

FCC TEST REPORT  
FOR  
Shenzhen jienengbao Technology Co.,Ltd  
WIRELESS REMOTELY OPERATED SWITCH  
Model No.: RF251 (51183, 28070, 28069)

Prepared for : Shenzhen jienengbao Technology Co.,Ltd  
Address : 2/F,Building A3, nanchang the second Industrial Zone,  
xixiang town, baoan district, shenzhen city, china

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.  
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Date of receipt of test sample : June 06, 2016  
Number of tested samples : 1  
Serial number : Prototype  
Date of Test : June 06, 2016 ~ June 14, 2016  
Date of Report : June 14, 2016

**FCC TEST REPORT****FCC CFR 47 PART 15 Subpart B: 2015****Report Reference No. ....: LCS1606060462E**

Date Of Issue.....: June 14, 2016

**Testing Laboratory Name .....: Shenzhen LCS Compliance Testing Laboratory Ltd.**Address.....: 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue,  
Bao'an District, Shenzhen, Guangdong, ChinaTesting Location/ Procedure .....: Full application of Harmonised standards ☒  
Partial application of Harmonised standards ☐  
Other standard testing method ☐**Applicant's Name .....: Shenzhen jienengbao Technology Co.,Ltd**Address.....: 2/F,Building A3, nanchang the second Industrial Zone, xixiang  
town, baoan district, shenzhen city, china**Test Specification**

Standard.....: FCC CFR 47 PART 15 Subpart B: 2015, ANSI C63.4-2015

Test Report Form No.....: LCSEMC-1.0

TRF Originator.....: Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF .....: Dated 2011-03

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**Test Item Description.....: WIRELESS REMOTELY OPERATED SWITCH**

Trade Mark.....: JIENENGBAO

Model/Type Reference.....: RF251 (51183, 28070, 28069)

Ratings.....: Input: AC 125V, DC 2-2.5V for IC decoder

**Result .....: Positive****Compiled by:**

Aking Jin

Aking Jin/ File administrators

**Supervised by:**

Glin Lu

Glin Lu/ Technique principal

**Approved by:**

Gavin Liang

Gavin Liang/ Manager

## FCC -- TEST REPORT

**Test Report No. : LCS1606060462E**June 14, 2016

Date of issue

Type / Model..... : RF251 (51183, 28070, 28069)

EUT..... : WIRELESS REMOTELY OPERATED SWITCH

**Applicant..... : Shenzhen jienengbao Technology Co.,Ltd**

Address..... : 2/F,Building A3, nanchang the second Industrial Zone, xixiang town, baoan district, shenzhen city, china

Telephone..... : /

Fax..... : /

**Manufacturer..... : Dongguan Lingjie Smart Technology Co., Ltd**

Address..... : No.10, 9th Lane, Minchang Road, the 6th Industrial zone, Nance, Humen Town, Dongguan City,Guangdong Province, China

Telephone..... : /

Fax..... : /

**Factory..... : Dongguan Lingjie Smart Technology Co., Ltd**

Address..... : No.10, 9th Lane, Minchang Road, the 6th Industrial zone, Nance, Humen Town, Dongguan City,Guangdong Province, China

Telephone..... : /

Fax..... : /

**Test Result** according to the standards on page 6: **Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

**Revision History**

| Revision | Issue Date | Revisions     | Revised By  |
|----------|------------|---------------|-------------|
| 00       | 2016-06-14 | Initial Issue | Gavin Liang |
|          |            |               |             |
|          |            |               |             |

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# 1. SUMMARY OF STANDARDS AND RESULTS

## 1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

| EMISSION                                 |                                    |         |         |
|------------------------------------------|------------------------------------|---------|---------|
| Description of Test Item                 | Standard                           | Limits  | Results |
| Conducted disturbance at mains terminals | FCC CFR 47 PART 15 Subpart B: 2015 | Class B | PASS    |
| Radiated disturbance                     | FCC CFR 47 PART 15 Subpart B: 2015 | Class B | PASS    |

## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

EUT : WIRELESS REMOTELY OPERATED SWITCH

Model Number : RF251 (51183, 28070, 28069)

Power Supply : Input: AC 125V, DC 2-2.5V for IC decoder

Frequency Range : 433.92MHz

Modulation Technology : ASK

Antenna Type and Gain : Integral Antenna, 0dBi (Max.)

