

TEST REPORT

ETSI EN 301 489-1 V1.9.2(2011-09) **ETSI EN 301 489-17 V2.2.1(2012-09)**

Product : Wireless sport earbuds
Model Name : P326.23X
Brand : N/A
Report No. : PTCHX04161101902E-EM02

Prepared for

Prepared by

DongGuan Precise Testing Service Co.,Ltd.
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TEST RESULT CERTIFICATION

Applicant's name :
Address :
Manufacture's name :
Address :
Product name : Wireless sport earbuds
Model name : P326.23X

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the 2014/53/EU R&TTE Directive Art.3.2 requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests : November 28, 2016 – December 7, 2016

Date of Issue: December 7, 2016

Test Result: **Pass**

Tested By:



August Qiu / Engineer

Approved & Authorized Signer



Chris Du / Manager

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2 Test Summary

Test	Test Requirement	Test Method	Limit / Severity	Result
EMC Emission				
Conducted Emissions	EN 301 489-17	EN301489-1, EN 55022	Class B	N/A
Radiated Emissions	EN 301 489-17	EN301489-1, EN 55022	Class B	PASS
Harmonic Current Emissions	EN 301 489-17	EN301489-1, EN 61000-3-2	Clause 7 of EN 61000-3-2	N/A
Voltage Fluctuations and Flicker	EN 301 489-17	EN301489-1, EN 61000-3-3	Clause 5 of EN 61000-3-3	N/A
EMC Immunity				
Electrostatic Discharge(ESD)	EN 301 489-17	EN301489-1, EN 61000-4-2	±2,4 kV Contact ±2,4,8 kV Air	N/A
Radiated Immunity (R/S)	EN 301 489-17	EN301489-1, EN 61000-4-3	3V/m, 80%, 1kHz, Amp. Mod.	PASS
Electrical Fast Transients (EFT)	EN 301 489-17	EN301489-1, EN 61000-4-4	AC±0.5/1.0kV	N/A
Surge Immunity	EN 301 489-17	EN301489-1, EN 61000-4-5	±1kV D.M.† ±2kV C.M.‡	N/A
Conducted Immunity (C/S)	EN 301 489-17	EN301489-1, EN 61000-4-6	3Vrms(emf), 80%, 1kHz Amp. Mod.	N/A
Voltage Dips and Interruptions	EN 301 489-17	EN301489-1, EN 61000-4-11	0 % UT* for 0.5per 0 % UT* for 1per 70 % UT* for 25per 0 % UT* for 250per	N/A
Remark: N/A: Not Applicable				

3 General Information

3.1 General Description of E.U.T.

Product Name : Wireless sport earbuds

Model Name : P326.23X

Model Description : N/A

Bluetooth Version: : V2.1

Frequency Range: : 2402-2480MHz

Antenna installation: : Integrated Antenna

Antenna Gain: : 0dBi

Type of Modulation : ASK

Power supply : 5V 100mah-1A

4 Equipment During Test

4.1 Equipments List

CONDUCTED EMISSION							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	Rohde&Schwarz	ESCI	101417	July 15, 2016	July 14, 2017	1 year
2	Artificial Mains Network	Narda	L2-16B	000WX31025	July 15, 2016	July 14, 2017	1 year
RADIATED EMISSION							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	Rohde&Schwarz	ESCI	101417	July 15, 2016	July 14, 2017	1 year
2	Trilog Broadband	SCHWARZBECK	VULB9160	9160-3355	July 15, 2016	July 14, 2017	1 year
3	Amplifier	EM	EM-30180	060538	July 15, 2016	July 14, 2017	1 year
4	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1246	July 15, 2016	July 14, 2017	1 year
HARMONICS AND FILCK							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Harmonics & Flicker Analyzer	LAPLACE	AC 2000A	311216	July 15, 2016	July 14, 2017	1 year
2	AC Power Source	MToni	PHF-5010	630976	July 15, 2016	July 14, 2017	1 year
ESD							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	ESD Generator	HTEC	HESD 16	1416011	July 15, 2016	July 14, 2017	1 year
RS							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Signal Generator	Agilent	N517113-50B	MY53050160	Oct.30, 2016	Oct.29, 2017	1 year



