

# Test Report

Report No.: MTi171121E067

Date of issue: Nov. 28, 2017

Sample Description: Fusion wireless headphone

Model(s): P326.471

Applicant:

Address:

Date of Test:

Nov. 10, 2017 – Nov. 16, 2017

Shenzhen Microtest Co., Ltd.  
<http://www.mtitest.com>



1. This test report is valid for the tested samples only. It cannot be reproduced except in full without prior written consent of Shenzhen Microtest Co., Ltd.

2. This report is the revision of the test report number MTi170220E046, the original report is invalid.

Tel: (86-755) 88850135

Fax: (86-755) 88850136

Web: <http://www.mtitest.com>

E-mail: [mti@51mti.com](mailto:mti@51mti.com)

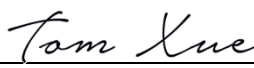
Address: No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China

## Table of Contents

<b>Table of Contents</b> .....	<b>2</b>
<b>1 General description</b> .....	<b>5</b>
1.1 Feature of equipment under test (EUT).....	5
1.2 Test mode.....	5
1.3 Test conditions.....	5
1.4 Ancillary equipment list.....	5
1.5 Measurement Uncertainty .....	6
<b>2 Testing site</b> .....	<b>6</b>
<b>3 List of test equipment</b> .....	<b>7</b>
<b>4 EMC emission test</b> .....	<b>8</b>
4.1 Conducted emission .....	8
4.2 Radiated emission .....	9
<b>5 Immunity test</b> .....	<b>14</b>
5.1 Electrostatic discharge immunity (ESD) .....	14
5.2 RF electromagnetic field immunity (RS) .....	17
<b>Photographs of the Test Setup</b> .....	<b>19</b>
<b>Photographs of the Test Setup</b> .....	<b>21</b>

<b>Test Result Certification</b>	
<b>Applicant's name:</b>	
<b>Address:</b>	
<b>Manufacture's Name:</b>	
<b>Address:</b>	
<b>Product name:</b>	Fusion wireless headphone
<b>Trademark:</b>	N/A
<b>Model name:</b>	P326.471
<b>Standards:</b>	(Draft) EN 301 489-1 V2.2.0 (2017-03) (Draft) EN 301 489-17 V3.2.0 (2017-03)

*This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the Radio equipment directive requirements. And it is applicable only to the tested sample identified in the report.*

Tested by:		
	Amy Lu	Nov. 28, 2017
Reviewed by:		
	Smith Chen	Nov. 28, 2017
Approved by:		
	Tom Xue	Nov. 28, 2017

THIS DOCUMENT WAS REDACTED WITH THE PRODUCTIP REDACTION TOOL ON 2017-12-29. AT THE TIME OF GENERATING THE DOCUMENT THE ORIGINAL DOCUMENT WAS AVAILABLE ONLY BE MADE AVAILABLE BY THE DOCUMENT OWNER.

## Summary of Test Result

Item	Description of Test	Result
EMC emission		
1	Conducted emission	Pass
2	Radiated emission	Pass
3	Harmonic current emission	N/A*
4	Voltage fluctuations & flicker	Pass
Immunity		
1	Electrostatic discharge immunity (ESD)	Pass
2	Radiated electromagnetic field immunity (RS)	Pass
3	Fast transients / burst immunity (EFT)	Pass
4	Surge immunity	Pass
5	Conducted disturbance immunity (CS)	Pass
6	Voltage interruptions & voltage Dips immunity	Pass

\*Not Applicable.

## 1 General description

### 1.1 Feature of equipment under test (EUT)

Product name:	Fusion wireless headphone
Model name:	P326.471
Power source:	DC 3.7V form Li-ion battery
Antenna designation:	PCB antenna (Antenna Gain: 1.2dBi)
BT	
Bluetooth version:	V4.0
Tx/Rx frequency range:	Tx/Rx: 2402MHz~2480MHz

### 1.2 Test mode

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.

Test mode	Description
Mode 1	BT

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.

Note: Pre-scan above all test mode, found below test mode which it was worse case mode.

Test item	Test mode (Worse case mode)
Conducted emission	Mode 1
Radiated emission below 1GHz	Mode 1
Radiated emission above 1GHz	Mode 1

### 1.3 Test conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 20°C~30°C
- Humidity: 30%~70% (30%~60% for ESD test)
- Atmospheric pressure: 98kPa~101kPa

### 1.4 Ancillary equipment list

Equipment	Model	S/N	Manufacturer
/	/	/	/

## 1.5 Measurement Uncertainty

Measurement Uncertainty for a Level of Confidence of 95 %,  $U=2 \times U_c(y)$

Conducted emission(150kHz~30MHz)	$\pm 2.5$ dB
Radiated emission(30MHz~1GHz)	$\pm 4.2$ dB
Radiated emission (above 1GHz)	$\pm 4.3$ dB
Temperature	$\pm 1$ degree
Humidity	$\pm 5$ %

## 2 Testing site

Test laboratory:	Shenzhen Microtest Co., Ltd.
Laboratory location:	No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China
CNAS Registration No.:	L5868
Telephone:	(86-755)88850135
Fax:	(86-755)88850136

