

**FCC PART 15 SUBPART C TEST REPORT**

**for**

**Bluetooth USB Dongle**

**Model No.: BD-Q382A**

**FCC ID: WDYQ1021201**

**of**

**Applicant: Qstarz International Co., Ltd.**

**Address: 6F-2, No. 160, Sec. 6, Ming-Chuan E. Rd., Taipei 114 Taiwan**

**Tested and Prepared**

**by**

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

**FCC Registration No.: 930600**

**Industry Canada filed test laboratory Reg. No. IC 5679A-1**

**A2LA Accredited No.: 2732.01**



**Report No.: W6M21311-13647-C-1**

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



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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:**

November 29, 2013

Spencer Yang

Date

WTS-Lab.

Name

Signature

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

November 29, 2013

Kevin Wang

Date

WTS

Name

Signature



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

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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

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. 930600

Industry Canada filed test laboratory Reg. No. IC 5679A-1



**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: Qstarz International Co., Ltd.

Street: 6F-2, No. 160, Sec. 6, Ming-Chuan E. Rd.,

Town: Taipei 114

Country: Taiwan

Telephone: 886-22792-0061

Fax: 886-22792-0062



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## **1.4 Application details**

Date of receipt of test item: November 15, 2013

Date of test: from November 18, 2013 to November 29, 2013

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

Type of test item: Bluetooth USB Dongle

Model Number: BD-Q382A

Multi-listing model number: ./.

Photos: see Annex

### **Technical data**

Frequency band: 2402 - 2480 MHz

Frequency ( ch A): 2.402 GHz

Frequency ( ch B): 2.441 GHz

Frequency ( ch C): 2.480 GHz

### **Transmitter**

### **Unom**

#### **Normal Mode**

Power ( ch A or ch 0): Conducted: 5.84 dBm

Power ( ch B or ch 39): Conducted: 8.17 dBm

Power ( ch C or ch 78): Conducted: 9.01 dBm

#### **EDR Mode**

Power ( ch A or ch 0): Conducted: 4.02 dBm

Power ( ch B or ch 39): Conducted: 6.85 dBm

Power ( ch C or ch 78): Conducted: 7.98 dBm

Power supply: USB 5 VDC (Power on PC)

Operation modes: duplex

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

Antenna Type: Printed Antenna

Antenna gain: -0.13 dBi



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

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Host device: none

Classification:

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

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

Name: MAVIN TECHNOLOGY INC.  
Street: 3F, NO.35,Hsin Tai Rd.,  
Town: Chupei City, Hsinchu County 302,  
Country: Taiwan, R.O.C.

Additional information: ./.

## **1.6 Test standards**

Technical standard : FCC RULES PART 15 SUBPART C § 15.247 (2011-10)



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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**

Temperature: 23 °C

Relative humidity content: 20 ... 75 %

Air pressure: 86 ... 103 kPa

Details of power supply USB 5VDC (Power on PC)

Extreme conditions parameters: test voltage : -- extreme  
min : -- V  
max : -- V



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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                   | 2013/9/2      | 2014/9/1       |
| 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                   | 2012/12/21    | 2013/12/20     |
| ETSTW-CE 006 | IMPULSBEGRENZER<br>PULSE LIMITER                    | ESH3-Z2         | 100226        | R&S                   | 2013/3/4      | 2014/3/3       |
| ETSTW-CE 008 | HF-EICHLLEITUNG 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           | 2013/7/10     | 2014/7/9       |
| ETSTW-RE 004 | EMI TEST RECEIVER                                   | ESI 40          | 832427/004    | R&S                   | 2013/9/2      | 2014/9/1       |
| ETSTW-RE 005 | EMI TEST RECEIVER                                   | ESVS10          | 843207/020    | R&S                   | 2013/9/2      | 2014/9/1       |
| 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                    | 2013/10/15    | 2014/10/14     |
| ETSTW-RE 027 | Passive Loop Antenna                                | 6512            | 00034563      | ETS-Lindgren          | 2013/7/3      | 2014/7/2       |
| ETSTW-RE 030 | Double-Ridged Guide Horn<br>Antenna                 | 3117            | 00035224      | EMCO                  | 2013/3/4      | 2014/3/3       |
| ETSTW-RE 045 | ESA-E SERIES<br>SPECTRUM ANALYZER                   | E4404B          | MY45111242    | Agilent               | Pre-test Use  |                |
| ETSTW-RE 049 | TRILOG Super Broadband<br>test Antenna              | VULB 9160       | 9160-3185     | Schwarzbeck           | 2013/3/21     | 2014/3/20      |
| ETSTW-RE 050 | Attenuator 10dB                                     | 50HF-010-1      | None          | JFW                   | 2013/3/4      | 2014/3/3       |
| ETSTW-RE 051 | Attenuator 6dB                                      | 50HF-006-1      | None          | JFW                   | 2013/3/4      | 2014/3/3       |
| ETSTW-RE 053 | Attenuator 3dB                                      | 50HF-003-1      | None          | JFW                   | 2013/3/4      | 2014/3/3       |
| ETSTW-RE 055 | SPECTRUM ANALYZER                                   | FSU 26          | 200074        | R&S                   | 2013/5/31     | 2014/5/30      |
| ETSTW-RE 060 | Attenuator 30dB                                     | 5015-30         | F651012z-01   | ATM                   | 2013/3/4      | 2014/3/3       |
| ETSTW-RE 062 | Amplifier Module                                    | CHC 2           | None          | KMIC                  | 2013/11/27    | 2014/11/26     |
| ETSTW-RE 064 | Bluetooth Test Set                                  | MT8852B-042     | 6K00005709    | Anritsu               | Function Test |                |
| ETSTW-RE 069 | Double-Ridged Guide Horn<br>Antenna                 | 3117            | 00069377      | EMCO                  | Function Test |                |
| ETSTW-RE 072 | CELL SITE TEST SET                                  | 8921A           | 3339A00375    | HP                    | 2013/10/7     | 2014/10/6      |
| ETSTW-RE 088 | SOLID STATE<br>AMPLIFIER                            | KMA180265A01    | 99057         | KMIC                  | 2013/10/11    | 2014/10/10     |
| ETSTW-RE 099 | DC Block  | 50DB-007-1      | None          | JFW                   | 2013/3/4      | 2014/3/3       |
| ETSTW-RE 106 | Humidity Temperature<br>Meter                       | TES-1366        | 091011113     | TES                   | 2013/11/27    | 2014/11/26     |
| ETSTW-RE 111 | TRILOG Super Broadband<br>test Antenna              | VULB 9160       | 9160-3309     | Schwarz beck          | 2012/12/13    | 2013/12/12     |
| ETSTW-RE 112 | AC POWER SOURCE                                     | TFC-1005        | None          | T-Power               | Function test |                |
| ETSTW-RE 115 | 2.4GHz Notch Filter                                 | N0124411        | 473874        | MICROWAVE<br>CIRCUITS | 2013/1/11     | 2014/1/10      |
| ETSTW-RE 120 | RF Player   | MP9200          | MP9210-111022 | ADIVIC                | Function test |                |





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|                 |                                      |  |              |                    |                  |            |
|-----------------|--------------------------------------|--|--------------|--------------------|------------------|------------|
| ETSTW-RE 122    | SIGNAL GENERATOR                     | SMF100A                                | 102149       | R&S                | 2013/6/28        | 2014/6/27  |
| ETSTW-RE 125    | 5GHz Notch filter                    | 5NSL11-5200/E221.3-O/O                 | 1            | K&L Microwave      | 2013/8/16        | 2014/8/15  |
| ETSTW-RE 126    | 5GHz Notch filter                    | 5NSL11-5800/E221.3-O/O                 | 1            | K&L Microwave      | 2013/8/16        | 2014/8/15  |
| ETSTW-RE 127    | RF Switch Box                        | RFS-01                                 | None         | WTS                | 2013/3/4         | 2014/3/3   |
| ETSTW-RE 128    | 5.3GHz Notch filter                  | N0153001                               | SN487233     | Microwave Circuits | 2013/8/13        | 2014/8/12  |
| ETSTW-RE 129    | 5.5GHz Notch filter                  | N0555984                               | SN487234     | Microwave Circuits | 2013/8/13        | 2014/8/12  |
| ETSTW-RE 130    | Handheld RF Spectrum Analyzer        | N9340A                                 | CN0147000204 | Agilent            | Pre-test Use     |            |
| ETSTW-GSM 002   | Universal Radio Communication Tester | CMU 200                                | 109439       | R&S                | 2013/10/7        | 2014/10/6  |
| ETSTW-GSM 019   | Band Reject Filter                   | WRCTF824/849-822/851-40/12+9SS         | 3            | WI                 | 2013/1/11        | 2014/1/10  |
| ETSTW-GSM 020   | Band Reject Filter                   | WRCD1747/1748-1743/1752-32/5SS         | 1            | WI                 | 2013/1/11        | 2014/1/10  |
| ETSTW-GSM 021   | Band Reject Filter                   | WRCD1879.5/1880.5-1875.5/1884.5-32/5SS | 3            | WI                 | 2013/1/11        | 2014/1/10  |
| ETSTW-GSM 022   | Band Reject Filter                   | WRCT901.9/903.1-904.25-50/8SS          | 1            | WI                 | 2013/1/11        | 2014/1/10  |
| ETSTW-GSM 023   | Power Divider                        | 4901.19.A                              | None         | SUHNER             | 2013/9/18        | 2014/9/17  |
| ETSTW-Cable 010 | BNC Cable                            | 5 M BNC Cable                          | None         | JYE BAO CO.,LTD.   | 2013/3/4         | 2014/3/3   |
| ETSTW-Cable 011 | BNC Cable                            | BNC Cable 1                            | None         | JYE BAO CO.,LTD.   | Pre-test Use NCR |            |
| ETSTW-Cable 012 | N TYPE To SMA Cable                  | Cable 012                              | None         | JYE BAO CO.,LTD.   | 2013/3/4         | 2014/3/3   |
| ETSTW-Cable 016 | BNC Cable                            | Switch Box                             | B Cable 1    | Schwarz beck       | 2013/3/4         | 2014/3/3   |
| ETSTW-Cable 017 | BNC Cable                            | X Cable                                | B Cable 2    | Schwarz beck       | 2013/3/4         | 2014/3/3   |
| ETSTW-Cable 018 | BNC Cable                            | Y Cable                                | B Cable 3    | Schwarz beck       | 2013/3/4         | 2014/3/3   |
| ETSTW-Cable 019 | BNC Cable                            | Z Cable                                | B Cable 4    | Schwarz beck       | 2013/3/4         | 2014/3/3   |
| ETSTW-Cable 022 | N TYPE Cable                         | 5006                                   | 0002         | JYE BAO CO.,LTD.   | 2013/3/26        | 2014/3/25  |
| ETSTW-Cable 026 | Microwave Cable                      | SUCOFLEX 104                           | 279075       | HUBER+SUHNER       | 2013/3/4         | 2014/3/3   |
| ETSTW-Cable 027 | Microwave Cable                      | SUCOFLEX 104                           | 279083       | HUBER+SUHNER       | 2013/3/4         | 2014/3/3   |
| ETSTW-Cable 028 | Microwave Cable                      | FA147A0015M2020                        | 30064-2      | UTIFLEX            | 2013/10/11       | 2014/10/10 |
| ETSTW-Cable 029 | Microwave Cable                      | FA147A0015M2020                        | 30064-3      | UTIFLEX            | 2013/10/11       | 2014/10/10 |
| ETSTW-Cable 030 | Microwave Cable                      | SUCOFLEX 104 (S Cable 9)               | 279067       | HUBER+SUHNER       | 2013/3/4         | 2014/3/3   |
| ETSTW-Cable 031 | Microwave Cable                      | SUCOFLEX 104 (S Cable 10)              | 238092       | HUBER+SUHNER       | 2013/11/27       | 2014/11/26 |
| ETSTW-Cable 043 | Microwave Cable                      | SUCOFLEX 104                           | 317576       | HUBER+SUHNER       | 2013/11/27       | 2014/11/26 |
| ETSTW-Cable 047 | Microwave Cable                      | SUCOFLEX 104                           | 325518       | HUBER+SUHNER       | 2013/11/27       | 2014/11/26 |
| ETSTW-Cable 053 | N TYPE To SMA Cable                  | RG142                                  | None         | JYE BAO CO.,LTD.   | 2013/3/26        | 2014/3/25  |
| ETSTW-Cable 058 | Microwave Cable                      | SUCOFLEX 104                           | none         | HUBER+SUHNER       | 2013/6/20        | 2014/6/19  |
| WTSTW-SW 002    | EMI TEST SOFTWARE                    | EZ EMC                                 | None         | Farad              | Version ETS-03A1 |            |



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## **2.4 General Test Procedure**

**POWER LINE CONDUCTED INTERFERENCE:** The procedure used was ANSI STANDARD C63.4-2009 5.2 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 C63.4-2009 6.4 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. The ambient temperature of the UUT was 23°C with a humidity of 40 %.

**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 C63.4-2009 6.3.1. 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.

Measurements were made by Worldwide Testing Services(Taiwan) Co., Ltd. at the registered open field test site located No.5-1, Lishui, Shuang Sing Village, Wanli Dist., New Taipei City 207, Taiwan (R.O.C.). The Registration Number: **930600**.



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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.

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

$T = 100\text{ms}$  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 C63.4-2009 10.2.7: 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.



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

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

| Test case  | Para. Number     | Required                            | Test passed                         | Test failed              |
|--|------------------|-------------------------------------|-------------------------------------|--------------------------|
| Peak Output Power                                    | 15.247(b)        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Equivalent isotropically radiated Power              | 15.247(b)        | <input checked="" type="checkbox"/> | <input checked="" 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 checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Number of Hopping Frequencies                        | 15.247(a) (1)(i) | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Time of Occupancy (Dwell Time)                       | 15.247(a) (1)(i) | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 20 dB Bandwidth                                      | 15.247(a) (1)(i) | <input checked="" type="checkbox"/> | <input checked="" 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"/> |
| Radiated Emission from Digital 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"/> |

The following is intentionally left blank.



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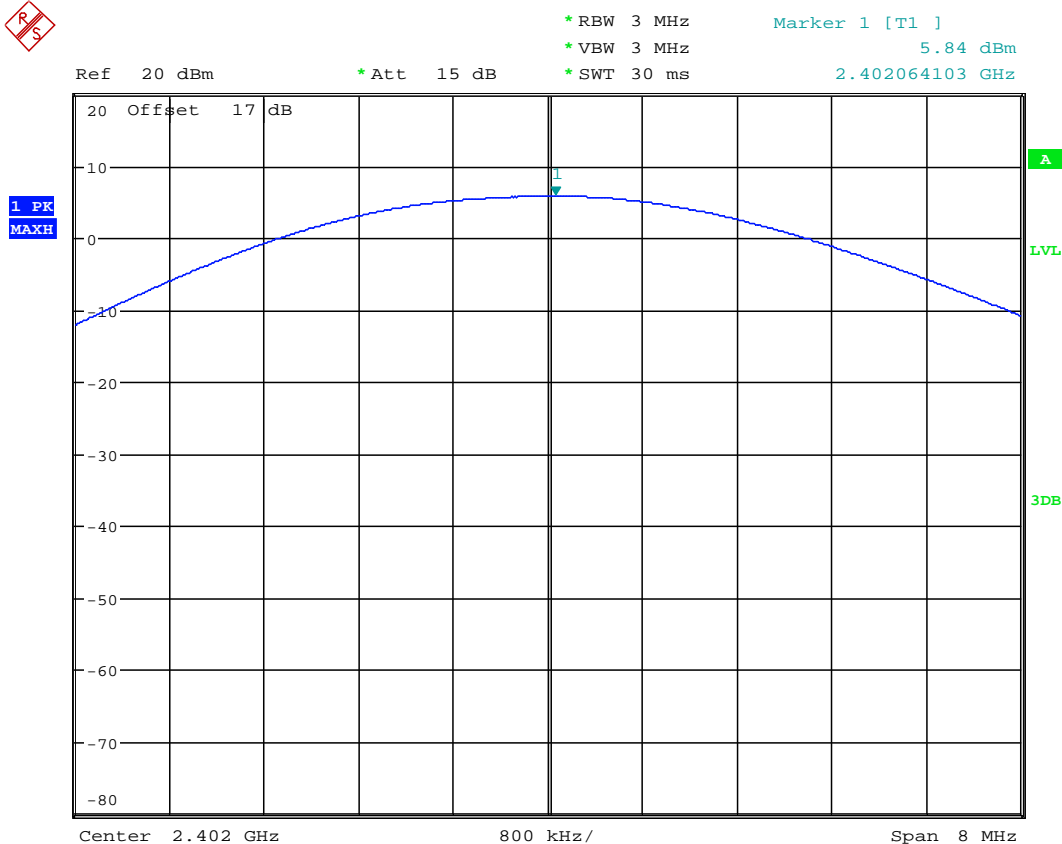
## 3.1 Peak Output Power (transmitter)

FCC Rule: 15.247

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.

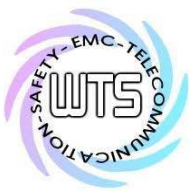
The power was measured with modulation (declared by the applicant).

Normal mode



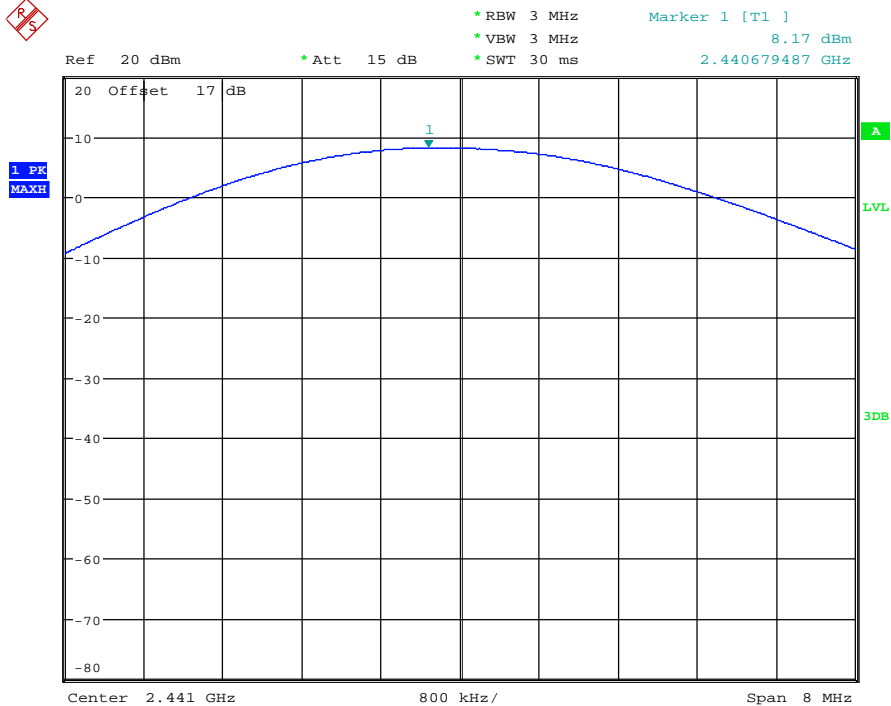
MAX OUTPUT POWER CH0

Date: 19.NOV.2013 10:48:09

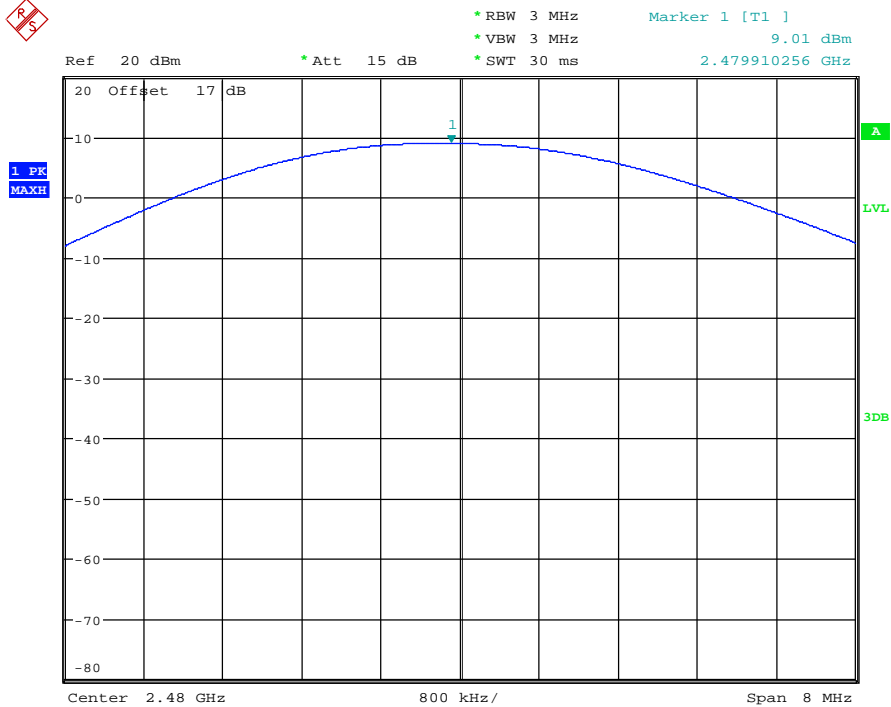


# Worldwide Testing Services(Taiwan) Co., Ltd.

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FCC ID: WDYQ1021201



MAX OUTPUT POWER CH39  
Date: 19.NOV.2013 10:47:42



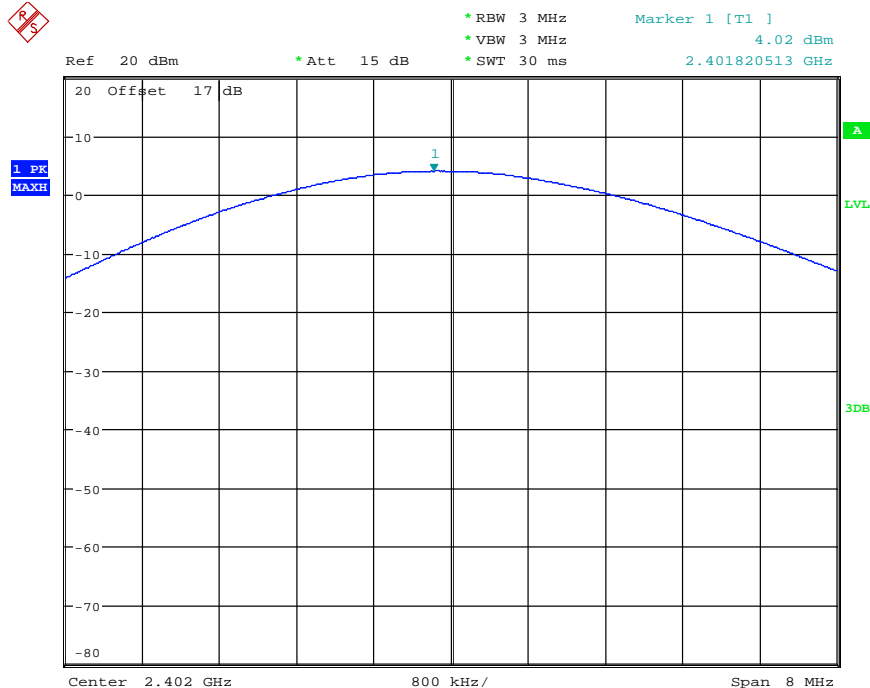
MAX OUTPUT POWER CH78  
Date: 19.NOV.2013 10:47:14



Registration number: W6M21311-13647-C-1

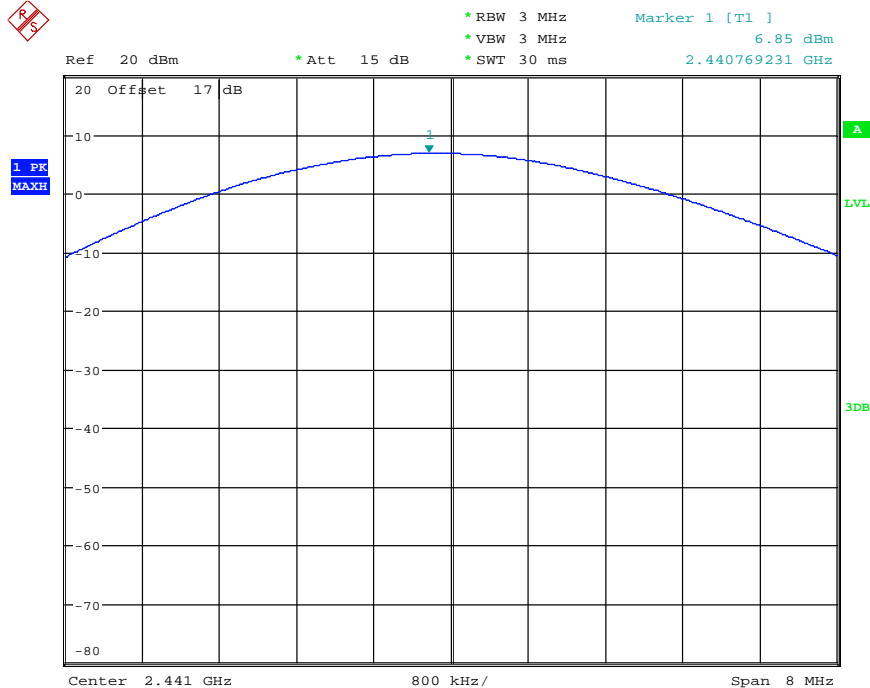
FCC ID: WDYQ1021201

EDR mode



MAX OUTPUT POWER CH0 EDR MODE

Date: 19.NOV.2013 10:12:45

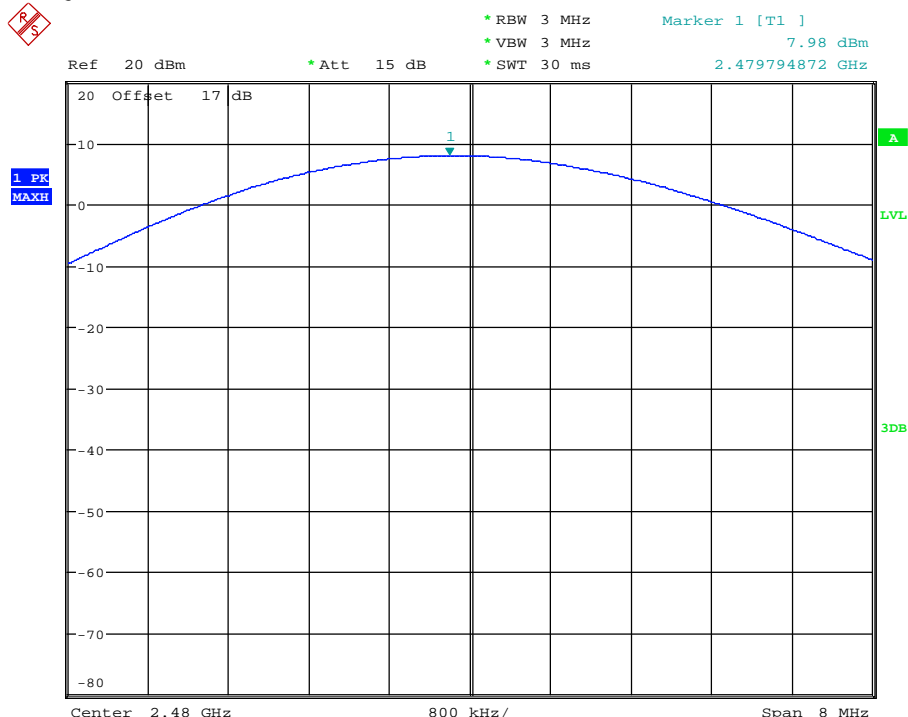


MAX OUTPUT POWER CH39 EDR MODE

Date: 19.NOV.2013 10:13:21



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MAX OUTPUT POWER CH78 EDR MODE  
Date: 19.NOV.2013 10:13:51

## Maximum Peak Output Power

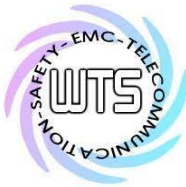
Limits:

| Frequency<br>MHz | Number of hopping channels |           |              |              |
|------------------|----------------------------|-----------|--------------|--------------|
|                  | $\geq 75$                  | $\geq 50$ | $49 \geq 25$ | $74 \geq 15$ |
| 902-928          | --                         | 30 dBm    | 24 dBm       | --           |
| 2400-2483.5 MHz  | 30 dBm                     | --        | --           | 21 dBm       |
| 5725-5850 MHz    | 30 dBm                     | --        | --           | --           |

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

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





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## **3.2 RF Exposure Compliance Requirements**

According to Supplement C, Edition 01-01 to OET Bulletin 65, Edition 97-01 this spread spectrum transmitter is categorically excluded from routine environmental evaluation because of the low power level, where there is a high likelihood of compliance with RF exposure standards.

