

# Variant FCC RF Test Report

**APPLICANT** : ZTE CORPORATION  
**EQUIPMENT** : HSPA/LTE CPE  
**BRAND NAME** : ZTE  
**MODEL NAME** : MF275R  
**FCC ID** : SRQ-MF275R  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : (DTS) Digital Transmission System

This is a variant report which is only valid together with the original test report. The product was received on Jul. 18, 2016 and testing was completed on Aug. 30, 2016. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.



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Prepared by: James Huang / Manager



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Approved by: Jones Tsai / Manager



**SPORTON INTERNATIONAL (KUNSHAN) INC.**  
**No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China**



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## REVISION HISTORY

| REPORT NO.   | VERSION | DESCRIPTION                                                                                                                                                                                                                                                                                      | ISSUED DATE   |
|--------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| FR560506-01A | Rev. 01 | This is a variant report for MF275R. The product equality declaration could be referred to Appendix C. Based on the similarity between two models, only worse cases of Radiated Spurious Emission from original test report (Sporton Report Number FR560506A) were verified for the differences. | Aug. 31, 2016 |
| FR560506-01A | Rev. 02 | Update report for revising the Equipment Name.                                                                                                                                                                                                                                                   | Sep. 05, 2016 |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |
|              |         |                                                                                                                                                                                                                                                                                                  |               |



## SUMMARY OF TEST RESULT

| Report Section | FCC Rule  | IC Rule        | Description                                           | Limit                    | Result | Remark                                    |
|----------------|-----------|----------------|-------------------------------------------------------|--------------------------|--------|-------------------------------------------|
| 3.1            | 15.247(d) | RSS-247<br>5.5 | Radiated Band Edges and<br>Radiated Spurious Emission | 15.209(a) &<br>15.247(d) | Pass   | Under limit<br>4.46 dB at<br>2483.760 MHz |

# 1 General Description

## 1.1 Applicant

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

## 1.2 Manufacturer

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

## 1.3 Product Feature of Equipment Under Test

| Product Feature                 |                                                                                                                                    |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Equipment                       | HSPA/LTE CPE                                                                                                                       |
| Brand Name                      | ZTE                                                                                                                                |
| Model Name                      | MF275R                                                                                                                             |
| FCC ID                          | SRQ-MF275R                                                                                                                         |
| EUT supports Radios application | WCDMA/HSPA/HSPA+(16QAM uplink is not supported)/DC-HSDPA/LTE/<br>WLAN2.4GHz 802.11b/g/n HT20/HT40/<br>WLAN5GHz 802.11a/n HT20/HT40 |
| IMEI Code                       | Radiation: 862425030001164                                                                                                         |
| HW Version                      | dgpB                                                                                                                               |
| SW Version                      | MF275R1.2.3                                                                                                                        |
| EUT Stage                       | Identical Prototype                                                                                                                |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Product Specification subjective to this standard

| Product Specification subjective to this standard |                                                                                                                          |              |              |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------|--------------|
| Tx/Rx Channel Frequency Range                     | 802.11b/g/n : 2412 MHz ~ 2462 MHz                                                                                        |              |              |
| Antenna Type                                      | WLAN for Chain Port 1: Monopole Antenna with gain 2.68 dBi<br>WLAN for Chain Port 2: Monopole Antenna with gain 4.51 dBi |              |              |
| Type of Modulation                                | 802.11b : DSSS (DBPSK / DQPSK / CCK)<br>802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)                                   |              |              |
| Antenna Function for Transmitter                  |                                                                                                                          |              |              |
|                                                   |                                                                                                                          | Chain Port 1 | Chain Port 2 |
|                                                   | 802.11 b                                                                                                                 | V            | V            |
|                                                   | 802.11 g                                                                                                                 | V            | V            |
|                                                   | 802.11 n SISO                                                                                                            | V            | V            |
|                                                   | 802.11 n MIMO                                                                                                            | V            | V            |

## 1.5 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.6 Testing Location

|                    |                                                                                                                       |                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------|
| Test Site          | SPORTON INTERNATIONAL (KUNSHAN) INC.                                                                                  |                         |
| Test Site Location | No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China<br>TEL: +86-0512-5790-0158<br>FAX: +86-0512-5790-0958 |                         |
| Test Site No.      | Sporton Site No.                                                                                                      | FCC/IC Registration No. |
|                    | 03CH02-KS                                                                                                             | 418269/4086E            |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

## 1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

### Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

## 2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X,Y plane) were recorded in this report.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.2.

### 2.1 Carrier Frequency and Channel

| Frequency Band  | Channel | Freq.<br>(MHz) | Channel | Freq.<br>(MHz) |
|-----------------|---------|----------------|---------|----------------|
| 2400-2483.5 MHz | 1       | 2412           | 7       | 2442           |
|                 | 2       | 2417           | 8       | 2447           |
|                 | 3       | 2422           | 9       | 2452           |
|                 | 4       | 2427           | 10      | 2457           |
|                 | 5       | 2432           | 11      | 2462           |
|                 | 6       | 2437           |         |                |



