



## EMC TEST REPORT

**ETSI EN 301 489-1 V2.2.3 (2019-11)**  
**ETSI EN 301 489-3 V2.1.1 (2019-03)**  
**ETSI EN 301 489-17 V3.2.4 (2020-09)**  
**ETSI EN 301 489-19 V2.1.1 (2019-04)**  
**ETSI EN 301 489-52 V1.2.1 (2021-11)**  
**EN 55032:2015+A1:2020**  
**EN 55035:2017+A11:2020**  
**EN IEC 61000-3-2:2019+A1:2021**  
**EN 61000-3-3:2013+A2:2021**

**Product :** 4G Tablet

**Trade Mark :** Blackview/OSCAL

**Model Name :** Tab 80

**Family Model :** Pad 12

**Report No. :** S23082304801001

### Prepared for

DOKE COMMUNICATION (HK) LIMITED

RM 1902 EASEY COMM BLDG 253-261 HENNESSY ROAD WANCHAI HK CHINA

### Prepared by

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TEST RESULT CERTIFICATION

Applicant's Name..... : DOKE COMMUNICATION (HK) LIMITED
Address ..... : RM 1902 EASEY COMM BLDG 253-261 HENNESSY ROAD
WANCHAI HK CHINA

Manufacturer's Name ..... : Shenzhen DOKE Electronic Co., Ltd
Address ..... : 801, Building3, 7th Industrial Zone, Yulv Community, Yutang
Road, Guangming District, Shenzhen, China.

Product description

Product name ..... : 4G Tablet
Trade Mark ..... : Blackview/OSCAL
Model Name ..... : Tab 80
Family Model ..... : Pad 12

Standards ..... : ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-3 V2.1.1 (2019-03)
ETSI EN 301 489-17 V3.2.4 (2020-09)
ETSI EN 301 489-19 V2.1.1 (2019-04)
ETSI EN 301 489-52 V1.2.1 (2021-11)
EN 55032:2015+A1:2020; EN 55035:2017+A11:2020
EN IEC 61000-3-2:2019+A1:2021;EN 61000-3-3:2013+A2:2021

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the of article 3.1(b) of the Directive 2014/53/EU requirements. And it is applicable only to the tested sample identified in the report.

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Test Sample Number ..... : S230613041002

Date of Test.....

Date (s) of performance of tests ..... : Jun 16, 2023 ~ Jul 11, 2023
Aug 25, 2023 ~ Sep 05, 2023

Date of Issue..... : Sep 05, 2023

Test Result..... : Pass

Note: A Part of test data of this report are based on the original test report
S23061304102001 dated by Jul 12, 2023

Testing Engineer : Allen Huang
(Allen Huang)

Authorized Signatory : Alex Li
(Alex Li)

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### 1. TEST SUMMARY

Test procedures according to the technical standards:

ETSI EN 301 489-1 V2.2.3 (2019-11)  
 ETSI EN 301 489-3 V2.1.1 (2019-03)  
 ETSI EN 301 489-17 V3.2.4 (2020-09)  
 ETSI EN 301 489-19 V2.1.1 (2019-04)  
 ETSI EN 301 489-52 V1.2.1 (2021-11)  
 EN 55032:2015+A1:2020; EN 55035:2017+A11:2020  
 EN IEC 61000-3-2:2019+A1:2021;EN 61000-3-3:2013+A2:2021

#### EMC Emission

| Standard                      | Test Item   | Limit   | Judgment | Remark   |
|-------------------------------|---|---------|----------|----------|
| EN 55032:2015+A1:2020         | Conducted Emission On AC And Telecom Port 150kHz to 30MHz                           | Class B | PASS     |          |
|                               | Disturbance Voltage at The Antenna Terminals (30MHz To 2150MHz)                     | -----   | N/A      |          |
|                               | Wanted signal and disturbance voltage at the RF output terminals (30MHz To 2150MHz) | -----   | N/A      |          |
|                               | Radiated Emission 30MHz to 1000MHz  | Class B | PASS     |          |
|                               | Radiated Emission 1GHz to 6GHz  | Class B | PASS     |          |
| EN IEC 61000-3-2:2019+A1:2021 | Harmonic Current Emission   | Class A | N/A      | NOTE (1) |
| EN 61000-3-3:2013+A2:2021     | Voltage Fluctuations & Flicker  | -----   | PASS     |          |

#### EMC Immunity

| Section                           | Test Item   | Performance Criteria  | Judgment | Remark   |
|-----------------------------------|---|-----------------------|----------|----------|
| EN 55035:2017+A11:2020            |   |                       |          |          |
| EN 61000-4-2:2009                 | Electrostatic Discharge                                     | B                     | PASS     |          |
| EN 61000-4-3:2006+A1:2008+A2:2010 | RF electromagnetic field                                    | A                     | PASS     |          |
| EN 61000-4-4:2012                 | Fast transients   | B                     | PASS     |          |
| EN 61000-4-5:2014+A1:2017         | Surges  | B                     | PASS     |          |
| EN 61000-4-6:2014                 | Continuous radio frequency disturbances or Injected Current | A                     | PASS     |          |
| EN 61000-4-8:2010                 | Power Frequency Magnetic Field                              | A                     | N/A      | NOTE (3) |
| EN 61000-4-11:2004                | Volt. Interruptions Volt. Dips                              | B / C / C<br>NOTE (2) | PASS     |          |

**NOTE:**

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

(2) Voltage dip: 100% reduction – Performance Criteria **B**

Voltage dip: 30% reduction – Performance Criteria **C**

Voltage Interruption: 100% Interruption – Performance Criteria **C**

(3) Applicable only to equipment containing devices intrinsically susceptible to magnetic fields, such as CRT monitors, Hall effect elements, electro-dynamic microphones, magnetic field sensors or audio frequency transformers.

(4) For client's request and manual description, the test will not be executed.



## 2 TEST FACILITY

Shenzhen NTEK Testing Technology Co., Ltd.

Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street Bao'an District, Shenzhen 518126 P.R. China

CNAS-Lab. : The Certificate Registration Number is L5516

IC-Registration : The Certificate Registration Number is CN0074

FCC- Accredited : Test Firm Registration Number: 463705  
Designation Number: CN1184

A2LA-Lab. : The Certificate Registration Number is 4298.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories.

This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

## 3 MEASUREMENT UNCERTAINTY

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

| Test Item                          | Measurement Frequency Range | K | U(dB) |
|------------------------------------|-----------------------------|---|-------|
| AC Mains Conducted Emission        | 0.009kHz ~ 0.15MHz          | 2 | 2.66  |
| AC Mains Conducted Emission        | 0.15MH ~ 30MHz              | 2 | 2.80  |
| Telecom Conducted Emission (Cat 3) | 0.15MHz ~ 30MHz             | 2 | 2.40  |
| Telecom Conducted Emission (Cat 5) | 0.15MHz ~ 30MHz             | 2 | 2.58  |
| Radiated Emission                  | 30MHz ~ 1000MHz             | 2 | 2.64  |
| Radiated Emission                  | 1000MHz ~ 6000MHz           | 2 | 2.40  |
| Radiated Emission                  | 6000MHz ~ 18000MHz          | 2 | 2.52  |







|                        |   |
|------------------------|---|
| Modulation Mode:       | <input checked="" type="checkbox"/> BT(1Mbps)/BLE: GFSK<br><input checked="" type="checkbox"/> BT EDR(2Mbps): $\pi/4$ -DQPSK<br><input checked="" type="checkbox"/> BT EDR(3Mbps): 8-DPSK<br><input checked="" type="checkbox"/> BLE(2Mbps): GFSK<br><input checked="" type="checkbox"/> IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK)<br><input checked="" type="checkbox"/> IEEE 802.11g/n (HT20/HT40) : OFDM (64QAM, 16QAM, QPSK, BPSK)<br><input checked="" type="checkbox"/> 802.11a:OFDM (BPSK / QPSK / 16QAM)<br><input checked="" type="checkbox"/> 802.11n:OFDM (QPSK/BPSK/16QAM/64QAM)<br><input checked="" type="checkbox"/> 802.11ac:OFDM (QPSK/BPSK/16QAM/64QAM/256QAM)<br><input checked="" type="checkbox"/> GSM/GPRS/EGPRS: GMSK, 8PSK<br><input checked="" type="checkbox"/> WCDMA(Voice /HSDPA/HSUPA): QPSK<br><input checked="" type="checkbox"/> LTE: QPSK, 16QAM<br><input checked="" type="checkbox"/> GPS: BPSK modulation<br><input checked="" type="checkbox"/> FM Receiver: FM; |
| Adapter                | Adapter 1:<br>Brand name: OSCAL<br>Model: QZ-01000EA00<br>Input: 100-240V~50/60Hz 0.3A<br>Output: 5.0V $\overline{\text{---}}$ 2.0A (10.0W)<br>Adapter 2:<br>Brand name: Blackview<br>Model: QZ-01000EA00<br>Input: 100-240V~50/60Hz 0.3A<br>Output: 5.0V $\overline{\text{---}}$ 2.0A (10.0W)<br>Adapter 3:<br>Brand name: Blackview<br>Model: QZ-01001EA00<br>Input: 100-240V~50/60Hz 0.3A<br>Output: 5.0V $\overline{\text{---}}$ 2.0A (10.0W)   |
| Battery                | DC 3.85V, 7680mAh   |
| Rating                 | DC 3.85V from battery or DC 5V from adapter   |
| Connecting I/O Port(s) | Please refer to the User's Manual   |
| Antenna:               | BT/WIFI/GPS: PIFA Antenna; GSM/WCDMA/LTE: PIFA Antenna;<br>FM: Use earphone as Antenna;   |
| Hard Ware Version      | T30-T616-V2.0   |
| Soft Ware Version      | Tab80_EEA_T30_V1.0  |

## 1.2 DESCRIPTION OF TEST MODES

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

| Pretest Mode | Description                              |
|--------------|--|
| Mode 1       | Charging+TF Playing                      |
| Mode 2       | Charging+REC (Front / Rear)              |
| Mode 3       | Data transmission                        |
| Mode 4       | Charging+FM (87.6MHz / 98MHz / 107.9MHz) |
| Mode 5       | BT Link mode                             |
| Mode 6       | Wi-Fi 2.4G/ Wi-Fi 5.2G/ Wi-Fi 5.8G       |
| Mode 7       | GSM / GPRS / EGPRS 900 / 1800            |
| Mode 8       | WCDMA / HSDPA / HSUPA B1 / B8            |
| Mode 9       | LTE Band 1 / 3 / 7 / 8 / 20 / 40         |
| Mode 10      | GPS Receiver                             |

| For Conducted Test |                     |
|--------------------|---------------------|
| Final Test Mode    | Description         |
| Mode 1             | Charging+TF Playing |

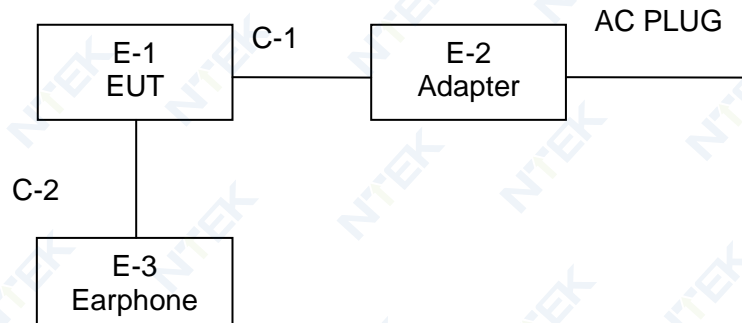
| <b>For Radiated Test</b> |                     |
|--------------------------|---------------------|
| Final Test Mode          | Description         |
| Mode 1                   | Charging+TF Playing |

| <b>For EMS Test</b> |  |
|---------------------|--|
| Pretest Mode        | Description                              |
| Mode 1              | Charging+TF Playing                      |
| Mode 2              | Charging+REC (Front / Rear)              |
| Mode 3              | Data transmission                        |
| Mode 4              | Charging+FM (87.6MHz / 98MHz / 107.9MHz) |
| Mode 5              | BT Link mode                             |
| Mode 6              | Wi-Fi 2.4G/ Wi-Fi 5.2G/ Wi-Fi 5.8G       |
| Mode 7              | GSM / GPRS / EGPRS 900 / 1800            |
| Mode 8              | WCDMA / HSDPA / HSUPA B1 / B8            |
| Mode 9              | LTE Band 1 / 3 / 7 / 8 / 20 / 40         |
| Mode 10             | GPS Receiver                             |

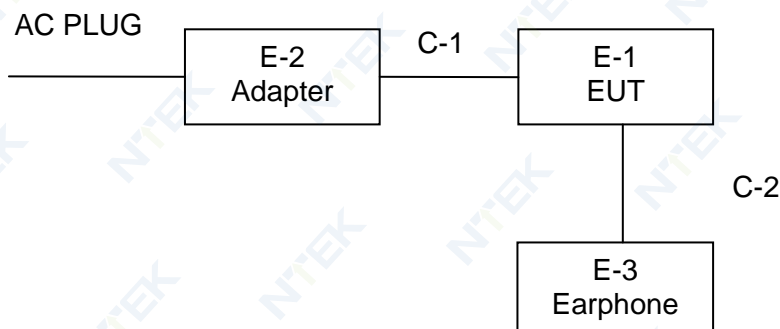
NOTE: The test modes were carried out for all operation modes. The final test mode of the EUT was the worst test mode for EMI, and its test data was showed.

1.3 DESCRIPTION OF TEST SETUP

CE



RE



1.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

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

| Item | Equipment | Model/Type No. | Series No. | Note        |
|------|-----------|----------------|------------|-------------|
| E-1  | 4G Tablet | Tab 80         | N/A        | EUT         |
| E-2  | Adapter   | QZ-01000EA00   | N/A        | Peripherals |
|      |           | QZ-01001EA00   | N/A        | Peripherals |
| E-3  | Earphone  | N/A            | N/A        | Peripherals |
|      |           |                |            |             |

| Item | Cable Type     | Shielded Type | Ferrite Core | Length | Note |
|------|----------------|---------------|--------------|--------|------|
| C-1  | USB Cable      | YES           | NO           | 1.0m   |      |
| C-2  | Earphone Cable | NO            | NO           | 1.2m   |      |
|      |                |               |              |        |      |

Note:

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

## 1.5 MEASUREMENT INSTRUMENTS LIST

### 1.5.1 CONDUCTED EMISSION

| Item | Kind of Equipment                                  | Manufacturer | Type No.   | Serial No.  | Last calibration | Calibrated until | Calibration period |
|------|--|--------------|------------|-------------|------------------|------------------|--------------------|
| 1    | Test Cable   | N/A          | C01        | N/A         | 2023.05.06       | 2026.05.05       | 3 years            |
| 2    | Test Cable   | N/A          | C02        | N/A         | 2023.05.06       | 2026.05.05       | 3 years            |
| 3    | Test Cable   | N/A          | C03        | N/A         | 2023.05.06       | 2026.05.05       | 3 years            |
| 4    | Pulse Limiter                                      | SCHWARZBECK  | VTSD 9561F | 9716        | 2022.06.17       | 2025.06.16       | 3 year             |
| 5    | 50Ω Switch   | ANRITSU CORP | MP59B      | 6200983704  | 2023.05.06       | 2026.05.05       | 3 year             |
| 6    | EMI Test Receiver                                  | R&S          | ESCI       | 101160      | 2023.03.27       | 2024.03.26       | 1 year             |
| 7    | Unversal radio communication tester                | R&S          | CMU200     | 1100.008.02 | 2023.05.29       | 2024.05.28       | 1 year             |
| 8    | Wideband Radio Communication Tester Specifications | R&S          | CMW500     | 148500      | 2023.05.29       | 2024.05.28       | 1 year             |
| 9    | LISN   | SCHWARZBECK  | NNLK 8129  | 8129245     | 2023.03.27       | 2024.03.26       | 1 year             |
| 10   | LISN   | R&S          | ENV216     | 101313      | 2023.03.27       | 2024.03.26       | 1 year             |

### 1.5.2 RADIATED TEST SITE

| Item | Kind of Equipment                                  | Manufacturer | Type No.    | Serial No.  | Last calibration | Calibrated until | Calibration period |
|------|--|--------------|-------------|-------------|------------------|------------------|--------------------|
| 1    | Antenna Mast                                       | EM           | SC100_1     | N/A         | N/A              | N/A              | N/A                |
| 2    | Turn Table   | EM           | SC100       | 060531      | N/A              | N/A              | N/A                |
| 3    | EMI Test Receiver                                  | R&S          | ESCI-7      | 101318      | 2023.03.27       | 2024.03.26       | 1 year             |
| 4    | 50Ω Switch   | Anritsu Corp | MP59B       | 6200983705  | 2023.05.06       | 2026.05.05       | 3 year             |
| 5    | Spectrum Analyzer                                  | Aglient      | E4440A      | MY41000130  | 2023.03.27       | 2024.03.26       | 1 year             |
| 6    | Unversal radio communication tester                | R&S          | CMU200      | 1100.008.02 | 2023.05.29       | 2024.05.28       | 1 year             |
| 7    | Wideband Radio Communication Tester Specifications | R&S          | CMW500      | 148500      | 2023.05.29       | 2024.05.28       | 1 year             |
| 8    | Test Cable   | N/A          | R-01        | N/A         | 2022.06.17       | 2025.06.16       | 3 years            |
| 9    | Test Cable   | N/A          | R-02        | N/A         | 2022.06.17       | 2025.06.16       | 3 years            |
| 10   | Bilog Antenna                                      | TESEQ        | CBL6111D    | 31216       | 2023.03.16       | 2024.03.15       | 1 year             |
| 11   | Horn Antenna                                       | SCHWARZBECK  | BBHA 9120D  | 2816        | 2023.01.12       | 2024.01.11       | 1 year             |
| 12   | Amplifier  | EMC          | EMC051835SE | 980246      | 2023.05.29       | 2024.05.28       | 1 year             |



**1.5.3 HARMONICS AND FILCK**

| Item | Kind of Equipment                                  | Manufacturer | Type No. | Serial No.      | Last calibration | Calibrated until | Calibration period |
|------|--|--------------|----------|-----------------|------------------|------------------|--------------------|
| 1    | Harmonic & Flicker                                 | EM TEST      | DPA500   | 0303-04         | 2023.03.27       | 2024.03.26       | 1 year             |
| 2    | AC Power Source                                    | EM TEST      | ACS500   | 0203-01         | 2023.03.28       | 2024.03.27       | 1 year             |
| 3    | Unversal radio communication tester                | R&S          | CMU200   | 1100.008.0<br>2 | 2023.05.29       | 2024.05.28       | 1 year             |
| 4    | Wideband Radio Communication Tester Specifications | R&S          | CMW500   | 148500          | 2023.05.29       | 2024.05.28       | 1 year             |

**1.5.4 ESD**

| Item | Kind of Equipment                                  | Manufacturer | Type No. | Serial No.         | Last calibration | Calibrated until | Calibration period |
|------|--|--------------|----------|--------------------|------------------|------------------|--------------------|
| 1    | Unversal radio communication tester                | R&S          | CMU200   | 1100.008.0<br>2    | 2023.05.29       | 2024.05.28       | 1 year             |
| 2    | Wideband Radio Communication Tester Specifications | R&S          | CMW500   | 148500             | 2023.05.29       | 2024.05.28       | 1 year             |
| 3    | Electrostatic Discharge Generator                  | Lioncel      | ESD-203B | ESD203B0<br>150402 | 2023.05.29       | 2024.05.28       | 1 year             |

**1.5.5 RS**

| Item | Kind of Equipment                                  | Manufacturer | Type No. | Serial No.      | Last calibration | Calibrated until | Calibration period |
|------|--|--------------|----------|-----------------|------------------|------------------|--------------------|
| 1    | Unversal radio communication tester                | R&S          | CMU200   | 1100.008.0<br>2 | 2023.05.29       | 2024.05.28       | 1 year             |
| 2    | Wideband Radio Communication Tester Specifications | R&S          | CMW500   | 148500          | 2023.05.29       | 2024.05.28       | 1 year             |
| 3    | Audio Power Amplifier                              | Brüel & Kjær | 4602B    | 2185667         | 2023.05.29       | 2024.05.28       | 1 year             |
| 4    | Mouth Simulator                                    | Brüel & Kjær | 2669     | 2143265         | 2023.05.29       | 2024.05.28       | 1 year             |
| 5    | Sound Calibrator                                   | Brüel & Kjær | 4185     | 2194825         | 2023.05.29       | 2024.05.28       | 1 year             |
| 6    | 1/2" Pressure-field Microphone                     | Brüel & Kjær | 735      | 2641678         | 2023.05.29       | 2024.05.28       | 1 year             |
| 7    | Telephone Test Head                                | Brüel & Kjær | 4185     | 2631728         | 2023.05.29       | 2024.05.28       | 1 year             |
| 8    | Audio Analyzer                                     | R&S          | UPV      | 100419          | 2023.05.29       | 2024.05.28       | 1 year             |

|    |                             |              |                                       |            |            |            |        |
|----|-----------------------------|--------------|---------------------------------------|------------|------------|------------|--------|
| 9  | Ear Simulator for Telephony | Brüel & Kjær | 4185                                  | 2553612    | 2023.03.27 | 2024.03.26 | 1 year |
| 10 | Bilog Antenna               | ETS          | 3142E(Frequency range 30MHz to 6 GHz) | 00214344   | 2022.11.04 | 2023.11.03 | 1 year |
| 11 | Broadband Amplifier         | AR           | 60S1G6                                | 0350414    | 2023.03.21 | 2024.03.20 | 1 year |
| 12 | MXG Vector Signal Generator | Agilent      | N5182A                                | MY47070317 | 2023.05.29 | 2024.05.28 | 1 year |
| 13 | Power Amplifier             | rflight      | NTWPA-00810200                        | 17063153   | 2023.05.29 | 2024.05.28 | 1 year |
| 14 | Power Amplifier             | AR           | 25S1G4A                               | 308598     | 2023.05.29 | 2024.05.28 | 1 year |
| 15 | Power Meter                 | Agilent      | E4419B                                | MY45102538 | 2023.05.29 | 2024.05.28 | 1 year |
| 16 | Power Sensor                | Agilent      | E9301A                                | MY41495644 | 2023.05.29 | 2024.05.28 | 1 year |
| 17 | Power Sensor                | Agilent      | E9301A                                | US39212148 | 2023.05.29 | 2024.05.28 | 1 year |

1.5.6 SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

| Item | Kind of Equipment                                  | Manufacturer | Type No.       | Serial No.  | Last calibration         | Calibrated until         | Calibration period |
|------|--|--------------|----------------|-------------|--------------------------|--------------------------|--------------------|
| 1    | Surge Generator                                    | EVERFINE     | EMS61000-5A-V1 | 1101002     | 2022.07.27<br>2023.07.04 | 2023.07.26<br>2024.07.03 | 1 year             |
| 2    | DIPS Generator                                     | EVERFINE     | EMS61000-11K   | 1011002     | 2022.07.27<br>2023.07.04 | 2023.07.26<br>2024.07.03 | 1 year             |
| 3    | EFT/B Generator                                    | EVERFINE     | EMS61000-4A-V2 | 1012005     | 2023.03.27               | 2024.03.26               | 1 year             |
| 4    | Unversal radio communication tester                | R&S          | CMU200         | 1100.008.02 | 2023.05.29               | 2024.05.28               | 1 year             |
| 5    | Wideband Radio Communication Tester Specifications | R&S          | CMW500         | 148500      | 2023.05.29               | 2024.05.28               | 1 year             |

