



# **FCC Radio Test Report**

# FCC ID: V7TA9V2

This report concerns: Original Grant

| Project No.  | : | 1901C127  |
|--------------|---|---|
| Equipment    | : | Wireless N300 Universal Range Extender          |
| Test Model   | : | A9  |
| Series Model | : | N/A   |
| Applicant    | : | SHENZHEN TENDA TECHNOLOGY CO., LTD              |
| Address      | : | 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan    |
|              |   | Road, Nanshan District, Shenzhen, China. 518052 |

Date of Receipt : Feb. 22, 2019 Issued Date Tested by

Date of Test : Feb. 25, 2019 ~ Mar. 15, 2019 : May 22, 2019 : BTL Inc.

**Testing Engineer** 

**Technical Manager** 

Authorized Signatory

Vin Cent. Tan (Vincent Tan) <u>Seeven Lu</u> (Steven Lu) <u>Juhan Ma</u>



No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China. TEL: +86-769-8318-3000 FAX: +86-769-8319-6000



Certificate #5123.02



#### Declaration

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

**BTL**'s reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

**BTL**'s laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

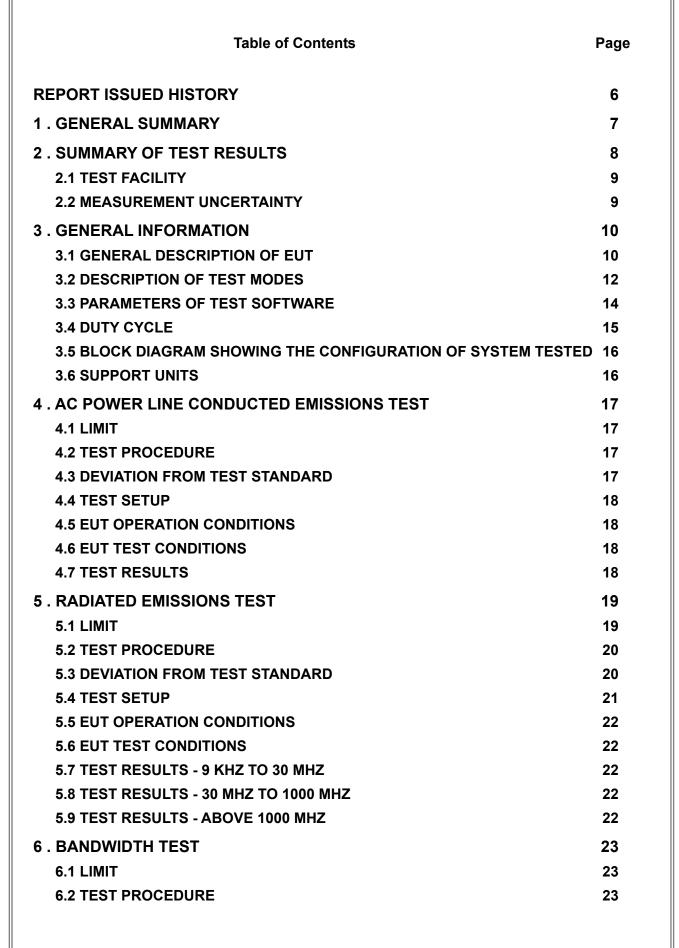
BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

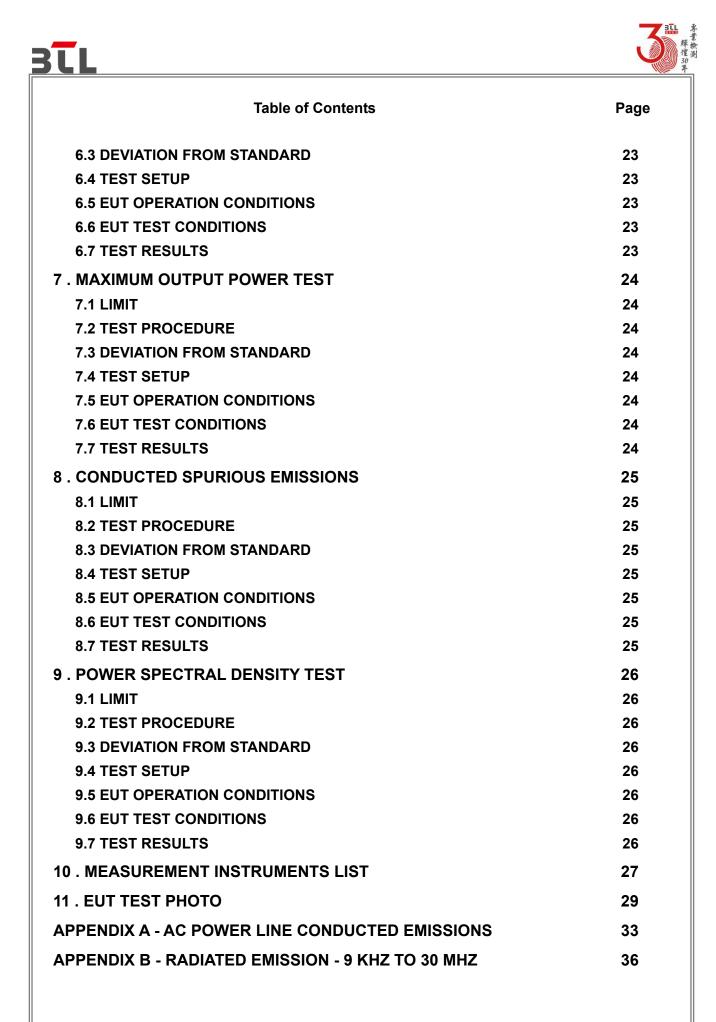
The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

#### Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective. Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.











Page

專業

辉魚

| Table of Contents |
|-------------------|
|-------------------|

| 41  |                 |
|-----|-----------------|
| 44  |                 |
| 93  |                 |
| 97  |                 |
| 103 |                 |
| 114 |                 |
|     | 93<br>97<br>103 |





## **REPORT ISSUED HISTORY**

| Report Version | Description     | Issued Date  |
|----------------|-----------------|--------------|
| R00            | Original Issue. | May 22, 2019 |





## 1. GENERAL SUMMARY

|                | Wireless N300 Universal Range Extender                               |
|----------------|--|
| Brand Name :   | Tenda  |
| Test Model :   | A9   |
| Series Model : | N/A  |
| Applicant :    | SHENZHEN TENDA TECHNOLOGY CO., LTD                                   |
| Manufacturer : | SHENZHEN TENDA TECHNOLOGY CO., LTD                                   |
| Address :      | 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, |
|                | Shenzhen, China. 518052  |
| Date of Test : | Feb. 25, 2019 ~ Mar. 15, 2019  |
| Test Sample :  | Engineering Sample No.: D190201575                                   |
| Standard(s) :  | FCC Part15, Subpart C (15.247)                                       |
|                | ANSI C63.10-2013   |
|                | FCC KDB 558074 D01 DTS Meas Guidance v05r02                          |
|                | FCC KDB 662911 D01 Multiple Transmitter Output v02r01                |

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-1-1901C127) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).



## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

| Applied Standard(s): FCC Part15 (15.247) , Subpart C |                                   |  |          |        |  |  |
|--|-----------------------------------|--|----------|--------|--|--|
| Standard(s) Section                                  | Test Item                         | Test Result                            | Judgment | Remark |  |  |
| 15.207   | AC Power Line Conducted Emissions | APPENDIX A                             | PASS     |        |  |  |
| 15.247(d)<br>15.205(a)<br>15.209(a)                  | Radiated Emissions                | APPENDIX B<br>APPENDIX C<br>APPENDIX D | PASS     |        |  |  |
| 15.247(a)(2)   | Bandwidth                         | APPENDIX E                             | PASS     |        |  |  |
| 15.247(b)(3)   | Maximum Output Power              | APPENDIX F                             | PASS     |        |  |  |
| 15.247(d)  | Conducted Spurious Emissions      | APPENDIX G                             | PASS     |        |  |  |
| 15.247(e)  | Power Spectral Density            | APPENDIX H                             | PASS     |        |  |  |
| 15.203   | Antenna Requirement               |  | PASS     |        |  |  |

Note:

(1) "N/A" denotes test is not applicable in this test report.



#### 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China. BTL's Test Firm Registration Number for FCC: 357015 BTL's Designation Number for FCC: CN1240

#### 2.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2) The BTL measurement uncertainty as below table:

#### A. AC power line conducted emissions test:

| Test Site | Method | Measurement Frequency Range | U, (dB) |
|-----------|--------|-----------------------------|---------|
| DG-C02    | CISPR  | 150 kHz ~ 30 MHz            | 2.32    |

#### B. Radiated emissions test:

| Test Site | Method | Measurement Frequency | Ant.<br>H / V | U, (dB) |  |  |
|-----------|--------|-----------------------|---------------|---------|--|--|
| -         |        | Range                 | Π/Υ           |         |  |  |
|           |        | 9 KHz~30 MHz          | V             | 3.79    |  |  |
|           |        | 9 KHz~30 MHz          | Н             | 3.57    |  |  |
|           | CISPR  | 30 MHz~200 MHz        | V             | 3.82    |  |  |
| DG-CB03   |        | 30 MHz~200 MHz        | Н             | 3.78    |  |  |
|           |        | 200 MHz~1,000 MHz     | V             | 4.10    |  |  |
|           |        | 200 MHz~1,000 MHz     | Н             | 4.06    |  |  |
|           |        | 1 GHz~18 GHz          | V             | 3.12    |  |  |
|           |        | 1 GHz~18 GHz          | Н             | 3.68    |  |  |
|           |        | 18 GHz~40 GHz         | V             | 4.15    |  |  |
|           |        | 18 GHz~40 GHz         | Н             | 4.14    |  |  |

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.



## **3. GENERAL INFORMATION**

#### 3.1 GENERAL DESCRIPTION OF EUT

| Equipment                                 | Wireless N300 Universal Range Extender   |
|---|--|
| Brand Name                                | Tenda  |
| Test Model                                | A9   |
| Series Model                              | N/A  |
| Model Difference(s)                       | N/A  |
| Power Source                              | AC Mains.  |
| Power Rating                              | 100-240V~ 50/60Hz 0.3A   |
| Operation Frequency                       | 2412 MHz ~ 2462 MHz  |
| Modulation Type                           | IEEE 802.11b: DSSS<br>IEEE 802.11g: OFDM<br>IEEE 802.11n: OFDM   |
| Bit Rate of Transmitter                   | IEEE 802.11b: 11/5.5/2/1 Mbps<br>IEEE 802.11g: 54/48/36/24/18/12/9/6 Mbps<br>IEEE 802.11n: up to 300 Mbps  |
| Maximum Output Power_<br>Non-Beamforming  | IEEE 802.11b: 22.25 dBm (0.1679 W)<br>IEEE 802.11g: 25.56 dBm (0.3598 W)<br>IEEE 802.11n (HT20): 29.17 dBm (0.8260 W)<br>IEEE 802.11n (HT40): 23.46 dBm (0.2218 W) |
| Maximum Output Power_<br>With Beamforming | IEEE 802.11n (HT20): 28.95 dBm (0.7852 W)<br>IEEE 802.11n (HT40): 23.38 dBm (0.2178 W)   |

#### Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- 2. Channel List:

|    | CH01 - CH11 for 802.11b, 802.11g, 802.11n(20 MHz)<br>CH03 - CH09 for 802.11n(40 MHz) |    |      |    |      |                    |      |
|----|--|----|------|----|------|--------------------|------|
|    |  |    |      |    |      | Frequency<br>(MHz) |      |
| 01 | 2412   | 04 | 2427 | 07 | 2442 | 10                 | 2457 |
| 02 | 2417   | 05 | 2432 | 08 | 2447 | 11                 | 2462 |
| 03 | 2422   | 06 | 2437 | 09 | 2452 |                    |      |

#### 3. Antenna Specification:

| Ant. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) |
|------|-------|------------|--------------|-----------|------------|
| 1    | N/A   | N/A        | Dipole       | N/A       | 2.7        |
| 2    | N/A   | N/A        | Dipole       | N/A       | 2.7        |

Note:

 Antenna Gain=2.7dBi. This EUT supports MIMO 2X2, any transmit signals are correlated with each other, so Directional gain = G<sub>ANT</sub>+10log(N)dBi, that is Directional gain=2.7+ 10log(2)dBi=5.71.

(2) Beamforming Gain: 3dB, so Directional gain=2.7+3=5.70.



## 4. The worst case for 1TX / 2TX as follow:

| Operating Mode<br>TX Mode | 1TX       | 2TX               |
|---------------------------|-----------|-------------------|
| IEEE 802.11b              | V (ANT 2) | -                 |
| IEEE 802.11g              | V (ANT 2) | -                 |
| IEEE 802.11n (HT20)       | -         | V (ANT 1 + ANT 2) |
| IEEE 802.11n (HT40)       | -         | V (ANT 1 + ANT 2) |



## 3.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

| Pretest Mode  | Description                       |  |
|---|-----------------------------------|--|
| Mode 1  | TX B Mode Channel 01/06/11        |  |
| Mode 2  | TX G Mode Channel 01/06/11        |  |
| Mode 3  | TX N-20 MHz Mode Channel 01/06/11 |  |
| Mode 4  | TX N-40 MHz Mode Channel 03/06/09 |  |
| Mode 5  | TX N20 Mode Channel 06            |  |
| Following mode(s) as (were) found to be the worst case(s) and selected for the final test |                                   |  |

Following mode(s) as (were) found to be the worst case(s) and selected for the final test.

| AC power line conducted emissions test |                        |  |  |
|--|------------------------|--|--|
| Final Test Mode: Description           |                        |  |  |
| Mode 5                                 | TX N20 Mode Channel 06 |  |  |

| Radiated emissions test |                                   |  |
|-------------------------|-----------------------------------|--|
| Final Test Mode:        | Description                       |  |
| Mode 1                  | TX B Mode Channel 01/06/11        |  |
| Mode 2                  | TX G Mode Channel 01/06/11        |  |
| Mode 3                  | TX N-20 MHz Mode Channel 01/06/11 |  |
| Mode 4                  | TX N-40 MHz Mode Channel 03/06/09 |  |

| Conducted test               |                                   |  |
|------------------------------|-----------------------------------|--|
| Final Test Mode: Description |                                   |  |
| Mode 1                       | TX B Mode Channel 01/06/11        |  |
| Mode 2                       | TX G Mode Channel 01/06/11        |  |
| Mode 3                       | TX N-20 MHz Mode Channel 01/06/11 |  |
| Mode 4                       | TX N-40 MHz Mode Channel 03/06/09 |  |





NOTE:

- (1) The measurements are performed at the high, middle, low available channels.
- (2) 802.11b mode: CCK (1 Mbps) 802.11g mode: BPSK (6 Mbps) 802.11n HT20 mode : BPSK (13 Mbps) 802.11n HT40 mode : BPSK (27 Mbps) For radiated emission tests, the highest output powers were set for final test.
- (3) For radiated emission below 1 GHz test, the IEEE 802.11b is found to be the worst case and recorded.
- (4) For radiated emission above 1 GHz test, 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.

## 3.3 PARAMETERS OF TEST SOFTWARE

| Non-Beamforming      |      |      |      |
|----------------------|------|------|------|
| Test Software        |      | cart |      |
| Test Frequency (MHz) | 2412 | 2437 | 2462 |
| IEEE 802.11b         | 14   | 15   | 17   |
| IEEE 802.11g         | 13   | 18   | 12.5 |
| IEEE 802.11n (HT20)  | 12.5 | 19   | 12   |
| Test Frequency (MHz) | 2422 | 2437 | 2452 |
| IEEE 802.11n (HT40)  | 9.5  | 13   | 10   |

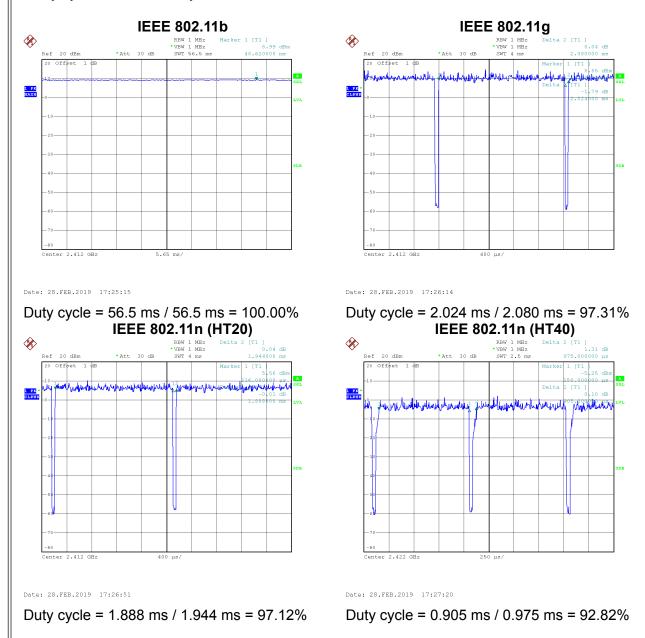
| With | Beamforming |  |
|------|-------------|--|
|      |             |  |

| Test Software        |      | cart |      |
|----------------------|------|------|------|
| Test Frequency (MHz) | 2412 | 2437 | 2462 |
| IEEE 802.11n (HT20)  | 12   | 18.5 | 11.5 |
| Test Frequency (MHz) | 2422 | 2437 | 2452 |
| IEEE 802.11n (HT40)  | 9    | 12.5 | 9.5  |



## 3.4 DUTY CYCLE

If duty cycle is  $\geq$  98 %, duty factor is not required. If duty cycle is < 98 %, duty factor shall be considered.



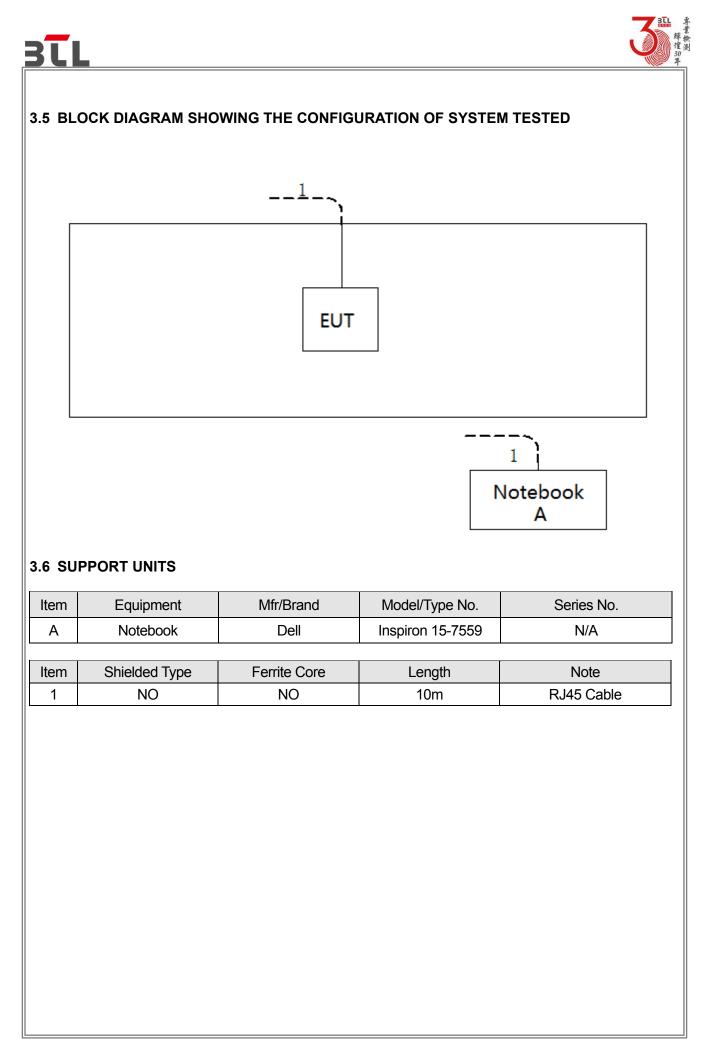
#### NOTE:

For IEEE 802.11g and IEEE 802.11n (HT20):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz (Duty cycle < 98%).

