



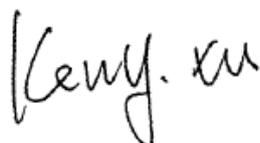
Report No.: SZEM201201354901  
 Page: 1 of 43

## **TEST REPORT**

**Application No.:** SZEM2012013549CR  
**Applicant:** Shenzhen DO Intelligent Technology Co., Ltd  
**Address of Applicant:** Floor 11, Building 3, Changyi Industrial Factory, No.1 Lirong Road, Xinshi Community, Dalang Sub-district, Longhua District, Shenzhen City, China  
**Manufacturer:** Shenzhen DO Intelligent Technology Co., Ltd  
**Address of Manufacturer:** Floor 11, Building 3, Changyi Industrial Factory, No.1 Lirong Road, Xinshi Community, Dalang Sub-district, Longhua District, Shenzhen City, China  
**Factory:** Shenzhen DO Intelligent Technology Co., Ltd  
**Address of Factory:** Floor 11, Building 3, Changyi Industrial Factory, No.1 Lirong Road, Xinshi Community, Dalang Sub-district, Longhua District, Shenzhen City, China  
**Equipment Under Test (EUT):**  
**EUT Name:** Smart Watch  
**Model No.:** ID206 ♣  
 ♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.  
**Trade Mark:** IDO  
**Standard(s) :** EN 301 489-1 V2.2.3  
 EN 301 489-17 V3.2.4  
**Date of Receipt:** 2020-12-30  
**Date of Test:** 2020-12-30 to 2021-01-04  
**Date of Issue:** 2021-01-11

|                     |              |
|---------------------|--------------|
| <b>Test Result:</b> | <b>Pass*</b> |
|---------------------|--------------|

\* In the configuration tested, the EUT complied with the standards specified above.

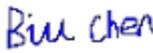


Keny Xu  
 EMC Laboratory Manager



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| <i>Revision Record</i> |                |             |                 |               |
|------------------------|----------------|-------------|-----------------|---------------|
| <i>Version</i>         | <i>Chapter</i> | <i>Date</i> | <i>Modifier</i> | <i>Remark</i> |
| 01                     |                | 2021-01-11  |                 | Original      |
|                        |                |             |                 |               |
|                        |                |             |                 |               |

|                                 |  |   |  |
|---------------------------------|--|---|--|
| <b>Authorized for issue by:</b> |  |   |  |
|                                 |  |    |  |
|                                 |  | <hr/> <b>Bill Chen/Project Engineer</b>   |  |
|                                 |  |  |  |
|                                 |  | <hr/> <b>Eric Fu/Reviewer</b>   |  |



## 2 Test Summary

| Emission Part   |  |                           |                          |        |
|---|--|---------------------------|--------------------------|--------|
| Item  | Standard                                       | Method                    | Requirement              | Result |
| Conducted Emissions at AC Mains Power Port (150kHz-30MHz) | EN 301 489-1 V2.2.3<br>EN 301 489-17<br>V3.2.4 | EN 55032:2015             | Class B                  | Pass   |
| Radiated Emissions (30MHz-1GHz)                           |  | EN 55032:2015             | Class B                  | Pass   |
| Voltage Fluctuations and Flicker                          |  | EN 61000-3-3:2013+A1:2019 | Clause 5 of EN 61000-3-3 | Pass   |
| Harmonic Current Emission                                 |  | EN IEC 61000-3-2:2019     | Class A                  | Pass   |

| Immunity Part  |  |                                    |  |        |
|--|--|------------------------------------|--|--------|
| Item   | Standard                                       | Method                             | Requirement  | Result |
| Radiated Immunity (80MHz-6GHz)                           | EN 301 489-1 V2.2.3<br>EN 301 489-17<br>V3.2.4 | EN 61000-4-3:2006 +A1:2008+A2:2010 | 3V/m, 80%, 1kHz Amp. Mod.  | Pass   |
| Surge at AC Mains Power Port                             |  | EN 61000-4-5:2014 +A1:2017         | 1.2/50µs Tr/Td; 1kV Line to Line   | Pass   |
| Conducted Immunity at AC Mains Power Port (150kHz-80MHz) |  | EN 61000-4-6:2014                  | 3Vrms (emf), 80%, 1kHz Amp. Mod.   | Pass   |
| Voltage Dips and Interruptions                           |  | EN 61000-4-11:2004 +A1:2017        | 0 % UT for 0.5per; 0 % UT for 1per; 0 % UT for 250per; 70 % UT for 25per; UT is Supply Voltage | Pass   |
| Electrostatic Discharge                                  |  | EN 61000-4-2:2009                  | 4kV Contact Discharge<br>8kV Air Discharge   | Pass   |
| Electrical Fast Transients Burst at AC Mains Power Port  |  | EN 61000-4-4:2012                  | 1kV; 5/50ns Tr/Td; 5kHz Repetition Frequency   |        |

### Remark:

Model No.: ID206

There are two kinds of samples for the above model.

Only the sample 1 was tested fully, and the sample 2 was performed the Radiated Emissions (30MHz-1GHz), Radiated Immunity (80MHz-6GHz), Electrostatic Discharge test for discrepancy, since according to the declaration of the applicant, the electrical circuit design, PCB layout, components used and internal wiring were identical for the above model, with only difference on display screen.



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### 3 Contents

|   | Page      |
|---|-----------|
| <b>1 COVER PAGE .....</b>   | <b>1</b>  |
| <b>2 TEST SUMMARY .....</b>   | <b>3</b>  |
| <b>3 CONTENTS .....</b>   | <b>4</b>  |
| <b>4 GENERAL INFORMATION .....</b>                                  | <b>6</b>  |
| 4.1 DETAILS OF E.U.T. ....  | 6         |
| 4.2 DESCRIPTION OF SUPPORT UNITS .....                              | 6         |
| 4.3 MEASUREMENT UNCERTAINTY .....                                   | 6         |
| 4.4 TEST LOCATION .....   | 7         |
| 4.5 TEST FACILITY .....   | 7         |
| 4.6 DEVIATION FROM STANDARDS .....                                  | 7         |
| 4.7 ABNORMALITIES FROM STANDARD CONDITIONS .....                    | 7         |
| 4.8 EMS MONITOR .....   | 7         |
| <b>5 EQUIPMENT LIST .....</b>                                       | <b>8</b>  |
| <b>6 EMISSION TEST RESULTS.....</b>                                 | <b>11</b> |
| 6.1 CONDUCTED EMISSIONS AT AC MAINS POWER PORT (150kHz-30MHz) ..... | 11        |
| 6.1.1 E.U.T. Operation .....  | 11        |
| 6.1.2 Test Mode Description .....                                   | 11        |
| 6.1.3 Test Setup Diagram .....                                      | 11        |
| 6.1.4 Measurement Procedure and Data .....                          | 11        |
| 6.2 RADIATED EMISSIONS (30MHz-1GHz) .....                           | 14        |
| 6.2.1 E.U.T. Operation .....  | 14        |
| 6.2.2 Test Mode Description .....                                   | 14        |
| 6.2.3 Test Setup Diagram .....                                      | 14        |
| 6.2.4 Measurement Procedure and Data .....                          | 15        |
| 6.3 VOLTAGE FLUCTUATIONS AND FLICKER.....                           | 20        |
| 6.3.1 E.U.T. Operation .....  | 20        |
| 6.3.2 Test Mode Description .....                                   | 20        |
| 6.3.3 Test Setup Diagram .....                                      | 20        |
| 6.3.4 Measurement Procedure and Data .....                          | 20        |
| 6.4 HARMONIC CURRENT EMISSION .....                                 | 22        |
| <b>7 IMMUNITY TEST RESULTS .....</b>                                | <b>23</b> |
| 7.1 RADIATED IMMUNITY (80MHz-6GHz) .....                            | 25        |
| 7.1.1 Test Setup Diagram .....                                      | 25        |
| 7.1.2 E.U.T. Operation .....  | 25        |
| 7.1.3 Test Mode Description .....                                   | 25        |
| 7.1.4 Test Condition and Results: .....                             | 26        |
| 7.2 SURGE AT AC MAINS POWER PORT .....                              | 27        |
| 7.2.1 Test Setup Diagram .....                                      | 27        |
| 7.2.2 E.U.T. Operation .....  | 27        |
| 7.2.3 Test Mode Description .....                                   | 27        |
| 7.2.4 Test Condition and Results: .....                             | 28        |



|       |  |    |
|-------|--|----|
| 7.3   | CONDUCTED IMMUNITY AT AC MAINS POWER PORT (150KHZ-80MHZ) | 29 |
| 7.3.1 | Test Setup Diagram                                       | 29 |
| 7.3.2 | E.U.T. Operation   | 29 |
| 7.3.3 | Test Mode Description                                    | 29 |
| 7.3.4 | Test Condition and Results:                              | 30 |
| 7.4   | VOLTAGE DIPS AND INTERRUPTIONS                           | 31 |
| 7.4.1 | Test Setup Diagram                                       | 31 |
| 7.4.2 | E.U.T. Operation   | 31 |
| 7.4.3 | Test Mode Description                                    | 31 |
| 7.4.4 | Test Condition and Results:                              | 32 |
| 7.5   | ELECTROSTATIC DISCHARGE                                  | 33 |
| 7.5.1 | Test Setup Diagram                                       | 33 |
| 7.5.2 | E.U.T. Operation   | 33 |
| 7.5.3 | Test Mode Description                                    | 33 |
| 7.5.4 | Test Condition and Results:                              | 34 |
| 7.6   | ELECTRICAL FAST TRANSIENTS BURST AT AC MAINS POWER PORT  | 35 |
| 7.6.1 | Test Setup Diagram                                       | 35 |
| 7.6.2 | E.U.T. Operation   | 35 |
| 7.6.3 | Test Mode Description                                    | 35 |
| 7.6.4 | Test Condition and Results:                              | 35 |
| 8     | TEST SETUP PHOTO   | 36 |
| 9     | EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)                  | 43 |



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## 4 General Information

### 4.1 Details of E.U.T.

|   |   |
|---|---|
| Power supply:                                       | Rechargeable battery: DC 3.8V 300mAh (Charged by USB) |
| Cable(s):   | USB cable:60cm unshielded                             |
| The highest working frequency(except RF modulator): | Less than 108MHz                                      |

### 4.2 Description of Support Units

| Description | Manufacturer | Model No. | Serial No.        |
|-------------|--------------|-----------|-------------------|
| Adapter     | Apple        | A1443     | REF. No.SEA05D09B |
| iPhone 8    | Apple        | A1863     | REF. No.SEA16J00  |

### 4.3 Measurement Uncertainty

| Test Item   | Measurement Uncertainty |
|---|-------------------------|
| Conducted Emissions at AC Mains Power Port (150kHz-30MHz) | ± 3.0dB                 |
| Radiated Emissions (30MHz-1GHz)                           | ± 4.5dB                 |
| Voltage Fluctuations and Flicker                          | ± 3.7%                  |
| Harmonic Current Emission                                 | ± 0.068dB               |
| Radiated Immunity (80MHz-6GHz)                            | ± 1.64dB                |
| Surge at AC Mains Power Port                              | ± 5 %                   |
| Conducted Immunity at AC Mains Power Port (150kHz-80MHz)  | ± 0.96dB                |
| Voltage Dips and Interruptions                            | ± 4 %                   |
| Electrostatic Discharge                                   | ±6 %                    |
| Electrical Fast Transients Burst at AC Mains Power Port   | ± 5 %                   |

**Remark:**

The  $U_{lab}$  (lab Uncertainty) is less than  $U_{CISPR}$  (CISPR Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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#### 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.  
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

#### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None

#### 4.8 EMS Monitor

Visual: Monitored the work status and display of the EUT.