## 2.2 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

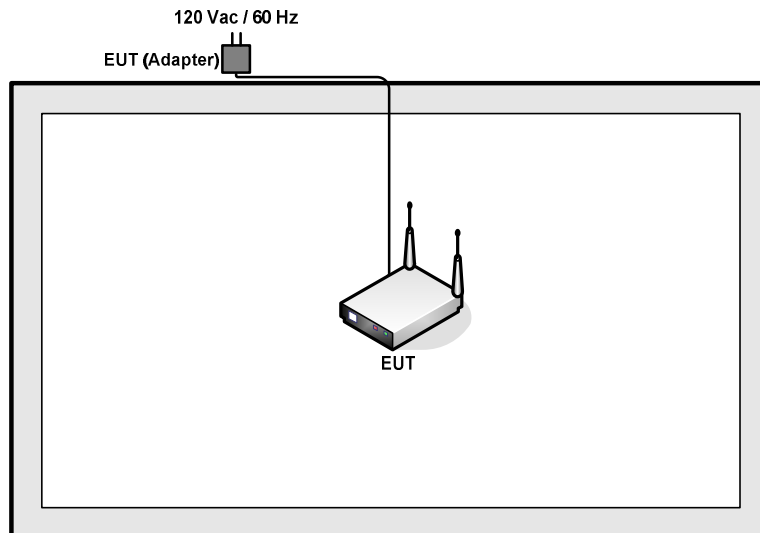
### MIMO Antenna

<2.4GHz>

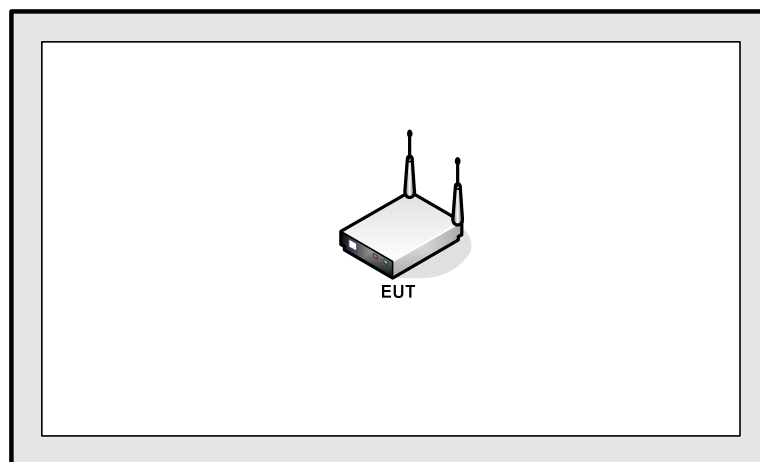
| Modulation   | Data Rate |
|--------------|-----------|
| 802.11b      | 1 Mbps    |
| 802.11g      | 6 Mbps    |
| 802.11n HT20 | MCS0      |
| 802.11n HT40 | MCS0      |

## 2.3 Connection Diagram of Test System

<WLAN 802.11g/n HT40Tx Mode>



<WLAN 802.11b/n HT20Tx Mode>



## 2.4 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuously transmit/receive.

### 3 Test Result

#### 3.1 Radiated Band Edges and Spurious Emission Measurement

##### 3.1.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

| Frequency<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(meters) |
|--------------------|--------------------------------------|----------------------------------|
| 0.009 – 0.490      | $2400/F(\text{kHz})$                 | 300                              |
| 0.490 – 1.705      | $24000/F(\text{kHz})$                | 30                               |
| 1.705 – 30.0       | 30                                   | 30                               |
| 30 – 88            | 100                                  | 3                                |
| 88 – 216           | 150                                  | 3                                |
| 216 - 960          | 200                                  | 3                                |
| Above 960          | 500                                  | 3                                |

##### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.1.3 Test Procedure

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW=100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz, VBW= 3MHz for  $f \geq 1$  GHz for peak measurement.

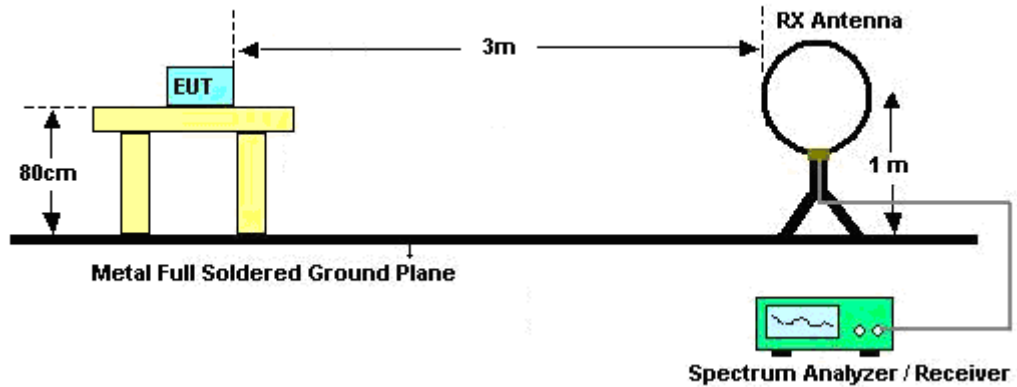
For average measurement:

  - VBW = 10 Hz, when duty cycle is no less than 98 percent.
  - VBW  $\geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