#### For IEEE 802.11n (HT40):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 2 kHz (Duty cycle < 98%).





## 4. AC POWER LINE CONDUCTED EMISSIONS TEST

#### 4.1 LIMIT

| Frequency of Emission (MHz) | Limit (d   | BμV)      |
|-----------------------------|------------|-----------|
| Frequency of Emission (MHz) | Quasi-peak | Average   |
| 0.15 - 0.50                 | 66 to 56*  | 56 to 46* |
| 0.50 - 5.0                  | 56         | 46        |
| 5.0 - 30.0                  | 60         | 50        |

NOTE:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) The test result calculated as following: Measurement Value = Reading Level + Correct Factor Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor (if use) Margin Level = Measurement Value – Limit Value

The following table is the setting of the receiver

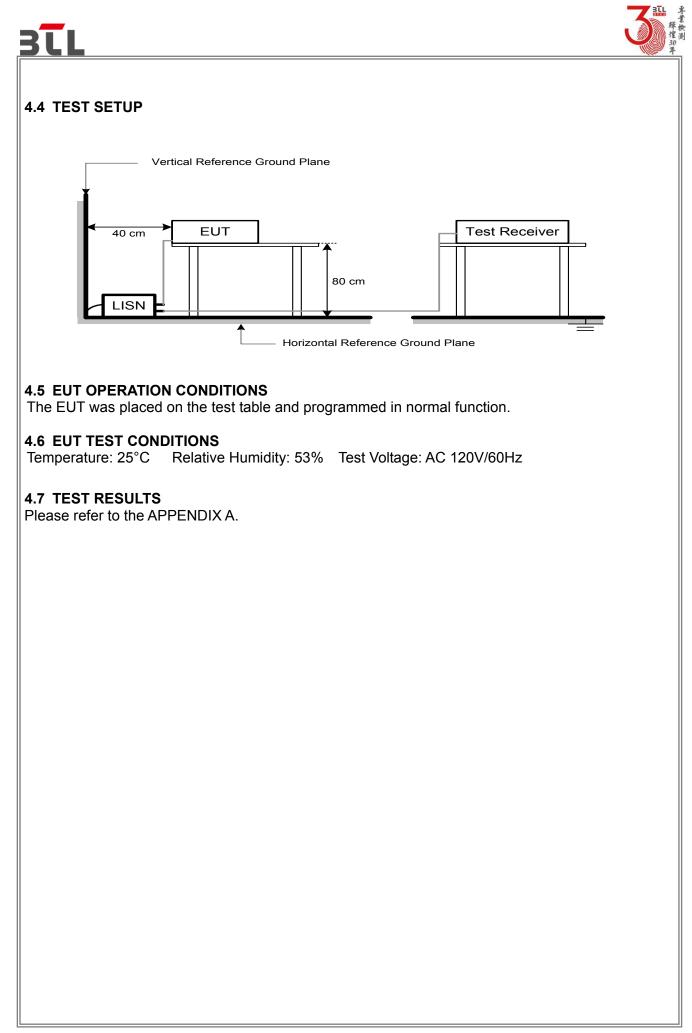
| Receiver Parameters | Setting  |
|---------------------|----------|
| Attenuation         | 10 dB    |
| Start Frequency     | 0.15 MHz |
| Stop Frequency      | 30 MHz   |
| IF Bandwidth        | 9 kHz    |

#### 4.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### 4.3 DEVIATION FROM TEST STANDARD

No deviation





## 5. RADIATED EMISSIONS TEST

#### 5.1 LIMIT

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-1000 MHz)

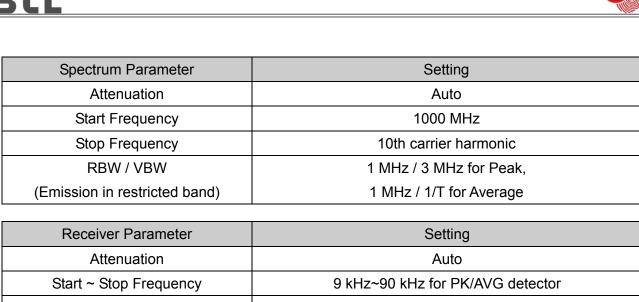
| Frequency   | Field Strength     | Measurement Distance |
|-------------|--------------------|----------------------|
| (MHz)       | (microvolts/meter) | (meters)             |
| 0.009-0.490 | 2400/F(kHz)        | 300                  |
| 0.490-1.705 | 24000/F(kHz)       | 30                   |
| 1.705-30.0  | 30                 | 30                   |
| 30-88       | 100                | 3                    |
| 88-216      | 150                | 3                    |
| 216-960     | 200                | 3                    |
| Above 960   | 500                | 3                    |

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000 MHz)

|                 | (dBuV/m at 3 m) |         |
|-----------------|-----------------|---------|
| Frequency (MHz) | Peak            | Average |
| Above 1000      | 74              | 54      |

NOTE:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following:
- Measurement Value = Reading Level + Correct Factor Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use) Margin Level = Measurement Value - Limit Value



Start ~ Stop Frequency90 kHz~110 kHz for QP detectorStart ~ Stop Frequency110 kHz~490 kHz for PK/AVG detectorStart ~ Stop Frequency490 kHz~30 MHz for QP detectorStart ~ Stop Frequency30 MHz~1000 MHz for QP detector

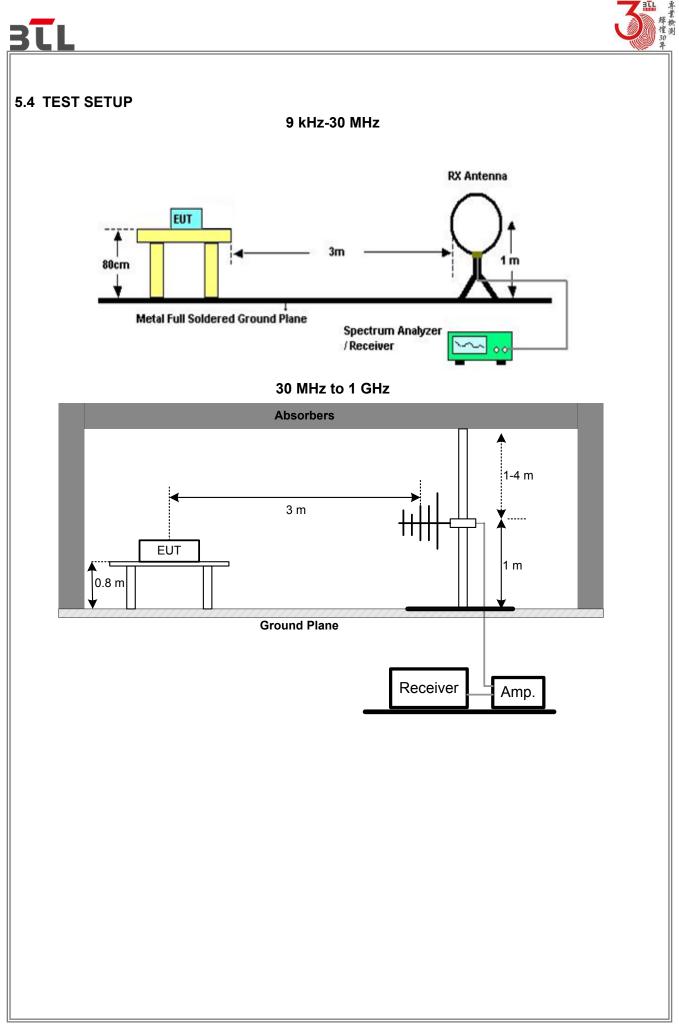
#### 5.2 TEST PROCEDURE

- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
- b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1 GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1 GHz)
- h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1 GHz)
- i. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### 5.3 DEVIATION FROM TEST STANDARD

No deviation





 Solution
 Absorbers

 January of the provided of

#### 5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 5.6 EUT TEST CONDITIONS

Temperature: 21°C Relative Humidity: 60% Test Voltage: AC 120V/60Hz

#### 5.7 TEST RESULTS - 9 KHZ TO 30 MHZ

Please refer to the APPENDIX B

Remark:

- (1) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

#### 5.8 TEST RESULTS - 30 MHZ TO 1000 MHZ

Please refer to the APPENDIX C.

## 5.9 TEST RESULTS - ABOVE 1000 MHZ

Please refer to the APPENDIX D. Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable. For fundamental signal judgment was referred to Peak output test.



## 6. BANDWIDTH TEST

#### 6.1 LIMIT

| FCC Part15 (15.247) , Subpart C |                        |                 |  |
|---------------------------------|------------------------|-----------------|--|
| Section Test Item Limit         |                        |                 |  |
| 15 247(-)(2)                    | 6 dB Bandwidth         | Minimum 500 kHz |  |
| 15.247(a)(2)                    | 99% Emission Bandwidth | -               |  |

#### 6.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

- b. Spectrum Setting: RBW= 100 kHz, VBW=300 kHz, Sweep time = 2.5 ms.
- c. The bandwidth was performed in accordance with method 11.8 of ANSI C63.10-2013.

#### 6.3 DEVIATION FROM STANDARD

No deviation.

#### 6.4 TEST SETUP



SPECTRUM

ANALYZER

#### 6.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 6.6 EUT TEST CONDITIONS

Temperature: 23.2°C Relative Humidity: 57.3% Test V

Test Voltage: AC 120V/60Hz

#### 6.7 TEST RESULTS

Please refer to the APPENDIX E.





## 7. MAXIMUM OUTPUT POWER TEST

#### **7.1 LIMIT**

| FCC Part15 (15.247), Subpart C |                      |                 |  |  |
|--------------------------------|----------------------|-----------------|--|--|
| Section Test Item Limit        |                      |                 |  |  |
| 15.247(b)(3)                   | Maximum Output Power | 1 Watt or 30dBm |  |  |

#### 7.2 TEST PROCEDURE

- a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below.
- b. The maximum conducted output power was performed in accordance with method 11.9.1.3 of ANSI C63.10-2013.

#### 7.3 DEVIATION FROM STANDARD

No deviation.

#### 7.4 TEST SETUP

| EUT | Power Meter |
|-----|-------------|
|     |             |

#### 7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 7.6 EUT TEST CONDITIONS

Temperature: 23.2°C Relative Humidity: 57.3% Test Voltage: AC 120V/60Hz

#### 7.7 TEST RESULTS

Please refer to the APPENDIX F.



## 8. CONDUCTED SPURIOUS EMISSIONS

#### 8.1 LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB 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, provided the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

#### 8.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting: RBW= 100 kHz, VBW=300 kHz, Sweep time = Auto.

#### 8.3 DEVIATION FROM STANDARD

No deviation.

#### 8.4 TEST SETUP

| EUT | SPECTRUM |
|-----|----------|
|     | ANALYZER |

#### 8.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 8.6 EUT TEST CONDITIONS

Temperature: 23.2°C Relative Humidity: 57.3%

Test Voltage: AC 120V/60Hz

#### 8.7 TEST RESULTS

Please refer to the APPENDIX G.





## 9. POWER SPECTRAL DENSITY TEST

#### 9.1 LIMIT

| FCC Part15 (15.247), Subpart C |                        |                         |  |  |
|--------------------------------|------------------------|-------------------------|--|--|
| Section                        | Limit                  |                         |  |  |
| 15.247(e)                      | Power Spectral Density | 8 dBm<br>(in any 3 kHz) |  |  |

#### 9.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting: RBW=3 kHz, VBW=10 kHz, Sweep time = Auto.
- c. The Power Spectral Density was performed in accordance with method 11.10.2 of ANSI C63.10-2013.

#### 9.3 DEVIATION FROM STANDARD

No deviation.

#### 9.4 TEST SETUP



#### 9.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 9.6 EUT TEST CONDITIONS

Temperature: 23.2°C Relative Humidity: 57.3%

Test Voltage: AC 120V/60Hz

#### 9.7 TEST RESULTS

Please refer to the APPENDIX H.



## **10. MEASUREMENT INSTRUMENTS LIST**

|      | AC Power Line Conducted Emissions |                 |                          |            |                  |
|------|-----------------------------------|-----------------|--------------------------|------------|------------------|
| Item | Kind of Equipment                 | Manufacturer    | Type No.                 | Serial No. | Calibrated until |
| 1    | EMI Test Receiver                 | R&S             | ESCI                     | 100382     | Mar. 10, 2020    |
| 2    | LISN                              | EMCO            | 3816/2                   | 52765      | Mar. 10, 2020    |
| 3    | 50Ω Terminator                    | SHX             | TF5-3                    | 15041305   | Mar. 10, 2020    |
| 4    | Artificial-Mains<br>Network       | SCHWARZBEC<br>K | NSLK 8127                | 8127685    | Jun. 25, 2019    |
| 5    | TRANSIENT<br>LIMITER              | EM              | EM-7600                  | 772        | Mar. 10, 2020    |
| 6    | Measurement<br>Software           | Farad           | EZ-EMC<br>Ver.NB-03A1-01 | N/A        | N/A              |
| 7    | Cable                             | N/A             | RG223                    | 12m        | Mar. 23, 2019    |

|      | Radiated Emissions - 9 kHz to 30 MHz |              |                          |            |                  |  |
|------|--------------------------------------|--------------|--------------------------|------------|------------------|--|
| Item | Kind of Equipment                    | Manufacturer | Type No.                 | Serial No. | Calibrated until |  |
| 1    | Loop Antenna                         | EM           | EM-6876-1                | 230        | Jan. 15, 2020    |  |
| 2    | Cable                                | N/A          | RG 213/U                 | C-102      | Jun. 01, 2019    |  |
| 3    | EMI Test Receiver                    | R&S          | ESCI                     | 100382     | Mar. 10, 2020    |  |
| 4    | Measurement<br>Software              | Farad        | EZ-EMC<br>Ver.NB-03A1-01 | N/A        | N/A              |  |

|      | Radiated Emissions - 30 MHz to 1 GHz |              |                                |             |                  |  |
|------|--------------------------------------|--------------|--------------------------------|-------------|------------------|--|
| Item | Kind of Equipment                    | Manufacturer | Type No.                       | Serial No.  | Calibrated until |  |
| 1    | Antenna                              | Schwarzbeck  | VULB9160                       | 9160-3232   | Mar. 09, 2020    |  |
| 2    | Amplifier                            | HP           | 8447D                          | 2944A09673  | Aug. 11, 2019    |  |
| 3    | Receiver                             | Agilent      | N9038A                         | MY52130039  | Aug. 11, 2019    |  |
| 4    | Cable                                | emci         | LMR-400(30MHz-<br>1GHz)(8m+5m) | N/A         | May 25, 2019     |  |
| 5    | Controller                           | СТ           | SC100                          | N/A         | N/A              |  |
| 6    | Controller                           | MF           | MF-7802                        | MF780208416 | N/A              |  |
| 7    | Measurement<br>Software              | Farad        | EZ-EMC<br>Ver.NB-03A1-01       | N/A         | N/A              |  |

|      | Radiated Emissions - Above 1 GHz          |                   |                          |               |                  |  |
|------|---|-------------------|--------------------------|---------------|------------------|--|
| Item | Kind of Equipment                         | Manufacturer      | Type No.                 | Serial No.    | Calibrated until |  |
| 1    | Double Ridged<br>Guide Antenna            | ETS               | 3115                     | 75789         | Mar. 09, 2020    |  |
| 2    | Broad-Band Horn<br>Antenna                | Schwarzbeck       | BBHA 9170                | 9170319       | Jun. 30, 2019    |  |
| 3    | Amplifier                                 | Agilent           | 8449B                    | 3008A02274    | Mar. 10, 2020    |  |
| 4    | Microwave<br>Preamplifier With<br>Adaptor | EMC<br>INSTRUMENT | EMC2654045               | 980039 & HA01 | Mar. 10, 2020    |  |
| 5    | Receiver                                  | Agilent           | N9038A                   | MY52130039    | Aug. 11, 2019    |  |
| 6    | Controller                                | СТ                | SC100                    | N/A           | N/A              |  |
| 7    | Controller                                | MF                | MF-7802                  | MF780208416   | N/A              |  |
| 8    | Cable                                     | mitron            | B10-01-01-12M            | 18072744      | Jul. 30, 2019    |  |
| 9    | Measurement<br>Software                   | Farad             | EZ-EMC<br>Ver.NB-03A1-01 | N/A           | N/A              |  |





|      | Bandwidth                 |              |          |            |                  |
|------|---------------------------|--------------|----------|------------|------------------|
| Item | Kind of Equipment         | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1    | Spectrum Analyzer         | R&S          | FSP40    | 100185     | Aug. 11, 2019    |
|      |                           |              |          |            |                  |
|      | Peak Output Power         |              |          |            |                  |
| Item | Kind of Equipment         | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1    | 1 P-series power<br>meter | Agilent      | N1911A   | MY45100473 | Aug. 11, 2019    |
| 2    | wideband power sensor     | Agilent      | N1921A   | MY51100041 | Aug. 11, 2019    |

| Antenna Conducted Spurious Emissions |                     |              |          |            |                  |
|--------------------------------------|---------------------|--------------|----------|------------|------------------|
| Iter                                 | m Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1                                    | Spectrum Analyzer   | R&S          | FSP40    | 100185     | Aug. 11, 2019    |

| Power Spectral Density |                   |              |          |            |                  |
|------------------------|-------------------|--------------|----------|------------|------------------|
| Item                   | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1                      | Spectrum Analyzer | R&S          | FSP40    | 100185     | Aug. 11, 2019    |

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.





## 11. EUT TEST PHOTO

## AC Power Line Conducted Emissions Test Photos



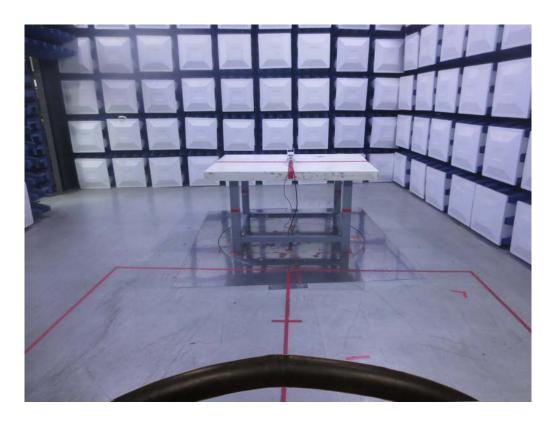




## Radiated Emissions Test Photos

9 kHz to 30 MHz







### Radiated Emissions Test Photos

30 MHz to 1 GHz

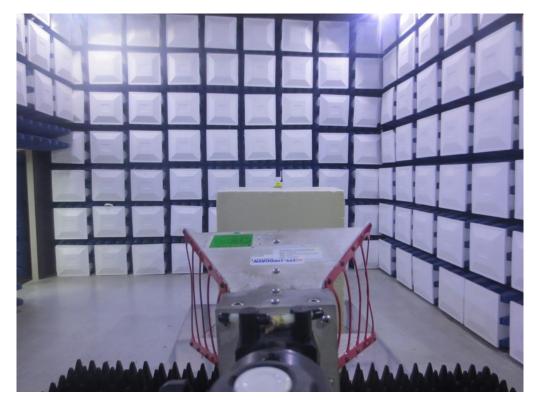






## **Radiated Emissions Test Photos**

Above 1 GHz







## **APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS**



3

4

5

6

0.3030

0.4605

0.8610

2.0220

24.60

22.41

15.47

11.49

9.82

9.80

9.91

10.00

34.42

32.21

25.38

21.49



Test Mode: TX N20 MODE CHANNEL 06 Line 80 dBuV Ж 40 5 and the property of the second when much when the w MANYAN 0 0.15 0.50 1.00 5.00 10.00 30.00(MHz) Reading Correct Measure Limit Margin No. Freq. Level Factor ment MHz dBuV dB dB dBuV Comment dBuV Detector -17.86 1 \* 0.1590 37.84 9.82 47.66 65.52 Peak 2 0.2265 30.97 9.82 40.79 62.58 -21.79 Peak

60.16

56.68

5**6. 00** 

56.00

-25.74

-24.47

-30.62

-34.51

Peak

Peak

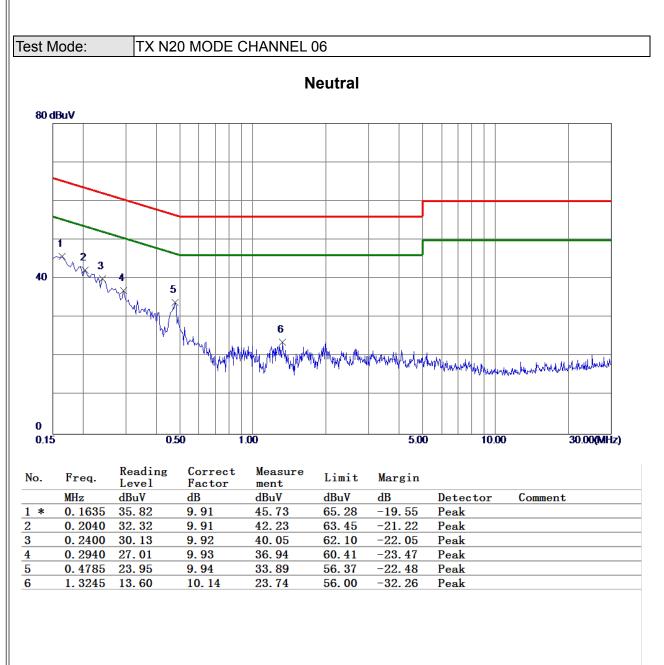
Peak

Peak

REMARKS: (1) Measurement Value = Reading Level + Correct Factor. (2) Margin Level = Measurement Value - Limit Value.