Audio: None.



## 5 Equipment List

| Conducted Emissions at AC Mains Power Port (150kHz-30MHz) |                  |                 |              |            |              |
|---|------------------|-----------------|--------------|------------|--------------|
| Equipment   | Manufacturer     | Model No        | Inventory No | Cal Date   | Cal Due Date |
| Shielding Room  | ZhongYu Electron | GB-88           | SEM001-06    | 2019-06-13 | 2022-06-12   |
| EMI Test Receiver   | Rohde&Schwarz    | ESCI            | SEM004-02    | 2020-03-24 | 2021-03-23   |
| Measurement Software                                      | AUDIX            | e3 V8.2014-6-27 | N/A          | N/A        | N/A          |
| Coaxial Cable   | SGS              | N/A             | SEM024-01    | 2020-07-10 | 2021-07-09   |
| LISN  | Rohde&Schwarz    | ENV216          | SEM007-01    | 2020-09-23 | 2021-09-22   |
| LISN  | ETS-LINDGREN     | 3816/2          | SEM007-02    | 2020-04-01 | 2021-03-31   |

| Radiated Emissions (30MHz-1GHz) |                      |                 |              |            |              |
|---------------------------------|----------------------|-----------------|--------------|------------|--------------|
| Equipment                       | Manufacturer         | Model No        | Inventory No | Cal Date   | Cal Due Date |
| 3m Semi-Anechoic Chamber        | ETS-LINDGREN         | N/A             | SEM001-01    | 2020-07-19 | 2023-07-18   |
| MXE EMI Receiver                | Agilent Technologies | N9038A          | SEM004-15    | 2020-11-02 | 2021-11-01   |
| BiConiLog Antenna               | ETS-LINDGREN         | 3142C           | SEM003-02    | 2019-05-24 | 2022-05-23   |
| Pre-Amplifier                   | Agilent Technologies | 8447D           | SEM005-01    | 2020-04-01 | 2021-03-31   |
| Measurement Software            | AUDIX                | e3 V8.2014-6-27 | N/A          | N/A        | N/A          |
| Coaxial Cable                   | SGS                  | N/A             | SEM025-01    | 2020-07-10 | 2021-07-09   |

| Voltage Fluctuations and Flicker |                        |                 |              |            |              |
|----------------------------------|------------------------|-----------------|--------------|------------|--------------|
| Equipment                        | Manufacturer           | Model No        | Inventory No | Cal Date   | Cal Due Date |
| AC Power Source                  | California Instruments | 5001ix          | SEM016-02    | 2020-04-09 | 2021-04-08   |
| Power Analyzer                   | California Instruments | PACS-1          | SEM016-01    | 2020-04-09 | 2021-04-08   |
| Measurement Software             | California Instruments | CTS 4.0 V4.17.0 | N/A          | N/A        | N/A          |

| Harmonic Current Emission |                        |                 |              |            |              |
|---------------------------|------------------------|-----------------|--------------|------------|--------------|
| Equipment                 | Manufacturer           | Model No        | Inventory No | Cal Date   | Cal Due Date |
| AC Power Source           | California Instruments | 5001ix          | SEM016-02    | 2020-04-09 | 2021-04-08   |
| Power Analyzer            | California Instruments | PACS-1          | SEM016-01    | 2020-04-09 | 2021-04-08   |
| Measurement Software      | California Instruments | CTS 4.0 V4.17.0 | N/A          | N/A        | N/A          |

| Radiated Immunity (80MHz-6GHz) |                       |          |              |            |              |
|--------------------------------|-----------------------|----------|--------------|------------|--------------|
| Equipment                      | Manufacturer          | Model No | Inventory No | Cal Date   | Cal Due Date |
| Fully-Anechoic Chamber 2       | Chang Zhou Zhong Shuo | 854      | SEM001-05    | 2020-07-10 | 2021-07-09   |
| Power Sensor                   | Rohde&Schwarz         | NRP-Z91  | SEM009-09    | 2020-03-23 | 2021-03-22   |



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|                                      |                    |                |           |            |            |
|--------------------------------------|--------------------|----------------|-----------|------------|------------|
| Stacked Log.-Per.-Broadband Antenna  | Schwarzbeck        | STLP 9129      | SEM003-25 | N/A        | N/A        |
| Signal Generator                     | Rohde&Schwarz      | SMB100A        | SEM006-11 | 2020-03-23 | 2021-03-22 |
| Broadband Amplifier                  | Rohde&Schwarz      | BBA150-BC250   | SEM005-12 | 2020-09-23 | 2021-09-22 |
| Broadband Amplifier                  | Rohde&Schwarz      | BBA150-D110    | SEM005-13 | 2020-04-01 | 2021-03-31 |
| Broadband Amplifier                  | Rohde&Schwarz      | BBA150-E60     | SEM005-16 | 2020-05-21 | 2021-05-20 |
| Measurement Software                 | Rohde&Schwarz      | EMC32 V9.25.00 | N/A       | N/A        | N/A        |
| Amplifier                            | Amplifier Research | 75A250A        | SEM005-11 | 2020-04-01 | 2021-03-31 |
| Wire ISN                             | Rohde&Schwarz      | ENY 22         | EMC0114   | N/A        | N/A        |
| Audio Analyzer                       | Rohde&Schwarz      | UPL            | SEM008-01 | 2020-09-23 | 2021-09-22 |
| Conditioning Amplifier               | Brüel&Kjaer        | 2690-OS2       | SEM005-10 | 2020-04-14 | 2021-04-13 |
| Mouth Simulator                      | Brüel&Kjaer        | 4227           | SEM017-01 | 2020-04-14 | 2021-04-13 |
| Signal Source                        | Brüel&Kjaer        | 4231           | SEM017-02 | 2020-03-25 | 2021-03-24 |
| Coupling/Decoupling Network          | SCHLODER           | CDN-M2+3       | SEM007-10 | 2020-09-23 | 2021-09-22 |
| Universal Radio Communication Tester | Rohde&Schwarz      | CMU200         | SEM010-06 | 2019-09-23 | 2021-09-22 |

**Surge at AC Mains Power Port**

| Equipment                              | Manufacturer | Model No  | Inventory No | Cal Date   | Cal Due Date |
|--|--------------|-----------|--------------|------------|--------------|
| Ultra Compact Simulator                | EM Test      | UCS 500N7 | SEM018-02    | 2020-03-26 | 2021-03-25   |
| High Speed Coupling/Decoupling Network | EM Test      | CNI 508N2 | SEM018-05    | 2020-07-01 | 2021-06-30   |

**Conducted Immunity at AC Mains Power Port (150kHz-80MHz)**

| Equipment                   | Manufacturer | Model No | Inventory No | Cal Date   | Cal Due Date |
|-----------------------------|--------------|----------|--------------|------------|--------------|
| Shielding Room              | AUDIX        | N/A      | SEM001-08    | 2019-06-13 | 2022-06-12   |
| RF-Generator                | SCHAFFNER    | NSG 2070 | SEM006-01    | 2020-10-22 | 2021-10-21   |
| Coupling/Decoupling Network | SCHAFFNER    | CDN M016 | SEM007-03    | 2020-04-09 | 2021-04-08   |

**Voltage Dips and Interruptions**

| Equipment               | Manufacturer | Model No  | Inventory No | Cal Date   | Cal Due Date |
|-------------------------|--------------|-----------|--------------|------------|--------------|
| Ultra Compact Simulator | EM Test      | UCS 500N7 | SEM018-02    | 2020-03-26 | 2021-03-25   |

**Electrostatic Discharge**

| Equipment        | Manufacturer | Model No | Inventory No | Cal Date   | Cal Due Date |
|------------------|--------------|----------|--------------|------------|--------------|
| ESD Generator    | TESEQ AG     | NSG 437  | SEM019-02    | 2020-04-17 | 2021-04-16   |
| ESD Ground Plane | SGS(3m*3m)   | N/A      | SEN006-01    | N/A        | N/A          |
| ESD Simulator    | SCHAFFNER    | NSG 438  | SEM019-01    | 2020-04-07 | 2021-04-06   |



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| <b>Electrical Fast Transients Burst at AC Mains Power Port</b> |                     |                 |                     |                 |                     |
|--|---------------------|-----------------|---------------------|-----------------|---------------------|
| <b>Equipment</b>   | <b>Manufacturer</b> | <b>Model No</b> | <b>Inventory No</b> | <b>Cal Date</b> | <b>Cal Due Date</b> |
| Ultra Compact Simulator  | EM Test             | UCS 500N7       | SEM018-02           | 2020-03-26      | 2021-03-25          |
| Capacitive Coupling Clamp                                      | EM Test             | HFK             | SEM018-03           | 2020-03-26      | 2021-03-25          |

| <b>General used equipment</b>   |   |                 |                     |                 |                     |
|---------------------------------|---|-----------------|---------------------|-----------------|---------------------|
| <b>Equipment</b>                | <b>Manufacturer</b>                       | <b>Model No</b> | <b>Inventory No</b> | <b>Cal Date</b> | <b>Cal Due Date</b> |
| Humidity/ Temperature Indicator | Shanghai Meteorological Industry Factory  | ZJ1-2B          | SEM002-04           | 2020-09-15      | 2021-09-14          |
| Humidity/ Temperature Indicator | Mingle                                    | N/A             | SEM002-08           | 2020-09-15      | 2021-09-14          |
| Barometer                       | Changchun Meteorological Industry Factory | DYM3            | SEM002-01           | 2020-04-07      | 2021-04-06          |



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## 6 Emission Test Results

### 6.1 Conducted Emissions at AC Mains Power Port (150kHz-30MHz)

Test Requirement: EN 301 489-1 V2.2.3  
 EN 301 489-17 V3.2.4  
 Test Method: EN 55032:2015  
 Limit:

| Frequency of emission(MHz) | Conducted limit(dBμV) |           |
|----------------------------|-----------------------|-----------|
|                            | Quasi-peak            | Average   |
| 0.15-0.5                   | 66 to 56*             | 56 to 46* |
| 0.5-5                      | 56                    | 46        |
| 5-30                       | 60                    | 50        |

\*Decreases with the logarithm of the frequency.  
 Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

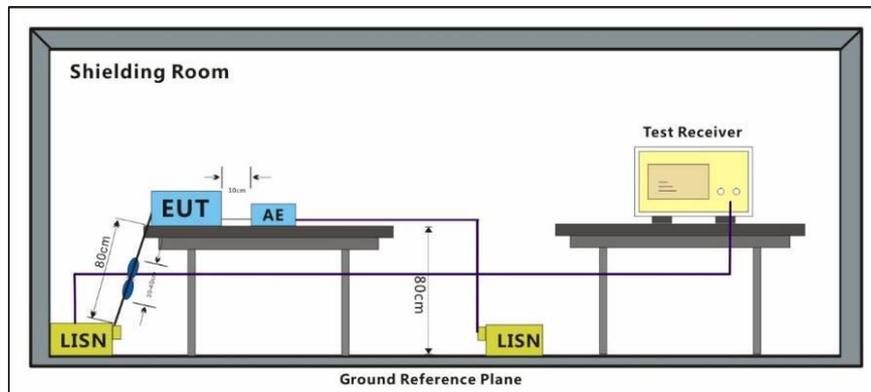
#### 6.1.1 E.U.T. Operation

Operating Environment:  
 Temperature: 22.5 °C      Humidity: 43.6 % RH      Atmospheric Pressure: 1010 mbar