The antenna used for this Bluetooth transceiver module must not be co-located or operating in conjunction with any other antenna or transmitter.

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

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 below 1GHz :

Max. reading – 20 dB

Guidance on Measurement of FHSS 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.” Here the correction was added to the limit instead subtracted from the reading.

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

For frequencies above 1GHz (Peak measurements).

Limit = max. aver. reading-20dB +20dB(because Peak detector is used)

For frequencies above 1GHz (Average measurements).

Max. reading – 20 dB - duty cycle correction:

No duty cycle correction was added to the reading

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 111, ETSTW-RE 030, ETSTW-RE 064

Explanation: See attached diagrams in appendix.



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## **3.4 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 26000 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 FHSS Systems:

“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.” Here the correction was added to the limit instead subtracted from the reading.

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

For frequencies above 1GHz (Average measurements).

Limit – duty cycle correction

No duty cycle correction was added to the reading.

54.0dB $\mu$ V/m

For frequencies above 1GHz (Peak measurements).

Limit + 20dB

54.0dB $\mu$ V/m + 20 dB= 74 dB $\mu$ V/m

Test equipment used: ETSTW-RE 004, ETSTW-RE 030, ETSTW-RE 111, ETSTW-RE 064

Explanation: See attached diagrams in appendix.



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## 3.5 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))

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.

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 "Marker-Delta-Method" or the „Duty-Cycle Correction Factor“.

## Summary table with radiated data of the test plots

Model: BD-Q382A Date: 2013/11/27  
 Mode: TX Bluetooth Normal+EDR CH0 Temperature: 24 °C Engineer: Roy  
 Polarization: Horizontal Humidity: 60 %

| Frequency (MHz) | Reading (dBuV) | Detector | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Table Degree (Deg.) | Ant. High (cm) |
|-----------------|----------------|----------|-------------|-----------------|----------------|-------------|---------------------|----------------|
| 335.1904        | 25.38          | peak     | 16.77       | 42.15           | 46.00          | -3.85       | 240                 | 100            |
| 403.2264        | 18.81          | peak     | 18.69       | 37.50           | 46.00          | -8.50       | 100                 | 100            |

| Frequency (MHz) | Reading (dBuV) |       | Factor (dB) Corr. | Result (dBuV/m) |       | Limit (dBuV/m) |       | Margin (dB) | Table Degree (Deg.) | Ant. High (cm) |
|-----------------|----------------|-------|-------------------|-----------------|-------|----------------|-------|-------------|---------------------|----------------|
|                 | Peak           | Ave.  |                   | Peak            | Ave.  | Peak           | Ave.  |             |                     |                |
| 4804.0580       | 53.85          | 49.88 | 0.45              | 54.30           | 50.33 | 74.00          | 54.00 | -3.67       | 285                 | 100            |
| 7206.0000       | 41.10          | ---   | 4.01              | 45.11           | ---   | 74.00          | 54.00 | -28.89      | 45                  | 100            |
| 9608.0000       | 34.61          | ---   | 9.14              | 43.75           | ---   | 74.00          | 54.00 | -30.25      | 155                 | 100            |
| 12010.0000      | 33.23          | ---   | 13.41             | 46.64           | ---   | 74.00          | 54.00 | -27.36      | 25                  | 100            |

Polarization: Vertical

| Frequency (MHz) | Reading (dBuV) | Detector | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Table Degree (Deg.) | Ant. High (cm) |
|-----------------|----------------|----------|-------------|-----------------|----------------|-------------|---------------------|----------------|
| 51.3828         | 24.68          | QP       | 14.08       | 38.76           | 40.00          | -1.24       | 160                 | 100            |
| 335.1904        | 20.54          | peak     | 16.77       | 37.31           | 46.00          | -8.69       | 290                 | 100            |



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| Frequency<br>(MHz) | Reading<br>(dBuV) |       | Factor<br>(dB)<br>Corr. | Result (dBuV/m) |       | Limit (dBuV/m) |       | Margin<br>(dB) | Table<br>Degree<br>(Deg.) | Ant.<br>High<br>(cm) |
|--------------------|-------------------|-------|-------------------------|-----------------|-------|----------------|-------|----------------|---------------------------|----------------------|
|                    | Peak              | Ave.  |                         | Peak            | Ave.  | Peak           | Ave.  |                |                           |                      |
| 4804.0500          | 52.92             | 50.05 | 0.45                    | 53.37           | 50.50 | 74.00          | 54.00 | -3.50          | 135                       | 100                  |
| 7206.0000          | 41.42             | ---   | 4.01                    | 45.43           | ---   | 74.00          | 54.00 | -28.57         | 290                       | 100                  |
| 9608.0000          | 33.48             | ---   | 9.14                    | 42.62           | ---   | 74.00          | 54.00 | -31.38         | 70                        | 100                  |
| 12010.0000         | 33.31             | ---   | 13.41                   | 46.72           | ---   | 74.00          | 54.00 | -27.28         | 305                       | 100                  |

Mode: TX Bluetooth Normal+EDR CH39

Polarization: Horizontal

| 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) |
|--------------------|-------------------|----------|----------------|--------------------|-------------------|----------------|---------------------------|----------------------|
| 335.1904           | 25.49             | peak     | 16.77          | 42.26              | 46.00             | -3.74          | 300                       | 100                  |
| 751.1824           | 14.98             | peak     | 24.94          | 39.92              | 46.00             | -6.08          | 115                       | 100                  |

| Frequency<br>(MHz) | Reading<br>(dBuV) |       | Factor<br>(dB)<br>Corr. | Result (dBuV/m) |       | Limit (dBuV/m) |       | Margin<br>(dB) | Table<br>Degree<br>(Deg.) | Ant.<br>High<br>(cm) |
|--------------------|-------------------|-------|-------------------------|-----------------|-------|----------------|-------|----------------|---------------------------|----------------------|
|                    | Peak              | Ave.  |                         | Peak            | Ave.  | Peak           | Ave.  |                |                           |                      |
| 4881.7640          | 52.38             | 49.93 | 0.63                    | 53.01           | 50.56 | 74.00          | 54.00 | -3.44          | 85                        | 100                  |
| 7323.0000          | 42.60             | ---   | 4.24                    | 46.84           | ---   | 74.00          | 54.00 | -27.16         | 220                       | 100                  |
| 9764.0000          | 35.84             | ---   | 9.61                    | 45.45           | ---   | 74.00          | 54.00 | -28.55         | 65                        | 100                  |
| 12205.0000         | 31.82             | ---   | 14.88                   | 46.70           | ---   | 74.00          | 54.00 | -27.30         | 180                       | 100                  |

Polarization: Vertical

| 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) |
|--------------------|-------------------|----------|----------------|--------------------|-------------------|----------------|---------------------------|----------------------|
| 51.3828            | 24.72             | QP       | 14.08          | 38.80              | 40.00             | -1.20          | 150                       | 100                  |
| 335.1904           | 20.82             | peak     | 16.77          | 37.59              | 46.00             | -8.41          | 220                       | 100                  |

| Frequency<br>(MHz) | Reading<br>(dBuV) |       | Factor<br>(dB)<br>Corr. | Result (dBuV/m) |       | Limit (dBuV/m) |       | Margin<br>(dB) | Table<br>Degree<br>(Deg.) | Ant.<br>High<br>(cm) |
|--------------------|-------------------|-------|-------------------------|-----------------|-------|----------------|-------|----------------|---------------------------|----------------------|
|                    | Peak              | Ave.  |                         | Peak            | Ave.  | Peak           | Ave.  |                |                           |                      |
| 4882.0270          | 52.93             | 49.15 | 0.63                    | 53.56           | 49.78 | 74.00          | 54.00 | -4.22          | 70                        | 100                  |
| 7323.0000          | 42.53             | ---   | 4.24                    | 46.77           | ---   | 74.00          | 54.00 | -27.23         | 305                       | 100                  |
| 9764.0000          | 33.52             | ---   | 9.61                    | 43.13           | ---   | 74.00          | 54.00 | -30.87         | 90                        | 100                  |
| 12205.0000         | 34.23             | ---   | 14.88                   | 49.11           | ---   | 74.00          | 54.00 | -24.89         | 240                       | 100                  |

Mode: TX Bluetooth Normal+EDR CH78

Polarization: Horizontal

| 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) |
|--------------------|-------------------|----------|----------------|--------------------|-------------------|----------------|---------------------------|----------------------|
| 333.2465           | 25.90             | peak     | 16.72          | 42.62              | 46.00             | -3.38          | 65                        | 100                  |
| 751.1824           | 14.58             | peak     | 24.94          | 39.52              | 46.00             | -6.48          | 205                       | 100                  |



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| Frequency<br>(MHz) | Reading<br>(dBuV) |       | Factor<br>(dB)<br>Corr. | Result (dBuV/m) |       | Limit (dBuV/m) |       | Margin<br>(dB) | Table<br>Degree<br>(Deg.) | Ant.<br>High<br>(cm) |
|--------------------|-------------------|-------|-------------------------|-----------------|-------|----------------|-------|----------------|---------------------------|----------------------|
|                    | Peak              | Ave.  |                         | Peak            | Ave.  | Peak           | Ave.  |                |                           |                      |
| 4953.9080          | 51.28             | 49.62 | 1.06                    | 52.34           | 50.68 | 74.00          | 54.00 | -3.32          | 255                       | 100                  |
| 7440.0000          | 40.80             | ---   | 4.47                    | 45.27           | ---   | 74.00          | 54.00 | -28.73         | 110                       | 100                  |
| 9920.0000          | 36.00             | ---   | 9.65                    | 45.65           | ---   | 74.00          | 54.00 | -28.35         | 230                       | 100                  |
| 12400.0000         | 31.53             | ---   | 15.29                   | 46.82           | ---   | 74.00          | 54.00 | -27.18         | 100                       | 100                  |

Polarization: Vertical

| 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) |
|--------------------|-------------------|----------|----------------|--------------------|-------------------|----------------|---------------------------|----------------------|
| 51.3828            | 24.70             | QP       | 14.08          | 38.78              | 40.00             | -1.22          | 140                       | 100                  |
| 335.1904           | 20.46             | peak     | 16.77          | 37.23              | 46.00             | -8.77          | 320                       | 100                  |

| Frequency<br>(MHz) | Reading<br>(dBuV) |       | Factor<br>(dB)<br>Corr. | Result (dBuV/m) |       | Limit (dBuV/m) |       | Margin<br>(dB) | Table<br>Degree<br>(Deg.) | Ant.<br>High<br>(cm) |
|--------------------|-------------------|-------|-------------------------|-----------------|-------|----------------|-------|----------------|---------------------------|----------------------|
|                    | Peak              | Ave.  |                         | Peak            | Ave.  | Peak           | Ave.  |                |                           |                      |
| 4961.9240          | 52.48             | 49.92 | 1.12                    | 53.60           | 51.04 | 74.00          | 54.00 | -2.96          | 260                       | 100                  |
| 7440.0000          | 41.22             | ---   | 4.47                    | 45.69           | ---   | 74.00          | 54.00 | -28.31         | 55                        | 100                  |
| 9920.0000          | 33.38             | ---   | 9.65                    | 43.03           | ---   | 74.00          | 54.00 | -30.97         | 105                       | 100                  |
| 12400.0000         | 32.05             | ---   | 15.29                   | 47.34           | ---   | 74.00          | 54.00 | -26.66         | 200                       | 100                  |

- 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. **Measurement uncertainty above 1GHz: 30-1000 MHz =  $\pm 3.72$  dB, 1-18 GHz =  $\pm 5.33$  dB, 18-40 GHz =  $\pm 3.43$  dB ; Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.**
  6. **See attached diagrams in appendix.**

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

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

Test equipment used: ETSTW-RE 004, ETSTW-RE 030, ETSTW-RE 111, ETSTW-RE 064  
ETSTW-RE 088, ETSTW-RE 018



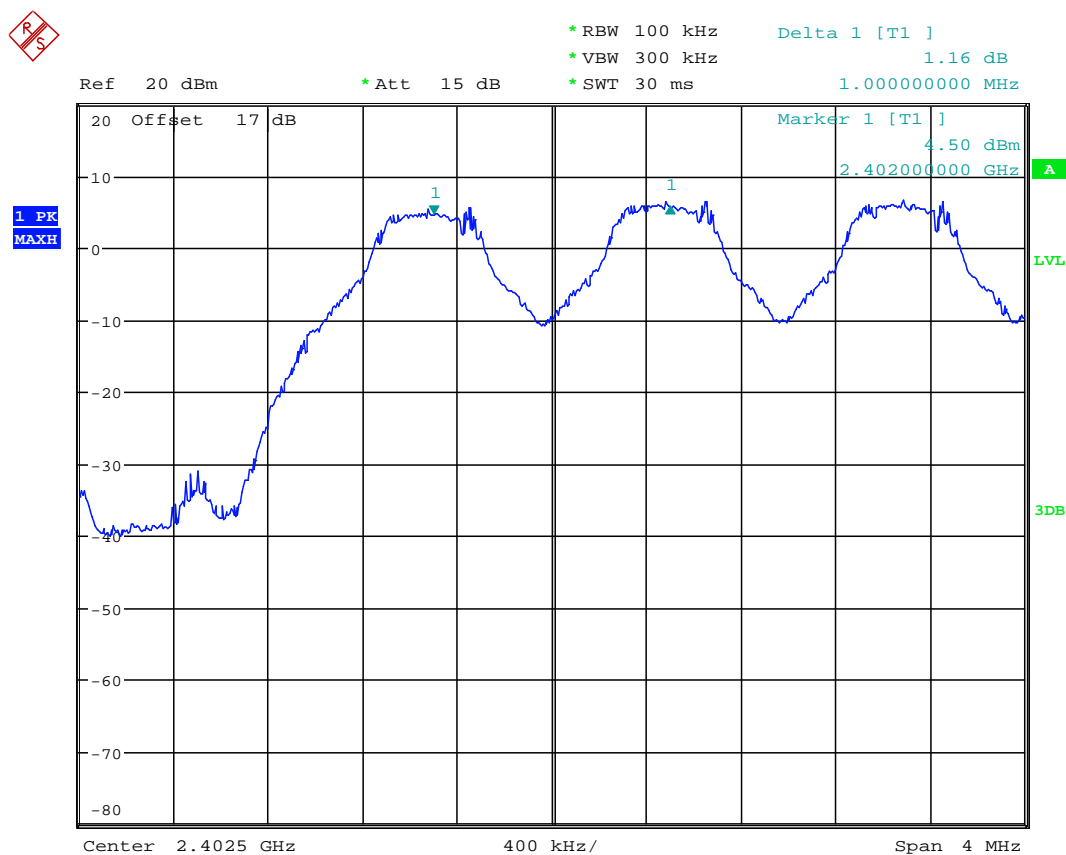
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

## 3.6 Carrier Frequency Separation

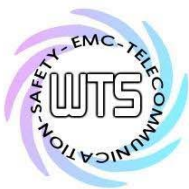
Carrier Frequency Separation was measured with modulation (declared by manufacturer).

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.



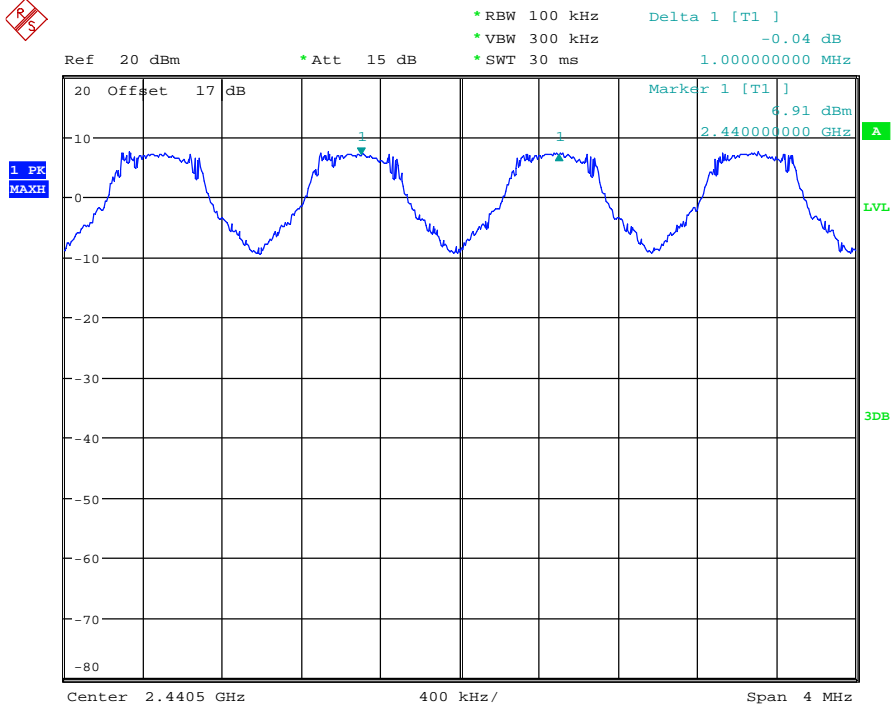
FREQUENCY SEPARATION CH0

Date: 19.NOV.2013 10:16:41

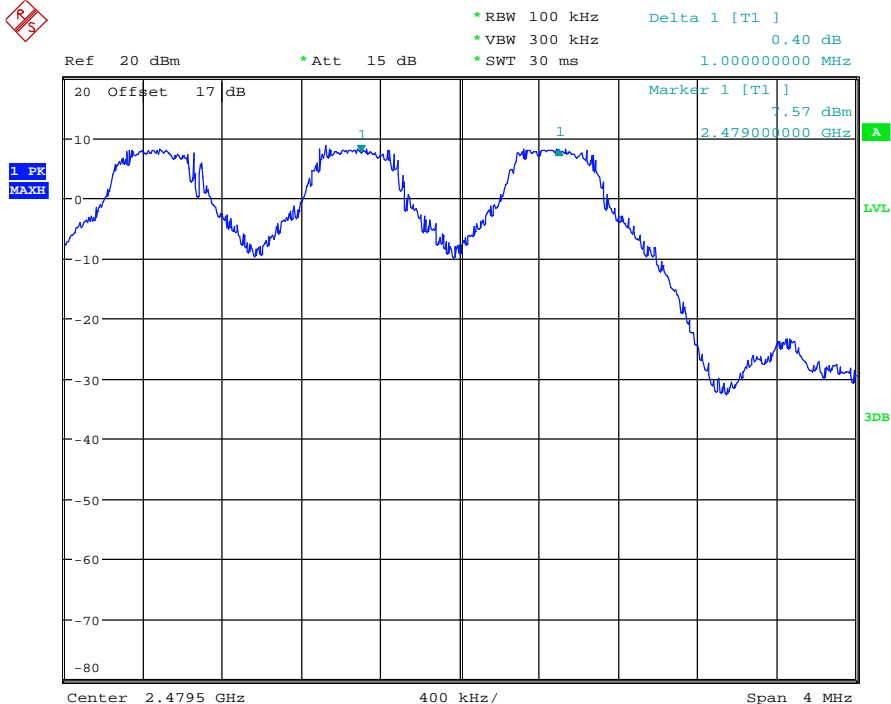


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FREQUENCY SEPARATION CH39  
Date: 19.NOV.2013 10:17:31



FREQUENCY SEPARATION CH78  
Date: 19.NOV.2013 10:18:32



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

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FCC ID: WDYQ1021201

### **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





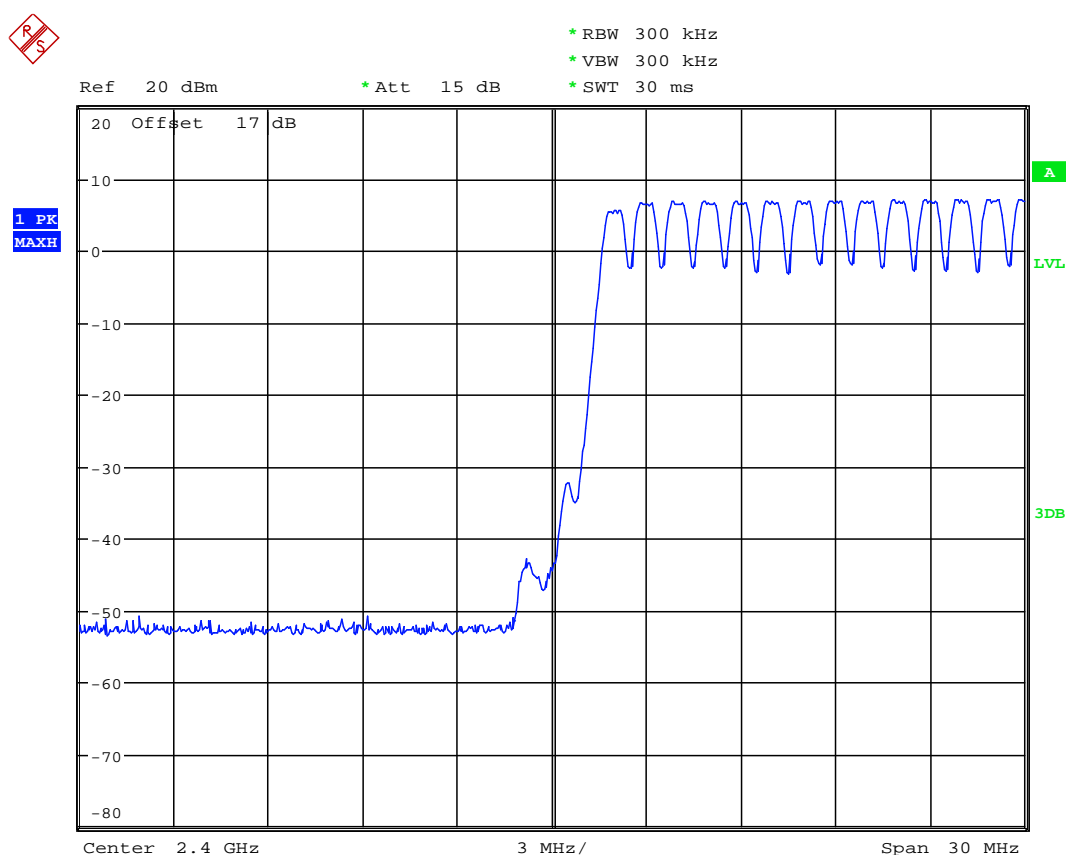
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

## 3.7 Number of Hopping Frequencies

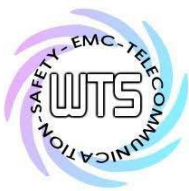
According to FCC rules part 15 subpart C §15.247 frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping frequencies. Frequency hopping systems in 5725-5850 MHz bands shall use least 75 hopping frequencies.

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.



