     | 1.207                            | Pass   |
| Middle  | 2441               | 0.803                           | 1.220                                     | 1.207                            | Pass   |
| High    | 2480               | 0.803                           | 1.224                                     | 1.211                            | Pass   |

The spectrum analyzer plots are attached as below.

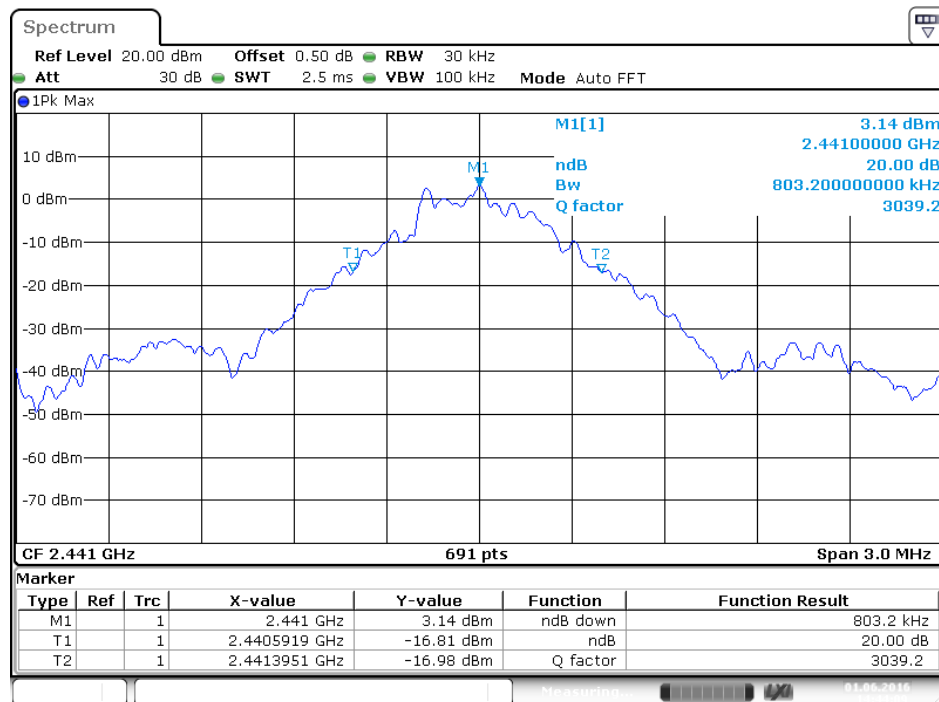
## GFSK Mode

### Low channel



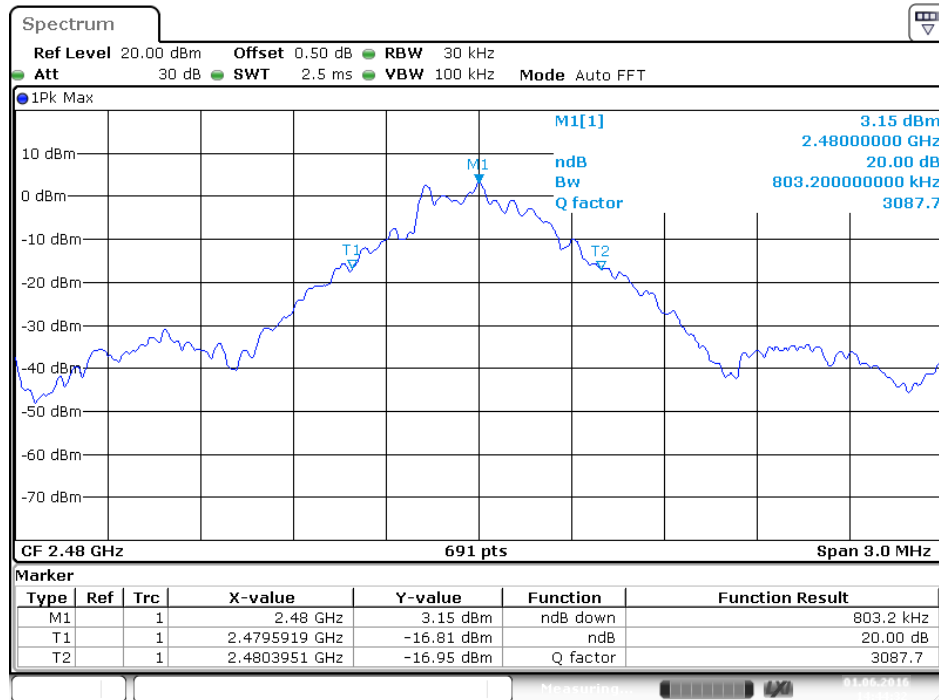
Date: 1.Jun.2016 14:43:11

### Middle channel



Date: 1.Jun.2016 14:44:10

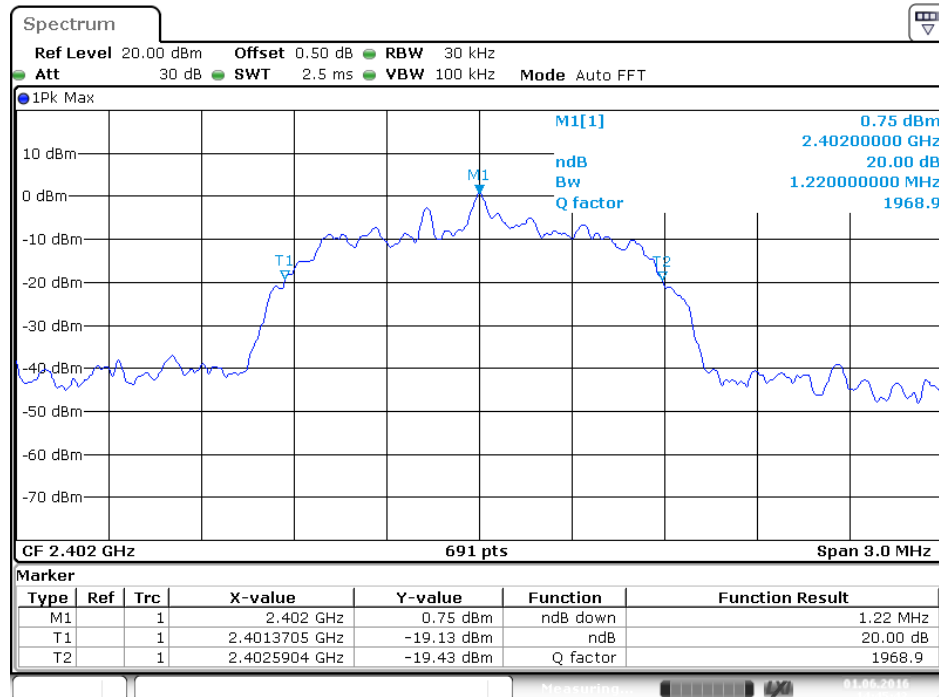
## High channel



Date: 1.Jun.2016 14:44:32

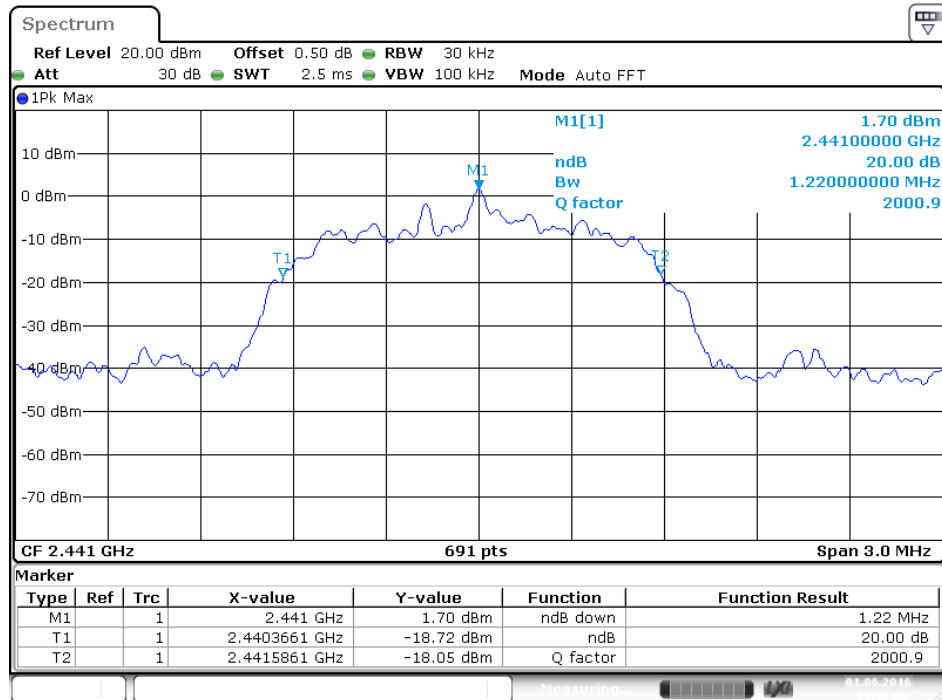
## II/4-DQPSK Mode

## Low channel



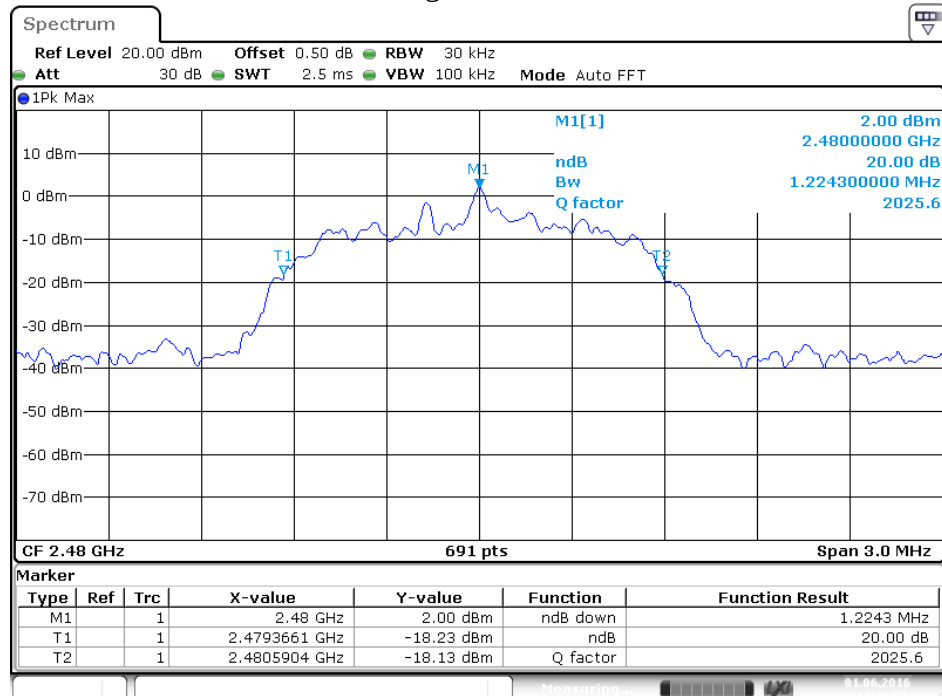
Date: 1.Jun.2016 14:45:43

## Middle channel



Date: 1.Jun.2016 14:46:02

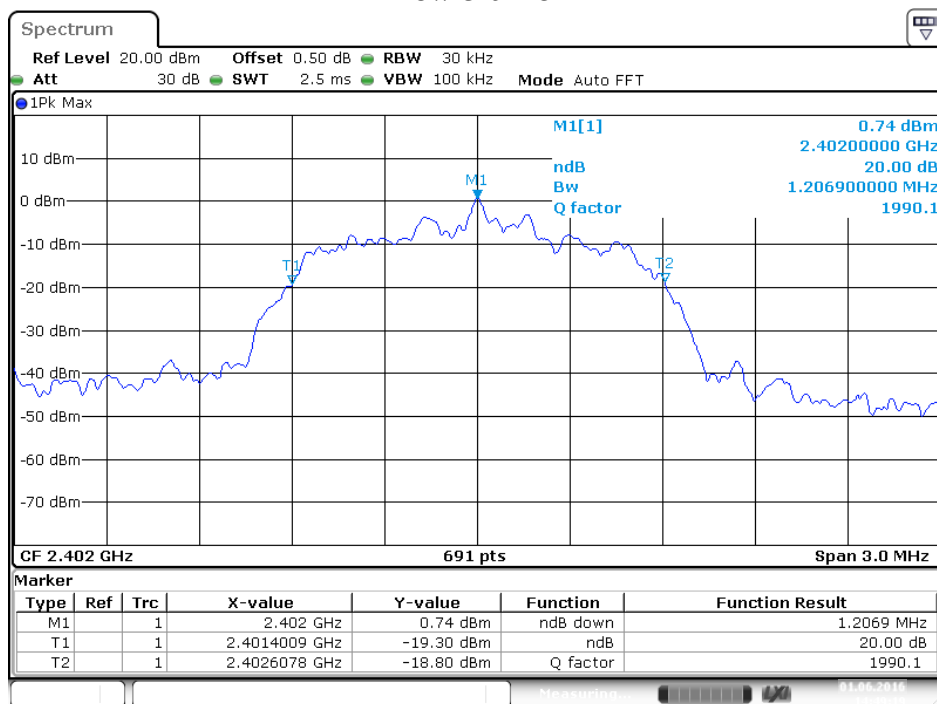
## High channel



Date: 1.Jun.2016 14:46:51

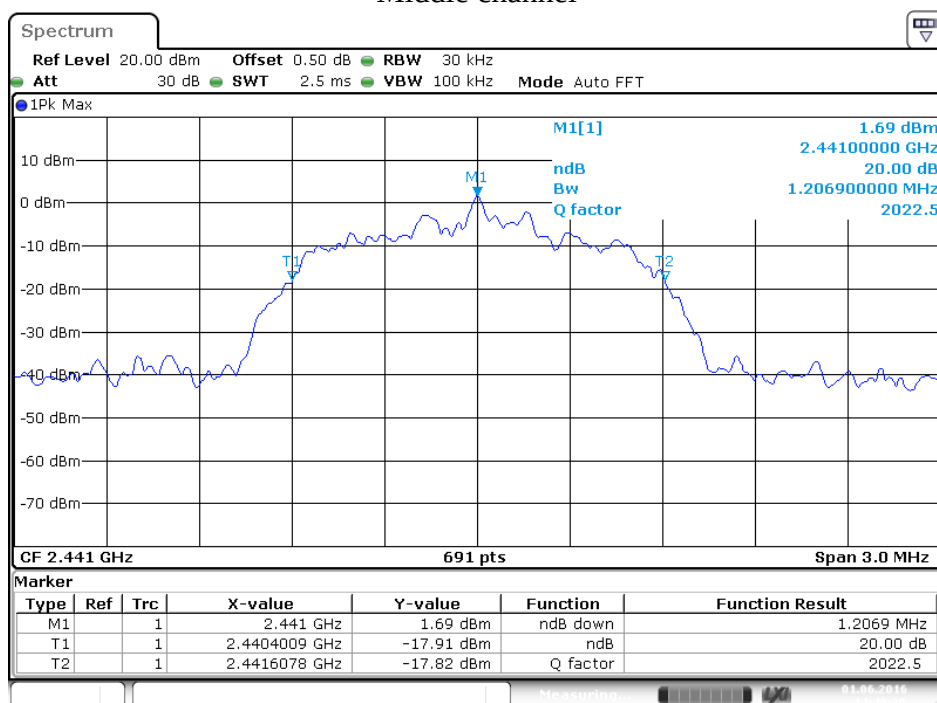
## 8DPSK Mode

### Low channel



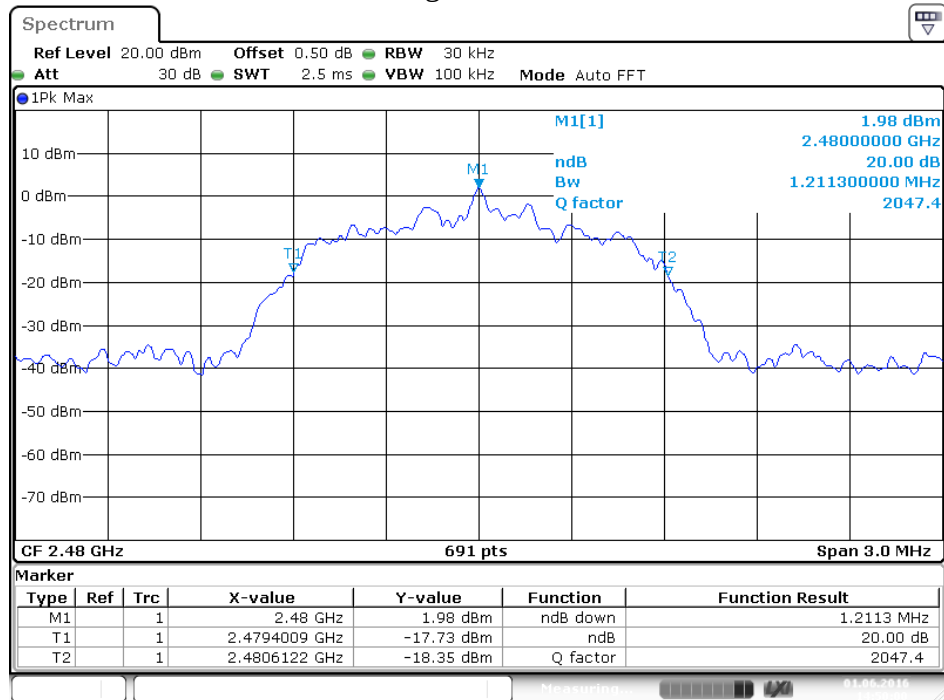
Date: 1.Jun.2016 14:49:19

### Middle channel



Date: 1.Jun.2016 14:49:39

## High channel



Date: 1.Jun.2016 14:50:00

## 6. CARRIER FREQUENCY SEPARATION TEST

### 6.1. Block Diagram of Test Setup



(EUT: RUGGED WIRELESS SPEAKER)

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

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

### 6.3. EUT Configuration on Measurement

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

### 6.4. Operating Condition of EUT

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

6.4.2. Turn on the power of all equipment.

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

## 6.5. Test Procedure

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

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

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

6.5.4. Measurement the channel separation

## 6.6. Test Result

### GFSK

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz)             | Result |
|---------|-----------------|-------------------------|-------------------------|--------|
| Low     | 2402            | 1.0014                  | 25KHz or 20dB bandwidth | PASS   |
|         | 2403            |                         |                         |        |
| Middle  | 2440            | 1.0014                  | 25KHz or 20dB bandwidth | PASS   |
|         | 2441            |                         |                         |        |
| High    | 2479            | 1.0014                  | 25KHz or 20dB bandwidth | PASS   |
|         | 2480            |                         |                         |        |

### Π/4-DQPSK

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz)                 | Result |
|---------|-----------------|-------------------------|-----------------------------|--------|
| Low     | 2402            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2403            |                         |                             |        |
| Middle  | 2440            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2441            |                         |                             |        |
| High    | 2479            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2480            |                         |                             |        |

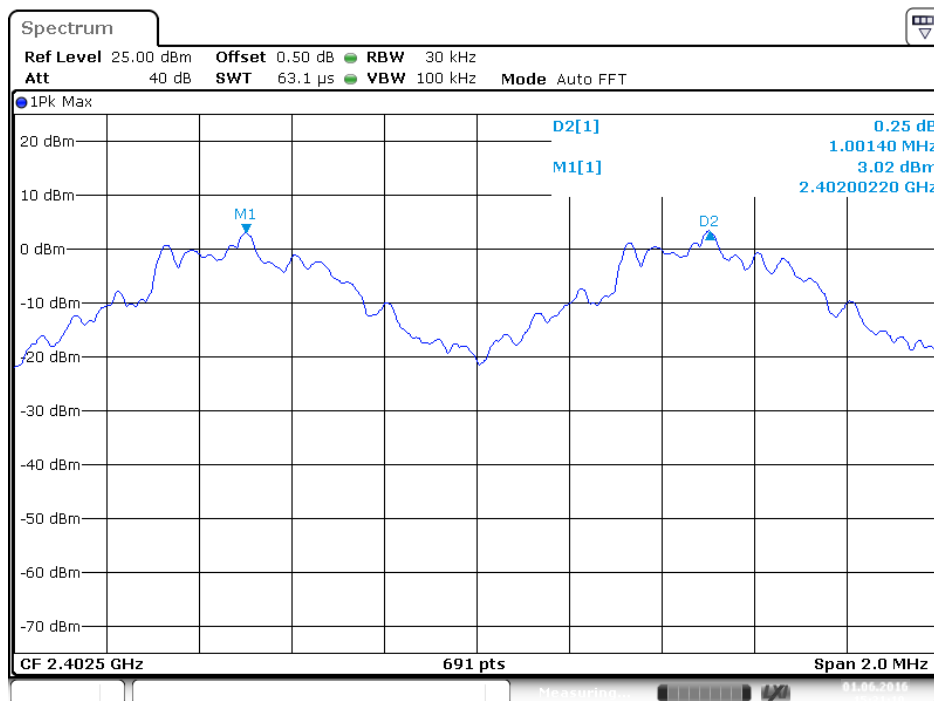
### 8DPSK

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz)                 | Result |
|---------|-----------------|-------------------------|-----------------------------|--------|
| Low     | 2402            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2403            |                         |                             |        |
| Middle  | 2440            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2441            |                         |                             |        |
| High    | 2479            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | PASS   |
|         | 2480            |                         |                             |        |

The spectrum analyzer plots are attached as below.

