

# TEST REPORT

of

**FCC Part 15 Subpart C §15.249****FCC ID : RVBXPG140T**

Equipment Under Test : 2.4GHz Wireless Presenter  
Model Name : XPG140T  
Serial No. : N/A  
Applicant : Chois Technology Co., Ltd.  
Manufacturer : Chois Technology Co., Ltd.  
Date of Test(s) : 2012.11.02 ~ 2012.11.09  
Date of Issue : 2012.11.26

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Date

2012. 11.26

Hyunchae You

Approved By:



Date

2012. 11.26

Feel Jeong

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## 1. General information

### 1.1 Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- Wireless Div. 3FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

Telephone : +82 31 428 5700

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### 1.2 Details of applicant

Applicant : Chois Technology Co., Ltd.

Address : 1102, Incheon, IT Tower, 592-5, Dowha-1dong, Namgu, Incheon, Korea

Contact Person : Nam, Sang-Hwan

Phone No. : +82 32 246 3404

### 1.3. Description of EUT

|                             |                             |
|-----------------------------|-----------------------------|
| <b>Kind of Product</b>      | 2.4GHz Wireless Presenter   |
| <b>Model Name</b>           | XPG140T                     |
| <b>Serial Number</b>        | N/A                         |
| <b>Power Supply</b>         | DC 3 V (Battery type)       |
| <b>Frequency Range</b>      | 2 430 MHz ~ 2 460 MHz       |
| <b>Modulation Technique</b> | GFSK                        |
| <b>Number of Channels</b>   | 31(Channel spacing : 1 MHz) |
| <b>Antenna Type</b>         | PCB Antenna                 |

### 1.4 Details of modification

-N/A

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## 1.5. Test equipment list

| Equipment         | Manufacturer                  | Model                                  | S/N           | Cal Date      | Cal Interval | Cal Due.      |
|-------------------|-------------------------------|--|---------------|---------------|--------------|---------------|
| Signal Generator  | R&S                           | SMR40                                  | 100540        | Jan, 05, 2012 | Annual       | Jan, 05, 2013 |
| Spectrum Analyzer | R&S                           | FSV30                                  | 101004        | Jul. 05, 2012 | Annual       | Jul. 05, 2013 |
| Attenuator        | Mini-Circuits                 | BW-N20W5+                              | 0950-4        | Mar. 30, 2012 | Annual       | Mar. 30, 2013 |
| High Pass Filter  | Wainwright                    | WHK3.0/18G-6SS                         | 4             | Aug. 01, 2012 | Annual       | Aug. 01, 2013 |
| Low Pass Filter   | Mini circuits                 | NLP-1200+                              | V9500401023-1 | Aug. 01, 2012 | Annual       | Aug. 01, 2013 |
| DC Power Supply   | Agilent                       | U8002A                                 | MY50020026    | Mar. 29, 2012 | Annual       | Mar. 29, 2013 |
| Preamplifier      | R & S                         | 8447D                                  | 1726A01265    | Sep. 14, 2012 | Annual       | Sep. 14, 2013 |
| Preamplifier      | R & S                         | SCU 18                                 | 10070         | Aug. 06, 2012 | Annual       | Aug. 06, 2013 |
| Preamplifier      | MITEQ Inc.                    | JS44-18004000-35-8P                    | 1546891       | Jul. 04, 2012 | Annual       | Jul. 04, 2013 |
| Test Receiver     | R & S                         | ESU40                                  | 100075        | Feb. 13, 2012 | Annual       | Feb. 13, 2013 |
| Bilog Antenna     | SCHWARZBECK                   | VULB9163                               | 9163-437      | Oct. 04, 2012 | Biennial     | Oct. 04, 2013 |
| Horn Antenna      | R&S                           | HF907                                  | 100208        | Aug. 13, 2012 | Biennial     | Aug. 13, 2014 |
| Horn Antenna      | SCHWARZBECK<br>MESSELEKTRONIK | BBHA9170                               | BBHA9170431   | May 15, 2012  | Biennial     | May 15, 2014  |
| Antenna Master    | INN-CO                        | MA4000-EP                              | N/A           | N.C.R         | N/A          | N.C.R.        |
| Turn Table        | INN-CO                        | DT-3000S                               | N/A           | N.C.R         | N/A          | N.C.R.        |
| Anechoic Chamber  | SY Corporation                | L x W x H<br>(21.5 m x 13.0 m x 9.0 m) | N/A           | N.C.R         | N/A          | N.C.R.        |

