



FCC PART 15D
MEASUREMENT AND TEST REPORT

For

IPN Headsets

Bijsterhuizen 2414, 6604 LL Wijchen, Netherlands

FCC ID: 2ALB3W990BS

Report Type: Original Report	Product Type: Wireless Headset (Base Unit)
Report Number: RSZ180814001-00BA1	
Report Date: 2018-11-22	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The IPN Headsets's product, model number: W990 (FCC ID: 2ALB3W990BS) or the "EUT" in this report in this report was a base unit of Wireless Headset, which was measured approximately: 11.0cm (L) x 11.0cm (W) x 6.1 cm (H), rated input voltage: DC 8.5V from adapter.

Adapter Information:

Model: ZHT061U-0850500

Input: AC 100-240V, 50/60Hz, 0.35A Max

Output: DC 8.5V, 5000 mA

Note: The series product models LH370, LH375, LH380, W995, W997 and W990 are electrically identical, the difference among them is just model number due to marketing purpose, model W990 was selected for fully testing, the detailed information can be referred to the declaration which was stated and guaranteed by the applicant.

**All measurement and test data in this report was gathered from production sample serial number: 1801290 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2018-08-14.*

Objective

This test report was based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.17 - 2013.

The tests were performed in order to determine the compliance of the EUT with FCC Part 15-Subpart D, section 15.207, 15.315, 15.317, 15.319 and 15.323 rules.

Related Submittal(s)/Grant(s)

Submitted with Part 15.247 DSS submission with FCC ID: 2ALB3W990BS.

Submitted with Part 15D PUE submission with FCC ID: 2ALB3W985HS.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.17 - 2013, American National Standard Methods of Measurement of the Electromagnetic and Operational Compatibility of Unlicensed Personal Communications Services (UPCS) Devices.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item	Uncertainty
AC Power Lines Conducted Emissions	±1.95dB
RF conducted test with spectrum	±1.5dB
Occupied Bandwidth	±5%
Temperature	±3°C
Humidity	±6%
Supply voltages	±0.4%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing mode which is provided by the manufacturer.

Equipment Modifications

No modification was made to the EUT tested.

Local Support Equipment List and Details

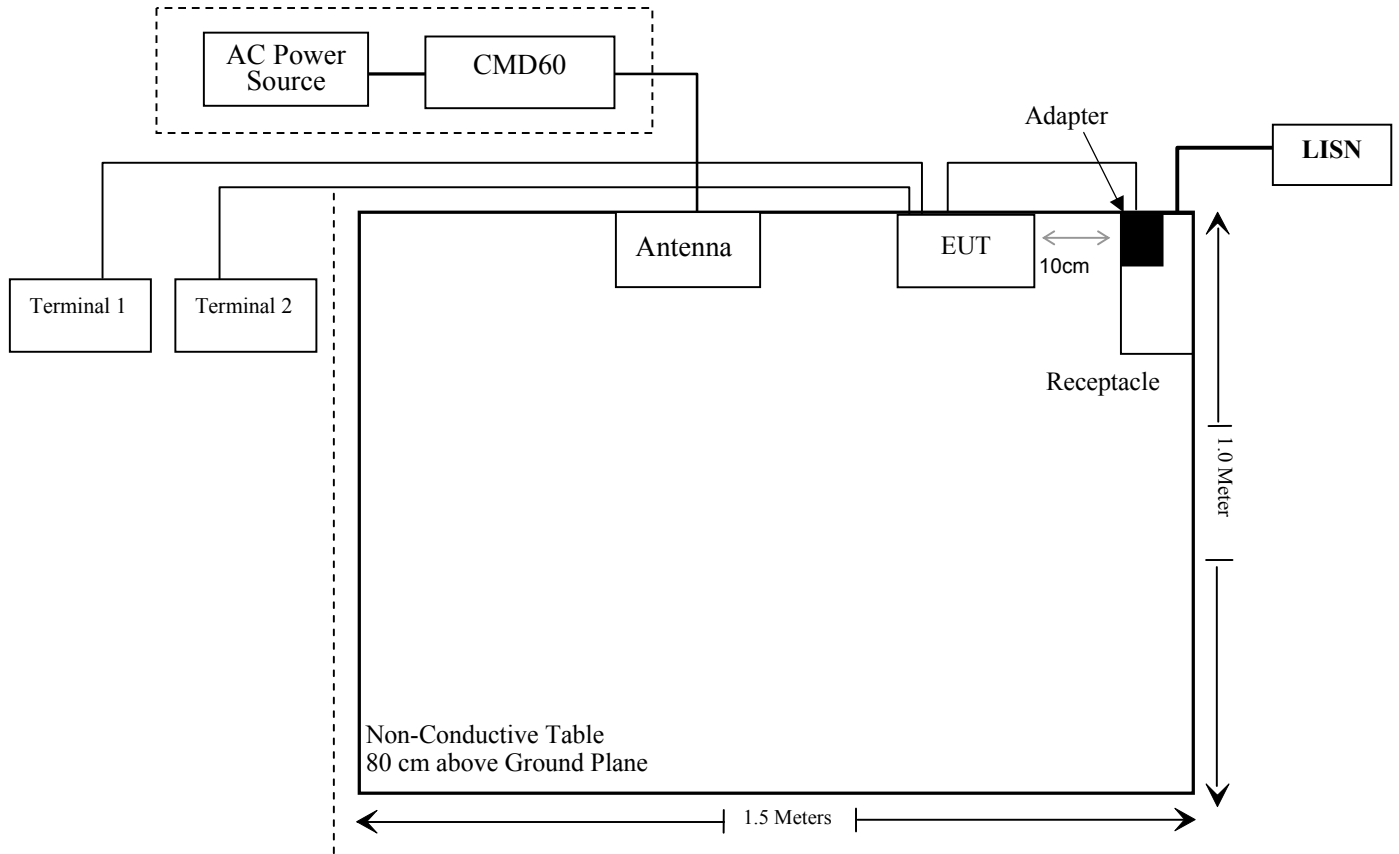
Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Digital Radio Communication Test	CMD60	830861/029
IPN Headsets	Terminal 1	Unknown	Unknown
IPN Headsets	Terminal 2	Unknown	Unknown

