

TEST REPORT FOR CERTIFICATION
On Behalf of
Chungear Industrial Co., Ltd
Ceiling Fan Remote Controller (Transmitter)
Model No.: (1)TR207A (2)TR206A
FCC ID: KUJCE10325

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

Prepared By : AUDIX Technology Corporation
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Report Number : EM-F150038
Date of Test : 2014. 12. 17 ~ 2015. 03. 20
Date of Report : 2015. 03. 26

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TEST REPORT CERTIFICATION

Applicant : Chungear Industrial Co., Ltd
 Manufacturer #1 : Chungear Industrial Co., Ltd
 Manufacturer #2 : Satellite Electronic (Zhongshan) Ltd.
 Manufacturer #3 : Zhongshan Amity Electronic Ltd.
 EUT Description : Ceiling Fan Remote Controller (Transmitter)
 FCC ID : KIJCE10325
 (A) Model No. : (1)TR207A (2)TR206A
 (B) Serial No. : N/A
 (C) Power Supply : AC 120V/Hz
 (D) Test Voltage : AC 120V/Hz

Measurement Procedure Used:

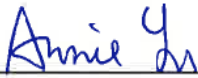
FCC RULES AND REGULATIONS PART 15 SUBPART C, October 2013
 AND ANSI C63.4/2003
 (FCC CFR 47 Part 15C, §15.207, §15.209 and §15.231)

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 both radiated and conducted emissions.

The measurement results were 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 : 2014. 12. 17 ~ 2015. 03. 20 Date of Report : 2015. 03 26

Producer : 
 (Annie Yu/Administrator)

Signatory: 
 (Ben Cheng/Manager)

1. DESCRIPTION OF VERSION

Edition No.	Date of Rev.	Revision Summary	Report No.
0	2015. 03. 26	Original Report.	EM-F150038

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Description	:	Ceiling Fan Remote Controller (Transmitter)
Model Number	:	(1)TR207A (2)TR206A The difference among models is different front appearance (REV button), others circuit and specification are the same. The model TR207A is test in this report.
FCC ID	:	KUJCE10325
Applicant	:	Chungear Industrial Co., Ltd 106 Kanho Rd., Taichung, Taiwan
Manufacturer #1	:	Chungear Industrial Co., Ltd. 106 Kanho Rd., Taichung, Taiwan
Manufacturer #2	:	Satellite Electronic (Zhongshan), Ltd No.15, Torch Hi-Tech Industrial Development Zone, Zhong Shan City Guangdong Province China
Manufacturer #3	:	Zhongshan Amity Electronic Ltd. No. 16 Torch Hi-Tech Industrial Development Zone, Zhong Shan City Guangdong Province China.
Fundamental Frequency	:	304MHz
Power Supply	:	AC 120V/Hz
Date of Receipt of Sample	:	2014. 12. 12
Date of Test	:	2015. 03. 26

* Ceiling Fan Remote Controller (Receiver) - 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.: MR101F, FCC by DoC
- (10)Model No.: MR101F-2, FCC by DoC
- (11)Model No.: MR62A, FCC by DoC
- (12)Model No.: MR76T, FCC by DoC

2.2. Tested Supporting System Details

2.2.1. Support Peripheral Unit

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Test Jig	N/A	N/A	N/A	N/A

2.2.2. Cable Lists

No.	Signal Cable Description Of The Above Support Units
1.	Cable: Non-Shielded, Undetachable, 0.8m*3 Power Cord: Non-Shielded, Undetachable, 1.2m

2.3. Description of Test Facility

- Name of Firm : **AUDIX Technology Corporation
EMC Department**
No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan
- Test Site (C8/AC) : **No. 8 Shielded Room**
No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan
- Semi-Anechoic Chamber**
No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan
Federal Communication Commission
Registration Number: 90993
Filing on: 2012. 05. 11
- NVLAP Lab. Code : 200077-0
- TAF Accreditation No : 1724

2.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	±3.5dB
Radiation Test (Distance: 3m)	300MHz~1000MHz	± 5.3dB
	Above 1GHz	± 4.8dB

