



## Shenzhen Asia Test Technology Co., Ltd.

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# FCC RADIO TEST REPORT

## FCC ID: 2AFHYCT868

**Product :** Smart Home(WiFi camera)

**Trade Name :** HUANSO

**Model Name :** CT868W-SH

**Serial Model :** CT568W, CT518W, SK001W, SS001W,  
SS002W, SS003W, SS004W, SS005W,  
CT518W-SH, CT568W-SH, CT768W-SH,  
CT878W-SH, CT888W-SH, CT868W, CT768W,  
CT878W, CT888W, SK002W, SS006W,  
SS007W, SS008W, SS009W

### Prepared for

ZHUHAI HUANSO INDUSTRIAL CO., LTD.

2F, No.8, Jingyuan Road, Jida Industrial Park, Jida, 519015, Xiangzhou, Zhuhai,  
Guangdong, China

### Prepared by

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# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 2 of 51 -

## TEST RESULT CERTIFICATION

**Manufacture's Name...** ZHUHAI HUANSO INDUSTRIAL CO., LTD.

**Address .....** 2F, No.8, Jingyuan Road, Jida Industrial Park, Jida, 519015, Xiangzhou, Zhuhai, Guangdong, China

### Product description

**Product name .....** Smart Home(WiFi camera)

**Model and/or type reference .....** CT868W-SH

**Additional Model .....** CT568W, CT518W, SK001W, SS001W, SS002W, SS003W, SS004W, SS005W, CT518W-SH, CT568W-SH, CT768W-SH, CT878W-SH, CT888W-SH, CT868W, CT768W, CT878W, CT888W, SK002W, SS006W, SS007W, SS008W, SS009W

**Standards .....** FCC Part15.247

**Test procedure .....** ANSI C63.4-2003

This device described above has been tested by ATT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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**Date of Test .....**

**Date (s) of performance of tests .....** Jun. 08 2015 ~Jun. 24 2015

**Date of Issue .....** Jun. 24 2015

**Test Result .....** **Pass**

Testing Engineer :

(Jack Yu)

Technical Manager :

(Jerry You)

Authorized Signatory :

(Can Liu)

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# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 3 of 51 -

| Table of Contents                                           | Page      |
|-------------------------------------------------------------|-----------|
| <b>1 . SUMMARY OF TEST RESULTS</b>                          | <b>5</b>  |
| 1.1 TEST FACILITY                                           | 6         |
| 1.2 MEASUREMENT UNCERTAINTY                                 | 6         |
| <b>2 . GENERAL INFORMATION</b>                              | <b>7</b>  |
| 2.1 GENERAL DESCRIPTION OF EUT                              | 7         |
| 2.2 DESCRIPTION OF TEST MODES                               | 9         |
| 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED | 10        |
| 2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)            | 11        |
| 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS                      | 12        |
| <b>3 . EMC EMISSION TEST</b>                                | <b>13</b> |
| 3.1 CONDUCTED EMISSION MEASUREMENT                          | 13        |
| 3.1.1 POWER LINE CONDUCTED EMISSION LIMITS                  | 13        |
| 3.1.2 TEST PROCEDURE                                        | 14        |
| 3.1.3 DEVIATION FROM TEST STANDARD                          | 14        |
| 3.1.4 TEST SETUP                                            | 14        |
| 3.1.5 EUT OPERATING CONDITIONS                              | 14        |
| 3.1.6 TEST RESULTS                                          | 15        |
| 3.2 RADIATED EMISSION MEASUREMENT                           | 17        |
| 3.2.1 RADIATED EMISSION LIMITS                              | 17        |
| 3.2.2 TEST PROCEDURE                                        | 17        |
| 3.2.3 DEVIATION FROM TEST STANDARD                          | 18        |
| 3.2.4 TEST SETUP                                            | 19        |
| 3.2.5 EUT OPERATING CONDITIONS                              | 20        |
| 3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)                  | 21        |
| 3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)                   | 22        |
| 3.2.8 TEST RESULTS (ABOVE 1000 MHZ)                         | 23        |
| <b>4 . POWER SPECTRAL DENSITY TEST</b>                      | <b>33</b> |
| 4.1 APPLIED PROCEDURES / LIMIT                              | 33        |
| 4.1.1 TEST PROCEDURE                                        | 33        |
| 4.1.2 DEVIATION FROM STANDARD                               | 33        |
| 4.1.3 TEST SETUP                                            | 33        |



# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 4 of 51 -

| Table of Contents                                  | Page |
|----------------------------------------------------|------|
| 4.1.4 EUT OPERATION CONDITIONS                     | 33   |
| 4.1.5 TEST RESULTS                                 | 34   |
| 5 . BANDWIDTH TEST                                 | 38   |
| 5.1 APPLIED PROCEDURES / LIMIT                     | 38   |
| 5.1.1 TEST PROCEDURE                               | 38   |
| 5.1.2 EUT OPERATION CONDITIONS                     | 38   |
| 5.1.3 TEST RESULTS                                 | 39   |
| 6 . PEAK OUTPUT POWER TEST                         | 43   |
| 6.1 APPLIED PROCEDURES / LIMIT                     | 43   |
| 6.1.1 TEST PROCEDURE                               | 43   |
| 6.1.2 DEVIATION FROM STANDARD                      | 43   |
| 6.1.3 TEST SETUP                                   | 43   |
| 6.1.4 EUT OPERATION CONDITIONS                     | 43   |
| 6.1.5 TEST RESULTS                                 | 44   |
| 7 . 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE       | 45   |
| 7.1 DEVIATION FROM STANDARD                        | 45   |
| 7.2 TEST SETUP                                     | 45   |
| 7.3 EUT OPERATION CONDITIONS                       | 45   |
| 7.4 TEST RESULTS                                   | 46   |
| 8 . ANTENNA REQUIREMENT                            | 49   |
| 8.1 STANDARD REQUIREMENT                           | 49   |
| 8.2 EUT ANTENNA                                    | 49   |
| 9 . EUT TEST PHOTO                                 | 50   |
| APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS |      |



## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15 (15.247) |                            |          |        |
|---------------------|----------------------------|----------|--------|
| Standard Section    | Test Item                  | Judgment | Remark |
| 15.207              | Conducted Emission         | PASS     |        |
| 15.247 (a)(2)       | 6dB Bandwidth              | PASS     |        |
| 15.247 (b)          | Peak Output Power          | PASS     |        |
| 15.247 (c)          | Radiated Spurious Emission | PASS     |        |
| 15.247 (d)          | Power Spectral Density     | PASS     |        |
| 15.205              | Band Edge Emission         | PASS     |        |
| 15.203              | Antenna Requirement        | PASS     |        |

### NOTE:

(1) "N/A" denotes test is not applicable in this Test Report



# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 6 of 51 -

## 1.1 TEST FACILITY

Asia Institute Technology (DongGuan) Limited  
No. 22,JinQianLing Street 3, JiTiGang Village, Huang-Jiang Town, DongGuan, Guangdong,  
523757 China  
FCC Registration No.: 248337

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

| No. | Item                         | Uncertainty               |
|-----|------------------------------|---------------------------|
| 1   | Conducted Emission Test      | $\pm 1.38\text{dB}$       |
| 2   | RF power,conducted           | $\pm 0.16\text{dB}$       |
| 3   | Spurious emissions,conducted | $\pm 0.21\text{dB}$       |
| 4   | All emissions,radiated(<1G)  | $\pm 4.68\text{dB}$       |
| 5   | All emissions,radiated(>1G)  | $\pm 4.89\text{dB}$       |
| 6   | Temperature                  | $\pm 0.5^{\circ}\text{C}$ |
| 7   | Humidity                     | $\pm 2\%$                 |



## Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 7 of 51 -

### 2. GENERAL INFORMATION

#### 2.1 GENERAL DESCRIPTION OF EUT

|                     |                                                                                                                                                                                                                    |                                                              |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Equipment           | Smart Home(WiFi camera)                                                                                                                                                                                            |                                                              |
| Model Name          | CT868W-SH                                                                                                                                                                                                          |                                                              |
| Serial number       | S500023                                                                                                                                                                                                            |                                                              |
| Serial Model        | CT568W, CT518W, SK001W, SS001W, SS002W, SS003W, SS004W, SS005W, CT518W-SH, CT568W-SH, CT768W-SH, CT878W-SH, CT888W-SH, CT868W, CT768W, CT878W, CT888W, SK002W, SS006W, SS007W, SS008W, SS009W                      |                                                              |
| Model Difference    | All models are identical except model name.                                                                                                                                                                        |                                                              |
| Product Description | The EUT is a Smart Home(WiFi camera)                                                                                                                                                                               |                                                              |
|                     | Operation Frequency:                                                                                                                                                                                               | 802.11b/g: 2412~2462MHz                                      |
|                     | Modulation Type:                                                                                                                                                                                                   | CCK/OFDM/DBPSK/DAPSK                                         |
|                     | Bit Rate of Transmitter                                                                                                                                                                                            | 802.11b:11/5.5/2/1 Mbps<br>802.11g:54/48/36/24/18/12/9/6Mbps |
|                     | Number Of Channel                                                                                                                                                                                                  | 802.11b/g:11CH                                               |
|                     | Antenna Designation:                                                                                                                                                                                               | Please see Note 3.                                           |
|                     | Output Power(Conducted):                                                                                                                                                                                           | 802.11b: 9.46 dBm (Max. AV)<br>802.11g: 8.79 dBm (Max. AV)   |
|                     | Antenna Gain (dBi)                                                                                                                                                                                                 | 0dbi                                                         |
|                     | Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual. |                                                              |
| Channel List        | Please refer to the Note 2.                                                                                                                                                                                        |                                                              |
| Ratings             | 12.0Vdc                                                                                                                                                                                                            |                                                              |
| Adapter             | M/N:CS-1201000<br>Input:AC100-240V, 50/60 Hz, 0.5A<br>Output:DC 12V, 1A                                                                                                                                            |                                                              |
| Battery             | N/A                                                                                                                                                                                                                |                                                              |
| HW:                 | APZ_5350_AOP_201504                                                                                                                                                                                                |                                                              |
| SW:                 | CTHY_0500_V1.1                                                                                                                                                                                                     |                                                              |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

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## Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 8 of 51 -

2.

| Channel List for 802.11b/g |                 |         |                 |         |                 |         |                 |
|----------------------------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| Channel                    | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 01                         | 2412            | 04      | 2427            | 07      | 2442            | 10      | 2457            |
| 02                         | 2417            | 05      | 2432            | 08      | 2447            | 11      | 2462            |
| 03                         | 2422            | 06      | 2437            | 09      | 2452            |         |                 |

3.

Table for Filed Antenna

| Ant | Brand | Model Name | Antenna Type   | Connector      | Gain (dBi) | NOTE         |
|-----|-------|------------|----------------|----------------|------------|--------------|
| A   | N/A   | N/A        | dipole antenna | ipex connector | 0          | Wifi Antenna |



## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description            |
|--------------|------------------------|
| Mode 1       | 802.11b CH1/ CH6/ CH11 |
| Mode 2       | 802.11g CH1/ CH6/ CH11 |
| Mode 3       | Link Mode              |

| For Conducted Emission |             |
|------------------------|-------------|
| Final Test Mode        | Description |
| Mode 3                 | Link Mode   |

| For Radiated Emission |                        |
|-----------------------|------------------------|
| Final Test Mode       | Description            |
| Mode 1                | 802.11b CH1/ CH6/ CH11 |
| Mode 2                | 802.11g CH1/ CH6/ CH11 |

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported. The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.
- (3) measurements are performed according to the KDB 558074 D01 DTS Meas Guidance v03r03

| Test Items                                                                                                                                                                               | Mode     | Data Rate | Channel |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|---------|
| Maximum Peak Conducted Output Power<br>Power Spectral Density<br>6dB Bandwidth<br>Spurious RF conducted emission<br>Radiated Emission 9kHz~1GHz&<br>Radiated Emission 1GHz~10th Harmonic | 11b/DSSS | 1 Mbps    | 1/6/11  |
|                                                                                                                                                                                          | 11g/OFDM | 6 Mbps    | 1/6/11  |
| Band Edge                                                                                                                                                                                | 11b/DSSS | 1 Mbps    | 1/11    |
|                                                                                                                                                                                          | 11g/OFDM | 6 Mbps    | 1/11    |



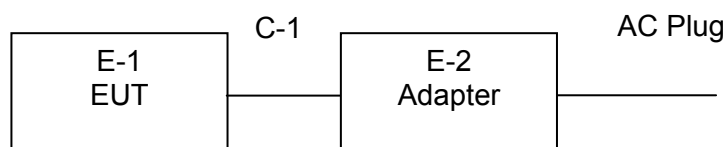
## Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 10 of 51 -

NOTE: Typical working modes for each IEEE 802.11 mode are selected to perform tests. The manufacturer provide special test software(LLKY\_5350\_TEST) to control TX duty cycle >98% for TX test. set the output power to 13dbm(PK) for test.

| Test Mode | Test Modes Description                                 |
|-----------|--------------------------------------------------------|
| 11b       | IEEE 802.11b with data rate of 1 Mbps using SISO mode. |
| 11g       | IEEE 802.11g with data rate of 6 Mbps using SISO mode. |

### 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED





## 2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment               | Brand  | Model/Type No. | Series No. | Note |
|------|-------------------------|--------|----------------|------------|------|
| E-1  | Smart Home(WiFi camera) | HUANSO | CT868W-SH      | N/A        | EUT  |
| E-2  | Adapter                 | N/A    | CS-1201000     | N/A        |      |
|      |                         |        |                |            |      |
|      |                         |        |                |            |      |
|      |                         |        |                |            |      |
|      |                         |        |                |            |      |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
| C-1  | NO            | NO           | 0.8m   |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 12 of 51 -

## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS For Conducted Test (In Shielded Room)

| Item | Equipment           | Manufacturer | Model No. | Serial No. | Last Cal.  | Cal. Interval |
|------|---------------------|--------------|-----------|------------|------------|---------------|
| 1    | EMI Receiver        | R&S          | ESCI      | 100124     | 2014.06.26 | 1Y            |
| 2    | L.I.S.N.#1          | Kyoritsu     | KNW-242   | 8-837-4    | 2014.06.26 | 1Y            |
| 3    | L.I.S.N.#2          | Kyoritsu     | KNW-407   | 8-1789-4   | 2014.06.26 | 1Y            |
| 4    | Coaxial Switch      | Anritsu      | MP59B     | 6200264417 | 2014.06.26 | 6M            |
| 5    | Cable<br>0.09-30MHz | N/A          | AIT005    | C001       | 2014.07.10 | 1 Y           |

