

**FCC PART 15 SUBPART C TEST REPORT**

**for**

**Tablet Computer**

**Model No.: DR13**

**FCC ID: IR5DR13**

**of**

Applicant: MilDef Crete Inc.

Address: 7F, No. 250, Sec.3, Pei Shen Rd., Shen Keng District,  
New Taipei City Taiwan R.O.C.

Tested and Prepared

by

**Worldwide Testing Services (Taiwan) Co., Ltd.**

**FCC Registration No.: TW1477, TW0020, TW1072**

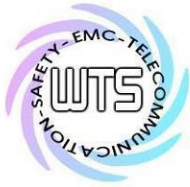
**Industry Canada filed test laboratory Reg. No. 20037**

**A2LA Accredited No.: 2732.01**



**Report No.: W6M21910-19416-C-1**

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.  
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## **TABLE OF CONTENTS**

|          |                                                               |           |
|----------|---------------------------------------------------------------|-----------|
| <b>1</b> | <b>GENERAL INFORMATION .....</b>                              | <b>2</b>  |
| 1.1      | NOTES .....                                                   | 2         |
| 1.2      | TESTING LABORATORY .....                                      | 3         |
| 1.2.1    | Location .....                                                | 3         |
| 1.2.2    | Details of accreditation status .....                         | 3         |
| 1.3      | DETAILS OF APPROVAL HOLDER .....                              | 3         |
| 1.4      | APPLICATION DETAILS .....                                     | 4         |
| 1.5      | GENERAL INFORMATION OF TEST ITEM .....                        | 4         |
| 1.6      | TEST STANDARDS .....                                          | 5         |
| <b>2</b> | <b>TECHNICAL TEST .....</b>                                   | <b>6</b>  |
| 2.1      | SUMMARY OF TEST RESULTS .....                                 | 6         |
| 2.2      | TEST ENVIRONMENT .....                                        | 6         |
| 2.3      | TEST EQUIPMENT LIST .....                                     | 7         |
| 2.4      | GENERAL TEST PROCEDURE .....                                  | 10        |
| <b>3</b> | <b>TEST RESULTS (ENCLOSURE) .....</b>                         | <b>12</b> |
| 3.1      | PEAK OUTPUT POWER (TRANSMITTER) .....                         | 13        |
| 3.2      | RF EXPOSURE COMPLIANCE REQUIREMENTS .....                     | 14        |
| 3.3      | TRANSMITTER RADIATED EMISSIONS IN RESTRICTED BANDS .....      | 15        |
| 3.4      | SPURIOUS EMISSIONS (TX) .....                                 | 16        |
| 3.5      | CARRIER FREQUENCY SEPARATION .....                            | 18        |
| 3.6      | NUMBER OF HOPPING FREQUENCIES .....                           | 19        |
| 3.6.1    | Pseudorandom Frequency Hopping Sequence .....                 | 19        |
| 3.6.2    | Coordination of hopping sequences to other transmitters ..... | 19        |
| 3.6.3    | System Receiver Hopping Capability .....                      | 19        |
| 3.7      | TIME OF OCCUPANCY (DWEIL TIME) .....                          | 20        |
| 3.8      | 20dB BANDWIDTH .....                                          | 21        |
| 3.8.1    | System Receiver Input Bandwidth .....                         | 21        |
| 3.9      | MINIMUM 6 dB BANDWIDTH .....                                  | 22        |
| 3.10     | RADIATED EMISSION ON THE BAND EDGE .....                      | 23        |
| 3.11     | PEAK POWER SPECTRAL DENSITY .....                             | 47        |
| 3.12     | RADIATED EMISSION FROM RECEIVER PART .....                    | 48        |
| 3.13     | POWER LINE CONDUCTED EMISSION .....                           | 48        |
|          | APPENDIX .....                                                | 51        |



Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

## **1 General Information**

### **1.1 Notes**

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.

The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.

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#### **Specific Conditions:**

Usage of the hereunder tested device in combination with other integrated or external antennas requires at least additional output power measurements, spurious emission measurements, conducted emission measurements (AC supply lines) and radio frequency exposure evaluations for each individual configuration performed, for certification by FCC.

#### **Tester:**

November 8, 2019

Kent Lin

Date

WTS-Lab.

Name

Signature

#### **Technical responsibility for area of testing:**

November 8, 2019

Kevin Wang

Date

WTS

Name

Signature



# **Worldwide Testing Services(Taiwan) Co., Ltd.**

Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

## **1.2 Testing laboratory**

### **1.2.1 Location**

OATS

No.5-1, Lishui, Shuang Sing Village,

Wanli Dist., New Taipei City 207,

Taiwan (R.O.C.)

3 meter semi-anechoic chamber

No.35, Aly. 21, Ln. 228, Ankang Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

TEL:886-2-6613-0228

FAX:886-2-2791-5046

Company

Worldwide Testing Services(Taiwan) Co., Ltd.

6F, NO. 58, LANE 188, RUEY-KUANG RD.

NEIHU, TAIPEI 114, TAIWAN R.O.C.

Tel : 886-2-66068877

Fax : 886-2-66068879

### **1.2.2 Details of accreditation status**

Accredited testing laboratory

A2LA accredited number: 2732.01

FCC filed test laboratory Reg. No. TW1477, TW0020, TW1072

Industry Canada filed test laboratory Reg. No. 20037

**Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd. :**

Name: ./.

Accredited number: ./.

Street: ./.

Town: ./.

Country: ./.

Telephone: ./.

Fax: ./.

## **1.3 Details of approval holder**

Name: MilDef Crete Inc.

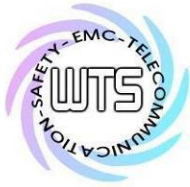
Street: 7F, No. 250, Sec.3, Pei Shen Rd., Shen Keng District,

Town: New Taipei City

Country: Taiwan R.O.C.

Telephone: 886 2 2662 6074

Fax: 886 2 2662 6079



Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

## **1.4 Application details**

Date of receipt of test item: October 15, 2019

Date of test: from October 15, 2019 to November 5, 2019

## **1.5 General information of Test item**

Type of test item: Tablet Computer

Model Number: DR13

Brand Name: MilDef Crete

Multi-listing model number: ./.

Photos: see Appendix

### **Technical data**

Frequency band: 2.4 GHz – 2.4835 GHz

#### **802.11b, g, n 20MHz**

Frequency ( ch 1): 2.412 GHz

Frequency ( ch 7): 2.442 GHz

Frequency ( ch 13): 2.472 GHz

#### **802.11n 40MHz**

Frequency ( ch 1): 2.422 GHz

Frequency ( ch 5): 2.442 GHz

Frequency ( ch 9): 2.462 GHz

#### **Bluetooth Normal, EDR**

Frequency ( ch 0): 2.402 GHz

Frequency ( ch 39): 2.441 GHz

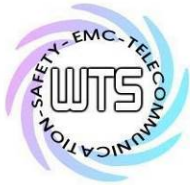
Frequency ( ch 78): 2.480 GHz

#### **Bluetooth Low Energy**

Frequency ( ch 0): 2.402 GHz

Frequency ( ch 19): 2.440 GHz

Frequency ( ch 39): 2.480 GHz



# **Worldwide Testing Services(Taiwan) Co., Ltd.**

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

Number of Channels: 802.11b, g, n 20MHz: 13 channels, 11n 40MHz: 9 channels  
Bluetooth: 79 channels (normal & EDR), 40channels (BLE)

Operation modes: Duplex

Modulation Type: DSSS/OFDM、GFSK、 $\pi/4$ DQPSK、8DPSK

Fixed point-to-point operation: ☐ Yes / ☒ No

Type of Antenna: PIFA Antenna

Antenna gain: WLAN ANTA: -0.34 dBi, ANTB: -0.49 dBi  
Bluetooth 2.0: -0.34 dBi  
Bluetooth 4.0: -0.34 dBi

Directional gain: 2.6 dBi

According to KDB 662911, Unequal antenna gains, with equal transmit powers. For antenna gains given by  $G_1, G_2, \dots, G_N$  dBi. If transmit signals are correlated, then Directional gain  $= 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N]$  dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

Each with the same directional gain  $G_{ANT}$  dBi, being driven by  $N_{ANT}$  transmitter outputs of equal power. Directional gain is to be computed as follows:

If any transmit signals are correlated with each other, Direction gain=  $G_{ANT} + 10 \log(N_{ANT})$  dBi

Power supply: Adapter (I/P: 100-240V~50-60Hz, 1.2A MAX.  
O/P: 19V 4.74A)  
Battery 10.8V=5800mAh, 63Wh

Host device: none

Classification:

|                                              |                                     |
|----------------------------------------------|-------------------------------------|
| Fixed Device                                 | <input type="checkbox"/>            |
| Mobile Device (Human Body distance > 20cm)   | <input checked="" type="checkbox"/> |
| Portable Device (Human Body distance < 20cm) | <input type="checkbox"/>            |
| Modular Radio Device                         | <input type="checkbox"/>            |

## **Manufacturer: (if applicable)**

Name: ./.

Street: ./.

Town: ./.

Country: ./.

## **1.6 Test standards**

Technical standard : FCC RULES PART 15 SUBPART C § 15.247 (2018-10)



Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

## **2 Technical test**

### **2.1 Summary of test results**

No deviations from the technical specification(s) were ascertained in the course of the tests performed. ☒

**or**

The deviations were ascertained in the course of the tests performed. ☐

### **2.2 Test environment**

Relative humidity content: 20 ... 75 %  
Air pressure: 86 ... 103 kPa  
Power supply: Adaptor (Input: 100-240V~50-60Hz 1.2A MAX.  
Output: 19V=4.74A)  
Battery 10.8V=5800mAh, 63Wh

Extreme conditions parameters: ./.

| Test item Name                                                                                                                              | Uncertainty                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Estimation Result of Uncertainty of Conducted Emission                                                                                      | Expanded Uncertainty:<br>AMN: 1.30 dB<br>Voltage probe: 1.36 dB                                                   |
| Estimation Result of Uncertainty of Radiated Emission (3M)                                                                                  | Expanded Uncertainty:<br>0.009-30 MHz: 2.02 dB<br>30-1000 MHz: 3.49 dB<br>1-18 GHz: 3.01 dB<br>18-40 GHz: 2.43 dB |
| Estimation Result of Uncertainty of Bandwidth Measurement<br>20 dB Bandwidth, Occupied bandwidth, Channel bandwidth,<br>Necessary Bandwidth | Expanded Uncertainty: 0.45 kHz                                                                                    |
| Estimation Result of Uncertainty of Conducted Output Power<br>Measurement Output power                                                      | Expanded Uncertainty: 1.72 dB                                                                                     |
| Estimation Result of Uncertainty of Power Density Measurement<br>Power density                                                              | Expanded Uncertainty: 1.73 dB                                                                                     |
| Estimation Result of Uncertainty of Band Edge Measurement                                                                                   | Expanded Uncertainty: 0.98 dBc                                                                                    |
| Estimation Result of Uncertainty of Frequency Separation<br>Measurement Hopping channel separation                                          | Expanded Uncertainty: 554.14 Hz                                                                                   |
| Estimation Result of Uncertainty of Duty Cycle Measurement<br>Dwell time                                                                    | Expanded Uncertainty: 0.1 ms                                                                                      |

The decision rule is: Measurement uncertainty is not taken into account.



