



Registration  
No.910917

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# TEST REPORT FOR BLUETOOTH TESTING

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Report No.: SRTC2017-9004(F)-0033

Product Name: LTE/WCDMA/GSM (GPRS) Multi-Mode Digital Mobile  
Phone

Product Model: 602ZT

Applicant: ZTE Corporation

Manufacturer: ZTE Corporation

Specification: FCC Part 15, Subpart C (October, 2016 edition)

FCC ID: SRQ-602ZT

The State Radio\_monitoring\_center Testing Center (SRTC)

No.80 Beilishi Road Xicheng District Beijing, China

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## **1. GENERAL INFORMATION**

### **1.1 Notes of the test report**

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The test results relate only to individual items of the samples which have been tested.

### **1.2 Information about the testing laboratory**

|                    |                                                         |
|--------------------|---------------------------------------------------------|
| Company:           | The State Radio_monitoring_center Testing Center (SRTC) |
| Address:           | No.80 Beilishi Road, Xicheng District                   |
| City:              | Beijing                                                 |
| Country or Region: | P.R.China                                               |
| Contacted person:  | liujia                                                  |
| Tel:               | +86 10 5799 6181                                        |
| Fax:               | +86 10 5799 6288                                        |
| Email:             | liujiaf@srtc.org.cn                                     |

### **1.3 Applicant's details**

|                    |                                                                                      |
|--------------------|--------------------------------------------------------------------------------------|
| Company:           | ZTE Corporation                                                                      |
| Address:           | ZTE Plaza, #55 Keji Road South, Hi-Tech, Industrial Park, Nanshan District,Guangdong |
| City:              | Shenzhen                                                                             |
| Country or Region: | P.R.China                                                                            |
| Grantee Code:      | SRQ                                                                                  |
| Contacted person:  | Min Zhang                                                                            |
| Tel:               | 021-68897867                                                                         |
| Fax:               | 021-50801070                                                                         |
| Email:             | zhang.min13@zte.com.cn                                                               |

### **1.4 Manufacturer's details**

|                    |                                                                                      |
|--------------------|--------------------------------------------------------------------------------------|
| Company:           | ZTE Corporation                                                                      |
| Address:           | ZTE Plaza, #55 Keji Road South, Hi-Tech, Industrial Park, Nanshan District,Guangdong |
| City:              | Shenzhen                                                                             |
| Country or Region: | P.R.China                                                                            |
| Contacted person:  | Min Zhang                                                                            |
| Tel:               | 021-68897867                                                                         |
| Fax:               | 021-50801070                                                                         |
| Email:             | zhang.min13@zte.com.cn                                                               |

## 1.5 Test Environment

|                                         |            |
|-----------------------------------------|------------|
| Date of Receipt of test sample at SRTC: | 2017.04.11 |
| Testing Start Date:                     | 2017.04.17 |
| Testing End Date:                       | 2017.04.26 |

| Environmental Data: | Temperature (°C) | Humidity (%) |
|---------------------|------------------|--------------|
| Ambient             | 25               | 38           |
| Maximum Extreme     | 55               | 40           |
| Minimum Extreme     | -10              | ---          |

|                                          |      |
|------------------------------------------|------|
| Normal Supply Voltage (V d.c.):          | 3.85 |
| Maximum Extreme Supply Voltage (V d.c.): | 4.24 |
| Minimum Extreme Supply Voltage (V d.c.): | 3.47 |

## **2 DESCRIPTION OF THE DEVICE UNDER TEST**

### **2.1 Final Equipment Build Status**

|                            |                    |
|----------------------------|--------------------|
| Frequency Range            | 2.4GHz~2.4835GHz   |
| Number of Channel          | 40                 |
| Modulation Type            | GFSK               |
| Duplex Mode                | TDD                |
| Channel Spacing            | 1MHz               |
| Data Rate                  | 1Mbps              |
| Antenna Type               | Fixed Internal     |
| Power Supply               | Battery or Charger |
| Rated Power Supply Voltage | 3.85V              |
| HW Version                 | csrB               |
| SW Version                 | 602ZT a0.1         |
| IMEI                       | 863720030003387    |

## 2.2 Support Equipment

The following support equipment was used to exercise the DUT during testing:

### Battery 1

|               |                    |
|---------------|--------------------|
| Equipment     | Battery            |
| Manufacturer  | BYD                |
| Model Number  | Li3824T44P4h716043 |
| Serial Number | -----              |

### Headset 1

|               |                                           |
|---------------|-------------------------------------------|
| Equipment     | Headset                                   |
| Manufacturer  | Dongle Guan Kan Tsang Industrial Co., LTD |
| Model Number  | QZESDM1532001A00                          |
| Serial Number | ---                                       |

NOTE: Accessories(Charger/USB Cable/Headset)are provided by testlab.

### **3 REFERENCE SPECIFICATION**

| Specification | Version       | Title                                                                       |
|---------------|---------------|-----------------------------------------------------------------------------|
| 15.35         | Mar. 6, 2014  | Measurement detector functions and bandwidths.                              |
| 15.209        | Oct. 30, 1997 | Radiated emission limits; general requirements.                             |
| 15.247        | May 1, 2014   | Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz. |

## **4 KEY TO NOTES AND RESULT CODES**

| Code | Meaning                                                                                  |
|------|------------------------------------------------------------------------------------------|
| PASS | Test result shows that the requirements of the relevant specification have been met.     |
| FAIL | Test result shows that the requirements of the relevant specification have not been met. |
| N/T  | Test case is not tested.                                                                 |
| NTC  | Nominal voltage, Normal Temperature                                                      |
| HV   | High voltage, Normal Temperature                                                         |
| LV   | Low voltage, Normal Temperature                                                          |
| HTHV | high voltage, High Temperature                                                           |
| LTHV | High voltage, Low Temperature                                                            |
| HTLV | Low voltage, High Temperature                                                            |
| LTLV | Low voltage, Low Temperature                                                             |

## 5 RESULT SUMMARY

| No. | Test case                                  | FCC reference             | Verdict |
|-----|--------------------------------------------|---------------------------|---------|
| 1   | Occupied Bandwidth                         | 15.247(a)(2)              | Pass    |
| 2   | Peak Power Output                          | 15.247(b)(3)              | Pass    |
| 3   | Transmitter Power Spectral Density         | 15.247(e)                 | Pass    |
| 4   | Conducted Out of band emission measurement | 15.247(d)                 | Pass    |
| 5   | Spurious Radiated Emissions                | 15.247(d)/15.35(b)/15.209 | Pass    |
| 6   | AC Power line Conducted Emission           | 15.207                    | Pass    |

|                                                    |                               |
|----------------------------------------------------|-------------------------------|
| This Test Report Is Issued by:<br>Mr. Peng Zhen 彭振 | Checked by:<br>Ms. Liu Jia 刘佳 |
| Tested by:<br>Mr. He Dengshun 何邓顺                  | Issued date:<br>20170426      |

## **6 TEST RESULT**

### **6.1 Occupied Bandwidth**

#### **6.1.1 Ambient condition**

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 22°C        | 40%               | 101.5kPa |

#### **6.1.2 Test Description**

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer and Bluetooth test set via a power splitter with a known loss. Which connected to the transmitter antenna terminal of the EUT while the EUT is operating at maximum power and at the appropriate frequencies. All modes of operation were investigated and the worst case configuration results are reported in this section.

#### **6.1.3 Test limit**

Part15.247(a)(2)

The minimum permissible 6dB bandwidth is 500 kHz

#### **6.1.4 Test Procedure Used**

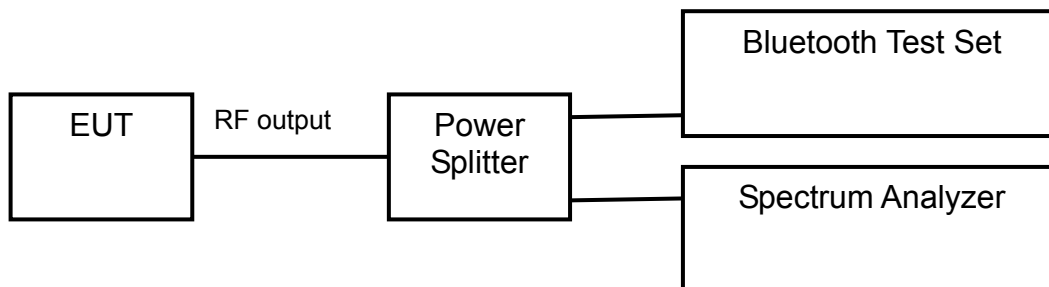
KDB 558074 D01 v03r02 – Section 8.1 Option 1

#### **6.1.5 Test Settings**

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

#### **6.1.6 Test Setup**

The EUT and measurement equipment were set up as shown in the diagram below.



#### **6.1.7 Test result**

The test results are shown in Appendix A .

