

**47 CFR PART 15 SUBPART C TEST REPORT**

**for**

**Frontpoint Hub**

**Model No.: FPHUB3**

**FCC ID: GX9FPHUB3**

**of**

**Applicant: CLIMAX TECHNOLOGY CO., LTD.**

**Address: No. 258, Sinhu 2nd Rd., Neihu District  
Taipei City 114 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**



**Report No.: W6R22104-20827-C-1**

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

The test report may only be reproduced or published in full.

Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.

#### **Tester:**

May 19, 2021

Rick Chen

*Rick Chen.*

Date

WTS-Lab.

Name

Signature

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

May 19, 2021

Kevin Wang

*Kevin Wang*

Date

WTS

Name

Signature



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## **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

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

Accredited testing laboratory

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: CLIMAX TECHNOLOGY CO., LTD.

Street: No. 258, Sinhu 2nd Rd., Neihu District

Town: Taipei City 114

Country: Taiwan (R.O.C.)

Telephone: +886-2-2794-0001

Fax: +886-2-2792-6618

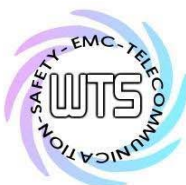
## **1.4 Application details**

Date of receipt of test item(1<sup>st</sup>): May 29, 2018

Date of test(1<sup>st</sup>): from May 29, 2018 to June 07, 2018

Date of receipt of test item(2<sup>nd</sup>): April 26, 2021

Date of test(2<sup>nd</sup>): from April 27, 2021 to May 05, 2021



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## **1.5 Test item**

Description of test item: Frontpoint Hub

Type identification: FPHUB3

Brand name: ./.

Multi-listing model number: FPHUB1,  
FPHUB2: Top-cover change for FPHUB1,

Transmitting frequency: 433.82 MHz

Operation mode: Half-duplex

Voltage supply: Adaptor (I/P: 100-240V~ 50/60Hz, 0.8A; O/P: 12V, 1.5A)  
Battery 7.2V, 2300mAh

(The device is tested under fresh battery condition.)

Highest clock frequency: 433.82 MHz

Antenna type: Monopole antenna

Photos: see Annex

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

Name: ./.

Street: ./.

Town: ./.

Country: ./.

Additional information: ./.

## **1.6 Test standards**

Technical standard : 47 CFR PART 15 SUBPART C § 15.231 (a) (2019-10)

### **Special statement**

1. This test report is based on the original test report no.: W6R21805-18133-C-1.
2. The relevant Circuitry, PCB Layout, Inner element and Function is exactly the same as the one in original test report. The differences are the model number, multi-listing model number, adaptor, appearance, test item of conducted emission has been retested and version of test standard. After estimation, there is no deviation between these standards. Therefore the other test result is also based on the original test report no. W6R21805-18133-C-1 without retesting.



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## 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 as specified in 3 were ascertained in the course of the tests performed. ☐

### 2.2 Test environment

Relative humidity content: 20 ... 75 %

Air pressure: 86 ... 103 kPa

| Test item Name                                                                                                                              | Uncertainty                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Estimation Result of Uncertainty of Conducted Emission                                                                                      | Expanded Uncertainty :<br>AMN : 1.05 dB<br>Voltage probe : 1.05 dB                                                     |
| Estimation Result of Uncertainty of Radiated Emission(3M)                                                                                   | Expanded Uncertainty :<br>0.009-30 MHz : 2.13 dB<br>30-1000 MHz : 3.53 dB<br>1-18 GHz : 4.19 dB<br>18-40 GHz : 4.09 dB |
| Estimation Result of Uncertainty of Bandwidth Measurement<br>20 dB Bandwidth, Occupied bandwidth, Channel bandwidth,<br>Necessary Bandwidth | Expanded Uncertainty : 0.41 kHz                                                                                        |
| Estimation Result of Uncertainty of Frequency Drift Measurement<br>Frequency stability                                                      | Expanded Uncertainty : 6.11 Hz                                                                                         |
| Estimation Result of Uncertainty of Band Edge Measurement                                                                                   | Expanded Uncertainty : 1.33 dBc                                                                                        |

The decision rule is: Measurement uncertainty is not included in the calculation of test results.



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## 2.3 Test equipment utilized

| No.          | Test equipment                                       | Type            | Serial No.  | Manufacturer          | Cal. Date     | Next Cal. Date |
|--------------|------------------------------------------------------|-----------------|-------------|-----------------------|---------------|----------------|
| ETSTW-CE 001 | EMI TEST RECEIVER                                    | ESHS10          | 842121/013  | R&S                   | 2020/6/11     | 2021/6/10      |
| 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                   | 2020/11/6     | 2021/11/5      |
| ETSTW-CE 006 | IMPULSBEGRENZER<br>PULSE LIMITER                     | ESH3-Z2         | 100226      | R&S                   | 2020/9/22     | 2021/9/21      |
| ETSTW-CE 008 | HF-EICHELLEITUNG 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           | 2020/7/22     | 2021/7/21      |
| ETSTW-CE 016 | TWO-LINE V-NETWORK                                   | ENV216          | 100050      | R&S                   | 2020/10/26    | 2021/10/25     |
| ETSTW-CE 028 | MXE EMI Receiver                                     | N9038A          | MY53220110  | Agilent               | 2020/7/29     | 2021/7/28      |
| ETSTW-RE 003 | EMI TEST RECEIVER                                    | ESI 26          | 831438/001  | R&S                   | 2020/6/12     | 2021/6/11      |
| ETSTW-RE 004 | EMI TEST RECEIVER                                    | ESI 40          | 832427/004  | R&S                   | 2020/9/14     | 2021/9/13      |
| 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                    | 2020/7/30     | 2021/7/29      |
| ETSTW-RE 019 | MICROWAVE HORN<br>ANTENNA                            | 22240-25        | 121074      | FM                    | 2021/5/5      | 2022/5/4       |
| ETSTW-RE 027 | Passive Loop Antenna                                 | 6512            | 00034563    | ETS-Lindgren          | 2020/7/8      | 2021/7/7       |
| ETSTW-RE 030 | Double-Ridged Guide Horn<br>Antenna                  | 3117            | 00035224    | ETS-Lindgren          | 2021/4/19     | 2022/4/18      |
| ETSTW-RE 042 | Biconical Antenna                                    | HK116           | 100172      | R&S                   | 2021/3/18     | 2022/3/17      |
| ETSTW-RE 043 | Log-Periodic Dipole<br>Antenna                       | HL223           | 100166      | R&S                   | 2021/5/5      | 2022/5/4       |
| ETSTW-RE 044 | Log-Periodic Antenna                                 | HL050           | 100094      | R&S                   | 2020/8/3      | 2021/8/2       |
| 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                   | 2021/2/19     | 2022/2/18      |
| ETSTW-RE 051 | Attenuator 6dB                                       | 50HF-006-1      | None        | JFW                   | 2021/2/19     | 2022/2/18      |
| ETSTW-RE 053 | Attenuator 3dB                                       | 50HF-003-1      | None        | JFW                   | 2021/2/19     | 2022/2/18      |
| ETSTW-RE 055 | SPECTRUM ANALYZER                                    | FSU 26          | 200074      | R&S                   | 2021/3/16     | 2022/3/15      |
| ETSTW-RE 060 | Attenuator 30dB                                      | 5015-30         | F651012z-01 | ATM                   | 2021/2/19     | 2022/2/18      |
| ETSTW-RE 062 | Amplifier Module                                     | CHC 2           | None        | KMIC                  | 2021/5/5      | 2022/5/4       |
| 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                    | 2020/10/15    | 2021/10/14     |
| ETSTW-RE 088 | SOLID STATE<br>AMPLIFIER                             | KMA180265A01    | 99057       | KMIC                  | 2020/9/17     | 2021/9/16      |
| ETSTW-RE 091 | Match Pad                                            | MDCS1500        | None        | WOKEN                 | 2020/5/22     | 2021/5/21      |
| ETSTW-RE 099 | DC Block                                             | 50DB-007-1      | None        | JFW                   | 2021/2/19     | 2022/2/18      |
| 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 | 2021/1/6      | 2022/1/5       |



