

Prüfbericht - Nr.: Seite 1 von 23 16019833 001 Page 1 of 23 Test Report No.: 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 Audio Transmitter Test item: **AKG T912** MVAT912-001T Bezeichnung: FCC ID: Identification: FCC ID Wareneingangs-Nr.: 173047769 Eingangsdatum: Sep. 22, 2009 Receipt No.: Date of receipt: Prüfort: TÜV Rheinland (Guangdong) Ltd. EMC Listed test laboratory Testing location: Laboratory according to FCC rules section 2.948 for Guangzhou Auto Market, Yuan Gang Section of measuring devices under Guangshan Road, Guangzhou 510650, Parts 15 P. R. China Prüfgrundlage: ANSI C63.4: 2003 Test specification: FCC Part 15: July 10, 2008 Subpart C section 15.207, 15.209 and 15.249 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: Ken Kuang/Project Engineer Ricky Liu/Project Manager Datum Name/Stellung Unterschrift Datum Name/Stellung Unterschrift Date Name/Position Signature Date Name/Position Signature Sonstiges/ Other Aspects: Abkürzungen: entspricht Prüfgrundlage P(ass) Abbreviations: P(ass) passed entspricht nicht Prüfgrundlage F(ail) F(ail) failed nicht anwendbar not applicable N/A N/A nicht getestet N/T 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 CONDUCTED EMISSION FOR FCC PART 15 PER SECTION 15.207(A)

RESULT:

5.2 RADIATED EMISSION FOR FCC PART 15 PER SECTION 15.209(A)

RESULT: Pass

5.3 FUNDAMENTAL AND HARMONICS RADIATED EMISSION FOR FCC PART 15 PER **SECTION 15.249(A)**

RESULT: Pass



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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix 1: Test result-26dB bandwidth

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 | Туре | 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 |
| Loop Antenna | HFH2-Z2 | Rohde & Schwarz | 100111 | 25.Nov.2011 | 2 year |
| EMI Test Receiver | ESCS30 | Rohde & Schwarz | 100316 | 16.Mar.2010 | 1 year |
| Two-Line V- Network | ESH3-Z5 | Rohde & Schwarz | 100308 | 16.Mar.2010 | 1 year |
| Pulse Limiter | ESH3-Z2 | Rohde & Schwarz | 100701 | 16.Mar.2010 | 1 year |
| Audio generator | TAG-101 | LWDQGS | 358033 | 16.Mar.2011 | 1 year |
| Noise generator | DM8899 | DM | 607014 | 16.Mar.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.



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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.

2.5 Measurement Uncertainty

Uncertainty for conducted emissions measurements is ± 2.51 dB. Uncertainty for radiated emissions measurements is ± 4.9 dB (30MHz-1GHz), ± 4.84 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 attached at Appendix 1 of this report and delivered to the applicant. A copy has been retained in the TUV 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 samples:

The submitted sample AKG T912 is a 900MHz transmitter for wireless speaker system with 3 channels available. Stereo audio signal input to the audio-in port of the sample and modulated as a FM signal for transmission. 19 kHz pilot signal is also included in the RF signal as complete FM transmission. The antenna type is integrated.

3.1 Product Function and Intended Use

For details, refer to technical documentation and the user manual.

3.2 Ratings and System Details

| Type designation | : | AKG T912 |
|--------------------|---|--|
| Frequency range | : | 915.50MHz, 916.00MHz, 916.50MHz |
| Number of channels | : | 3 channels |
| Type of antenna | : | Integral antenna |
| FCC ID | : | MVAT912-001T |
| Power supply | : | AC/DC adaptor input |
| Ports | : | Audio input; |
| | | 8V DC input; |
| | | DC Charge output port (to the relative |
| | | headphone receiver) |
| RF Power level | : | <50 mV/m |
| Protection Class | : | III |

Refer to the technical documentation for further information



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3.3 Independent Operation Modes

The basic operation modes are:

Transmitting and standby

For further information refer to User Manual

3.4 Submitted Documents

Block Diagram Circuit Diagram Components List 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

The product has been tested together with the following switching power supply AC/DC Adaptor:

Model number : SUV-005-080-020-A2 Input : AC 100-240V, 50/60Hz

Output : DC 8V / 200mA

Protection class : II

4.4 Countermeasures to achieve EMC Compliance

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



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4.5 Test set-up

Diagram 1 of Measurement Equipment Configuration for Testing Conducted Emission

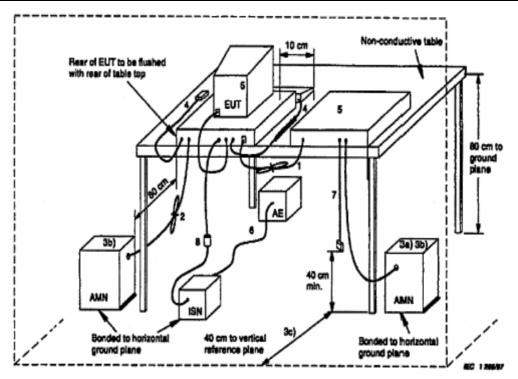
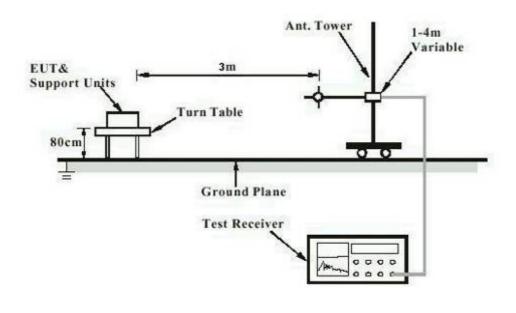


Diagram 2 of Measurement Equipment Configuration for Testing Radiated Emission





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5 Test Results EMISSION

5.1 Conducted Emission for FCC Part 15 Per Section 15.207(a)

RESULT: Pass

Date of testing : Oct. 22, 2009

Test specification : FCC Part 15 Per Section 15.207(a) Limits : FCC Part 15 Per Section 15.207(a)

Test procedure : Procedure specified in ANSI C63.4 were followed

Deviations from Standard Test

procedures : None

Kind of test site : Shielded room Operation mode : Transmitting

Power supply : AC 120V to the AC/DC adaptor

Temperature : 21°C Humidity : 51%

Test procedure:

- 1. Place the EUT as specified in ANSI C63.4 Clause 7.2.1
- 2. Plug the LISN to a correct power source (pay attention to: AC/DC, voltage, frequency).
- 4. Connect the EUT to LISN and choose N or L1 on the LISN.
- 5. Connect ESCS30 and LISN via a 50-ohm coaxial cable and a pulse limiter then begin exploratory measurement as specified in ANSI C63.4 Clause 7.2.3
- 6. Make final measurement as specified in ANSI C63.4 Clause 7.2.4
- 7. Switch to the other line on the LISN and repeat step 4 to 6.



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Table 2: Disturbance Voltage on AC Mains

| Frequency | Line | QP | AV | Quasi Peak Limit | Average Limit |
|-----------|------|--------|--------|------------------|---------------|
| [MHz] | L/N | [dBµV] | [dBµV] | [dBµV] | [dBµV] |
| 0.186 | N | 45.7 | / | 64.2 | / |
| 0.289 | L | 41.0 | / | 60.5 | / |
| 0.469 | N | 37.2 | / | 56.7 | / |
| 0.730 | L | 37.2 | / | 56.0 | / |
| 1.162 | L | 34.4 | / | 56.0 | / |
| 3.678 | L | 32.9 | / | 56.0 | / |
| 4.933 | L | 34.2 | / | 56.0 | / |
| 5.235 | L | 33.8 | / | 56.0 | / |
| 0.190 | N | / | 32.0 | / | 54.0 |
| 0.361 | N | / | 30.1 | / | 48.7 |
| 0.406 | L | / | 33.3 | / | 47.7 |
| 0.735 | L | / | 28.7 | / | 46.0 |
| 1.180 | L | / | 25.0 | / | 46.0 |
| 1.576 | L | / | 23.9 | / | 46.0 |
| 4.911 | L | / | 28.0 | / | 46.0 |
| 5.307 | L | / | 27.6 | / | 50.0 |
| *) | | | | | |

^{*)} Measurement is made from 150 kHz to 30 MHz. Disturbances other than those mentioned above are small or not detectable.

If the result of the measurement with the Quasi Peak detector is below the Average limit, the measurement with Average Detector may be omitted.



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5.2 Radiated Emission for FCC Part 15 Per Section 15.209(a)

RESULT: Pass

Date of testing : Oct. 21, 2009

Test specification : FCC Part 15 Per Section 15.209(a) Limits : FCC Part 15 Per Section 15.209(a)