## 6.2 Peak Power Output

### 6.2.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 22°C        | 40%               | 101.5kPa |

### 6.2.2 Test Description

The transmitter antenna terminal of the EUT is connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. Measurements are made while the EUT is operating at maximum power and at the appropriate frequencies.

### 6.2.3 Test limit

Part15.247(b)(3)

The maximum permissible conducted output power is 1 Watt.

Used conversion factor: Limit (dBm) = 10 log (Limit (W)/1mW)

==> Maximum Output Power: 30.0 dBm

### 6.2.4 Test Procedure Used

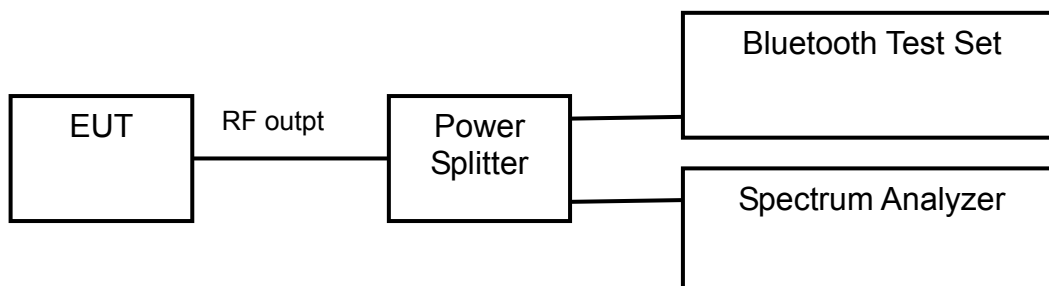
KDB 558074 D01 v03r02 - Section 9.1.1

### 6.2.5 Test Settings

- a) RBW =2 MHz
- b) VBW =10 MHz
- c) span  $\geq 3 \times$  RBW
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

### 6.2.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



### 6.2.7 Test result

The test results are shown in Appendix A .

## 6.3 Transmitter Power Spectral Density

### 6.3.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 22°C        | 40%               | 101.5kPa |

### 6.3.2 Test Description

The peak power density is measured with a spectrum analyzer and Bluetooth test set via a power splitter with a known loss connected to the antenna terminal of the EUT while the EUT is operating at maximum power and at the appropriate frequencies.

### 6.3.3 Test limit

Part15.247(e)

The maximum permissible power spectral density is 8.0 dBm in any 3 kHz band.

### 6.3.4 Test Procedure Used

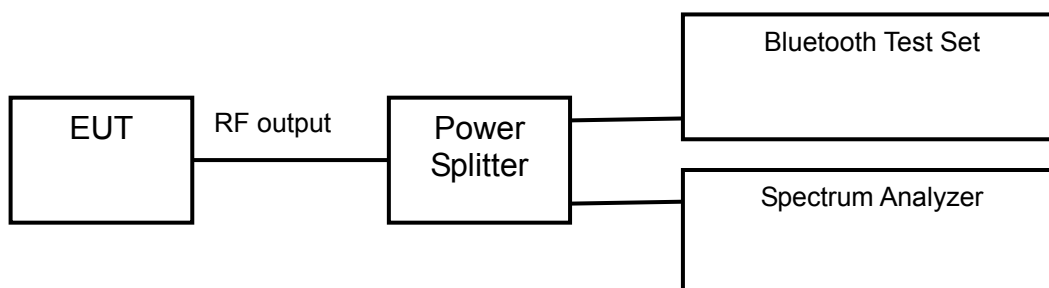
KDB 558074 D01 v03r02 Section 10.2.

### 6.3.5 Test Settings

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- Set the VBW  $\geq 3 \times \text{RBW}$ .
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 6.3.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



### 6.3.7 Test result

The test results are shown in Appendix A.

## 6.4 Conducted Out of band emission measurement

### 6.4.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 22°C        | 40%               | 101.5kPa |

### 6.4.2 Test Description

For the following out of band conducted spurious emissions plots, the EUT was set to transmit at maximum power with the largest packet size available. The worst case spurious emissions were found in this configuration.

### 6.4.3 Test limit

Part 15.247(d)

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth.

### 6.4.4 Test Procedure Used

KDB 558074 D01 v03r02 Section 11.3

### 6.4.5 Test Settings

- Set the center frequency and span to encompass frequency range to be measured.
- Set the RBW = 100kHz.
- Set the VBW  $\geq$  300kHz.
- Detector = peak.
- Set span to encompass the spectrum to be examined
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

### 6.4.6 Test Setup

The EUT and measurement equipment were set up as shown in 2.2.3.6

### 6.4.7 Test result

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

The test results are shown in Appendix A .

## 6.5 Spurious Radiated Emissions

### 6.5.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 20.8°C      | 36.5%             | 100.9kPa |

### 6.5.2 Test Description

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

### 6.5.3 Test limit

Part15.205, 15.209, 15.247(d);

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in below Table per Section 15.209.

| Frequency [MHz] | Field strength [μV/m] | Measured Distance [meters] |
|-----------------|-----------------------|----------------------------|
| 30~88           | 100                   | 3                          |
| 88~216          | 150                   | 3                          |
| 216~960         | 200                   | 3                          |
| Above 960       | 500                   | 3                          |

**Radiated Limits**

Part15.35(b):

there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit

**Used conversion factor: Limit (dBμV/m) = 20 log (Limit (μV/m)/1μV/m)**

| Frequency [MHz]                                                            | Detector   | Unit (dBμV/m) |
|----------------------------------------------------------------------------|------------|---------------|
| 30~88                                                                      | Quasi-peak | 40.0          |
| 88~216                                                                     | Quasi-peak | 43.5          |
| 216~960                                                                    | Quasi-peak | 46.0          |
| 960~1000                                                                   | Quasi-peak | 54.0          |
| 1000~5th harmonic of the highest frequency<br>or 40GHz, whichever is lower | Average    | 54.0          |
|                                                                            | Peak       | 74.0          |

**Conversion Radiated limits**

#### 6.5.4 Test Procedure Used

- KDB 558074 D01 v03r02 – Section 12.2.5 (average power measurements)  
KDB 558074 D01 v03r02 – Section 12.2.4 (peak power measurements)

#### 6.5.5 Test Settings

##### Average Field Strength Measurements per Section 12.2.5.3 of KDB 558074 v03r02

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3kHz > 1/T
4. Averaging type was set to RMS to ensure that video filtering was applied in the power domain
5. Detector = peak
6. Sweep time = auto
7. Trace mode = max hold
8. Trace was allowed to run for at least 50 times (1/duty cycle) traces

##### Peak Field Strength Measurements per Section 12.2.4 of KDB 558074 v03r02

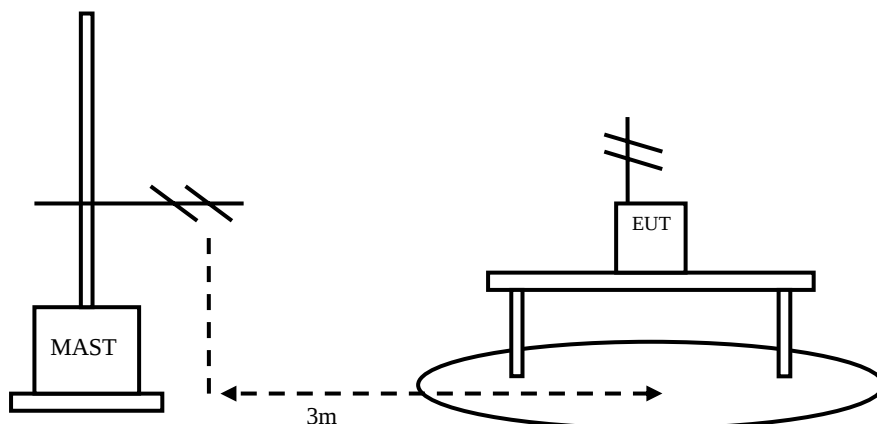
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW is set depending on measurement frequency, as specified in following table

| Frequency  | RBW        |
|------------|------------|
| 9-150kHz   | 200-300Hz  |
| 0.15-30MHz | 9-10kHz    |
| 30-1000MHz | 100-120kHz |
| >1000MHz   | 1MHz       |

3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

### 6.5.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below



The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration. Then start the test software ES-K1. Sweep the whole frequency band through the range from 30MHz to 1GHz or above, using receive log period antenna HL562 or Ridge horn antenna HF906.

During the test, the antenna height and EUT azimuth were varied in order to identify the maximum level of emission from the EUT. The height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees. The measurements shall be repeated with orthogonal polarization of the test antenna. The results shall be showed the worst case of the three orthogonal axes.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

### 6.5.7 Test result

The test results are shown in Appendix B.

## 6.6 AC Power line Conducted Emission

### 6.6.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 20.8°C      | 36.5%             | 100.9kPa |

### 6.6.2 Test limit

FCC Part15.207

| Frequency of Emission<br>(MHz) | Conducted Limit (dBuV) |            |
|--------------------------------|------------------------|------------|
| 0.15-0.5<br>0.5-5<br>5-30      | Quasi-peak             | Average    |
|                                | 66 to 56 *             | 56 to 46 * |
|                                | 56                     | 46         |
|                                | 60                     | 50         |

\* Decreases with the logarithm of the frequency.