## 1.6. Support equipment

| Equipment | Manufacturer | Model name | S/N |
|-----------|--------------|------------|-----|
| -         | -            | -          | -   |

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## 1.6. Summary of test results

The EUT has been tested according to the following specifications:

| Applied Standard : FCC Part15, Subpart C      |  |          |
|---|--|----------|
| Standard Section                              | Test Item  | Result   |
| 15.209(a)<br>15.249(a)<br>15.249(d)<br>15.205 | Fundamental, Spurious emission and edge band radiated emission | Complied |

## 1.7. Test report revision

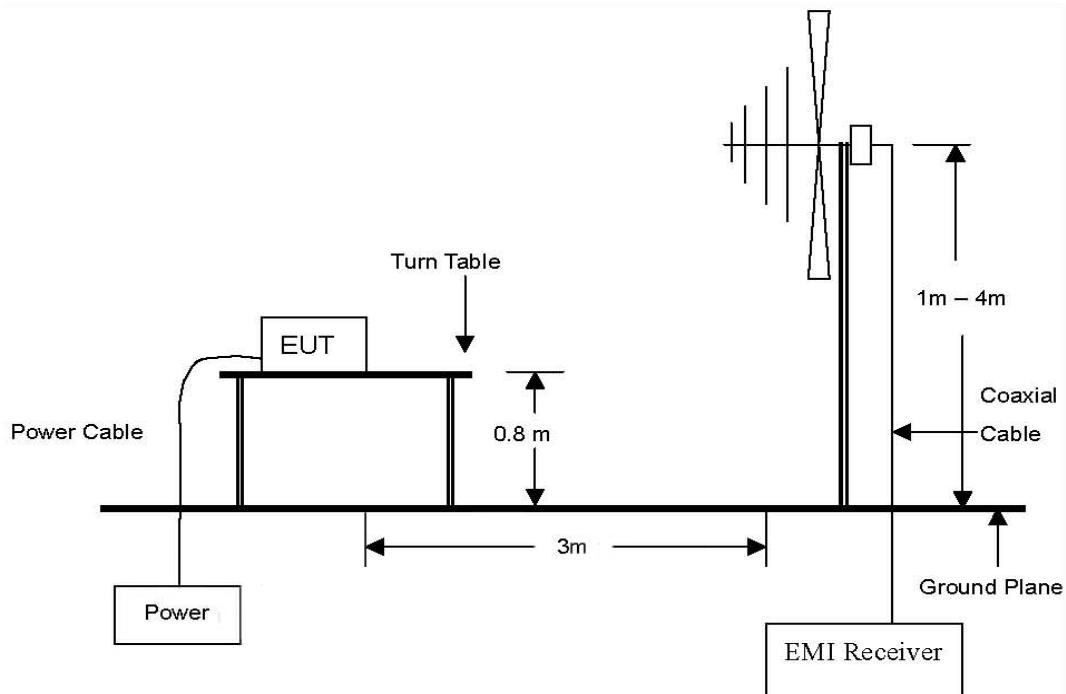
| Revision | Report number          | Description               |
|----------|------------------------|---------------------------|
| 0        | F690501/RF-RTL005965   | Initial                   |
| 1        | F690501/RF-RTL005965-1 | Revised channel number    |
| 2        | F690501/RF-RTL005965-2 | Add the mximum duty cycle |

