

Prüfbericht - Nr.: 14008086 001		Seite 1 von 13	
Test Report No.		Page 1 of 13	
Auftraggeber: Applicant	Intex Plastics (Xiamen) Co. Ltd. 1#, Wengjiao Road Xinyang Industrial Zone Xinglin Qu, Xiamen Fujian 361022 P.R. China		
Gegenstand der Prüfung: Test item	Superheterodyne Receiver		
Bezeichnung: Identification	AP619RW	Serien-Nr.: Serial No.	Engineering sample
Wareneingangs-Nr.: Receipt No.	041203034	Eingangsdatum: Date of receipt	03.12.2004
Prüfört: Testing location	TÜV Rheinland Hong Kong Ltd. Unit 8, 25 th Floor, Skyline Tower, 39 Wang Kwong Road, Kowloon Bay Kowloon, Hong Kong Hong Kong Productivity Council HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong		
Prüfgrundlage: Test specification	FCC Part 15, Subpart B		
Prüfergebnis: Test Result	Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage. The above mentioned product was tested and passed.		
geprüft / tested by:		kontrolliert / reviewed by:	
28.12.2004	Prudence Poon	28.12.2004	Thomas Berns
Datum Date	Name Name	Unterschrift Signature	Unterschrift Signature
Sonstiges: FCC ID SVYAP619RWT Other Aspects			
Abkürzungen:		Abbreviations:	
OK, Pass, P	= entspricht Prüfgrundlage	OK, Pass, P	= passed
Fail, F	= entspricht nicht Prüfgrundlage	Fail, F	= failed
N/A	= nicht anwendbar	N/A	= not applicable
NT	= nicht getestet	NT	= 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 duplicate in extracts. This test report does not entitle to carry any safety mark on this or similar products.			

Test Summary

Conducted Emissions

Result: Pass

Spurious Radiated Emissions

Result: Pass

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General Remarks

Complementary Materials

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

Appendix 1: Test Results

Appendix 2: Test Setup

Appendix 3: EUT External Photo

Appendix 4: EUT Internal Photo

Appendix 5: FCCID Label, Block Diagram, Schematics and User manual.

List of Test and Measurement Instruments

Kind of Equipment	Manufacturer	Type	S/N
Test Receiver	Rohde & Schwarz	ESVS30	842807/009
Biconical Antenna	Rohde & Schwarz	HK116	841489/015
Log.-Periodic Antenna	Rohde & Schwarz	HL223	841516/017
Double Ridge Horn Antenna	EMCO	3115	9002-3351
Double Ridge Horn Antenna	EMCO	3115	9002-3347
Signal Generator	Rohde & Schwarz	SMY 01	844146/024
Test Receiver	Rohde & Schwarz	ESHS30	847115/005
L/I/S/N	Rohde & Schwarz	ESH3-Z5	849876/026

General Product Information

Product Function and Intended Use

The equipment under test (EUT) is a RF electric pump operating at 433.920 MHz.

FCC ID SVYAP619RWT

Model	Product description
AP619RW	Electric Air Pump

Circuit Description

After voltage is dropped through R and C , and is stabilized (12V, 5V) by the voltage regulator, this control board is power supplies to the control IC. The receiver module adopts a piece of single chip IC RX3310A which receives ASK (Amplitude-Shift-Keying) wireless digital signal transfer. The antenna receives the carrier signal which is then filtered through R and C, then the signal is amplified by RF amplifier and mixed by the mixer, the oscillating signal from the oscillator formed by R, L, C is to be compared with the received signal, the intermediate frequency(1.8MHz) signal is gained as a result. This signal is then to be amplified by the IF amplifier in the emitter coupled pair with dual input symmetrically and single output, filtered by the IF filter, limited by the voltage limiter. The message is divided into two in parallel and sent to the comparator. Different low-pass constant will be taken from the same message, the digitalized message is separated through the comparator and decoded by the remote control special chip HX2272, the solenoid valve and the motor switches are controlled by the pins, and cycling self-lock control of the motor is done by DQ trigger CD4013, auto-off control of the motor is realized with RC delay circuit.

Ratings and System Details

	Receiver
Frequency range	: 433.920MHz
Crystal Tolerance	: +/- 100KHz
Number of channels	: 1
Type of antenna	: Integral antenna
Power supply	: AC120 V
Ports	: AC mains
Protection class	: II
Classification of device	: B

Independent Operation Modes

The basic operation modes are:

- **RF pump:** Air inflation and deflation of the pump can be controlled by the associated transmitter or by pressing the inflation and deflation button at the front panel of EUT.

For further information refer to User Manual

Submitted Documents

The submitted documents are listed as follow:

- Circuit diagram
- Block diagram
- User manual
- Label artwork

Related Submittal(s) Grants

This is a single application for certification of the Receiver.

Test Set-up and Operation Mode

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.

Test Operation and Test Software

Test operation should refer to test methodology.

- There was no special software to exercise the device.

Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

- none

Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the Circuit Diagram or the Technical Construction File. No additional measures were employed to achieve compliance.

Test Methodology

Conducted Emission

The conducted emission measurements were performed according to the procedures in ANSI C63.4-2003.

