TEST REPORT FOR CERTIFICATION
On Behalf of

Chungear Industrial Co., Ltd.

Ceiling Fan Remote Controller (Transmitter)

Model: TR171B

FCC ID: KUJCE10205

Prepared for : Chungear Industrial Co., Ltd.
106 Kanho Rd., Taichung, Taiwan

Prepared By : AUDIX Technology Corporation
EMC Department
No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan, R.O.C.

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Date of Test	:	Nov. 04, 2013
Date of Report	:	Nov. 04, 2013

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TEST REPORT CERTIFICATION

Applicant	:	Chungear Industrial Co., Ltd.
Manufacturer	:	Satellite Electronic (Zhongshan)., Ltd.
EUT Description	:	Ceiling Fan Remote Controller (Transmitter)
FCC ID	:	KUJCE10205
	(A) Model No.	: TR171B
	(B) Serial No.	: N/A
	(C) Power Supply	: DC 12V (Battery)
	(D) Test Voltage	: DC 12V

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C, Oct. 2012
(FCC CFR 47 Part 15C, §15.207, §15.209 and §15.231)

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test : Nov. 04, 2013 Date of Report : Nov. 04, 2013

Producer : Annie Yu
(Annie Yu/Administrator)

Signatory: Ben Cheng
(Ben Cheng/Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Ceiling Fan Remote Controller (Transmitter)
Model Number	:	TR171B
FCC ID	:	KUJCE10205
Applicant	:	Chungear Industrial Co., Ltd. 106 Kanho Rd., Taichung, Taiwan
Manufacturer	:	Satellite Electronic (Zhongshan)., Ltd 8, Chuang Ye Road, Zhongshan, Guangdong, China
Fundamental Frequency	:	433.9MHz
Power Supply	:	DC 12V (Battery)
Date of Receipt of Sample	:	Oct. 11, 2013
Date of Test	:	Nov. 04, 2013

* Ceiling Fan Remote Controller (Transmitter) - Receiver
(1)Model No.: JY199, FCC by DoC
(2)Model No.: JY326B, FCC by DoC
(3)Model No.: JY326D, FCC by DoC
(4)Model No.: MR36T, FCC by DoC
(5)Model No.: MR36R, FCC by DoC
(6)Model No.: MR58A, FCC by DoC
(7)Model No.: MR56E, FCC by DoC
(8)Model No.: MR101D, FCC by DoC
(9)Model No.: MR62A, FCC by DoC
(10)Model No.: MR76T, FCC by DoC

Remark:
Antenna requirement: This EUT's transmitter antenna is designed to be soldered on a printed circuit board, comply with §15.203 and inform to user that any change and modify is prohibited.

1.2. Description of Test Facility

Name of Firm	:	**AUDIX Technology Corporation** **EMC Department** No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C
Test Facility & Location	:	**Semi-Anechoic Chamber** No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C Renewal on May 14, 2009 Federal Communication Commission Registration Number: 90993 IC Test Site Registration No.: 5183B-1
NVLAP Lab. Code	:	200077-0
TAF Accreditation No	:	1724

1.3. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Radiation Test (Distance: 3m)	30MHz~300MHz	± 2.91dB
	300MHz~1000MHz	± 2.74dB
	Above 1GHz	± 4.35dB

Remark：Uncertainty = $ku_c(y)$

Test Item	Uncertainty
Emission Bandwidth (20dB)	± 0.2kHz
Periodic Operated	± 0.05s

2. CONDUCTED EMISSION MEASUREMENT

【The EUT only employs battery power for operation, no conductive emission limits are required】

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

The following test equipment was used during the radiated emission test:

3.1.1. For Frequency Range 30MHz~1000MHz (Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 18, 13’	Aug. 17, 14’
2.	Test Receiver	R & S	ESCS30	100338	Jul. 01, 13’	Jun. 30, 14’
3.	Amplifier	HP	8447D	2944A06305	Feb. 12, 13’	Feb. 11, 14’
4.	Log Periodic Antenna	Schwarzbeck	UHALP 9108-A	0810	Mar. 02, 13’	Mar. 01, 14’
5.	Biconical Antenna	CHASE	VBA6106A	1264	Mar. 02, 13’	Mar. 01, 14’