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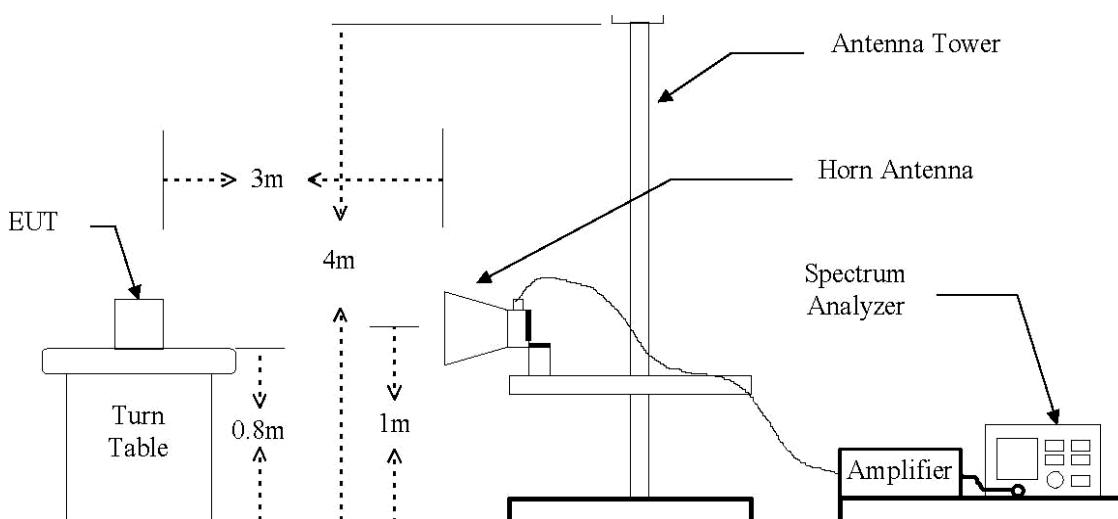
## 2. Fundamental, Spurious emission and edge band radiated emission

### 2.1. Test setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission .The spurious emissions were investigated from 1 GHz to the 10th harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.



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## 2.2. Test procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic Chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission above 1 GHz, the EUT was set 3 meter away from the interference-receiving antenna.
3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Note :

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1 GHz.
3. If the device does not transmit continuously then video bandwidth is 1/T (period) to ensure they are not over averaging

## 2.3. Limit

In the section 15.249(a) :

Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of fundamental (mV/m) | Field strength of harmonics (μV/m) |
|-----------------------|--------------------------------------|------------------------------------|
| 902 ~ 928 MHz         | 50                                   | 500                                |
| 2 400 ~ 2 483.5 MHz   | 50                                   | 500                                |
| 5 725 ~ 5 875 MHz     | 50                                   | 500                                |
| 24.0 ~ 24.25 GHz      | 250                                  | 2 500                              |

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Fundamental frequency (MHz) | Field strength (μV/m) | Measurement distance (m) |
|-----------------------------|-----------------------|--------------------------|
| 30 ~ 88                     | 100*                  | 3                        |
| 88 ~ 216                    | 150*                  | 3                        |
| 216 ~ 960                   | 200*                  | 3                        |
| Above 960                   | 500                   | 3                        |

Remark:

Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

In the above emission table, the tighter limit applies at the band edges.

| Fundamental frequency (MHz) | Field strength (μV/m at 3 meter) | Field strength (dBμV/m at 3 meter) |
|-----------------------------|----------------------------------|------------------------------------|
| 30 ~ 88                     | 100                              | 40                                 |
| 88 ~ 216                    | 150                              | 43.5                               |
| 216 ~ 960                   | 200                              | 46                                 |
| Above 960                   | 500                              | 54                                 |

## 2.4. Test result

Ambient temperature :  $(24 \pm 2)^\circ\text{C}$   
Relative humidity : 47 % R.H.

### 2.4.1. Below 1 GHz

The frequency spectrum from 30 MHz to 1000 MHz was investigated. Emission levels are not reported much lower than the limits by over 30 dB. All reading values are peak values.

| Radiated Emissions |                      |             | Ant  | Correction Factors |               | Total                 | FCC Limit            |             |
|--------------------|----------------------|-------------|------|--------------------|---------------|-----------------------|----------------------|-------------|
| Frequency (MHz)    | Reading (dB $\mu$ V) | Detect Mode | Pol. | AF (dB/m)          | AMP + CL (dB) | Actual (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
| Below 1 000.00     | Not detected         | -           | -    |                    |               |                       |                      |             |

#### Remark

1. To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes. XZ plane is worst case.
2. All spurious emission at channels are almost the same below 1 GHz, so that the channel was chosen at representative in final test.