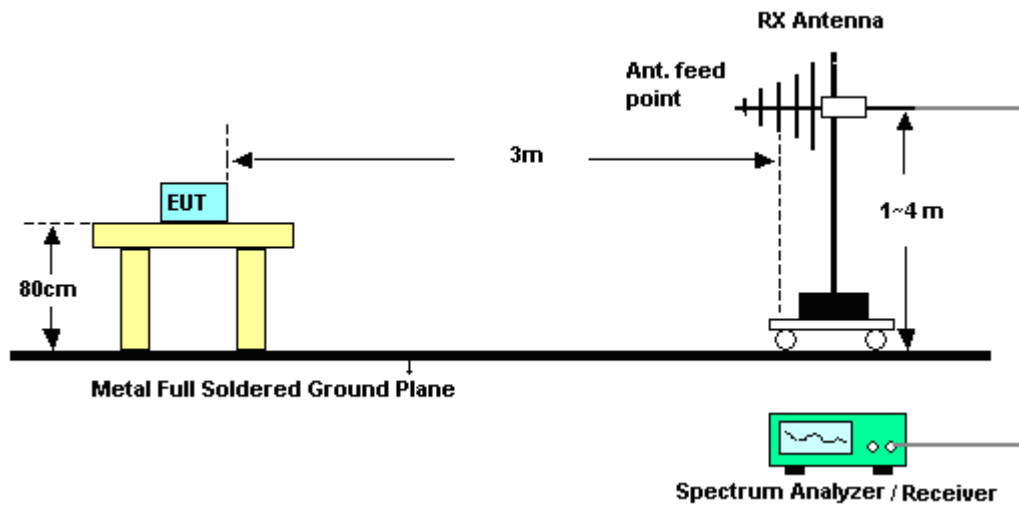
| Chain Port | Band                | Duty Cycle(%) | T(ms) | 1/T(kHz) | VBW Setting |
|------------|---------------------|---------------|-------|----------|-------------|
| 1          | 802.11b             | 100           | -     | -        | 10Hz        |
| 2          | 802.11g             | 96.48         | 1.37  | 0.73     | 1kHz        |
| 1+2        | 2.4GHz 802.11n HT20 | 96.35         | 1.27  | 0.79     | 1kHz        |
| 1+2        | 2.4GHz 802.11n HT40 | 89.42         | 0.34  | 2.96     | 3kHz        |

### 3.1.4 Test Setup

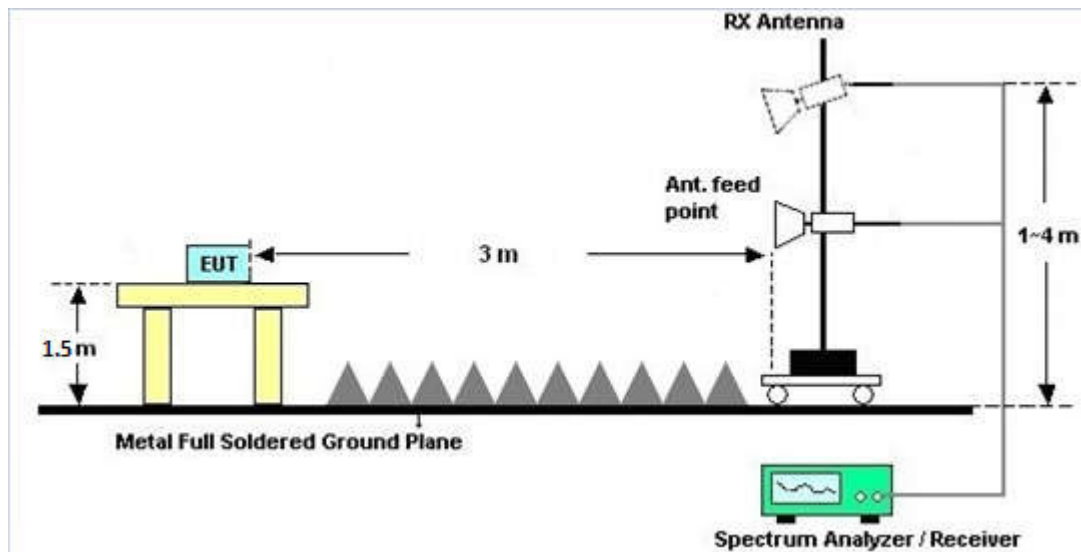
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 3.1.5 Test Results of Radiated Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

### 3.1.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A of this test report.

### 3.1.7 Test Result of Radiated Spurious Emission (30MHz ~ 10<sup>th</sup> Harmonic)

Please refer to Appendix A of this test report.



