Prüfbericht - Nr.: Test Report No.	**14007646 002**	**Seite 1 von 13** 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	**Low Power Transmitter**	
Bezeichnung: Identification	**AP619RW**	**Serien-Nr.:** Serial No. **Engineering sample**
Wareneingangs-Nr.: Receipt No.	**041122014**	**Eingangsdatum:** Date of receipt **22.11.2004**
Prüfort: Testing location	**TÜV Rheinland Hong Kong Ltd.** Unit 8, 25th 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 C**	
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	**Datum** Date	**Name** Name	**Unterschrift** Signature

Sonstiges: **FCC ID SVYAP619RW**
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**

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Test Summary

Radiated Emission of Carrier Frequency

Result: Pass

Spurious Radiated Emissions

Result: Pass

Bandwidth Measurement

Result: Pass

Contents

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
Signal Generator	Rohde & Schwarz	SMY 01	844146/023
Spectrum Analyzer	Rohde & Schwarz	FSP30	1093.4495K30

General Product Information

Product Function and Intended Use

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

The transmitter has two push-to-operate switches that will automatically and immediately deactivate the transmitter when release the switch, hence transmitter will be ceased to operate within not more than 5 seconds of being released.

FCC ID SVYAP619RW

Model	Product description
AP619RW	**Electric Air Pump**

Circuit Description

Two 1.5V batteries are used in this board, special IC HX2262 for remote control is used as main control circuit which was processed with CMOS and is also a remote control coding circuit, whose datum and address are coded into series strand codes. The datum is coded with the high level of HX2262 digit pin controlled by the two trigger switches, then the codes are sent out through 433.92MHz carrier by high frequency vibration circuit combined by R. C. L.

Ratings and System Details

		Transmitter
Frequency range	:	433.920 MHz
Crystal Tolerance	:	+/- 100KHz
Number of channels	:	1
Type of antenna	:	Integral antenna
Power supply	:	DC12V
Ports	:	none
Protection Class	:	III

Independent Operation Modes

The basic operation modes are:

- **Remote Control**: It has a push to operate switch and is under manual control at all transmission time. It will cease transmission immediately when release the switch. The EUT has two control buttons to control the inflation and deflation of pump.

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 transmitter.

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

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.

System Factor = CF + FA – PA.

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

Test Results

Radiated Emission of Carrier Frequency — Section 15.231(b)

RESULT: **Pass**

Test Specification : FCC Part 15 Section 15.231(b1 and b2)
Test Method : ANSI 63.4-2003
Measurement Location : Semi Anechoic Chamber
Measurement Distance : 3m
Detector Function : Peak and Average
Measurement BW : 100 kHz
Supply Voltage : DC12V

Polarization: Vertical

Detector function	Frequency (MHz)	Reading (dBuV)	Antenna Factor (dBuV/m)	Attenuation of cable (dB)	Measured Field strength at 3m (dBuV/m)	Delta to Limit (dB)
Peak	433.86	45.10	16.3	1.8	63.2	-37.60
Average	433.86	32.30	16.3	1.8	50.4	-30.40

Polarization: Horizontal

Detector function	Frequency (MHz)	Reading (dBuV)	Antenna Factor (dBuV/m)	Attenuation of cable (dB)	Measured Field strength at 3m (dBuV/m)	Delta to Limit (dB)
Peak	433.86	54.30	16.3	1.8	72.4	-28.40
Average	433.86	41.50	16.3	1.8	59.6	-21.20

Limit **Section 15.231(b2)**

Frequency within the band (MHz)	Peak Emission		Average Emission	
	(microvolt/meter)	dBµV/m	(microvolt/meter)	dBµV/m
433.920	109,967	100.8	10,996	80.8

According to section 15.35(b), When average radiated emission measurements are specified, including emission measurement below 1000MHz, there also is limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated.

Spurious Radiated Emissions — Section 15.231(b)

RESULT: **Pass**

Test Specification : FCC Part 15 Section 15.231(b1 and b3)
Test Method : ANSI 63.4-2003
Measurement Location : Semi Anechoic Chamber
Measurement Distance : 3m
Detector Function : Quasi Peak
Measurement BW : 100 kHz
Supply Voltage : DC12V
Measuring Frequency Range : 30-4500MHz

Polarization: Vertical

Frequency (MHz)	Reading (dBuV/m)	Antenna Factor (dBuV/m)	System Factor (dB)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
867.727	17.20	22.30	2.60	42.10	60.80	-18.70
*1301.16	26.86	24.90	-34.34	17.42	54.00	-36.58
1735.48	23.65	26.50	-33.27	16.88	60.80	-43.92
2169.39	22.95	27.80	-33.10	17.65	60.80	-43.15
2605.25	21.88	28.88	-31.15	19.61	60.80	-41.19
3036.28	23.48	30.00	-29.73	23.75	60.80	-37.05
3471.82	23.18	30.24	-31.09	22.33	60.80	-38.47
*3908.39	22.23	32.24	-30.27	24.20	54.00	-29.80
*4336.51	21.03	32.45	-29.91	23.57	54.00	-30.43

Polarization: Horizontal

Frequency (MHz)	Reading (dBuV/m)	Antenna Factor (dBuV/m)	System Factor (dB)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
867.727	29.60	22.30	2.60	54.50	60.80	-6.30
*1301.66	28.21	24.9	-34.34	18.77	54.00	-35.23
1735.46	26.67	26.50	-33.27	19.90	60.80	-40.90
2169.35	23.88	27.80	-33.10	18.58	60.80	-42.22
2603.41	22.30	28.88	-31.15	20.03	60.80	-40.77
3036.54	23.64	30.00	-29.73	23.91	60.80	-36.89
3473.78	23.35	30.24	-31.09	22.50	60.80	-38.30
*3906.49	22.43	32.24	-30.27	24.40	54.00	-29.60
*4334.51	21.19	32.45	-29.91	23.73	54.00	-30.27

Remark: ‘ * ‘ indicates the frequency of the emissions fall into the restricted band.

Limit **Section 15.231(b3)**

Frequency (MHz)	Field strength (microvolt/meter)	Field strength (dBμV/m)	Measurement distance (meters)
433.920	1,099	20*log(1099) = 60.8	3

Section 15.209

Radiated emissions, which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209.

Limit for Radiated Emission under Section 15.209:

Frequency (MHz)	Field strength (microvolt/meter)	Field strength (dBμV/m)	Measurement distance (meters)
30-88	100	20*log(100) = 40.0	3
88-216	150	20*log(150) = 43.5	3
216-960	200	20*log(200) = 46.0	3
960-2500	500	20*log(500) = 54.0	3

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector and above 1000 MHz are based on the measurements employing an average detector.

Bandwidth Measurement — Section 15.231(c)

RESULT: **Pass**

Test Specification	:	FCC Part 15 section 15.231(c)
Port of Testing	:	Antenna port
Detector Function	:	Peak
Supply Voltage	:	DC12V

The 20dB bandwidth shall be no wider than 0.25% (1.08MHz) of the centre frequency 433.84MHz. From the result, it shows that the 20 dB points of the lower edge and upper edge are 8.8KHz and 6.8KHz respectively apart from the centre frequency. Hence it is deemed to fulfil the requirement.

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

Limit — Section 15.231(c)

The bandwidth of the emission shall be no wider than 0.25% if the center frequency for devices operating above 70MHz and below 900MHz.