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|                 |                                      |                                        |                 |                    |                  |            |
|-----------------|--------------------------------------|----------------------------------------|-----------------|--------------------|------------------|------------|
| ETSTW-RE 120    | RF Player                            | MP9200                                 | MP9210-111022   | ADIVIC             | 2020/12/25       | 2021/12/24 |
| ETSTW-RE 122    | SIGNAL GENERATOR                     | SMF100A                                | 102149          | R&S                | 2020/6/11        | 2021/6/10  |
| ETSTW-RE 125    | 5GHz Notch filter                    | 5NSL11-5200/E221.3-O/O                 | 1               | K&L Microwave      | 2020/8/7         | 2021/8/6   |
| ETSTW-RE 126    | 5GHz Notch filter                    | 5NSL12-5800/E221.3-O/O                 | 1               | K&L Microwave      | 2020/8/7         | 2021/8/6   |
| ETSTW-RE 127    | RF Switch Box                        | RFS-01                                 | None            | WTS                | 2021/2/19        | 2022/2/18  |
| ETSTW-RE 128    | 5.3GHz Notch filter                  | N0153001                               | SN487233        | Microwave Circuits | 2020/8/7         | 2021/8/6   |
| ETSTW-RE 129    | 5.5GHz Notch filter                  | N0555984                               | SN487234        | Microwave Circuits | 2020/8/7         | 2021/8/6   |
| ETSTW-RE 130    | Handheld RF Spectrum Analyzer        | N9340A                                 | CN0147000204    | Agilent            | Pre-test Use     |            |
| ETSTW-RE 142    | Amplifier                            | 8447D                                  | 2805A03378      | Agilent            | 2021/5/5         | 2022/5/4   |
| ETSTW-RE 146    | Preamplifier                         | JPA-10M1G                              | 15090004        | JPT                | 2020/6/5         | 2021/6/4   |
| ETSTW-RE 147    | Bi-log Hybrid Antenna                | MCTD 2786B                             | BLB16M04005     | ETC                | 2021/4/7         | 2022/4/6   |
| ETSTW-RE 148    | Bi-log Hybrid Antenna                | MCTD 2786B                             | BLB16M04006     | ETC                | 2020/7/9         | 2021/7/8   |
| ETSTW-RE 153    | Signal Analyzer                      | FSV40                                  | 101929          | R&S                | 2020/10/1        | 2021/9/30  |
| ETSTW-RF 002    | Electromagnetic field probe          | LF-30                                  | K-0007          | STT                | 2020/6/9         | 2021/6/8   |
| ETSTW-EMI 011   | USB Compact Modulator                | SFC-U                                  | 101689          | R&S                | 2020/5/21        | 2021/5/20  |
| ETSTW-GSM 002   | Universal Radio Communication Tester | CMU 200                                | 109439          | R&S                | 2021/3/16        | 2022/3/15  |
| ETSTW-GSM 003   | Radio Communication Analyzer         | MT8820C                                | 6201342073      | Anritsu            | 2021/4/27        | 2022/4/26  |
| ETSTW-GSM 004   | Wideband Radio Communication Tester  | CMW500                                 | 128092          | R&S                | 2020/11/10       | 2021/11/9  |
| ETSTW-GSM 019   | Band Reject Filter                   | WRCTF824/849-822/851-40 /12+9SS        | 3               | WI                 | 2021/1/6         | 2022/1/5   |
| ETSTW-GSM 020   | Band Reject Filter                   | WRCD1747/1748-1743/1752-32/5SS         | 1               | WI                 | 2021/1/6         | 2022/1/5   |
| ETSTW-GSM 021   | Band Reject Filter                   | WRCD1879.5/1880.5-1875.5/1884.5-32/5SS | 3               | WI                 | 2021/1/6         | 2022/1/5   |
| ETSTW-GSM 022   | Band Reject Filter                   | WRCT901.9/903.1-904.25-50/8SS          | 1               | WI                 | 2021/1/6         | 2022/1/5   |
| ETSTW-GSM 023   | Power Divider                        | 4901.19.A                              | None            | SUHNER             | 2020/9/8         | 2021/9/7   |
| ETSTW-GSM 024   | Radio Communication Analyzer         | MT8821C                                | None            | Anritsu            | 2021/4/1         | 2022/3/31  |
| ETSTW-GSM 025   | Band Reject Filter                   | BRM19835                               | 001             | Micro-Tronics      | 2020/8/7         | 2021/8/6   |
| 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       | 2021/2/19        | 2022/2/18  |
| ETSTW-Cable 017 | BNC Cable                            | X Cable                                | B Cable 2       | Schwarz beck       | 2021/2/19        | 2022/2/18  |
| ETSTW-Cable 018 | BNC Cable                            | Y Cable                                | B Cable 3       | Schwarz beck       | 2021/2/19        | 2022/2/18  |
| ETSTW-Cable 019 | BNC Cable                            | Z Cable                                | B Cable 4       | Schwarz beck       | 2021/2/19        | 2022/2/18  |
| ETSTW-Cable 020 | N TYPE Cable                         | OATS Cable 1                           | N30N30-L335-15M | JYE BAO CO.,LTD.   | 2020/7/1         | 2021/6/30  |
| ETSTW-Cable 027 | Microwave Cable                      | SUCOFLEX 104                           | 279083          | HUBER+SUHNER       | 2021/5/5         | 2022/5/4   |
| ETSTW-Cable 028 | Microwave Cable                      | FA147A0015M2020                        | 30064-2         | UTIFLEX            | 2020/9/17        | 2021/9/16  |
| ETSTW-Cable 029 | Microwave Cable                      | FA147A0015M2020                        | 30064-3         | UTIFLEX            | 2020/9/17        | 2021/9/16  |
| ETSTW-Cable 030 | Microwave Cable                      | SUCOFLEX 104 (S Cable 9)               | 279067          | HUBER+SUHNER       | 2021/2/19        | 2022/2/18  |
| ETSTW-Cable 043 | Microwave Cable                      | SUCOFLEX 104                           | 317576          | HUBER+SUHNER       | 2021/5/5         | 2022/5/4   |
| ETSTW-Cable 047 | Microwave Cable                      | SUCOFLEX 104                           | 325518          | HUBER+SUHNER       | 2020/7/3         | 2021/7/2   |



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|                 |                          |                           |          |              |                  |           |
|-----------------|--------------------------|---------------------------|----------|--------------|------------------|-----------|
| ETSTW-Cable 058 | Microwave Cable          | SUCOFLEX 104              | none     | HUBER+SUHNER | 2020/6/5         | 2021/6/4  |
| ETSTW-Cable 064 | Microwave Cable          | SUCOFLEX 104              | MY28891  | HUBER+SUHNER | 2021/5/5         | 2022/5/4  |
| ETSTW-Cable 071 | N TYPE CABLE             | EMCCFD400-NM-<br>NM-25000 | 170239   | EMCI         | 2020/6/5         | 2021/6/4  |
| ETSTW-Cable 072 | SMA type cable (8m)      | SUCOFLEX 104              | 805800/4 | HUBER+SUHNER | 2021/5/5         | 2022/5/4  |
| ETSTW-Cable 074 | SMA type cable (2m)      | SUCOFLEX 104              | 802563/4 | HUBER+SUHNER | 2021/5/5         | 2022/5/4  |
| 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 002    | Thermohygrometer         | 608-H1                    | 45204317 | Testo        | 2020/9/23        | 2021/9/22 |
| ETSTW-TH 003    | Wireless weather station | GAIA                      | N/A      | TFA          | 2020/12/3        | 2021/12/2 |



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## **2.4 General Test Procedure**

**POWER LINE CONDUCTED INTERFERENCE:** The procedure used was ANSI STANDARD C63.10-2013 6.2 using a 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 ANSI STANDARD C63.10-2013 6.3 using a spectrum analyzer. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was the 100 kHz and the video bandwidth was 300 kHz.

**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 dBμV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

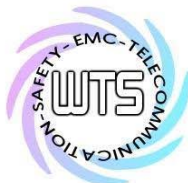
|            |                                                         |
|------------|---------------------------------------------------------|
| Freq (MHz) | METER READING + ACF + CABLE LOSS (to the receiver) = FS |
| 33         | 20 dBμV + 10.36 dB/m + 6 dB = 36.36 dBμV/m @3m          |

**ANSI STANDARD C63.10-2013 6.2.2 MEASUREMENT PROCEDURES:** The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table). The EUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10<sup>th</sup> harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings.

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.

**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.



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### **3 Test results (enclosure)**

☒ 1st test

☐ test after modification

☐ production test

| TEST CASE                                    | Para. Number  | Required                            | Test passed                         | Test failed              |
|----------------------------------------------|---------------|-------------------------------------|-------------------------------------|--------------------------|
| Transmission Requirements                    | FCC 15.231(a) | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Radiated Emission                            | FCC 15.231(b) | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Bandwidth of Emission                        | FCC 15.231(c) | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Frequency Tolerance                          | FCC 15.231(d) | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Period Alternate Field Strength Requirements | FCC 15.231(e) | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Antenna Requirement                          | FCC 15.203    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Conducted Measurement at (AC) Power Line     | FCC 15.207    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**The following is intentionally left blank.**

Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPHUB3

## 3.1 Transmission Requirements

FCC 15.231(a)

### 3.1.1 Limit of Transmission Time

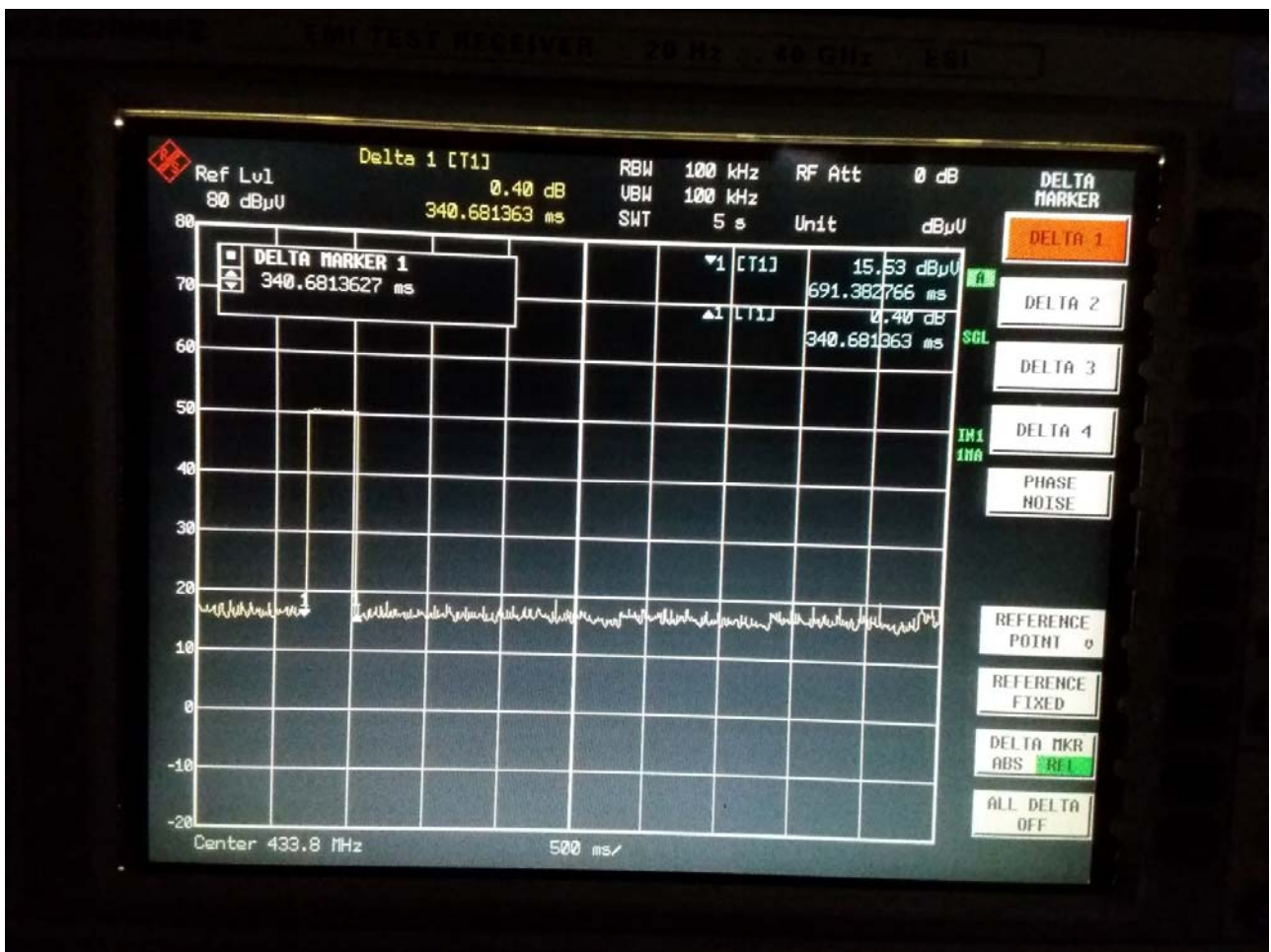
☒ According to 15.231(a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

☐ According to 15.231(a)(2), a transmitter activated automatically shall cease transmission within 5 seconds after activation.