NUMBER OF HOPPING CH0-13

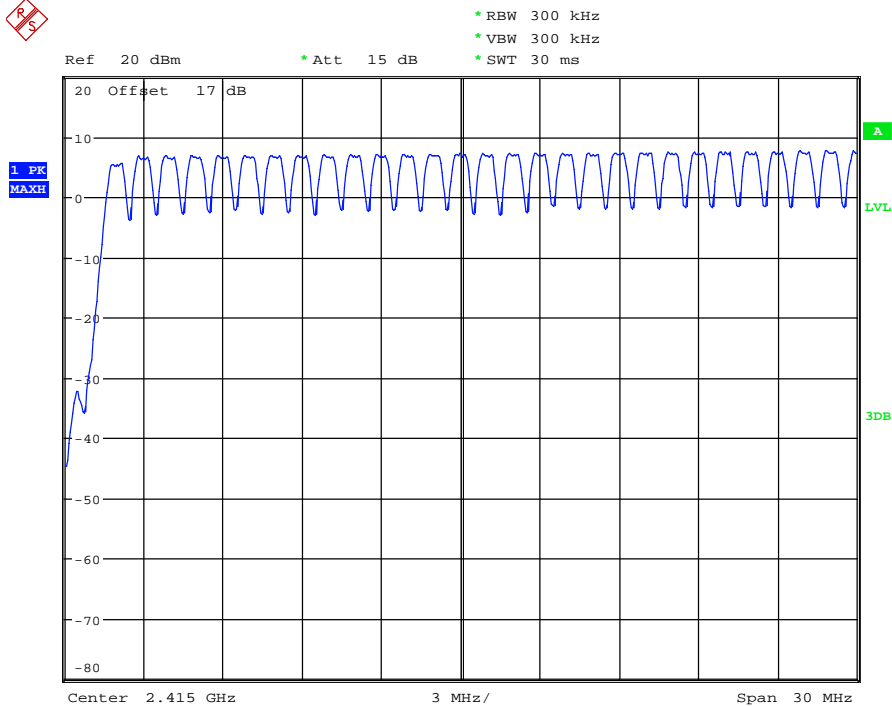
Date: 19.NOV.2013 10:20:06



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

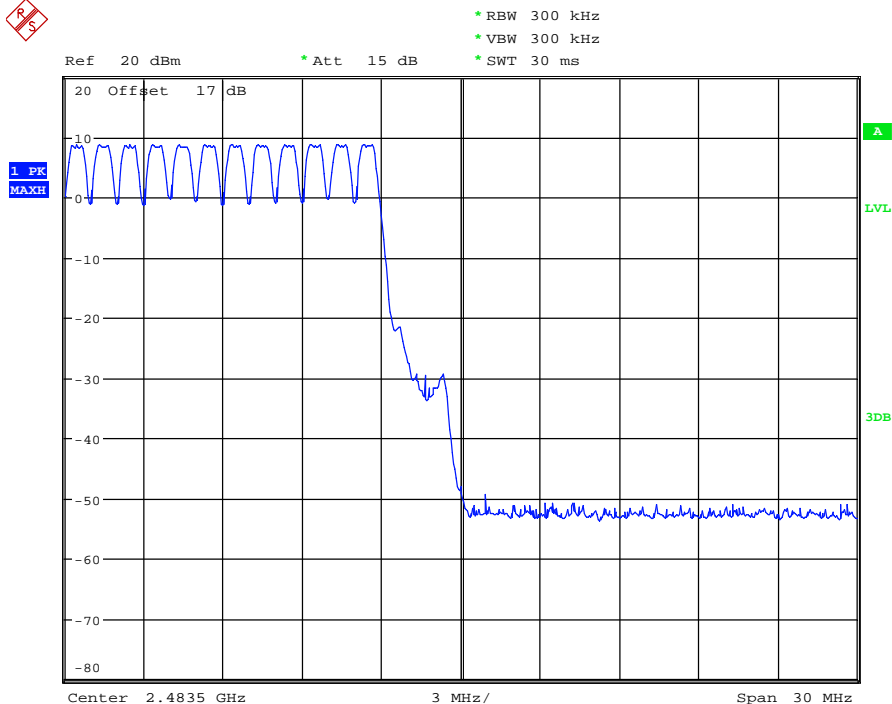
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201



NUMBER OF HOPPING CH14-66

Date: 19.NOV.2013 10:20:48



NUMBER OF HOPPING CH67-78

Date: 19.NOV.2013 10:21:18



Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201

## **Limits:**

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

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

### **3.7.1 Pseudorandom Frequency Hopping Sequence**

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

### **3.7.2 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.

### **3.7.3 System Receiver Hopping Capability**

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



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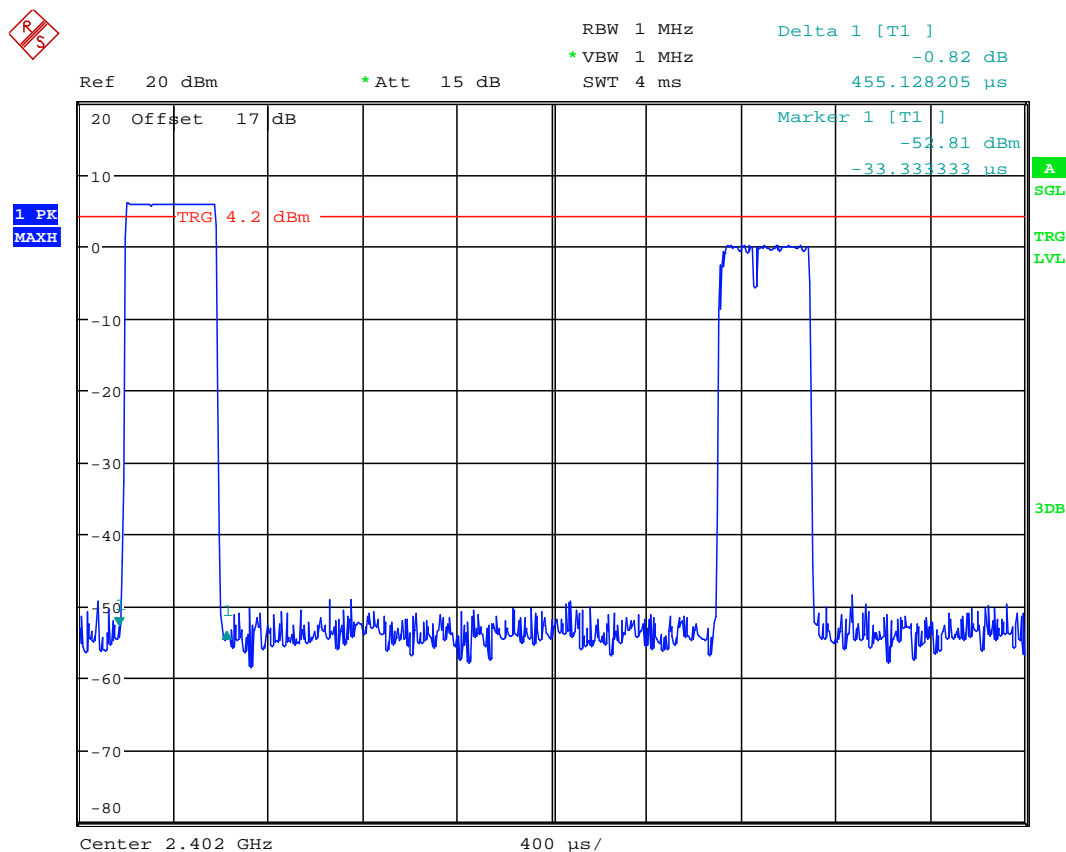
FCC ID: WDYQ1021201

## 3.8 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.

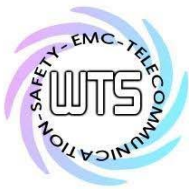
In 2400-2483.5 MHz band the average time of occupancy on any channel shall not be greater than 0.4 seconds multiplied by the number of hopping channels employed.

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.



DWELL TIME CH0 DH1 ( 0.455ms \* 320events = 145.6ms )

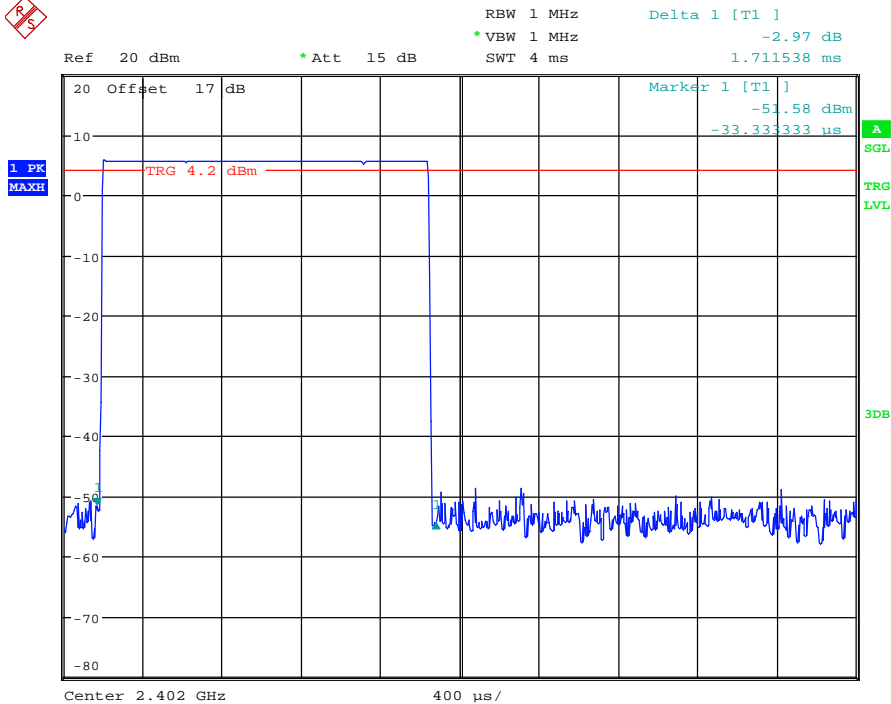
Date: 19.NOV.2013 11:13:03



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

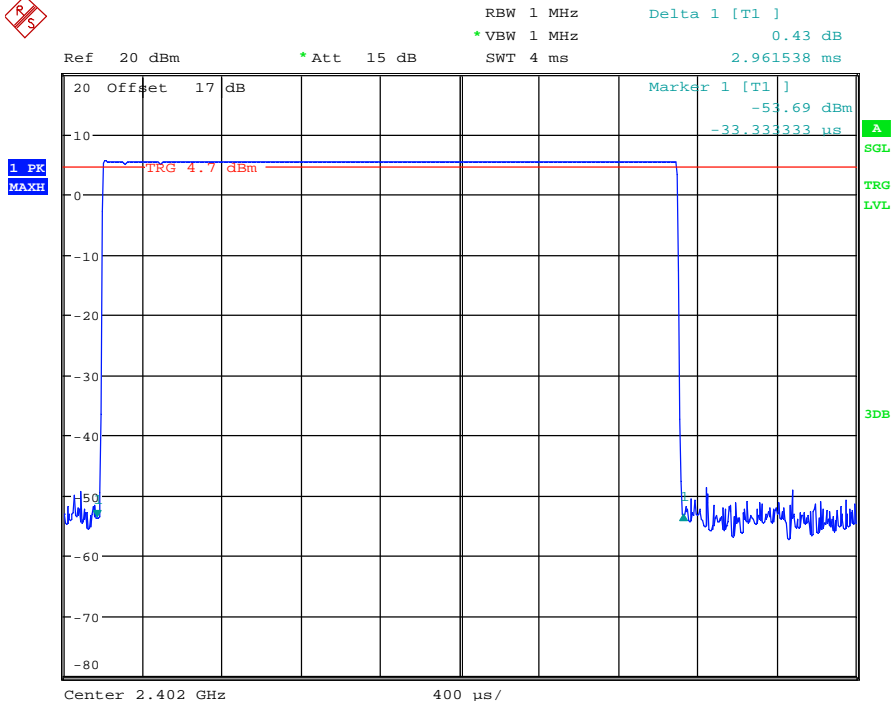
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201



DWELL TIME CH0 DH3 ( 1.711ms \* 160events = 273.76ms )

Date: 19.NOV.2013 11:10:09

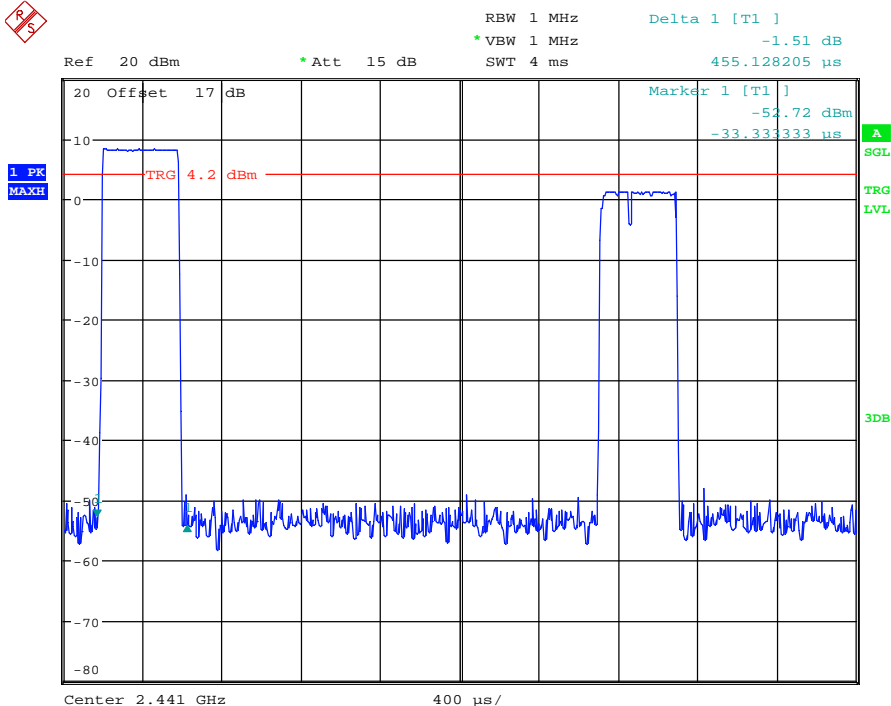


DWELL TIME CH0 DH5 ( 2.948ms \* 110events = 325.71ms )

Date: 19.NOV.2013 10:55:07

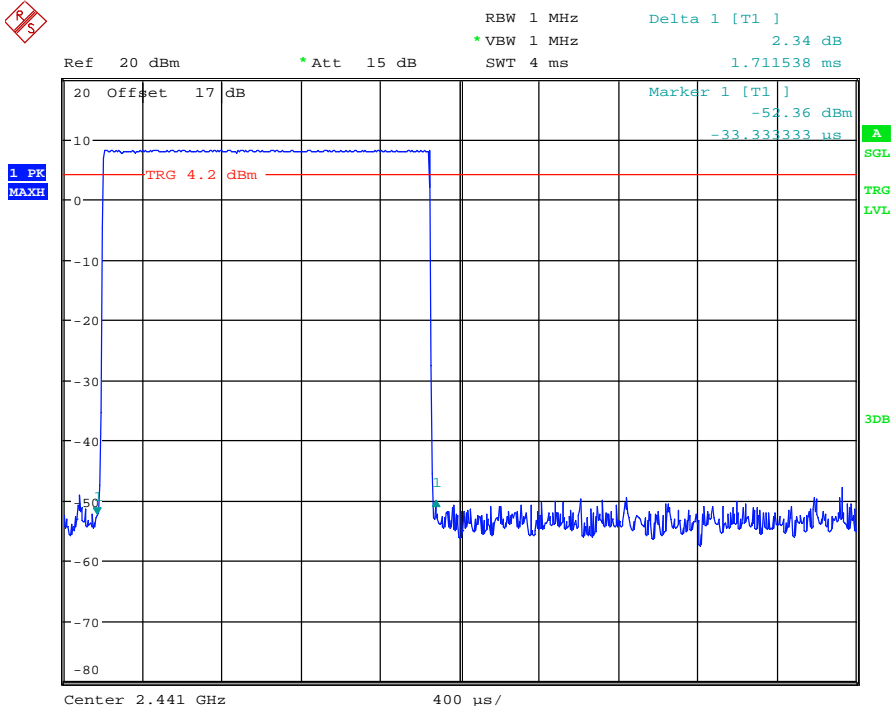


Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201



DWELL TIME CH39 DH1 ( 0.455ms \* 320events = 145.6ms )

Date: 19.NOV.2013 11:12:42

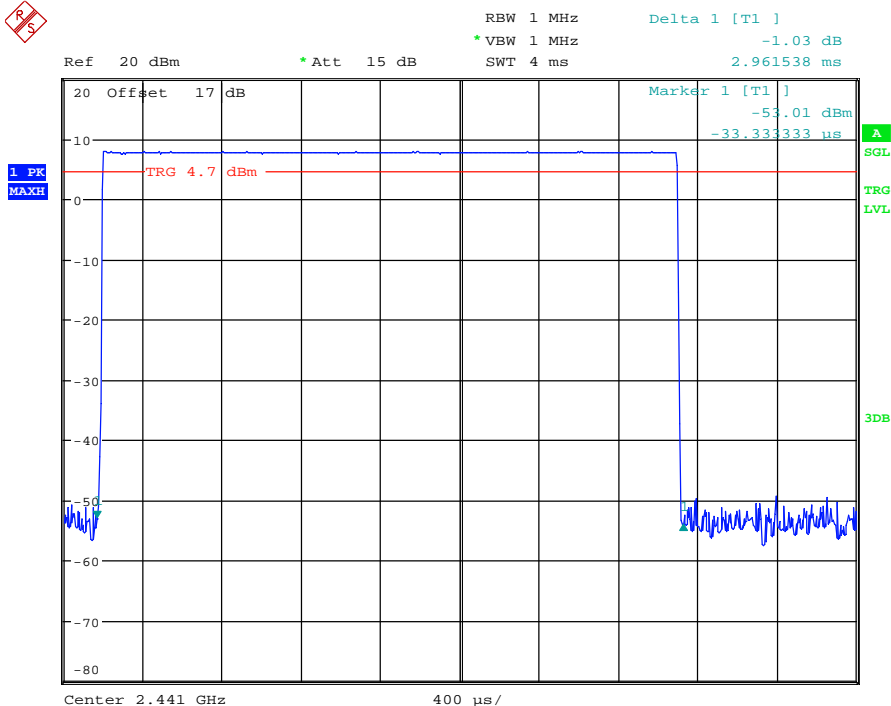


DWELL TIME CH39 DH3 ( 1.711ms \* 160events = 273.76ms )

Date: 19.NOV.2013 11:10:34

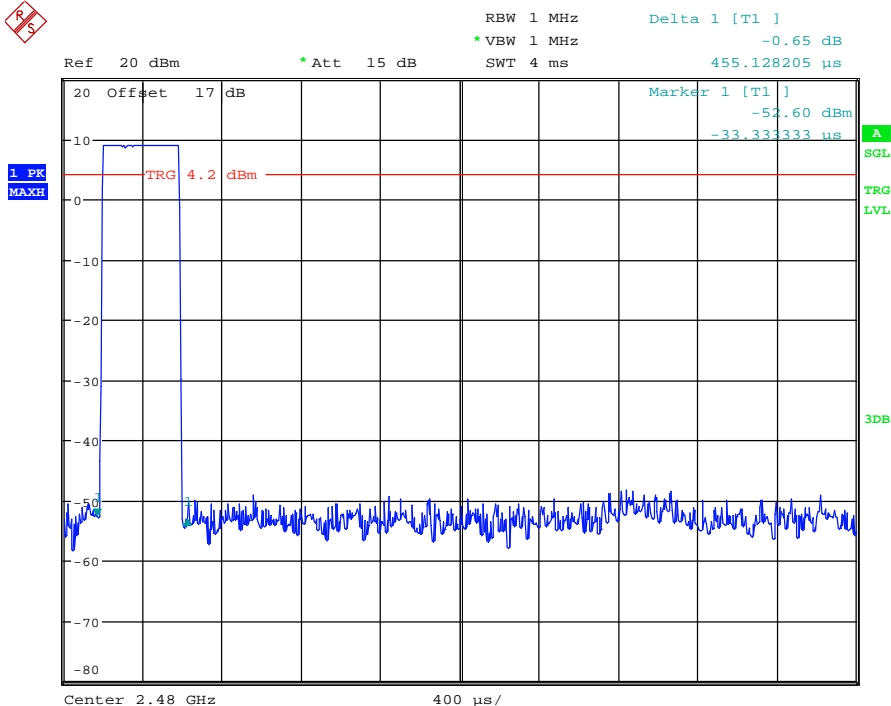


Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201



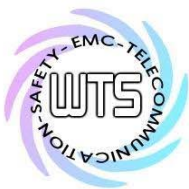
DWELL TIME CH39 DH5 ( 2.948ms \* 110events = 325.71ms )

Date: 19.NOV.2013 10:55:27

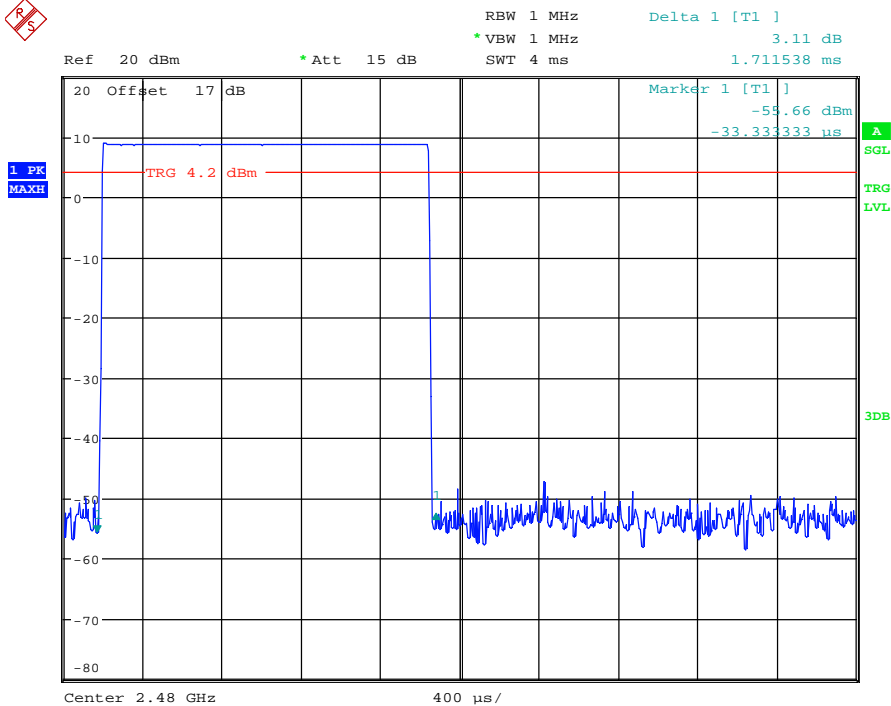


DWELL TIME CH78 DH1 ( 0.455ms \* 320events = 145.6ms )

Date: 19.NOV.2013 11:12:15

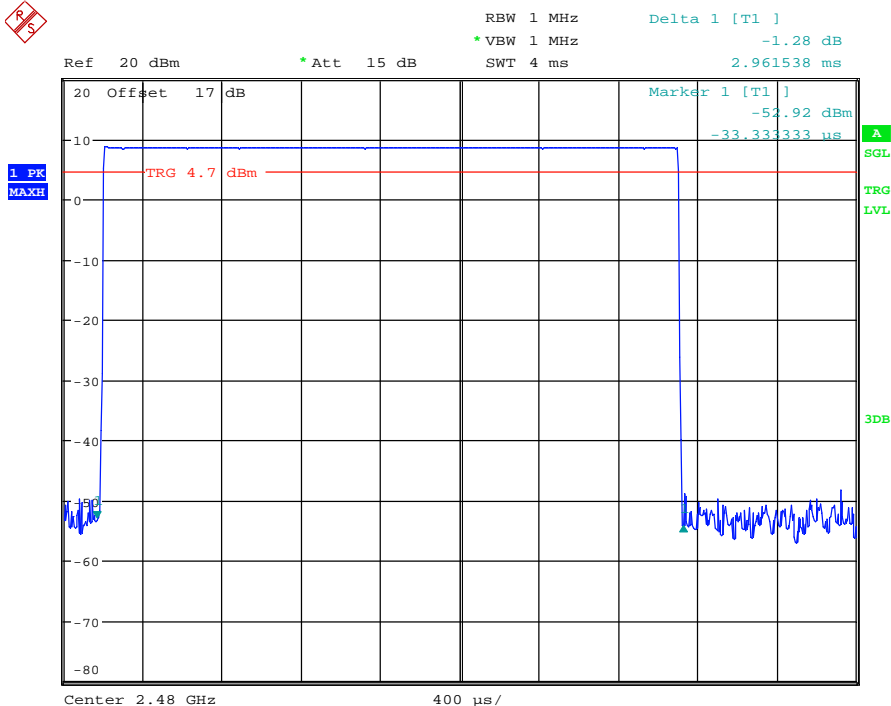


Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201



DWELL TIME CH78 DH3 ( 1.711ms \* 160events = 273.76ms )

Date: 19.NOV.2013 11:10:54



DWELL TIME CH78 DH5 ( 2.948ms \* 110events = 325.71ms )

Date: 19.NOV.2013 10:55:51





Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201

**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



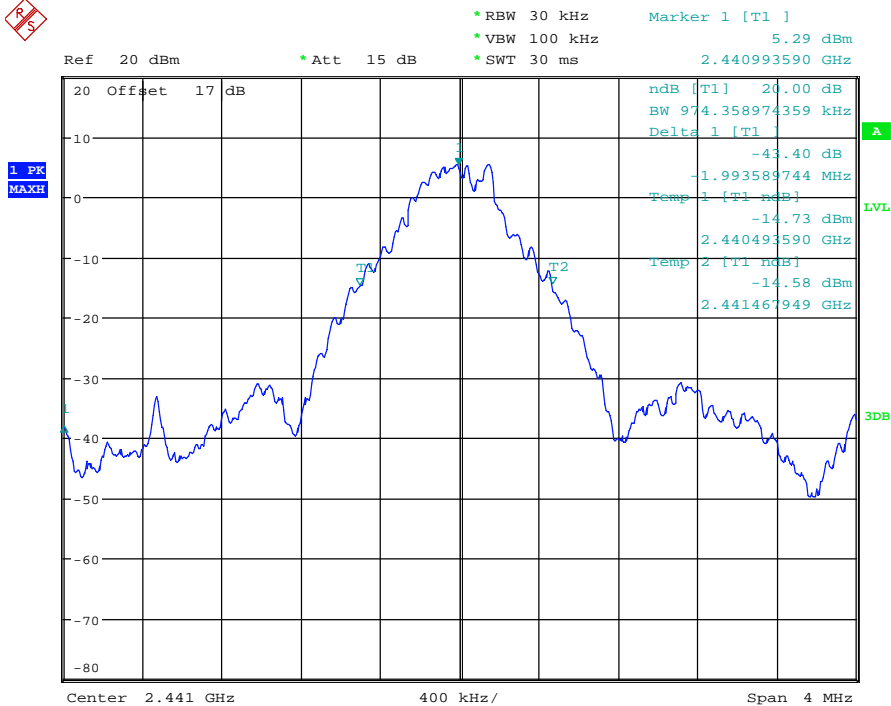
FCC ID: WDYQ1021201



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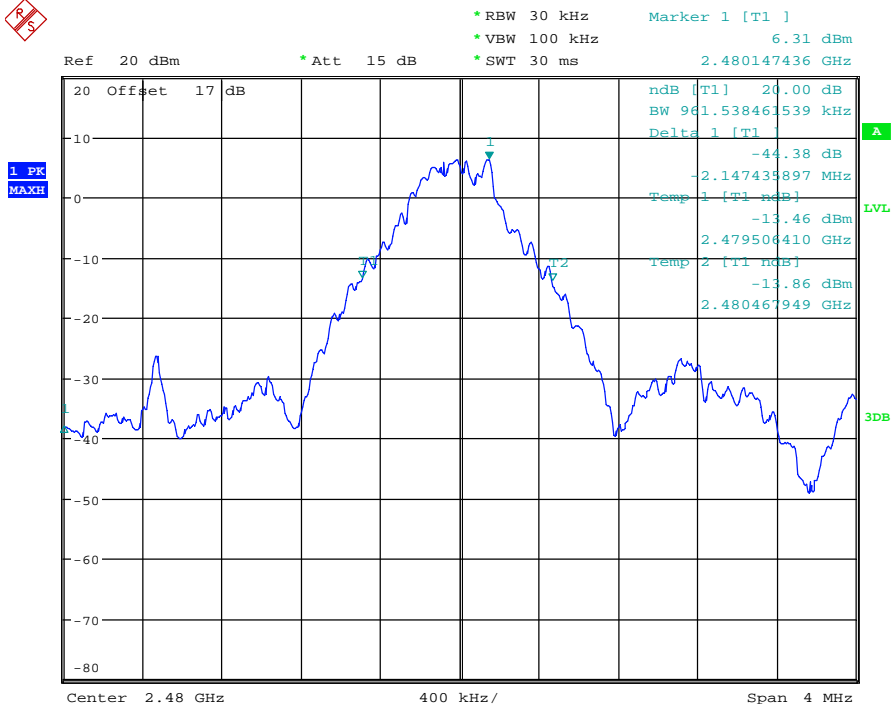
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201