3.1.2. For Frequency Range Above 1GHz (Semi-Anechoic Chamber)

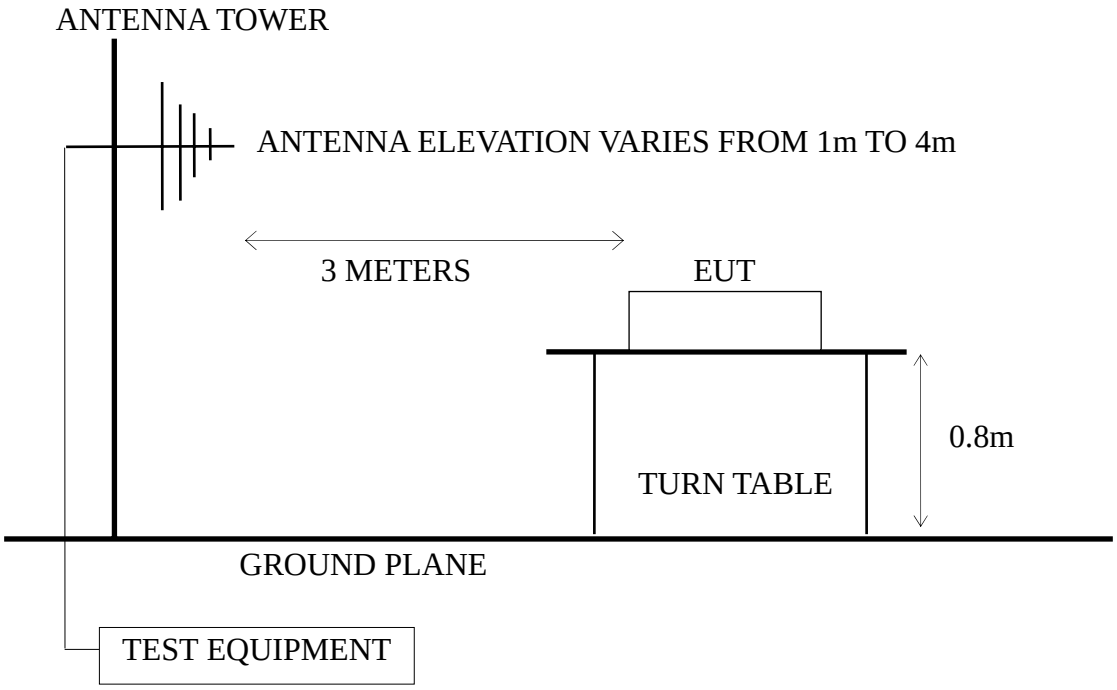
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 18, 13’	Aug. 17, 14’
2.	Amplifier	HP	8449B	3008A00529	Jan. 31, 13’	Jan. 30, 14’
3.	Horn Antenna	EMCO	3115	9112-3775	May 07, 13’	May 06, 14’