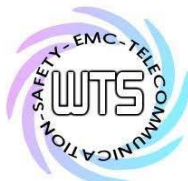
### 3.1.2 Active Time

☒ This manually operated transmitter employs a switch that automatically deactivate the transmitter within 340.681363 ms of being released.

☐ This transmitter is operated by automatic activation and active will cease transmission in \_\_ ms after activation..



Test equipment used : ETSTW-RE 004



Registration number: W6R22104-20827-C-1

FCC ID: GX9FPHUB3

## 3.2 Output Power (Field Strength)

Radiated Emission Measurement

Operator: Leon

File :power

Data :#1

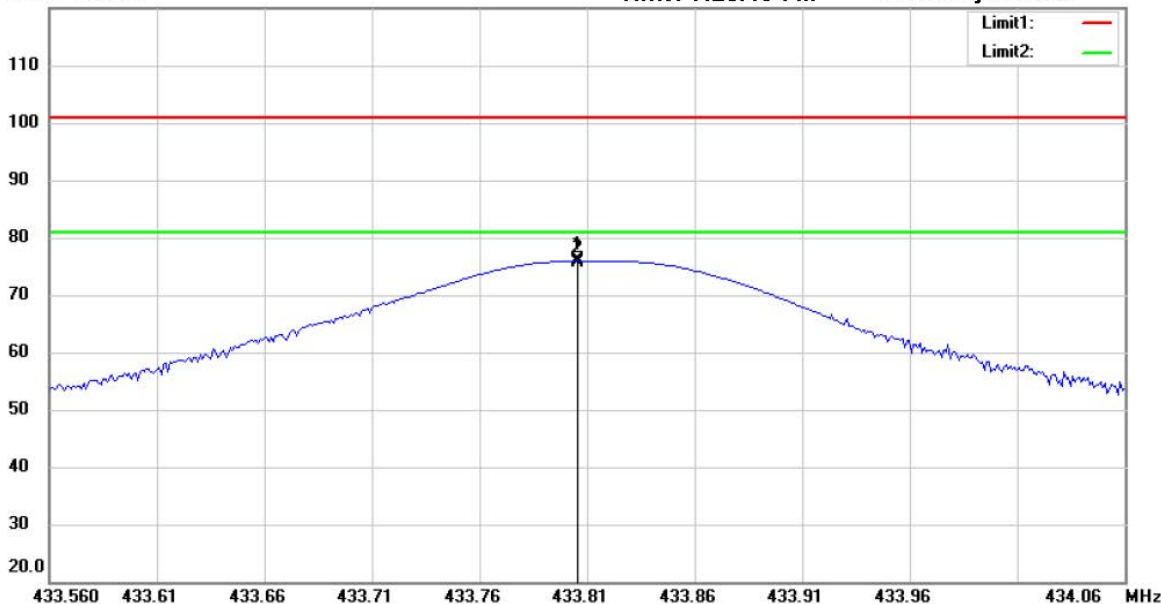
Date: 6/4/2018

Temperature:26.8 °C

120.0 dBuV/m

Time: 7:28:45 PM

Humidity:62.1 %



Site : Chamber

Condition : FCC 15.231(433MHz)Power(PK)

Polarization: *Horizontal*

EUT : W6R21805-18133

Power : 120 Va.c.

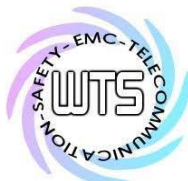
M/N:

Distance: 3m

Test Mode : TX 433.82MHz

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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 433.8055        | 50.52          | peak     | 25.49               | 76.01           | 100.80         | 210          | 209            | -24.79      |         |
| *   | 433.8055        | 50.06          | AVG      | 25.49               | 75.55           | 80.80          | 210          | 209            | -5.25       |         |



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

Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPUB3

## Radiated Emission Measurement

Operator: Leon

File :power  
120.0 dBuV/m

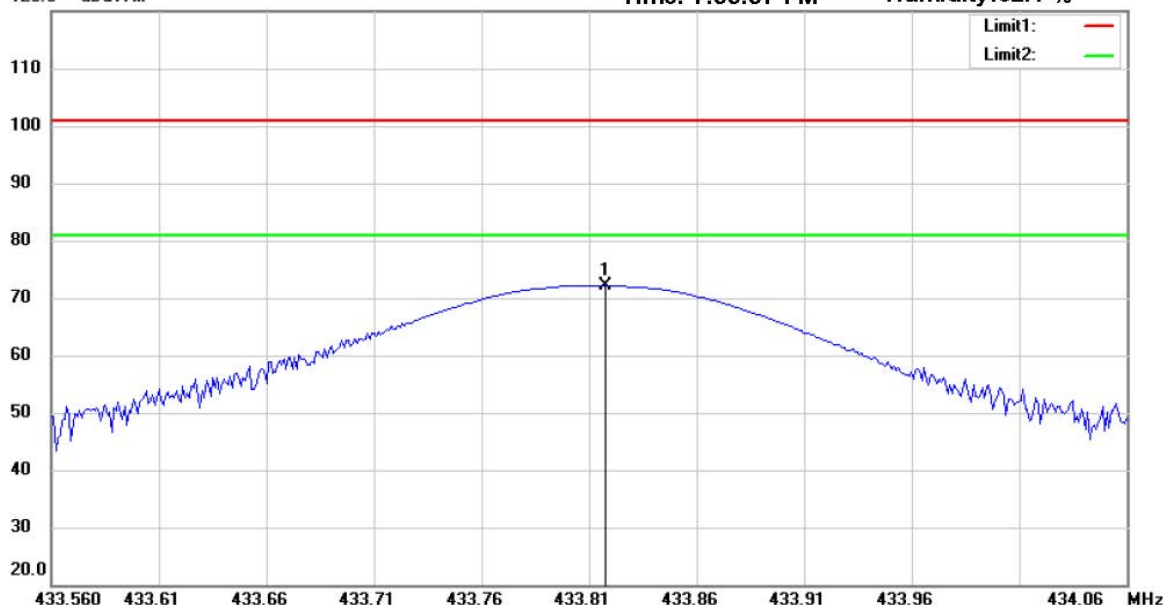
Data :#2

Date: 6/4/2018

Temperature:26.8 °C

Time: 7:33:37 PM

Humidity:62.1 %



Site : Chamber

Condition : FCC 15.231(433MHz)Power(PK)

Polarization: **Vertical**

EUT : W6R21805-18133

Power : 120 Va.c.

M/N:

Distance: 3m

Test Mode : TX 433.82MHz

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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
| *   | 433.8175        | 46.65          | peak     | 25.49               | 72.14           | 100.80         | 100          | 165            | -28.66      |         |

Limit 15.231(b)

| Fundamental Frequency (MHz) | Field strength of fundamental, limit $\mu\text{V/m}$                                    |
|-----------------------------|-----------------------------------------------------------------------------------------|
| 40.66 – 40.70               | 2,250                                                                                   |
| 70 – 130                    | 1,250                                                                                   |
| 130 – 174                   | 1,250 to 3,750                                                                          |
| 174 – 260                   | 3,750                                                                                   |
| 260 – 470                   | 3,750 to 12,500**<br>(433.82 MHz: 80.82 dB $\mu\text{V/m}$ = 10992.51 $\mu\text{V/m}$ ) |
| Above 470                   | 12,500                                                                                  |

\*\* linear interpolation

Test equipment used: ETSTW-RE 004, ETSTW-RE 062, ETSTW-RE 142, ETSTW-RE 147



Registration number: W6R22104-20827-C-1

FCC ID: GX9FPHUB3

## **3.3 Out of Band Radiated Emissions**

FCC Rule: 15.231(b) , 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.

Guidance on Measurement of pulsed emission: 15.35(c)

“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.”

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

Limits:

For frequencies (Average measurements)

Correction factor conform 15.35 (c) (Average measurements)

Duty cycle correction :

Max. Peak reading – duty cycle correction

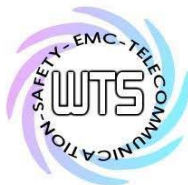
Max permitted average Limits = Max permitted Fundamental limit – 20 dB

For example for 433.82 fundamental carrier:

Max permitted average Limit:  $80.82 \text{ dB}\mu\text{V/m} - 20 \text{ dB} = 60.82 \text{ dB}\mu\text{V/m}$

For frequencies above 1GHz (Peak measurements).

Modified Limits for peak conform 15.35 (b) = Max Permitted average Limits + 20dB (because Peak detector is used)



Registration number: W6R22104-20827-C-1

FCC ID: GX9FPUB3

## **3.4 Transmitter Radiated Emissions in restricted Bands**

FCC Rules: 15.231 (b), 15.205, 15.209, 15.35

Radiated emission measurements were performed from 30 MHz to 8000 MHz.

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

RES BW VID BW

Frequency <1 GHz 100 kHz 100 kHz (Peak measurements)

Frequency >1 GHz 1 MHz 1 MHz (Peak measurements)

1 MHz 1 MHz (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 960                      | 500                                  | 54.0                                    |

For frequencies above 1GHz (Average measurements).

Guidance on Measurement of pulsed emission:

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

For frequencies above 1GHz (Average measurements).