Remark : Uncertainty = $ku_c(y)$

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

3. CONDUCTED EMISSION MEASUREMENT

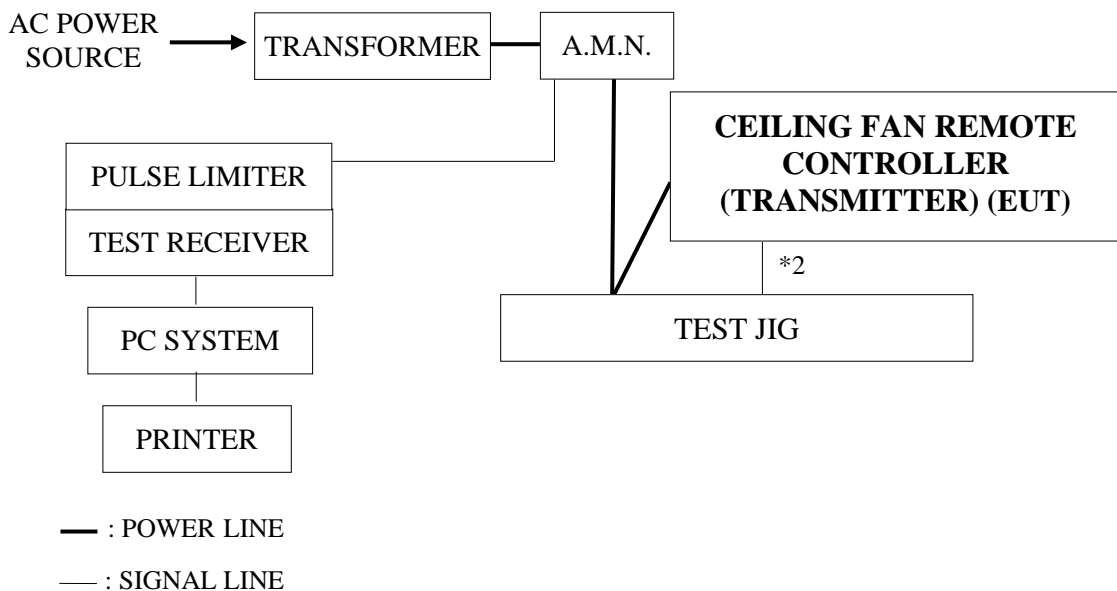
3.1. Test Equipments

The following test equipment was used during the conducted emission measurement :
(No. 8 Shielded Room)

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Test Receiver	R&S	ESR3	101774	2015. 02. 06	1 Year
2	A.M.N.	R&S	ENV4200	100169	2014. 05. 06	1 Year
3	Pulse Limiter	R&S	ESH3-Z2	100354	2015. 01. 17	1 Year

3.2. Test Setup

3.2.1. Block Diagram of connection between EUT and simulators



3.3. Radiation Emission Limits (§15.207)

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dB μ V	56 ~ 46 dB μ V
500kHz ~ 5MHz	56 dB μ V	46 dB μ V
5MHz ~ 30MHz	60 dB μ V	50 dB μ V

Remark 1.: If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

2.: The lower limit applies at the band edges.

3.4. Operating Condition of EUT

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

3.4.2. The EUT was operated on maximum transmitting status during all testing.

3.5. Test Procedure

The EUT was placed on the table which was above the ground by 80cm and notebook PC's power cord was connected to the AC mains through an Artificial Mains Network (A.M.N.). The peripheral devices power cord connected to the power mains through another line impedance stabilization network (L.I.S.N.). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions simulators of the interface cables should be manipulated according to ANSI C63.4-2003 regulation during conducted measurement.

The bandwidth of the R&S Test Receiver ESR3 was set at 9kHz.

The frequency range from 150kHz to 30MHz was checked.

All the final readings from Test Receiver were measured with the Quasi-Peak detector and Average detector. Remark: If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

3.6. Radiated Emission Noise Measurement Results

PASSED.

(All the emissions not reported below are too low against the prescribed limits.)

EUT was performed during this section testing and all the test results are attached in next pages.