The measurement is made according to ANSI C63.4-2014

### 6.6.3 Test result

The test results are shown in AppendixB .

## **7 MEASUREMENT UNCERTAINTIES**

| Items                | Uncertainty    |        |
|----------------------|----------------|--------|
| Occupied Bandwidth   | 3kHz           |        |
| Peak power output    | 0.67dB         |        |
| Band edge compliance | 1.20dB         |        |
| Spurious emissions   | 30MHz~1GHz     | 2.83dB |
|                      | 1GHz~12.75GHz  | 2.50dB |
|                      | 12.75GHz~25GHz | 2.75dB |

## 8 TEST EQUIPMENTS

| No. | Name/ Model                                    | Manufacturer  | S/N        | Cal Due date |
|-----|------------------------------------------------|---------------|------------|--------------|
| 1.  | Spectrum Analyzer FSV                          | ROHDE&SCHWARZ | 101065     | 2017.08.20   |
| 2.  | Signal Generator MG3700A                       | Anritsu       | 6200677084 | 2017.08.20   |
| 3.  | Bluetooth Test Set MT8852B                     | Anritsu       | 1142010    | 2018.03.01   |
| 4.  | Cable 104EA                                    | SUCOFLEX      | 9272/4EA   | 2018.03.01   |
| 5.  | Cable 104EA                                    | SUCOFLEX      | 9266/4EA   | 2018.03.01   |
| 6.  | Power Splitter 11850C                          | Agilent       | 026057     | 2017.08.20   |
| 7.  | 12.65m×8.03m×7.50m<br>Fully-Anechoic Chamber   | FRANKONIA     | -----      | -----        |
| 8.  | 23.18m×16.88m×9.60m<br>Semi-Anechoic Chamber   | FRANKONIA     | ---        | -----        |
| 9.  | Turn table Diameter:1m                         | HD            | -----      | -----        |
| 10. | Turn table Diameter:5m                         | HD            | -----      | -----        |
| 11. | Antenna master FAC(MA4.0)                      | MATURO        | -----      | -----        |
| 12. | Antenna master SAC(MA4.0)                      | MATURO        | -----      | -----        |
| 13. | 9.080m×5.255m×3.525m<br>Shielding room         | FRANKONIA     | -----      | -----        |
| 14. | HF 906 Double-Ridged<br>Waveguide Horn Antenna | R&S           | 100030     | 2017.08.20   |
| 15. | HF 906 Double-Ridged<br>Waveguide Horn Antenna | R&S           | 100029     | 2017.08.20   |
| 16. | HL562 Ultra log antenna                        | R&S           | 100016     | 2017.08.20   |
| 17. | 3160-09 Receive antenna                        | SCHWARZ-BECK  | 002058-002 | 2017.08.20   |
| 18. | ESI 40 EMI test receiver                       | R&S           | 100015     | 2017.08.20   |
| 19. | Radio tester                                   | CMU 200       | 114667     | 2017.08.20   |
| 20. | ESCS30 EMI test receiver                       | R&S           | 100029     | 2017.08.20   |
| 21. | HL562 Receive antenna                          | R&S           | 100167     | 2017.08.20   |
| 22. | ESH3-Z5 LISN                                   | R&S           | 100020     | 2017.08.20   |

## **APPENDIX A – TEST DATA OF CONDUCTED EMISSION**

Please refer to the attachment.

## **APPENDIX B – TEST DATA OF RADIATED EMISSION**

Please refer to the attachment.

## **APPENDIX C – TEST SETUP**

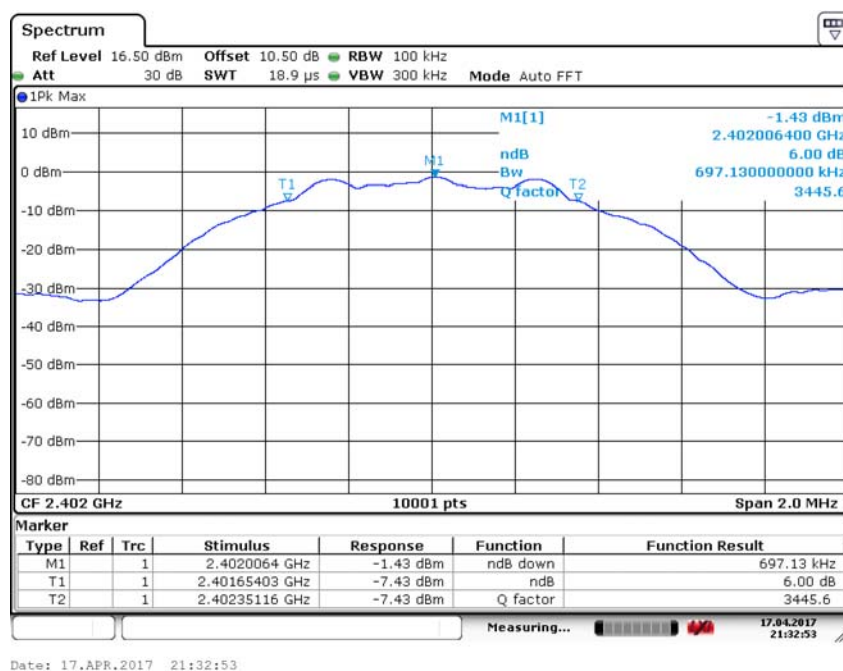
Please refer to the attachment.

## APPENDIX A – TEST DATA OF CONDUCTED EMISSION

### Occupied Bandwidth

Modulation type: GFSK (LE)

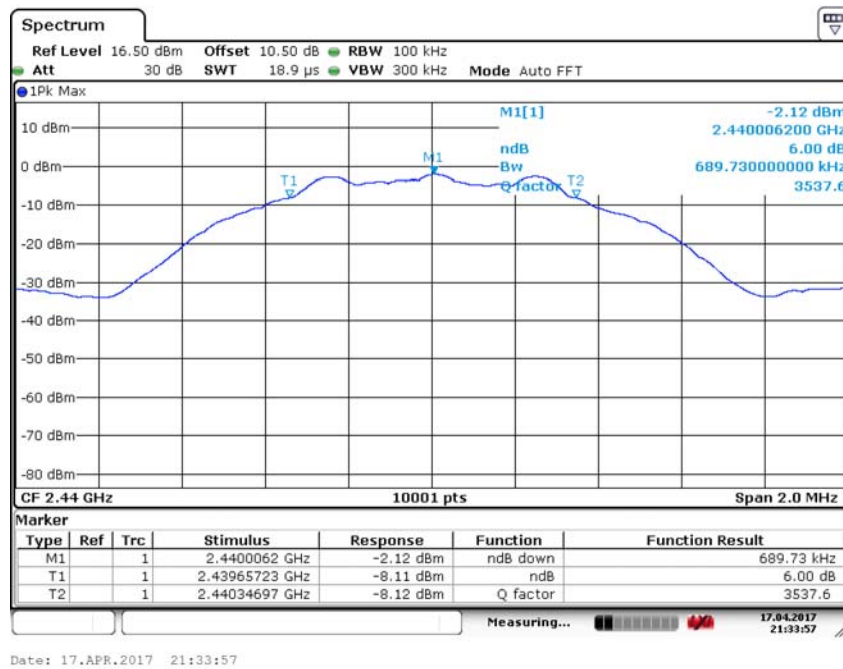
| Carrier frequency (MHz) | Channel No. | 6 dB bandwidth(kHz) |
|-------------------------|-------------|---------------------|
| 2402                    | 0           | 697.1               |
| 2440                    | 19          | 689.7               |
| 2480                    | 39          | 695.3               |



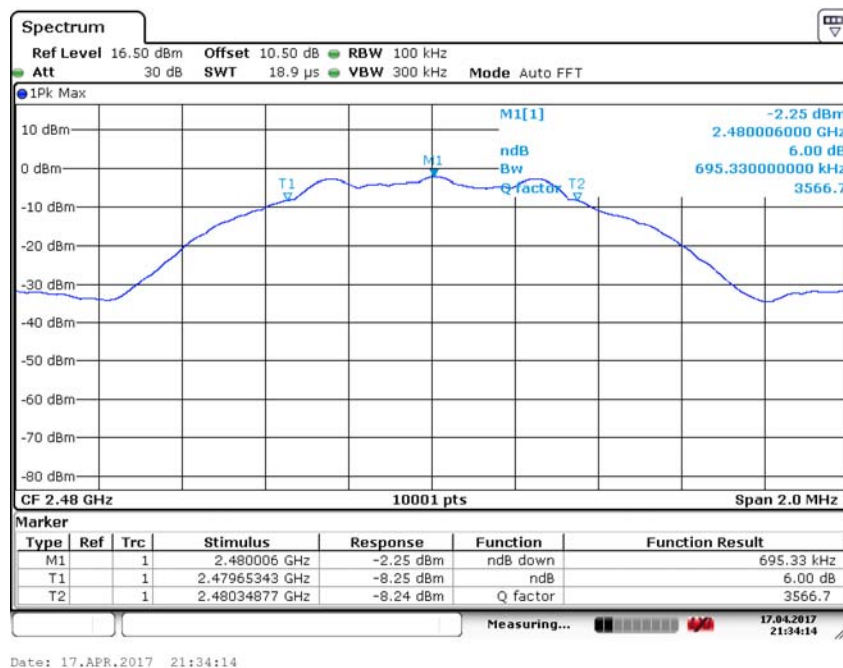
Carrier frequency (MHz): 2402

Channel No.:0

Modulation type: GFSK (LE)



