

EMC TEST REPORT

No. SH12060514-001

Applicant : SHANGHAI YILIQI CHILDREN'S BICYCLE CO., LTD.
ALLEY 95, LANGHUA ROAD, LANGXIA INDUSTRIAL
PARK JINSHAN DISTRICT, SHANGHAI, CHINA

Manufacturer : SHANGHAI YILIQI CHILDREN'S BICYCLE CO., LTD.
ALLEY 95, LANGHUA ROAD, LANGXIA INDUSTRIAL
PARK JINSHAN DISTRICT, SHANGHAI, CHINA

Equipment : Remote Controller

Type/Model : 9017238

SUMMARY

The equipment complies with the requirements according to the following standard(s):

47CFR Part 15 (2010): Radio Frequency Devices

ANSI C63.4 (2009): American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

ANSI C63.10 (2009): American National Standard for Testing Unlicensed Wireless Devices

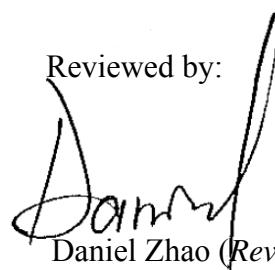
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Prepared by:



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Description of Test Facility

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1. General Information

1.1 Applicant Information

Applicant: SHANGHAI YILIQI CHILDREN'S BICYCLE CO., LTD.
ALLEY 95, LANGHUA ROAD, LANGXIA
INDUSTRIAL PARK JINSHAN DISTRICT, SHANGHAI,
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CHINA

Sample received date: June 7, 2012
Sample Identification No: *0120607-11-001*
Date of test: June 7, 2012 ~ July 8, 2012

1.2 Identification of the EUT

Equipment: Remote Controller
Type/model: 9017238
FCC ID: OIU-3388YLQ
IC: Not applied

1.3 Technical specification

Operation Frequency Band:	27.145MHz - 27.145MHz
Modulation:	FSK
Antenna Designation:	Rod antenna, non-standardized connector
Gain of Antenna:	1.2dBi
Rating:	Battery: DC 3V Working frequency: 27.145MHz
Description of EUT:	There is one model only. The EUT transmits RF signal to control the working condition of the corresponding receiver.
Channel Description:	There is one channel only, namely 27.145MHz.

1.4 Mode of operation during the test / Test peripherals used

Within this test report, EUT was tested with modulation and tested under its rating voltage and frequency.

For the EUT is handheld device, it was set up and tested in three axes (X, Y and Z). The three axes were tested one by one while the test receiver worked as “max hold” continuously and the highest reading among the whole test procedure was recorded.

2. Test Specification

2.1 Instrument list

Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
Test Receiver	ESIB 26	R&S	EC 3045	2011-10-21	2012-10-20
Semi-anechoic chamber	-	Albatross project	EC 3048	2012-5-21	2013-5-20
Bilog Antenna	CBL 6112D	TESEQ	EC 4206	2011-5-16	2013-5-15
Horn antenna	HF 906	R&S	EC 3049	2011-5-13	2013-5-12
Pre-amplifier	Pre-amp 18	R&S	EC 3222	2012-4-12	2013-4-11
Test Receiver	ESCS 30	R&S	EC 2107	2011-10-21	2012-10-20
A.M.N.	ESH2-Z5	R&S	EC 3119	2012-1-9	2013-1-8
A.M.N.	ESH3-Z5	R&S	EC 2109	2012-1-10	2013-1-9
High Pass Filter	WHKX 1.0/15G-10SS	Wainwright	EC4297-1	2012-2-8	2013-2-7
High Pass Filter	WHKX 2.8/18G-12SS	Wainwright	EC4297-2	2012-2-8	2013-2-7
High Pass Filter	WHKX 7.0/1.8G-8SS	Wainwright	EC4297-3	2012-2-8	2013-2-7
Band Reject Filter	WRCGV 2400/2483-2390/2493-35/10SS	Wainwright	EC4297-4	2012-2-8	2013-2-7
Loop Antenna	FMZB 1516	SCHWARZB ECK	/	2011-11-29	2012-11-28