3.2. Test Setup

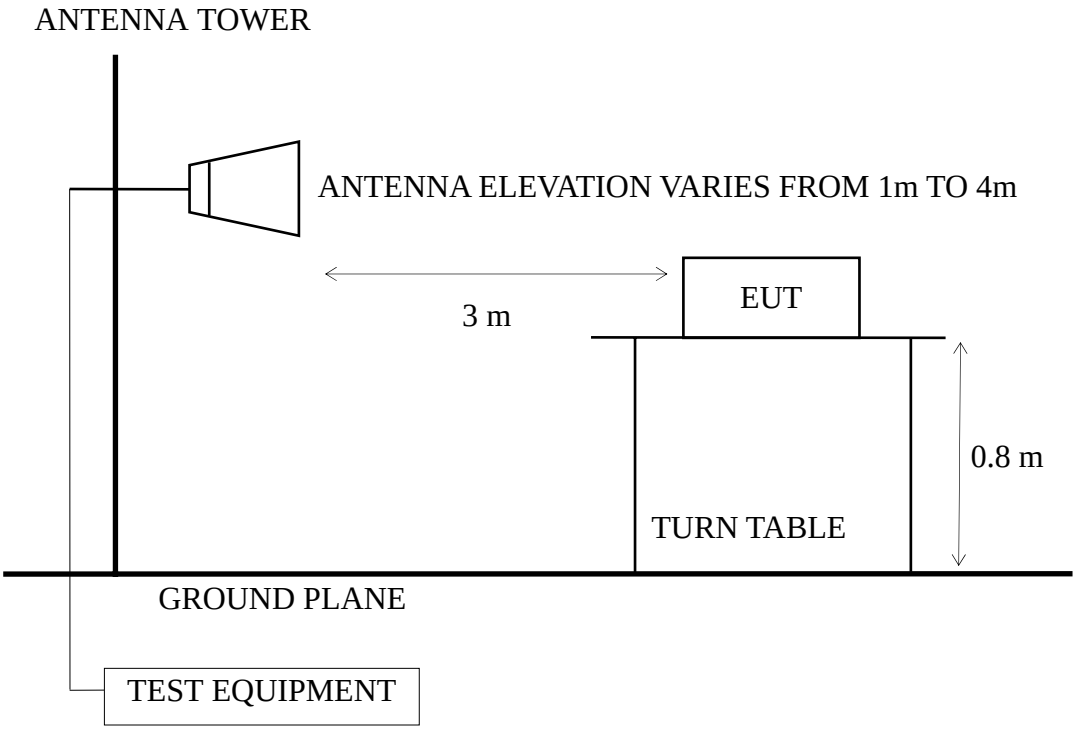
3.2.1. Block Diagram of connection between EUT and simulators

CEILING FAN REMOTE CONTROLLER (TRANSMITTER) (EUT)

3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz



3.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



3.3. Radiation Emission Limits (§15.209)

3.3.1. Spurious Emission Limit (§15.209)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		μV/m	dBμV/m
30 - 88	3	100	40.00
88 - 216	3	150	43.50
216 - 960	3	200	46.00
Above 960	3	500	54.00
Above 1000	3	74.0 dBμV/m (Peak) 54.0 dBμV/m (Average)	

Remarks： (1) Emission level (dBμV/m) = 20 log Emission level (μV/m)
(2) The tighter limit applies at the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4. Operating Condition of EUT

3.4.1. Set up the EUT and simulator as shown on 3.2.

3.4.2. Turn on the power.

3.4.3. The EUT {Ceiling Fan Remote Controller (Transmitter)} emitted the fundamental frequency with data code at the stand, side and lying conditions.

(The worst mode is lying)

3.4.4. The EUT was operated on maximum transmitting status during all testing (lying condition).

3.5. Test Procedure

The EUT and was placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set to 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log- periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of test receiver was set at 120kHz for frequencies below 1GHz and resolution bandwidth of spectrum analyzer was set at 1MHz for frequencies above 1GHz.

The frequency range from 30MHz to 1000MHz was measured with Quasi-Peak detector.

The frequency range from 1GHz to up to 10^{th} harmonics was pre-scanned with Peak detector. 30MHz to 1000MHz was measured with Peak detector. Pursuant to ANSI 4.2.2, peak detector is an alternate option for frequency from 30MHz to 1000MHz.

EUT with worst positions (lying) was tested during radiated measurement and all the test results are listed in section 3.6.

3.6. Radiated Emission Noise Measurement Results

3.6.1. Frequency Range 30MHz to 1GHz Measurement Results: **PASSED.**

All the emissions not reported below are too low against the FCC part 15 Subpart C limit.