## For Radiation Test and other conducted test (bandwidth,output power, power spectral density)

| Item | Equipment              | Manufacturer | Model No.        | Serial No. | Last Cal.  | Cal. Interval |
|------|------------------------|--------------|------------------|------------|------------|---------------|
| 1    | Spectrum Analyzer      | ADVANTEST    | R3182            | 150900201  | 2014.06.26 | 1Y            |
| 2    | EMI Measuring Receiver | R&S          | ESR              | 101160     | 2014.06.26 | 1Y            |
| 3    | Preamplifier           | Tsj          | MLA-10K01-B01-27 | 1205323    | 2014.06.26 | 1Y            |
| 4    | Preamplifier           | Tsj          | MLA-0120-A02-34  | 2648A04738 | 2014.12.02 | 1Y            |
| 5    | Bilog Antenna          | SCHWARZBECK  | VULB9160         | 3206       | 2014.12.03 | 1Y            |
| 6    | Horn Antenna           | SCHWARZBECK  | BBHA 9120D       | 452        | 2014.12.03 | 1Y            |
| 7    | Horn Ant               | Schwarzbeck  | BBHA 9170        | 9170-181   | 2015.05.29 | 1 Y           |
| 8    | Loop Antenna           | TESEQ        | HLA6120          | 35779      | 2015.05.29 | 1 Y           |
| 9    | Coaxial Switch         | Anritsu      | MP59B            | 6200264416 | 2015.03.25 | 6M            |
| 10   | Power Mete             | Anritsu      | ML2487B          | 110553     | 2014.07.10 | 1Y            |
| 11   | Power Sensor           | Anritsu      | MA2411B          | 100345     | 2014.07.10 | 1Y            |
| 12   | Cable below 30MHz      | N/A          | AIT005           | R005       | 2014.07.10 | 1Y            |
| 13   | RF Cabl<br>30-1000MHz  | N/A          | AIT001           | R001       | 2014.07.10 | 1Y            |
| 14   | RF Cabl<br>1-25GHz     | N/A          | AIT001           | R001       | 2014.07.10 | 1Y            |

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### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Class A (dBuV) |         | Class B (dBuV) |           | Standard |
|-----------------|----------------|---------|----------------|-----------|----------|
|                 | Quasi-peak     | Average | Quasi-peak     | Average   |          |
| 0.15 -0.5       | 79.00          | 66.00   | 66 - 56 *      | 56 - 46 * | CISPR    |
| 0.50 -5.0       | 73.00          | 60.00   | 56.00          | 46.00     | CISPR    |
| 5.0 -30.0       | 73.00          | 60.00   | 60.00          | 50.00     | CISPR    |

|           |       |       |           |           |     |
|-----------|-------|-------|-----------|-----------|-----|
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * | FCC |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00     | 46.00     | FCC |
| 5.0 -30.0 | 73.00 | 60.00 | 60.00     | 50.00     | FCC |

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.

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    |



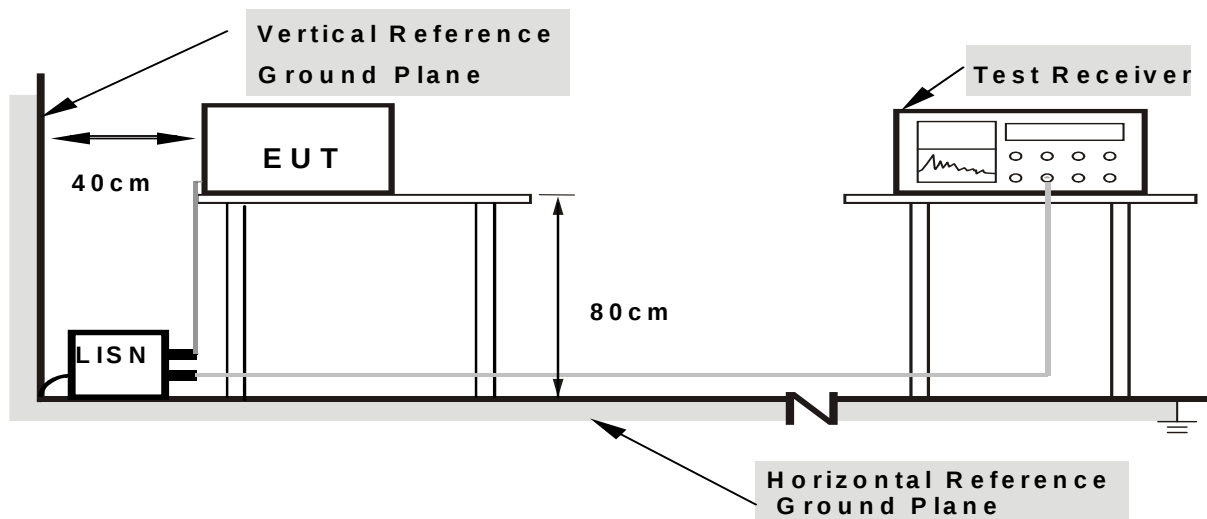
### 3.1.2 TEST PROCEDURE

- 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 equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.4 TEST SETUP



**Note: 1.**Support units were connected to second LISN.

**2.**Both of LISNs (AMN) are 80 cm from EUT and at least 80  
from other units and other metal planes

### 3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



## Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 15 of 51 -

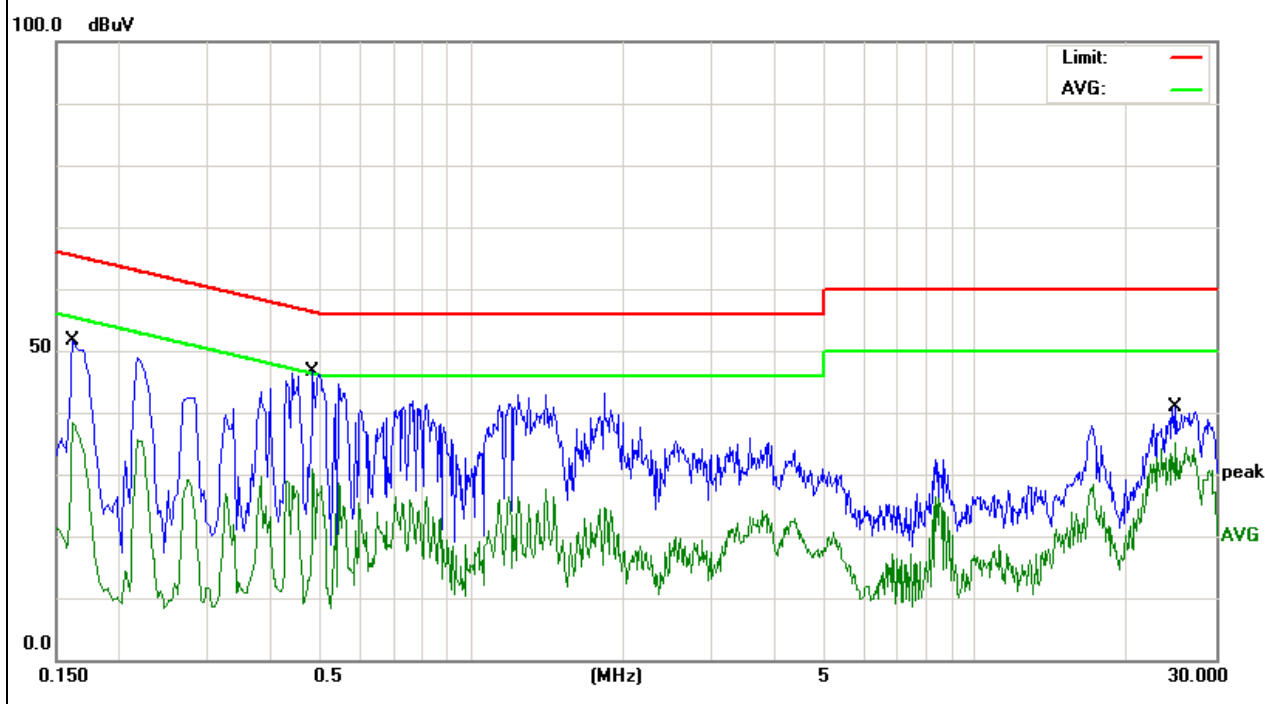
### 3.1.6 TEST RESULTS

|                |                                     |                     |           |
|----------------|-------------------------------------|---------------------|-----------|
| EUT :          | Smart Home(WiFi camera)             | Model Name. :       | CT868W-SH |
| Temperature :  | 26 °C                               | Relative Humidity : | 56%       |
| Pressure :     | 1010hPa                             | Phase :             | L         |
| Test Voltage : | DC 12V from adapter AC<br>120V/60Hz | Test Mode :         | Mode 3    |

| Freq.<br>(MHz) | Reading<br>(dBuV) | Factor<br>(dBuV) | Measurement<br>(dBuV) | Limit<br>(dBuV) | Over<br>(dB) | Detector |
|----------------|-------------------|------------------|-----------------------|-----------------|--------------|----------|
| 0.162          | 41.12             | 10.45            | 51.57                 | 65.36           | -13.79       | QP       |
| 0.162          | 28                | 10.45            | 38.45                 | 55.36           | -16.91       | AVG      |
| 0.486          | 36.16             | 10.4             | 46.56                 | 56.24           | -9.68        | QP       |
| 0.486          | 20.4              | 10.4             | 30.8                  | 46.24           | -15.44       | AVG      |
| 24.986         | 30.02             | 10.73            | 40.75                 | 60              | -19.25       | QP       |
| 24.986         | 24.27             | 10.73            | 35                    | 50              | -15          | AVG      |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. N/A means All Data have pass Limit



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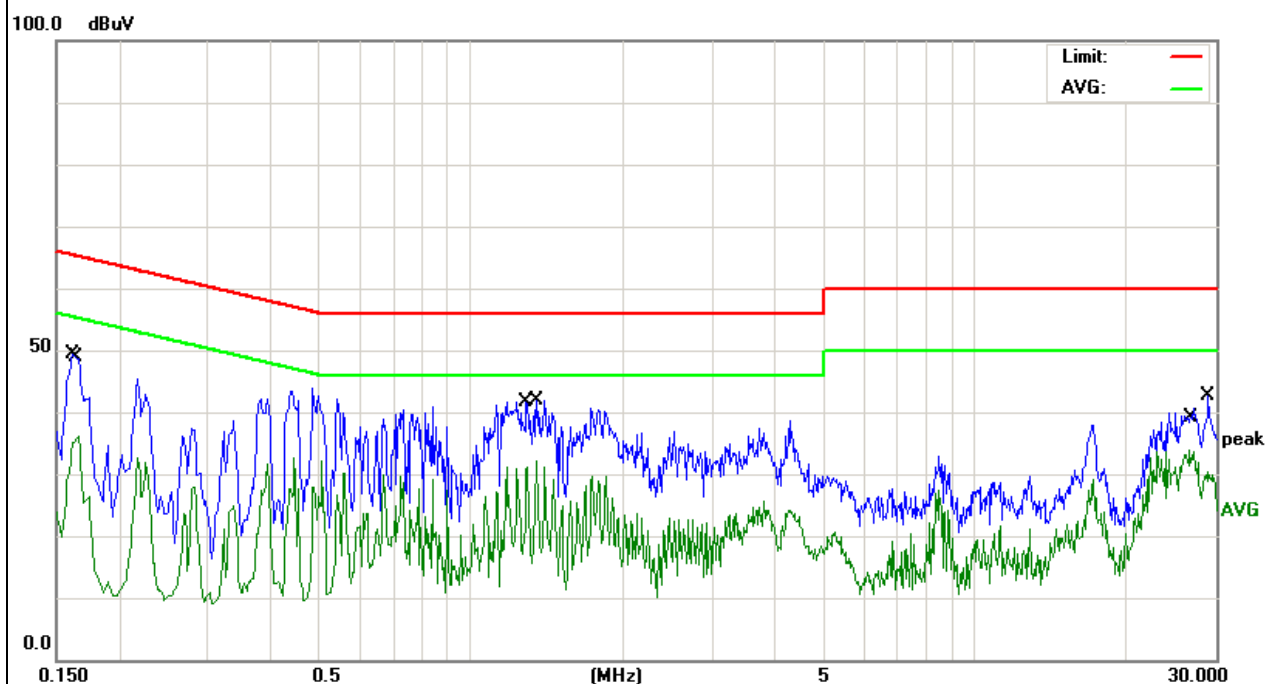
Report No. ATT-2015SZ0611808F  
- Page 16 of 51 -

|                |                                  |                     |           |
|----------------|----------------------------------|---------------------|-----------|
| EUT :          | Smart Home(WiFi camera)          | Model Name. :       | CT868W-SH |
| Temperature :  | 26 °C                            | Relative Humidity : | 56%       |
| Pressure :     | 1010hPa                          | Phase :             | N         |
| Test Voltage : | DC 12V from adapter AC 120V/60Hz | Test Mode :         | Mode 3    |

| Freq.<br>(MHz) | Reading<br>(dBuV) | Factor<br>(dBuV) | Measurement<br>(dBuV) | Limit<br>(dBuV) | Over<br>(dB) | Detector |
|----------------|-------------------|------------------|-----------------------|-----------------|--------------|----------|
| 0.162          | 38.94             | 10.33            | 49.27                 | 65.36           | -16.09       | QP       |
| 0.166          | 25.68             | 10.34            | 36.02                 | 55.15           | -19.13       | AVG      |
| 1.286          | 31.26             | 10.45            | 41.71                 | 56              | -14.29       | QP       |
| 1.346          | 21.61             | 10.45            | 32.06                 | 46              | -13.94       | AVG      |
| 26.61          | 23.18             | 10.74            | 33.92                 | 50              | -16.08       | AVG      |
| 28.95          | 32.04             | 10.65            | 42.69                 | 60              | -17.31       | QP       |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. N/A means All Data have pass Limit



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## 3.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. 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.

| Frequencies<br>(MHz) | Field Strength<br>(microvolt/meter) | Measurement Distance<br>(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                                |

Notes:

- (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).