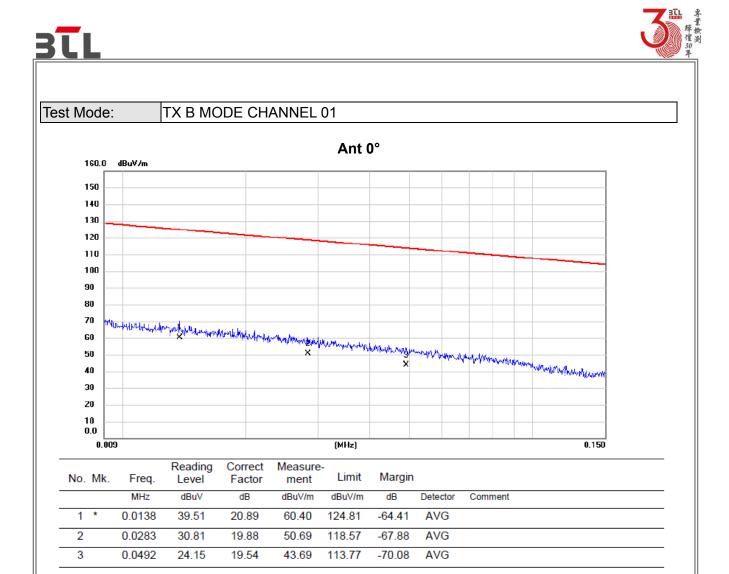




REMARKS: (1) Measurement Value = Reading Level + Correct Factor. (2) Margin Level = Measurement Value - Limit Value.



## APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ



**REMARKS**:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



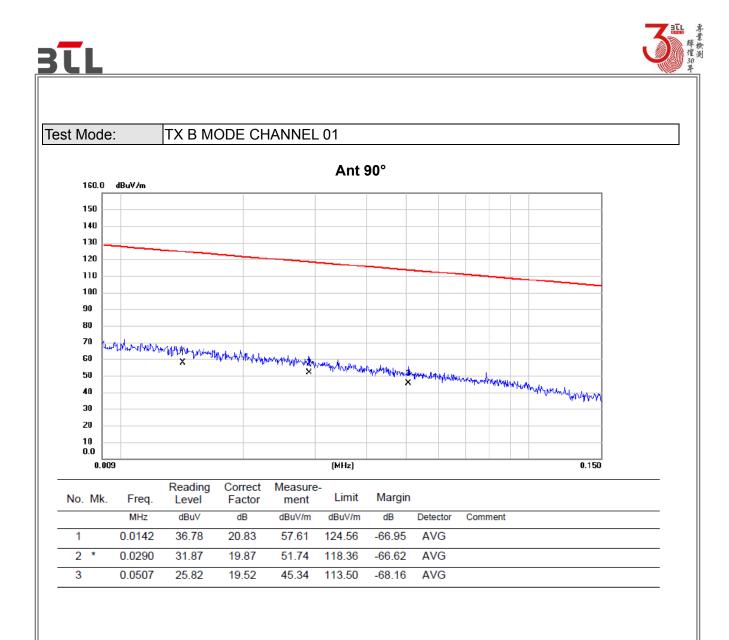


Test Mode: TX B MODE CHANNEL 01 Ant 0° 160.0 dBu∀/m 150 140 130 120 110 100 90 80 70 2 •×1 60 1 MA 50 **Å**. 40 30 20 10 0.0 0.150 0.5 (MHz) 5 30.000

| No. Mk. | Freq.  | Reading<br>Level |       | Measure-<br>ment | Limit  | Margin |          |         |
|---------|--------|------------------|-------|------------------|--------|--------|----------|---------|
|         | MHz    | dBuV             | dB    | dBuV/m           | dBuV/m | dB     | Detector | Comment |
| 1       | 0.2971 | 32.97            | 17.04 | 50.01            | 98.15  | -48.14 | AVG      |         |
| 2 *     | 2.1956 | 39.72            | 17.00 | 56.72            | 69.54  | -12.82 | QP       |         |
| 3       | 3.7794 | 26.53            | 15.92 | 42.45            | 69.54  | -27.09 | QP       |         |

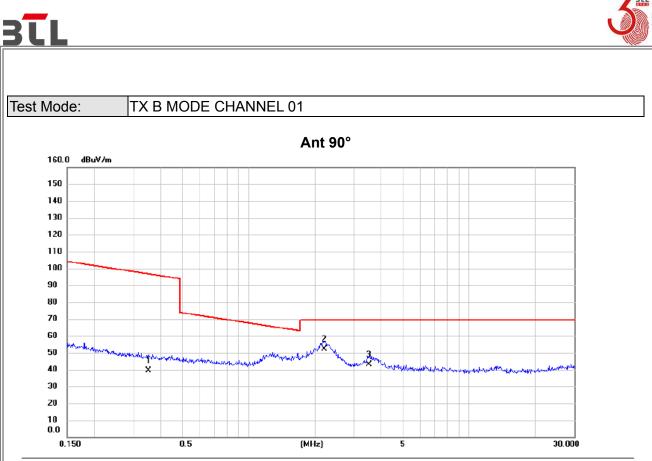
**REMARKS**:

- (1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value Limit Value.



REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



| No. Mk. | Freq.  | Reading<br>Level | Correct<br>Factor | Measure-<br>ment | Limit  | Margin |          |         |
|---------|--------|------------------|-------------------|------------------|--------|--------|----------|---------|
|         | MHz    | dBuV             | dB                | dBuV/m           | dBuV/m | dB     | Detector | Comment |
| 1       | 0.3511 | 22.35            | 17.02             | 39.37            | 96.70  | -57.33 | AVG      |         |
| 2 *     | 2.2072 | 35.14            | 17.00             | 52.14            | 69.54  | -17.40 | QP       |         |
| 3       | 3.5278 | 26.95            | 16.12             | 43.07            | 69.54  | -26.47 | QP       |         |

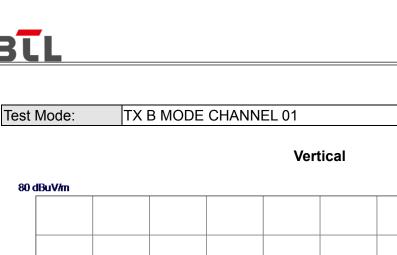
REMARKS:

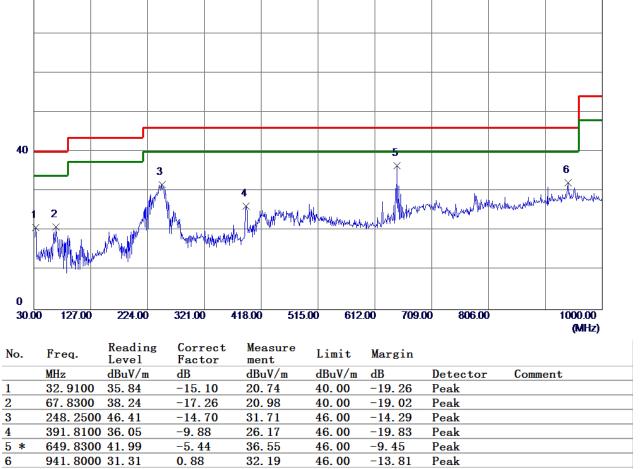
(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.



## APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

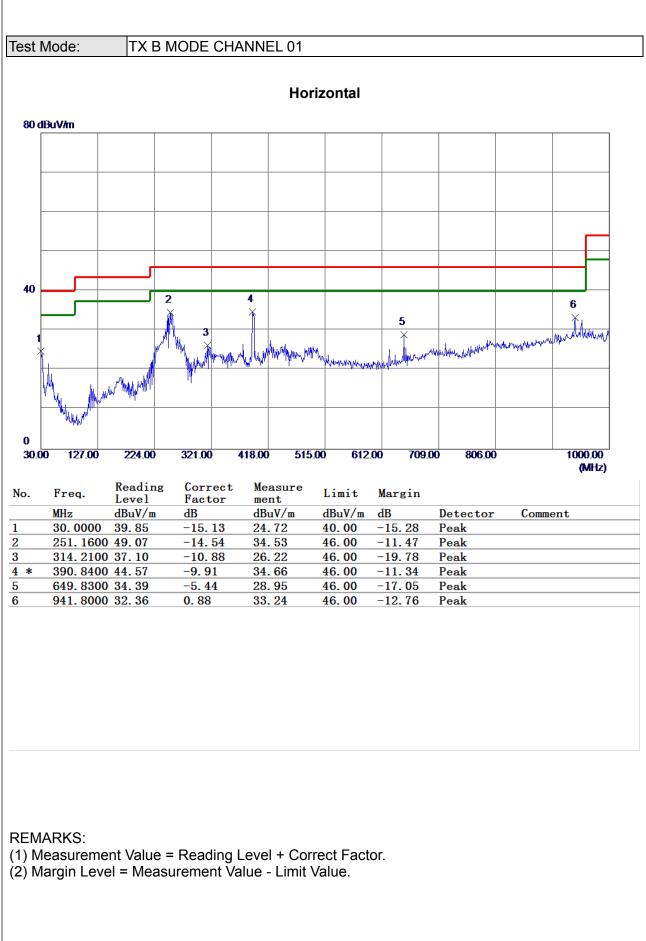




REMARKS: (1) Measurement Value = Reading Level + Correct Factor. (2) Margin Level = Measurement Value - Limit Value.

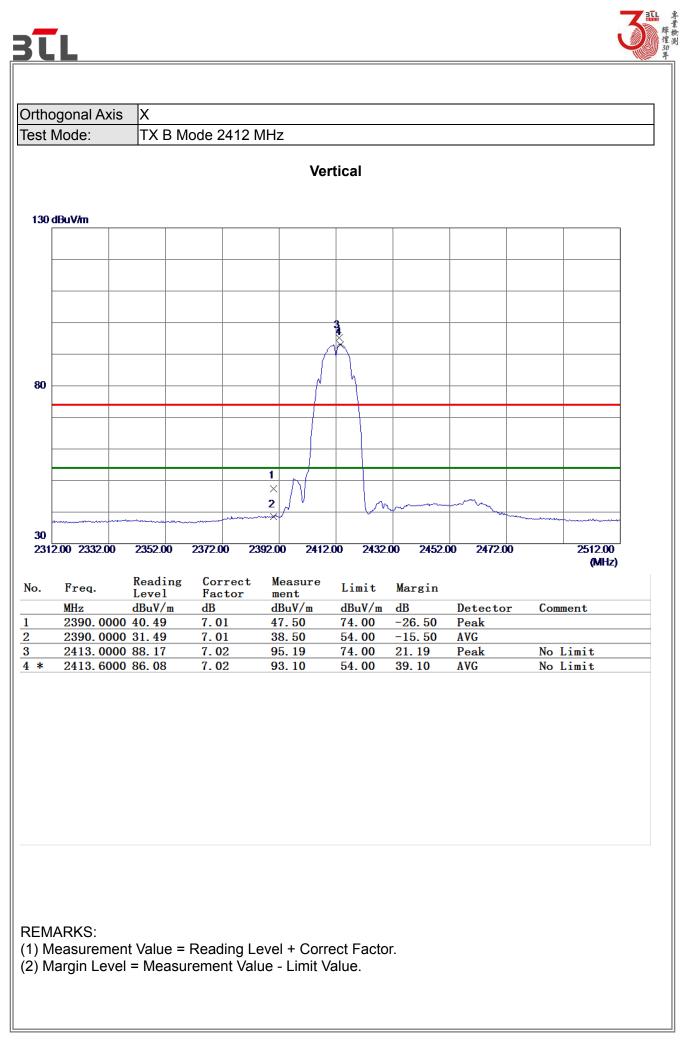


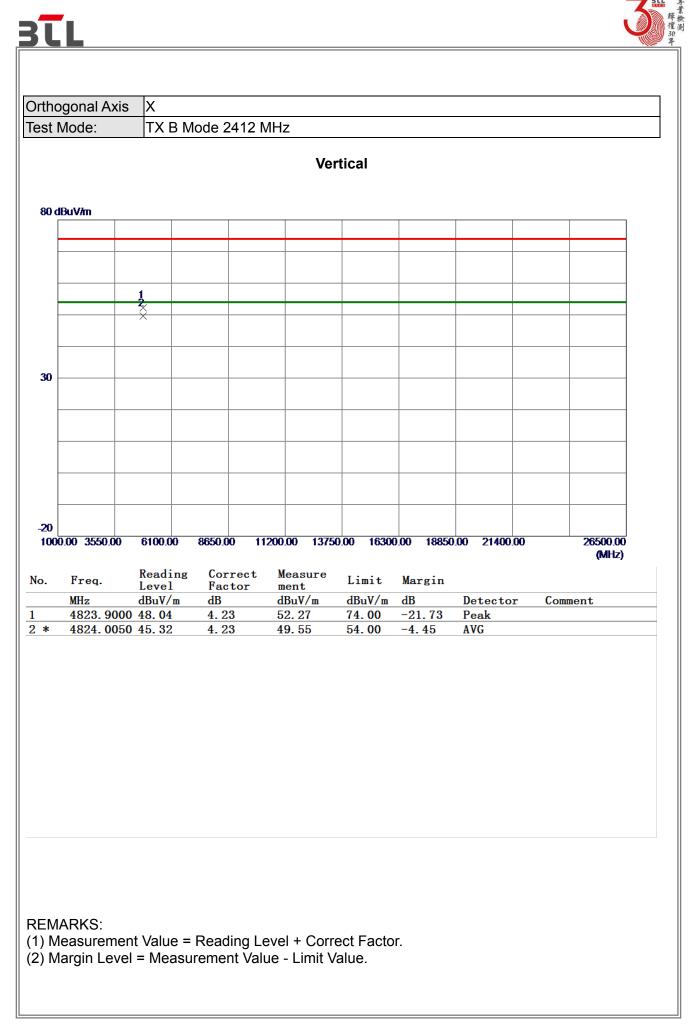


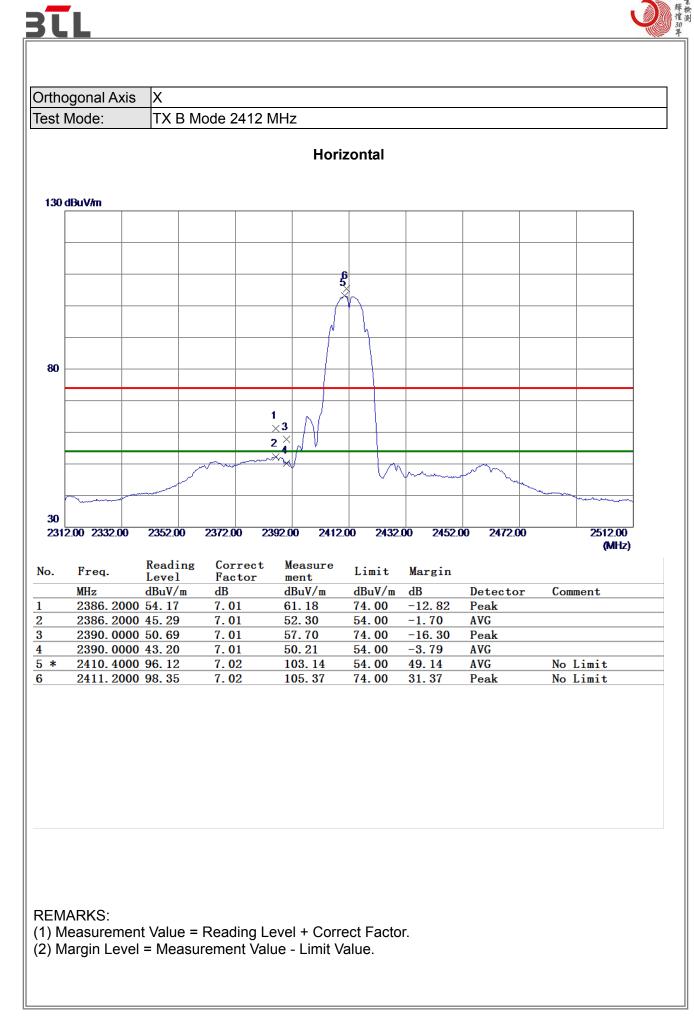


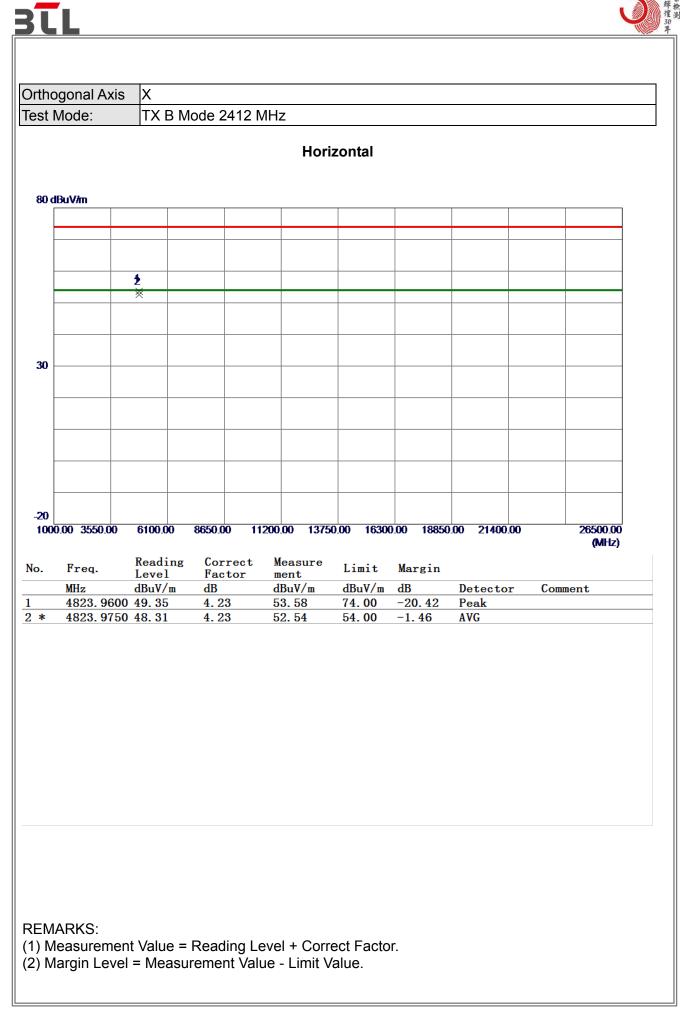


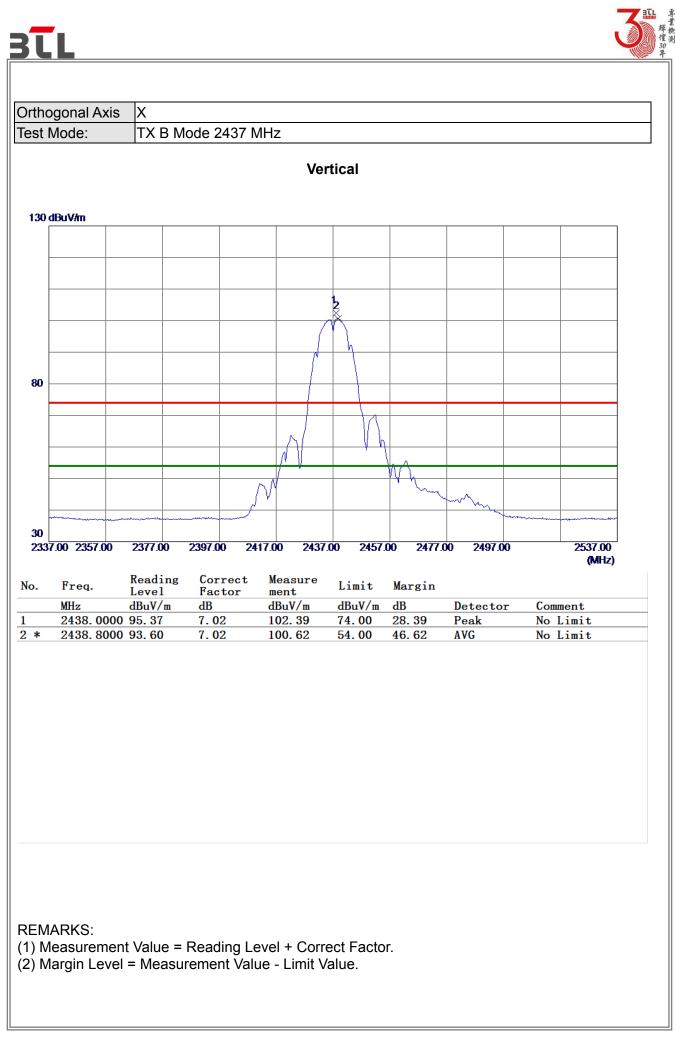
## **APPENDIX D - RADIATED EMISSION- ABOVE 1000 MHZ**