1.5.7 INJECTION CURRENT

| Item | Kind of Equipment     | Manufacturer | Type No.     | Serial No. | Last calibration         | Calibrated until         | Calibration period |
|------|-----------------------|--------------|--------------|------------|--------------------------|--------------------------|--------------------|
| 1    | Attenuator            | TESEQ        | ATN 6075     | 38411      | N/A                      | N/A                      | N/A                |
| 2    | RF Cable              | TESEQ        | RF Cable     | N/A        | N/A                      | N/A                      | N/A                |
| 3    | Signal Generator      | R&S          | SML03        | 100954     | 2022.11.01               | 2023.10.31               | 1 year             |
| 4    | Power Amplifier       | TESEQ        | CBA 230M-080 | T44376     | 2022.09.01<br>2023.07.04 | 2023.08.31<br>2024.07.03 | 1 year             |
| 5    | EM Clamp              | FCC          | F-203I-23M M | 504        | 2022.11.01               | 2023.10.31               | 1 year             |
| 6    | Audio Power Amplifier | Brüel & Kjær | 4602B        | 2185667    | 2023.03.27               | 2024.03.26               | 1 year             |

|    |  |              |          |             |            |            |        |
|----|--|--------------|----------|-------------|------------|------------|--------|
| 7  | Mouth Simulator                                    | Brüel & Kjær | 2669     | 2143265     | 2022.11.01 | 2023.10.31 | 1 year |
| 8  | Sound Calibrator                                   | Brüel & Kjær | 4185     | 2194825     | 2022.11.01 | 2023.10.31 | 1 year |
| 9  | 1/2" Pressure-field Microphone                     | Brüel & Kjær | 735      | 2641678     | 2022.11.01 | 2023.10.31 | 1 year |
| 10 | Audio Analyzer                                     | R&S          | UPV      | 100419      | 2022.11.01 | 2023.10.31 | 1 year |
| 11 | Ear Simulator for Telephonometry                   | Brüel & Kjær | 4185     | 2553612     | 2023.05.29 | 2024.05.28 | 1 year |
| 12 | Telephone Test Head                                | Brüel & Kjær | 4185     | 2631728     | 2023.05.29 | 2024.05.28 | 1 year |
| 13 | Unversal radio communication tester                | R&S          | CMU200   | 1100.008.02 | 2023.05.29 | 2024.05.28 | 1 year |
| 14 | Wideband Radio Communication Tester Specifications | R&S          | CMW500   | 148500      | 2023.05.29 | 2024.05.28 | 1 year |
| 15 | Coupling and Decoupling Network                    | TESEQ        | CDN M016 | 38722       | 2023.05.29 | 2024.05.28 | 1 year |

## 2. EMC EMISSION TEST

### 2.1 CONDUCTED EMISSION MEASUREMENT

#### 2.1.1 POWER LINE CONDUCTED EMISSION

(Frequency Range 150kHz-30MHz)

**Table A.8 – Requirements for conducted emissions from the AC mains power ports of Class A equipment**

| Applicable to  |                     |                                 |                           |                       |
|--|---------------------|---------------------------------|---------------------------|-----------------------|
| 1. AC mains power ports (3.1.1)                        |                     |                                 |                           |                       |
| Table clause   | Frequency range MHz | Coupling device (see Table A.7) | Detector type / bandwidth | Class A limits dB(μV) |
| A8.1   | 0,15 – 0,5          | AMN                             | Quasi Peak / 9 kHz        | 79                    |
|  | 0,5 – 30            |                                 |                           | 73                    |
| A8.2   | 0,15 – 0,5          | AMN                             | Average / 9 kHz           | 66                    |
|  | 0,5 – 30            |                                 |                           | 60                    |
| Apply A8.1 and A8.2 across the entire frequency range. |                     |                                 |                           |                       |

**Table A.9 – Requirements for conducted emissions from the AC mains power ports of Class B equipment**

| Applicable to  |                     |                                 |                           |                       |
|--|---------------------|---------------------------------|---------------------------|-----------------------|
| 1. AC mains power ports (3.1.1)                        |                     |                                 |                           |                       |
| Table clause   | Frequency range MHz | Coupling device (see Table A.7) | Detector type / bandwidth | Class B limits dB(μV) |
| A9.1   | 0,15 – 0,5          | AMN                             | Quasi Peak / 9 kHz        | 66 – 56               |
|  | 0,5 – 5             |                                 |                           | 56                    |
|  | 5 – 30              |                                 |                           | 60                    |
| A9.2   | 0,15 – 0,5          | AMN                             | Average / 9 kHz           | 56 – 46               |
|  | 0,5 – 5             |                                 |                           | 46                    |
|  | 5 – 30              |                                 |                           | 50                    |
| Apply A9.1 and A9.2 across the entire frequency range. |                     |                                 |                           |                       |

**Note:**

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

**2.1.2 TELECOMMUNICATION PORT CONDUCTED EMISSION(VOLTAGE LIMITS)**  
 (Frequency Range 150kHz-30MHz)

**Table A.10 – Requirements for asymmetric mode conducted emissions from Class A equipment**

| <b>Applicable to</b>   |                            |  |                                  |                                      |                                      |
|--|----------------------------|--|----------------------------------|--------------------------------------|--------------------------------------|
| 1. wired network ports (3.1.30)<br>2. optical fibre ports (3.1.24) with metallic shield or tension members<br>3. antenna ports (3.1.3)   |                            |  |                                  |                                      |                                      |
| <b>Table clause</b>  | <b>Frequency range MHz</b> | <b>Coupling device (see Table A.7)</b> | <b>Detector type / bandwidth</b> | <b>Class A voltage limits dB(μV)</b> | <b>Class A current limits dB(μA)</b> |
| A10.1  | 0,15 – 0,5                 | AAN                                    | Quasi Peak / 9 kHz               | 97 – 87                              | n/a                                  |
|  | 0,5 – 30                   |  |                                  | 87                                   |                                      |
|  | 0,15 – 0,5                 | AAN                                    | Average / 9 kHz                  | 84 – 74                              |                                      |
|  | 0,5 – 30                   |  |                                  | 74                                   |                                      |
| A10.2  | 0,15 – 0,5                 | CVP and current probe                  | Quasi Peak / 9 kHz               | 97 – 87                              | 53 – 43                              |
|  | 0,5 – 30                   |  |                                  | 87                                   | 43                                   |
|  | 0,15 – 0,5                 | CVP and current probe                  | Average / 9 kHz                  | 84 – 74                              | 40 – 30                              |
|  | 0,5 – 30                   |  |                                  | 74                                   | 30                                   |
| A10.3  | 0,15 – 0,5                 | Current Probe                          | Quasi Peak / 9 kHz               | n/a                                  | 53 – 43                              |
|  | 0,5 – 30                   |  |                                  |                                      | 43                                   |
|  | 0,15 – 0,5                 | Current Probe                          | Average / 9 kHz                  |                                      | 40 – 30                              |
|  | 0,5 – 30                   |  |                                  |                                      | 30                                   |
| The choice of coupling device and measurement procedure is defined in Annex C.<br>AC mains ports that also have the function of a wired network port shall meet the limits given in Table A.8.<br>The test shall cover the entire frequency range.<br>The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to Table C.1 for applicability.<br>Testing is required at only one EUT supply voltage and frequency.<br>Applicable to ports listed above and intended to connect to cables longer than 3 m. |                            |  |                                  |                                      |                                      |

**Table A.12 – Requirements for conducted differential voltage emissions from Class B equipment**

| Applicable to   |                     |  |                            |                              |                            |               |
|---|---------------------|--|----------------------------|------------------------------|----------------------------|---------------|
| 1. TV broadcast receiver tuner ports (3.1.8) with an accessible connector |                     |  |                            |                              |                            |               |
| 2. RF modulator output ports (3.1.27)                                     |                     |  |                            |                              |                            |               |
| 3. FM broadcast receiver tuner ports (3.1.8) with an accessible connector |                     |  |                            |                              |                            |               |
| Table clause  | Frequency range MHz | Detector type/ bandwidth                             | Class B limits dB(μV) 75 Ω |                              |                            | Applicability |
|   |                     |  | Other                      | Local Oscillator Fundamental | Local Oscillator Harmonics |               |
| A12.1   | 30 – 950            | For frequencies ≤1 GHz<br><br>Quasi Peak/<br>120 kHz | 46                         | 46                           | 46                         | See a)        |
|   | 950 – 2 150         |  | 46                         | 54                           | 54                         |               |
| A12.2   | 950 – 2 150         |  | 46                         | 54                           | 54                         | See b)        |
| A12.3   | 30 – 300            |  | 46                         | 54                           | 50                         | See c)        |
|   | 300 – 1 000         | 52   |                            |                              |                            |               |
| A12.4   | 30 – 300            | For frequencies ≥1 GHz                               | 46                         | 66                           | 59                         | See d)        |
|   | 300 – 1 000         |  |                            |                              | 52                         |               |
| A12.5   | 30 – 950            |  | 46                         | 76                           | 46                         | See e)        |
|   | 950 – 2 150         |  |                            |                              | n/a                        |               |

- a) Television receivers (analogue or digital), video recorders and PC TV broadcast receiver tuner cards working in channels between 30 MHz and 1 GHz, and digital audio receivers.
- b) Tuner units (not the LNB) for satellite signal reception.
- c) Frequency modulation audio receivers and PC tuner cards.
- d) Frequency modulation car radios.
- e) Applicable to EUTs with RF modulator output ports (for example DVD equipment, video recorders, camcorders and decoders etc.) designed to connect to TV broadcast receiver tuner ports.

Testing is required at only one EUT supply voltage and frequency.

The term 'other' refers to all emissions other than the fundamental and the harmonics of the local oscillator.

The test shall be performed with the device operating at each reception channel.

The test shall cover the entire frequency range.

The following table is the setting of the receiver

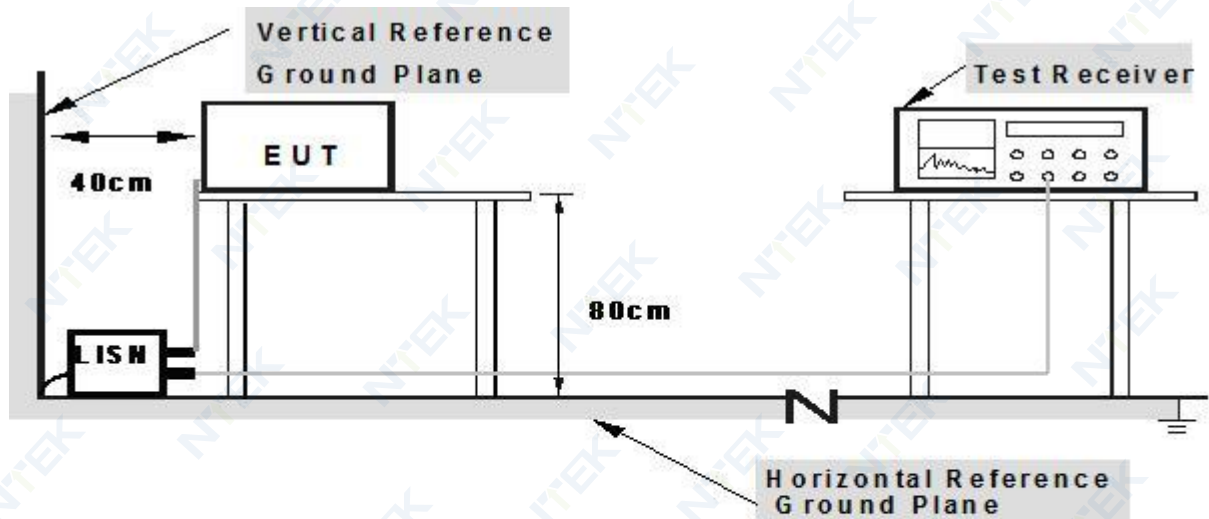
| Receiver Parameters | Setting  |
|---------------------|----------|
| Attenuation         | 10 dB    |
| Start Frequency     | 0.15 MHz |
| Stop Frequency      | 30 MHz   |
| IF Bandwidth        | 9 kHz    |



2.1.3 TEST PROCEDURE

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

2.1.4 TEST SETUP



**Note: 1.Support units were connected to second LISN.  
 2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

2.1.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.2 Unless otherwise a special operating condition is specified in the follows during the testing.



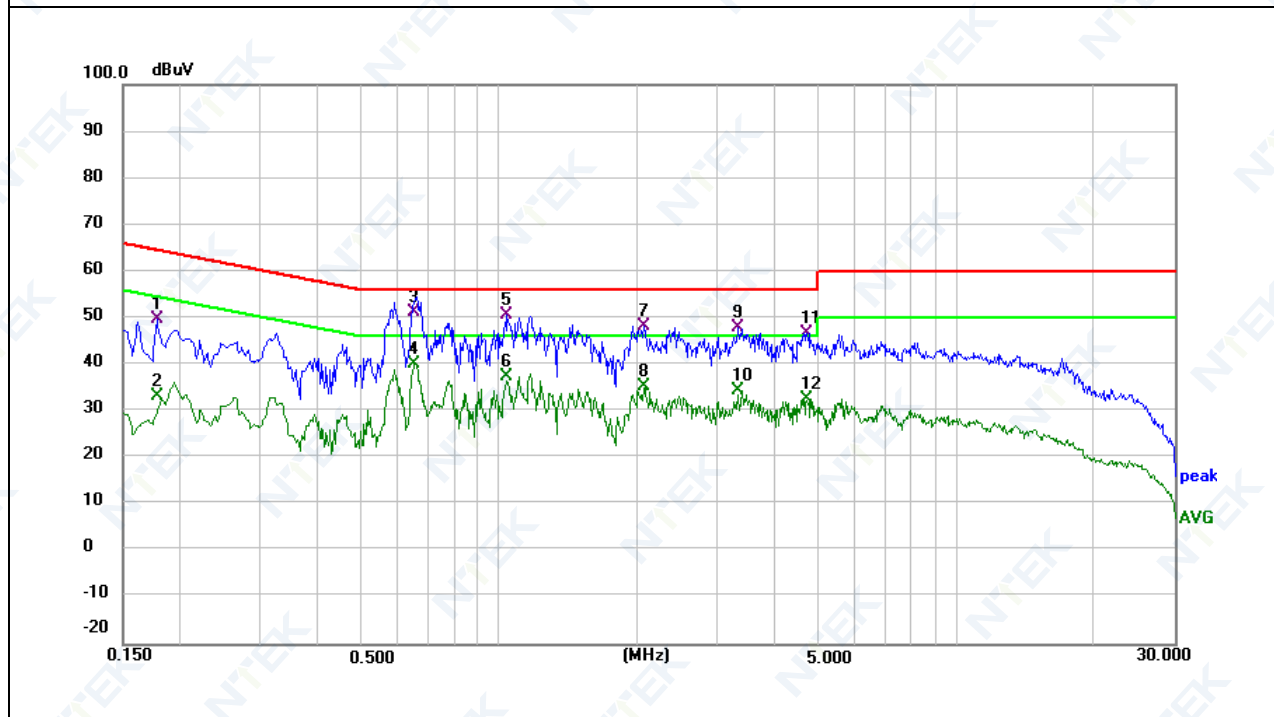
2.1.6 TEST RESULTS

|               |                                    |                    |               |
|---------------|------------------------------------|--------------------|---------------|
| EUT:          | 4G Tablet                          | Model Name:        | Tab 80        |
| Temperature:  | 24.7°C                             | Relative Humidity: | 53%           |
| Pressure:     | 1010hPa                            | Phase:             | L             |
| Test Voltage: | DC 5V from Adapter<br>AC 230V/50Hz | Test Mode:         | Mode 1-Tab 80 |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV) | Limits<br>(dBμV) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|----------------|--------------------------|------------------|----------------|--------|
| 0.1780             | 39.78                   | 9.99           | 49.77                    | 64.58            | -14.81         | QP     |
| 0.1780             | 23.20                   | 9.99           | 33.19                    | 54.58            | -21.39         | AVG    |
| 0.6540             | 40.35                   | 10.95          | 51.30                    | 56.00            | -4.70          | QP     |
| 0.6540             | 29.25                   | 10.95          | 40.20                    | 46.00            | -5.80          | AVG    |
| 1.0380             | 38.91                   | 11.74          | 50.65                    | 56.00            | -5.35          | QP     |
| 1.0380             | 25.75                   | 11.74          | 37.49                    | 46.00            | -8.51          | AVG    |
| 2.0740             | 38.68                   | 9.66           | 48.34                    | 56.00            | -7.66          | QP     |
| 2.0740             | 25.64                   | 9.66           | 35.30                    | 46.00            | -10.70         | AVG    |
| 3.3340             | 38.42                   | 9.67           | 48.09                    | 56.00            | -7.91          | QP     |
| 3.3340             | 24.75                   | 9.67           | 34.42                    | 46.00            | -11.58         | AVG    |
| 4.7020             | 37.15                   | 9.67           | 46.82                    | 56.00            | -9.18          | QP     |
| 4.7020             | 22.90                   | 9.67           | 32.57                    | 46.00            | -13.43         | AVG    |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

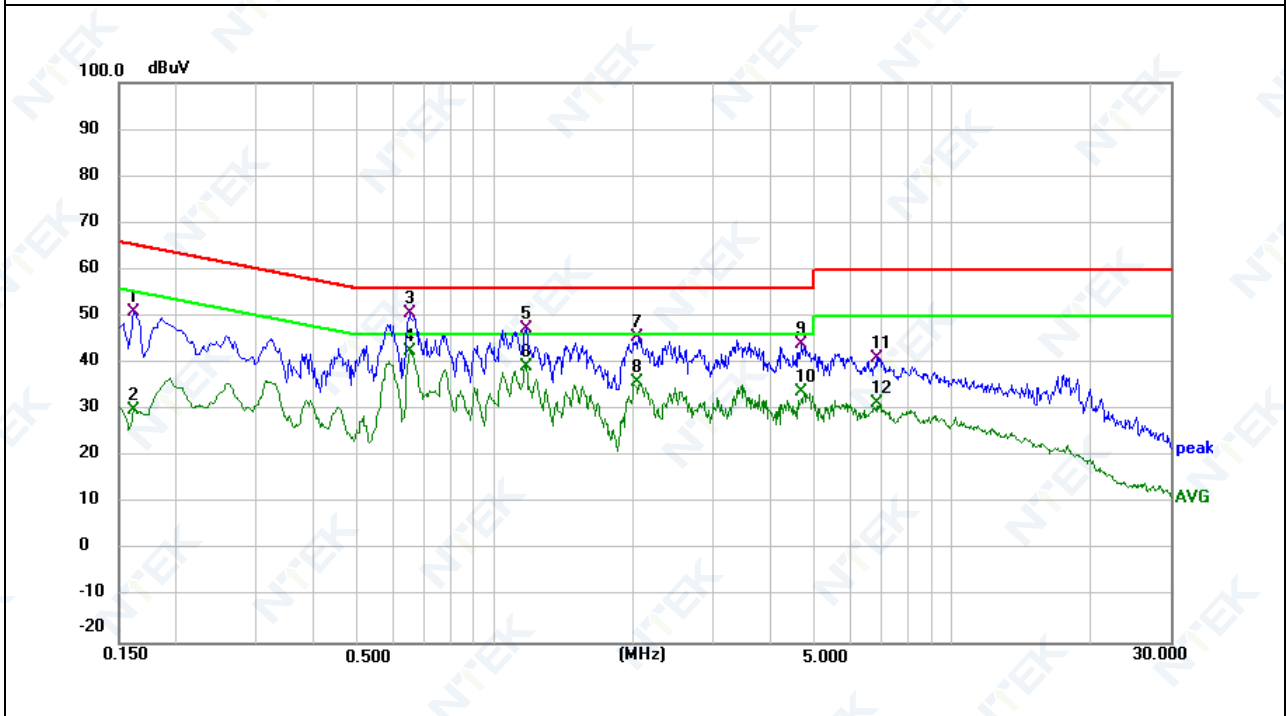


|               |                                    |                    |               |
|---------------|------------------------------------|--------------------|---------------|
| EUT:          | 4G Tablet                          | Model Name:        | Tab 80        |
| Temperature:  | 21.1°C                             | Relative Humidity: | 50%           |
| Pressure:     | 1010hPa                            | Phase:             | N             |
| Test Voltage: | DC 5V from Adapter<br>AC 230V/50Hz | Test Mode:         | Mode 1-Tab 80 |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV) | Limits<br>(dBμV) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|----------------|--------------------------|------------------|----------------|--------|
| 0.1620             | 41.11                   | 9.95           | 51.06                    | 65.36            | -14.30         | QP     |
| 0.1620             | 20.12                   | 9.95           | 30.07                    | 55.36            | -25.29         | AVG    |
| 0.6500             | 39.61                   | 10.95          | 50.56                    | 56.00            | -5.44          | QP     |
| 0.6500             | 31.52                   | 10.95          | 42.47                    | 46.00            | -3.53          | AVG    |
| 1.1700             | 35.29                   | 12.00          | 47.29                    | 56.00            | -8.71          | QP     |
| 1.1700             | 27.32                   | 12.00          | 39.32                    | 46.00            | -6.68          | AVG    |
| 2.0579             | 35.86                   | 9.66           | 45.52                    | 56.00            | -10.48         | QP     |
| 2.0579             | 26.26                   | 9.66           | 35.92                    | 46.00            | -10.08         | AVG    |
| 4.6860             | 34.28                   | 9.67           | 43.95                    | 56.00            | -12.05         | QP     |
| 4.6860             | 24.13                   | 9.67           | 33.80                    | 46.00            | -12.20         | AVG    |
| 6.8300             | 31.35                   | 9.68           | 41.03                    | 60.00            | -18.97         | QP     |
| 6.8300             | 21.64                   | 9.68           | 31.32                    | 50.00            | -18.68         | AVG    |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