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-shielding Un-detachable DC Cable	1.5	EUT	Adapter
Un-shielding Dtachable RJ9 Cable	2.0	EUT	Terminal 1
Un-shielding Dtachable RJ9 Cable	2.0	EUT	Terminal 2

Block Diagram of Test Setup

For conducted emissions:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 15.319 (i)&2.1091	Maximum Permissible exposure (MPE)	Compliance
§ 15.317, § 15.203	Antenna Requirement	Compliance
§ 15.315, § 15.207	Conducted Emission	Compliance
§ 15.323 (a)	Emission Bandwidth	Compliance*
§ 15.319 (c)	Peak Transmit Power	Compliance*
§ 15.319 (d)	Power Spectral Density	Compliance*
§ 15.323 (d)	Emission Inside and Outside the sub-band	Compliance*
§ 15.319 (g)	Radiated Emission	Not Applicable*
§ 15.323 (f)	Frequency Stability Handset	Compliance*
§ 15.323 (c)(e) § 15.319 (f)	Specific Requirements for UPCS	Compliance*

Not Applicable*: EUT is compliance with 15.323 (d).

Compliance*: The schematics and PCB layout of DECT part for this device is the same as the product with FCC ID: 2ALB3W985BS, so these test items please refer to the data about the product with FCC ID: 2ALB3W985BS granted on 2017-05-29.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2018-07-11	2019-07-11
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2017-12-21	2018-12-21
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2018-11-12	2019-05-12
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
Un-known	Conducted Emission Cable	78652	UF A210B-1-0720-504504	2018-11-12	2019-05-12

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

§1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to FCC §15.319(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission’s guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	842/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

MPE Calculation

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For worst case:

Frequency (MHz)	Antenna Gain		Tune-up conducted power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
	(dBi)	(numeric)	(dBm)	(mW)			
2402-2480	0	1	3.5	2.24	20	0.0004	1.0
1921.536 - 1928.448	0	1	15.5	35.48	20	0.007	1.0

Considered the Bluetooth and DECT transmitting simultaneously:

The rate=0.0004/1+0.007/1=0.0074<1.0

Result: Compliance. To maintain compliance with the FCC’s RF exposure guidelines, place the equipment at least 20cm from nearby persons.