2	Amplifier	A&R	150W1000 M3	313157	Oct.30, 2016	Oct.29, 2017	1 year
3	Amplifier	A&R	50SIG6M2	0342835	Oct.30, 2016	Oct.29, 2017	1 year
4	Antenna	SCHWARZBECK	STLP9149	9149.222	Oct.30, 2016	Oct.29, 2017	1 year
5	Isotropic Field Probe	A&R	FL7006	0342652	Oct.30, 2016	Oct.29, 2017	1 year
6	Log-periodic Antenna	SCHWARZBECK	STLP 9128E	9128E-012	Oct.30, 2016	Oct.29, 2017	1 year

CS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	C/S Test System	SCHLODER	CDG-6000-25	126A1279/2014	July 15, 2016	July 14, 2017	1 year
2	CDN	SCHLODER	CDN-M2+3	A2210251/2013	July 15, 2016	July 14, 2017	1 year

EFT

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EFT Generator	HTEC	HEFT 51	1416010	July 15, 2016	July 14, 2017	1 year

Surge

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Surge Generator	HTEC	HCOMB 70	142101	July 15, 2016	July 14, 2017	1 year
2	Surge Generator	HTEC	TCOMB 4	142103	July 15, 2016	July 14, 2017	1 year
3	CDN	HTEC	SCDN 161P	142102	July 15, 2016	July 14, 2017	1 year

Dips

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Dips Tester	HTEC	HPFS 161P	1416009	July 15, 2016	July 14, 2017	1 year



4.2 Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 5\%$
RF output power, conducted	$\pm 1.5\text{dB}$
Power Spectral Density, conducted	$\pm 3\text{dB}$
Unwanted Emissions, conducted	$\pm 3\text{dB}$
All emissions, radiated	$\pm 6\text{dB}$
Time	$\pm 2\%$
Duty Cycle	$\pm 2\%$
Temperature	$\pm 1^\circ\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 3\%$
Conduction disturbance(150kHz~30MHz)	$\pm 3.23\text{dB}$
Radiated Emission(30MHz~1GHz)	$\pm 4.34\text{dB}$
Radiated Emission(1GHz~25GHz)	$\pm 5.25\text{dB}$

5 EMC Requirements for Emissions

(1) Normal Test Conditions:

Ambient Condition: Normal

(2) Extreme Test Conditions:

N/A

(3) Test Configuration

- measurements shall be made in the operational mode producing the largest emission in the frequency band being investigated consistent with normal applications;
- the equipment shall be configured in a manner which is representative for normal/typical operation, where practical;
- where radio equipment is provided with an integral antenna, it shall be tested with the antenna fitted in a manner typical of normal intended use, unless declared as a removable antenna;
- if the equipment is part of a system, or can be connected to ancillary equipment, then it shall be acceptable to test the equipment while connected to the minimum representative configuration of ancillary equipment necessary to exercise the ports;
- if the equipment has a large number of ports, then a sufficient number shall be selected to simulate actual operational conditions and to ensure that all the different types of termination are covered;
- ports, which in normal operation are connected, shall be connected to an ancillary equipment or to a representative piece of cable terminated to simulate the impedance of the ancillary equipment. RF input/output ports shall be correctly terminated;
- the configuration and mode of operation during the measurements shall be precisely noted in the test report.

(4) Test Mode

TM1*	BLE link
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5.1 Radiated Emissions

Test Requirement	:	EN 301 489-17
Test Method	:	EN 301 489-1, EN 55022
Frequency Range	:	30MHz to 1GHz, 1GHz to 6GHz
Class/Severity	:	Class B/ Table 6 of EN 55022 (30MHz to 1GHz) Class B/ Table 8 of EN 55022 (1GHz to 6GHz)
Detector	:	Peak for pre-scan (120kHz Resolution Bandwidth Below 1GHz; 1MHz Resolution Bandwidth Above 1GHz)

5.1.1 EUT Operation

Operating Environment :

