

Prüfbericht - Nr.: 16020577 001

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Auftraggeber: Uni-Art Precise Products Ltd.
Client: 11-12/F., YUE XIU IND'L BLDG.
87 HUNG TO ROAD,
KWUN TONG, KOWLOON
HONG KONG

Gegenstand der Prüfung: Wireless Headphone Receiver
Test item:

Bezeichnung: AKG K912 **FCC ID:** MVAK912-001R
Identification: *FCC ID*

Wareneingangs-Nr.: 173047769 **Eingangsdatum:** Sep. 22, 2009
Receipt No.: *Date of receipt:*

Prüfört: TÜV Rheinland (Guangdong) Ltd. EMC
Testing location: Laboratory
Guangzhou Auto Market, Yuan Gang Section of
Guangshan Road, Guangzhou 510650,
P. R. China
Listed test laboratory
according to FCC rules
section 2.948 for
measuring devices under
Parts 15

Prüfgrundlage: ANSI C63.4:2003
Test specification:

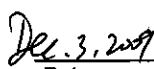
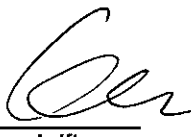
FCC Part 15: July 10, 2008
Subpart B section 15.109 and 15.121

Prüfergebnis: Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).
Test Result: *The test item passed the test specification(s).*

Prüflaboratorium: TÜV Rheinland (Guangdong) Ltd.
Testing Laboratory:

geprüft/ tested by:

kontrolliert/ reviewed by:

		
Dec. 3, 2009 Ken Kuang/Project Engineer	Dec. 3, 2009 Ricky Liu/Project Manager	
Datum Name/Stellung Unterschrift	Datum Name/Stellung Unterschrift	Datum Name/Stellung Unterschrift
Date Name/Position Signature	Date Name/Position Signature	Date Name/Position Signature

Sonstiges/ Other Aspects:

Abkürzungen: P(ass) = entspricht Prüfgrundlage
F(ail) = entspricht nicht Prüfgrundlage
N/A = nicht anwendbar
N/T = nicht getestet

Abbreviations: P(ass) = passed
F(ail) = failed
N/A = not applicable
N/T = not tested

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.

This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.

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TEST SUMMARY

5.1 RADIATED EMISSION FOR FCC PART 15 PER SECTION 15.109(a)

RESULT: Pass

5.2 38 dB REJECTION SIGNAL FROM CELLULAR FREQUENCY BAND 15.121(b)

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

None

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Guangdong) Ltd. EMC Laboratory

Guangzhou Auto Market, Yuan Gang Section of Guangshan Road
Guangzhou 510650

P. R. China

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2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Type	Manufacturer	S/N	Calibrated until	Calibrated Interval
EMI Test Receiver	ESCI-3	Rohde & Schwarz	100216	16.Mar.2010	1 year
Spectrum Analyzer	FSP30	Rohde & Schwarz	100286	27.Aug.2010	1 year
Trilog-Broadband Antenna	VULB9168	SCHWARZBECK MESS- ELEKTRONIK	209	07.Nov.2010	2 year
Double-Ridged Waveguide Horn Antenna	HF906	Rohde & Schwarz	100385	18.Jul.2010	2 year
Pre-amplifier	AFS42-00101800-25-S-42	MITEQ	1101599	31.Jul.2010	2 year
Band Reject Filter	BRM50702	Micro-Tronics	023	14.Mar.2010	2 year
Pre-amplifier	AFS33-18002650-30-8P-44	MITEQ	1108282	16.Mar.2010	2 year
3m Anechoic Chamber	N/A	Albatross Project GmbH	N/A	10.Feb.2010	1 year

2.3 Trace ability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

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2.5 Measurement Uncertainty

Uncertainty for conducted emissions measurements is $\pm 2.51\text{dB}$.

Uncertainty for radiated emissions measurements is $\pm 4.9\text{dB}$ (30MHz-1GHz), $\pm 4.84\text{dB}$ (>1GHz).

The reported expanded uncertainty is based on a standard uncertainty multiply by a coverage factor $k=2$, providing a level of confidence of approximately 95%.