Registration number: W6M21910-19416-C-1

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## 2.3 Test Equipment List

| No.          | Test equipment                                     | Type            | Serial No.  | Manufacturer          | Cal. Date     | Next Cal. Date |
|--------------|----------------------------------------------------|-----------------|-------------|-----------------------|---------------|----------------|
| ETSTW-CE 001 | EMI TEST RECEIVER                                  | ESHS10          | 842121/013  | R&S                   | 2019/6/4      | 2020/6/3       |
| ETSTW-CE 003 | AC POWER SOURCE                                    | APS-9102        | D161137     | GW                    | Function Test |                |
| ETSTW-CE 004 | ZWEILEITER-V-NETZNACHBILDUNG<br>TWO-LINE V-NETWORK | ESH3-Z5         | 840731/011  | R&S                   | 2019/10/31    | 2020/10/30     |
| ETSTW-CE 006 | IMPULSBEGRENZER<br>PULSE LIMITER                   | ESH3-Z2         | 100226      | R&S                   | 2019/9/24     | 2020/9/23      |
| ETSTW-CE 008 | HF-EICHELUNG RF<br>STEP ATTENUATOR<br>139dB DPSP   | 334.6010.02     | 844581/024  | R&S                   | Function Test |                |
| ETSTW-CE 009 | TEMP.&HUMIDITY<br>CHAMBER                          | GTH-225-40-1P-U | MAA0305-009 | GIANT FORCE           | 2019/7/23     | 2020/7/22      |
| ETSTW-CE 016 | TWO-LINE V-NETWORK                                 | ENV216          | 100050      | R&S                   | 2019/10/3     | 2020/10/2      |
| ETSTW-CE 028 | MXE EMI Receiver                                   | N9038A          | MY53220110  | Agilent               | 2019/7/18     | 2020/7/17      |
| ETSTW-RE 003 | EMI TEST RECEIVER                                  | ESI 26          | 831438/001  | R&S                   | 2019/6/4      | 2020/6/3       |
| ETSTW-RE 004 | EMI TEST RECEIVER                                  | ESI 40          | 832427/004  | R&S                   | 2019/5/29     | 2020/5/28      |
| ETSTW-RE 012 | TUNABLE BANDREJECT<br>FILTER                       | D.C 0309        | 146         | K&L                   | Function Test |                |
| ETSTW-RE 013 | TUNABLE BANDREJECT<br>FILTER                       | D.C 0336        | 397         | K&L                   | Function Test |                |
| ETSTW-RE 018 | MICROWAVE HORN<br>ANTENNA                          | AT4560          | 27212       | AR                    | 2019/7/25     | 2020/7/24      |
| ETSTW-RE 027 | Passive Loop Antenna                               | 6512            | 00034563    | ETS-Lindgren          | 2019/7/22     | 2020/7/21      |
| ETSTW-RE 030 | Double-Ridged Guide Horn<br>Antenna                | 3117            | 00035224    | ETS-Lindgren          | 2019/4/2      | 2020/4/1       |
| ETSTW-RE 042 | Biconical Antenna                                  | HK116           | 100172      | R&S                   | 2019/1/29     | 2020/1/28      |
| ETSTW-RE 043 | Log-Periodic Dipole<br>Antenna                     | HL223           | 100166      | R&S                   | 2019/4/23     | 2020/4/22      |
| ETSTW-RE 044 | Log-Periodic Antenna                               | HL050           | 100094      | R&S                   | 2019/5/13     | 2020/5/12      |
| ETSTW-RE 045 | ESA-E SERIES<br>SPECTRUM ANALYZER                  | E4404B          | MY45111242  | Agilent               | Pre-test Use  |                |
| ETSTW-RE 050 | Attenuator 10dB                                    | 50HF-010-1      | None        | JFW                   | 2019/2/27     | 2020/2/26      |
| ETSTW-RE 051 | Attenuator 6dB                                     | 50HF-006-1      | None        | JFW                   | 2019/2/27     | 2020/2/26      |
| ETSTW-RE 053 | Attenuator 3dB                                     | 50HF-003-1      | None        | JFW                   | 2019/2/27     | 2020/2/26      |
| ETSTW-RE 055 | SPECTRUM ANALYZER                                  | FSU 26          | 200074      | R&S                   | 2019/3/5      | 2020/3/4       |
| ETSTW-RE 060 | Attenuator 30dB                                    | 5015-30         | F651012z-01 | ATM                   | 2019/2/27     | 2020/2/26      |
| ETSTW-RE 062 | Amplifier Module                                   | CHC 2           | None        | KMIC                  | 2019/5/16     | 2020/5/15      |
| ETSTW-RE 064 | Bluetooth Test Set                                 | MT8852B-042     | 6K00005709  | Anritsu               | Function Test |                |
| ETSTW-RE 069 | Double-Ridged Guide Horn<br>Antenna                | 3117            | 00069377    | ETS-Lindgren          | Function Test |                |
| ETSTW-RE 072 | CELL SITE TEST SET                                 | 8921A           | 3339A00375  | HP                    | 2019/9/23     | 2020/9/22      |
| ETSTW-RE 088 | SOLID STATE<br>AMPLIFIER                           | KMA180265A01    | 99057       | KMIC                  | 2019/9/18     | 2020/9/17      |
| ETSTW-RE 091 | Match Pad                                          | MDCS1500        | None        | WOKEN                 | 2019/5/9      | 2020/5/8       |
| ETSTW-RE 099 | DC Block                                           | 50DB-007-1      | None        | JFW                   | 2019/2/22     | 2020/2/21      |
| ETSTW-RE 112 | AC POWER SOURCE                                    | TFC-1005        | T-0A023536  | T-Power               | Function test |                |
| ETSTW-RE 115 | 2.4GHz Notch Filter                                | N0124411        | 473874      | MICROWAVE<br>CIRCUITS | 2019/1/14     | 2020/1/13      |



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Registration number: W6M21910-19416-C-1

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|                 |                                      |                                        |                 |                    |                  |            |
|-----------------|--------------------------------------|----------------------------------------|-----------------|--------------------|------------------|------------|
| ETSTW-RE 120    | RF Player                            | MP9200                                 | MP9210-111022   | ADIVIC             | Function test    |            |
| ETSTW-RE 122    | SIGNAL GENERATOR                     | SMF100A                                | 102149          | R&S                | 2019/6/3         | 2020/6/2   |
| ETSTW-RE 125    | 5GHz Notch filter                    | 5NSL11-5200/E221.3-O/O                 | 1               | K&L Microwave      | 2019/8/8         | 2020/8/7   |
| ETSTW-RE 126    | 5GHz Notch filter                    | 5NSL12-5800/E221.3-O/O                 | 1               | K&L Microwave      | 2019/8/8         | 2020/8/7   |
| ETSTW-RE 127    | RF Switch Box                        | RFS-01                                 | None            | WTS                | 2019/2/26        | 2020/2/25  |
| ETSTW-RE 128    | 5.3GHz Notch filter                  | N0153001                               | SN487233        | Microwave Circuits | 2019/8/8         | 2020/8/7   |
| ETSTW-RE 129    | 5.5GHz Notch filter                  | N0555984                               | SN487234        | Microwave Circuits | 2019/8/8         | 2020/8/7   |
| ETSTW-RE 130    | Handheld RF Spectrum Analyzer        | N9340A                                 | CN0147000204    | Agilent            | Pre-test Use     |            |
| ETSTW-RE 142    | Amplifier                            | 8447D                                  | 2805A03378      | Agilent            | 2019/5/16        | 2020/5/15  |
| ETSTW-RE 147    | Bi-log Hybrid Antenna                | MCTD 2786B                             | BLB16M04005     | ETC                | 2019/4/2         | 2020/4/1   |
| ETSTW-RF 002    | Electromagnetic field probe          | LF-30                                  | K-0007          | STT                | 2019/5/27        | 2020/5/26  |
| ETSTW-EMI 011   | USB Compact Modulator                | SFC-U                                  | 101689          | R&S                | 2019/5/16        | 2020/5/15  |
| ETSTW-GSM 002   | Universal Radio Communication Tester | CMU 200                                | 109439          | R&S                | 2019/3/5         | 2020/3/4   |
| ETSTW-GSM 003   | Radio Communication Analyzer         | MT8820C                                | 6201342073      | Anritsu            | 2019/3/26        | 2020/3/25  |
| ETSTW-GSM 004   | Wideband Radio Communication Tester  | CMW500                                 | 128092          | R&S                | 2019/10/18       | 2020/10/17 |
| ETSTW-GSM 019   | Band Reject Filter                   | WRCTF824/849-822/851-40 /12+9SS        | 3               | WI                 | 2019/1/14        | 2020/1/13  |
| ETSTW-GSM 020   | Band Reject Filter                   | WRCD1747/1748-1743/1752-32/5SS         | 1               | WI                 | 2019/1/14        | 2020/1/13  |
| ETSTW-GSM 021   | Band Reject Filter                   | WRCD1879.5/1880.5-1875.5/1884.5-32/5SS | 3               | WI                 | 2019/1/14        | 2020/1/13  |
| ETSTW-GSM 022   | Band Reject Filter                   | WRCT901.9/903.1-904.25-50/8SS          | 1               | WI                 | 2019/1/14        | 2020/1/13  |
| ETSTW-GSM 023   | Power Divider                        | 4901.19.A                              | None            | SUHNER             | 2019/9/12        | 2020/9/11  |
| ETSTW-GSM 024   | Radio Communication Analyzer         | MT8821C                                | None            | Anritsu            | 2019/3/5         | 2020/3/4   |
| ETSTW-GSM 025   | Band Reject Filter                   | BRM19835                               | 001             | Micro-Tronics      | 2019/8/9         | 2020/8/8   |
| ETSTW-Cable 011 | SMA to N type Cable                  | RGU-400                                | None            | THERMAX            | Pre-test Use NCR |            |
| ETSTW-Cable 016 | BNC Cable                            | Switch Box                             | B Cable 1       | Schwarz beck       | 2019/2/21        | 2020/2/20  |
| ETSTW-Cable 017 | BNC Cable                            | X Cable                                | B Cable 2       | Schwarz beck       | 2019/2/21        | 2020/2/20  |
| ETSTW-Cable 018 | BNC Cable                            | Y Cable                                | B Cable 3       | Schwarz beck       | 2019/2/21        | 2020/2/20  |
| ETSTW-Cable 019 | BNC Cable                            | Z Cable                                | B Cable 4       | Schwarz beck       | 2019/2/21        | 2020/2/20  |
| ETSTW-Cable 020 | N TYPE Cable                         | OATS Cable 1                           | N30N30-L335-15M | JYE BAO CO.,LTD.   | 2019/7/2         | 2020/7/1   |
| ETSTW-Cable 026 | Microwave Cable                      | SUCOFLEX 104                           | 279075          | HUBER+SUHNER       | 2019/2/25        | 2020/2/24  |
| ETSTW-Cable 027 | Microwave Cable                      | SUCOFLEX 104                           | 279083          | HUBER+SUHNER       | 2019/5/14        | 2020/5/13  |
| ETSTW-Cable 028 | Microwave Cable                      | FA147A0015M2020                        | 30064-2         | UTIFLEX            | 2019/9/18        | 2020/9/17  |
| ETSTW-Cable 029 | Microwave Cable                      | FA147A0015M2020                        | 30064-3         | UTIFLEX            | 2019/9/18        | 2020/9/17  |
| ETSTW-Cable 030 | Microwave Cable                      | SUCOFLEX 104 (S Cable 9)               | 279067          | HUBER+SUHNER       | 2019/2/25        | 2020/2/24  |
| ETSTW-Cable 043 | Microwave Cable                      | SUCOFLEX 104                           | 317576          | HUBER+SUHNER       | 2019/5/16        | 2020/5/15  |
| ETSTW-Cable 058 | Microwave Cable                      | SUCOFLEX 104                           | none            | HUBER+SUHNER       | 2019/6/6         | 2020/6/5   |
| ETSTW-Cable 064 | Microwave Cable                      | SUCOFLEX 104                           | MY28891         | HUBER+SUHNER       | 2019/5/16        | 2020/5/15  |
| ETSTW-Cable 066 | SMA type cable                       | 32022                                  | None            | ASTROLAB           | 2019/9/24        | 2020/9/23  |



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|                 |                     |                       |          |              |                  |           |
|-----------------|---------------------|-----------------------|----------|--------------|------------------|-----------|
| ETSTW-Cable 071 | N TYPE CABLE        | EMCCFD400-NM-NM-25000 | 170239   | EMCI         | 2019/6/6         | 2020/6/5  |
| ETSTW-Cable 072 | SMA type cable (8m) | SUCOFLEX 104          | 805800/4 | HUBER+SUHNER | 2019/5/16        | 2020/5/15 |
| ETSTW-Cable 074 | SMA type cable (2m) | SUCOFLEX 104          | 802563/4 | HUBER+SUHNER | 2019/5/16        | 2020/5/15 |
| WTSTW-SW 002    | EMI TEST SOFTWARE   | EZ EMC                | None     | Farad        | Version ETS-03A1 |           |
| WTSTW-SW 006    | EMI TEST SOFTWARE   | e3                    | None     | AUDIX        | Version 9.161014 |           |
| WTSTW-SW 008    | Signal studio       | Agilent               | None     | AUDIX        | Version 2.0.0.1  |           |
| ETSTW-TH 001    | Thermohygrometer    | 608-H1                | 45204316 | Testo        | 2019/9/9         | 2020/9/8  |
| ETSTW-TH 002    | Thermohygrometer    | 608-H1                | 45204317 | Testo        | 2019/9/9         | 2020/9/8  |



Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

## **2.4 General Test Procedure**

**POWER LINE CONDUCTED INTERFERENCE:** The procedure used was ANSI STANDARD C63.10-2013 6.2 using a 50 $\mu$ H LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

**RADIATION INTERFERENCE:** The test procedure used was according to ANSI STANDARD C63.10-2013 6.3 employing a spectrum analyzer. For investigated frequency is equal to or below 1GHz, the RBW and VBW of the spectrum analyzer was 100 kHz and 100kHz respectively with an appropriate sweep speed. For investigated frequency is above 1GHz, both of RBW and VBW of the spectrum analyzer were 1 MHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

**FORMULA OF CONVERSION FACTORS:** The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dB $\mu$ V) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

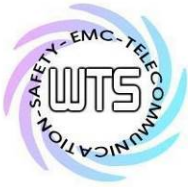
|            |                                                          |
|------------|----------------------------------------------------------|
| Freq (MHz) | METER READING + ACF + CABLE LOSS (to the receiver) = FS  |
| 33         | 20 dB $\mu$ V + 10.36 dB + 6 dB = 36.36 dB $\mu$ V/m @3m |

The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table) and arranged according to ANSI C63.10-2013 6.2.2. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to the frequency specified as follows:

- (1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
- (2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
- (3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
- (4) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a)(1)-(a)(3) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this Section, whichever is the higher frequency range of investigation.

For hand-held devices, a exploratory test was performed with three (3) orthogonal planes to determine the highest emissions.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.



Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

The formula is as follows:

Average = Peak + Duty Factor

Duty Factor =  $20 \log (\text{dwell time}/T)$

T = 100ms when the pulse train period is over 100 ms or the period of the pulse train.

