

ETSI EN 301 489-1 V2.1.1: 2017/-17 V3.1.1: 2017
EMISSION/IMMUNITY/HARMONICS/FLICKER
COMPLIANCE

Test Report

FOR

" TWinS " TWS Bluetooth Sporty Earphone Set

Model No.: BH-289

Trade Mark:

Report No.: ED170717013E

Issue Date: July 27, 2017

Prepared for

Prepared by

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1 TEST RESULT CERTIFICATION

Applicant :

Manufacture :

EUT : " TWinS " TWS Bluetooth Sporty Earphone Set

Model : BH-289

Trademark :

Measurement Procedure Used:

| APPLICABLE STANDARDS | |
|---------------------------------|-------------|
| STANDARD | TEST RESULT |
| ETSI EN 301 489-1 V2.1.1: 2017 | PASS |
| ETSI EN 301 489-17 V3.1.1: 2017 | PASS |

The device described above is tested by EMTEK (DONGGUAN) CO., LTD and EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (DONGGUAN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the ETSI EN 301 489-1 V2.1.1: 2017 and ETSI EN 301 489-17 V3.1.1: 2017 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (DONGGUAN) CO., LTD.

Date of Test :

July 17, 2017 to July 24, 2017

Abby Li

Prepared by :

Abby Li/Editor

Tomas Yang

Reviewer :

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Approve & Authorized Signer :

Sam Lv/Manager

Modified History

| Version | Report No. | Revision Date | Summary |
|---------|-----------------|---------------|--------------|
| V1.0 | Original Report | / | ED170717013E |
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| | | | |

2 EUT DESCRIPTION

| | | | |
|---------------------|--|--|-------------------------------|
| Product: | " TWinS " TWS Bluetooth Sporty Earphone Set | | |
| Model Number: | BH-289 | | |
| Trademark: | | | |
| Modulation: | <input type="checkbox"/> WIFI | DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n; | |
| | <input checked="" type="checkbox"/> BT-CM | GFSK, $\pi/4$ -DQPSK, 8DPSK | |
| | <input type="checkbox"/> BT-LE | GFSK | |
| Frequency Range: | <input type="checkbox"/> WIFI | <input type="checkbox"/> 2412-2472MHz for 802.11b; <input type="checkbox"/> 2412-2472MHz for 802.11g; <input type="checkbox"/> 2412-2472MHz for 802.11n(HT20); <input type="checkbox"/> 2422-2462MHz for 802.11n(HT40); | |
| | <input checked="" type="checkbox"/> BT-CM | <input checked="" type="checkbox"/> 2402-2480MHz | |
| | <input type="checkbox"/> BT-LE | <input type="checkbox"/> 2402-2480MHz | |
| Number of Channels: | <input type="checkbox"/> WIFI | <input type="checkbox"/> 13 Channels for 802.11b; <input type="checkbox"/> 13 Channels for 802.11g; <input type="checkbox"/> 13 Channels for 802.11n(HT20); <input type="checkbox"/> 9 Channels for 802.11n(HT40); | |
| | <input checked="" type="checkbox"/> BT-CM | <input checked="" type="checkbox"/> 79 Channels | |
| | <input type="checkbox"/> BT-LE | <input type="checkbox"/> 40 Channels | |
| Smart system: | <input type="checkbox"/> WIFI | <input type="checkbox"/> SISO | <input type="checkbox"/> MIMO |
| | <input checked="" type="checkbox"/> BT-CM | <input checked="" type="checkbox"/> SISO | <input type="checkbox"/> MIMO |
| | <input type="checkbox"/> BT-LE | <input type="checkbox"/> SISO | <input type="checkbox"/> MIMO |
| Max Transmit Power: | <input type="checkbox"/> WIFI | | |
| | <input checked="" type="checkbox"/> BT-CM | 0.75dBm | |
| | <input type="checkbox"/> BT-LE | | |
| Antenna: | <input type="checkbox"/> WIFI | | |
| | <input checked="" type="checkbox"/> BT-CM | PCB Antenna | |
| | <input type="checkbox"/> BT-LE | | |
| Antenna Gain: | <input type="checkbox"/> WIFI | | |
| | <input checked="" type="checkbox"/> BT-CM | 0 dBi | |
| | <input type="checkbox"/> BT-LE | | |
| Power supply: | <input checked="" type="checkbox"/> DC 3.7V Battery | | |
| | <input checked="" type="checkbox"/> AC 230V/50Hz for adapter | | |
| Temperature Range: | -20°C ~ +55°C | | |

3 SUMMARY OF TEST RESULT

| Applicable Standard: ETSI EN 301 489-1 v2.1.1: 2017 | | | |
|---|---|--------|---------|
| Standard | Description of Test Item | Result | Remarks |
| EN 55032:2015 | Conducted Emissions From The AC Mains Power Ports Emission Test 150 kHz – 30 MHz | - | Note1 |
| | Asymmetric Mode Conducted Emissions Emission Test 150 kHz – 30 MHz | - | Note1 |
| | Radiated Emissions 30 MHz – 1000 MHz @ 3 m 1000 MHz – 6000 MHz @ 3 m | PASS | |
| EN 61000-3-2:2006 +A1:2009+A2:2009 | Harmonic current emission test | - | Note1 |
| EN 61000-3-3:2013 | Voltage fluctuations & flicker tests | - | Note1 |
| EN 61000-4-2:2009 | Electrostatic Discharge ± 2, 4 kV Contact Discharge ± 2, 4, 8 kV Air Discharge Standard Criterion B | PASS | |
| EN 61000-4-3:2006 +A1:2008+A2:2010 | Radio frequency electromagnetic field Frequency Range: 80 MHz to 6000 MHz and Electromagnetic field: 3 V/m (unmodulated, r.m.s) Amplitude modulated: 80 % AM (1 kHz) Standard Criterion A | PASS | |
| EN 61000-4-4:2012 | Fast transients, common mode AC ports 5/50 ns, ± 1 kV, 5 kHz DC ports 5/50 ns, ± 0.5 kV I/O ports 5/50 ns, ± 0.5 kV, 5 kHz Standard Criterion B | - | Note1 |
| EN 61000-4-5:2006 | Surge (Power port 1.2/50 µs, Signal port 10/700 µs / 1.2/50 µs) AC ports: line to line: ± 0.5 kV, 1 kV line to earth: ± 0.5 kV, 1 kV, 2 kV indoor signal ports and telecommunication ports: ± 0.5 kV outdoor signal ports and telecommunication ports for symmetrically operated: ± 1 kV non-symmetrically operated: ± 0.5 kV, 1 kV Standard Criterion B | - | Note1 |
| EN 61000-4-6:2009 | Radio frequency, common mode Frequency Range: 150 kHz to 80 MHz Electromagnetic field: 3 V (unmodulated, r.m.s) Amplitude modulated: 80 % AM (1 kHz) Standard Criterion A | - | Note1 |
| EN 61000-4-11:2004 | Voltage dips and interruptions voltage dip 0% 10 ms (0.5 cycles) – Standard Criterion B voltage dip 0% 20 ms (1.0 cycles) – Standard Criterion B voltage dip 70% (at 50 Hz) 500 ms (25 cycles) – Standard Criterion C voltage interruption 0% (at 50 Hz) 5000 ms (250 cycles) – Standard Criterion C | - | Note1 |
| Note1: Not applicable | | | |

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
ETSI EN 301 489-1: ElectroMagnetic Compatibility (EMC) standard for radio equipment and services;
Part 1: Common technical requirements; Harmonised Standard covering the essential requirements
of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU
ETSI EN 301 489-17: ElectroMagnetic Compatibility (EMC) standard for radio equipment and services;
Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering
the essential requirements of article 3.1(b) of Directive 2014/53/EU