2.2 Test Standard

47CFR Part 15 (2010): Radio Frequency Devices

ANSI C63.4 (2009): American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

ANSI C63.10 (2009): American National Standard for Testing Unlicensed Wireless Devices

2.3 Test Summary

This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	FCC REFERANCE	RESULT
Fundamental & spurious emission	15.227	Pass
Power line conducted emission	15.207	NA
Emission bandwidth	15.215(c)	Pass

3. Fundamental & Spurious Emission & Restrict band radiated emission

Test result: PASS

3.1 Test limit

The emission shall test through the 10th harmonic or to 40GHz, whichever is lower.

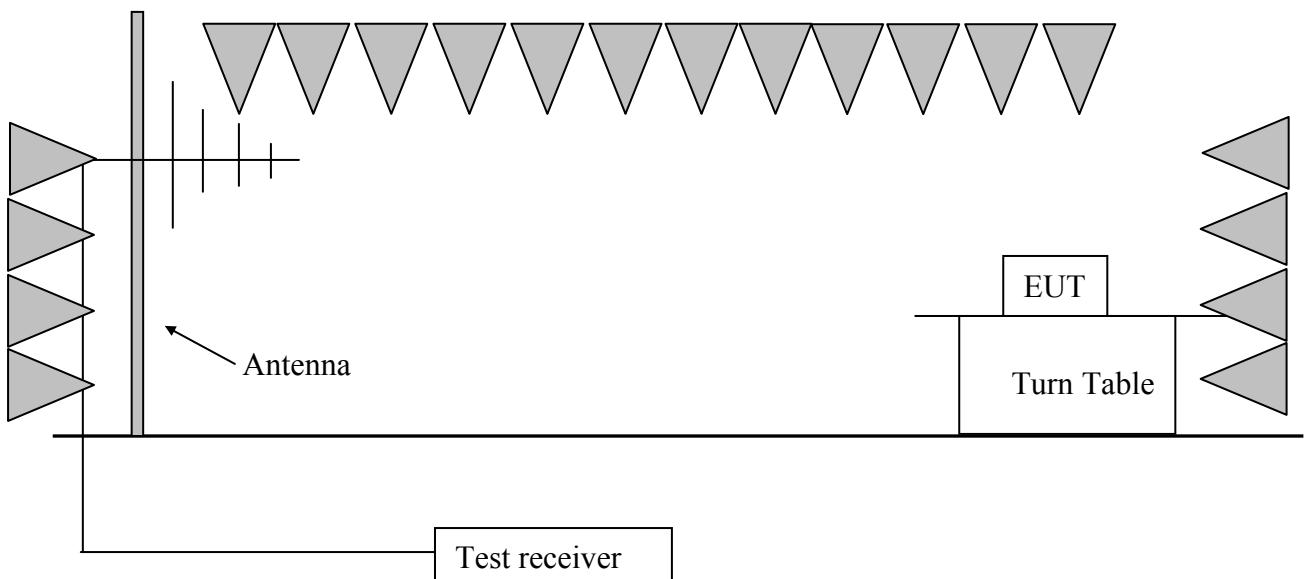
The fundamental emission should comply with the limits below:

Fundamental Frequency (MHz)	AV limit (dBuV/m)	PK limit (dBuV/m)
☒ 26.96 – 27.28	80	100

For emission outside the band 26.96 – 27.28MHz, it should comply with the radiated emission limits specified in §15.209(a) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
0.009 – 0.490	147.6-20lg (F _{kHz})	3
0.490 – 1.705	127.6-20lg (F _{kHz})	3
1.705 – 30.0	69.5	3
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

3.2 Test Configuration



3.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber.

For emission test lower than 30MHz, The center of the loop antenna shall be 1 m above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level.