#### 6.1.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description  |
|-----------------------|-----------|--|
| Final test            | 04        | Charging:Keep the battery of the EUT in charging mode. |

#### 6.1.3 Test Setup Diagram



#### 6.1.4 Measurement Procedure and Data

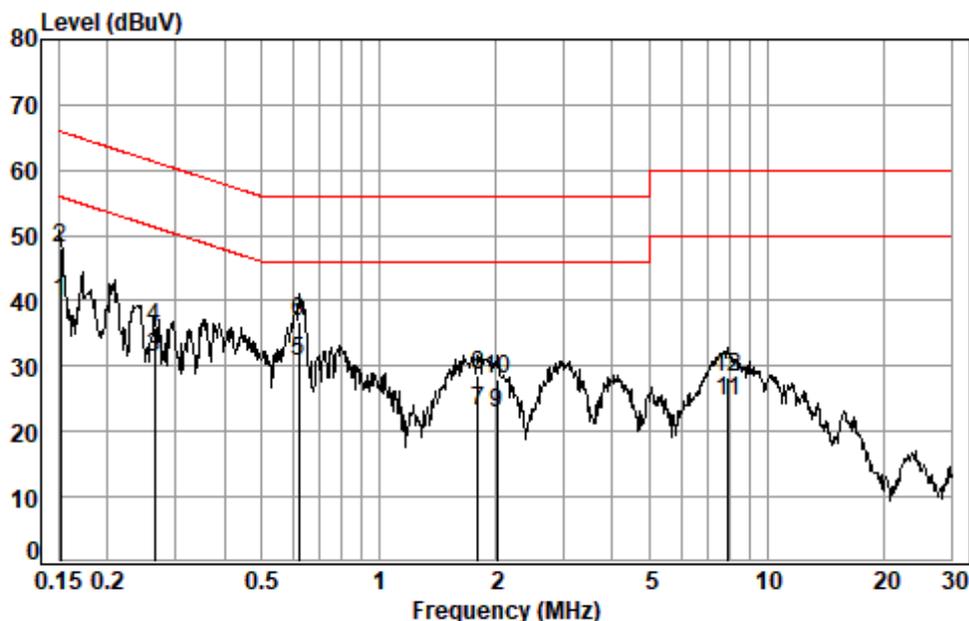
Frequency range: 150kHz-30MHz

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.



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Test Mode: 04; Line: Live line



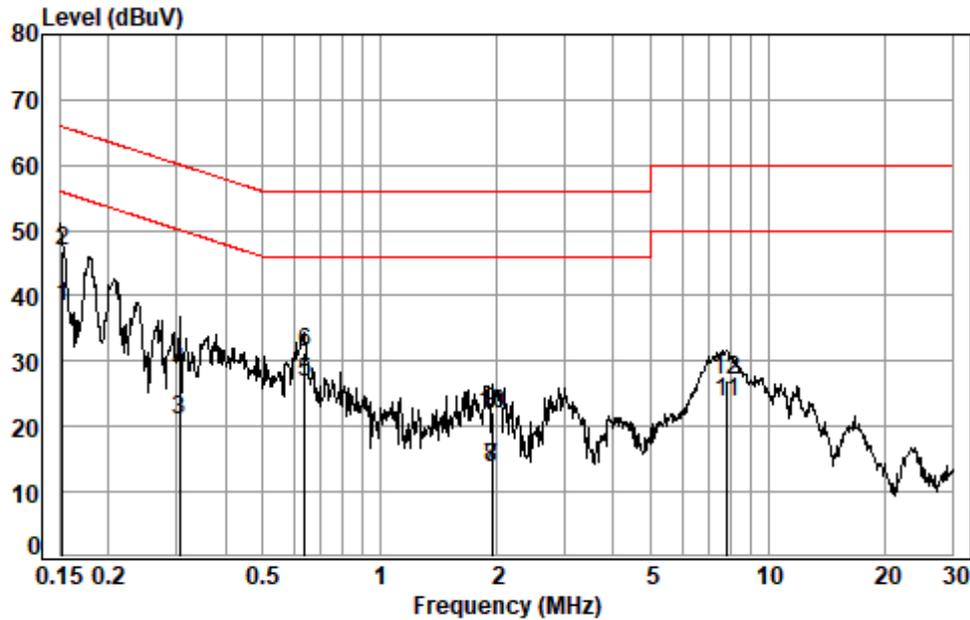
Site : Shielding Room  
 Condition: Line  
 Job No. : 13549CR  
 Test mode: 04

|    | Freq   | Cable Loss | LISN Factor | Read Level | Limit Line | Over Limit | Remark  |
|----|--------|------------|-------------|------------|------------|------------|---------|
|    | MHz    | dB         | dB          | dBuV       | dBuV       | dB         |         |
| 1  | 0.1516 | 0.03       | 9.70        | 29.99      | 55.91      | -16.19     | Average |
| 2  | 0.1516 | 0.03       | 9.70        | 38.34      | 65.91      | -17.84     | QP      |
| 3  | 0.2644 | 0.05       | 9.74        | 21.43      | 51.29      | -20.07     | Average |
| 4  | 0.2644 | 0.05       | 9.74        | 26.21      | 61.29      | -25.29     | QP      |
| 5  | 0.6238 | 0.08       | 9.77        | 20.88      | 46.00      | -15.27     | Average |
| 6  | 0.6238 | 0.08       | 9.77        | 27.10      | 56.00      | -19.05     | QP      |
| 7  | 1.8000 | 0.12       | 9.81        | 13.12      | 46.00      | -22.95     | Average |
| 8  | 1.8000 | 0.12       | 9.81        | 18.72      | 56.00      | -27.35     | QP      |
| 9  | 2.0119 | 0.13       | 9.81        | 12.87      | 46.00      | -23.19     | Average |
| 10 | 2.0119 | 0.13       | 9.81        | 18.00      | 56.00      | -28.06     | QP      |
| 11 | 7.9353 | 0.16       | 10.09       | 14.26      | 50.00      | -25.49     | Average |
| 12 | 7.9353 | 0.16       | 10.09       | 17.91      | 60.00      | -31.84     | QP      |



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Test Mode: 04; Line: Neutral Line



Site : Shielding Room  
 Condition: Neutral  
 Job No. : 13549CR  
 Test mode: 04

|    | Freq   | Cable Loss | LISN Factor | Read Level | Limit Line | Over Limit | Remark  |
|----|--------|------------|-------------|------------|------------|------------|---------|
|    | MHz    | dB         | dB          | dBuV       | dBuV       | dB         |         |
| 1  | 0.1524 | 0.03       | 9.71        | 28.67      | 55.87      | -17.46     | Average |
| 2  | 0.1524 | 0.03       | 9.71        | 37.15      | 65.87      | -18.98     | QP      |
| 3  | 0.3051 | 0.05       | 9.74        | 11.15      | 50.10      | -29.16     | Average |
| 4  | 0.3051 | 0.05       | 9.74        | 18.35      | 60.10      | -31.96     | QP      |
| 5  | 0.6406 | 0.08       | 9.77        | 16.96      | 46.00      | -19.19     | Average |
| 6  | 0.6406 | 0.08       | 9.77        | 21.59      | 56.00      | -24.56     | QP      |
| 7  | 1.9489 | 0.12       | 9.81        | 3.80       | 46.00      | -32.27     | Average |
| 8  | 1.9489 | 0.12       | 9.81        | 3.78       | 46.00      | -32.29     | Average |
| 9  | 1.9489 | 0.12       | 9.81        | 12.17      | 56.00      | -33.90     | QP      |
| 10 | 1.9489 | 0.12       | 9.81        | 12.02      | 56.00      | -34.05     | QP      |
| 11 | 7.8516 | 0.16       | 10.09       | 13.43      | 50.00      | -26.32     | Average |
| 12 | 7.8516 | 0.16       | 10.09       | 16.85      | 60.00      | -32.90     | QP      |



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**6.2 Radiated Emissions (30MHz-1GHz)**

Test Requirement: EN 301 489-1 V2.2.3  
 EN 301 489-17 V3.2.4  
 Test Method: EN 55032:2015  
 Measurement Distance: 3m  
 Limit:

| FREQUENCY (MHz)  | dBuV/m (At 10m) | dBuV/m (At 3m) |
|--|-----------------|----------------|
|  | Class B         | Class B        |
| 30 ~ 230   | 30              | 40             |
| 230 ~ 1000   | 37              | 47             |
| Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz |                 |                |

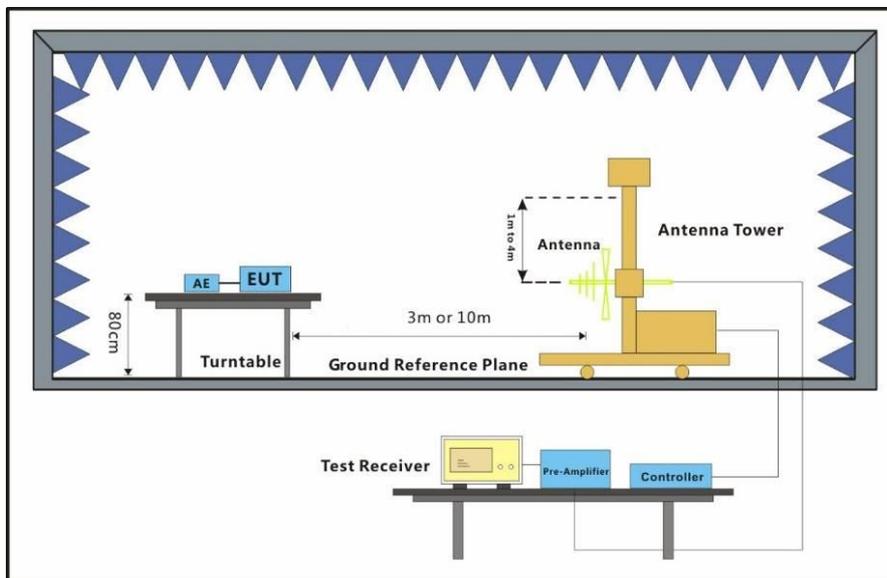
**6.2.1 E.U.T. Operation**

Operating Environment:  
 Temperature: 25.5 °C      Humidity: 51.3 % RH      Atmospheric Pressure: 1010 mbar

**6.2.2 Test Mode Description**

| Pre-scan / Final test | Mode Code | Description  |
|-----------------------|-----------|--|
| Pre-scan              | 03        | Operation(BT):Keep the EUT communicating with other Bluetooth devices. |
| Final test            | 04        | Charging:Keep the battery of the EUT in charging mode.                 |
| Pre-scan              | 05        | Idle:Keep the EUT standby.   |

**6.2.3 Test Setup Diagram**



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#### 6.2.4 Measurement Procedure and Data