### 2.2. Description of Test Facility

EMC Lab. : CNAS Registration Number. is L4595.

FCC Registration Number. is 899208.

Industry Canada Registration Number. is 9642A-1.

VCCI Registration Number. is C-4260 and R-3804.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

### 2.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

### 2.4. Measurement Uncertainty

| Test Item          | Frequency Range    | Expanded uncertainty (U <sub>lab</sub> ) | Expanded uncertainty (U <sub>cispr</sub> ) |
|--------------------|--------------------|------------------------------------------|--------------------------------------------|
| Conducted Emission | (9kHz to 150kHz)   | 2.63 dB                                  | 4.0 dB                                     |
|                    | (150kHz to 30MHz)  | 2.35 dB                                  | 3.6 dB                                     |
| Radiated Emission  | (9kHz to 30MHz)    | 3.68 dB                                  | N/A                                        |
| Radiated Emission  | (30MHz to 1000MHz) | 3.48 dB                                  | 5.2 dB                                     |
| Radiated Emission  | (above 1000MHz)    | 3.90 dB                                  | N/A                                        |

- (1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.
- (2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

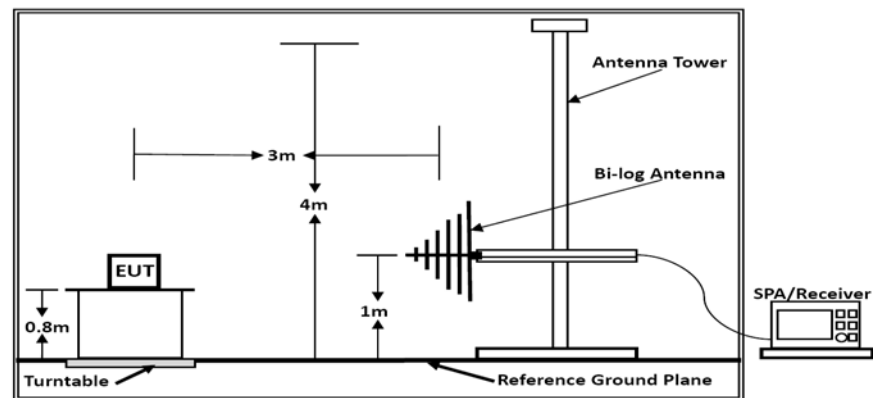
### 3. RADIATED EMISSION MEASUREMENT

#### 3.1. Test Equipment

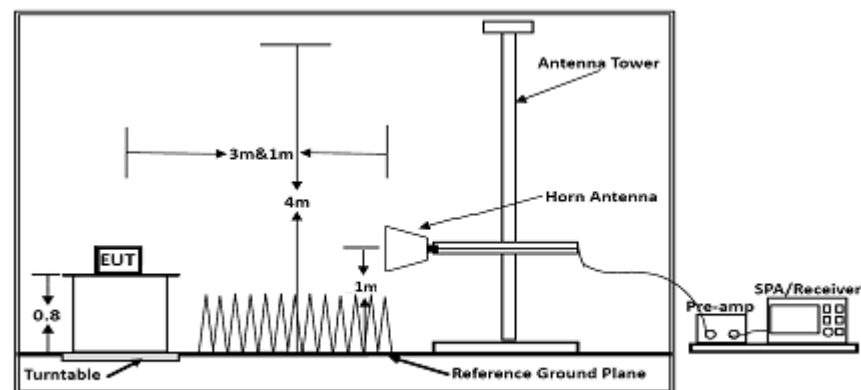
The following test equipments are used during the radiated emission measurement:

| Item | Equipment                                  | Manufacturer    | Model No. | Serial No. | Last Cal.  |
|------|--------------------------------------------|-----------------|-----------|------------|------------|
| 1    | 3m Semi Anechoic Chamber                   | SIDT FRANKONIA  | SAC-3M    | 03CH03-HY  | 2016/02/04 |
| 2    | EMI Test WIRELESS REMOTELY OPERATED SWITCH | ROHDE & SCHWARZ | ESPI      | 101840     | 2016/06/18 |
| 3    | Log per Antenna                            | SCHWARZBECK     | VULB9163  | 9163-470   | 2016/06/18 |
| 4    | EMI Test Software                          | AUDIX           | E3        | N/A        | 2016/06/18 |
| 5    | Positioning Controller                     | MF              | MF-7082   | /          | 2016/06/18 |