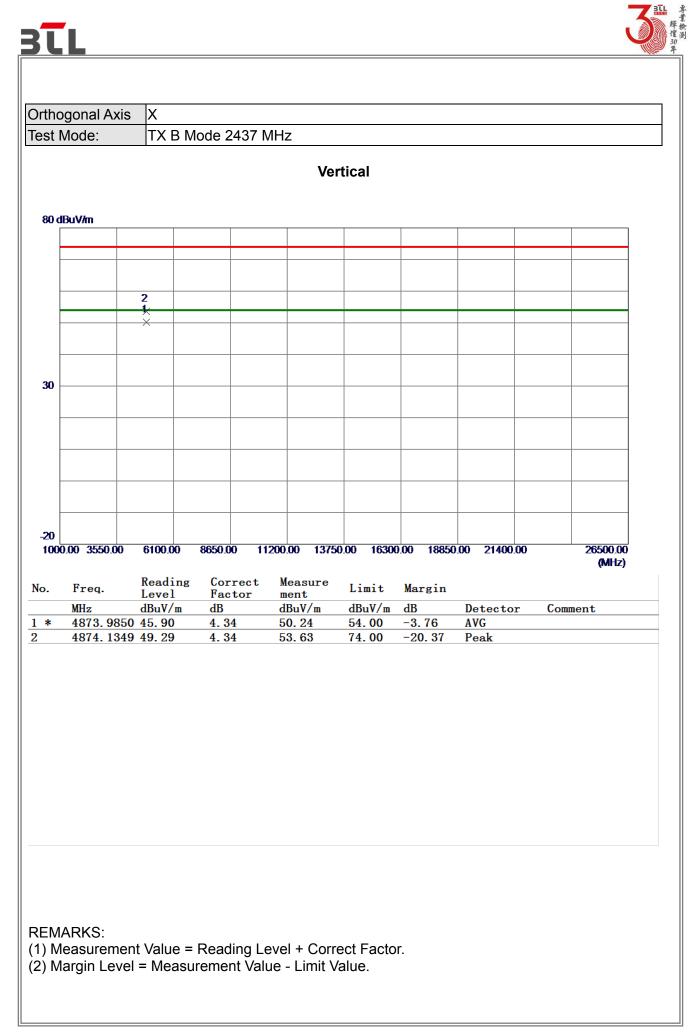


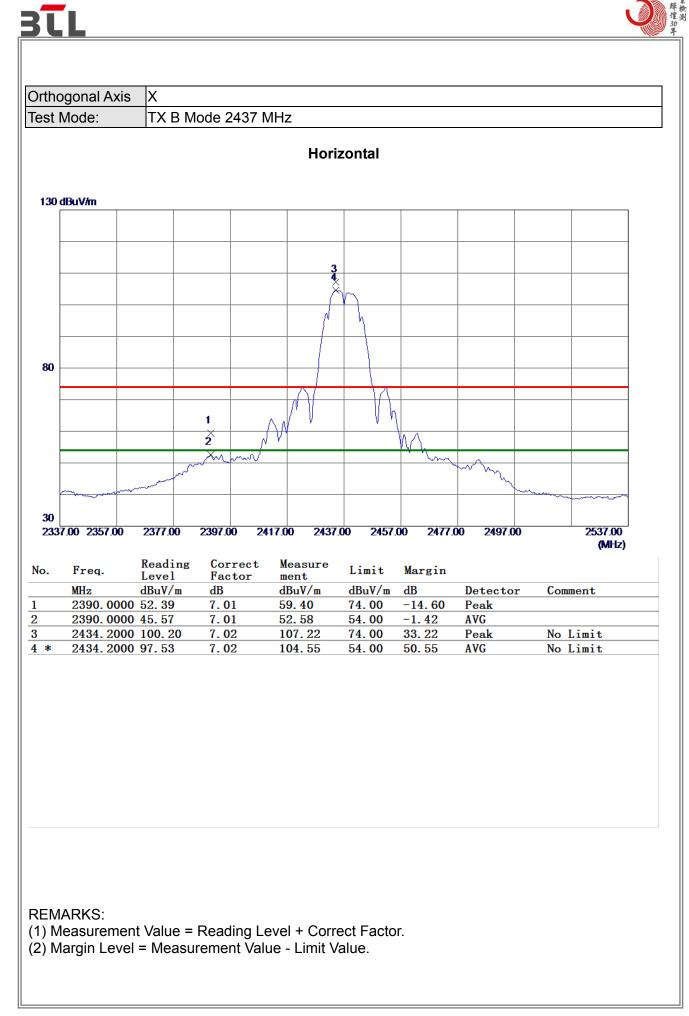


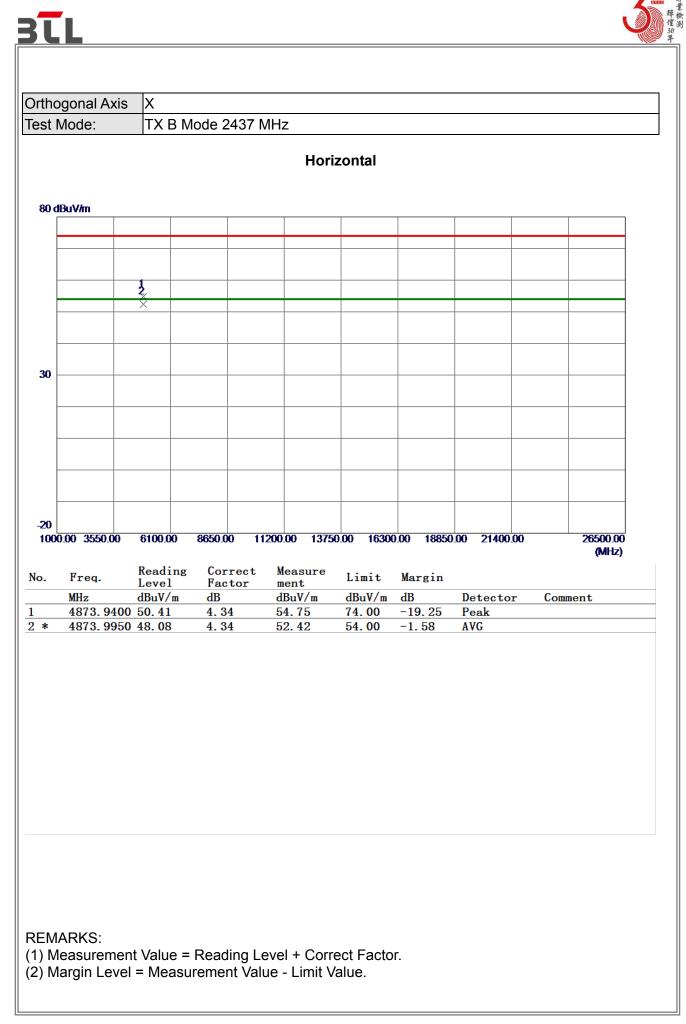


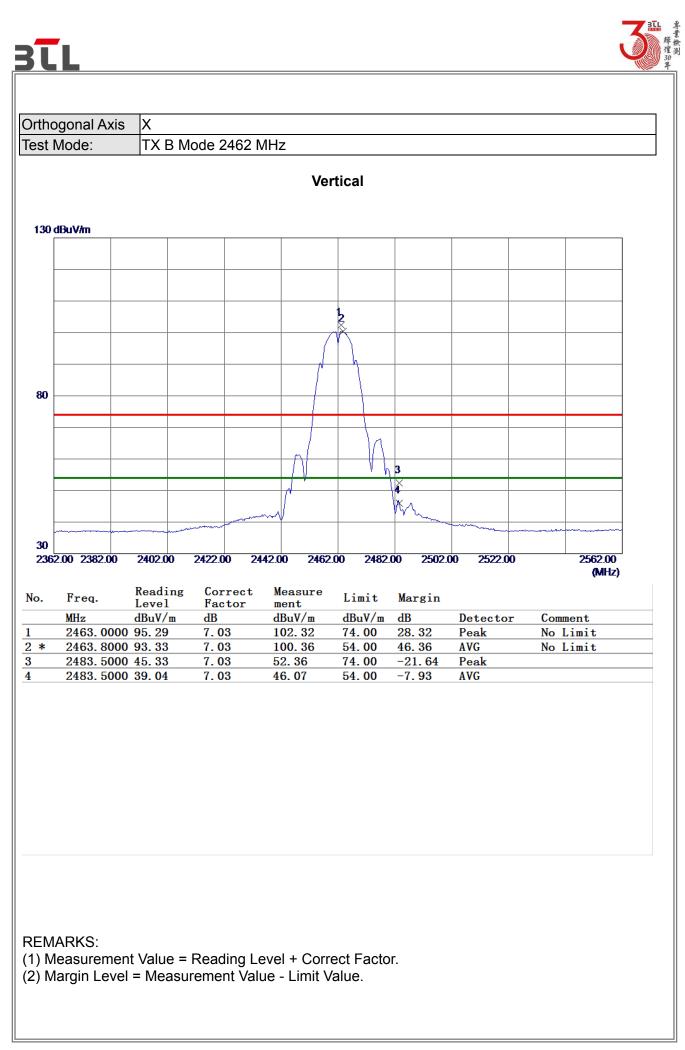


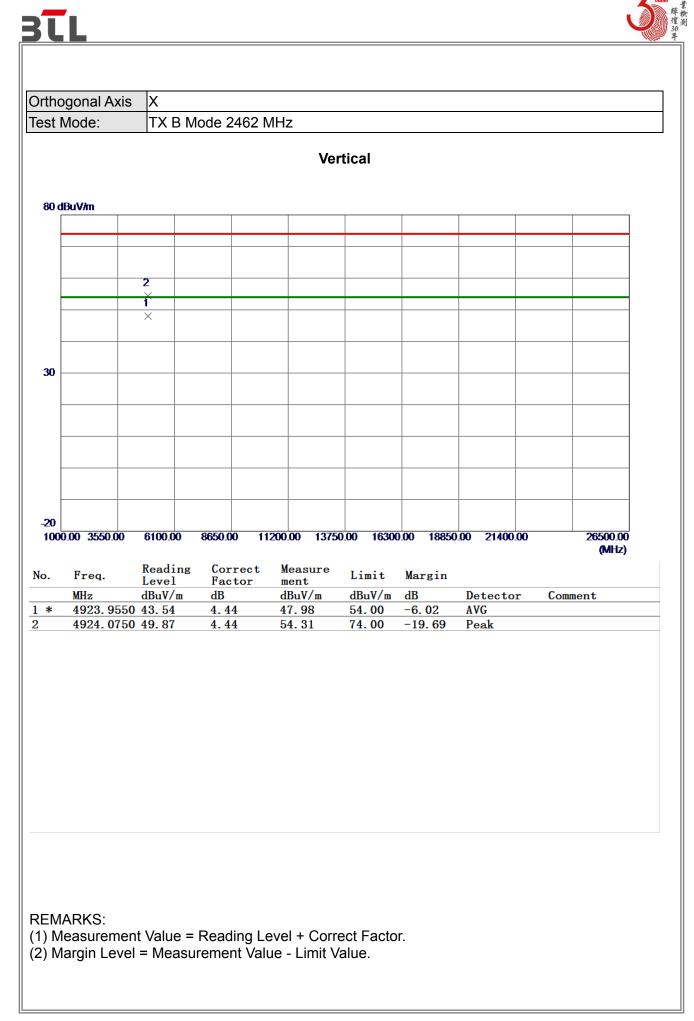


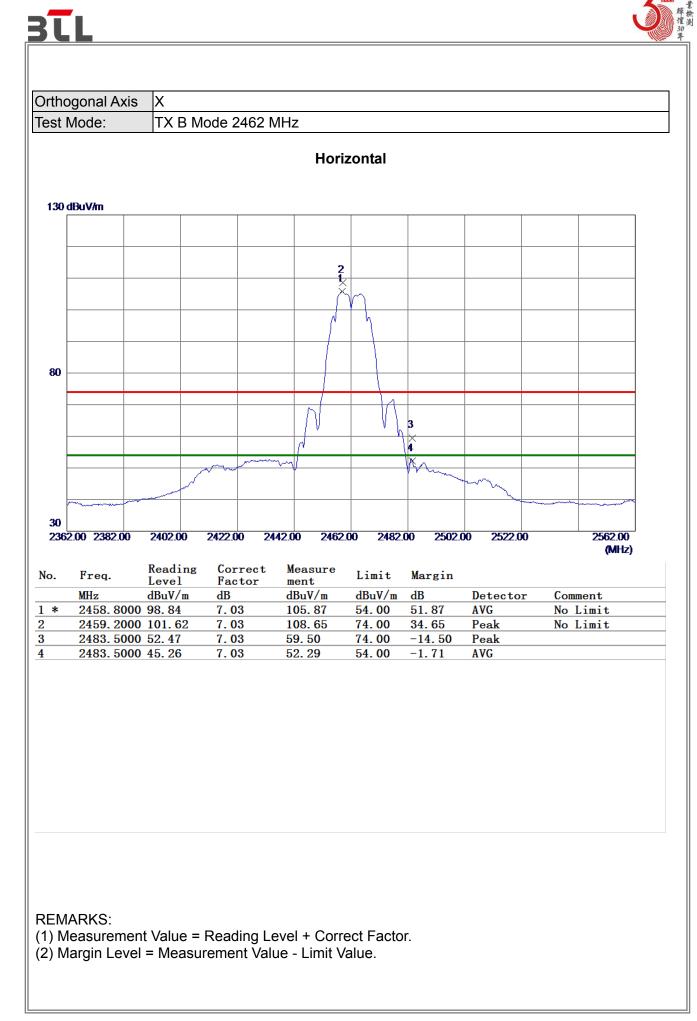


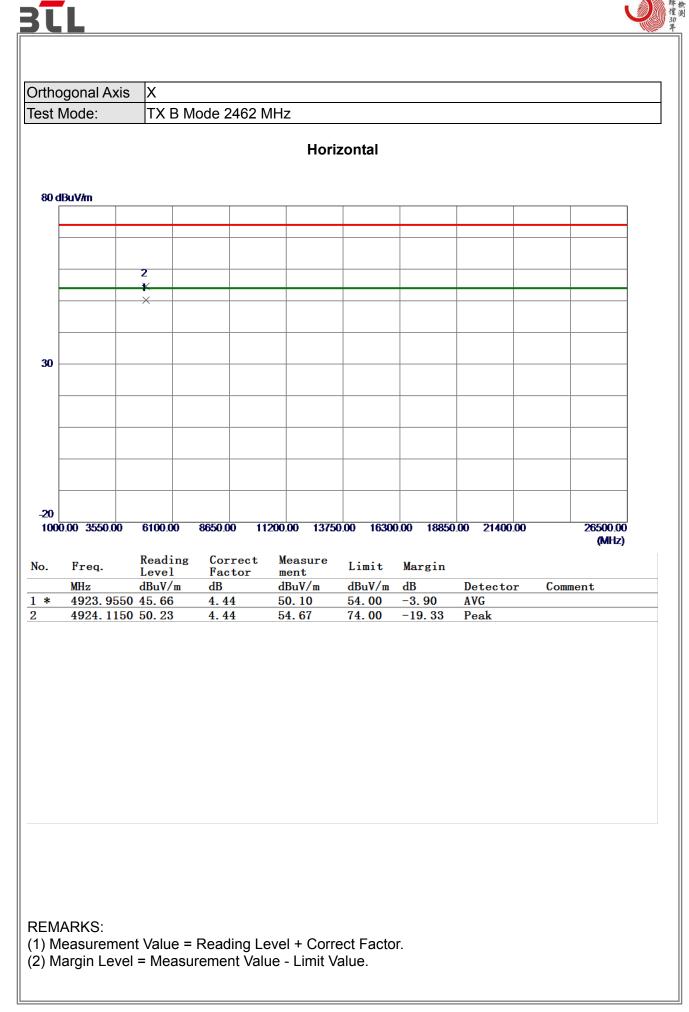


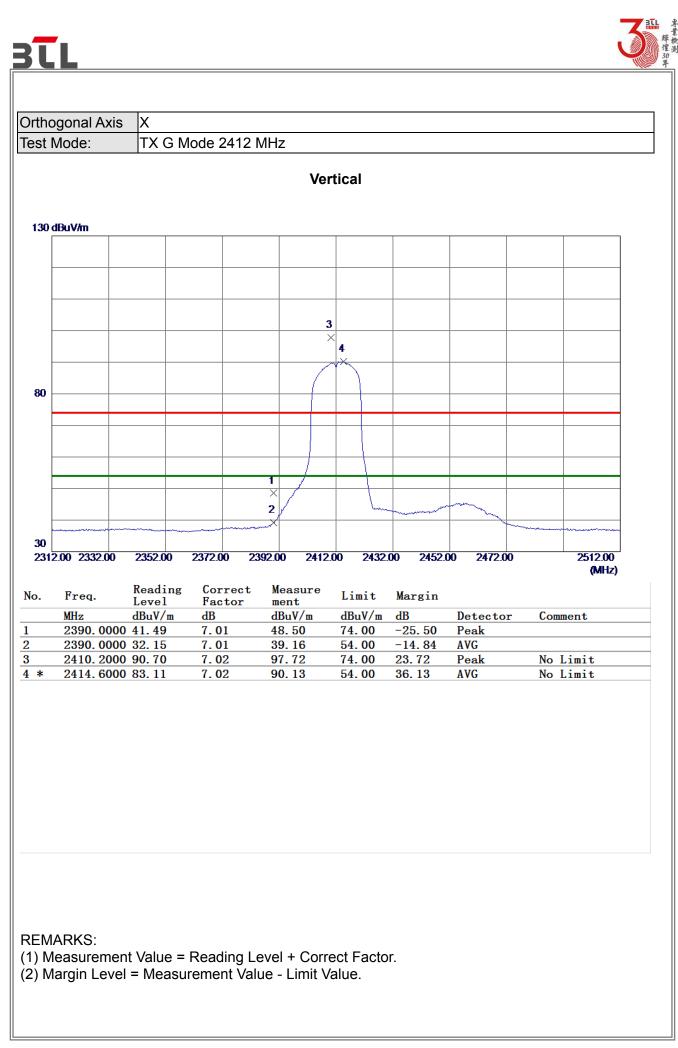


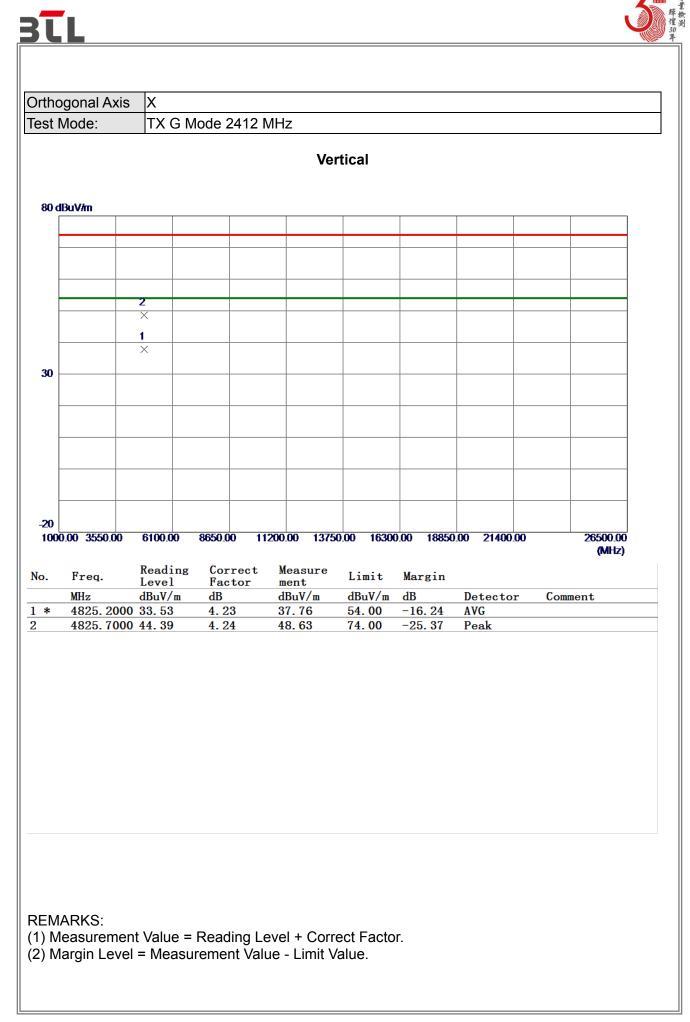


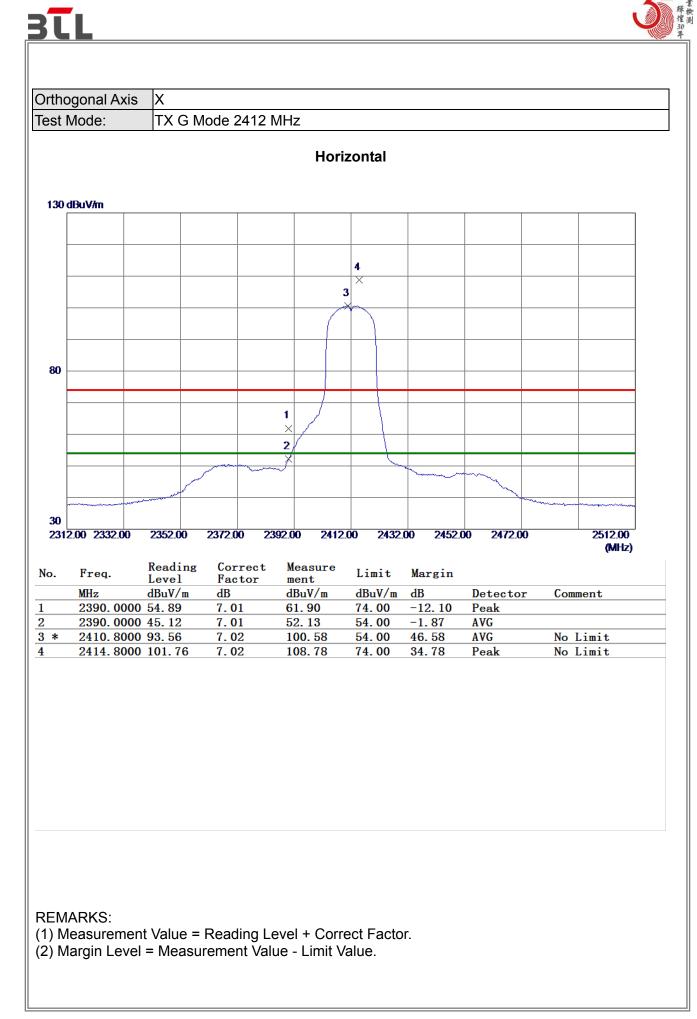




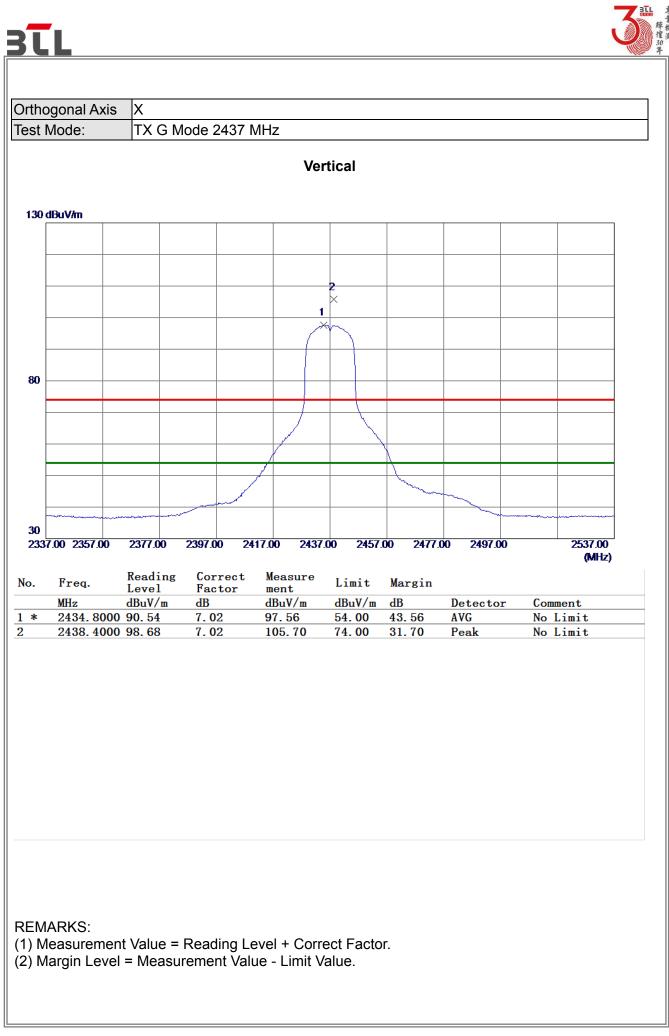


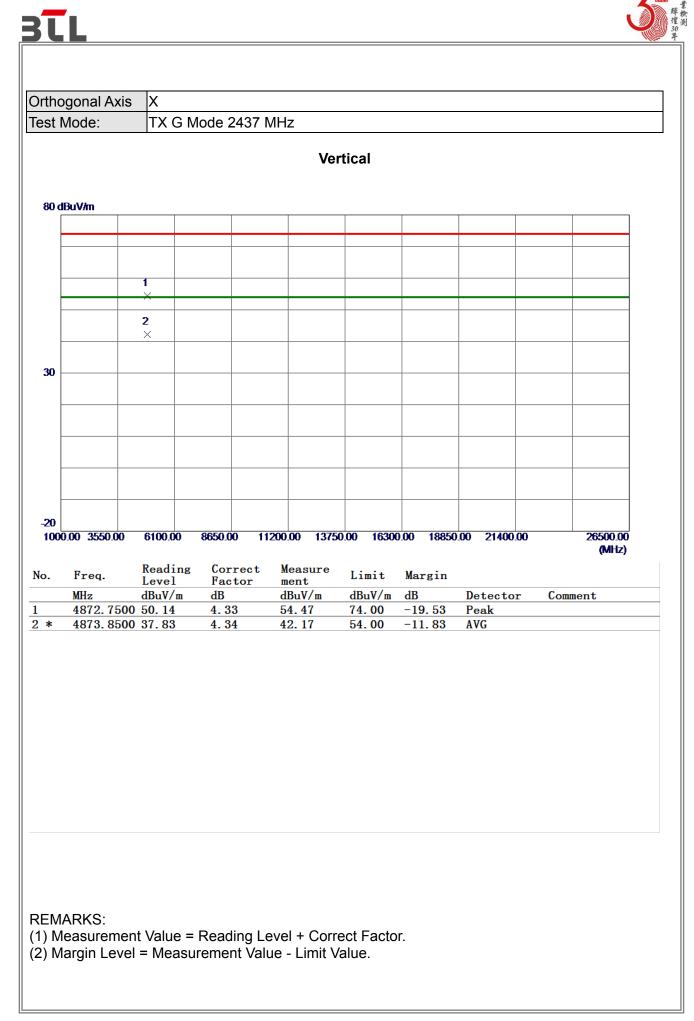


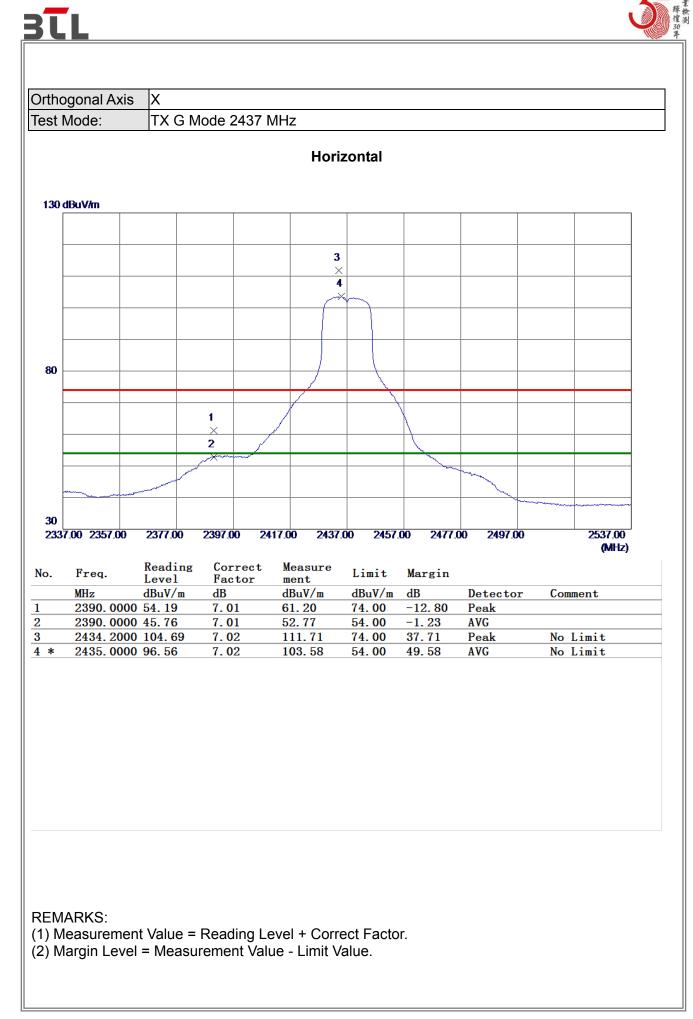




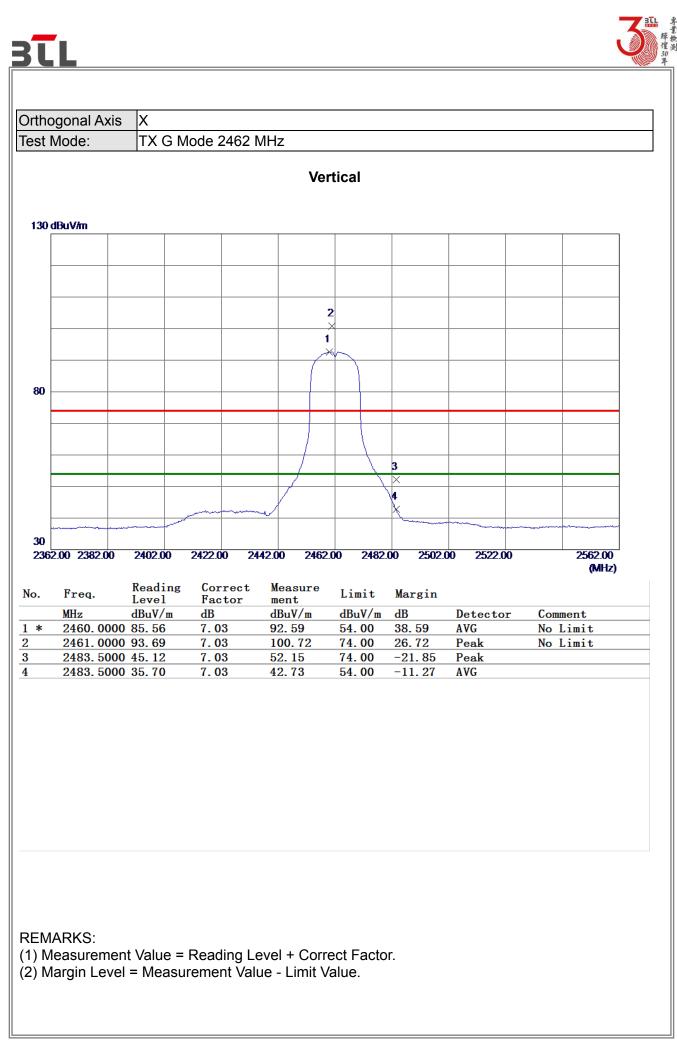
| st M     | lode:           |                   |            |                 |                 |              |                 |                     |
|----------|-----------------|-------------------|------------|-----------------|-----------------|--------------|-----------------|---------------------|
|          |                 | TX G N            | lode 2412  | MHz             |                 |              |                 |                     |
|          |                 |                   |            | Hori            | zontal          |              |                 |                     |
|          |                 |                   |            |                 |                 |              |                 |                     |
|          | kuV/m           |                   |            |                 |                 |              |                 |                     |
|          |                 |                   |            |                 |                 |              |                 |                     |
| _        |                 |                   |            |                 |                 |              |                 |                     |
|          |                 | 2<br>×            |            |                 |                 |              |                 |                     |
|          |                 | 1                 |            |                 |                 |              |                 |                     |
|          |                 | X                 |            |                 |                 |              |                 |                     |
| 30       |                 |                   |            |                 |                 |              |                 |                     |
| $\vdash$ |                 |                   |            |                 |                 |              |                 |                     |
| -        |                 |                   |            |                 |                 |              |                 |                     |
|          |                 |                   |            |                 |                 |              |                 |                     |
|          |                 |                   |            |                 |                 |              |                 |                     |
| 20       |                 |                   |            |                 |                 |              |                 |                     |
| 1000.    | 00 3550.00      | 6100.00           | 8650.00 1  | 1200.00 1375    | 0.00 16300      | 0.00 18850   | .00 21400.0     | 0 26500.00<br>(MHz) |
|          | Freq.           | Level             | Factor     | Measure<br>ment | Limit           | Margin       |                 |                     |
|          | MHz<br>4824.650 | dBuV/m<br>0 34.80 | dB<br>4.23 | dBuV/m<br>39.03 | dBuV/m<br>54.00 | dB<br>-14.97 | Detector<br>AVG | Comment             |
|          | 4826.250        |                   | 4.24       | <b>50.</b> 41   | 74.00           | -23. 59      | Peak            |                     |