**2.4.2. Above 1 GHz**

## A. Low Channel (2 430 MHz)

| Radiated Emissions |                      |             | Ant  | Correction Factors |             | Total                 | FCC Limit            |             |
|--------------------|----------------------|-------------|------|--------------------|-------------|-----------------------|----------------------|-------------|
| Frequency (MHz)    | Reading (dB $\mu$ V) | Detect Mode | Pol. | AF (dB/m)          | CL (dB)     | Actual (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
| 2 430.00           | 59.60                | Peak        | V    | 29.43              | 8.99        | 98.02                 | 114.00               | 15.98       |
| 2 430.00           | 42.08                | Average     | V    | 29.43              | 8.99        | 80.50                 | 94.00                | 13.50       |
| *2 390.00          | 28.89                | Peak        | V    | 29.34              | 8.87        | 67.10                 | 74.00                | 6.90        |
| *2 390.00          | 6.20                 | Average     | V    | 29.34              | 8.87        | 44.41                 | 54.00                | 9.59        |
| Radiated Emissions |                      |             | Ant  | Correction Factors |             | Total                 | FCC Limit            |             |
| Frequency (MHz)    | Reading (dB $\mu$ N) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dB $\mu$ N/m) | Limit (dB $\mu$ N/m) | Margin (dB) |
| *4 859.26          | 55.65                | Peak        | V    | 34.12              | -30.14      | 59.63                 | 74.00                | 14.37       |
| *4 859.26          | 42.93                | Average     | V    | 34.12              | -30.14      | 46.91                 | 54.00                | 7.09        |
| *7 289.57          | 45.75                | Peak        | V    | 35.67              | -26.43      | 54.99                 | 74.00                | 19.01       |
| *7 289.57          | 34.23                | Average     | V    | 35.67              | -26.43      | 43.47                 | 54.00                | 10.53       |
| Above 7 300.00     | Not Detected         | -           | -    | -                  | -           | -                     | -                    | -           |

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## B. Middle Channel (2 445 MHz)

| Radiated Emissions |                      |             | Ant  | Correction Factors |             | Total                 | FCC Limit            |             |
|--------------------|----------------------|-------------|------|--------------------|-------------|-----------------------|----------------------|-------------|
| Frequency (MHz)    | Reading (dB $\mu$ N) | Detect Mode | Pol. | AF (dB/m)          | CL (dB)     | Actual (dB $\mu$ N/m) | Limit (dB $\mu$ N/m) | Margin (dB) |
| 2 445.00           | 58.95                | Peak        | V    | 29.47              | 9.04        | 97.46                 | 114.00               | 16.54       |
| 2 445.00           | 41.55                | Average     | V    | 29.47              | 9.04        | 80.06                 | 94.00                | 13.94       |
| Radiated Emissions |                      |             | Ant  | Correction Factors |             | Total                 | FCC Limit            |             |
| Frequency (MHz)    | Reading (dB $\mu$ N) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dB $\mu$ N/m) | Limit (dB $\mu$ N/m) | Margin (dB) |
| *4 897.64          | 55.12                | Peak        | V    | 34.17              | -30.26      | 59.03                 | 74.00                | 14.97       |
| *4 897.64          | 42.70                | Average     | V    | 34.17              | -30.26      | 46.61                 | 54.00                | 7.39        |
| *7 348.36          | 45.21                | Peak        | V    | 35.71              | -26.34      | 54.58                 | 74.00                | 19.42       |
| *7 348.36          | 34.08                | Average     | V    | 35.71              | -26.34      | 43.45                 | 54.00                | 10.55       |
| Above 7 400.00     | Not Detected         | -           | -    | -                  | -           | -                     | -                    | -           |

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## C. High Channel (2 460 MHz)

| Radiated Emissions |                      |             | Ant  | Correction Factors |             | Total                 | FCC Limit            |             |
|--------------------|----------------------|-------------|------|--------------------|-------------|-----------------------|----------------------|-------------|
| Frequency (MHz)    | Reading (dB $\mu$ V) | Detect Mode | Pol. | AF (dB/m)          | CL (dB)     | Actual (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
| 2 460.00           | 58.32                | Peak        | V    | 29.50              | 9.08        | 96.90                 | 114.00               | 17.10       |
| 2 460.00           | 41.48                | Average     | V    | 29.50              | 9.08        | 80.06                 | 94.00                | 13.94       |
| *2 483.50          | 17.61                | Peak        | V    | 29.56              | 9.15        | 56.32                 | 74.00                | 17.68       |
| *2 483.50          | 5.54                 | Average     | V    | 29.56              | 9.15        | 44.25                 | 54.00                | 9.75        |
| Radiated Emissions |                      |             | Ant  | Correction Factors |             | Total                 | FCC Limit            |             |
| Frequency (MHz)    | Reading (dB $\mu$ V) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
| *4 922.65          | 54.14                | Peak        | V    | 34.20              | -30.35      | 57.99                 | 74.00                | 16.01       |
| *4 922.65          | 41.12                | Average     | V    | 34.20              | -30.35      | 44.97                 | 54.00                | 9.03        |
| *7 379.96          | 44.43                | Peak        | V    | 35.73              | -26.29      | 53.87                 | 74.00                | 20.13       |
| *7 379.96          | 33.65                | Average     | V    | 35.73              | -26.29      | 43.09                 | 54.00                | 10.91       |
| Above 5 000.00     | Not Detected         | -           | -    | -                  | -           | -                     | -                    | -           |