## 4 List of Measuring Equipment

| Instrument            | Manufacturer | Model No. | Serial No.       | Characteristics         | Calibration Date | Test Date     | Due Date      | Remark                   |
|-----------------------|--------------|-----------|------------------|-------------------------|------------------|---------------|---------------|--------------------------|
| EMI Test Receiver     | R&S          | ESR7      | 101403           | 9kHz~7GHz;<br>Max 30dBm | Aug. 09, 2016    | Aug. 30, 2016 | Aug. 08, 2017 | Radiation<br>(03CH02-KS) |
| EXA Spectrum Analyzer | Keysight     | N9010A    | MY551502<br>08   | 10Hz~44GHz;<br>Max 30dB | Apr. 22, 2016    | Aug. 30, 2016 | Apr. 21, 2017 | Radiation<br>(03CH02-KS) |
| Loop Antenna          | R&S          | HFH2-Z2   | 100321           | 9kHz~30MHz              | Nov. 07, 2015    | Aug. 30, 2016 | Nov. 06, 2016 | Radiation<br>(03CH02-KS) |
| Bilog Antenna         | TeseQ        | CBL6112D  | 37879            | 30MHz~2GHz              | Sep. 12, 2015    | Aug. 30, 2016 | Sep. 11, 2016 | Radiation<br>(03CH02-KS) |
| Horn Antenna          | Schwarzbeck  | BBHA9120D | 9120D-135<br>6   | 1GHz~18GHz              | Apr. 16, 2016    | Aug. 30, 2016 | Apr. 15, 2017 | Radiation<br>(03CH02-KS) |
| SHF-EHF Horn          | com-power    | AH-840    | 101070           | 18GHz~40GHz             | Oct. 10, 2015    | Aug. 30, 2016 | Oct. 09, 2016 | Radiation<br>(03CH02-KS) |
| Amplifier             | com-power    | PA-103A   | 161069           | 1kHz~1000MHz<br>/ 32 dB | Apr. 22, 2016    | Aug. 30, 2016 | Apr. 21, 2017 | Radiation<br>(03CH02-KS) |
| Amplifier             | Agilent      | 8449B     | 3008A023<br>84   | 1GHz~26.5GHz            | Oct. 24, 2015    | Aug. 30, 2016 | Oct. 23, 2016 | Radiation<br>(03CH02-KS) |
| AC Power Source       | Chroma       | 61601     | 616010002<br>473 | N/A                     | NCR              | Aug. 30, 2016 | NCR           | Radiation<br>(03CH02-KS) |
| Turn Table            | MF           | MF7802    | N/A              | 0~360 degree            | NCR              | Aug. 30, 2016 | NCR           | Radiation<br>(03CH02-KS) |
| Antenna Mast          | MF           | MF7802    | N/A              | 1 m~4 m                 | NCR              | Aug. 30, 2016 | NCR           | Radiation<br>(03CH02-KS) |

## 5 Uncertainty of Evaluation

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

|                                                                         |       |
|-------------------------------------------------------------------------|-------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 5.1dB |
|-------------------------------------------------------------------------|-------|

### Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

|                                                                         |       |
|-------------------------------------------------------------------------|-------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 4.5dB |
|-------------------------------------------------------------------------|-------|

### Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

|                                                                         |       |
|-------------------------------------------------------------------------|-------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 5.1dB |
|-------------------------------------------------------------------------|-------|



## Appendix A. Radiated Spurious Emission

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

| WIFI                        | Note | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak  | Pol.  |
|-----------------------------|------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|-------|-------|
| Ant.                        |      |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.  |       |
| 1                           |      | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11b<br>CH 01<br>2412MHz |      | 2345.37   | 49.57      | -24.43 | 74         | 46.07    | 31.35    | 5.64   | 33.49  | 214    | 224     | P     | H     |
|                             |      | 2330.25   | 38.06      | -15.94 | 54         | 34.71    | 31.33    | 5.64   | 33.62  | 214    | 224     | A     | H     |
|                             | *    | 2413.193  | 102.34     | -      | -          | 98.58    | 31.41    | 5.56   | 33.21  | 214    | 224     | P     | H     |
|                             | *    | 2413.778  | 89.23      | -      | -          | 85.47    | 31.41    | 5.56   | 33.21  | 214    | 224     | A     | H     |
|                             |      | 2389.11   | 49.63      | -24.37 | 74         | 45.99    | 31.4     | 5.59   | 33.35  | 145    | 63      | P     | V     |
|                             |      | 2329.62   | 37.85      | -16.15 | 54         | 34.5     | 31.33    | 5.64   | 33.62  | 145    | 63      | A     | V     |
|                             | *    | 2413.193  | 101.09     | -      | -          | 97.33    | 31.41    | 5.56   | 33.21  | 145    | 63      | P     | V     |
|                             | *    | 2410.938  | 88.06      | -      | -          | 84.3     | 31.41    | 5.56   | 33.21  | 145    | 63      | A     | V     |



## 2.4GHz 2400~2483.5MHz

## WIFI 802.11b (Harmonic @ 3m)

| WIFI<br>Ant.<br>1           | Note                                                                                        | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>( P/A ) | Pol.<br>( H/V ) |
|-----------------------------|---------------------------------------------------------------------------------------------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|-------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| 802.11b<br>CH 01<br>2412MHz |                                                                                             | 4824                 | 51.4                | -22.6                   | 74                          | 69.39                     | 34.98                         | 6.41                    | 59.38                      | 138                  | 189                     | P                       | H               |
|                             |                                                                                             | 4824                 | 46.51               | -7.49                   | 54                          | 64.5                      | 34.98                         | 6.41                    | 59.38                      | 138                  | 189                     | A                       | H               |
|                             |                                                                                             | 7236                 | 50.09               | -23.91                  | 74                          | 64.32                     | 35.8                          | 8.18                    | 58.21                      | 100                  | 0                       | P                       | H               |
|                             |                                                                                             | 9648                 | 51.69               | -22.31                  | 74                          | 61.48                     | 37.54                         | 9.7                     | 57.03                      | 126                  | 270                     | P                       | H               |
|                             |                                                                                             | 4824                 | 46.88               | -27.12                  | 74                          | 64.87                     | 34.98                         | 6.41                    | 59.38                      | 152                  | 177                     | A                       | V               |
|                             |                                                                                             | 7236                 | 51.54               | -22.46                  | 74                          | 65.77                     | 35.8                          | 8.18                    | 58.21                      | 152                  | 177                     | P                       | V               |
|                             |                                                                                             | 7236                 | 45.42               | -8.58                   | 54                          | 59.65                     | 35.8                          | 8.18                    | 58.21                      | 154                  | 192                     | A                       | V               |
| Remark                      | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         |                 |