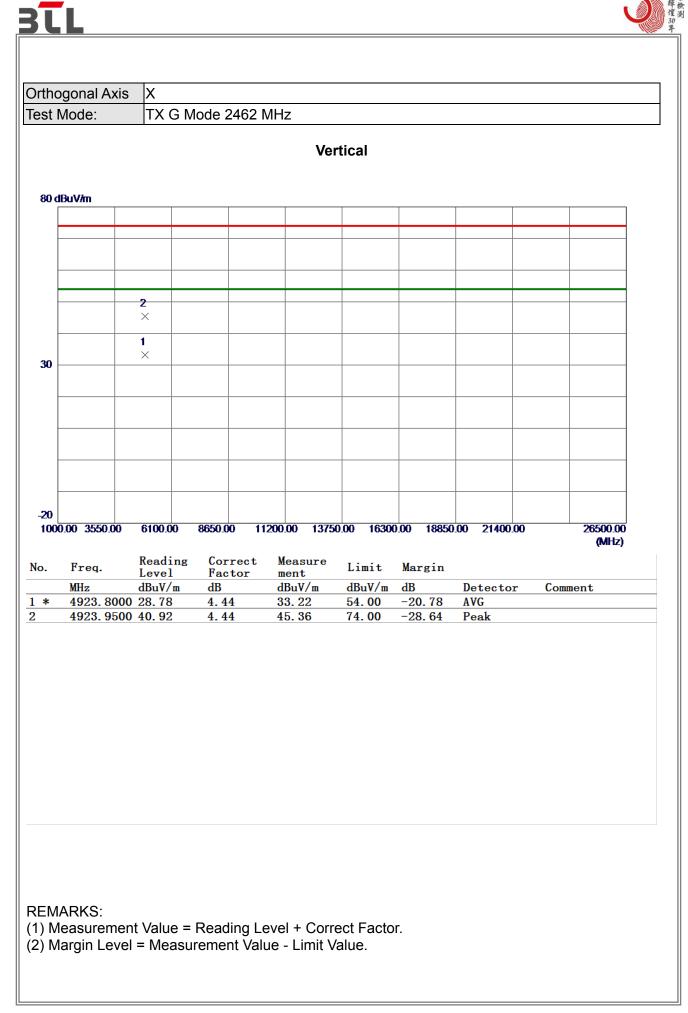


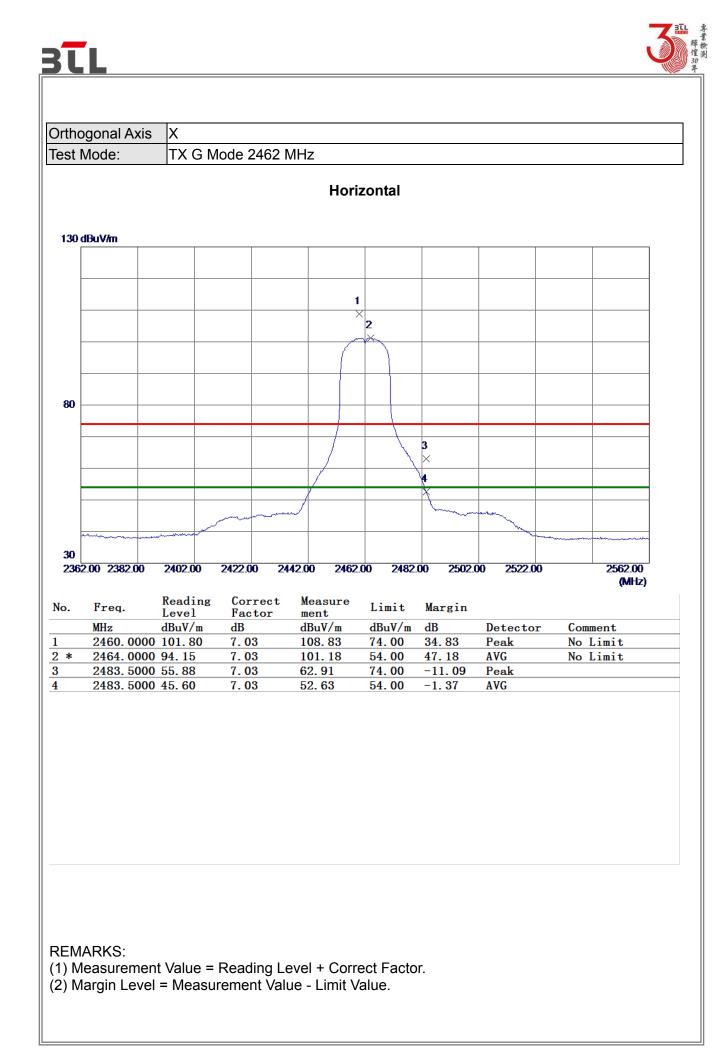




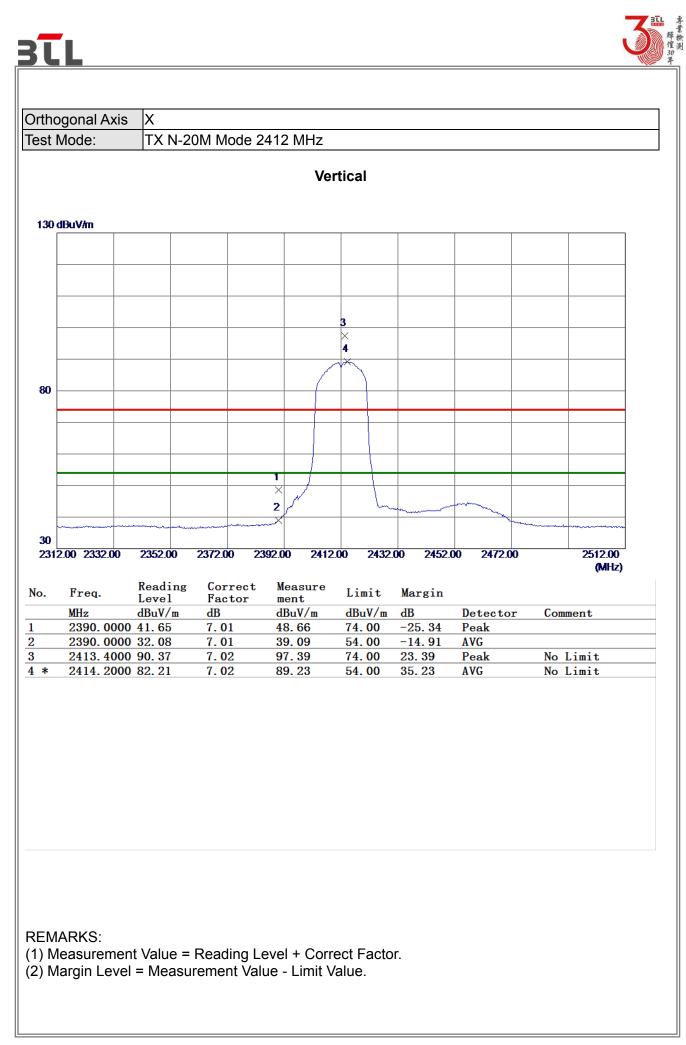




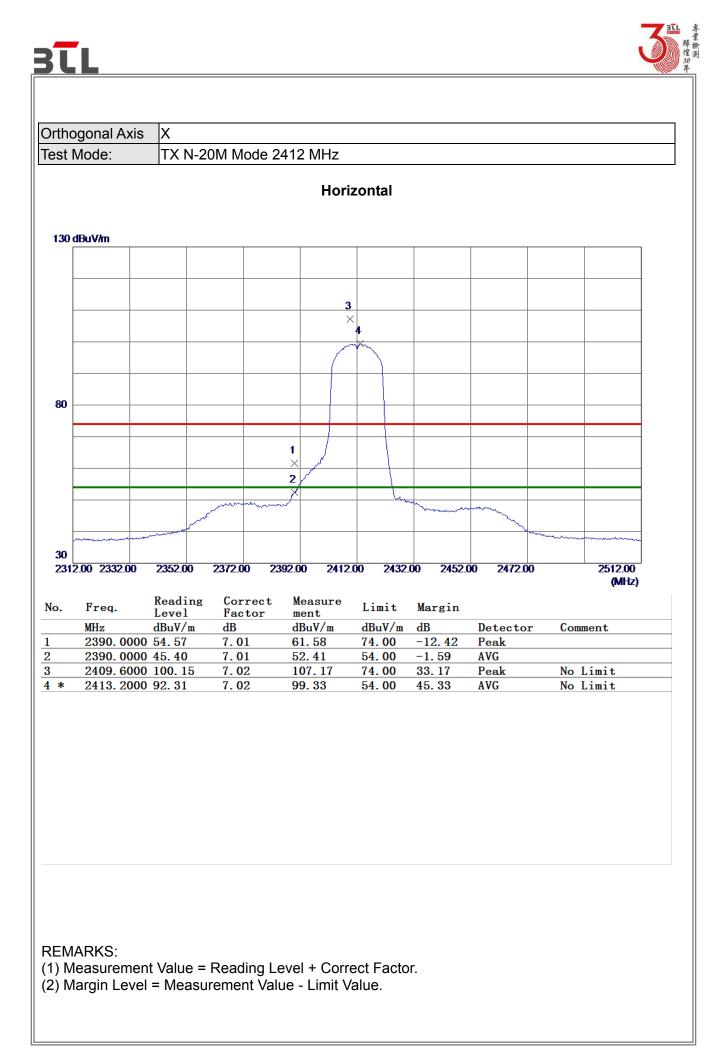


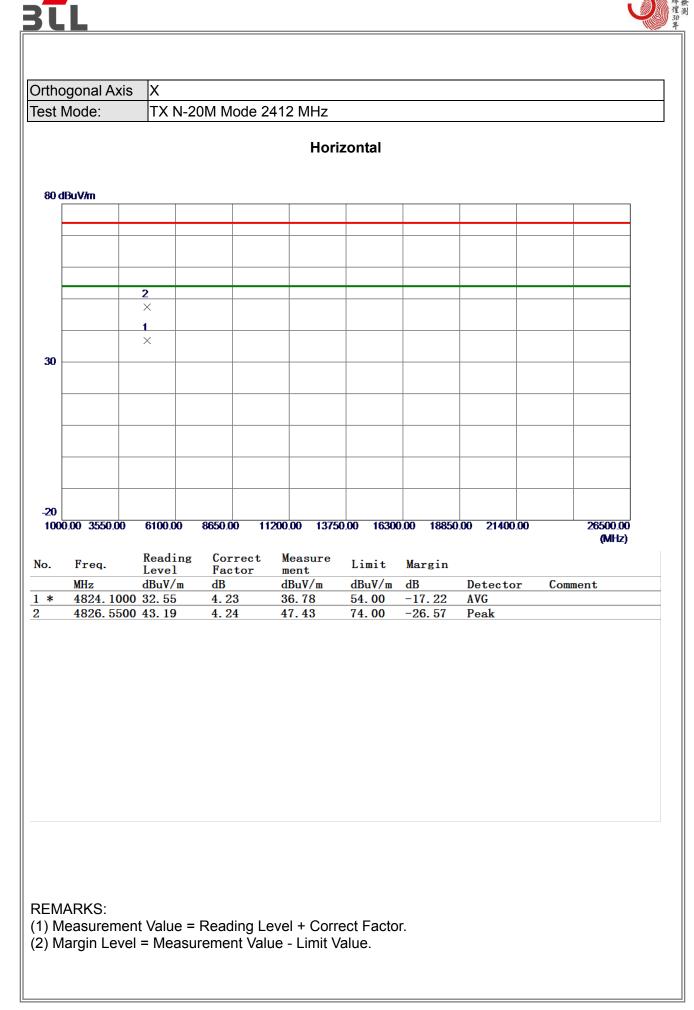


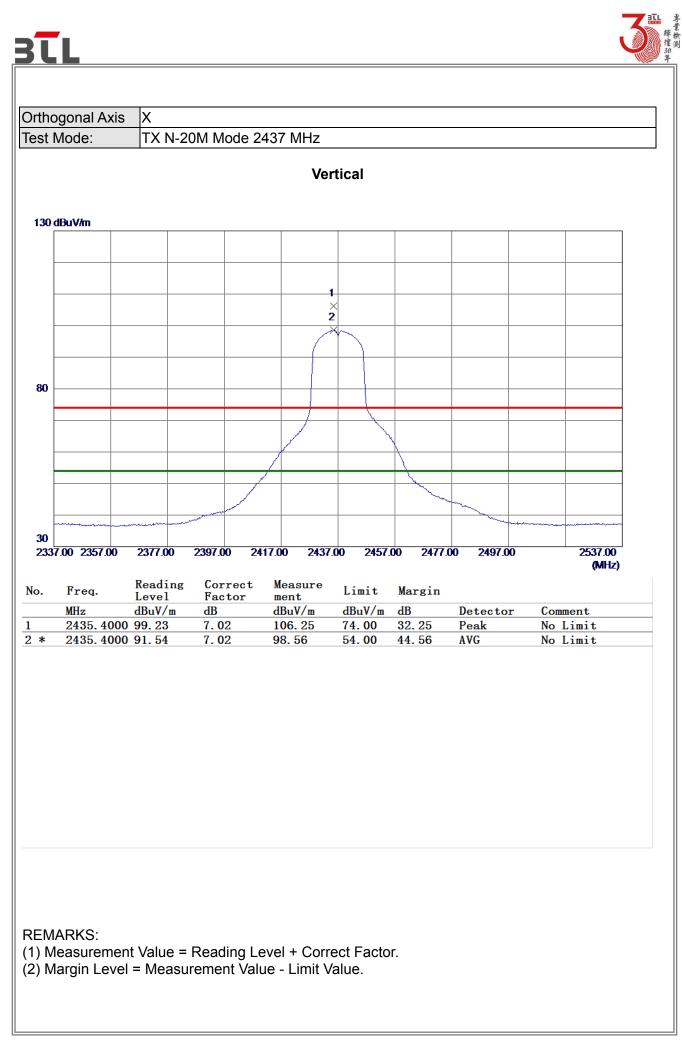


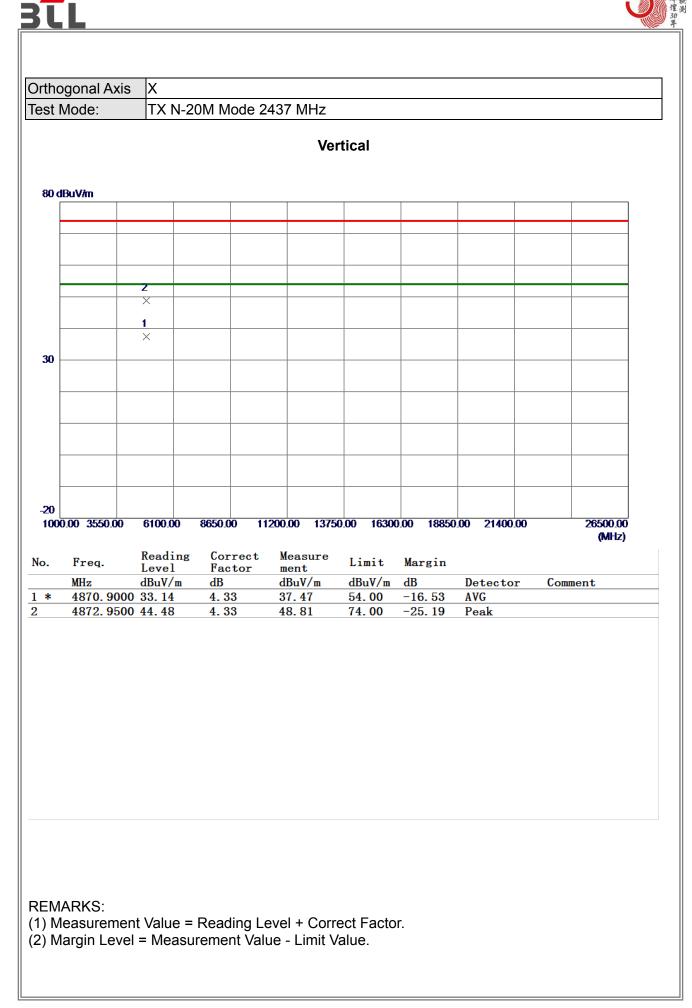


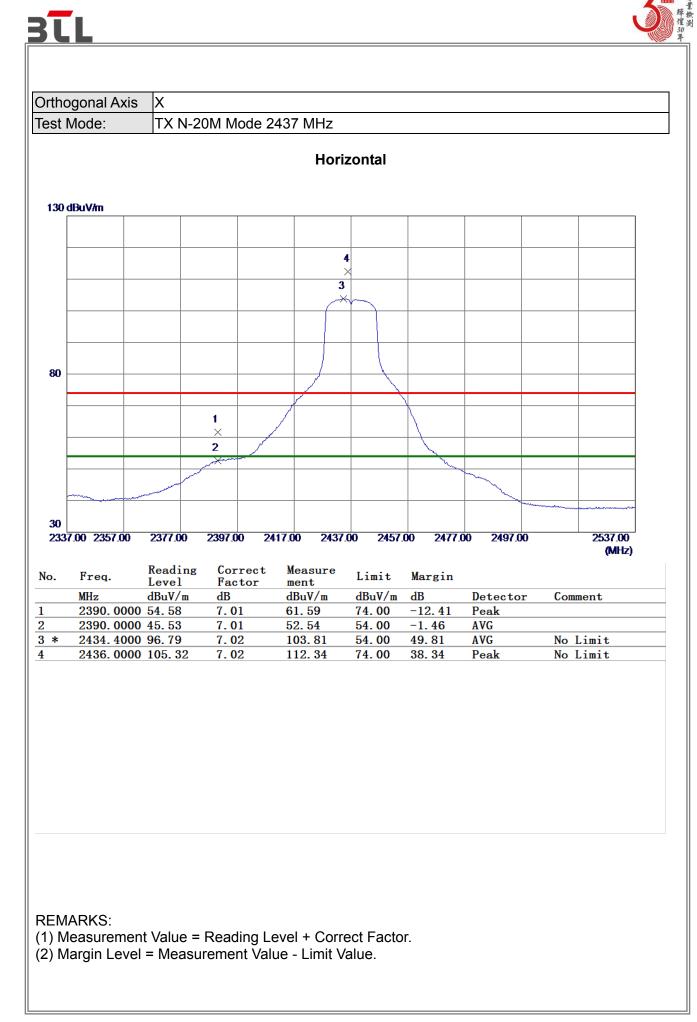


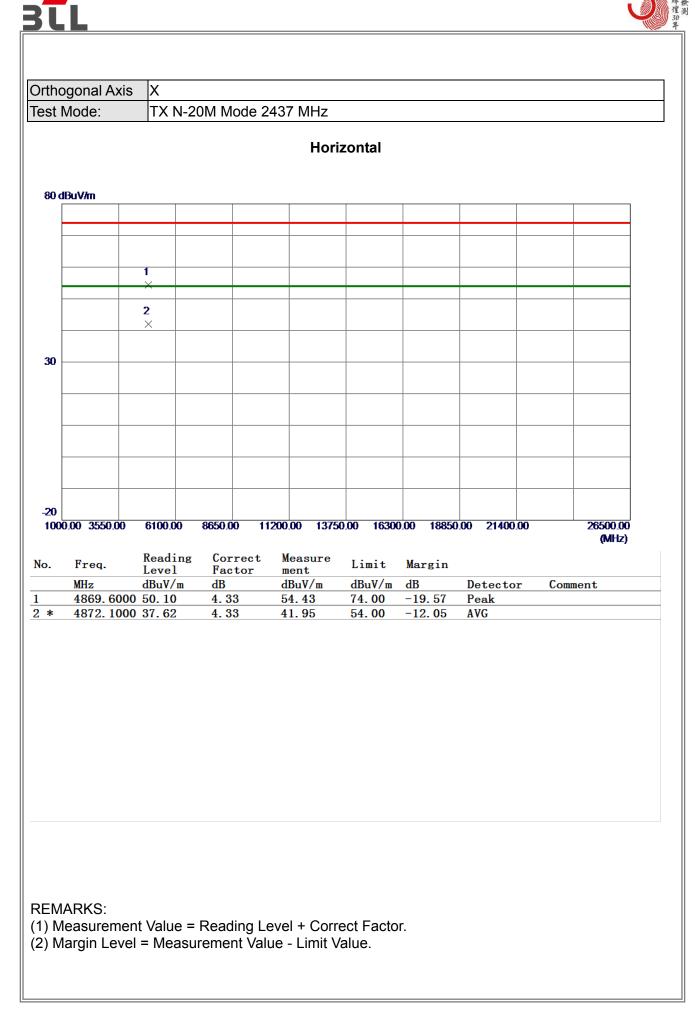


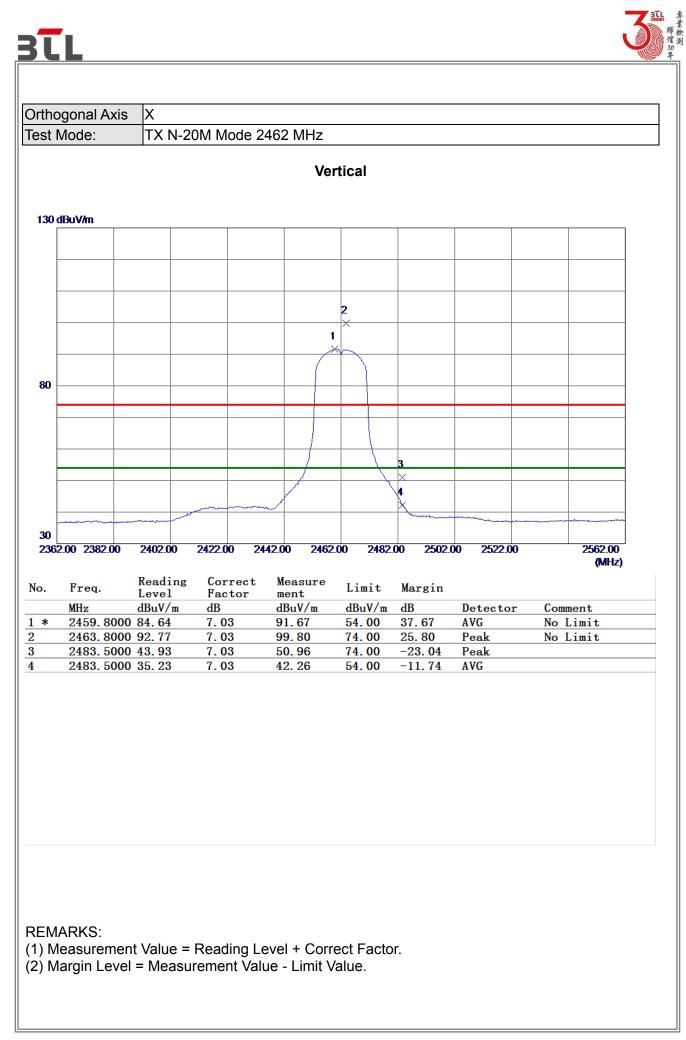


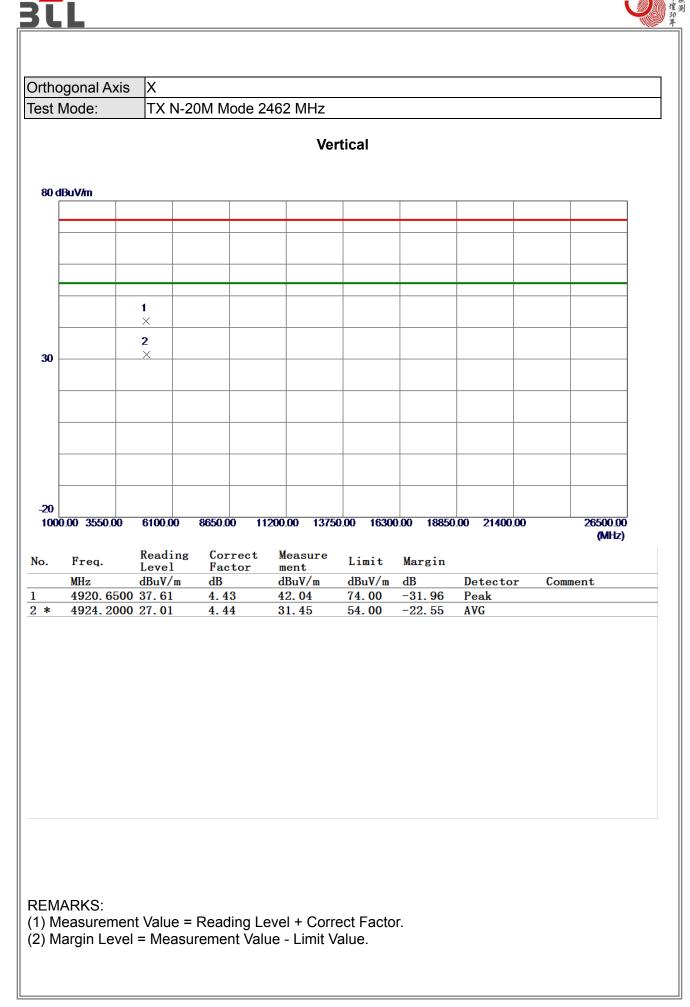






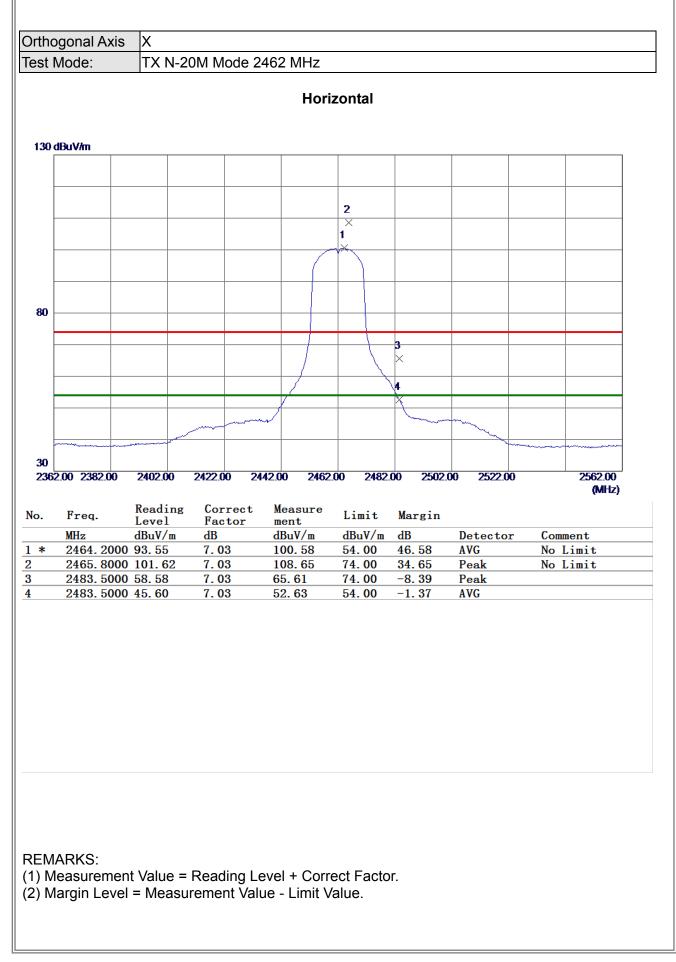


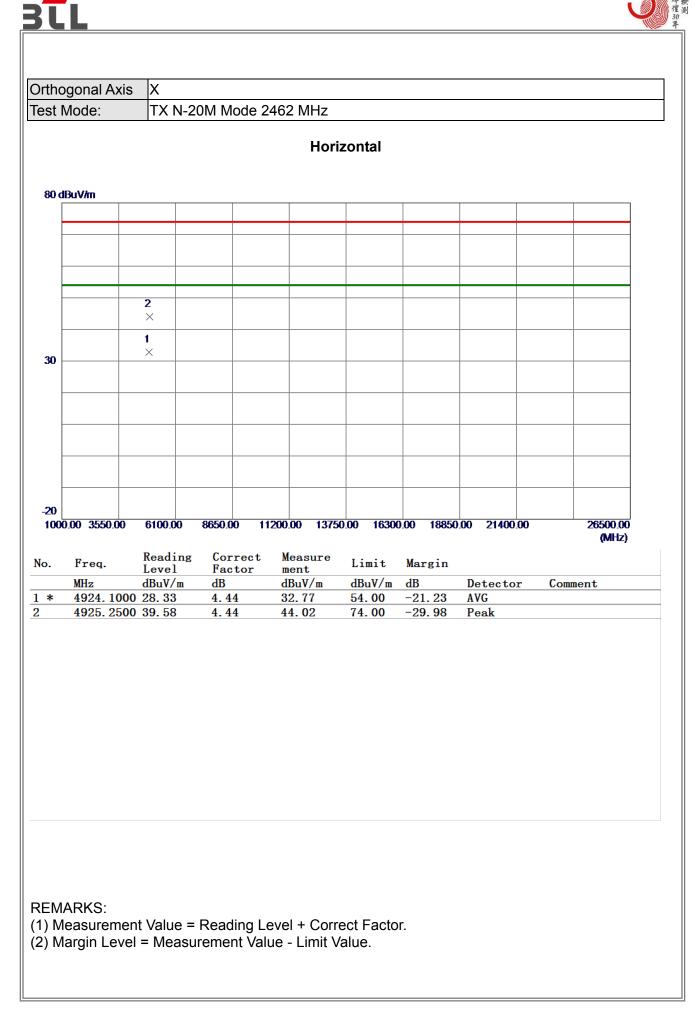