FCC§15.317 & §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has two internal antennas arrangement, which were permanently attached and the gain is 0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

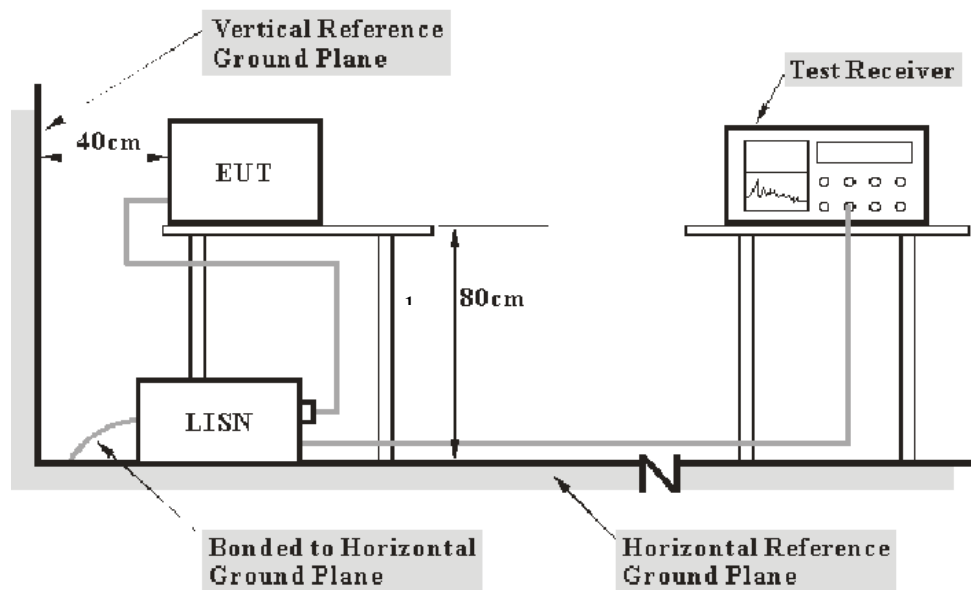
Result: Compliant.

FCC§15.315 & §15.207 - CONDUCTED EMISSIONS

Applicable Standard

FCC§15.315, an unlicensed PCS device that is designed to be connected to the public utility (AC) power line must meet the limits specified in §15.207.

EUT Setup



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

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC 15.315 and FCC 15.207 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding the Outlet Cable Loss, LISN Insertion Loss, Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = Outlet Cable Loss + LISN Insertion Loss + Cable Loss + Transient Limiter Attenuation

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(L_m)} \leq L_{lim} + U_{cispr}$$

In BAEL, $U_{(L_m)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data

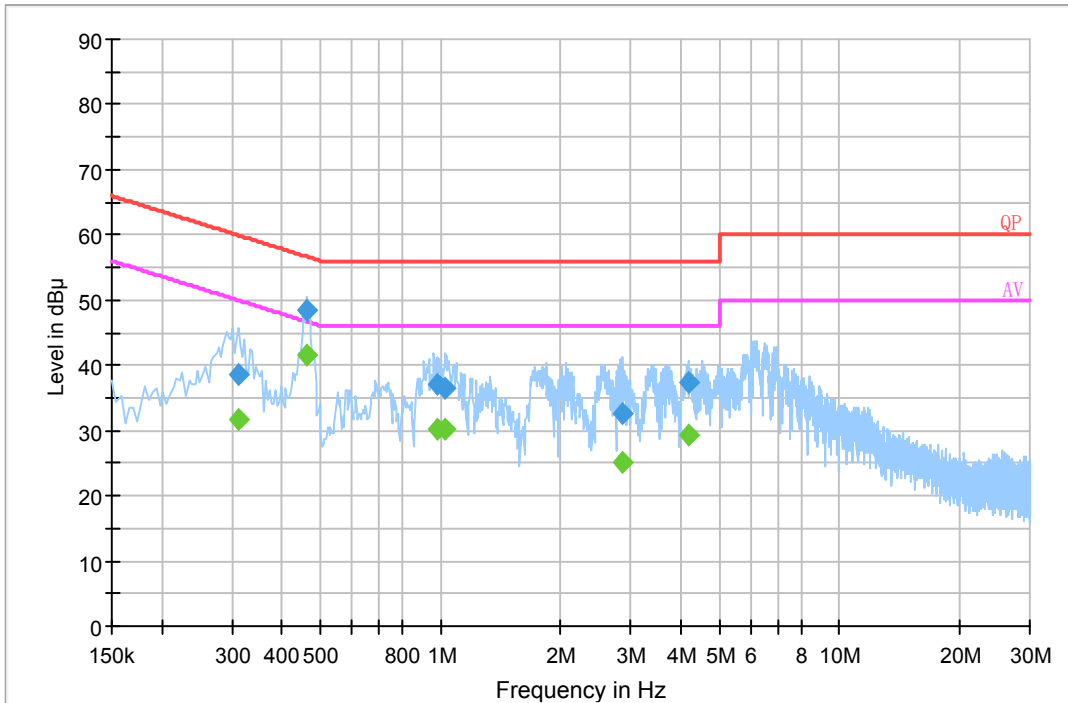
Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Hill He on 2018-12-19.