### 3 List of test equipment

Emission test:

Equipment	Manufacturer	Model	Serial No.	Calibration Due
LISN	Schwarzbeck	NSLK8127	#841	2018/9/25
LISN	Laplace	LISN-16A	003420	2018/11/4
EMI Test Receiver	Rohde&schwarz	ESCI3	101368	2018/11/4
Broadband TRILOG Antenna	Schwarabeck	VULB9163	9163-872	2018/11/14
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1145	2018/11/14
Amplifier	HP	8447D	3113A06150	2018/11/4
Amplifier	Agilent	8449B	3008A02400	2018/7/4
Test Receiver	Schwarabeck	ESPI7	100314	2018/11/4
Spectrum analyzer	Agilent	E4407B	MY41441082	2018/11/4
Harmonics, Flicker & Power Analyser	Laplace	AC 2000A	311216	2018/11/4

Immunity test:

Equipment	Manufacturer	Model	Serial No.	Calibration Due
ESD Generator	Schloder	SESD 3000	509325	2018/11/14
Surge Generator	HTEC	HCWG 51	153702	2018/11/17
EFT Generator	HTEC	HEFT 51	153701	2018/11/17
Cycle SAG Simulator	Prima	DRP61011AG	PR15056303	2018/11/4
Conducted Disturbances Test System	Schloder	CDG-6000-25	126A1343/2015	2018/11/4
CDN	Schloder	CDN-M2+3	A2210332/2015	2018/11/4
Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3058	2018/11/14
Signal Generator	Agilent	E4438C	MY49070163	2018/11/4
Power Amplifier	AR	SESD 3000	509325	2018/11/4

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

## 4 EMC emission test

### 4.1 Conducted emission

#### 4.1.1 Limits

Frequency (MHz)	Class A (dB $\mu$ V)		Class B (dB $\mu$ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79	66	66 - 56 *	56 - 46 *
0.5 -5	73	60	56	46
5 -30	73	60	60	50

#### 4.1.2 Test Procedures

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through an Artificial mains networks (AMN). All other support equipment powered from additional AMN. The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

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.

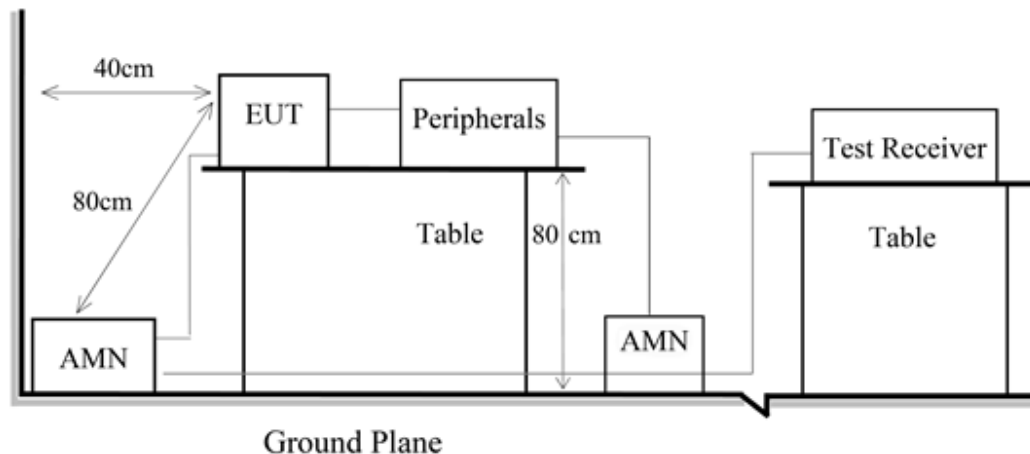
I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

AMN is at least 80 cm from nearest part of EUT chassis.

Setup of the receiver

Frequency	Detector	Setting
0.15MHz – 30MHz	QP	IF bandwidth: 9kHz

#### 4.1.3 Test setup



#### 4.1.4 Test Result

N/A.



## 4.2 Radiated emission

### 4.2.1 Limits

Frequency (MHz)	Class B Limit (dB $\mu$ V/m)		Class A Limit (dB $\mu$ V/m)	
	Quasi-peak/Peak	Average	Quasi-peak/Peak	Average
30 ~ 230	40 (at 3m)	/	50 (at 3m)	/
230 ~ 1000	47 (at 3m)	/	57 (at 3m)	/
1000 ~ 3000	70 (at 3m)	50 (at 3m)	76 (at 3m)	56 (at 3m)
3000 ~ 6000	74 (at 3m)	54 (at 3m)	80 (at 3m)	60 (at 3m)

### 4.2.2 Test Procedures

The radiated emission tests were performed in the 3 meters.

The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.