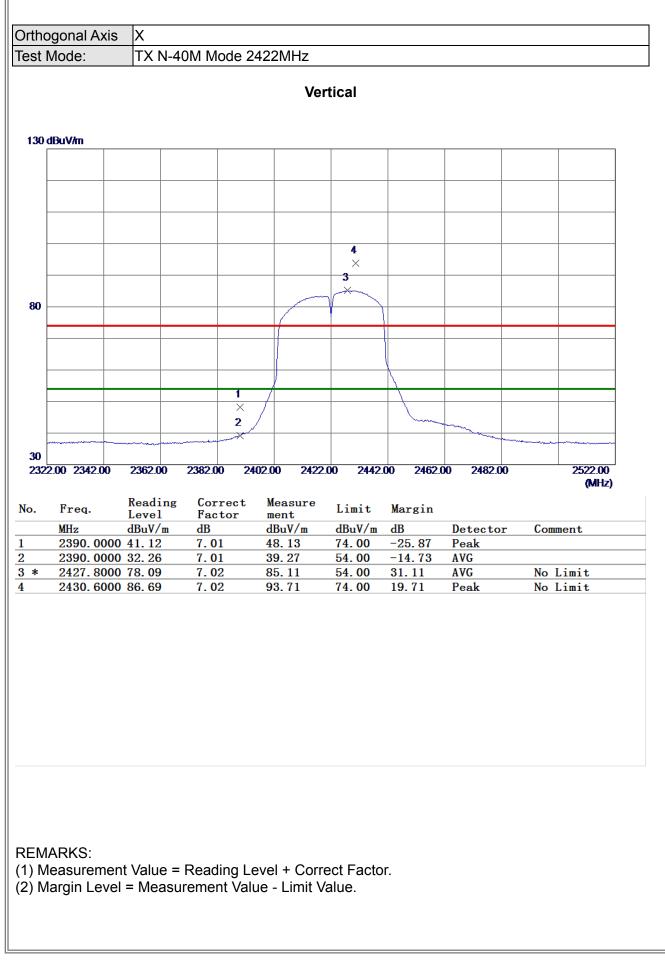


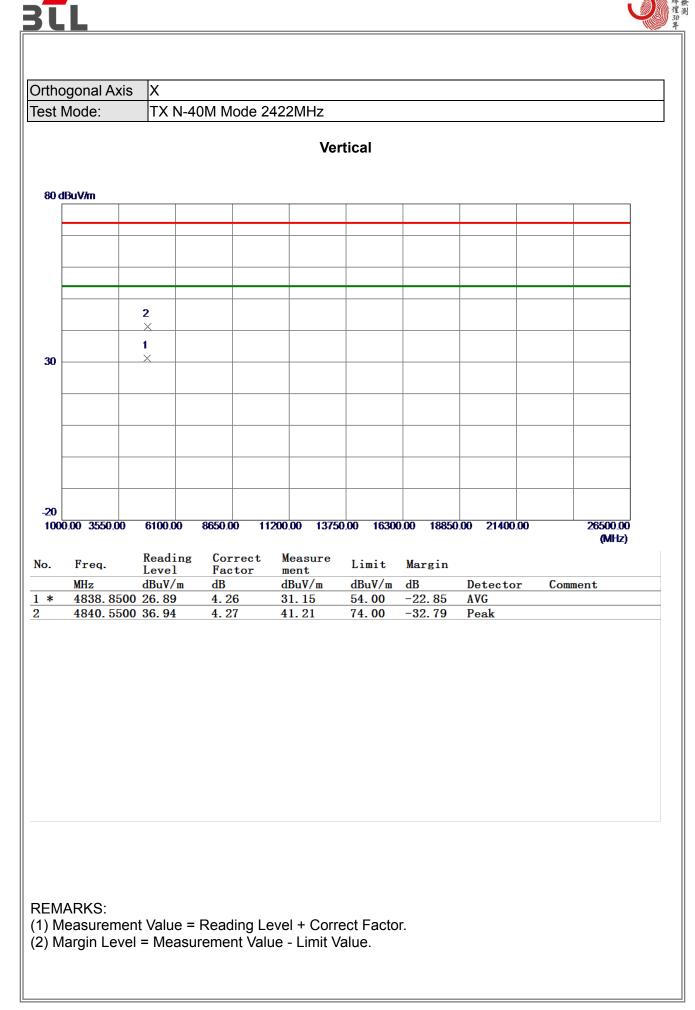






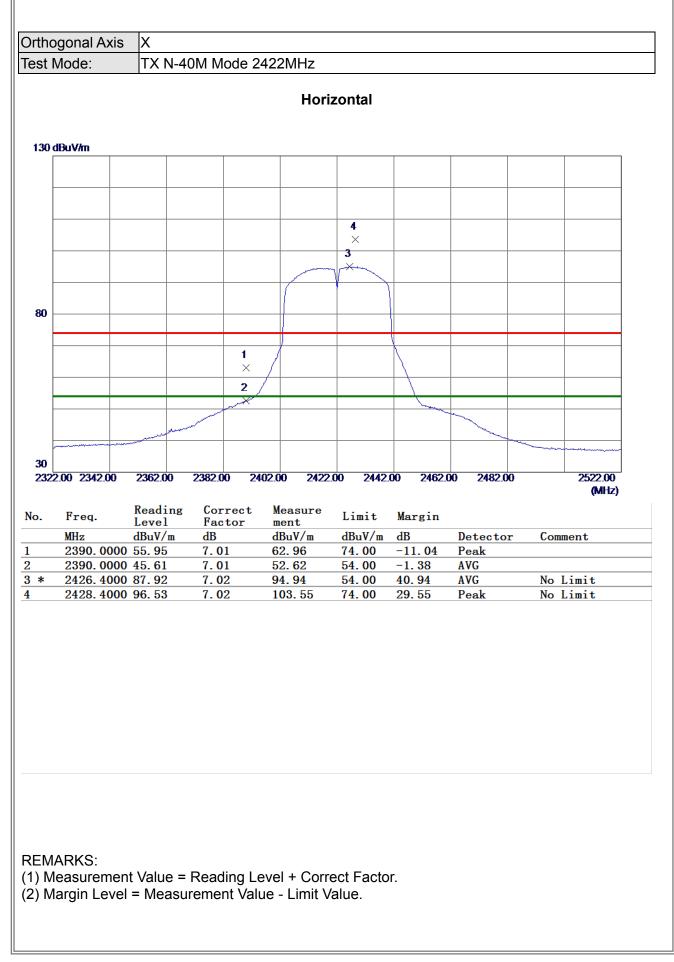


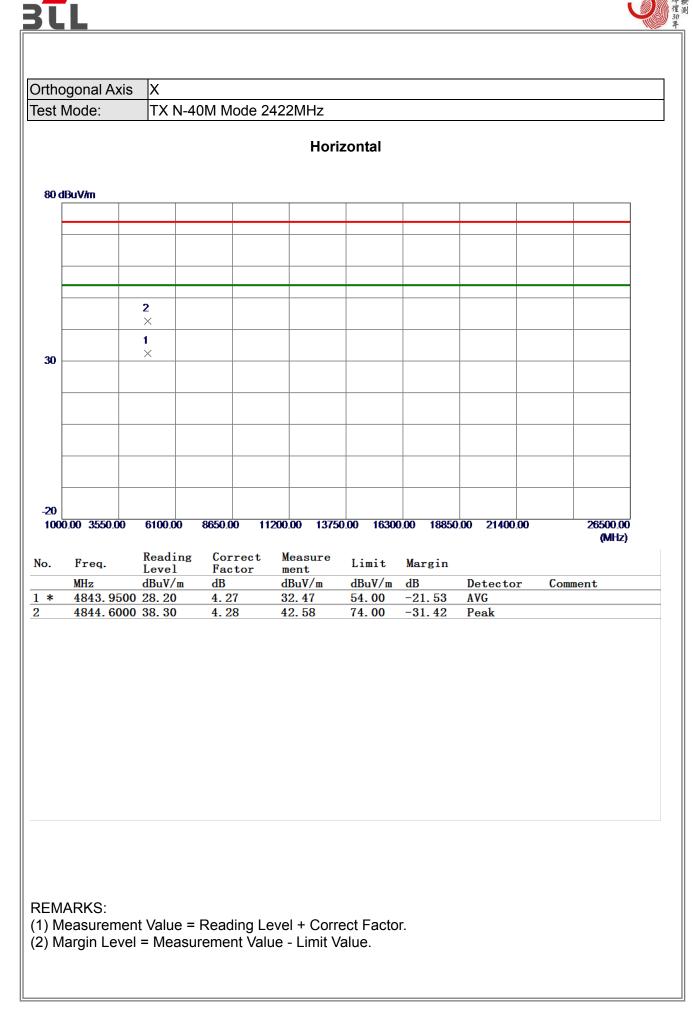


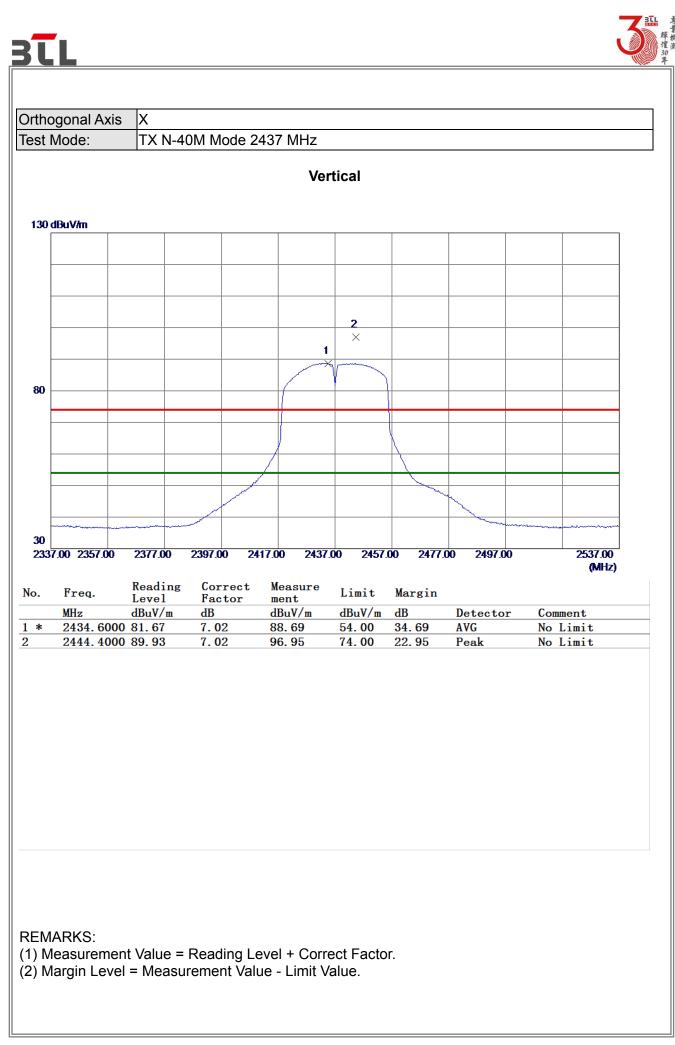


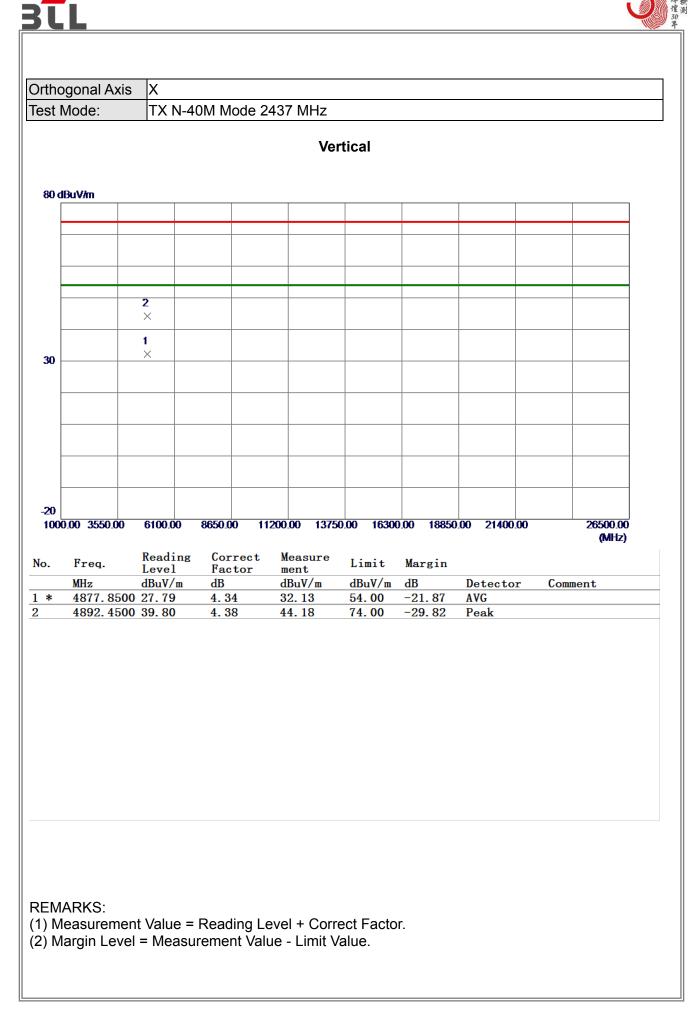






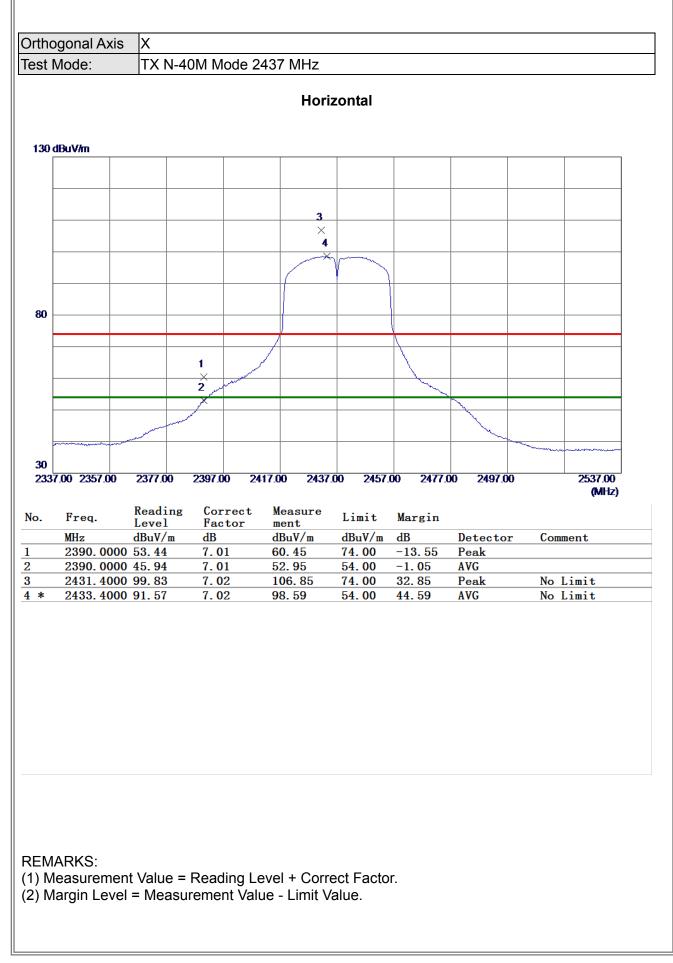


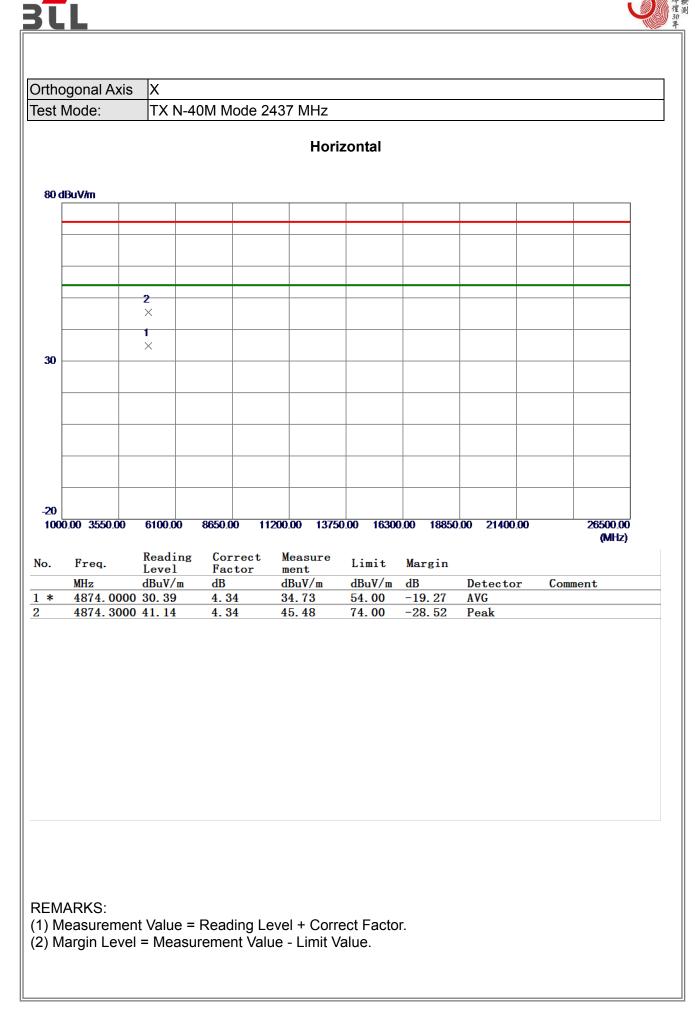


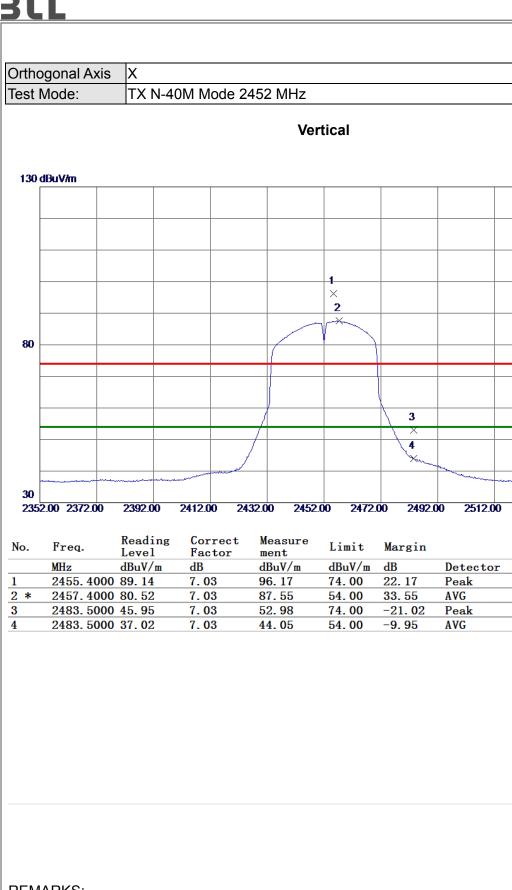












REMARKS:

(1) Measurement Value = Reading Level + Correct Factor.

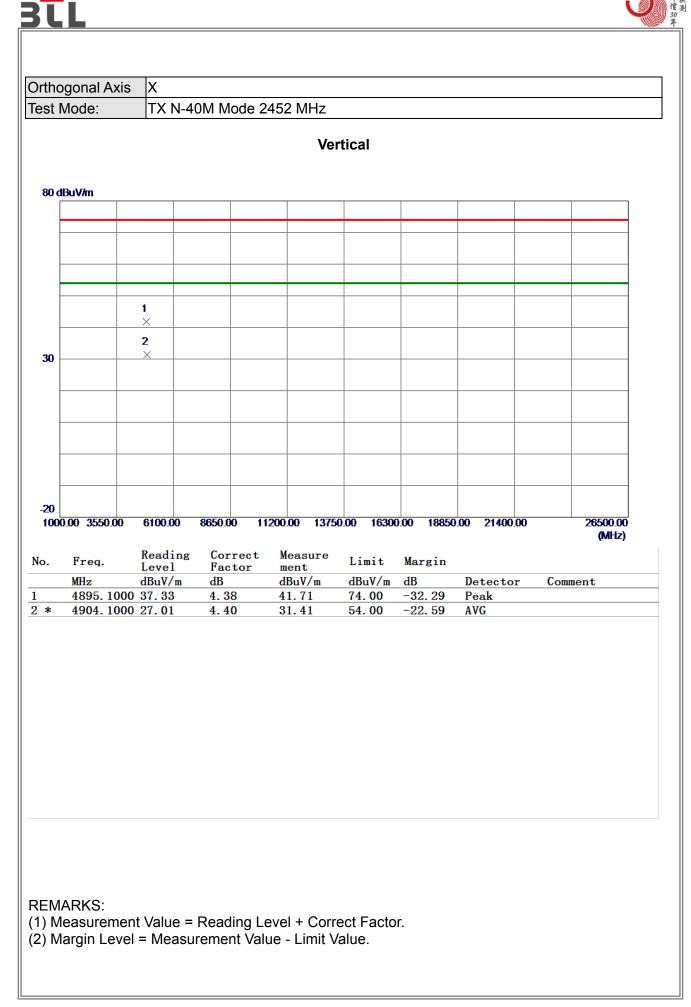
(2) Margin Level = Measurement Value - Limit Value.