Carrier frequency (MHz): 2440  
Channel No.:19  
Modulation type: GFSK (LE)

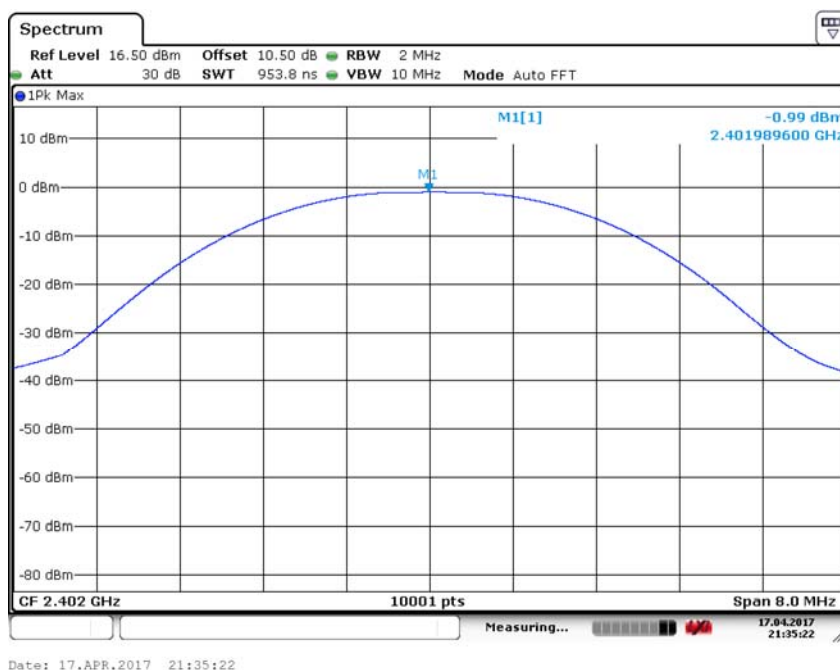


Carrier frequency (MHz): 2480  
Channel No.:39  
Modulation type: GFSK (LE)

## Peak Power Output

| Modulation type | Average Power Output (dBm) |                   |                   |
|-----------------|----------------------------|-------------------|-------------------|
|                 | 2402MHz<br>(Ch0)           | 2440MHz<br>(Ch19) | 2480MHz<br>(Ch39) |
| GFSK (LE)       | -2.21                      | -3.01             | -3.92             |

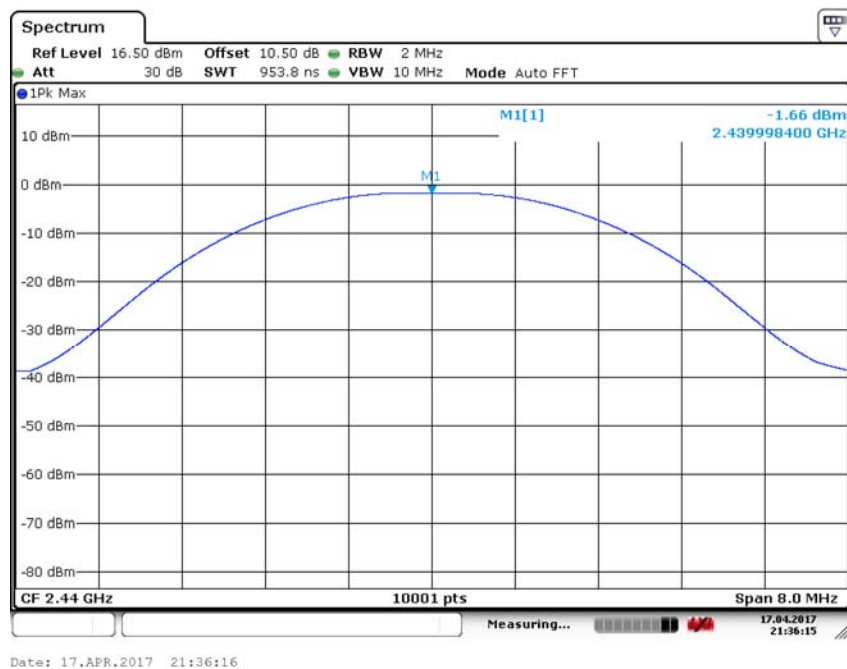
| Modulation type | Peak Power Output (dBm) |                   |                   |
|-----------------|-------------------------|-------------------|-------------------|
|                 | 2402MHz<br>(Ch0)        | 2440MHz<br>(Ch19) | 2480MHz<br>(Ch39) |
| GFSK (LE)       | -0.99                   | -1.66             | -1.99             |



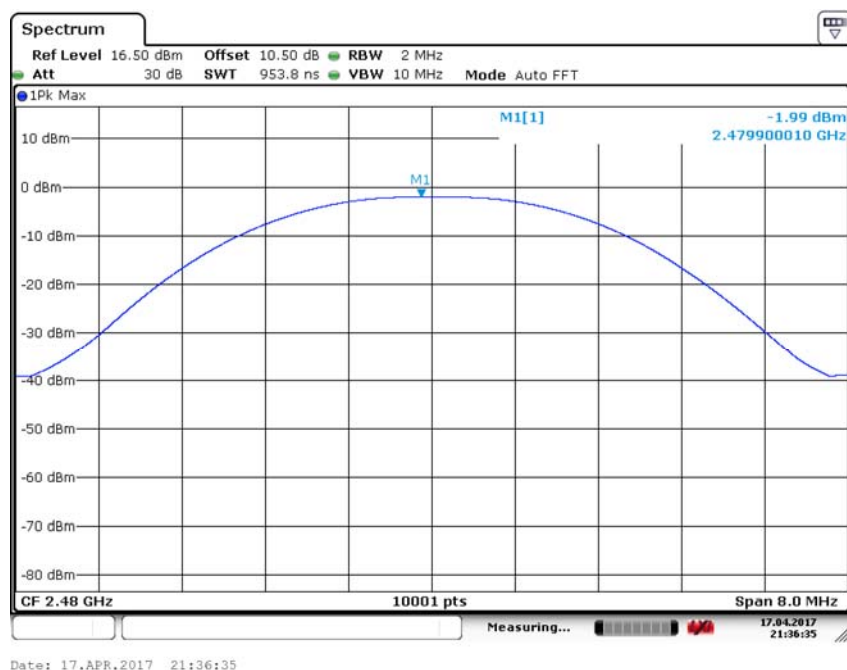
Carrier frequency (MHz): 2402

Channel No.:0

Modulation type: GFSK (LE)



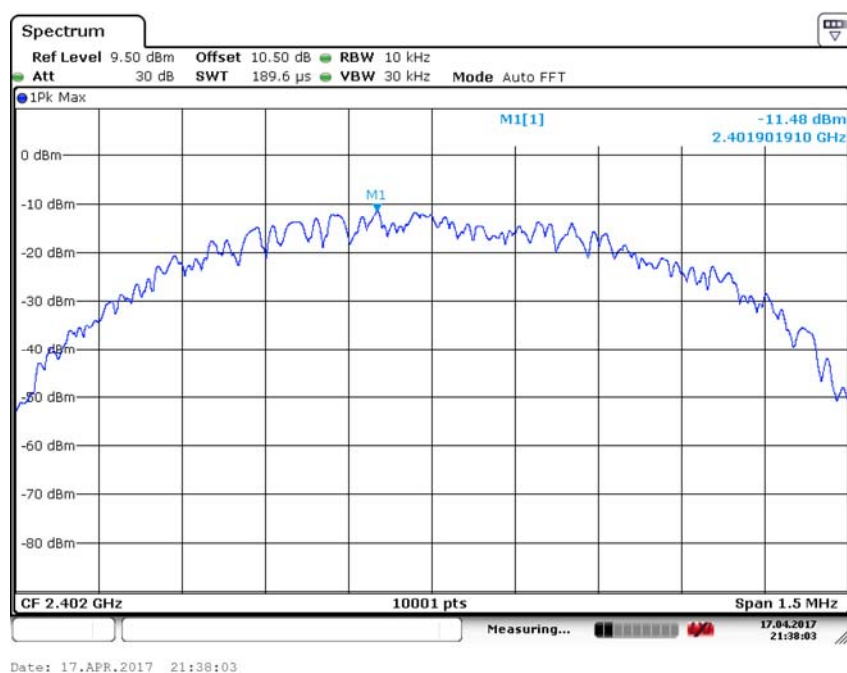
Carrier frequency (MHz): 2440  
Channel No.:19  
Modulation type: GFSK (LE)