## 2.4GHz 2400~2483.5MHz

## WIFI 802.11g (Band Edge @ 3m)

| WIFI                        | Note                                                                                        | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak  | Pol.  |
|-----------------------------|---------------------------------------------------------------------------------------------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|-------|-------|
| Ant.                        |                                                                                             |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.  |       |
| 2                           |                                                                                             | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11g<br>CH 11<br>2462MHz | *                                                                                           | 2465.13   | 107.15     | -      | -          | 104.05   | 31.46    | 4.88   | 33.24  | 282    | 50      | P     | H     |
|                             | *                                                                                           | 2463.627  | 99.11      | -      | -          | 96.01    | 31.46    | 4.88   | 33.24  | 282    | 50      | A     | H     |
|                             |                                                                                             | 2483.52   | 68.27      | -5.73  | 74         | 65.41    | 31.47    | 4.65   | 33.26  | 282    | 50      | P     | H     |
|                             |                                                                                             | 2483.68   | 47.22      | -6.78  | 54         | 44.36    | 31.47    | 4.65   | 33.26  | 282    | 50      | A     | H     |
|                             | *                                                                                           | 2464.629  | 104.39     | -      | -          | 101.29   | 31.46    | 4.88   | 33.24  | 166    | 0       | P     | V     |
|                             | *                                                                                           | 2463.376  | 96.4       | -      | -          | 93.3     | 31.46    | 4.88   | 33.24  | 166    | 0       | A     | V     |
|                             |                                                                                             | 2483.56   | 62.84      | -11.16 | 74         | 59.98    | 31.47    | 4.65   | 33.26  | 166    | 0       | P     | V     |
|                             |                                                                                             | 2483.52   | 43.12      | -10.88 | 54         | 40.26    | 31.47    | 4.65   | 33.26  | 166    | 0       | A     | V     |
| Remark                      | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |           |            |        |            |          |          |        |        |        |         |       |       |

**2.4GHz 2400~2483.5MHz****WIFI 802.11g (Harmonic @ 3m)**

| WIFI<br>Ant.<br>2           | Note                                                                                        | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>( P/A ) | Pol.<br>( H/V ) |
|-----------------------------|---------------------------------------------------------------------------------------------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|-------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| 802.11g<br>CH 11<br>2462MHz |                                                                                             | 4926                 | 36.39               | -37.61                  | 74                          | 53.96                     | 34.88                         | 6.45                    | 58.9                       | 100                  | 0                       | P                       | H               |
|                             |                                                                                             | 7386                 | 35.57               | -38.43                  | 74                          | 50.4                      | 35.86                         | 8.29                    | 58.98                      | 100                  | 0                       | P                       | H               |
|                             |                                                                                             | 4924                 | 37.52               | -36.48                  | 74                          | 55.09                     | 34.88                         | 6.45                    | 58.9                       | 300                  | 360                     | P                       | V               |
|                             |                                                                                             | 7386                 | 36.46               | -37.54                  | 74                          | 51.29                     | 35.86                         | 8.29                    | 58.98                      | 300                  | 360                     | P                       | V               |
| Remark                      | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         |                 |



## 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT20 (Band Edge @ 3m)

| WIFI                                | Note                                                                                        | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak  | Pol.  |
|-------------------------------------|---------------------------------------------------------------------------------------------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|-------|-------|
| Ant.                                |                                                                                             |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.  |       |
| 1+2                                 |                                                                                             | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11n<br>HT20<br>CH 11<br>2462MHz | *                                                                                           | 2463.126  | 108.17     | -      | -          | 105.07   | 31.46    | 4.88   | 33.24  | 165    | 23      | P     | H     |
|                                     | *                                                                                           | 2464.044  | 100.46     | -      | -          | 97.36    | 31.46    | 4.88   | 33.24  | 165    | 23      | A     | H     |
|                                     |                                                                                             | 2483.8    | 65.11      | -8.89  | 74         | 62.25    | 31.47    | 4.65   | 33.26  | 165    | 23      | P     | H     |
|                                     |                                                                                             | 2483.76   | 45.65      | -8.35  | 54         | 42.79    | 31.47    | 4.65   | 33.26  | 165    | 23      | A     | H     |
|                                     | *                                                                                           | 2462.708  | 108.43     | -      | -          | 105.33   | 31.46    | 4.88   | 33.24  | 252    | 0       | P     | V     |
|                                     | *                                                                                           | 2463.126  | 99.15      | -      | -          | 96.05    | 31.46    | 4.88   | 33.24  | 252    | 0       | A     | V     |
|                                     |                                                                                             | 2483.64   | 67.81      | -6.19  | 74         | 64.95    | 31.47    | 4.65   | 33.26  | 252    | 0       | P     | V     |
|                                     |                                                                                             | 2483.76   | 49.54      | -4.46  | 54         | 46.68    | 31.47    | 4.65   | 33.26  | 252    | 0       | A     | V     |
| Remark                              | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |           |            |        |            |          |          |        |        |        |         |       |       |