#### 3.2. Block Diagram of Test Setup



Below 1GHz



Above 1GHz

### 3.3. Radiated Emission Limit (Class B)

Limits for radiated disturbance Blow 1GHz

| FREQUENCY<br>MHz                                                                                                                                                                                                                                                                                                                        | DISTANCE<br>Meters | FIELD STRENGTHS LIMIT |                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------|-----------------------------------|
|                                                                                                                                                                                                                                                                                                                                         |                    | $\mu\text{V/m}$       | $\text{dB}(\mu\text{V})/\text{m}$ |
| 30 ~ 88                                                                                                                                                                                                                                                                                                                                 | 3                  | 100                   | 40                                |
| 88 ~ 216                                                                                                                                                                                                                                                                                                                                | 3                  | 150                   | 43.5                              |
| 216 ~ 960                                                                                                                                                                                                                                                                                                                               | 3                  | 200                   | 46                                |
| 960 ~ 1000                                                                                                                                                                                                                                                                                                                              | 3                  | 500                   | 54                                |
| Remark : (1) Emission level $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$<br>(2) The smaller limit shall apply at the cross point between two frequency bands.<br>(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system. |                    |                       |                                   |

### 3.4. EUT Configuration on Measurement

The following equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 3.5. Operating Condition of EUT

4.5.1. Setup the EUT as shown in Section 4.2.

4.5.2. Let the EUT work in test mode (on) and measure it.

### 3.6. Test Procedure

EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated by-log antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Below 1G:

The bandwidth of the EMI test receiver is set at 120 kHz.

The frequency range from 30MHz to 1000MHz is checked.

Above 1G:

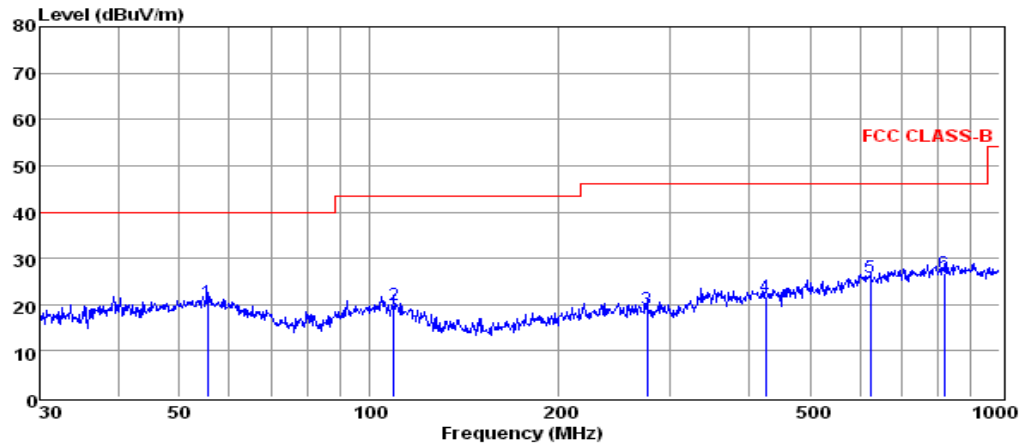
The bandwidth of the EMI test receiver is set at 1MHz, 3MHz for Peak detector.

The bandwidth of the EMI test receiver is set at 1MHz, 10Hz for Average detector

The frequency range from 1GHz to 26.5GHz is checked.