4.2 MEASUREMENT EQUIPMENT USED

FOR RADIATED EMISSION MEASUREMENT

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|--------------------------------|-----------------|-----------|------------|--------------|---------------|
| 1. | Test Receiver | Rohde & Schwarz | ESCI | 100137 | May 16, 2017 | 1 Year |
| 2. | Bilog Antenna | Schwarzbeck | VULB9163 | 000141 | May 16, 2017 | 1 Year |
| 3. | Power Amplifier | CDS | RSU-M352 | 818 | May 16, 2017 | 1 Year |
| 4. | Power Amplifier | HP | 8447F | OPT H64 | May 16, 2017 | 1 Year |
| 5. | Color Monitor | SUNSPO | SP-140A | N/A | May 16, 2017 | 1 Year |
| 6. | Single Line Filter | JIANLI | XL-3 | N/A | May 16, 2017 | 1 Year |
| 7. | Single Phase Power Line Filter | JIANLI | DL-2X100B | N/A | May 16, 2017 | 1 Year |
| 8. | 3 Phase Power Line Filter | JIANLI | DL-4X100B | N/A | May 16, 2017 | 1 Year |
| 9. | DC Power Filter | JIANLI | DL-2X50B | N/A | May 16, 2017 | 1 Year |
| 10. | Cable | Schwarzbeck | PLF-100 | 519489 | May 16, 2017 | 1 Year |
| 11. | Cable | Rosenberger | CIL02 | A0783566 | May 16, 2017 | 1 Year |
| 12. | Cable | Rosenberger | RG 233/U | 525178 | May 16, 2017 | 1 Year |

FOR ELECTROSTATIC DISCHARGE TEST

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|------------|--------------|-----------|------------|--------------|---------------|
| 1 | ESD Tester | TESEQ AG | NSG437 | EE166 | May 16, 2017 | 1 Year |

FOR RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY

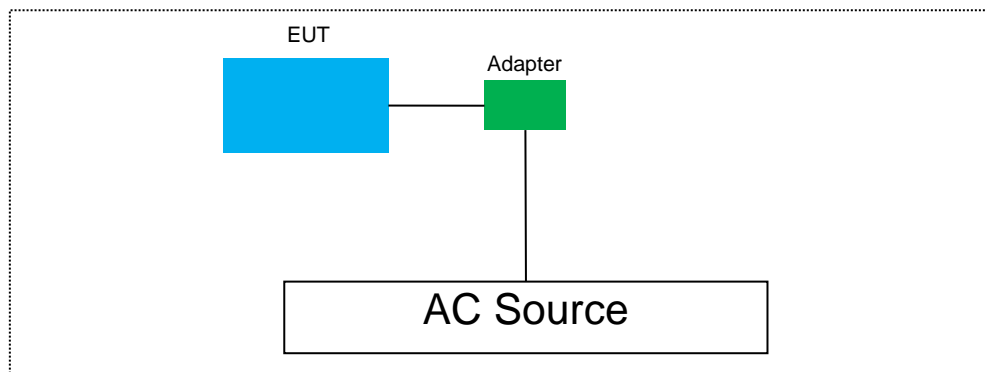
| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|---------------------------------|--------------|--------------|-------------------|--------------|---------------|
| 1 | Signal Generator | Agilent | N5181A | MY50145187 | May 16, 2017 | 1 Year |
| 2 | RF Power Meter. Dual Channel | BOONTON | 4232A | 10539 | May 16, 2017 | 1 Year |
| 3 | 50ohm Diode Power Sensor | BOONTON | 51011EMC | 34236/34238 | May 16, 2017 | 1 Year |
| 4 | Field Strength Meter | DARE | RSS1006A | 10I00037SO2 2 | May 16, 2017 | 1 Year |
| 5 | 50ohm Diode Power Sensor | BOONTON | 51011EMC | 36164 | May 16, 2017 | 1 Year |
| 6 | Power Amplifier | MILMEGA | 80RF1000-175 | 1059345 | May 16, 2017 | 1 Year |
| 7 | Power Amplifier | MILMEGA | AS0102-55 | 1018770 | May 16, 2017 | 1 Year |
| 8 | Power Amplifier | MILMEGA | AS1860-50 | 1059346 | May 16, 2017 | 1 Year |
| 9 | Log.-Per. Antenna | Schwarzbeck | VULP 9118E | 811 | May 16, 2017 | 1 Year |
| 10 | Broad-Band Horn Antenna | Schwarzbeck | STLP 9149 | 9149-227 | May 16, 2017 | 1 Year |
| 11 | Multi-function interface system | DARE | CTR1009B | 12I00250SNO 72 | N/A | N/A |
| 12 | Automatic switch group | DARE | RSW1004A | N/A | N/A | N/A |

4.3 DESCRIPTION OF TEST MODES

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

| Test Mode | Description |
|---|-------------|
| 1 | BT LINK |
| 2 | BT IDLE |
| 3 | |
| Mode 1 is the worst case, so it was selected to record in this test report. | |

4.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



4.5 SUPPORT EQUIPMENT

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID | Note |
|------|-----------|-----------|-----------------|--------|------|
| 1. | Adapter | N/A | YSV6-0501000 US | N/A | N/A |

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

| Site Description | |
|------------------|--|
| EMC Lab. | <ul style="list-style-type: none">: Accredited by CNAS, 2015.09.24: The certificate is valid until 2018.07.03: The Laboratory has been assessed and proved to be in compliance: with CNAS/CL01:2006 <p>The Certificate Registration Number is L3150</p> <p>Registered on Industry Canada, January 13, 2017</p> <p>The Certificate Number is 9444A</p> |

6 TEST SYSTEM UNCERTAINTY

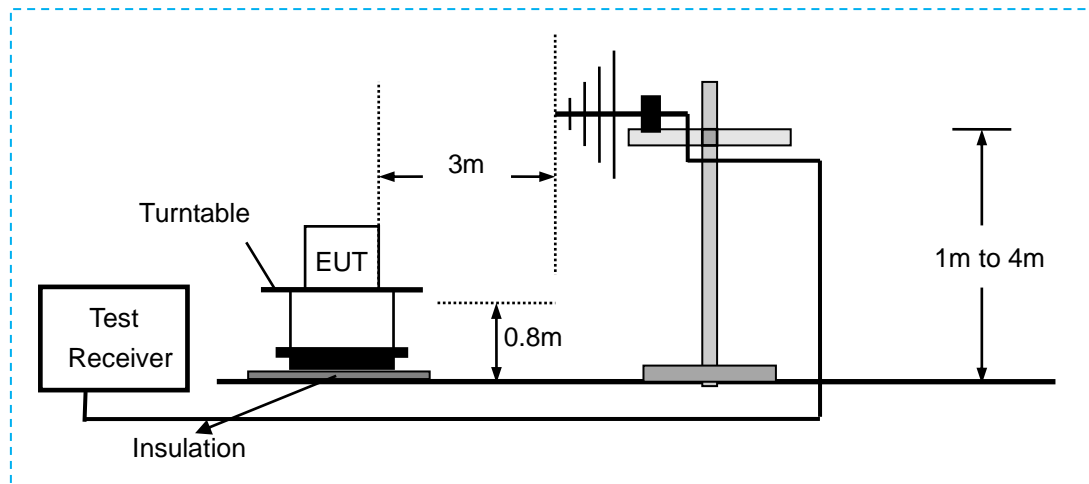
Maximum measurement uncertainty of the test system

| Test Item | Measurement Uncertainty |
|--|--|
| Conducted Emissions | 2.96dB(9k~150kHz Conduction 1#) 2.74dB(150k-30MHz Conduction 1#) |
| Radiated Emission(3m Chamber) | 3.78dB (30M~1GHz Polarize: H) 4.27dB (30M~1GHz Polarize: V) 3.7dB (1~18GHz Polarize: H) 3.6dB (1~18GHz Polarize: V) |
| Voltage fluctuations & flicker tests | 0.07% |
| Harmonic current emission test | 1.8% |
| Electrostatic Discharge | 6 % |
| Radio frequency, common mode | 1.45(Using CDN Test) 2.37(Using EM Clamp Test) |
| Radio frequency electromagnetic field | 2.10dB(80MHz-1000MHz) 1.76dB(1000MHz-6000MHz) |
| Uncertainty for test site temperature and humidity | 0.6℃ 4% |