The equipment under test (EUT) was placed on the 80cm height non-conducting table above the reference ground plane, and the vertical conducting plane is located 40cm to the rear of EUT. Each current –carrying conductor of EUT power cord except the ground conductor will be connected to the 50 μ H/50 ohms LISN to the input power source. The excess power cord between EUT to LISN shall be folded back and forth parallel to the lead so as to form a bundle with a length of 0.3m to 0.4m.

The operating mode and cable position of EUT will be arranged to product the highest emission, then the RF voltage and the frequency of the highest amplitude relative to the limit will be recorded as final result.

Radiated Emission

The radiated emission measurements were performed according to the procedures in ANSI C63.4-2003.

The equipment under test (EUT) was placed at the middle of the 80 cm height turntable, and the turntable is 3 meters far from the measuring antenna. During the testing, the EUT was operated standalone and arranged for maximum emissions. The EUT was tested in three orthogonal planes.

The investigation is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.

All radiated tests were performed at an antenna to EUT with 3 meters distance, unless stated otherwise in section 7.1.1 and 7.1.2 of this test report.

Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$FS = R + AF + CF + FA - PA$$

Where FS = Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer in dBuV.

AF = Antenna Factor in dB.

CF = Cable Attenuation Factor in dB.

FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

$$\text{System Factor} = CF + FA - PA.$$

FA and PA are only be used for the measuring frequency above 1 GHz.

Test Results

Conducted Emissions

Section 15.107

RESULT:

Pass

Test Specification : FCC Part 15 Section 15.107
 Test Method : ANSI 63.4-2003
 Measurement Location : Shield Room
 Detector Function : Quasi Peak
 Measurement BW : 100 kHz
 Supply Voltage : AC120V
 Measuring Frequency Range: 0.15-30MHz

Frequency [MHz]	Measured Terminal	Quasi-peak		Average	
		Field Strength [dBμV]	Delta to limit [dBμV]	Field Strength [dBμV]	Delta to limit [dBμV]
0.150	L	60.8	-5.2	46.8	-9.2
0.204	L	55.4	-8.0	41.8	-11.6
0.240	L	54.8	-7.3	41.0	-11.1
0.288	L	52.0	-8.6	37.9	-1.4
0.354	L	49.8	-9.1	34.6	-14.3
0.480	L	46.0	-10.3	30.4	-15.9
0.150	N	59.2	-6.8	45.7	-10.3
0.234	N	54.7	-7.6	41.4	-10.9
0.312	N	50.4	-9.6	36.2	-13.7
0.336	N	49.1	-10.2	34.7	-14.6
0.516	N	44.4	-11.6	28.9	-17.1

For test results refer to Appendix 1, page 1-2.

Limit

Section 15.107

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Spurious Radiated Emissions**Section 15.109****RESULT:****Pass**

Test Specification : FCC Part 15 Section 15.109
 Test Method : ANSI 63.4-2003
 Measurement Location : Semi Anechoic Chamber
 Measurement Distance : 3m
 Detector Function : Quasi Peak
 Measurement BW : 100 kHz
 Supply Voltage : AC120V
 Measuring Frequency Range : 30-4500MHz
 :

Polarization: Vertical

Frequency	Reading	Antenna Factor	System Factor	Field strength at 3m	Limit at 3m	Delta to Limit
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
435.727	43.20	16.35	1.85	43.2	46.0	-2.80
871.454	8.60	22.35	2.65	33.6	46.0	-12.40
1307.181	41.48	24.90	-36.18	30.2	54.0	-23.80
1742.908	42.97	26.50	-34.47	35.0	54.0	-19.00
2178.635	37.42	27.62	-33.74	31.3	54.0	-22.70
2614.362	33.78	28.88	-31.16	31.5	54.0	-22.50
3050.089	34.53	30.00	-29.73	34.8	54.0	-19.20
3485.816	36.29	31.20	-31.09	36.4	54.0	-17.60
4066.000	35.85	32.50	-30.35	38.0	54.0	-16.00

For test results refer to Appendix 1, page 3-8.

Polarization: Horizontal

Frequency	Reading	Antenna Factor	System Factor	Field strength at 3m	Limit at 3m	Delta to Limit
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
435.726	44.5	16.35	1.85	44.5	46.0	-1.50
871.454	33.40	22.35	2.65	33.4	46.0	-12.60
1307.181	41.78	24.90	-36.18	30.5	54.0	-23.50
1742.908	42.77	26.50	-34.47	34.8	54.0	-19.20
2178.635	36.92	27.62	-33.74	30.8	54.0	-23.20
2614.362	33.38	28.88	-31.16	31.1	54.0	-22.90
3050.089	34.13	30.00	-29.73	34.4	54.0	-19.60
3485.816	36.09	31.20	-31.09	36.2	54.0	-17.80
3957.760	35.15	32.50	-30.35	37.3	54.0	-16.70

For test results refer to Appendix 1.

Limit**Section 15.109**

The field strength of radiated emissions from unintentional radiators at a distance of 3 meters :

Frequency (MHz)	Field strength (microvolts/meter)	Field strength (dB μ V/m)	Measurement distance (meters)
30-88	100	$20 \cdot \log(100) = 40.0$	3
88-216	150	$20 \cdot \log(150) = 43.5$	3
216-960	200	$20 \cdot \log(200) = 46.0$	3
Above 960	500	$20 \cdot \log(500) = 54.0$	3