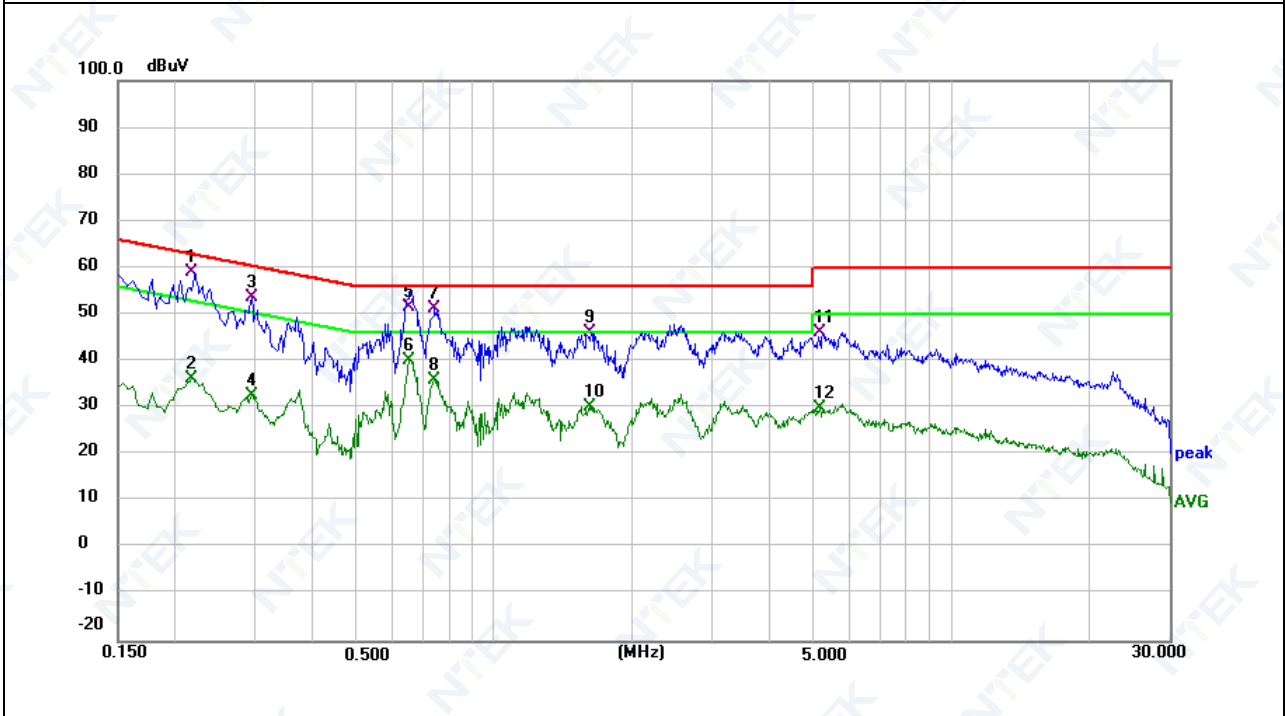
Note: The test modes were carried out for all operation modes. The worst test mode for test data was showed in the report.

|               |                                    |                    |                  |
|---------------|------------------------------------|--------------------|------------------|
| EUT:          | 4G Tablet                          | Model Name:        | Tab 80           |
| Temperature:  | 24.7°C                             | Relative Humidity: | 53%              |
| Pressure:     | 1010hPa                            | Phase:             | L                |
| Test Voltage: | DC 5V from Adapter<br>AC 230V/50Hz | Test Mode:         | Mode 1-Adapter 3 |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV) | Limits<br>(dBμV) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|----------------|--------------------------|------------------|----------------|--------|
| 0.2180             | 48.99                   | 10.08          | 59.07                    | 62.89            | -3.82          | QP     |
| 0.2180             | 26.16                   | 10.08          | 36.24                    | 52.89            | -16.65         | AVG    |
| 0.2940             | 43.37                   | 10.22          | 53.59                    | 60.41            | -6.82          | QP     |
| 0.2940             | 22.47                   | 10.22          | 32.69                    | 50.41            | -17.72         | AVG    |
| 0.6540             | 40.55                   | 10.95          | 51.50                    | 56.00            | -4.50          | QP     |
| 0.6540             | 29.11                   | 10.95          | 40.06                    | 46.00            | -5.94          | AVG    |
| 0.7420             | 40.13                   | 11.13          | 51.26                    | 56.00            | -4.74          | QP     |
| 0.7420             | 24.97                   | 11.13          | 36.10                    | 46.00            | -9.90          | AVG    |
| 1.6260             | 33.28                   | 12.92          | 46.20                    | 56.00            | -9.80          | QP     |
| 1.6260             | 17.46                   | 12.92          | 30.38                    | 46.00            | -15.62         | AVG    |
| 5.1620             | 36.45                   | 9.67           | 46.12                    | 60.00            | -13.88         | QP     |
| 5.1620             | 20.18                   | 9.67           | 29.85                    | 50.00            | -20.15         | AVG    |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

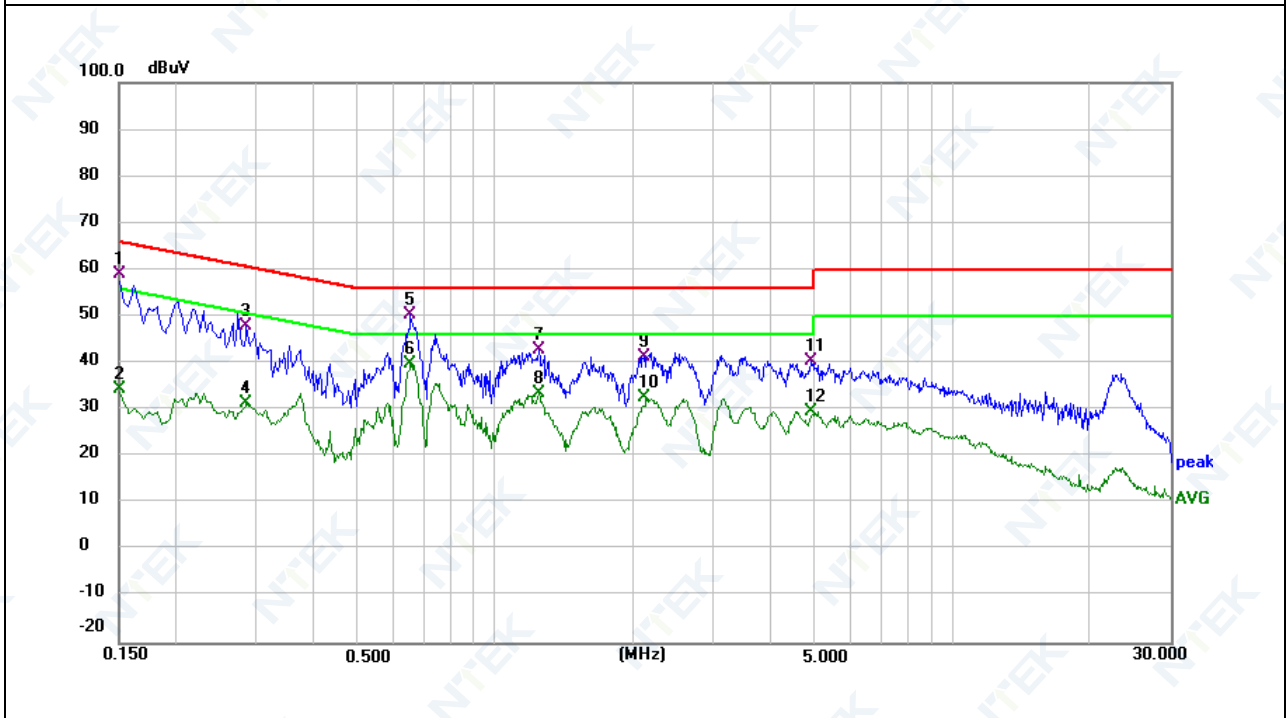


|               |                                    |                    |                  |
|---------------|------------------------------------|--------------------|------------------|
| EUT:          | 4G Tablet                          | Model Name:        | Tab 80           |
| Temperature:  | 21.1°C                             | Relative Humidity: | 50%              |
| Pressure:     | 1010hPa                            | Phase:             | N                |
| Test Voltage: | DC 5V from Adapter<br>AC 230V/50Hz | Test Mode:         | Mode 1-Adapter 3 |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV) | Limits<br>(dBμV) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|----------------|--------------------------|------------------|----------------|--------|
| 0.1500             | 49.01                   | 9.93           | 58.94                    | 66.00            | -7.06          | QP     |
| 0.1500             | 24.66                   | 9.93           | 34.59                    | 56.00            | -21.41         | AVG    |
| 0.2860             | 37.69                   | 10.22          | 47.91                    | 60.64            | -12.73         | QP     |
| 0.2860             | 21.09                   | 10.22          | 31.31                    | 50.64            | -19.33         | AVG    |
| 0.6540             | 39.37                   | 10.95          | 50.32                    | 56.00            | -5.68          | QP     |
| 0.6540             | 28.90                   | 10.95          | 39.85                    | 46.00            | -6.15          | AVG    |
| 1.2460             | 30.66                   | 12.16          | 42.82                    | 56.00            | -13.18         | QP     |
| 1.2460             | 21.25                   | 12.16          | 33.41                    | 46.00            | -12.59         | AVG    |
| 2.1180             | 31.79                   | 9.66           | 41.45                    | 56.00            | -14.55         | QP     |
| 2.1180             | 22.96                   | 9.66           | 32.62                    | 46.00            | -13.38         | AVG    |
| 4.9220             | 30.86                   | 9.67           | 40.53                    | 56.00            | -15.47         | QP     |
| 4.9220             | 20.02                   | 9.67           | 29.69                    | 46.00            | -16.31         | AVG    |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



Note: The test modes were carried out for all operation modes. The worst test mode for test data was showed in the report.

## 2.2 RADIATED EMISSION MEASUREMENT

### 2.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

**Table A.2 – Requirements for radiated emissions at frequencies up to 1 GHz for Class A equipment**

| Table clause | Frequency range<br>MHz | Measurement   |                             | Class A limits dB(μV/m)     |  |
|--------------|------------------------|---------------|-----------------------------|-----------------------------|--|
|              |                        | Distance<br>m | Detector type/<br>bandwidth | OATS/SAC<br>(see Table A.1) |  |
| A2.1         | 30 – 230               | 10            | Quasi Peak /<br>120 kHz     | 40                          |  |
|              | 230 – 1 000            |               |                             | 47                          |  |
| A2.2         | 30 – 230               | 3             |                             | 50                          |  |
|              | 230 – 1 000            |               |                             | 57                          |  |

Apply only A2.1 or A2.2 across the entire frequency range.

**Table A.4 – Requirements for radiated emissions at frequencies up to 1 GHz for Class B equipment**

| Table clause | Frequency range<br>MHz | Measurement   |                             | Class B limits dB(μV/m)     |  |
|--------------|------------------------|---------------|-----------------------------|-----------------------------|--|
|              |                        | Distance<br>m | Detector type/<br>bandwidth | OATS/SAC<br>(see Table A.1) |  |
| A4.1         | 30 – 230               | 10            | Quasi Peak /<br>120 kHz     | 30                          |  |
|              | 230 – 1 000            |               |                             | 37                          |  |
| A4.2         | 30 – 230               | 3             |                             | 40                          |  |
|              | 230 – 1 000            |               |                             | 47                          |  |

Apply only table clause A4.1 or A4.2 across the entire frequency range.

**Table A.6 – Requirements for radiated emissions from FM receivers**

| Table clause | Frequency range<br>MHz | Measurement   |                             | Class B limit dB(μV/m)      |                             |    |
|--------------|------------------------|---------------|-----------------------------|-----------------------------|-----------------------------|----|
|              |                        | Distance<br>m | Detector type/<br>bandwidth | Fundamental                 | Harmonics                   |    |
|              |                        |               |                             | OATS/SAC<br>(see Table A.1) | OATS/SAC<br>(see Table A.1) |    |
| A6.1         | 30 – 230               | 10            | Quasi peak/<br>120 kHz      | 50                          | 42                          |    |
|              | 230 – 300              |               |                             |                             | 42                          |    |
|              | 300 – 1 000            |               |                             |                             | 46                          |    |
| A6.2         | 30 – 230               | 3             |                             | Quasi peak/<br>120 kHz      | 60                          | 52 |
|              | 230 – 300              |               |                             |                             |                             | 52 |
|              | 300 – 1 000            |               |                             |                             |                             | 56 |

Apply only A.6.1 or A.6.2 across the entire frequency range.

These relaxed limits apply only to emissions at the fundamental and harmonic frequencies of the local oscillator. Signals at all other frequencies shall be compliant with the limits given in Table A.4.

2.2.2 LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

**Table A.3 – Requirements for radiated emissions at frequencies above 1 GHz for Class A equipment**

| Table clause | Frequency range MHz | Measurement |                          | Class A limits dB(μV/m) |
|--------------|---------------------|-------------|--------------------------|-------------------------|
|              |                     | Distance m  | Detector type/ bandwidth | FSOATS (see Table A.1)  |
| A3.1         | 1 000 – 3 000       | 3           | Average / 1 MHz          | 56                      |
|              | 3 000 – 6 000       |             |                          | 60                      |
| A3.2         | 1 000 – 3 000       |             | Peak / 1 MHz             | 76                      |
|              | 3 000 – 6 000       |             |                          | 80                      |

Apply A3.1 and A3.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1.

**Table A.5 – Requirements for radiated emissions at frequencies above 1 GHz for Class B equipment**

| Table clause | Frequency range MHz | Measurement |                          | Class B limits dB(μV/m) |
|--------------|---------------------|-------------|--------------------------|-------------------------|
|              |                     | Distance m  | Detector type/ bandwidth | FSOATS (see Table A.1)  |
| A5.1         | 1 000 – 3 000       | 3           | Average/ 1 MHz           | 50                      |
|              | 3 000 – 6 000       |             |                          | 54                      |
| A5.2         | 1 000 – 3 000       |             | Peak/ 1 MHz              | 70                      |
|              | 3 000 – 6 000       |             |                          | 74                      |

Apply A5.1 and A5.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1.

Notes:

- (1) The limit for radiated test was performed according to as following: CISPR 32.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBμV/m)=20log Emission level (uV/m).

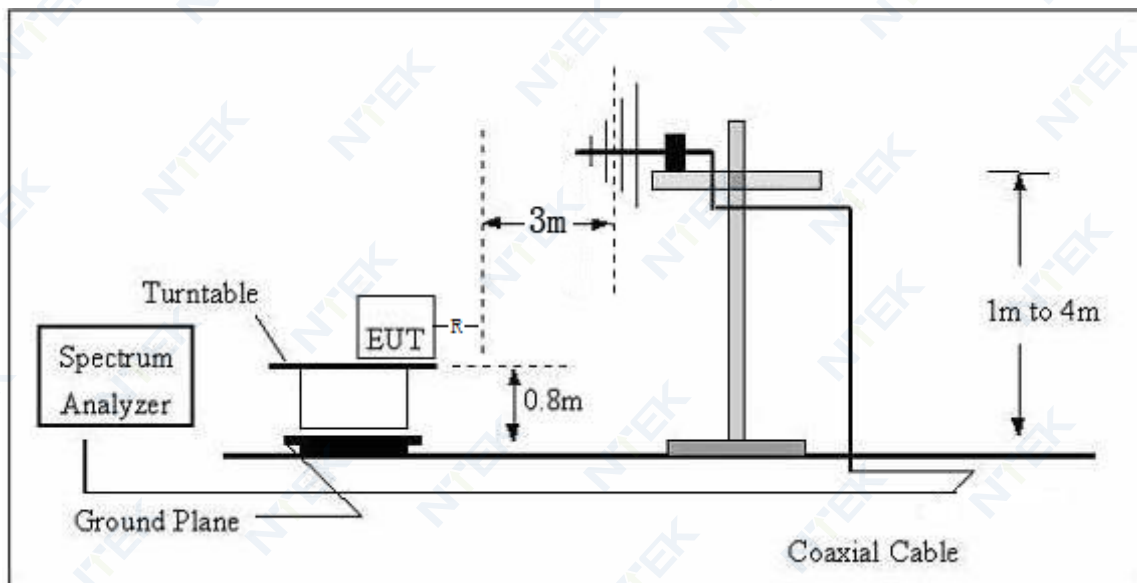


2.2.3 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

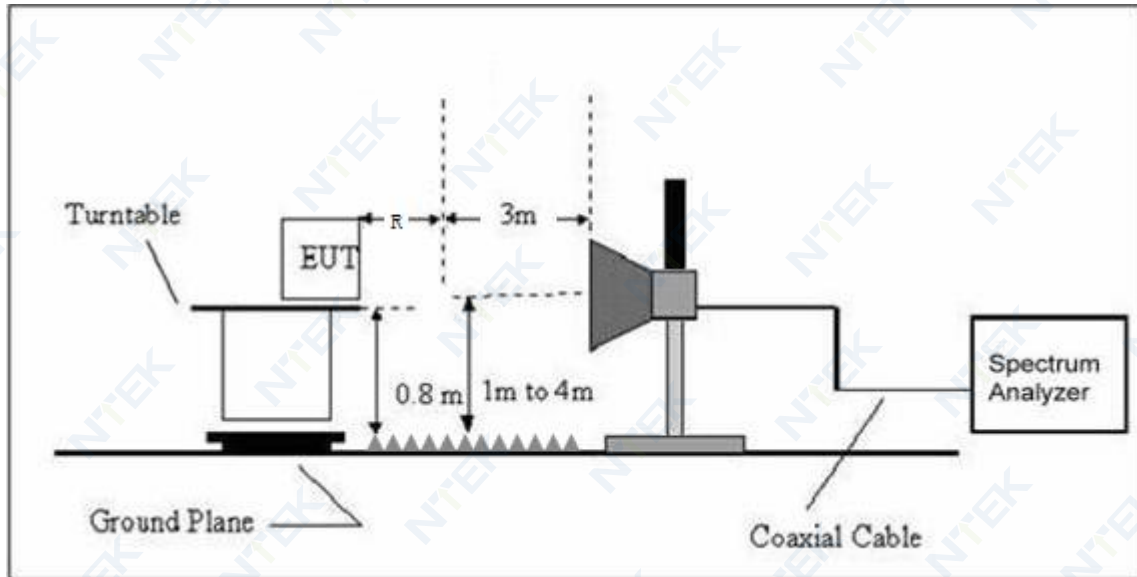
2.2.4 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz





(B) Radiated Emission Test Set-Up Frequency Above 1GHz



2.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.2 Unless otherwise a special operating condition is specified in the follows during the testing.

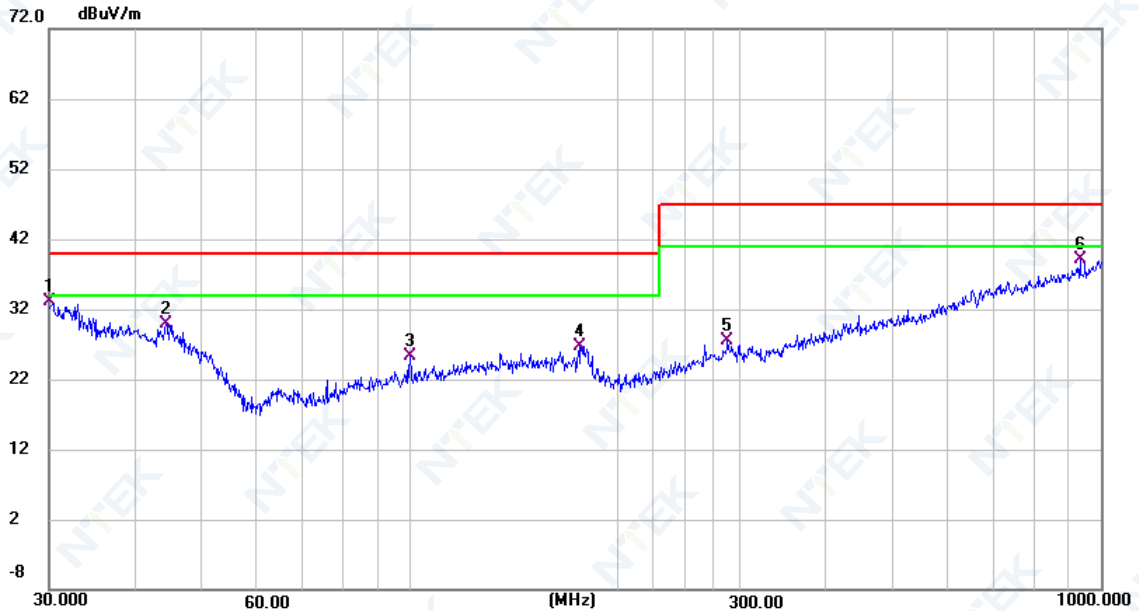
2.2.6 TEST RESULTS (30-1000MHz)

|              |                               |                    |                     |
|--------------|-------------------------------|--------------------|---------------------|
| EUT:         | 4G Tablet                     | Model Name:        | Tab 80              |
| Temperature: | 23.9°C                        | Relative Humidity: | 52%                 |
| Pressure:    | 1010 hPa                      | Polarization:      | Vertical            |
| Test Power:  | DC 5V from PC<br>AC 230V/50Hz | Test Mode:         | Mode 1-Tab 80(64GB) |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|--------|
| 30.0000         | 6.61                 | 26.47       | 33.08                   | 40.00           | -6.92       | QP     |
| 44.2752         | 11.36                | 18.56       | 29.92                   | 40.00           | -10.08      | QP     |
| 99.8777         | 7.64                 | 17.67       | 25.31                   | 40.00           | -14.69      | QP     |
| 176.2686        | 9.52                 | 17.14       | 26.66                   | 40.00           | -13.34      | QP     |
| 287.9904        | 7.41                 | 20.07       | 27.48                   | 47.00           | -19.52      | QP     |
| 932.2715        | 8.01                 | 31.17       | 39.18                   | 47.00           | -7.82       | QP     |

Remark:

1. Emission Level= Meter Reading+ Factor, Margin= Emission Level- Limit.

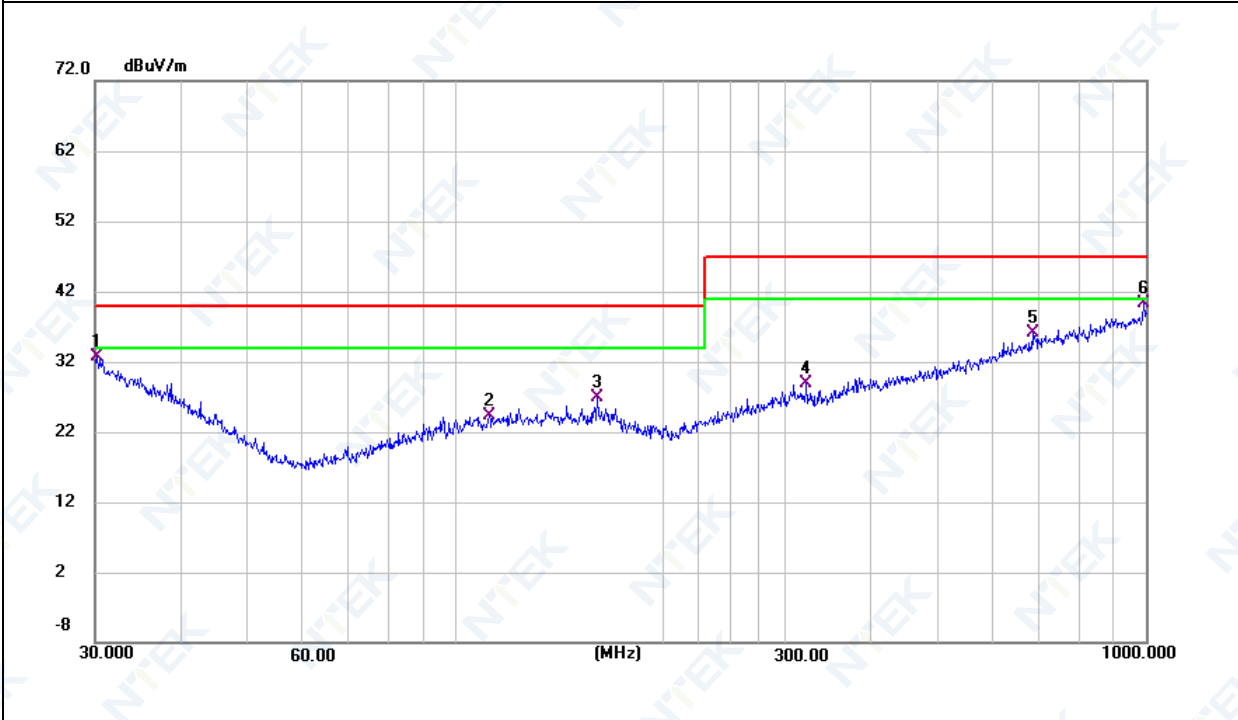


|              |                               |                    |                     |
|--------------|-------------------------------|--------------------|---------------------|
| EUT:         | 4G Tablet                     | Model Name:        | Tab 80              |
| Temperature: | 24.5°C                        | Relative Humidity: | 51%                 |
| Pressure:    | 1010 hPa                      | Polarization:      | Horizontal          |
| Test Power:  | DC 5V from PC<br>AC 230V/50Hz | Test Mode:         | Mode 1-Tab 80(64GB) |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|--------|
| 30.2111            | 6.30                    | 26.35          | 32.65                      | 40.00              | -7.35          | QP     |
| 111.7380           | 5.79                    | 18.42          | 24.21                      | 40.00              | -15.79         | QP     |
| 160.3456           | 8.77                    | 18.04          | 26.81                      | 40.00              | -13.19         | QP     |
| 322.1886           | 8.37                    | 20.56          | 28.93                      | 47.00              | -18.07         | QP     |
| 684.7454           | 8.36                    | 27.70          | 36.06                      | 47.00              | -10.94         | QP     |
| 993.0114           | 7.89                    | 32.36          | 40.25                      | 47.00              | -6.75          | QP     |

Remark:

1. Emission Level= Meter Reading+ Factor, Margin= Emission Level- Limit.



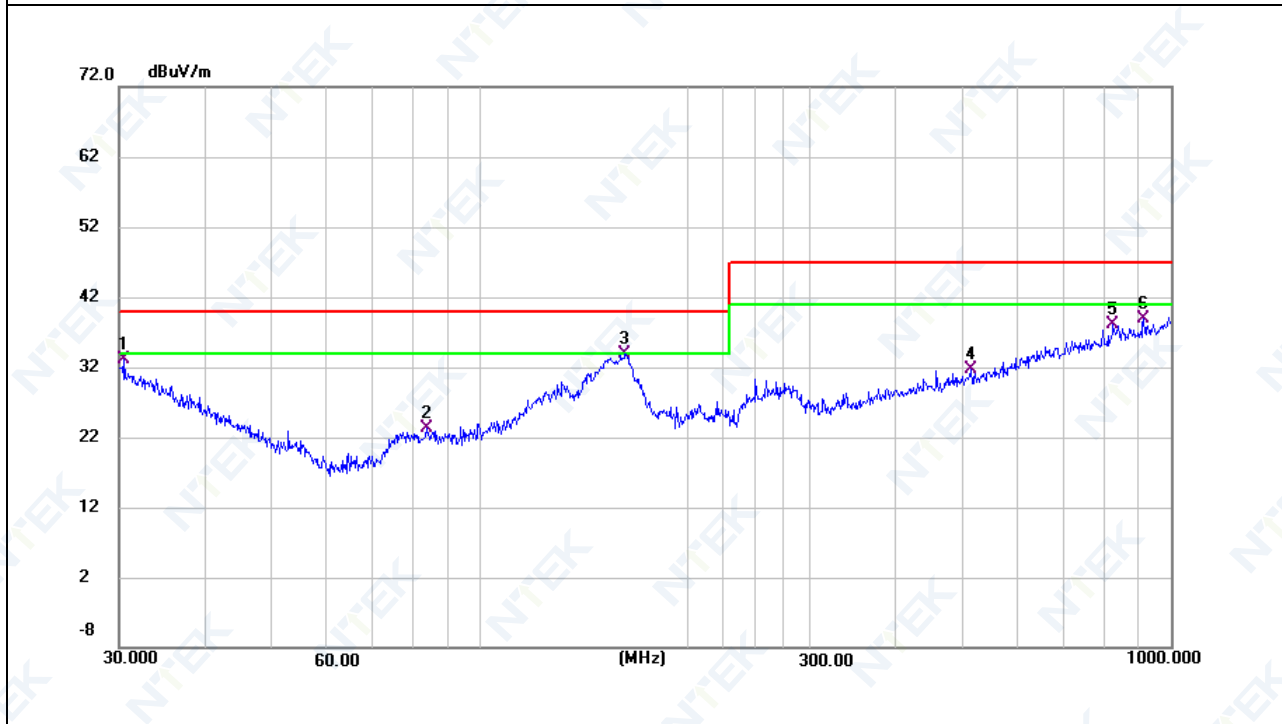
Note: The test modes were carried out for all operation modes. The worst test mode for test data was showed in the report.

|              |                               |                    |                       |
|--------------|-------------------------------|--------------------|-----------------------|
| EUT:         | 4G Tablet                     | Model Name:        | Tab 80                |
| Temperature: | 23.9°C                        | Relative Humidity: | 52%                   |
| Pressure:    | 1010 hPa                      | Polarization:      | Vertical              |
| Test Power:  | DC 5V from PC<br>AC 230V/50Hz | Test Mode:         | Mode 1- Tab 80(128GB) |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|--------|
| 30.5305            | 6.88                    | 26.17          | 33.05                      | 40.00              | -6.95          | QP     |
| 83.5222            | 7.38                    | 15.86          | 23.24                      | 40.00              | -16.76         | QP     |
| 162.0414           | 15.97                   | 17.95          | 33.92                      | 40.00              | -6.08          | QP     |
| 513.6331           | 6.57                    | 25.06          | 31.63                      | 47.00              | -15.37         | QP     |
| 824.5968           | 8.23                    | 29.87          | 38.10                      | 47.00              | -8.90          | QP     |
| 912.8620           | 7.89                    | 30.94          | 38.83                      | 47.00              | -8.17          | QP     |

Remark:

1. Emission Level= Meter Reading+ Factor, Margin= Emission Level- Limit.

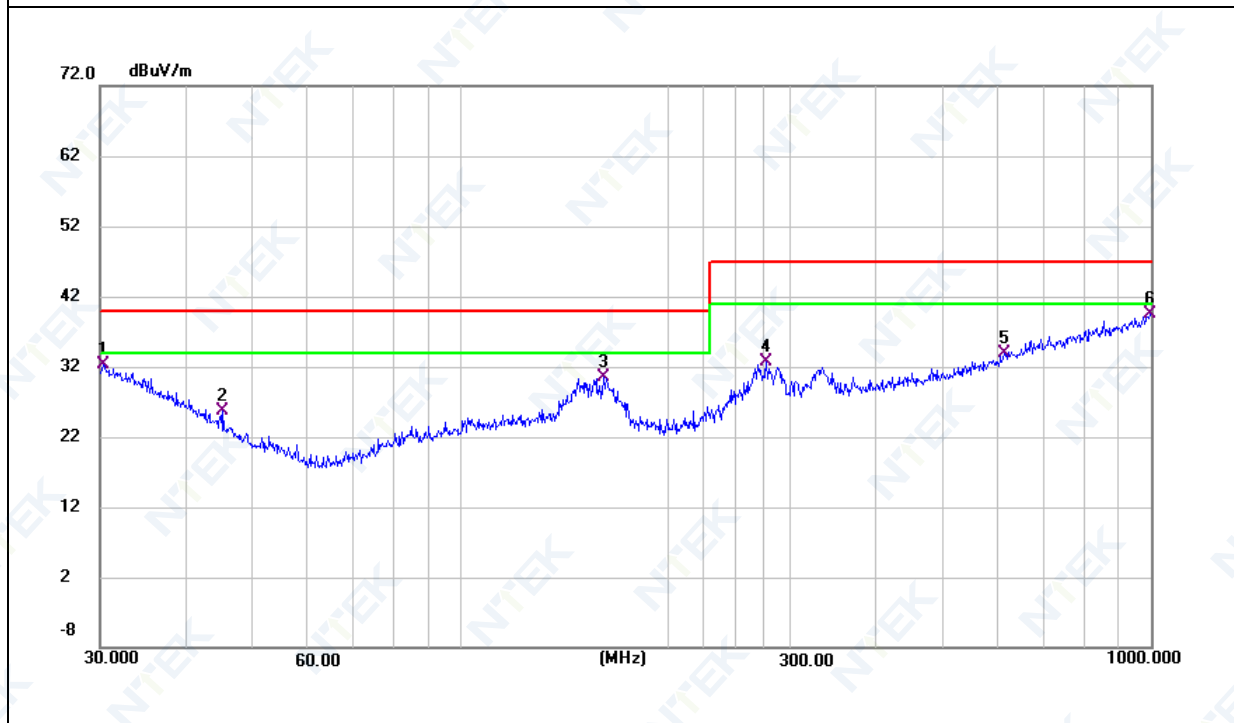


|              |                               |                    |                       |
|--------------|-------------------------------|--------------------|-----------------------|
| EUT:         | 4G Tablet                     | Model Name:        | Tab 80                |
| Temperature: | 24.5°C                        | Relative Humidity: | 51%                   |
| Pressure:    | 1010 hPa                      | Polarization:      | Horizontal            |
| Test Power:  | DC 5V from PC<br>AC 230V/50Hz | Test Mode:         | Mode 1- Tab 80(128GB) |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|--------|
| 30.3172            | 5.97                    | 26.29          | 32.26                      | 40.00              | -7.74          | QP     |
| 45.2166            | 7.78                    | 18.02          | 25.80                      | 40.00              | -14.20         | QP     |
| 160.9089           | 12.40                   | 18.01          | 30.41                      | 40.00              | -9.59          | QP     |
| 277.0935           | 12.70                   | 19.92          | 32.62                      | 47.00              | -14.38         | QP     |
| 614.2142           | 7.19                    | 26.67          | 33.86                      | 47.00              | -13.14         | QP     |
| 996.4995           | 6.93                    | 32.50          | 39.43                      | 47.00              | -7.57          | QP     |

Remark:

1. Emission Level= Meter Reading+ Factor, Margin= Emission Level- Limit.



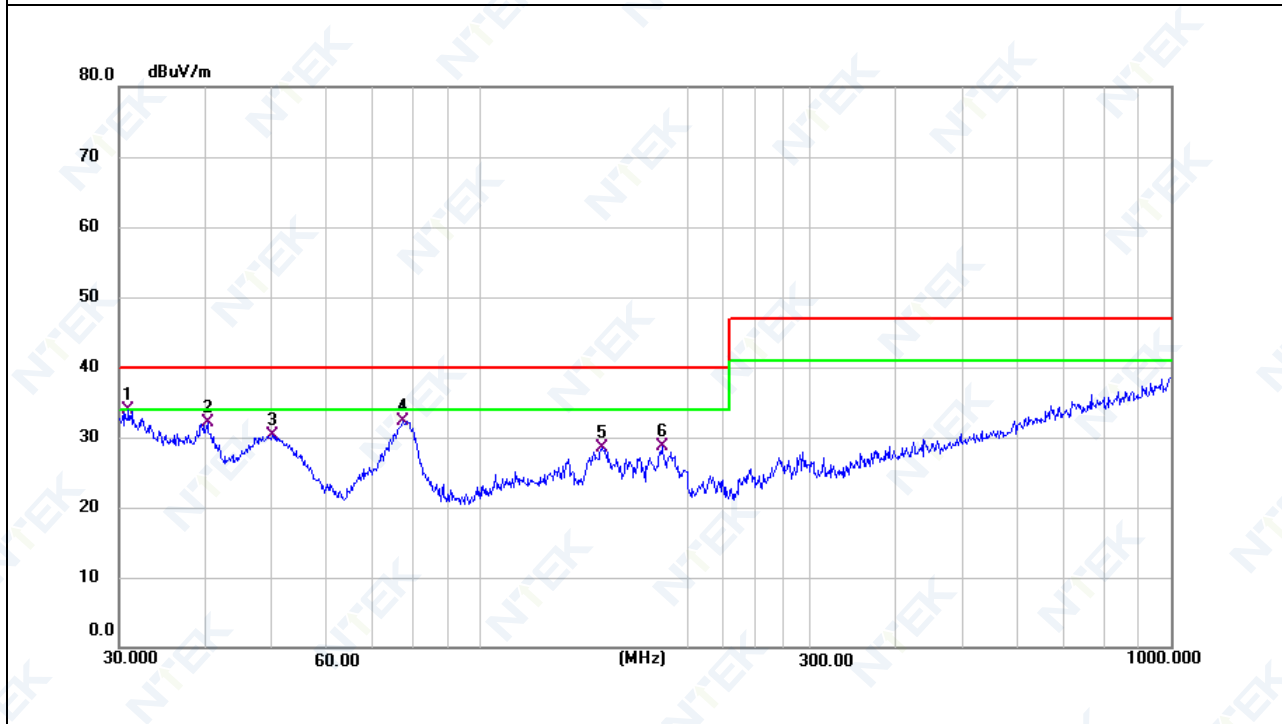
Note: The test modes were carried out for all operation modes. The worst test mode for test data was showed in the report.

|              |                               |                    |                   |
|--------------|-------------------------------|--------------------|-------------------|
| EUT:         | 4G Tablet                     | Model Name:        | Tab 80            |
| Temperature: | 23.9°C                        | Relative Humidity: | 52%               |
| Pressure:    | 1010 hPa                      | Polarization:      | Vertical          |
| Test Power:  | DC 5V from PC<br>AC 230V/50Hz | Test Mode:         | Mode 1- Adapter 3 |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|--------|
| 30.9619            | 7.99                    | 25.93          | 33.92                      | 40.00              | -6.08          | QP     |
| 40.2757            | 11.23                   | 20.86          | 32.09                      | 40.00              | -7.91          | QP     |
| 50.0566            | 14.99                   | 15.24          | 30.23                      | 40.00              | -9.77          | QP     |
| 77.3212            | 17.37                   | 14.90          | 32.27                      | 40.00              | -7.73          | QP     |
| 150.0108           | 9.97                    | 18.53          | 28.50                      | 40.00              | -11.50         | QP     |
| 183.2005           | 11.90                   | 16.76          | 28.66                      | 40.00              | -11.34         | QP     |

Remark:

1. Emission Level= Meter Reading+ Factor, Margin= Emission Level- Limit.



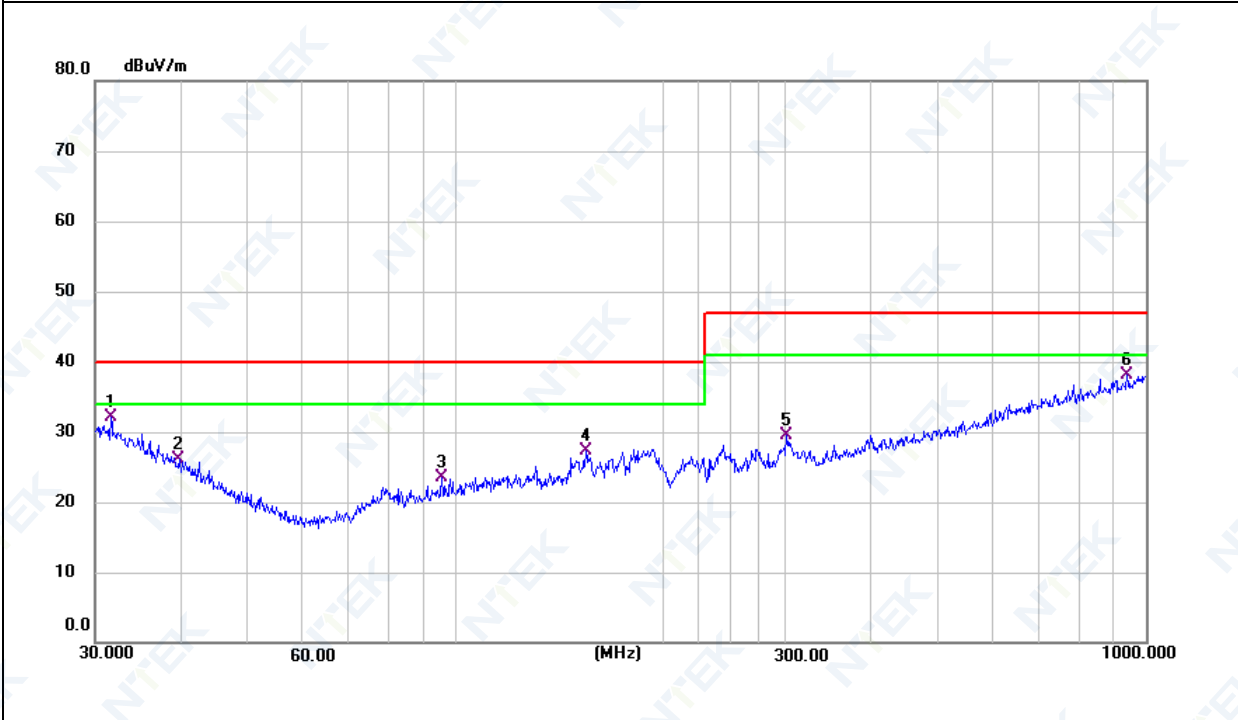


|              |                               |                    |                   |
|--------------|-------------------------------|--------------------|-------------------|
| EUT:         | 4G Tablet                     | Model Name:        | Tab 80            |
| Temperature: | 24.5°C                        | Relative Humidity: | 51%               |
| Pressure:    | 1010 hPa                      | Polarization:      | Horizontal        |
| Test Power:  | DC 5V from PC<br>AC 230V/50Hz | Test Mode:         | Mode 1- Adapter 3 |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|--------|
| 31.6202            | 6.61                    | 25.57          | 32.18                      | 40.00              | -7.82          | QP     |
| 39.7146            | 4.91                    | 21.17          | 26.08                      | 40.00              | -13.92         | QP     |
| 95.4270            | 6.18                    | 17.29          | 23.47                      | 40.00              | -16.53         | QP     |
| 154.2786           | 8.89                    | 18.37          | 27.26                      | 40.00              | -12.74         | QP     |
| 301.4224           | 9.18                    | 20.23          | 29.41                      | 47.00              | -17.59         | QP     |
| 938.8326           | 6.92                    | 31.25          | 38.17                      | 47.00              | -8.83          | QP     |

Remark:

1. Emission Level= Meter Reading+ Factor, Margin= Emission Level- Limit.



Note: The test modes were carried out for all operation modes. The worst test mode for test data was showed in the report.

2.2.7 TEST RESULTS(1000-6000MHz)

|              |                                 |                    |               |
|--------------|---------------------------------|--------------------|---------------|
| EUT:         | 4G Tablet                       | Model Name:        | Tab 80        |
| Temperature: | 24.5°C                          | Relative Humidity: | 51%           |
| Pressure:    | 1010 hPa                        | Test Mode:         | Mode 1-Tab 80 |
| Test Power:  | DC 5V from Adapter AC 230V/50Hz |                    |               |

| Polar | Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Remark |
|-------|-----------|---------------|--------|----------------|----------|--------|--------|
| (H/V) | (MHz)     | (dBμV/m)      | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |        |
| V     | 1255.000  | 37.57         | 5.26   | 42.83          | 74.00    | -31.17 | peak   |
| V     | 2245.000  | 36.54         | 7.37   | 43.91          | 74.00    | -30.09 | peak   |
| V     | 3020.000  | 35.66         | 9.81   | 45.47          | 74.00    | -28.53 | peak   |
| V     | 3885.000  | 34.24         | 11.38  | 45.62          | 74.00    | -28.38 | peak   |
| V     | 4980.000  | 33.48         | 14.10  | 47.58          | 74.00    | -26.42 | peak   |
| V     | 5935.000  | 32.74         | 15.44  | 48.18          | 74.00    | -25.82 | peak   |
| H     | 1065.000  | 38.99         | 4.95   | 43.94          | 74.00    | -30.06 | peak   |
| H     | 3110.000  | 34.98         | 10.14  | 45.12          | 74.00    | -28.88 | peak   |
| H     | 3945.000  | 33.97         | 11.54  | 45.51          | 74.00    | -28.49 | peak   |
| H     | 4420.000  | 33.03         | 12.59  | 45.62          | 74.00    | -28.38 | peak   |
| H     | 5160.000  | 33.06         | 14.26  | 47.32          | 74.00    | -26.68 | peak   |
| H     | 5875.000  | 32.74         | 15.39  | 48.13          | 74.00    | -25.87 | peak   |

**Remark:**Emission Level= Meter Reading+ Factor, Margin= Emission Level- Limit

Note: The test modes were carried out for all operation modes. The worst test mode for test data was showed in the report.

|              |                                 |                    |                  |
|--------------|---------------------------------|--------------------|------------------|
| EUT:         | 4G Tablet                       | Model Name:        | Tab 80           |
| Temperature: | 24.5°C                          | Relative Humidity: | 51%              |
| Pressure:    | 1010 hPa                        | Test Mode:         | Mode 1-adapter 3 |
| Test Power:  | DC 5V from Adapter AC 230V/50Hz |                    |                  |

| Polar | Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Remark |
|-------|-----------|---------------|--------|----------------|----------|--------|--------|
| (H/V) | (MHz)     | (dBμV/m)      | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |        |
| V     | 2700.000  | 35.87         | 8.51   | 44.38          | 74.00    | -29.62 | peak   |
| V     | 3175.000  | 34.77         | 10.25  | 45.02          | 74.00    | -28.98 | peak   |
| V     | 4110.000  | 33.90         | 11.92  | 45.82          | 74.00    | -28.18 | peak   |
| V     | 4625.000  | 33.36         | 12.90  | 46.26          | 74.00    | -27.74 | peak   |
| V     | 4950.000  | 34.09         | 14.04  | 48.13          | 74.00    | -25.87 | peak   |
| V     | 5895.000  | 32.65         | 15.43  | 48.08          | 74.00    | -25.92 | peak   |
| H     | 2720.000  | 36.06         | 8.55   | 44.61          | 74.00    | -29.39 | peak   |
| H     | 3050.000  | 34.96         | 9.88   | 44.84          | 74.00    | -29.16 | peak   |
| H     | 3930.000  | 34.36         | 11.50  | 45.86          | 74.00    | -28.14 | peak   |
| H     | 4235.000  | 34.12         | 12.21  | 46.33          | 74.00    | -27.67 | peak   |
| H     | 4795.000  | 33.81         | 13.47  | 47.28          | 74.00    | -26.72 | peak   |
| H     | 5985.000  | 33.13         | 15.53  | 48.66          | 74.00    | -25.34 | peak   |

**Remark:** Emission Level= Meter Reading+ Factor, Margin= Emission Level- Limit

Note: The test modes were carried out for all operation modes. The worst test mode for test data was showed in the report.