| Spectrum Parameter                    | Setting                                          |
|---------------------------------------|--------------------------------------------------|
| Attenuation                           | Auto                                             |
| Start Frequency                       | 1000 MHz                                         |
| Stop Frequency                        | 10th carrier harmonic                            |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average |
| Receiver Parameter                    | Setting                                          |
| Attenuation                           | Auto                                             |
| Start ~ Stop Frequency                | 9kHz~150kHz / RB 200Hz for QP                    |
| Start ~ Stop Frequency                | 150kHz~30MHz / RB 9kHz for QP                    |
| Start ~ Stop Frequency                | 30MHz~1000MHz / RB 120kHz for QP                 |

### 3.2.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.



## Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F

- Page 18 of 51 -

- c. The height of the equipment or of the substitution antenna shall be 0.8 m; 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. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested. The worst case emissions were reported

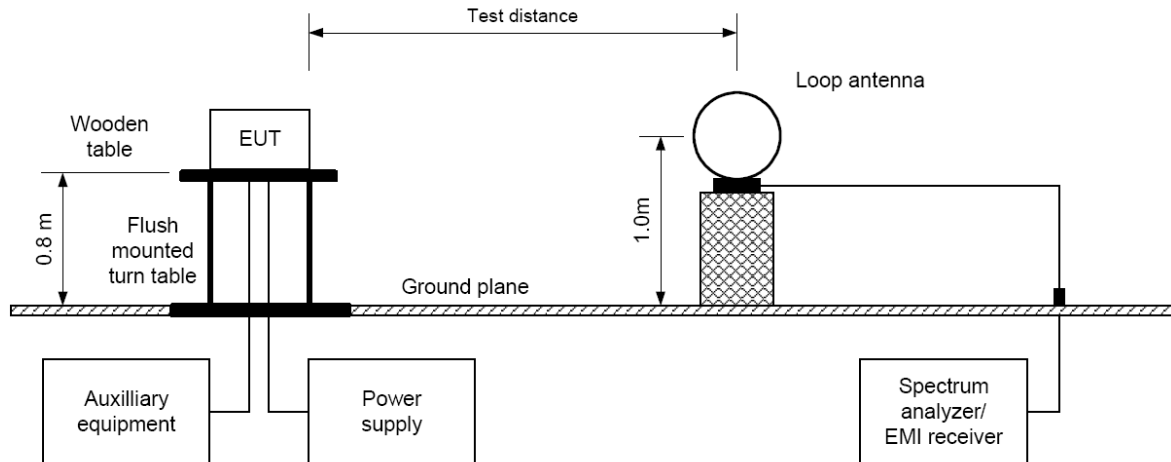
### 3.2.3 DEVIATION FROM TEST STANDARD

No deviation

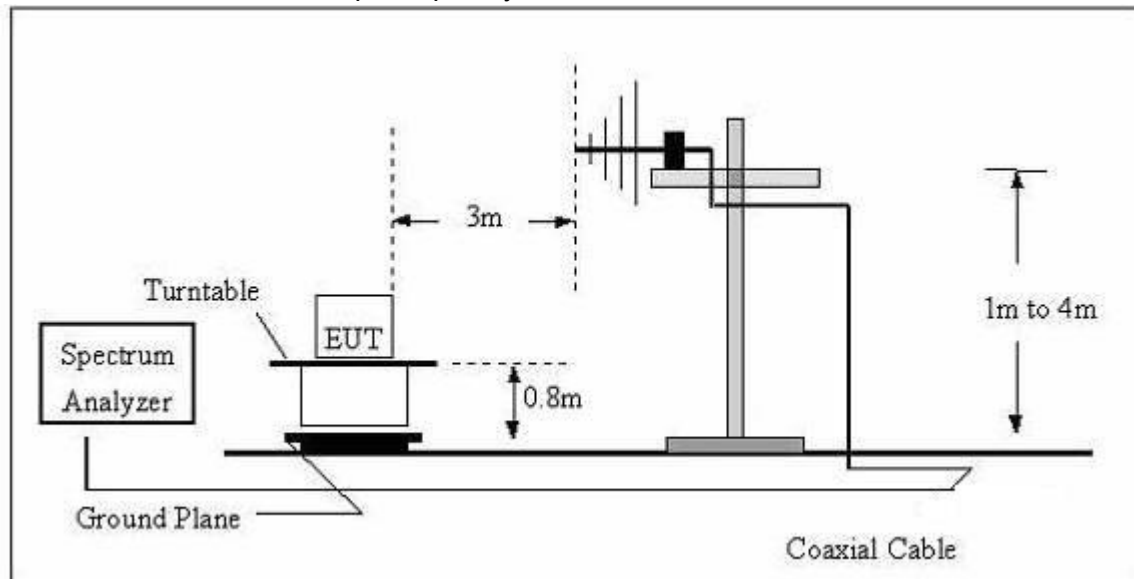


### 3.2.4 TEST SETUP

#### (A) Radiated Emission Test-Up Frequency Below 30MHz

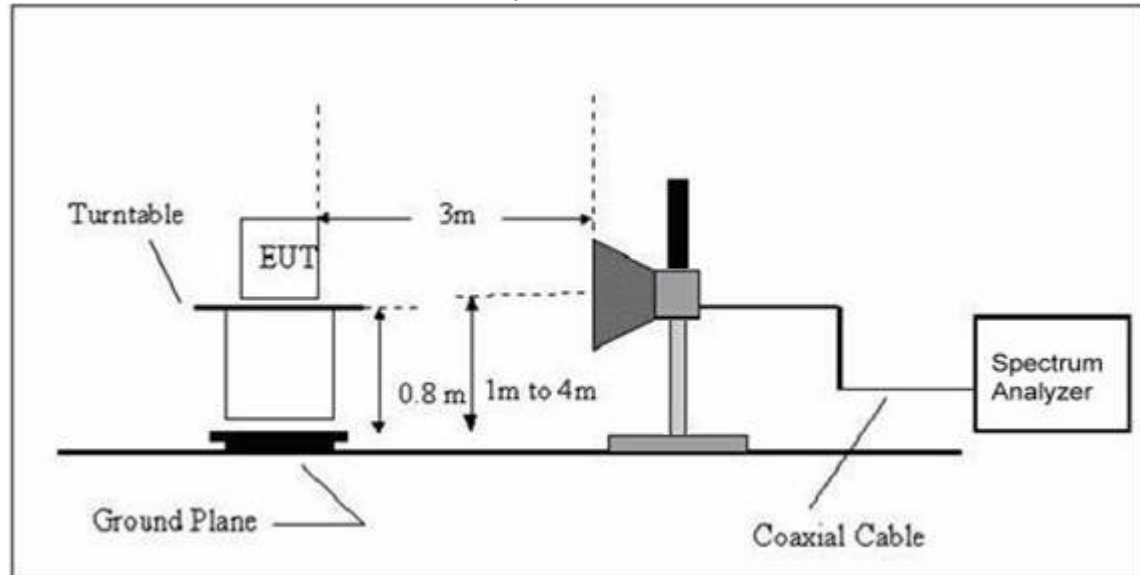


#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz





(C) Radiated Emission Test-Up Frequency Above 1GHz



### 3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



## Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 21 of 51 -

### 3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

|              |                         |                    |                                     |
|--------------|-------------------------|--------------------|-------------------------------------|
| EUT:         | Smart Home(WiFi camera) | Model Name. :      | CT868W-SH                           |
| Temperature: | 20 °C                   | Relative Humidity: | 48%                                 |
| Pressure:    | 1010 hPa                | Test Voltage :     | DC 12V from adapter<br>AC 120V/60Hz |
| Test Mode :  | TX                      | Polarization :     | --                                  |

| Freq. | Reading  | Limit    | Margin | State |
|-------|----------|----------|--------|-------|
| (MHz) | (dBuV/m) | (dBuV/m) | (dB)   | P/F   |
| --    | --       | --       | --     | P     |
| --    | --       | --       | --     | P     |

#### NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =  $40 \log (\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuV) + distance extrapolation factor.



## Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 22 of 51 -

### 3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

|               |                         |                     |                                  |
|---------------|-------------------------|---------------------|----------------------------------|
| EUT :         | Smart Home(WiFi camera) | Model Name :        | CT868W-SH                        |
| Temperature : | 20 °C                   | Relative Humidity : | 48%                              |
| Pressure:     | 1010 hPa                | Test Voltage :      | DC 12V from adapter AC 120V/60Hz |
| Test Mode :   | 802.11B TX 2412         |                     |                                  |

| Polarization | Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detect or Type | Comment |
|--------------|-----------|---------------|--------|----------------|----------|--------|----------------|---------|
|              | (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |                |         |
| Below 1G     |           |               |        |                |          |        |                |         |
| Horizontal   | 32.53     | 25.85         | 8.75   | 34.6           | 40       | -5.4   | QP             |         |
| Horizontal   | 96.37     | 24.85         | 12.68  | 37.53          | 43.5     | -5.97  | QP             |         |
| Horizontal   | 129.75    | 27.84         | 13.28  | 41.12          | 43.5     | -2.38  | QP             |         |
| Horizontal   | 189.57    | 23.74         | 14.49  | 38.23          | 43.5     | -5.27  | QP             |         |
| Horizontal   | 225.38    | 22.74         | 15.74  | 38.48          | 46       | -7.52  | QP             |         |
| Horizontal   | 361.74    | 25.85         | 17.33  | 43.18          | 46       | -2.82  | QP             |         |
| Vertical     | 67.38     | 23.37         | 12.64  | 36.01          | 40       | -3.99  | QP             |         |
| Vertical     | 122.64    | 21.74         | 12.74  | 34.48          | 43.5     | -9.02  | QP             |         |
| Vertical     | 218.95    | 25.85         | 13.74  | 39.59          | 46       | -6.41  | QP             |         |
| Vertical     | 332.47    | 23.34         | 14.26  | 37.6           | 46       | -8.4   | QP             |         |
| Vertical     | 389.75    | 25.74         | 16.29  | 42.03          | 46       | -3.97  | QP             |         |
| Vertical     | 445.83    | 25.17         | 17.36  | 42.53          | 46       | -3.47  | QP             |         |

Note: test performed on 802.11b/g mode, "802.11b TX2412" mode is the worst mode and has been reported.



# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 23 of 51 -

## 3.2.8 TEST RESULTS (1000 MHz - 26.5GHz)

| Frequency<br>(MHz)                | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detect<br>or<br>Type | Comment    |
|-----------------------------------|-------------------------|----------------|----------------------------|--------------------|----------------|----------------------|------------|
| Low Channel (2412 MHz)-Above 1G   |                         |                |                            |                    |                |                      |            |
| 4824.12                           | 54.37                   | 9.97           | 64.34                      | 74                 | -9.66          | Pk                   | Vertical   |
| 4824.12                           | 41.46                   | 9.97           | 51.43                      | 54                 | -2.57          | Av                   | Vertical   |
| 7236.35                           | 49.75                   | 12.35          | 62.1                       | 74                 | -11.9          | Pk                   | Vertical   |
| 7236.35                           | 38.57                   | 12.35          | 50.92                      | 54                 | -3.08          | Av                   | Vertical   |
| 4824.63                           | 47.84                   | 10.57          | 58.41                      | 74                 | -15.59         | Pk                   | Horizontal |
| 4824.63                           | 36.18                   | 10.57          | 46.75                      | 54                 | -7.25          | Av                   | Horizontal |
| 7236.16                           | 44.74                   | 12.35          | 57.09                      | 74                 | -16.91         | Pk                   | Horizontal |
| 7236.16                           | 36.74                   | 12.35          | 49.09                      | 54                 | -4.91          | Av                   | Horizontal |
| Mid Channel (2437 MHz)-Above 1G   |                         |                |                            |                    |                |                      |            |
| 4874.25                           | 48.75                   | 10.4           | 59.15                      | 74                 | -14.85         | Pk                   | Vertical   |
| 4874.25                           | 40.36                   | 10.4           | 50.76                      | 54                 | -3.24          | Av                   | Vertical   |
| 7311.15                           | 47.47                   | 12.75          | 60.22                      | 74                 | -13.78         | Pk                   | Vertical   |
| 7311.15                           | 38.45                   | 12.75          | 51.2                       | 54                 | -2.8           | Av                   | Vertical   |
| 4874.21                           | 46.37                   | 10.4           | 56.77                      | 74                 | -17.23         | Pk                   | Horizontal |
| 4874.21                           | 35.12                   | 10.4           | 45.52                      | 54                 | -8.48          | Av                   | Horizontal |
| 7311.36                           | 40.73                   | 12.75          | 53.48                      | 74                 | -20.52         | Pk                   | Horizontal |
| 7311.36                           | 33.34                   | 12.75          | 46.09                      | 54                 | -7.91          | Av                   | Horizontal |
| High Channel (2462 MHz)- Above 1G |                         |                |                            |                    |                |                      |            |
| 4924.41                           | 48.5                    | 10.39          | 58.89                      | 74                 | -15.11         | Pk                   | Vertical   |
| 4924.41                           | 39.72                   | 10.39          | 50.11                      | 54                 | -3.89          | Av                   | Vertical   |
| 7386.26                           | 46.29                   | 12.68          | 58.97                      | 74                 | -15.03         | Pk                   | Vertical   |
| 7386.26                           | 35.22                   | 12.68          | 47.9                       | 54                 | -6.1           | Av                   | Vertical   |
| 4924.38                           | 45.74                   | 10.39          | 56.13                      | 74                 | -17.87         | Pk                   | Horizontal |
| 4924.38                           | 33.47                   | 10.39          | 43.86                      | 54                 | -10.14         | Av                   | Horizontal |
| 7386.55                           | 39.38                   | 12.68          | 52.06                      | 74                 | -21.94         | Pk                   | Horizontal |
| 7386.55                           | 29.75                   | 12.68          | 42.43                      | 54                 | -11.57         | Av                   | Horizontal |

Note: test perform on 802.11b/g mode, "802.11b" mode is the worst mode and has been reported. spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported above 8G.