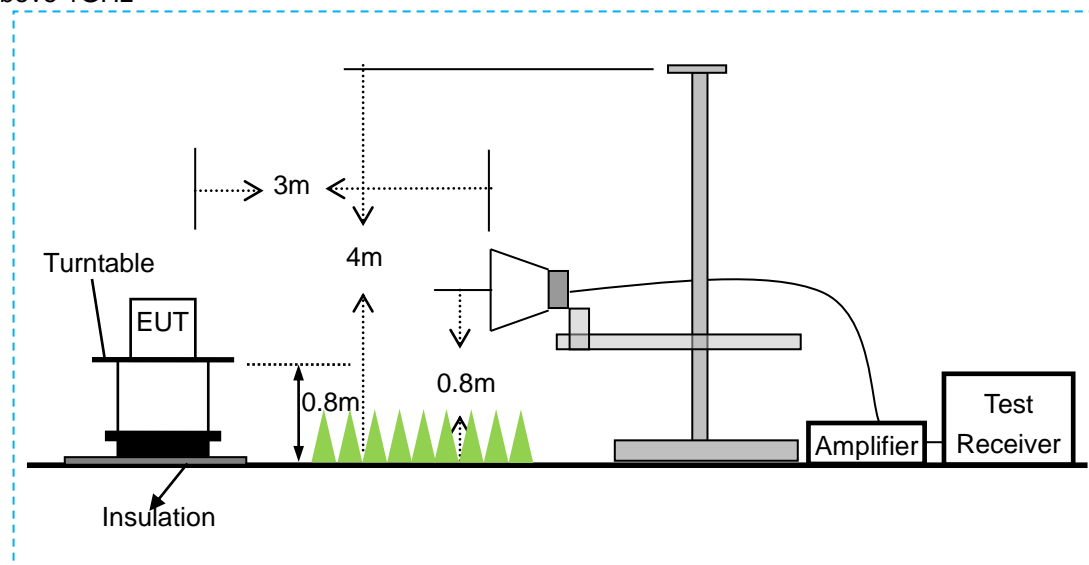
7 RADIATED EMISSIONS

7.1 BLOCK DIAGRAM OF TEST SETUP

Below 1GHz



Above 1GHz



7.2 MEASURING STANDARD

ETSI EN 301 489-1 Clause 8.2
EN 55032: 2015 Clause A.2

7.3 RADIATED EMISSION LIMITS (CLASS B)

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

| Table clause | Frequency range MHz | Measurement | | | Class B limits dB(mV/m) |
|--|---------------------|-----------------------------|---------------|-----------------------------|----------------------------|
| | | Facility (see Table A.1) | Distance m | Detector type /bandwidth | |
| A4.1 | 30 to 230 | OATS/SAC | 10 | Quasi Peak / 120 kHz | 30 |
| | 230 to 1 000 | | | | 37 |
| A4.2 | 30 to 230 | OATS/SAC | 3 | | 40 |
| | 230 to 1 000 | | | | 47 |
| A4.3 | 30 to 230 | FAR | 10 | Quasi Peak / 120 kHz | 32 to 25 |
| | 230 to 1 000 | | | | 32 |
| A4.4 | 30 to 230 | FAR | 3 | | 42 to 35 |
| | 230 to 1 000 | | | | 42 |
| Apply only table clause A4.1 or A4.2 or A4.3 or A4.4 across the entire frequency range. These requirements are not applicable to the local oscillator and harmonics frequencies of equipment covered by Table A.6. | | | | | |

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

7.4 EUT CONFIGURATION ON MEASUREMENT

The EN 55032 regulations test method must be used to find the maximum emission during radiated emission measurement.

7.5 OPERATING CONDITION OF EUT

Operating Condition of EUT is listed in section 4.4.

7.6 TEST PROCEDURE

The EUT is placed on a turntable which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 and 10 meters away from the receiving antenna that is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) and horn antenna are used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

ResultdB(uV/m):

Measurement Level dB(uV/m)= Antenna factor(dB) –Amp Factor +Cable Loss(dB) +Reading Level dB(uV)

Note: Antenna factor(dB) and Cable Loss(dB) are included Correct factor(dB) in test software.

Margin QP(db)=Reading Level dB(uV/m)- Limit dB(uV/m) for 30~1GHz
Over(db)= Emission Level dB(uV/m)- Limit dB(uV/m) for above 1GHz

The bandwidth of the Receiver is set at 120 kHz (For 30MHz to 1000MHz).
The resolution bandwidth of the receiver RS ESU26 was set at 1MHz ((For above 1GHz.).
The frequency range for 1GHz to 6GHz was checked with peak and average detector, measurement distance is 3m in 3m Anechoic chamber.

The frequency range for 30MHz to 1GHz was checked with Quasi-peak detector, measurement distance is 3m in 3m semi-chamber.

7.7 MEASURING RESULTS

PASS.

All of the Configurations were tested,
the data of the worst case are recorded in the appendix A.

8 PERFORMANCE CRITERIA

8.1 GENERAL PERFORMANCE CRITERIA

The performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

8.2 PERFORMANCE TABLE

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

8.3 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.

8.4 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.

8.5 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.

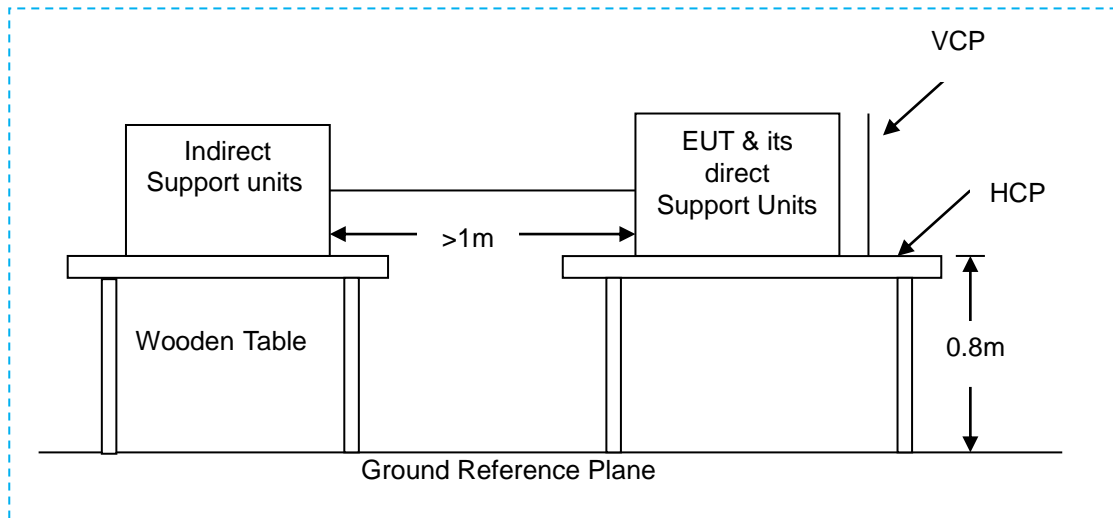
8.6 PERFORMANCE CRITERIA FOR TRANSIENT PHENOMENA APPLIED TO RECEIVERS (TR)

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.