EUT : Ceiling Fan Remote Controller (Transmitter) M/N : TR207A

Test Date: 2014. 12. 17 Temperature: 26 Humidity: 45%

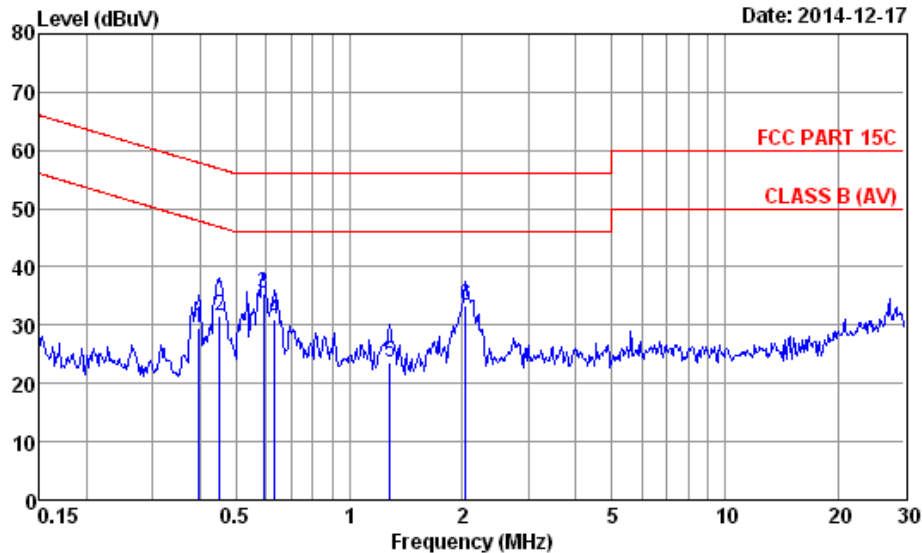
The details are as follows :

Mode	Reference Test Data	
	Neutral	Line
1.	# 2	# 1



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 Email: emc@audixtech.com

Data: 2 File: D:\test data\REPORT\2014\1M1412XXX\1M1412174-C-D(RF).EM6 (2)



Site no. : No.8 Shielded Room Data no. : 2
 Condition : ENV4200 100169 Phase : NEUTRAL
 Limit : FCC PART 15C
 Env. / Ins. : 26°C / 45% ESR3 (1774) Engineer : Hank
 EUT : TR207A
 Power Rating : 120Vac/60Hz
 Test Mode : Operating

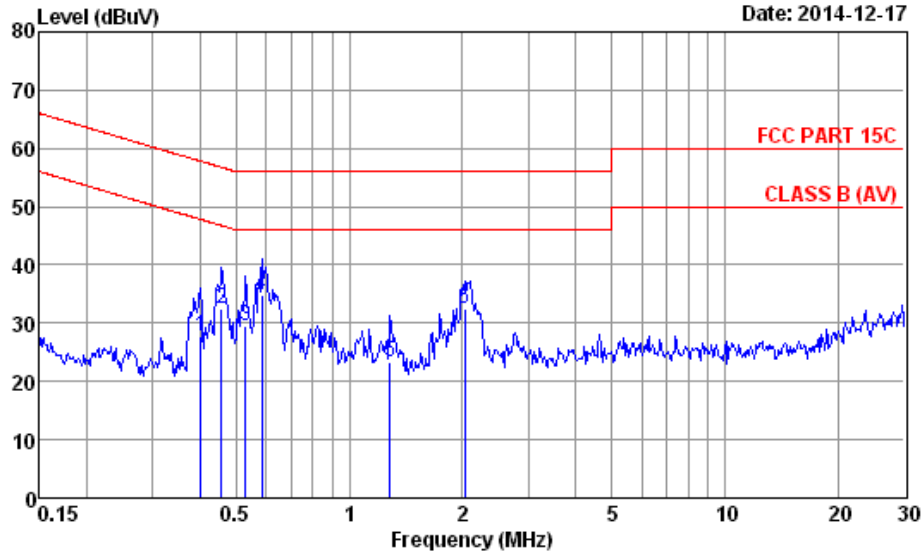
	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.398	10.47	0.03	9.84	9.12	29.46	57.90	28.44	QP
2	0.452	10.47	0.03	9.85	11.30	31.65	56.85	25.20	QP
3	0.592	10.46	0.04	9.86	14.92	35.28	56.00	20.72	QP
4	0.634	10.46	0.04	9.85	10.77	31.12	56.00	24.88	QP
5	1.282	10.46	0.06	9.85	3.26	23.63	56.00	32.37	QP
6	2.044	10.48	0.08	9.84	12.93	33.33	56.00	22.67	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
 2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