**2.4GHz 2400~2483.5MHz**  
**WIFI 802.11n HT20 (Harmonic @ 3m)**

| WIFI<br>Ant.<br>1+2                 | Note                                                                                        | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>( P/A ) | Pol.<br>( H/V ) |
|-------------------------------------|---------------------------------------------------------------------------------------------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|-------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| 802.11n<br>HT20<br>CH 11<br>2462MHz |                                                                                             | 4926                 | 41.4                | -32.6                   | 74                          | 58.97                     | 34.88                         | 6.45                    | 58.9                       | 100                  | 0                       | P                       | H               |
|                                     |                                                                                             | 7386                 | 46.16               | -27.84                  | 74                          | 60.99                     | 35.86                         | 8.29                    | 58.98                      | 100                  | 0                       | P                       | H               |
|                                     |                                                                                             | 4924                 | 43.85               | -30.15                  | 74                          | 61.42                     | 34.88                         | 6.45                    | 58.9                       | 300                  | 360                     | P                       | V               |
|                                     |                                                                                             | 7386                 | 45.89               | -28.11                  | 74                          | 60.72                     | 35.86                         | 8.29                    | 58.98                      | 300                  | 360                     | P                       | V               |
| Remark                              | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         |                 |



## 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT40 (Band Edge @ 3m)

| WIFI<br>Ant.<br>1+2                 | Note                                                                                        | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>( P/A ) | Pol.<br>( H/V ) |
|-------------------------------------|---------------------------------------------------------------------------------------------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|-------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| 802.11n<br>HT40<br>CH 09<br>2452MHz |                                                                                             | 2390                 | 49.65               | -24.35                  | 74                          | 45.87                     | 31.4                          | 5.59                    | 33.21                      | 142                  | 241                     | P                       | H               |
|                                     |                                                                                             | 2332.59              | 38.94               | -15.06                  | 54                          | 35.59                     | 31.33                         | 5.64                    | 33.62                      | 142                  | 241                     | A                       | H               |
|                                     | *                                                                                           | 2449.014             | 105.92              | -                       | -                           | 102.61                    | 31.44                         | 5.11                    | 33.24                      | 142                  | 241                     | P                       | H               |
|                                     | *                                                                                           | 2448.764             | 98.06               | -                       | -                           | 94.75                     | 31.44                         | 5.11                    | 33.24                      | 142                  | 241                     | A                       | H               |
|                                     |                                                                                             | 2485.04              | 65.83               | -8.17                   | 74                          | 62.97                     | 31.47                         | 4.65                    | 33.26                      | 142                  | 241                     | P                       | H               |
|                                     |                                                                                             | 2491.2               | 37.68               | -16.32                  | 54                          | 34.8                      | 31.49                         | 4.65                    | 33.26                      | 142                  | 241                     | A                       | H               |
|                                     |                                                                                             | 2317.2               | 48.9                | -25.1                   | 74                          | 45.54                     | 31.31                         | 5.67                    | 33.62                      | 224                  | 96                      | P                       | V               |
|                                     |                                                                                             | 2389.83              | 39                  | -15                     | 54                          | 35.22                     | 31.4                          | 5.59                    | 33.21                      | 224                  | 96                      | A                       | V               |
|                                     | *                                                                                           | 2448.263             | 103.2               | -                       | -                           | 99.89                     | 31.44                         | 5.11                    | 33.24                      | 224                  | 96                      | P                       | V               |
|                                     | *                                                                                           | 2449.599             | 94.66               | -                       | -                           | 91.35                     | 31.44                         | 5.11                    | 33.24                      | 224                  | 96                      | A                       | V               |
|                                     |                                                                                             | 2483.96              | 65.33               | -8.67                   | 74                          | 62.47                     | 31.47                         | 4.65                    | 33.26                      | 224                  | 96                      | P                       | V               |
|                                     |                                                                                             | 2484.72              | 48.43               | -5.57                   | 54                          | 45.57                     | 31.47                         | 4.65                    | 33.26                      | 224                  | 96                      | A                       | V               |
| Remark                              | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         |                 |



**2.4GHz 2400~2483.5MHz**  
**WIFI 802.11n HT40 (Harmonic @ 3m)**

| WIFI<br>Ant.<br>1+2                             | Note                                                                                        | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>( P/A ) | Pol.<br>( H/V ) |
|-------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|-------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| 802.11n<br><br>HT40<br><br>CH 09<br><br>2452MHz |                                                                                             | 4902                 | 42.13               | -31.87                  | 74                          | 59.77                     | 34.9                          | 6.44                    | 58.98                      | 150                  | 360                     | P                       | H               |
|                                                 |                                                                                             | 7356                 | 43.39               | -30.61                  | 74                          | 58.1                      | 35.84                         | 8.26                    | 58.81                      | 150                  | 360                     | P                       | H               |
|                                                 |                                                                                             | 4902                 | 39.57               | -34.43                  | 74                          | 57.21                     | 34.9                          | 6.44                    | 58.98                      | 150                  | 360                     | P                       | V               |
|                                                 |                                                                                             | 7356                 | 42.06               | -31.94                  | 74                          | 56.77                     | 35.84                         | 8.26                    | 58.81                      | 150                  | 360                     | P                       | V               |
| Remark                                          | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         |                 |



