



# CMA Testing and Certification Laboratories

廠商會檢定中心

## TEST REPORT

Report No. : AY0030168(7)-R1 Date : 15 Jul 2019

Application No. : LY014803(5)

Applicant : Kidztech Toys Manufacturing Ltd  
Room 802, 8/F, Inter Continental Plaza,  
94 Granville Road, TST East, Kowloon, HK

Sample Description : One(1) item of submitted sample stated to be:

| Sample Description           | Model No. |
|------------------------------|-----------|
| 1/10 R/C Yamaha YXZ1000R ATV | 84555     |

Radio Frequency : 2410MHz – 2475MHz Transmitter  
Rating : 2 x 1.5V AAA size batteries (For Remote)  
No. of submitted sample : One (1) piece (s)  
Sample registration No. : RY008983-001

Date Received : 17 May 2019.

Test Period : 17 May 2019 – 31 May 2019.

Test Requested : FCC 47CFR Part 15 Certification

Test Method : 47 CFR Part 15 (10-1-17 Edition)  
ANSI C63.10 – 2013  
ANSI C63.4 – 2014

Test Result : See attached sheet(s) from page 2 to 19.

Conclusion : The submitted sample was found to comply with requirement of FCC 47CFR Part 15 Subpart C, section 15.249.

Remark : This report supersedes the report no. AY0030168(7), dated on 10 Jun 2019

For and on behalf of  
CMA Industrial Development Foundation Limited

Authorized Signature : \_\_\_\_\_

Mr. WONG Lap-pong, Andrew  
Manager

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CMA Industrial Development Foundation Limited

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### 1 General Information

#### 1.1 General Description

The equipment under test (EUT) is a controller of 2.4GHz wireless remote car 1/10 R/C Yamaha YXZ1000R ATV.

It is powered by 2 x 1.5V AAA size batteries, and the radio transmission frequency band is 2410 - 2475MHz. An Accelerator Trigger and Steering wheel are responsible to given Forward, Backward, Turn Left and Turn Right control command to receiver.

The radio transmissions and digital modulation are controlled by IC SR080, and the oscillation frequency is 12MHz generated by crystal.

A non-replaceable intergraded antenna is used in EUT and the radio transmission power are un-adjustable.

The brief circuit description is listed as follows:

- U1 and its associated circuit act as radio transmissions and digital modulation controller.
- Y1 and its associated circuit act as 12MHz crystal for IC SR080.
- L1,C2 and its associated circuit act as RF filter and matching network.



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### 1.2 Location of the test site

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2014. A Semi-Anechoic Chamber Testing Site is set up for investigation and located at:

Ground Floor, Yan Hing Centre,  
9 – 13 Wong Chuk Yeung Street,  
Fo Tan, Shatin,  
New Territories,  
Hong Kong.

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2014. A shielded room is located at :

Ground Floor, Yan Hing Centre,  
9 – 13 Wong Chuk Yeung Street,  
Fo Tan, Shatin,  
New Territories,  
Hong Kong.

FCC Accredited Lab (Designation Number: HK0004)  
Conformity Assessment Body Identifier (CABID: HK0002)



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### 1.3 List of measuring equipment

| Equipment                          | Manufacturer     | Model No.              | Serial No.      | Calibration Due Date | Calibration Period |
|------------------------------------|------------------|------------------------|-----------------|----------------------|--------------------|
| EMI Test Receiver                  | Rohde & Schwarz  | ESCI                   | 100152          | 31 May 2020          | 1Year              |
| Spectrum Analyzer                  | Rohde & Schwarz  | FSV40                  | 100964          | 11 Sep 2019          | 1Year              |
| Loop Antenna                       | EMCO             | 6502                   | 00056620        | 29 Oct 2020          | 2Years             |
| Biconical Antenna                  | Rohde & Schwarz  | HK116                  | 837414/004      | 08 Oct 2020          | 2Years             |
| Log Periodic Antenna               | TESEQ            | UPA6109                | 43666           | 08 Oct 2019          | 2Years             |
| Horn Antenna                       | Schwarzbeck      | BBHA9120D              | 9120D531        | 21 Dec 2019          | 1Year              |
| Pre-amplifier                      | Schwarzbeck      | BBV9718                | 9718-119        | 21 Dec 2019          | 1Year              |
| High-pass Filter                   | Trilithic Inc    | 6HC3000/18<br>000-3-KK | 200720014       | 21 Dec 2019          | 1Year              |
| Horn Antenna                       | Schwarzbeck      | BBHA9170               | BBHA9170<br>442 | 24 Aug 2019          | 2Years             |
| Pre-amplifier                      | Schwarzbeck      | BBHA9719               | 9719-010        | 23 Aug 2019          | 2Years             |
| Coaxial Cable                      | Humber+Suhner    | RG 213/U               | N/A             | 08 May 2020          | 1Year              |
| Coaxial Cable                      | Humber+Suhner    | RG 214/U               | N/A             | 08 May 2020          | 1Year              |
| RF cable With 11 N-47<br>connector | HUBER+SUHN<br>ER | -                      | MY24201/4       | 22 Jan 2020          | 2Years             |
| RF cable with PC2.4<br>connectors  | HUBER+SUHN<br>ER | -                      | MY3432/2        | 22 Jan 2020          | 2Years             |