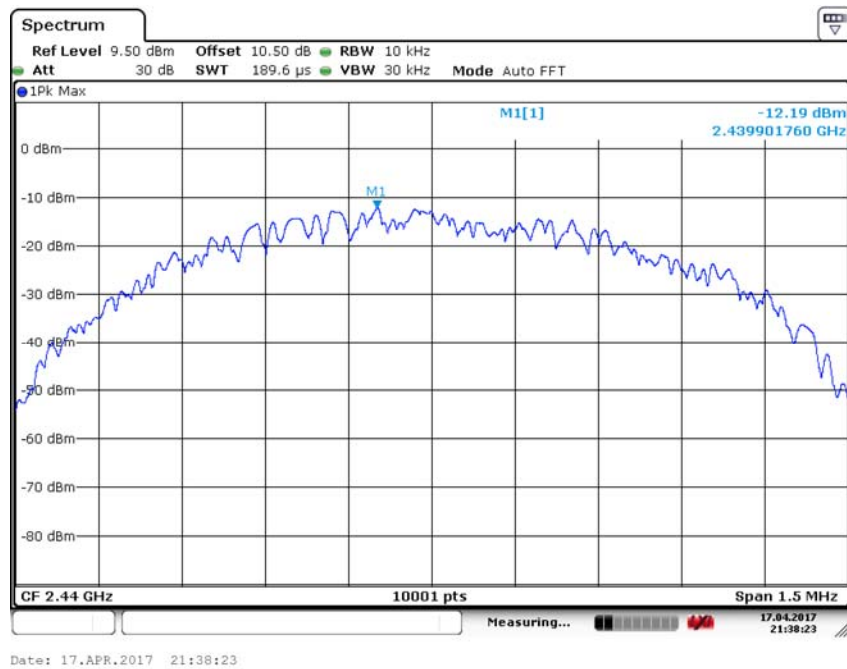
Carrier frequency (MHz): 2480  
Channel No.:39  
Modulation type: GFSK (LE)

## Transmitter Power Spectral Density

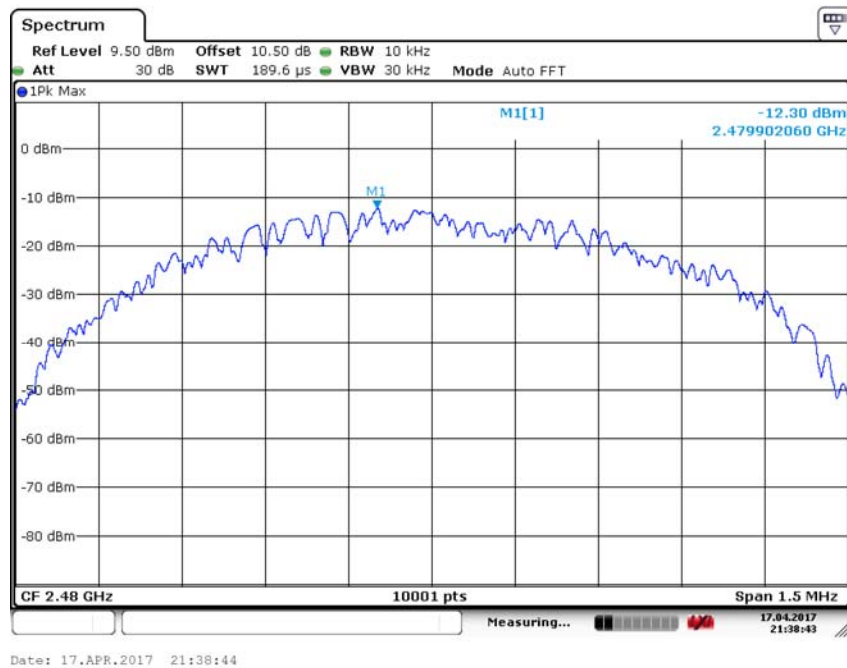
| Carrier frequency (MHz) | Channel No | Power Density |
|-------------------------|------------|---------------|
| 2402                    | 0          | -11.48        |
| 2440                    | 19         | -12.19        |
| 2480                    | 39         | -12.30        |



Carrier frequency (MHz): 2402  
 Channel No.: 0  
 Modulation type: GFSK (LE)



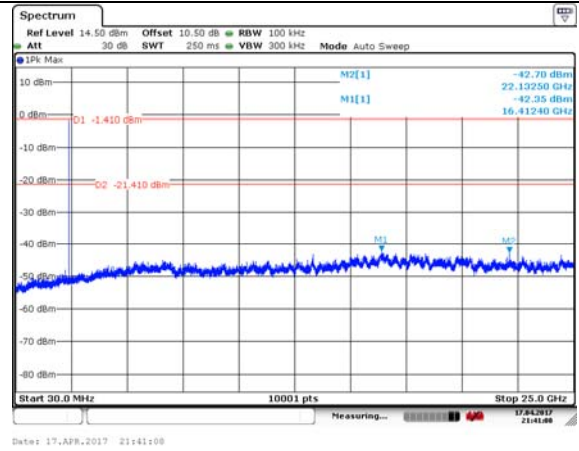
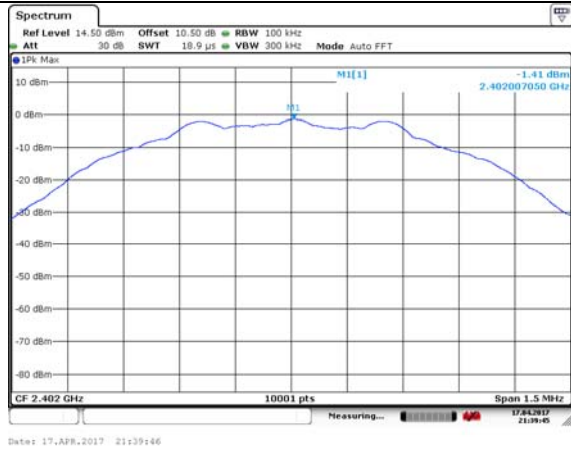
Carrier frequency (MHz): 2440  
Channel No.:19  
Modulation type: GFSK (LE)



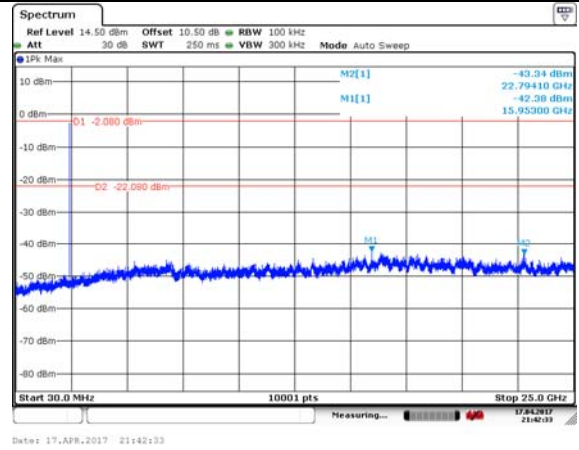
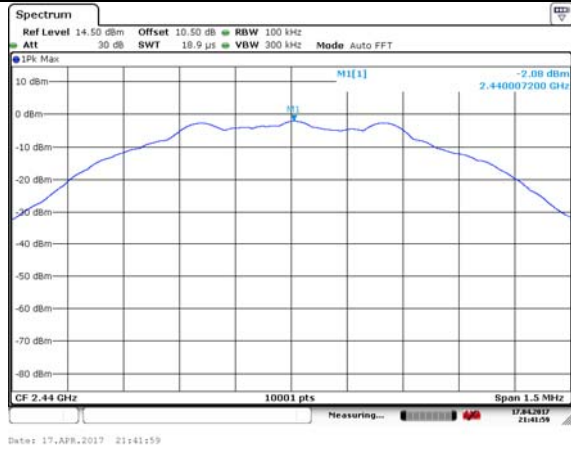
Carrier frequency (MHz): 2480  
Channel No.:39  
Modulation type: GFSK (LE)