**Remarks :**

- “\*” means the restricted band.
- To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes. XZ plane is worst case
- Measuring frequencies from 1 GHz to the 10<sup>th</sup> harmonic of highest fundamental Frequency.
- Radiated emissions measured in frequency above 1 000 MHz were made with an instrument using peak/average detector mode.
- Average test would be performed if the peak result were greater than the average limit.
- Actual = Reading + AF - Amp Gain + CL
- This EUT is tested by maximum duty cycle

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### 3. Bandwidth of operation frequency

#### 3.1. Test setup



#### 3.2. Limit

None; for reporting purpose only

#### 3.3. Test procedure

1. The transmitter output is connected to the spectrum analyzer.
2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using RBW=10 kHz, VBW=10 kHz and Span=3 MHz.

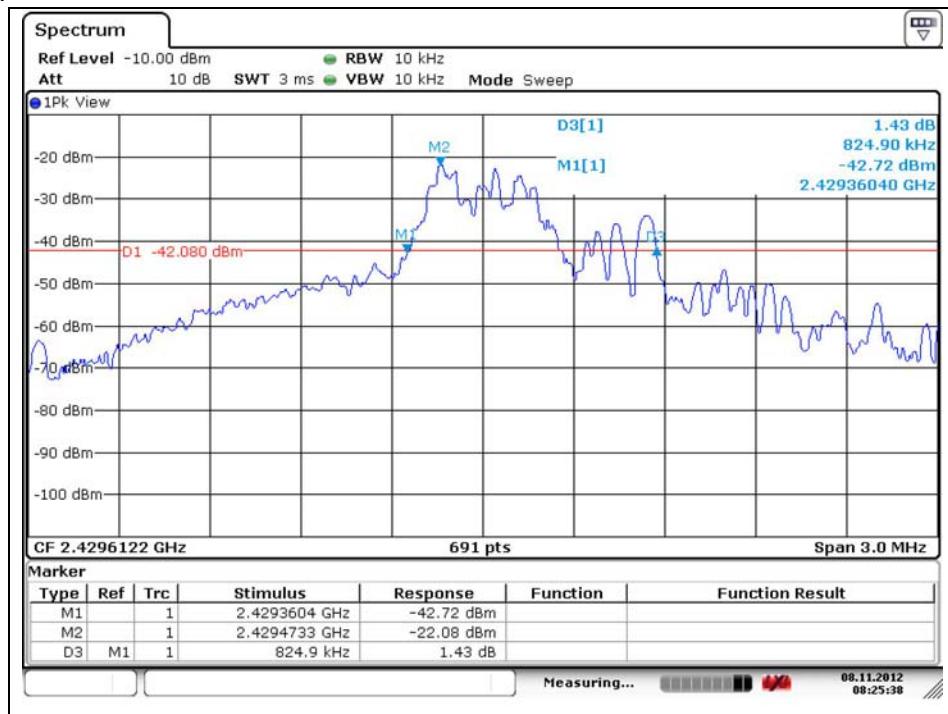
### 3.4. Test result

Ambient temperature :  $(24 \pm 2)^\circ\text{C}$

Relative humidity : 47 % R.H.