Date of Test：	Nov. 04, 2013	Temperature：	26℃
EUT：	Ceiling Fan Remote Controller (Transmitter)	Humidity：	54%
Test Mode：	Operating (lying)		

Frequency (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Magin (dB)	Polarization	Detector
868.08	21.35	7.20	27.27	55.81	60.82	5.00	Horizontal	Peak

Frequency (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Magin (dB)	Polarization	Detector
868.08	21.35	7.20	13.26	41.81	60.82	19.01	Vertical	Peak

Remark: 1. Emission Level = Ant. Factor + Cable Loss + Reading

2. "*" is Harmonic Frequency, where limit of Harmonic Frequency is calculated by:
41.6667x433.872-7083.333= 10996.68μV/m
20log(10996.68)= 80.82dBμV/m (Limit for fundamental frequency)
80.82-20Db= 60.82 dBμV/m (Limit for harmonic frequency)

3.6.2. Frequency Range 1GHz to up to 10th harmonics Measurement Results: **PASSED.**

There is no emission be found from 1GHz to up to 10th harmonics.

4. FUNDAMENTAL MEASUREMENT

4.1. Test Equipment

The following test equipment was used during the radiated emission test:

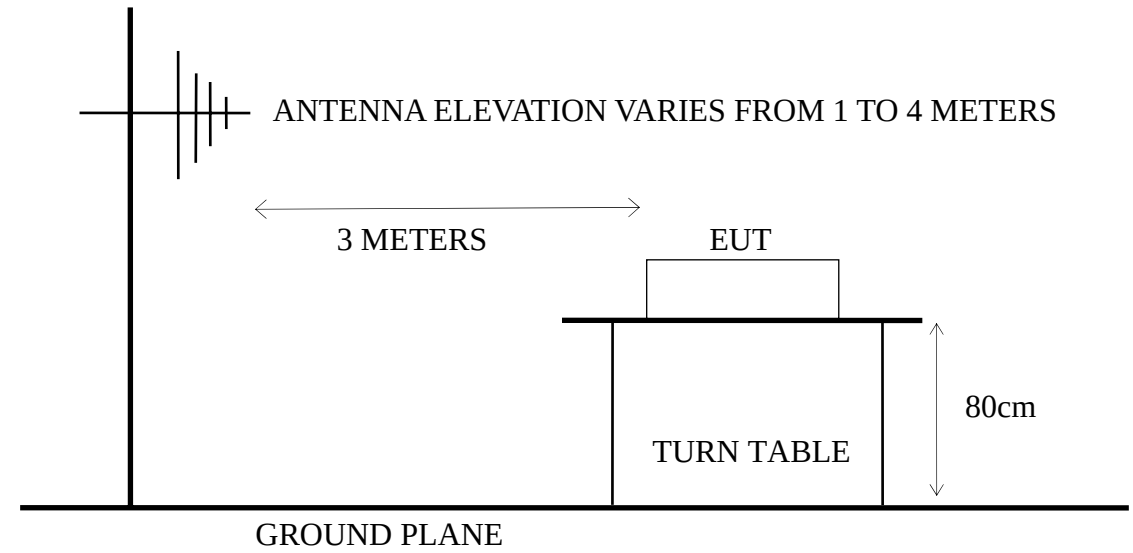
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 18, 13’	Aug. 17, 14’
2.	Test Receiver	R & S	ESCS30	100338	Jul. 01, 13’	Jun. 30, 14’
3.	Amplifier	HP	8447D	2944A06305	Feb. 12, 13’	Feb. 11, 14’
4.	Log Periodic Antenna	Schwarzbeck	UHALP 9108-A	0810	Mar. 02, 13’	Mar. 01, 14’
5.	Biconical Antenna	CHASE	VBA6106A	1264	Mar. 02, 13’	Mar. 01, 14’

4.2. Test Setup

4.2.1. Block Diagram of connection between EUT and simulators

CEILING FAN REMOTE CONTROLLER (TRANSMITTER) (EUT)

4.2.2. Semi-Anechoic Chamber (3m) Setup Diagram



4.3. Radiation Emission Limits (RSS-210, A1.1)

4.3.1. Fundamental Frequency Emission Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		μV/m	dBμV/m
Fundamental Frequency	3	10994.68	80.82 (Quasi-Peak)
Harmonic	3	1099.468	60.82 (Quasi-Peak)

Remarks： (1) Emission level (dBμV/m) = 20 log Emission level (μV/m)
(2) The tighter limit applies at the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
(4) Where limit of Fundamental Freq. is calculated by: 41.67x433.872-7083.3333 = 10994.68μV/m = 80.82 dBμV/m
(5) The limits in this table are based on RSS-210, A1.1 (Table A).