Temperature	:	25.5 °C
Humidity	:	51 % RH
Atmospheric Pressure	:	101.2kPa

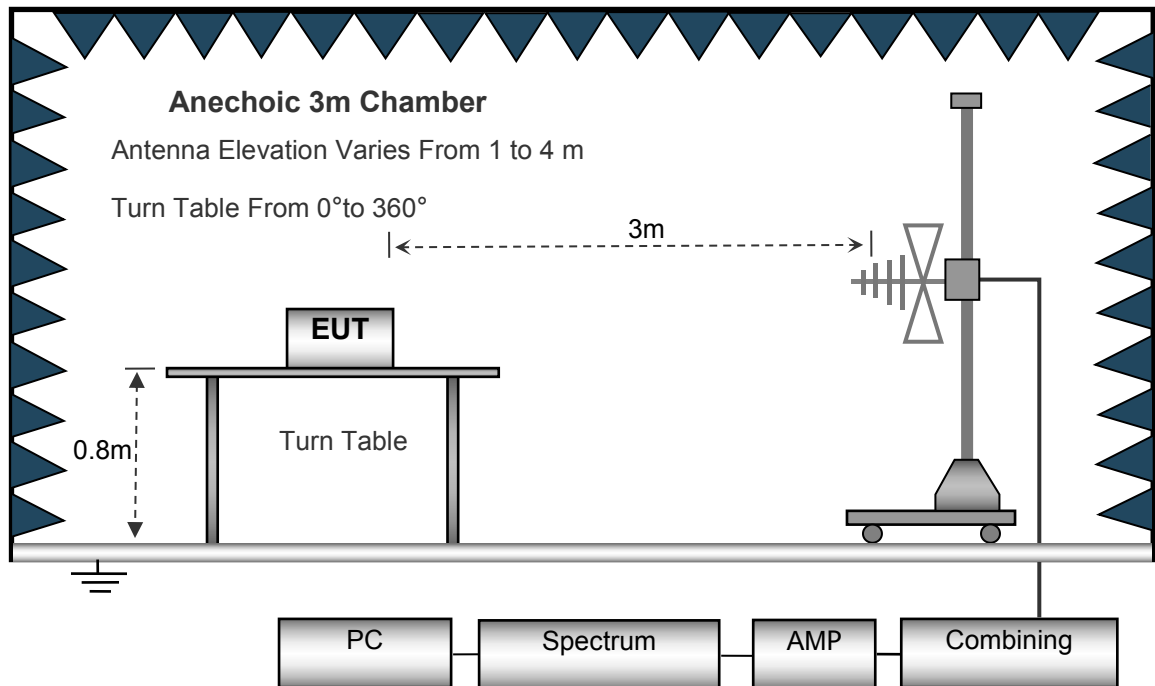
EUT Operation :

Refer to section 5(4).