### 3.7. Radiated Emission Noise Measurement Result

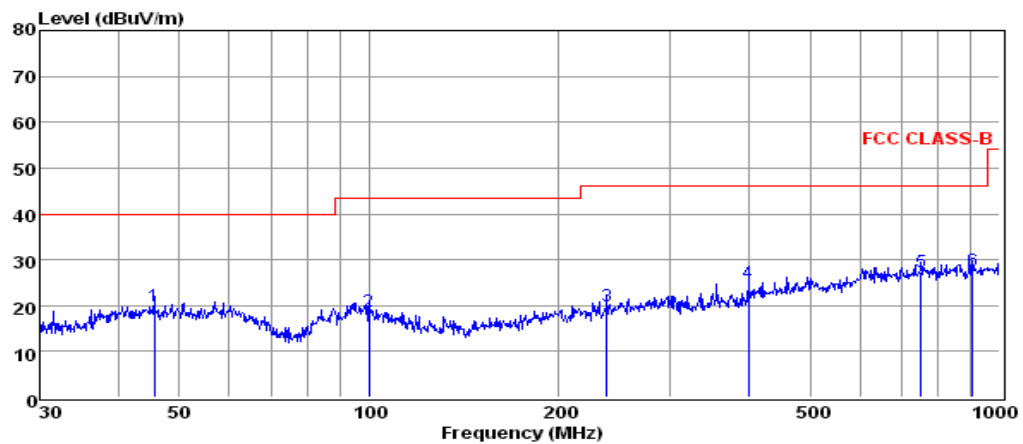
#### PASS.



Env./Ins: 24 °C / 56 %  
 pol: HORIZONTAL

|   | Freq   | Reading | CabLos | Antfac | Measured | Limit  | Over   | Remark |
|---|--------|---------|--------|--------|----------|--------|--------|--------|
|   | MHz    | dBuV    | dB     | dB/m   | dBuV/m   | dBuV/m | dB     |        |
| 1 | 55.41  | 7.11    | 0.47   | 12.99  | 20.57    | 40.00  | -19.43 | QP     |
| 2 | 109.41 | 7.04    | 0.61   | 12.30  | 19.95    | 40.00  | -20.05 | QP     |
| 3 | 276.12 | 5.50    | 1.00   | 12.55  | 19.05    | 47.00  | -27.95 | QP     |
| 4 | 425.03 | 4.99    | 1.16   | 15.49  | 21.64    | 47.00  | -25.36 | QP     |
| 5 | 622.89 | 5.75    | 1.49   | 18.53  | 25.77    | 47.00  | -21.23 | QP     |
| 6 | 815.97 | 4.71    | 1.79   | 20.22  | 26.72    | 47.00  | -20.28 | QP     |

Note: 1. All readings are Quasi-peak values.  
 2. Measured= Reading + Antenna Factor + Cable Loss  
 3. The emission that ate 20db blow the official limit are not reported



Env./Ins: 24 °C / 56 %  
 pol: VERTICAL

|   | Freq   | Reading | CabLos | Antfac | Measured | Limit  | Over   | Remark |
|---|--------|---------|--------|--------|----------|--------|--------|--------|
|   | MHz    | dBuV    | dB     | dB/m   | dBuV/m   | dBuV/m | dB     |        |
| 1 | 45.53  | 6.06    | 0.41   | 13.52  | 19.99    | 40.00  | -20.01 | QP     |
| 2 | 99.88  | 5.10    | 0.60   | 13.15  | 18.85    | 40.00  | -21.15 | QP     |
| 3 | 238.31 | 7.06    | 0.96   | 12.01  | 20.03    | 47.00  | -26.97 | QP     |
| 4 | 399.03 | 8.68    | 1.22   | 15.04  | 24.94    | 47.00  | -22.06 | QP     |
| 5 | 750.11 | 6.27    | 1.65   | 19.44  | 27.36    | 47.00  | -19.64 | QP     |
| 6 | 906.48 | 4.56    | 2.03   | 21.13  | 27.72    | 47.00  | -19.28 | QP     |

Note: 1. All readings are Quasi-peak values.  
 2. Measured= Reading + Antenna Factor + Cable Loss  
 3. The emission that ate 20db blow the official limit are not reported

|                                   |                             |
|-----------------------------------|-----------------------------|
| <b>Test Mode:</b> Receive         | <b>Tested by:</b> Aking     |
| <b>Test voltage:</b> AC 120V      | <b>Test Distance:</b> 3m    |
| <b>Detector Function:</b> Peak+AV | <b>Test Results:</b> Passed |

