



CMA Testing and Certification Laboratories

廠商會檢定中心

TEST REPORT

Report No. : AY0030172(2) Date : 12 Jun 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 Kawasaki Jet Ski Ultra 310R / 1:10 Kawasaki RC Jet Ski	84514 / AD16616

Radio Frequency : 2410MHz – 2475MHz Transmitter

Rating

Tx : 2 x 1.5V AAA size batteries (For Remote)

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 (10-1-18 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 : Manufacturer declare that all **Two** models are the same cosmetics, materials, PCB layout, electrical, mechanical, physical design, including software/firmware except non-conductive outer casing of receiver only; therefore model **84514** was provided to be the representative of the test sample.

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____

Mr. WONG Lap-pong, Andrew
Manager

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FCC ID: OTM-8451419-24GTX

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1 General Information

1.1 General Description

The equipment under test (EUT) is a controller of 2.4GHz wireless remote boat 1/10 R/C Kawasaki Jet Ski Ultra 310R and 1:10 Kawasaki RC Jet Ski.

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	6HC3000/18 000-3-KK	200720014	21 Dec 2019	1Year
Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170 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 connector	HUBER+SUHN ER	-	MY24201/4	22 Jan 2020	2Years
RF cable with PC2.4 connectors	HUBER+SUHN 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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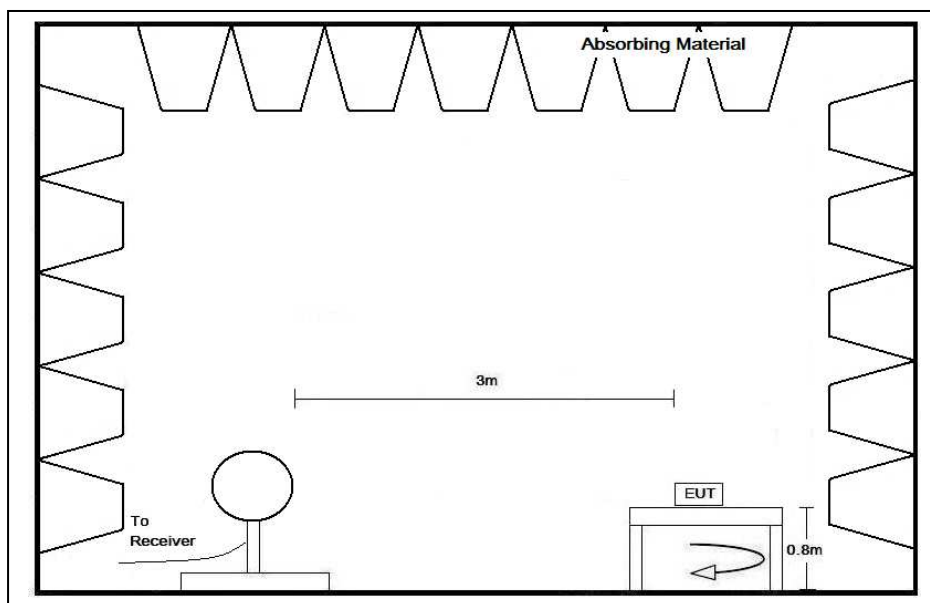
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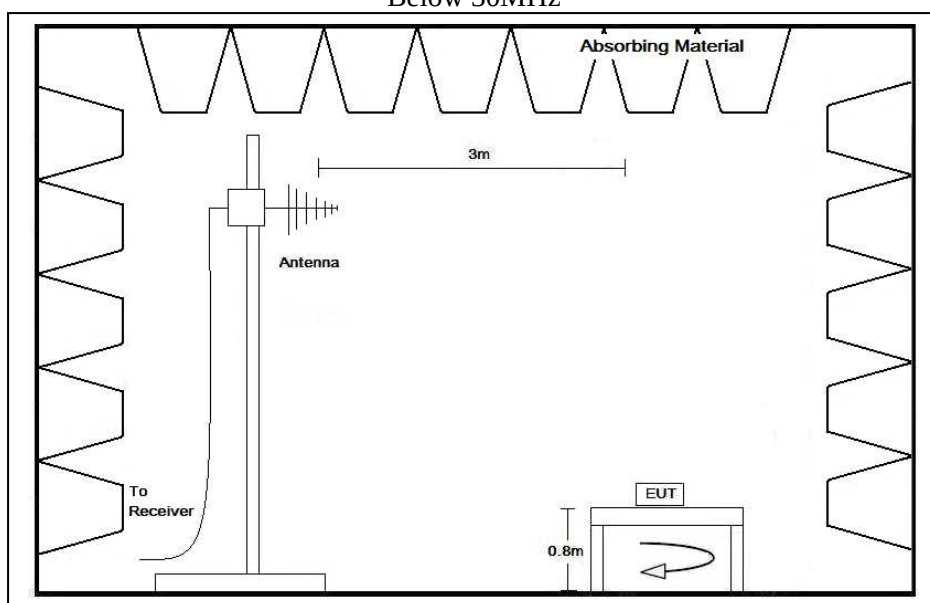
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2.2 Test Setup