4.4. Operating Condition of EUT

4.4.1. Set up the EUT and simulator as shown on 4.2.

4.4.2. Turn on the power.

4.4.3. The EUT {Ceiling Fan Remote Controller (Transmitter)} emitted the fundamental frequency with data code at the stand, side and lying conditions. (The worst mode is lying)

4.4.4. The EUT was operated on maximum transmitting status during all testing (lying condition).

4.5. Test Procedure

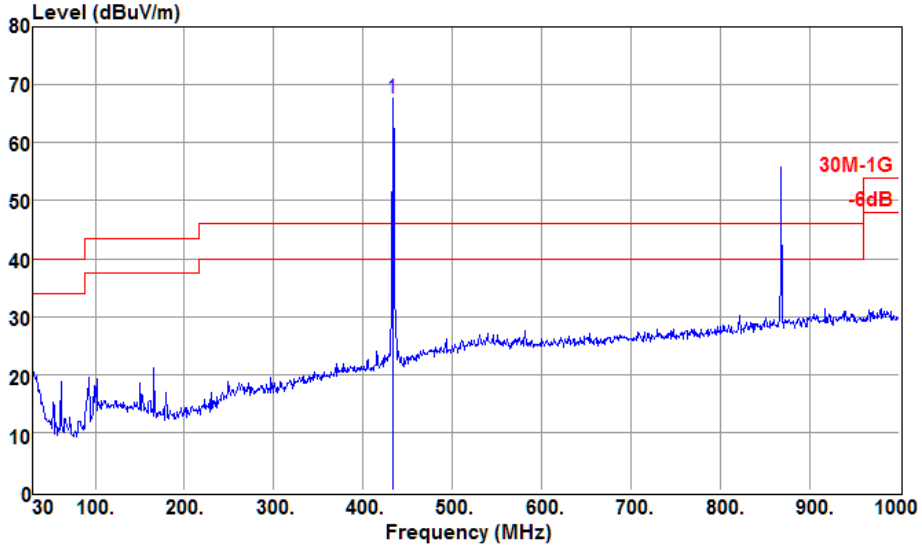
The EUT and was placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set to 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log- periodical antenna or horn antenna is used as a receiving antenna. Both polarizations horizontal and vertical are set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

EUT with worst positions (Lying) was tested during radiated measurement and all the test results are listed in section 4.6.

4.6. Fundamental Measurement Results

AUDIX Technology Corporation
EMC Department
No.53-11, Dingfu, Linkou Dist., New Taipei City,
Taiwan R.O.C. Post Code:24443
Tel:+886-2-26092133 Fax:+886-2-26099303
Email:ttemc@ttemc.com.

Data: 7 File: D:\share DOC\johnny-e3\C1M1310143(長益 NCC)\b\433.84MHz.em6 (7)



Site no. : Audix NO.1 Chamber Data no. : 7
Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : HORIZONTAL
Limit : 30M-1G
Env. / Ins. : 26*C / 54% N9030A(014) Engineer : Johnny_Hsueh
EUT : TR171B
Power Rating : DC 12.0V
Test Mode : Tx433.872MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Marg (dB)	Detector
1	433.52	16.90	5.24	45.43	67.57	46.00	-21.57	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reporte

Horizontal is the strongest polarization and Peak value has complied with limit, so vertical won't be listed in test report.

Because RBW of spectrum is larger than PRF, thus PDCF is no need for finding true peak level.