Frequency Range : 9kHz to 10GHz

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 : Transmitting

Power supply : AC 120V to the AC/DC adaptor

Temperature : 22°C Humidity : 40%

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 3: Radiated Emission (Transmitting at channel low)

| Frequency | QP | AV | PK | Polarity | Limit | | |
|------------|------|--------|-----|----------|----------|-----|-----|
| | | | | | QP | AV | PK |
| [MHz] | [(| dBμV/n | 1] | (H/V) | [dBµV/m] | | |
| 40.200000 | 10.4 | N/A | N/A | Н | 40.0 | N/A | N/A |
| 49.800000 | 10.8 | N/A | N/A | Н | 40.0 | N/A | N/A |
| 120.400000 | 10.9 | N/A | N/A | Н | 43.5 | N/A | N/A |
| 153.300000 | 12.0 | N/A | N/A | Н | 43.5 | N/A | N/A |
| 368.050000 | 13.0 | N/A | N/A | Н | 46.0 | N/A | N/A |
| 501.100000 | 21.3 | N/A | N/A | Н | 46.0 | N/A | N/A |
| 45.500000 | 11.8 | N/A | N/A | V | 40.0 | N/A | N/A |
| 57.000000 | 25.2 | N/A | N/A | V | 40.0 | N/A | N/A |
| 80.800000 | 18.2 | N/A | N/A | V | 40.0 | N/A | N/A |
| 99.300000 | 17.6 | N/A | N/A | V | 43.5 | N/A | N/A |
| 112.500000 | 18.3 | N/A | N/A | V | 43.5 | N/A | N/A |
| 649.000000 | 20.0 | N/A | N/A | V | 46.0 | N/A | N/A |
| *) | | | | | | | |

Table 4: Radiated Emission (Transmitting at channel mid)

| Frequency | QP | AV | PK | Polarity | | Limit | |
|------------|------|--------|-----|----------|----------|-------|-----|
| | | | | | QP | AV | PK |
| [MHz] | [(| lBμV/n | 1] | (H/V) | [dBµV/m] | | |
| 38.400000 | 10.7 | N/A | N/A | Н | 40.0 | N/A | N/A |
| 54.900000 | 10.8 | N/A | N/A | Н | 40.0 | N/A | N/A |
| 127.000000 | 10.7 | N/A | N/A | Н | 43.5 | N/A | N/A |
| 143.600000 | 13.9 | N/A | N/A | Н | 43.5 | N/A | N/A |
| 228.000000 | 9.9 | N/A | N/A | Н | 46.0 | N/A | N/A |
| 711.900000 | 20.7 | N/A | N/A | Н | 46.0 | N/A | N/A |
| 45.500000 | 11.7 | N/A | N/A | V | 40.0 | N/A | N/A |
| 57.000000 | 23.6 | N/A | N/A | V | 40.0 | N/A | N/A |
| 80.500000 | 18.3 | N/A | N/A | V | 40.0 | N/A | N/A |
| 100.100000 | 16.7 | N/A | N/A | V | 43.5 | N/A | N/A |
| 113.200000 | 17.0 | N/A | N/A | V | 43.5 | N/A | N/A |
| 602.800000 | 18.9 | N/A | N/A | V | 46.0 | N/A | N/A |
| *) | | | | | | | |



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Table 5: Radiated Emission (Transmitting at channel high)

| Frequency | QP | AV | PK | Polarity | Limit | | |
|------------|------|--------|------------|----------|----------|-----|-----|
| | | | | | QP | AV | PK |
| [MHz] | [0 | lBμV/n | 1] | (H/V) | [dBµV/m] | | |
| 41.100000 | 11.2 | N/A | N/A | Н | 40.0 | N/A | N/A |
| 55.100000 | 10.7 | N/A | N/A | Н | 40.0 | N/A | N/A |
| 110.400000 | 9.9 | N/A | N/A | Н | 43.5 | N/A | N/A |
| 146.400000 | 12.0 | N/A | N/A | Н | 43.5 | N/A | N/A |
| 224.300000 | 8.4 | N/A | N/A | Н | 46.0 | N/A | N/A |
| 496.600000 | 15.8 | N/A | N/A | Н | 46.0 | N/A | N/A |
| 45.500000 | 11.9 | N/A | N/A | V | 40.0 | N/A | N/A |
| 57.000000 | 23.7 | N/A | N/A | V | 40.0 | N/A | N/A |
| 79.900000 | 17.0 | N/A | N/A | V | 40.0 | N/A | N/A |
| 99.000000 | 16.7 | N/A | N/A | V | 43.5 | N/A | N/A |
| 114.000000 | 17.1 | N/A | N/A | V | 43.5 | N/A | N/A |
| 767.500000 | 21.5 | N/A | N/A | V | 46.0 | N/A | N/A |
| *) | | | | | - | _ | - |

*) Note:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz 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 9 kHz to 10 GHz. Disturbances other than those mentioned above are small or not detectable.