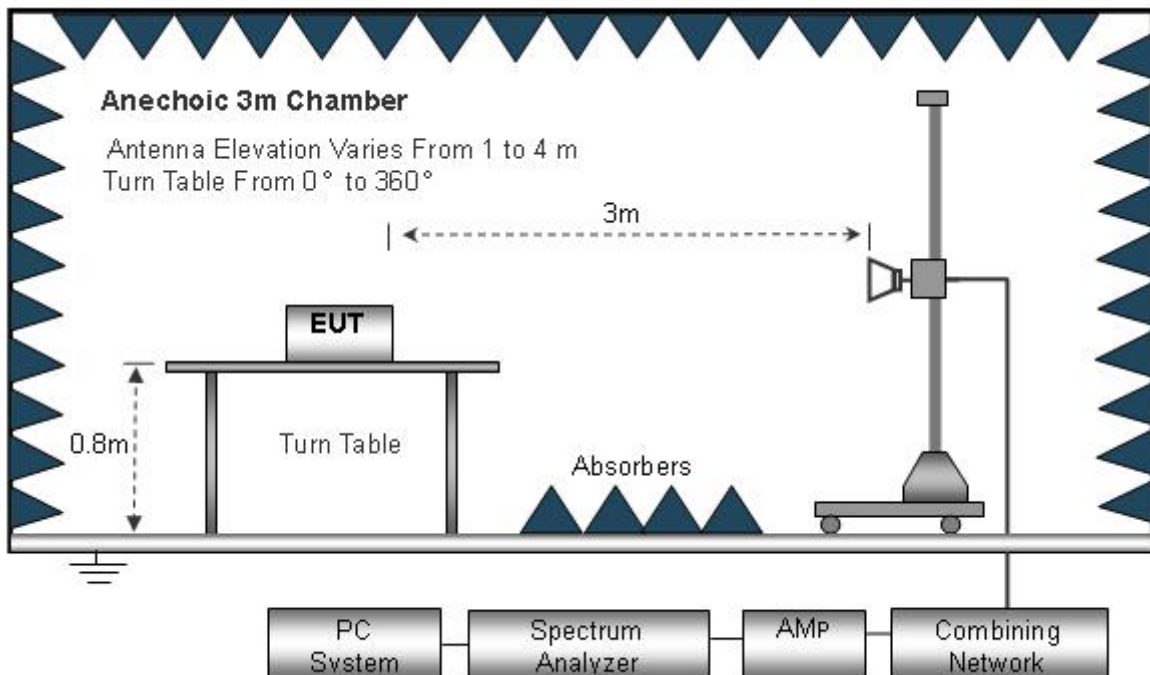
5.1.2 Test Setup

The radiated emission tests were performed using the setup accordance with the EN 55022.

Frequency Range: Below 1 GHz



Frequency Range: Above 1 GHz



5.1.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

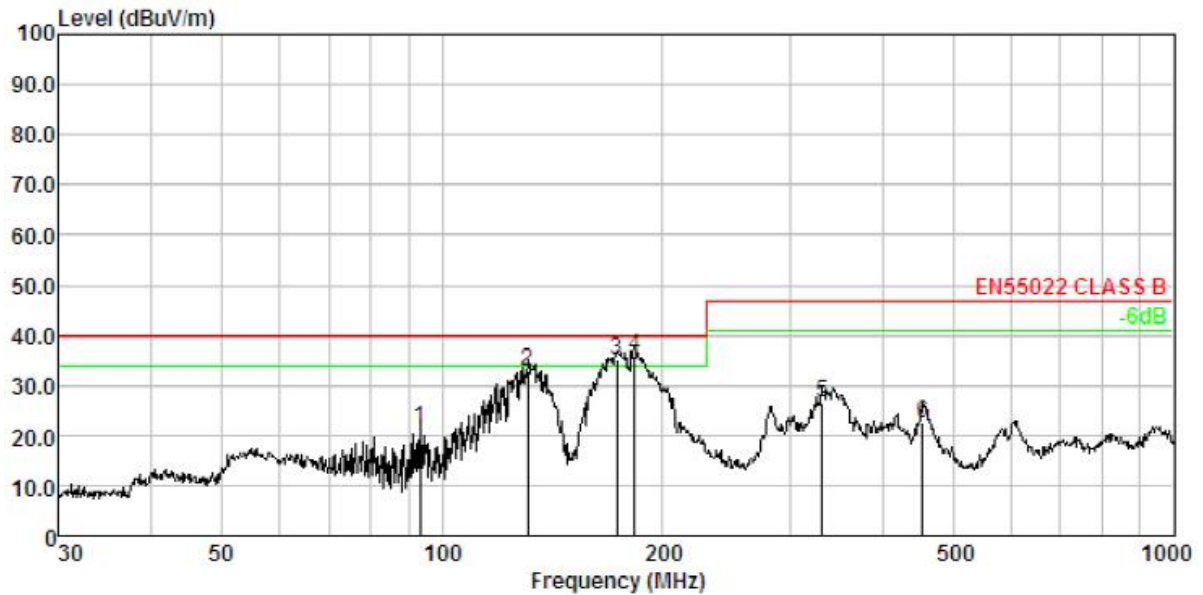
The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