2.6 Location of original data

The original copies of all test data taken during actual testing were delivered to the applicant. A copy has been retained in the TÜV Rheinland (Guangzhou) file for certification follow-up purposes.

2.7 Status of facility used for testing

TÜV Rheinland (Guangdong) Ltd. EMC Laboratory; Guangzhou Auto Market, Yuan Gang Section of Guangshan Road, Guangzhou 510650, P. R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements, the register no. 833845

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3 General Product Information

Brief description of the test sample:

The EUT is analogue Wireless Headphone Receiver with 3 operating frequencies. The EUT will auto-scan the 3 channels and stay on the channel with signal detected.

Please refer to User Manual for further details.

3.1 Product Function and Intended Use

For details, refer to User Manual.

3.2 Ratings and System Details

Frequency range	:	915.50MHz, 916.00MHz, 916.50MHz
Number of channels	:	3(auto tunable)
Type of antenna	:	Integral antenna
Modulation Type	:	FM
FCC ID:		MVAK912-001R
Power supply	:	2.4V by 2 x AAA batteries
Ports	:	DC charge input (from relative transmitter)
Protection Class	:	III

Refer to technical documentation for further information

3.3 Independent Operation Modes

The basic operation modes are:

Receiving with volume, freq. auto adjustable

For further information refer to User Manual

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3.4 Submitted Documents

Block Diagram
Circuit Diagram
PCB Layout
FCC Label
User Manual
Photo Document

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4 Test Set-up and Operation Mode

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Refer to Test set-up in chapter 5.

4.3 Special Accessories and Auxiliary Equipment

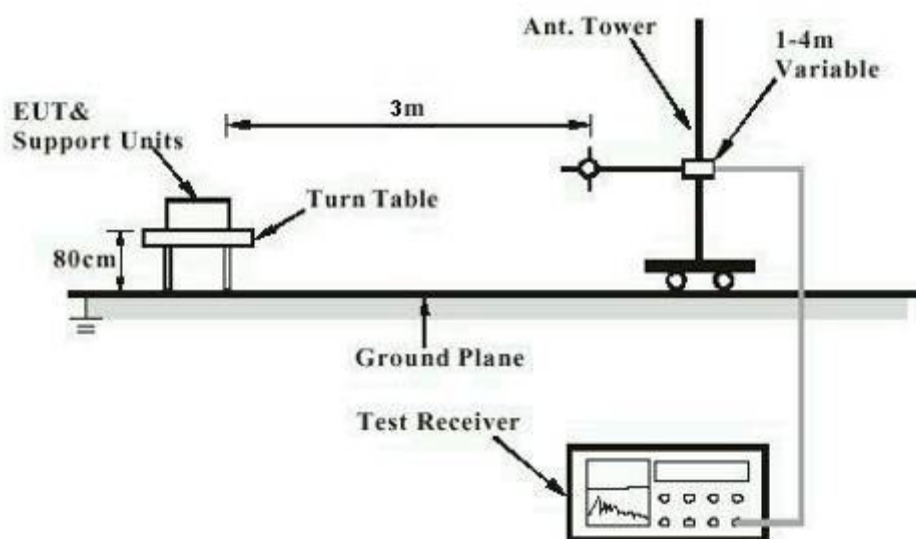
None.

4.4 Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the Constructional Data Form or the Technical document. No additional measures were employed to achieve compliance.

4.5 Test set-up

Diagram 2 of Measurement Equipment Configuration for Testing Radiated Emission



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5 Test Results EMISSION

5.1 Radiated Emission for FCC Part 15 Per Section 15.109(a)

RESULT:

Pass

Date of testing	:	Oct. 20, 2009 ~ Nov. 26, 2009
Test specification	:	FCC Part 15 Per Section 15.109(a)
Limits	:	FCC Part 15 Per Section 15.109(a)
Frequency Range	:	30MHz to 5GHz
Test procedure	:	Procedure specified in ANSI C63.4 were followed
Deviations from Standard Test procedures	:	None
Kind of test site	:	3m Semi-anechoic chamber
Operation mode	:	Receiving, scanning
Power Supply	:	2.4V DC
Temperature	:	22°C
Humidity	:	51%

Test procedure:

1. The EUT was placed on the top of a rotatable table 0.8 meters above the ground with 3-orthogonal direction and be kept close enough to the receiving antenna. The table was rotated 360 degrees to determine the suspected emission frequency and the position of the worst radiation case with both horizontal and vertical antenna polarization.
2. The EUT was then set 3 meters away from the receiving antenna, which was mounted on a variable-height antenna tower.
3. For each suspected emission frequency recorded in step 1, the EUT was arranged to its worst case and:
for tests below 30MHz the loop antenna is positioned with its plane vertical and the center of it is 1m above the ground. During the tests it is rotated about its vertical axis for maximum response at each azimuth about the EUT;
for tests above 30MHz the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to read the maximum emission.

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Table 2: Radiated Emission (operation mode: receiving low channel)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dBμ V/m]			(H/V)	[dBμ V/m]		
32.900000	10.6	N/A	N/A	V	40.0	N/A	N/A
127.300000	21.7	N/A	N/A	V	43.5	N/A	N/A
151.500000	12.1	N/A	N/A	V	43.5	N/A	N/A
282.900000	25.6	N/A	N/A	V	46.0	N/A	N/A
634.800000	19.9	N/A	N/A	V	46.0	N/A	N/A
915.500000	32.9	N/A	N/A	V	46.0	N/A	N/A
46.150000	11.0	N/A	N/A	H	40.0	N/A	N/A
127.300000	29.8	N/A	N/A	H	43.5	N/A	N/A
141.450000	17.2	N/A	N/A	H	43.5	N/A	N/A
268.750000	27.5	N/A	N/A	H	46.0	N/A	N/A
282.900000	33.2	N/A	N/A	H	46.0	N/A	N/A
915.500000	35.9	N/A	N/A	H	46.0	N/A	N/A
1810.500000	N/A	30.6	36.5	V	N/A	54.0	74.0
2716.000000	N/A	37.4	42.5	V	N/A	54.0	74.0
3621.500000	N/A	34.5	43.7	V	N/A	54.0	74.0
4527.000000	N/A	33.6	41.4	V	N/A	54.0	74.0
1810.500000	N/A	26.2	35.0	H	N/A	54.0	74.0
2716.000000	N/A	34.5	38.3	H	N/A	54.0	74.0
3621.500000	N/A	35.8	40.9	H	N/A	54.0	74.0
3958.500000	N/A	32.2	40.9	H	N/A	54.0	74.0
*)---							

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Table 3: Radiated Emission (operation mode: receiving mid channel)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dBμ V/m]			(H/V)	[dBμ V/m]		
39.800000	10.3	N/A	N/A	V	40.0	N/A	N/A
127.300000	21.1	N/A	N/A	V	43.5	N/A	N/A
240.500000	12.8	N/A	N/A	V	46.0	N/A	N/A
268.750000	15.7	N/A	N/A	V	46.0	N/A	N/A
282.900000	24.9	N/A	N/A	V	46.0	N/A	N/A
655.600000	20.2	N/A	N/A	V	46.0	N/A	N/A
916.000000	36.9	N/A	N/A	V	46.0	N/A	N/A
127.300000	30.5	N/A	N/A	H	43.5	N/A	N/A
141.500000	21.3	N/A	N/A	H	43.5	N/A	N/A
268.750000	29.5	N/A	N/A	H	46.0	N/A	N/A
282.900000	34.5	N/A	N/A	H	46.0	N/A	N/A
297.100000	25.4	N/A	N/A	H	46.0	N/A	N/A
916.000000	28.1	N/A	N/A	H	46.0	N/A	N/A
1810.500000	N/A	31.2	37.4	V	N/A	54.0	74.0
2716.000000	N/A	37.6	41.9	V	N/A	54.0	74.0
3621.500000	N/A	34.5	40.2	V	N/A	54.0	74.0
4527.000000	N/A	32.1	41.2	V	N/A	54.0	74.0
1711.000000	N/A	27.4	40.6	H	N/A	54.0	74.0
2717.500000	N/A	34.1	40.5	H	N/A	54.0	74.0
3623.000000	N/A	35.2	42.1	H	N/A	54.0	74.0
4529.500000	N/A	32.6	42.2	H	N/A	54.0	74.0
*)---							