The height of the test antenna shall vary between 1m to 4m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

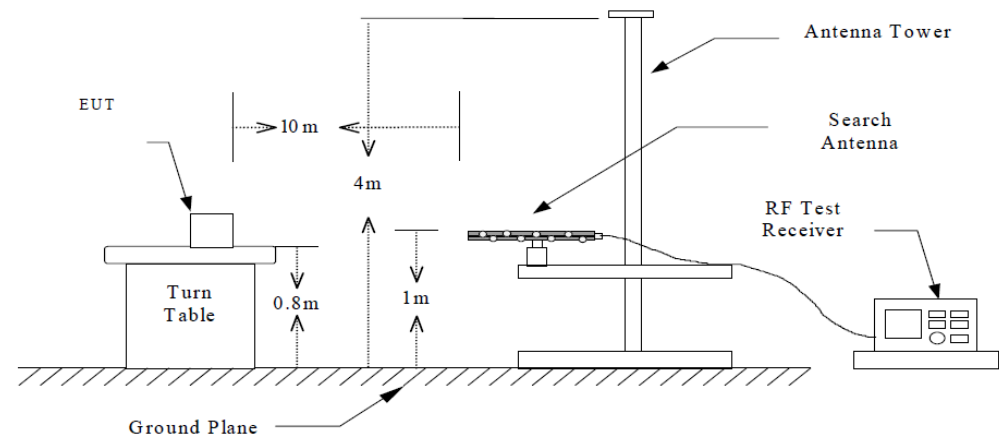
If the peak mode measured value compliance with and lower than quasi peak mode limit, the EUT shall be deemed to meet QP limits and then no additional QP mode measurement performed.

If the peak mode measured value compliance with and lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.

Setup of receiver

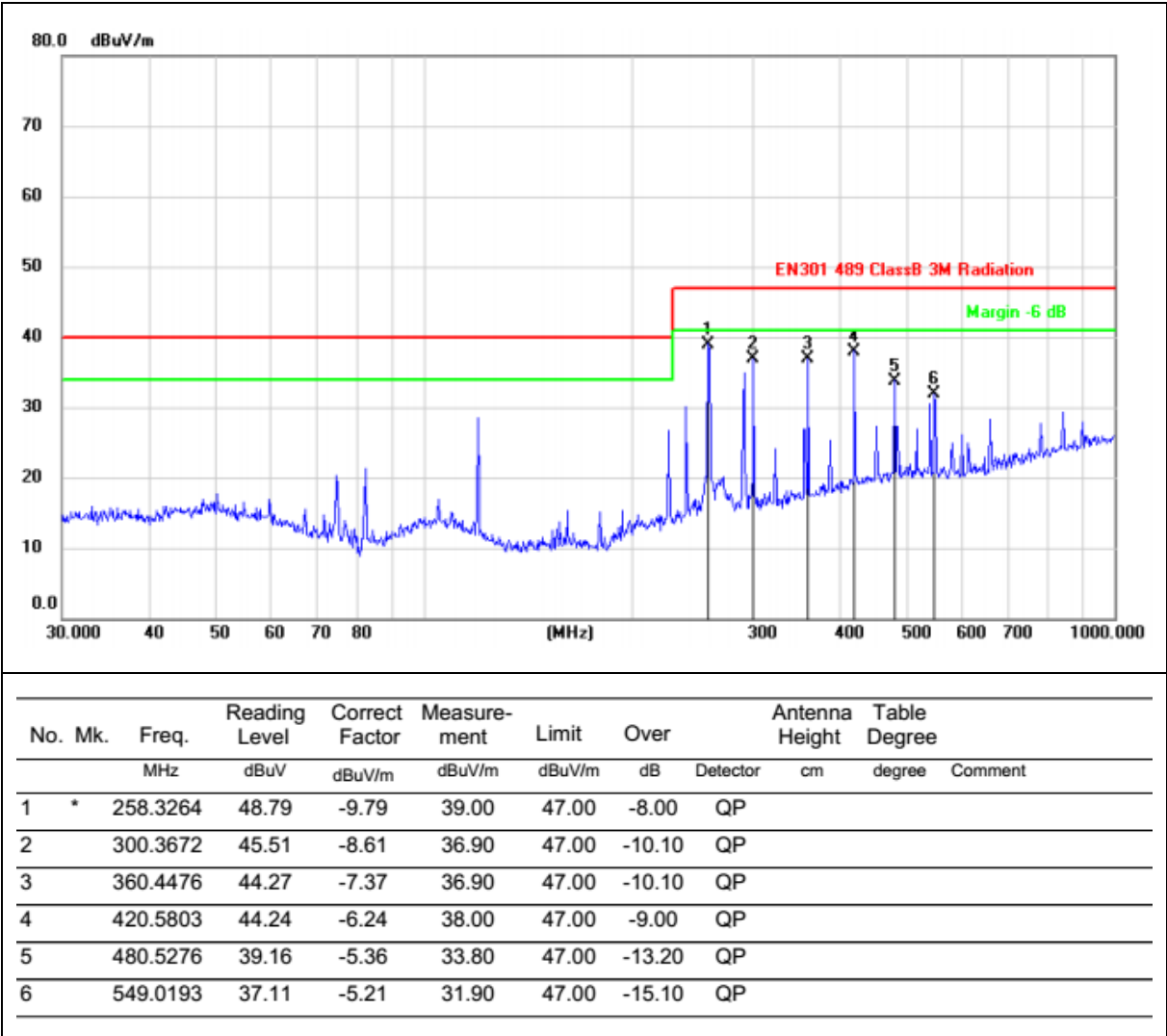
Frequency	Detector	Setting
30MHz – 1GHz	QP	IF bandwidth: 120kHz
Above 1GHz	Peak	RBW: 1MHz, VBW: 3MHz
	AV	RBW: 1MHz, VBW: 10Hz