Both X, Y and Z polarities of the loop antenna were assessed and the highest reading was listed in this report.

For emission test higher than 30MHz, the EUT and simulators were placed on a 0.8m high wooden turntable above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

Both horizontal and vertical polarities of the receiving antenna were assessed and the higher reading was listed in this report.

The radiated emission was measured using the test receiver with the resolutions bandwidth set as:

RBW = 200Hz, VBW = 1kHz (9kHz~0.15MHz)

RBW = 10kHz, VBW = 30kHz (0.15MHz~30MHz)

3.4 Test protocol

Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Emission Type	Limit (dBuV/m)	Margin	Detector
Y	27.14	26.60	79.60	Fundamental	100.00 (PK limit)	20.40	PK
Y	0.0098	19.30	70.30	Spurious	127.80	57.50	PK
X	0.017	20.20	48.00	Spurious	123.00	75.00	PK
Y	0.090	19.70	44.20	Spurious	108.50	64.30	PK
Y	26.96	26.60	68.10	Spurious	69.50	1.40	PK
Y	27.28	26.60	65.50	Spurious	69.50	4.00	PK
V	54.09	9.55	37.60	Spurious	40.00	2.40	QP
H	216.61	12.70	26.90	Spurious	46.00	19.10	PK
H	488.76	19.60	32.20	Spurious	46.00	13.80	PK

Remark: 1. Correct Factor = Antenna Factor + Cable Loss

2. Corrected Reading = Original Receiver Reading + Correct Factor

3. Margin = limit - Corrected Reading

Example: Assuming Antenna Factor = 20.20dB/m, Cable Loss = 2.00dB, Original Receiver Reading = 10.00dBuV, limit = 40.00dBuV/m.

Then Correct Factor = $20.20 + 2.00 = 22.20$ dB/m; Corrected Reading = $10.00 + 22.20 = 32.20$ dBuV/m; Margin = $40.00 - 32.20 = 7.80$ dB.

Calculating the AV value according to the duty cycle

Antenna	Frequency (MHz)	PK Reading (dBuV/m)	Correct Factor (dB)	AV Reading (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
Y	27.14	79.60	-4.20	75.40	80.00	4.60

Remark: 1. Correct Factor = $20\lg(\text{duty cycle}) = 20\lg(0.620) = -4.20$

2. AV Reading = PK Reading + Correct Factor

3. Margin = AV limit - AV Reading

4. Power line conducted emission

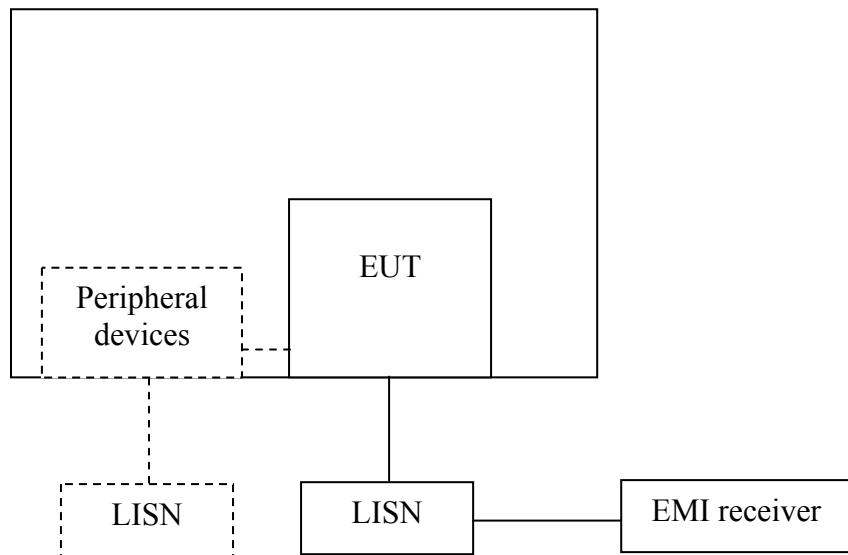
Test result: **NA**

4.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
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.