Modified Limits for peak according to 15.35 (b) = Max Permitted average Limits + 20dB

ANSI STANDARD C63.10-2013 B.2.7: Any measurements that utilize special test software shall be indicated and referenced in the test report. During testing, test software 'EZ EMC' was used for setting up different operation modes.



Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

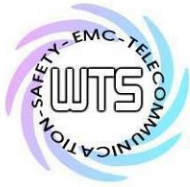
### 3 Test results (enclosure)

| TEST CASE                                            | Para. Number     | Required                            | Test passed                         | Test failed              |
|------------------------------------------------------|------------------|-------------------------------------|-------------------------------------|--------------------------|
| Peak Output Power                                    | 15.247(b)        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Equivalent isotropically radiated Power              | 15.247(b)        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Spurious Emissions radiated – Transmitter operating  | 15.247(c)        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Spurious Emissions conducted – Transmitter operating | 15.247           | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Carrier Frequency Separation                         | 15.247(a) (1)    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Number of Hopping Frequencies                        | 15.247(a) (1)(i) | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Time of Occupancy (Dwell Time)                       | 15.247(a) (1)(i) | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| 20 dB Bandwidth                                      | 15.247(a) (1)(i) | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Minimum 6 dB Bandwidth                               | 15.247(a)(2)     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Band-edge Compliance of RF Emission                  | 15.247(d)        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Peak Power Spectral Density                          | 15.247(d)        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Radiated Emission from Receiver Part                 | 15.109           | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Power Line Conducted Emission                        | 15.207(a)        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

#### Note:

1. This EUT incorporates a MIMO function with IEEE 802.11b, 802.11g, and 802.11n. Physically, this EUT includes two transmitters and two receivers with two incoherent streams. This device uses multiplexing and also employ cyclic delay diversity to improve range and throughput, and this device simultaneously operates on two adjacent channels.
2. This EUT is 2\*2 spatial MIMO (2Tx&2Rx) without beam forming function. That operates dual chain configuration. The Pre-test was performed to determine the worst case mode from all possible combinations between all available modulations, data rates, bandwidths, and spatial stream modes.
3. The detail of chosen mode for full testing are as below:

| Mode            | Available channel | Chosen Channel | Modulation Technology | Modulation Type          | Data Rate (Mbps) |
|-----------------|-------------------|----------------|-----------------------|--------------------------|------------------|
| 802.11b         | 1 to 11           | 1,6,11         | DSSS                  | DBPSK, DQPSK, CCK        | 1                |
| 802.11g         | 1 to 11           | 1,6,11         | OFDM                  | BPSK, QPSK, 16QAM, 64QAM | 6                |
| 802.11n (20MHz) | 1 to 11           | 1,6,11         | OFDM                  | BPSK, QPSK, 16QAM, 64QAM | 6.5              |
| 802.11n (40MHz) | 1 to 7            | 1,4,7          | OFDM                  | BPSK, QPSK, 16QAM, 64QAM | 13.5             |



Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

### **3.1 Peak Output Power (transmitter)**

FCC Rule: 15.247(b)(3)

This measurement applies to equipment with an integral antenna and to equipment with an antenna connector and equipped with an antenna as declared by the applicant.  
The power was measured with modulation (declared by the applicant).

Limits:

| Frequency<br>MHz | Power<br>dBm |
|------------------|--------------|
| 902 - 928        | 30           |
| 2400 – 2483.5    | 30           |
| 5725 – 5850      | 30           |

In case of employing transmitter antennas having antenna gain  $> 6$  dBi and using fixed point-to point operation consider §15.247 (b)(4)

Test equipment used: ETSTW-RE 055, ETSTW-RE 050,  
ETSTW-RE 064

Explanation: This test is not required.



Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

## **3.2 RF Exposure Compliance Requirements**

FCC OET Bulletin 65 Edition 97.01 determines the equations for predicting RF fields and applicable limits.

The prediction for power density in the far-field but will over-predict power density in the near field, where it could be used for walking a “worst case” or conservative prediction.

$$S = \frac{PG}{4\pi R^2}$$

S – Power Density

P – Output power ERP

R – Distance

D – Cable Loss

AG – Antenna Gain

| Item | Unit               | Value | Remarks          |
|------|--------------------|-------|------------------|
| P    | mW                 | --    | Peak value       |
| D    | dB                 | --    | --               |
| AG   | dBi                | --    | --               |
| G    | --                 | --    | Calculated Value |
| R    | cm                 | --    | Assumed value    |
| S    | mW/cm <sup>2</sup> | --    | Calculated value |

Limits:

| Limit for General Population / Uncontrolled Exposure |                                        |
|------------------------------------------------------|----------------------------------------|
| Frequency<br>(MHz)                                   | Power Density<br>(mW/cm <sup>2</sup> ) |
| 1500 – 100.000                                       | 1.0                                    |

Explanation: Please refer to SAR report.



Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

### **3.3 Transmitter Radiated Emissions in Restricted Bands**

FCC Rules: 15.247 (c), 15.205, 15.209, 15.35

Radiated emission measurements were performed from 30 MHz to 26500 MHz.

For radiated emission tests, the analyzer setting was as followings:

Frequency  $\leq$  1 GHz, RBW:100 kHz, VBW: 100 kHz (Peak measurements)

Frequency  $>$  1 GHz, RBW: 1 MHz, VBW: 1 MHz (Peak measurements)

Frequency  $>$  1 GHz , RBW:1 MHz , VBW: 10 Hz (Average measurements)

Limits.

For frequencies below 1GHz:

| Frequency of Emission<br>(MHz) | Field strength<br>(microvolts/meter) | Field Strength<br>(dB microvolts/meter) |
|--------------------------------|--------------------------------------|-----------------------------------------|
| 30 - 88                        | 100                                  | 40.0                                    |
| 88 - 216                       | 150                                  | 43.5                                    |
| 216 - 960                      | 200                                  | 46.0                                    |
| Above                          | 500                                  | 54.0                                    |

For frequencies above 1GHz (Average measurements).

Guidance on Measurement of Digit Transmission Systems:

“If the emission is pulsed, modify the unit for continuous operation, use the setting shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.”

The correction factor, based on the total channel dwell time in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

Duty cycle correction =  $20 \log (\text{dwell time} / 100\text{ms})$

Note: No duty cycle correction was added to the reading of this EUT.

Explanation: See attached diagrams in Appendix.



Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

## **3.4 Spurious Emissions (tx)**

Spurious emission was measured with modulation (declared by manufacturer).

In any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB 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. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c))

FCC Rule: 15.247(c), 15.35

For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Limits:

For frequencies above 1GHz (Peak measurements).

Modified Limit for peak according to 15.35 (b) = Max Permitted average Limits + 20dB

For frequencies above 1GHz (Average measurements).

Max. reading – 20dB

Max. reading – 20 dB

Guidance on Measurement of Digit Transmission Systems:

“If the emission is pulsed, modify the unit for continuous operation, use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.”

The correction factor, based on the total channel dwell time in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

Duty Cycle correction =  $20 \log (\text{dwell time}/100\text{ms})$

Test equipment used: ETSTW-RE 030, ETSTW-RE 111, ETSTW-RE 088, ETSTW-RE 018,  
ETSTW-RE 064

Note: No duty cycle correction was added to the reading of EUT.



# ***Worldwide Testing Services(Taiwan) Co., Ltd.***

Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

SAMPLE CALCULATION OF LIMIT. All results will be updated by an automatic measuring system in accordance with point 2.3.

Calculation of test results:

Such factors like antenna correction, cable loss, external attenuation etc. are already included in the provided measurement results. This is done by using validated test software and calibrated test system according the accreditation requirements.

The peak and average spurious emission plots was measured with the average limits.

In the Table being listed the critical peak and average value and exhibit the compliance with the above calculated Limits.

If in the column's correction factor states a value then the max. Field strength in the same row is corrected by a value gained from the "Correction Factor".

## **Summary table with radiated data of the test plots**

| Model:             | DR13              | Date:        | --             |                    |                   |                |                           |                      |  |
|--------------------|-------------------|--------------|----------------|--------------------|-------------------|----------------|---------------------------|----------------------|--|
| Mode:              | --                | Temperature: | --             | °C                 | Engineer:         | --             |                           |                      |  |
| Polarization:      | --                | Humidity:    | --             | %                  |                   |                |                           |                      |  |
| Frequency<br>(MHz) | Reading<br>(dBuV) | Detector     | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Table<br>Degree<br>(Deg.) | Ant.<br>High<br>(cm) |  |
| --                 | --                | --           | --             | --                 | --                | --             | --                        | --                   |  |
| --                 | --                | --           | --             | --                 | --                | --             | --                        | --                   |  |

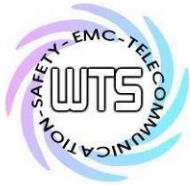
| Frequency<br>(MHz) | Reading<br>(dBuV) |      | Factor<br>(dB) | Result @3m<br>(dBuV/m) |      | Limit @3m<br>(dBuV/m) |      | Margin<br>(dB) | Table<br>Degree<br>(Deg.) | Ant.<br>High<br>(cm) |
|--------------------|-------------------|------|----------------|------------------------|------|-----------------------|------|----------------|---------------------------|----------------------|
|                    | Peak              | Ave. | Corr.          | Peak                   | Ave. | Peak                  | Ave. |                |                           |                      |
| --                 | --                | --   | --             | --                     | --   | --                    | --   | --             | --                        | --                   |
| --                 | --                | --   | --             | --                     | --   | --                    | --   | --             | --                        | --                   |

### **Note**

1. **Correction Factor = Antenna factor + Cable loss - Preamplifier**
2. **The formula of measured value as: Test Result = Reading + Correction Factor**
3. **Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
4. **All not in the table noted test results are more than 20 dB below the relevant limits.**
5. **After evaluated, the test result in this report adopt the worst case to measure, please see attached diagrams in appendix.**

**TEST RESULT (Transmitter):** The unit DOES meet the FCC requirements.

Test equipment used: ETSTW-RE 030, ETSTW-RE 111, ETSTW-RE 088, ETSTW-RE 018,  
ETSTW-RE 064



Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

### **3.5 Carrier Frequency Separation**

Carrier Frequency Separation was measured with modulation (declared by manufacturer).

According to FCC rules part 15 subpart C §15.247 frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or 20 dB bandwidth of the hopping channel, whichever is greater.

#### **Limits:**

| Frequency Range<br>MHz     | Limits                   |                          |
|----------------------------|--------------------------|--------------------------|
|                            | 20 dB bandwidth < 25 kHz | 20 dB bandwidth > 25 kHz |
| 902-928                    | 25 kHz                   | 20 dB bandwidth          |
| 2400-2483.5<br>5725-5850.0 | 25 kHz                   | 20 dB bandwidth          |

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

Explanation: This test is not required.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

### **3.6 Number of Hopping Frequencies**

According to FCC rules part 15 subpart C §15.247 frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping frequencies. Frequency hopping systems in 5725-5850 MHz bands shall use least 75 hopping frequencies.

For frequency hopping systems operating in the 902-928 MHz band: if the 20dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies; if the 20dB bandwidth of the hopping channel 250 kHz or greater, the system shall use at least 25 hopping frequencies.

#### **Limits:**

| Frequency Range<br>MHz | Limit               |                    |
|------------------------|---------------------|--------------------|
|                        | 20dB Bandwidth      | Number of Channels |
| 902-928 MHz            | Bandwidth < 250 kHz | ≥ 50               |
|                        | Bandwidth ≥ 250 kHz | ≥ 25               |
| 2400-2483.5            | not defined         | 15                 |
| 5725-5850.0 MHz        | 1 MHz               | 75                 |

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

Explanation: This test is not required.

#### **3.6.1 Pseudorandom Frequency Hopping Sequence**

The generation of the hopping sequence is determined by the Bluetooth core specification and complies with the FCC requirements.

#### **3.6.2 Coordination of hopping sequences to other transmitters**

According to the Bluetooth core specification such a coordination is not possible. During scatternet function only one of the two hopping sequences will be used at a definite moment.

#### **3.6.3 System Receiver Hopping Capability**

According to the Bluetooth core specification. The system receivers shift frequencies in synchronization with the transmitted signals.



Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

## **3.7 Time of Occupancy (Dwell Time)**

Frequency hopping systems operating in the 5725-5850 MHz band shall use an average time of occupancy on any frequency not greater than 0.4 seconds within a 30 second period.

In 2400-2483.5 MHz band the average time of occupancy on any channel shall not be greater than 0.4 seconds multiplied by the number of hopping channels employed.

For frequency hopping systems operating in the 902-928 MHz band: if the 20dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any frequency shall not greater than 0.4 seconds within a 20 second period; if the 20dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

### **Limits and measurement periods:**

| Frequency MHz | Number of channels | Measurement Periode             | Limit |
|---------------|--------------------|---------------------------------|-------|
| 902 – 928     | $\geq 50$          | 20 s                            | 0.4 s |
|               | $49 \geq 25$       | 10 s                            | 0.4 s |
| 2400 – 2483.5 | $\geq 15$          | 0.4 s * number of used channels | 0.4 s |
| 5725- 5850    | $\geq 75$          | 30 s                            | 0.4s  |

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

Explanation: This test is not required.



Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

### **3.8 20dB Bandwidth**

Frequency hopping systems operating in the 5725-5850 MHz bands shall use a maximum 20dB bandwidth of 1 MHz.

The 20dB bandwidth is measured on the lowest, middle and highest hopping channel.

For frequency hopping systems operating in the 902-928 MHz band the maximum 20dB bandwidth of the hopping channel is 500 kHz.

#### **Limits:**

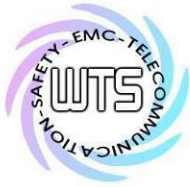
| Frequency Range / MHz | Limit          |
|-----------------------|----------------|
| 902-928               | $\leq 500$ kHz |
| 2400-2483.5           | not defined    |
| 5725-5850             | $\leq 1$ MHz   |

Test equipment used: ETSTW-RE 055, ETSTW-RE 064

Explanation: This test is not required.

#### **3.8.1 System Receiver Input Bandwidth**

It is determined in the Bluetooth core specification. The value matches to the bandwidth of transmitter signal.



Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

### **3.9 Minimum 6 dB Bandwidth**

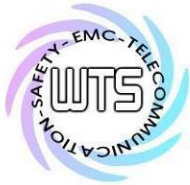
The analyzer ResBW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK reading was taken, two markers were set 6 dB below the maximum level on the right and the left side of the emission.  
The 6 dB bandwidth is the frequency difference between the two markers.

#### **Limits:**

| Frequency Range<br>MHz | Limits      |
|------------------------|-------------|
| 902-928                | min 500 kHz |
| 2400-2483.5            | min 500 kHz |
| 5725-5850              | min 500 kHz |

Test equipment used: ETSTW-RE 055, ETSTW-RE 050

Explanation: This test is not required.



Registration number: W6M21910-19416-C-1

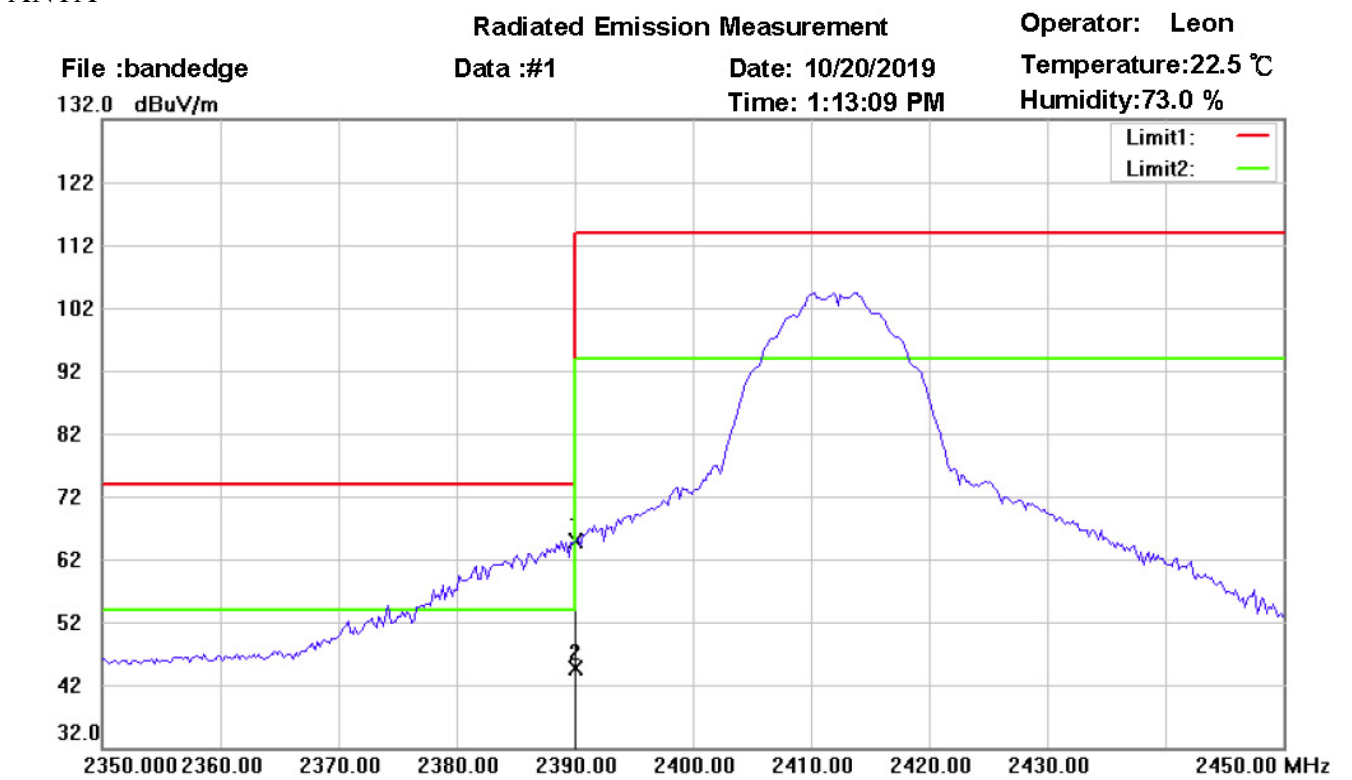
FCC ID: IR5DR13

## 3.10 Radiated Emission on the band edge

According to FCC rules part 15 subpart C §15.247(d) in any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB 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. Attenuation below the general limits specified in § 15.209(a) is not required.

In addition radiated emission which fall in the restricted bands, as defined in section 15.205(a), must also with the radiated emission limits.

ANTA



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11b CH1

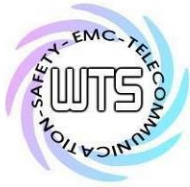
Note :

Polarization: *Horizontal*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
| *   | 2390.000        | 27.95          | peak     | 37.02               | 64.97           | 74.00          | 223          | 309            | -9.03       |         |
|     | 2390.000        | 7.70           | AVG      | 37.02               | 44.72           | 54.00          | 223          | 309            | -9.28       |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#2

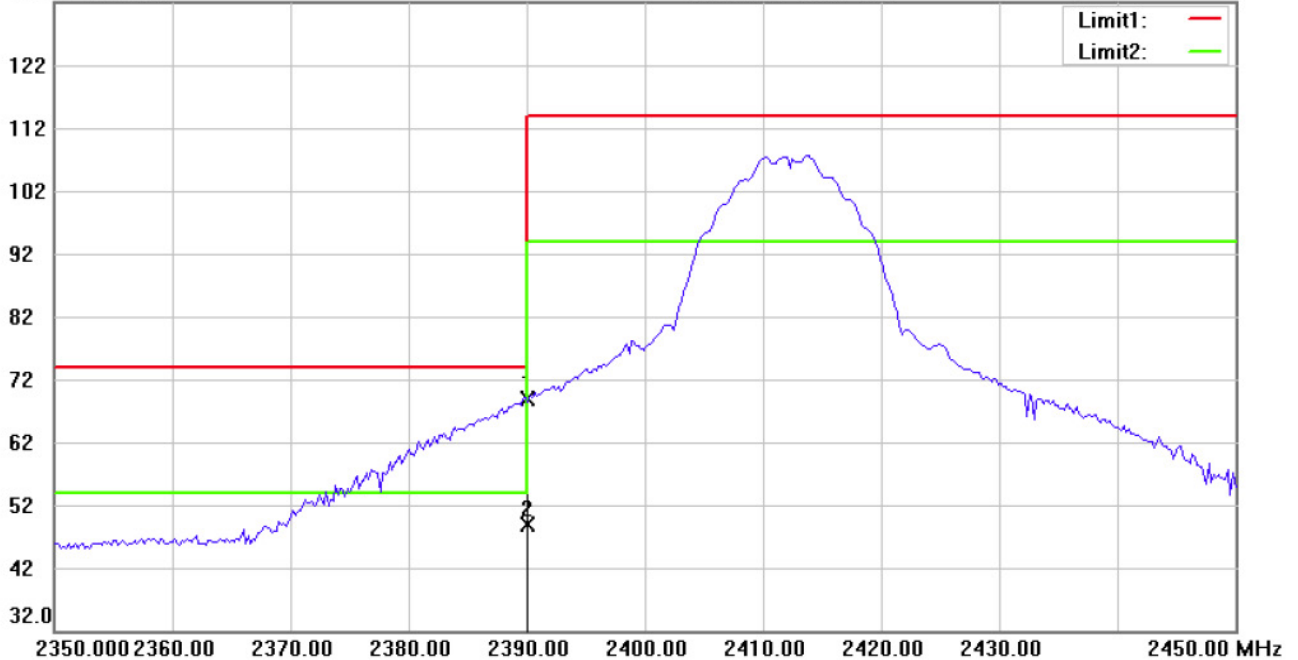
Date: 10/20/2019

Temperature:22.5 °C

132.0 dBuV/m

Time: 1:28:08 PM

Humidity:73.0 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11b CH1

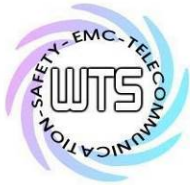
Note :

Polarization: *Vertical*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2390.000        | 31.82          | peak     | 37.02               | 68.84           | 74.00          | 240          | 15             | -5.16       |         |
| *   | 2390.000        | 11.97          | AVG      | 37.02               | 48.99           | 54.00          | 240          | 15             | -5.01       |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#1

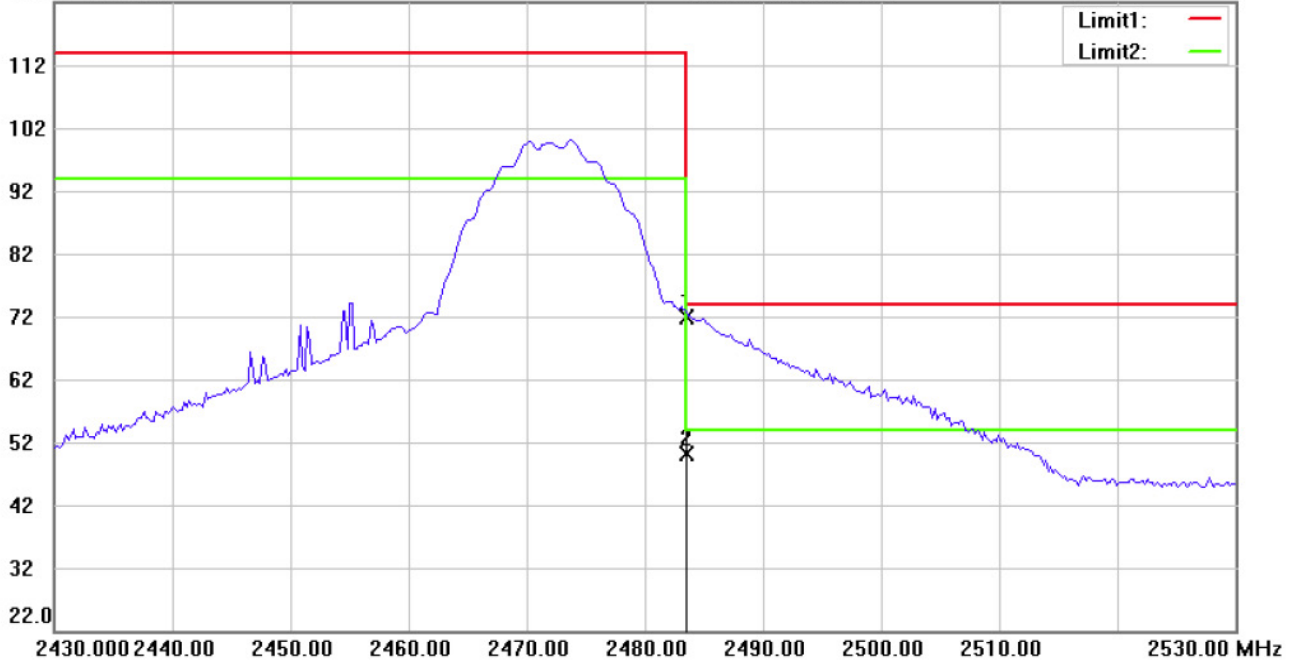
Date: 10/20/2019

Temperature:22.5 °C

122.0 dBuV/m

Time: 3:57:09 PM

Humidity:73.0 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11b CH13

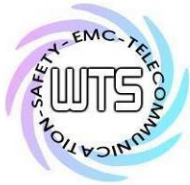
Note :

Polarization: *Horizontal*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
| *   | 2483.500        | 34.18          | peak     | 37.74               | 71.92           | 74.00          | 150          | 305            | -2.08       |         |
|     | 2483.500        | 12.32          | AVG      | 37.74               | 50.06           | 54.00          | 150          | 305            | -3.94       |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#2