### 4.2.3 Test Setup

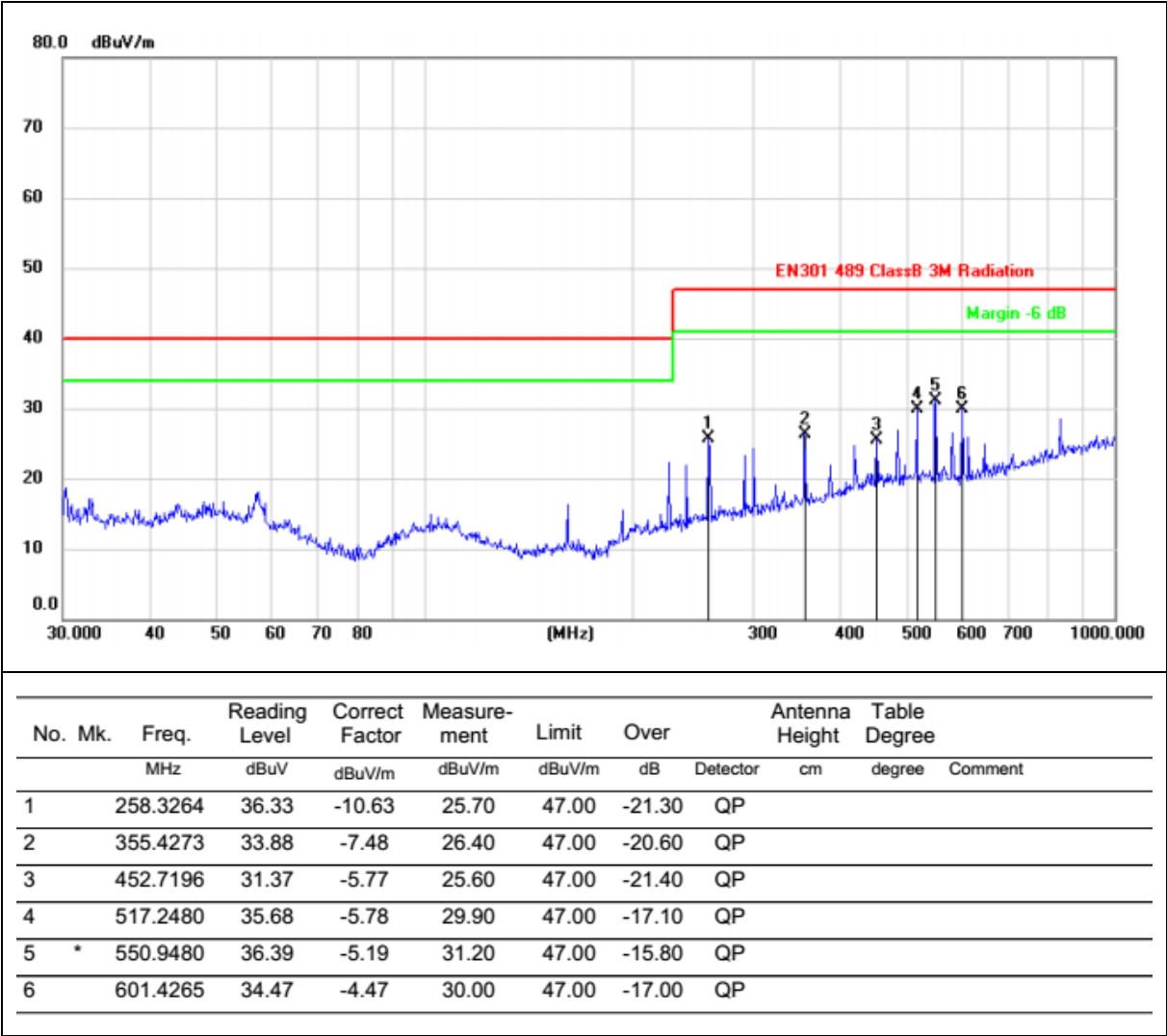


4.2.4 Test Result

Temperature:	25℃	Relative Humidity:	44%
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	AC 230V/50Hz	Test mode:	Mode 1