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### 1.4 Measurement Uncertainty

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%.

#### Radiated emissions

| Frequency                     | Uncertainty ( $U_{lab}$ ) |
|-------------------------------|---------------------------|
| 30MHz ~ 200MHz (Horizontal)   | 4.59dB                    |
| 30MHz ~ 200MHz (Vertical)     | 4.49dB                    |
| 200MHz ~ 1000MHz (Horizontal) | 4.94dB                    |
| 200MHz ~ 1000MHz (Vertical)   | 4.97dB                    |
| 1GHz ~ 6GHz                   | 4.52dB                    |
| 6GHz ~ 18GHz                  | 4.58dB                    |
| 18GHz ~ 40GHz                 | 4.80dB                    |

### 1.5 Test Summary

| TEST ITEM                         | FCC REFERENCE | RESULT |
|-----------------------------------|---------------|--------|
| Fundamental and harmonic emission | 15.249(a)     | Comply |
| Out-band emission                 | 15.249(d)     | Comply |
| Peak Limit                        | 15.249(e)     | Comply |
| Bandwidth                         | 15.215(c)     | Comply |

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### 2 Description of the radiated emission test

#### 2.1 Test Procedure

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013.

A non-conductive turntable with dimensions of 1.5m x 0.4m x 0.8m (L x W x H) placed above the reference ground plane. The equipment under test (EUT) was placed at 0.8m height for below 1GHz measurement and 1.5m height for above 1GHz measurement. The test distance is 3m between EUT and receiving antenna. A broadband antenna mounting on the mast received the signal strength. The turntable was rotated to maximize the emission level. The antenna was moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated. Additional absorbing material will be placed between the EUT and receiving antenna for above 1GHz measurement.

For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1 m above the ground.

The device was rotated through three orthogonal axes to determine which attitude and configuration produce the highest emission during measurement.



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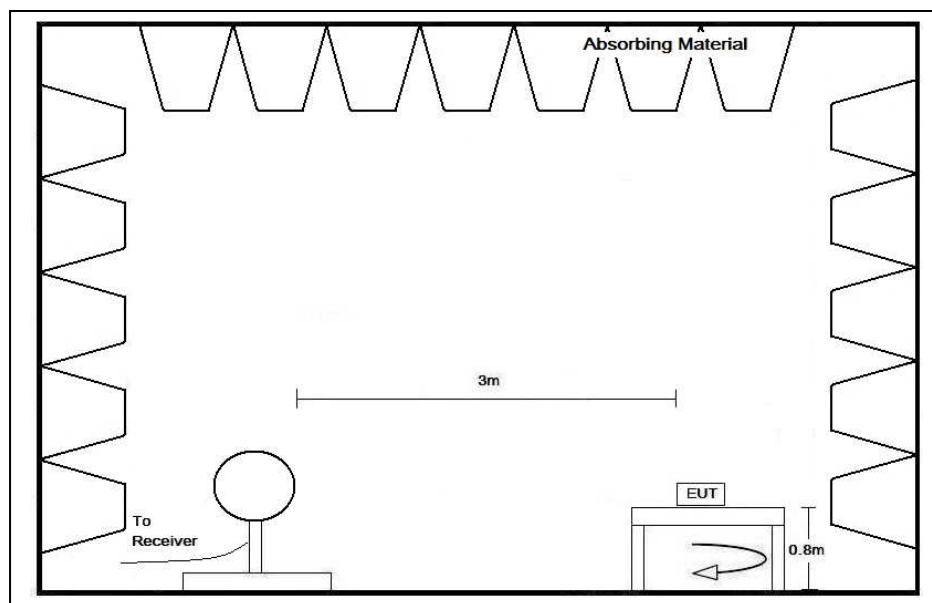
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## TEST REPORT