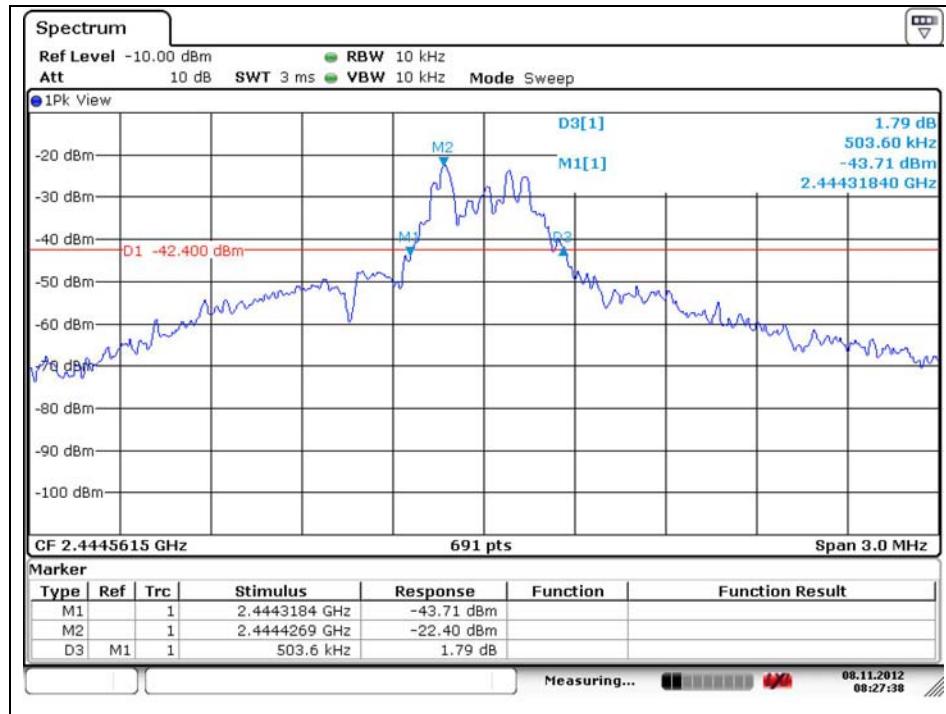
| Channel | 20 dB Bandwidth (kHz) |
|---------|-----------------------|
| Low     | 824.90                |
| Middle  | 503.60                |
| High    | 755.40                |

Low channel

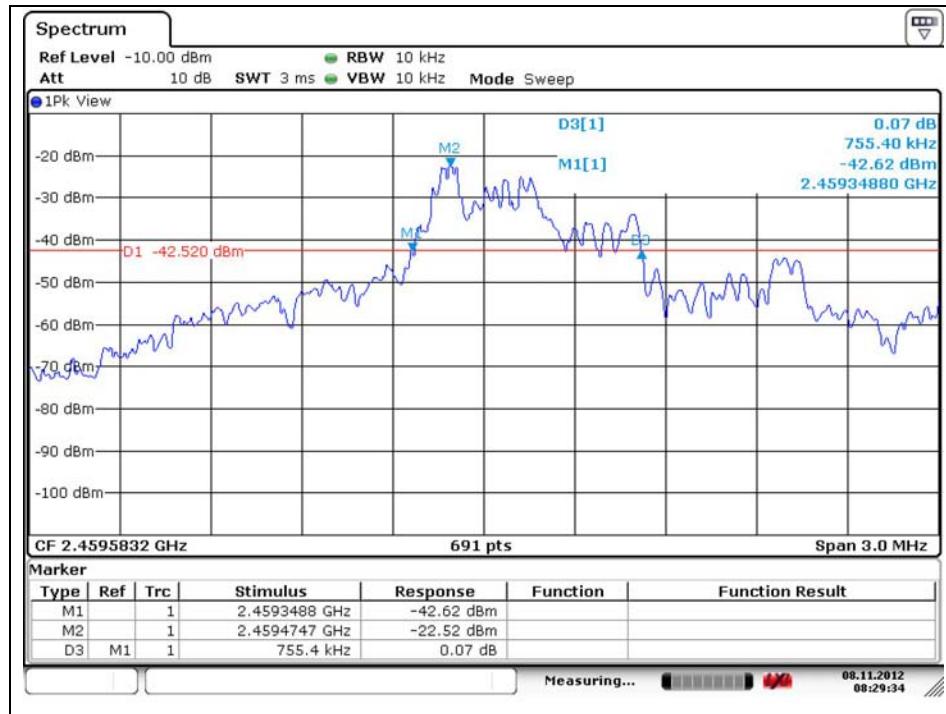


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## Middle channel



## High channel



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