5.1.4 Test Result

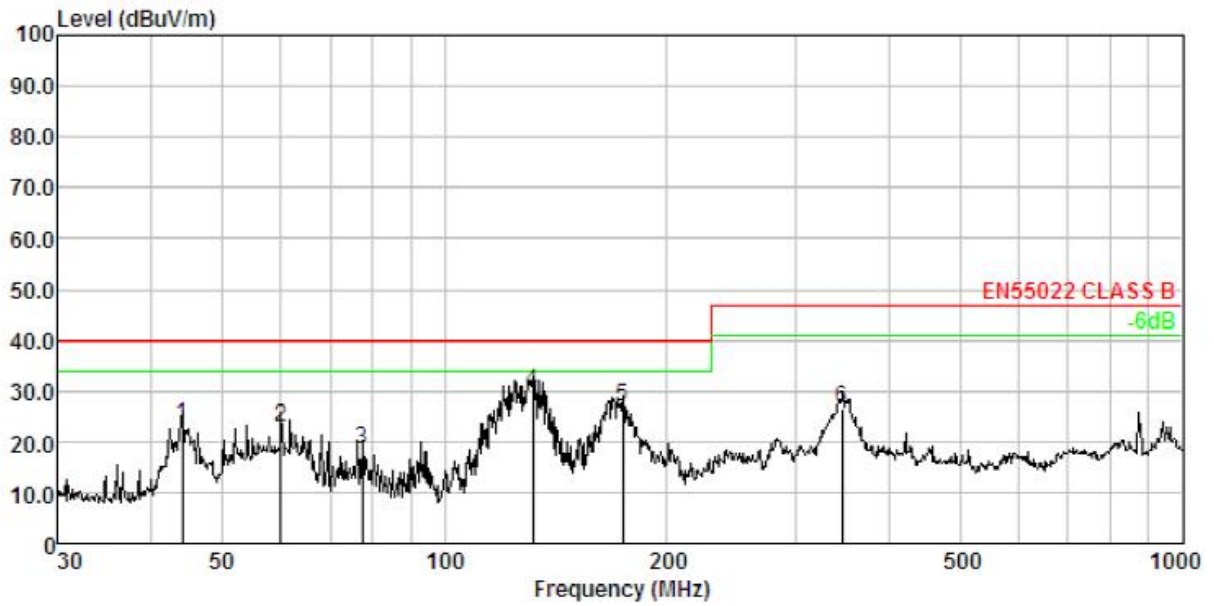
Frequency Range: 30MHz ~ 1000MHz

Antenna Polarization: Horizontal



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	93.440	2.08	9.61	40.01	30.37	21.33	40.00	-18.67	QP
2.	130.837	2.39	12.69	48.34	30.48	32.94	40.00	-7.06	QP
3.	173.205	2.64	13.04	49.92	30.58	35.02	40.00	-4.98	QP
4.	183.201	2.69	12.00	51.69	30.60	35.78	40.00	-4.22	QP
5.	331.355	3.23	13.90	40.28	30.81	26.60	47.00	-20.40	QP
6.	454.310	3.52	16.43	33.64	30.92	22.67	47.00	-24.33	QP

Antenna Polarization: Vertical



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	44.120	1.40	13.33	38.47	30.10	23.10	40.00	-16.90	QP
2.	60.069	1.68	12.17	39.30	30.21	22.94	40.00	-17.06	QP
3.	77.321	1.91	9.35	37.43	30.30	18.39	40.00	-21.61	QP
4.	131.758	2.39	12.76	45.15	30.48	29.82	40.00	-10.18	QP
5.	174.424	2.65	12.93	42.01	30.58	27.01	40.00	-12.99	QP
6.	345.595	3.27	14.18	39.88	30.82	26.51	47.00	-20.49	QP

Frequency Range: 1000MHz ~ 6000MHz

Antenna Polarization: Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
1725.36	57.68	-16.36	41.32	74.00	-32.68	peak
2662.51	56.58	-12.17	44.41	74.00	-29.59	peak
3591.22	55.76	-8.69	47.07	74.00	-26.93	peak
4422.36	56.57	-5.42	51.13	74.00	-22.87	peak

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Antenna Polarization: Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
1480.98	54.35	-17.14	37.21	74.00	-36.79	peak
2734.80	54.73	-14.73	40.00	74.00	-30.00	peak
4156.08	53.62	-5.67	47.95	74.00	-26.05	peak
5135.62	53.55	-3.82	49.73	74.00	-24.27	peak

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

6 EMC Requirement for Immunity

(1). Normal Test Conditions:

Ambient Condition: Normal

(2). Extreme Test Conditions:

N/A

(3). Test Configuration

- the tests shall be made in the mode(s) of operation specified in clause 4 in the relevant part of the EN 301 489 series [i.13] dealing with the particular type of radio equipment;
- the tests shall be carried out at a point within the specified normal operating environmental range and at the rated supply voltage for the equipment;
- if the equipment is part of a system, or can be connected to ancillary equipment, then it shall be acceptable to test the equipment connected to the minimum representative configuration of ancillary equipment necessary to exercise the ports;
- where radio equipment is provided with an integral antenna, it shall be tested with the antenna fitted in a manner typical of normal intended use, unless declared as a removable antenna;
- for the immunity tests of ancillary equipment, without a separate pass/fail criteria, the receiver or transmitter coupled to the ancillary equipment, shall be used to judge whether the ancillary equipment passes or fails;
- if the equipment has a large number of ports, then a sufficient number shall be selected to simulate actual operational conditions and to ensure that all the different types of termination are covered;
- ports, which in normal operation are connected, shall be connected to an ancillary equipment or to

a

representative piece of cable terminated to simulate the impedance of the ancillary equipment. RF input/output ports shall be correctly terminated;