## Conducted Out of band emission measurement

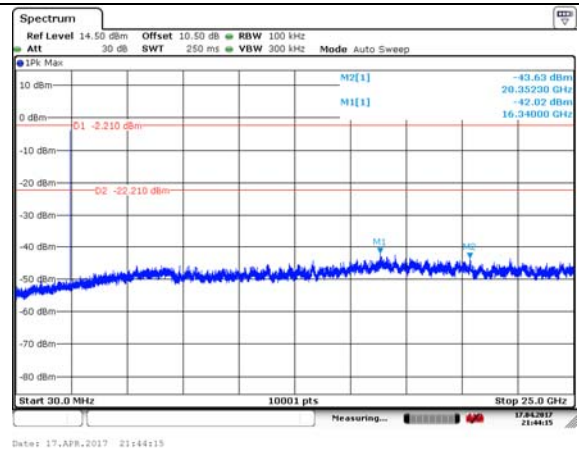
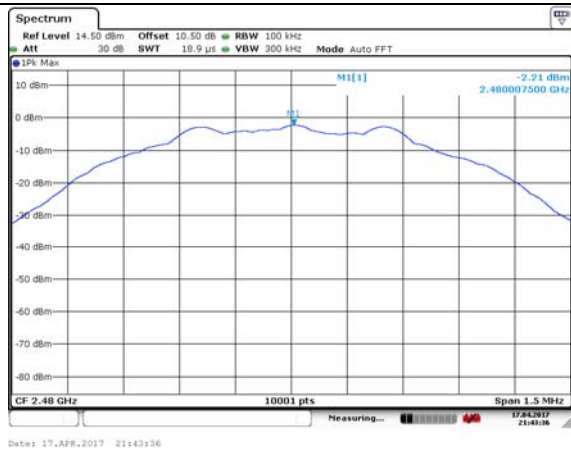
### CH0



### CH19



### CH39



## **APPENDIX B – TEST DATA OF RADIATED EMISSION**

### **Spurious Radiated Emissions**

The worst case attitude: The mobile lay down.

Carrier frequency (MHz): 2402

Channel No.:0

Test Mode: GFSK (LE)

Polarity: Vertical

Detector: Peak

| No | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | cable loss (dB) | antenna factor (dB) |
|----|-----------------|------------------------|----------------------|-----------------|----------------|-----------------|---------------------|
| 1  | 2402            | 91.32                  | 57.32                | N/A             | N/A            | 8.90            | 25.10               |
| 2  | 2390            | 47.57                  | 13.57                | -26.43          | 74.0           | 8.90            | 25.10               |

Carrier frequency (MHz): 2402

Channel No.:0

Test Mode: GFSK (LE)

Polarity: Horizontal

Detector: Peak

| No | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | cable loss (dB) | antenna factor (dB) |
|----|-----------------|------------------------|----------------------|-----------------|----------------|-----------------|---------------------|
| 1  | 2402            | 85.59                  | 51.59                | N/A             | N/A            | 8.90            | 25.10               |
| 2  | 2390            | 41.23                  | 7.23                 | -32.77          | 74.0           | 8.90            | 25.10               |

Carrier frequency (MHz): 2402

Channel No.:0

Test Mode: GFSK (LE)

Polarity: Vertical

Detector: Average

| No | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | cable loss (dB) | antenna factor (dB) |
|----|-----------------|------------------------|----------------------|-----------------|----------------|-----------------|---------------------|
| 1  | 2402            | 81.11                  | 47.11                | N/A             | N/A            | 8.90            | 25.10               |
| 2  | 2390            | 39.29                  | 5.29                 | -14.71          | 54.0           | 8.90            | 25.10               |

Carrier frequency (MHz): 2402  
Channel No.:0  
Test Mode: GFSK (LE)  
Polarity: Horizontal  
Detector: Average

| No | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | cable loss (dB) | antenna factor (dB) |
|----|-----------------|------------------------|----------------------|-----------------|----------------|-----------------|---------------------|
| 1  | 2402            | 75.74                  | 41.74                | N/A             | N/A            | 8.90            | 25.10               |
| 2  | 2390            | 38.33                  | 4.33                 | -15.67          | 54.0           | 8.90            | 25.10               |

Carrier frequency (MHz): 2480  
Channel No.:39  
Test Mode: GFSK (LE)  
Polarity: Vertical  
Detector: Peak

| No | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | cable loss (dB) | antenna factor (dB) |
|----|-----------------|------------------------|----------------------|-----------------|----------------|-----------------|---------------------|
| 1  | 2480            | 91.37                  | 57.37                | N/A             | N/A            | 8.90            | 25.10               |
| 2  | 2483.5          | 48.70                  | 14.70                | -25.30          | 74.0           | 8.90            | 25.10               |

Carrier frequency (MHz): 2480  
Channel No.:39  
Test Mode: GFSK (LE)  
Polarity: Horizontal  
Detector: Peak

| No | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | cable loss (dB) | antenna factor (dB) |
|----|-----------------|------------------------|----------------------|-----------------|----------------|-----------------|---------------------|
| 1  | 2480            | 84.38                  | 50.38                | N/A             | N/A            | 8.90            | 25.10               |
| 2  | 2483.5          | 43.99                  | 9.99                 | -30.01          | 74.0           | 8.90            | 25.10               |

Carrier frequency (MHz): 2480  
Channel No.:39  
Test Mode: GFSK (LE)  
Polarity: Vertical  
Detector: Average

| No | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | cable loss (dB) | antenna factor (dB) |
|----|-----------------|------------------------|----------------------|-----------------|----------------|-----------------|---------------------|
| 1  | 2480            | 81.44                  | 47.44                | N/A             | N/A            | 8.90            | 25.10               |
| 2  | 2483.5          | 39.38                  | 5.38                 | -14.62          | 54.0           | 8.90            | 25.10               |

Carrier frequency (MHz): 2480

Channel No.:39

Test Mode: GFSK (LE)

Polarity: Horizontal

Detector: Average

| No | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | cable loss (dB) | antenna factor (dB) |
|----|-----------------|------------------------|----------------------|-----------------|----------------|-----------------|---------------------|
| 1  | 2480            | 78.47                  | 44.47                | N/A             | N/A            | 8.90            | 25.10               |
| 2  | 2483.5          | 38.67                  | 4.67                 | -15.33          | 54.0           | 8.90            | 25.10               |

### Sample Calculations

Determining Spurious Emissions Levels

A “reference path loss” is established and the  $A_{Rpl}$  is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

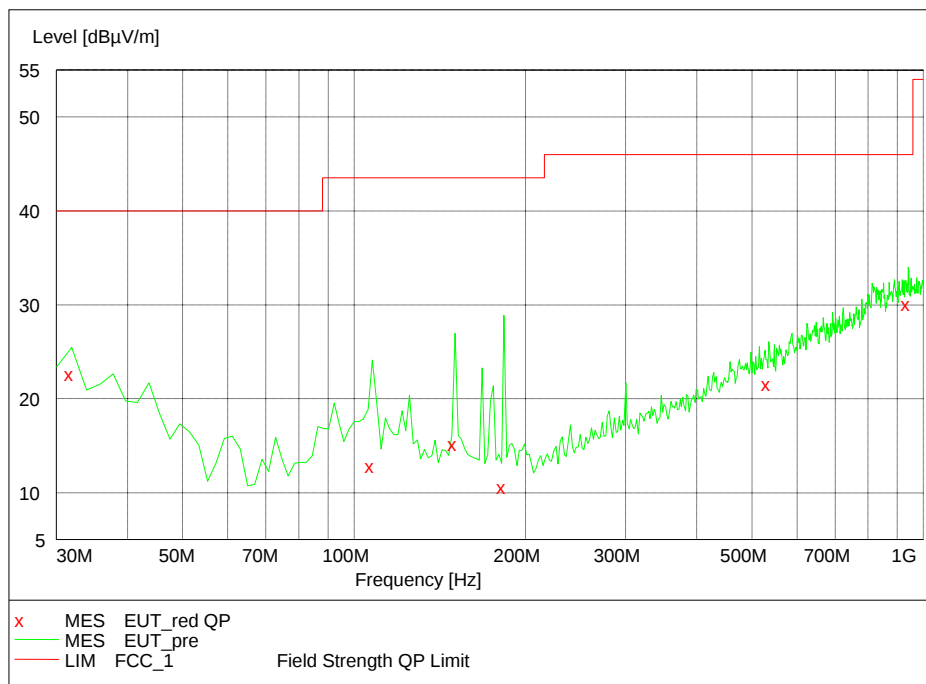
Result=  $P_{mea} + A_{Rpl}$

The worst case attitude: The mobile lay down.