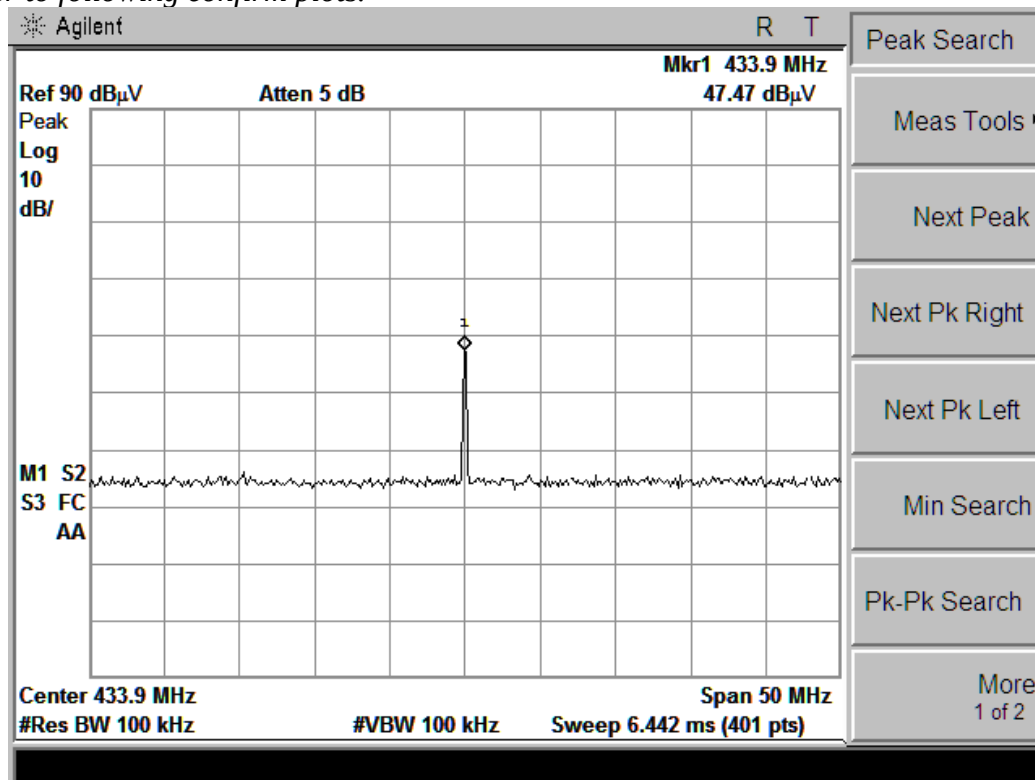
| Polarization | Frequency MHz | Emission Level<br>dB $\mu$ V/m |       | Limits<br>dB $\mu$ V/m |       | Margin<br>dB $\mu$ V/m |        |
|--------------|---------------|--------------------------------|-------|------------------------|-------|------------------------|--------|
|              |               | Peak                           | AVG   | Peak                   | AVG   | Peak                   | AVG    |
| Horizontal   | 1259.10       | 55.53                          | 43.90 | 74.00                  | 54.00 | -18.47                 | -10.10 |
|              | 2964.03       | 54.93                          | 41.80 | 74.00                  | 54.00 | -19.07                 | -12.20 |
|              | 4820.60       | 57.94                          | 41.38 | 74.00                  | 54.00 | -16.06                 | -12.62 |
| Vertical     | 1356.03       | 53.33                          | 43.29 | 74.00                  | 54.00 | -20.67                 | -10.71 |
|              | 3258.82       | 58.16                          | 42.45 | 74.00                  | 54.00 | -15.84                 | -11.55 |
|              | 5100.88       | 54.22                          | 40.83 | 74.00                  | 54.00 | -19.78                 | -13.17 |

**Notes:**

1. Measuring frequencies from 9k~5GHz, No emission found between lowest internal used/generated frequencies to 30MHz.
2. Radiated emissions measured in frequency range from 9k~5GHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measure

**WIRELESS REMOTELY OPERATED SWITCH Type:**

The receiver not belongs to Super regenerative WIRELESS REMOTELY OPERATED SWITCH;  
please refer to following confirm plots.