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Table 4: Radiated Emission (operation mode: receiving high channel)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dBμ V/m]			(H/V)	[dBμ V/m]		
33.300000	10.9	N/A	N/A	V	40.0	N/A	N/A
127.300000	22.4	N/A	N/A	V	43.5	N/A	N/A
151.200000	11.9	N/A	N/A	V	43.5	N/A	N/A
282.900000	24.9	N/A	N/A	V	46.0	N/A	N/A
501.100000	26.5	N/A	N/A	V	46.0	N/A	N/A
916.500000	36.2	N/A	N/A	V	46.0	N/A	N/A
37.900000	11.1	N/A	N/A	H	40.0	N/A	N/A
127.300000	29.8	N/A	N/A	H	43.5	N/A	N/A
151.000000	11.9	N/A	N/A	H	43.5	N/A	N/A
268.750000	27.6	N/A	N/A	H	46.0	N/A	N/A
282.900000	32.3	N/A	N/A	H	46.0	N/A	N/A
905.300000	26.2	N/A	N/A	H	46.0	N/A	N/A
1812.000000	N/A	36.9	47.3	V	N/A	54.0	74.0
2717.500000	N/A	52.2	55.1	V	N/A	54.0	74.0
3623.500000	N/A	47.8	53.7	V	N/A	54.0	74.0
2717.500000	N/A	43.0	49.7	H	N/A	54.0	74.0
3623.500000	N/A	45.6	54.3	H	N/A	54.0	74.0
*)---							

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Table 5: Radiated Emission (operation mode: scanning)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dBμ V/m]			(H/V)	[dBμ V/m]		
46.200000	15.7	N/A	N/A	V	40.0	N/A	N/A
158.300000	17.6	N/A	N/A	V	43.5	N/A	N/A
660.400000	25.6	N/A	N/A	V	46.0	N/A	N/A
127.400000	25.6	N/A	N/A	H	43.5	N/A	N/A
226.300000	22.7	N/A	N/A	H	46.0	N/A	N/A
296.900000	24.6	N/A	N/A	H	46.0	N/A	N/A
943.200000	34.8	N/A	N/A	H	46.0	N/A	N/A
2715.500000	N/A	23.7	40.5	H	N/A	54.0	74.0
3620.500000	N/A	26.4	40.8	H	N/A	54.0	74.0
1807.500000	N/A	20.2	37.8	V	N/A	54.0	74.0
1947.500000	N/A	25.4	35.8	V	N/A	54.0	74.0
2715.000000	N/A	28.3	40.5	V	N/A	54.0	74.0
3620.000000	N/A	26.2	40.7	V	N/A	54.0	74.0
*)---							

*) Note:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200Hz at frequency from below 150 kHz

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz at frequency from 150 kHz to 1GHz.

The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz at frequency above 1GHz.

Measurement is made from 30MHz to 5GHz. Disturbances other than those mentioned above are small or not detectable.

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5.2 38 dB rejection signal from Cellular Frequency band

RESULT:

Pass

Date of testing : Oct. 20, 2008
 Test specification : FCC Part 15 Per Section 15.121(b)
 Limit : FCC Part 15 Per Section 15.121(b)
 Operation mode: Receiving
 Kind of test site : Shielded room
 Test signal : RF signal FM at 1kHz audio, 19kHz pilot with 75kHz deviation
 Reference level : -40dBm

Test procedure:

1. Set the wanted signal to establish reference sensitivity (12dB SINAD), the level of wanted signal input was recorded as reference level.
2. Inject unwanted cellular signal into the EUT and increase the unwanted signal lever until the SINAD is reached 12dB or its level is 41dB (add 3dB margin with the 38dB rejection) higher than the reference level recorded in step 1.
3. Record the level of the unwanted mobile signal relative to the reference in step 1. The result is the rejection level in dB.
4. Repeat test steps 2-3 for other cellular frequencies.