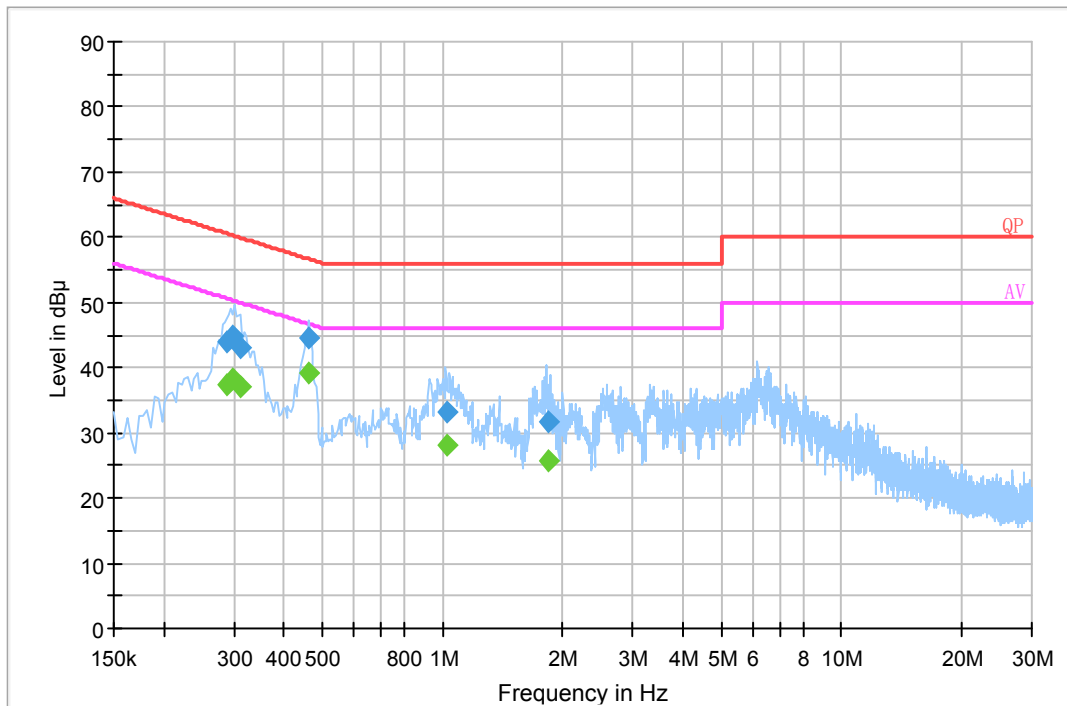
Test mode: Transmitting

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.313350	38.6	19.8	59.9	21.3	QP
0.463070	48.4	19.7	56.6	8.2	QP
0.976430	37.2	19.8	56.0	18.8	QP
1.026550	36.3	19.8	56.0	19.7	QP
2.870950	32.7	19.9	56.0	23.3	QP
4.198910	37.3	20.0	56.0	18.7	QP
0.313350	31.7	19.8	49.9	18.2	Ave.
0.463070	41.4	19.7	46.6	5.2	Ave.
0.976430	30.1	19.8	46.0	15.9	Ave.
1.026550	30.3	19.8	46.0	15.7	Ave.
2.870950	25.3	19.9	46.0	20.7	Ave.
4.198910	29.3	20.0	46.0	16.7	Ave.

AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.286500	44.0	19.8	60.6	16.6	QP
0.297470	44.7	19.8	60.3	15.6	QP
0.313230	43.1	19.8	59.9	16.8	QP
0.463070	44.5	19.8	56.6	12.1	QP
1.030730	33.3	19.8	56.0	22.7	QP
1.853390	31.6	19.9	56.0	24.4	QP
0.286500	37.4	19.8	50.6	13.2	Ave.
0.297470	38.3	19.8	50.3	12.0	Ave.
0.313230	37.2	19.8	49.9	12.7	Ave.
0.463070	39.1	19.8	46.6	7.5	Ave.
1.030730	28.0	19.8	46.0	18.0	Ave.
1.853390	25.8	19.9	46.0	20.2	Ave.

- Note:**
 1) Correction Factor = LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
 2) Corrected Amplitude = Reading + Correction Factor
 3) Margin = Limit – Corrected Amplitude

******* END OF REPORT *******