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Data: 1 File: D:\test data\REPORT\2014\1M1412XXX\1M1412174-C-D(RF).EM6 (2)



Site no. : No.8 Shielded Room Data no. : 1
 Condition : ENV4200 100169 Phase : LINE
 Limit : FCC PART 15C
 Env. / Ins. : 26°C / 45% ESR3 (1774) Engineer : Hank
 EUT : TR207A
 Power Rating : 120Vac/60Hz
 Test Mode : Operating

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.402	10.48	0.03	9.84	7.33	27.68	57.81	30.13	QP
2	0.456	10.48	0.03	9.85	12.22	32.58	56.76	24.18	QP
3	0.529	10.47	0.04	9.85	9.18	29.54	56.00	26.46	QP
4	0.585	10.47	0.04	9.86	14.35	34.72	56.00	21.28	QP
5	1.282	10.47	0.06	9.85	2.99	23.37	56.00	32.63	QP
6	2.033	10.50	0.08	9.84	12.00	32.42	56.00	23.58	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
 2. If the average limit is met when using a quasi-peak detector,
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

4. RADIATED EMISSION MEASUREMENT

4.1. Test Equipments

The following test equipments were used during the radiated emission test:

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

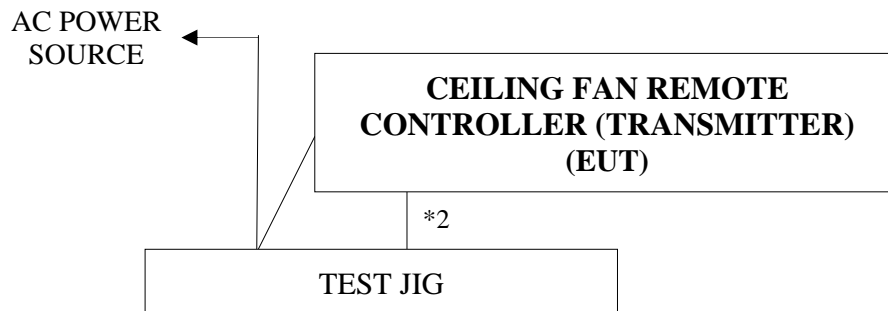
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2014. 09. 15	1 Year
2	Test Receiver	R & S	ESCS30	100338	2014. 06. 24	1 Year
3	Amplifier	HP	8447D	2944A06305	2015. 02. 12	1 Year
4	Bilog Antenna	CHASE	CBL6112D	33821	2014. 08. 02	1 Year

4.1.2. For Frequency Range above 1GHz (Semi-Anechoic Chamber)

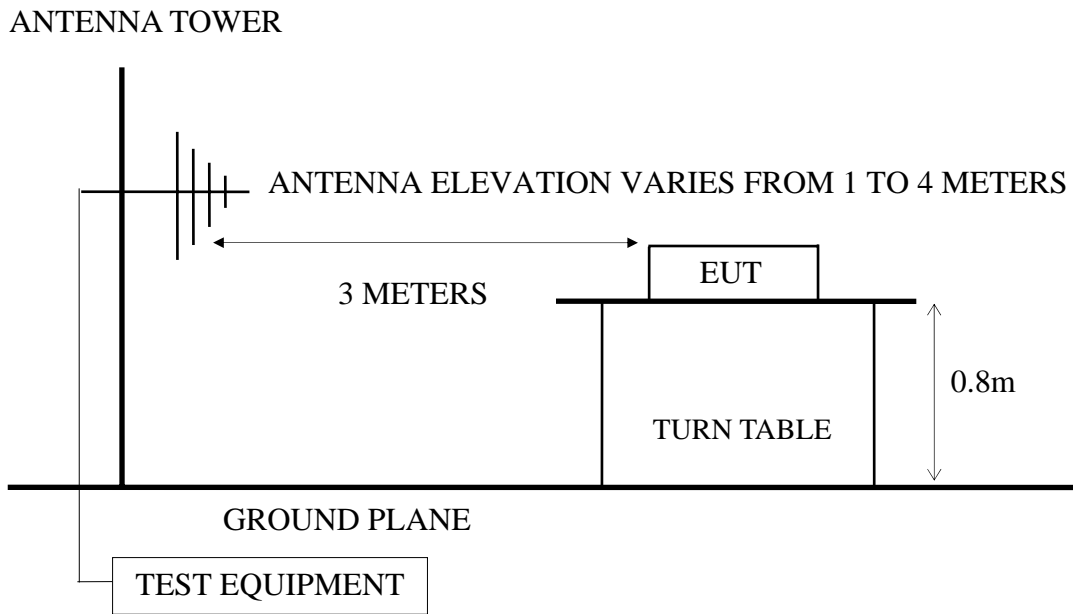
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2014. 09. 15	1 Year
2	Amplifier	Agilent	8449B	3008A02676	2015. 02. 11	1 Year
3	Horn Antenna	EMCO	3115	9609-4927	2014. 06. 17	1 Year