The correction factor, based on the 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 =  $20 \log (\text{dwell time}/100\text{ms})$

No duty cycle correction was added to the reading

Modified Limits for peak conform 15.35 (b) = Max Permitted average Limits + 20dB (because Peak detector is used)

Above 960 MHz

For mode DSSS CW:  $54 \text{ dB}\mu\text{V/m} + 20 \text{ dB} = 74 \text{ dB}\mu\text{V/m}$



Registration number: W6R22104-20827-C-1

FCC ID: GX9FPUB3

## 3.5 Spurious Emission radiated, Transmitter

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

The limits on the field strength of the spurious emission in the table § 15.231(b) are based on the fundamental frequency of the intentional radiator. Spurious emission shall be attenuated to the average (or alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in § 15.209, whichever limit permits a higher field strength.

In addition, radiated emission 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)).

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

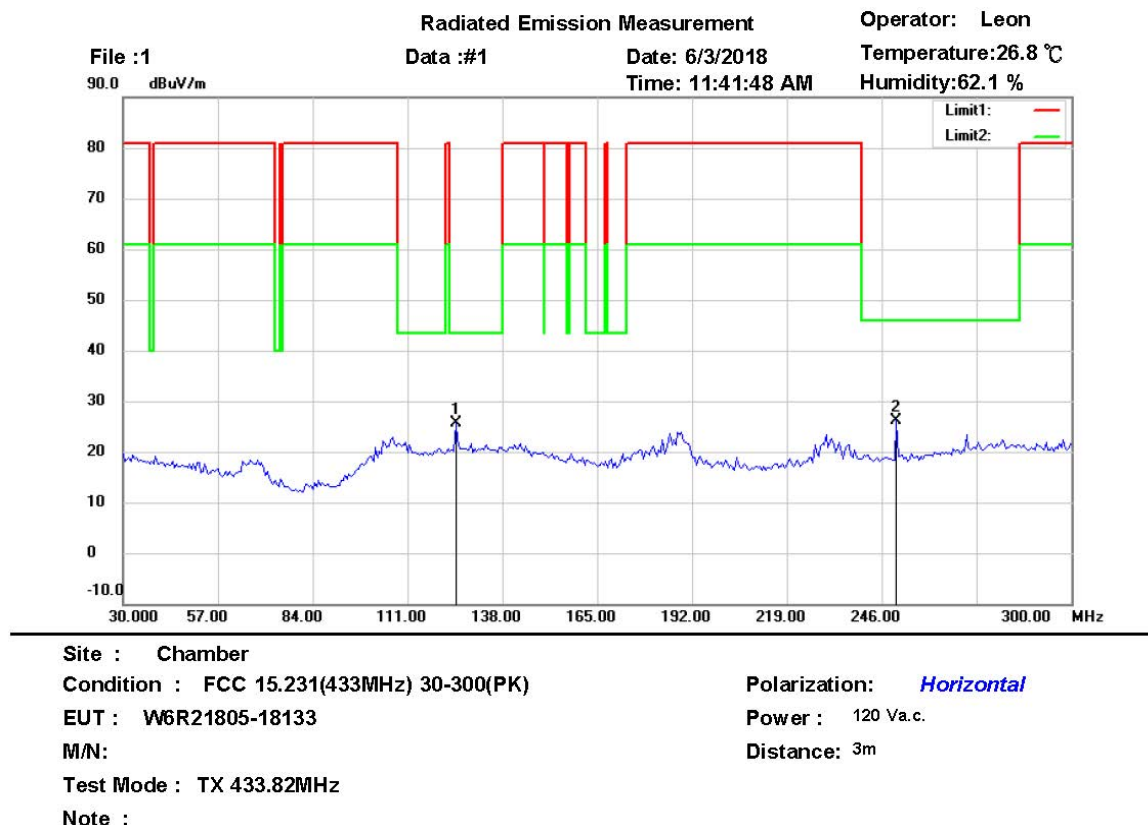
Calculation of test results:

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.

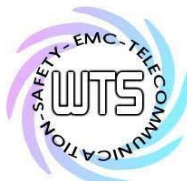
The peak and average spurious emission plots was measured with the average limits.

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

Summary table with radiated data of the test plots



| 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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
| *   | 124.6894        | 32.16          | peak     | -6.46               | 25.70           | 43.50          | 100          | 190            | -17.80      |         |
|     | 250.2204        | 33.51          | peak     | -7.36               | 26.15           | 46.00          | 100          | 173            | -19.85      |         |



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

Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPUB3

## Radiated Emission Measurement

Operator: Leon

File :1

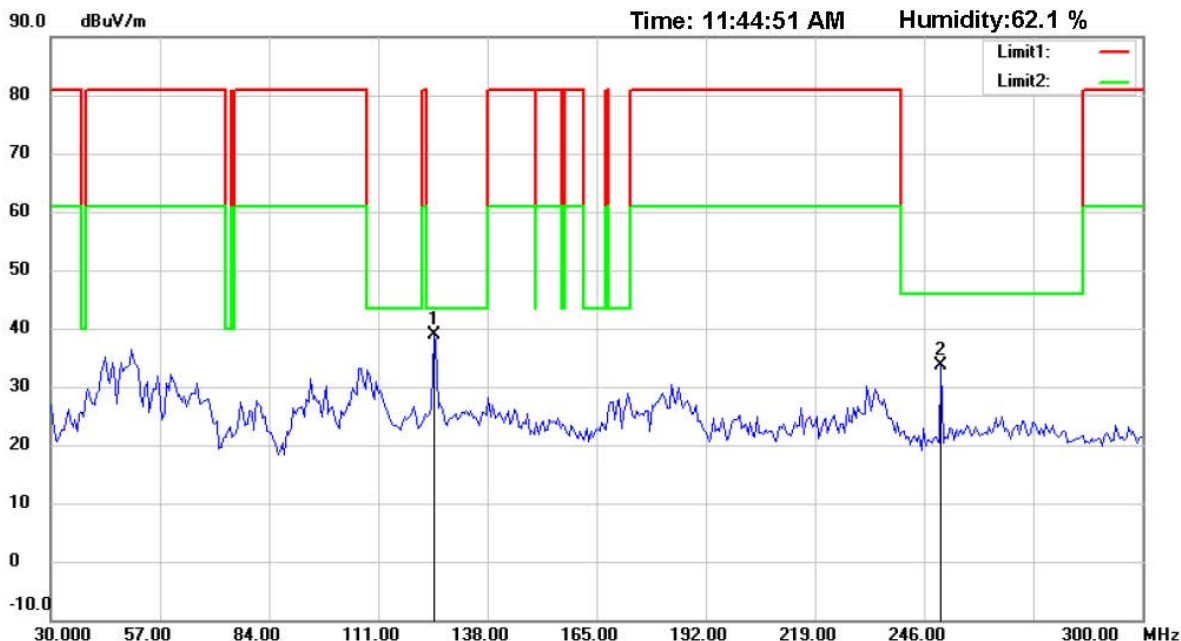
Data :#2

Date: 6/3/2018

Temperature:26.8 °C

Time: 11:44:51 AM

Humidity:62.1 %



Site : Chamber

Condition : FCC 15.231(433MHz) 30-300(PK)

EUT : W6R21805-18133

M/N:

Test Mode : TX 433.82MHz

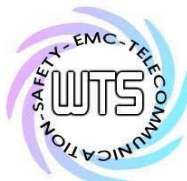
Note :

Polarization: **Vertical**

Power : 120 V.a.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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
| *   | 124.6894        | 45.46          | peak     | -6.46               | 39.00           | 43.50          | 100          | 172            | -4.50       |         |
|     | 250.2204        | 41.10          | peak     | -7.36               | 33.74           | 46.00          | 100          | 96             | -12.26      |         |



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

Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPHUB3

## Radiated Emission Measurement

Operator: Leon

File :2

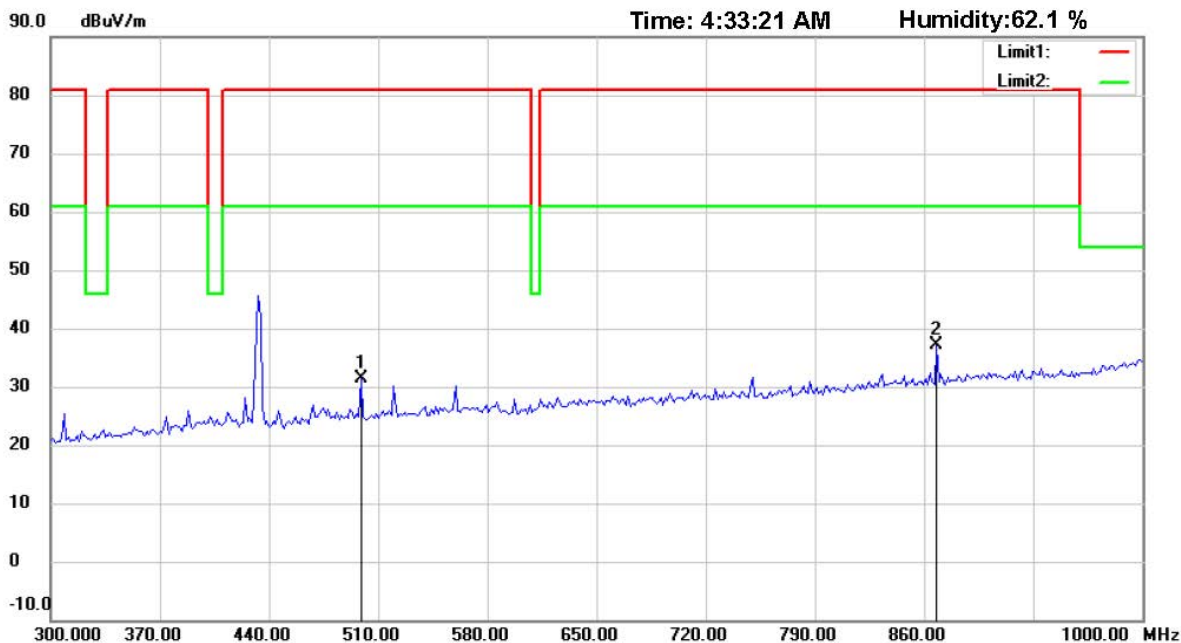
Data :#1

Date: 6/3/2018

Temperature:26.8 °C

Time: 4:33:21 AM

Humidity:62.1 %



Site : Chamber

Condition : FCC 15.231(433MHz) 300-1000(PK)

EUT : W6R21805-18133

M/N:

Test Mode : TX 433.82MHz

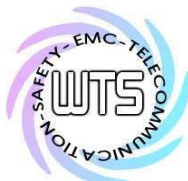
Note :