Below 30MHz



30MHz – 1GHz



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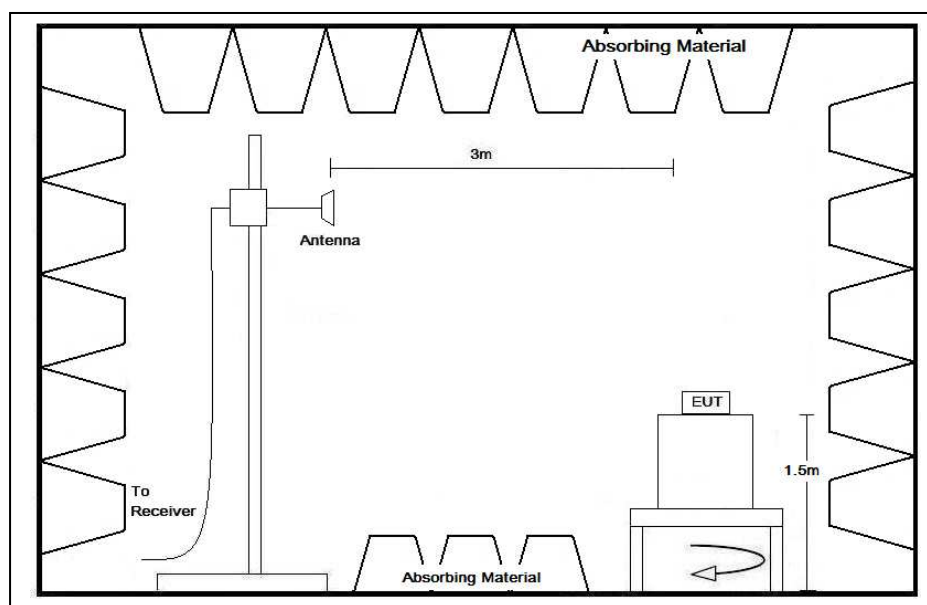
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2.2 Test Setup



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 ¹	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 ¹	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 ¹	45.1	3.2	48.3	54.0	-5.7	Peak
V	7320.434	54.1	10.4	64.5	74.0	-9.5	Peak
V	7319.882	34.4	10.4	44.8	54.0	-9.2	Average
V	9761.019 ¹	37.4	13.7	51.1	54.0	-2.9	Peak

Remark: 1) The peak value of emission 4880.034MHz and 9761.019MHz 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 ¹	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 ¹	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