2.3 HARMONICS CURRENT

2.3.1 LIMITS OF HARMONICS CURRENT

Table 1 – Limits for Class A equipment

| Harmonic order (n)  | Maximum permissible harmonic current (A) |
|---------------------|--|
| Odd harmonics       |  |
| 3                   | 2.3                                      |
| 5                   | 1.14                                     |
| 7                   | 0.77                                     |
| 9                   | 0.4                                      |
| 11                  | 0.33                                     |
| 13                  | 0.21                                     |
| $15 \leq n \leq 39$ | $0.15 \cdot (15/n)$                      |
| Even harmonics      |  |
| 2                   | 1.08                                     |
| 4                   | 0.43                                     |
| 6                   | 0.30                                     |
| $8 \leq n \leq 40$  | $0.23 \cdot (8/n)$                       |

Note: Reference standard of the table above: EN61000-3-2.

### 3.3.2 TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.

b. The classification of EUT is according to section 5 of EN 61000-3-2. The EUT is classified as follows:

Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

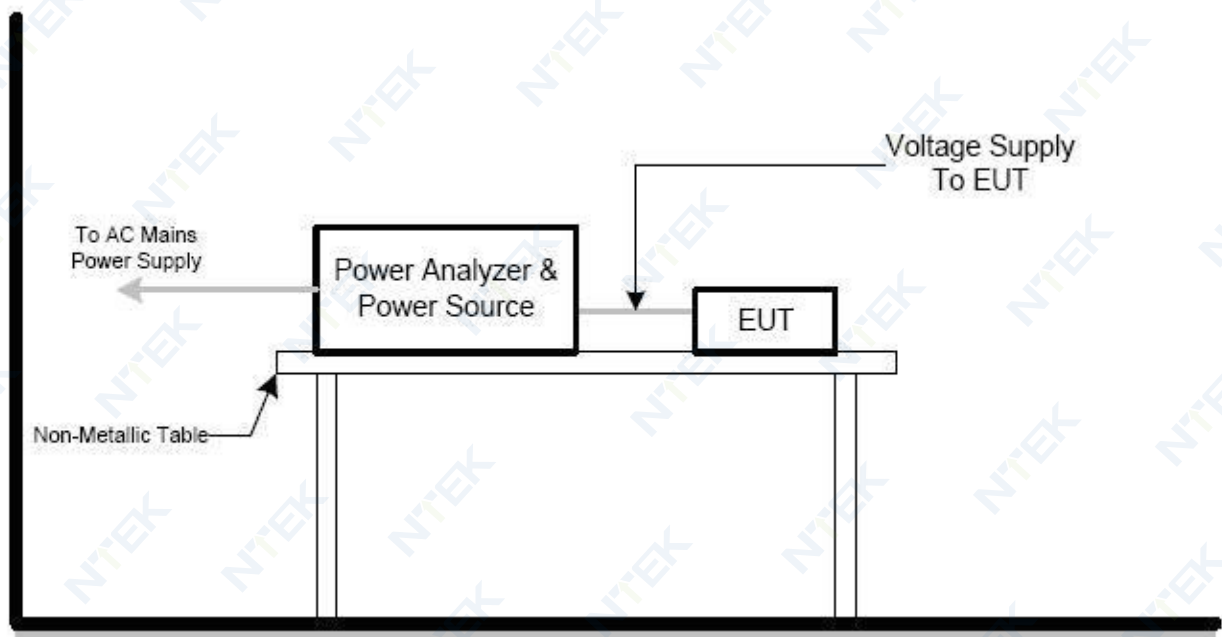
Class D: Equipment having a specified power less than or equal to 600W of the following types: Personal computers and personal computer monitors and television receivers.

c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

### 3.3.3 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.3.4 TEST SETUP



### 3.3.5 TEST RESULTS

|                 |           |                    |        |
|-----------------|-----------|--------------------|--------|
| EUT:            | 4G Tablet | Model Name:        | Tab 80 |
| Temperature:    | 22°C      | Relative Humidity: | 53%    |
| Pressure:       | 1012hPa   | Test duration:     | 150s   |
| Classification: | Class A   | Test Power:        | N/A    |
| Test Mode:      | N/A       |                    |        |

Note: The active input power of the EUT is less than 75 W. No limits apply for equipment with an active input power up to and including 75W.



## 2.4 VOLTAGE FLUCTUATION AND FLICKERS

### 2.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

| Test items | Limits(EN61000-3-3)   | Descriptions                           |
|------------|---|--|
| $P_{st}$   | $\leq 1.0, T_p=10\text{min}$  | short-term flicker indicator           |
| $P_{lt}$   | $\leq 0.65, T_p=2\text{h}$  | long-term flicker indicator            |
| $d_c$      | $\leq 3.3\%$  | relative steady-state voltage change   |
| $d_{max}$  | $\leq 4\%$ (or $6\%$ <sub>Note(1)</sub> ,<br>$7\%$ <sub>Note(2)</sub> ) | maximum relative voltage change:       |
| $d_{(t)}$  | $\leq 3.3\%$ , more than<br>500ms                                       | relative voltage change characteristic |

**Note:**

1. 6 % for equipment which is:
  - a. switched manually, or
  - b. switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.
2. 7 % for equipment which is
  - a. attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
  - b. switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

### 3.4.2 TEST PROCEDURE

a. Harmonic Current Test:

Test was performed according to the procedures specified in Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.

b. Fluctuation and Flickers Test:

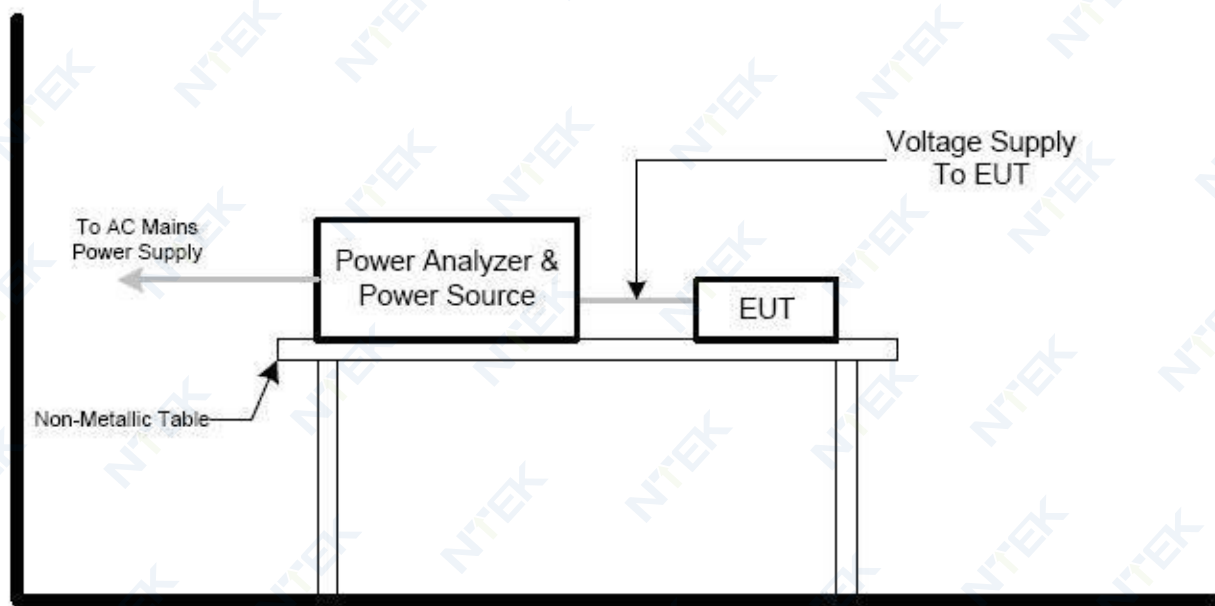
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.

c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

### 3.4.3 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.4.4 TEST SETUP



### 3.4.5 TEST RESULTS

|              |           |                    |                                    |
|--------------|-----------|--------------------|------------------------------------|
| EUT:         | 4G Tablet | Model Name:        | Tab 80                             |
| Temperature: | 22.2°C    | Relative Humidity: | 52%                                |
| Pressure:    | 1010 hPa  | Test Power:        | DC 5V from Adapter<br>AC 230V/50Hz |
| Test Mode:   | Mode 1    |                    |                                    |

|          | EUT values | Limit | Result |
|----------|------------|-------|--------|
| Pst      | 0.017      | 1.00  | PASS   |
| Plt      | 0.007      | 0.65  | PASS   |
| dc [%]   | 0.000      | 3.30  | PASS   |
| dmax [%] | 0.350      | 4.00  | PASS   |
| Tmax [s] | 0.000      | 0.50  | PASS   |

|              |                  |                    |                                    |
|--------------|------------------|--------------------|------------------------------------|
| EUT:         | 4G Tablet        | Model Name:        | Tab 80                             |
| Temperature: | 22.2°C           | Relative Humidity: | 52%                                |
| Pressure:    | 1010 hPa         | Test Power:        | DC 5V from Adapter<br>AC 230V/50Hz |
| Test Mode:   | Mode 1-adapter 3 |                    |                                    |

|          | EUT values | Limit | Result |
|----------|------------|-------|--------|
| Pst      | 0.014      | 1.00  | PASS   |
| Plt      | 0.006      | 0.65  | PASS   |
| dc [%]   | 0.000      | 3.30  | PASS   |
| dmax [%] | 0.000      | 4.00  | PASS   |
| Tmax [s] | 0.000      | 0.50  | PASS   |

**3. EMC IMMUNITY TEST**

**3.1 GENERAL PERFORMANCE CRITERIA**

**3.1.1 PERFORMANCE CRITERIA**

According to **EN 55035** standard, the general performance criteria as following:

|                    |   |
|--------------------|---|
| <b>Criterion A</b> | <p>The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.</p> <p>The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p> |
| <b>Criterion B</b> | <p>After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.</p> <p>The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.</p>   |
| <b>Criterion C</b> | <p>Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.</p> <p>Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p>   |

According to **EN 301 489-3** standard, the general performance criteria as following:

| Criteria | During the test   | After the test   |
|----------|---|--|
| A        | <p>Operate as intended</p> <p>No loss of function</p> <p>No unintentional responses</p> | <p>Operate as intended</p> <p>No loss of function</p> <p>No degradation of performance</p> <p>No loss of stored data or user programmable functions</p>                        |
| B        | <p>May show loss of function</p> <p>No unintentional responses</p>                      | <p>Operate as intended</p> <p>Lost function(s) shall be self-recoverable</p> <p>No degradation of performance</p> <p>No loss of stored data or user programmable functions</p> |

According to **EN 301 489-17** standard, the general performance criteria as following:

| Criteria | During the test  | After the test  |
|----------|--|---|
| A        | <p>Shall operate as intended (see note 1).<br/>                     Shall be no loss of function.<br/>                     Shall be no unintentional transmissions</p>                       | <p>Shall operate as intended.<br/>                     Shall be no degradation of performance (see note 3).<br/>                     Shall be no loss of function.<br/>                     Shall be no loss of stored data or user programmable functions</p>                          |
| B        | <p>May show loss of function (one or more).<br/>                     May show degradation of performance (see note 2).<br/>                     Shall be no unintentional transmissions.</p> | <p>Functions shall be self-recoverable.<br/>                     Shall operate as intended after recovering.<br/>                     Shall be no degradation of performance (see note 3).<br/>                     Shall be no loss of stored data or user programmable functions.</p> |
| C        | <p>May be loss of function (one or more)</p>   | <p>Functions shall be recoverable by the operator.<br/>                     Shall operate as intended after recovering.<br/>                     Shall be no degradation of performance (see note 3).</p>   |

NOTE 1: Operate as intended during the test allows a level of degradation not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance.

If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 3: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

According to **EN 301 489-19** standard, the general performance criteria as following:

If the EUT is of a non specialized nature or the EUT is combined with an ancillary equipment, the test modulation, test arrangements, etc. as required in clause 4 shall apply.

The EUT, for all immunity tests according to the present document, except the spot frequency test of the immunity test with radiated RF electromagnetic fields (see ETSI EN 301 489-1 [1], clause 9.2), shall be assessed for:

- the storage of messages in the memory of the EUT at the start of the test;
- unintentional responses of the EUT during the test;
- the maintenance of the EUT memory assessed at the conclusion of the test;
- the ability to receive and store messages at the conclusion of the test.

For the spot frequency test of the immunity test with radiated RF electromagnetic fields (see ETSI EN 301 489-1 [1], clause 9.2) the EUT shall be assessed by monitoring the accuracy of the call received alert signal.

#### **Performance criteria for Continuous phenomena applied to ROMES and ROGNSS receivers (CR)**

For the EUT, excluding spot frequency tests as part of the immunity test with radiated RF electromagnetic fields (see ETSI EN 301 489-1 [1], clause 9.2):

- the general performance criteria set out in clause 6.1;
- during the test no false calls shall occur;
- at the conclusion of the test comprising the series of individual exposures the EUT shall operate as intended with no loss of functions or stored data (messages), as declared by the manufacturer.

For the spot frequency test as part of the immunity test with radiated RF electromagnetic fields (see ETSI EN 301 489-1 [1], clause 9.2) the EUT shall be assessed by monitoring the accuracy of the call received alert signal.

#### **Performance criteria for Transient phenomena applied to ROMES and ROGNSS receivers (TR)**

For the EUT:

- the general performance criteria set out in clause 6.1;
- during the test no false calls shall occur;
- at the conclusion of the test comprising the series of individual exposures, the EUT shall operate as intended with no loss of function and/or stored data (messages), as declared by the manufacturer.



**Special conditions for EMC immunity tests**

**Table 2: Special conditions for EMC immunity tests**

| Reference to clauses in ETSI EN 301 489-1 [1]                                    | Special product-related conditions, additional to or modifying the test conditions in ETSI EN 301 489-1 [1], clause 9  |
|--|--|
| <p><b>9.1 Test configuration; Test methods and levels for immunity tests</b></p> | <p>The message memory shall be loaded with recognizable messages. The EUT shall operate in stand-by mode of operation, except for the spot frequency test as part of the immunity test with radiated RF electromagnetic fields (see ETSI EN 301 489-1 [1], clause 9.2) where repetitive calls shall be coupled to the input of the receiver.</p> <ul style="list-style-type: none"> <li>• for the immunity tests of ancillary equipment, without a separate pass/fail criteria, an EUT coupled to the ancillary equipment shall be used to judge whether the ancillary equipment passes or fails.</li> </ul> |
| <p><b>9.2.2 Test method; Radio frequency electromagnetic field</b></p>           | <p><b>Spot frequency test:</b><br/>A spot frequency test shall additionally be performed at:</p> <ul style="list-style-type: none"> <li>• 80 MHz;</li> <li>• 104 MHz;</li> <li>• 136 MHz;</li> <li>• 165 MHz;</li> <li>• 200 MHz;</li> <li>• 260 MHz;</li> <li>• 330 MHz;</li> <li>• 430 MHz;</li> <li>• 560 MHz;</li> <li>• 715 MHz ± 1 MHz;</li> <li>• a spot frequency test shall be performed at 920 MHz ± 1 MHz using a test level of 3 V/m (measured unmodulated) 100 % modulated by 200 Hz pulses of equal mark to space ratio.</li> </ul>  |

**PERFORMANCE FOR TT**

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

**PERFORMANCE FOR TR**

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration for which performance criteria C shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

**PERFORMANCE FOR CT**

The performance criteria A shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an Acknowledgement (ACK) or Not Acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

**PERFORMANCE FOR CR**

The performance criteria A shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

According to **EN 301 489-52** standard, the general performance criteria as following:

**GSM and DCS Performance Criteria**

Please refer to the standard ETSI EN 301 489-52 V1.2.1 clause 6.1.

**CDMA Direct Spread (UTRA and E-UTRA) Performance Criteria**

Please refer to the standard ETSI EN 301 489-52 V1.2.1 clause 6.2.

**3.2 GENERAL PERFORMANCE CRITERIA TEST SETUP**

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

**3.3 ESD TESTING**

**3.3.1 TEST SPECIFICATION**

|                      |   |
|----------------------|---|
| Basic Standard:      | IEC/EN 61000-4-2  |
| Discharge Impedance: | 330 ohm / 150 pF  |
| Required Performance | B   |
| Discharge Voltage:   | Air Discharge: 2kV/4kV/8kV<br>Contact Discharge: 2kV/4kV (Direct/Indirect)                    |
| Polarity:            | Positive & Negative   |
| Number of Discharge: | Air Discharge: min. 20 times at each test point<br>Contact Discharge: min. 200 times in total |
| Discharge Mode:      | A/C Discharge   |
| Discharge Period:    | 1 second minimum  |

**3.3.2 TEST PROCEDURE**

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Indirect application of the discharge:

Vertical Coupling Plane (VCP):

At least 10 single discharges (in the most sensitive polarity) shall be applied to the centre of one vertical edge of the coupling plane. The coupling plane, of dimensions 0,5 m × 0,5 m, is placed parallel to, and positioned at a distance of 0,1 m from, the EUT.

Discharges shall be applied to the coupling plane, with sufficient different positions such that the four faces of the EUT are completely illuminated. One VCP position is considered to illuminate 0,5 m × 0,5 m area of the EUT surface.

Horizontal Coupling Plane (HCP):

Discharge to the HCP shall be made horizontally to the edge of the HCP.

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the centre point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

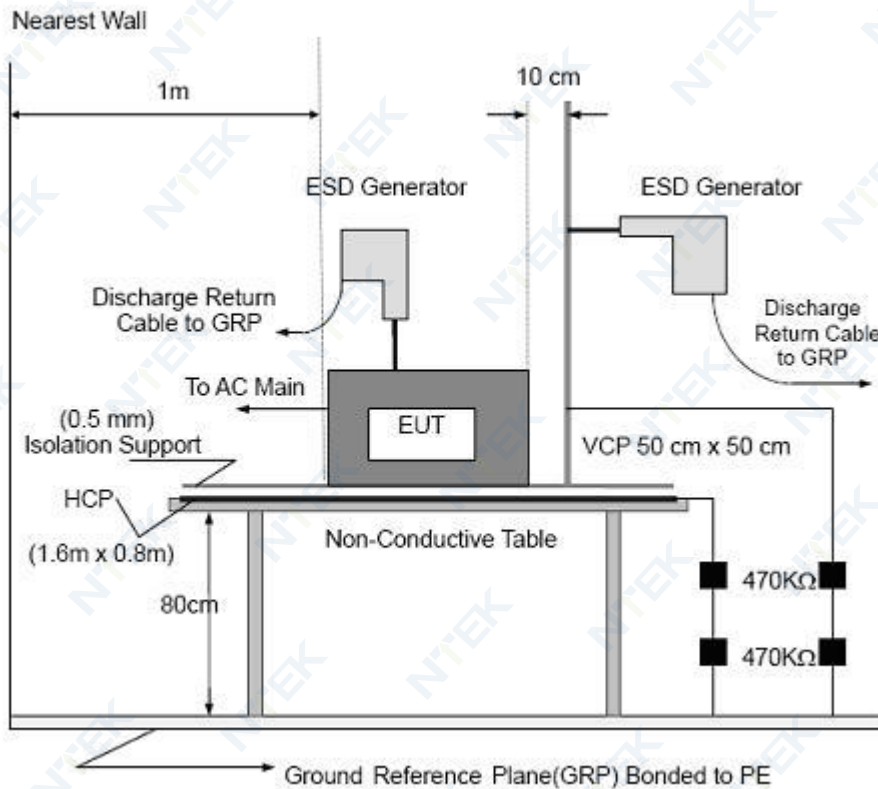
The discharge electrode shall be in contact with the edge of the HCP before the discharge switch is operated

b. Direct application of discharges to the EUT

The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied.

For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

3.3.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

### 3.3.4 TEST RESULTS

|              |                           |                    |   |
|--------------|---------------------------|--------------------|---|
| EUT:         | 4G Tablet                 | Model Name:        | Tab 80  |
| Temperature: | 22°C                      | Relative Humidity: | 53%   |
| Pressure:    | 1010 hPa                  | Test Power:        | DC 5V from Adapter AC 230V/50Hz / DC 5V from PC |
| Test Mode:   | Mode 1/2/3/4/5/6/7/8/9/10 |                    |   |

| Mode | Contact Discharge (Indirect) |            |   |   |   |   | Criterion | Result   |                 |   |
|------|------------------------------|------------|---|---|---|---|-----------|----------|-----------------|---|
|      | Test level(kV)               | Test Point | 2 |   | 4 |   |           |          | 6               |   |
|      |                              |            | + | - | + | - |           |          | +               | - |
| HCP  | Front                        | P          | P | P | P |   |           | <b>B</b> | <b>Complies</b> |   |
|      | Rear                         | P          | P | P | P |   |           |          |                 |   |
|      | Left                         | P          | P | P | P |   |           |          |                 |   |
|      | Right                        | P          | P | P | P |   |           |          |                 |   |
| VCP  | Front                        | P          | P | P | P |   |           |          |                 |   |
|      | Rear                         | P          | P | P | P |   |           |          |                 |   |
|      | Left                         | P          | P | P | P |   |           |          |                 |   |
|      | Right                        | P          | P | P | P |   |           |          |                 |   |

**TEST RESULT**

**Mode 5/6/7/8/9/10**

| Mode           | Air Discharge |   |   |   |   |   |    |   | Contact Discharge |   |   |   |   |   |   |   | BT / WIFI / GSM / WCDMA / LTE Observation | GPS Observation | Criterion | Result   |
|----------------|---------------|---|---|---|---|---|----|---|-------------------|---|---|---|---|---|---|---|---|-----------------|-----------|----------|
|                | 2             |   | 4 |   | 8 |   | 15 |   | 2                 |   | 4 |   | 6 |   | 8 |   |   |                 |           |          |
| Test level(kV) | +             | - | + | - | + | - | +  | - | +                 | - | + | - | + | - | + | - |   |                 |           |          |
| Test Location  | +             | - | + | - | + | - | +  | - | +                 | - | + | - | + | - | + | - |   |                 |           |          |
| A1             | P             | P | P | P | P | P |    |   |                   |   |   |   |   |   |   |   | TT,TR                                     | TR              | B         | Complies |
| A2             | P             | P | P | P | P | P |    |   |                   |   |   |   |   |   |   |   |   |                 |           |          |
| A3             | P             | P | P | P | P | P |    |   |                   |   |   |   |   |   |   |   |   |                 |           |          |
| C1             |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |   |                 |           |          |
| C2             |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |   |                 |           |          |
| C3             |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |   |                 |           |          |
| C4             |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |   |                 |           |          |
| C5             |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |   |                 |           |          |
| C6             |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |   |                 |           |          |



**Mode 1/2/3/4**

| Mode | Air Discharge |   |   |   |   |   |    |   | Contact Discharge |   |   |   |   |   |   |   | Crite<br>rion | Result          |
|------|---------------|---|---|---|---|---|----|---|-------------------|---|---|---|---|---|---|---|---------------|-----------------|
|      | 2             |   | 4 |   | 8 |   | 15 |   | 2                 |   | 4 |   | 6 |   | 8 |   |               |                 |
|      | +             | - | + | - | + | - | +  | - | +                 | - | + | - | + | - | + | - |               |                 |
| A1   | P             | P | P | P | P | P |    |   |                   |   |   |   |   |   |   |   | <b>B</b>      | <b>Complies</b> |
| A2   | P             | P | P | P | P | P |    |   |                   |   |   |   |   |   |   |   |               |                 |
| A3   | P             | P | P | P | P | P |    |   |                   |   |   |   |   |   |   |   |               |                 |
| C1   |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |               |                 |
| C2   |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |               |                 |
| C3   |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |               |                 |
| C4   |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |               |                 |
| C5   |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |               |                 |
| C6   |               |   |   |   |   |   |    |   | P                 | P | P | P |   |   |   |   |               |                 |

**Note:**

- 1) +/- denotes the Positive/Negative polarity of the output voltage.
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 3) There was not any unintentional transmission in standby mode.