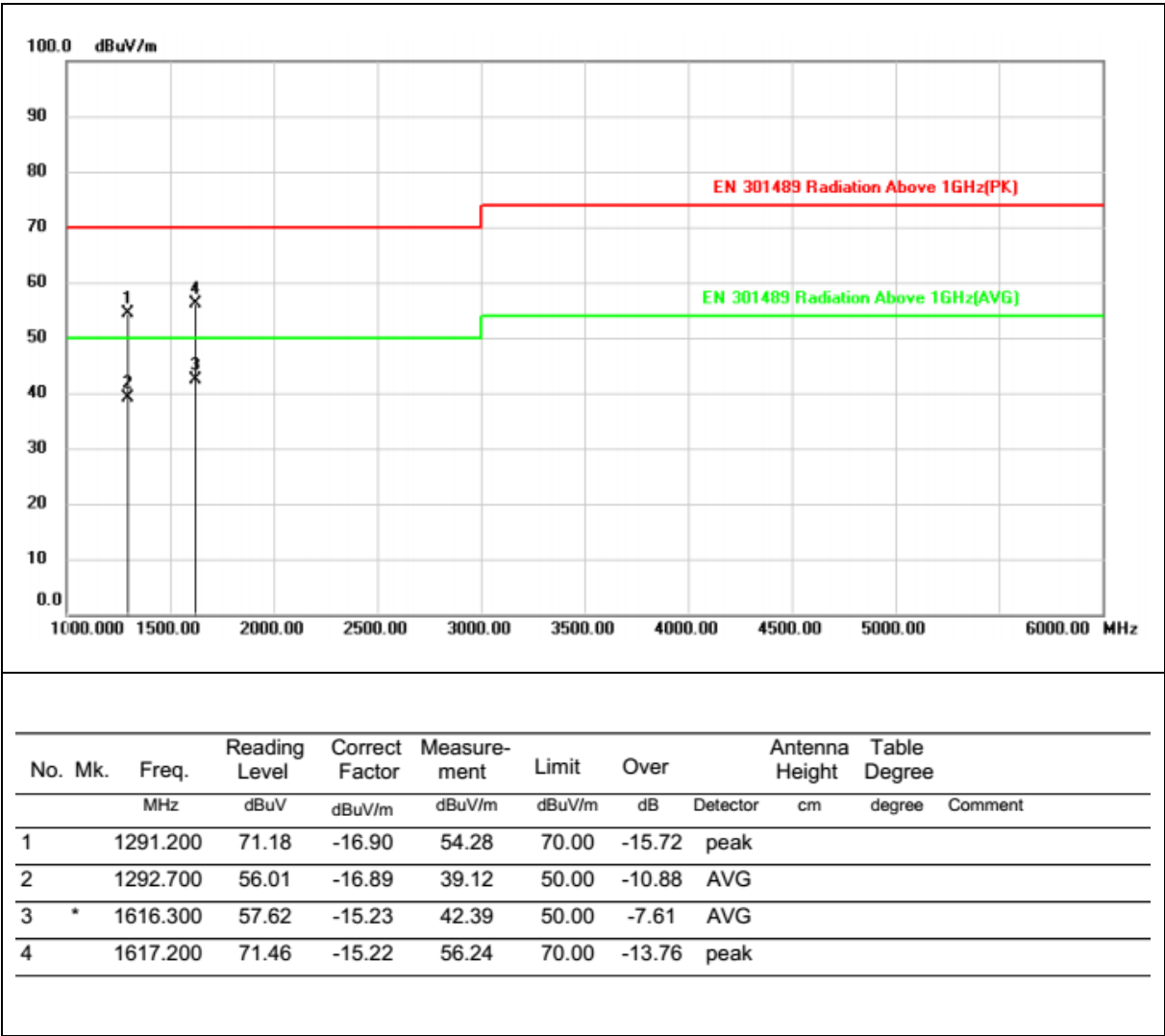
Temperature:	25℃	Relative Humidity:	44%
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	AC 230V/50Hz	Test mode:	Mode 1



Temperature:	25℃	Relative Humidity:	44%
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	AC 230V/50Hz	Test mode:	Mode 1



Temperature:	25℃	Relative Humidity:	44%
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	AC 230V/50Hz	Test mode:	Mode 1



## 5 Immunity test

### 5.1 Electrostatic discharge immunity (ESD)

#### 5.1.1 Test Method

The test method shall be in accordance with EN 61000-4-2.

For radio equipment and ancillary equipment the following requirements and evaluation of test results shall apply.

The test severity level for contact discharge shall be 4 kV and for air discharge 8kV. All other details, including intermediate test levels, are contained within EN 61000-4-2.

Electrostatic discharges shall be applied to all exposed surfaces of the EUT except where the user documentation specifically indicates a requirement for appropriate protective measures (see EN 61000-4-2).