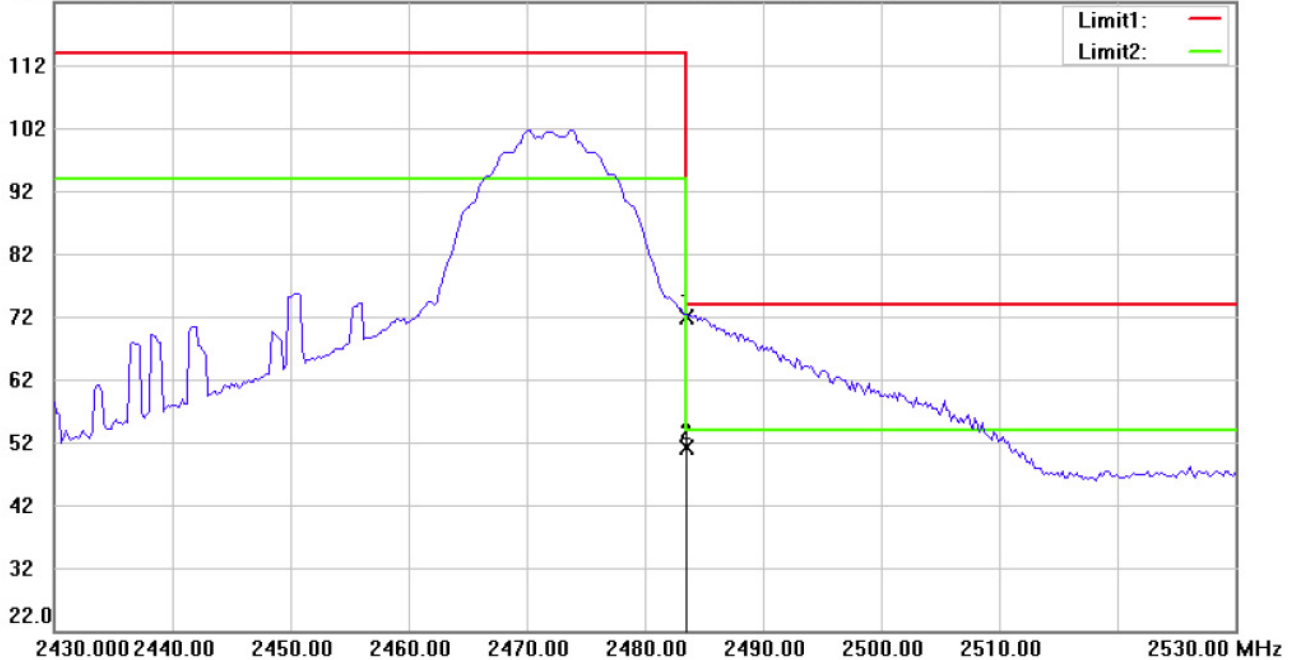
Date: 10/20/2019

Temperature:22.5 °C

122.0 dBuV/m

Time: 4:13:30 PM

Humidity:73.0 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11b CH13

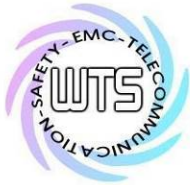
Note :

Polarization: *Vertical*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
| *   | 2483.500        | 34.26          | peak     | 37.74               | 72.00           | 74.00          | 155          | 5              | -2.00       |         |
|     | 2483.500        | 13.51          | AVG      | 37.74               | 51.25           | 54.00          | 155          | 5              | -2.75       |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#1

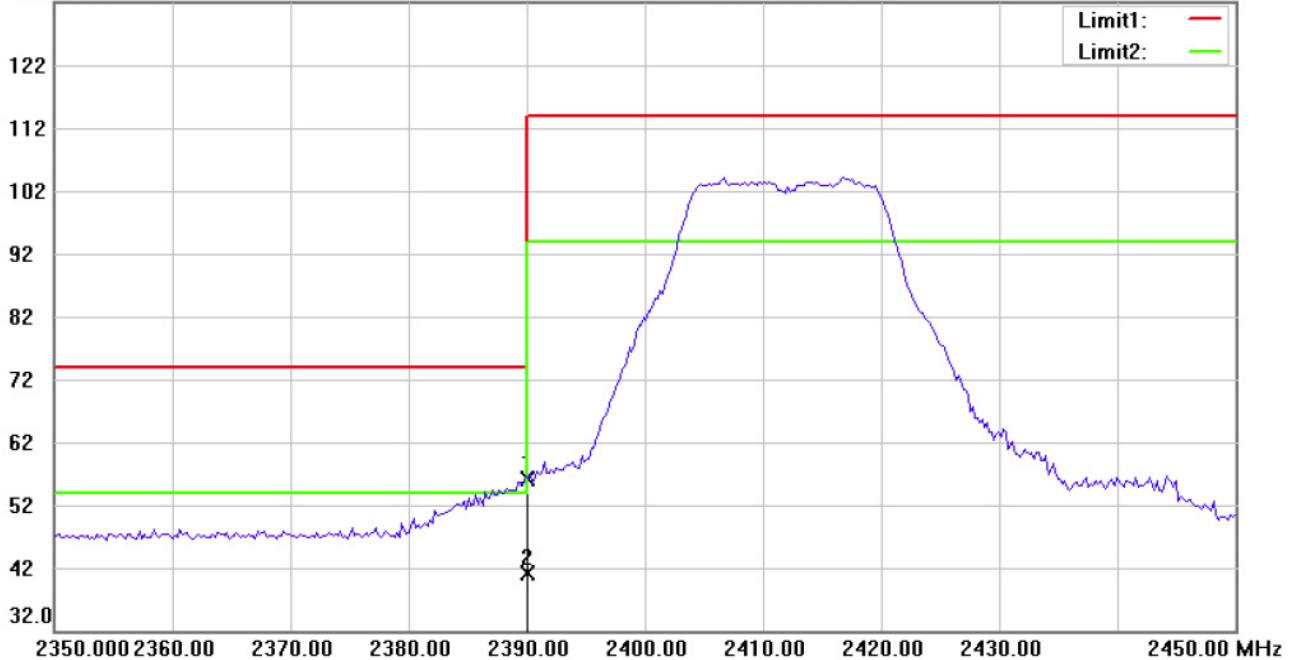
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 7:06:57 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11g CH1

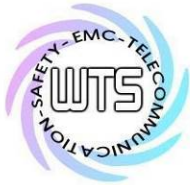
Note :

Polarization: *Horizontal*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2390.000        | 19.07          | peak     | 37.02               | 56.09           | 74.00          | 200          | 40             | -17.91      |         |
| *   | 2390.000        | 4.09           | AVG      | 37.02               | 41.11           | 54.00          | 200          | 40             | -12.89      |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#2

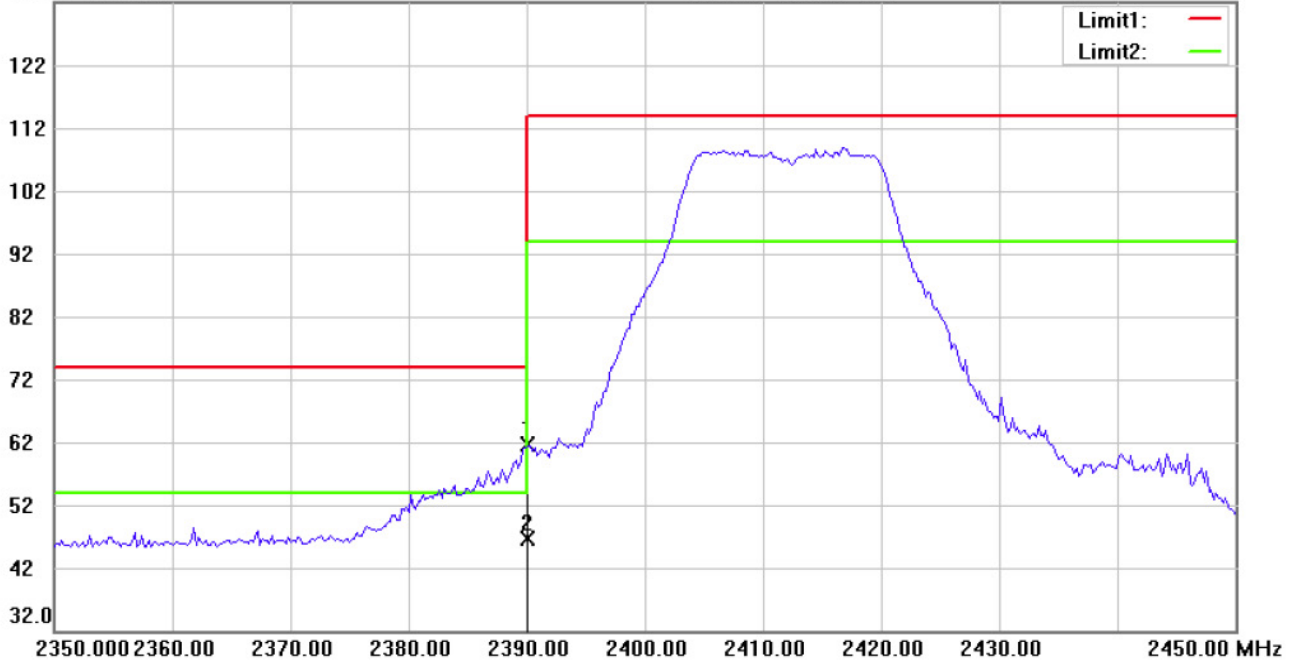
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 7:11:19 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11g CH1

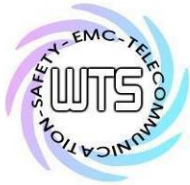
Note :

Polarization: *Vertical*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2390.000        | 24.62          | peak     | 37.02               | 61.64           | 74.00          | 210          | 360            | -12.36      |         |
| *   | 2390.000        | 9.67           | AVG      | 37.02               | 46.69           | 54.00          | 210          | 360            | -7.31       |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#1

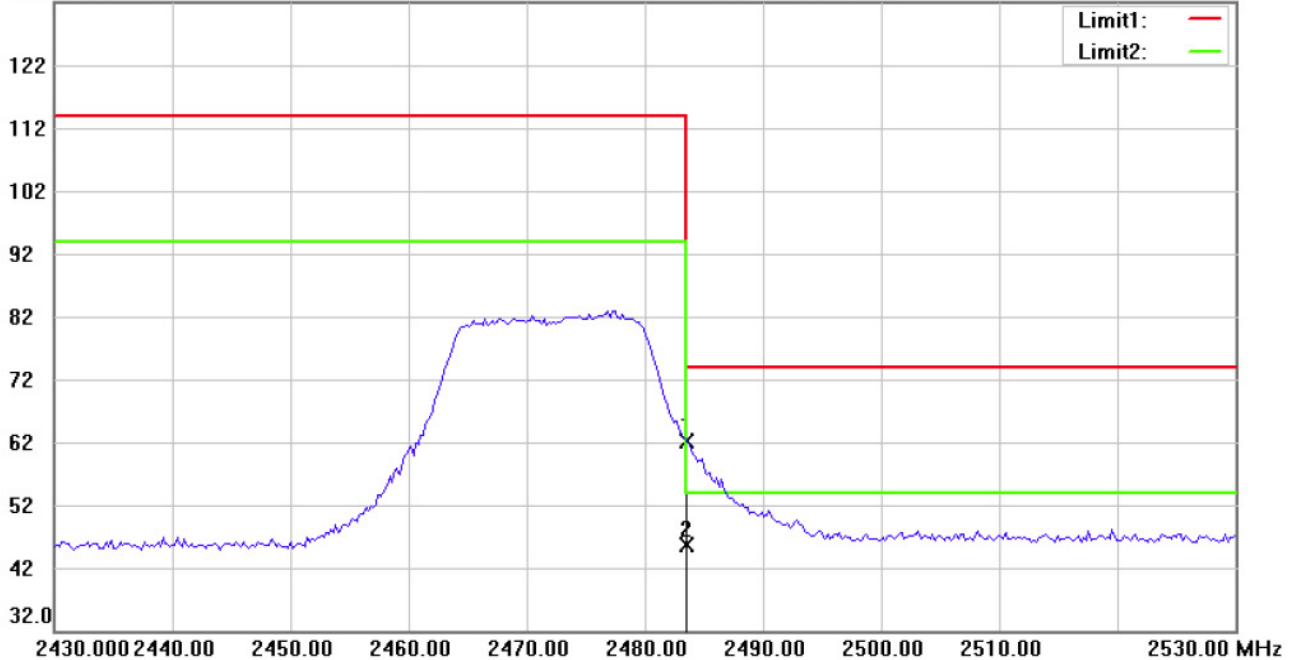
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 4:26:55 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11g CH13

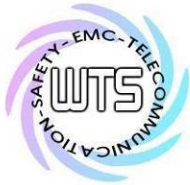
Note :

Polarization: *Horizontal*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2483.500        | 24.35          | peak     | 37.74               | 62.09           | 74.00          | 168          | 40             | -11.91      |         |
| *   | 2483.500        | 7.77           | AVG      | 37.74               | 45.51           | 54.00          | 168          | 40             | -8.49       |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#2