4.2. Test Setup

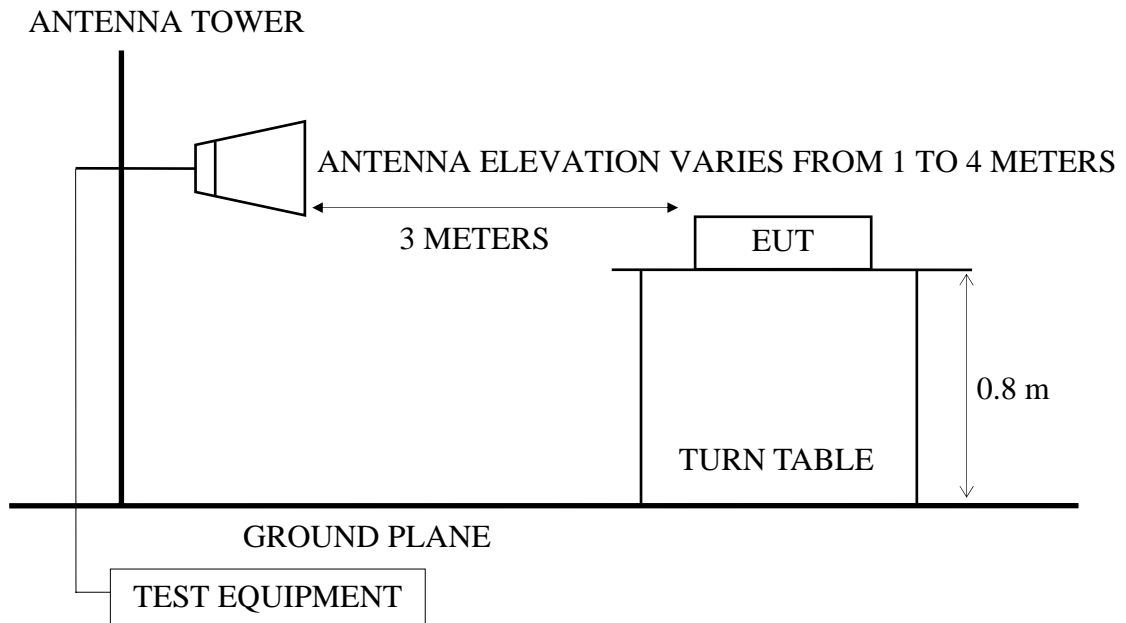
4.2.1. Block Diagram of connection between EUT and simulators



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



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



4.3. Radiation Emission Limits (§15.209)

Frequency MHz	Distance Meters	Field Strengths Limits	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 - 88	3	100	40.00
88 - 216	3	150	43.50
216 - 960	3	200	46.00
Above 960	3	500	54.00

- Remarks :
- (1) Emission level ($\text{dB}\mu\text{V/m}$) = $20 \log$ Emission level ($\mu\text{V/m}$)
 - (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.

4.4. Operating Condition of EUT

- 4.4.1. Set up the EUT and simulator as shown on 4.2.
- 4.4.2. The EUT emitted the fundamental frequency.
- 4.4.3. The EUT was operated on maximum transmitting status during all testing.

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 could be 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 4GHz (Up to 10th harmonics from fundamental frequency) was checked. 30MHz to 1000MHz was measured with Quasi-Peak detector. Pursuant to ANSI 63.4: 4.2, peak detector is an alternate option for frequency from 30MHz to 1000MHz.

Above 1GHz was measured with peak and average detector. For frequency from 2.68GHz to 4GHz, we checked it in 1 meter distance and with a shorter cable 2 meter instead of original's. There is no signal exist.