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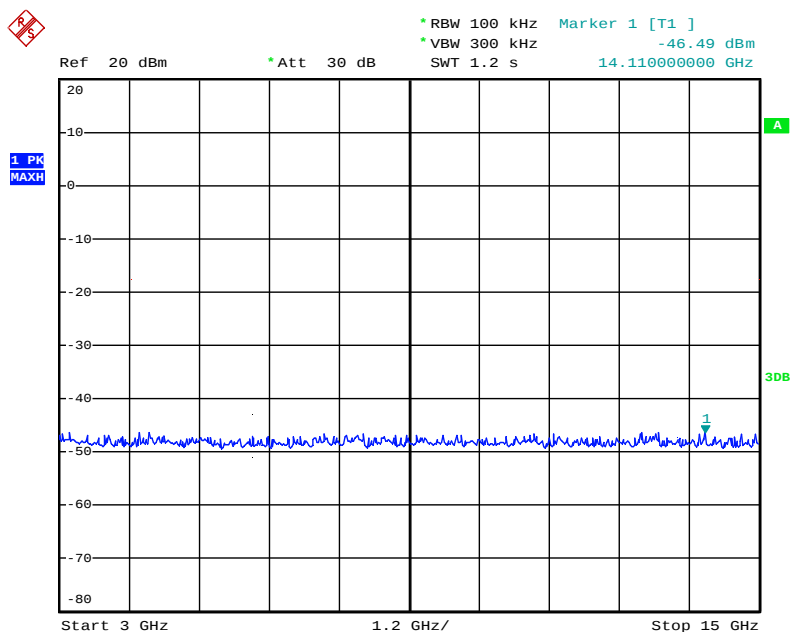
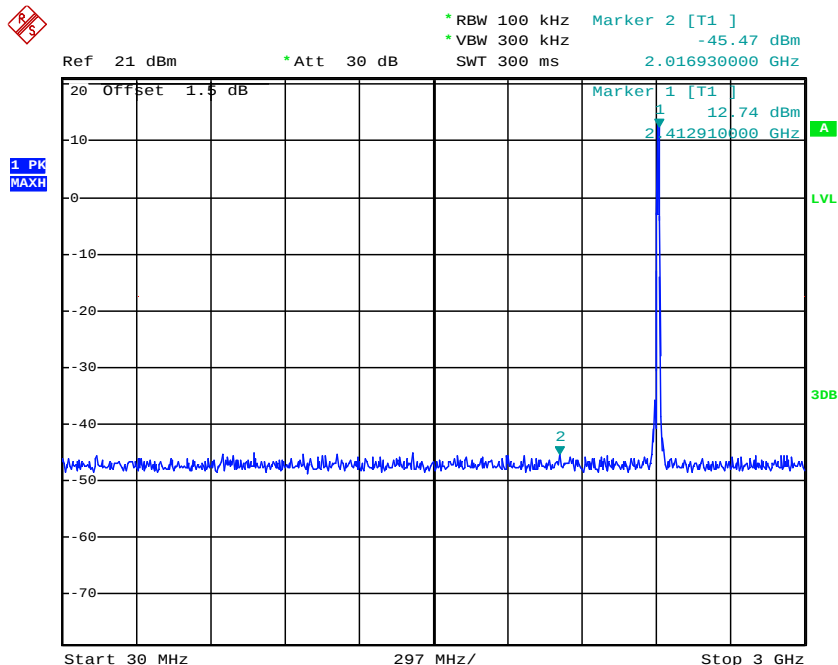
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Report No. ATT-2015SZ0611808F

- Page 24 of 51 -

## Conducted Spurious Emissions at Antenna Port:

### 802.11b Low Channel



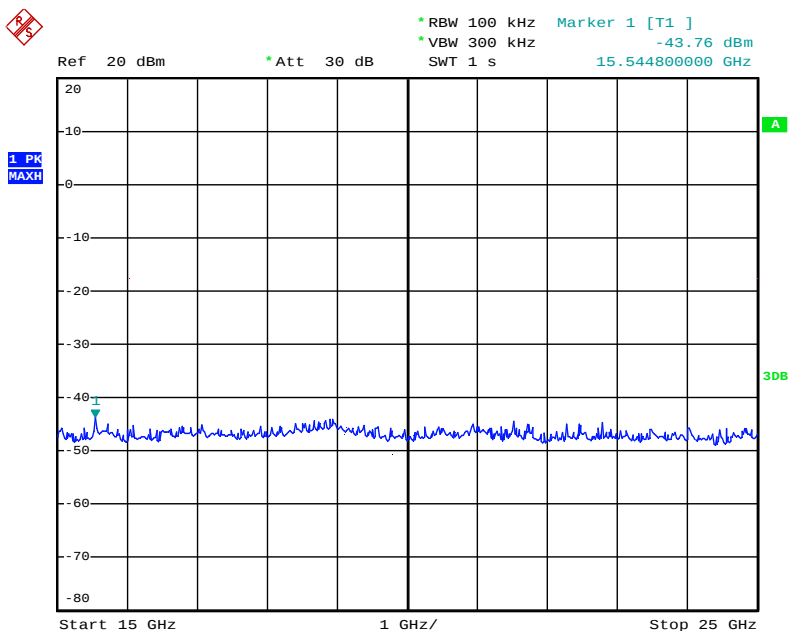
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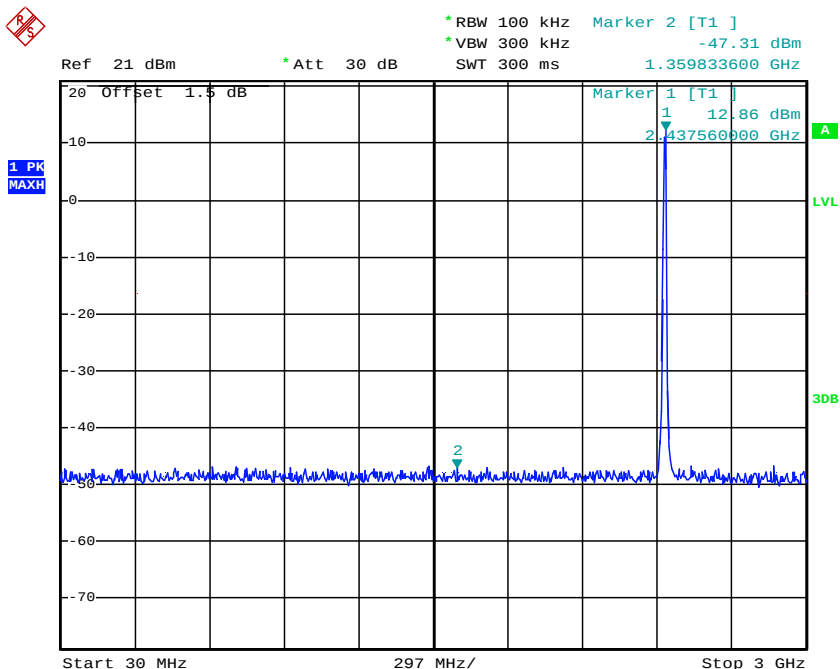
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Report No. ATT-2015SZ0611808F

- Page 25 of 51 -



## 802.11b Middle Channel



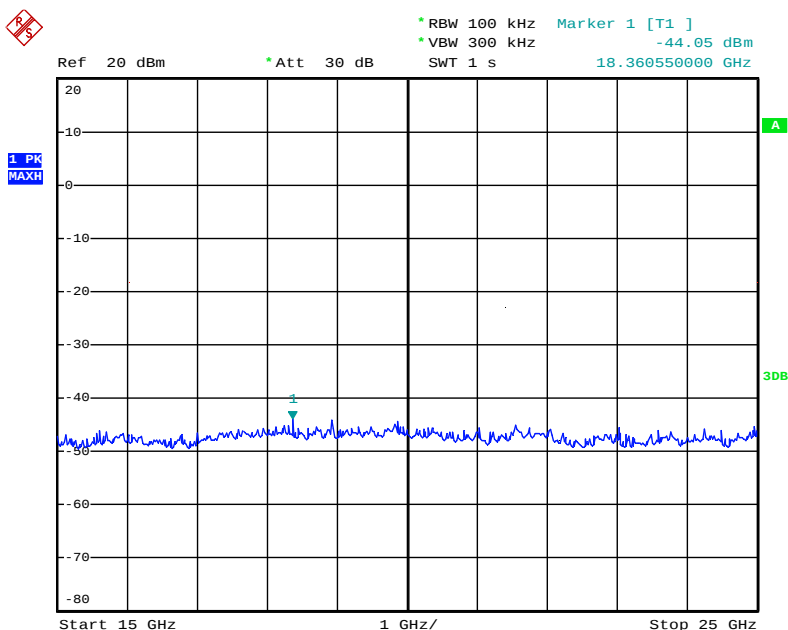
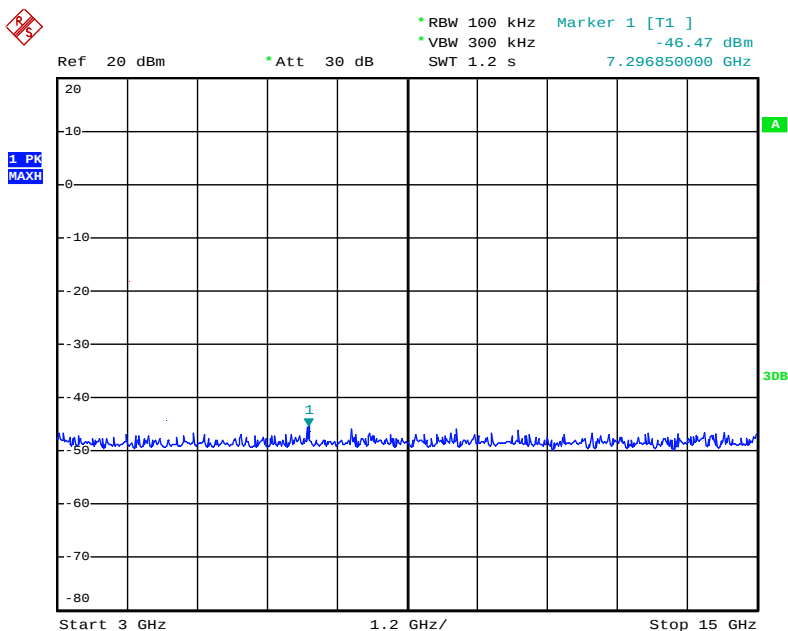
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Report No. ATT-2015SZ0611808F

- Page 26 of 51 -



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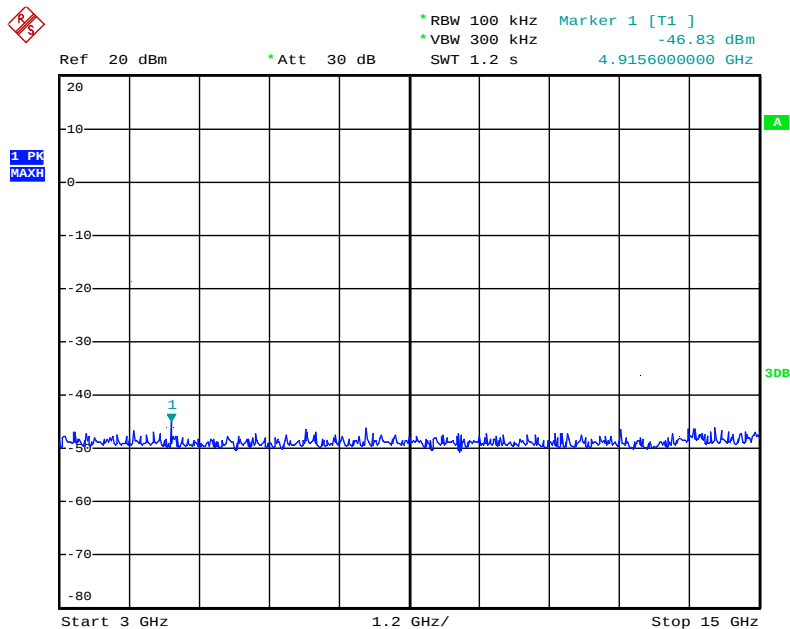
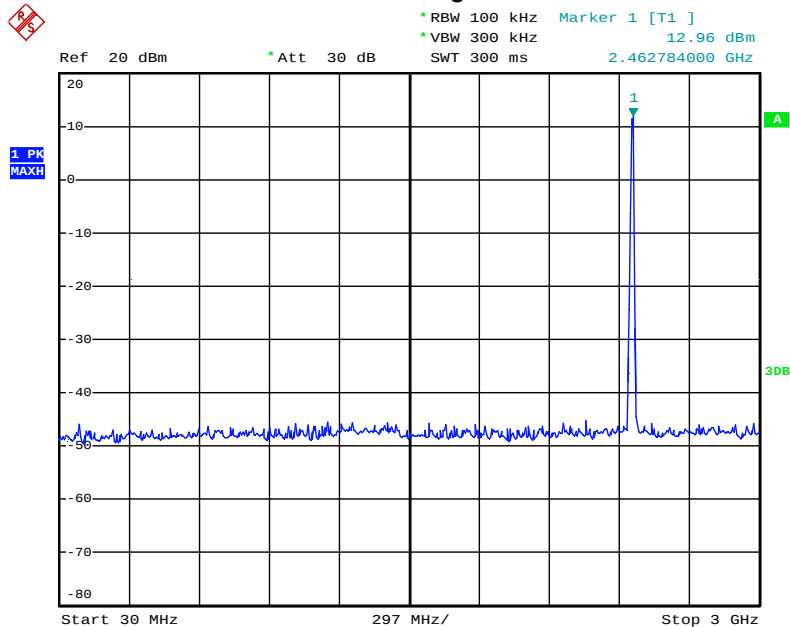


# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F

- Page 27 of 51 -

## 802.11b High Channel

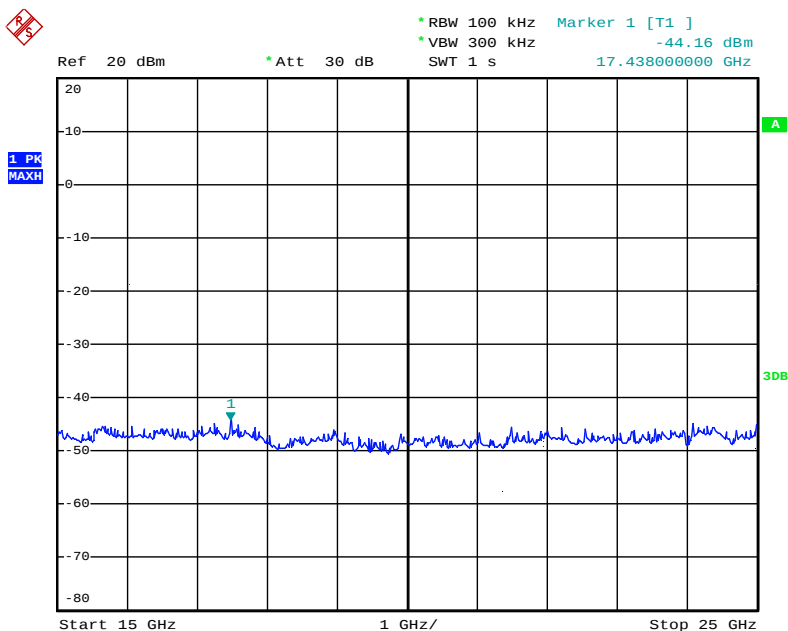




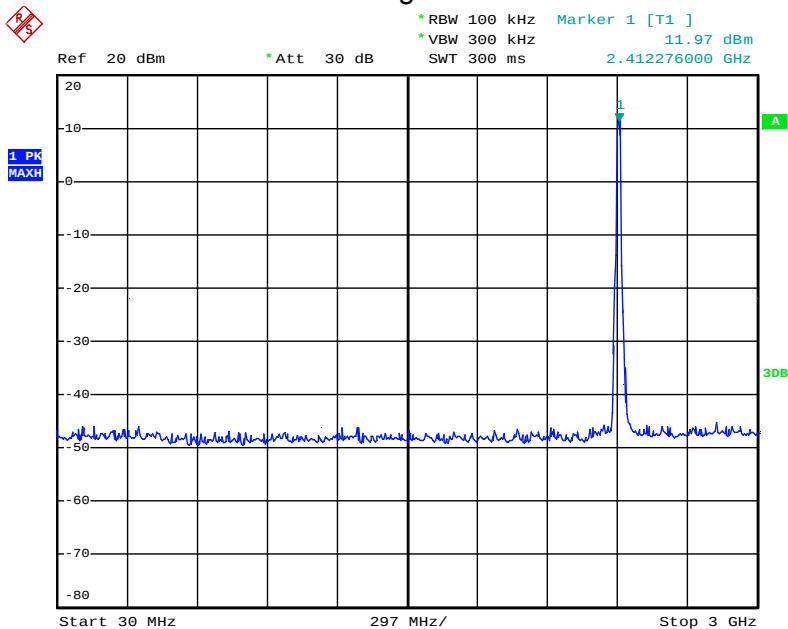
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Report No. ATT-2015SZ0611808F

- Page 28 of 51 -



## 802.11g Low Channel



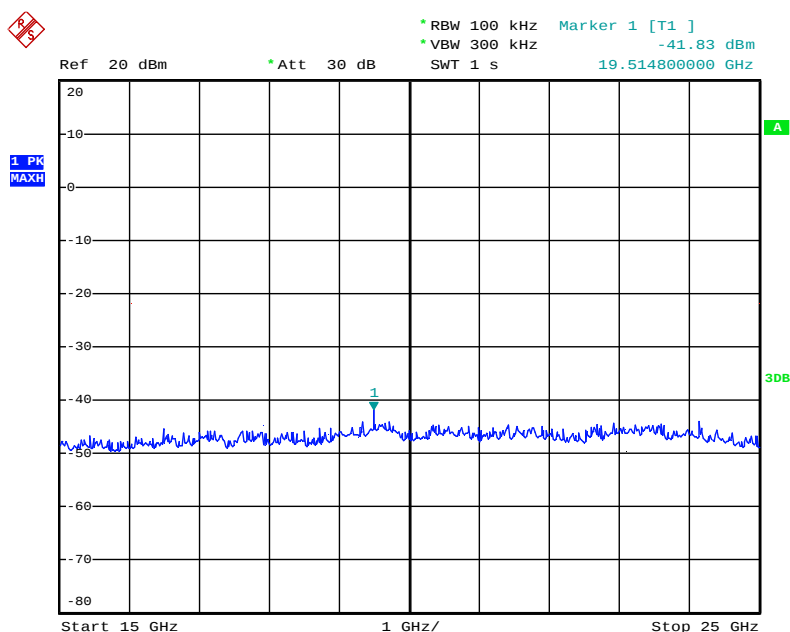
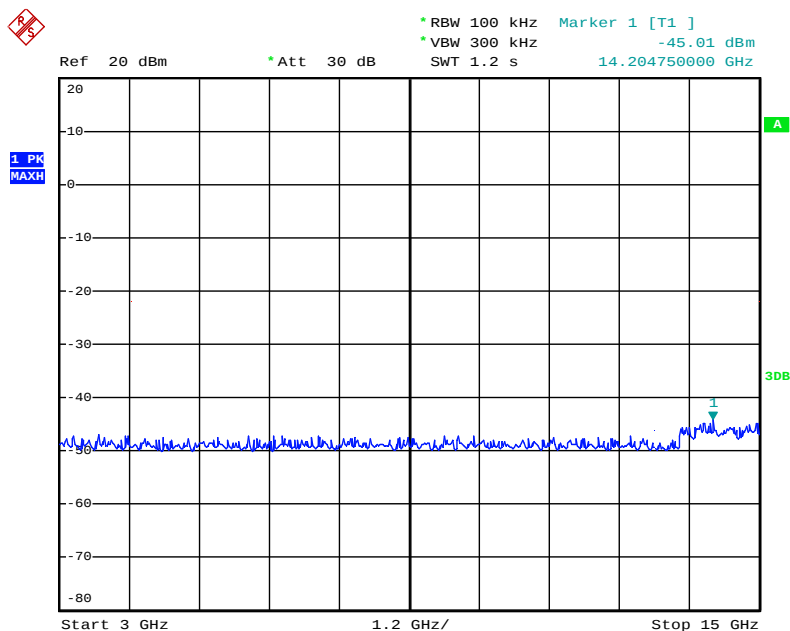
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# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F

- Page 29 of 51 -



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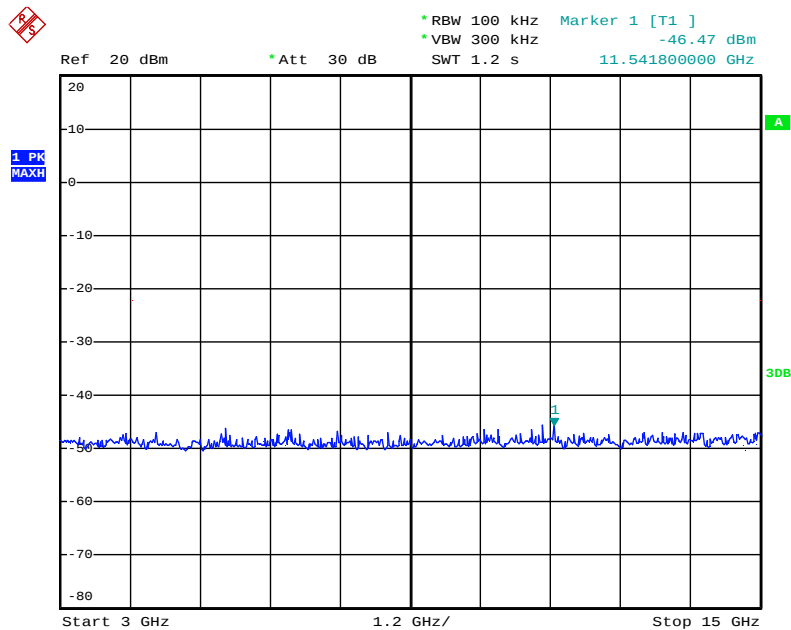
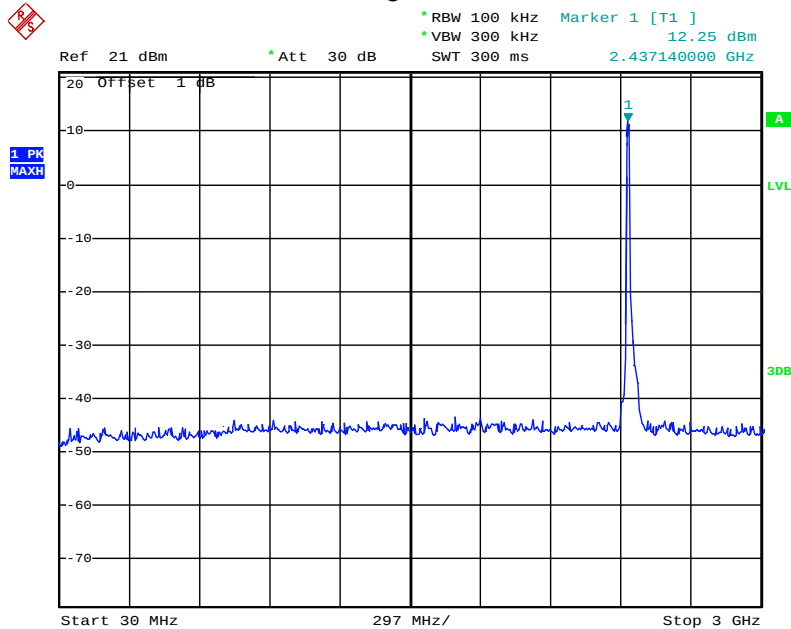


# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F

- Page 30 of 51 -

## 802.11g Middle Channel



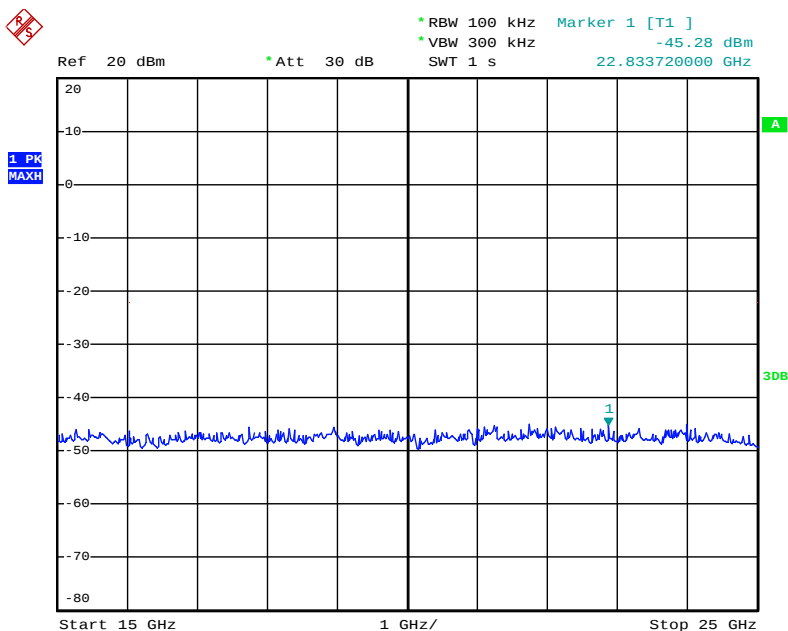
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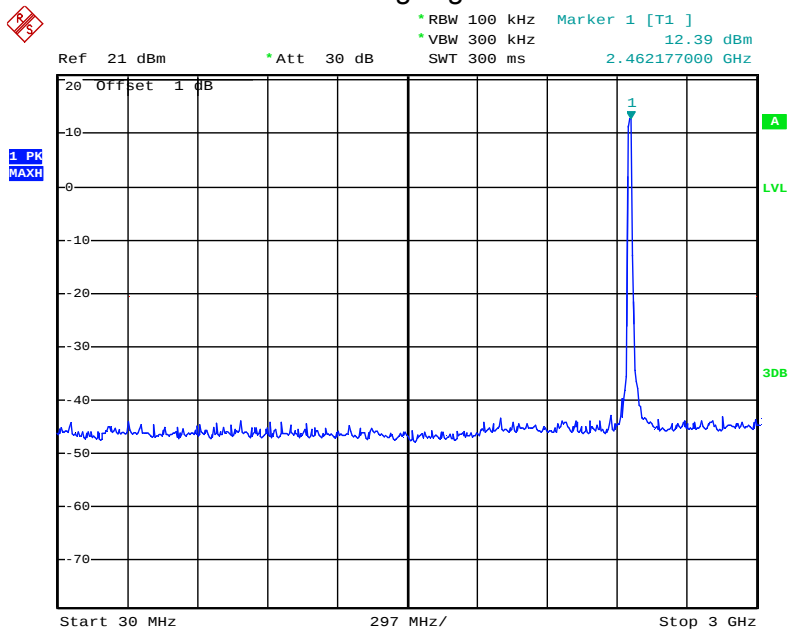
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Report No. ATT-2015SZ0611808F

- Page 31 of 51 -



## 802.11g High Channel



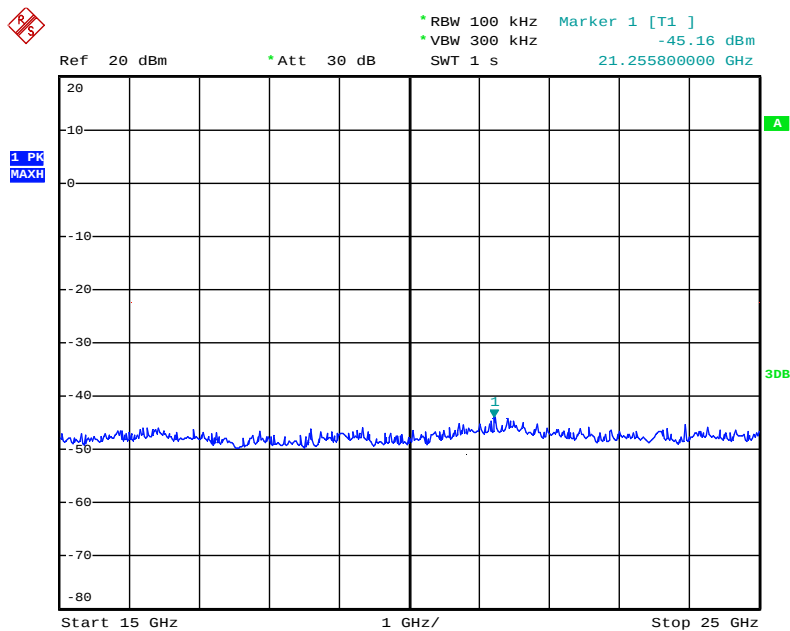
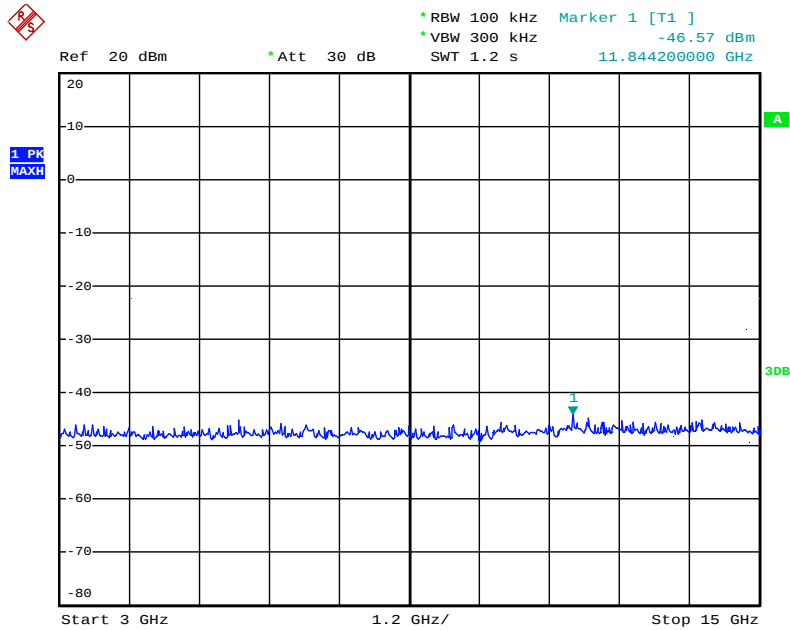
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# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F

- Page 32 of 51 -



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#### 4. POWER SPECTRAL DENSITY TEST

##### 4.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C |                        |                        |                       |        |
|---------------------------------|------------------------|------------------------|-----------------------|--------|
| Section                         | Test Item              | Limit                  | Frequency Range (MHz) | Result |
| 15.247                          | Power Spectral Density | 8 dBm<br>(in any 3KHz) | 2400-2483.5           | PASS   |

##### 4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW  $\geq 3$  kHz.
4. Set the VBW  $\geq 3 \times$  RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

##### 4.1.2 DEVIATION FROM STANDARD

No deviation.