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5.3 Fundamental and harmonics Radiated Emission for FCC Part 15 Per Section 15.249(a)

RESULT: Pass

Date of testing : Oct. 20, 2009

Test specification : FCC Part 15 Per Section 15.249(a) Limits : FCC Part 15 Per Section 15.249(a)

Frequency Range : 30MHz to 10GHz

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 : Transmitting

Power supply : AC 120V to the AC/DC adaptor

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 that 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 6: Fundamental and harmonics Radiated Emission (Transmitting at Low Channel)

| Frequency | Harm. | QP | AV | PK | Polarity | | Limit | |
|-----------|-------|------|--------|------|----------|-----|----------|-----|
| | No. | | | | | QP | AV | PK |
| [MHz] | | [0 | lBμV/n | 1] | (H/V) | | [dBµV/m] | |
| 915.61 | 1st | 90.5 | N/A | N/A | Н | 94 | N/A | N/A |
| 915.48 | 1st | 91.8 | N/A | N/A | V | 94 | N/A | N/A |
| 1831.00 | 2nd | N/A | 43.7 | 49.3 | Н | N/A | 54 | 74 |
| 1831.00 | 2nd | N/A | 48.6 | 52.3 | V | N/A | 54 | 74 |
| 2746.00 | 3nd | N/A | 46.3 | 52.6 | Н | N/A | 54 | 74 |
| 2746.00 | 3nd | N/A | 47.9 | 55.3 | V | N/A | 54 | 74 |
| 3662.00 | 4th | N/A | 49.8 | 55.6 | Н | N/A | 54 | 74 |
| 3662.00 | 4th | N/A | 50.9 | 56.7 | V | N/A | 54 | 74 |
| 4577.50 | 5th | N/A | 49.8 | 55.9 | V | N/A | 54 | 74 |
| *) | | | | | | | | |

Table 7: Fundamental and harmonics Radiated Emission (Transmitting at Mid Channel)

| Frequency | Harm. | QP | AV | PK | Polarity | | Limit | |
|-----------|-------|------|--------|------------|----------|-----|----------|-----|
| | No. | | | | | QP | AV | PK |
| [MHz] | | [0 | lBμV/n | 1] | (H/V) | | [dBµV/m] | |
| 916.09 | 1st | 90.4 | N/A | N/A | Н | 94 | N/A | N/A |
| 916.09 | 1st | 91.7 | N/A | N/A | V | 94 | N/A | N/A |
| 1832.00 | 2nd | N/A | 43.6 | 49.6 | Н | N/A | 54 | 74 |
| 1832.00 | 2nd | N/A | 48.1 | 51.6 | V | N/A | 54 | 74 |
| 2748.00 | 3nd | N/A | 48.4 | 52.7 | Н | N/A | 54 | 74 |
| 2748.00 | 3nd | N/A | 50.0 | 53.8 | V | N/A | 54 | 74 |
| 3664.00 | 4th | N/A | 49.5 | 55.7 | Н | N/A | 54 | 74 |
| 3664.00 | 4th | N/A | 50.5 | 56.3 | V | N/A | 54 | 74 |
| 4580.00 | 5th | N/A | 49.8 | 55.9 | V | N/A | 54 | 74 |
| *) | | | | | | | | |



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Table 8: Fundamental and harmonics Radiated Emission (Transmitting at High channel)

| Frequency | Harm. | QP | AV | PK | Polarity | | Limit | |
|-----------|-------|-------|--------|------|----------|-----|----------|-----|
| | No. | | | | | QP | AV | PK |
| [MHz] | | [0 | lBμV/n | n] | (H/V) | | [dBµV/m] | |
| 916.70 | 1st | 90.14 | N/A | N/A | Н | 94 | N/A | N/A |
| 916.45 | 1st | 91.77 | N/A | N/A | V | 94 | N/A | N/A |
| 1833.50 | 2nd | N/A | 44.0 | 50.2 | Н | N/A | 54 | 74 |
| 1833.50 | 2nd | N/A | 48.4 | 52.0 | V | N/A | 54 | 74 |
| 2749.50 | 3nd | N/A | 45.5 | 52.3 | Н | N/A | 54 | 74 |
| 2749.50 | 3nd | N/A | 48.9 | 53.2 | V | N/A | 54 | 74 |
| 3666.00 | 4th | N/A | 44.8 | 53.6 | Н | N/A | 54 | 74 |
| 3666.00 | 4th | N/A | 50.4 | 55.9 | V | N/A | 54 | 74 |
| 5560.00 | 5th | N/A | 40.2 | 53.3 | V | N/A | 54 | 74 |
| 4582.50 | 2nd | N/A | 49.9 | 56.0 | Н | N/A | 54 | 74 |
| *) | | | | | | | | |

^{*)} Disturbances other than those mentioned above are small or not detectable.

The final measurement for frequencies below 1000MHz is performed with Quasi Peak detector; the final measurement for frequencies above 1000MHz is performed with Average and Peak detector.

The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

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

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



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6 Photographs of the Test Set-Up

Note: "HP4891" showed on the test setup photo is the internal name code of the transmitter.

Photograph 1: Set-up for Conducted Emission on AC Mains





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







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Photograph 3: Set-up for Radiation Measurement Above 1GHz





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