EMC TEST REPORT

No. SH09061372-003

Applicant	:	NINGBO COMEN ELECTRONICS TECHNOLOGY CO., LTD No.2 Hongxing Road, Zone A Hongtang Industry Park, Ningbo, China
Manufacturer	:	NINGBO COMEN ELECTRONICS TECHNOLOGY CO., LTD No.2 Hongxing Road, Zone A Hongtang Industry Park, Ningbo, China
Equipment	:	Remote control power switch receiver
Type/Model	:	PA-US1-01RF, PA-US1-01RFP, AC51530(RX)

SUMMARY

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

47CFR Part 15 (2008): Radio Frequency Devices

ANSI C63.4 (2003): 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

RSS-210 Issue 7 (June 2007): Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

RSS-Gen Issue 2 (June 2007): General Requirements and Information for the Certification of Radiocommunication Equipment

Date of issue: July 27, 2009

Prepared by:

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Reviewed by:

Daniel Zhao (*Reviewer*)

Description of Test Facility

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IC Assigned Code: 2042B-1

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Content

1. General Information

1.1 Applicant Information

Applicant:	NINGBO COMEN ELECTRONICS TECHNOLOGY CO., LTD No.2 Hongxing Road,Zone A Hongtang Industry Park, Ningbo, China
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Manufacturer:	NINGBO COMEN ELECTRONICS TECHNOLOGY CO., LTD No.2 Hongxing Road,Zone A Hongtang Industry Park, Ningbo, China

Sample received date	:	June 10, 2009
Date of test	:	June 10, 2009 ~ July 27, 2009

1.2 Identification of the EUT

Equipment:	Remote control power switch receiver
Type/model:	PA-US1-01RF, PA-US1-01RFP, AC51530(RX)
FCC ID:	XK8-PAUS101RF
IC:	8476A-PAUS101RF

1.3 Technical specification

Rating:	AC 110V – 125V, 60Hz Maximum resistive load: 1800W Maximum motor load: 1/3hp Maximum tungsten load: 1000W
Description of EUT:	There are three models. They are electrically identical except for different outside view. As a result, the model PA-US1-01RFP was chosen to perform test as representative. The EUT is a receiver to receive wireless signal so that its on/off condition can be controlled by the transmitter.

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.
The EUT was set up and tested as typically used.
The Signal generator "SMR20" together with a transmitting antenna was employed to radiate 315MHz CW signal in close proximity to the EUT.

2. Test Specification

2.1 Instrument list

Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
Test Receiver	ESIB 26	R&S	EC 3045	2009-6-1	2010-5-31
Semi-anechoic chamber	-	Albatross project	EC 3048	2009-6-1	2010-5-31
A.M.N.	ESH2-Z5	R&S	EC 3119	2009-1-23	2010-1-22
Test Receiver	ESCS 30	R&S	EC 2107	2009-1-23	2010-1-22
Broadband antenna	CBL 6112D	TESEQ	EC 4206	2009-6-2	2010-6-1
Horn antenna	HF 906	R&S	EC 3049	2009-6-30	2010-6-29
Pre-amplifier	Pre-amp 18	R&S	EC 3222	2009-6-30	2010-6-9
Signal generator	SMR20	R&S	EC 3044-1	2008-8-21	2009-8-20

2.2 Test Standard

47CFR Part 15 (2008)
ANSI C63.4: 2003
RSS-210 Issue 7 (June 2007)
RSS-Gen Issue 2 (June 2007)

2.3 Test Summary

TEST ITEM	FCC REFERANCE	IC REFERANCE	RESULT
Radiated emission	15B	RSS-Gen Issue 7 Clause 6	Pass
Power line conducted emission	15B	RSS-Gen Issue 7 Clause 7.2.2	Pass