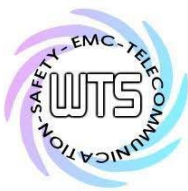
20DB BANDWIDTH CH39

Date: 19.NOV.2013 10:45:42



20DB BANDWIDTH CH78

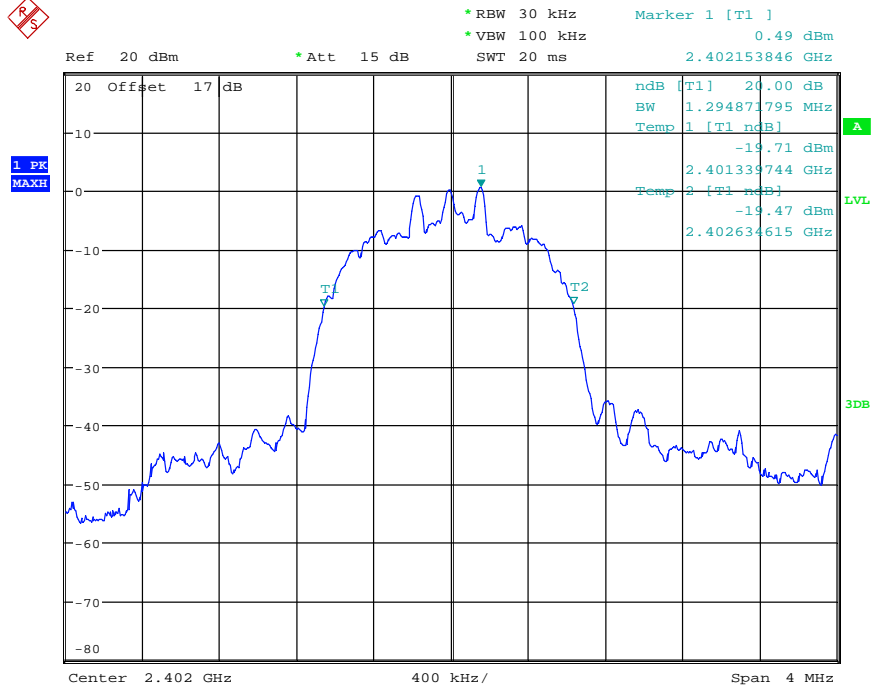
Date: 19.NOV.2013 10:46:11



Registration number: W6M21311-13647-C-1

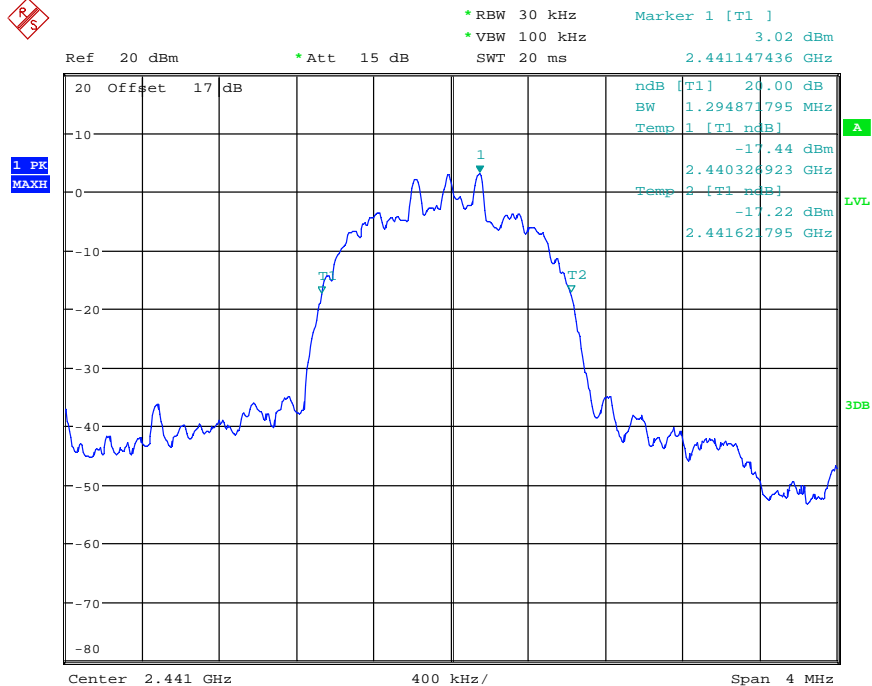
FCC ID: WDYQ1021201

EDR mode



20DB BANDWIDTH CH0 EDR MODE

Date: 19.NOV.2013 10:08:21

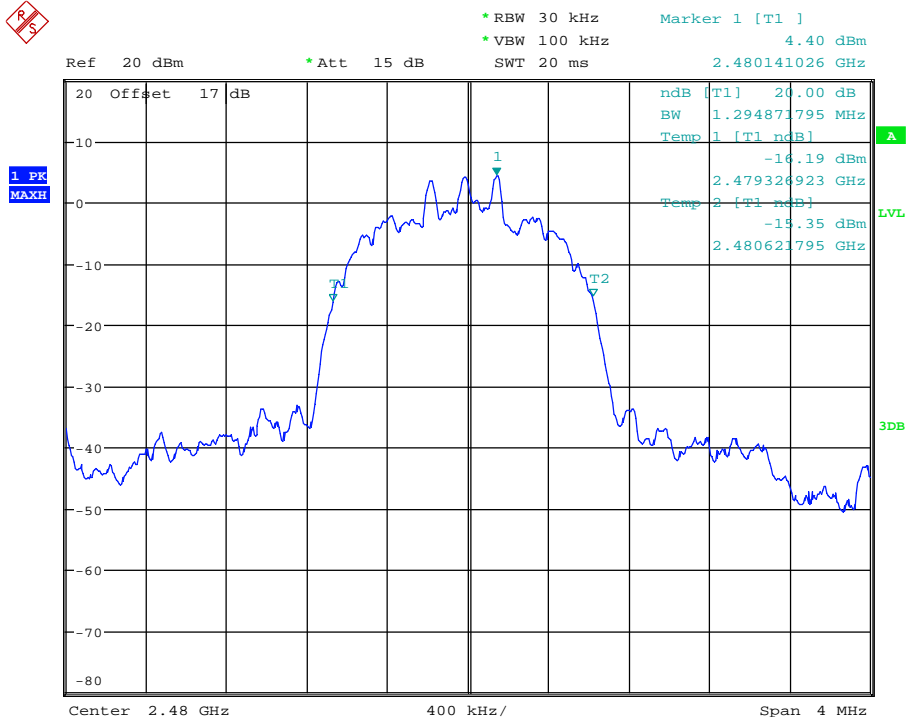


20DB BANDWIDTH CH39 EDR MODE

Date: 19.NOV.2013 10:09:13



Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201



20DB BANDWIDTH CH78 EDR MODE  
Date: 19.NOV.2013 10:09:48

## 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

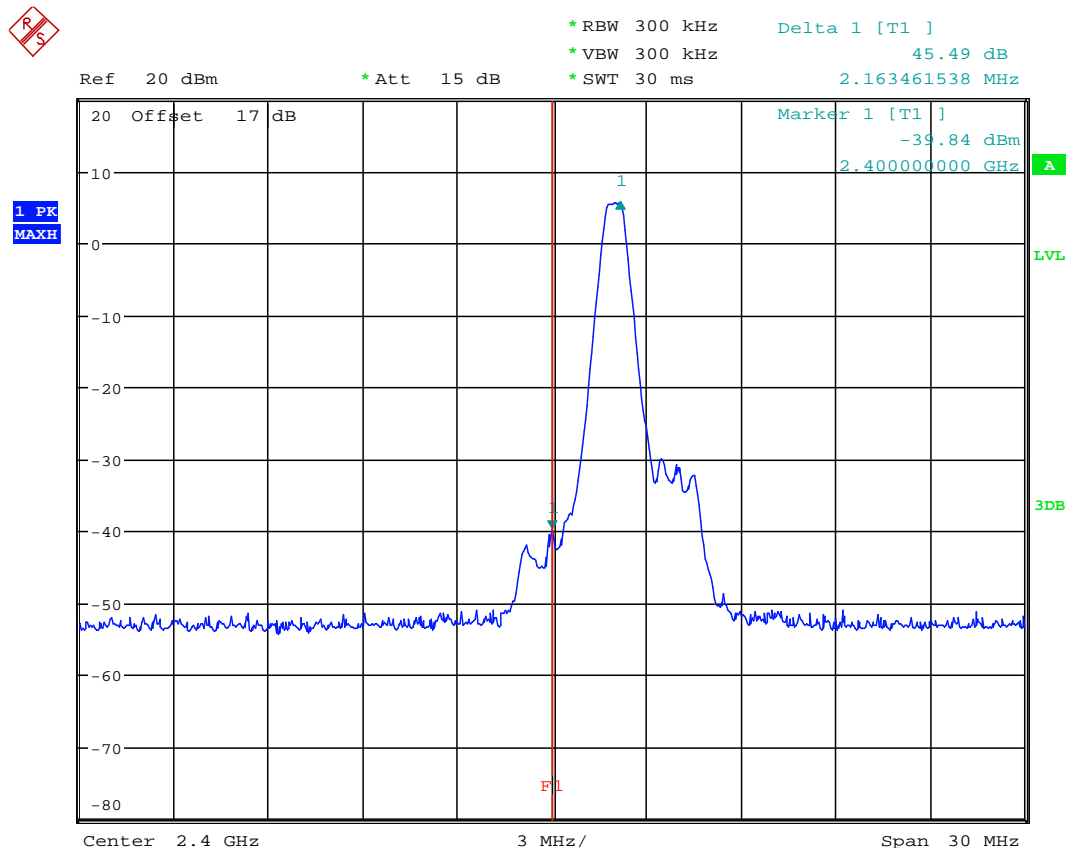
### 3.9.1 System Receiver Input Bandwidth

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

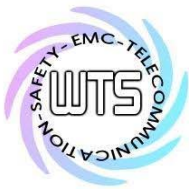


FCC ID: WDYQ1021201

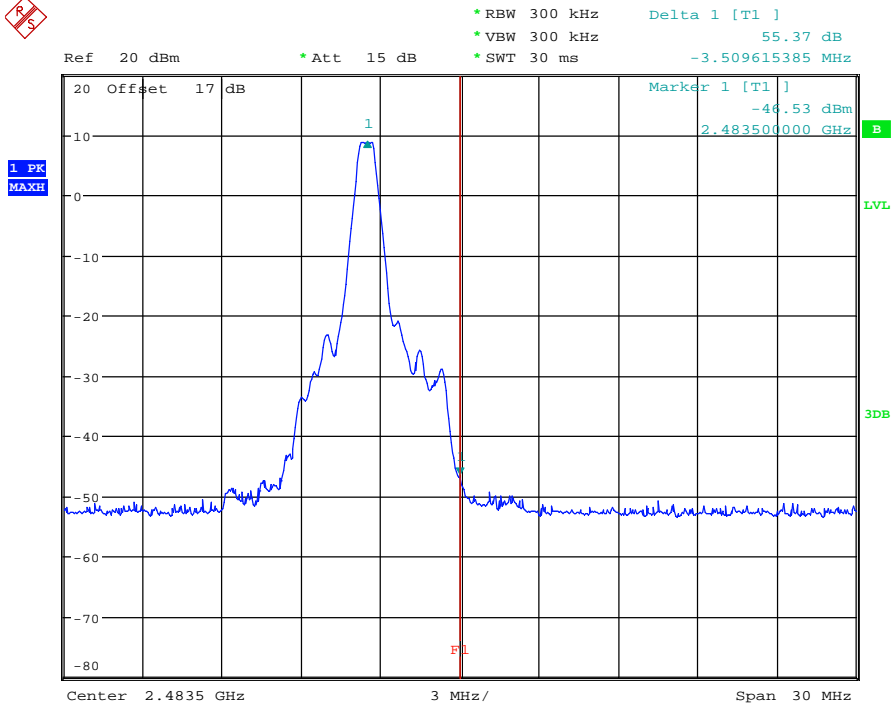
According to FCC rules part 15 subpart C §15.247(c) in any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100 kHz bandwidth within the band that 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.



Date: 19.NOV.2013 10:36:27

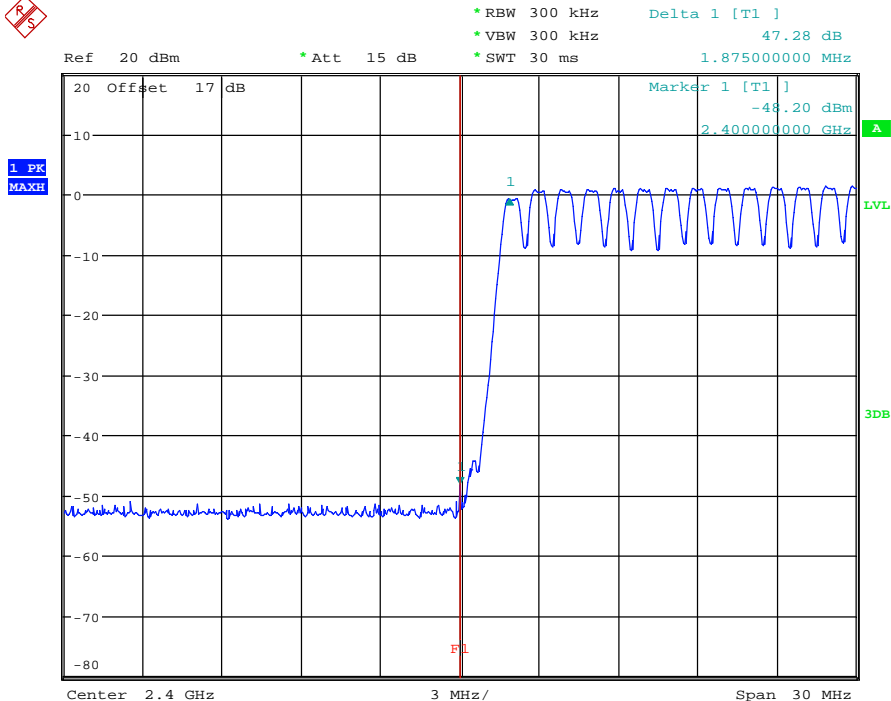


Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201



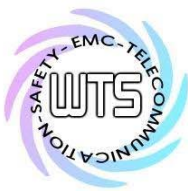
BANDEDGE CH78

Date: 19.NOV.2013 10:38:24

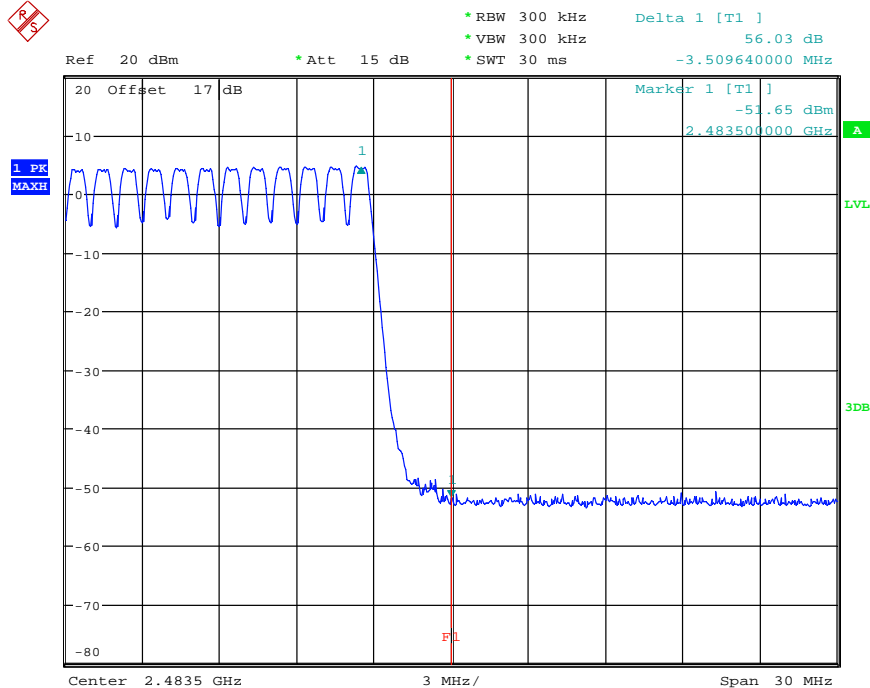


BANDEDGE CH0 HOPPING MODE

Date: 19.NOV.2013 09:52:17

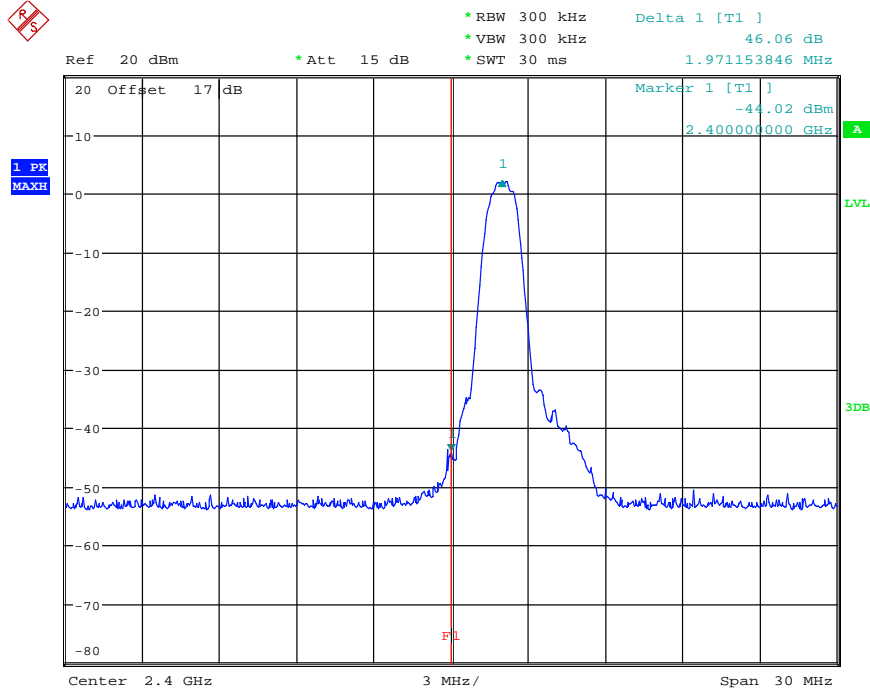


Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201



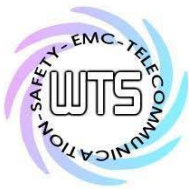
BANDEDGE CH78 HOPPING MODE  
Date: 19.NOV.2013 09:53:01

EDR mode



BANDEDGE CH00 EDR MODE  
Date: 19.NOV.2013 10:41:19

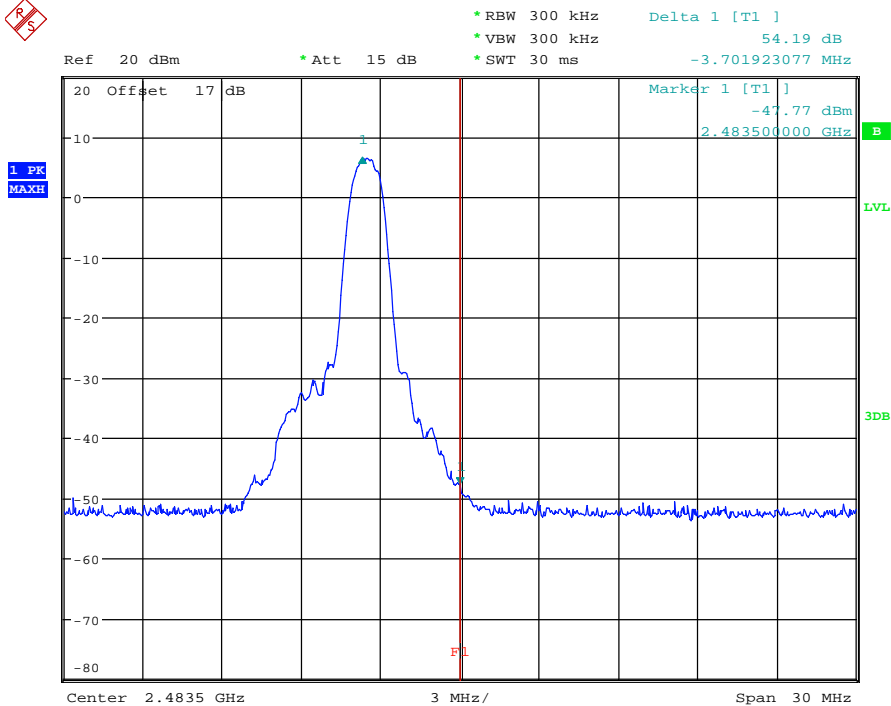




# Worldwide Testing Services(Taiwan) Co., Ltd.

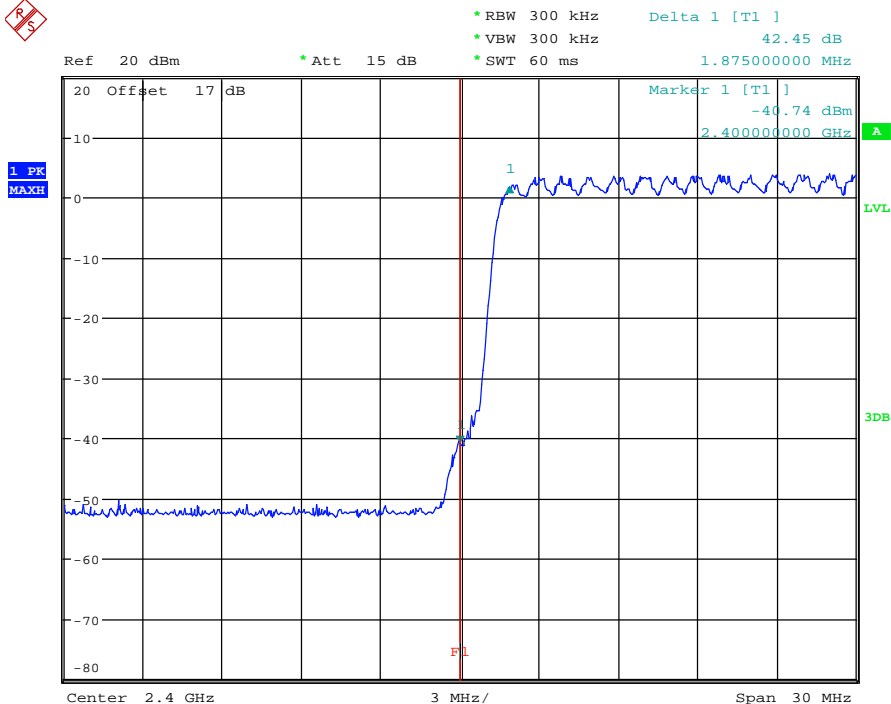
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201



BANDEDGE CH78 EDR MODE

Date: 19.NOV.2013 10:40:50

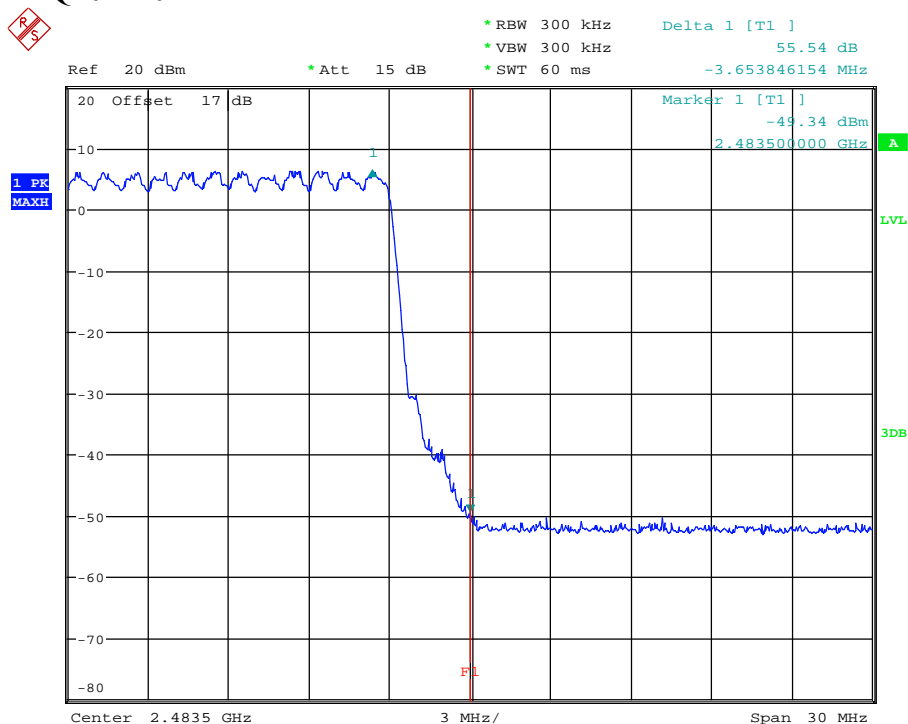


BANDEDGE CH0 EDR HOPPING MODE

Date: 19.NOV.2013 10:24:47



Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201



BANEDGE CH78 EDR HOPPING MODE  
Date: 19.NOV.2013 10:26:18

**Limits:**

| Frequency Range / MHz | Limit   |
|-----------------------|---------|
| 902 – 928             | - 20 dB |
| 2400 – 2483.5         |         |
| 5725 - 5850           |         |

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



Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

**3.11 Radiated Emissions from Digital Part**

FCC Rule: 15.109

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

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

Test equipment used: ETSTW-RE 055, ETSTW-RE 064, ETSTW-RE 004, ETSTW-RE 030  
ETSTW-RE 111

Explanation: The test results are listed in the separated test report no.: W6M21311-13647-P-15B.



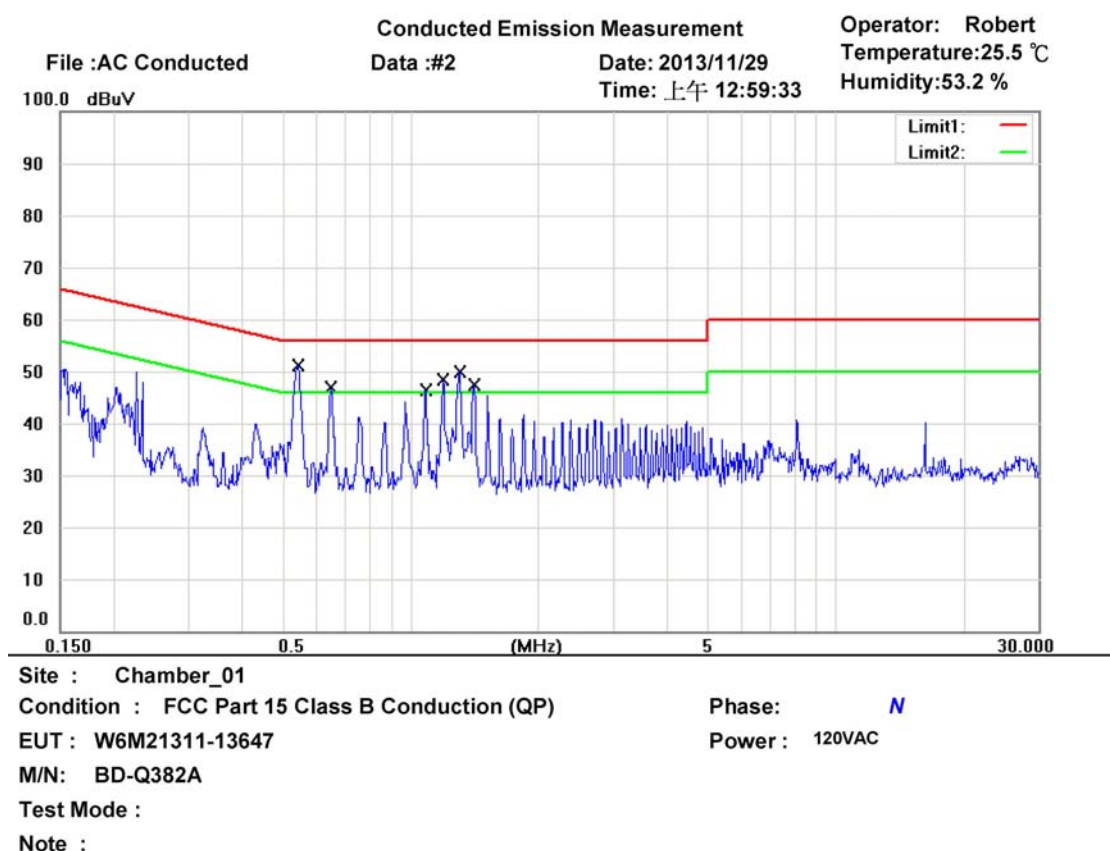
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

## 3.12 Power Line Conducted Emission

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.