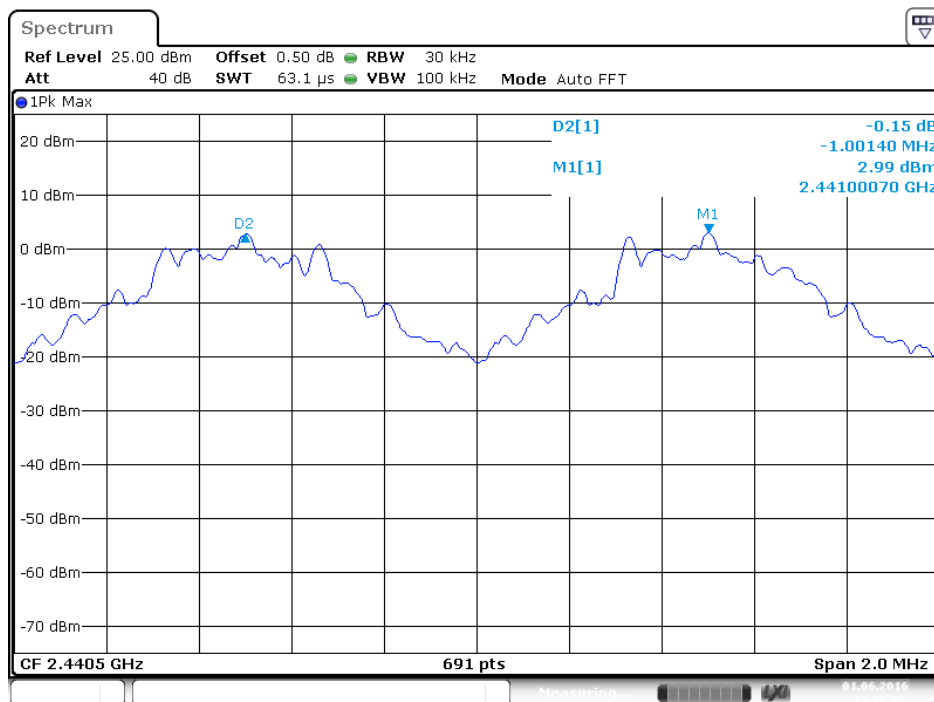
## GFSK Mode

### Low channel



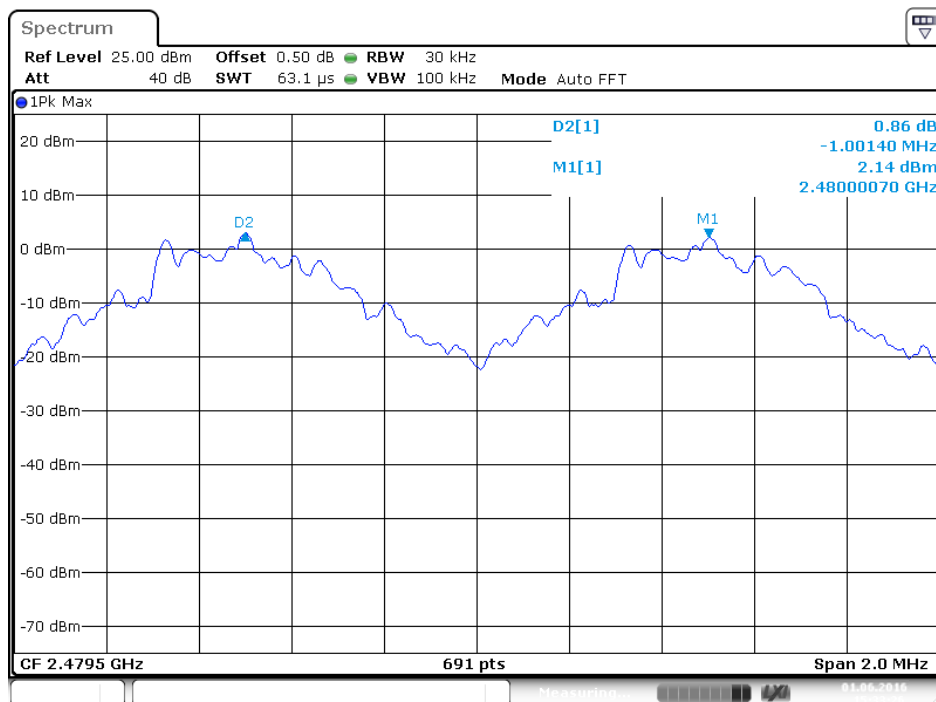
Date: 1.Jun.2016 15:31:11

### Middle channel



Date: 1.Jun.2016 15:32:22

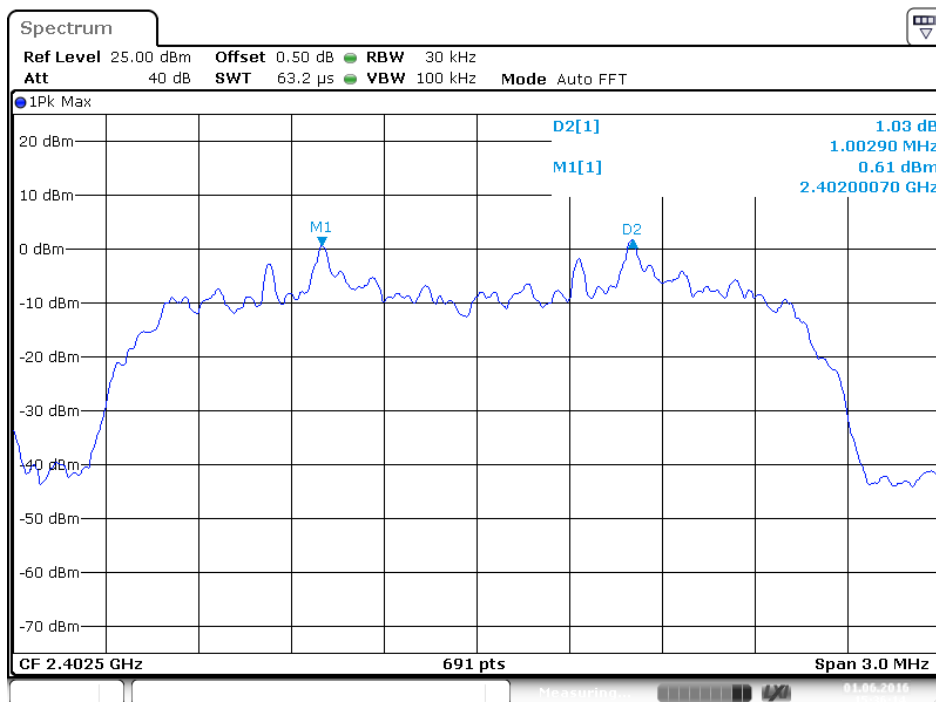
## High channel



Date: 1.Jun.2016 15:33:26

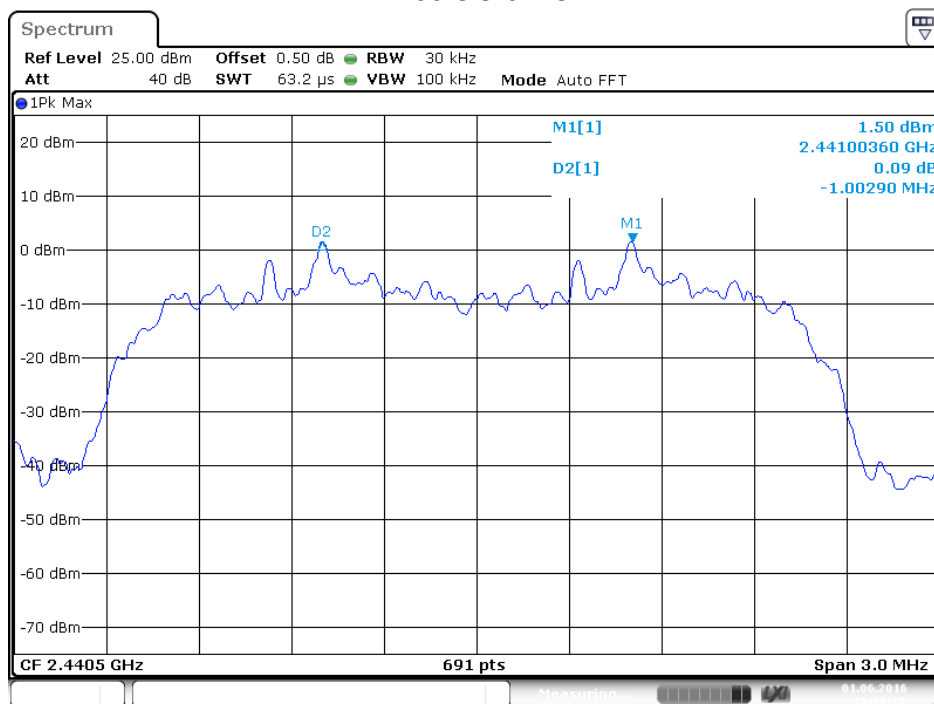
## Π/4-DQPSK Mode

## Low channel



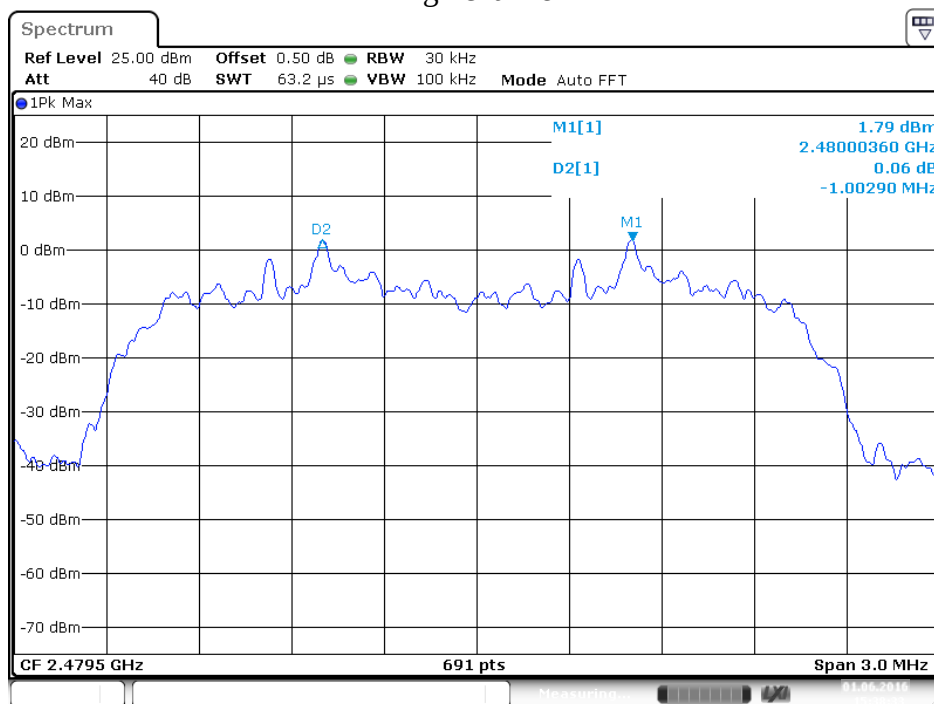
Date: 1.Jun.2016 15:36:14

## Middle channel



Date: 1.Jun.2016 15:37:34

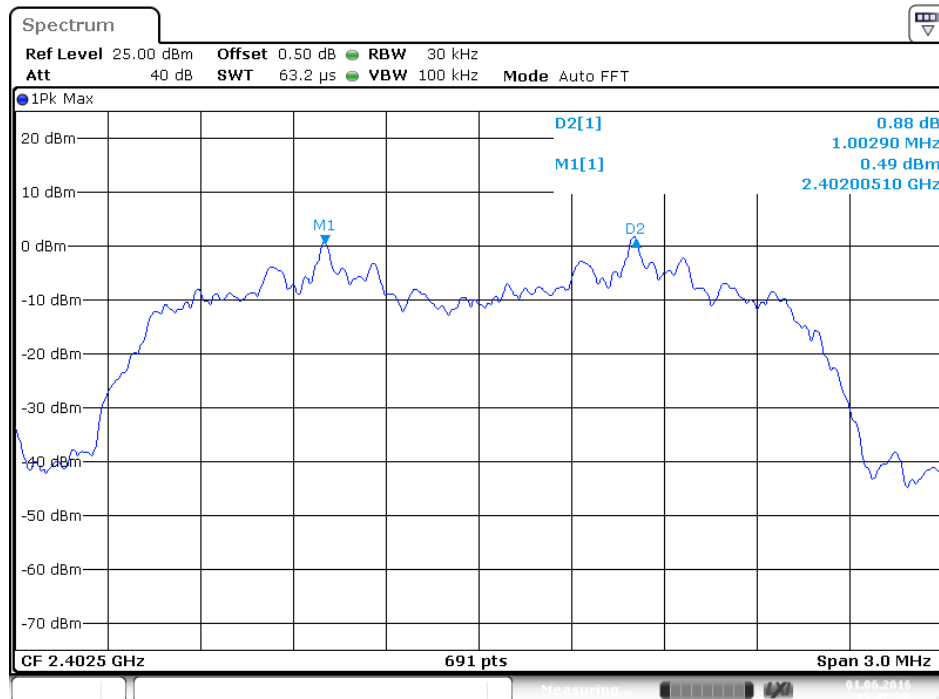
## High channel



Date: 1.Jun.2016 15:38:33

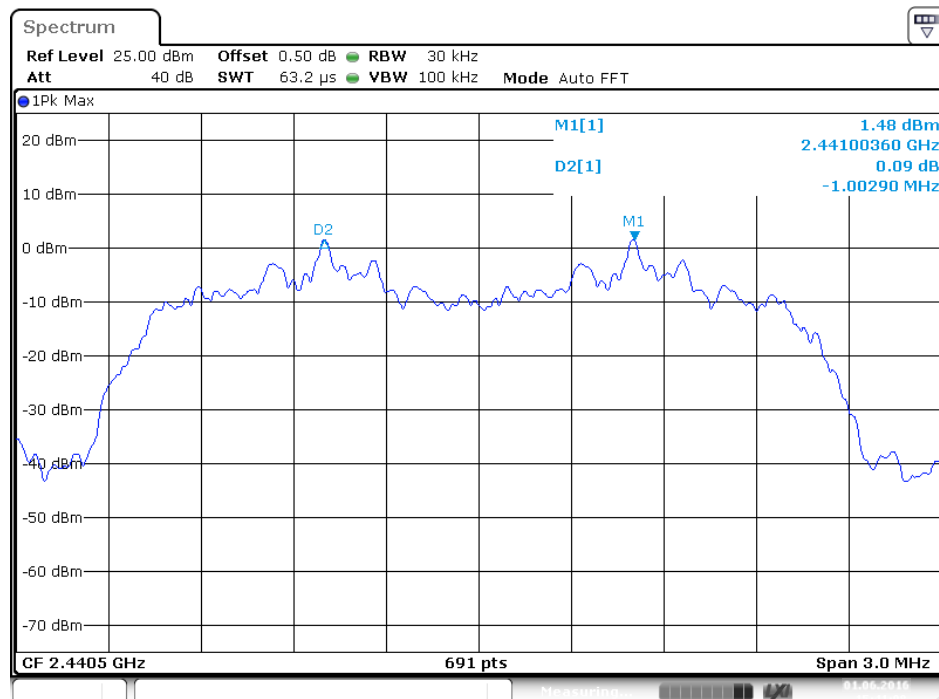
## 8DPSK Mode

### Low channel



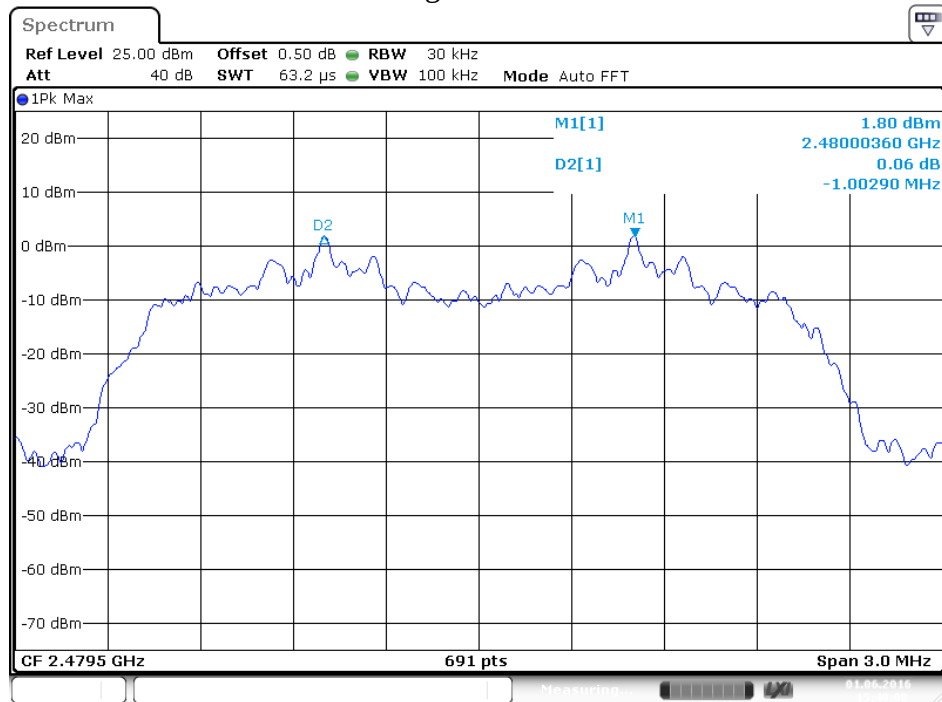
Date: 1. Jun. 2016 15:42:39

### Middle channel



Date: 1. Jun. 2016 15:41:08

## High channel



Date: 1.Jun.2016 15:40:08

## 7. NUMBER OF HOPPING FREQUENCY TEST

### 7.1. Block Diagram of Test Setup



(EUT: RUGGED WIRELESS SPEAKER)

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

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

### 7.3. EUT Configuration on Measurement

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

### 7.4. Operating Condition of EUT

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

7.4.2. Turn on the power of all equipment.

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

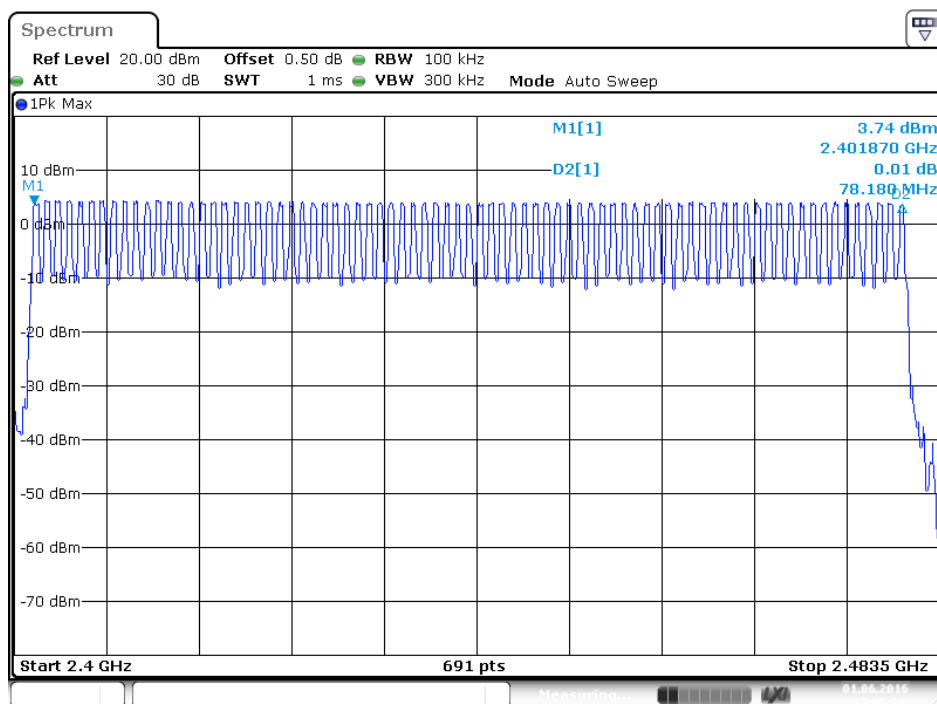
### 7.5. Test Procedure

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

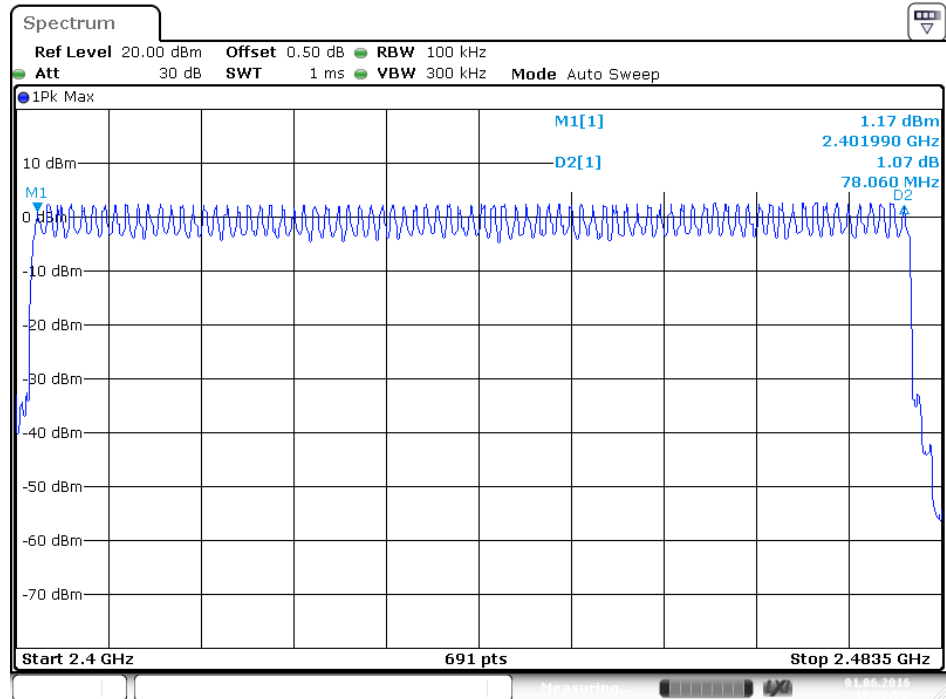
7.5.2. Set the spectrum analyzer as Span=83.5MHz, RBW=100 kHz, VBW=300 kHz.