3. Radiated emission

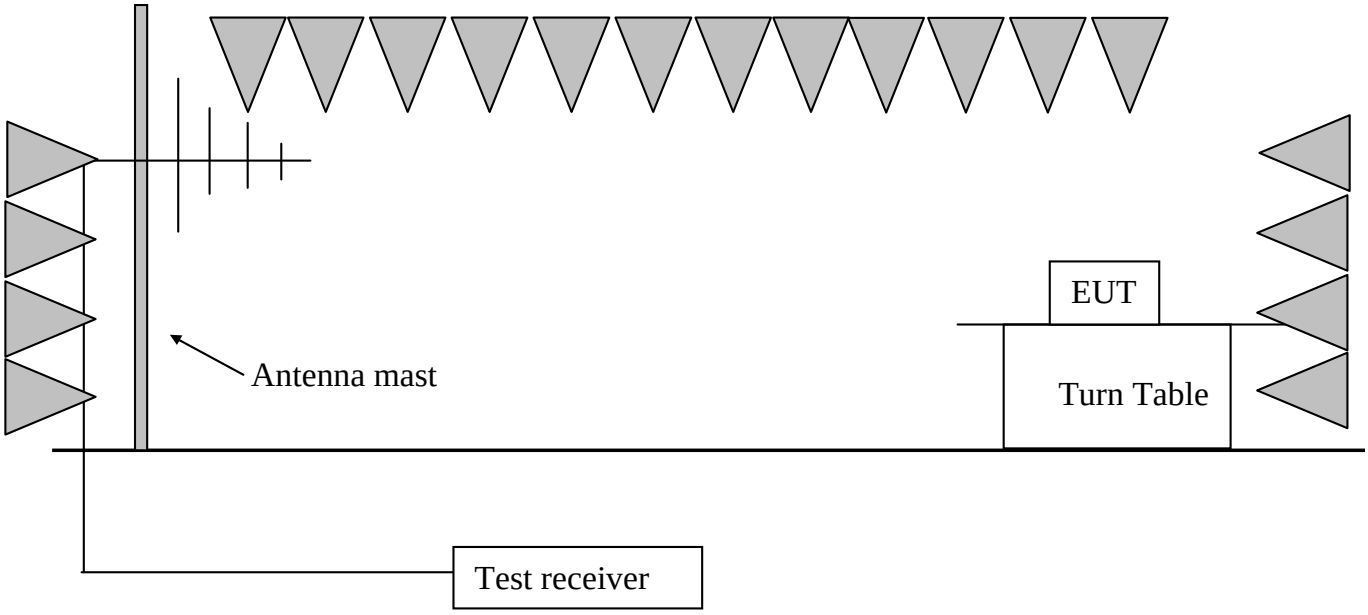
Test result: PASS

3.1 Test limit

The frequency range of radiated measurements should follow § 15.33. Here are the limits below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
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. While testing for spurious emission higher than 1GHz, the pre-amplifier is equipped just at the output terminal of the antenna.
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. The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

RBW = 100kHz, VBW = 300kHz (30MHz~1GHz)
RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

3.4 Test protocol

Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	309.92	16.10	39.90	46.00	6.10	PK
H	311.86	16.20	40.20	46.00	5.80	PK
H	319.64	16.40	37.10	46.00	8.90	PK
H	871.70	25.20	34.90	46.00	11.10	PK
V	916.41	25.60	35.70	46.00	10.30	PK
H	917.05	25.80	35.40	46.00	10.60	PK
H	1200.00	0.30	44.30	54.00	9.70	PK

Remark: 1.Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz)
2. Corrected Reading = Original Receiver Reading + Correct Factor

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m

3.5 Measurement uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty of radiated emission is: ± 5.31dB
The measurement uncertainty is given with a confidence of 95%, k=2.
The measurement uncertainty is traceable to internal procedure TI-036.

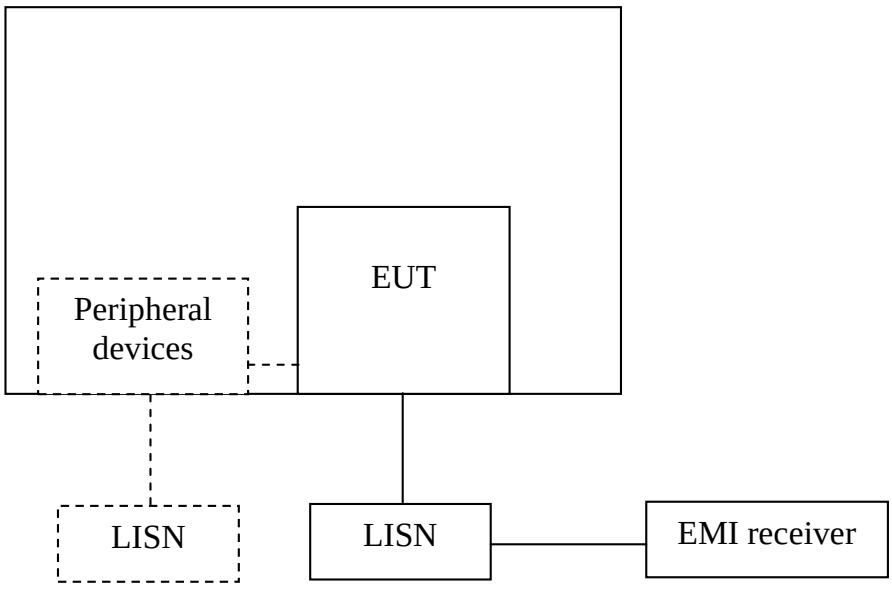
4. Power line conducted emission

Test result: **Pass**

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 50Ω/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50Ω/50uH 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

Frequency & Conductor line	Correct Factor (dB)	Corrected Reading (dBuV)		Limit (dBuV)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.15 (L)	3.00	10.20	-2.30	66.00	56.00	55.80	58.30
0.59 (L)	3.00	4.50	-4.90	56.00	46.00	51.50	50.90
3.00 (L)	3.00	8.30	-1.80	56.00	46.00	47.70	47.80
4.00 (L)	3.00	16.60	10.10	56.00	46.00	39.40	35.90
14.86 (N)	3.00	16.10	3.70	60.00	50.00	43.90	46.30
30.00 (N)	3.00	4.20	-1.90	60.00	50.00	55.80	51.90
Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB). 2. Margin (dB) = Limit - Corrected Reading							

4.5 Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty at mains terminal: ± 1.99dB
The measurement uncertainty is given with a confidence of 95%, k=2.
The measurement uncertainty is traceable to internal procedure TI-036.