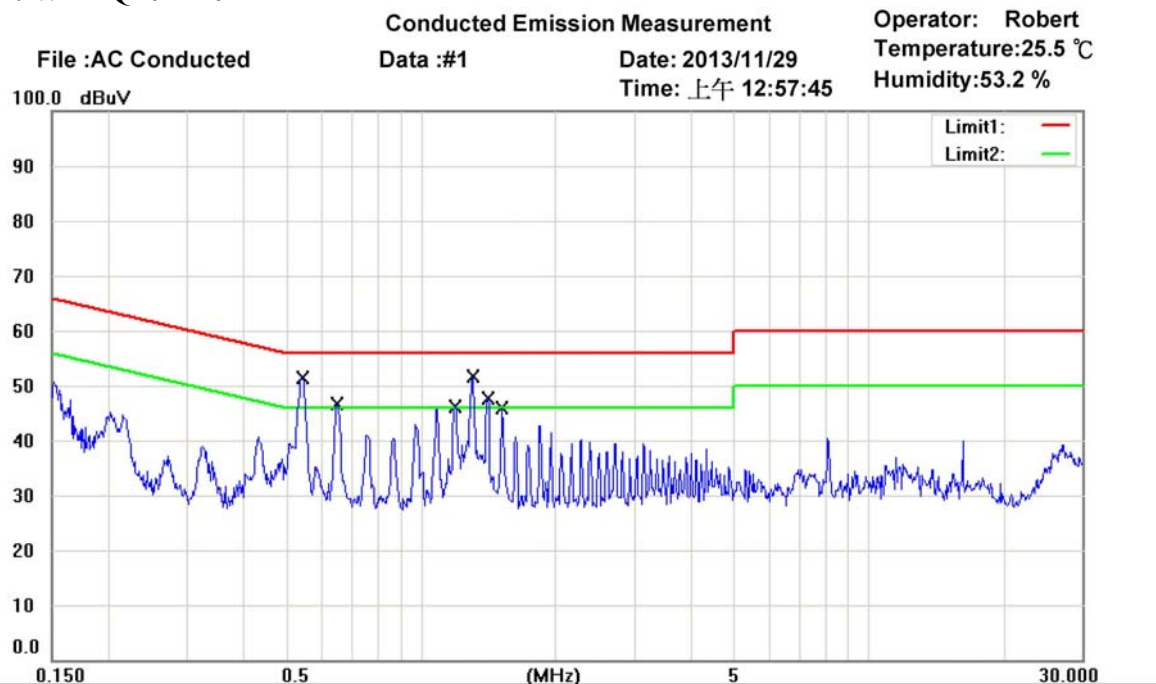


| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corrected factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|----------------------|---------------|--------------|-------------|---------|
| *   | 0.5427          | 39.22          | QP       | 10.12                | 49.34         | 56.00        | -6.66       |         |
|     | 0.5427          | 21.26          | AVG      | 10.12                | 31.38         | 46.00        | -14.62      |         |
|     | 0.6485          | 34.73          | QP       | 10.13                | 44.86         | 56.00        | -11.14      |         |
|     | 0.6485          | 18.98          | AVG      | 10.13                | 29.11         | 46.00        | -16.89      |         |
|     | 1.0828          | 34.26          | QP       | 10.14                | 44.40         | 56.00        | -11.60      |         |
|     | 1.0828          | 20.11          | AVG      | 10.14                | 30.25         | 46.00        | -15.75      |         |
|     | 1.1885          | 33.12          | QP       | 10.15                | 43.27         | 56.00        | -12.73      |         |
|     | 1.1885          | 18.42          | AVG      | 10.15                | 28.57         | 46.00        | -17.43      |         |
|     | 1.3033          | 31.33          | QP       | 10.15                | 41.48         | 56.00        | -14.52      |         |
|     | 1.3033          | 9.71           | AVG      | 10.15                | 19.86         | 46.00        | -26.14      |         |
|     | 1.4067          | 35.74          | QP       | 10.16                | 45.90         | 56.00        | -10.10      |         |
|     | 1.4067          | 20.09          | AVG      | 10.16                | 30.25         | 46.00        | -15.75      |         |



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

Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201



Site : Chamber\_01

Condition : FCC Part 15 Class B Conduction (QP)

Phase: L1

EUT : W6M21311-13647

Power : 120VAC

M/N: BD-Q382A

Test Mode :

Note :

| Mk. | Frequency (MHz) | Reading (dBuV) | Detector | Corrected factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Comment |
|-----|-----------------|----------------|----------|----------------------|---------------|--------------|-------------|---------|
| *   | 0.5427          | 39.20          | QP       | 10.12                | 49.32         | 56.00        | -6.68       |         |
|     | 0.5427          | 21.41          | AVG      | 10.12                | 31.53         | 46.00        | -14.47      |         |
|     | 0.6485          | 34.30          | QP       | 10.13                | 44.43         | 56.00        | -11.57      |         |
|     | 0.6485          | 16.32          | AVG      | 10.13                | 26.45         | 46.00        | -19.55      |         |
|     | 1.1885          | 32.61          | QP       | 10.15                | 42.76         | 56.00        | -13.24      |         |
|     | 1.1885          | 16.21          | AVG      | 10.15                | 26.36         | 46.00        | -19.64      |         |
|     | 1.3010          | 35.99          | QP       | 10.16                | 46.15         | 56.00        | -9.85       |         |
|     | 1.3010          | 16.22          | AVG      | 10.16                | 26.38         | 46.00        | -19.62      |         |
|     | 1.4045          | 34.87          | QP       | 10.16                | 45.03         | 56.00        | -10.97      |         |
|     | 1.4045          | 18.07          | AVG      | 10.16                | 28.23         | 46.00        | -17.77      |         |
|     | 1.5148          | 33.58          | QP       | 10.17                | 43.75         | 56.00        | -12.25      |         |
|     | 1.5148          | 17.20          | AVG      | 10.17                | 27.37         | 46.00        | -18.63      |         |

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. Measurement uncertainty=  $\pm 1.60$  dB; Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .
6. Up Line: QP Limit Line, Down Line: Ave Limit Line.



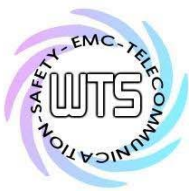
# **Worldwide Testing Services(Taiwan) Co., Ltd.**

Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201

## **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 001, ETSTW-CE 004, ETSTW-CE 006, ETSTW-RE 045, ETSTW-RE 064



Registration number: W6M21311-13647-C-1  
FCC ID: WDYQ1021201

## **Appendix**

### **Measurement diagrams**

Spurious Emissions radiated



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

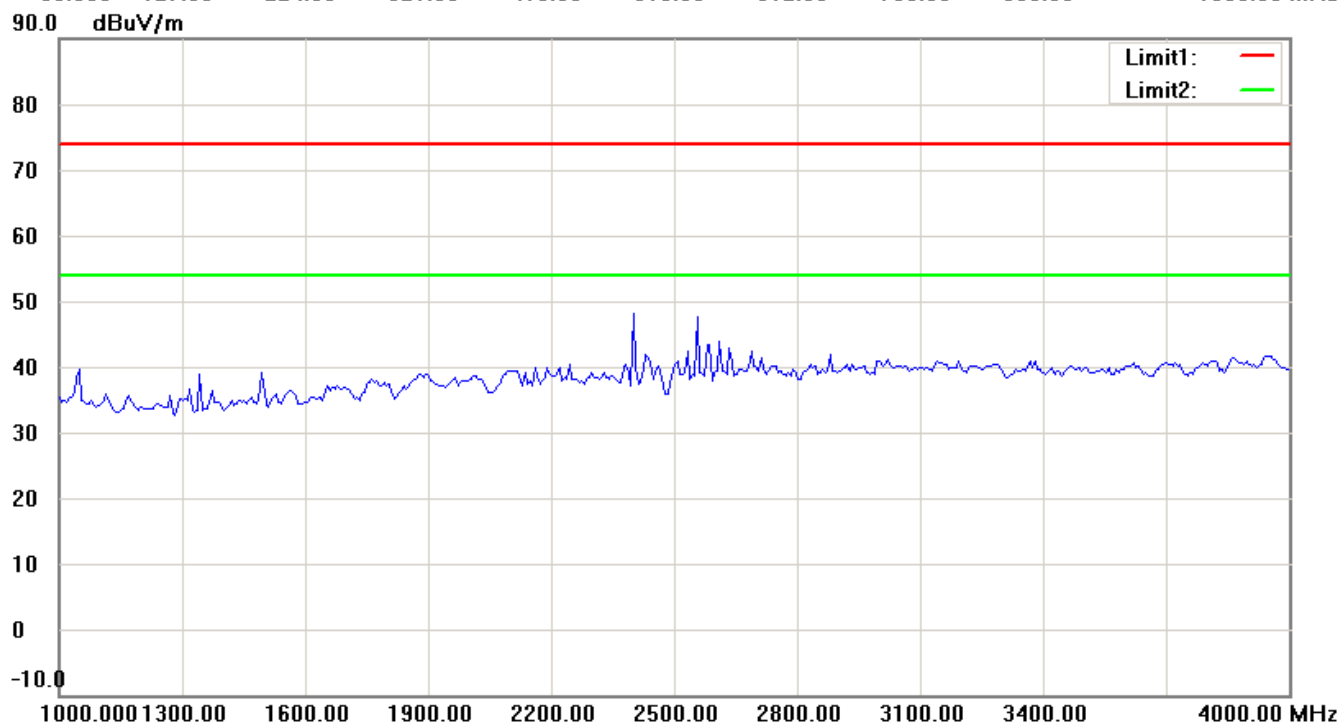
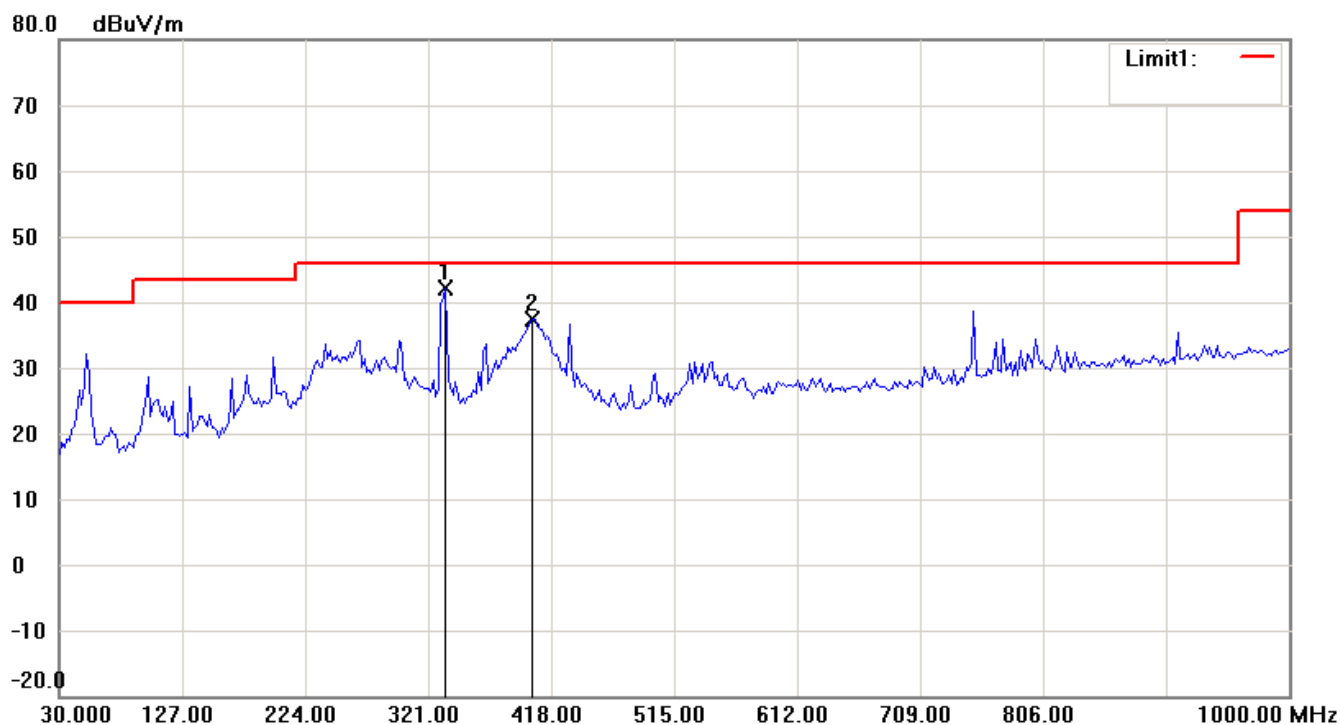
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

Spurious Emissions radiated

TX Bluetooth Normal+EDR CH0

Antenna Polarization H



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.

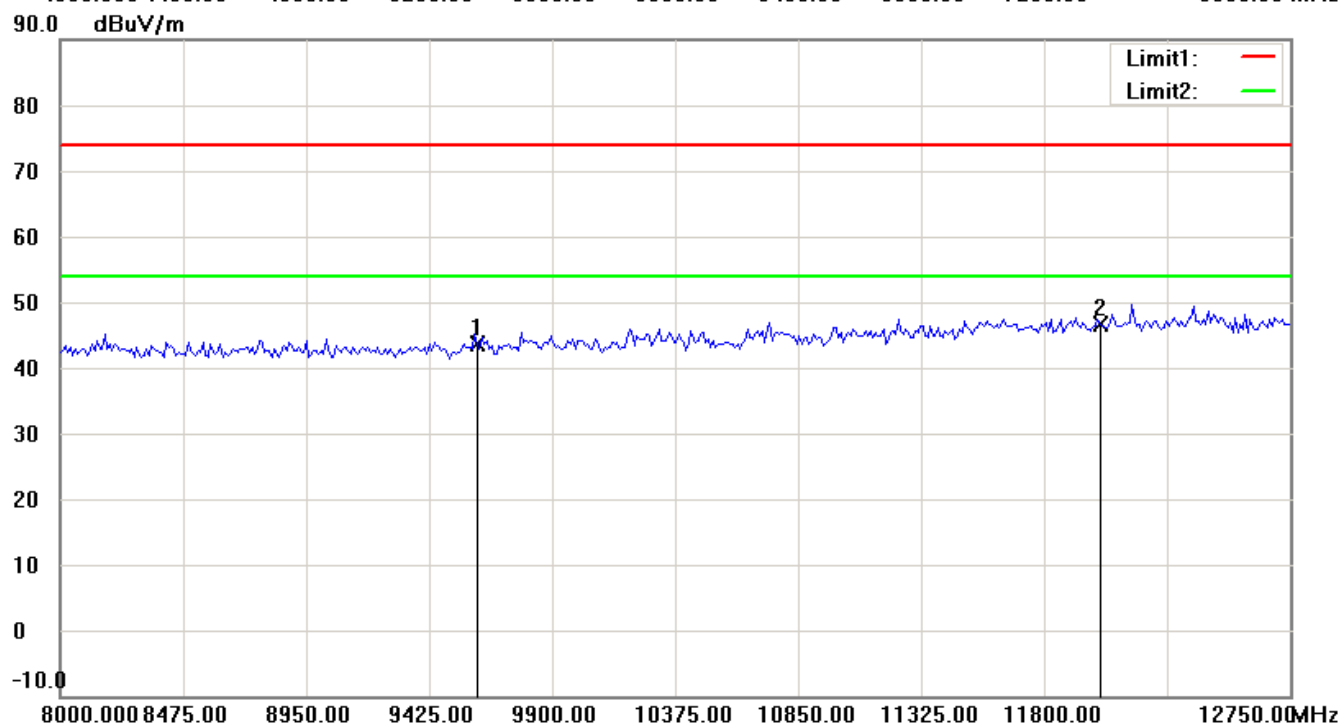
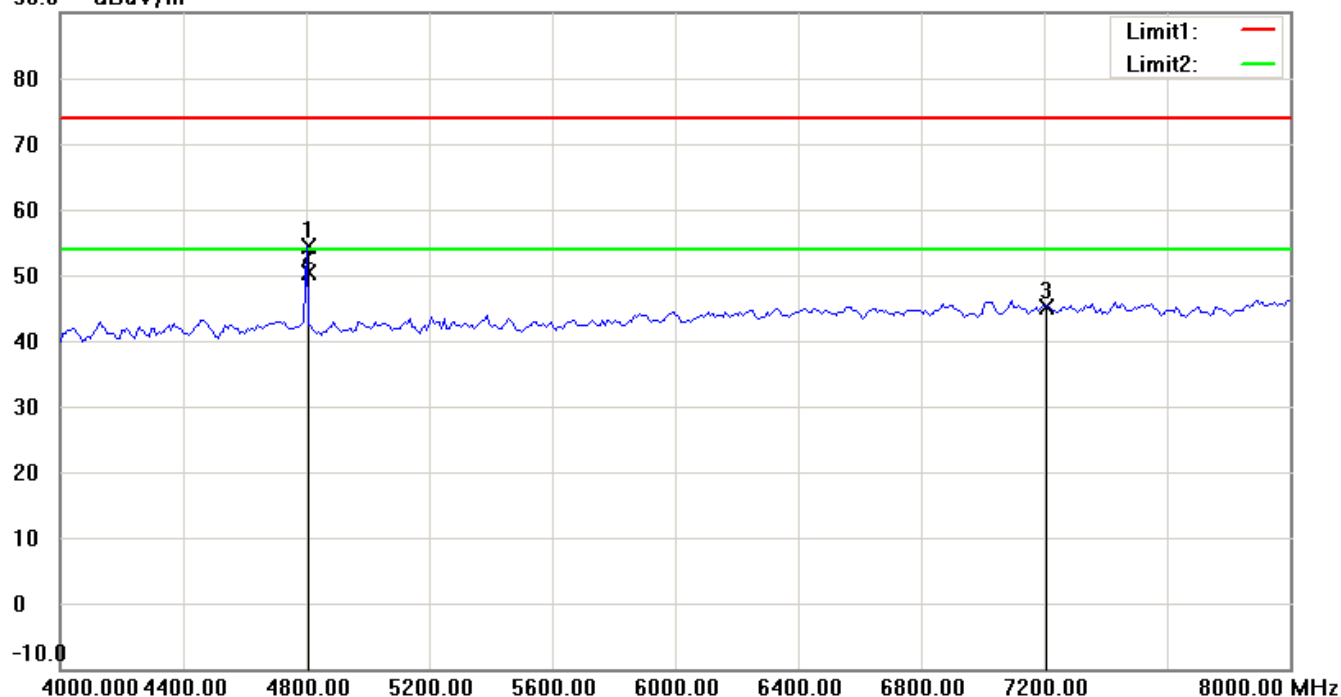




Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

90.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.

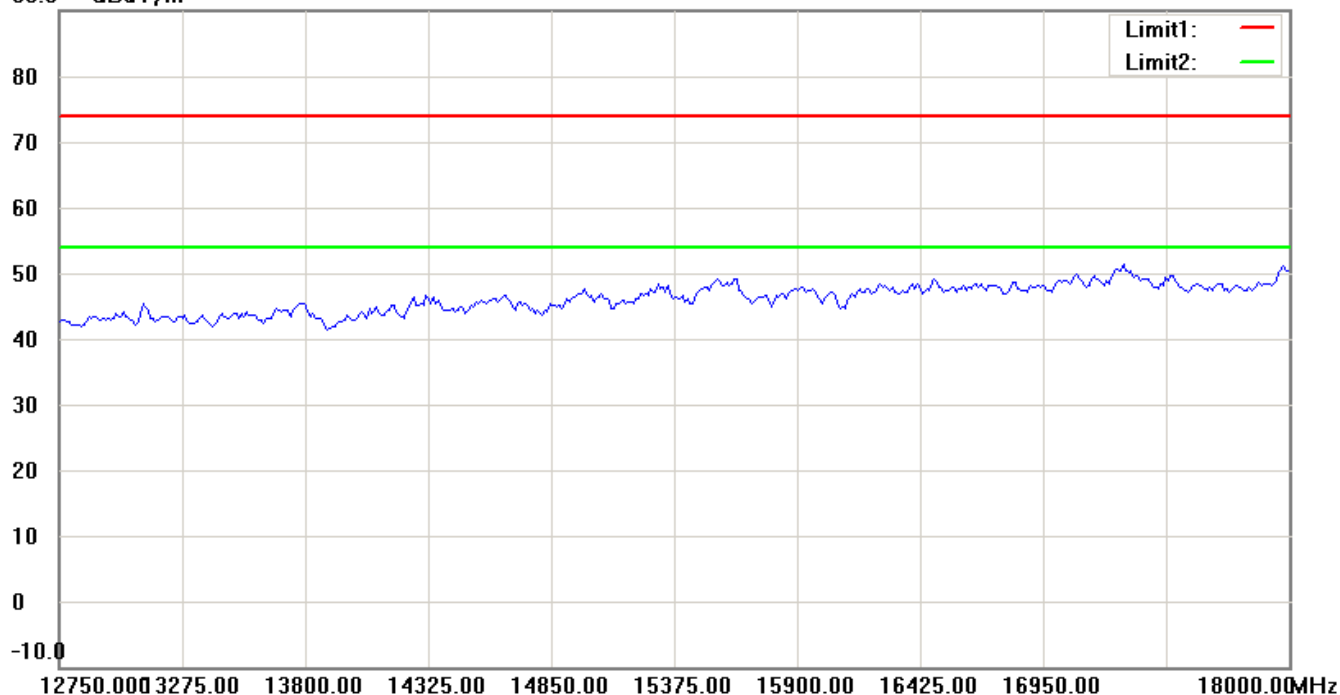


# Worldwide Testing Services(Taiwan) Co., Ltd.

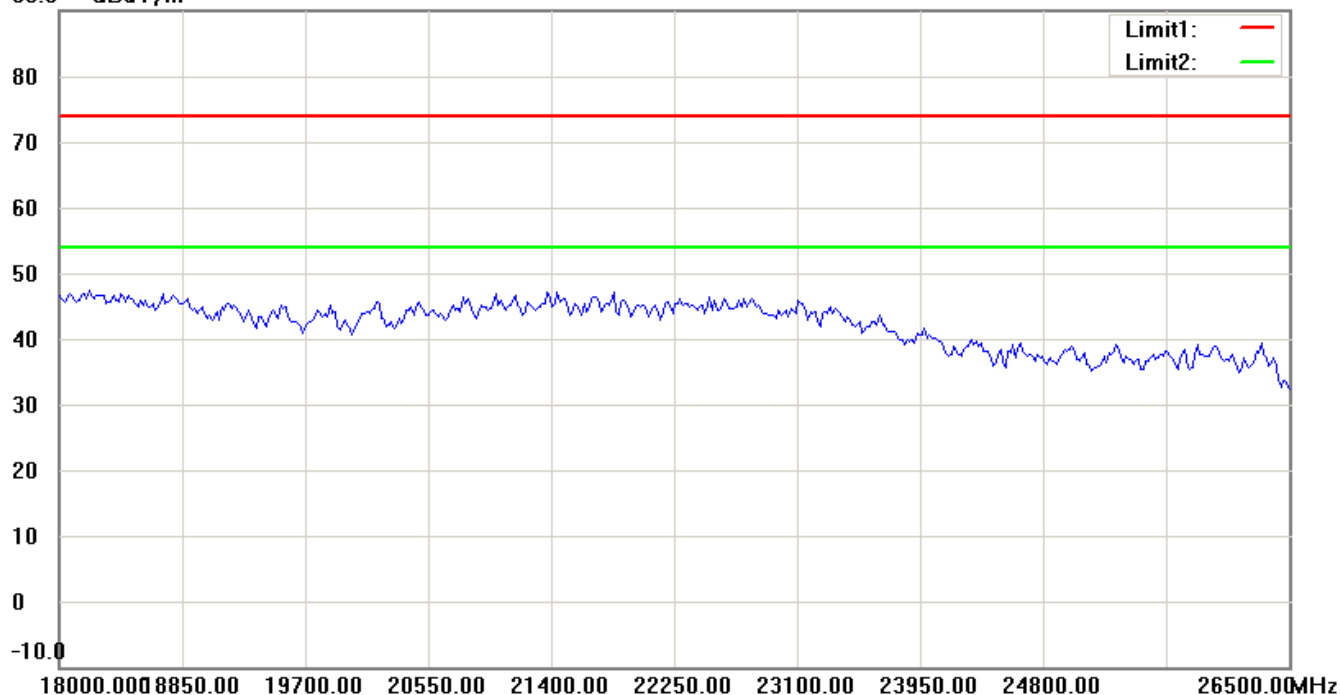
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

90.0 dBuV/m



90.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.