Table 6: 38 dB Rejection

Injection frequency(Cellular) in MHz	Rejection in dB	Limit in dB
824.04	>41	38
836.00	>41	38
848.97	>41	38
869.04	>41	38
881.00	>41	38
893.97	>41	38

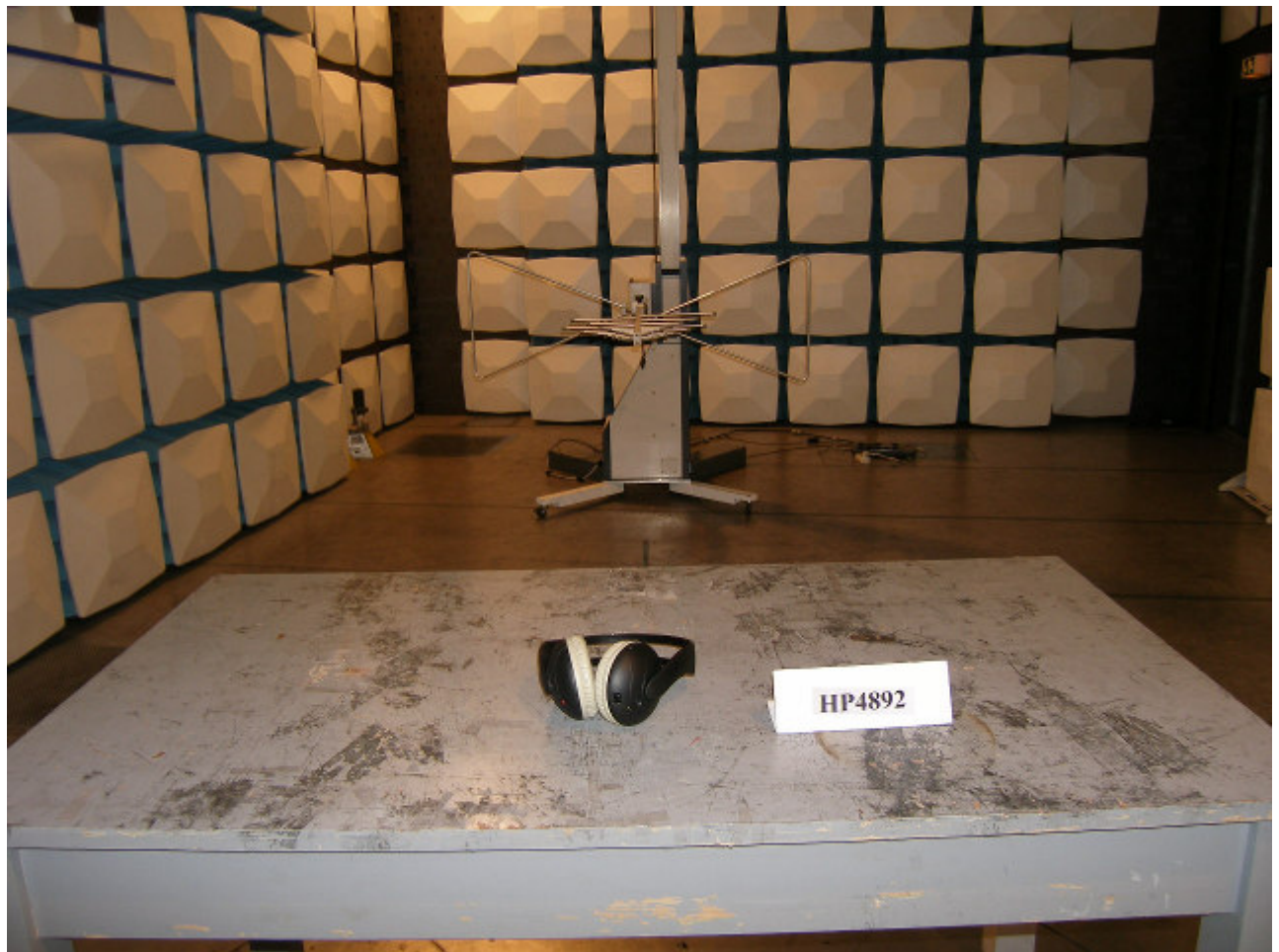
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6 Photographs of the Test Set-Up

Note: “HP4892” showed on the test setup photo is the internal name code of the receiver.

Photograph 1: Set-up for Radiation Measurement below 1GHz



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Photograph 2: Set-up for Radiation Measurement above 1GHz



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