For GFSK (LE)

Channel No.:19

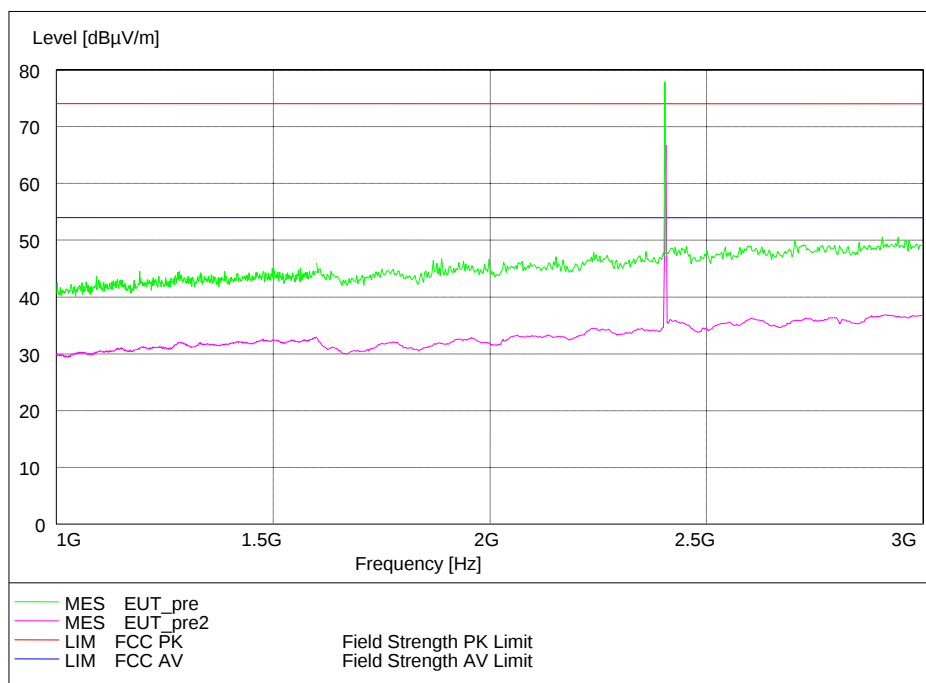
| Frequency (MHz) | Result (dBuV/m) | $A_{Rpl}$ (dB) | $P_{mea}$ (dBuV/m) | Polarity | Limit (dBuV/m) |
|-----------------|-----------------|----------------|--------------------|----------|----------------|
| 31.94           | 22.70           | 20.0           | 2.70               | Vertical | 40.0           |
| 107.75          | 12.90           | 12.5           | 0.40               | Vertical | 43.5           |
| 150.52          | 15.20           | 10.5           | 4.70               | Vertical | 43.5           |
| 183.56          | 10.60           | 11.0           | -0.40              | Vertical | 43.5           |
| 535.41          | 21.60           | 21.9           | -0.30              | Vertical | 46.0           |
| 941.68          | 30.20           | 28.2           | 2.00               | Vertical | 46.0           |



Frequency Range: 30MHz-1000 MHz

Detector: QP mode

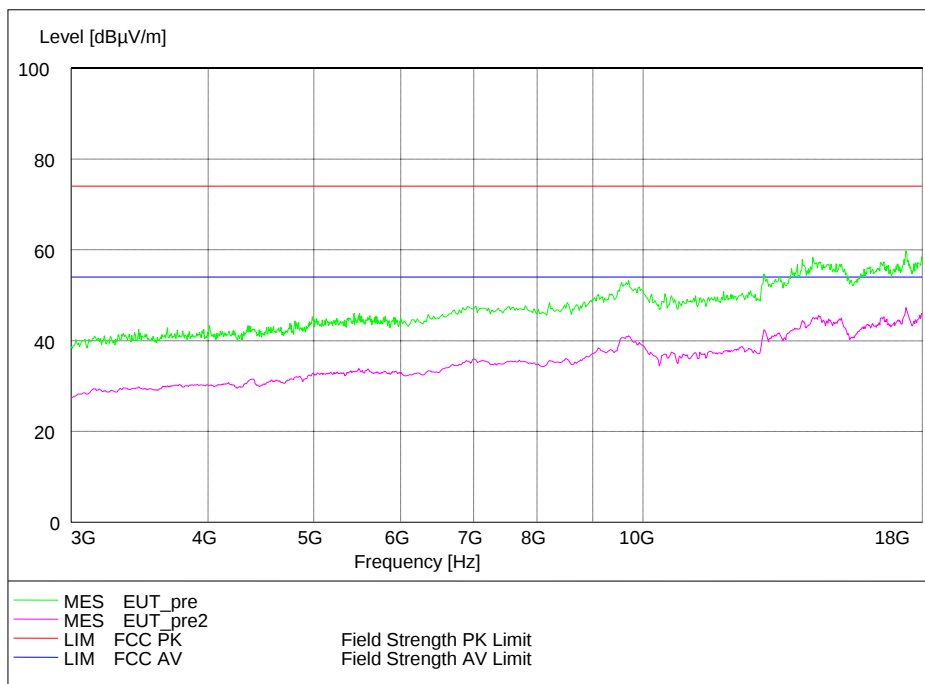
Modulation type: GFSK (LE)



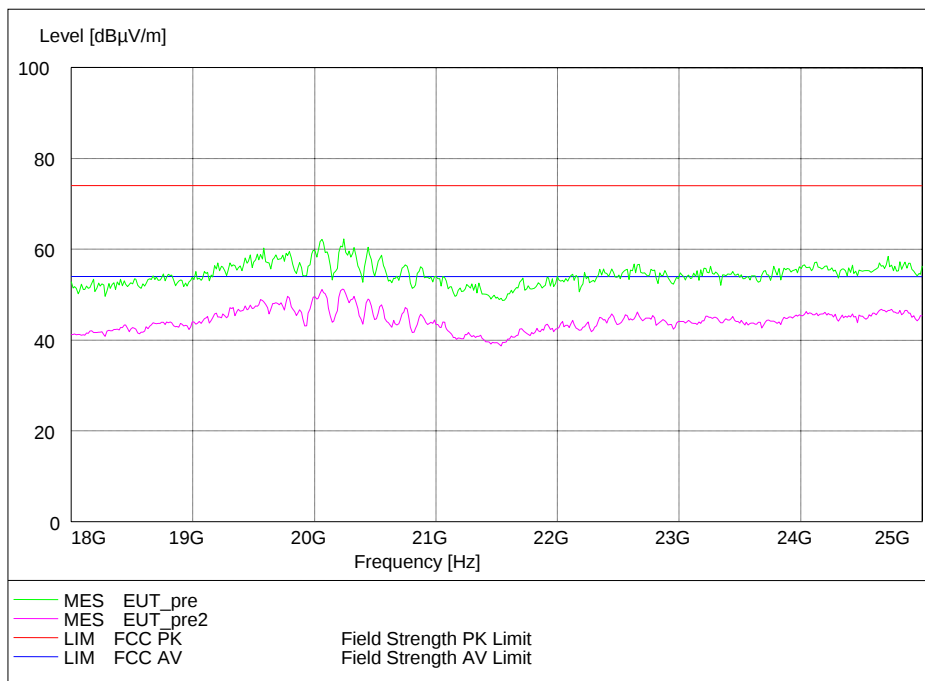
Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE)



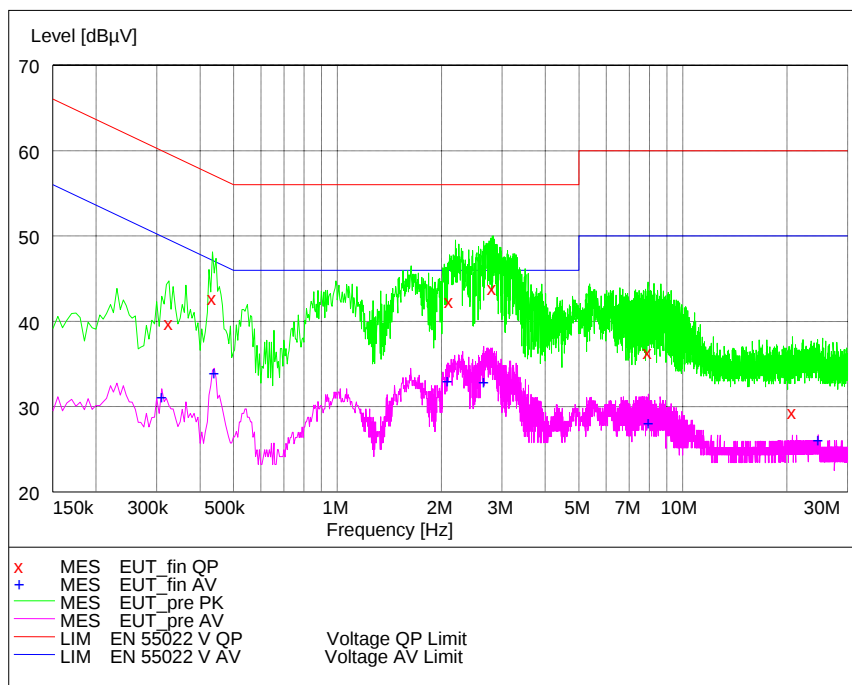
Frequency Range: 3GHz-18GHz  
Detector: Av mode and PK mode  
Modulation type: GFSK (LE)



Frequency Range: 18GHz-25GHz  
Detector: Av mode and PK mode  
Modulation type: GFSK (LE)