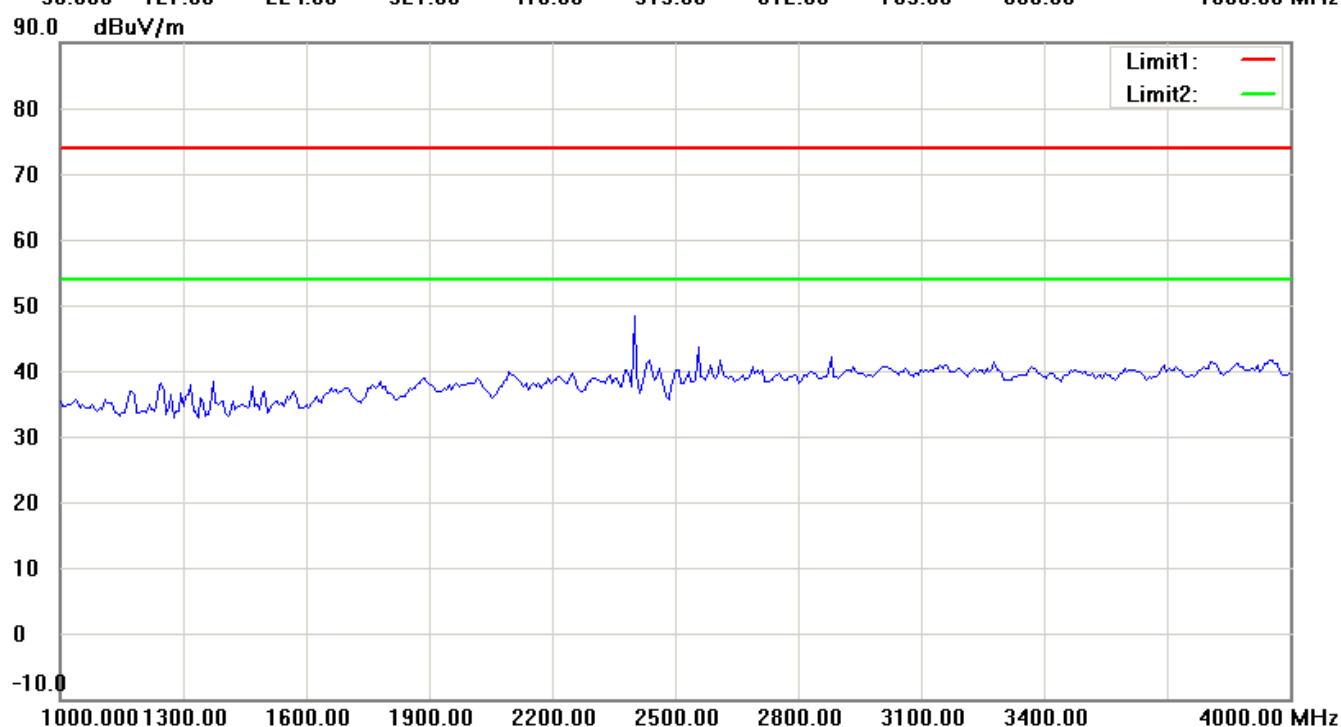
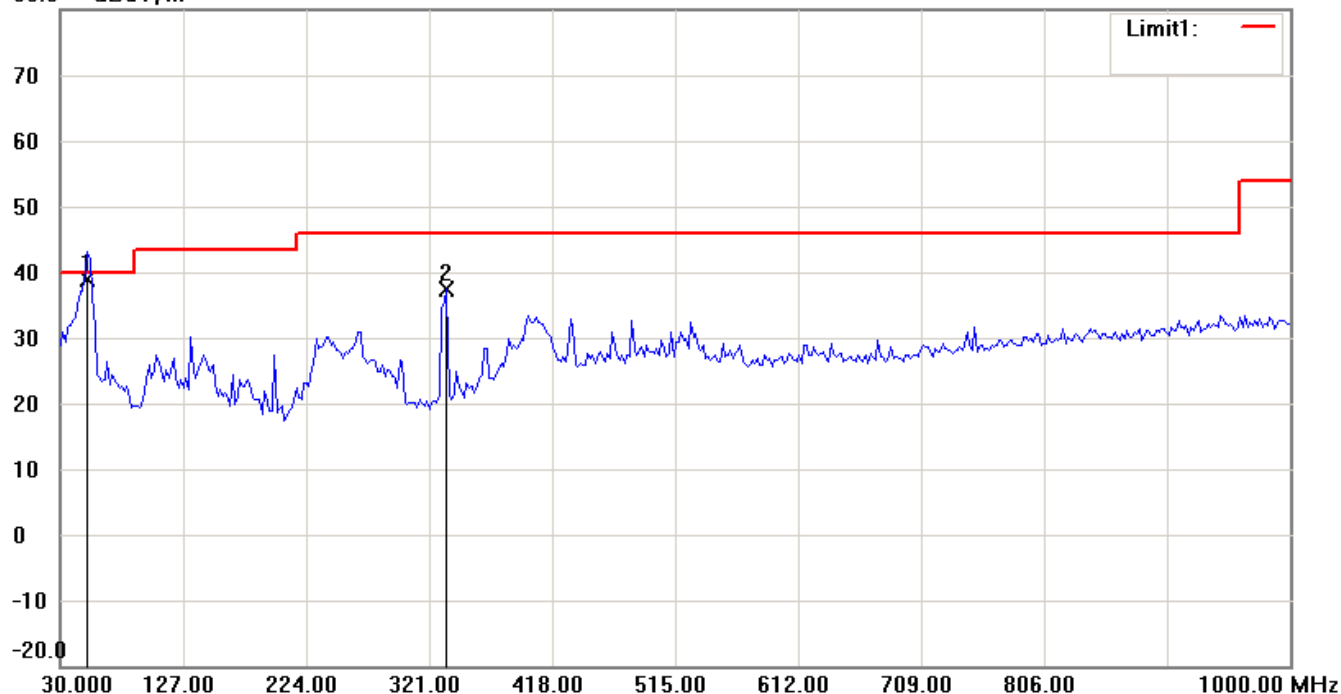
# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

Antenna Polarization V

80.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

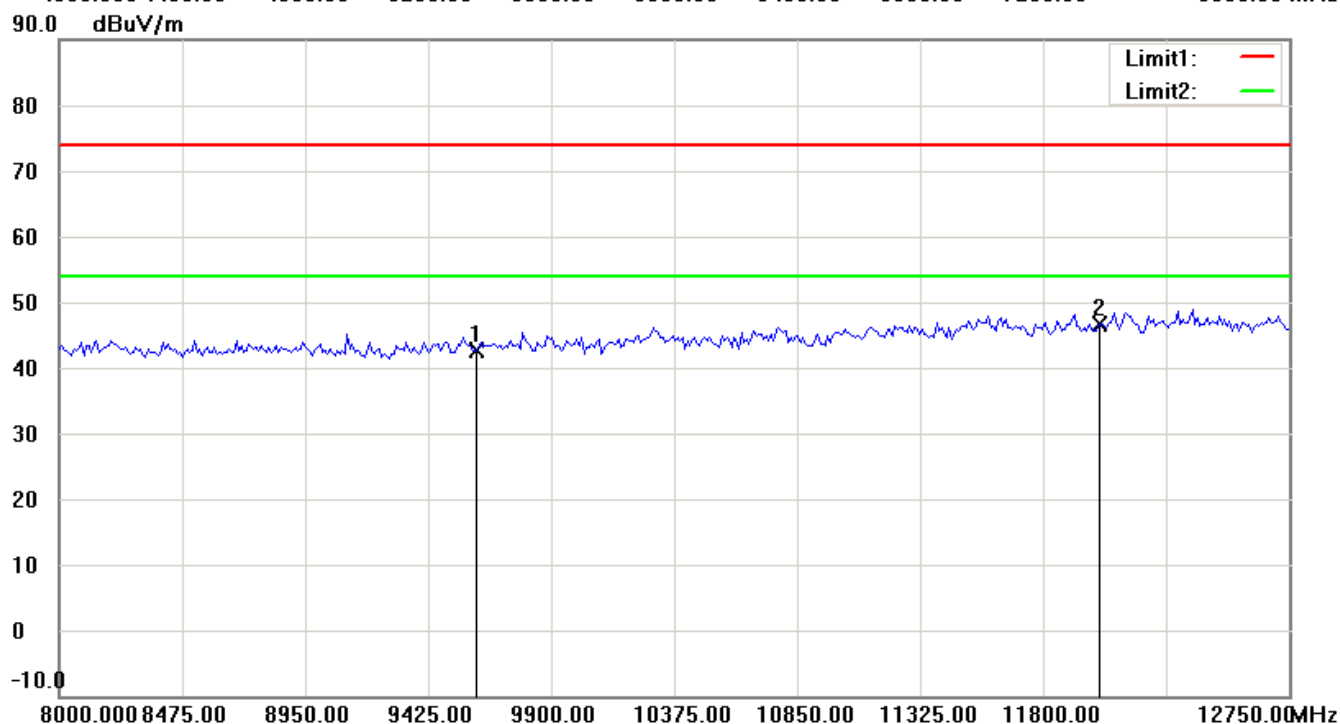
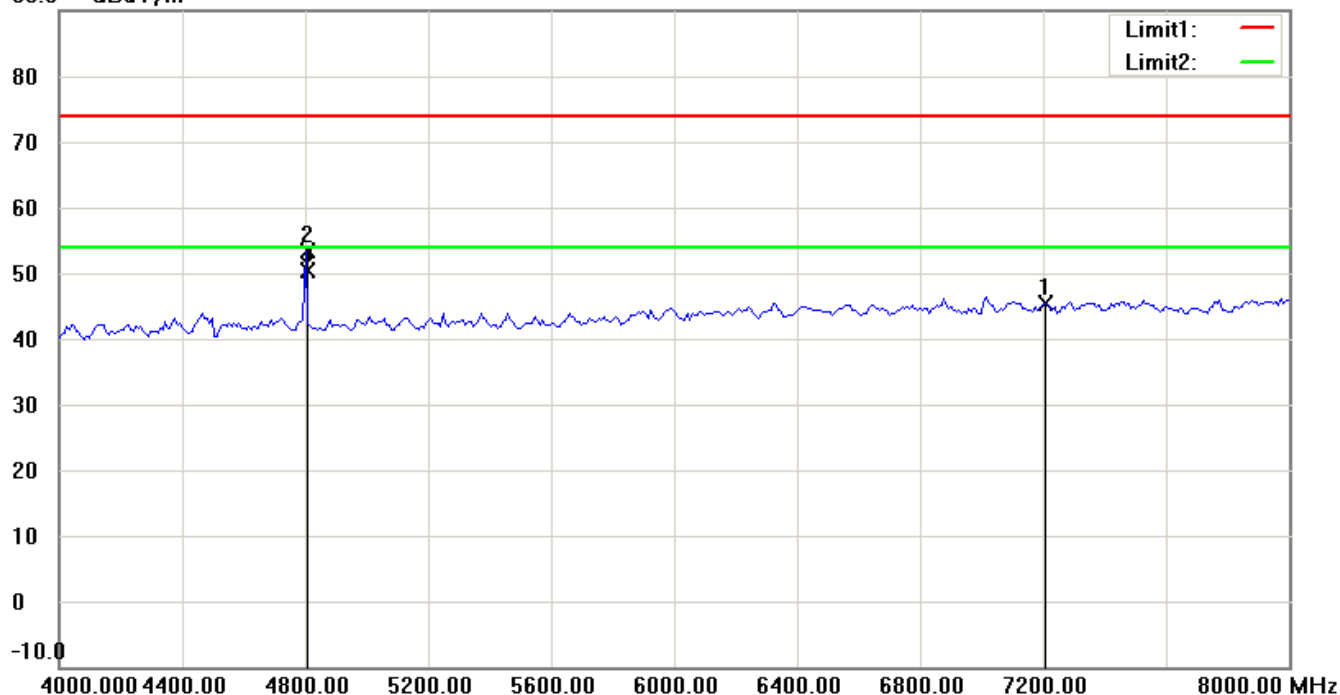
1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.



Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

90.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.

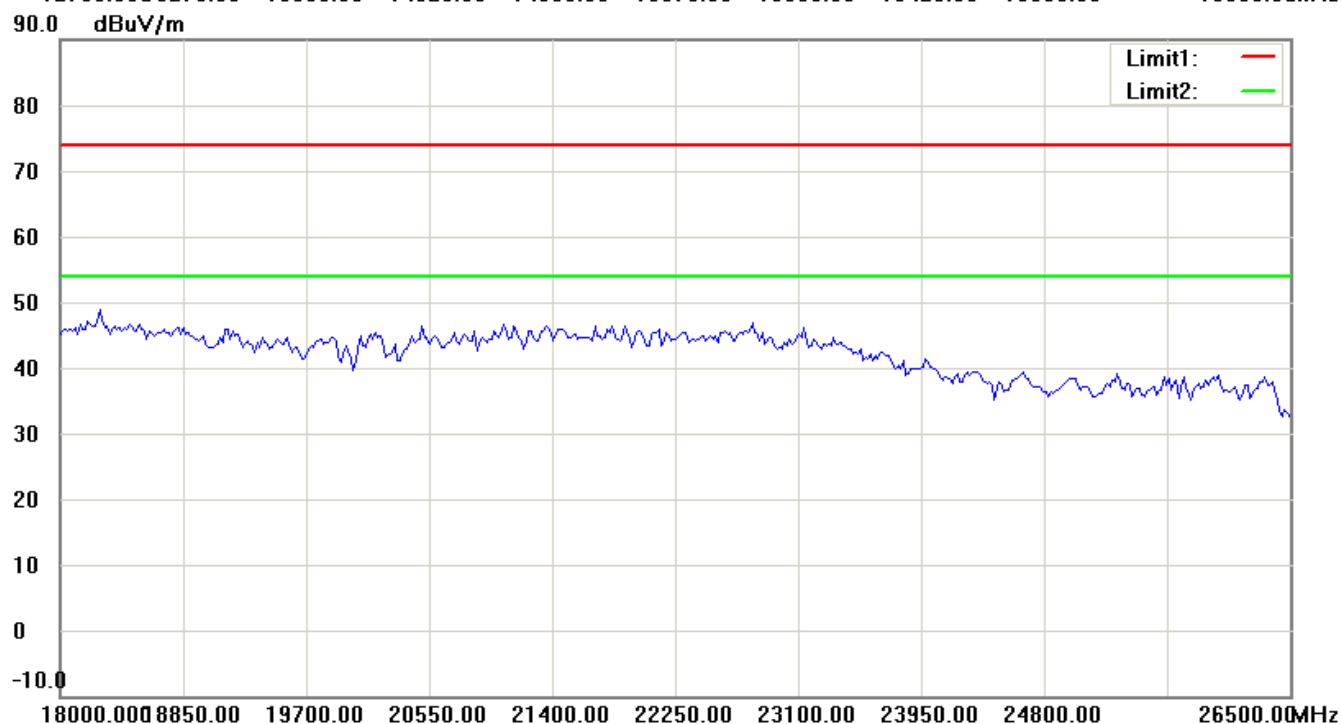
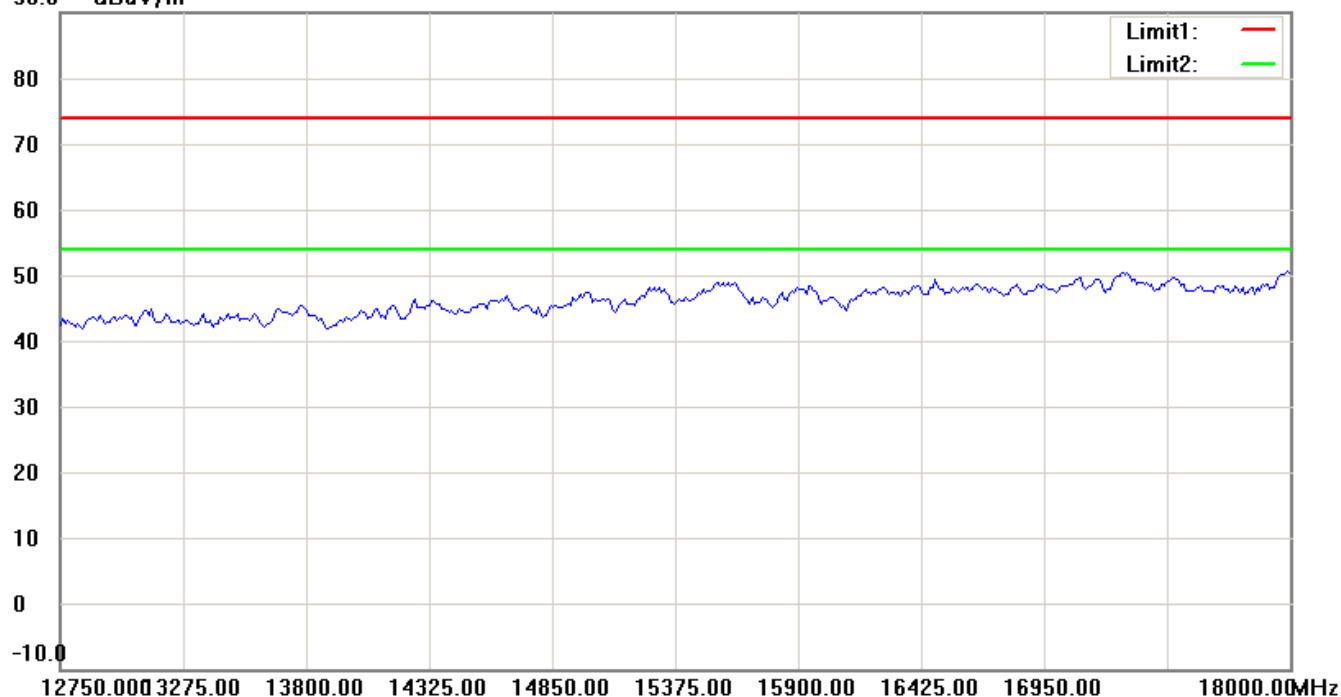


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

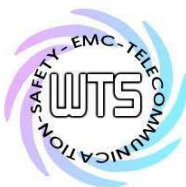
90.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.



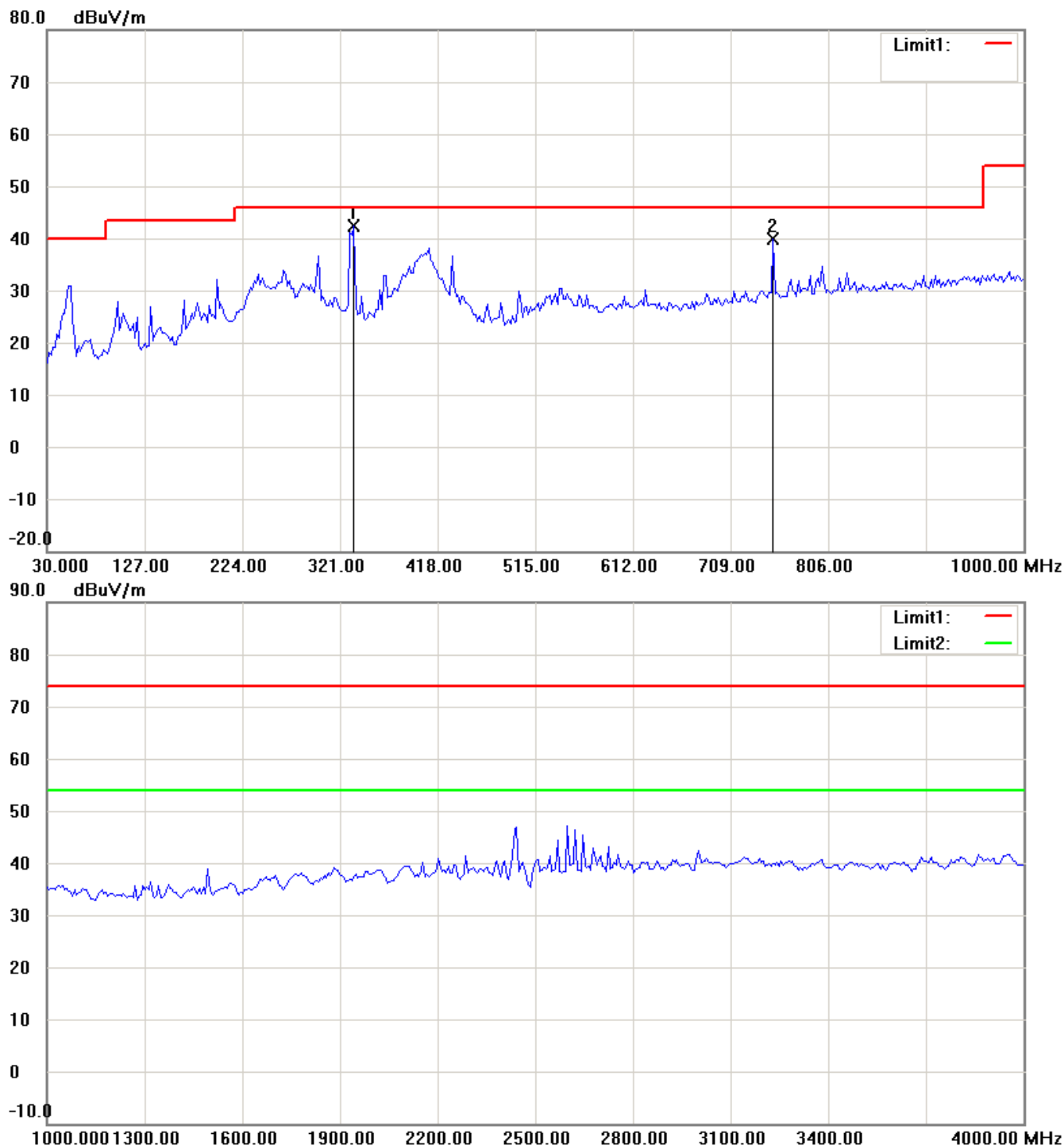
# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

TX Bluetooth Normal+EDR CH39

Antenna Polarization H



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

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2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.

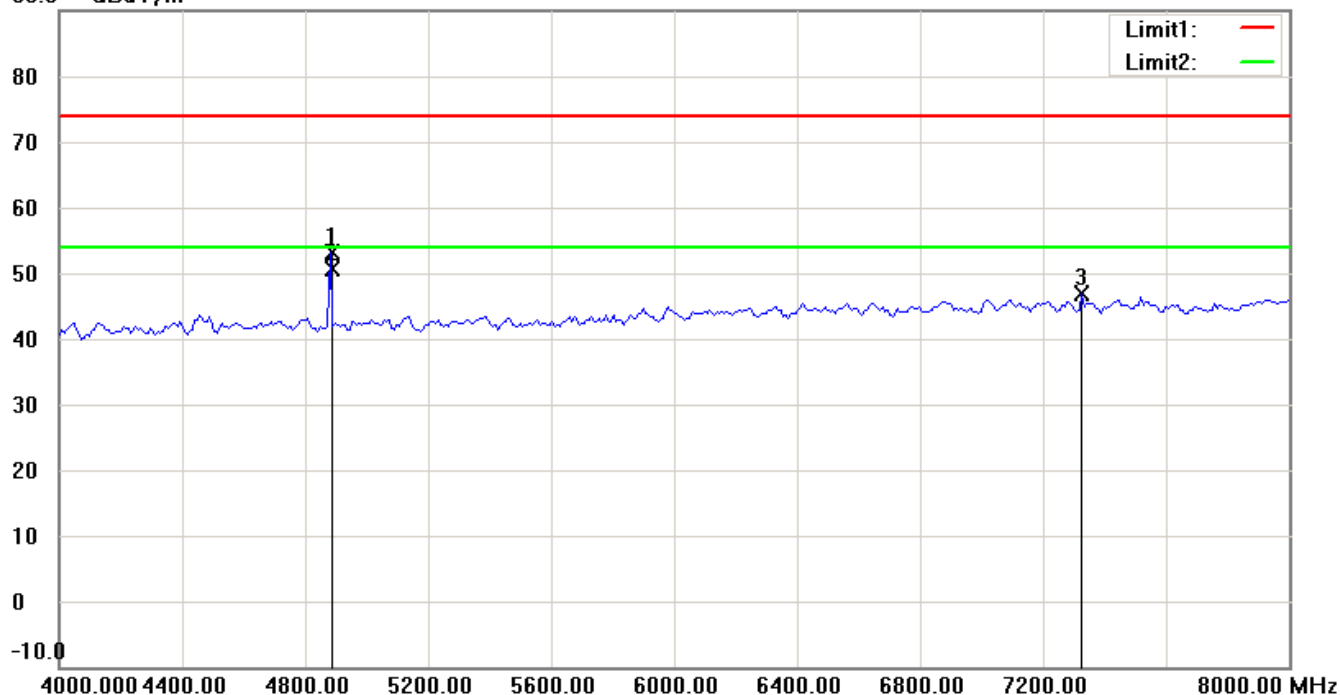


# Worldwide Testing Services(Taiwan) Co., Ltd.

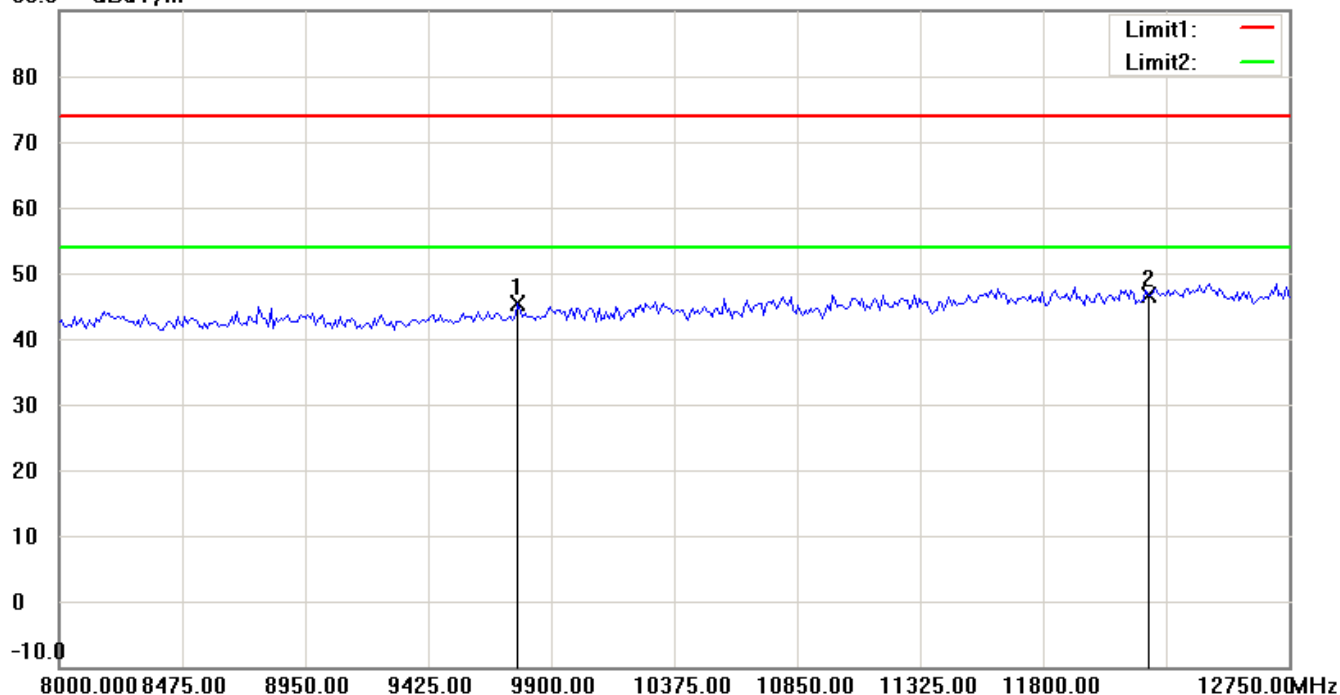
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

90.0 dBuV/m



90.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

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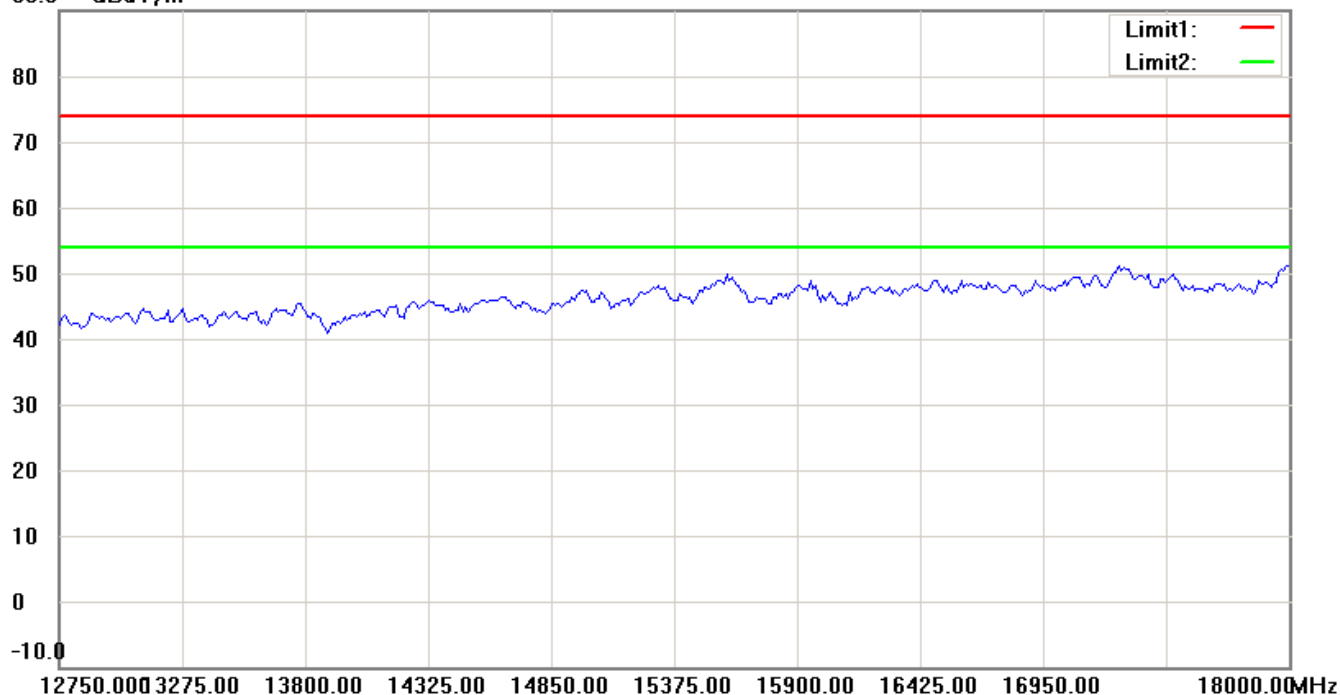