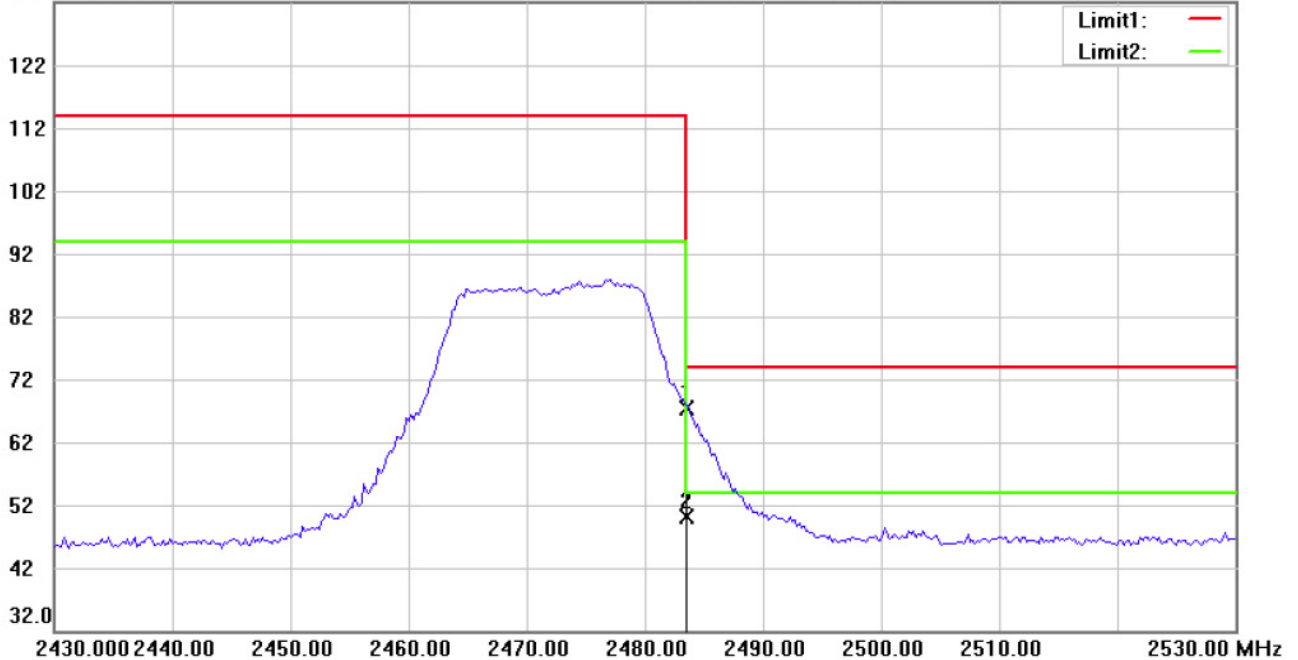
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 4:30:27 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11g CH13

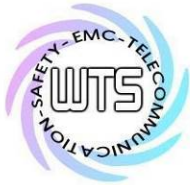
Note :

Polarization: *Vertical*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2483.500        | 29.65          | peak     | 37.74               | 67.39           | 74.00          | 205          | 360            | -6.61       |         |
| *   | 2483.500        | 12.38          | AVG      | 37.74               | 50.12           | 54.00          | 205          | 360            | -3.88       |         |

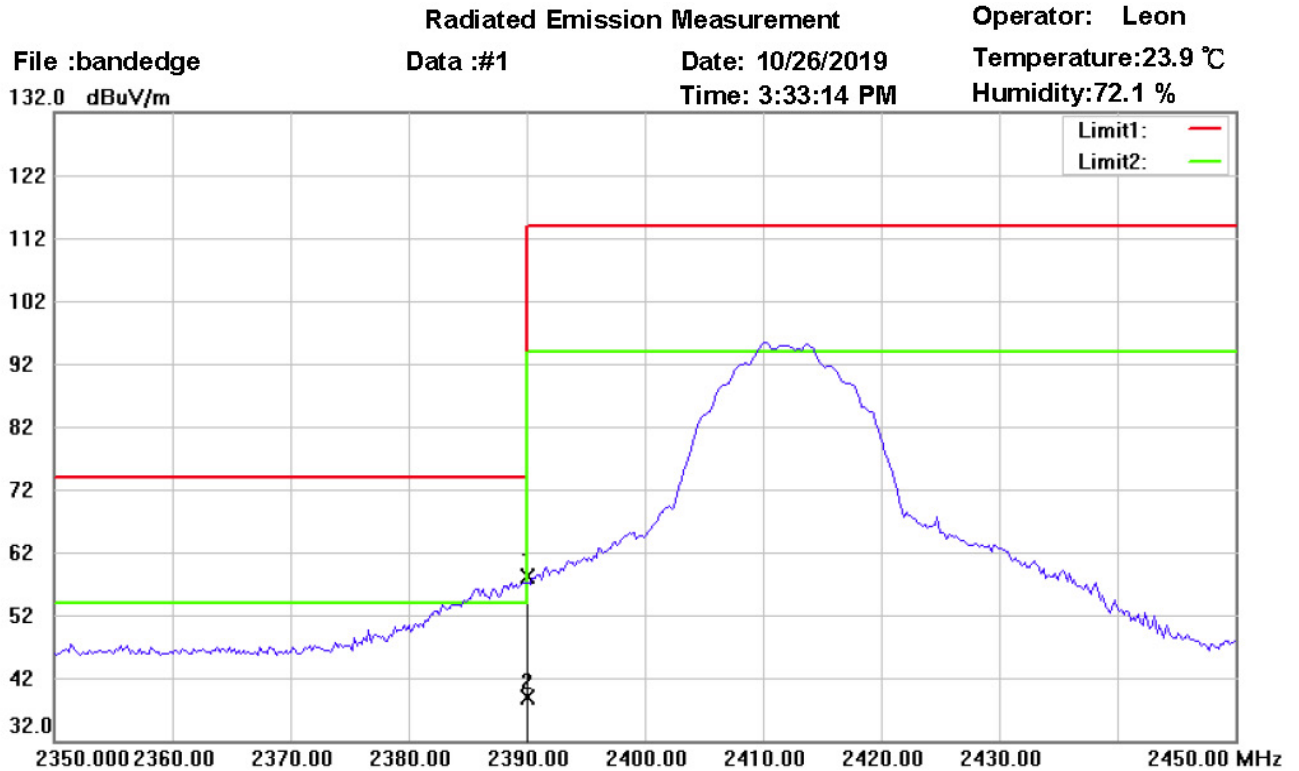


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

ANTB



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11b CH1

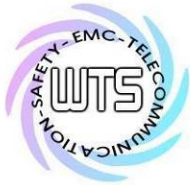
Note :

Polarization: *Horizontal*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2390.000        | 21.10          | peak     | 37.02               | 58.12           | 74.00          | 150          | 55             | -15.88      |         |
| *   | 2390.000        | 1.97           | AVG      | 37.02               | 38.99           | 54.00          | 150          | 55             | -15.01      |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#2

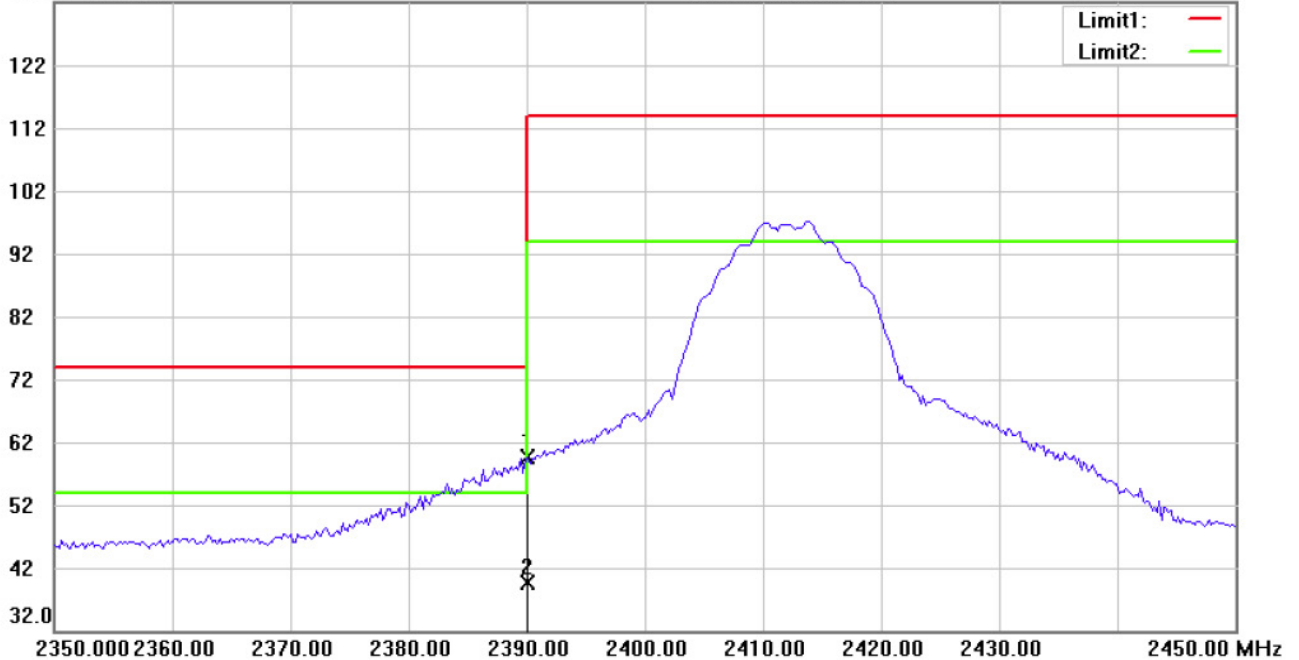
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 3:44:07 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11b CH1

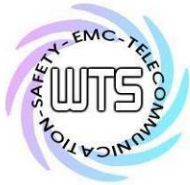
Note :

Polarization: *Vertical*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
| *   | 2390.000        | 22.70          | peak     | 37.02               | 59.72           | 74.00          | 195          | 300            | -14.28      |         |
|     | 2390.000        | 2.66           | AVG      | 37.02               | 39.68           | 54.00          | 195          | 330            | -14.32      |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#1

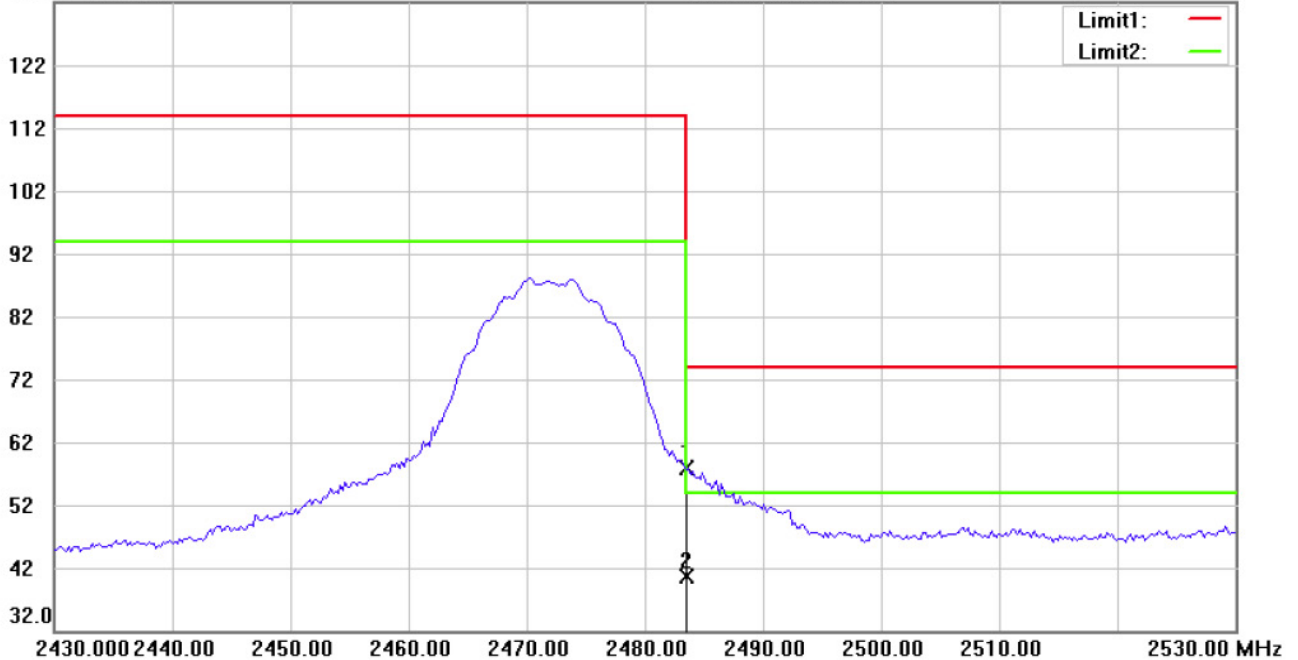
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 3:58:25 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11b CH13

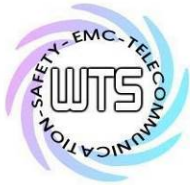
Note :

Polarization: *Horizontal*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2483.500        | 20.09          | peak     | 37.74               | 57.83           | 74.00          | 150          | 190            | -16.17      |         |
| *   | 2483.500        | 2.82           | AVG      | 37.74               | 40.56           | 54.00          | 150          | 190            | -13.44      |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#2