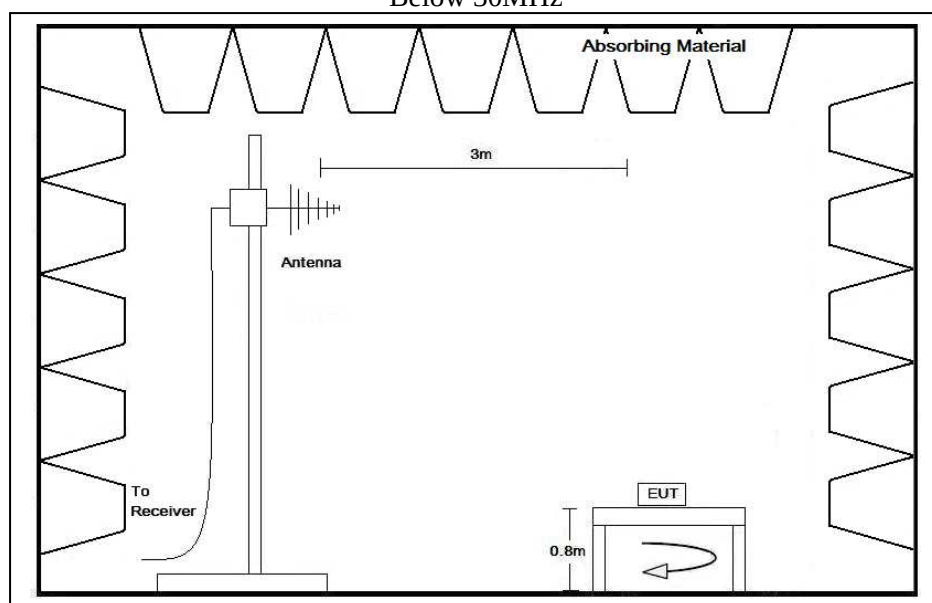
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### 2.2 Test Setup



Below 30MHz



30MHz – 1GHz

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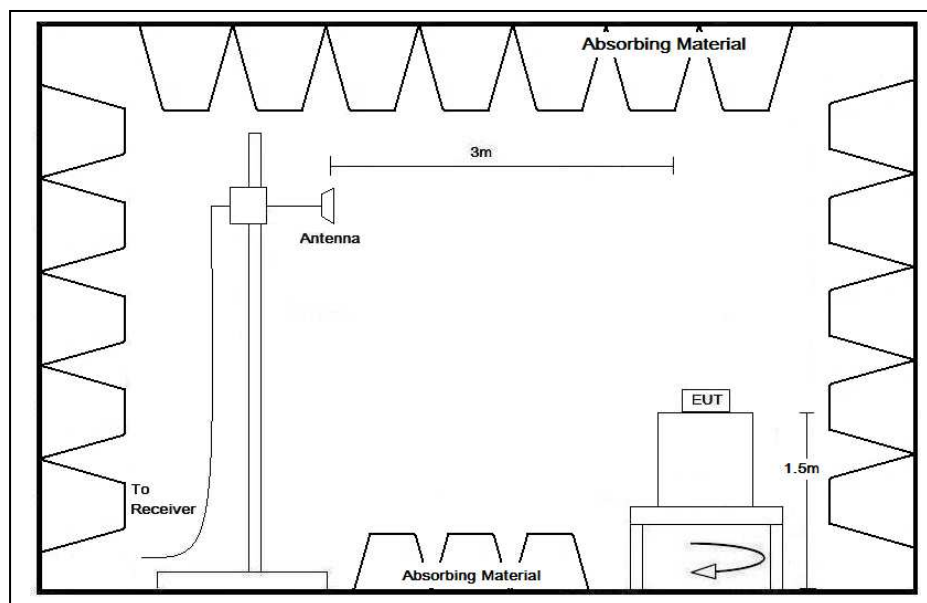
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### 2.2 Test Setup



Above 1GHz

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### 2.3 Test Result

Peak Detector data was measured unless otherwise stated.