##### 4.1.3 TEST SETUP



##### 4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.



# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 34 of 51 -

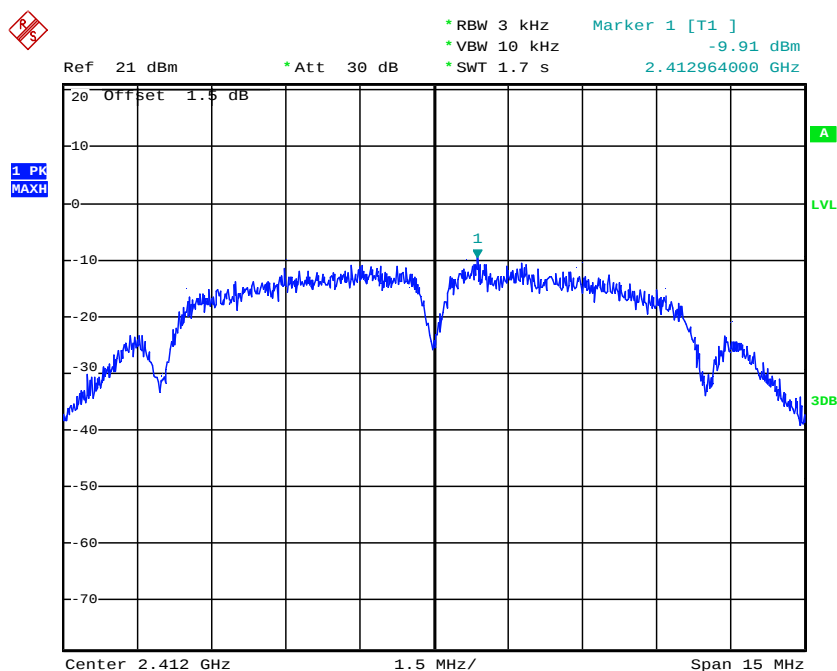
## 4.1.5 TEST RESULTS

|               |                             |                     |                                  |
|---------------|-----------------------------|---------------------|----------------------------------|
| EUT :         | Smart Home                  | Model Name :        | CT868W-SH                        |
| Temperature : | 25 °C                       | Relative Humidity : | 56%                              |
| Pressure :    | 1015 hPa                    | Test Voltage :      | DC 12V from adapter AC 120V/60Hz |
| Test Mode :   | TX b Mode /CH01, CH06, CH11 |                     |                                  |

Note: The relevant measured result has the offset with cable loss already.

| Frequency | Power Density (dBm/3kHz) | Limit (dBm/3kHz) | Result |
|-----------|--------------------------|------------------|--------|
| 2412 MHz  | -9.91                    | 8                | PASS   |
| 2437 MHz  | -9.76                    | 8                | PASS   |
| 2462 MHz  | -10.18                   | 8                | PASS   |

### TX CH01



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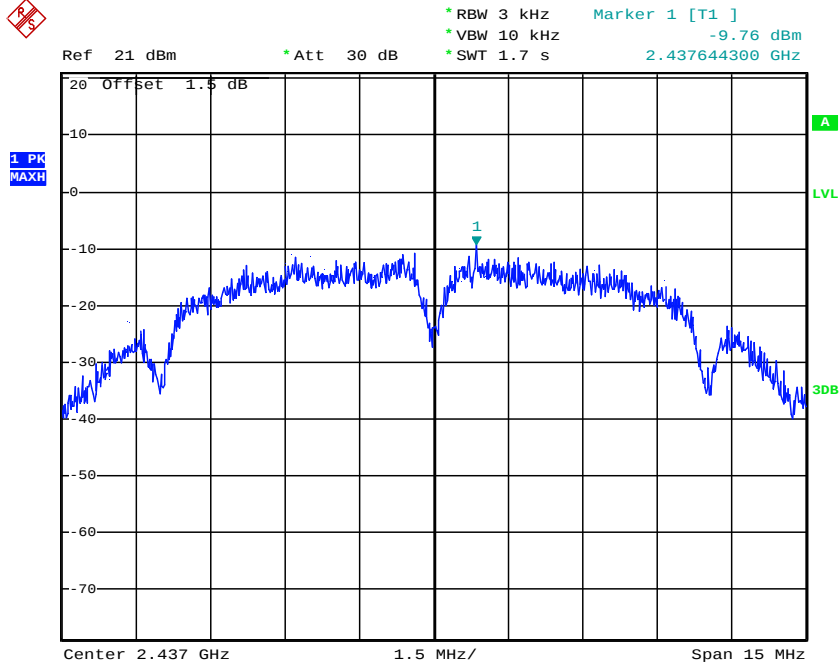


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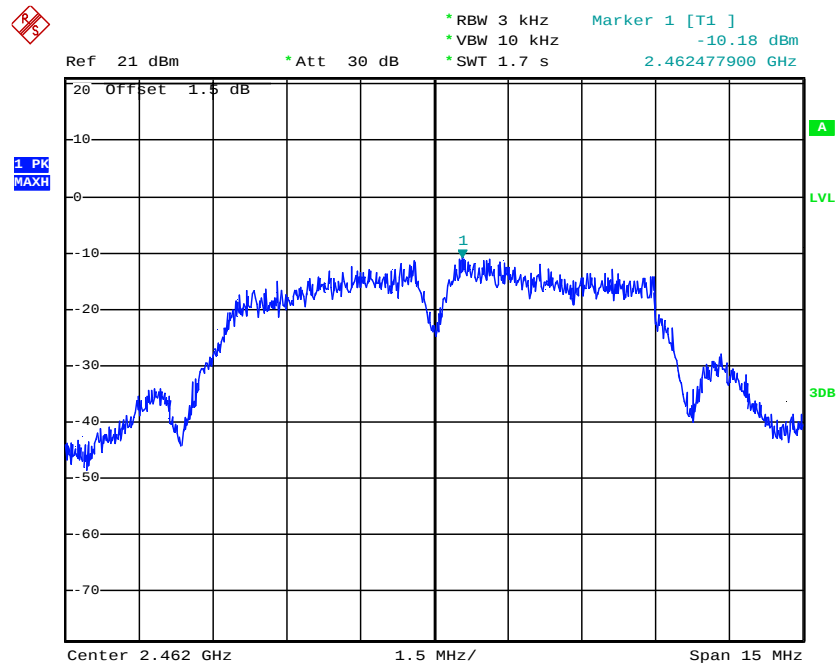
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- Page 35 of 51 -

## TX CH06



## TX CH11



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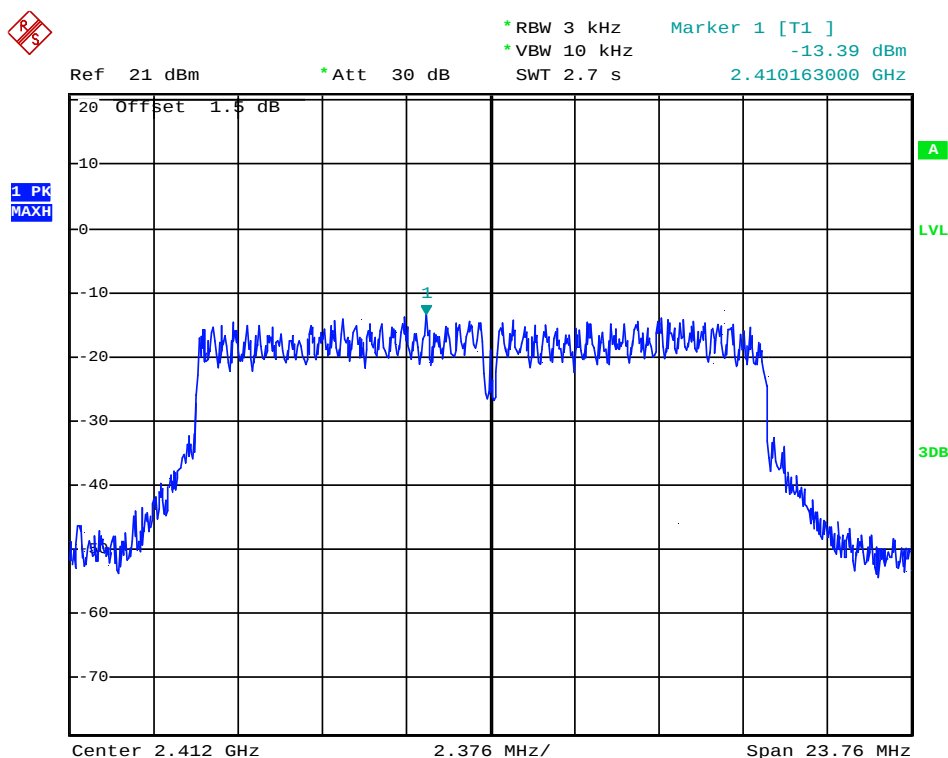
Report No. ATT-2015SZ0611808F  
- Page 36 of 51 -

|               |                             |                     |                                  |
|---------------|-----------------------------|---------------------|----------------------------------|
| EUT :         | Smart Home                  | Model Name :        | CT868W-SH                        |
| Temperature : | 25 °C                       | Relative Humidity : | 56%                              |
| Pressure :    | 1015 hPa                    | Test Voltage :      | DC 12V from adapter AC 120V/60Hz |
| Test Mode :   | TX g Mode /CH01, CH06, CH11 |                     |                                  |

Note: The relevant measured result has the offset with cable loss already.

| Frequency | Power Density (dBm/3kHz) | Limit (dBm/3kHz) | Result |
|-----------|--------------------------|------------------|--------|
| 2412 MHz  | -13.39                   | 8                | PASS   |
| 2437 MHz  | -12.35                   | 8                | PASS   |
| 2462 MHz  | -13.42                   | 8                | PASS   |

## TX CH01



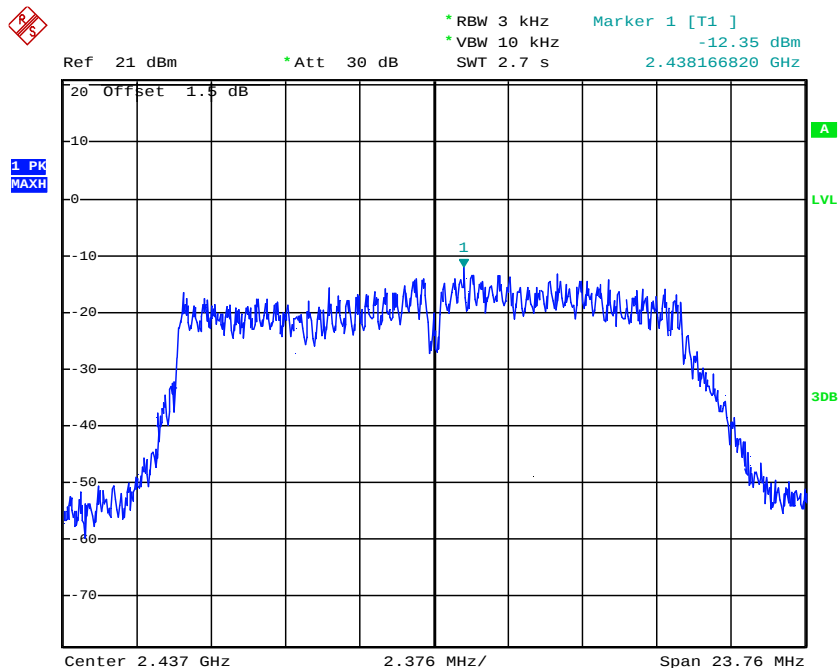
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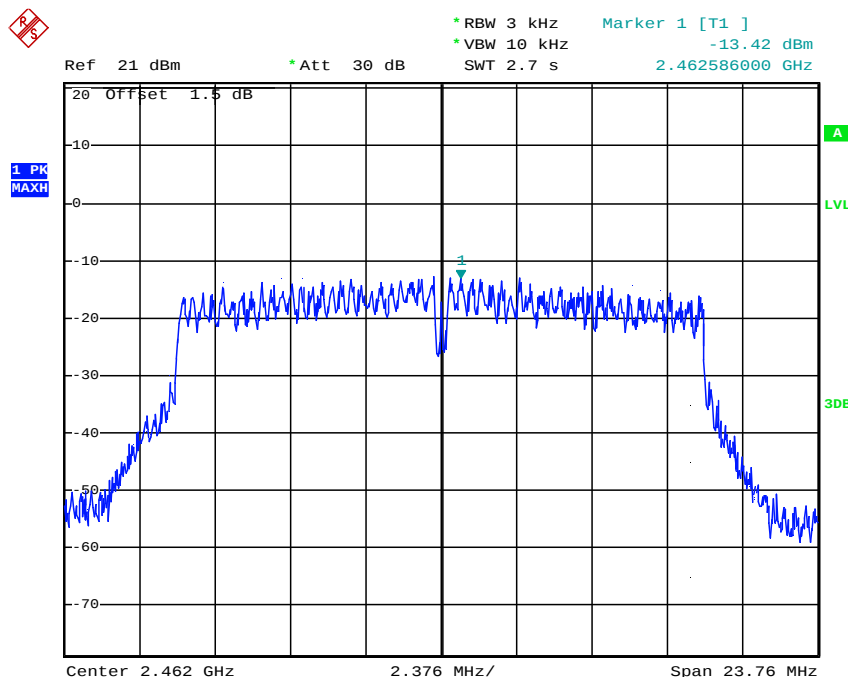
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Report No. ATT-2015SZ0611808F  
- Page 37 of 51 -