2552.00 (MHz)

Comment

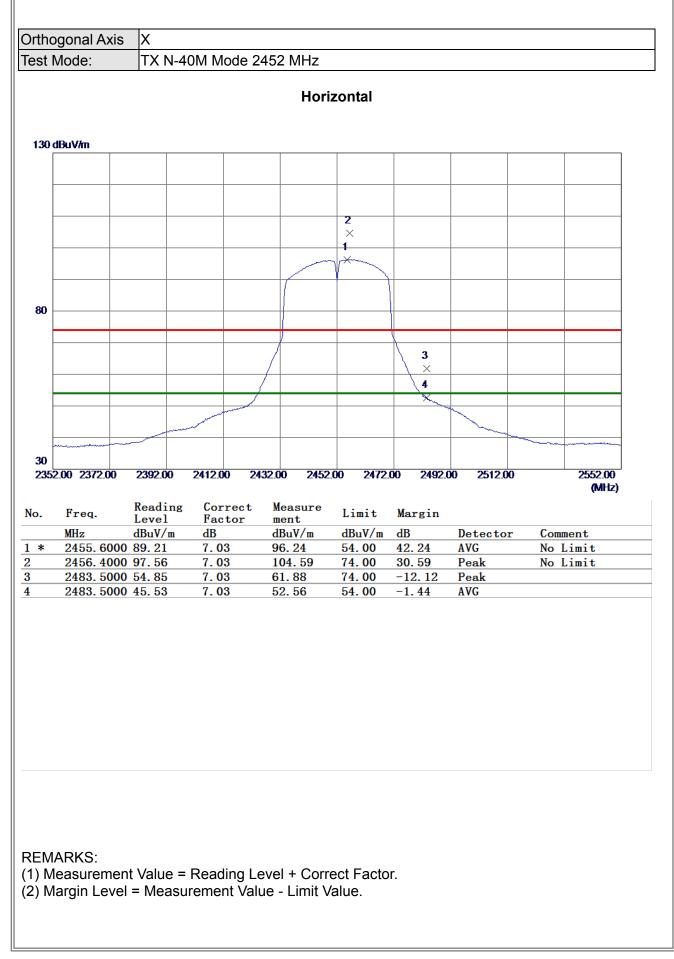
No Limit

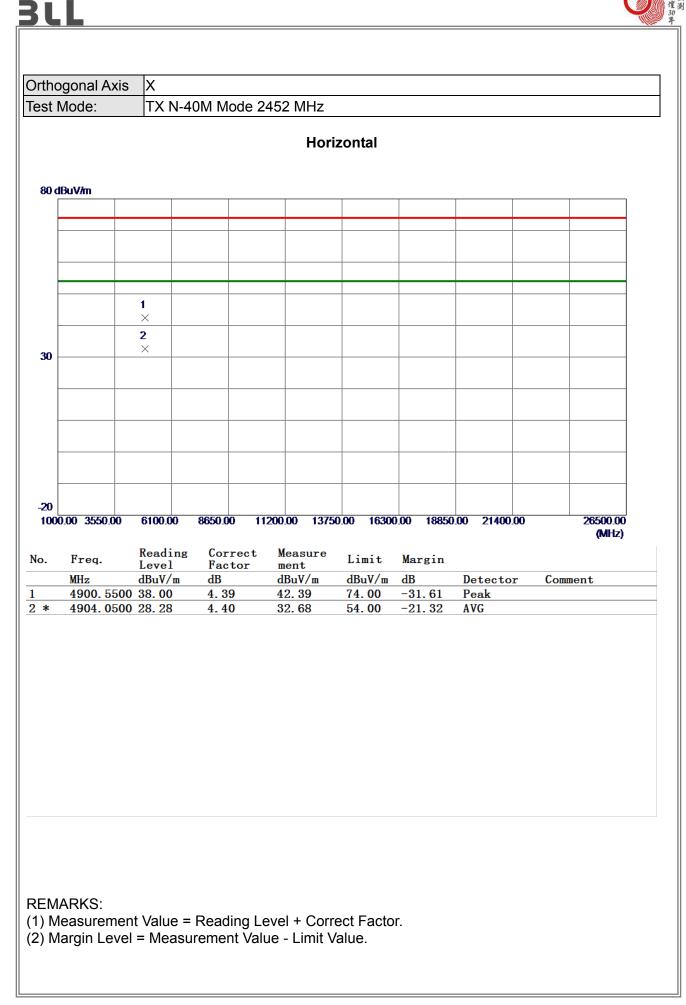
No Limit













## **APPENDIX E - BANDWIDTH**





| Non-Beamforming     |                    |                         |                                  |                                    |  |  |  |  |
|---------------------|--------------------|-------------------------|----------------------------------|------------------------------------|--|--|--|--|
| Test Mode TX B Mode |                    |                         |                                  |                                    |  |  |  |  |
|                     |                    |                         |                                  |                                    |  |  |  |  |
| Channel             | Frequency<br>(MHz) | 6 dB Bandwidth<br>(MHz) | 99 % Emission<br>Bandwidth (MHz) | 6 dB Bandwidth Min.<br>Limit (kHz) | Result   |  |  |  |
| 01                  | 2412               | 9.83                    | 13.40                            | 500                                | Complies   |  |  |  |
| 06                  | 2437               | 9.58                    | 13.48                            | 500                                | Complies   |  |  |  |
| 11                  | 2462               | 10.10                   | 13.60                            | 500                                | Complies   |  |  |  |
| <figure></figure>   |                    |                         |                                  |                                    |  |  |  |  |
|                     | Frequency          | 6 dB Bandwidth          | 99 % Emission                    | 6 dB Bandwidth Min.                |  |  |  |  |
| Channel             | (MHz)              | (MHz)                   | Bandwidth (MHz)                  | Limit (kHz)                        | Result   |  |  |  |
| 01                  | 2412               | 14.15                   | 16.20                            | 500                                | Complies   |  |  |  |
| 06                  | 2437               | 14.12                   | 16.20                            | 500                                | Complies   |  |  |  |
| 11                  | 2462               | 15.12                   | 16.24                            | 500                                | Complies   |  |  |  |
|                     |                    |                         |                                  |                                    | 16.172 - 202 000<br>16.172 - 202 000<br>2.452 - 000 000<br>2.452 - 000 000<br>2.452 - 000 000<br>0.452 - 000 000<br>0.452 - 000 000<br>0.452 - 000 000<br>0.452 - 00 |  |  |  |





| Test Mode TX N (HT20) Mode  |   |  |   |   |   |  |  |
|---|---|--|---|---|---|--|--|
| Channel   | Frequency<br>(MHz)  | 6 dB Bandwidth<br>(MHz)  | 99 % Emission<br>Bandwidth (MHz)  | 6 dB Bandwidth Min.<br>Limit (kHz)  | Result  |  |  |
| 01  | 2412  | 12.68  | 17.24   | 500   | Complies  |  |  |
| 06  | 2437  | 15.12  | 17.32   | 500   | Complies  |  |  |
| 11  | 2462  | 15.08  | 17.40   | 500 Complies  |   |  |  |
| Chere <t< td=""></t<> |   |  |   |   |   |  |  |
| Test Mode   TX N (HT40) Mode     Channel   Frequency (MHz)   6 dB Bandwidth (MHz)   99 % Emission (MHz)   6 dB Bandwidth (MHz)   Result   |   |  |   |   |   |  |  |
| 03  | 2422  | 34.00  | 35.60   | 500   | Complies  |  |  |
| 06  | 2437  | 33.84  | 35.76   | 500   | Complies  |  |  |
| 09  | 2452  | 32.72  | 35.76   | 500   | Complies  |  |  |
| Ref 20 dBm  | CH03<br>*NBM 100 kHz Celts 1 (<br>*VBM 300 kHz<br>*T5 m 3 33.99 | 1.08 dB  | CH06<br>*30 <sup>11</sup> 50 30 <sup>1</sup> 50 | CH09<br>*200 454 M2: D414 1 (T1 )<br>*200 20 45 M2: D414 1 (T1 )<br>*200 20 47 M2: D414 1 (T1 )<br>*200 20 47 M2: D414 1 (T1 )<br>*200 20 47 M2: D414 1 (T1 )   |   |  |  |
| 10 Offine 3 40<br>10  | 4 MEX   | <pre>control of the second sec</pre> | Carry 1, 766-0000 584,<br>Carry 1, 17, 17, 17, 17, 17, 17, 17, 17, 17,  | Not     20 cmm     Att     30 cm     WT 5 mm       10     10     10     10     10     10       10     10     10     10     10     10     10       10     10     10     10     10     10     10     10       10     10     10     10     10     10     10     10       10 | оли 3-1, чезовалют ник<br>статор 1 (22 они)<br>разначения (17)<br>разначения (17)<br>разначни (17)<br>разначения (17) |  |  |
|   |   |  |   |   |   |  |  |





| Beamforming   |  |   |  |  |  |  |  |  |
|---|--|---|--|--|--|--|--|--|
| Test Mode   | e TX N (I  | HT20) Mode                                |  |  |  |  |  |  |
| Channel   | Frequency<br>(MHz)   | 6 dB Bandwidth<br>(MHz)                   | 99 % Emission<br>Bandwidth (MHz)   | 6 dB Bandwidth Min.<br>Limit (kHz)   | Result   |  |  |  |
| 01  | 2412   | 15.16                                     | 17.24  | 500  | Complies   |  |  |  |
| 06  | 2437   | 13.90                                     | 17.40  | 500  | Complies   |  |  |  |
| 11  | 2462   | 14.24                                     | 17.24  | 500  | Complies   |  |  |  |
|   | CH01   |   | CHOC   | CH11   |  |  |  |  |
| Ref 20 dBm  | *REW 100 kHz Delta 1 (   | T1 ]<br>0.73 dB<br>9913000 MHz Ref 20 dBm | CH066<br>*384 100 kHz Celta 1 [T1]<br>*384 300 kHz Celta 1 [T1]<br>*384 300 kHz -0.72 dB<br>-0.72 dB | *RBW 100 kHz<br>*VEW 300 kHz   | Delta 1 [T1 ]<br>0.80 dB<br>14.23995000 MHr  |  |  |  |
| bet 2 0 dm   *At 2 0 dm |  |   |  |  |  |  |  |  |
| Date: 28.FEB.2019 16:43   | Date: 28.FEB.2019 16:43:15 Date: 28.FEB.2019 16:45:48 Date: 28.FEB.2019 16:50:36 |   |  |  |  |  |  |  |
| Test Mode TX N (HT40) Mode  |  |   |  |  |  |  |  |  |
| Channel   | Frequency<br>(MHz)   | 6 dB Bandwidth<br>(MHz)                   | 99 % Emission<br>Bandwidth (MHz)   | 6 dB Bandwidth Min.<br>Limit (kHz)   | Result   |  |  |  |
| 03  | 2422   | 35.16                                     | 35.60  | 500  | Complies   |  |  |  |
| 06  | 2437   | 35.16                                     | 35.68  | 500  | Complies   |  |  |  |
| 09  | 2452   | 31.52                                     | 35.76  | 500  | Complies   |  |  |  |
| 0g   2452     CPL03   0.000     0.000<  |  |   |  | Paf 20 dBm     *Att 30 dB     *(W8 300 kBz       20 dEfact 1 dB     10     10     10 | Salas 3, (17.) -2, 57. (0)   3,1,5380000 Her Her   Market 1, (17.) -   1,0,554000 Her Her   1,0,554000 Her Her   1,0,55400 Her Her   1,0,55400 Her Her   2,0,55400 Her Her   2,0,55400 Her Her   1,0,000 Her Her   2,0,000 Her Her   1,0,000 Her Her |  |  |  |
|   |  |   |  |  |  |  |  |  |





## **APPENDIX F - MAXIMUM OUTPUT POWER**





| Non-Beamforming |                    |                       |                  |                     |                   |          |  |
|-----------------|--------------------|-----------------------|------------------|---------------------|-------------------|----------|--|
| Test Mode       | e TX B Mo          | de                    |                  |                     |                   |          |  |
|                 |                    |                       |                  |                     |                   |          |  |
| Channel         | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |  |
| 01              | 2412               | 18.81                 | 0.0760           | 30.00               | 1.0000            | Complies |  |
| 06              | 2437               | 19.63                 | 0.0918           | 30.00               | 1.0000            | Complies |  |
| 11              | 2462               | 22.25                 | 0.1679           | 30.00               | 1.0000            | Complies |  |
|                 |                    |                       |                  |                     |                   |          |  |
| Test Mode       | e TX G Mo          | ode                   |                  |                     |                   |          |  |
|                 |                    |                       |                  |                     |                   |          |  |
| Channel         | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |  |
| 01              | 2412               | 21.95                 | 0.1567           | 30.00               | 1.0000            | Complies |  |
| 06              | 2437               | 25.56                 | 0.3598           | 30.00               | 1.0000            | Complies |  |
| 11              | 2462               | 22.17                 | 0.1648           | 30.00               | 1.0000            | Complies |  |



11



Complies

| Test Mode | e TX N (H          | T20) Mode_Ant. 1      |                  |                     |                   |          |
|-----------|--------------------|-----------------------|------------------|---------------------|-------------------|----------|
|           |                    |                       |                  |                     |                   |          |
| Channel   | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |
| 01        | 2412               | 21.34                 | 0.1361           | 30.00               | 1.0000            | Complies |
| 06        | 2437               | 25.65                 | 0.3673           | 30.00               | 1.0000            | Complies |

0.1560

30.00

1.0000

Test Mode TX N (HT20) Mode\_Ant. 2

21.93

2462

| Channel | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |
|---------|--------------------|-----------------------|------------------|---------------------|-------------------|----------|
| 01      | 2412               | 20.99                 | 0.1256           | 30.00               | 1.0000            | Complies |
| 06      | 2437               | 26.62                 | 0.4592           | 30.00               | 1.0000            | Complies |
| 11      | 2462               | 21.45                 | 0.1396           | 30.00               | 1.0000            | Complies |

Test Mode TX N (HT20) Mode\_Total

| Channel | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |
|---------|--------------------|-----------------------|------------------|---------------------|-------------------|----------|
| 01      | 2412               | 24.18                 | 0.2618           | 30.00               | 1.0000            | Complies |
| 06      | 2437               | 29.17                 | 0.8260           | 30.00               | 1.0000            | Complies |
| 11      | 2462               | 24.71                 | 0.2958           | 30.00               | 1.0000            | Complies |





| Test Mode | TX N (HT₄ | 40) Mode_Ant. 1 |           |           |
|-----------|-----------|-----------------|-----------|-----------|
|           |           |                 |           |           |
| Erec      | nuency    | Output Power    | Max Limit | Max Limit |

| Channel | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |
|---------|--------------------|-----------------------|------------------|---------------------|-------------------|----------|
| 03      | 2422               | 16.94                 | 0.0494           | 30.00               | 1.0000            | Complies |
| 06      | 2437               | 20.39                 | 0.1094           | 30.00               | 1.0000            | Complies |
| 09      | 2452               | 17.72                 | 0.0592           | 30.00               | 1.0000            | Complies |

### Test Mode TX N (HT40) Mode\_Ant. 2

| Channel | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |
|---------|--------------------|-----------------------|------------------|---------------------|-------------------|----------|
| 03      | 2422               | 16.97                 | 0.0498           | 30.00               | 1.0000            | Complies |
| 06      | 2437               | 20.51                 | 0.1125           | 30.00               | 1.0000            | Complies |
| 09      | 2452               | 17.55                 | 0.0569           | 30.00               | 1.0000            | Complies |

### Test Mode TX N (HT40) Mode\_Total

| Channel | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |
|---------|--------------------|-----------------------|------------------|---------------------|-------------------|----------|
| 03      | 2422               | 19.97                 | 0.0993           | 30.00               | 1.0000            | Complies |
| 06      | 2437               | 23.46                 | 0.2218           | 30.00               | 1.0000            | Complies |
| 09      | 2452               | 20.65                 | 0.1161           | 30.00               | 1.0000            | Complies |





| With Beamforming |                    |                       |                  |                     |                   |          |  |
|------------------|--------------------|-----------------------|------------------|---------------------|-------------------|----------|--|
| Test Mode        | e TX N (H          | T20) Mode_Ant. 1      |                  |                     |                   |          |  |
|                  |                    |                       |                  |                     |                   |          |  |
| Channel          | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |  |
| 01               | 2412               | 21.16                 | 0.1306           | 30.00               | 1.0000            | Complies |  |
| 06               | 2437               | 25.49                 | 0.3540           | 30.00               | 1.0000            | Complies |  |
| 11               | 2462               | 21.74                 | 0.1493           | 30.00               | 1.0000            | Complies |  |
|                  |                    |                       |                  |                     |                   |          |  |
| Test Mode        | e TX N (H          | T20) Mode_Ant. 2      |                  |                     |                   |          |  |
|                  |                    |                       |                  |                     |                   |          |  |
| Channel          | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |  |
| 01               | 2412               | 21.03                 | 0.1268           | 30.00               | 1.0000            | Complies |  |
| 06               | 2437               | 26.34                 | 0.4305           | 30.00               | 1.0000            | Complies |  |
| 11               | 2462               | 21.38                 | 0.1374           | 30.00               | 1.0000            | Complies |  |
| _                |                    |                       |                  |                     |                   |          |  |
| Test Mode        | e TX N (H          | T20) Mode_Total       |                  |                     |                   |          |  |
|                  |                    |                       |                  |                     |                   |          |  |
| Channel          | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |  |
| 01               | 2412               | 24.11                 | 0.2576           | 30.00               | 1.0000            | Complies |  |
| 06               | 2437               | 28.95                 | 0.7852           | 30.00               | 1.0000            | Complies |  |
| 11               | 2462               | 24.57                 | 0.2864           | 30.00               | 1.0000            | Complies |  |





| Test Mode TX N (HT40) Mode_Ant. 1 |                    |                       |                  |                     |                   |          |
|-----------------------------------|--------------------|-----------------------|------------------|---------------------|-------------------|----------|
|                                   |                    |                       |                  |                     |                   |          |
| Channel                           | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |
| 00                                | 0400               | 40.07                 | 0.0405           | 20.00               | 4 0000            | Comulias |

| 03 | 2422 | 16.67 | 0.0465 | 30.00 | 1.0000 | Complies |
|----|------|-------|--------|-------|--------|----------|
| 06 | 2437 | 20.31 | 0.1074 | 30.00 | 1.0000 | Complies |
| 09 | 2452 | 17.56 | 0.0570 | 30.00 | 1.0000 | Complies |
|    |      |       |        |       |        |          |

#### Test Mode TX N (HT40) Mode\_Ant. 2

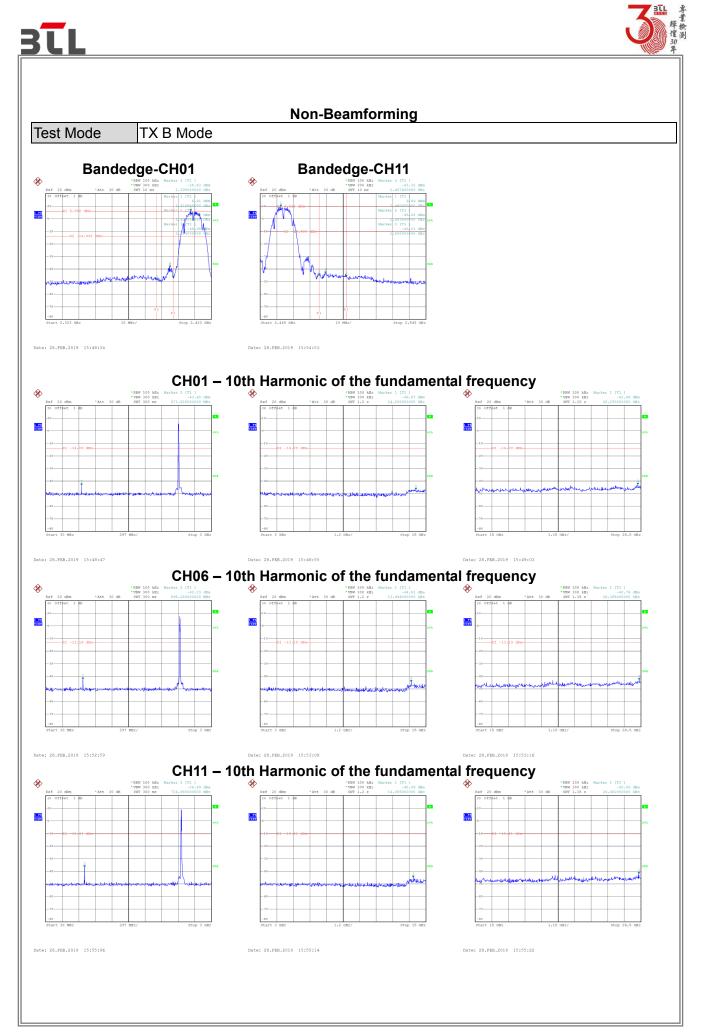
| Channel | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |
|---------|--------------------|-----------------------|------------------|---------------------|-------------------|----------|
| 03      | 2422               | 16.63                 | 0.0460           | 30.00               | 1.0000            | Complies |
| 06      | 2437               | 20.42                 | 0.1102           | 30.00               | 1.0000            | Complies |
| 09      | 2452               | 17.39                 | 0.0548           | 30.00               | 1.0000            | Complies |

### Test Mode TX N (HT40) Mode\_Total

| Channel | Frequency<br>(MHz) | Output Power<br>(dBm) | Output Power (W) | Max. Limit<br>(dBm) | Max. Limit<br>(W) | Result   |
|---------|--------------------|-----------------------|------------------|---------------------|-------------------|----------|
| 03      | 2422               | 19.66                 | 0.0925           | 30.00               | 1.0000            | Complies |
| 06      | 2437               | 23.38                 | 0.2178           | 30.00               | 1.0000            | Complies |
| 09      | 2452               | 20.49                 | 0.1119           | 30.00               | 1.0000            | Complies |



# **APPENDIX G - CONDUCTED SPURIOUS EMISSIONS**



Report No.: BTL-FCCP-1-1901C127