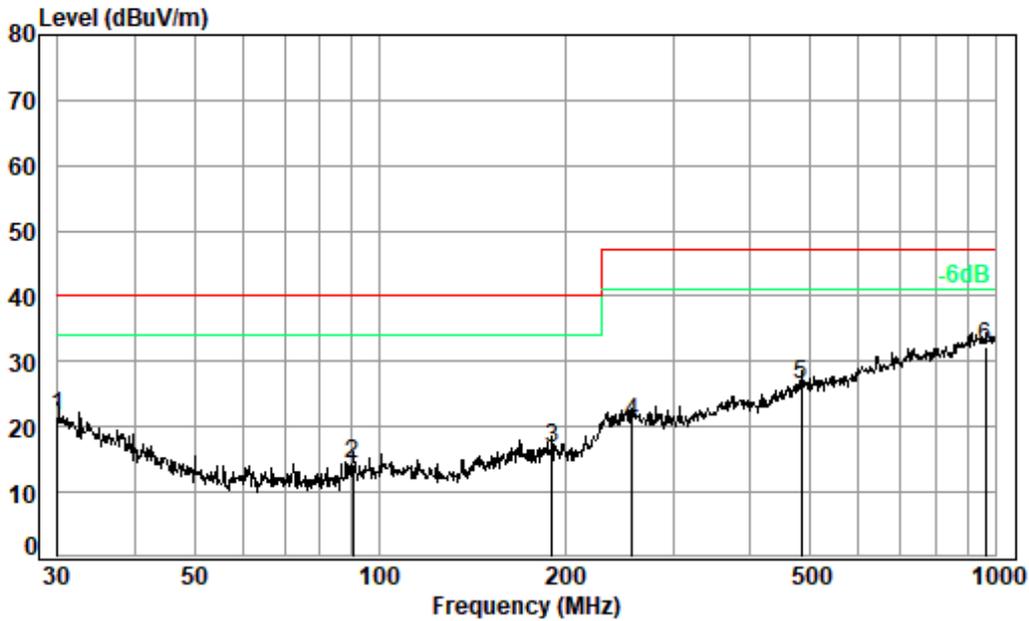
Frequency range: 30MHz-1GHz

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.



the sample 1

Test Mode: 04; Polarity: Horizontal



Condition: 3m HORIZONTAL

Job No. : 13549CR

Test mode: 04

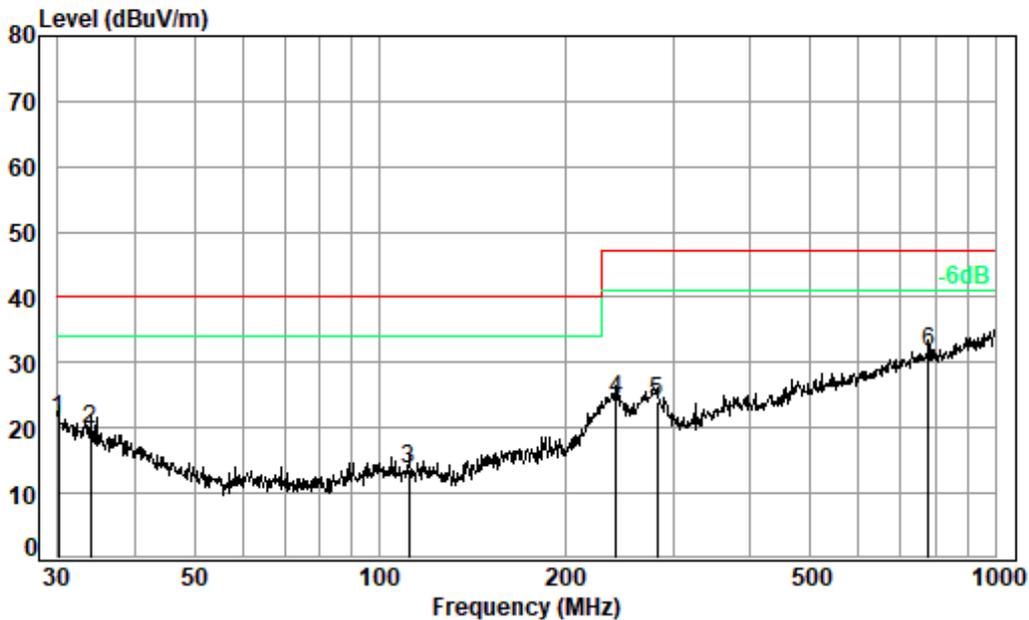
: different

|      | Freq   | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level  | Limit  | Over   | Remark |
|------|--------|------------|------------|---------------|------------|--------|--------|--------|--------|
|      | MHz    | dB         | dB/m       | dB            | dBuV       | dBuV/m | dBuV/m | dB     |        |
| 1    | 30.00  | 0.60       | 23.00      | 27.74         | 25.87      | 21.73  | 40.00  | -18.27 | QP     |
| 2    | 90.54  | 1.29       | 13.21      | 27.62         | 27.34      | 14.22  | 40.00  | -25.78 | QP     |
| 3    | 190.41 | 1.19       | 15.51      | 27.18         | 27.16      | 16.68  | 40.00  | -23.32 | QP     |
| 4    | 257.42 | 1.70       | 18.13      | 26.97         | 27.87      | 20.73  | 47.00  | -26.27 | QP     |
| 5    | 483.91 | 2.47       | 24.30      | 27.74         | 27.51      | 26.54  | 47.00  | -20.46 | QP     |
| 6 pp | 965.54 | 3.57       | 29.50      | 26.83         | 26.11      | 32.35  | 47.00  | -14.65 | QP     |



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Test Mode: 04; Polarity: Horizontal



Condition: 3m HORIZONTAL

Job No. : 13549CR

Test mode: 04

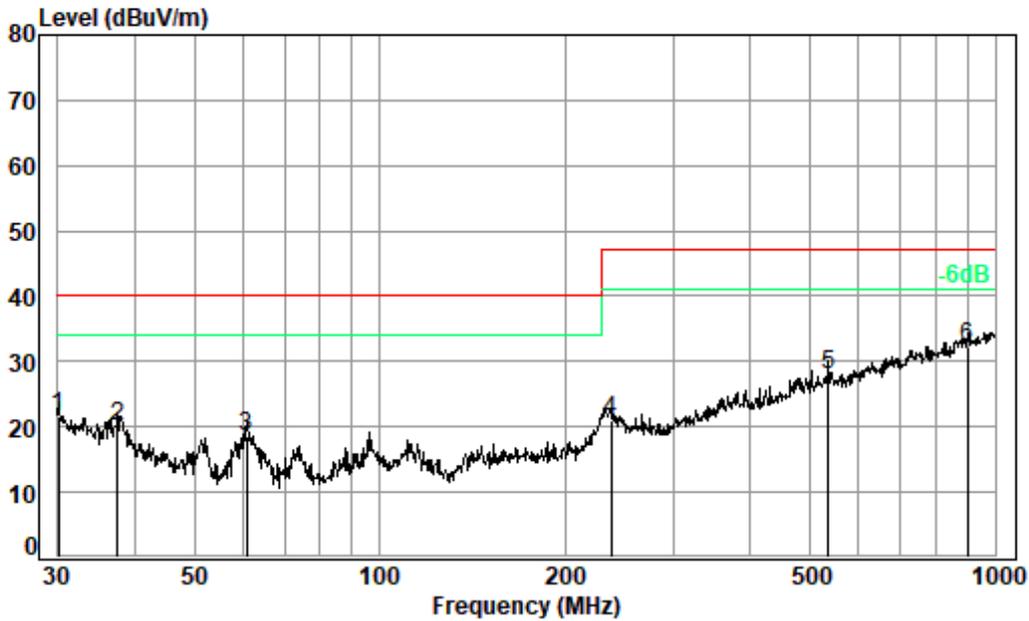
|   | Freq      | Cable Loss | Ant Factor | Preamp Factor | Read Level | Limit Level | Over Line | Over Limit | Remark |
|---|-----------|------------|------------|---------------|------------|-------------|-----------|------------|--------|
|   | MHz       | dB         | dB/m       | dB            | dBuV       | dBuV/m      | dBuV/m    | dB         |        |
| 1 | 30.11     | 0.60       | 22.92      | 27.74         | 25.55      | 21.33       | 40.00     | -18.67     | QP     |
| 2 | 33.92     | 0.64       | 20.92      | 27.72         | 25.94      | 19.78       | 40.00     | -20.22     | QP     |
| 3 | 111.74    | 1.12       | 13.57      | 27.54         | 26.54      | 13.69       | 40.00     | -26.31     | QP     |
| 4 | 242.53    | 1.58       | 17.90      | 27.01         | 31.95      | 24.42       | 47.00     | -22.58     | QP     |
| 5 | 281.99    | 1.88       | 18.38      | 26.91         | 30.83      | 24.18       | 47.00     | -22.82     | QP     |
| 6 | pp 779.61 | 3.22       | 28.10      | 27.77         | 27.96      | 31.51       | 47.00     | -15.49     | QP     |



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the sample 2

Test Mode: 04; Polarity: Vertical



Condition: 3m VERTICAL

Job No. : 13549CR

Test mode: 04

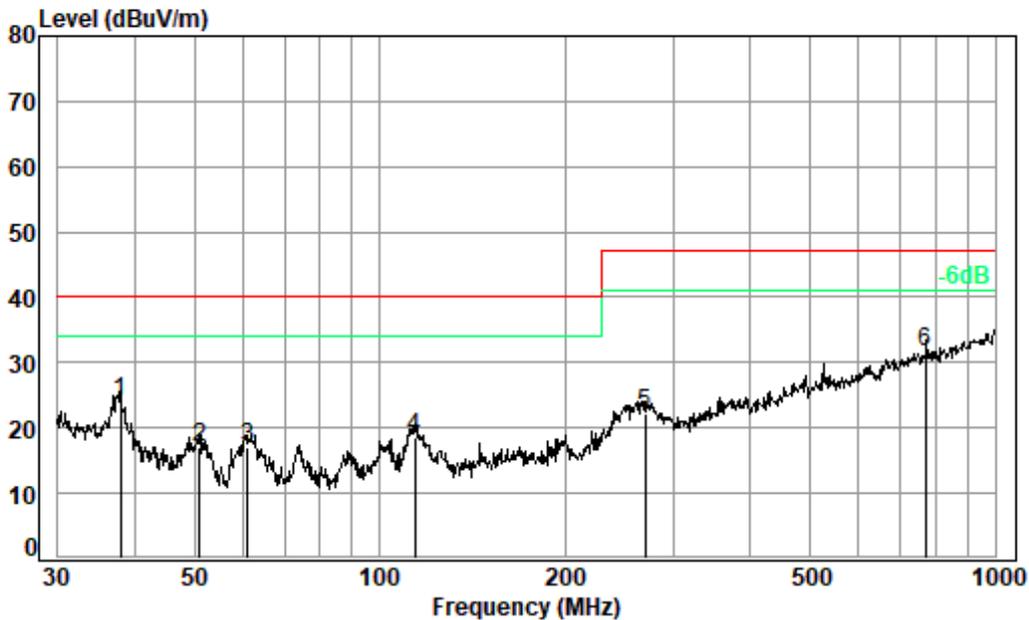
: different

|      | Freq   | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level  | Limit  | Over   | Remark |
|------|--------|------------|------------|---------------|------------|--------|--------|--------|--------|
|      | MHz    | dB         | dB/m       | dB            | dBuV       | dBuV/m | dBuV/m | dB     |        |
| 1    | 30.11  | 0.60       | 22.92      | 27.74         | 25.91      | 21.69  | 40.00  | -18.31 | QP     |
| 2    | 37.55  | 0.68       | 19.31      | 27.71         | 27.69      | 19.97  | 40.00  | -20.03 | QP     |
| 3    | 60.92  | 0.80       | 12.89      | 27.66         | 32.57      | 18.60  | 40.00  | -21.40 | QP     |
| 4    | 237.48 | 1.54       | 17.68      | 27.03         | 28.70      | 20.89  | 47.00  | -26.11 | QP     |
| 5    | 535.71 | 2.58       | 24.87      | 27.92         | 28.44      | 27.97  | 47.00  | -19.03 | QP     |
| 6 pp | 900.15 | 3.50       | 28.90      | 27.16         | 27.02      | 32.26  | 47.00  | -14.74 | QP     |