Pursuant to ANSI C63.4 8.3.1.2, when peak value complies with the average limit, we didn't perform measurement in average detector.

4.6. Radiated Emission Noise Measurement Results

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

Date of Test : 2015. 03. 20 Temperature : 25

EUT : Ceiling Fan Remote Controller (Transmitter) Humidity : 42%

Test Mode : Transmit, Frequency: 304MHz

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading Horizontal (dBμV)	Emission Level Horizontal (dBμV/m)	Limits (dBμV/m)	Margin (dB)
31.94	17.52	2.37	4.65	24.54	40.00	15.46
101.78	11.03	3.23	11.29	25.55	43.50	17.95
189.08	9.19	3.90	11.10	24.19	43.50	19.31
580.96	18.08	6.49	10.96	35.53	46.00	10.47
746.83	19.38	6.94	4.50	30.82	46.00	15.18
912.70	20.65	7.62	2.18	30.45	46.00	15.55

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
 2. Above all final readings were measured with Peak detector.

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading Vertical (dBμV)	Emission Level Vertical (dBμV/m)	Limits (dBμV/m)	Margin (dB)
30.97	18.07	2.34	3.71	24.12	40.00	15.88
165.80	9.65	3.73	10.19	23.57	43.50	19.93
374.35	15.00	5.43	6.62	27.05	46.00	18.95
486.87	16.80	6.35	5.22	28.37	46.00	17.63
580.96	18.08	6.49	11.67	36.24	46.00	9.76
952.47	20.85	7.84	1.02	29.71	46.00	16.29

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
 2. Above all final readings were measured with Peak detector.

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

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

5. FUNDAMENTAL MEASUREMENT

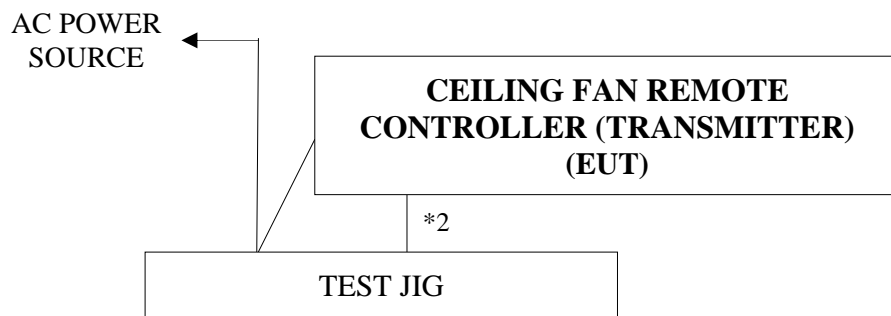
5.1. Test Equipment

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

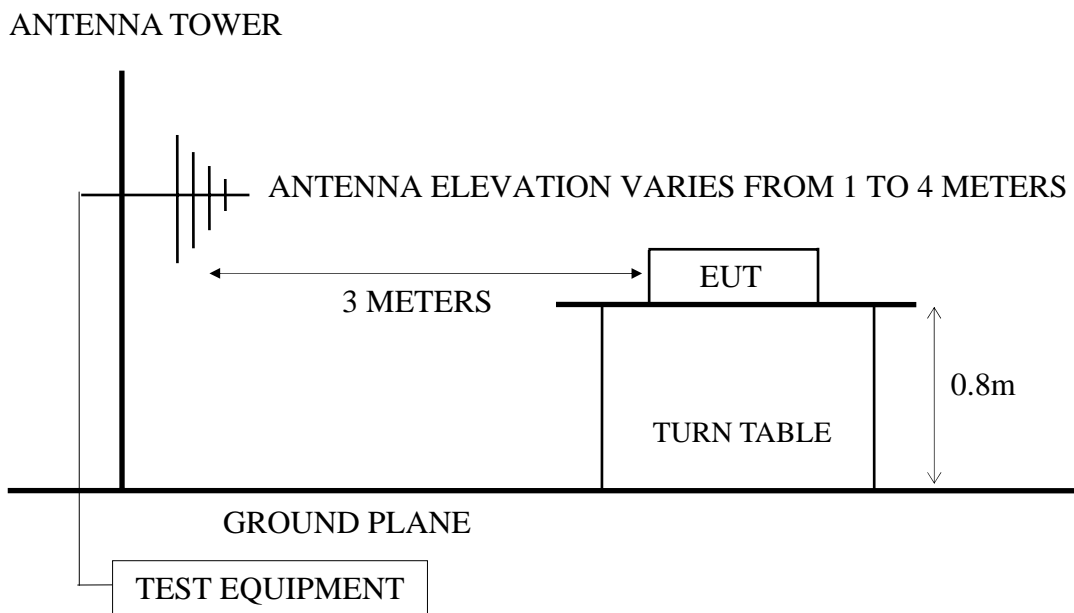
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2014. 09. 15	1 Year
2	Test Receiver	R & S	ESCS30	100338	2014. 06. 24	1 Year
3	Amplifier	HP	8447D	2944A06305	2015. 02. 12	1 Year
4	Bilog Antenna	CHASE	CBL6112D	33821	2014. 08. 02	1 Year