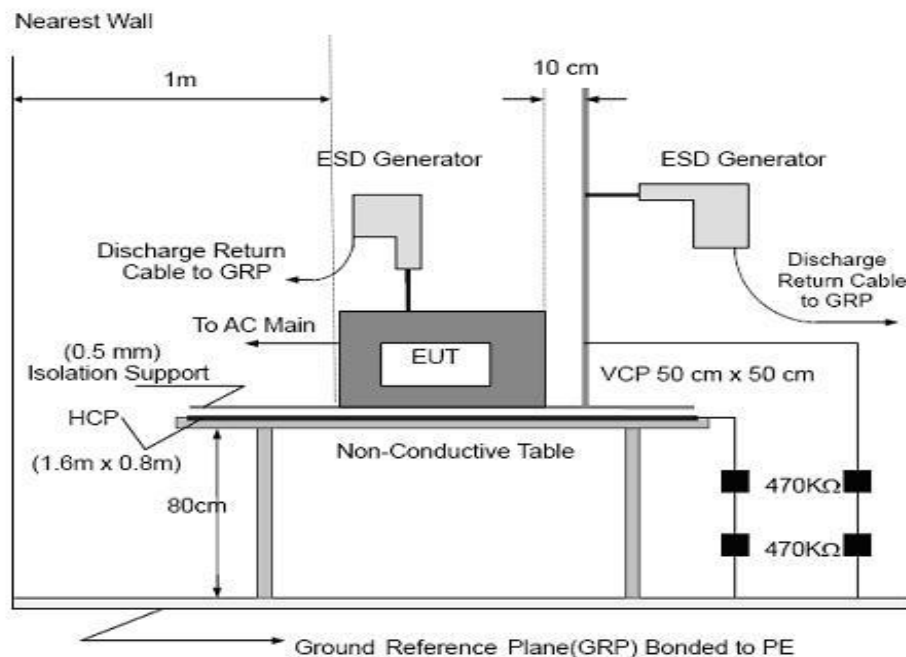
#### 5.1.2 Performance criteria

For transmitters the performance criteria for transient phenomena for transmitter shall apply.

For receivers the performance criteria for transient phenomena for receivers shall apply.

For ancillary equipment the pass/failure criteria supplied by the manufacturer shall apply, unless the ancillary equipment is tested in connection with a receiver or transmitter in which case the corresponding performance criteria above shall apply.

#### 5.1.3 Test Setup



#### 5.1.4 Test Result

Temperature:	25℃	Relative Humidity:	47%
Pressure:	101kPa	Test mode:	Mode 1

#### Indirect discharge

Test Point	Contact discharge level (kV)	Number and polarity	Criterion met	Criterion Required
1. VCP-Front side	<input type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	25 (+)	A	B
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	25 (-)	A	
2.VCP-Rear side	<input type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	25 (+)	A	
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	25 (-)	A	
3.VCP-Left side	<input type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	25 (+)	A	
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	25 (-)	A	
4. VCP-Right side	<input type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	25 (+)	A	
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	25 (-)	A	
5. HCP	<input type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	25 (+)	A	
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	25 (-)	A	

**Result: Compliance.**

#### Direct discharge

Test Point	discharge level (kV)	Air discharge level (kV)	Number and polarity	Criterion met	Criterion Required
1. Each nonconductive location touchable by hand	<input type="checkbox"/> ..2 <input type="checkbox"/> ..4	<input checked="" type="checkbox"/> ..2 <input checked="" type="checkbox"/> ..4	25 (+)	A	B
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	<input checked="" type="checkbox"/> ..6 <input checked="" type="checkbox"/> ..8	25 (-)	A	
1. Each conductive location touchable by hand	<input type="checkbox"/> ..2 <input type="checkbox"/> ..4	<input type="checkbox"/> ..2 <input type="checkbox"/> ..4	25 (+)	A	
	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	<input type="checkbox"/> ..6 <input type="checkbox"/> ..8	25 (-)	A	

**Result: compliance.**

Note1: Please see the photographs below about the details of test points.



## Test location



Note: Yellow circle for Air Discharge, Red circle for Contact Discharge



## 5.2 RF electromagnetic field immunity (RS)

### 5.2.1 Test Method

The test method shall be in accordance with EN 61000-4-3.

The following requirements and evaluation of test results shall apply:

- the test level shall be 3V/m (measured unmodulated). The test signal shall be amplitude modulated to a depth of 80% by a sinusoidal audio signal of 1000Hz. If the wanted signal is modulated at 1000Hz, then an audio signal of 400Hz shall be used;
- the test shall be performed over the frequency range 80MHz to 1000MHz and 1400MHz to 2700MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers, as appropriate;
- for receivers and transmitters the stepped frequency increments shall be 1% frequency increment of the momentary used frequency;
- responses on receivers occurring at discrete frequencies, which are narrow band responses, shall be disregarded from the test;

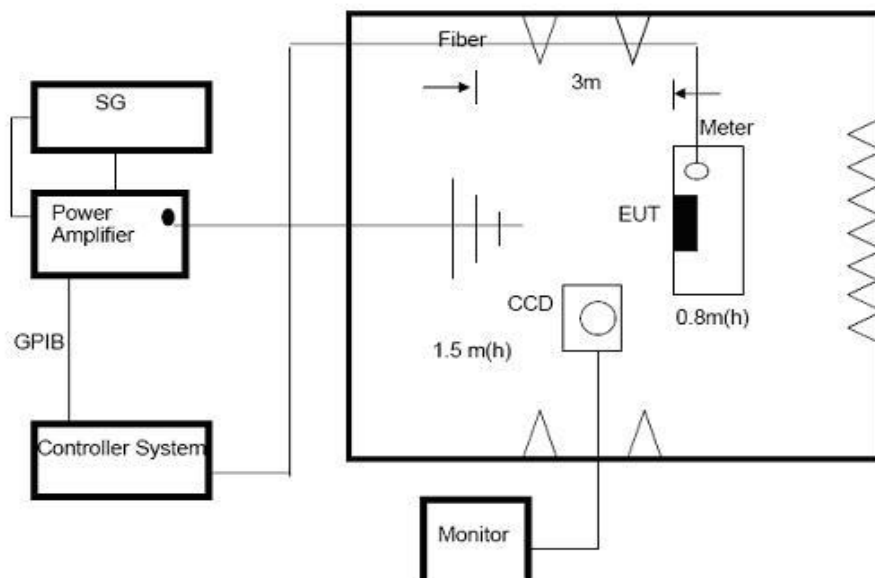
### 5.2.2 Performance criteria

For transmitters the performance criteria for continuous phenomena for transmitters shall apply.