## 2.4GHz 2400~2483.5MHz

## Emission below 1GHz

## 2.4GHz WIFI 802.11n HT20 (LF)

| WIFI                            | Note                                                                       | Frequency | Level      | Over   | Limit      | Read   | Antenna  | Cable  | Preamp | Ant    | Table   | Peak  | Pol.  |
|---------------------------------|----------------------------------------------------------------------------|-----------|------------|--------|------------|--------|----------|--------|--------|--------|---------|-------|-------|
| Ant.                            |                                                                            |           |            | Limit  | Line       | Level  | Factor   | Loss   | Factor | Pos    | Pos     | Avg.  |       |
| 1+2                             |                                                                            | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | (dBμV) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 2.4GHz<br>802.11n<br>HT20<br>LF |                                                                            | 45.52     | 18.73      | -21.27 | 40         | 38.28  | 12.22    | 0.83   | 32.6   | -      | -       | P     | H     |
|                                 |                                                                            | 95.96     | 20.38      | -23.12 | 43.5       | 38.82  | 12.7     | 1.18   | 32.32  | -      | -       | P     | H     |
|                                 |                                                                            | 103.72    | 20.14      | -23.36 | 43.5       | 38.06  | 13.15    | 1.23   | 32.3   | -      | -       | P     | H     |
|                                 |                                                                            | 147.37    | 21.64      | -21.86 | 43.5       | 38.85  | 13.76    | 1.47   | 32.44  | -      | -       | P     | H     |
|                                 |                                                                            | 174.53    | 22.47      | -21.03 | 43.5       | 41.07  | 12.28    | 1.6    | 32.48  | 100    | 0       | P     | H     |
|                                 |                                                                            | 323.91    | 23.47      | -22.53 | 46         | 38.17  | 15.33    | 2.21   | 32.24  | -      | -       | P     | H     |
|                                 |                                                                            | 34.85     | 24.35      | -15.65 | 40         | 38.2   | 17.9     | 0.71   | 32.46  | 100    | 360     | P     | V     |
|                                 |                                                                            | 53.28     | 22.73      | -17.27 | 40         | 46.12  | 8.28     | 0.88   | 32.55  | -      | -       | P     | V     |
|                                 |                                                                            | 98.87     | 25.3       | -18.2  | 43.5       | 43.41  | 13       | 1.2    | 32.31  | -      | -       | P     | V     |
|                                 |                                                                            | 113.42    | 26.46      | -17.04 | 43.5       | 44.22  | 13.29    | 1.28   | 32.33  | -      | -       | P     | V     |
|                                 |                                                                            | 305.48    | 23.93      | -22.07 | 46         | 39.08  | 15       | 2.15   | 32.3   | -      | -       | P     | V     |
|                                 |                                                                            | 470.38    | 23.78      | -22.22 | 46         | 35.5   | 17.76    | 2.71   | 32.19  | -      | -       | P     | V     |
| Remark                          | 1. No other spurious found.<br>2. All results are PASS against limit line. |           |            |        |            |        |          |        |        |        |         |       |       |

**Note symbol**

|     |                                                                                                                                                          |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| *   | <b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency. |
| !   | Test result is <b>over limit</b> line.                                                                                                                   |
| P/A | <b>P</b> eak or <b>A</b> verage                                                                                                                          |
| H/V | <b>H</b> orizontal or <b>V</b> ertical                                                                                                                   |



A calculation example for radiated spurious emission is shown as below:

| WIFI    | Note | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak    | Pol.    |
|---------|------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
| Ant.    |      |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.    |         |
| 1       |      | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | ( P/A ) | ( H/V ) |
| 802.11b |      | 2390      | 55.45      | -18.55 | 74         | 54.51    | 32.22    | 4.58   | 35.86  | 103    | 308     | P       | H       |
| CH 01   |      |           |            |        |            |          |          |        |        |        |         |         |         |
| 2412MHz |      | 2390      | 43.54      | -10.46 | 54         | 42.6     | 32.22    | 4.58   | 35.86  | 103    | 308     | A       | H       |

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

**For Average Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.



## **Appendix C. Product Equality Declaration**

**ZTE CORPORATION**

# **Product Change Description**

As the applicant of the below model, [ZTE Corporation] declares that the product,

[MF275R]

[ZTE Corporation]

is the variant of the initial certified product,

[MF275R]

[ZTE Corporation]