5. EMISSION BANDWIDTH MEASUREMENT

5.1.Test Equipment

The following test equipment was used during the Emission Bandwidth Test：

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Jul. 30, 13’	Jul. 29, 14’
2.	Wide Band Antenna	Diamond	RH799	2944A06305	N/A	N/A

5.2.Block Diagram of Test Setup

5.3.Specification Limits (§15.231-(c))

The bandwidth of emission shall be no wider than 0.25% of the center frequency for device operating above 70MHz and below 900MHz. Bandwidth is determined at the points 20dB down from the modulated carrier.

5.4.Emission Bandwidth Measurement Results

PASS.

Fundamental Frequency: 304MHz

Test Date: Nov. 04, 2013 Temperature: 26℃ Humidity: 54%

No.	Center Frequency	**Bandwidth**	**Tolerance (%)**
1.	304.20MHz	**46.0kHz**	**0.0106%**

The bandwidth of emission was measured at the point 20dB down from the center frequency of modulated carrier.

Graph of Bandwidth Measurement

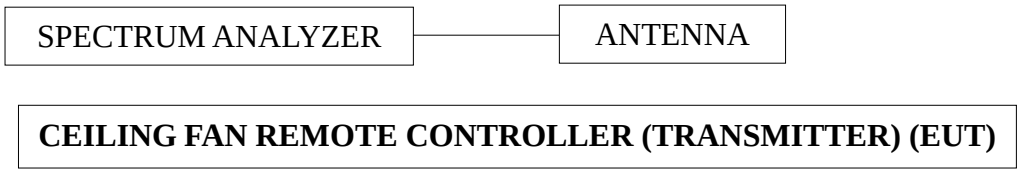
6. PERIODIC OPERATED MEASUREMENT

6.1.Test Equipment

The following test equipment was used during the periodic operated test：

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Jul. 30, 13’	Jul. 29, 14’
2.	Wide Band Antenna	Diamond	RH799	2944A06305	N/A	N/A

6.2.Block Diagram of Test Setup



6.3.Specification Limits [§15.231-(a)-(1)]

The operation of this device is manually operated transmitter that is automatically deactivated the transmitter within not more than 5 seconds of being released, Compliance with §15.231 (a)- (1).

6.4.Periodic Operated Measurement Results

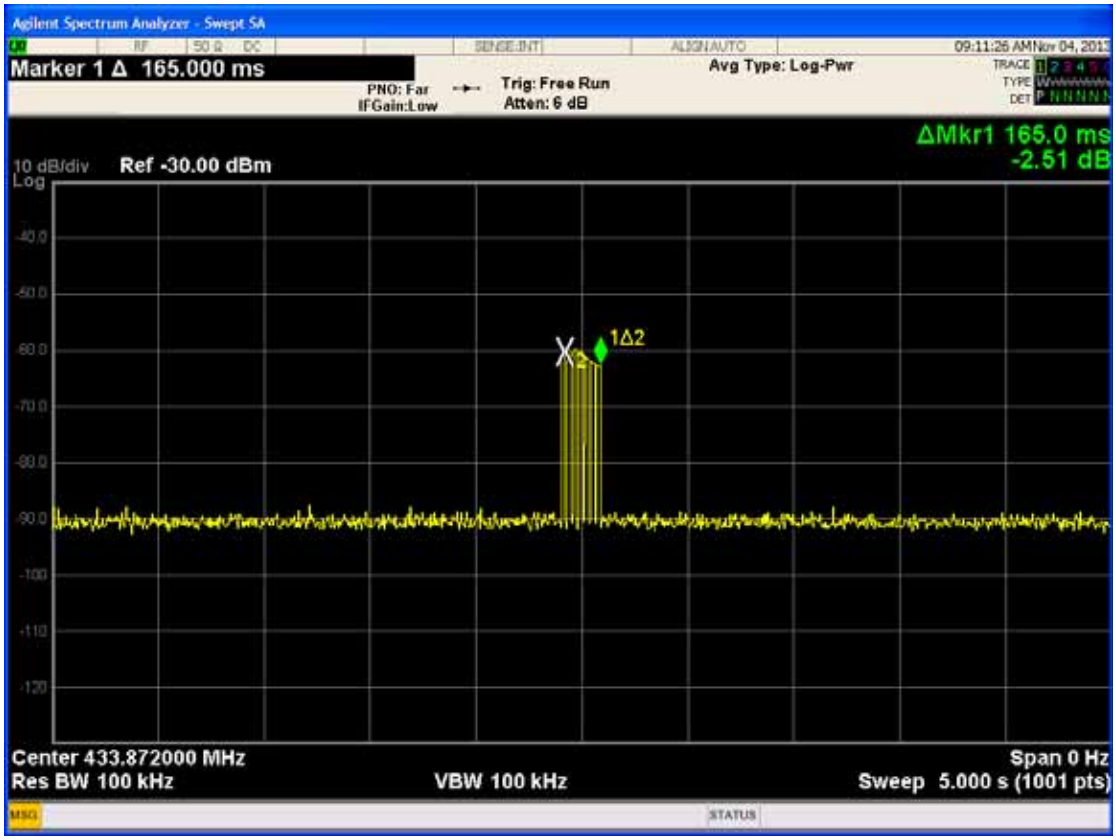
PASS. T = 0.29s. (< 5sec.)