9 ELECTROSTATIC DISCHARGE

9.1 BLOCK DIAGRAM OF TEST SETUP



9.2 TEST STANDARD

According to ETSI EN 301 489-1 Clause 9.3 and EN 61000-4-2

9.3 SEVERITY LEVELS AND PERFORMANCE CRITERION

9.3.1 SEVERITY LEVEL

| Level | Test Voltage Contact Discharge (kV) | Test Voltage Air Discharge (kV) |
|-------|--|------------------------------------|
| 1 | ±2 | ±2 |
| 2 | ±4 | ±4 |
| 3 | ±6 | ±8 |
| 4 | ±8 | ±15 |
| X | Special | Special |

9.3.2 PERFORMANCE CRITERION

| | | | |
|-----------------------------|--|-----------------------------|--|
| <input type="checkbox"/> CT | <input checked="" type="checkbox"/> TT | <input type="checkbox"/> CR | <input checked="" type="checkbox"/> TR |
|-----------------------------|--|-----------------------------|--|

9.4 OPERATING CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

9.5 TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

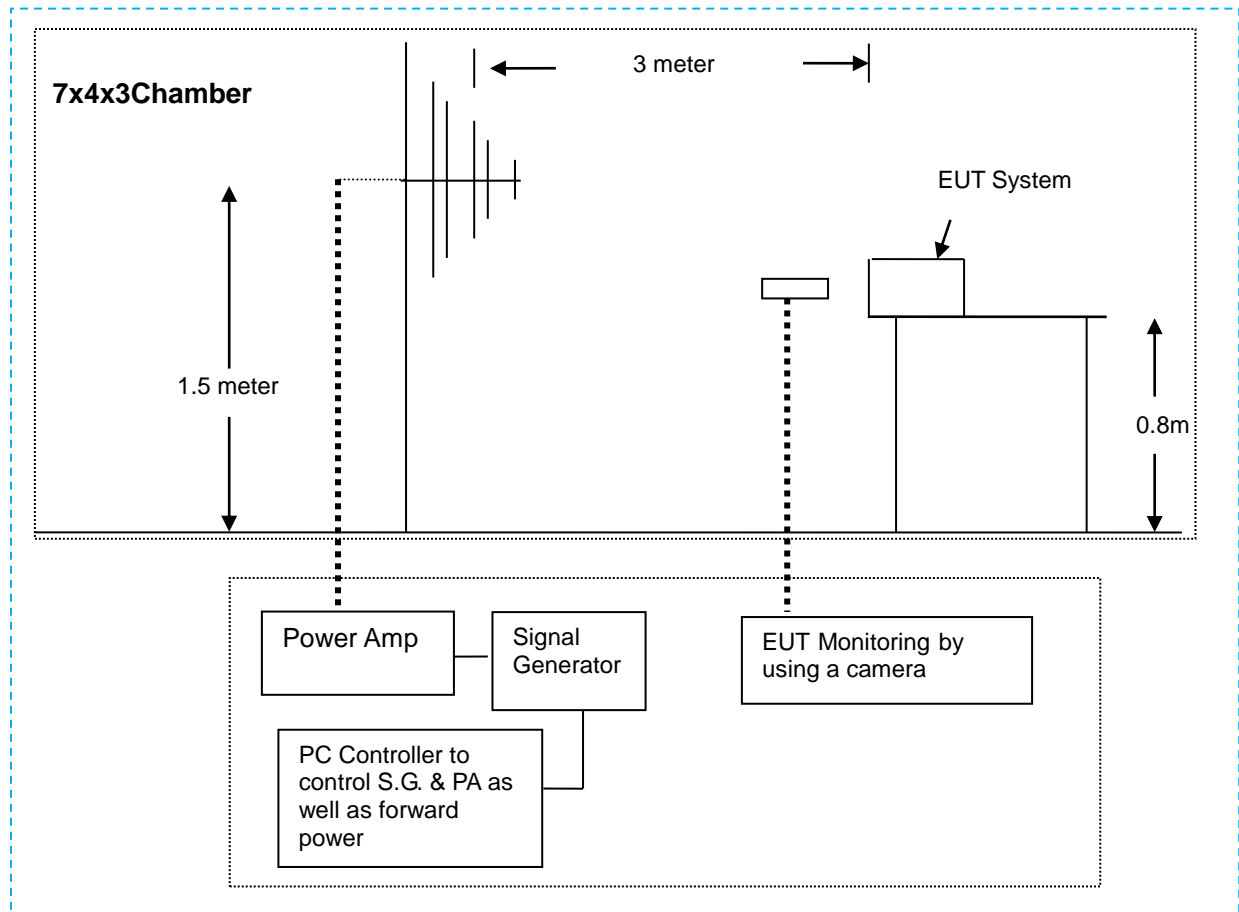
9.6 TEST RESULTS

PASS.

All of the Configurations were tested,
the data of the worst case are recorded in the appendix A.

10 RADIO FREQUENCY ELECTROMAGNETIC FIELD

10.1 BLOCK DIAGRAM OF TEST SETUP



10.2 TEST STANDARD

According to ETSI EN 301 489-1 Clause 9.2 and EN 61000-4-3

10.3 SEVERITY LEVELS AND PERFORMANCE CRITERION

10.3.1 SEVERITY LEVELS

| Level | Field Strength V/m |
|-------|--------------------|
| 1 | 1 |
| 2 | 3 |
| 3 | 10 |
| X | Special |

10.3.2 PERFORMANCE CRITERION

| | | | |
|--|-----------------------------|--|-----------------------------|
| <input checked="" type="checkbox"/> CT | <input type="checkbox"/> TT | <input checked="" type="checkbox"/> CR | <input type="checkbox"/> TR |
|--|-----------------------------|--|-----------------------------|