Polarization: *Horizontal*

Power : 120 V.a.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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 499.1983        | 33.69          | peak     | -2.23               | 31.46           | 80.80          | 100          | 245            | -49.34      |         |
| *   | 868.1363        | 32.80          | peak     | 4.25                | 37.05           | 80.80          | 100          | 356            | -43.75      |         |



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

Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPHUB3

## Radiated Emission Measurement

Operator: Leon

File :2

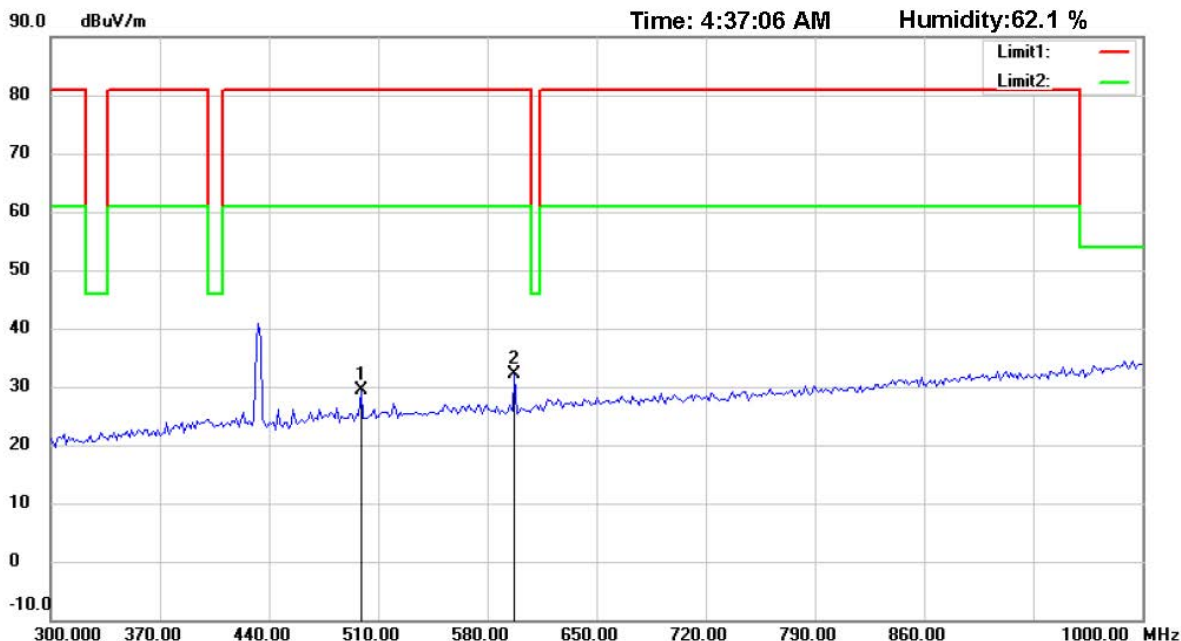
Data :#2

Date: 6/3/2018

Temperature:26.8 °C

Time: 4:37:06 AM

Humidity:62.1 %



Site : Chamber

Condition : FCC 15.231(433MHz) 300-1000(PK)

EUT : W6R21805-18133

M/N:

Test Mode : TX 433.82MHz

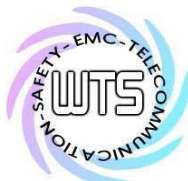
Note :

Polarization: **Vertical**

Power : 120 V.a.c.

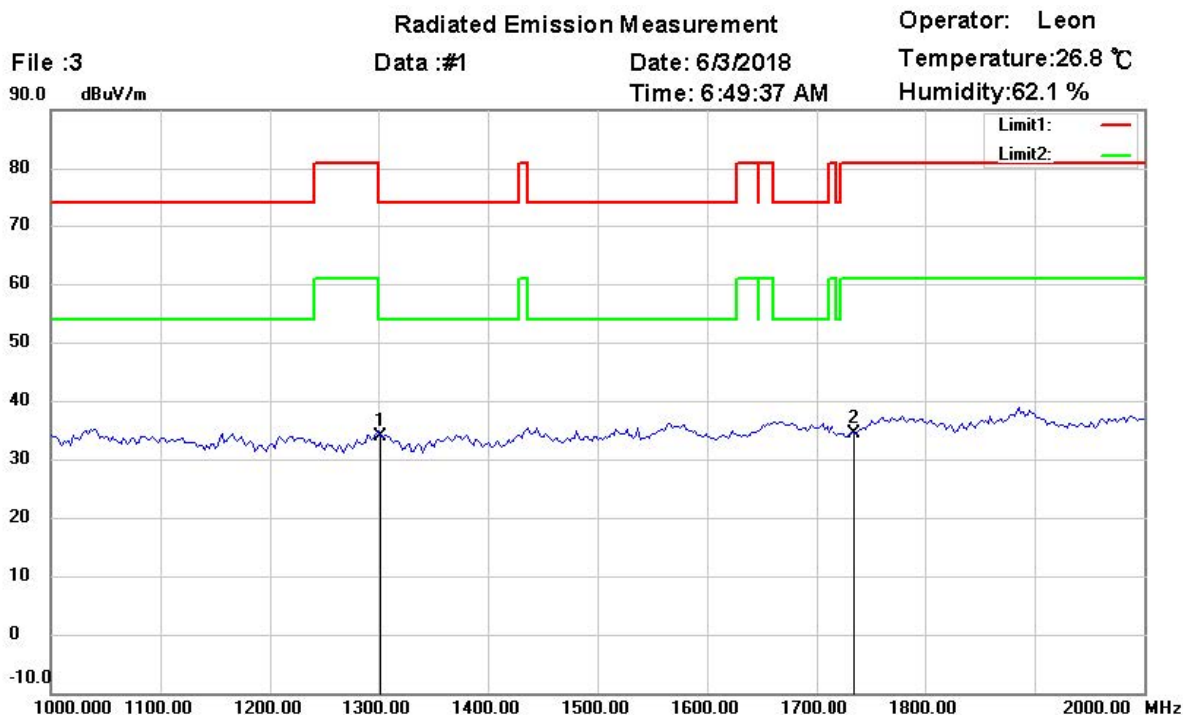
Distance: 3m

| 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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 499.1983        | 31.68          | peak     | -2.23               | 29.45           | 80.80          | 100          | 80             | -51.35      |         |
| *   | 597.3948        | 33.13          | peak     | -1.06               | 32.07           | 80.80          | 100          | 275            | -48.73      |         |



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

Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPHUB3



Site : Chamber

Condition : FCC 15.231(433MHz) 1000-2000(PK)

EUT : W6R21805-18133

M/N:

Test Mode : TX 433.82MHz

Note :

Polarization: *Horizontal*

Power : 120 V.a.c.

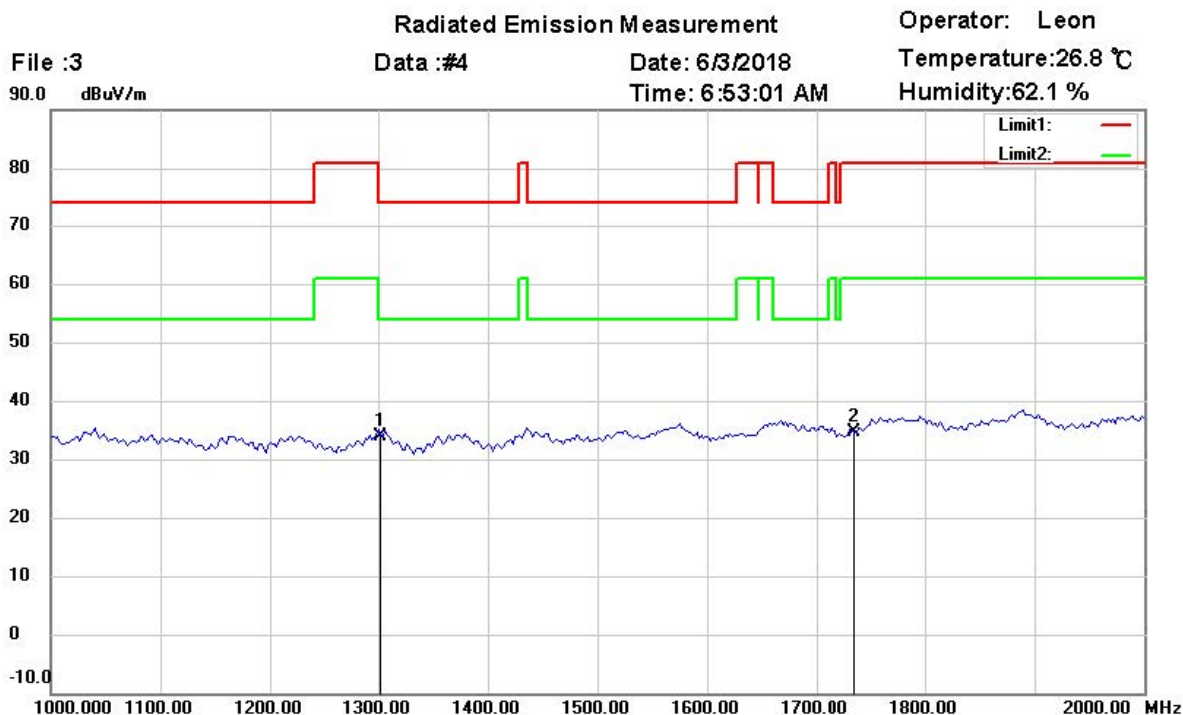
Distance: 3m

| 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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
| *   | 1301.400        | 42.94          | peak     | -9.00               | 33.94           | 74.00          | 150          | 245            | -40.06      |         |
|     | 1735.200        | 41.51          | peak     | -7.09               | 34.42           | 80.80          | 150          | 90             | -46.38      |         |



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

Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPHUB3



Site : Chamber

Condition : FCC 15.231(433MHz) 1000-2000(PK)

EUT : W6R21805-18133

M/N:

Test Mode : TX 433.82MHz

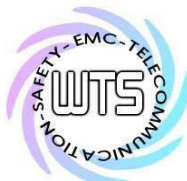
Note :

Polarization: *Vertical*

Power : 120 V.a.c.