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

|                                 |                        |           |
|---------------------------------|------------------------|-----------|
| Total number of hopping channel | Measurement result(CH) | Limit(CH) |
|                                 | 79                     | $\geq 15$ |

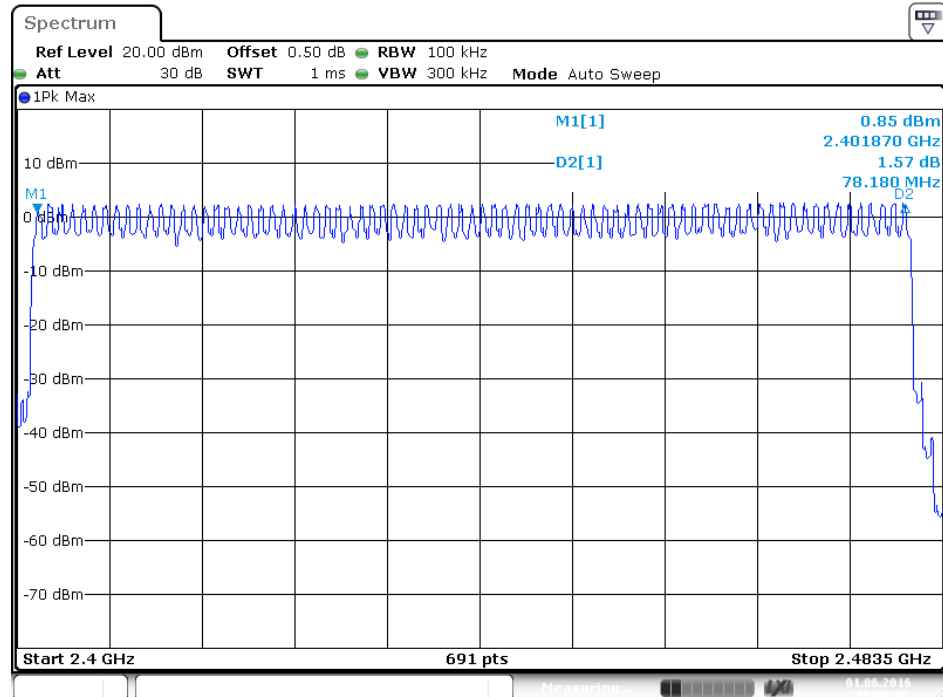


### Number of hopping channels( $\Pi/4$ -DQPSK)



Date: 1.Jun.2016 15:02:53

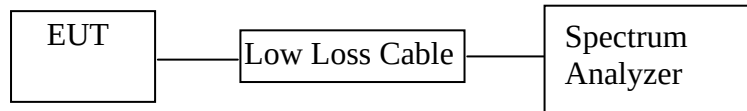
### Number of hopping channels(8DPSK)



Date: 1.Jun.2016 15:08:02

## 8. DWELL TIME TEST

### 8.1. Block Diagram of Test Setup



(EUT: RUGGED WIRELESS SPEAKER)

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

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

### 8.3. EUT Configuration on Measurement

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

### 8.4. Operating Condition of EUT

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

8.4.2. Turn on the power of all equipment.

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

### 8.5. Test Procedure

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

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

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

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

## 8.6.Test Result

### GFSK Mode

| Mode                                                                                                       | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|------------|
| DH1                                                                                                        | 2402                    | 0.428           | 136.96          | 400        |
|                                                                                                            | 2441                    | 0.438           | 140.16          | 400        |
|                                                                                                            | 2480                    | 0.442           | 141.44          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2*79)) \times 31.6$ |                         |                 |                 |            |
| DH3                                                                                                        | 2402                    | 1.746           | 279.36          | 400        |
|                                                                                                            | 2441                    | 1.790           | 286.40          | 400        |
|                                                                                                            | 2480                    | 1.761           | 281.76          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4*79)) \times 31.6$ |                         |                 |                 |            |
| DH5                                                                                                        | 2402                    | 2.978           | 317.65          | 400        |
|                                                                                                            | 2441                    | 2.978           | 317.65          | 400        |
|                                                                                                            | 2480                    | 3.000           | 320.00          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6*79)) \times 31.6$ |                         |                 |                 |            |

### Π/4-DQPSK

| Mode                                                                                                       | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|------------|
| DH1                                                                                                        | 2402                    | 0.446           | 142.72          | 400        |
|                                                                                                            | 2441                    | 0.442           | 141.44          | 400        |
|                                                                                                            | 2480                    | 0.438           | 140.16          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2*79)) \times 31.6$ |                         |                 |                 |            |
| DH3                                                                                                        | 2402                    | 1.714           | 274.24          | 400        |
|                                                                                                            | 2441                    | 1.714           | 274.24          | 400        |
|                                                                                                            | 2480                    | 1.728           | 276.48          | 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                    | 3.022           | 322.35          | 400        |
|                                                                                                            | 2480                    | 2.978           | 317.65          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6*79)) \times 31.6$ |                         |                 |                 |            |

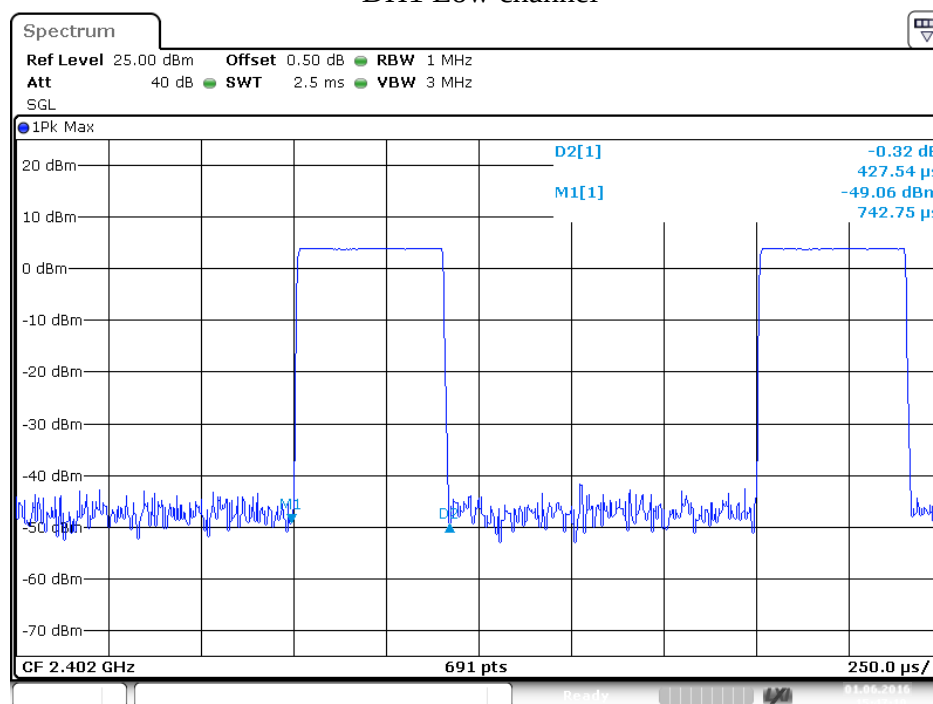
## 8DPSK Mode

| Mode                                                                                                              | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|-------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|------------|
| DH1                                                                                                               | 2402                    | 0.449           | 143.68          | 400        |
|                                                                                                                   | 2441                    | 0.446           | 142.72          | 400        |
|                                                                                                                   | 2480                    | 0.446           | 142.72          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH3                                                                                                               | 2402                    | 1.736           | 277.76          | 400        |
|                                                                                                                   | 2441                    | 1.721           | 275.36          | 400        |
|                                                                                                                   | 2480                    | 1.736           | 277.76          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH5                                                                                                               | 2402                    | 3.040           | 324.27          | 400        |
|                                                                                                                   | 2441                    | 2.975           | 317.33          | 400        |
|                                                                                                                   | 2480                    | 3.062           | 326.61          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$ |                         |                 |                 |            |

The spectrum analyzer plots are attached as below.