10.4 OPERATING CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

10.5 TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.2.2 and EN 61000-4-3 for the measurement methods.

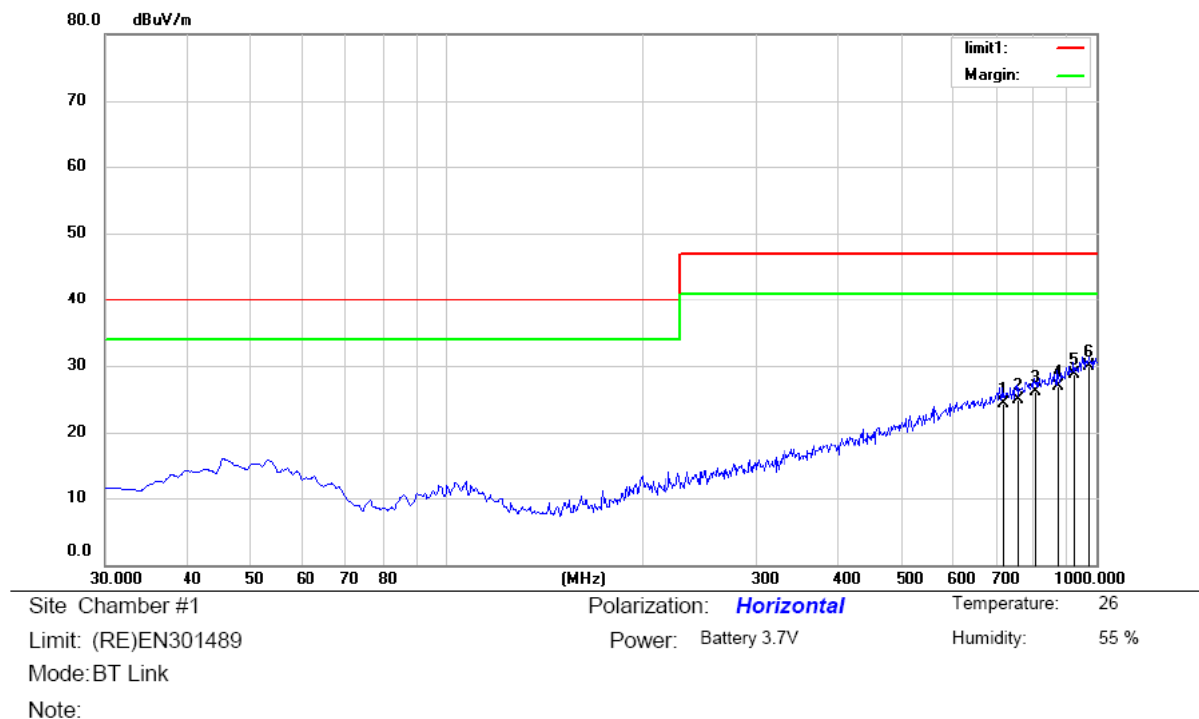
10.6 TEST RESULTS

PASS.

All of the Configurations were tested,
the data of the worst case are recorded in the appendix A.

11 APPENDIX A TEST DATA

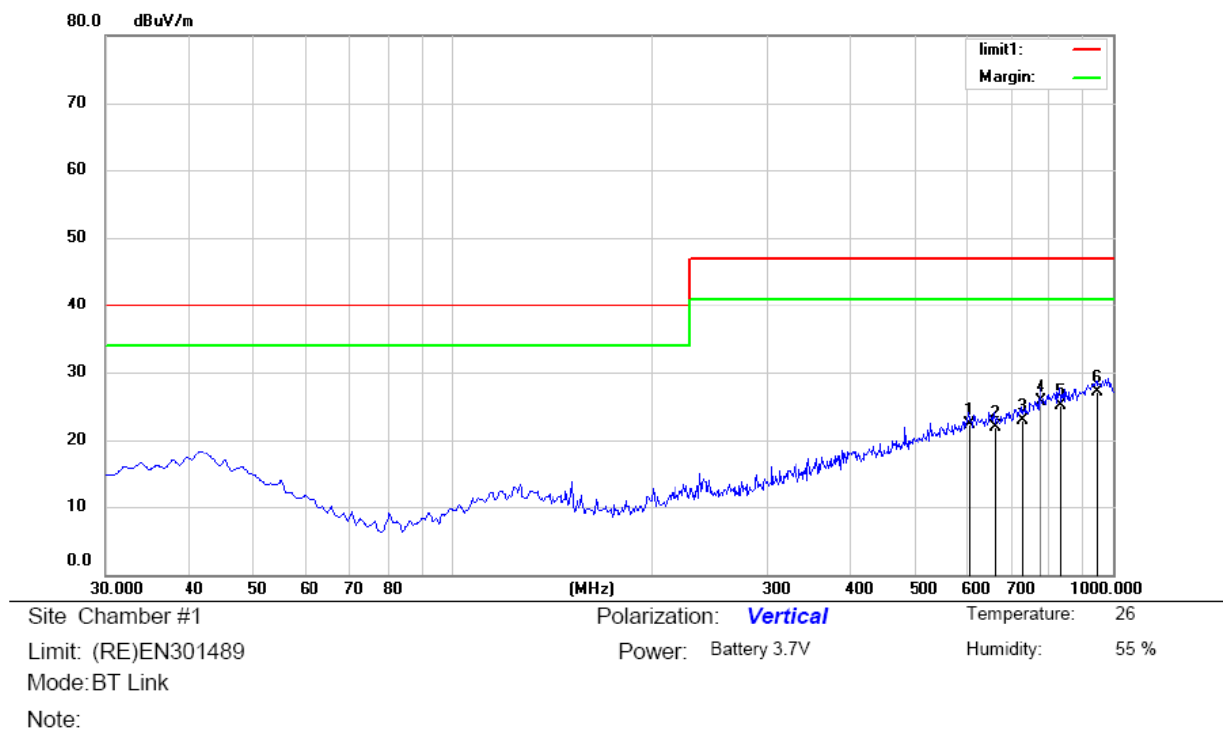
11.1 DATA FOR RADIATED EMISSIONS (THE WORST DATA OF TEST MODE (BT LINK))



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Antenna Height cm | Table Degree degree | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|-------------------------|---------------------------|---------|
| 1 | | 717.7300 | 28.57 | -4.28 | 24.29 | 47.00 | -22.71 | QP | | |
| 2 | | 754.5900 | 28.23 | -3.24 | 24.99 | 47.00 | -22.01 | QP | | |
| 3 | | 806.0000 | 28.55 | -2.40 | 26.15 | 47.00 | -20.85 | QP | | |
| 4 | | 873.9000 | 28.35 | -1.39 | 26.96 | 47.00 | -20.04 | QP | | |
| 5 | | 925.3100 | 28.59 | 0.05 | 28.64 | 47.00 | -18.36 | QP | | |
| 6 | * | 973.8100 | 28.65 | 1.21 | 29.86 | 47.00 | -17.14 | QP | | |