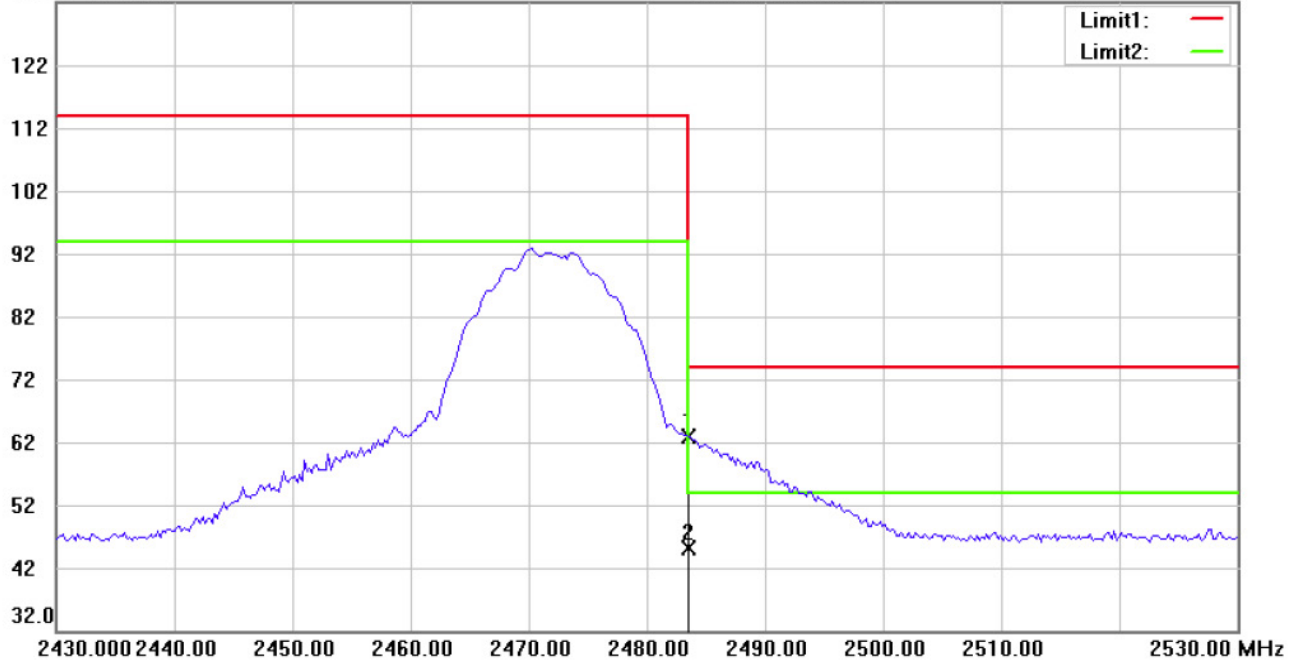
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 4:04:59 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11b CH13

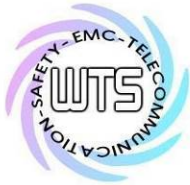
Note :

Polarization: *Vertical*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2483.500        | 25.08          | peak     | 37.74               | 62.82           | 74.00          | 150          | 205            | -11.18      |         |
| *   | 2483.500        | 7.27           | AVG      | 37.74               | 45.01           | 54.00          | 150          | 205            | -8.99       |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#1

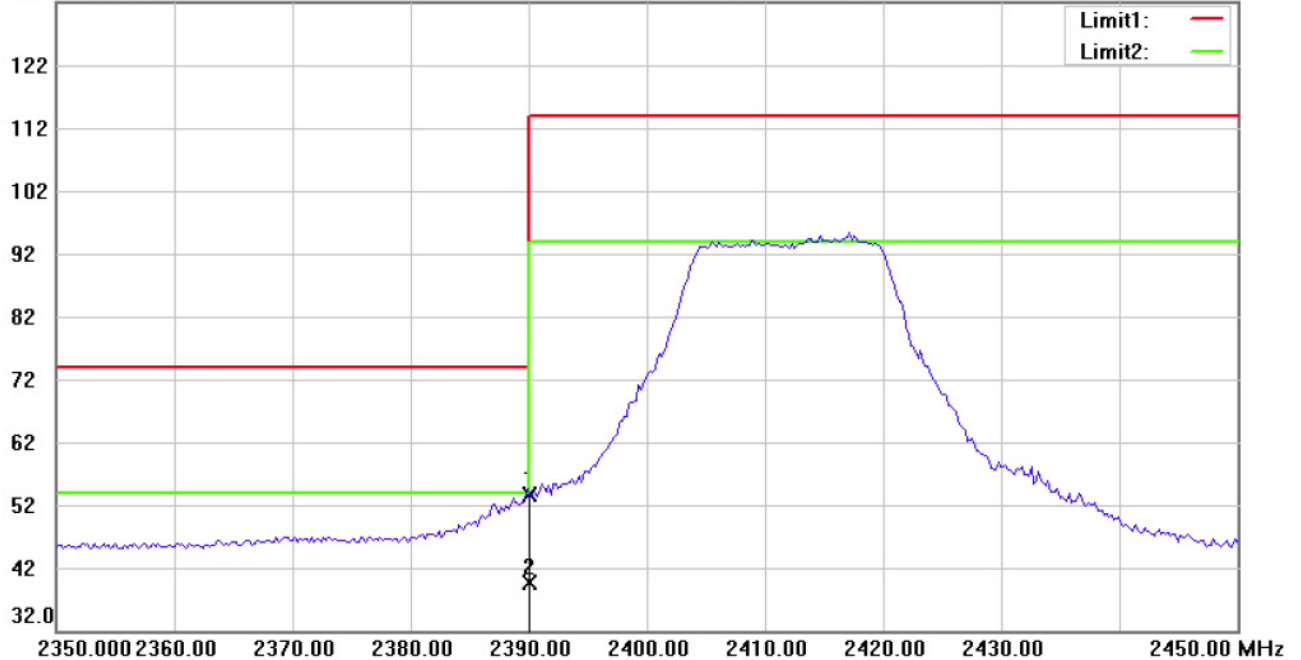
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 6:50:24 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11g CH1

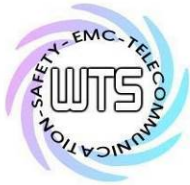
Note :

Polarization: *Horizontal*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2390.000        | 16.71          | peak     | 37.02               | 53.73           | 74.00          | 153          | 185            | -20.27      |         |
| *   | 2390.000        | 2.51           | AVG      | 37.02               | 39.53           | 54.00          | 153          | 185            | -14.47      |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#2

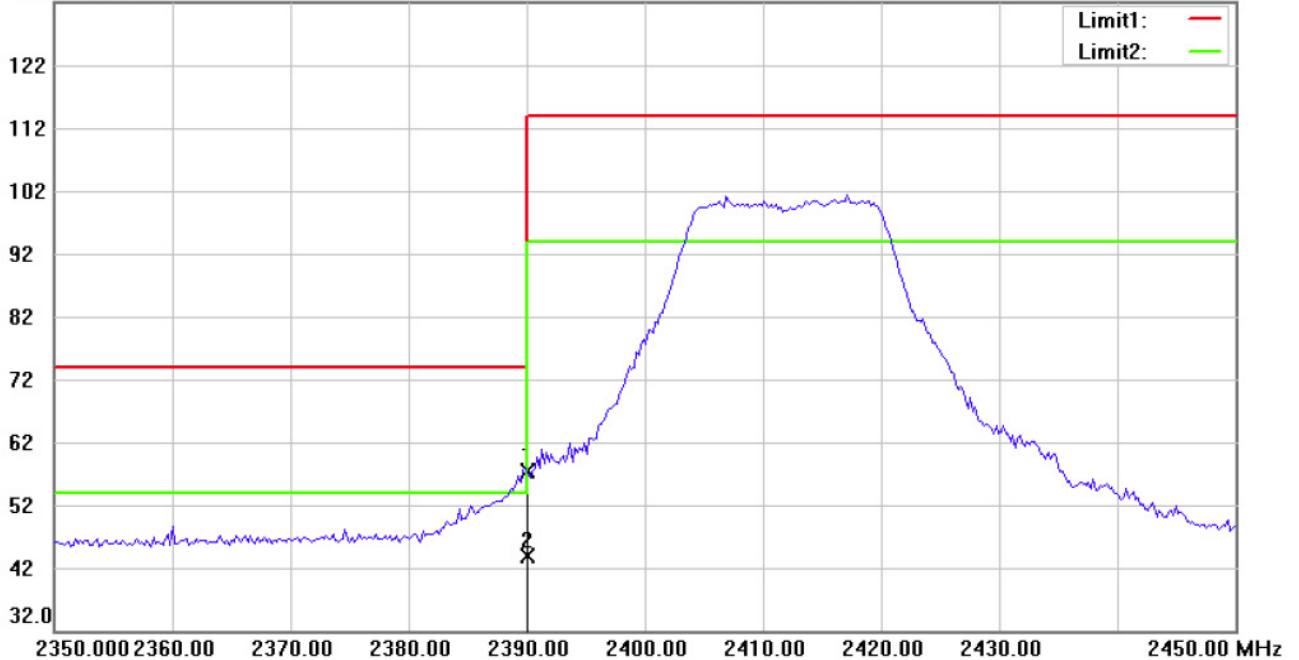
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 6:56:48 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11g CH1

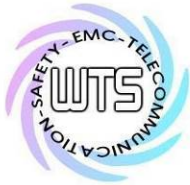
Note :

Polarization: *Vertical*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2390.000        | 20.40          | peak     | 37.02               | 57.42           | 74.00          | 195          | 320            | -16.58      |         |
| *   | 2390.000        | 6.75           | AVG      | 37.02               | 43.77           | 54.00          | 195          | 320            | -10.23      |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#1

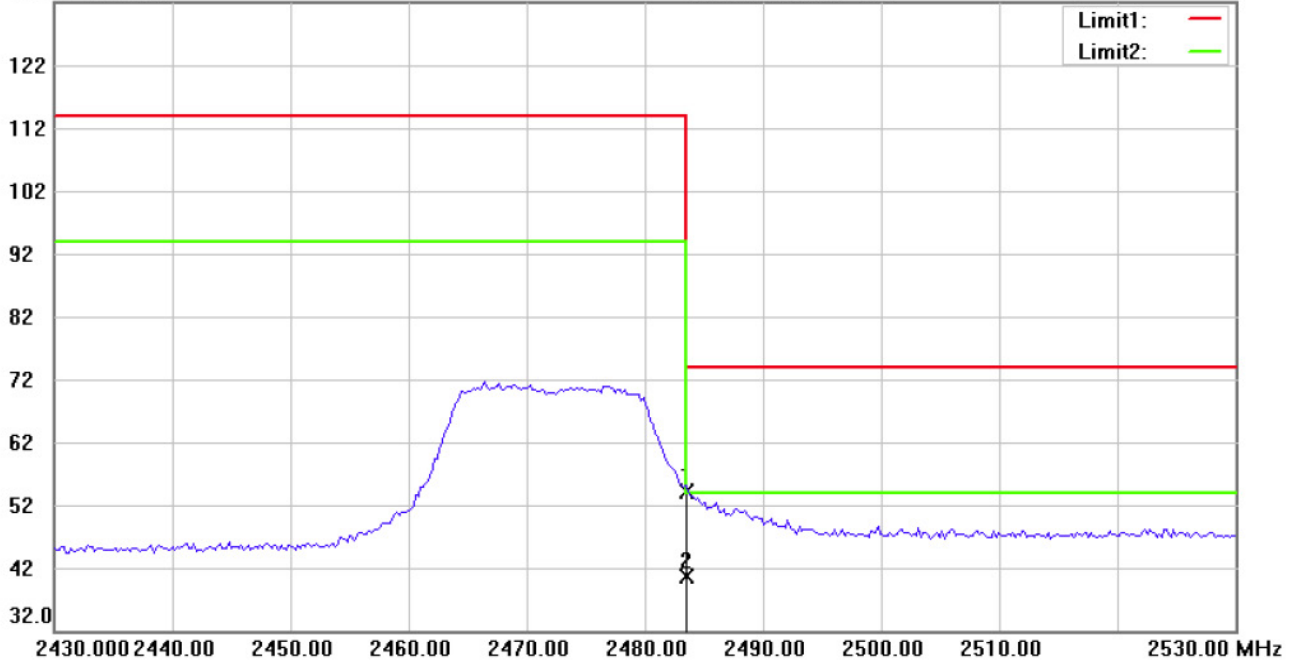
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 4:13:14 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

Polarization: *Horizontal*

EUT : W6M21910-19416

Power : 120 Va.c.