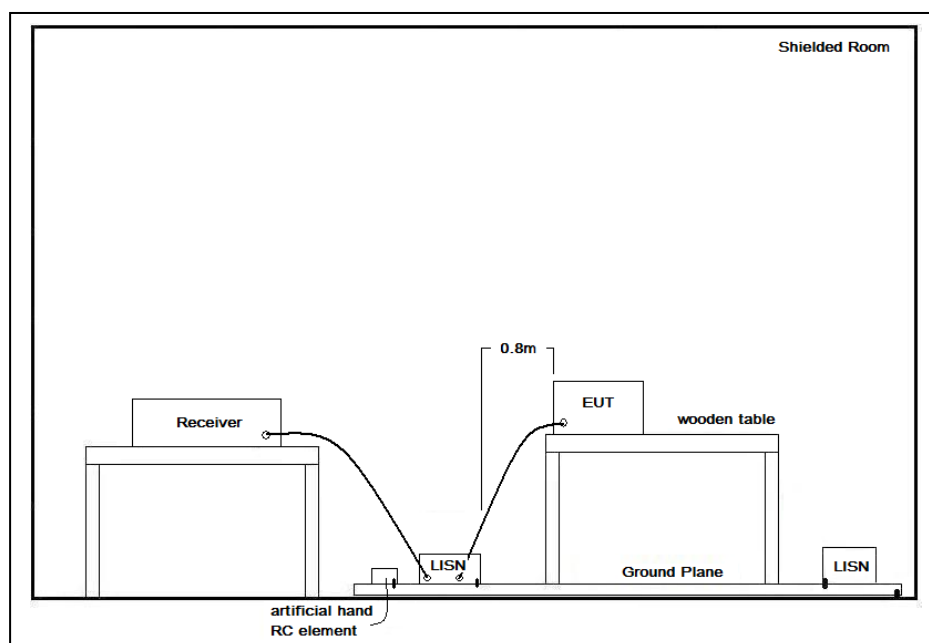
3.1 Test Procedure

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



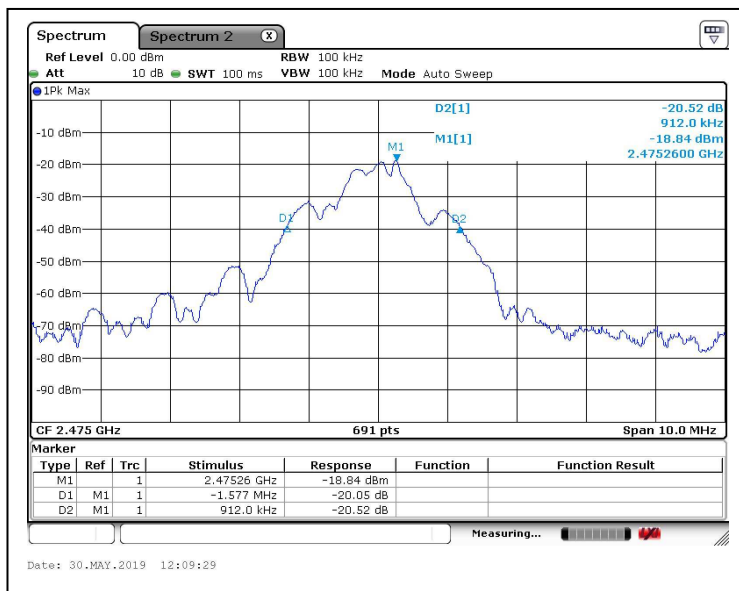
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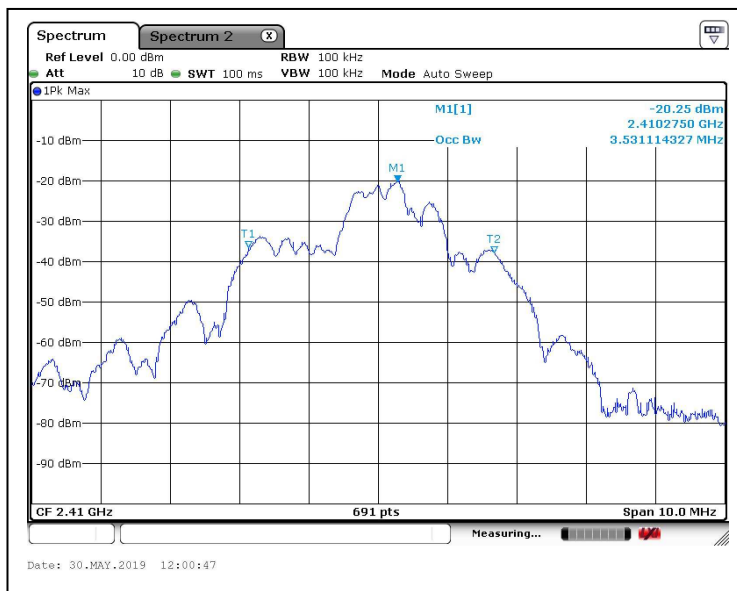
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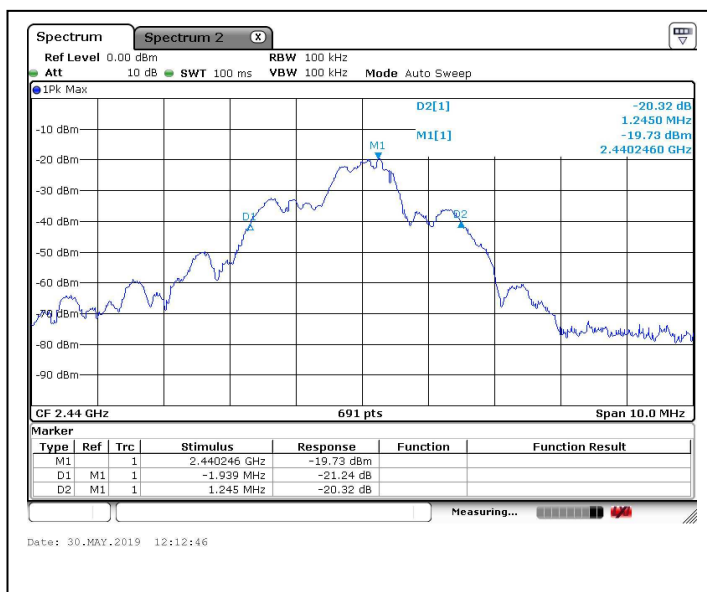