*:Maximum data x:Over limit l:over margin

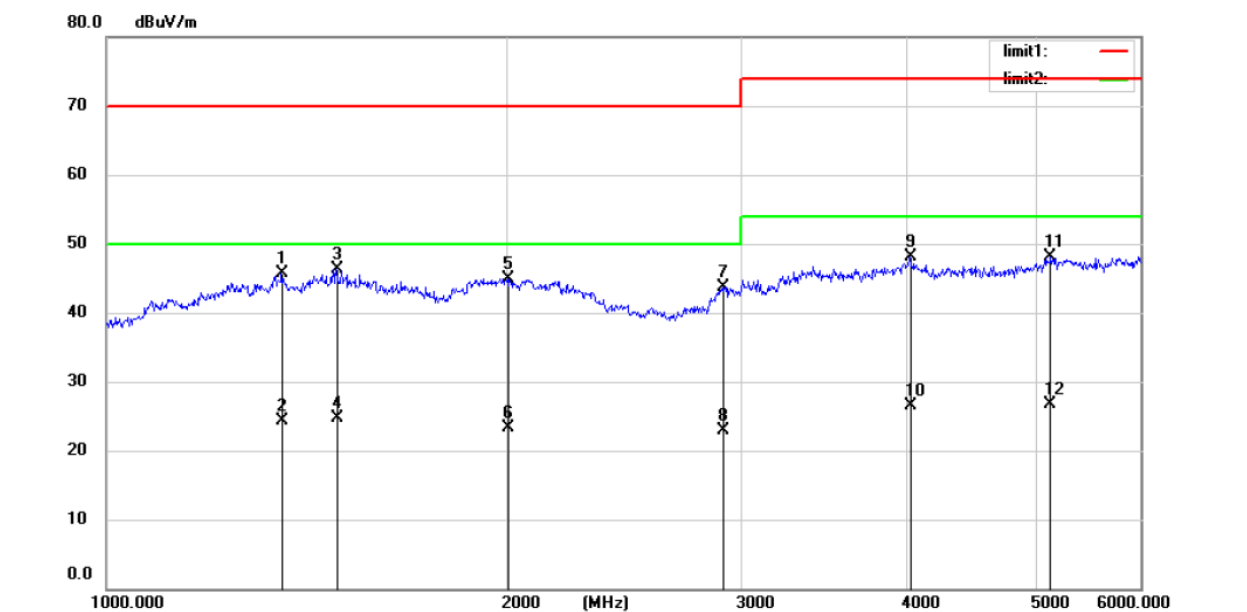
Operator: washington



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Antenna Height cm | Table Degree degree | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|-------------------------|---------------------------|---------|
| 1 | | 606.1800 | 29.65 | -7.30 | 22.35 | 47.00 | -24.65 | QP | | |
| 2 | | 661.4700 | 28.55 | -6.68 | 21.87 | 47.00 | -25.13 | QP | | |
| 3 | | 728.4000 | 28.10 | -5.17 | 22.93 | 47.00 | -24.07 | QP | | |
| 4 | | 774.9600 | 30.00 | -4.37 | 25.63 | 47.00 | -21.37 | QP | | |
| 5 | | 832.1900 | 28.35 | -3.16 | 25.19 | 47.00 | -21.81 | QP | | |
| 6 | * | 947.6200 | 27.85 | -0.70 | 27.15 | 47.00 | -19.85 | QP | | |

*:Maximum data x:Over limit !:over margin

Operator: washington



Site Chamber #1

Polarization: **Horizontal**

Temperature: 26

Limit: (RE)EN301489 (1-6G) PK

Power: Battery 3.7V

Humidity: 55 %

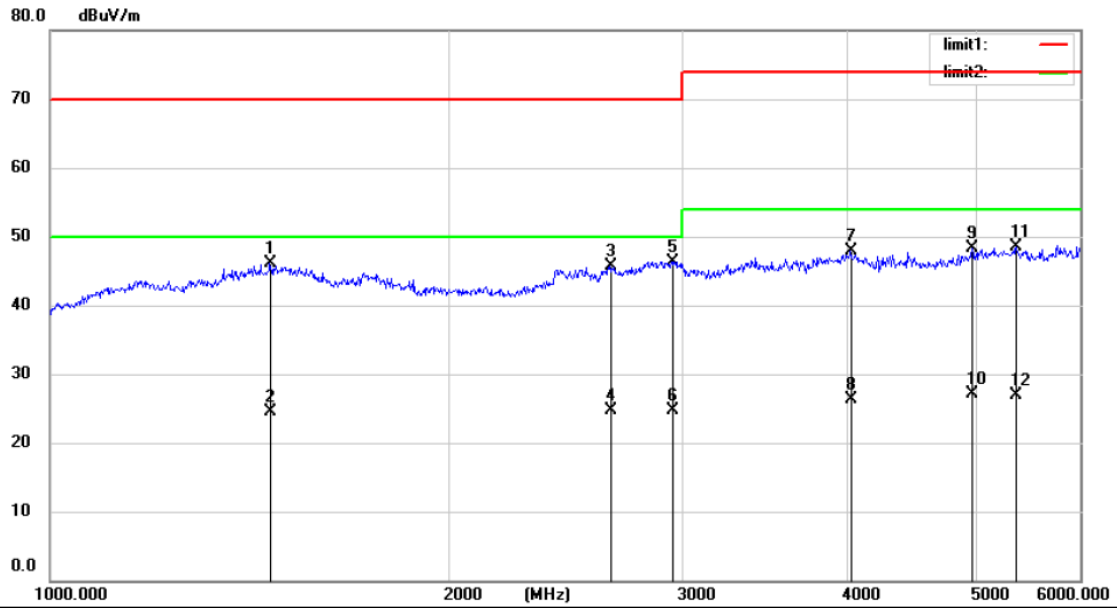
Mode:BT Link

Note:

| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Over | Antenna | Table | |
|-----|-----|----------|---------|---------|----------|--------|--------|----------|--------|--------|
| | | MHz | Level | Factor | ment | | | Height | Degree | |
| | | | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree |
| 1 | | 1353.654 | 58.00 | -12.34 | 45.66 | 70.00 | -24.34 | peak | | |
| 2 | | 1353.654 | 36.55 | -12.34 | 24.21 | 50.00 | -25.79 | AVG | | |
| 3 | * | 1488.503 | 57.88 | -11.52 | 46.36 | 70.00 | -23.64 | peak | | |
| 4 | | 1488.503 | 36.23 | -11.52 | 24.71 | 50.00 | -25.29 | AVG | | |
| 5 | | 2004.115 | 55.72 | -10.84 | 44.88 | 70.00 | -25.12 | peak | | |
| 6 | | 2004.115 | 34.12 | -10.84 | 23.28 | 50.00 | -26.72 | AVG | | |
| 7 | | 2909.231 | 50.46 | -6.68 | 43.78 | 70.00 | -26.22 | peak | | |
| 8 | | 2909.231 | 29.65 | -6.68 | 22.97 | 50.00 | -27.03 | AVG | | |
| 9 | | 4023.681 | 52.84 | -4.79 | 48.05 | 74.00 | -25.95 | peak | | |
| 10 | | 4023.681 | 31.22 | -4.79 | 26.43 | 54.00 | -27.57 | AVG | | |
| 11 | | 5133.955 | 52.76 | -4.60 | 48.16 | 74.00 | -25.84 | peak | | |
| 12 | | 5133.955 | 31.24 | -4.60 | 26.64 | 54.00 | -27.36 | AVG | | |

*:Maximum data x:Over limit !:over margin

Operator: washington



Site Chamber #1 Polarization: **Vertical** Temperature: 26
 Limit: (RE)EN301489 (1-6G) PK Power: Battery 3.7V Humidity: 55 %
 Mode:BT Link
 Note:

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | Antenna Height | Table Degree | |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | cm | degree | Comment |
| 1 | | 1464.692 | 57.66 | -11.65 | 46.01 | 70.00 | -23.99 | peak | | |
| 2 | | 1464.692 | 36.23 | -11.65 | 24.58 | 50.00 | -25.42 | AVG | | |
| 3 | | 2645.673 | 53.20 | -7.44 | 45.76 | 70.00 | -24.24 | peak | | |
| 4 | | 2645.673 | 32.15 | -7.44 | 24.71 | 50.00 | -25.29 | AVG | | |
| 5 | * | 2951.232 | 52.93 | -6.55 | 46.38 | 70.00 | -23.62 | peak | | |
| 6 | | 2951.232 | 31.22 | -6.55 | 24.67 | 50.00 | -25.33 | AVG | | |
| 7 | | 4023.681 | 52.70 | -4.79 | 47.91 | 74.00 | -26.09 | peak | | |
| 8 | | 4023.681 | 31.05 | -4.79 | 26.26 | 54.00 | -27.74 | AVG | | |
| 9 | | 4971.018 | 53.22 | -4.94 | 48.28 | 74.00 | -25.72 | peak | | |
| 10 | | 4971.018 | 32.05 | -4.94 | 27.11 | 54.00 | -26.89 | AVG | | |
| 11 | | 5369.154 | 52.65 | -4.24 | 48.41 | 74.00 | -25.59 | peak | | |
| 12 | | 5369.154 | 31.24 | -4.24 | 27.00 | 54.00 | -27.00 | AVG | | |