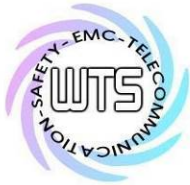
M/N:

Distance: 3m

Test Mode : TX 802.11g CH13

Note :

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2483.500        | 16.36          | peak     | 37.74               | 54.10           | 74.00          | 150          | 190            | -19.90      |         |
| *   | 2483.500        | 2.81           | AVG      | 37.74               | 40.55           | 54.00          | 150          | 190            | -13.45      |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#2

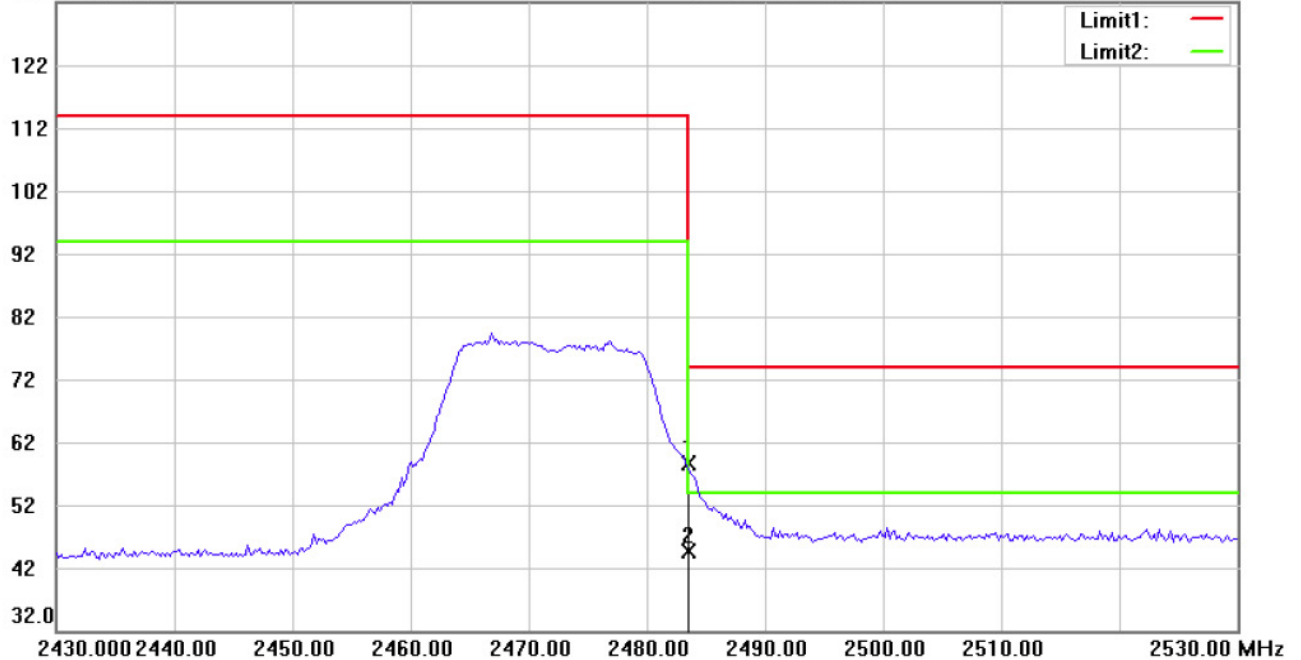
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 4:20:23 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11g CH13

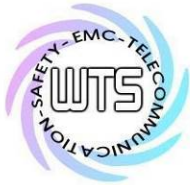
Note :

Polarization: *Vertical*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2483.500        | 20.86          | peak     | 37.74               | 58.60           | 74.00          | 195          | 320            | -15.40      |         |
| *   | 2483.500        | 6.87           | AVG      | 37.74               | 44.61           | 54.00          | 195          | 320            | -9.39       |         |

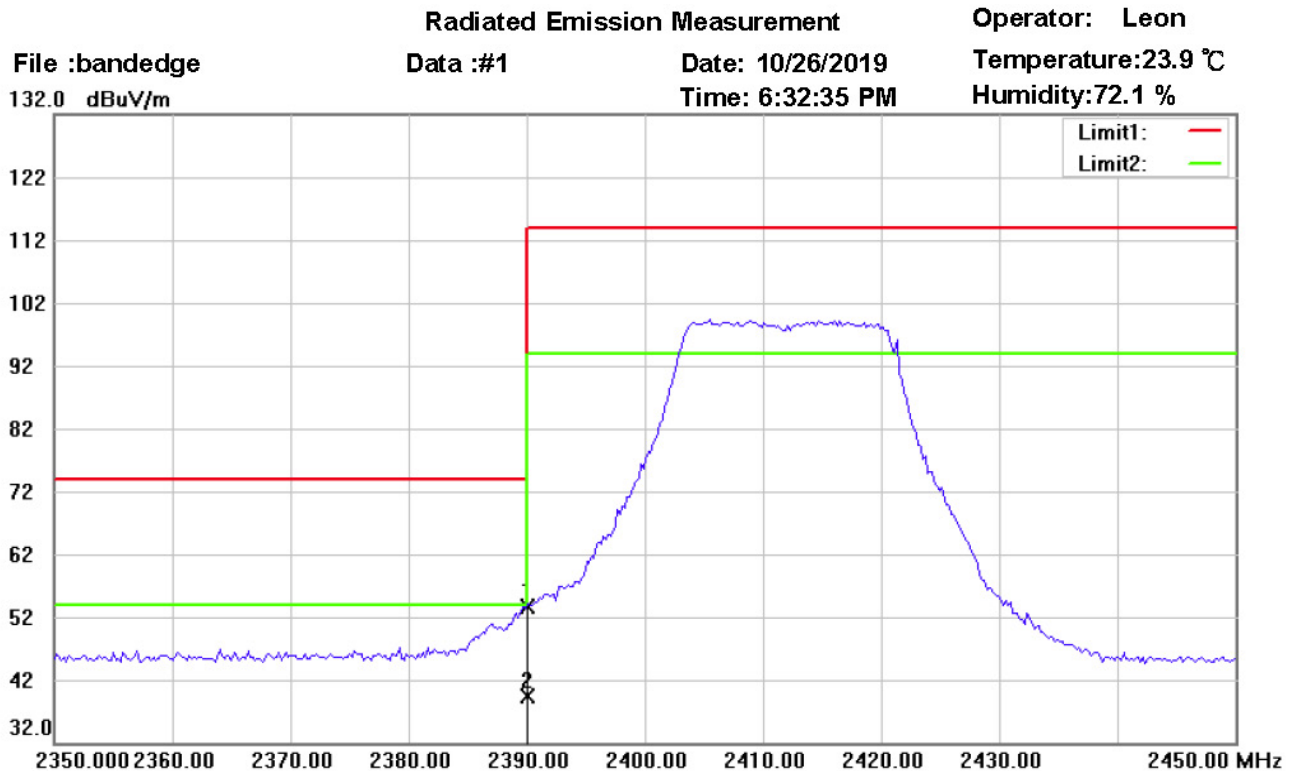


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1

FCC ID: IR5DR13

ANTA+ANTB



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11n20 CH1

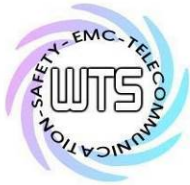
Note :

Polarization: *Horizontal*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2390.000        | 16.52          | peak     | 37.02               | 53.54           | 74.00          | 238          | 314            | -20.46      |         |
| *   | 2390.000        | 2.39           | AVG      | 37.02               | 39.41           | 54.00          | 238          | 314            | -14.59      |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#2

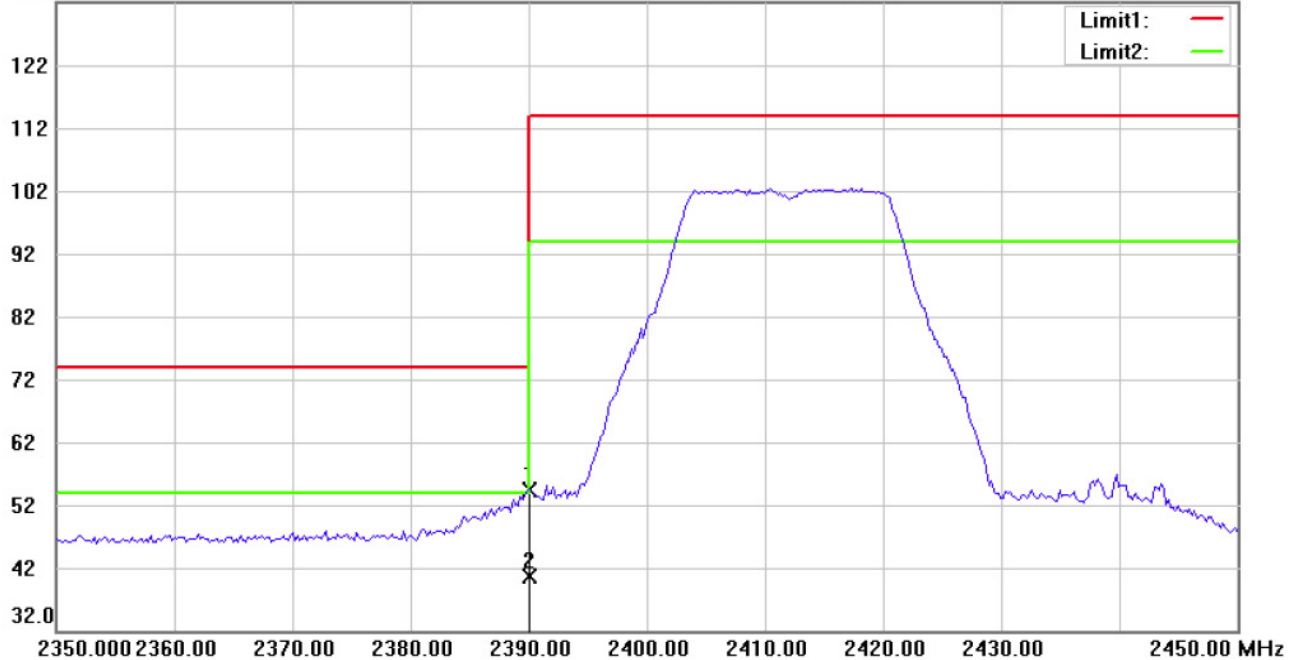
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 6:39:13 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11n20 CH1

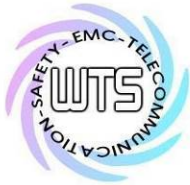
Note :

Polarization: *Vertical*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2390.000        | 17.43          | peak     | 37.02               | 54.45           | 74.00          | 240          | 10             | -19.55      |         |
| *   | 2390.000        | 3.67           | AVG      | 37.02               | 40.69           | 54.00          | 240          | 10             | -13.31      |         |



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21910-19416-C-1  
FCC ID: IR5DR13

## Radiated Emission Measurement

Operator: Leon

File :bandedge

Data :#1

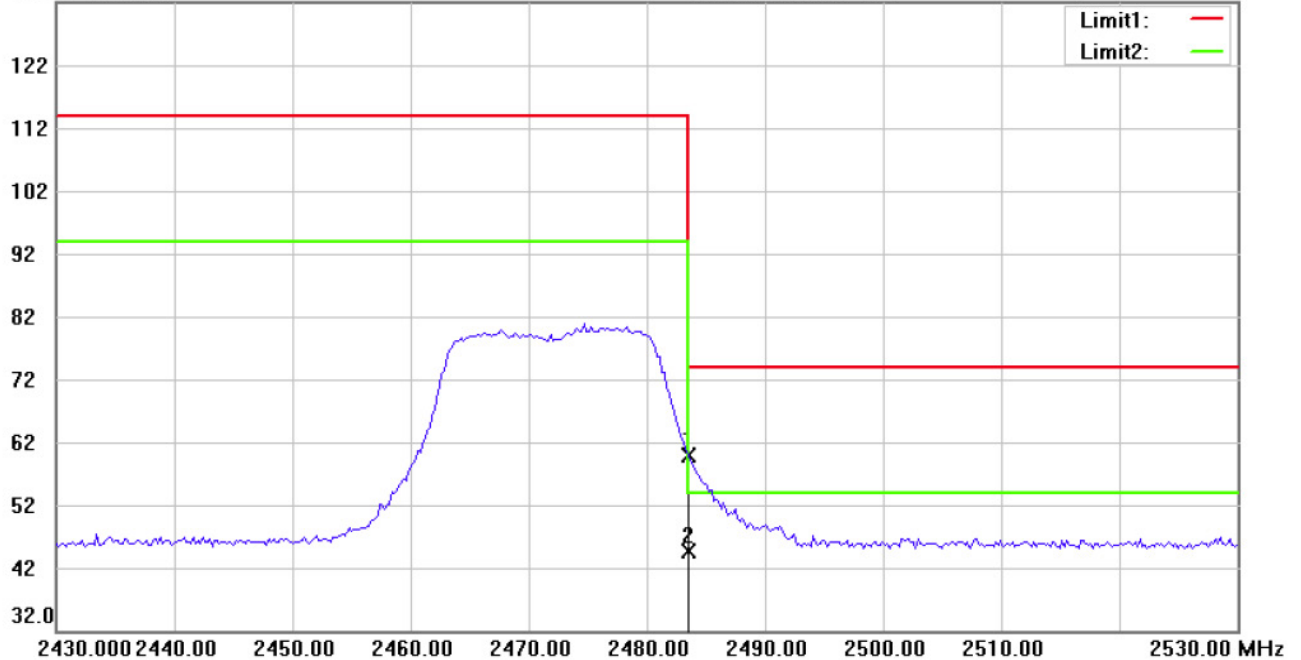
Date: 10/26/2019

Temperature:23.9 °C

132.0 dBuV/m

Time: 4:47:49 PM

Humidity:72.1 %



Site : Chamber

Condition : FCC 15.247 PK (Bandedge)

EUT : W6M21910-19416

M/N:

Test Mode : TX 802.11n20 CH13

Note :

Polarization: *Horizontal*

Power : 120 Va.c.

Distance: 3m

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corr. factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Ant.Pos (cm) | Tab.Pos (deg.) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2483.500        | 22.14          | peak     | 37.74               | 59.88           | 74.00          | 195          | 44             | -14.12      |         |
| *   | 2483.500        | 6.84           | AVG      | 37.74               | 44.58           | 54.00          | 195          | 44             | -9.42       |         |