## TX CH06



## TX CH11





## 5. BANDWIDTH TEST

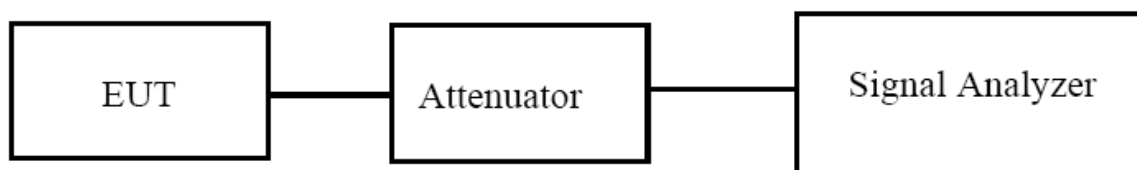
### 5.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C |           |                                         |                       |        |
|---------------------------------|-----------|-----------------------------------------|-----------------------|--------|
| Section                         | Test Item | Limit                                   | Frequency Range (MHz) | Result |
| 15.247(a)(2)                    | Bandwidth | $\geq 500\text{KHz}$<br>(6dB bandwidth) | 2400-2483.5           | PASS   |

#### 5.1.1 TEST PROCEDURE

According to KDB 558074 D01 DTS Meas Guidance v03r03

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



#### 5.1.2 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



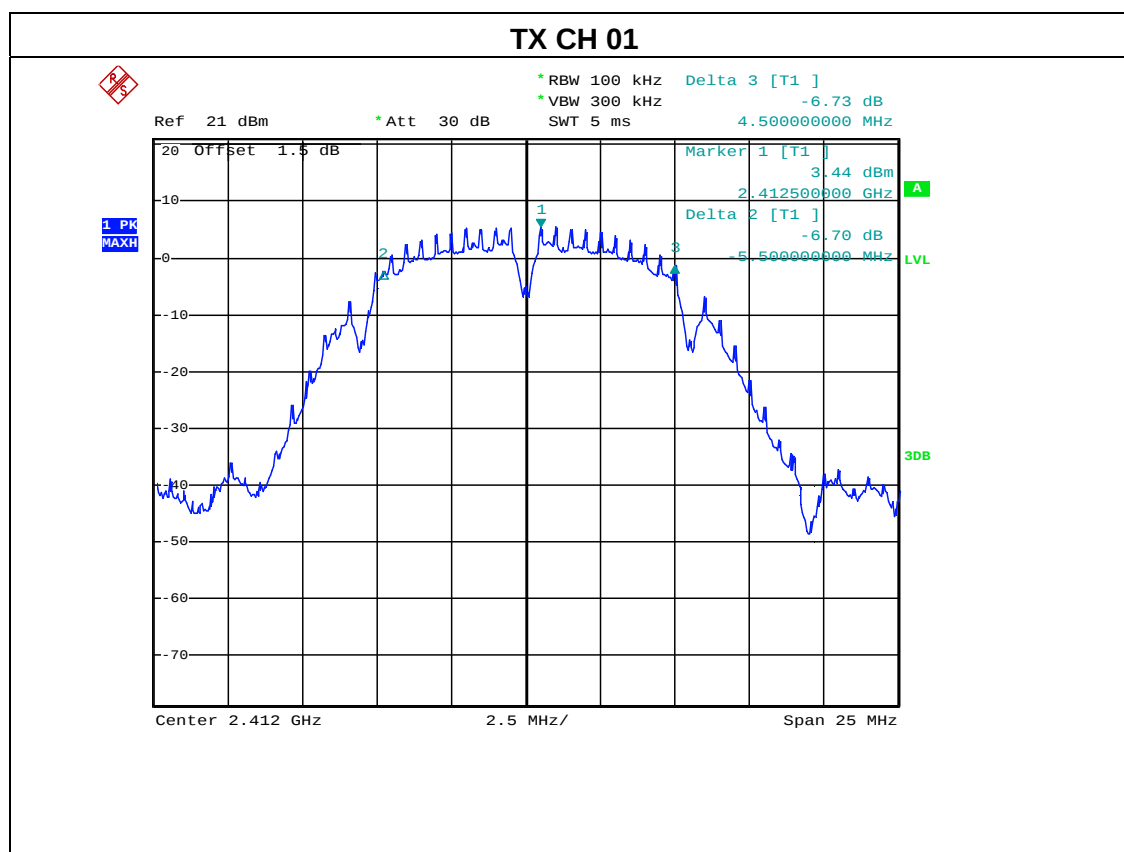
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Report No. ATT-2015SZ0611808F  
- Page 39 of 51 -

## 5.1.3 TEST RESULTS

|               |                             |                     |                                  |
|---------------|-----------------------------|---------------------|----------------------------------|
| EUT :         | Smart Home                  | Model Name :        | CT868W-SH                        |
| Temperature : | 25 °C                       | Relative Humidity : | 56%                              |
| Pressure :    | 1012 hPa                    | Test Voltage :      | DC 12V from adapter AC 120V/60Hz |
| Test Mode :   | TX b Mode /CH01, CH06, CH11 |                     |                                  |

| Channel | Frequency (MHz) | 6dB bandwidth (MHz) | Limit (kHz) | Result |
|---------|-----------------|---------------------|-------------|--------|
| Low     | 2412            | 10.000              | 500         | Pass   |
| Middle  | 2437            | 10.000              | 500         | Pass   |
| High    | 2462            | 10.000              | 500         | Pass   |



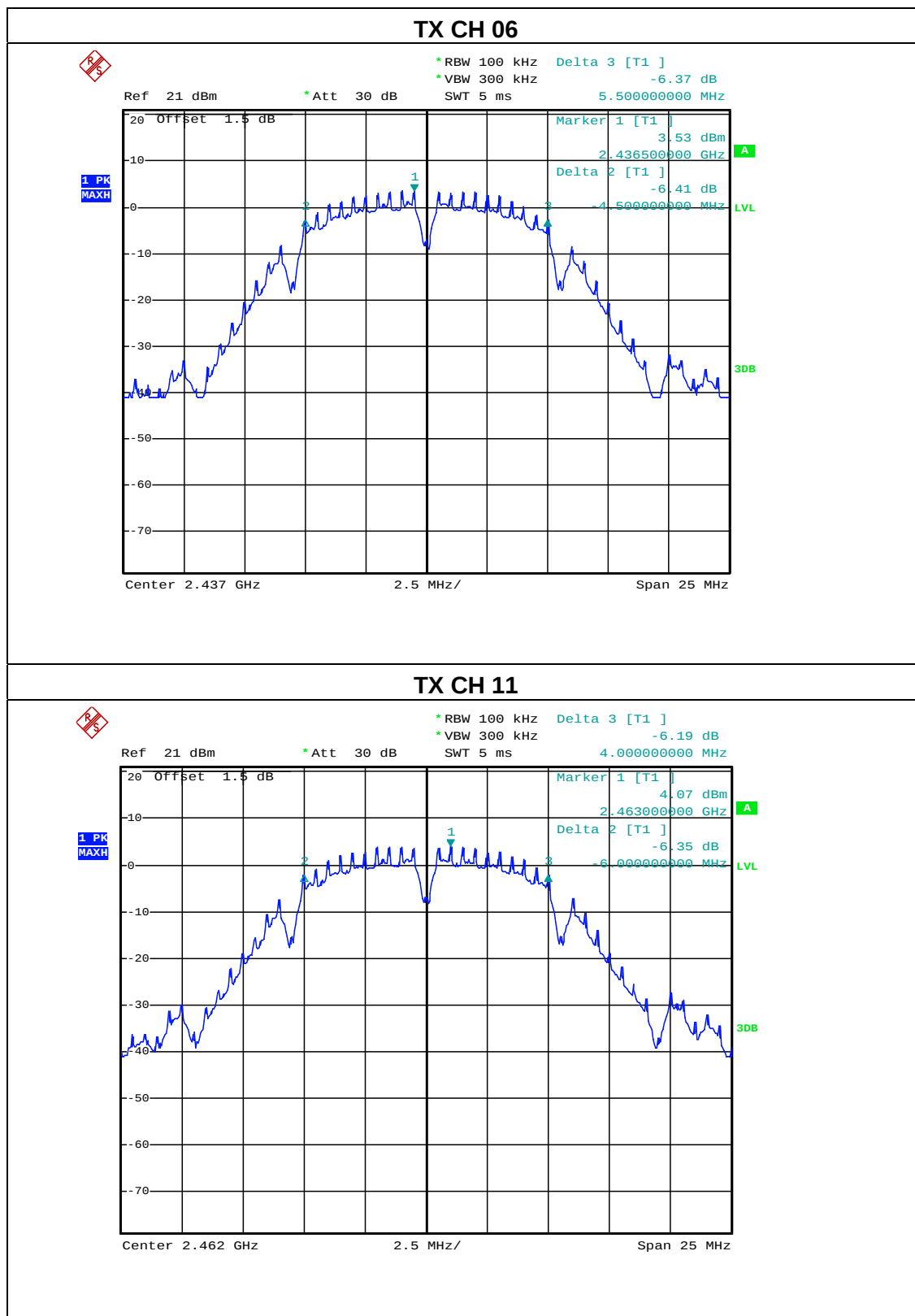
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# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F

- Page 40 of 51 -



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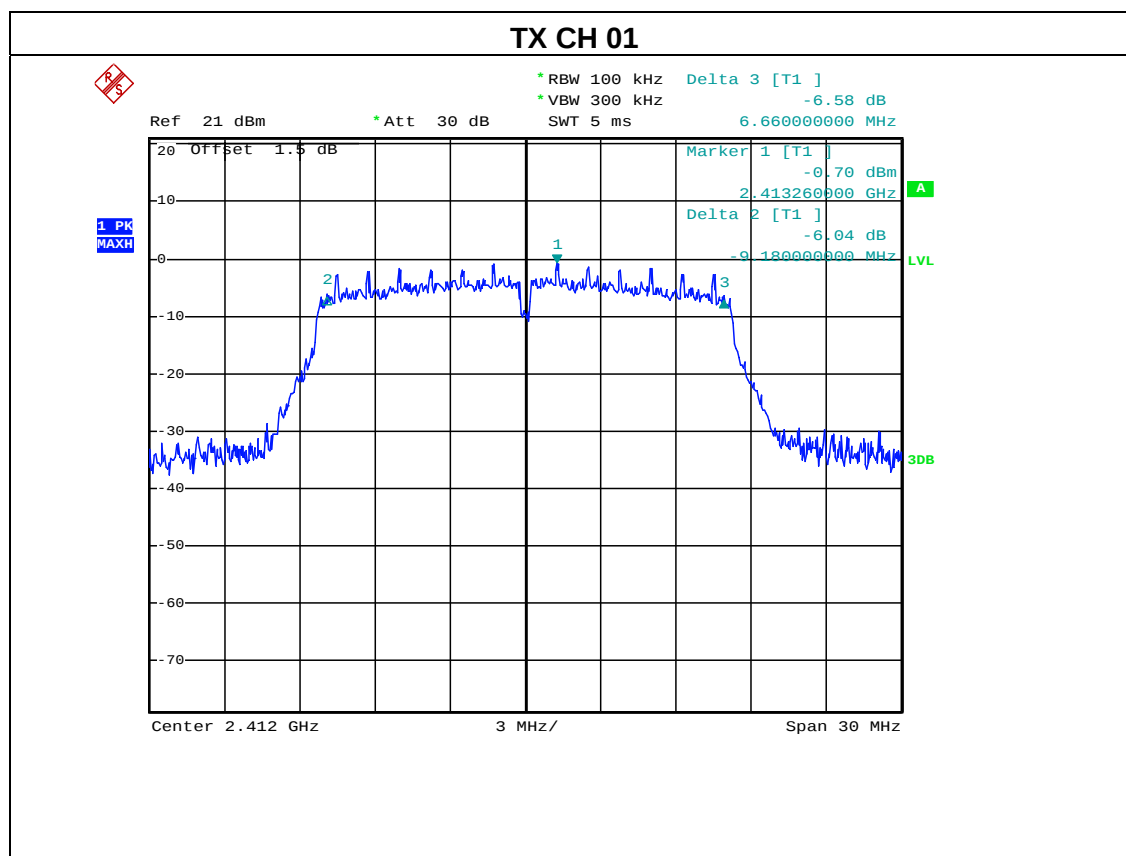


# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 41 of 51 -

|               |                             |                     |                                  |
|---------------|-----------------------------|---------------------|----------------------------------|
| EUT :         | Smart Home                  | Model Name :        | CT868W-SH                        |
| Temperature : | 25 °C                       | Relative Humidity : | 60%                              |
| Pressure :    | 1012 hPa                    | Test Voltage :      | DC 12V from adapter AC 120V/60Hz |
| Test Mode :   | TX g Mode /CH01, CH06, CH11 |                     |                                  |

| Channel | Frequency (MHz) | 6dB bandwidth (MHz) | Limit (kHz) | Result |
|---------|-----------------|---------------------|-------------|--------|
| Low     | 2412            | 15.840              | 500         | Pass   |
| Middle  | 2437            | 16.560              | 500         | Pass   |
| High    | 2462            | 15.840              | 500         | Pass   |