*:Maximum data x:Over limit !:over margin

Operator: washington

11.2 DATA FOR ELECTROSTATIC DISCHARGE

Electrostatic Discharge Test Results

| Applicant | | | |
|---------------------------------|---|--|---------------|
| EUT | " TWinS " TWS Bluetooth Sporty Earphone Set | Test Date | July 20, 2017 |
| M/N | BH-289 | Temperature | 22°C |
| Power Supply | Battery 3.7V | Humidity | 50% |
| Air discharge | $\pm 2.0, \pm 4.0 \text{ kV}, \pm 8.0 \text{ kV}$ | Test engineer | CSL |
| Contact discharge | $\pm 2.0, \pm 4.0 \text{ kV}$ | Criterion | TT&TR |
| Test Mode | BT LINK, BT IDLE | | |
| Location | | Kind A-Air Discharge C-Contact Discharge | Result |
| Port | | A,C | CT&CR |
| Slot | | A | CT&CR |
| HCP of front, rear, left, right | | C | CT&CR |
| VCP of front, rear, left, right | | C | CT&CR |
| | | | |
| | | | |
| | | | |
| Note: N/A | | | |

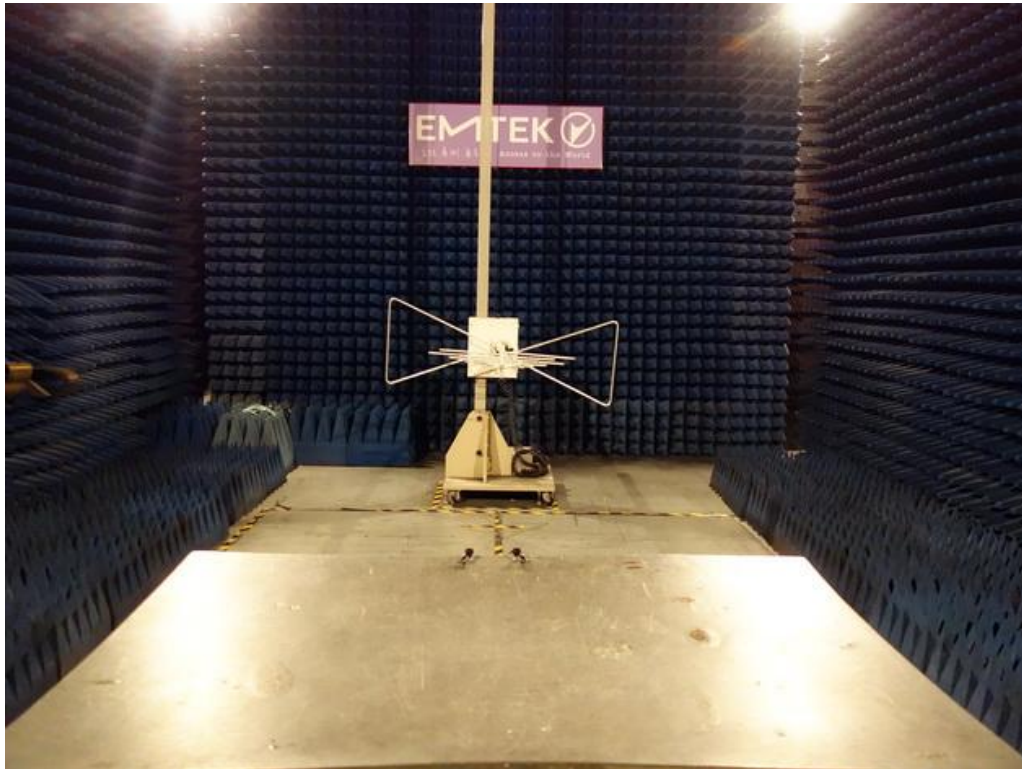
11.3 DATA FOR RADIO FREQUENCY ELECTROMAGNETIC FIELD

Radio-Frequency, Electromagnetic Field Test Results Test Results

| | | | | |
|----------------|---|----------|--------------------------------|---|
| Applicant | | | | |
| EUT | " TWInS " TWS Bluetooth Sporty Earphone Set | | Test Date | July 21, 2017 |
| M/N | BH-289 | | Temperature | 22°C |
| Field Strength | 3 V/m | | Humidity | 50% |
| Power Supply | Battery 3.7V | | Criterion | CT&CR |
| Test engineer | CSL | | Frequency Range | 80MHz to 6000MHz |
| Modulation | <input type="checkbox"/> None | | <input type="checkbox"/> Pulse | <input checked="" type="checkbox"/> AM 1kHz 80% |
| Steps | 1% | | | |
| Test Mode | BT LINK, BT IDLE | | | |
| | Horizontal | Vertical | Horizontal | Vertical |
| Front | CT&CR | CT&CR | | |
| Right | CT&CR | CT&CR | | |
| Rear | CT&CR | CT&CR | | |
| Left | CT&CR | CT&CR | | |
| | | | | |
| Note: | | | | |