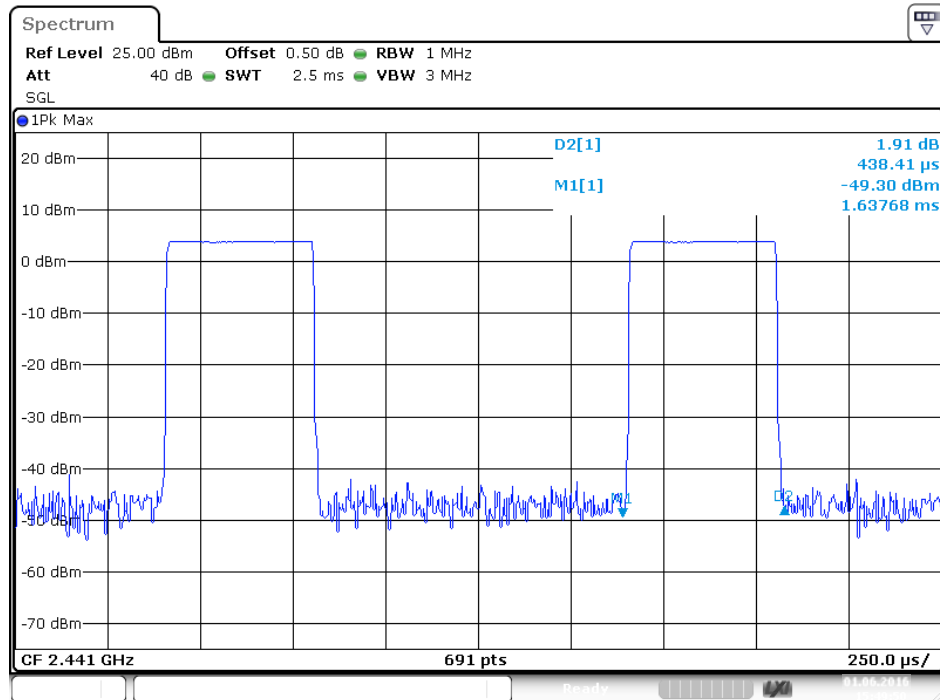
## GFSK Mode

### DH1 Low channel



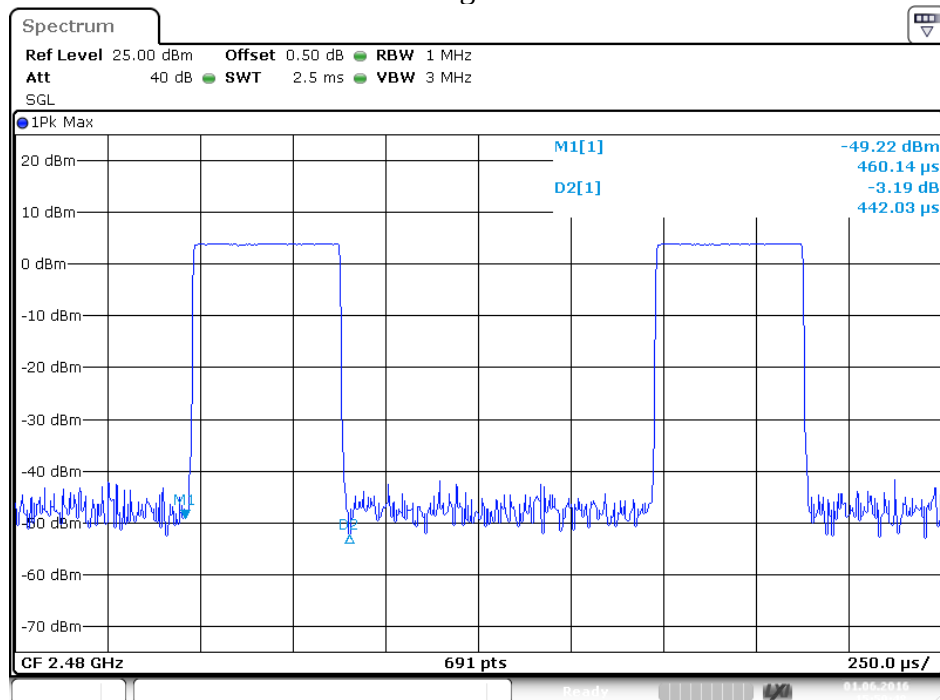
Date: 1.Jun.2016 15:47:20

## DH1 Middle channel



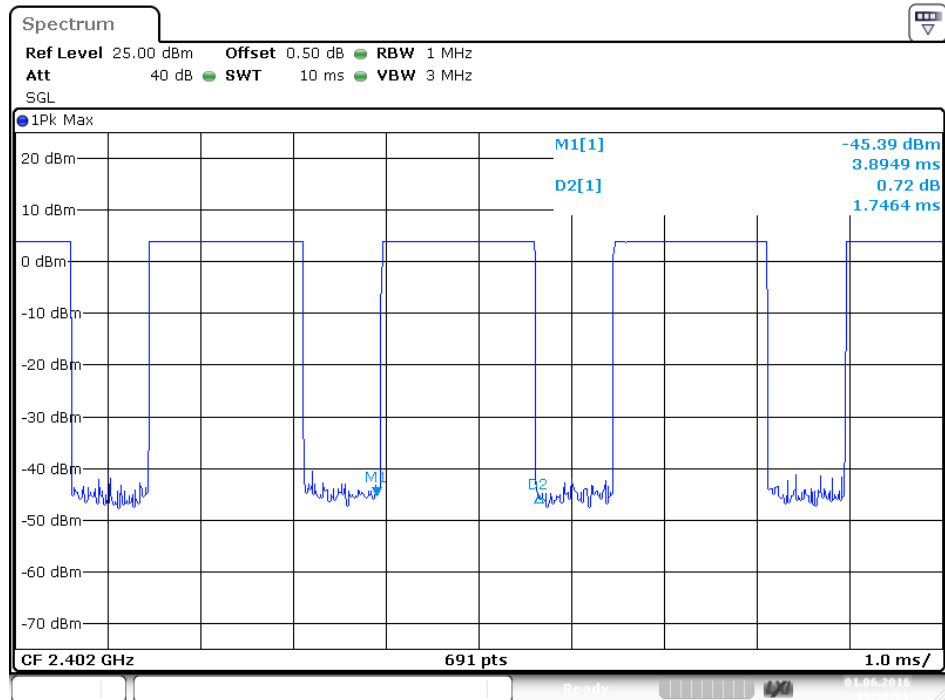
Date: 1.Jun.2016 15:49:50

## DH1 High channel



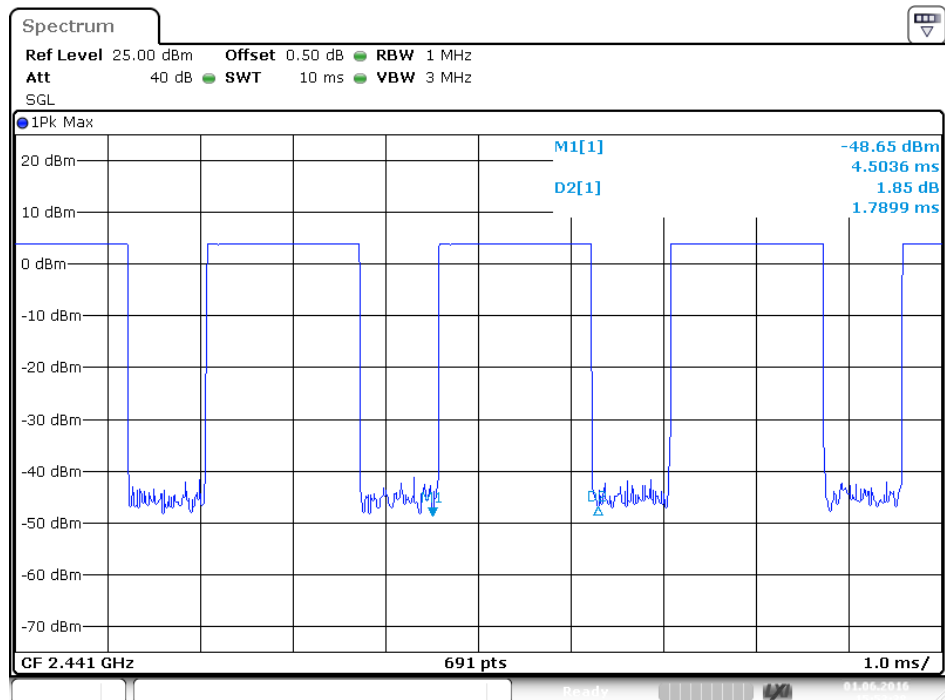
Date: 1.Jun.2016 15:50:48

## DH3 Low channel



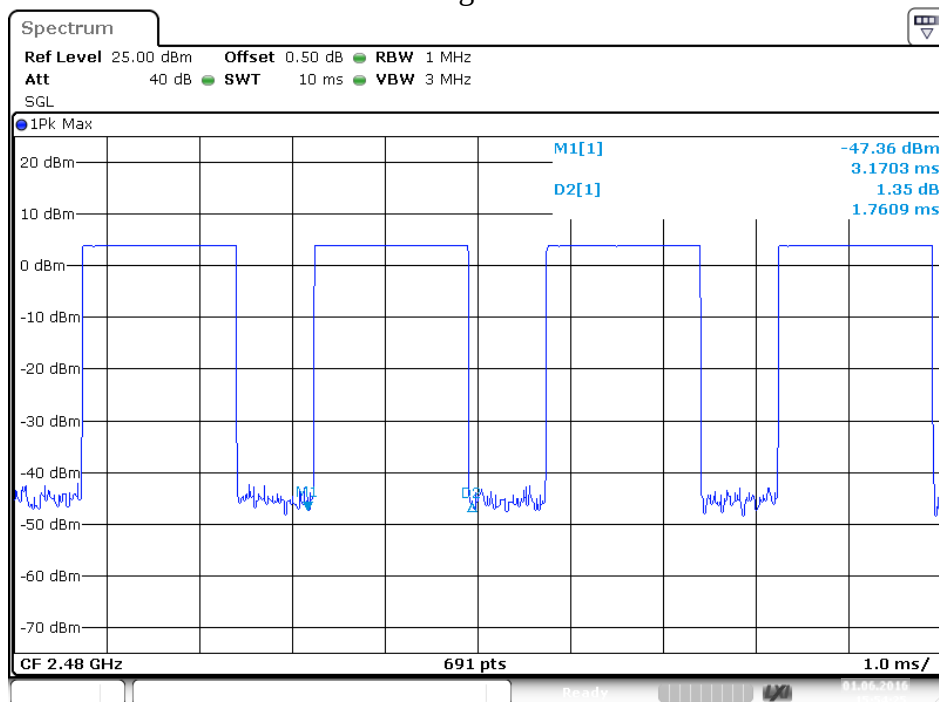
Date: 1.Jun.2016 15:52:54

## DH3 Middle channel



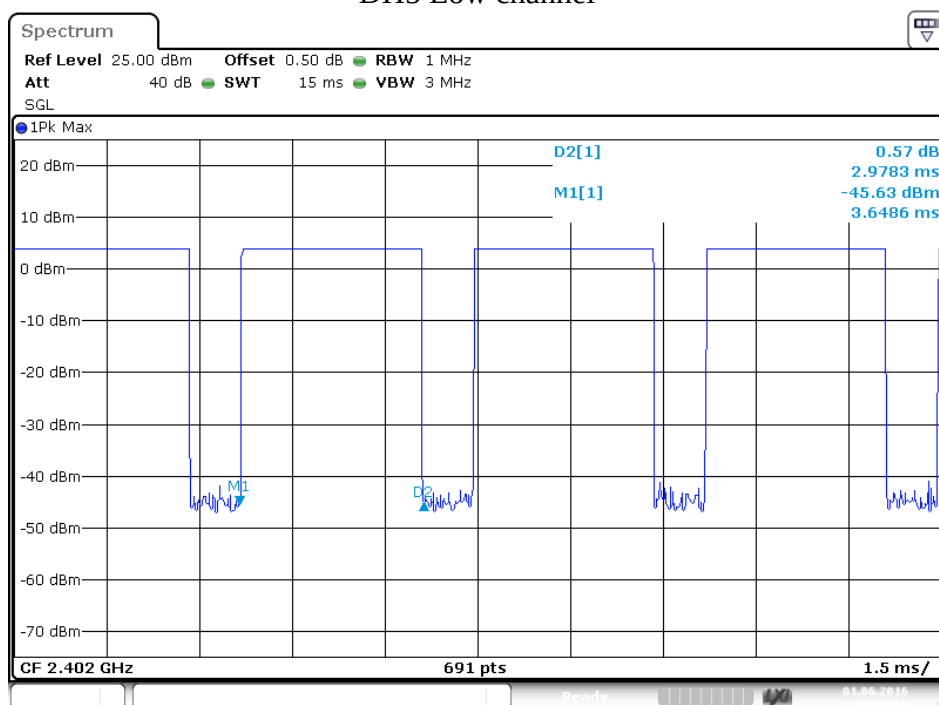
Date: 1.Jun.2016 15:53:38

## DH3 High channel



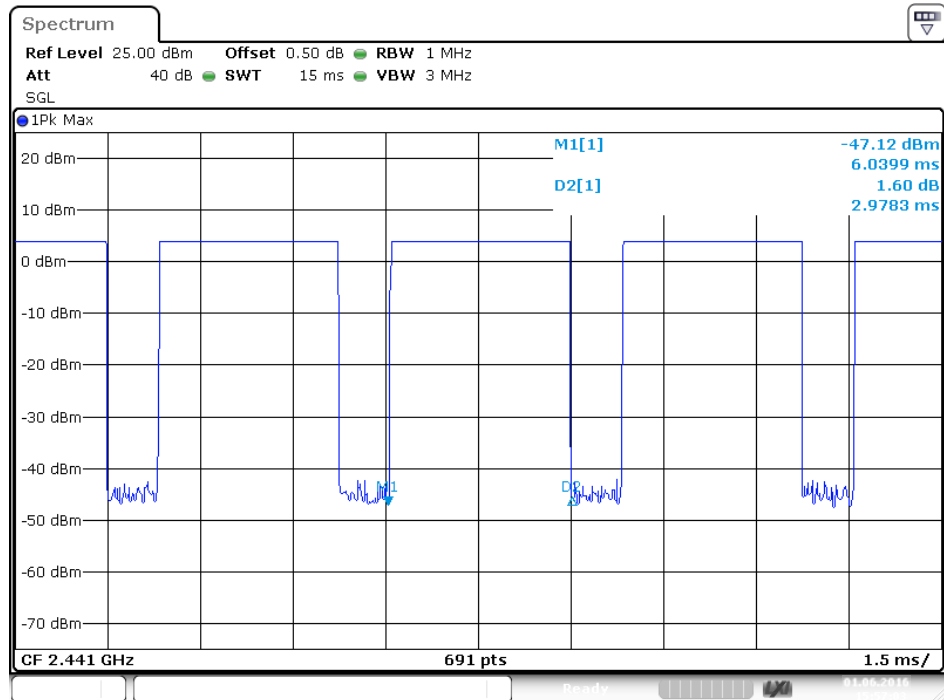
Date: 1.Jun.2016 15:54:25

## DH5 Low channel



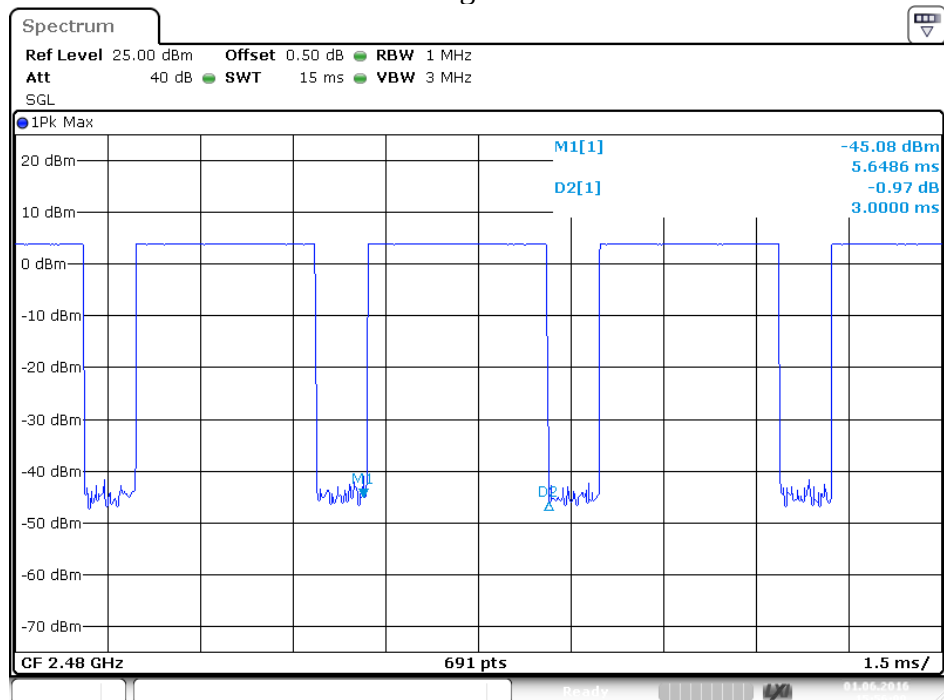
Date: 1.Jun.2016 15:57:51

## DH5 Middle channel



Date: 1.Jun.2016 15:57:03

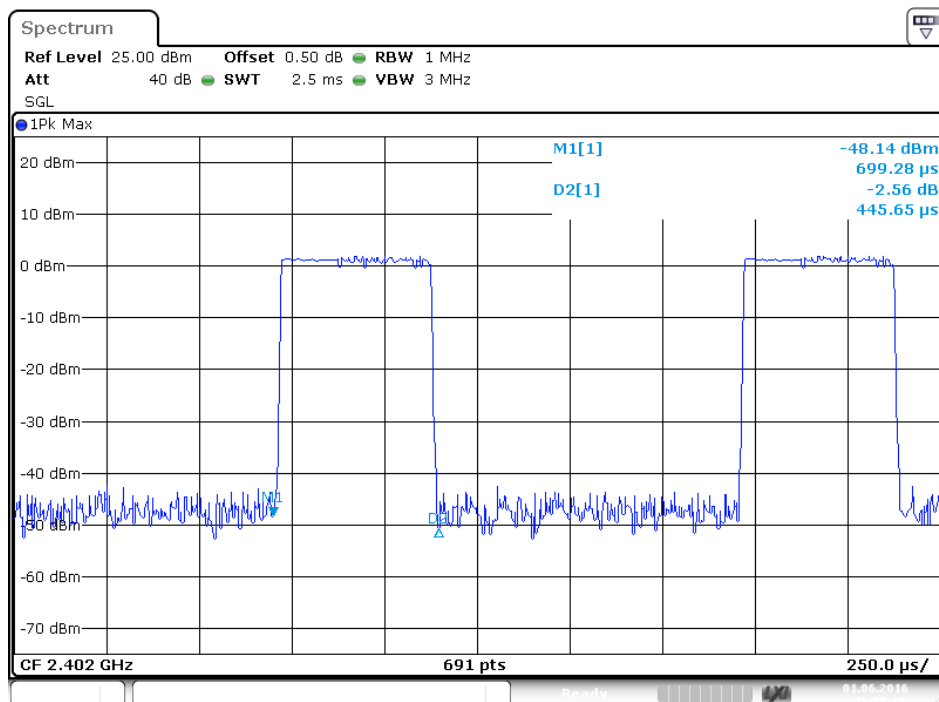
## DH5 High channel



Date: 1.Jun.2016 15:56:09

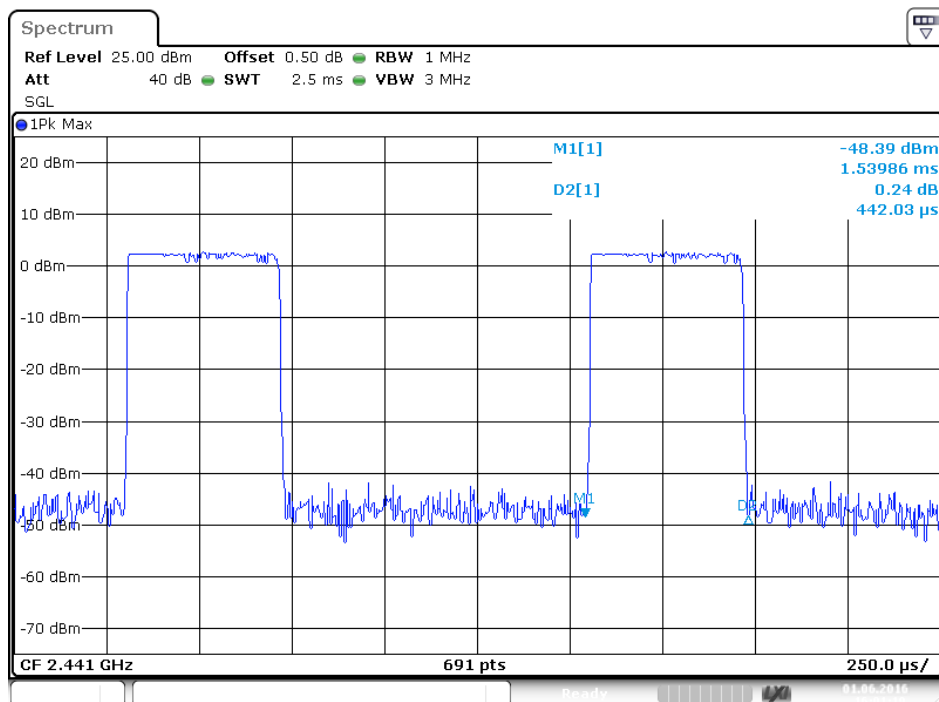
## Π/4-DQPSK

### 2DH1 Low channel



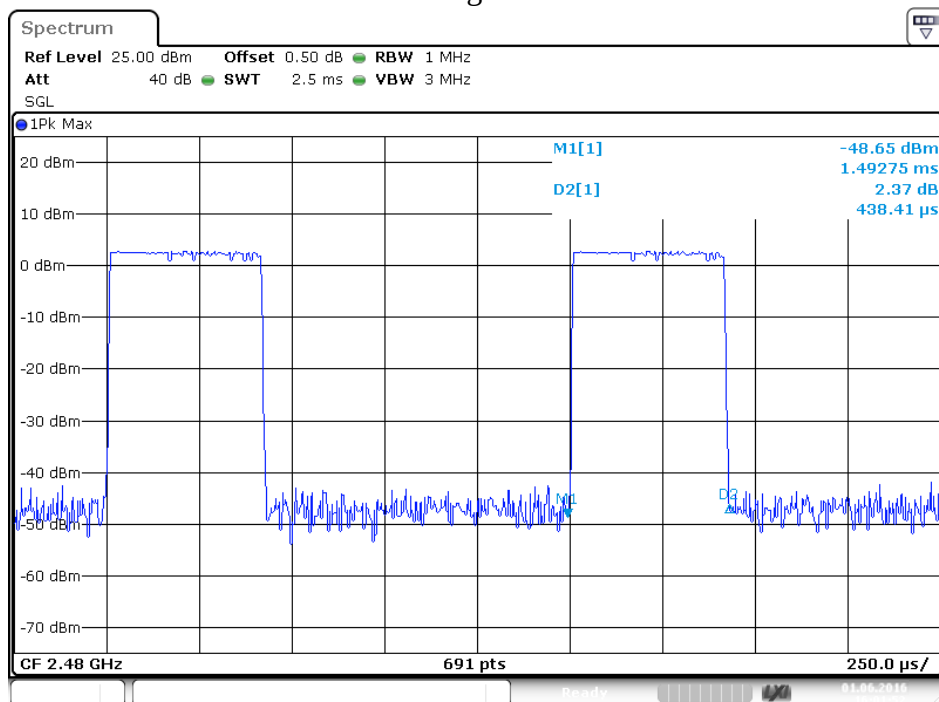
Date: 1.Jun.2016 16:00:11

### 2DH1 Middle channel



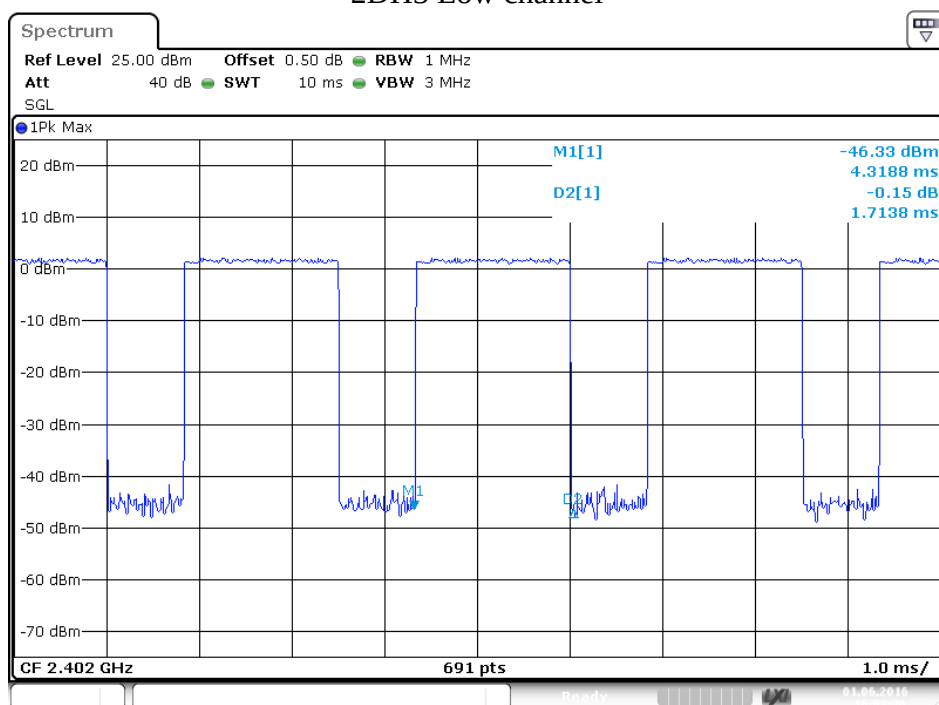
Date: 1.Jun.2016 16:01:19

## 2DH1 High channel



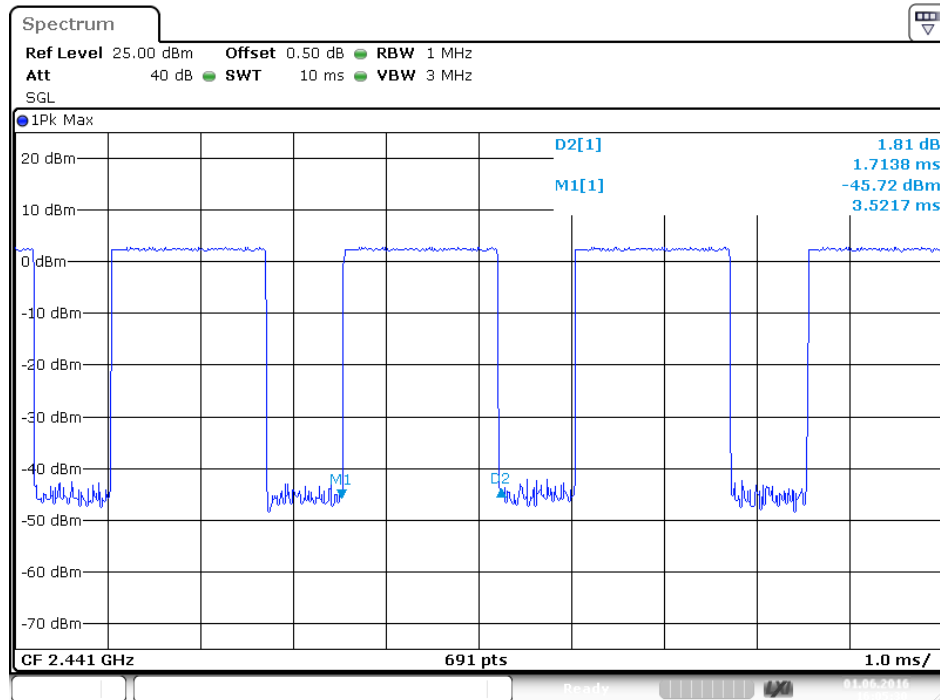
Date: 1.Jun.2016 16:01:53

## 2DH3 Low channel



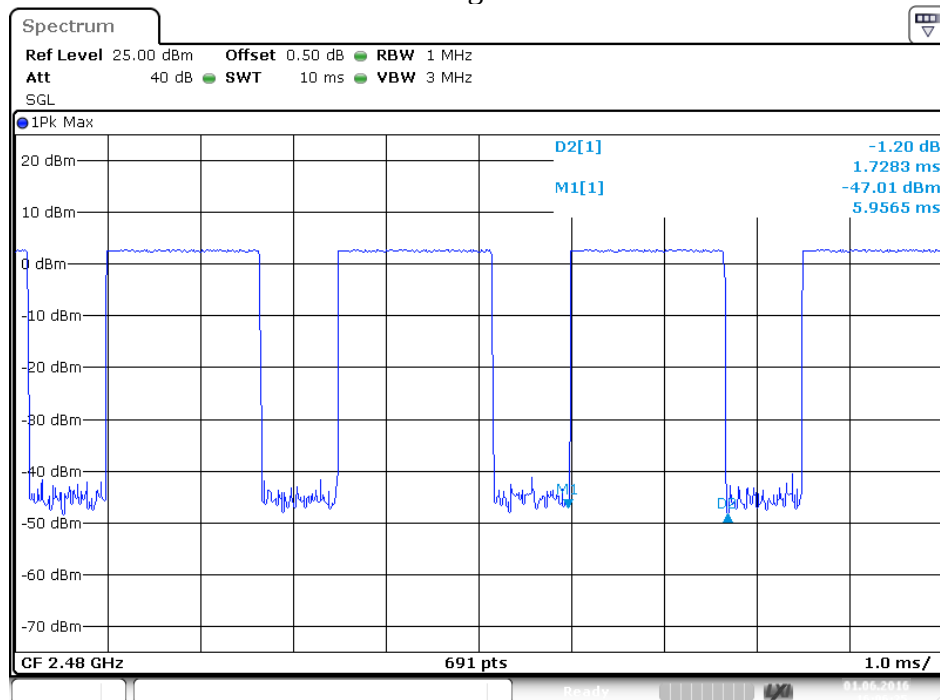
Date: 1.Jun.2016 16:03:40

## 2DH3 Middle channel



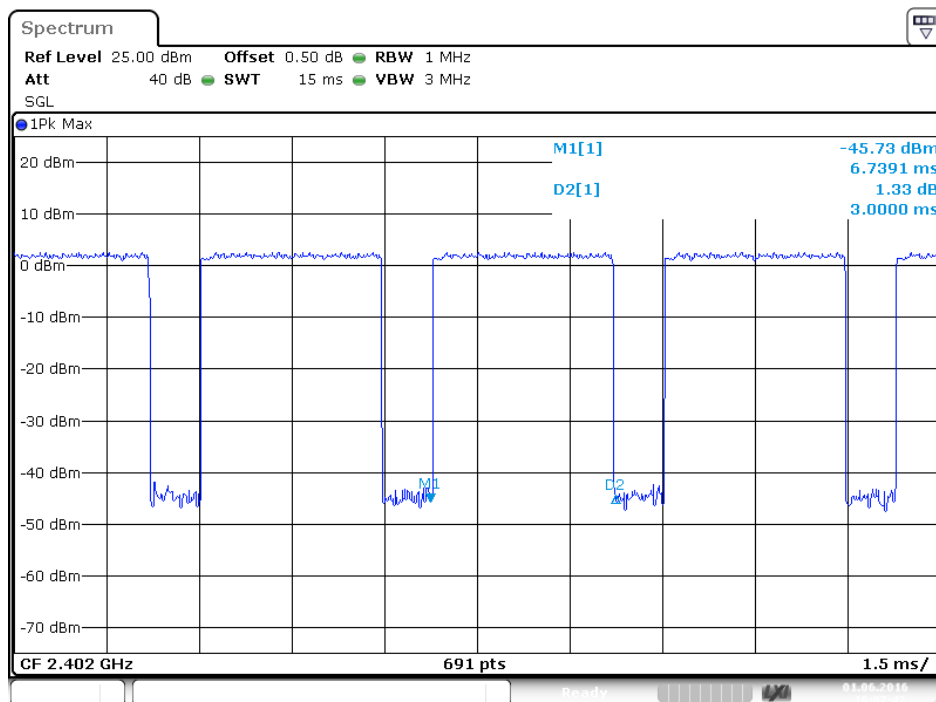
Date: 1.Jun.2016 16:05:30

## 2DH3 High channel



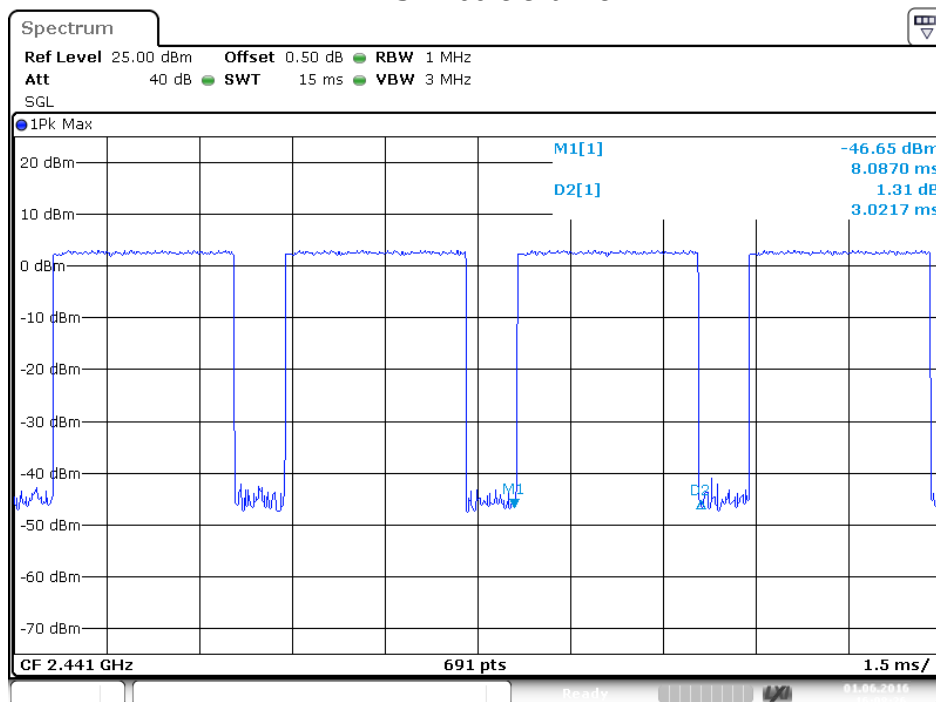
Date: 1.Jun.2016 16:06:26

## 2DH5 Low channel



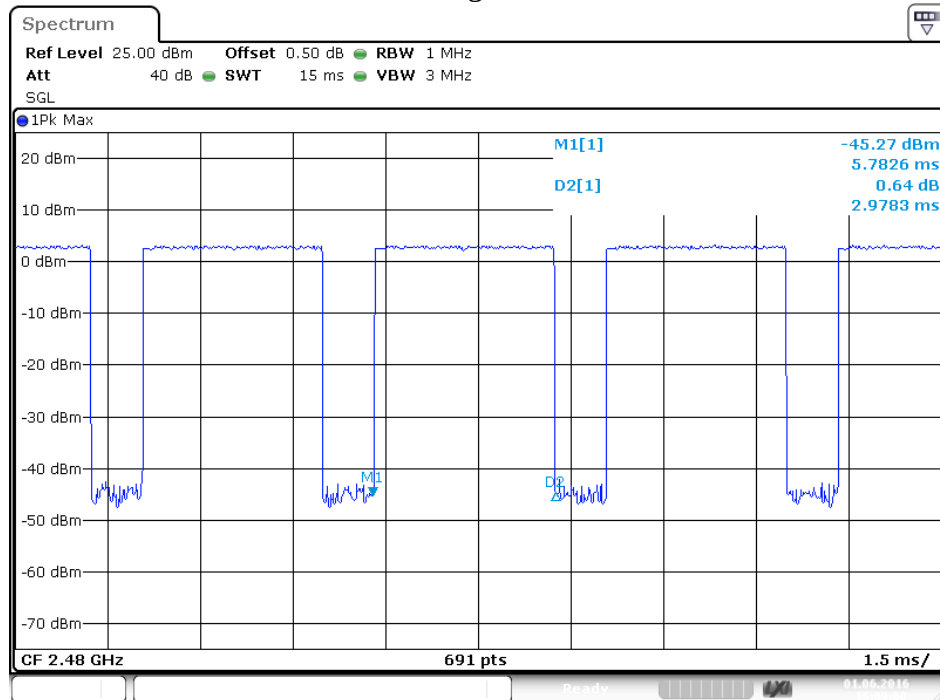
Date: 1.Jun.2016 16:07:43

## 2DH5 Middle channel



Date: 1.Jun.2016 16:08:26

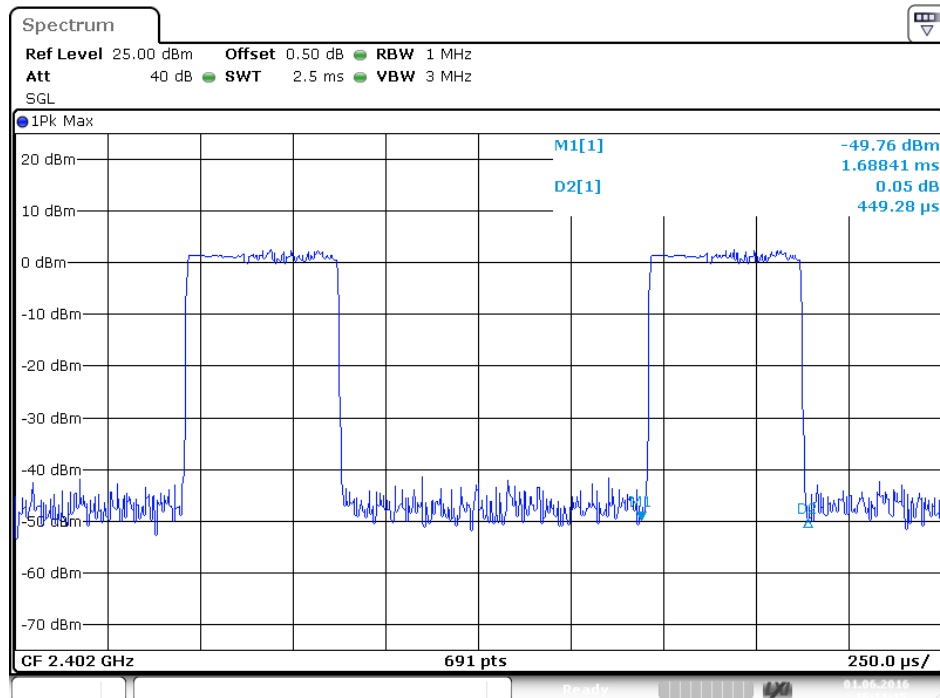
## 2DH5 High channel



Date: 1.Jun.2016 16:09:00

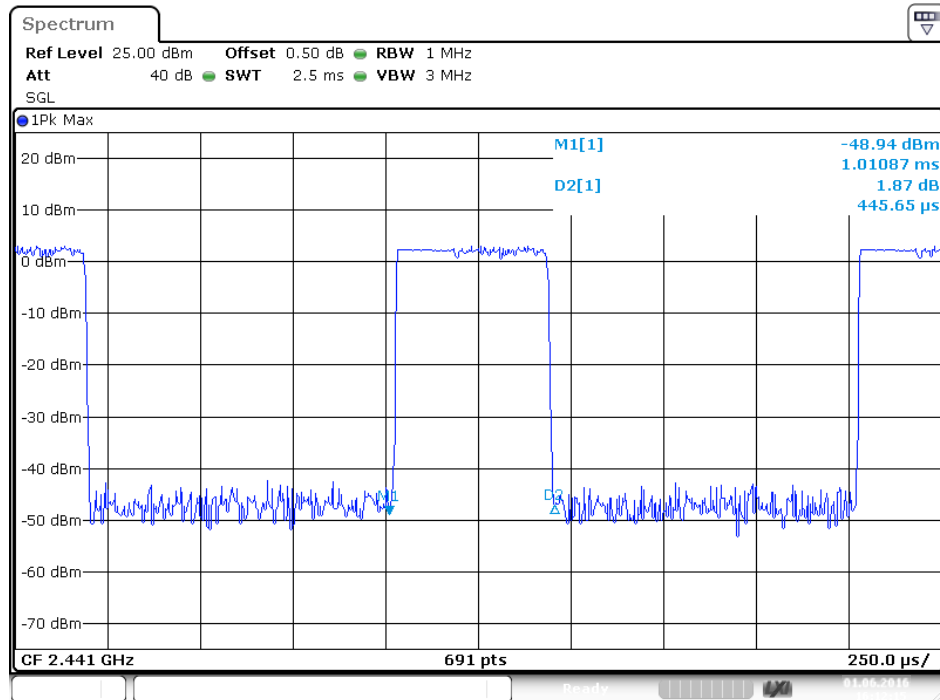
## 8DPSK Mode

## 3DH1 Low channel



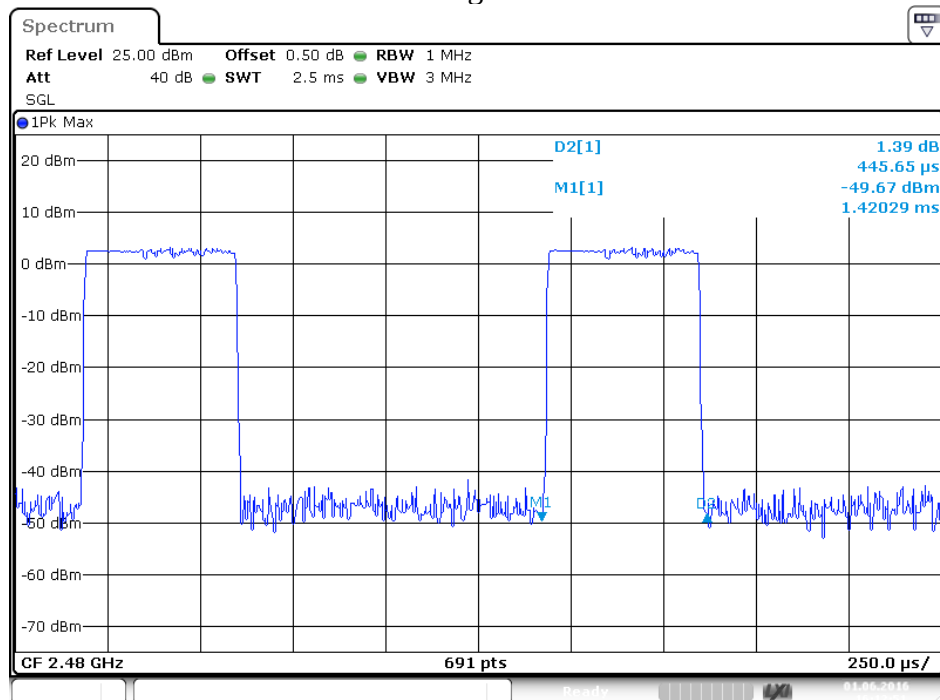
Date: 1.Jun.2016 16:11:15

## 3DH1 Middle channel



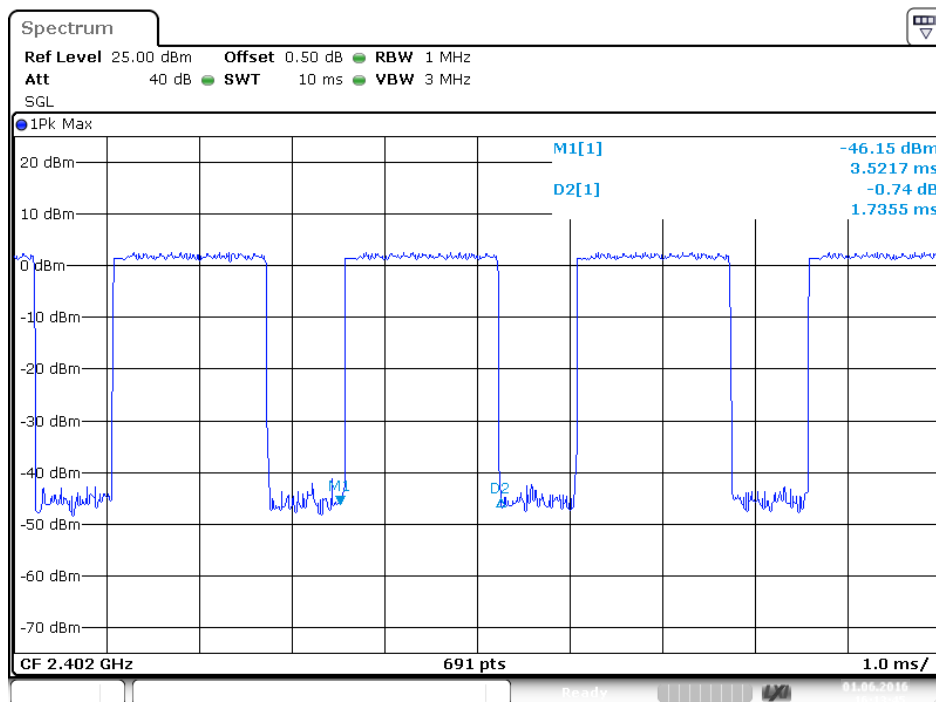
Date: 1.Jun.2016 16:12:15

## 3DH1 High channel



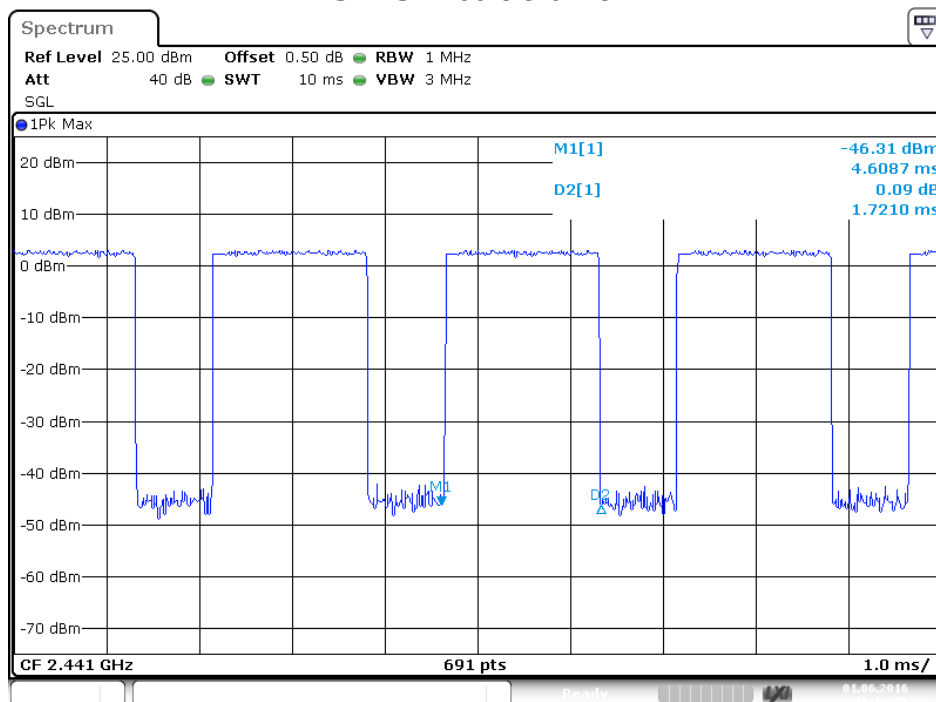
Date: 1.Jun.2016 16:12:52

## 3DH3 Low channel



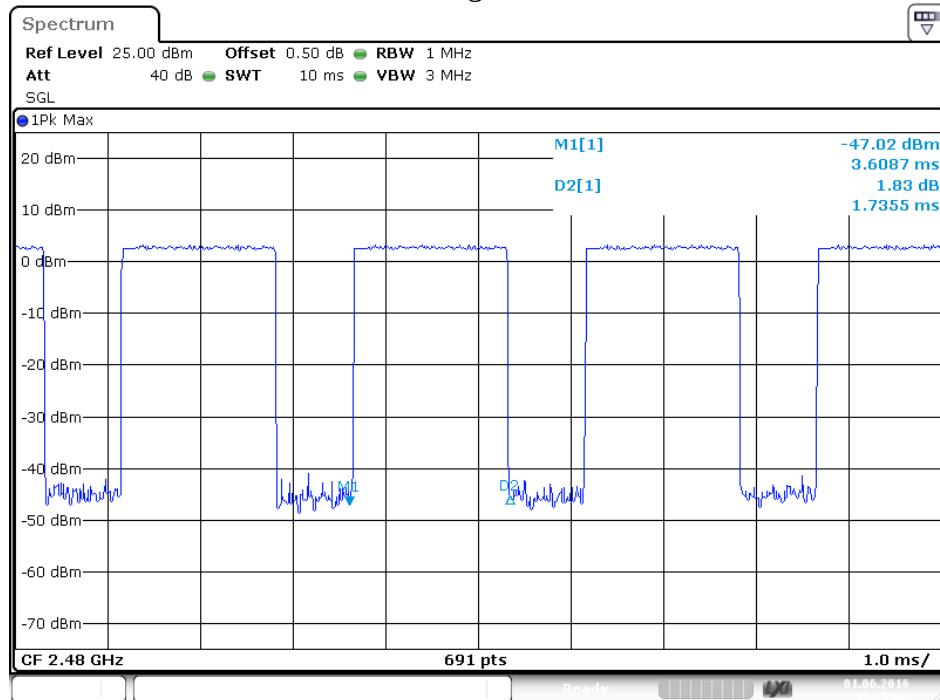
Date: 1.Jun.2016 16:13:45

## 3DH3 Middle channel



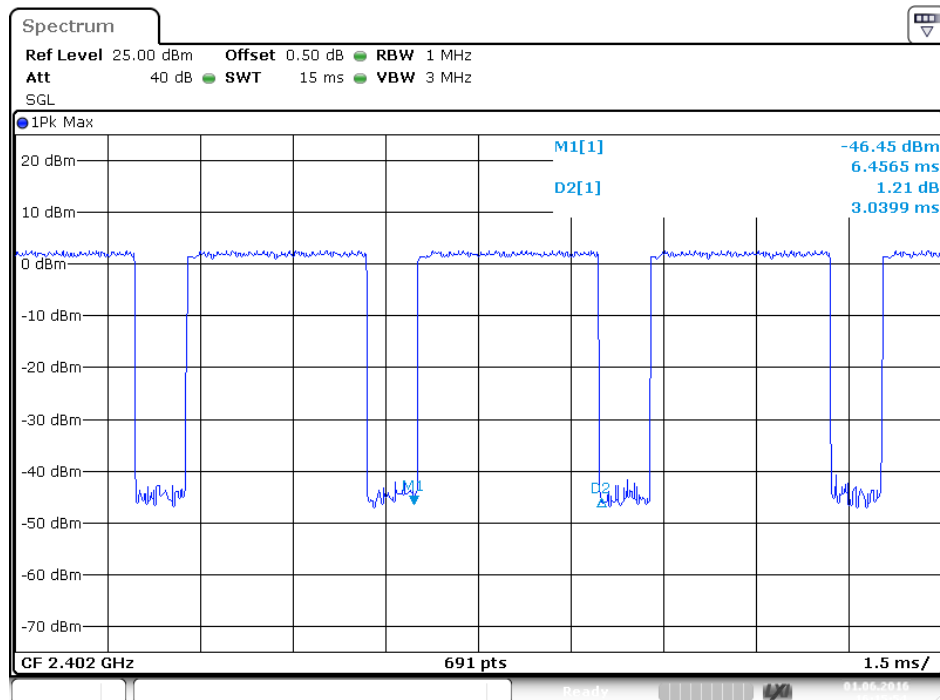