4.2 Test configuration



- For table top equipment, wooden support is 0.8m height table
- For floor standing equipment, wooden support is 0.1m height rack.

4.3 Test procedure and test set up

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a $50\Omega/50\mu\text{H}$ coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a $50\Omega/50\mu\text{H}$ coupling impedance with 50Ω termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement. The bandwidth of the test receiver is set at 9 kHz.

4.4 Test protocol

Power line: L

Frequency	Correct Factor (dB)	Corrected Reading (dBuV)		Limit (dBuV)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB).

2. Margin (dB) = Limit - Corrected Reading.

3. If the margin higher than 20dB, it would be marked as *.

Power line: N

Frequency	Correct Factor (dB)	Corrected Reading (dBuV)		Limit (dBuV)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB).

2. Margin (dB) = Limit - Corrected Reading.

3. If the margin higher than 20dB, it would be marked as *.

5. Emission Bandwidth

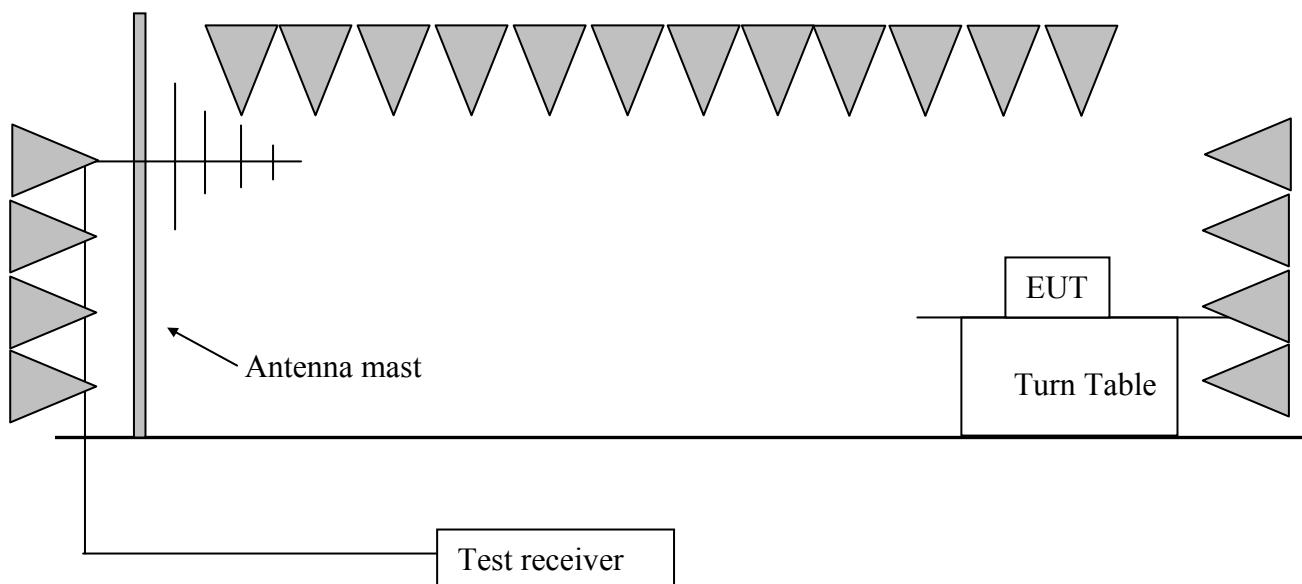
Test Status: Pass

5.1 Test limit

The EUT must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule.

If the frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of band operation.

5.2 Test Configuration



5.3 Test procedure and test setup

Please refer to clause 3.2 of this report.

5.4 Test protocol

Temperature : 25 °C
Relative Humidity : 55 %

Channel	Emission Bandwidth (MHz)	80% of Permitted Band (MHz)
1	27.122 – 27.174	26.992- 27.248