12 APPENDIX B PHOTOGRAPHS OF TEST SETUP

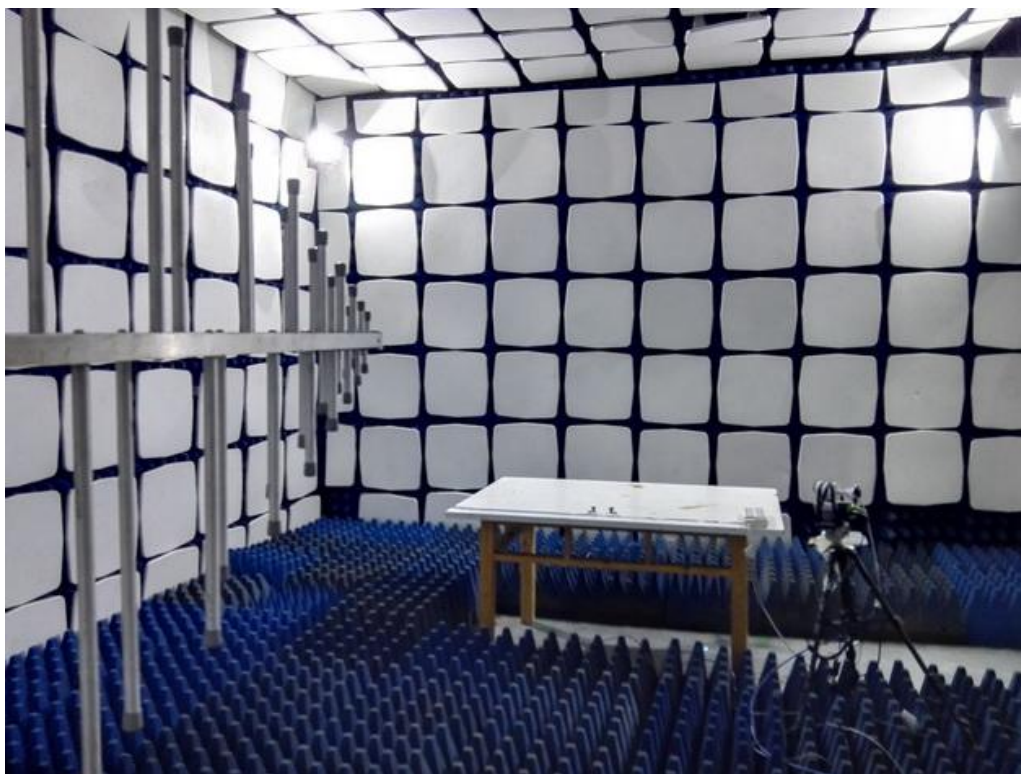
12.1 PHOTO FOR RADIATED EMISSIONS



12.2 PHOTO FOR ELECTROSTATIC DISCHARGE

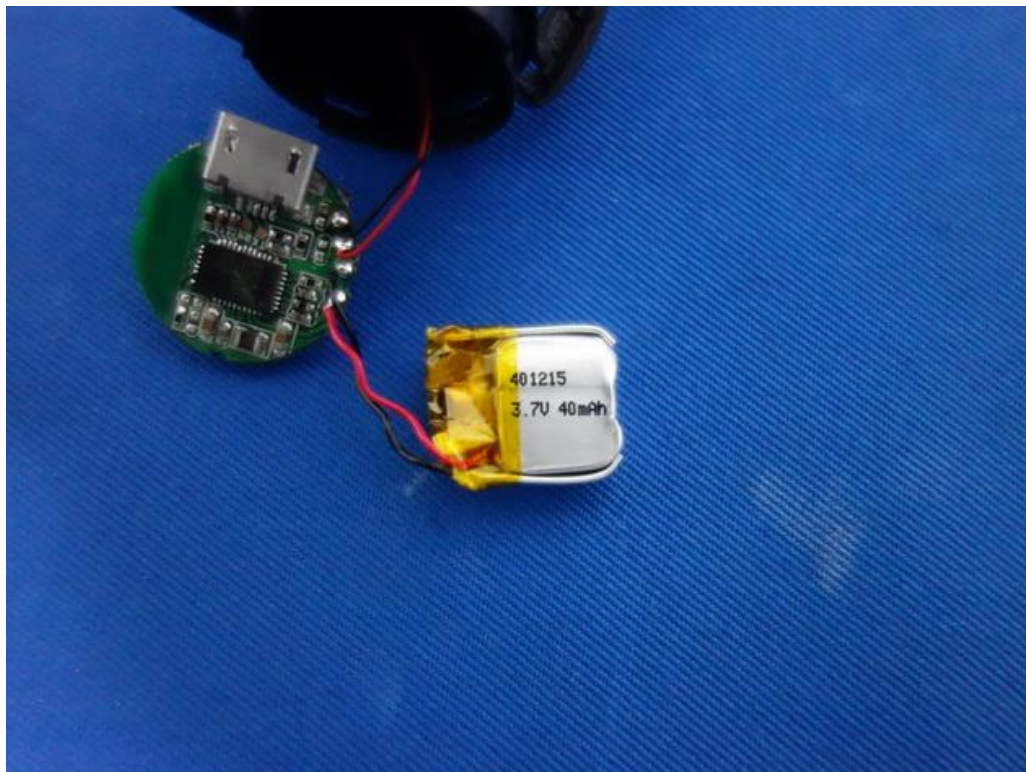


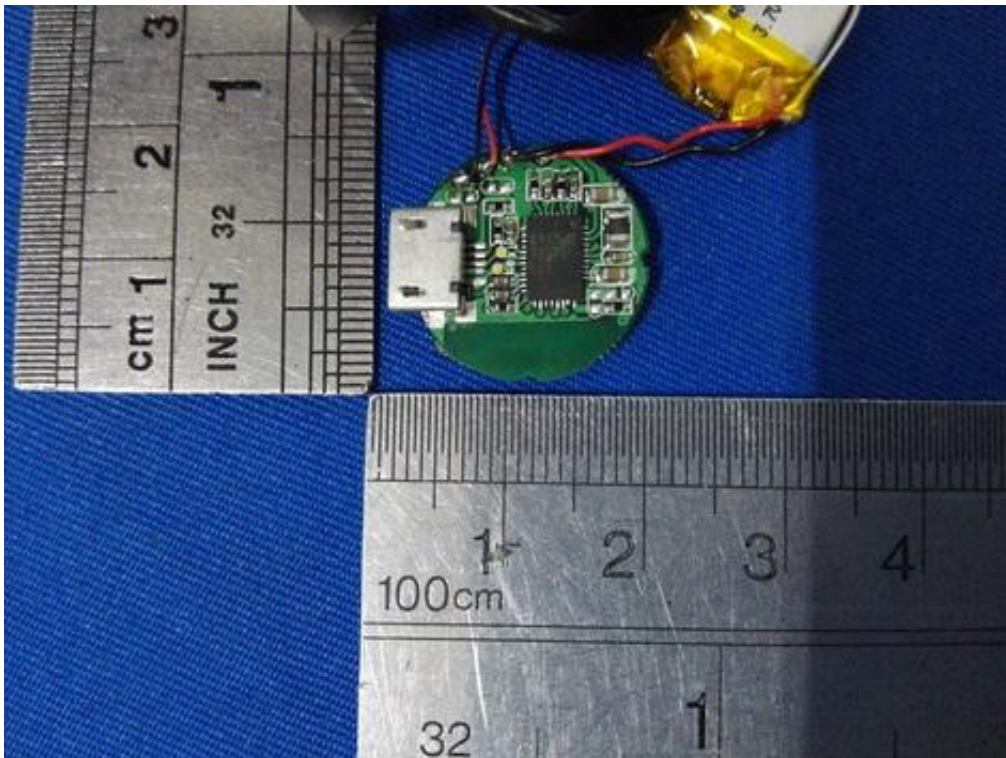
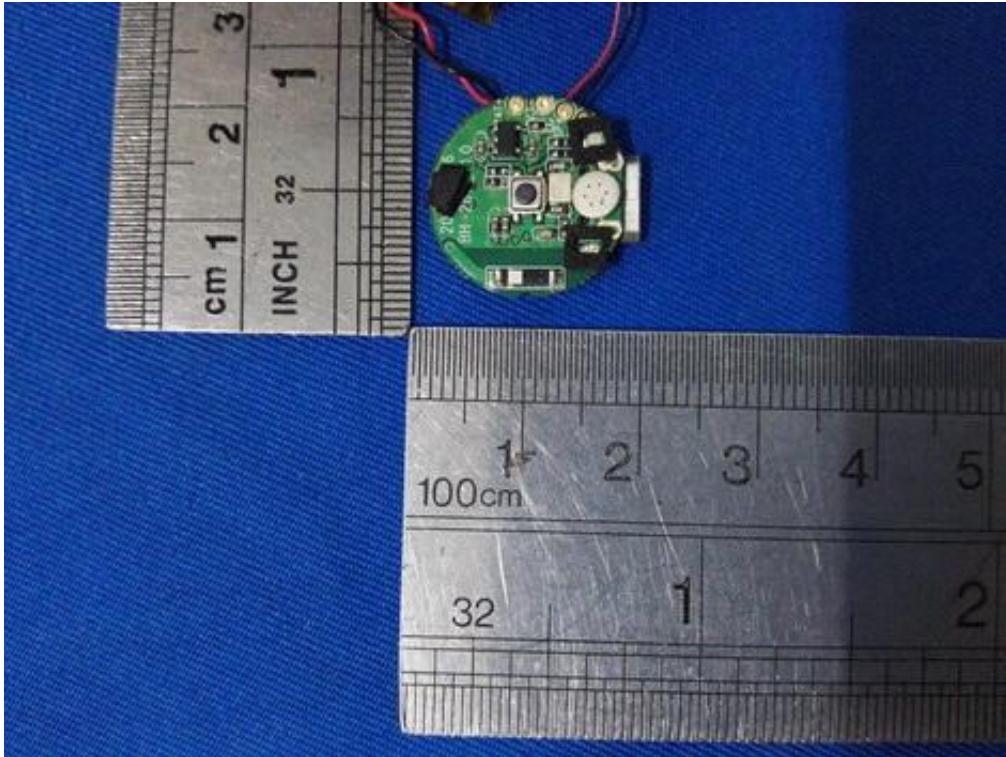
12.3 PHOTO FOR RADIO FREQUENCY ELECTROMAGNETIC FIELD



13 APPENDIX C PHOTOGRAPHS OF EUT







END OF REPORT