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Test Mode: 04; Polarity: Vertical



Condition: 3m VERTICAL

Job No. : 13549CR

Test mode: 04

|      | Freq   | Cable Loss | Ant Factor | Preamp Factor | Read Level | Limit Level | Over Line | Over Limit | Remark |
|------|--------|------------|------------|---------------|------------|-------------|-----------|------------|--------|
|      | MHz    | dB         | dB/m       | dB            | dBuV       | dBuV/m      | dBuV/m    | dB         |        |
| 1    | 37.94  | 0.68       | 19.21      | 27.71         | 31.75      | 23.93       | 40.00     | -16.07     | QP     |
| 2    | 50.94  | 0.71       | 13.81      | 27.68         | 30.22      | 17.06       | 40.00     | -22.94     | QP     |
| 3    | 61.13  | 0.80       | 12.91      | 27.66         | 30.91      | 16.96       | 40.00     | -23.04     | QP     |
| 4    | 114.11 | 1.12       | 13.40      | 27.52         | 31.60      | 18.60       | 40.00     | -21.40     | QP     |
| 5    | 269.43 | 1.79       | 18.57      | 26.94         | 28.74      | 22.16       | 47.00     | -24.84     | QP     |
| 6 pp | 771.45 | 3.19       | 28.02      | 27.78         | 28.16      | 31.59       | 47.00     | -15.41     | QP     |



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### 6.3 Voltage Fluctuations and Flicker

Test Requirement: EN 301 489-1 V2.2.3  
 EN 301 489-17 V3.2.4  
 Test Method: EN 61000-3-3:2013+A1:2019

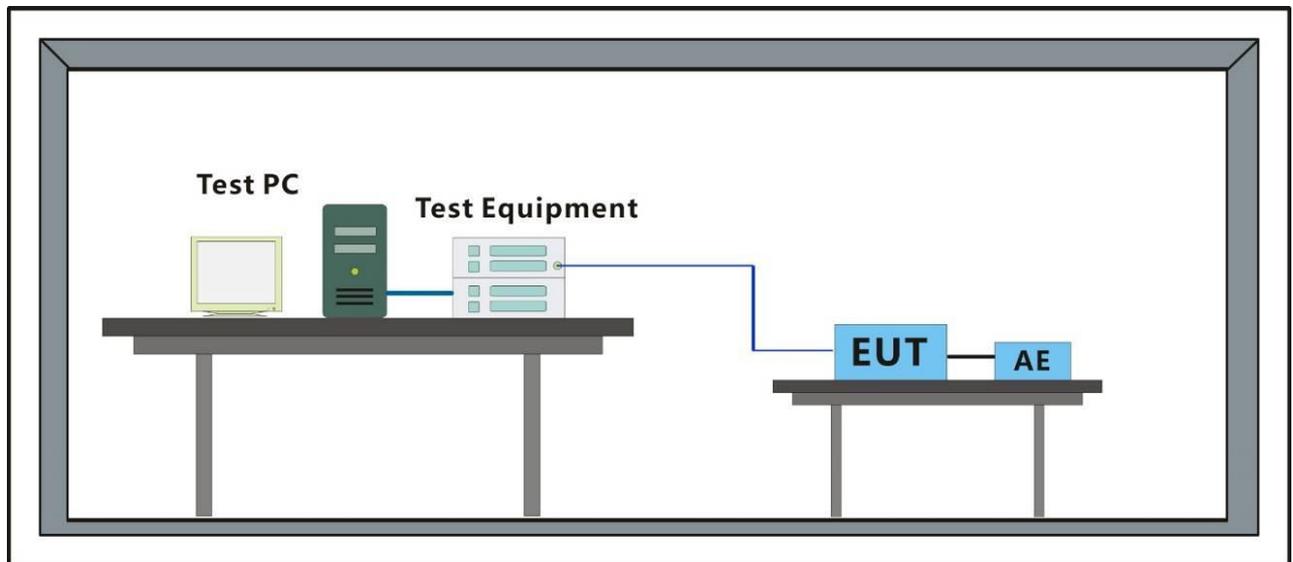
#### 6.3.1 E.U.T. Operation

Operating Environment:  
 Temperature: 20.6 °C Humidity: 49.9 % RH Atmospheric Pressure: 1010 mbar

#### 6.3.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description  |
|-----------------------|-----------|--|
| Final test            | 04        | Charging:Keep the battery of the EUT in charging mode. |

#### 6.3.3 Test Setup Diagram



#### 6.3.4 Measurement Procedure and Data



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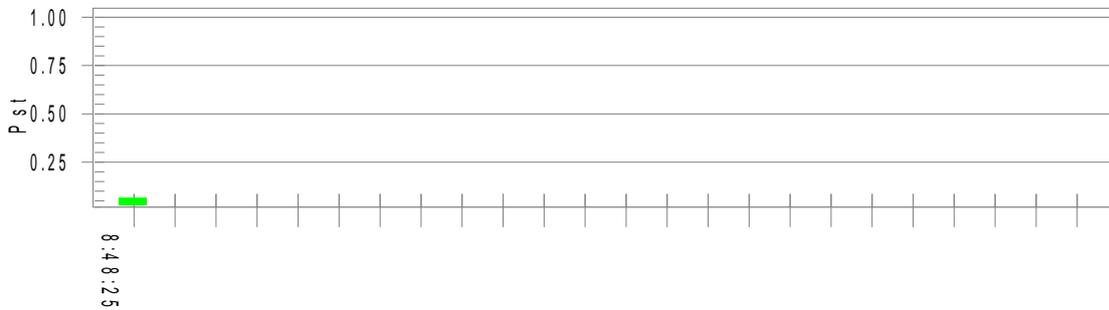


**Test Result: Pass**

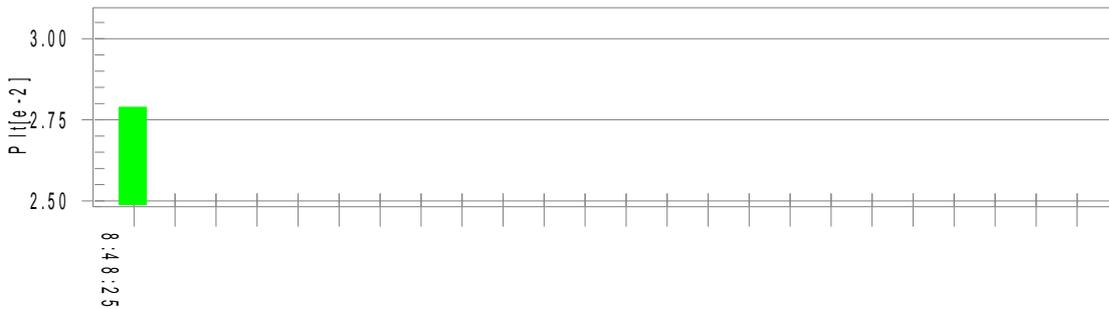
**Status: Test Completed**

**Pst<sub>i</sub> and limit line**

**European Limits**



**Plt and limit line**



**Parameter values recorded during the test:**

|  |               |                         |              |             |
|--|---------------|-------------------------|--------------|-------------|
| <b>Vrms at the end of test (Volt):</b> | <b>229.98</b> |                         |              |             |
| <b>T-max (mS):</b>                     | <b>0</b>      | <b>Test limit (mS):</b> | <b>500.0</b> | <b>Pass</b> |
| <b>Highest dc (%):</b>                 | <b>0.00</b>   | <b>Test limit (%):</b>  | <b>3.30</b>  | <b>Pass</b> |
| <b>Highest dmax (%):</b>               | <b>0.00</b>   | <b>Test limit (%):</b>  | <b>4.00</b>  | <b>Pass</b> |
| <b>Highest Pst (10 min. period):</b>   | <b>0.064</b>  | <b>Test limit:</b>      | <b>1.000</b> | <b>Pass</b> |



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#### 6.4 Harmonic Current Emission

Test Requirement: EN 301 489-1 V2.2.3  
EN 301 489-17 V3.2.4  
Test Method: EN IEC 61000-3-2:2019

There is no need for Harmonics test to be performed on this product (rated power is less than 75W) in accordance with EN IEC 61000-3-2:2019.

For further details, please refer to Clause 7 of EN IEC 61000-3-2:2019 which states:

"For the following categories of equipment, limits are not specified in this standard.- equipment with a rated power of 75W or less, other than lighting equipment."



## 7 Immunity Test Results

### Performance Criteria Description in EN 301 489-1

|   |  |
|---|--|
| <p><b>Performance criteria for continuous phenomena</b></p> | <p>During the test, the equipment shall:</p> <ul style="list-style-type: none"> <li>• continue to operate as intended;</li> <li>• not unintentionally transmit;</li> <li>• not unintentionally change its operating state;</li> <li>• not unintentionally change critical stored data.</li> </ul>  |
| <p><b>Performance criteria for transient phenomena</b></p>  | <p>For all ports and transient phenomena with the exception described below, the following applies:</p> <ul style="list-style-type: none"> <li>• The application of the transient phenomena shall not result in a change of the mode of operation (e.g. unintended transmission) or the loss of critical stored data.</li> <li>• After application of the transient phenomena, the equipment shall operate as intended.</li> </ul> <p>For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies:</p> <ul style="list-style-type: none"> <li>• For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be otherwise restored. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</li> <li>• For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</li> </ul> |



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**Performance Criteria Description in EN 301 489-17**

| Criteria | During Test  | After Test  |
|----------|--|---|
| <b>A</b> | Shall operate as intended.<br>(see note).<br>Shall be no loss of function.<br>Shall be no unintentional transmissions. | Shall operate as intended.<br>Shall be no degradation of performance.<br>Shall be no loss of function.<br>Shall be no loss of critical stored data. |
| <b>B</b> | May be loss of function.   | Functions shall be self-recoverable.<br>Shall operate as intended after recovering.<br>Shall be no loss of critical stored data.                    |
| <b>C</b> | May be loss of function.   | Functions shall be recoverable by the operator.<br>Shall operate as intended after recovering.<br>Shall be no loss of critical stored data.         |

NOTE: Operate as intended during the test allows a level of degradation in accordance with Minimum performance level.

**Minimum performance level**

For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

**Performance criteria for Continuous phenomena applied to Transmitters (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 criteria for Transient phenomena applied to Transmitters (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 criteria for Continuous phenomena applied to Receivers (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.

**Performance criteria for Transient phenomena applied to Receivers (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.