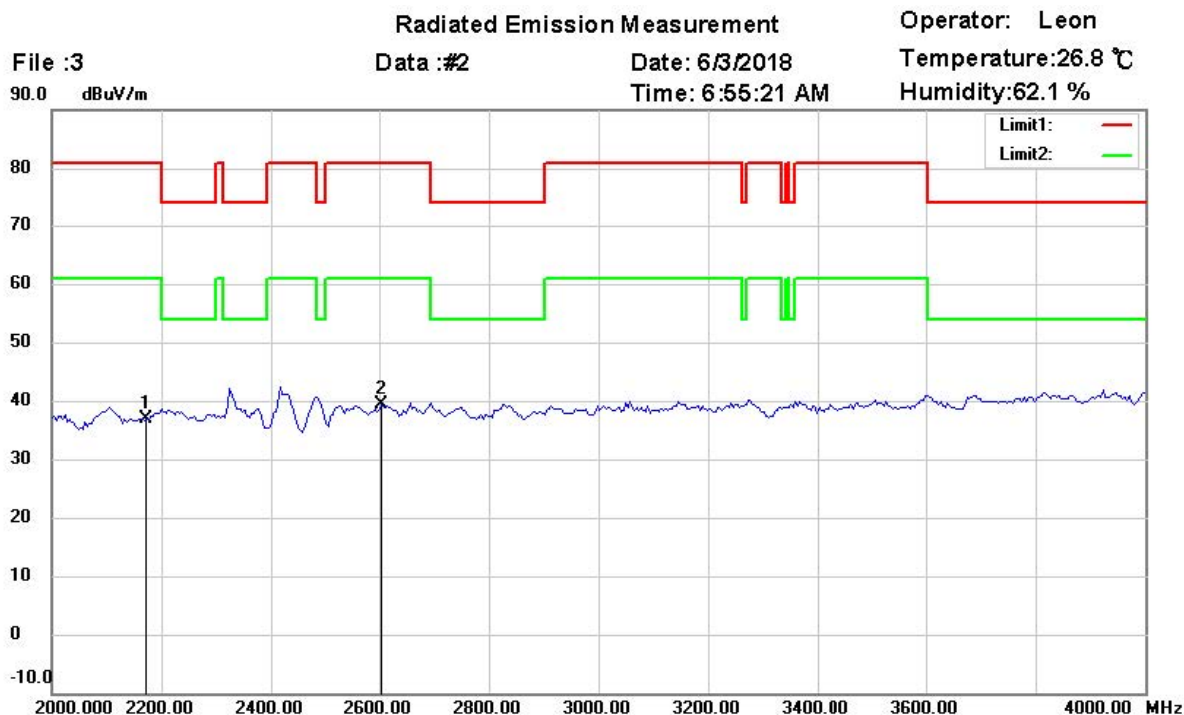
Distance: 3m

| 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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
| *   | 1301.400        | 42.80          | peak     | -9.00               | 33.80           | 74.00          | 150          | 280            | -40.20      |         |
|     | 1735.200        | 41.63          | peak     | -7.09               | 34.54           | 80.80          | 150          | 60             | -46.26      |         |



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

Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPHUB3



Site : Chamber

Condition : FCC 15.231(433MHz) 2000-4000(PK)

EUT : W6R21805-18133

M/N:

Test Mode : TX 433.82MHz

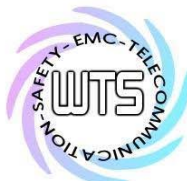
Note :

Polarization: *Horizontal*

Power : 120 V.a.c.

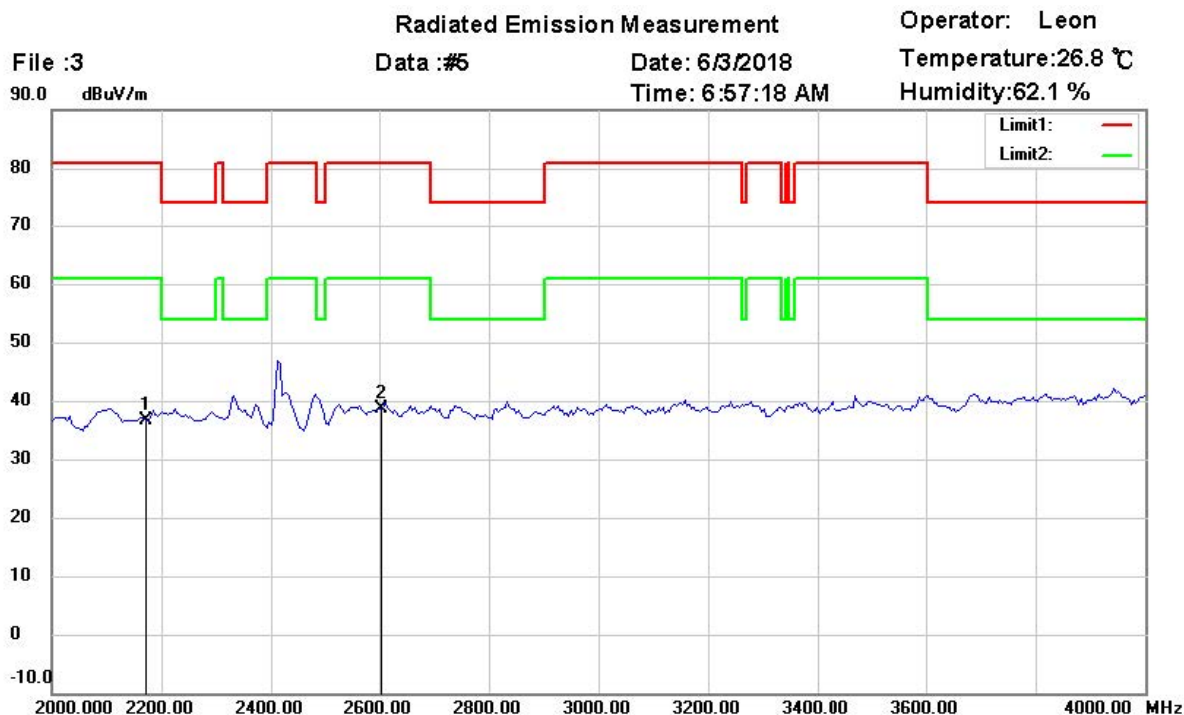
Distance: 3m

| 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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2169.000        | 41.96          | peak     | -5.13               | 36.83           | 80.80          | 150          | 270            | -43.97      |         |
| *   | 2602.800        | 42.72          | peak     | -3.30               | 39.42           | 80.80          | 150          | 89             | -41.38      |         |



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

Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPHUB3



Site : Chamber

Condition : FCC 15.231(433MHz) 2000-4000(PK)

EUT : W6R21805-18133

M/N:

Test Mode : TX 433.82MHz

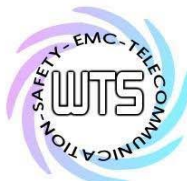
Note :

Polarization: *Vertical*

Power : 120 V.a.c.

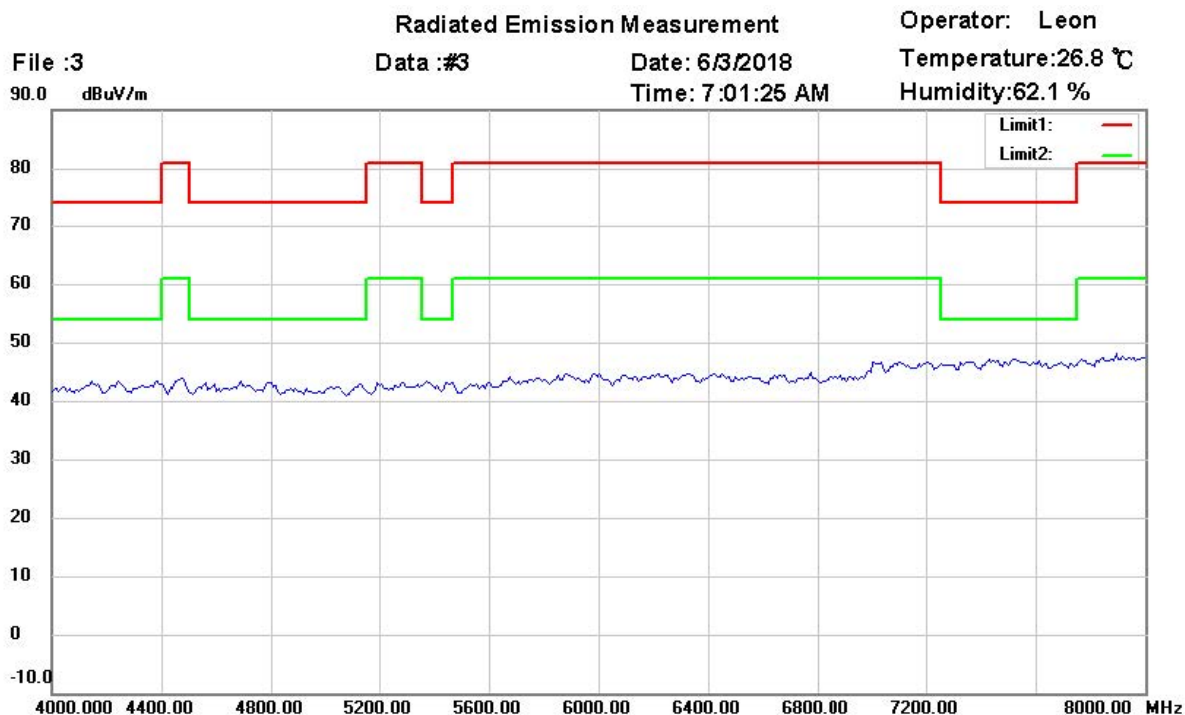
Distance: 3m

| 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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|     | 2169.000        | 41.73          | peak     | -5.13               | 36.60           | 80.80          | 150          | 35             | -44.20      |         |
| *   | 2602.800        | 41.82          | peak     | -3.30               | 38.52           | 80.80          | 150          | 214            | -42.28      |         |



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

Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPHUB3



Site : Chamber

Condition : FCC 15.231(433MHz) 4000-8000(PK)

EUT : W6R21805-18133

M/N:

Test Mode : TX 433.82MHz

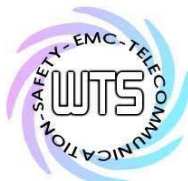
Note :