The radiated emissions are measured from 9kHz to 26GHz (the tenth harmonics)

The worst case configuration is shown on the worst case configuration of test setup photo.

The frequencies from fundamental up to tenth harmonics were investigated, and emissions more 20dB below limit were not reported. Thus, those highest emissions were presented in next pages.

The EUT has been tested in Transmission mode.

It was found that the EUT meet the FCC requirement.



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### 2.4 Radiated Emission Measurement Data

#### Radiated emission

##### Environmental conditions:

| Parameter            | Recorded value |     |
|----------------------|----------------|-----|
| Ambient temperature: | 24.5           | ° C |
| Relative humidity:   | 69.2           | %   |

Channel: 2410MHz

| Polarization | Frequency (MHz)       | Reading at 3m (dBμV) | Antenna Factor and Cable Loss (dB/m) | Field Strength at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) | Detector Type |
|--------------|-----------------------|----------------------|--------------------------------------|-------------------------------|----------------------|-------------|---------------|
| V            | 2410.371              | 105.7                | -4.6                                 | 101.1                         | 114.0                | -12.9       | Peak          |
| V            | 2409.990              | 87.2                 | -4.6                                 | 82.6                          | 94.0                 | -11.4       | Average       |
| V            | 4820.633 <sup>1</sup> | 44.3                 | 3.2                                  | 47.5                          | 54.0                 | -6.5        | Peak          |
| V            | 7230.844              | 50.7                 | 10.4                                 | 61.1                          | 74.0                 | -12.9       | Peak          |
| V            | 7229.210              | 31.2                 | 10.4                                 | 41.6                          | 54.0                 | -12.4       | Average       |
| V            | 9638.931 <sup>1</sup> | 36.4                 | 13.7                                 | 50.1                          | 54.0                 | -3.9        | Peak          |

Remark: 1) The peak value of emission 4820.633MHz, and 9638.931MHz are below the average limit, so no average measurement is performed.



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Channel: 2440 MHz

| Polarization | Frequency (MHz)       | Reading at 3m (dBμV) | Antenna Factor and Cable Loss (dB/m) | Field Strength at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) | Detector Type |
|--------------|-----------------------|----------------------|--------------------------------------|-------------------------------|----------------------|-------------|---------------|
| H            | 2440.036              | 106.5                | -4.6                                 | 101.9                         | 114.0                | -12.1       | Peak          |
| H            | 2440.014              | 87.9                 | -4.6                                 | 83.3                          | 94.0                 | -10.7       | Average       |
| H            | 4880.034 <sup>1</sup> | 45.1                 | 3.2                                  | 48.3                          | 74.0                 | -25.7       | Peak          |
| V            | 7230.844              | 50.7                 | 10.4                                 | 61.1                          | 54.0                 | -2.9        | Peak          |
| V            | 7229.210              | 31.2                 | 10.4                                 | 41.6                          | 54.0                 | -12.4       | Average       |
| V            | 9676.019 <sup>1</sup> | 37.4                 | 13.7                                 | 51.1                          | 54.0                 | -2.9        | Peak          |

Remark: 1) The peak value of emission 4880.034MHz, and 9679.019MHz are below the average limit, so no average measurement is performed.

Channel: 2475MHz

| Polarization | Frequency (MHz)       | Reading at 3m (dBμV) | Antenna Factor and Cable Loss (dB/m) | Field Strength at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) | Detector Type |
|--------------|-----------------------|----------------------|--------------------------------------|-------------------------------|----------------------|-------------|---------------|
| V            | 2475.291              | 106.5                | -4.6                                 | 101.9                         | 114.0                | -12.1       | Peak          |
| V            | 2474.978              | 87.9                 | -4.6                                 | 83.3                          | 94.0                 | -10.7       | Average       |
| V            | 4949.420 <sup>1</sup> | 44.2                 | 3.8                                  | 48.0                          | 54.0                 | -6.0        | Peak          |
| V            | 7425.749              | 53.6                 | 10.4                                 | 64.0                          | 74.0                 | -10.0       | Peak          |
| V            | 7424.135              | 33.8                 | 10.4                                 | 44.2                          | 54.0                 | -9.8        | Average       |
| V            | 9900.959 <sup>1</sup> | 38.0                 | 13.7                                 | 51.7                          | 54.0                 | -2.3        | Peak          |

Remark: 1) The peak value of emission 4949.420MHz, and 9900.959MHz are below the average limit, so no average measurement is performed.