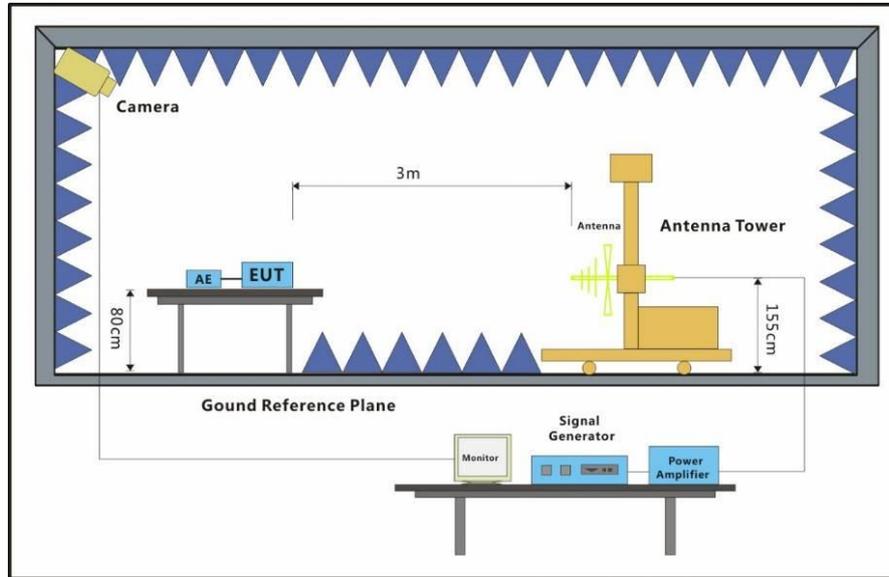


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**7.1 Radiated Immunity (80MHz-6GHz)**

Test Requirement: EN 301 489-1 V2.2.3  
 EN 301 489-17 V3.2.4  
 Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010

**7.1.1 Test Setup Diagram**



**7.1.2 E.U.T. Operation**

Operating Environment:  
 Temperature: 20.1 °C      Humidity: 56.3 % RH      Atmospheric Pressure: 1010 mbar

**7.1.3 Test Mode Description**

| Pre-scan / Final test | Mode Code | Description  |
|-----------------------|-----------|--|
| Final test            | 03        | Operation(BT):Keep the EUT communicating with other Bluetooth devices. |
| Final test            | 04        | Charging:Keep the battery of the EUT in charging mode.                 |
| Final test            | 05        | Idle:Keep the EUT standby.   |



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**7.1.4 Test Condition and Results:**

Performance Criterion: A

Frequency Range: 80MHz to 6GHz

Antenna Polarisation: Vertical and Horizontal

Modulation: 1kHz,80% Amp. Mod,1% increment

| Frequency  | Level (V/m) | EUT Face  | Dwell time | Result / Observations |
|------------|-------------|-----------|------------|-----------------------|
| 80MHz-6GHz | 3           | Front     | 2s         | A                     |
| 80MHz-6GHz | 3           | Back      | 2s         | A                     |
| 80MHz-6GHz | 3           | Left      | 2s         | A                     |
| 80MHz-6GHz | 3           | Right     | 2s         | A                     |
| 80MHz-6GHz | 3           | Top       | 2s         | A                     |
| 80MHz-6GHz | 3           | Underside | 2s         | A                     |

A: No degradation in the performance of the EUT was observed

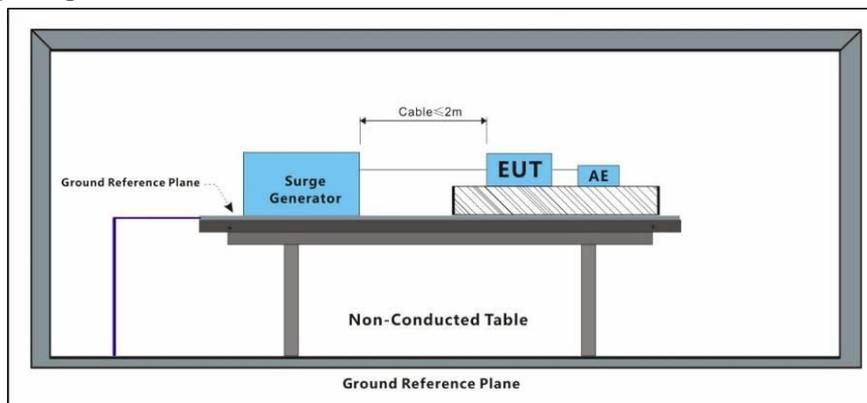


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## 7.2 Surge at AC Mains Power Port

Test Requirement: EN 301 489-1 V2.2.3  
 EN 301 489-17 V3.2.4  
 Test Method: EN 61000-4-5:2014 +A1:2017

### 7.2.1 Test Setup Diagram



### 7.2.2 E.U.T. Operation

Operating Environment:  
 Temperature: 20.7 °C      Humidity: 50.2 % RH      Atmospheric Pressure: 1010 mbar

### 7.2.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description  |
|-----------------------|-----------|--|
| Final test            | 04        | Charging:Keep the battery of the EUT in charging mode. |
| Final test            | 05        | Idle:Keep the EUT standby.                             |



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**7.2.4 Test Condition and Results:**

Performance Criterion: B

Interval: 60s between each surge

No. of surges: 5 positive, 5 negative at 0°, 90°, 180°, 270°

| Test Line | Level (kV) | Polarity | Phase (deg) | Result / Observations |
|-----------|------------|----------|-------------|-----------------------|
| L-N       | 1          | +        | 0°          | A                     |
| L-N       | 1          | -        | 0°          | A                     |
| L-N       | 1          | +        | 90°         | A                     |
| L-N       | 1          | -        | 90°         | A                     |
| L-N       | 1          | +        | 180°        | A                     |
| L-N       | 1          | -        | 180°        | A                     |
| L-N       | 1          | +        | 270°        | A                     |
| L-N       | 1          | -        | 270°        | A                     |

A: No degradation in the performance of the EUT was observed

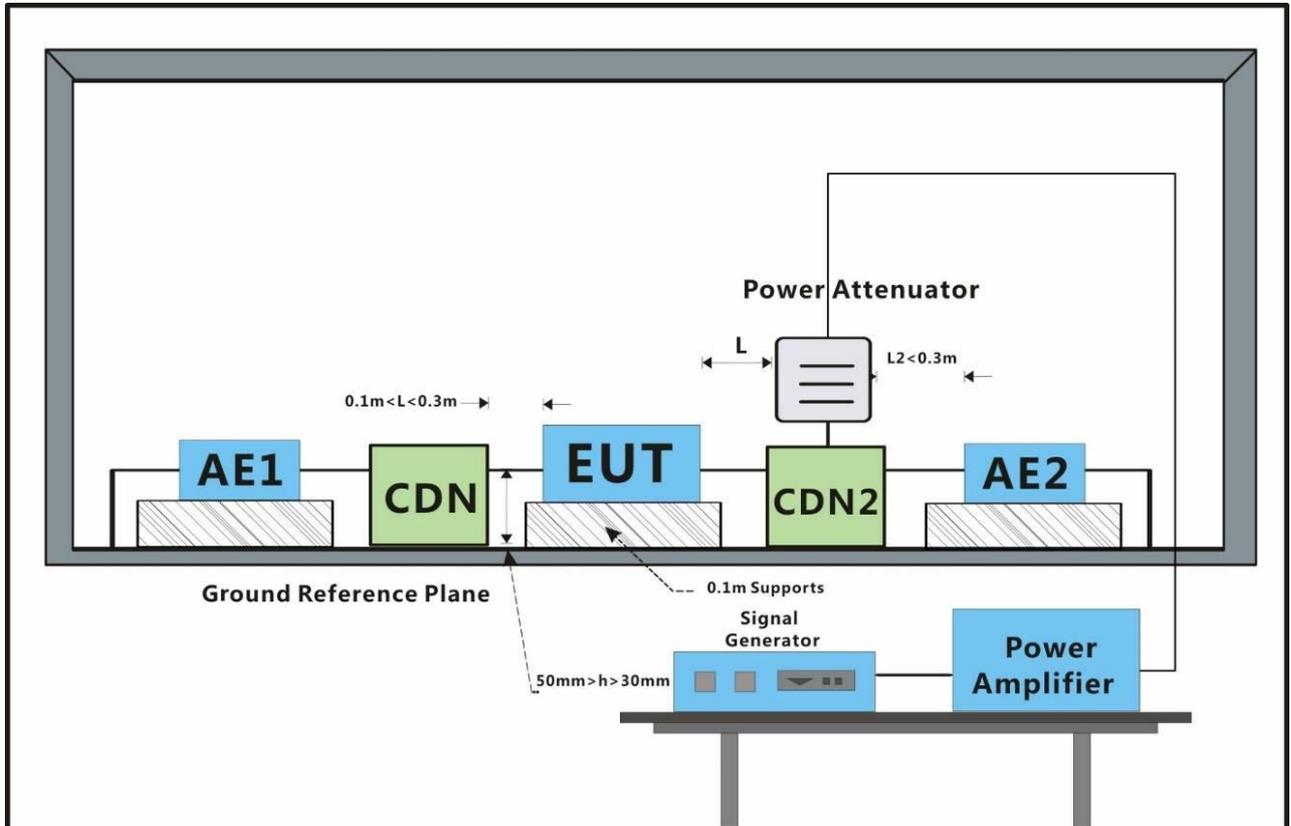


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### 7.3 Conducted Immunity at AC Mains Power Port (150kHz-80MHz)

Test Requirement: EN 301 489-1 V2.2.3  
 EN 301 489-17 V3.2.4  
 Test Method: EN 61000-4-6:2014

#### 7.3.1 Test Setup Diagram



#### 7.3.2 E.U.T. Operation

Operating Environment:  
 Temperature: 20.7 °C      Humidity: 50.2 % RH      Atmospheric Pressure: 1010 mbar

#### 7.3.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description   |
|-----------------------|-----------|---|
| Final test            | 04        | Charging: Keep the battery of the EUT in charging mode. |
| Final test            | 05        | Idle: Keep the EUT standby.                             |



**7.3.4 Test Condition and Results:**

Performance Criterion: A

Frequency Range: 0.15MHz to 80MHz

Modulation: 80%, 1kHz Amplitude Modulation

Step Size: 1%

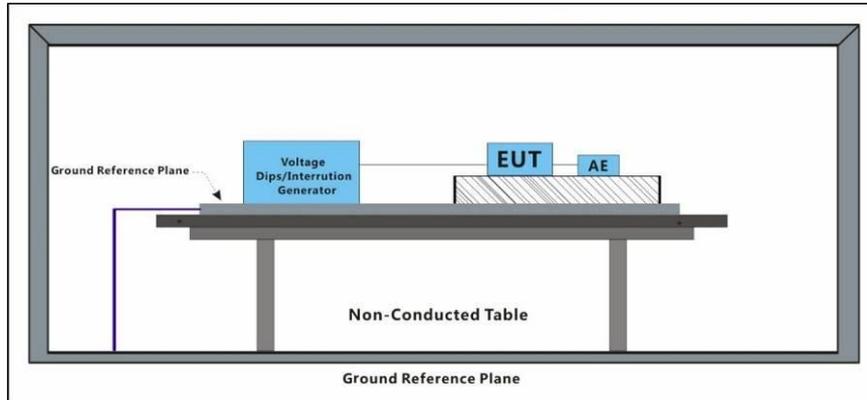
| Cable port   | Level (Vrms) | CDN/Clamp | Dwell time | Result / Observations |
|--|--------------|-----------|------------|-----------------------|
| AC power port  | 3            | CDN       | 2s         | A                     |
| A: No degradation in the performance of the EUT was observed |              |           |            |                       |



## 7.4 Voltage Dips and Interruptions

Test Requirement: EN 301 489-1 V2.2.3  
 EN 301 489-17 V3.2.4  
 Test Method: EN 61000-4-11:2004 +A1:2017