Polarization: *Horizontal*

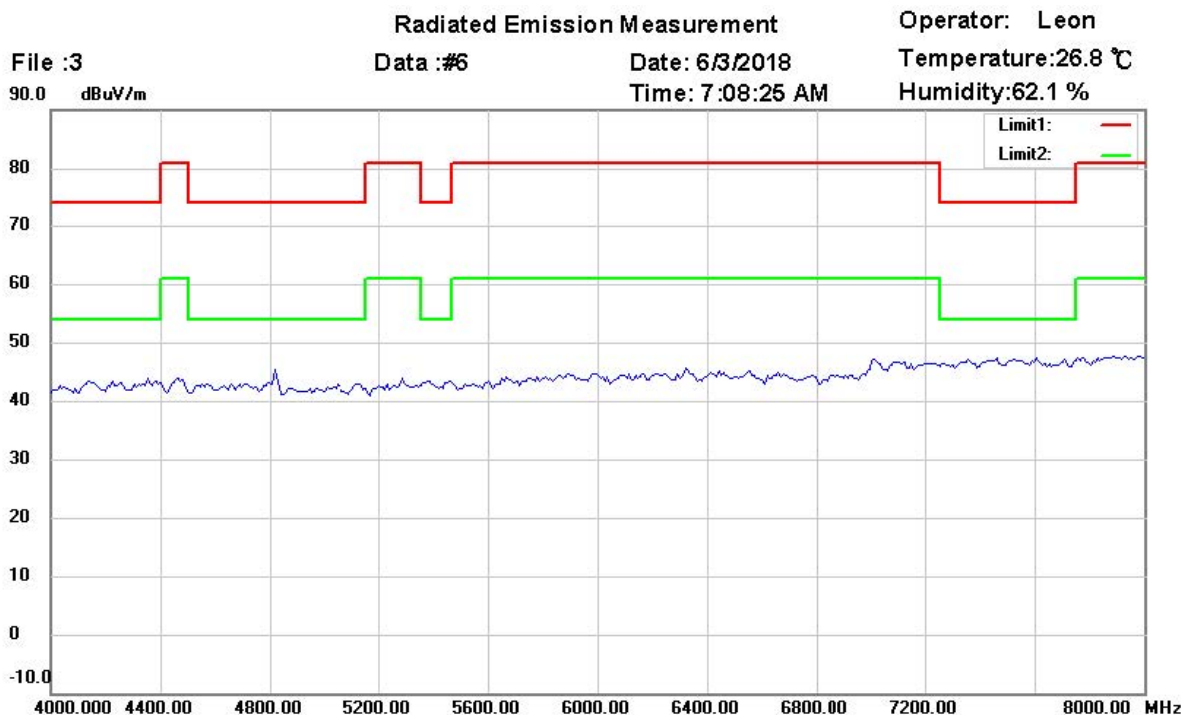
Power : 120 V.a.c.

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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|



Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPHUB3



Site : Chamber

Condition : FCC 15.231(433MHz) 4000-8000(PK)

EUT : W6R21805-18133

M/N:

Test Mode : TX 433.82MHz

Note :

Polarization: **Vertical**

Power : 120 V.a.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 |
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|
|-----|-----------------|----------------|----------|---------------------|-----------------|----------------|--------------|----------------|-------------|---------|

- 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. Up Line: PK Limit Line, Down Line: Ave Limit Line.

All other not noted test plots do not contain significant test results in relation to the limits

Test results: The unit meet the FCC requirements.

Test equipment used: ETSTW-RE 004, ETSTW-RE 030, ETSTW-RE 062, ETSTW-RE 142,  
ETSTW-RE 147

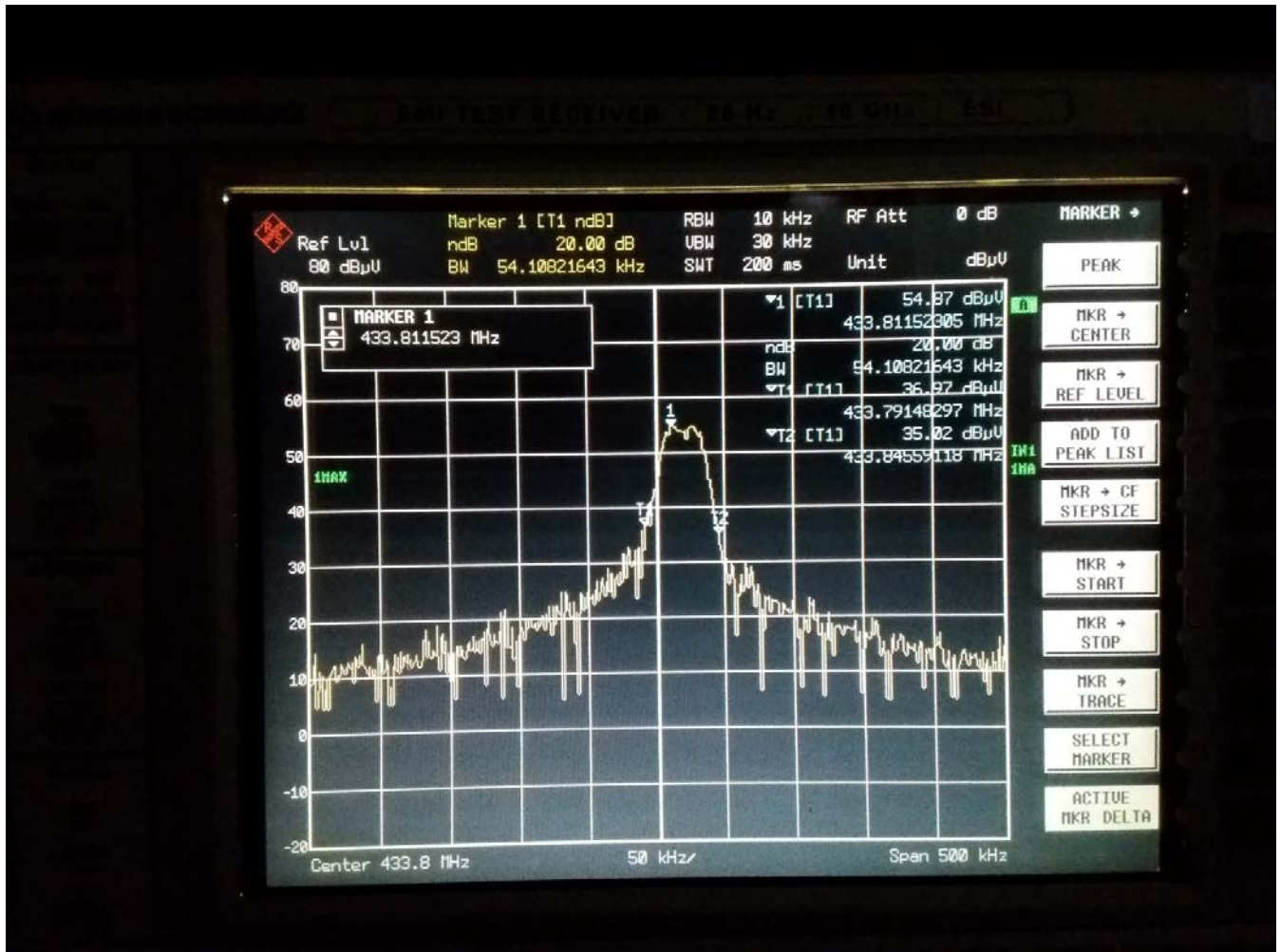
Registration number: W6R22104-20827-C-1

FCC ID: GX9FPUB3

## 3.6 Channel Bandwidth

Measurement of Necessary Bandwidth (BN)

| Used frequency | Bandwidth   | Limit      |
|----------------|-------------|------------|
| 433.811523 MHz | 54.1082 kHz | 1.0845 MHz |



Limits:

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test equipment used: ETSTW-RE 004



Registration number: W6R22104-20827-C-1  
FCC ID: GX9FPHUB3

### **3.7 Antenna requirement**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

Explanation: This Monopole antenna is integral antenna which passes antenna requirement.

|                                      |                                                   |                                |
|--------------------------------------|---------------------------------------------------|--------------------------------|
| The equipment meets the requirements | yes<br><input checked="checked" type="checkbox"/> | no<br><input type="checkbox"/> |
|--------------------------------------|---------------------------------------------------|--------------------------------|

Registration number: W6R22104-20827-C-1

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## 3.8 Duty Cycle

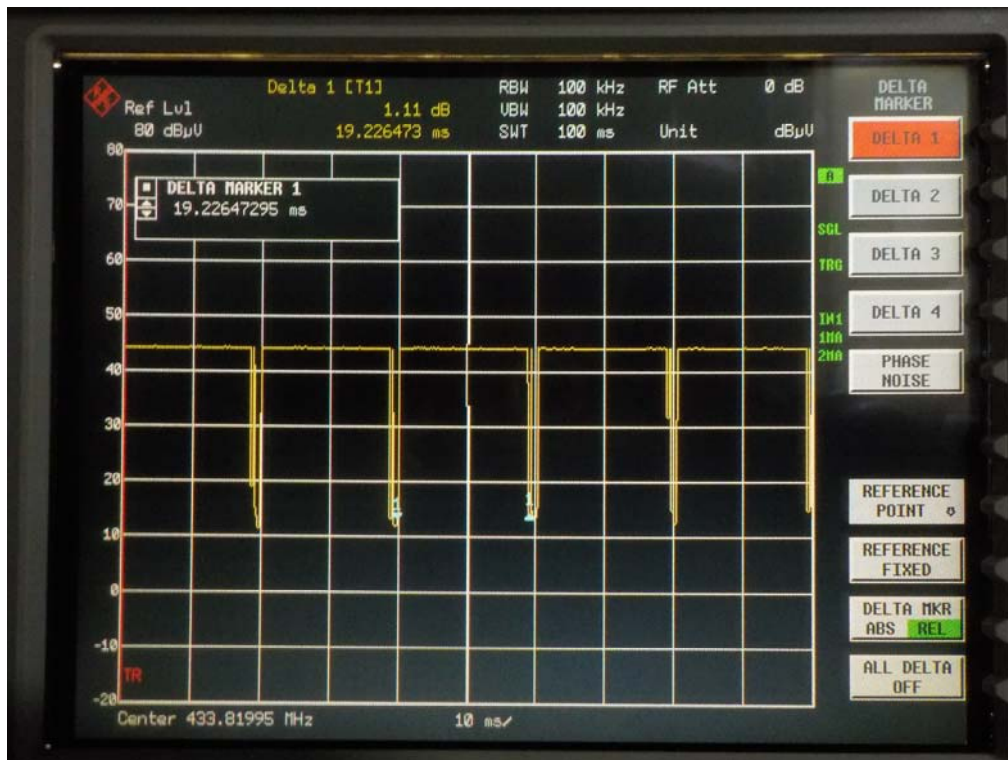
The correction factor, based on the channel dwell time in a 100ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the measured value.