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### 3 Description of the Line-conducted Test

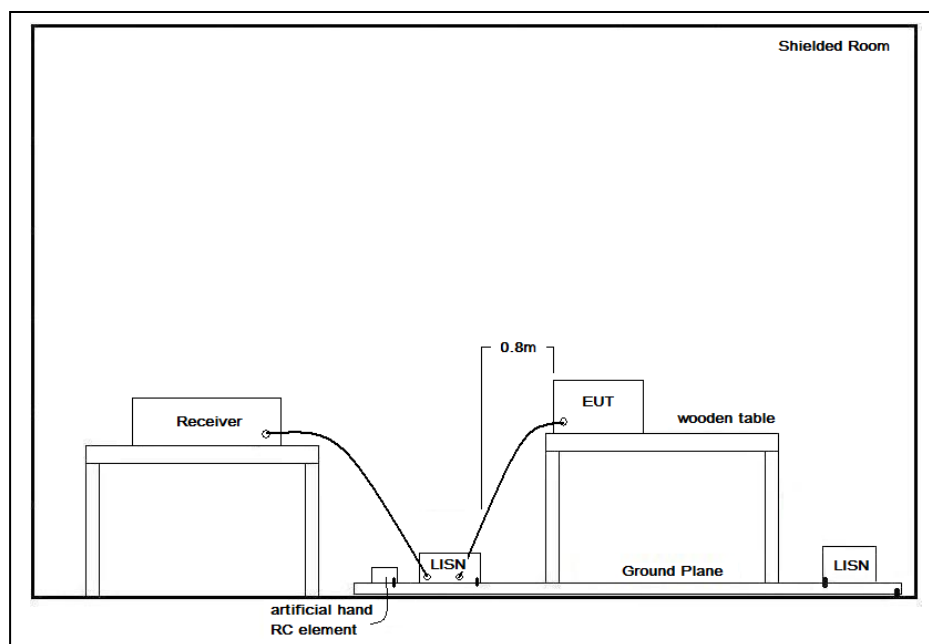
#### 3.1 Test Procedure

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.10 – 2013. The EUT was setup as described in the procedures, and both lines were measured.

#### 3.2 Test Result

No measurement is required as the EUT is a battery-operated product.

#### 3.3 Test Setup



#### 3.4 Graph and Table of Conducted Emission Measurement Data

Not Applicable



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### 4 Supplementary document

The following document were submitted by applicant, and for electronic filing, the document are saved with the following filenames:

| Document                | Filename                       |
|-------------------------|--------------------------------|
| ID Label/Location       | Label Artwork and Location.pdf |
| Block Diagram           | Block Diagram.pdf              |
| Schematic Diagram       | Schematic.pdf                  |
| Users Manual            | User Manual.pdf                |
| Operational Description | Operation Description.pdf      |

#### 4.1 Bandwidth

Appendices A1 and A2 are shown the fundamental emission is confined in the specified band. A 20dB bandwidth is 3.791MHz and 99% bandwidth is 3.531MHz. Both bandwidth fall in the band of 2400 – 2483.5MHz. It shows that the EUT met the requirement of FCC Part 15.215(c).



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### 5 Appendices

|     |                     |   |         |
|-----|---------------------|---|---------|
| A1. | 20dB Bandwidth Plot | 2 | page(s) |
| A2. | 99% Bandwidth       | 2 | page(s) |