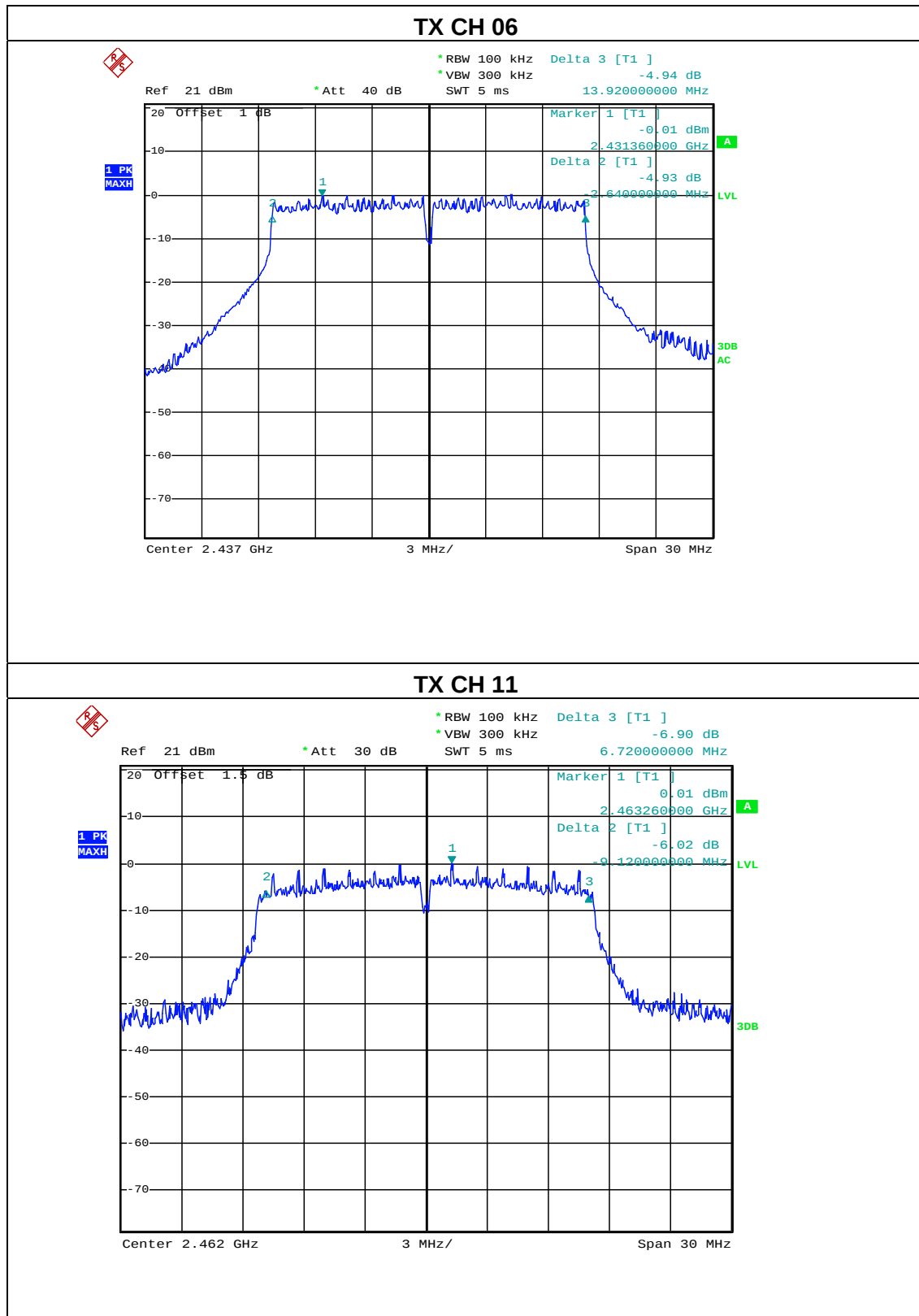
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# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F

- Page 42 of 51 -



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## **6. PEAK OUTPUT POWER TEST**

### **6.1 APPLIED PROCEDURES / LIMIT**

| FCC Part15 (15.247) , Subpart C |                   |                 |                       |        |
|---------------------------------|-------------------|-----------------|-----------------------|--------|
| Section                         | Test Item         | Limit           | Frequency Range (MHz) | Result |
| 15.247(b)(3)                    | Peak Output Power | 1 watt or 30dBm | 2400-2483.5           | PASS   |

#### **6.1.1 TEST PROCEDURE**

- a. The EUT was directly connected to the Power meter

#### **6.1.2 DEVIATION FROM STANDARD**

No deviation.

#### **6.1.3 TEST SETUP**



#### **6.1.4 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



## Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 44 of 51 -

### 6.1.5 TEST RESULTS

|               |                         |                     |                                  |
|---------------|-------------------------|---------------------|----------------------------------|
| EUT :         | Smart Home(WiFi camera) | Model Name :        | CT868W-SH                        |
| Temperature : | 25 °C                   | Relative Humidity : | 60%                              |
| Pressure :    | 1012 hPa                | Test Voltage :      | DC 12V from adapter AC 120V/60Hz |
| Test Mode :   | TX b/g Mode             |                     |                                  |

| Test Channel | Frequency | Maximum Conducted Output Power(PK) | Maximum Conducted Output Power(AV) | LIMIT |
|--------------|-----------|------------------------------------|------------------------------------|-------|
|              | (MHz)     | (dBm)                              | (dBm)                              | (dBm) |
| 802.11b      |           |                                    |                                    |       |
| CH01         | 2412      | 13.37                              | 9.46                               | 30    |
| CH06         | 2437      | 13.22                              | 9.37                               | 30    |
| CH11         | 2462      | 13.18                              | 9.25                               | 30    |
| 802.11g      |           |                                    |                                    |       |
| CH01         | 2412      | 12.25                              | 8.79                               | 30    |
| CH06         | 2437      | 12.06                              | 8.53                               | 30    |
| CH11         | 2462      | 12.24                              | 8.77                               | 30    |

Note: the highest AVG powers for:

802.11b: 1Mbps

802.11g: 6Mbps



## **7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE**

### **APPLICABLE STANDARD**

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 conducted power limits. If the transmitter complies with the conducted 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 §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)).

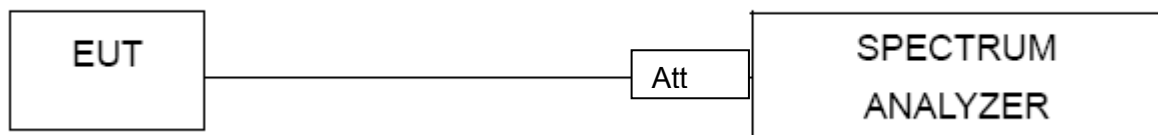
### **TEST PROCEDURE**

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

### **7.1 DEVIATION FROM STANDARD**

No deviation.

### **7.2 TEST SETUP**



### **7.3 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



## Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 46 of 51 -

### 7.4 TEST RESULTS

|               |                         |                     |                                  |
|---------------|-------------------------|---------------------|----------------------------------|
| EUT :         | Smart Home(WiFi camera) | Model Name :        | CT868W-SH                        |
| Temperature : | 25 °C                   | Relative Humidity : | 56%                              |
| Pressure :    | 1012 hPa                | Test Voltage :      | DC 12V from adapter AC 120V/60Hz |

| Frequency Band | Delta Peak to band emission (dBc) | > Limit (dBc) | Result |
|----------------|-----------------------------------|---------------|--------|
| 802.11b        |                                   |               |        |
| Left-band      | 54.40                             | 20            | Pass   |
| Right-band     | 55.84                             | 20            | Pass   |
| 802.11g        |                                   |               |        |
| Left-band      | 52.69                             | 20            | Pass   |
| Right-band     | 47.93                             | 20            | Pass   |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detect or Type | Comment  |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|----------------|----------|
| 802.11b         |                      |             |                         |                 |             |                |          |
| 2390            | 45.37                | 9.86        | 55.23                   | 74              | -18.77      | Pk             | Vertical |
| 2390            | 40.41                | 9.86        | 50.27                   | 54              | -3.73       | Av             | Vertical |
| 2483.5          | 44.28                | 10.14       | 54.42                   | 74              | -19.58      | Pk             | Vertical |
| 2483.5          | 39.32                | 10.14       | 49.46                   | 54              | -4.54       | Av             | Vertical |
| 802.11g         |                      |             |                         |                 |             |                |          |
| 2390            | 43.18                | 9.86        | 53.04                   | 74              | -20.96      | Pk             | Vertical |
| 2390            | 37.25                | 9.86        | 47.11                   | 54              | -6.89       | Av             | Vertical |
| 2483.5          | 41.82                | 10.14       | 51.96                   | 74              | -22.04      | Pk             | Vertical |
| 2483.5          | 33.26                | 10.14       | 43.4                    | 54              | -10.6       | Av             | Vertical |

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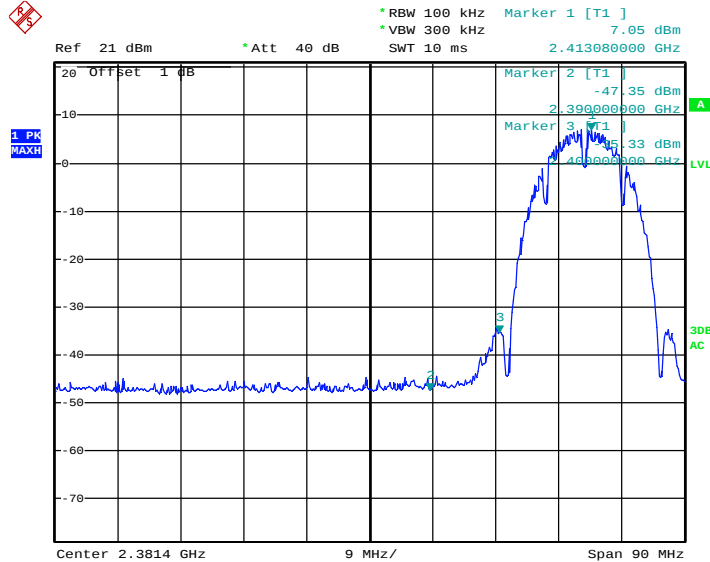


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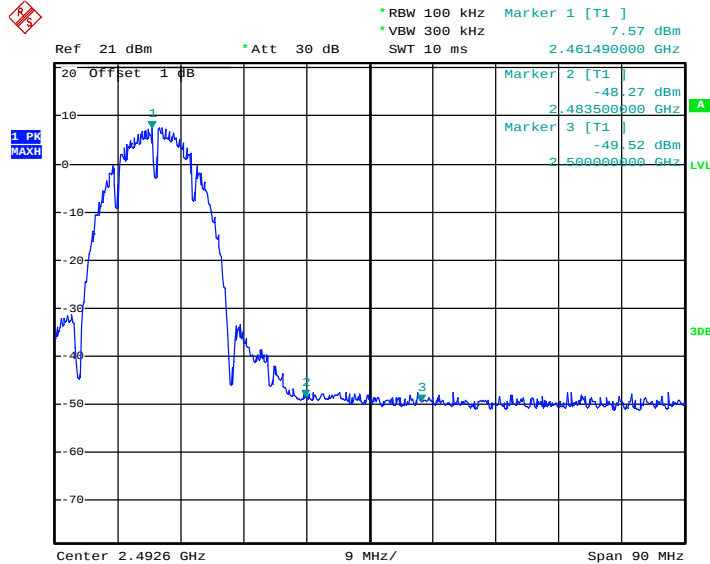
Report No. ATT-2015SZ0611808F

- Page 47 of 51 -

## 802.11b: Band Edge, Left Side



## 802.11b: Band Edge, Right Side



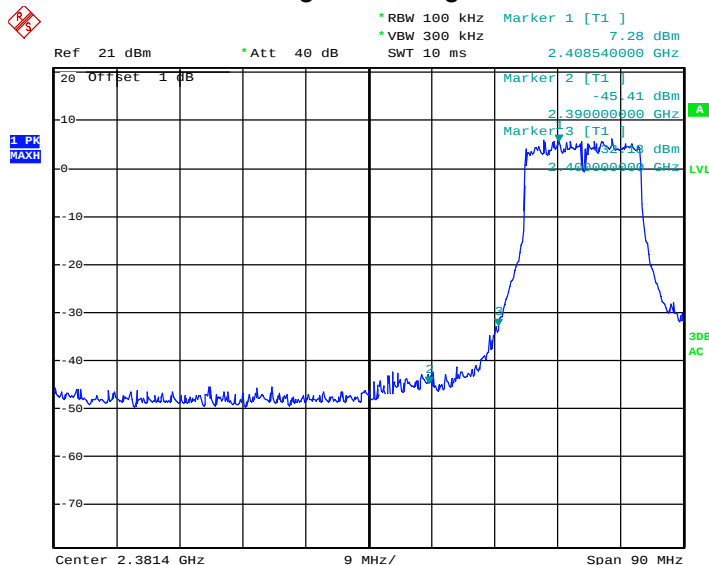


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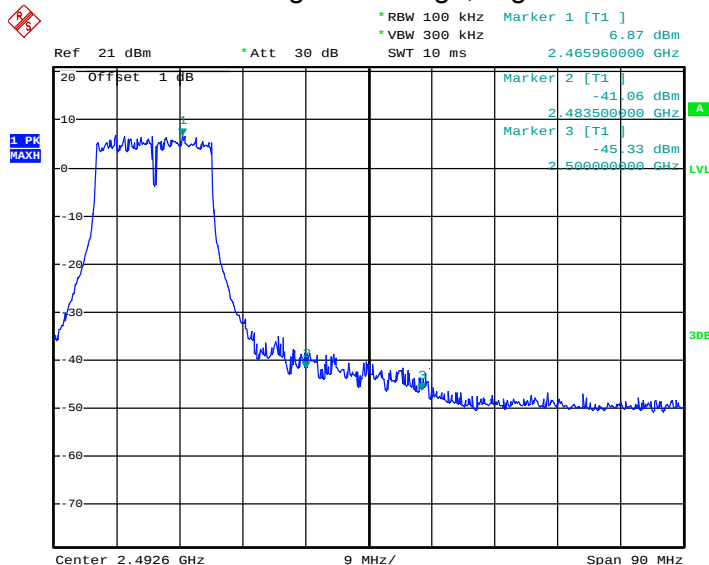
Report No. ATT-2015SZ0611808F

- Page 48 of 51 -

## 802.11g: Band Edge, Left Side



## 802.11g: Band Edge, Right Side





# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 49 of 51 -

## 8. ANTENNA REQUIREMENT

### 8.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### 8.2 EUT ANTENNA

The EUT antenna is dipole antenna with ipex connector. It comply with the standard requirement.



## Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F  
- Page 50 of 51 -

### 9. EUT TEST PHOTO

#### Radiated Measurement Photos



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# Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2015SZ0611808F

- Page 51 of 51 -

## Conducted Measurement Photos