3.3.5 PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED

Photo 1

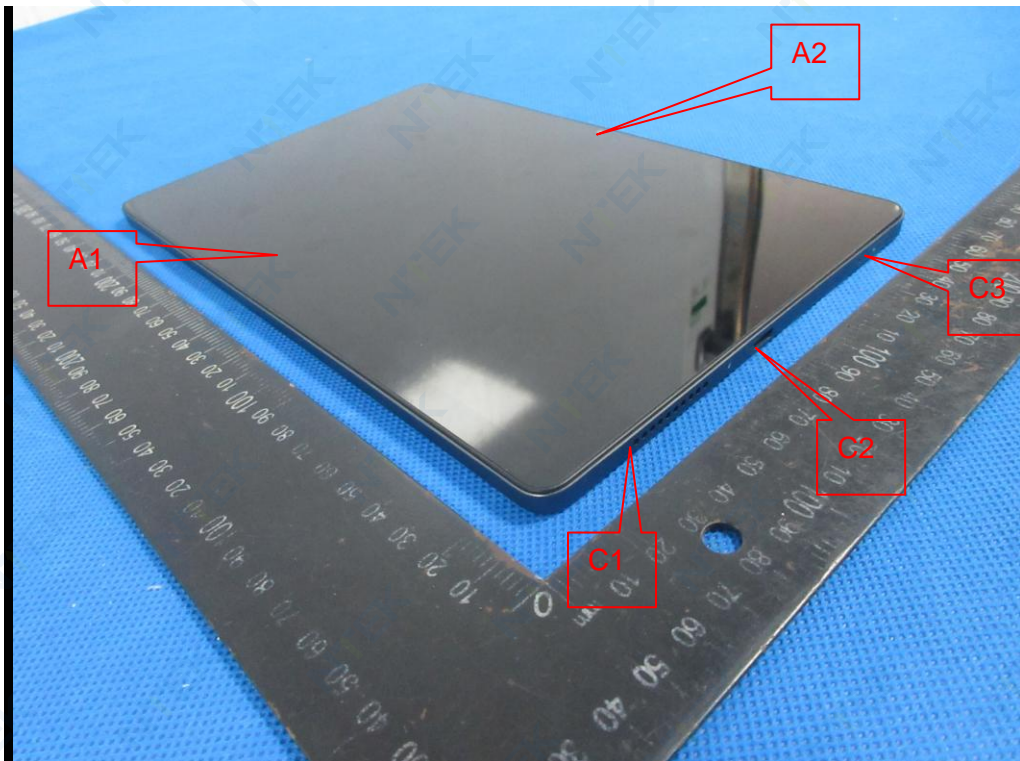
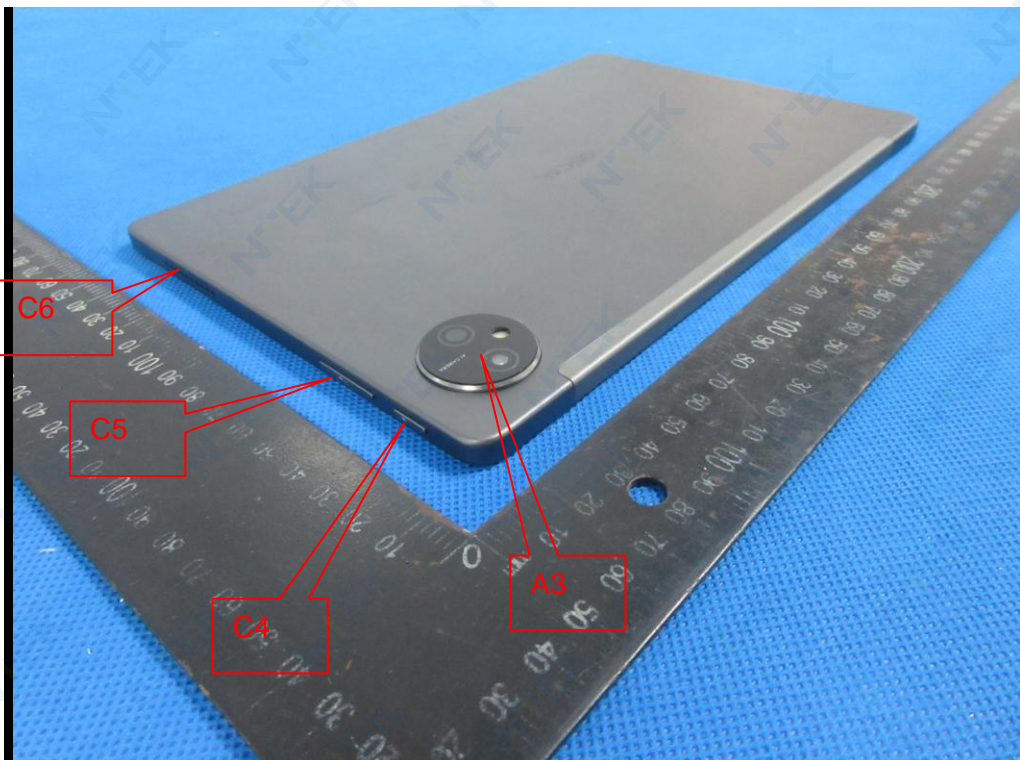


Photo 2



### 3.4 RS TESTING

#### 3.4.1 TEST SPECIFICATION

|                      |   |
|----------------------|---|
| Basic Standard:      | IEC/EN 61000-4-3  |
| Required Performance | A   |
| Frequency Range:     | According to EN 301 489-1:<br>80 MHz - 6000 MHz ;<br>According to EN 55035:<br>80 MHz to 1000 MHz<br>1800 MHz<br>2600 MHz<br>3500 MHz<br>5000 MHz |
| Field Strength:      | 3 V/m   |
| Modulation:          | 1kHz Sine Wave, 80%, AM Modulation  |
| Frequency Step:      | 1 % of fundamental  |
| Polarity of Antenna: | Horizontal and Vertical   |
| Test Distance:       | 3 m   |
| Antenna Height:      | 1.5 m   |
| Dwell Time:          | at least 3 seconds  |

#### 3.4.2 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

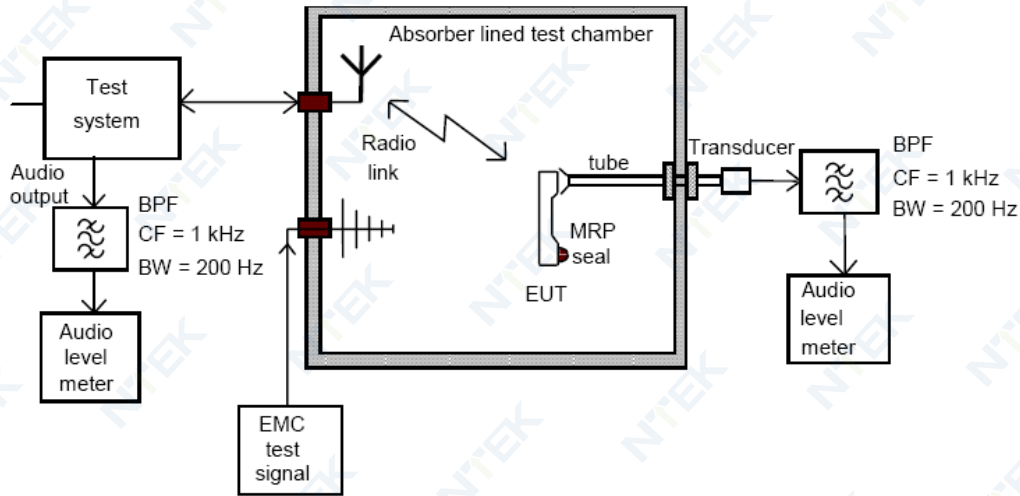
The testing distance from antenna to the EUT was 3 meters.

The other condition as following manner:

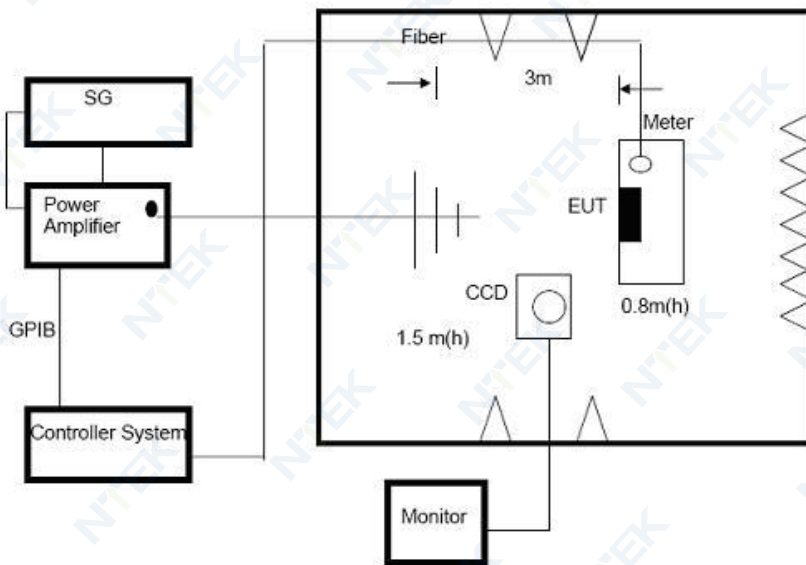
- a. The field strength level was 3V/m.
- b. The frequency range is swept from 80 MHz to 6000 MHz, 1800 MHz, 2600 MHz, 3500 MHz, 5000 MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- c. Sweep Frequency 900 MHz, with the Duty Cycle:1/8 and Modulation: Pulse 217 Hz(if applicable)
- d. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.4.3 TEST SETUP

Mobile Communication



General Communication



Note:

For the actual test configuration, please refer to the related Item –EUT Test Photos.

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.



### 3.4.4 TEST RESULTS

|              |                           |                    |   |
|--------------|---------------------------|--------------------|---|
| EUT:         | 4G Tablet                 | Model Name:        | Tab 80  |
| Temperature: | 23°C                      | Relative Humidity: | 57%   |
| Pressure:    | 1010 hPa                  | Test Power:        | DC 5V from Adapter AC 230V/50Hz / DC 5V from PC |
| Test Mode:   | Mode 1/2/3/4/5/6/7/8/9/10 |                    |   |

#### TEST RESULT

##### LTE FDD B1 / B3 / B7 / B8 / B20 / B40 Data Link

| Frequency Range (MHz) | RF Field Position | R.F. Field Strength                        | Azimuth | Observation | Results |
|-----------------------|-------------------|--|---------|-------------|---------|
| 80~1000<br>1000-6000  | H / V             | 3 V/m (rms)<br>AM Modulated<br>1000Hz, 80% | Front   | CT,CR       | P       |
|                       |                   |  | Rear    |             |         |
|                       |                   |  | Left    |             |         |
|                       |                   |  | Right   |             |         |

Note:

- The exclusion band has not been tested in 80MHz~6GHz.

For channelized equipment the exclusion band shall be calculated by using the following formulae:

For the lower edge for the exclusion band:

$$EXband(lower) = BandRX(lower) - nChWRX$$

and for the upper edge of the exclusion band:

$$EXband(upper) = BandRX(upper) + nChWRX$$

Where n = number of channel widths required for exclusion band.

- In the data transfer mode, the performance criteria shall be that the throughput shall be  $\geq 95\%$  of the maximum throughput of the reference measurement channel

**GSM 900 / 1800 / WCDMA 2100 / 900 Uplink and Downlink**

| Frequency Range (MHz) | RF Field Position | R.F. Field Strength                        | Azimuth | Observation  | Perform. Criteria | Results  |
|-----------------------|-------------------|--|---------|--------------|-------------------|----------|
| 80~1000<br>1000-6000  | H / V             | 3 V/m (rms)<br>AM Modulated<br>1000Hz, 80% | Front   | <b>CT,CR</b> | <b>A</b>          | <b>P</b> |
|                       |                   |  | Rear    |              |                   |          |
|                       |                   |  | Left    |              |                   |          |
|                       |                   |  | Right   |              |                   |          |

Note:

1. The exclusion band has not been tested in 80MHz~6GHz.

For channelized equipment the exclusion band shall be calculated by using the following formulae:

For the lower edge for the exclusion band:

$$EXband(lower) = BandRX(lower) - nChWRX$$

and for the upper edge of the exclusion band:

$$EXband(upper) = BandRX(upper) + nChWRX$$

Where n = number of channel widths required for exclusion band.

2: "A" stand for: the uplink/downlink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audio breakthrough check). The RXQUAL of the downlink is not exceeding the value of three, measured during each individual exposure in the test sequence. Or During and after the test, the apparatus continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level.



**GPRS / EGPRS / HSDPA / HSUPA Uplink and Downlink**

| Frequency Range (MHz) | RF Field Position | R.F. Field Strength                        | Azimuth | Observation  | Perform. Criteria | Results  |
|-----------------------|-------------------|--|---------|--------------|-------------------|----------|
| 80~1000<br>1000-6000  | H / V             | 3 V/m (rms)<br>AM Modulated<br>1000Hz, 80% | Front   | <b>CT,CR</b> | <b>A</b>          | <b>P</b> |
|                       |                   |  | Rear    |              |                   |          |
|                       |                   |  | Left    |              |                   |          |
|                       |                   |  | Right   |              |                   |          |

Note:

1. The exclusion band has not been tested in 80MHz~6GHz.

For channelized equipment the exclusion band shall be calculated by using the following formulae:

For the lower edge for the exclusion band:

$$EXband(lower) = BandRX(lower) - nChWRX$$

and for the upper edge of the exclusion band:

$$EXband(upper) = BandRX(upper) + nChWRX$$

Where n = number of channel widths required for exclusion band.

2. During the test, the Maximum Bit Error Ratio was less than  $1 \times 10^{-3}$ .

3. During the test, the Maximum Block Error Ratio was less than  $1 \times 10^{-2}$ .

**BT / WIFI link**

| Frequency Range (MHz) | RF Field Position | R.F. Field Strength                        | Azimuth | Observation  | Perform. Criteria | Results  |
|-----------------------|-------------------|--|---------|--------------|-------------------|----------|
| 80~1000<br>1000-6000  | H / V             | 3 V/m (rms)<br>AM Modulated<br>1000Hz, 80% | Front   | <b>CT,CR</b> | <b>A</b>          | <b>P</b> |
|                       |                   |  | Rear    |              |                   |          |
|                       |                   |  | Left    |              |                   |          |
|                       |                   |  | Right   |              |                   |          |

Note:

1. The exclusion band has not been tested in 80MHz~6GHz.

The exclusion band for immunity testing of equipment operating in the 2,4 GHz band shall be: • lower limit of exclusion band = lowest allocated band edge frequency -120 MHz, i.e. 2 280 MHz; • upper limit of exclusion band = highest allocated band edge frequency +120 MHz, i.e. 2 603,5MHz.

2. "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

**GPS Receiver Mode Link**

| Frequency Range (MHz)  | RF Field Position | R.F. Field Strength                        | Azimuth | Observation | Perform. Criteria | Results  |
|--|-------------------|--|---------|-------------|-------------------|----------|
| 80~1000<br>1000-6000   | H / V             | 3 V/m (rms)<br>AM Modulated<br>1000Hz, 80% | Front   | <b>CR</b>   | <b>A</b>          | <b>P</b> |
|  |                   |  | Rear    |             |                   |          |
|  |                   |  | Left    |             |                   |          |
|  |                   |  | Right   |             |                   |          |
| 80,104,136,<br>165,200,260,<br>330,430,560,<br>715 MHz ± 1,<br>920 MHz ± 1 | H / V             | 3 V/m (rms)<br>Unmodulated<br>200Hz, 100%  | Front   | <b>CR</b>   | <b>A</b>          | <b>P</b> |
|  |                   |  | Rear    |             |                   |          |
|  |                   |  | Left    |             |                   |          |
|  |                   |  | Right   |             |                   |          |

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

**Charging+TF Playing/ Charging+REC (Front / Rear) / Data transmission/ Charging+FM (87.6MHz / 98MHz / 107.9MHz) Mode**

| Frequency Range (MHz)                                | RF Field Position | R.F. Field Strength                        | Azimuth | Perform. Criteria | Results  |
|--|-------------------|--|---------|-------------------|----------|
| 80~1000<br>1000~6000<br>1800<br>2600<br>3500<br>5000 | H / V             | 3 V/m (rms)<br>AM Modulated<br>1000Hz, 80% | Front   | <b>A</b>          | <b>P</b> |
|  |                   |  | Rear    |                   |          |
|  |                   |  | Left    |                   |          |
|  |                   |  | Right   |                   |          |

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.  
There was not any unintentional transmission in standby mode.

### 3.5 EFT/BURST TESTING

#### 3.5.1 TEST SPECIFICATION

|                      |   |
|----------------------|---|
| Basic Standard:      | IEC/EN 61000-4-4  |
| Required Performance | B   |
| Test Voltage:        | Power Line: 1 kV<br>DC/Signal/ wired network Line: 0.5 KV       |
| Polarity:            | Positive & Negative   |
| Impulse Frequency:   | For xDSL wired network ports: 100 kHz<br>For DC/AC ports: 5 kHz |
| Impulse Wave shape : | 5/50 ns   |
| Burst Duration:      | 15 ms   |
| Burst Period:        | 300 ms  |
| Test Duration:       | Not less than 1 min.  |

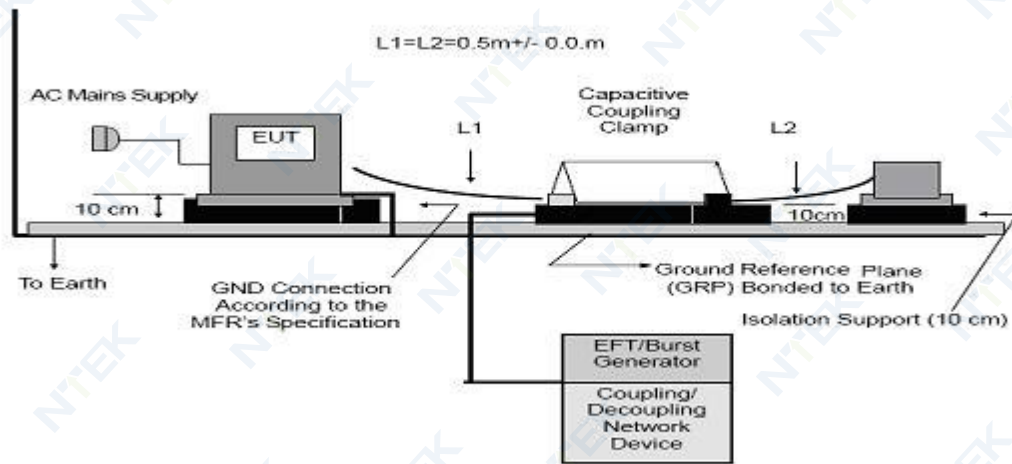
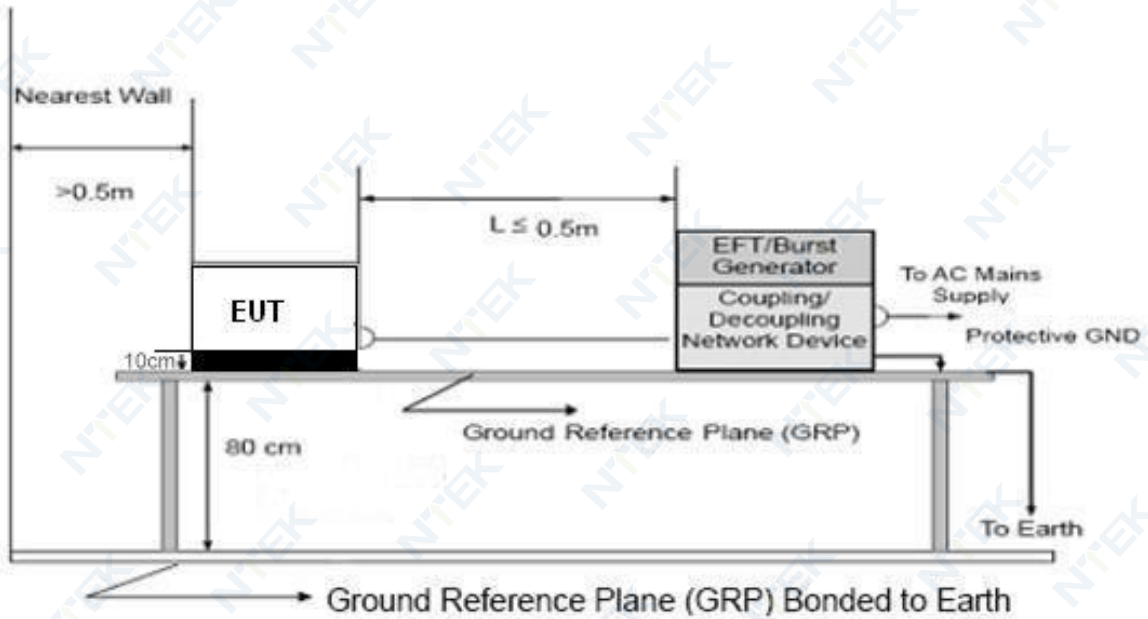
#### 3.5.2 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m\*1m min. and 0.65mm thick min.