Date: 1.Jun.2016 16:14:20

## 3DH3 High channel



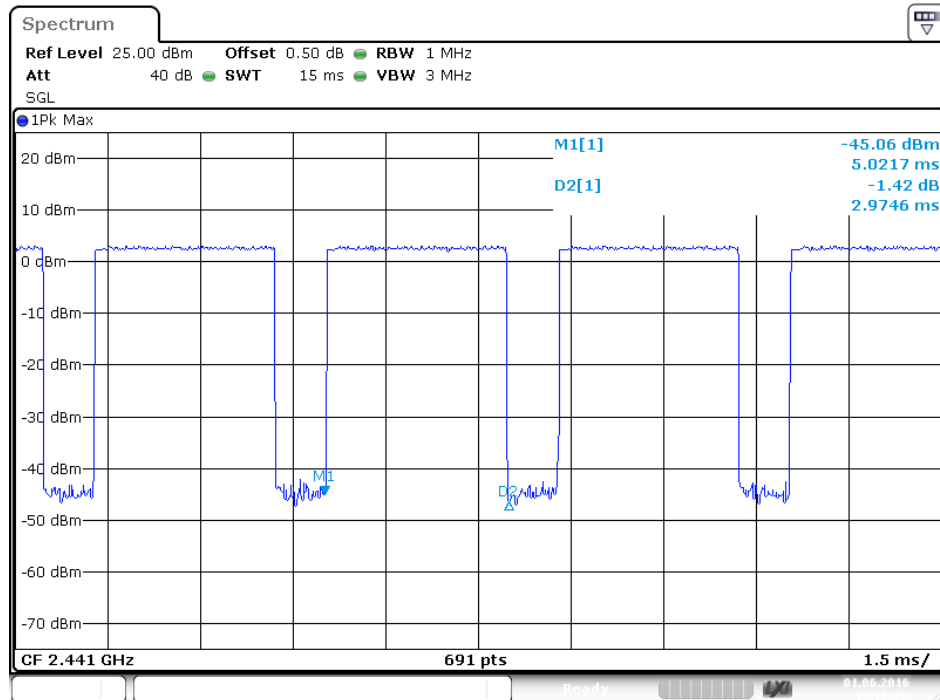
Date: 1.Jun.2016 16:15:02

## 3DH5 Low channel



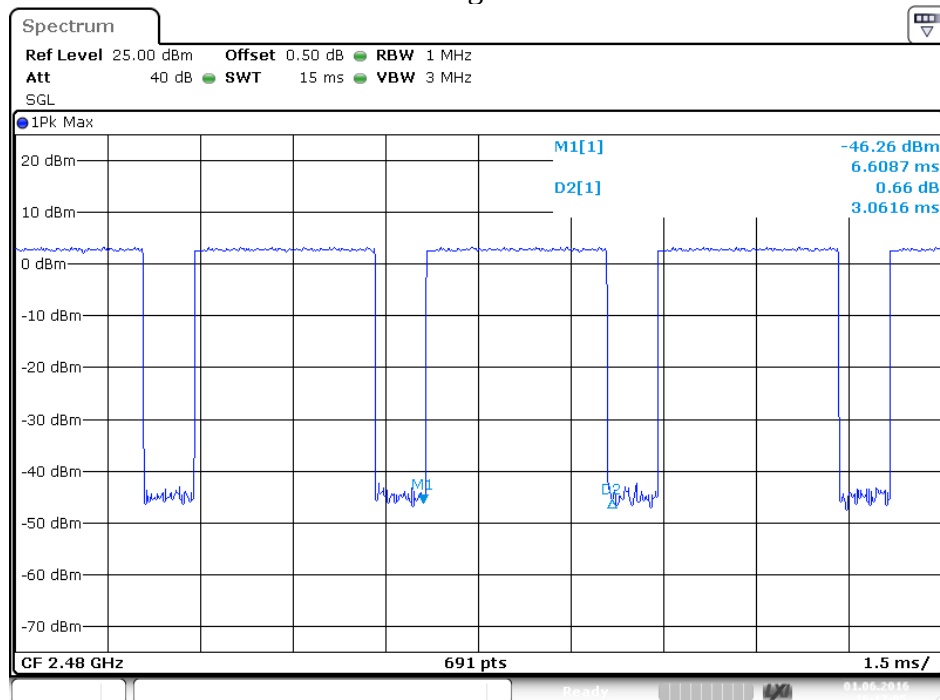
Date: 1.Jun.2016 16:15:54

## 3DH5 Middle channel



Date: 1.Jun.2016 16:16:28

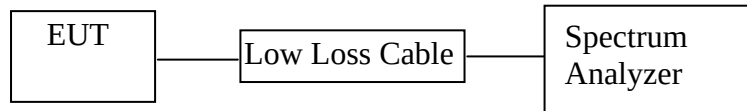
## 3DH5 High channel



Date: 1.Jun.2016 16:17:05

## 9. MAXIMUM PEAK OUTPUT POWER TEST

### 9.1. Block Diagram of Test Setup



(EUT: RUGGED WIRELESS SPEAKER)

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

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

### 9.3. EUT Configuration on Measurement

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

### 9.4. Operating Condition of EUT

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

9.4.2. Turn on the power of all equipment.

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

### 9.5. Test Procedure

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

9.5.2. Set RBW of spectrum analyzer to 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            | 4.18/0.0026               | 30 / 1.0       |
| Middle  | 2441            | 4.10/0.0026               | 30 / 1.0       |
| High    | 2480            | 4.04/0.0025               | 30 / 1.0       |

### Π/4-DQPSK Mode

| Channel | Frequency (MHz) | Peak Output Power (dBm/W) | Limits dBm / W |
|---------|-----------------|---------------------------|----------------|
| Low     | 2402            | 2.42/0.0017               | 21 / 0.125     |
| Middle  | 2441            | 3.07/0.0020               | 21 / 0.125     |
| High    | 2480            | 3.14/0.0021               | 21 / 0.125     |

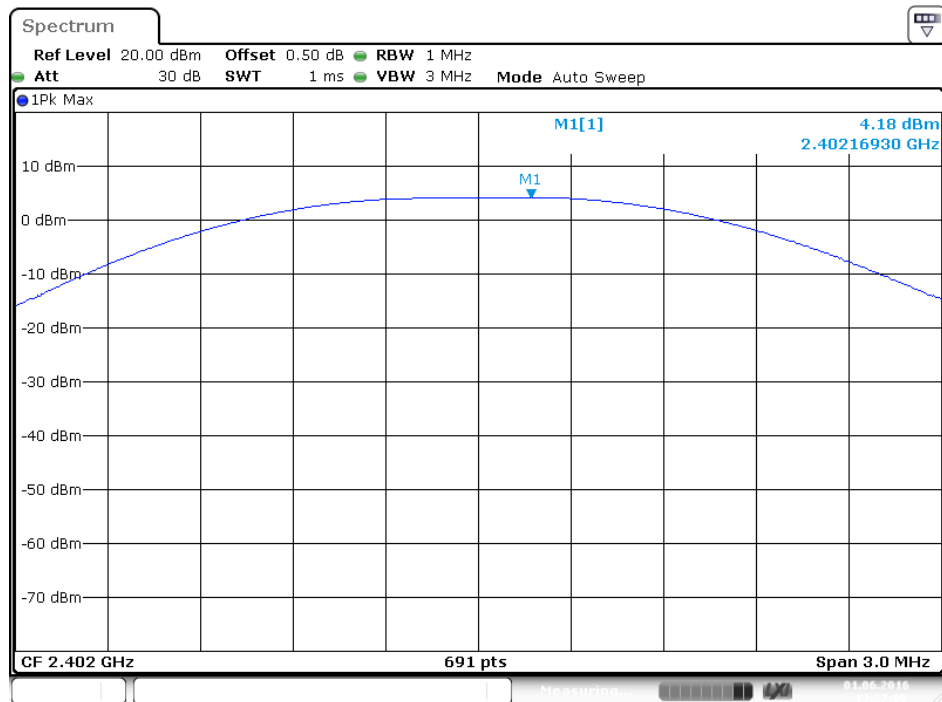
### 8DPSK Mode

| Channel | Frequency (MHz) | Peak Output Power (dBm/W) | Limits dBm / W |
|---------|-----------------|---------------------------|----------------|
| Low     | 2402            | 2.62/0.0018               | 21 / 0.125     |
| Middle  | 2441            | 3.18/0.0021               | 21 / 0.125     |
| High    | 2480            | 3.25/0.0021               | 21 / 0.125     |

The spectrum analyzer plots are attached as below.