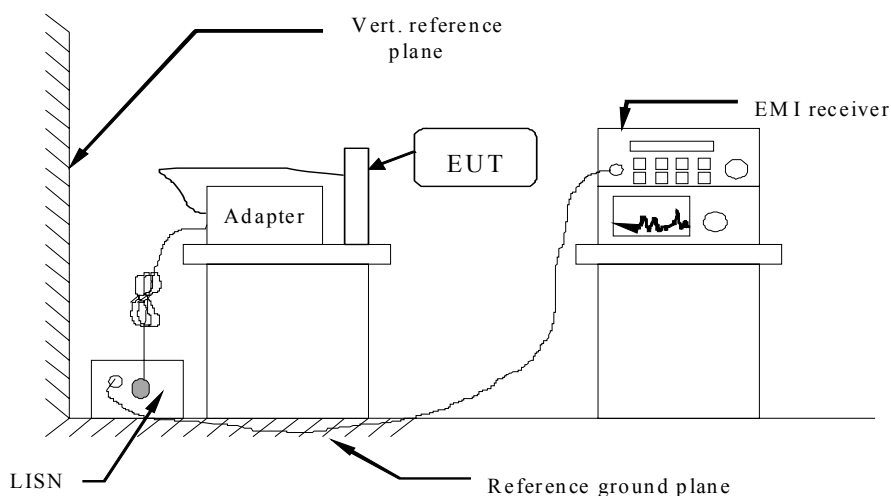
## 4. POWER LINE CONDUCTED EMISSIONS

### 4.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

| Frequency Range (MHz) | Limits (dB $\mu$ V) |          |
|-----------------------|---------------------|----------|
|                       | Quasi-peak          | Average  |
| 0.15 to 0.50          | 66 to 56            | 56 to 46 |
| 0.50 to 5             | 56                  | 46       |
| 5 to 30               | 60                  | 50       |

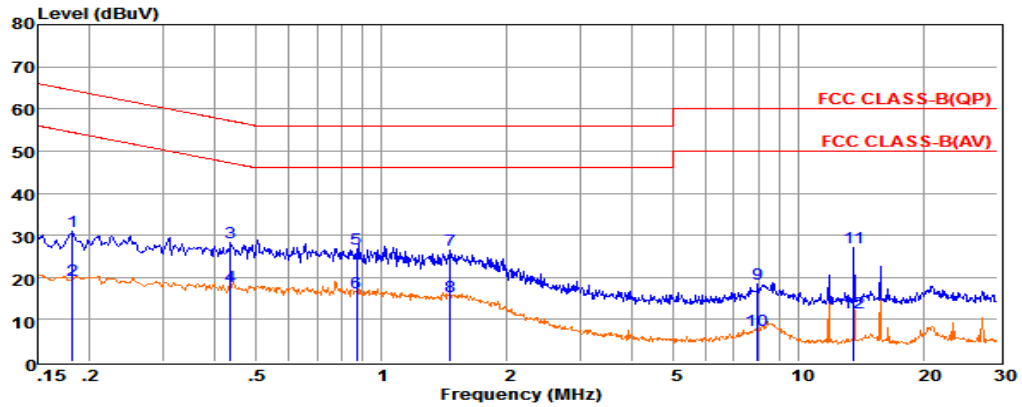
### 4.2 Block Diagram of Test Setup



### 4.3 Test Results

**Pass.**

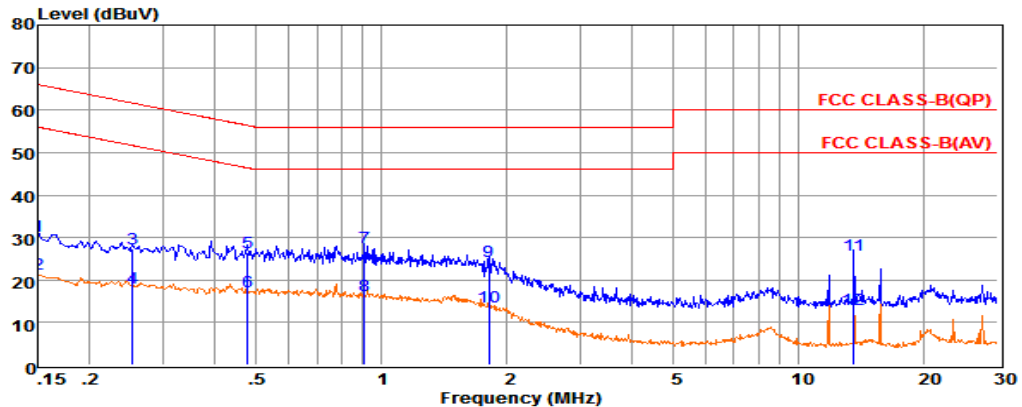
Please refer to following page.