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### A1. 20dB Bandwidth Plot



Channel: 2410MHz



Channel: 2440MHz

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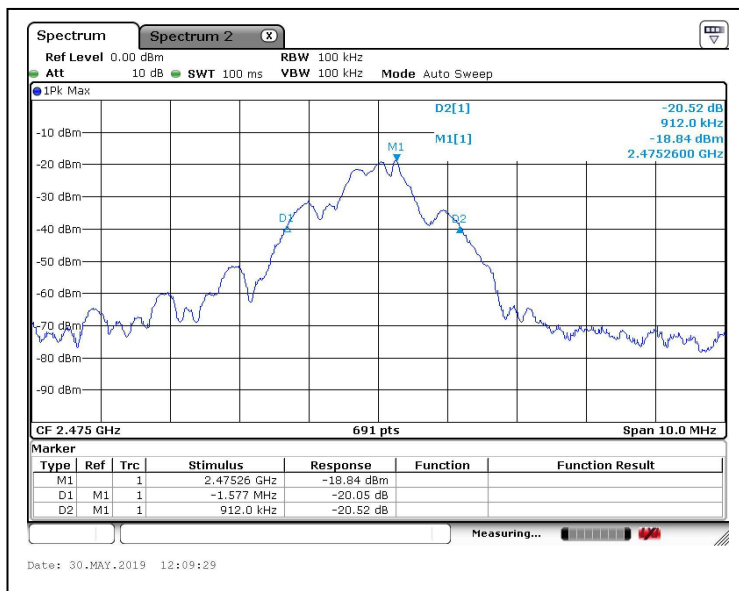
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Channel: 2475MHz

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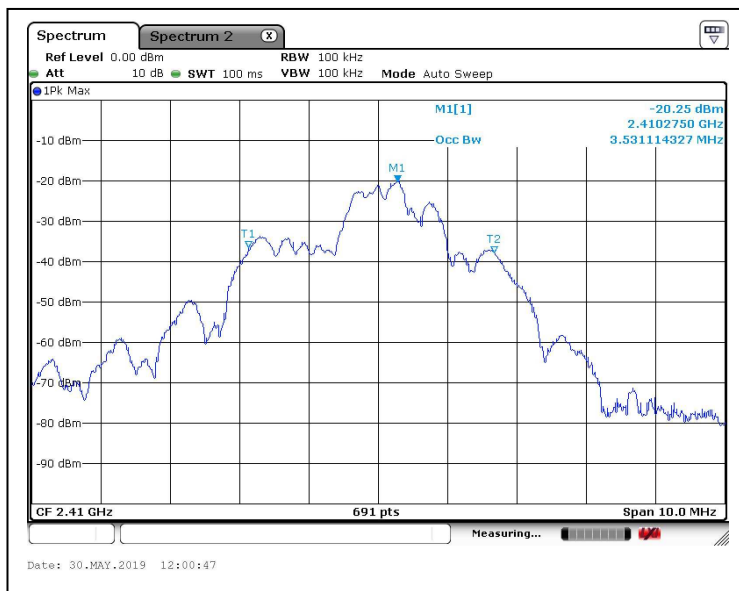
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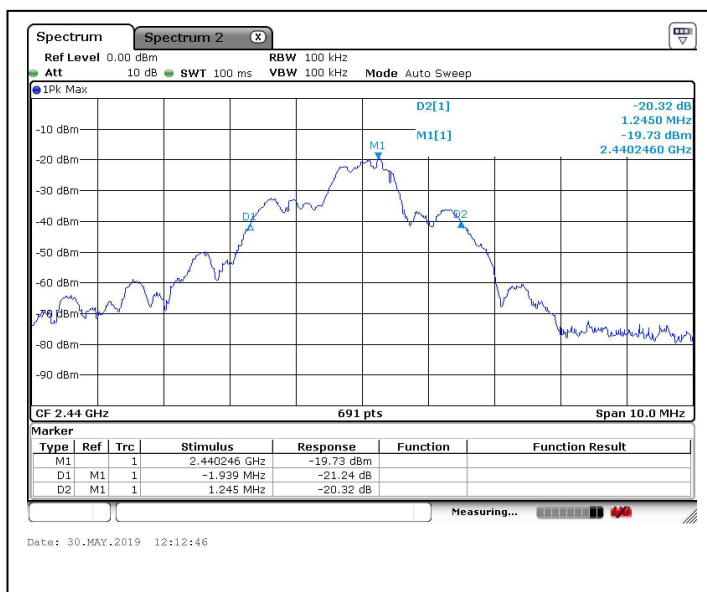
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### A2. 99% Bandwidth Plot



Channel: 2410MHz



Channel: 2440MHz

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