Fundamental Frequency: 304MHz

Test Date: Nov. 04, 2013 Temperature: 26℃ Humidity: 54%

The graph of testing is attached in next page.

Graph of Periodic Operated Measurement



7. DEVIATION TO TEST SPECIFICATIONS

【NONE】

8. PHOTOGRAPHS

8.1. Photos of Radiated Measurement at Semi-Anechoic Chamber (30~1000MHz)

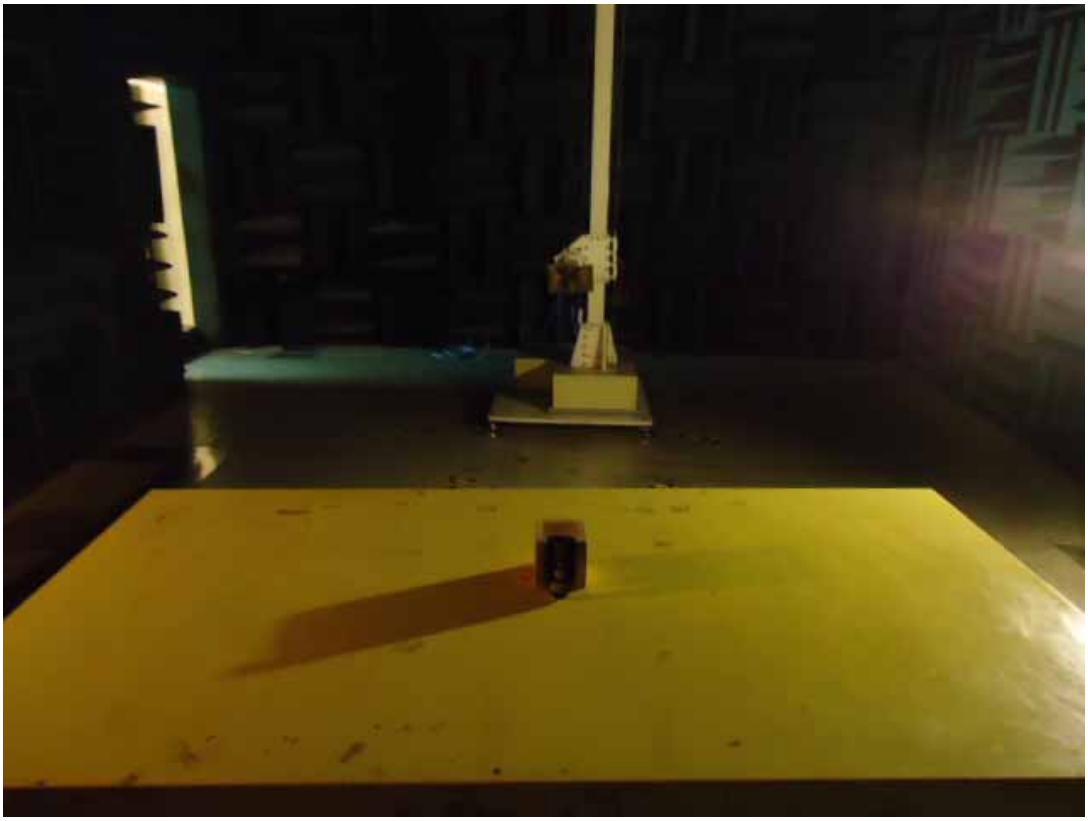
EUT on Stand

EUT on Side

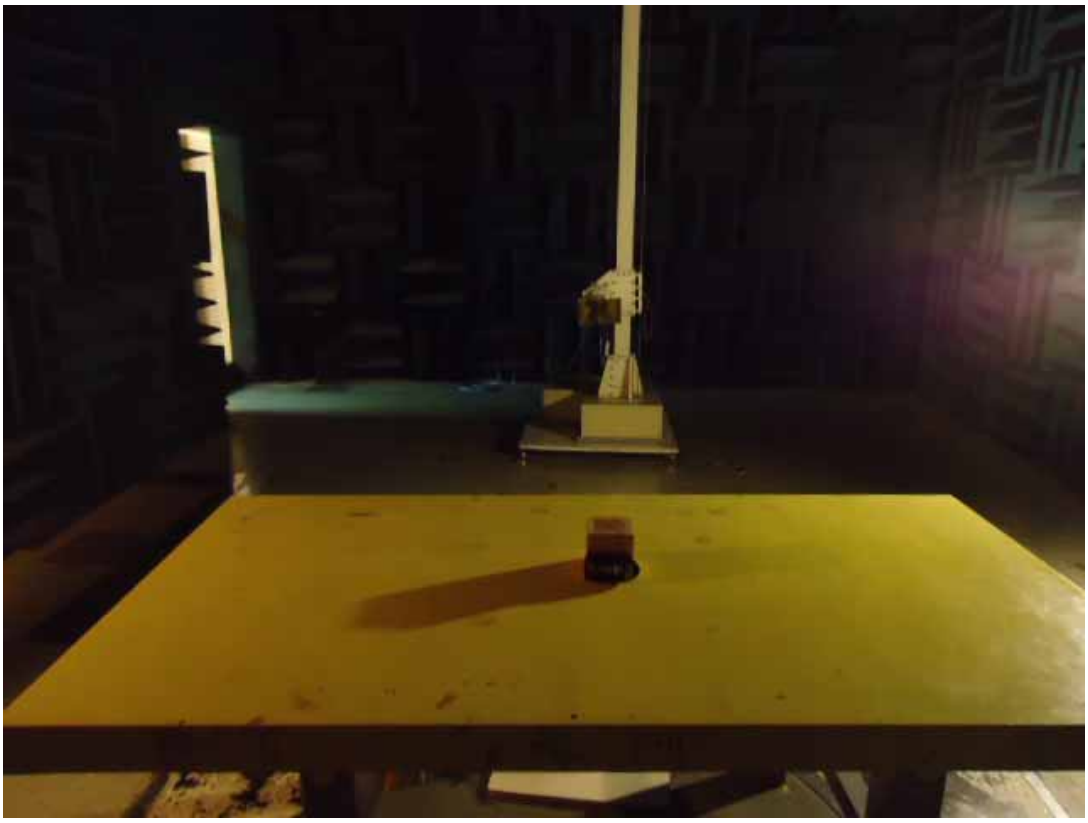
EUT on Lying

8.2. Photos of Radiated Measurement at Semi-Anechoic Chamber (Above 1GHz)

EUT on Stand



EUT on Side



EUT on Lying

8.3.Photo of Section RF Conducted Measurement