Env. Ins: 24\*/56%  
Pol: LINE

| Freq       | Reading | LisnFac | CabLos | Atten_Fac | Measured | Limit | Over   | Remark  |
|------------|---------|---------|--------|-----------|----------|-------|--------|---------|
| MHz        | dBuV    | dB      | dB     | dB        | dBuV     | dBuV  | dB     |         |
| 1 0.18152  | 11.27   | 9.61    | 0.02   | 10.00     | 30.90    | 64.42 | -33.52 | QP      |
| 2 0.18162  | -0.28   | 9.61    | 0.02   | 10.00     | 19.35    | 54.41 | -35.06 | Average |
| 3 0.43511  | 8.55    | 9.62    | 0.04   | 10.00     | 28.21    | 57.15 | -28.94 | QP      |
| 4 0.43521  | -1.92   | 9.62    | 0.04   | 10.00     | 17.74    | 47.15 | -29.41 | Average |
| 5 0.87103  | 7.23    | 9.63    | 0.04   | 10.00     | 26.90    | 56.00 | -29.10 | QP      |
| 6 0.87113  | -3.33   | 9.63    | 0.04   | 10.00     | 16.34    | 46.00 | -29.66 | Average |
| 7 1.46398  | 6.80    | 9.64    | 0.05   | 10.00     | 26.49    | 56.00 | -29.51 | QP      |
| 8 1.46498  | -4.22   | 9.64    | 0.05   | 10.00     | 15.47    | 46.00 | -30.53 | Average |
| 9 7.97744  | -1.25   | 9.68    | 0.07   | 10.00     | 18.50    | 60.00 | -41.50 | QP      |
| 10 7.97844 | -12.25  | 9.68    | 0.07   | 10.00     | 7.50     | 50.00 | -42.50 | Average |
| 1113.55086 | 7.13    | 9.71    | 0.10   | 10.00     | 26.94    | 60.00 | -33.06 | QP      |
| 1213.55186 | -8.13   | 9.71    | 0.10   | 10.00     | 11.68    | 50.00 | -38.32 | Average |

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten\_Fac.  
2. The emission levels that are 20dB below the official limit are not reported.



Env. Ins: 24\*/56%  
Pol: NEUTRAL

| Freq       | Reading | LisnFac | CabLos | Atten_Fac | Measured | Limit | Over   | Remark  |
|------------|---------|---------|--------|-----------|----------|-------|--------|---------|
| MHz        | dBuV    | dB      | dB     | dB        | dBuV     | dBuV  | dB     |         |
| 1 0.15000  | 10.48   | 9.70    | 0.02   | 10.00     | 30.20    | 66.00 | -35.80 | QP      |
| 2 0.15010  | 1.60    | 9.70    | 0.02   | 10.00     | 21.32    | 55.99 | -34.67 | Average |
| 3 0.25345  | 7.87    | 9.60    | 0.03   | 10.00     | 27.50    | 61.64 | -34.14 | QP      |
| 4 0.25355  | -1.38   | 9.60    | 0.03   | 10.00     | 18.25    | 51.64 | -33.39 | Average |
| 5 0.47865  | 6.69    | 9.62    | 0.04   | 10.00     | 26.35    | 56.36 | -30.01 | QP      |
| 6 0.47875  | -2.43   | 9.62    | 0.04   | 10.00     | 17.23    | 46.36 | -29.13 | Average |
| 7 0.90874  | 7.92    | 9.63    | 0.05   | 10.00     | 27.60    | 56.00 | -28.40 | QP      |
| 8 0.90884  | -3.35   | 9.63    | 0.05   | 10.00     | 16.33    | 46.00 | -29.67 | Average |
| 9 1.80957  | 4.58    | 9.63    | 0.05   | 10.00     | 24.26    | 56.00 | -31.74 | QP      |
| 10 1.81057 | -5.85   | 9.63    | 0.05   | 10.00     | 13.83    | 46.00 | -32.17 | Average |
| 1113.55086 | 6.10    | 9.74    | 0.10   | 10.00     | 25.94    | 60.00 | -34.06 | QP      |
| 1213.55186 | -6.81   | 9.74    | 0.10   | 10.00     | 13.03    | 50.00 | -36.97 | Average |

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten\_Fac.  
2. The emission levels that are 20dB below the official limit are not reported.

-----THE END OF TEST REPORT-----