### 7.4.1 Test Setup Diagram



### 7.4.2 E.U.T. Operation

Operating Environment:  
 Temperature: 20.8 °C      Humidity: 49.9 % RH      Atmospheric Pressure: 1010 mbar

### 7.4.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description  |
|-----------------------|-----------|--|
| Final test            | 04        | Charging:Keep the battery of the EUT in charging mode. |
| Final test            | 05        | Idle:Keep the EUT standby.                             |



**7.4.4 Test Condition and Results:**

Performance Criterion: 0% of UT (Supply Voltage) for 0.5 Periods:B;  
 0% of UT for 1 Periods:B; 0% of UT for 250 Periods:C;  
 70 % of UT for 25 Periods:C  
 No. of Dips / Interruptions: 3 per Level  
 Time between dropout: 10s

| Level % UT | Phase (deg) | Duration   | No. of Dips / Interruptions | Result / Observations |
|------------|-------------|------------|-----------------------------|-----------------------|
| 0          | 0°          | 0.5 Cycles | 3                           | A                     |
| 0          | 180°        | 0.5 Cycles | 3                           | A                     |
| 0          | 0°          | 1 Cycles   | 3                           | A                     |
| 0          | 180°        | 1 Cycles   | 3                           | A                     |
| 0          | 0°          | 250 Cycles | 3                           | C                     |
| 0          | 180°        | 250 Cycles | 3                           | C                     |
| 70         | 0°          | 25 Cycles  | 3                           | A                     |
| 70         | 180°        | 25 Cycles  | 3                           | A                     |

A: No degradation in the performance of the EUT was observed

C: The EUT stop being charged during the test. It can recover automatically after the test.

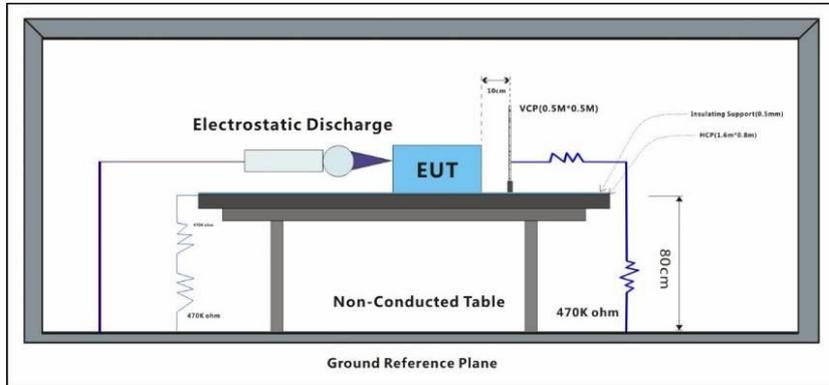


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### 7.5 Electrostatic Discharge

Test Requirement: EN 301 489-1 V2.2.3  
 EN 301 489-17 V3.2.4  
 Test Method: EN 61000-4-2:2009

#### 7.5.1 Test Setup Diagram



#### 7.5.2 E.U.T. Operation

Operating Environment:  
 Temperature: 23.1 °C      Humidity: 45.2 % RH      Atmospheric Pressure: 1010 mbar

#### 7.5.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description  |
|-----------------------|-----------|--|
| Final test            | 03        | Operation(BT):Keep the EUT communicating with other Bluetooth devices. |
| Final test            | 04        | Charging:Keep the battery of the EUT in charging mode.                 |
| Final test            | 05        | Idle:Keep the EUT standby.   |



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**7.5.4 Test Condition and Results:**

Performance Criterion: B

Discharge Impedance: 330Ω/150pF

Number of Discharge: Minimum 10 times at each test point

Discharge Mode: Single Discharge

Discharge Period: 1 second minimum

Test Point: 1. All insulated enclosure and seams.

2. All accessible metal parts of the enclosure.

3. All side

| Discharge type      | Level (kV) | Polarity | Test Point | Result / Observations |
|---------------------|------------|----------|------------|-----------------------|
| Air Discharge       | 2,4,8      | +        | 1          | A                     |
| Air Discharge       | 2,4,8      | -        | 1          | A                     |
| Contact Discharge   | 4          | +        | 2          | A                     |
| Contact Discharge   | 4          | -        | 2          | A                     |
| Horizontal Coupling | 4          | +        | 3          | A                     |
| Horizontal Coupling | 4          | -        | 3          | A                     |
| Vertical Coupling   | 4          | +        | 3          | A                     |
| Vertical Coupling   | 4          | -        | 3          | A                     |

A: No degradation in the performance of the EUT was observed

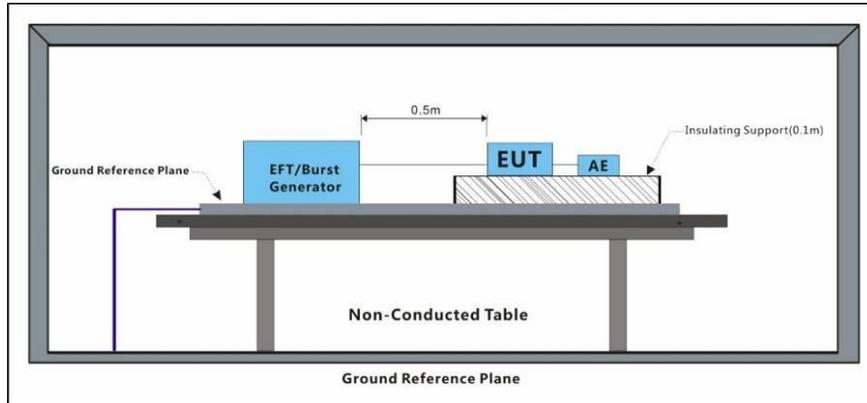


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**7.6 Electrical Fast Transients Burst at AC Mains Power Port**

Test Requirement: EN 301 489-1 V2.2.3  
 EN 301 489-17 V3.2.4  
 Test Method: EN 61000-4-4:2012

**7.6.1 Test Setup Diagram**



**7.6.2 E.U.T. Operation**

Operating Environment:  
 Temperature: 23.1 °C      Humidity: 45.2 % RH      Atmospheric Pressure: 1010 mbar

**7.6.3 Test Mode Description**

| Pre-scan / Final test | Mode Code | Description  |
|-----------------------|-----------|--|
| Final test            | 04        | Charging:Keep the battery of the EUT in charging mode. |

**7.6.4 Test Condition and Results:**

Performance Criterion: B  
 Repetition Frequency: 5kHz  
 Burst Period: 300ms

| Test Line           | Level (kV) | Polarity | CDN/Clamp | Result / Observations |
|---------------------|------------|----------|-----------|-----------------------|
| AC mains power port | 1          | +        | CDN       | A                     |
| AC mains power port | 1          | -        | CDN       | A                     |

A: No degradation in the performance of the EUT was observed



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## 8 Test Setup Photo

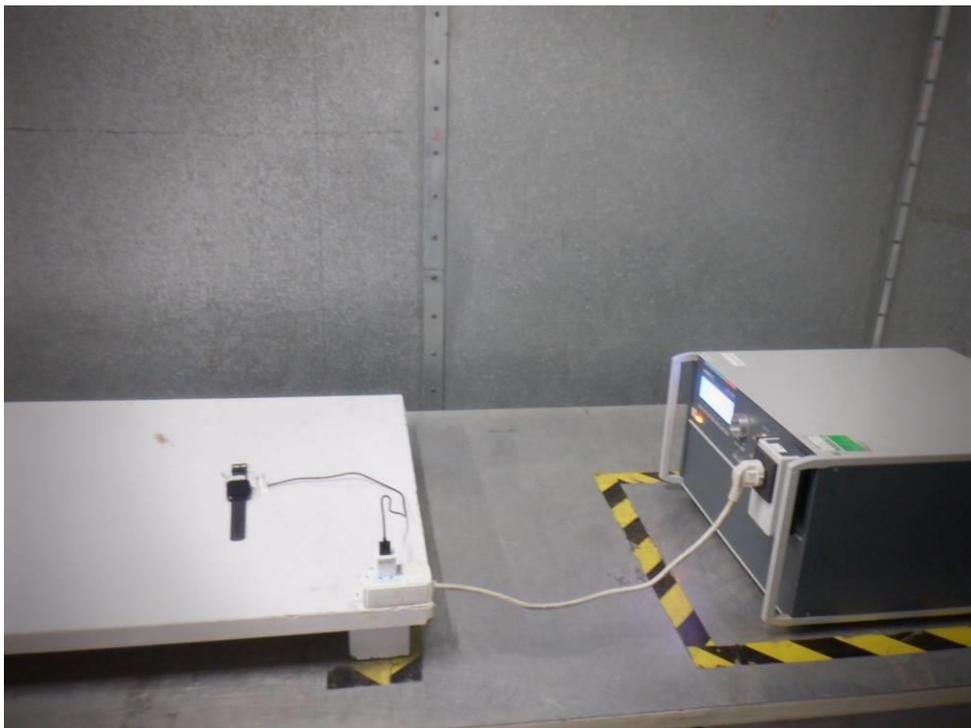
### Conducted Emissions at AC Mains Power Port (150kHz-30MHz)



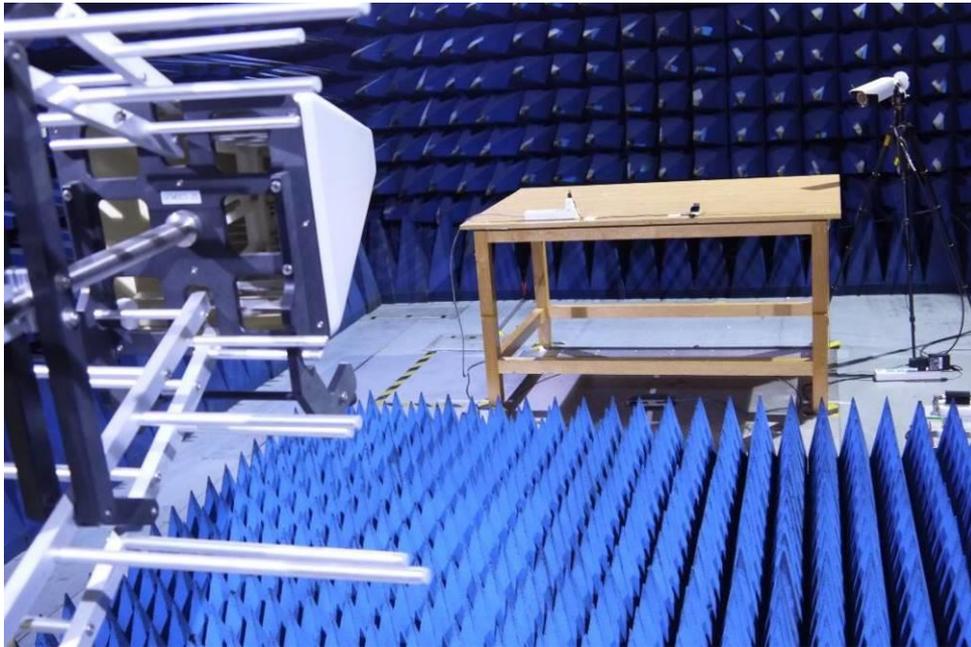
### Radiated Emissions (30MHz-1GHz)