The other condition as following manner:

- a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.
- b. Both positive and negative polarity discharges were applied.
- c. The duration time of each test sequential was 1 minute
- d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.5.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

### 3.5.4 TEST RESULTS

|              |                         |                    |                                    |
|--------------|-------------------------|--------------------|------------------------------------|
| EUT:         | 4G Tablet               | Model Name:        | Tab 80                             |
| Temperature: | 22°C                    | Relative Humidity: | 53%                                |
| Pressure:    | 1010 hPa                | Test Power:        | DC 5V from Adapter<br>AC 230V/50Hz |
| Test Mode:   | Mode 1/2/4/5/6/7/8/9/10 |                    |                                    |

#### TEST RESULT

Mode 5/6/7/8/9/10

| Coupling Line | Test level (kV) |   |   |   |   |   |   |   | BT / WIFI /<br>GSM /<br>WCDMA / LTE<br>Observation | GPS<br>Observation | Criteri<br>on | Result |          |
|---------------|-----------------|---|---|---|---|---|---|---|--|--------------------|---------------|--------|----------|
|               | 0.5             |   | 1 |   | 2 |   | 4 |   |  |                    |               |        |          |
|               | +               | - | + | - | + | - | + | - |  |                    |               |        |          |
| AC line       | L               | P | P | P | P |   |   |   |  | TT,TR              | TR            | B      | Complies |
|               | N               | P | P | P | P |   |   |   |  |                    |               |        | Complies |
|               | PE              |   |   |   |   |   |   |   |  |                    |               |        |          |
|               | L+N             | P | P | P | P |   |   |   |  |                    |               |        | Complies |
|               | L+PE            |   |   |   |   |   |   |   |  |                    |               |        |          |
|               | N+PE            |   |   |   |   |   |   |   |  |                    |               |        |          |
|               | L+N+PE          |   |   |   |   |   |   |   |  |                    |               |        |          |
| DC Line       |                 |   |   |   |   |   |   |   |  |                    |               |        |          |
| Signal Line   |                 |   |   |   |   |   |   |   |  |                    |               |        |          |

**Mode 1/2/4**

| Coupling Line |        | Test level (kV) |   |   |   |   |   |   |   | Criterion | Result          |
|---------------|--------|-----------------|---|---|---|---|---|---|---|-----------|-----------------|
|               |        | 0.5             |   | 1 |   | 2 |   | 4 |   |           |                 |
|               |        | +               | - | + | - | + | - | + | - |           |                 |
| AC line       | L      | P               | P | P | P |   |   |   |   | <b>B</b>  | <b>Complies</b> |
|               | N      | P               | P | P | P |   |   |   |   |           | <b>Complies</b> |
|               | PE     |                 |   |   |   |   |   |   |   |           |                 |
|               | L+N    | P               | P | P | P |   |   |   |   |           | <b>Complies</b> |
|               | L+PE   |                 |   |   |   |   |   |   |   |           |                 |
|               | N+PE   |                 |   |   |   |   |   |   |   |           |                 |
|               | L+N+PE |                 |   |   |   |   |   |   |   |           |                 |
| DC Line       |        |                 |   |   |   |   |   |   |   |           |                 |
| Signal Line   |        |                 |   |   |   |   |   |   |   |           |                 |

Note:

- 1) There was not any unintentional transmission in standby mode
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 3) There was not any unintentional transmission in standby mode.



**3.6 SURGE TESTING**

**3.6.1 TEST SPECIFICATION**

|                        |   |
|------------------------|---|
| Basic Standard:        | IEC/EN 61000-4-5  |
| Required Performance   | B   |
| Wave-Shape:            | Combination Wave<br>1.2 / 50 us Open Circuit Voltage<br>8 / 20 us Short Circuit Current |
| Test Voltage:          | Power Line:0.5 kV, 1 kV, 2 kV   |
| Surge Input / Output:  | L-N, L-PE, N-PE   |
| Generator Source:      | 2 ohm between networks  |
| Impedance:             | 12 ohm between network and ground   |
| Polarity:              | Positive / Negative   |
| Phase Angle:           | 0 / 90 / 180 / 270  |
| Pulse Repetition Rate: | 1 time / min. (maximum)   |
| Number of Tests:       | 5 positive and 5 negative at selected points  |

**3.6.2 TEST PROCEDURE**

a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

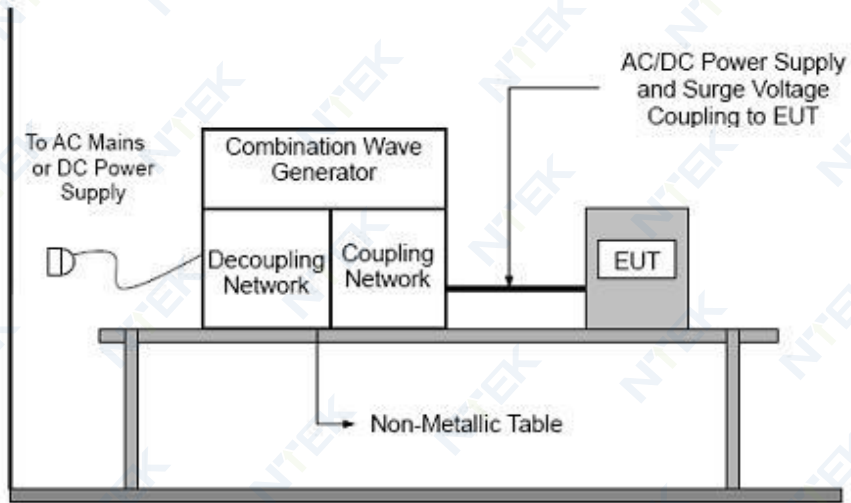
The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.6.3 TEST SETUP



### 3.6.4 TEST RESULTS

|              |                         |                    |                                    |
|--------------|-------------------------|--------------------|------------------------------------|
| EUT:         | 4G Tablet               | Model Name:        | Tab 80                             |
| Temperature: | 22°C                    | Relative Humidity: | 53%                                |
| Pressure:    | 1010 hPa                | Test Power:        | DC 5V from Adapter<br>AC 230V/50Hz |
| Test Mode:   | Mode 1/2/4/5/6/7/8/9/10 |                    |                                    |

#### TEST RESULT

##### Mode 5/6/7/8/9/10

| Coupling Line |      |      | Test level |   |     |   |     |   |     |   | BT / WIFI /<br>GSM /<br>WCDMA<br>/ LTE<br>Observation | GPS<br>Observation | Criterion | Result   |
|---------------|------|------|------------|---|-----|---|-----|---|-----|---|---|--------------------|-----------|----------|
|               |      |      | 0.5kV      |   | 1kV |   | 2kV |   | 4kV |   |   |                    |           |          |
|               |      |      | +          | - | +   | - | +   | - | +   | - |   |                    |           |          |
| AC<br>line    | L-N  | 0°   | P          | P | P   | P |     |   |     |   | TT,TR   | TR                 | B         | Complies |
|               |      | 90°  | P          | P | P   | P |     |   |     |   |   |                    |           |          |
|               |      | 180° | P          | P | P   | P |     |   |     |   |   |                    |           |          |
|               |      | 270° | P          | P | P   | P |     |   |     |   |   |                    |           |          |
|               | L-PE |      |            |   |     |   |     |   |     |   |   |                    |           |          |
|               |      |      |            |   |     |   |     |   |     |   |   |                    |           |          |
|               |      |      |            |   |     |   |     |   |     |   |   |                    |           |          |
|               |      |      |            |   |     |   |     |   |     |   |   |                    |           |          |
|               | N-PE |      |            |   |     |   |     |   |     |   |   |                    |           |          |
|               |      |      |            |   |     |   |     |   |     |   |   |                    |           |          |
|               |      |      |            |   |     |   |     |   |     |   |   |                    |           |          |
|               |      |      |            |   |     |   |     |   |     |   |   |                    |           |          |
| DC Line       |      |      |            |   |     |   |     |   |     |   |   |                    |           |          |
| Signal Line   |      |      |            |   |     |   |     |   |     |   |   |                    |           |          |

**Mode 1/2/4**

| Coupling Line |      |      | Test level |   |      |   |      |   |      |   | Criterion | Result          |
|---------------|------|------|------------|---|------|---|------|---|------|---|-----------|-----------------|
|               |      |      | 0.5 kV     |   | 1 kV |   | 2 kV |   | 4 kV |   |           |                 |
|               |      |      | +          | - | +    | - | +    | - | +    | - |           |                 |
| AC line       | L-N  | 0°   | P          | P | P    | P |      |   |      |   | <b>B</b>  | <b>Complies</b> |
|               |      | 90°  | P          | P | P    | P |      |   |      |   |           |                 |
|               |      | 180° | P          | P | P    | P |      |   |      |   |           |                 |
|               |      | 270° | P          | P | P    | P |      |   |      |   |           |                 |
|               | L-PE |      |            |   |      |   |      |   |      |   |           |                 |
|               |      |      |            |   |      |   |      |   |      |   |           |                 |
|               |      |      |            |   |      |   |      |   |      |   |           |                 |
|               |      |      |            |   |      |   |      |   |      |   |           |                 |
|               | N-PE |      |            |   |      |   |      |   |      |   |           |                 |
|               |      |      |            |   |      |   |      |   |      |   |           |                 |
|               |      |      |            |   |      |   |      |   |      |   |           |                 |
|               |      |      |            |   |      |   |      |   |      |   |           |                 |
| DC Line       |      |      |            |   |      |   |      |   |      |   |           |                 |
| Signal Line   |      |      |            |   |      |   |      |   |      |   |           |                 |

**Note:**

- 1) There was not any unintentional transmission in standby mode
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 3) There was not any unintentional transmission in standby mode.

### 3.7 INJECTION CURRENT TESTING

#### 3.7.1 TEST SPECIFICATION

|                      |                                    |
|----------------------|------------------------------------|
| Basic Standard:      | IEC/EN 61000-4-6                   |
| Required Performance | A                                  |
| Frequency Range:     | 0.15 MHz - 80 MHz                  |
| Field Strength:      | 3 Vr.m.s.                          |
| Modulation:          | 1kHz Sine Wave, 80%, AM Modulation |
| Frequency Step:      | 1 % of fundamental                 |
| Dwell Time:          | at least 3 seconds                 |

#### 3.7.2 TEST PROCEDURE

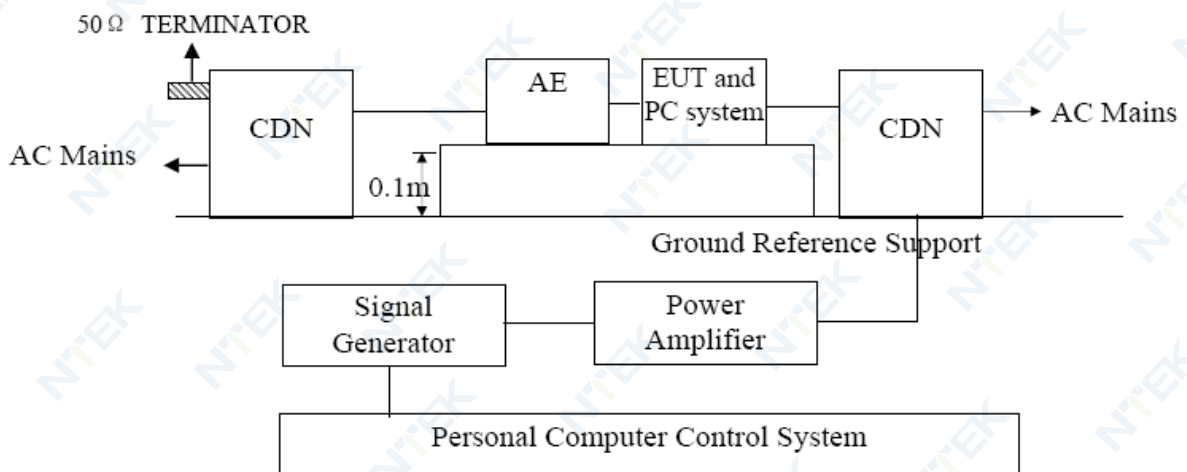
The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m\*1m min. and 0.65mm thick min.

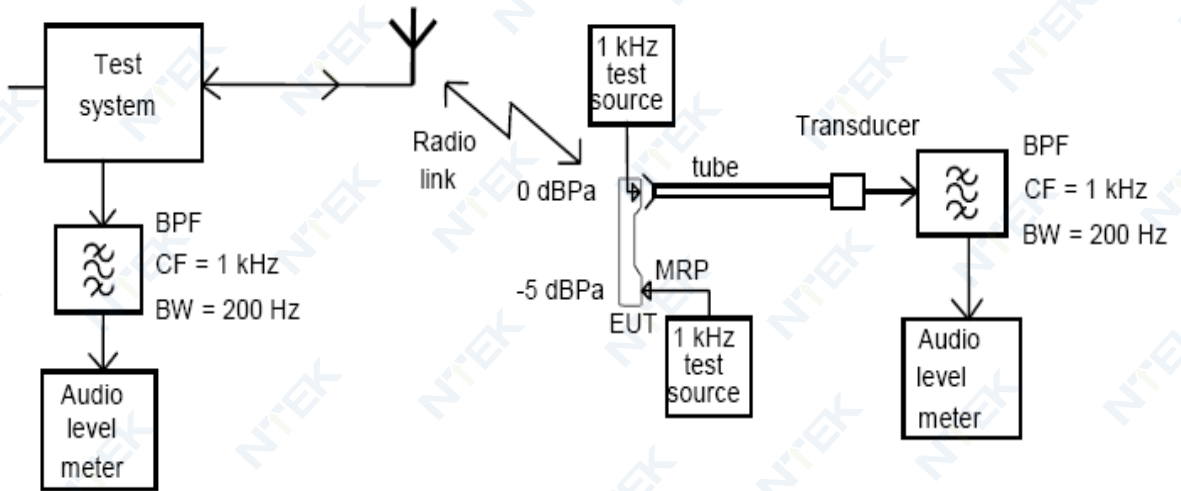
The other condition as following manner:

- The field strength level was 3V.
- The frequency range is swept from 150 KHz to 80 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

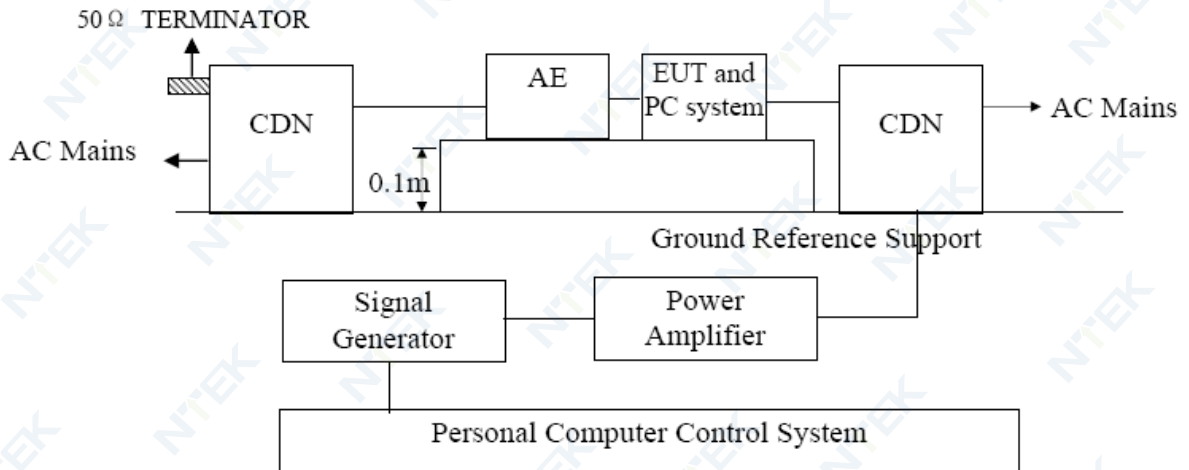
#### 3.7.3 TEST SETUP

Mobile Communication





☒ General Communication



For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.



### 3.7.4 TEST RESULTS

|              |                        |                    |                                    |
|--------------|------------------------|--------------------|------------------------------------|
| EUT:         | 4G Tablet              | Model Name:        | Tab 80                             |
| Temperature: | 22°C                   | Relative Humidity: | 53%                                |
| Pressure:    | 1010 hPa               | Test Power:        | DC 5V from Adapter<br>AC 230V/50Hz |
| Test Mode:   | Mode1/2/4/5/6/7/8/9/10 |                    |                                    |

#### TEST RESULT

##### LTE FDD B1 / B3 / B7 / B8 / B20 / B40 Link

| Test Ports (Mode)                | Freq. Range (MHz) | Field Strength                         | Observation   | Results    |
|----------------------------------|-------------------|--|---------------|------------|
| Input / Output<br>AC. Power Port | 0.15 ---80        | 3V(rms)<br>AM Modulated<br>1000Hz, 80% | <b>CT, CR</b> | <b>P</b>   |
| Input / Output<br>DC. Power Port | 0.15 --- 80       |  | <b>N/A</b>    | <b>N/A</b> |
| Signal Line                      | 0.15 --- 80       |  | <b>N/A</b>    | <b>N/A</b> |

Note: In the data transfer mode, the performance criteria shall be that the throughput shall be  $\geq$  95 % of the maximum throughput of the reference measurement channel

##### GSM 900 / 1800 / WCDMA 2100 / 900 Uplink and Downlink

| Test Ports (Mode)                | Freq. Range (MHz) | Field Strength                         | Observation   | Perform. Criteria | Results    |
|----------------------------------|-------------------|--|---------------|-------------------|------------|
| Input / Output<br>AC. Power Port | 0.15 ---80        | 3V(rms)<br>AM Modulated<br>1000Hz, 80% | <b>CT, CR</b> | <b>A</b>          | <b>P</b>   |
| Input / Output<br>DC. Power Port | 0.15 --- 80       |  | <b>N/A</b>    | <b>N/A</b>        | <b>N/A</b> |
| Signal Line                      | 0.15 --- 80       |  | <b>N/A</b>    | <b>N/A</b>        | <b>N/A</b> |

EUT is used for this calibration, the output of the audio source was adjusted to achieve a reference Level equivalent to a SPL of -5 dB Pa at 1 kHz at the Mouth Reference Point (MRP), the reading of the audio level meter, which was connected to the output of the communication tester, was recorded as a reference level. During the test, the uplink speech output level was monitored, it was confirmed to be at least 35 dB less than the previously- recorded reference level.

**GPRS / EGPRS / HSDPA / HSUPA Uplink and Downlink**

| Test Ports (Mode)             | Freq. Range (MHz) | Field Strength                         | Observation   | Perform. Criteria | Results    |
|-------------------------------|-------------------|--|---------------|-------------------|------------|
| Input / Output AC. Power Port | 0.15 ---80        | 3V(rms)<br>AM Modulated<br>1000Hz, 80% | <b>CT, CR</b> | <b>A</b>          | <b>P</b>   |
| Input / Output DC. Power Port | 0.15 --- 80       |  | <b>N/A</b>    | <b>N/A</b>        | <b>N/A</b> |
| Signal Line                   | 0.15 --- 80       |  | <b>N/A</b>    | <b>N/A</b>        | <b>N/A</b> |

Note: During the test, the Maximum Bit Error Ratio was less than  $1 \times 10^{-3}$ .

During the test, the Maximum Block Error Ratio was less than  $1 \times 10^{-2}$ .

**BT / WIFI link**

| Test Ports (Mode)             | Freq. Range (MHz) | Field Strength                         | Observation   | Perform. Criteria | Results    |
|-------------------------------|-------------------|--|---------------|-------------------|------------|
| Input / Output AC. Power Port | 0.15 ---80        | 3V(rms)<br>AM Modulated<br>1000Hz, 80% | <b>CT, CR</b> | <b>A</b>          | <b>P</b>   |
| Input / Output DC. Power Port | 0.15 --- 80       |  | <b>N/A</b>    | <b>N/A</b>        | <b>N/A</b> |
| Signal Line                   | 0.15 --- 80       |  | <b>N/A</b>    | <b>N/A</b>        | <b>N/A</b> |

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

**GPS Receiver Mode Link**

| Test Ports (Mode)             | Freq. Range (MHz) | Field Strength                         | Perform. Criteria | Results    |
|-------------------------------|-------------------|--|-------------------|------------|
| Input / Output AC. Power Port | 0.15 --- 80       | 3V(rms)<br>AM Modulated<br>1000Hz, 80% | <b>A</b>          | <b>P</b>   |
| Input / Output DC. Power Port | 0.15 --- 80       |  | <b>N/A</b>        | <b>N/A</b> |
| Signal Line                   | 0.15 --- 80       |  | <b>N/A</b>        | <b>N/A</b> |

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

**Charging+TF Playing / Charging+REC (Front / Rear) / Charging+FM (87.6MHz / 98MHz / 107.9MHz) Mode**

| Test Ports (Mode)             | Freq. Range (MHz) | Field Strength                         | Perform. Criteria | Results |
|-------------------------------|-------------------|--|-------------------|---------|
| Input / Output AC. Power Port | 0.15 ---80        | 3V(rms)<br>AM Modulated<br>1000Hz, 80% | A                 | P       |
| Input / Output DC. Power Port | 0.15 --- 80       |  | N/A               | N/A     |
| Signal Line                   | 0.15 --- 80       |  | N/A               | N/A     |

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

Note:

- 1) There was not any unintentional transmission in standby mode
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 3) There was not any unintentional transmission in standby mode.