# Worldwide Testing Services(Taiwan) Co., Ltd.

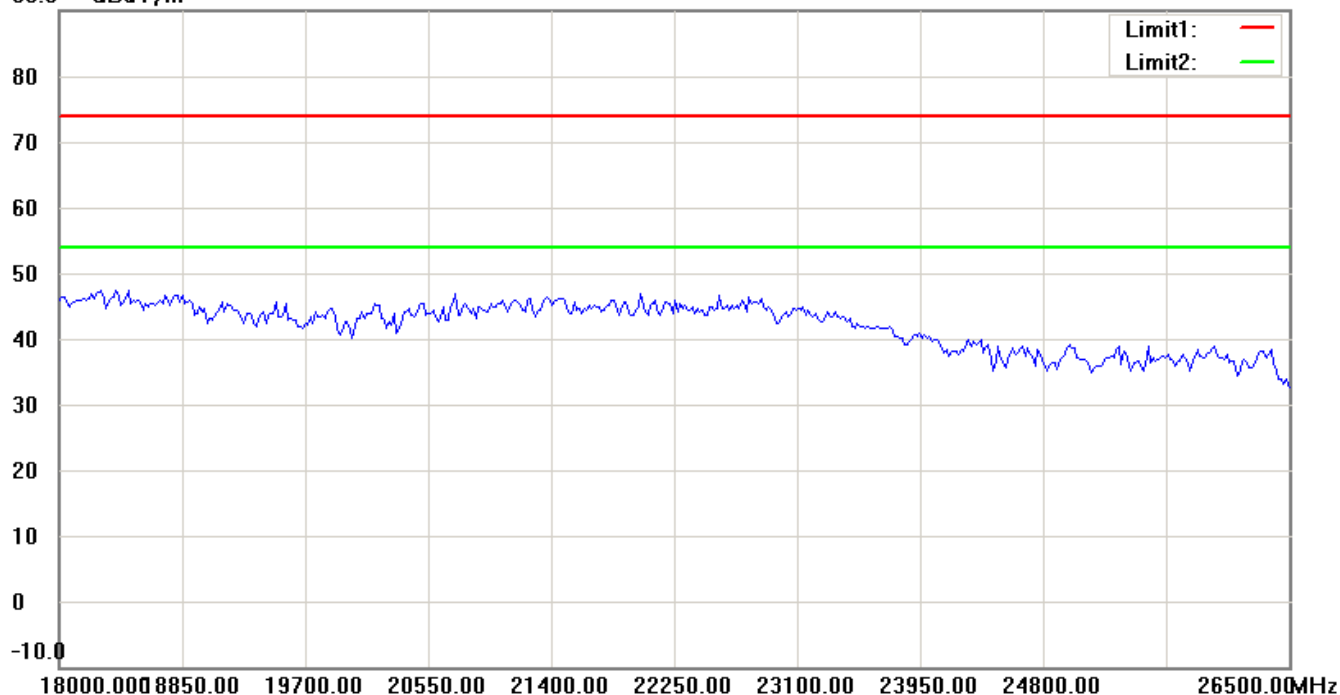
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

90.0 dBuV/m



90.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

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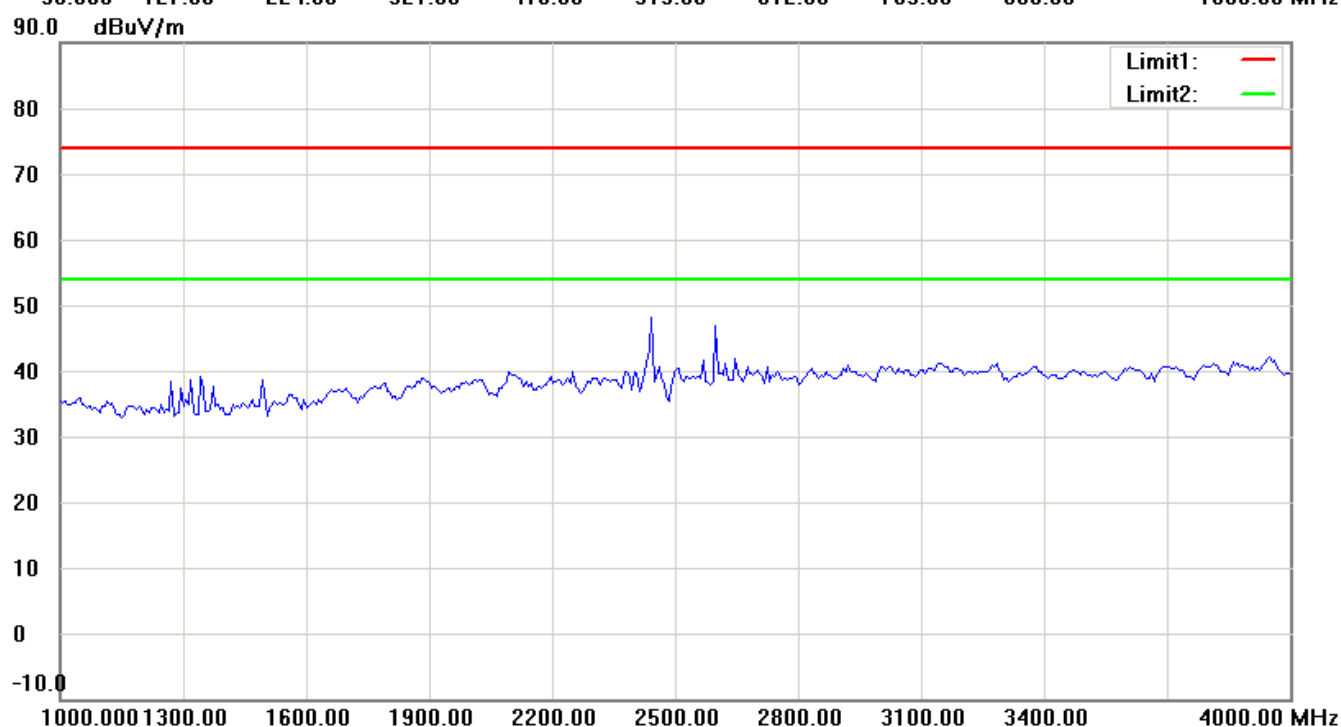
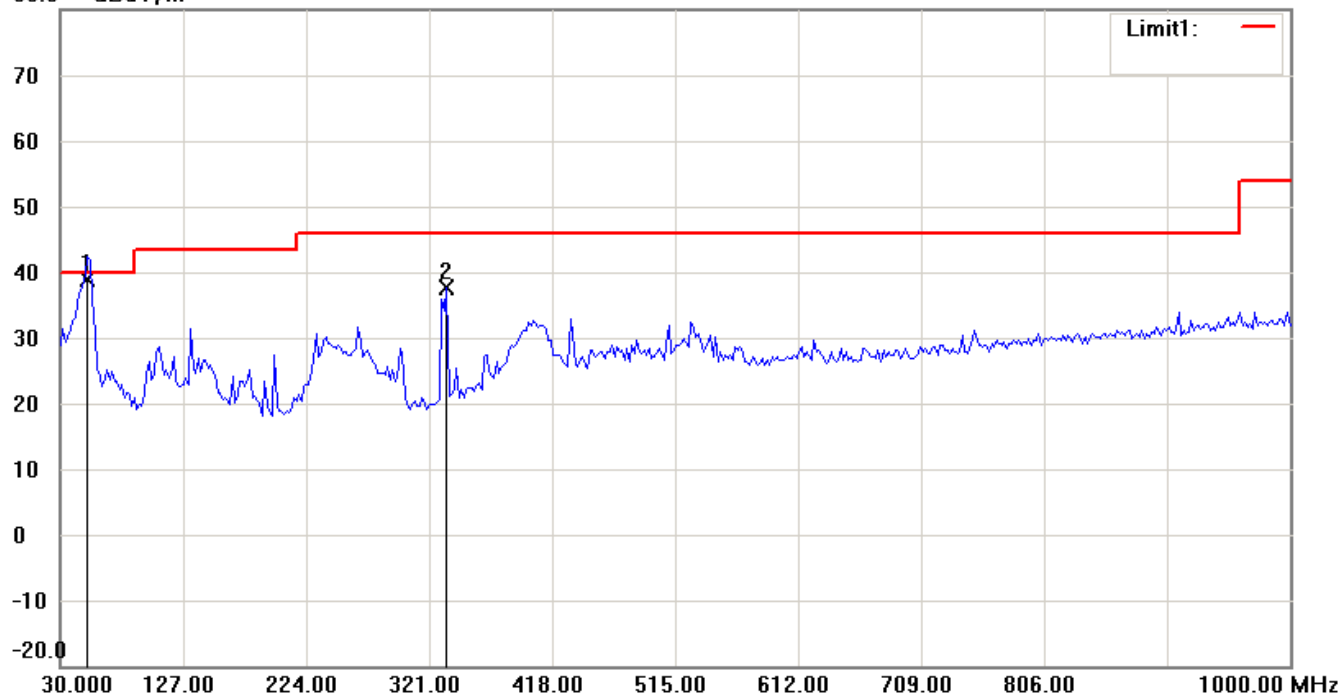
# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

Antenna Polarization V

80.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

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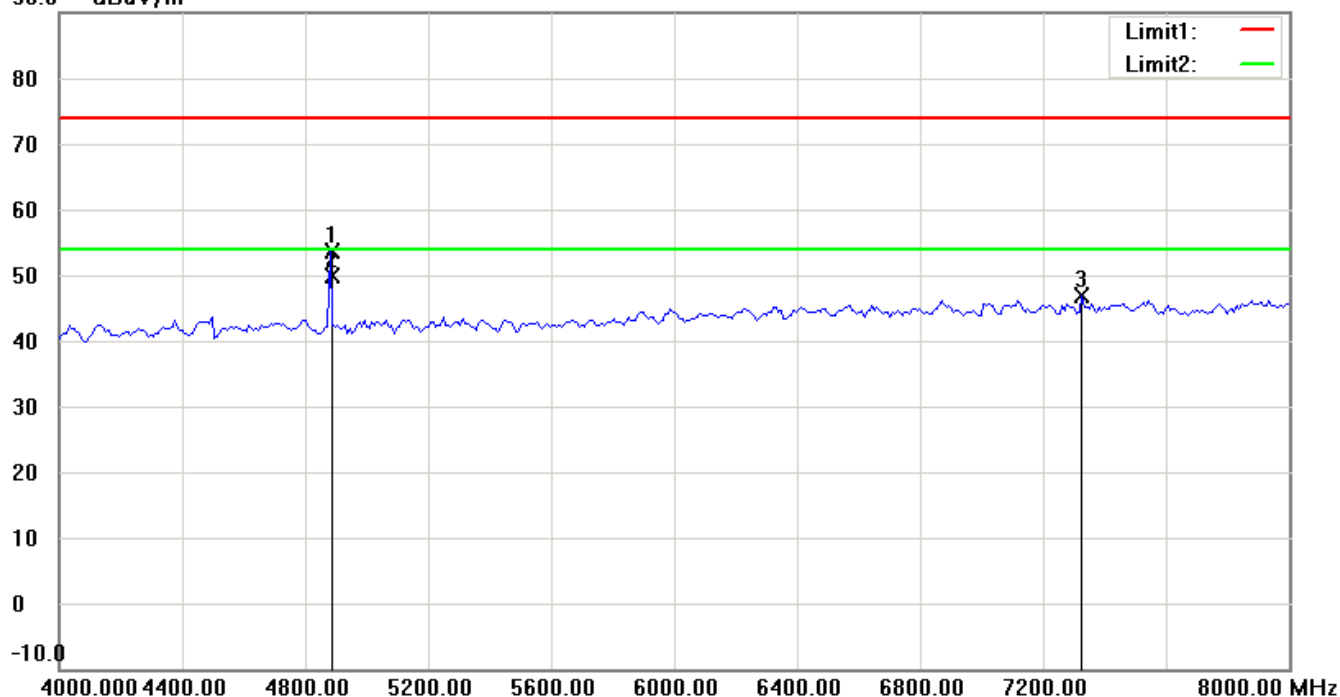


# Worldwide Testing Services(Taiwan) Co., Ltd.

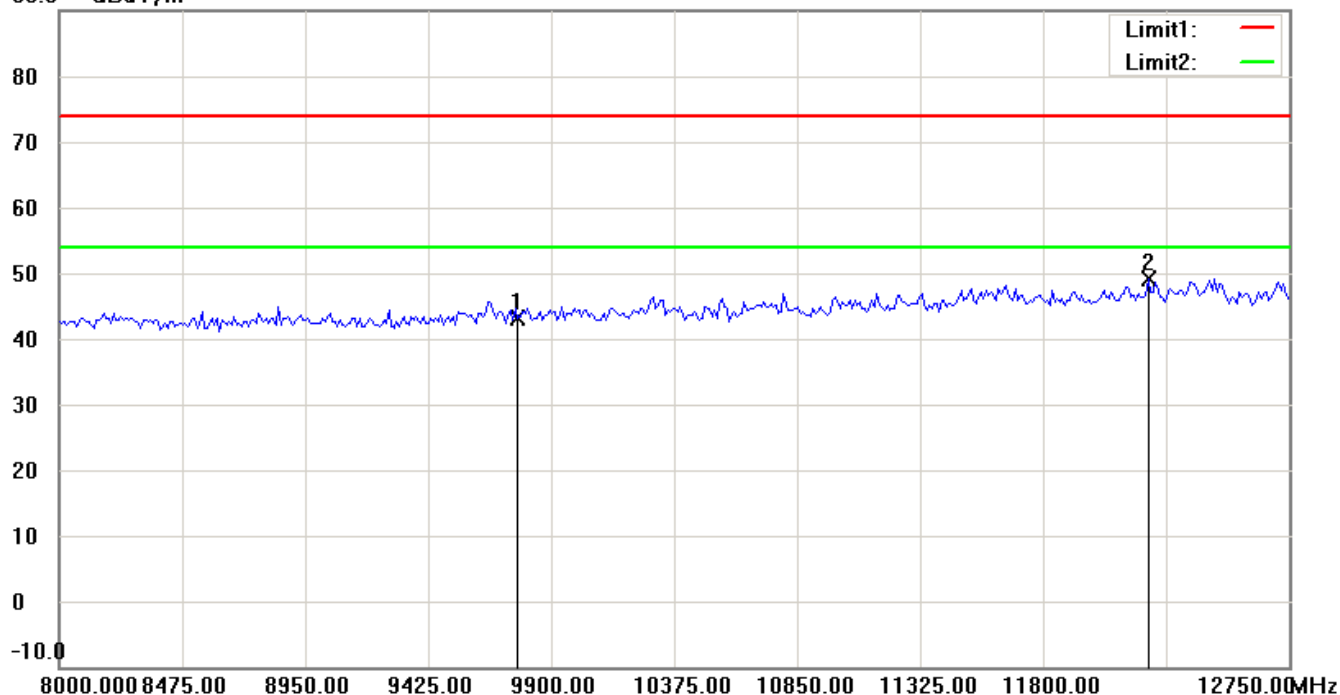
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

90.0 dBuV/m



90.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

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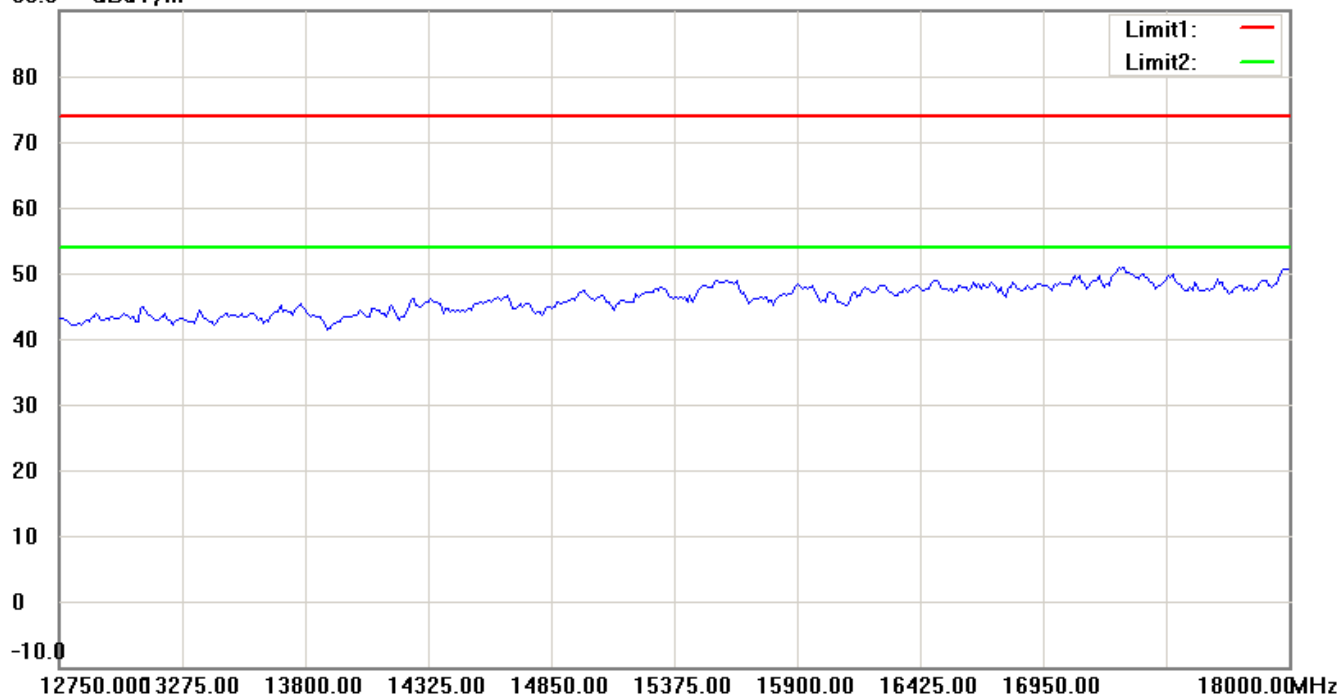


# Worldwide Testing Services(Taiwan) Co., Ltd.

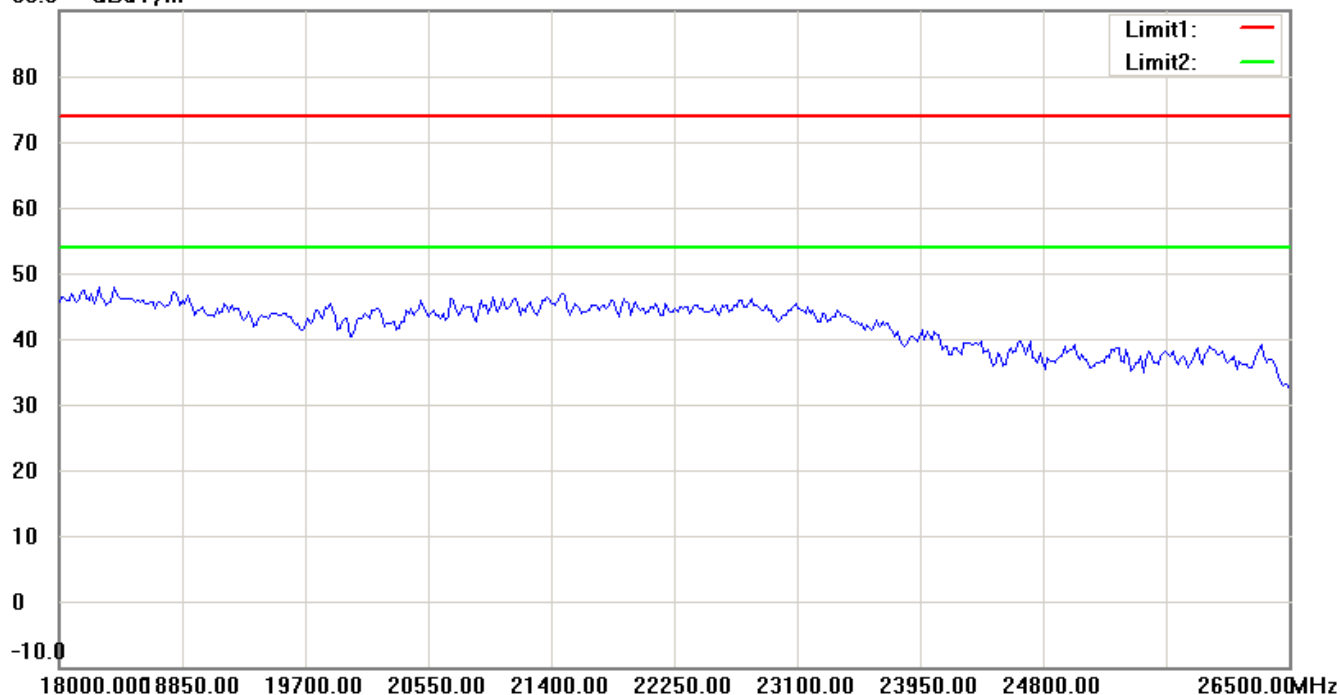
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

90.0 dBuV/m



90.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

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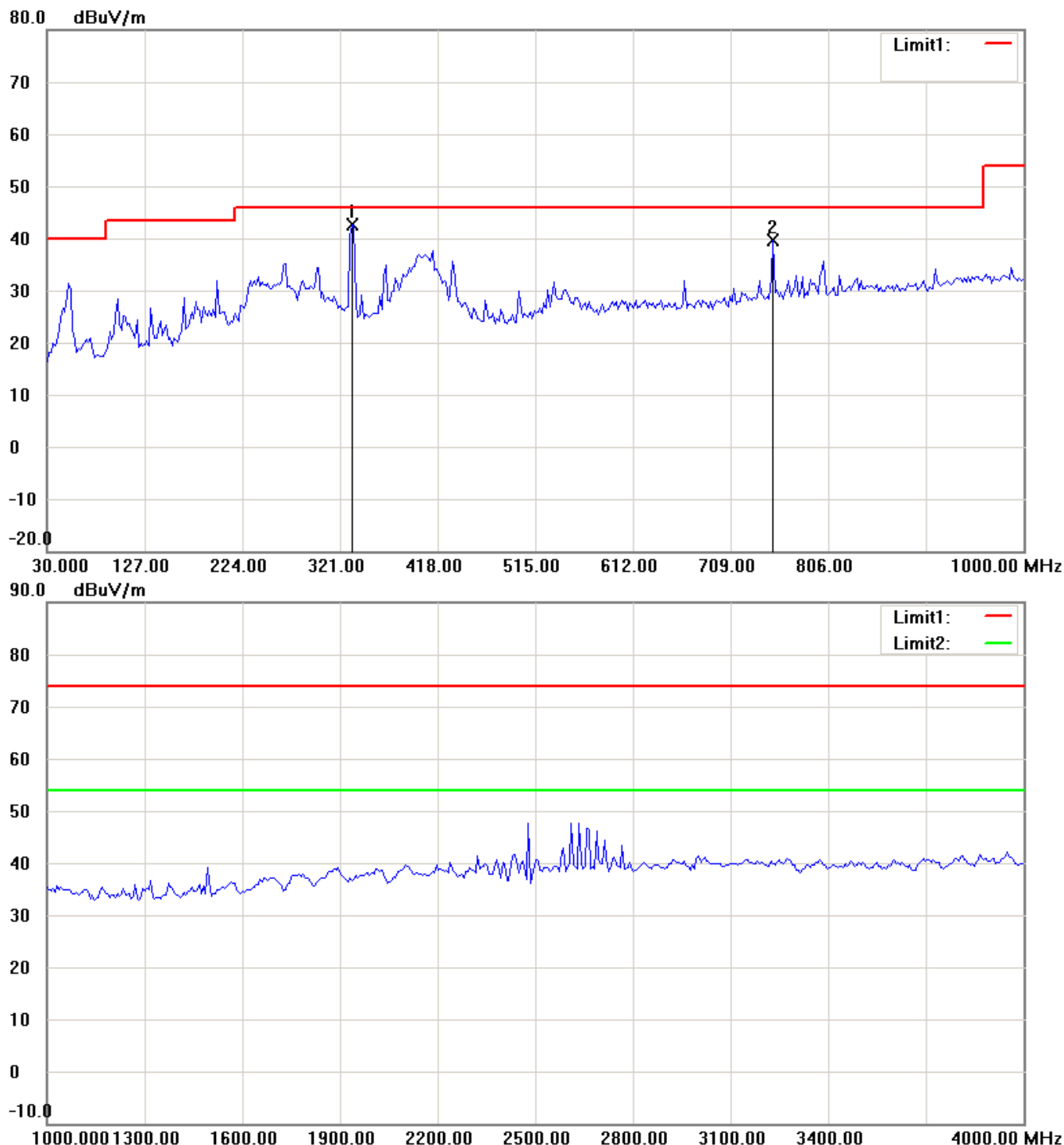
# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