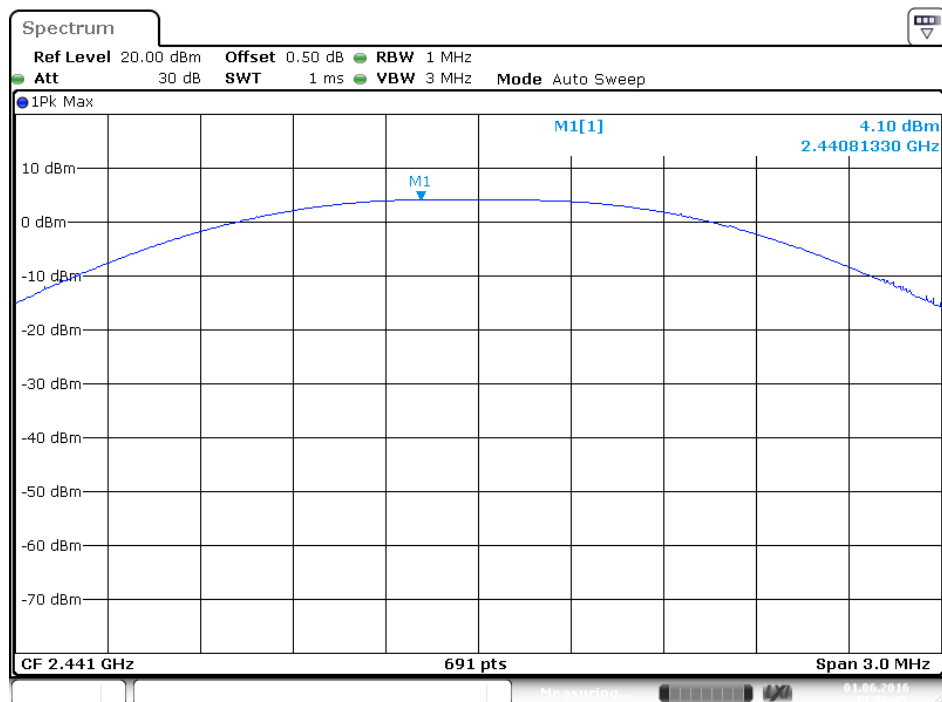
## GFSK Mode

### Low channel



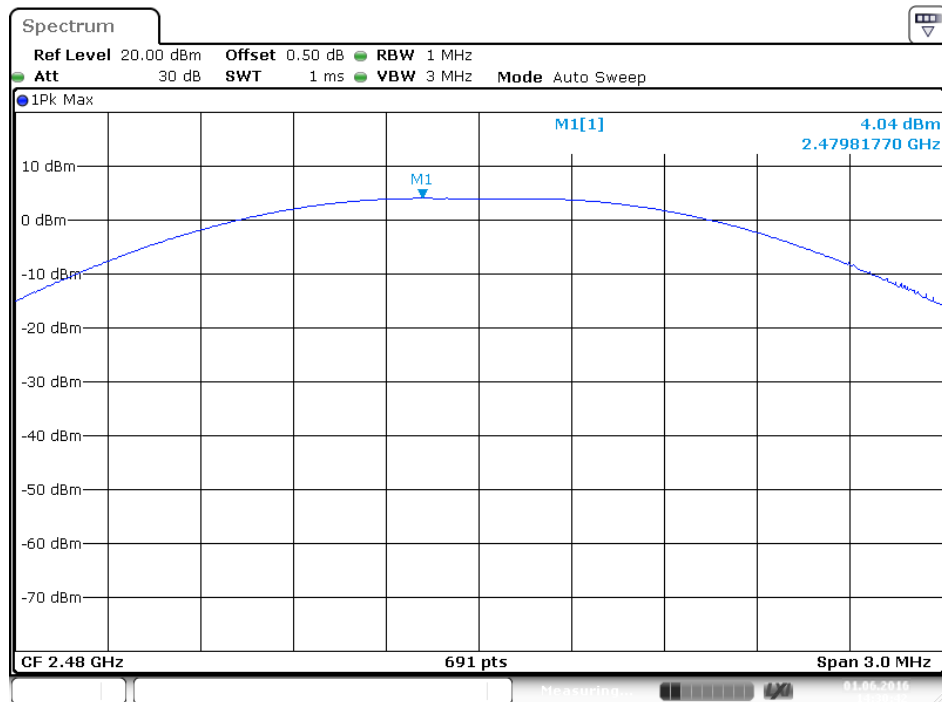
Date: 1 Jun. 2016 13:27:05

### Middle channel



Date: 1 Jun. 2016 13:28:44

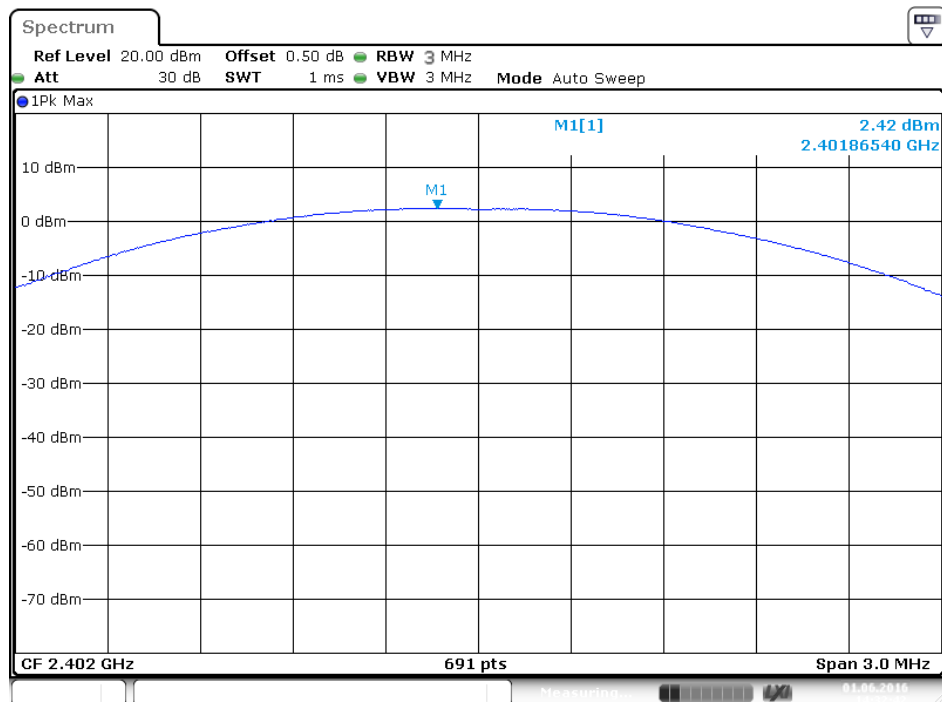
## High channel



Date: 1.Jun.2016 14:30:42

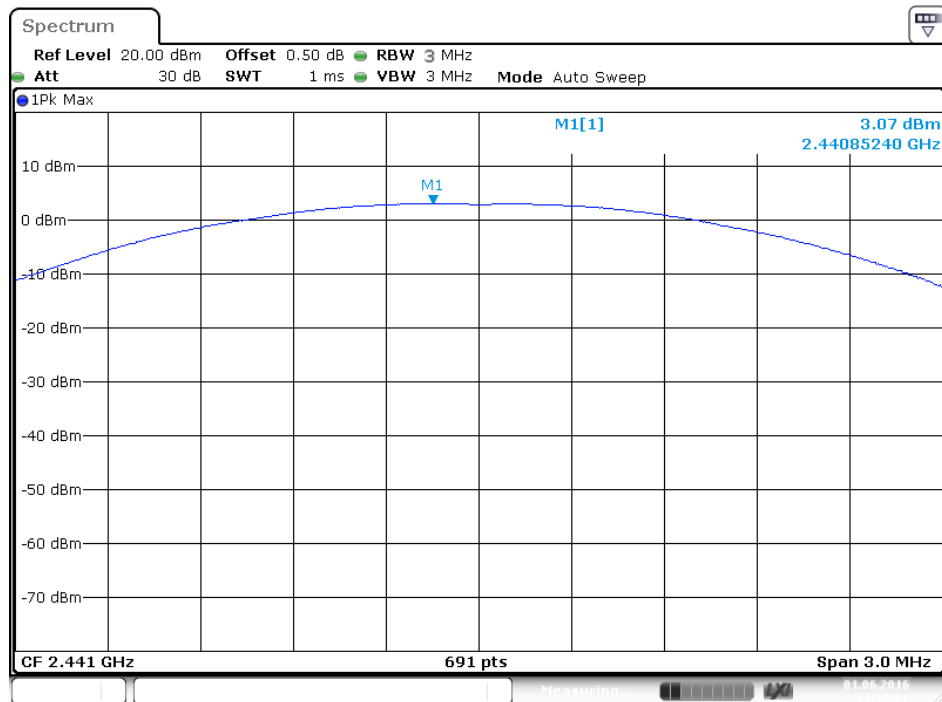
## II/4-DQPSK Mode

## Low channel



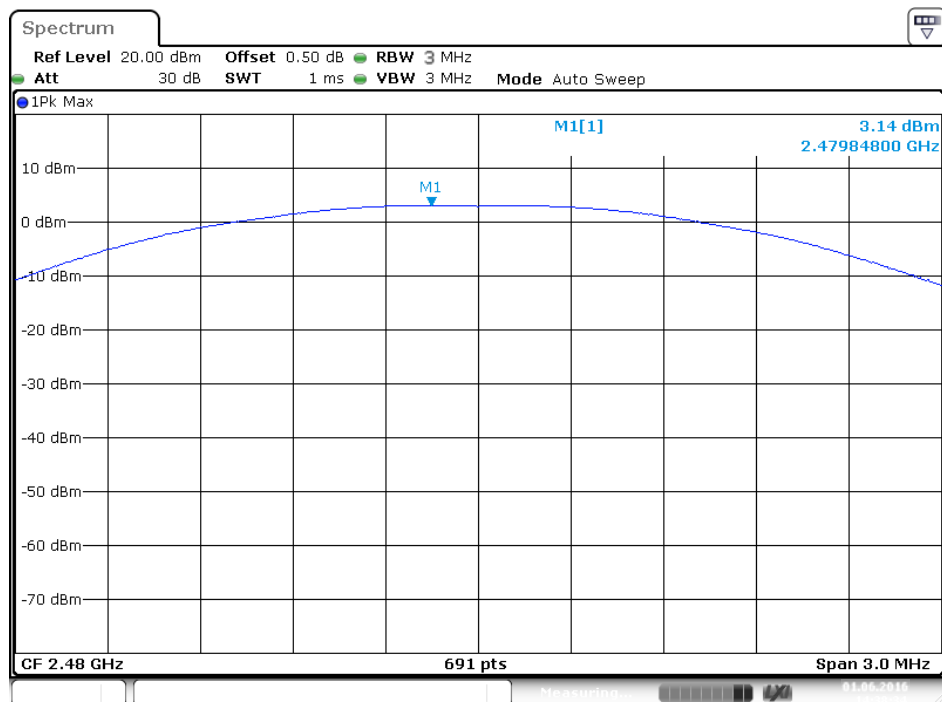
Date: 1.Jun.2016 14:32:42

## Middle channel



Date: 1.Jun.2016 14:38:15

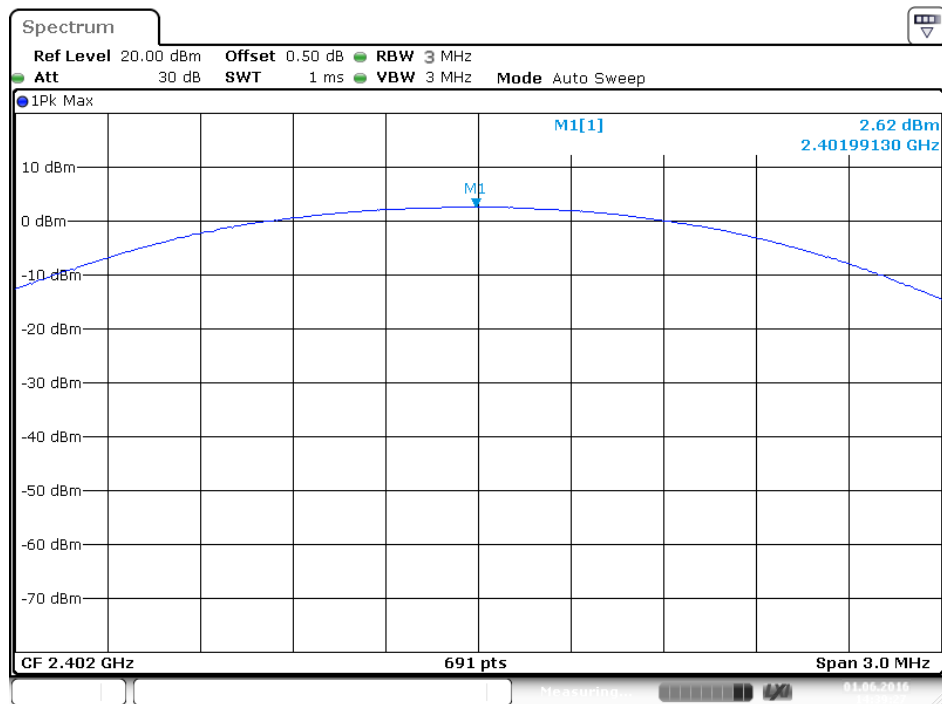
## High channel



Date: 1.Jun.2016 14:38:34

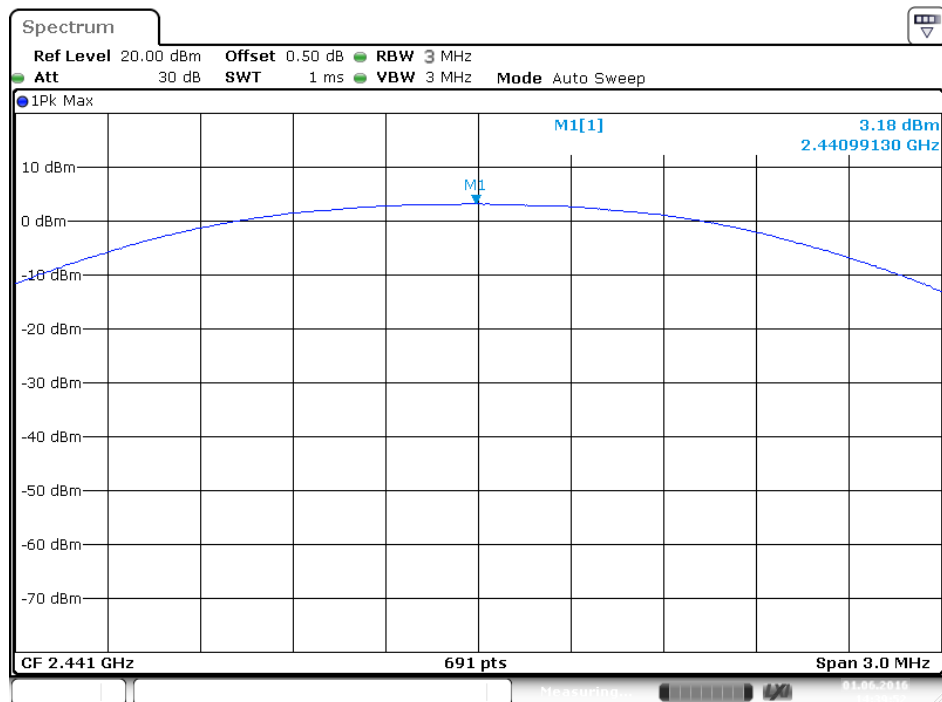
## 8DPSK Mode

### Low channel



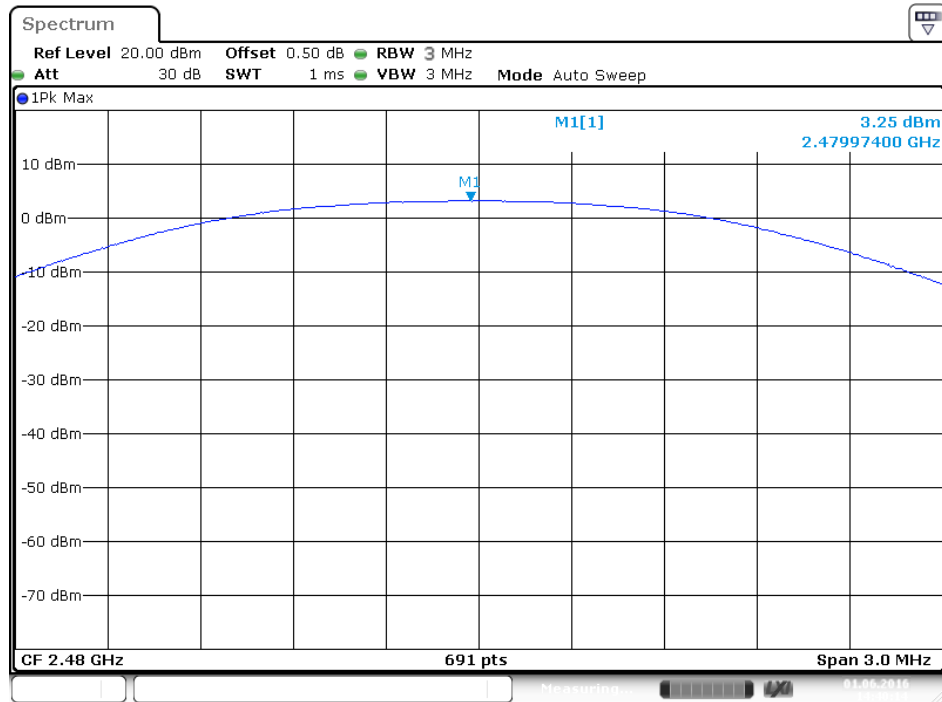
Date: 1.Jun.2016 14:39:28

### Middle channel



Date: 1.Jun.2016 14:39:53

### High channel

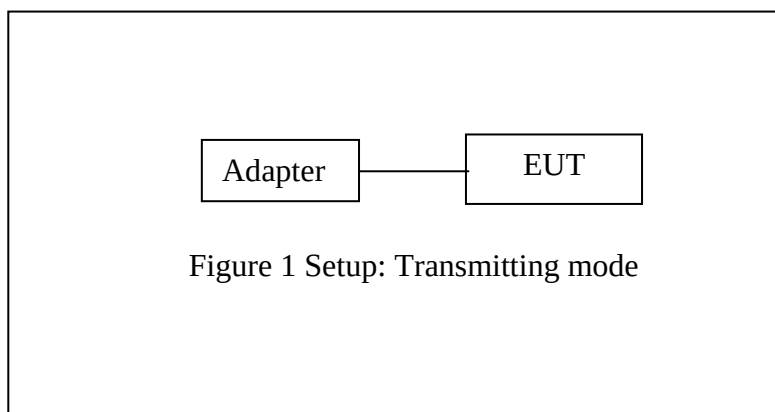


Date: 1.Jun.2016 14:40:14

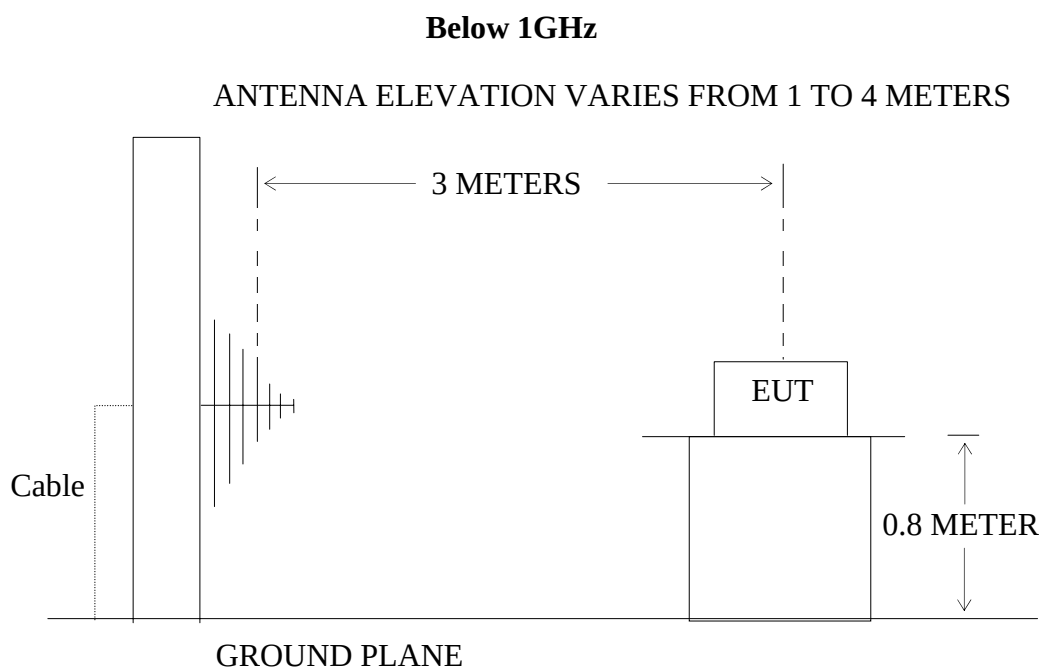
## 10.RADIATED EMISSION TEST

### 10.1.Block Diagram of Test Setup

#### 10.1.1.Block diagram of connection between the EUT and peripherals

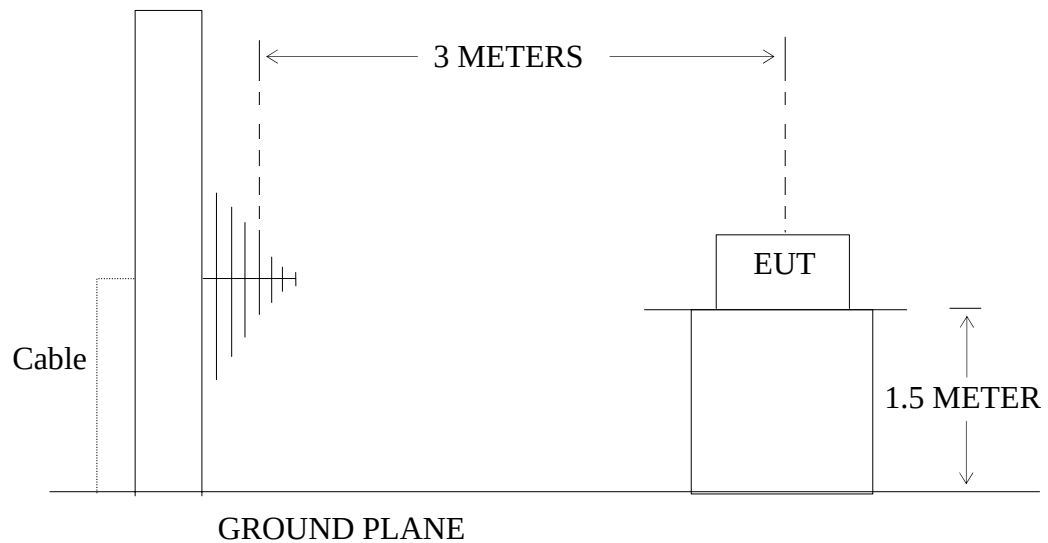


#### 10.1.2.Semi-Anechoic Chamber Test Setup Diagram



### Above 1GHz

ANTENNA ELEVATION VARIES FROM 1 TO 4 METERS



### 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         |
| <sup>1</sup> 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     | ( <sup>2</sup> ) |
| 13.36-13.41              |                     |               |                  |

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510

<sup>2</sup>Above 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 (Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground (Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

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

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

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

## Below 1GHz



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Job No.: STAR2015 #1144

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2402MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Horizontal

Power Source: DC 3.7V

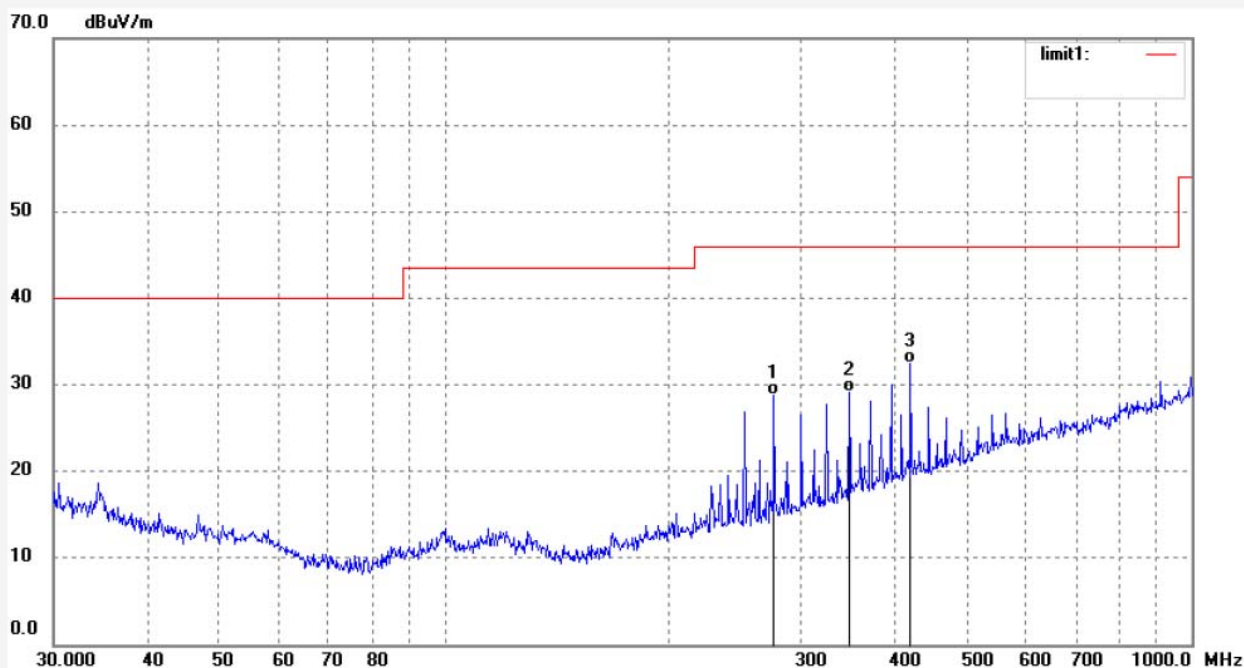
Date: 2016-5-24

Time: 0:48:42

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20160944





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Job No.: STAR2015 #1143

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2402MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Vertical