#### 4.8 VOLTAGE INTERRUPTION/DIPS TESTING

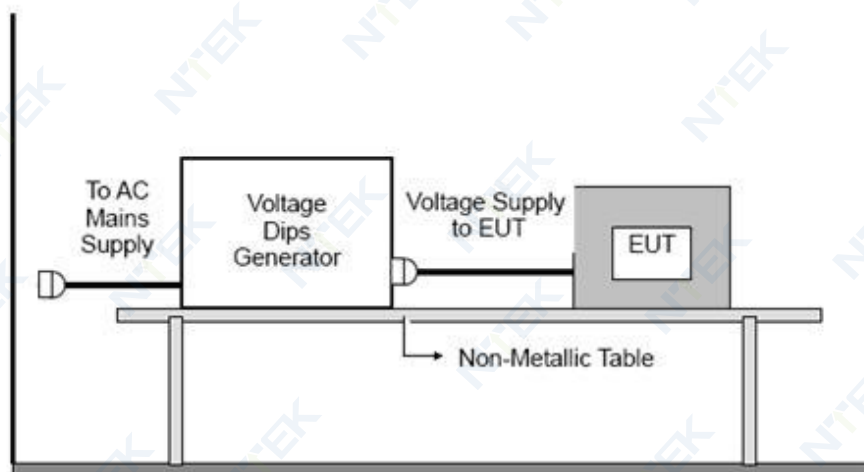
##### 4.8.1 TEST SPECIFICATION

|                         |  |
|-------------------------|--|
| Basic Standard:         | IEC/EN 61000-4-11  |
| Required Performance    | 100% reduction, 0.5 Cycle<br>100% reduction, 1.0 Cycle<br>30% reduction, 25 Cycles<br>30% reduction, 0.5 Cycle |
| Voltage Interruptions:  | 100% reduction, 250 Cycles   |
| Test Duration Time:     | Minimum three test events in sequence  |
| Interval between Event: | Minimum ten seconds  |
| Phase Angle:            | 0°/45°/90°/135°/180°/225°/270°/315°/360°   |
| Test Cycle:             | 3 times  |

##### 4.8.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

##### 4.8.3 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.8.4 TEST RESULTS

|              |                         |                    |                                    |
|--------------|-------------------------|--------------------|------------------------------------|
| EUT:         | 4G Tablet               | Model Name:        | Tab 80                             |
| Temperature: | 22°C                    | Relative Humidity: | 53%                                |
| Pressure:    | 1010 hPa                | Test Power:        | DC 5V from Adapter<br>AC 230V/50Hz |
| Test Mode:   | Mode 1/2/4/5/6/7/8/9/10 |                    |                                    |

#### TEST RESULT

##### Mode 5/6/7/8/9/10

| Voltage Reduction         | Duration (ms) | BT / WIFI / GSM / WCDMA / LTE Observation | GPS Observation | Perform Criteria | Results |
|---------------------------|---------------|---|-----------------|------------------|---------|
| Voltage dip: 0%           | 10            | TT, TR                                    | TR              | B                | P       |
| Voltage dip: 0%           | 20            | TT, TR                                    | TR              | B                | P       |
| Voltage dip: 70%          | 10            | TT, TR                                    | TR              | C                | P       |
| Voltage dip: 70%          | 500           | TT, TR                                    | TR              | C                | P       |
| Voltage interruptions: 0% | 5000          | TT, TR                                    | TR              | C                | P       |

##### Mode 1/2/4

| Voltage Reduction         | Duration (ms) | Perform Criteria | Results |
|---------------------------|---------------|------------------|---------|
| Voltage dip: 0%           | 10            | B                | P       |
| Voltage dip: 0%           | 20            | B                | P       |
| Voltage dip: 70%          | 10            | C                | P       |
| Voltage dip: 70%          | 500           | C                | P       |
| Voltage interruptions: 0% | 5000          | C                | P       |

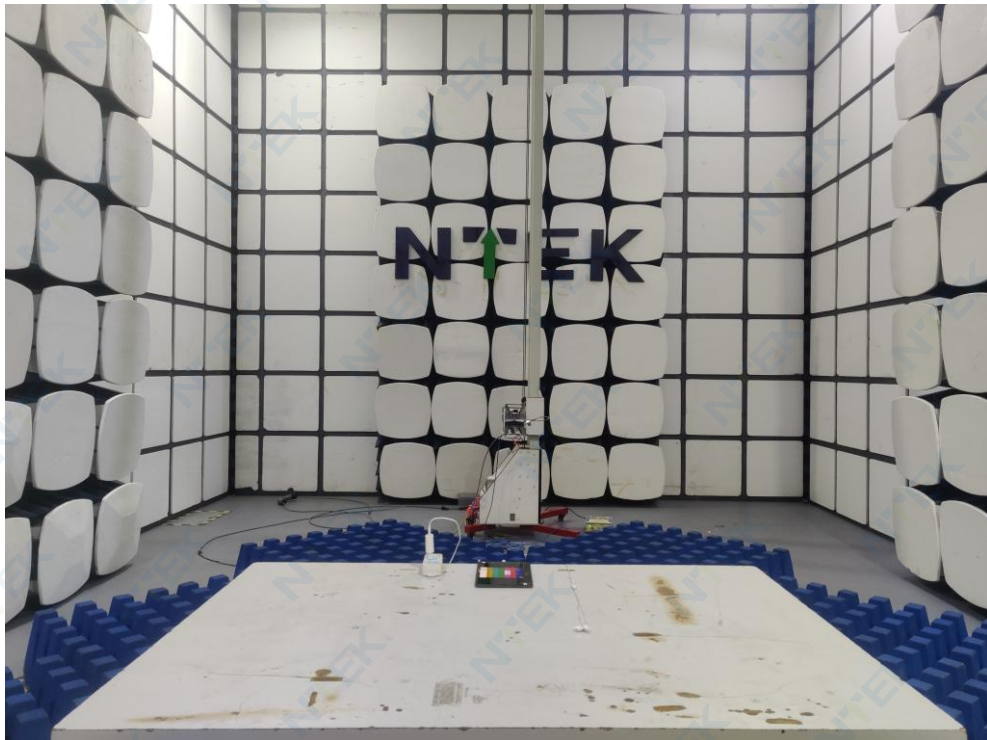
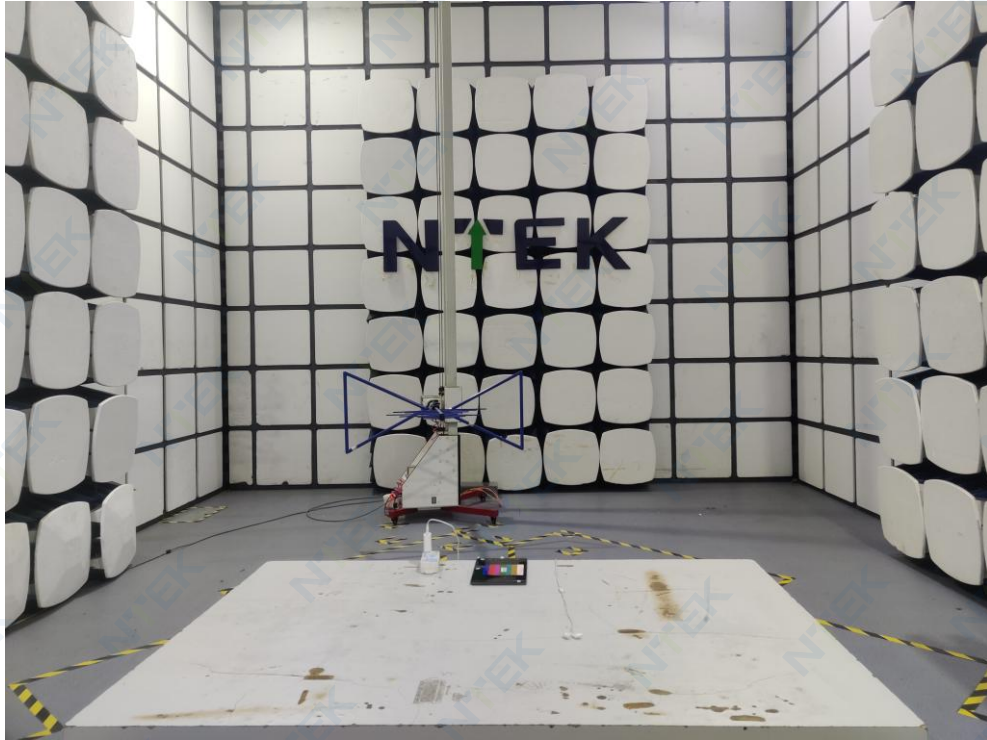
#### Note:

- 1) There was not any unintentional transmission in standby mode
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 3) There was not any unintentional transmission in standby mode.



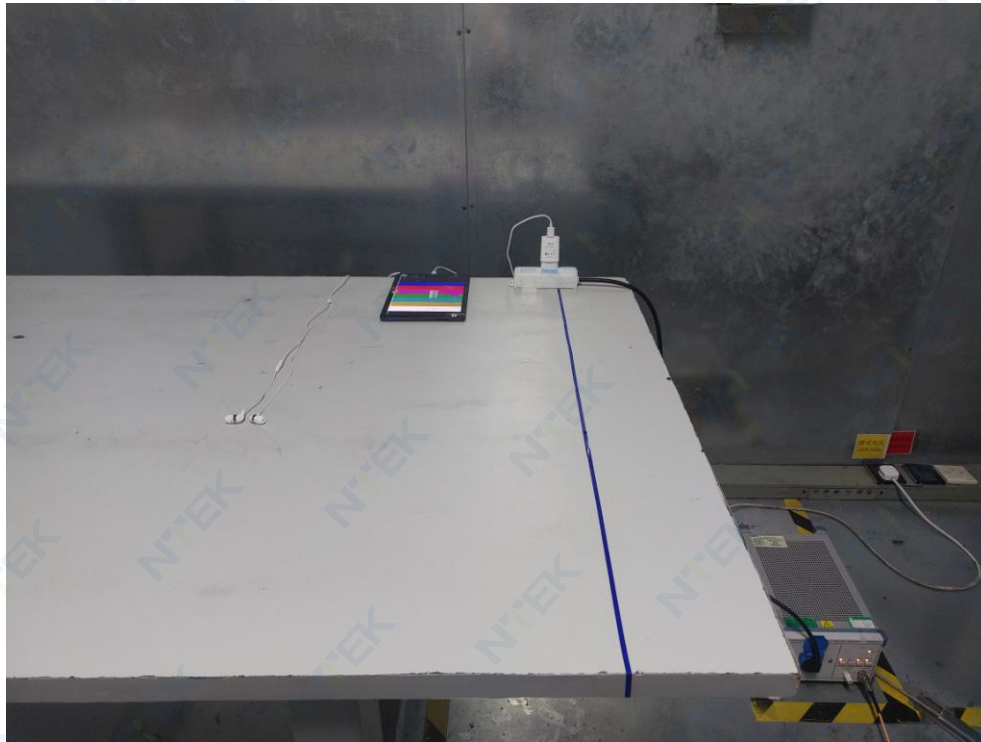
#### 4. EUT TEST PHOTO

Radiated Measurement Photo





**Conducted Measurement Photo**



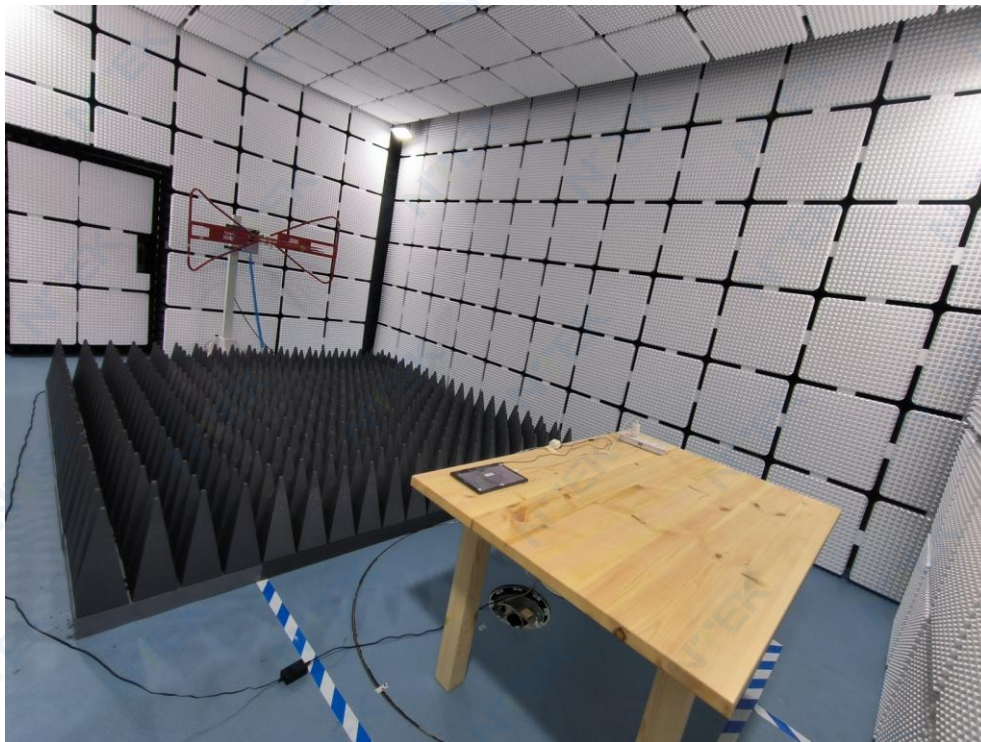
**Flick Measurement Photo**



ESD Measurement Photo



RS Measurement Photo





EFT Measurement Photo



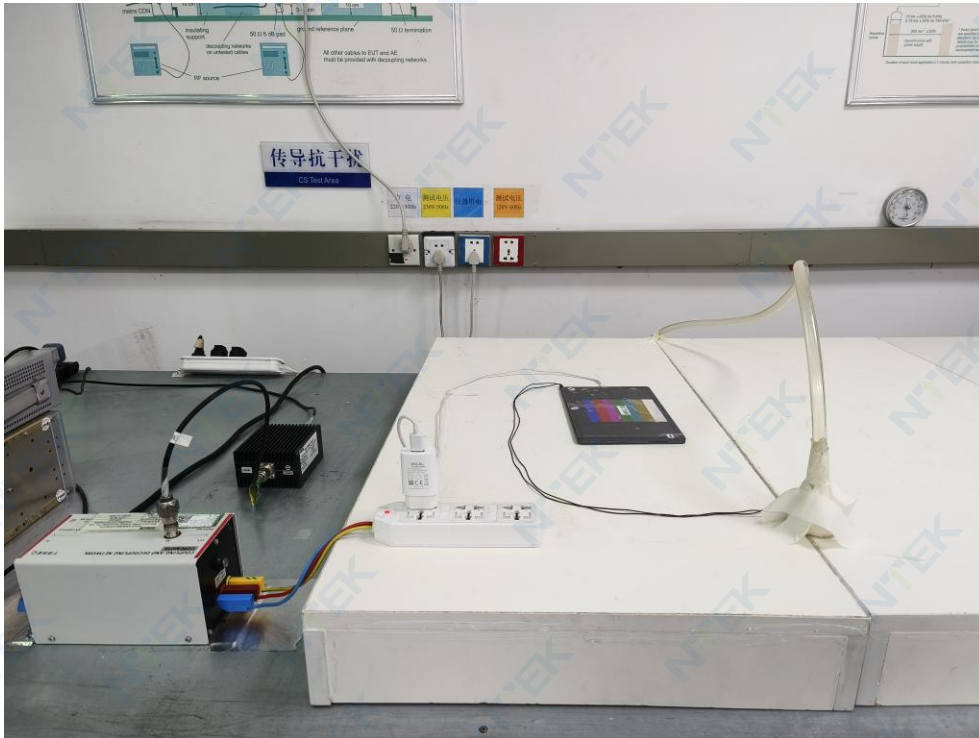
SURGE Measurement Photo



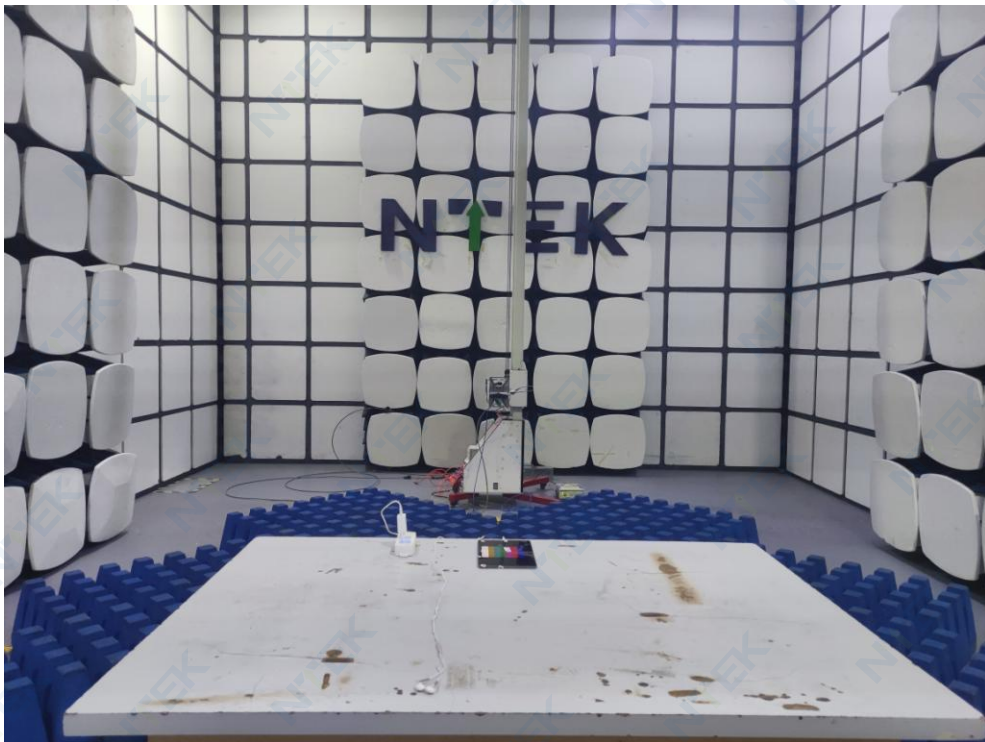
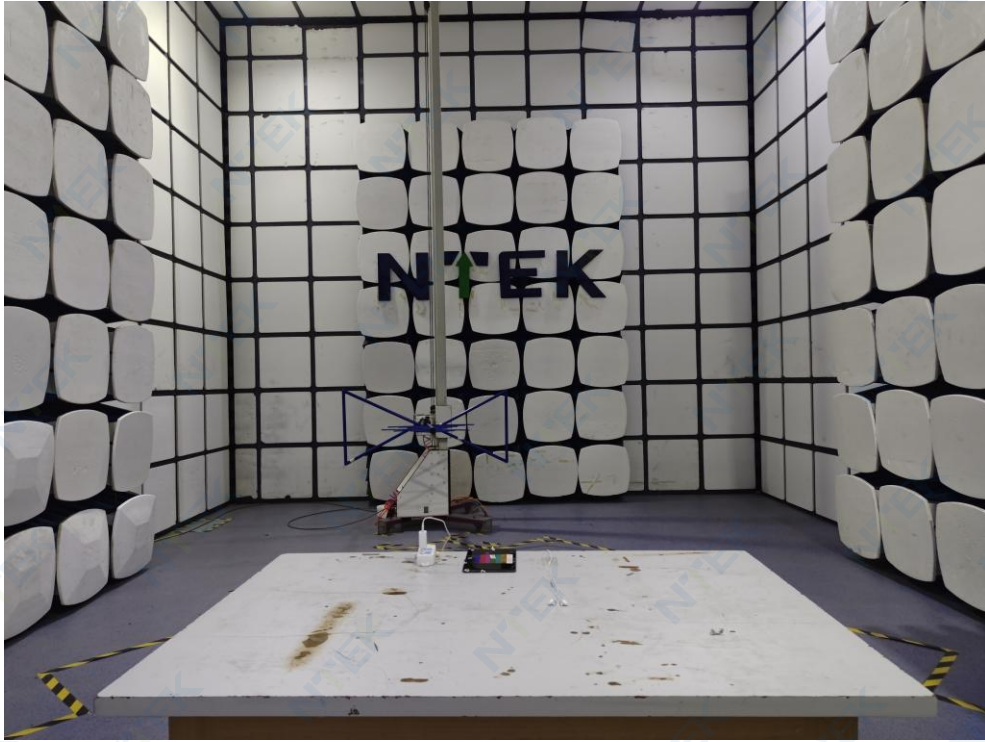
DIP Measurement Photo



CS Measurement Photo

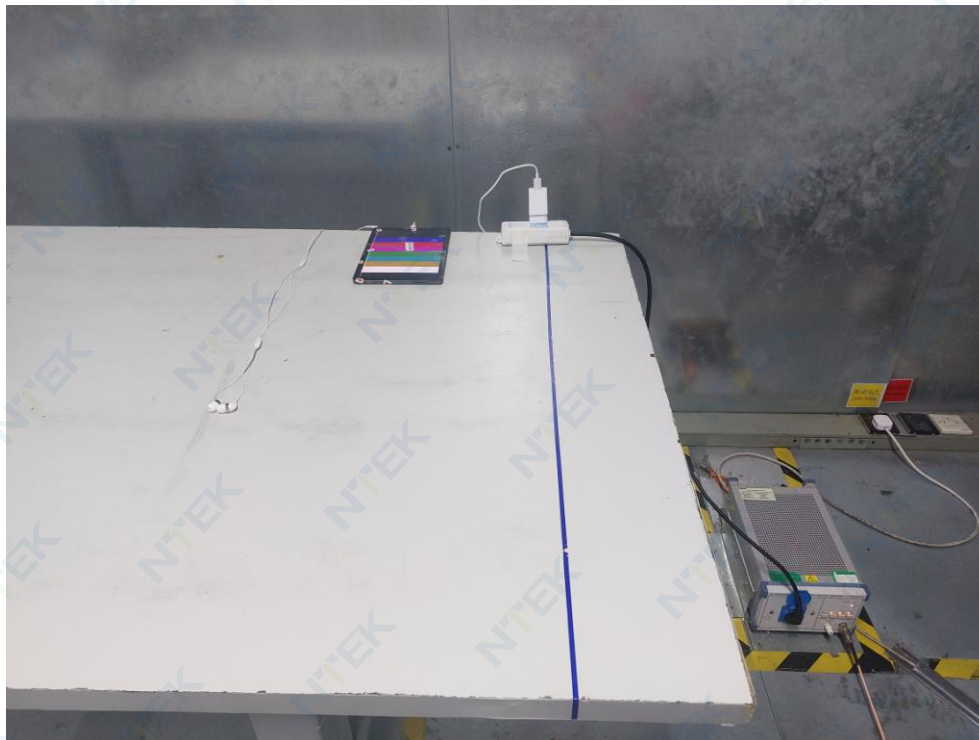


Adapter 3  
Radiated Measurement Photo





Conducted Measurement Photo



Flick Measurement Photo

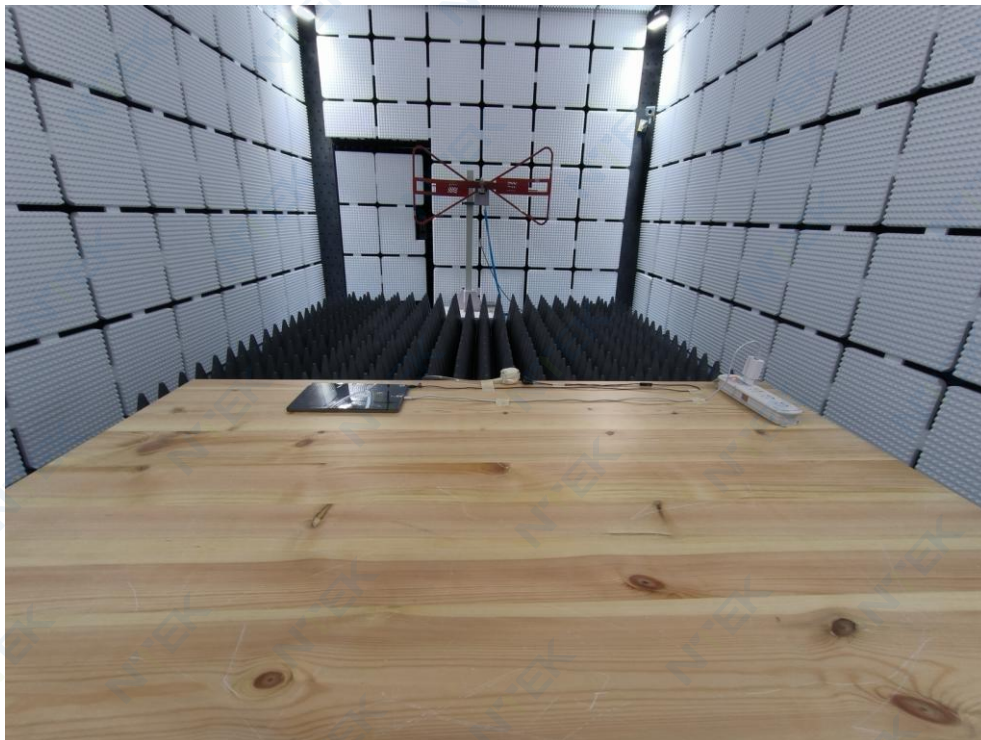




ESD Measurement Photo



RS Measurement Photo



EFT Measurement Photo



SURGE Measurement Photo



DIP Measurement Photo



CS Measurement Photo



END OF REPORT