TX Bluetooth Normal+EDR CH78

Antenna Polarization H



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

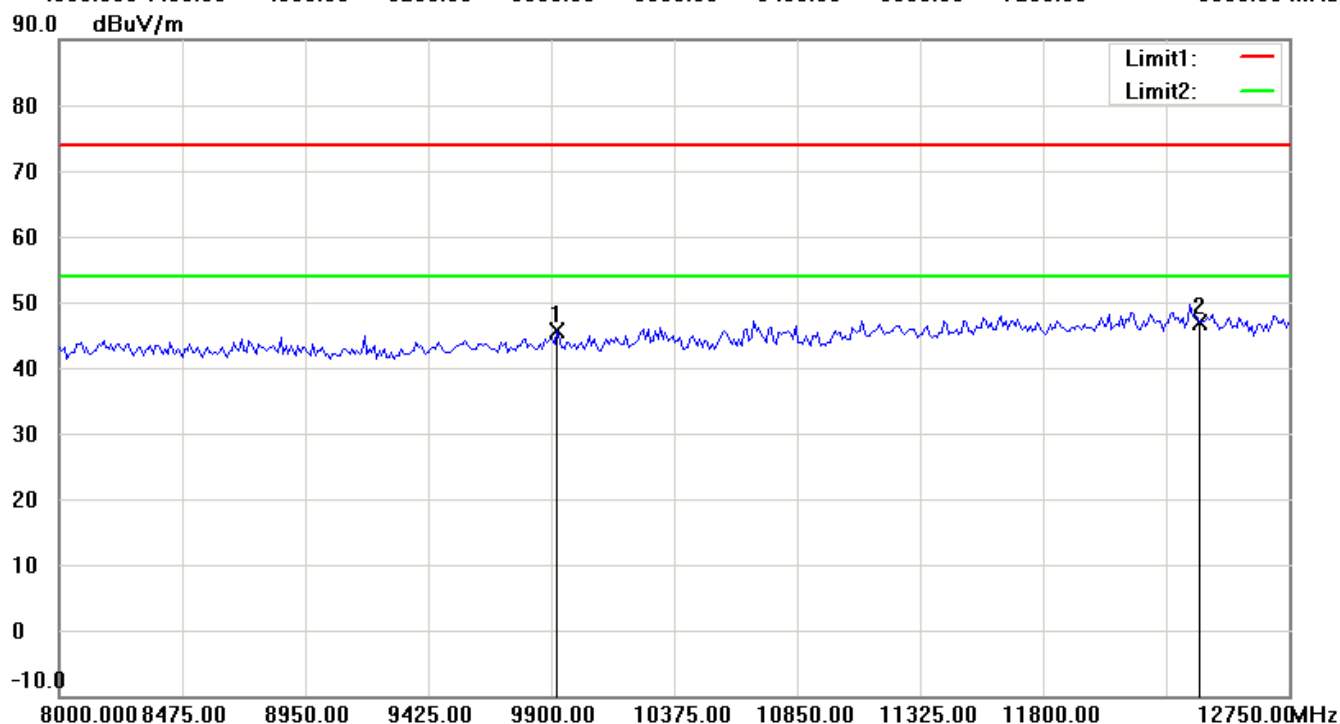
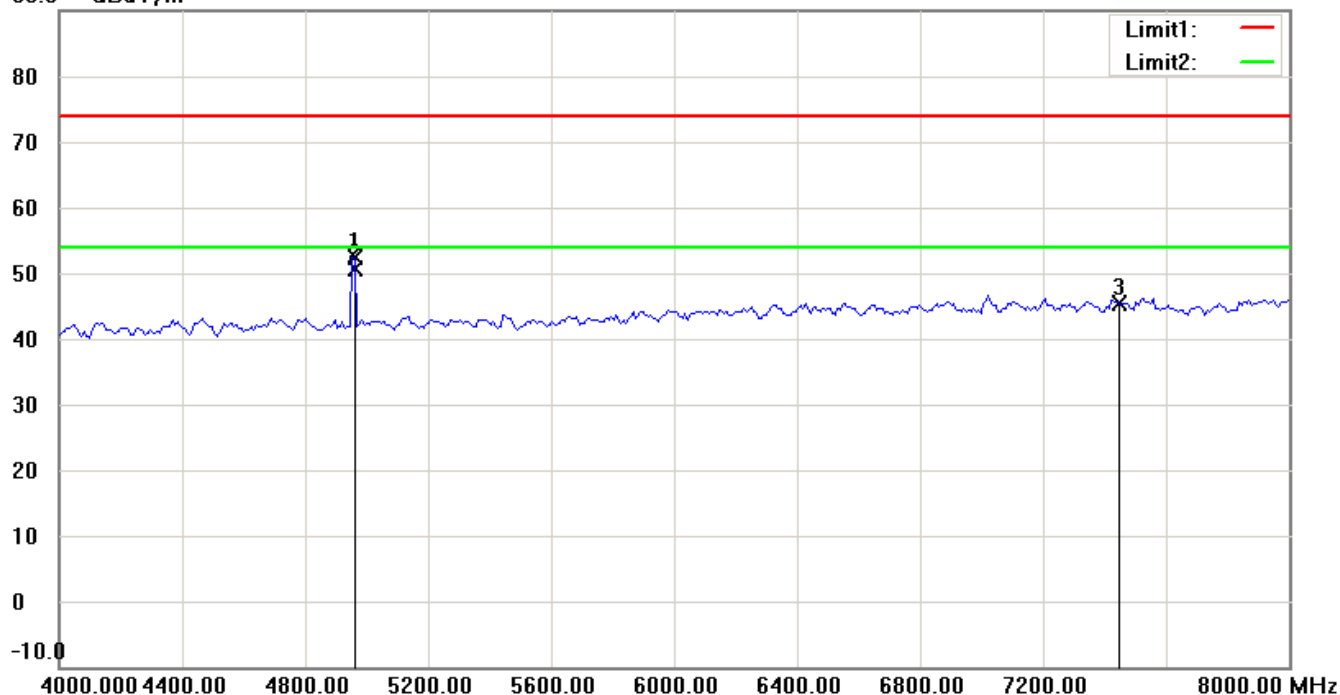
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Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

90.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

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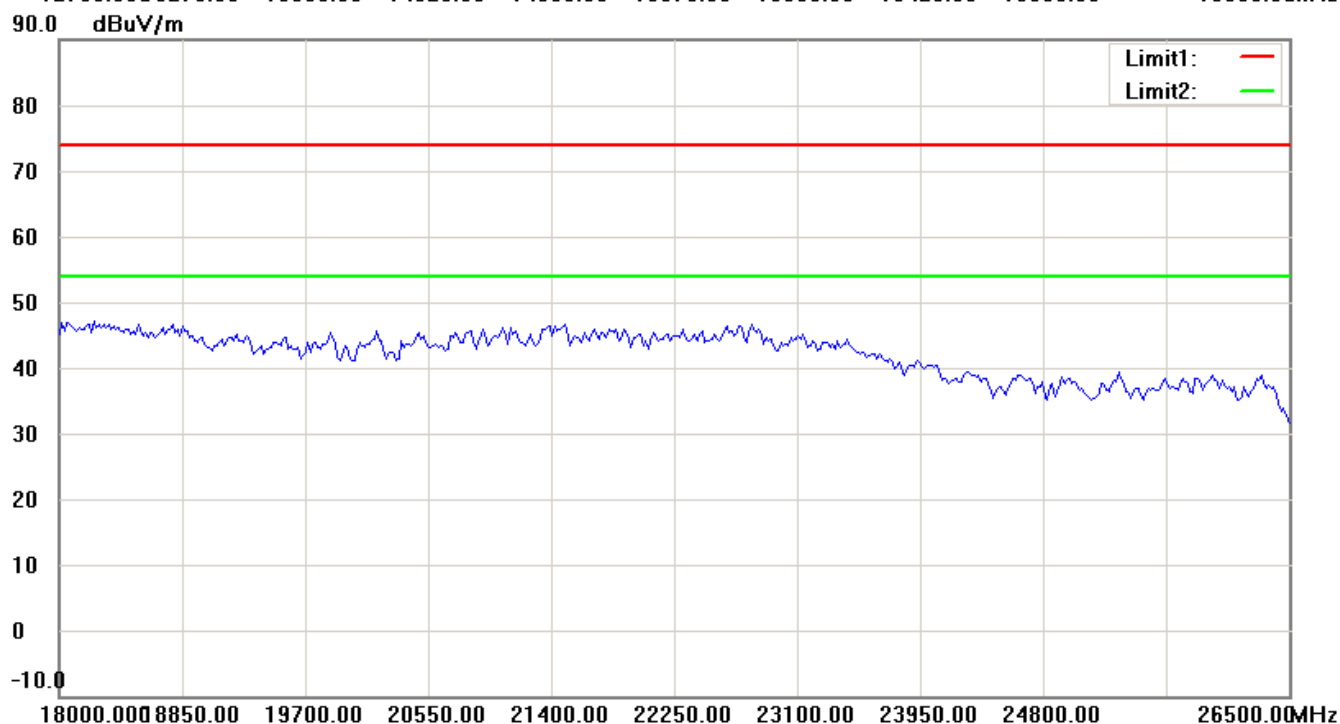
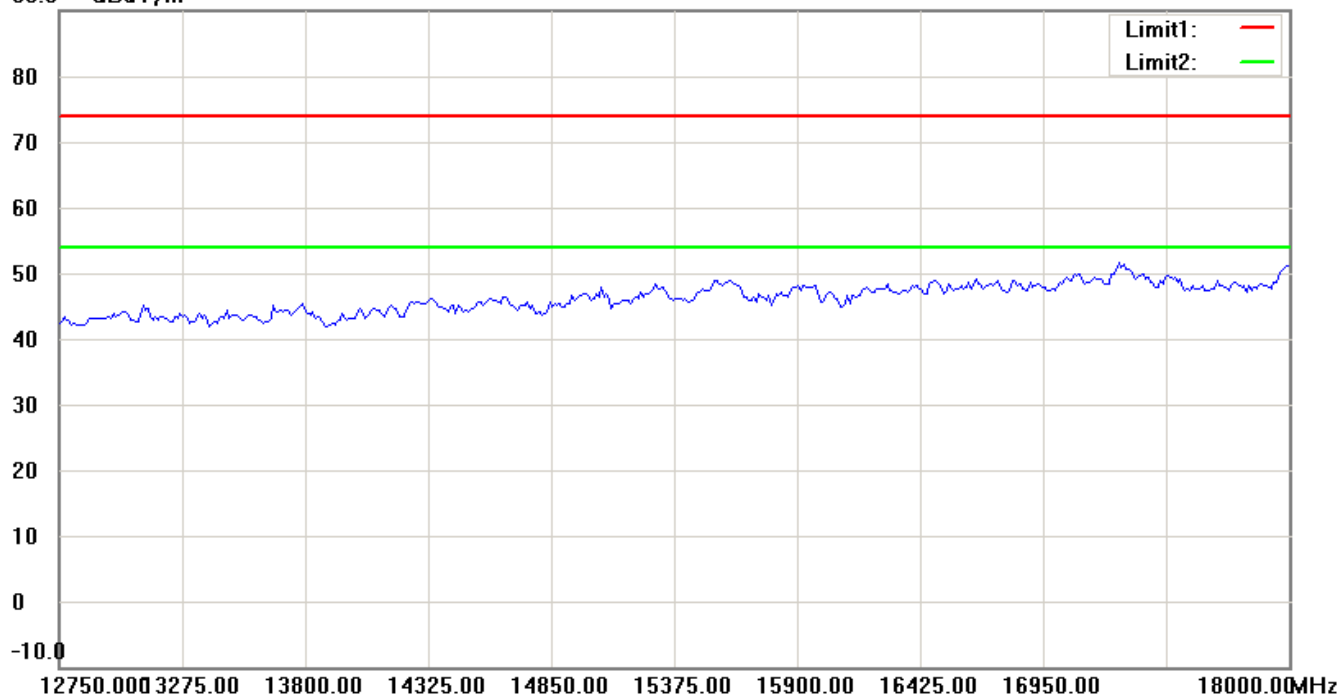


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

90.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

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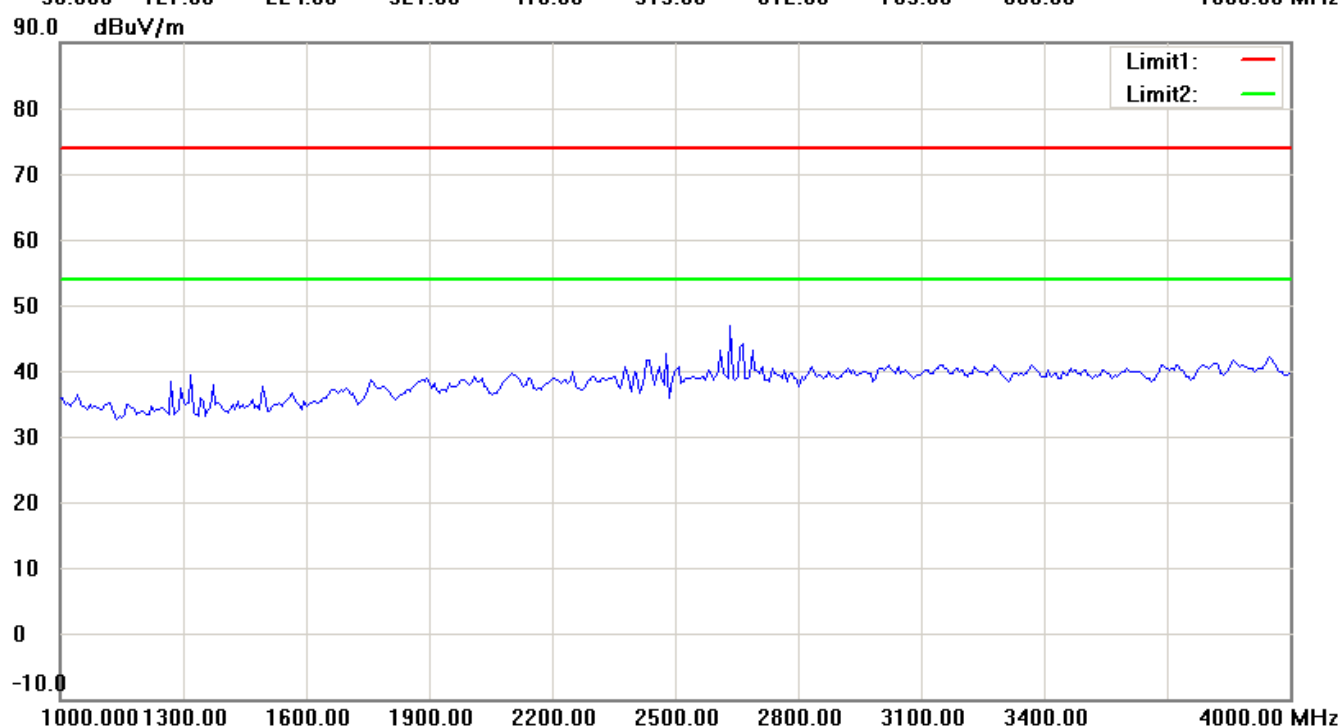
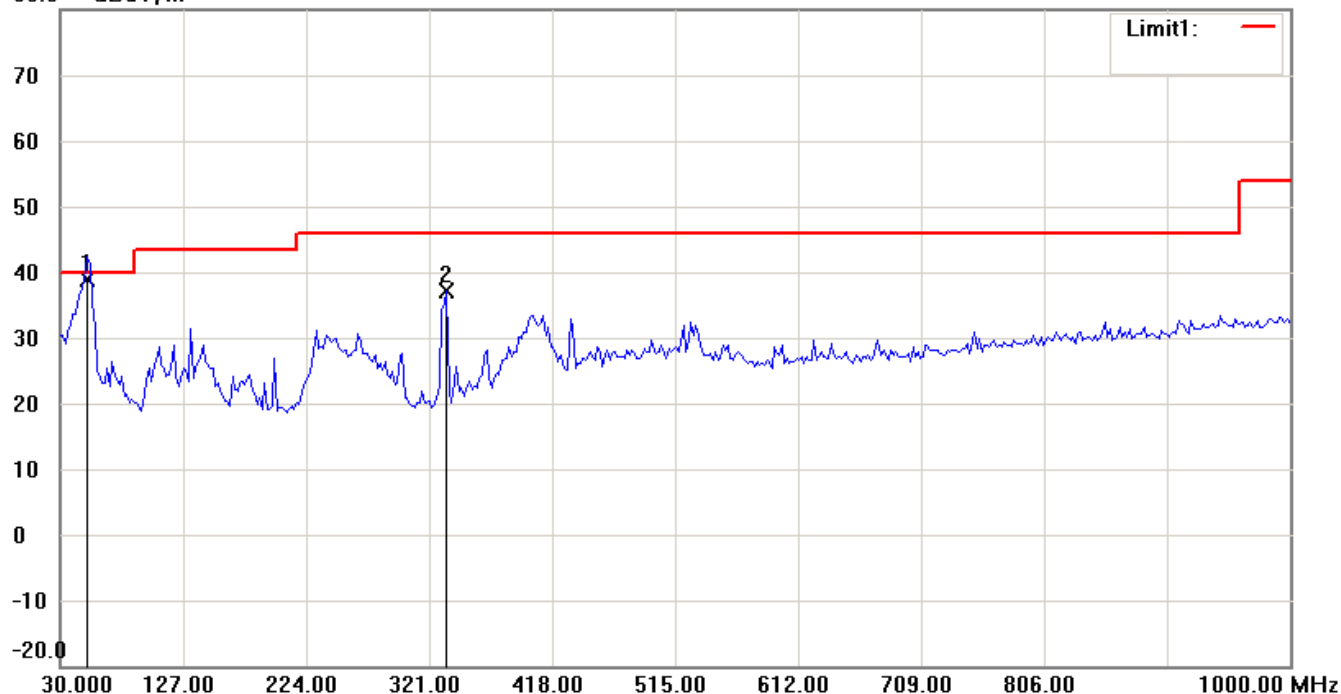
# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

Antenna Polarization V

80.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

Note:

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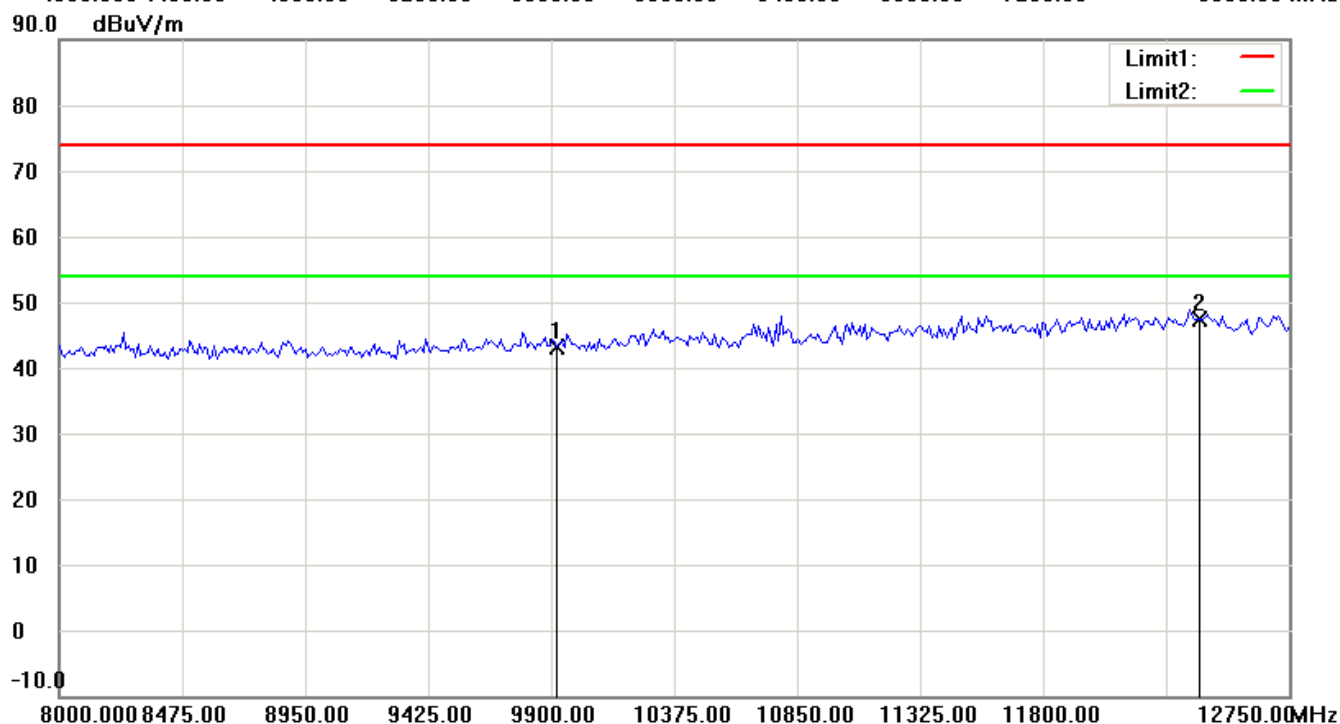
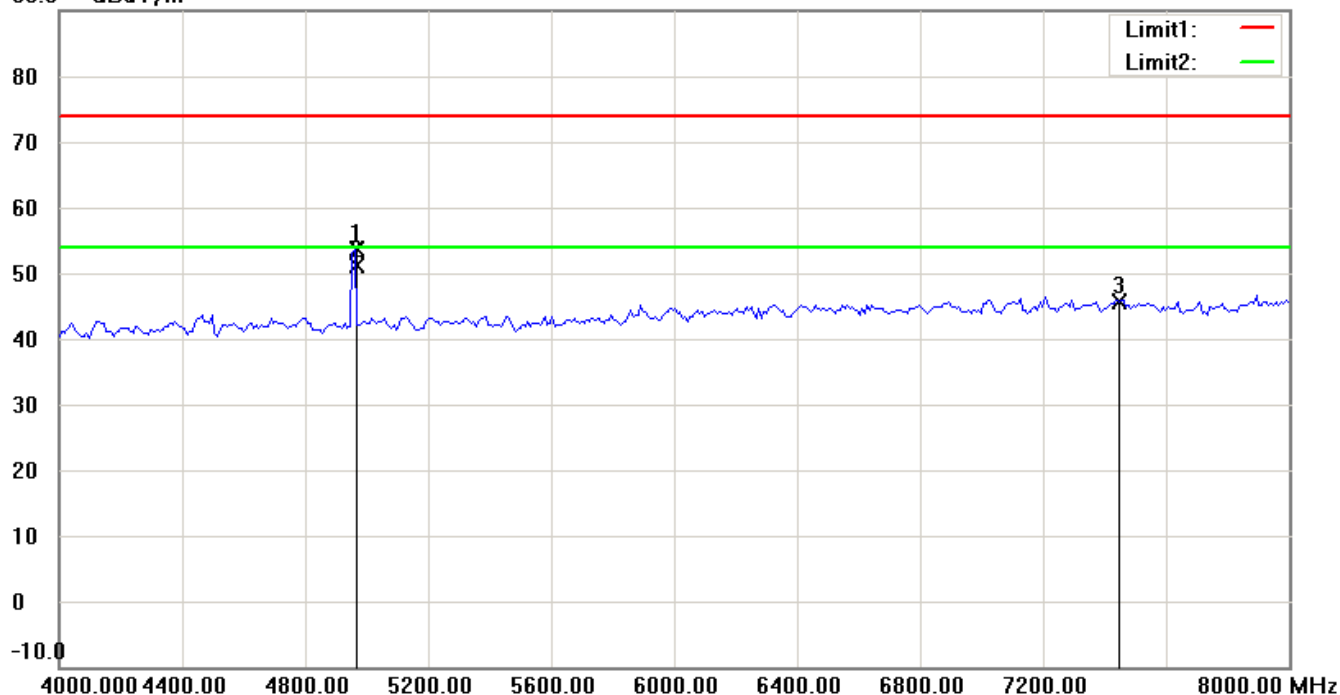


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Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

90.0 dBuV/m



Up Line: Peak Limit Line; Down Line: Ave Limit Line

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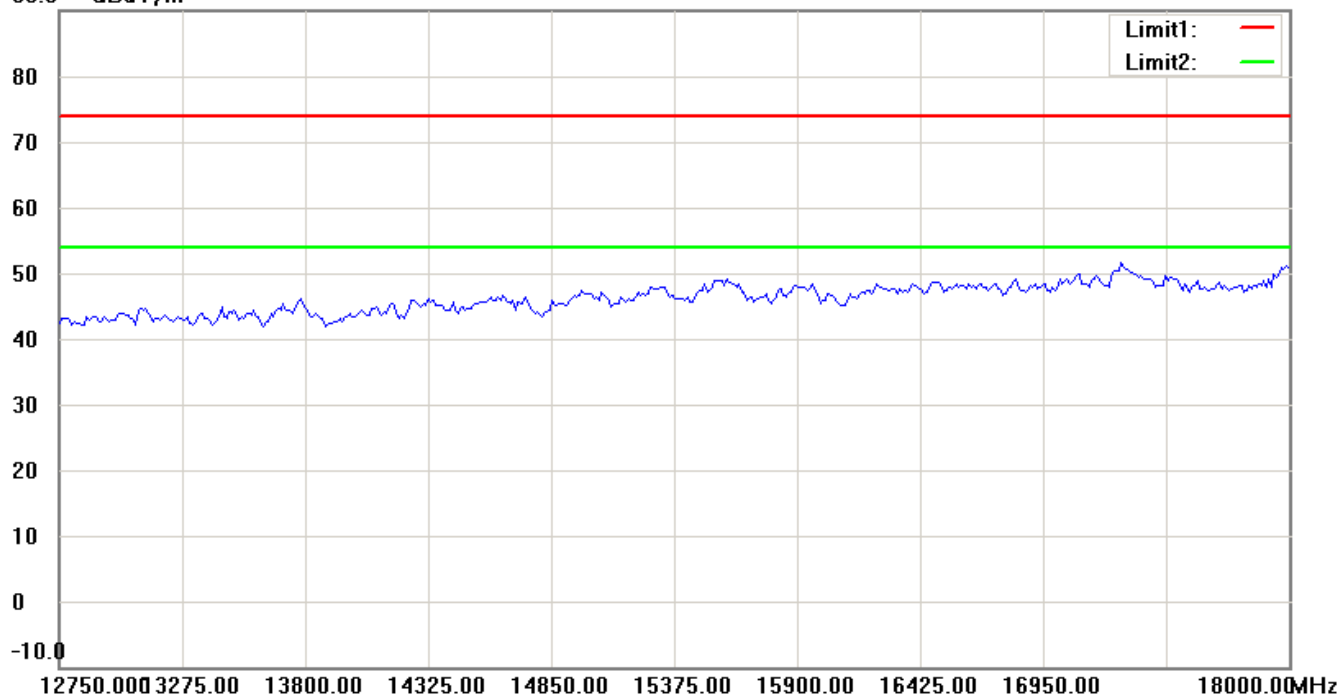


# Worldwide Testing Services(Taiwan) Co., Ltd.

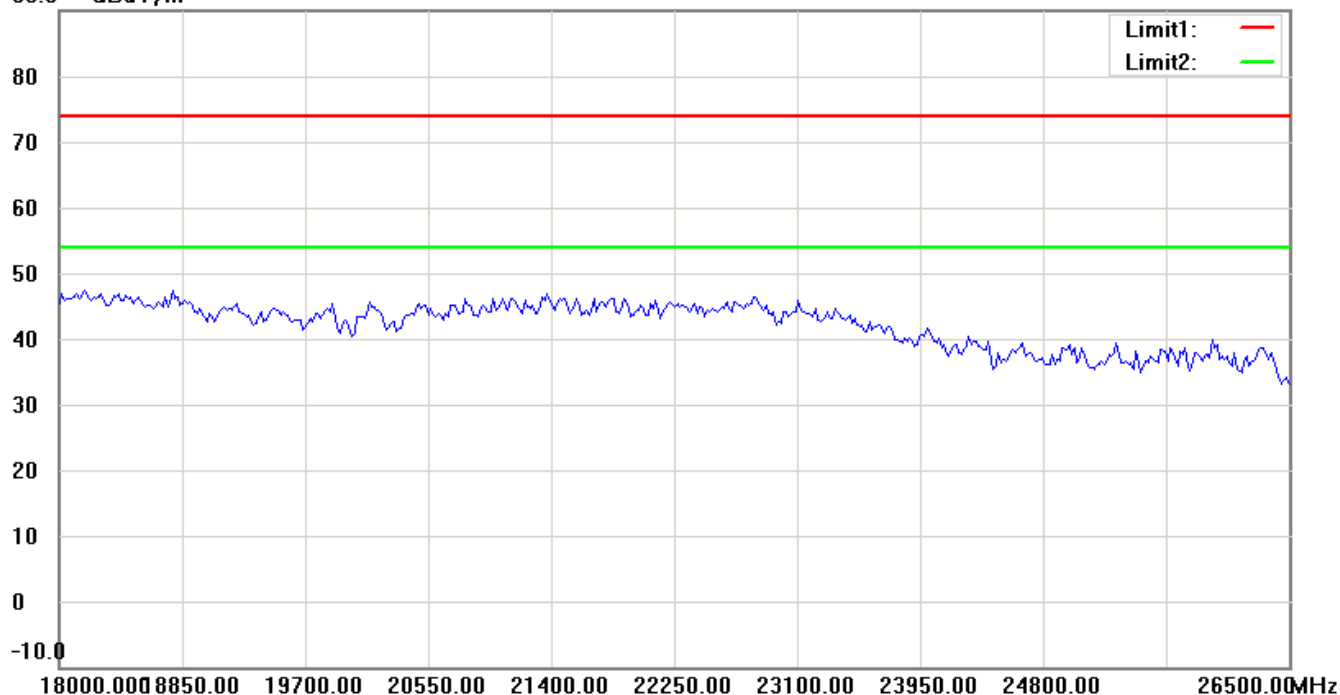
Registration number: W6M21311-13647-C-1

FCC ID: WDYQ1021201

90.0 dBuV/m



90.0 dBuV/m



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