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A2. 99% Bandwidth Plot



Channel: 2410MHz



Channel: 2440MHz



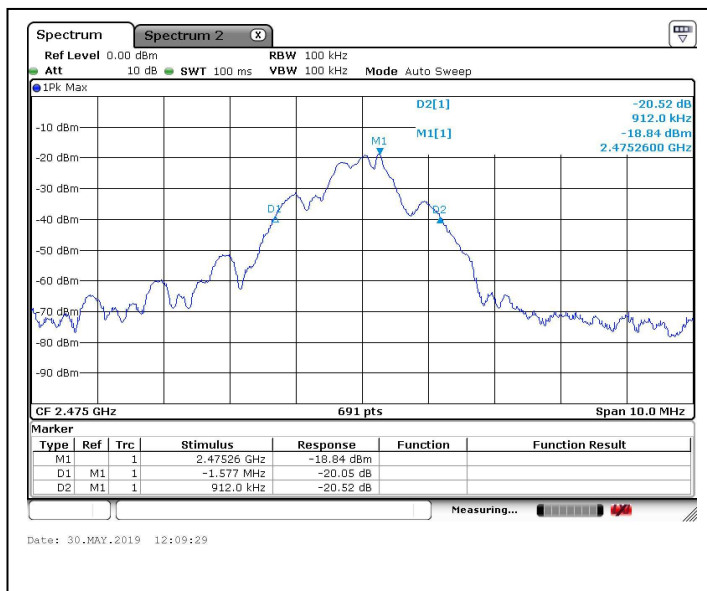
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Channel: 2475MHz

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