## **SOFTWARE MODIFICATIONS:**

Protocol Stack changes: NO

MMS/STK changes: NO

JAVA changes: NO

Other changes detailed: 1)change SSID name

2)change APN

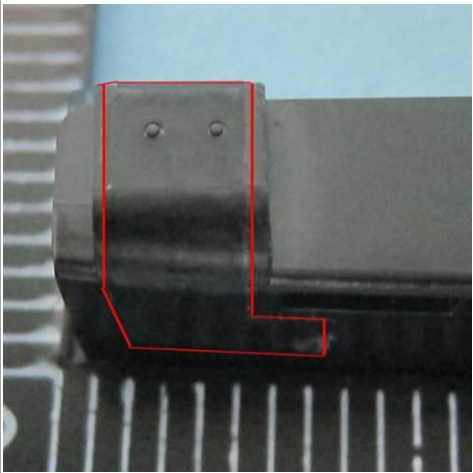
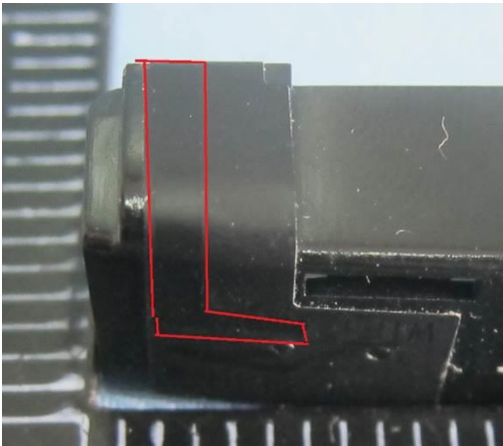
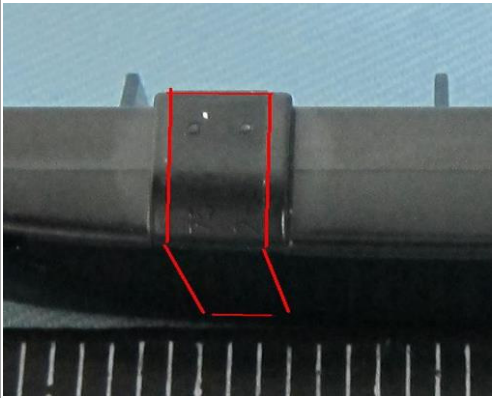
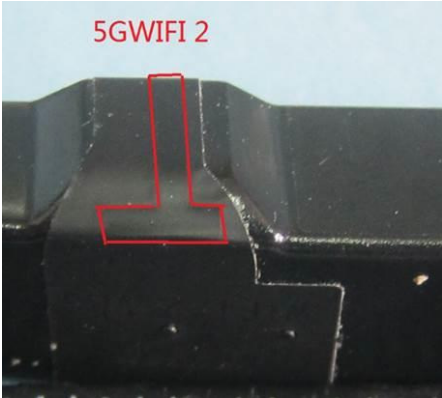
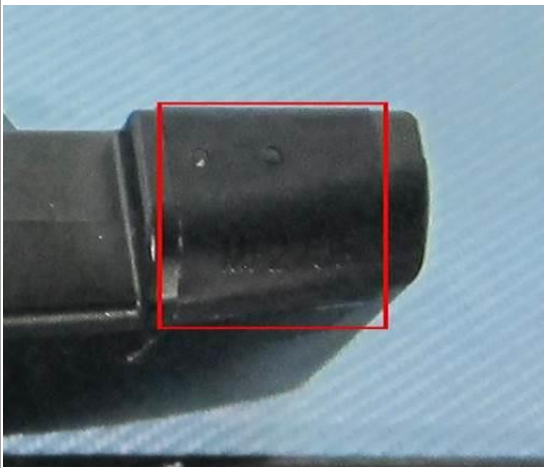
3)added the LTE Band V(Changed the VN)

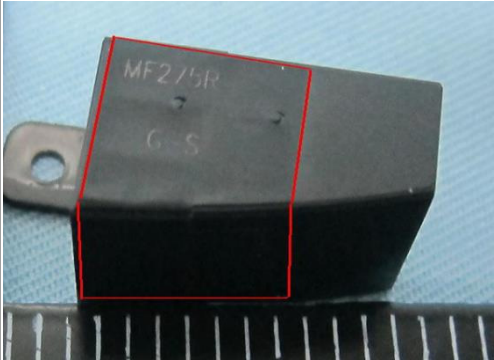
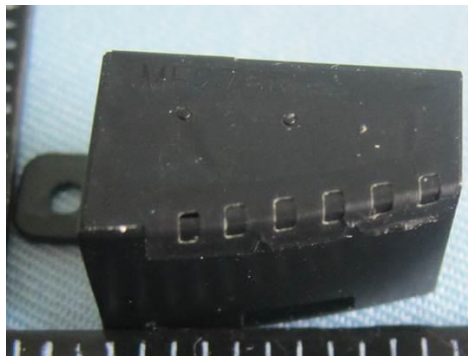
## **HARDWARE MODIFICATION:**

Band changes: NO

Power Amplifier changes: NO

Antenna changes: yes, Wifi and GPS antenna change

| Original Wifi 2 Ant                                                                 | Variant                                                                              |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|    |    |
| Original 5G Wifi 2                                                                  | Variant                                                                              |
|   |   |
| Original 5G Wifi main                                                               | Variant                                                                              |
|  |  |
|                                                                                     |                                                                                      |
|                                                                                     |                                                                                      |
|                                                                                     |                                                                                      |

| Original GPS Ant                                                                                                                                                                                                                                                                                  | Variant                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  A black rectangular GPS antenna module with a metal mounting bracket on the left. The top surface has the text 'MF2/5R' and 'G-S' printed on it. A red rectangle is drawn around the top portion of the module. |  A black rectangular GPS antenna module, similar to the original but with a different internal structure visible through the bottom surface, showing several small square openings. |

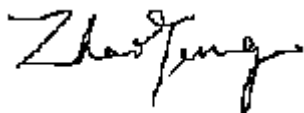
PCB Layout changes: NO  
Components on PCB changes: NO  
LCD changes: NO  
Speaker changes: NO  
Camera changes: NO  
Vibrator changes: NO  
Bluetooth changes: NO  
FM changes: NO  
Other changes:

## MECHANICAL MODIFICATIONS:

Use new metal front/back cover or keypad: NO  
Mechanical shell changes: NO  
Other changes detailed: NO

## ACCESSORY MODIFICATIONS:

Battery changes: NO  
AC Adaptor changes: NO  
Earphone changes: NO



APPROVED BY: zhaoyang

Project Manager:

Date:2016-7-21

Company: ZTE Corporation

Address: B109, #889, Bibo Rd, Zhangjiang Hi-Tech Park, Shanghai,China

Tel:+86-21-68896840

Fax: +86-21-68896835