For receivers the performance criteria for continuous phenomena for receivers shall apply.

For ancillary equipment the pass/failure criteria supplied by the manufacturer shall apply, unless the ancillary equipment is tested in connection with a receiver or transmitter in which case the corresponding performance criteria above shall apply.

### 5.2.3 Test setup



5.2.4 Test Result

Temperature:	25℃	Relative Humidity:	56%
Pressure:	101kPa	Test mode:	Mode 1

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Criterion met	Criterion Required
80~1000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	A	A
			Rear		
			Left		
			Right		

Result: compliance.

## Photographs of the Test Setup

Radiated emission- Below 1G



RS



ESD



Radiated emission- Above 1G



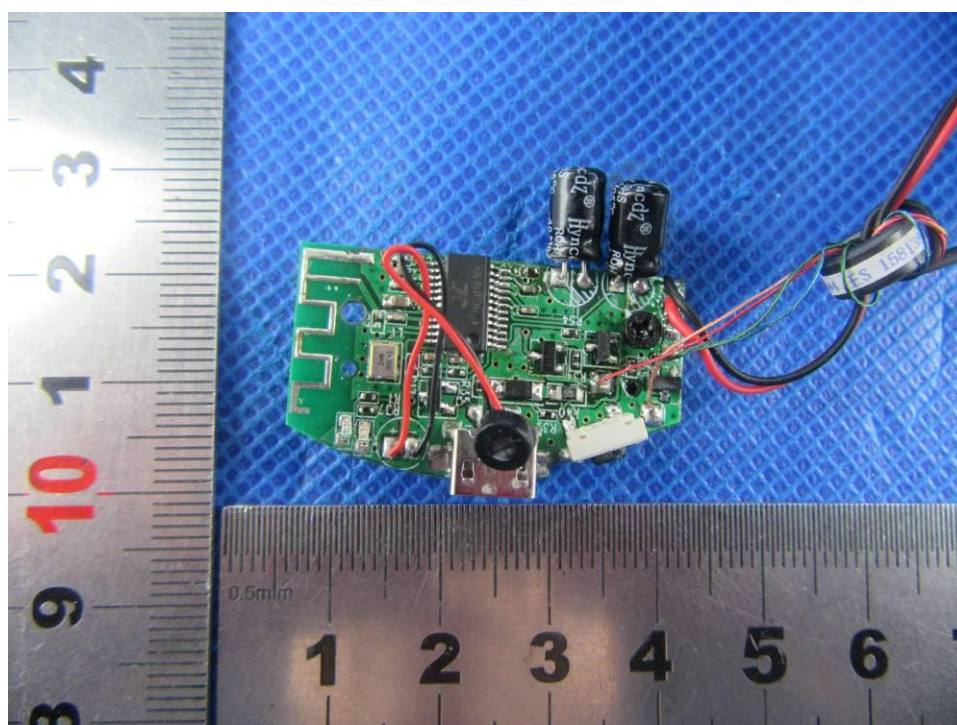
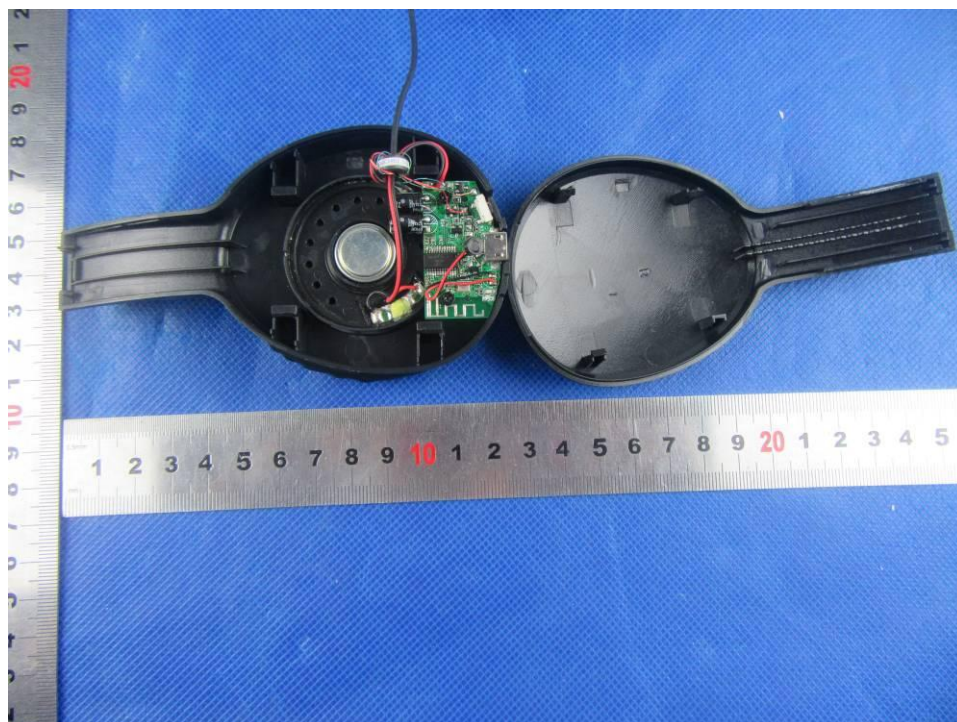