Power Source: DC 3.7V

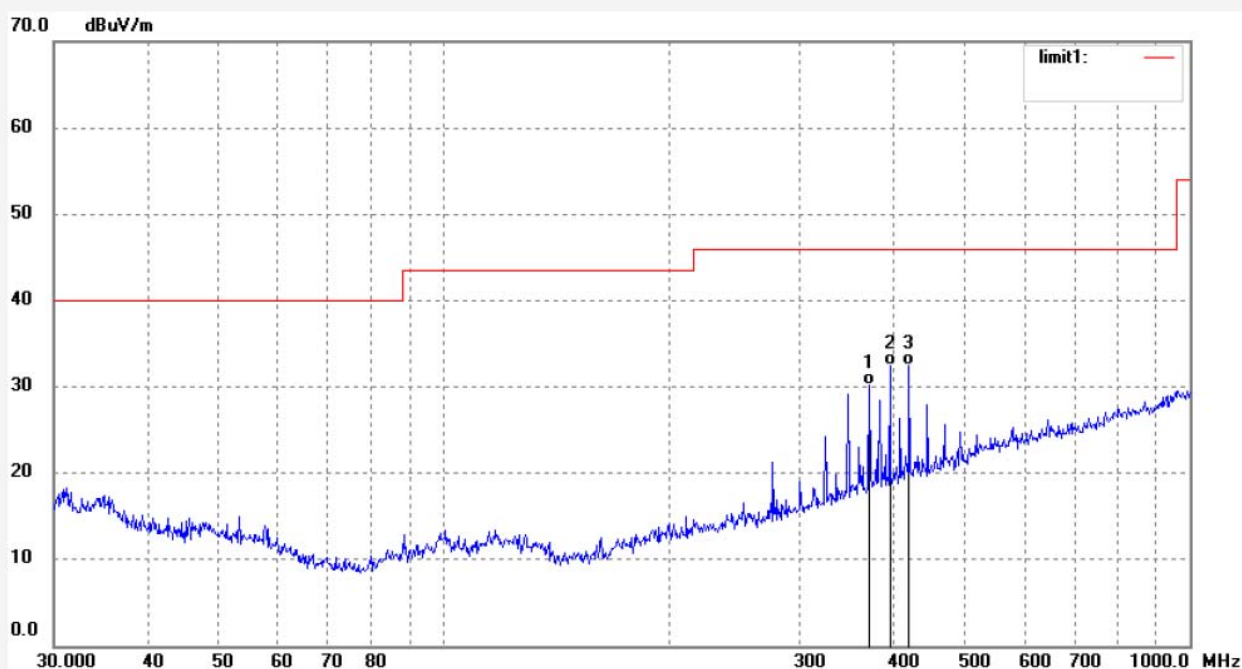
Date: 2016-5-24

Time: 0:47:28

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20160944



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 372.0045    | 37.62            | -7.48       | 30.14           | 46.00          | -15.86      | QP       |             |               |        |
| 2   | 396.2414    | 39.48            | -6.97       | 32.51           | 46.00          | -13.49      | QP       |             |               |        |
| 3   | 420.5803    | 38.61            | -6.15       | 32.46           | 46.00          | -13.54      | QP       |             |               |        |



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Job No.: STAR2015 #1145

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2441MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Horizontal

Power Source: DC 3.7V

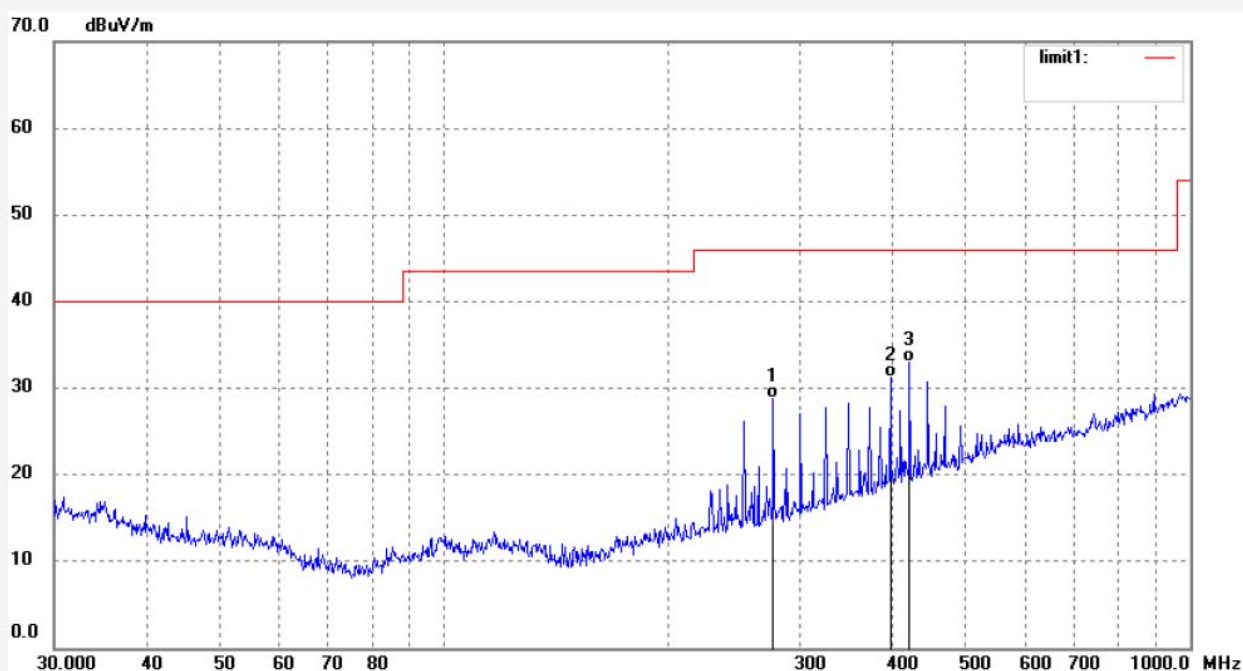
Date: 2016-5-24

Time: 0:49:49

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20160944



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 276.1235    | 38.72            | -9.95       | 28.77           | 46.00          | -17.23      | QP       |             |               |        |
| 2   | 396.2414    | 38.15            | -6.97       | 31.18           | 46.00          | -14.82      | QP       |             |               |        |
| 3   | 420.5803    | 39.15            | -6.15       | 33.00           | 46.00          | -13.00      | QP       |             |               |        |

Job No.: STAR2015 #1146

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2441MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Vertical

Power Source: DC 3.7V

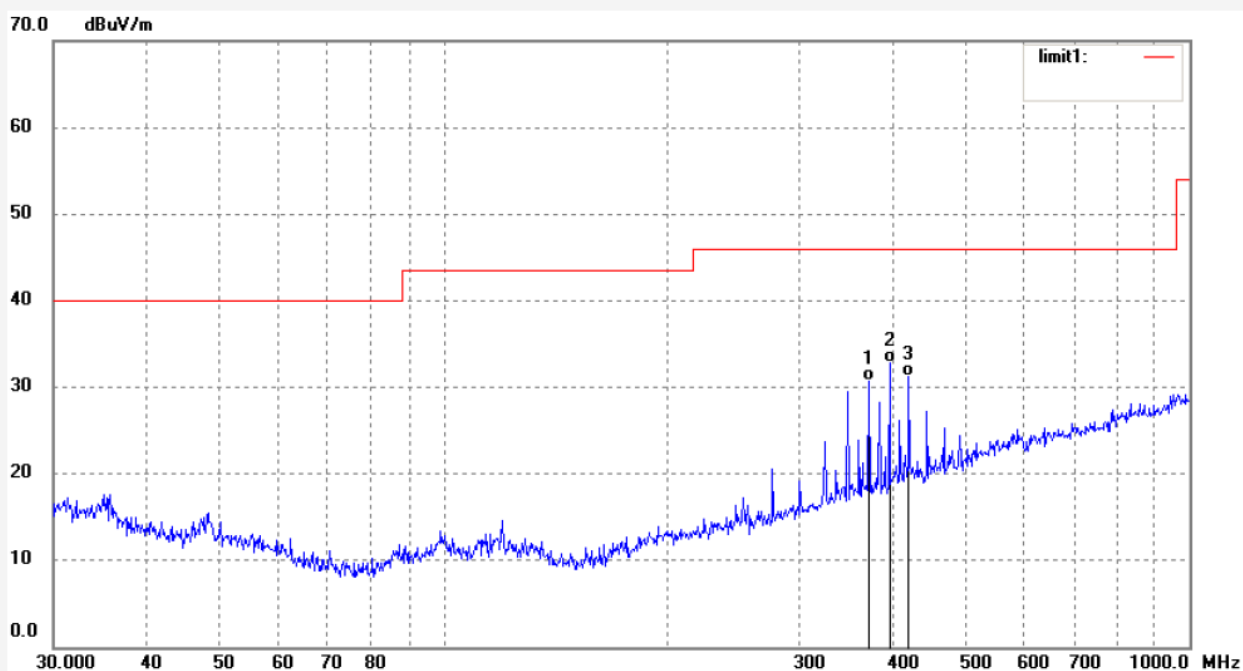
Date: 2016-5-24

Time: 0:50:38

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20160944



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 372.0045    | 38.24            | -7.48       | 30.76           | 46.00          | -15.24      | QP       |             |               |        |
| 2   | 396.2415    | 39.73            | -6.97       | 32.76           | 46.00          | -13.24      | QP       |             |               |        |
| 3   | 420.5803    | 37.45            | -6.15       | 31.30           | 46.00          | -14.70      | QP       |             |               |        |



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Job No.: STAR2015 #1148

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2480MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Horizontal

Power Source: DC 3.7V

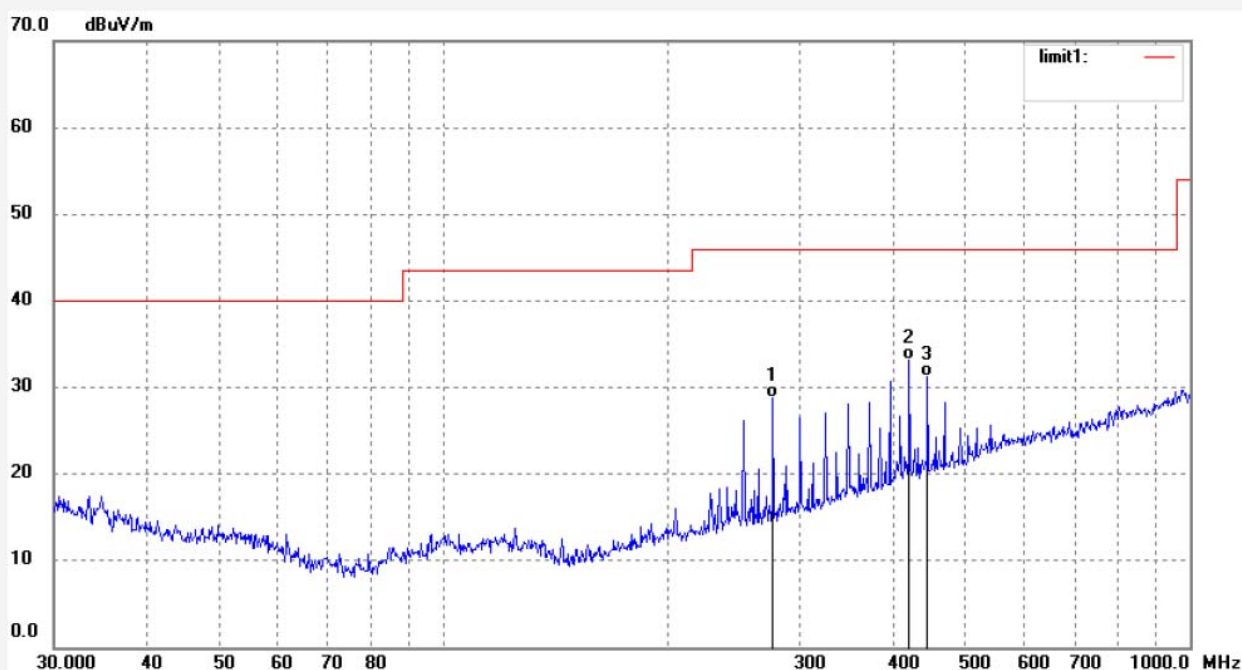
Date: 2016-5-24

Time: 0:53:19

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20160944



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 276.1235    | 38.66            | -9.95       | 28.71           | 46.00          | -17.29      | QP       |             |               |        |
| 2   | 420.5803    | 39.36            | -6.15       | 33.21           | 46.00          | -12.79      | QP       |             |               |        |
| 3   | 444.8514    | 37.17            | -5.86       | 31.31           | 46.00          | -14.69      | QP       |             |               |        |

Job No.: STAR2015 #1147

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2480MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Vertical

Power Source: DC 3.7V

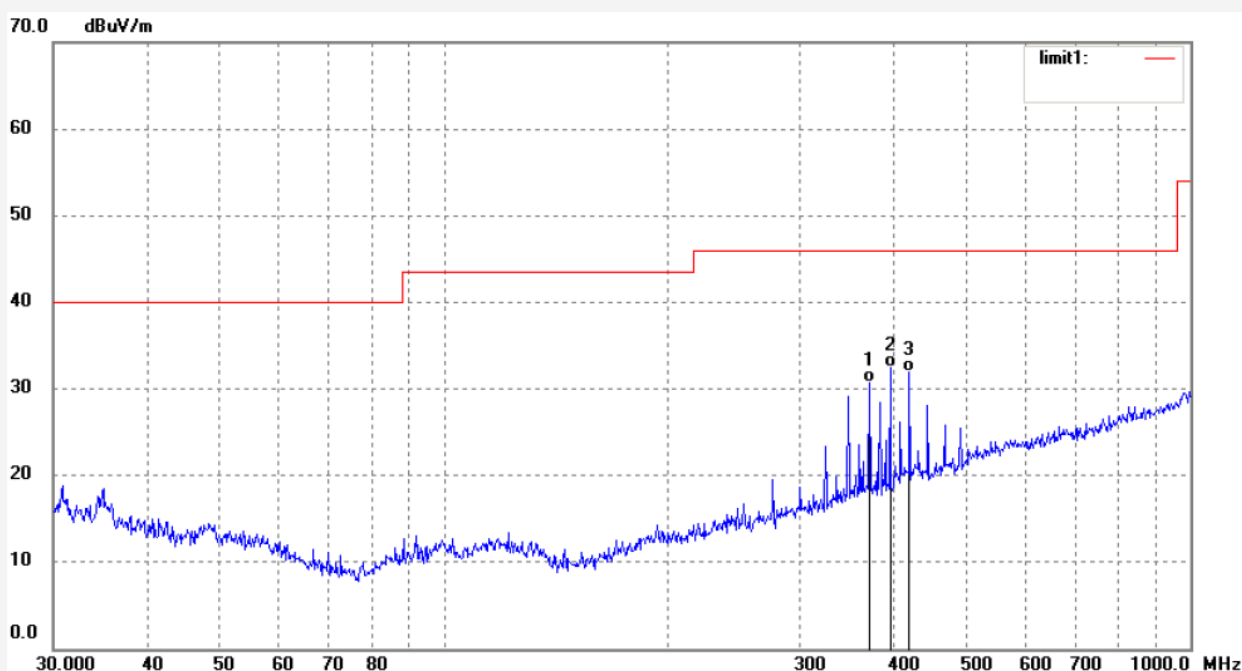
Date: 2016-5-24

Time: 0:51:41

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20160944



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 372.0045       | 38.14               | -7.48          | 30.66              | 46.00             | -15.34         | QP       |                |                  |        |
| 2   | 396.2415       | 39.35               | -6.97          | 32.38              | 46.00             | -13.62         | QP       |                |                  |        |
| 3   | 420.5803       | 38.11               | -6.15          | 31.96              | 46.00             | -14.04         | QP       |                |                  |        |

Above 1GHz



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Job No.: STAR2015 #1150

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2402MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Horizontal

Power Source: DC 3.7V

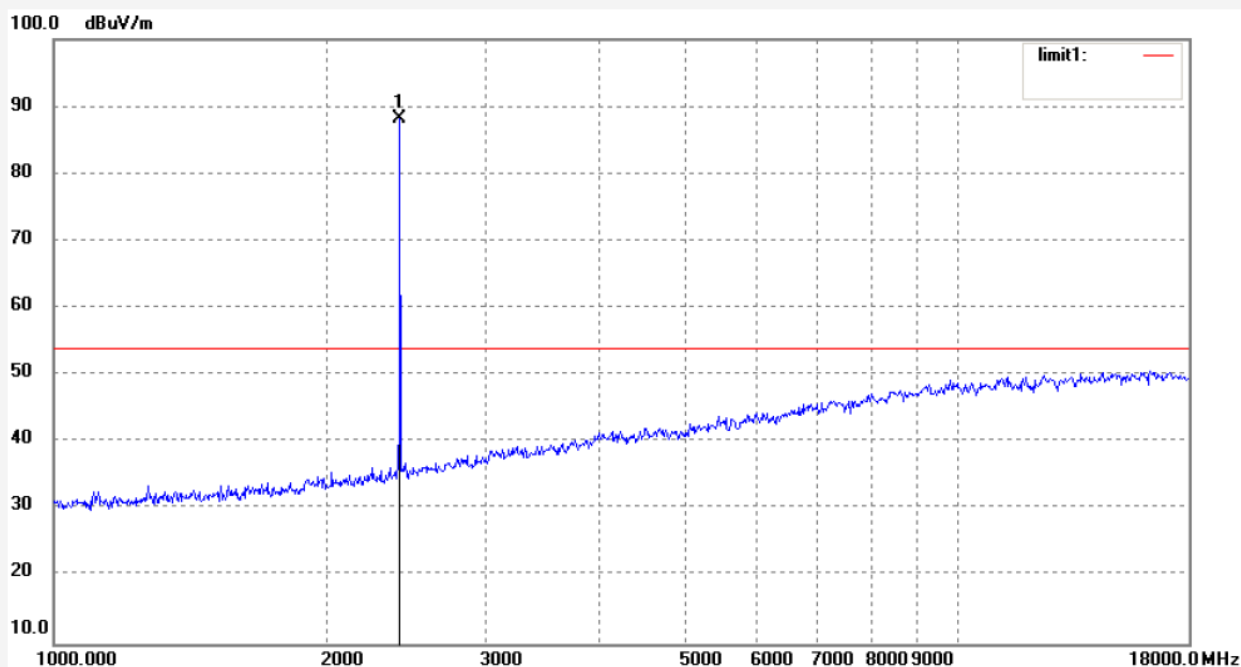
Date: 2016-5-24

Time: 0:56:37

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20160944



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2402.672       | 95.56               | -7.45          | 88.11              |                   |                | peak     |                |                  |        |



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Job No.: STAR2015 #1149

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2402MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Vertical

Power Source: DC 3.7V

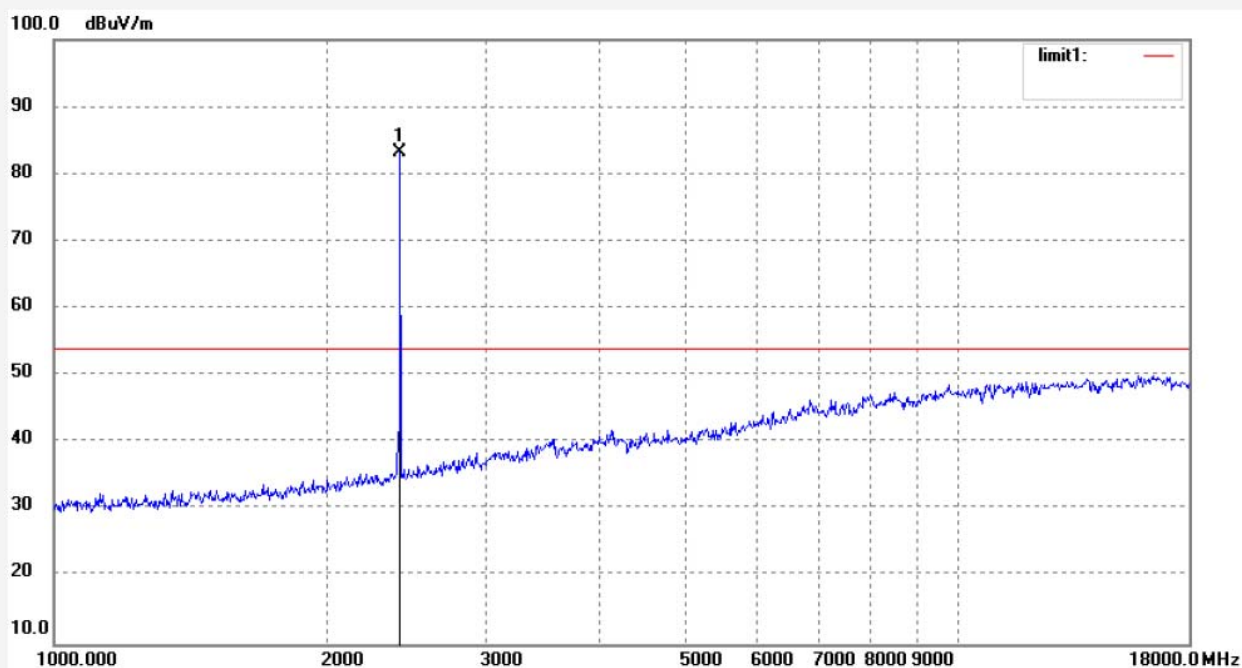
Date: 2016-5-24

Time: 0:54:51

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20160944



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2402.672       | 90.68               | -7.45          | 83.23              |                   |                | peak     |                |                  |        |

Job No.: STAR2015 #1151

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2441MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Horizontal