- ports which are not connected to cables during normal intended operation, e.g. service connectors, programming connectors, temporary connectors etc. shall not be connected to any cables for the purpose of EMC testing. Where cables have to be connected to these ports, or interconnecting cables have to be extended in length in order to exercise the Equipment Under Test (EUT), precautions shall be taken to ensure that the evaluation of the EUT is not affected by the addition or extension of these cables;
- the configuration and mode of operation during the tests shall be precisely noted in the test report.



PRECISE TESTING

Report No.: PTCHX04161101902E-EM02

(4).Test Mode

TM1*	BT link
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6.1 Performance Criteria Description

EN 301 489-1V1.9.2 Clause 6 requirements:

The performance criteria are used to take a decision on whether a radio equipment passes or fails immunity tests.

For the purpose of the present document four categories of performance criteria apply:

- performance criteria for continuous phenomena applied to transmitters(CT);
- performance criteria for transient phenomena applied to transmitters(TT);
- performance criteria for continuous phenomena applied to receivers(CR);
- performance criteria for transient phenomena applied to receivers(TR).

Normally, the performance criteria depend on the type of radio equipment. Thus, the present document only contains general performance criteria commonly used for the assessment of radio equipment. More specific and product-related performance criteria for a dedicated type of radio equipment may be found in the part of EN 301 489 series [i.13] dealing with the particular type of radio equipment.

Performance Criteria	Description
CT,CR	<p>If no further details are given in the relevant part of EN 301 489 series [i.13] dealing with the particular type of radio equipment, the following general performance criteria for continuous phenomena shall apply.</p> <p>During and after the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.</p> <p>During the test the EUT shall not unintentionally transmit or change its actual operating state and stored data.</p> <p>If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.</p>
TT,TR	If no further details are given in the relevant part of EN 301 489 series [i.13]

	<p>dealing with the particular type of radio equipment, the following general performance criteria for transient phenomena shall apply. After the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer, when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.</p> <p>During the EMC exposure to an electromagnetic phenomenon, a degradation of performance is, however, allowed. No change of the actual mode of operation (e.g. unintended transmission) or stored data is allowed.</p> <p>If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.</p>
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EN 301 489-17 V2.2.1 Clause 6 requirements:

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.

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

C	May be loss of function (one or more).	functions. Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2).
<p>NOTE 1: 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 2: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.</p>		

Performance Criteria	Description
CT	<p>The performance criteria A shall apply.</p> <p>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.</p>
TT	<p>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.</p> <p>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</p>

	correctly interpreted.
CR	<p>The performance criteria A shall apply.</p> <p>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.</p>
TR	<p>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.</p> <p>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.</p>

6.2 Radiated Immunity(R/S)

Test Requirement	: EN 301 489-17
Test Method	: EN 301 489-1, EN 61000-4-3
Face Under Test	: Three Mutually Orthogonal Faces
Severity	: 3V/m, 1kHz, 80% Amp. Mod. from 80MHz to 1GHz,
Test Result	: PASS

6.2.1 E.U.T. Operation

Operating Environment:

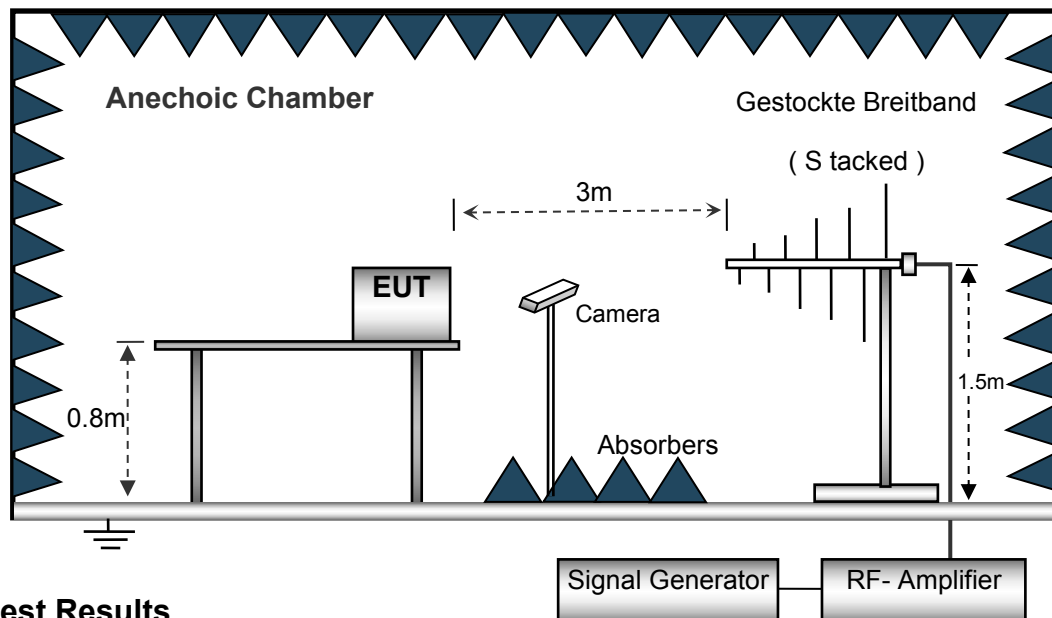
Temperature	: 21.4°C
Humidity	: 52.1 % RH
Barometric Pressure	: 101.2kPa

EUT Operation :

Refer to section 6(4).

6.2.2 Block Diagram of Setup

The Radiated Immunity test was performed in accordance with the EN 61000-4-3.



6.2.3 Test Results

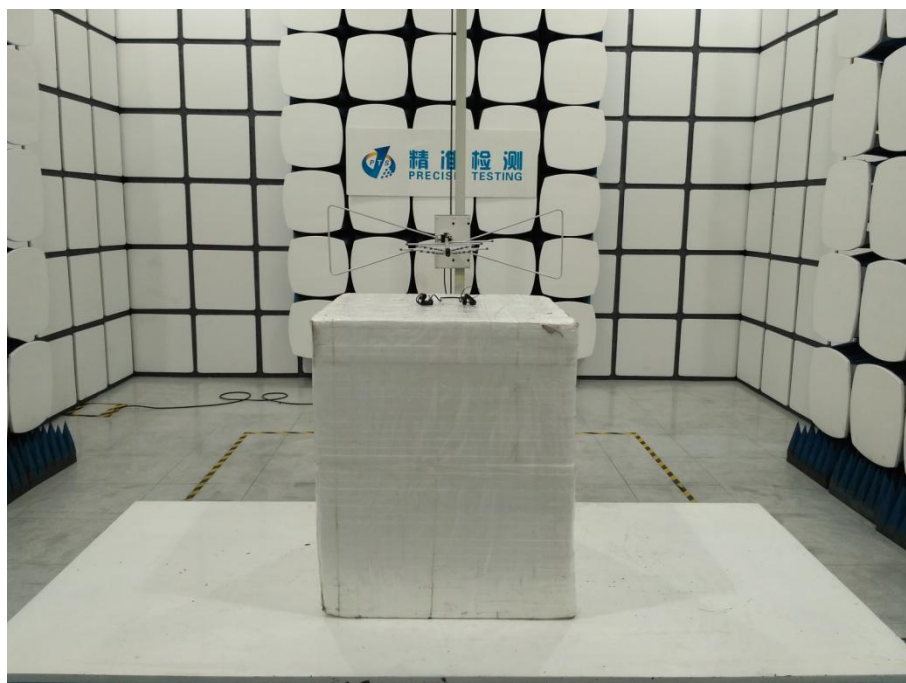
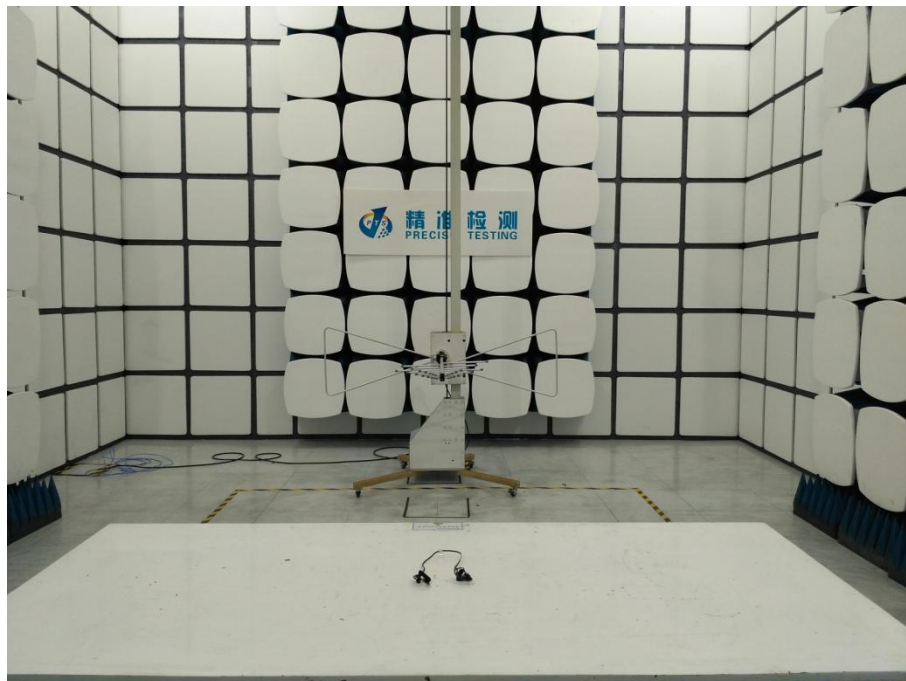
Frequency	Level	Modulation	ANT.	EUT Face	Performance Criteria
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			Polarization		
80MHz -1GHz,	3V/m	1kHz, 80%, Amp. Mod.	Horizontal/ Vertical	Front, Back Left, Right	CT/CR
1.4GHz - 2.7GHz	3V/m	1kHz, 80%, Amp. Mod.	Horizontal/ Vertical	Front, Back Left, Right	CT/CR