### Voltage Fluctuations and Flicker

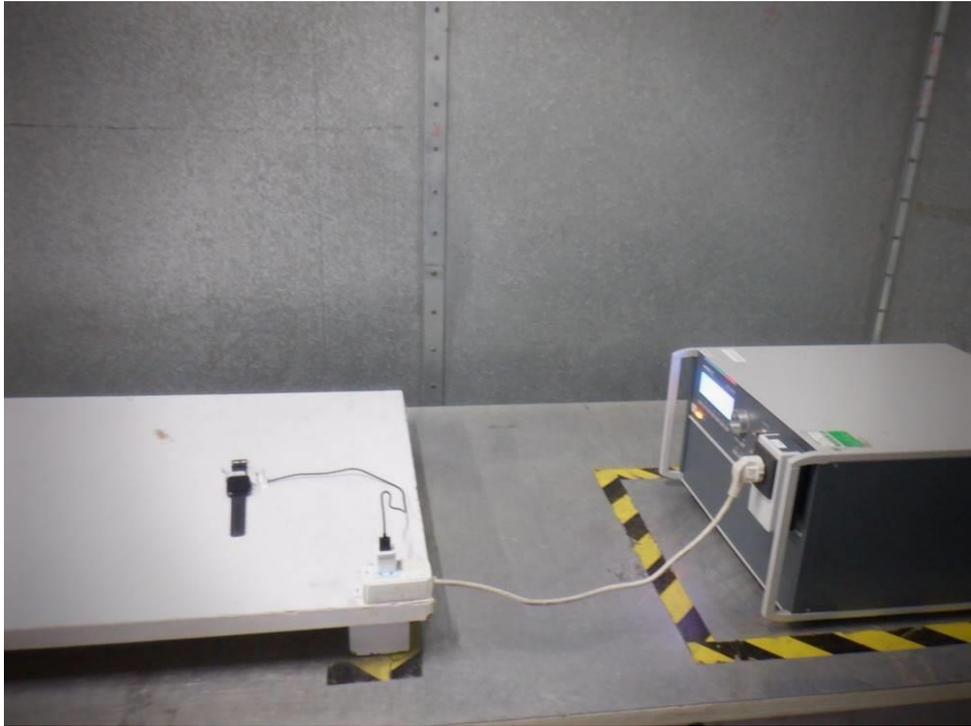


### Radiated Immunity (80MHz-6GHz)

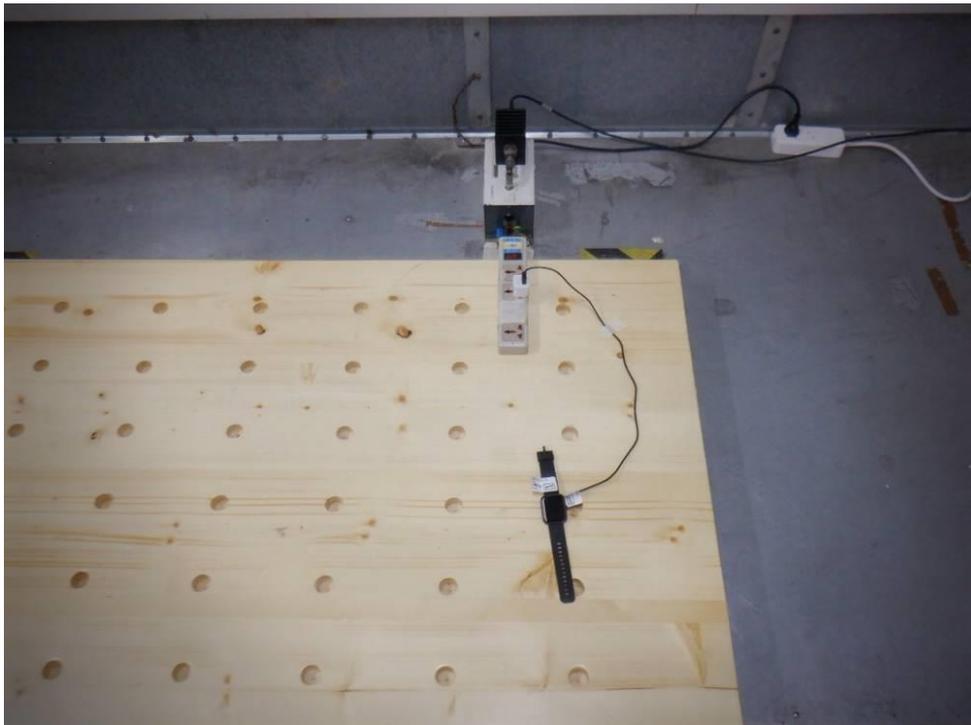


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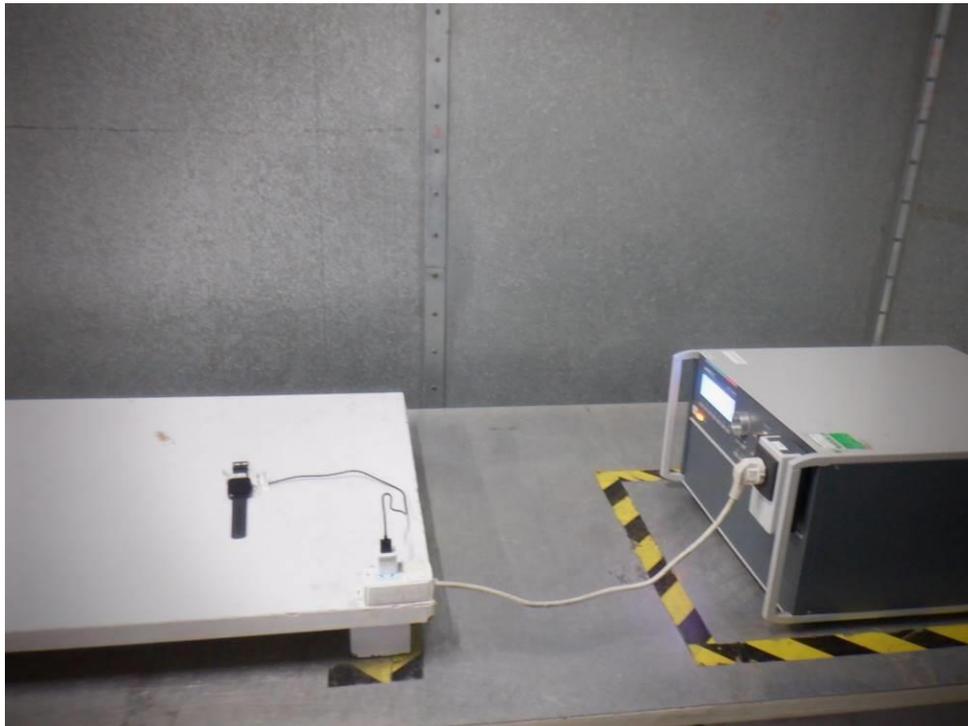
**Surge at AC Mains Power Port**



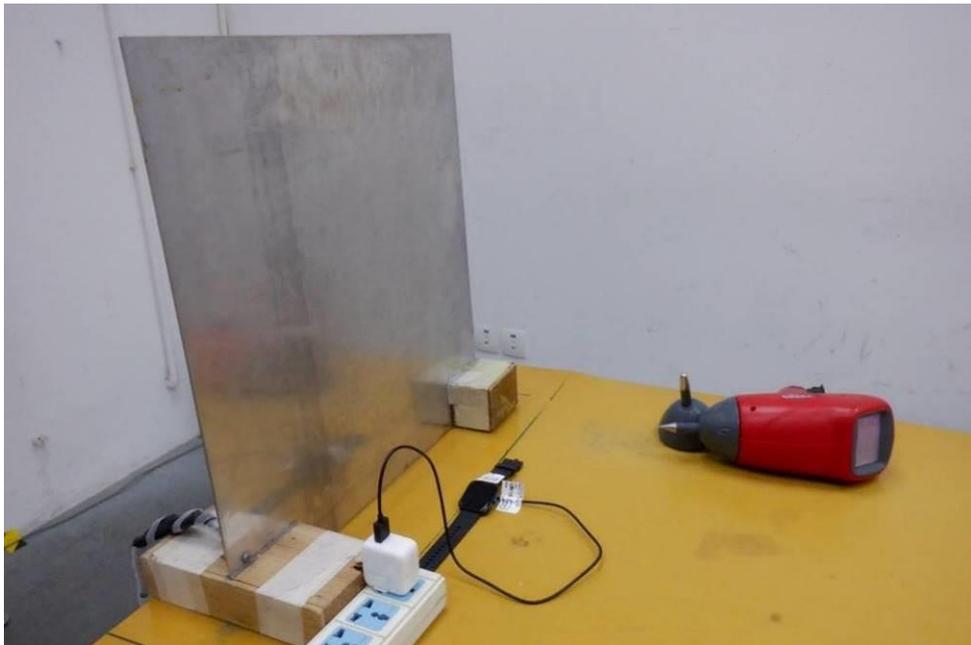
**Conducted Immunity at AC Mains Power Port (150kHz-80MHz)**



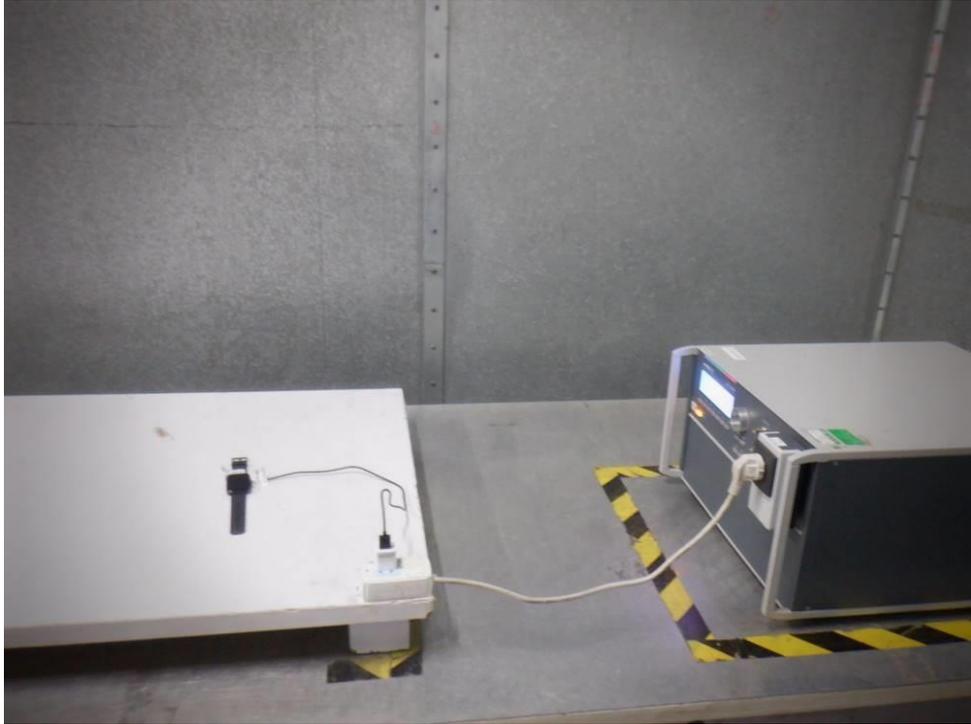
**Voltage Dips and Interruptions**



### Electrostatic Discharge



### Electrical Fast Transients Burst at AC Mains Power Port



## 9 EUT Constructional Details (EUT Photos)

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM2012013549CR.

- End of the Report -