Average Reading = Peak Reading (dBuV/m) + Duty Cycle Correction

Duty Cycle Correction = 20 log (Cycle)

In order to determine the Duty Cycle, the EUT is measured as:

| Testing Mode      | T period (ms) | T on (ms) | Duty Cycle | Duty Cycle Correction<br>20*log(Duty Cycle) |
|-------------------|---------------|-----------|------------|---------------------------------------------|
| Transmitting mode | 100           | 96.13     | 0.9613     | -0.34                                       |



Test equipment used: ETSTW-RE 055, ETSTW-RE 004



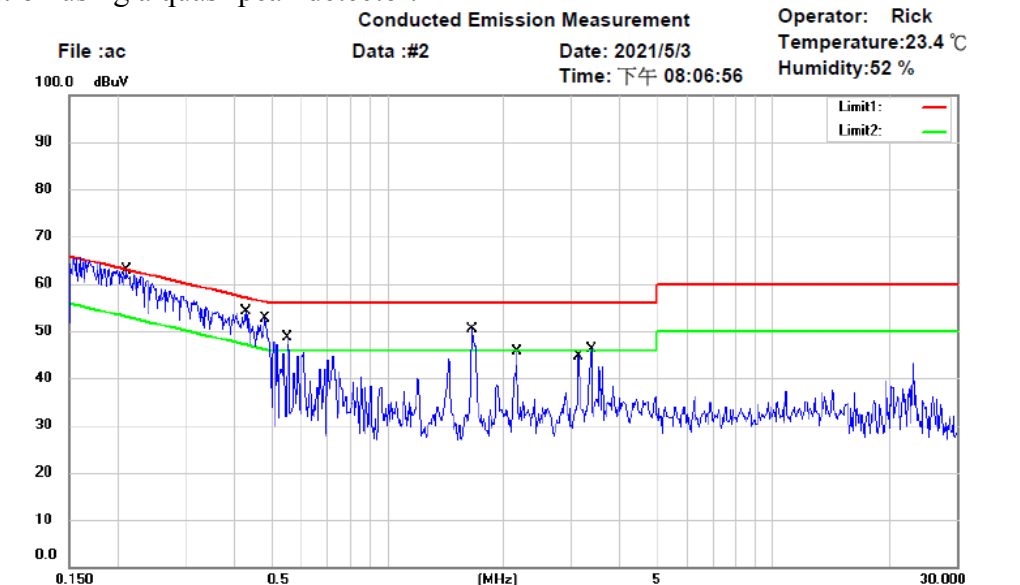
Registration number: W6R22104-20827-C-1

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## 3.9 Conducted Measurement at (AC) Power Line

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the table bellows with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

This measurement was transact first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector.



Site : Chamber\_03

Condition : FCC Part 15 Class B Conduction (QP)

EUT : W6R22104-20827

M/N:

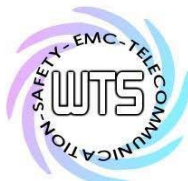
Test Mode :

Note :

Phase: N

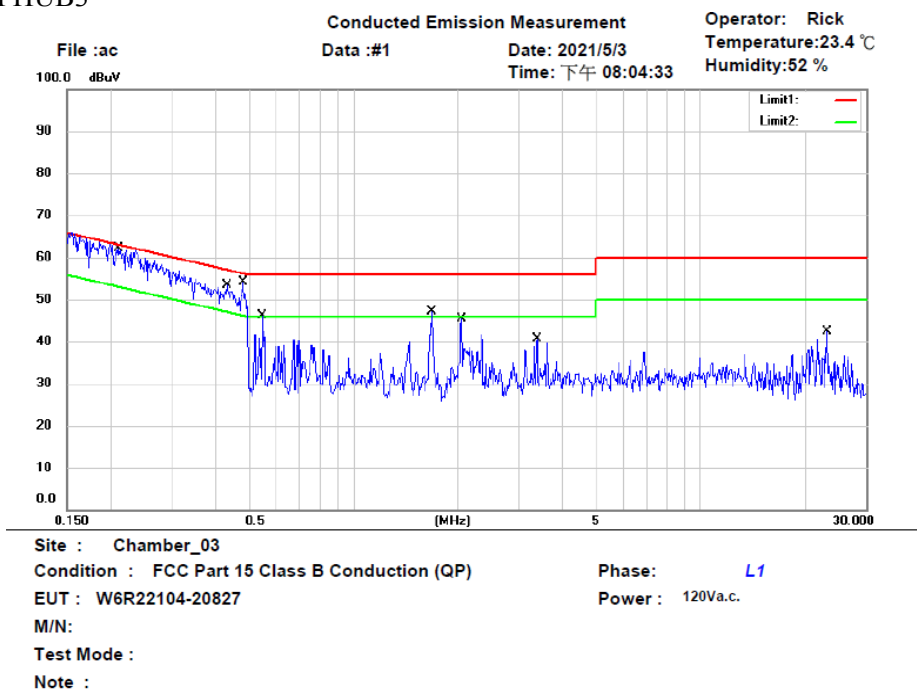
Power : 120Va.c.

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corrected factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|----------------------|---------------|--------------|-------------|---------|
|     | 0.2111          | 39.90          | QP       | 9.64                 | 49.54         | 63.16        | -13.62      |         |
|     | 0.2111          | 18.41          | AVG      | 9.64                 | 28.05         | 53.16        | -25.11      |         |
|     | 0.4303          | 34.25          | QP       | 9.62                 | 43.87         | 57.25        | -13.38      |         |
|     | 0.4303          | 29.27          | AVG      | 9.62                 | 38.89         | 47.25        | -8.36       |         |
|     | 0.4813          | 34.03          | QP       | 9.61                 | 43.64         | 56.32        | -12.68      |         |
| *   | 0.4813          | 30.67          | AVG      | 9.61                 | 40.28         | 46.32        | -6.04       |         |
|     | 0.5517          | 23.82          | QP       | 9.60                 | 33.42         | 56.00        | -22.58      |         |
|     | 0.5517          | 10.92          | AVG      | 9.60                 | 20.52         | 46.00        | -25.48      |         |
|     | 1.6588          | 30.69          | QP       | 9.49                 | 40.18         | 56.00        | -15.82      |         |
|     | 1.6588          | 13.02          | AVG      | 9.49                 | 22.51         | 46.00        | -23.49      |         |
|     | 2.1650          | 29.71          | QP       | 9.48                 | 39.19         | 56.00        | -16.81      |         |
|     | 2.1650          | 24.27          | AVG      | 9.48                 | 33.75         | 46.00        | -12.25      |         |
|     | 3.1235          | 27.87          | QP       | 9.55                 | 37.42         | 56.00        | -18.58      |         |
|     | 3.1235          | 20.96          | AVG      | 9.55                 | 30.51         | 46.00        | -15.49      |         |
|     | 3.3665          | 29.72          | QP       | 9.58                 | 39.30         | 56.00        | -16.70      |         |
|     | 3.3665          | 23.80          | AVG      | 9.58                 | 33.38         | 46.00        | -12.62      |         |



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

Registration number: W6R22104-20827-C-1  
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| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corrected factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|----------------------|---------------|--------------|-------------|---------|
|     | 0.2113          | 39.84          | QP       | 9.65                 | 49.49         | 63.15        | -13.66      |         |
|     | 0.2113          | 18.80          | AVG      | 9.65                 | 28.45         | 53.15        | -24.70      |         |
|     | 0.4274          | 28.68          | QP       | 9.63                 | 38.31         | 57.30        | -18.99      |         |
|     | 0.4274          | 17.96          | AVG      | 9.63                 | 27.59         | 47.30        | -19.71      |         |
|     | 0.4762          | 30.92          | QP       | 9.62                 | 40.54         | 56.41        | -15.87      |         |
|     | 0.4762          | 25.13          | AVG      | 9.62                 | 34.75         | 46.41        | -11.66      |         |
|     | 0.5472          | 24.24          | QP       | 9.61                 | 33.85         | 56.00        | -22.15      |         |
|     | 0.5472          | 8.32           | AVG      | 9.61                 | 17.93         | 46.00        | -28.07      |         |
|     | 1.6813          | 33.78          | QP       | 9.50                 | 43.28         | 56.00        | -12.72      |         |
| *   | 1.6813          | 28.50          | AVG      | 9.50                 | 38.00         | 46.00        | -8.00       |         |
|     | 2.0525          | 20.10          | QP       | 9.47                 | 29.57         | 56.00        | -26.43      |         |
|     | 2.0525          | 7.95           | AVG      | 9.47                 | 17.42         | 46.00        | -28.58      |         |
|     | 3.3688          | 29.53          | QP       | 9.59                 | 39.12         | 56.00        | -16.88      |         |
|     | 3.3688          | 23.27          | AVG      | 9.59                 | 32.86         | 46.00        | -13.14      |         |
|     | 23.1374         | 12.67          | QP       | 10.08                | 22.75         | 60.00        | -37.25      |         |
|     | 23.1374         | 6.52           | AVG      | 10.08                | 16.60         | 50.00        | -33.40      |         |

## Note

1. The formula of measured value as: Test Result = Reading + Correction Factor
2. The Correction Factor = Cable Loss + LISN Insertion Loss + Pulse Limit Loss
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. Up Line: QP Limit Line, Down Line: Ave Limit Line.

## Limits:

| Frequency of Emission (MHz) | Conducted Limit (dBuV) |          |
|-----------------------------|------------------------|----------|
|                             | Quasi Peak             | Average  |
| 0.15-0.5                    | 66 to 56               | 56 to 46 |
| 0.5-5                       | 56                     | 46       |
| 5-30                        | 60                     | 50       |

Test equipment used: ETSTW-CE 016, ETSTW-CE 028, ETSTW-RE 045