Power Source: DC 3.7V

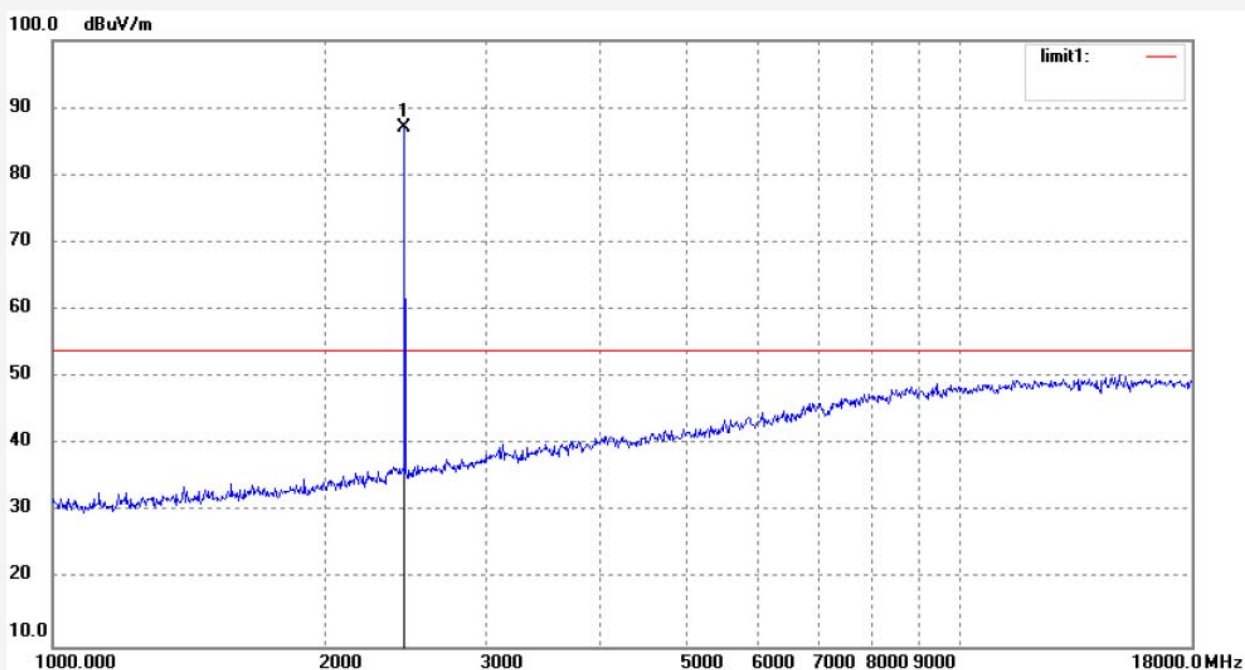
Date: 2016-5-24

Time: 0:59:17

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20160944



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2441.751       | 94.31               | -7.35          | 86.96              |                   |                | peak     |                |                  |        |



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Job No.: STAR2015 #1152

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2441MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Vertical

Power Source: DC 3.7V

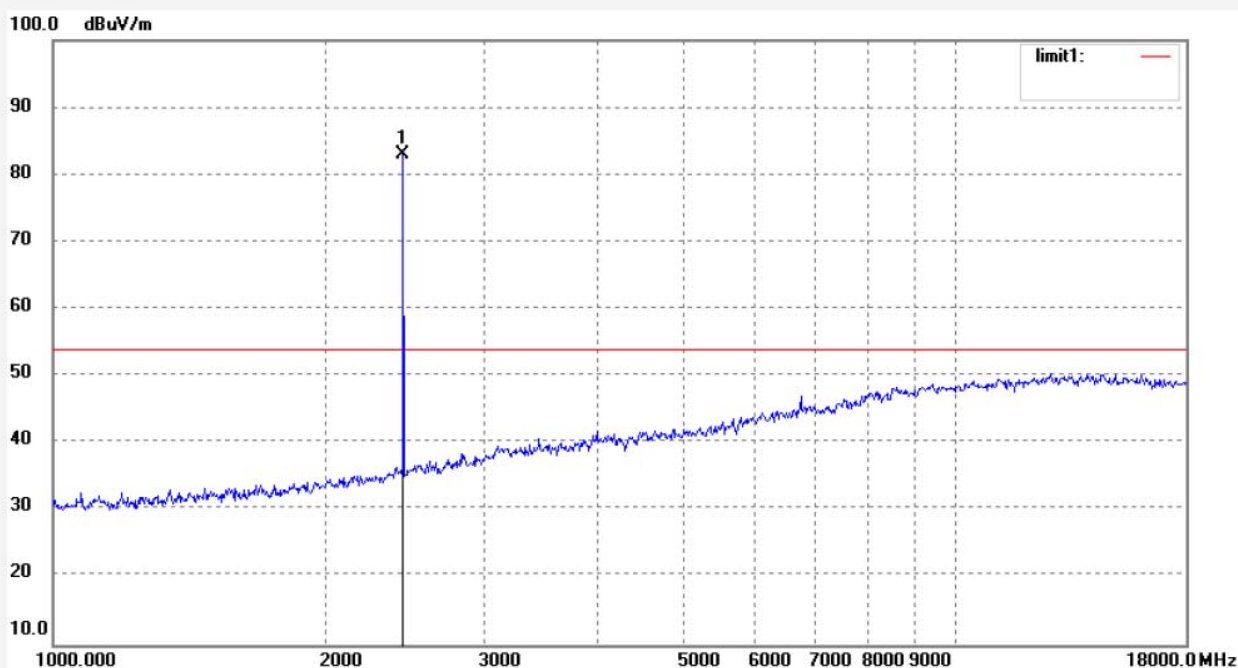
Date: 2016-5-24

Time: 1:01:35

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20160944



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2441.751    | 90.31            | -7.35       | 82.96           |                |             | peak     |             |               |        |



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Job No.: STAR2015 #1154

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2480MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Horizontal

Power Source: DC 3.7V

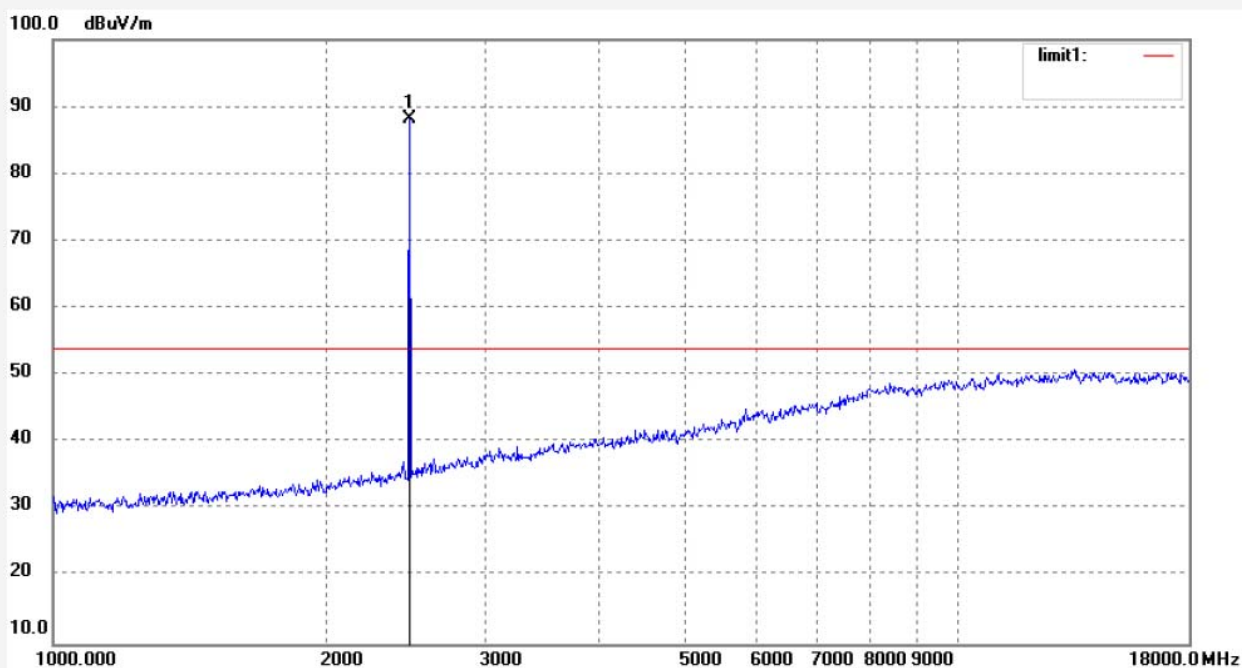
Date: 2016-5-24

Time: 1:05:16

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20160944



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2480.310       | 95.62               | -7.37          | 88.25              |                   |                | peak     |                |                  |        |

Job No.: STAR2015 #1153

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: RUGGED WIRELESS SPEAKER

Mode: TX 2480MHz

Model: CB-335088B

Manufacturer: CLEVER BRIGHT

Polarization: Vertical

Power Source: DC 3.7V

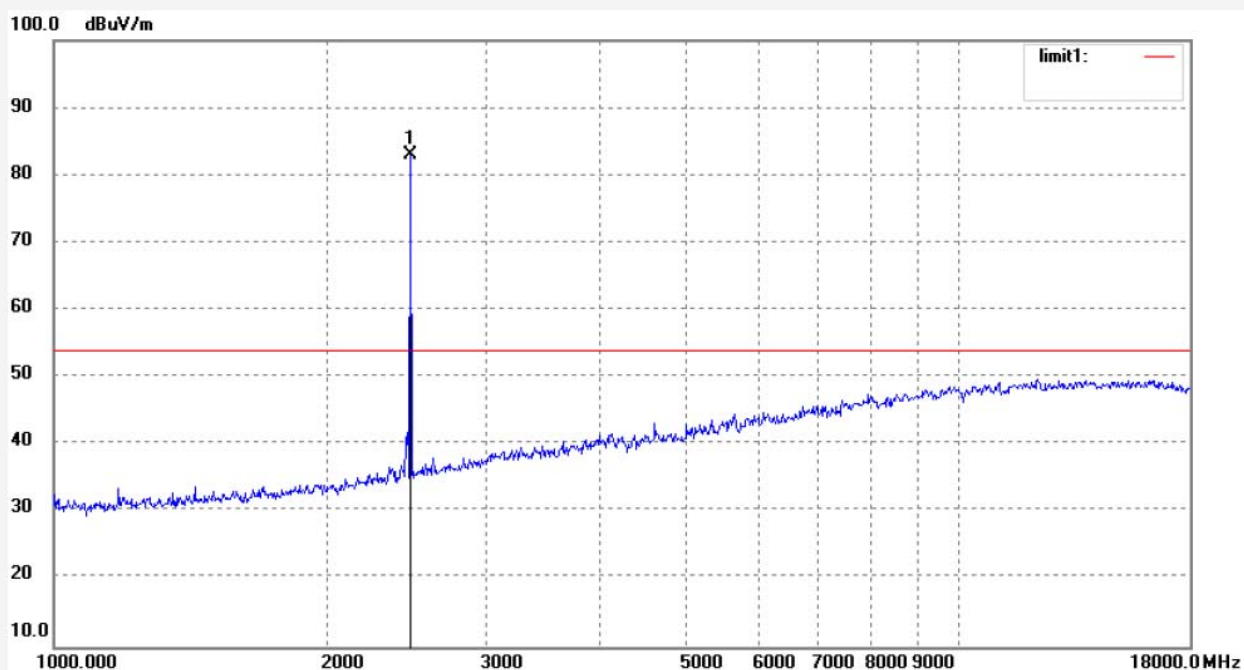
Date: 2016-5-24

Time: 1:03:25

Engineer Signature:

Distance: 3m

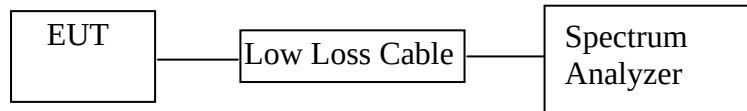
Note: Report NO.:ATE20160944



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2480.310       | 90.43               | -7.37          | 83.06              |                   |                | peak     |                |                  |        |

## 11.BAND EDGE COMPLIANCE TEST

### 11.1.Block Diagram of Test Setup



(EUT: RUGGED WIRELESS SPEAKER)

### 11.2.The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

### 11.3.EUT Configuration on Measurement

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

### 11.4.Operating Condition of EUT

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

11.4.2.Turn on the power of all equipment.

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

## 11.5. Test Procedure

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

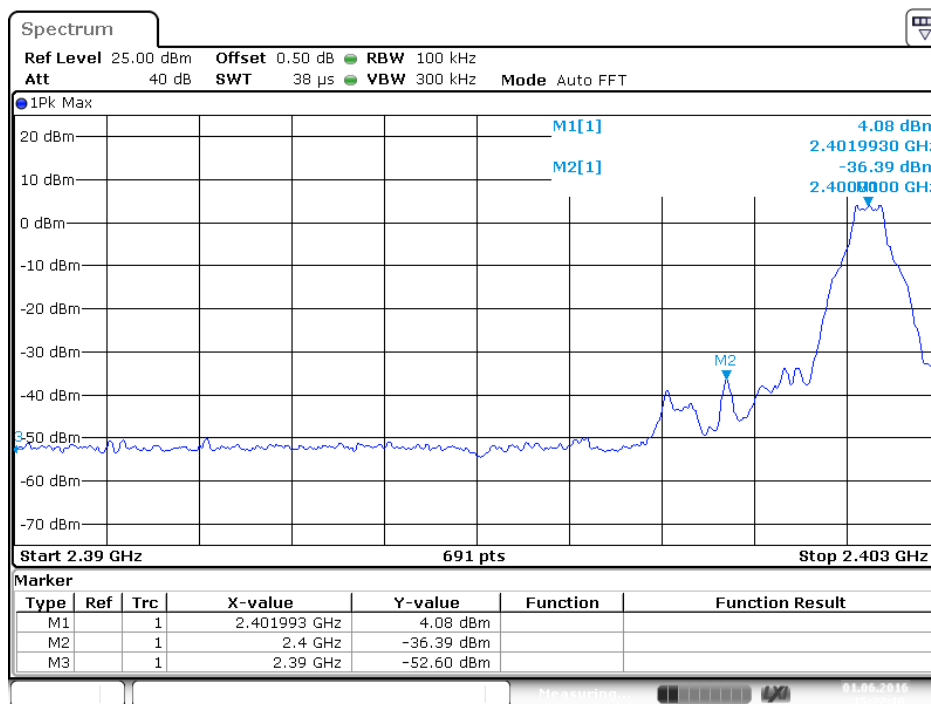
11.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

11.5.3. The band edges was measured and recorded.

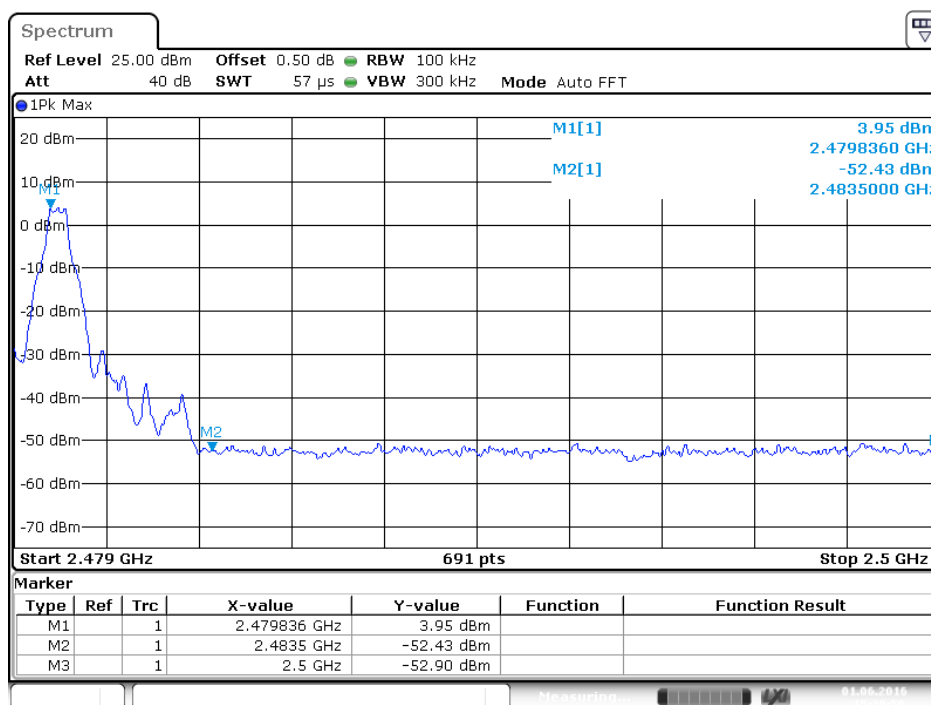
## 11.6. Test Result

| Frequency<br>(MHz) | Result of Band Edge<br>(dBc) | Limit of Band Edge<br>(dBc) |
|--------------------|------------------------------|-----------------------------|
| GFSK               |                              |                             |
| 2400.00            | 40.47                        | > 20dBc                     |
| 2483.50            | 56.38                        | > 20dBc                     |
| Π/4-DQPSK Mode     |                              |                             |
| 2400.00            | 33.86                        | > 20dBc                     |
| 2483.50            | 53.11                        | > 20dBc                     |
| 8DPSK              |                              |                             |
| 2400.00            | 34.13                        | > 20dBc                     |
| 2483.50            | 51.72                        | > 20dBc                     |

## GFSK

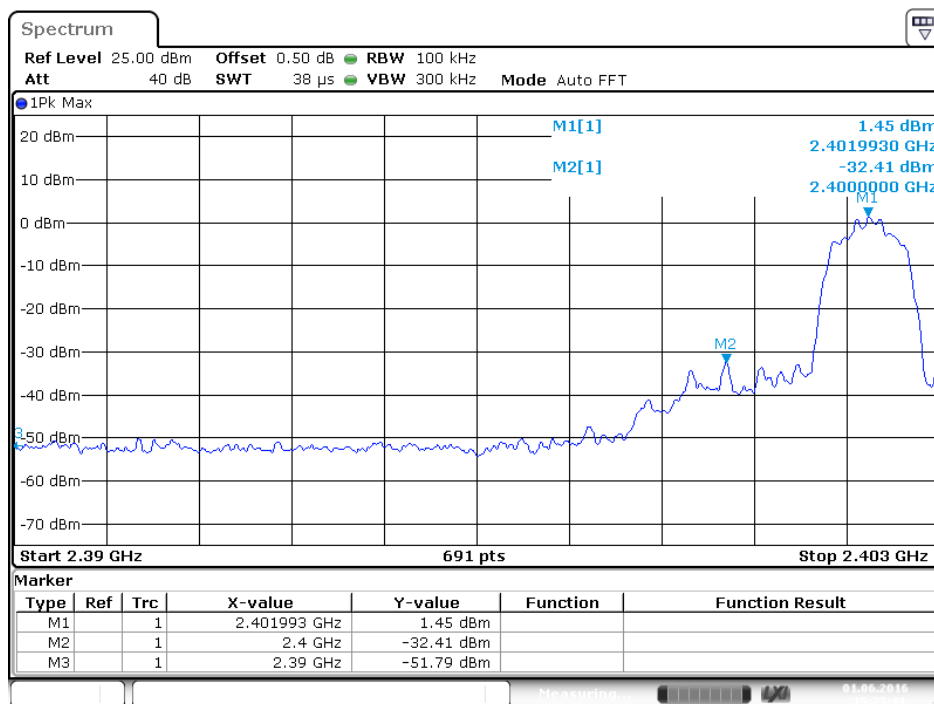


Date: 1.Jun.2016 15:22:10

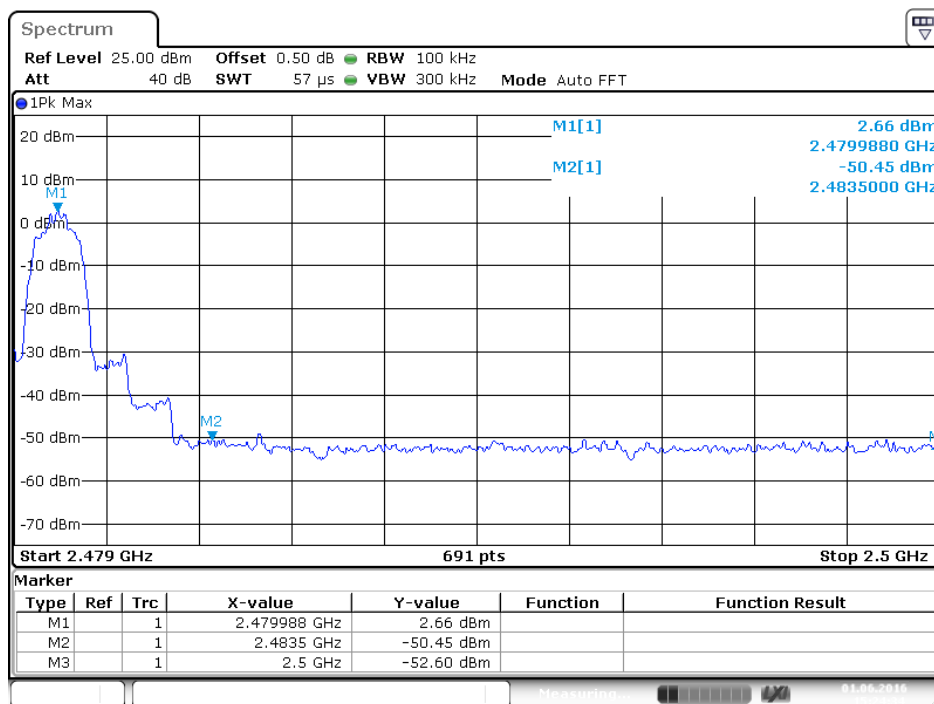


Date: 1.Jun.2016 15:20:58

## Π/4-DQPSK Mode



Date: 1.Jun.2016 15:23:44

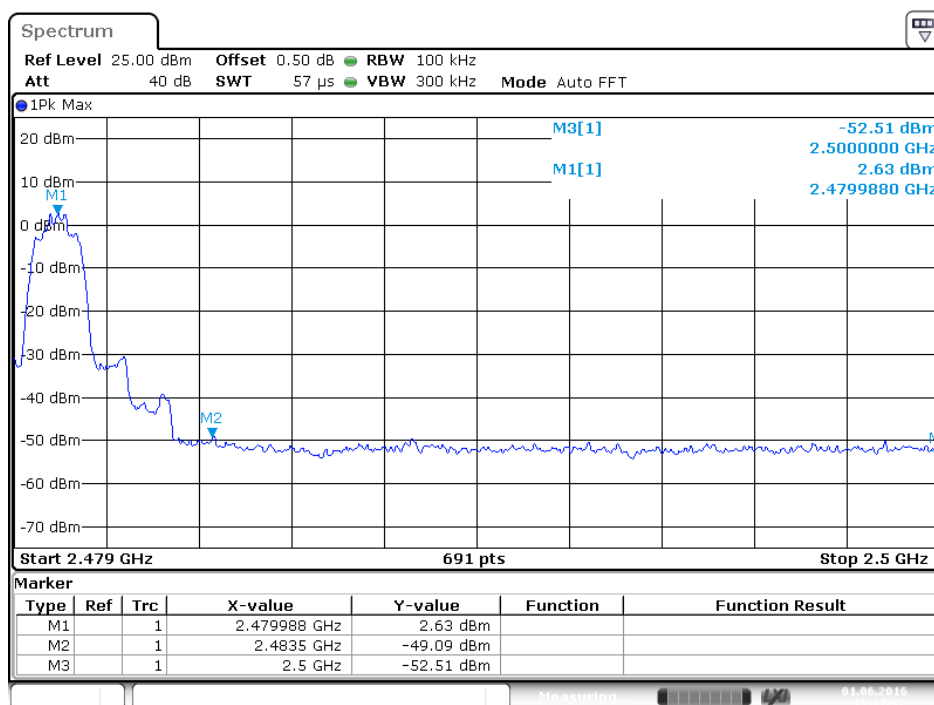


Date: 1.Jun.2016 15:24:34

## 8DPSK



Date: 1.Jun.2016 15:14:32



Date: 1.Jun.2016 15:17:54