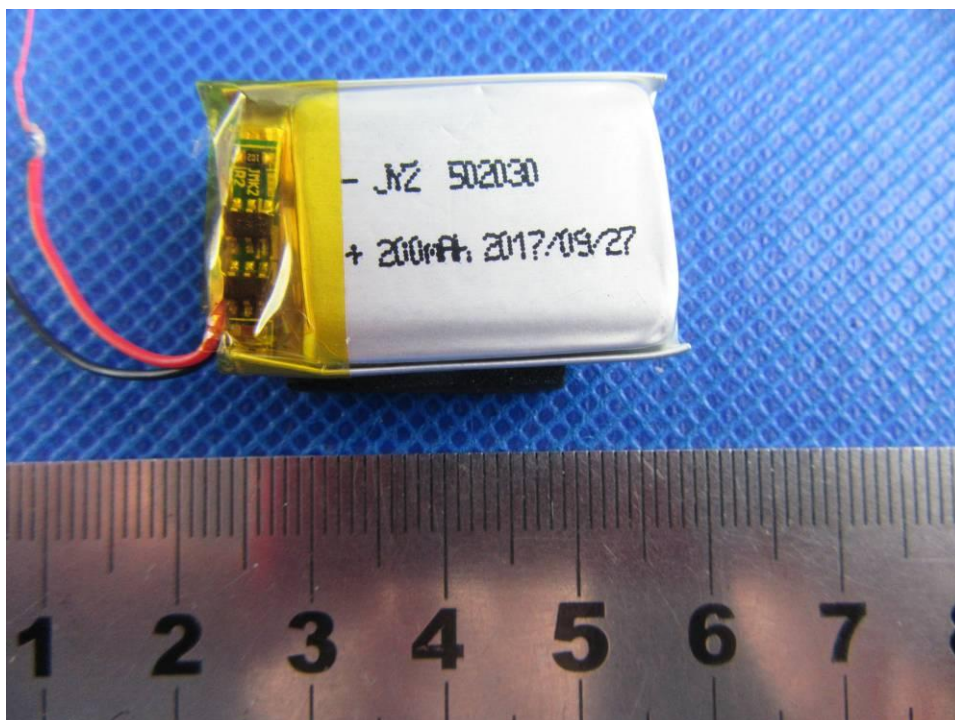
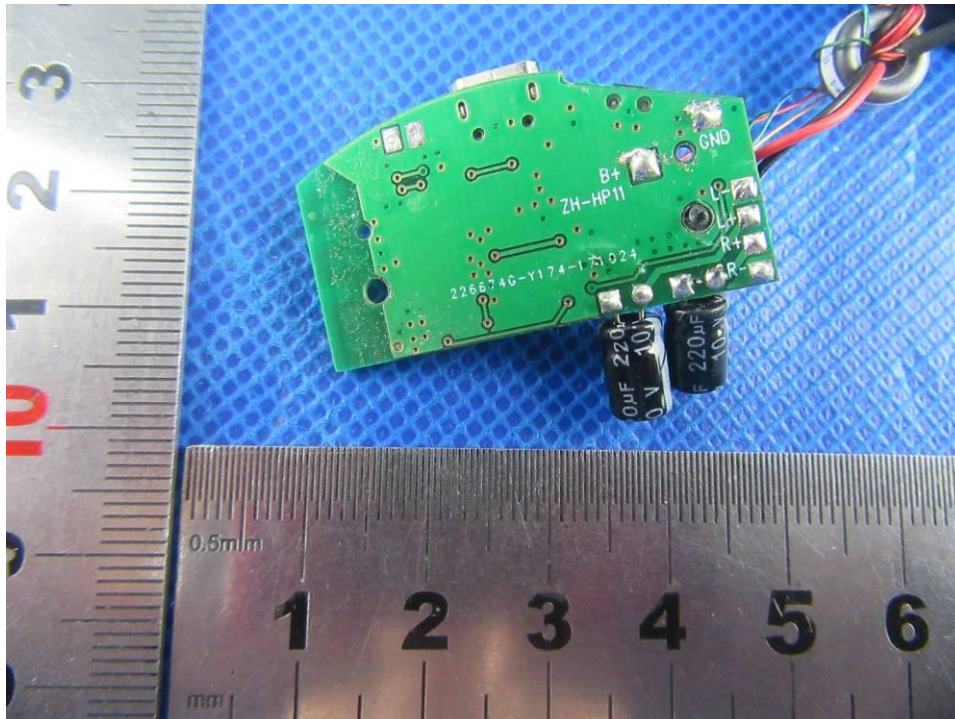
## Photographs of the Test Setup











----END OF REPORT----