7 Test Setup

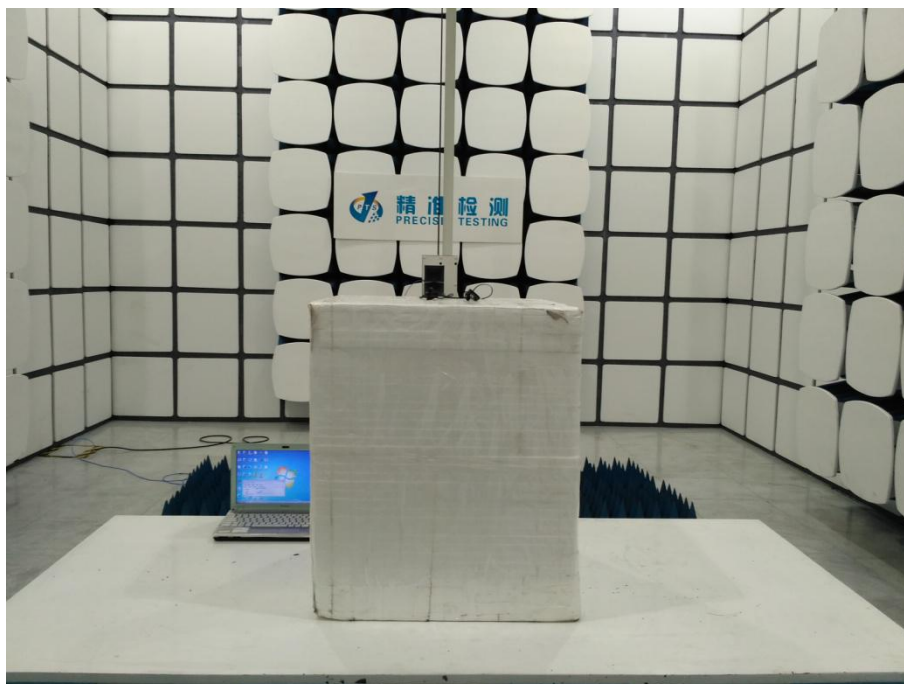
Radiated Emissions





PRECISE TESTING

Report No.: PTCHX04161101902E-EM02



*****THE END REPORT*****