## AC Power line Conducted Emission

### Noise Level of the Measuring Instrument



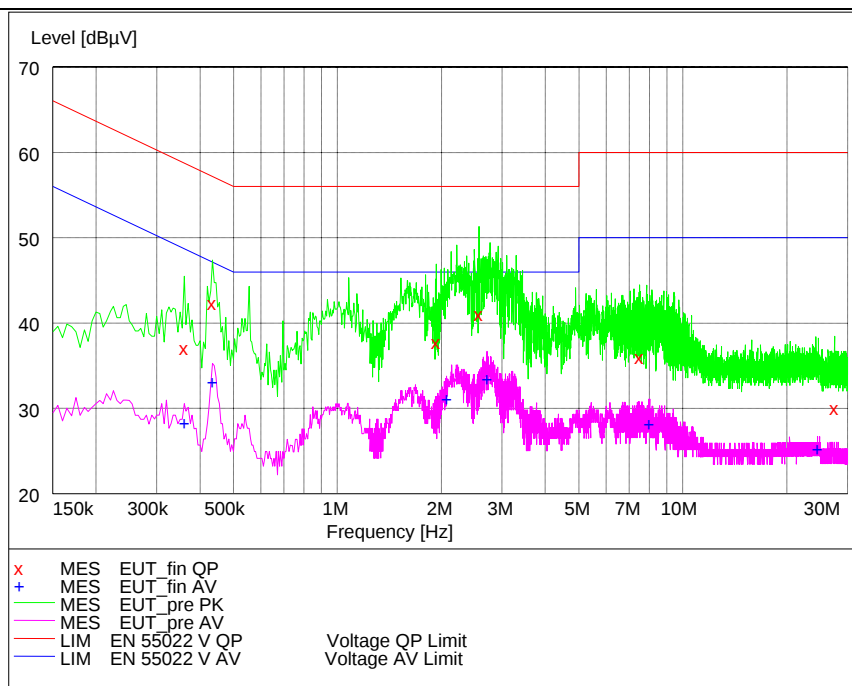
L Line

### MEASUREMENT RESULT: "MOBILE\_fin QP"

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.325000         | 40.00         | 29.6         | 60            | 19.6         | ---  | --- |
| 0.435000         | 42.90         | 29.5         | 57            | 14.2         | ---  | --- |
| 2.110000         | 42.50         | 29.5         | 56            | 13.5         | ---  | --- |
| 2.805000         | 44.10         | 29.6         | 56            | 11.9         | ---  | --- |
| 7.940000         | 36.60         | 29.7         | 60            | 23.4         | ---  | --- |
| 20.755000        | 29.50         | 30.5         | 60            | 30.5         | ---  | --- |

### MEASUREMENT RESULT: "MOBILE\_fin AV"

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.310000         | 31.30         | 29.6         | 50            | 18.7         | ---  | --- |
| 0.440000         | 34.10         | 29.5         | 47            | 13.0         | ---  | --- |
| 2.080000         | 33.20         | 29.6         | 46            | 12.8         | ---  | --- |
| 2.655000         | 33.00         | 29.5         | 46            | 13.0         | ---  | --- |
| 7.950000         | 28.30         | 29.7         | 50            | 21.7         | ---  | --- |
| 24.620000        | 26.20         | 31.1         | 50            | 23.8         | ---  | --- |



N Line

**MEASUREMENT RESULT: "MOBILE\_fin QP"**

| Frequency | Level | Transd | Limit | Margin | Line | PE  |
|-----------|-------|--------|-------|--------|------|-----|
| MHz       | dBμV  | dB     | dBμV  | dB     |      |     |
| 0.360000  | 37.20 | 29.5   | 59    | 21.5   | ---  | --- |
| 0.435000  | 42.50 | 29.5   | 57    | 14.6   | ---  | --- |
| 1.935000  | 37.90 | 29.5   | 56    | 18.1   | ---  | --- |
| 2.570000  | 41.20 | 29.5   | 56    | 14.8   | ---  | --- |
| 7.495000  | 36.20 | 29.7   | 60    | 23.8   | ---  | --- |
| 27.570000 | 30.20 | 31.7   | 60    | 29.8   | ---  | --- |

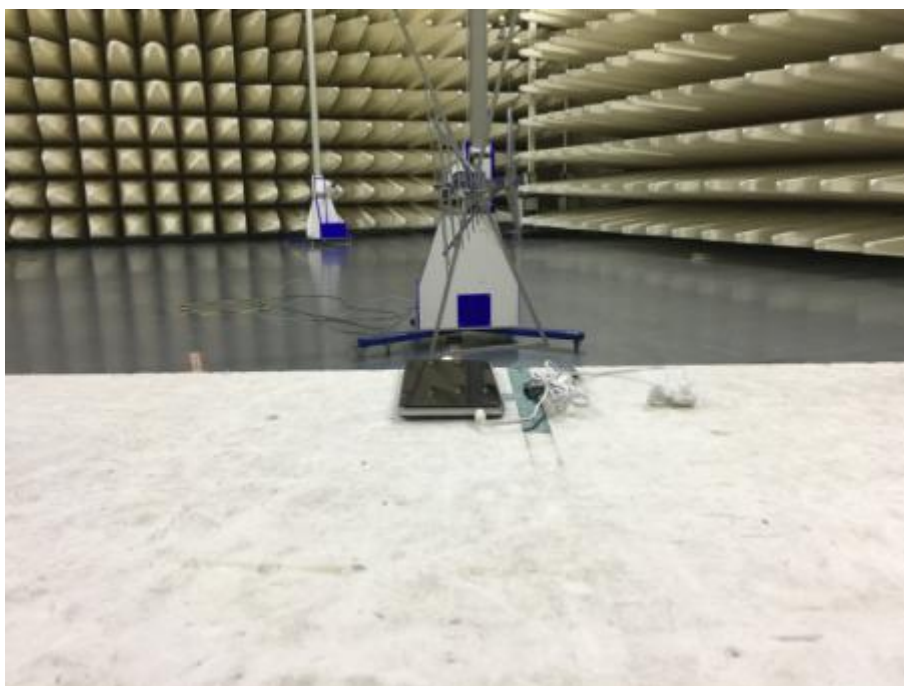
**MEASUREMENT RESULT: "MOBILE\_fin AV"**

| Frequency | Level | Transd | Limit | Margin | Line | PE  |
|-----------|-------|--------|-------|--------|------|-----|
| MHz       | dBμV  | dB     | dBμV  | dB     |      |     |
| 0.360000  | 28.50 | 29.5   | 49    | 20.2   | ---  | --- |
| 0.435000  | 33.30 | 29.5   | 47    | 13.8   | ---  | --- |
| 2.070000  | 31.30 | 29.6   | 46    | 14.7   | ---  | --- |
| 2.710000  | 33.60 | 29.6   | 46    | 12.4   | ---  | --- |
| 7.975000  | 28.40 | 29.7   | 50    | 21.6   | ---  | --- |
| 24.590000 | 25.40 | 31.1   | 50    | 24.6   | ---  | --- |

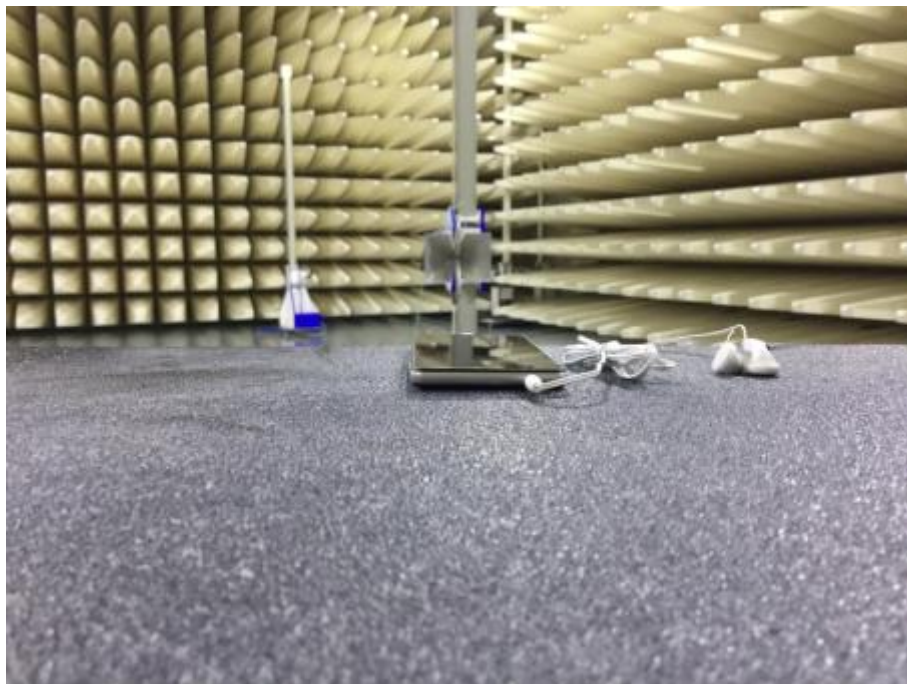
## APPENDIX C – TEST SETUP



Spurious RF Conducted Emissions Test setup



Spurious Radiated Emissions Test setup (30MHz~1GHz)



Spurious Radiated Emissions Test setup (1GHz~25GHz)

---End of Test Report---