5.2. Test Setup

5.2.1. Block Diagram of connection between EUT and simulators



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



5.3. Radiation Emission Limits (§15.231)

In addition to the provisions of §15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	¹ 1,250 to 3,750	¹ 125 to 375
174-260	3,750	375
260-470	¹ 3,750 to 12,500	¹ 375 to 1,250
Above 470	12,500	1,250
¹ :Linear Interpolations		

- Remarks :
- (1) Emission level (dB μ V/m) = 20 log Emission level (μ V/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:
 $41.6667 \times 304 - 7083.3333 = 5583.3435 \mu\text{V/m} = 74.94 \text{dB}\mu\text{V/m}$
 - (5) The limits in this table are based on CFR 47 Part 15.231(b).

5.4. Operating Condition of EUT

- 5.4.1. Set up the EUT and simulator as shown on 5.2.
- 5.4.2. The EUT emitted the fundamental frequency.
- 5.4.3. The EUT was operated on maximum transmitting status during all testing.

5.5. Test Procedure

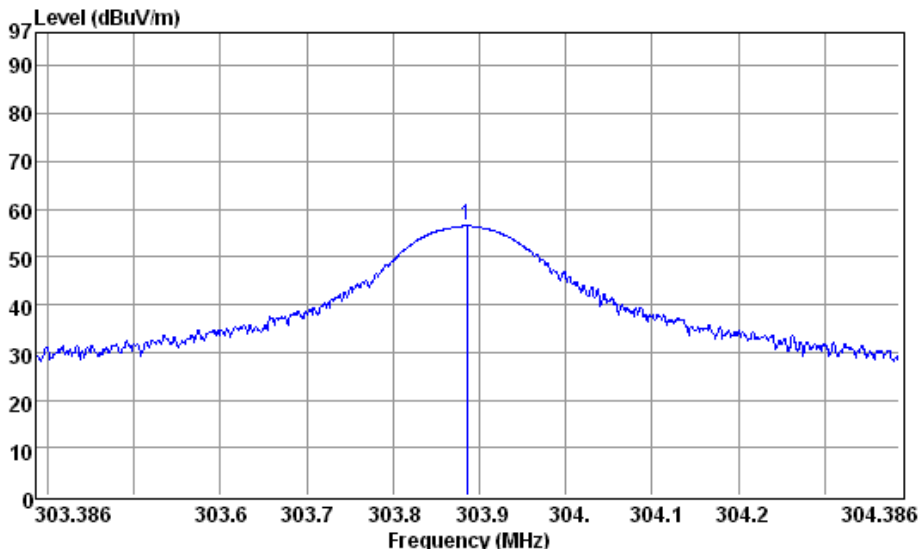
The EUT and was placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set to 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna could be moved up and down 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.

5.6. Fundamental Measurement Results

Test Date: 2015. 03. 20 Temperature: 25 Humidity: 42%



Data: 1



```

Site no.      : Audix NO.1 3m Chamber
Dis. / Ant.  : 3m CBL8112D 33821
Limit        :
Env. / Ins.  : 25*C/42% N9010A
EUT          : TR207A
Power Rating : 120Vac/60Hz
Test Mode    : operating
Data no.     : 1
Ant. pol.    : HORIZONTAL
Engineer     : An
    
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	303.89	13.22	4.70	38.58	56.50			Peak

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

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.

6. EMISSION BANDWIDTH MEASUREMENT

6.1. Test Equipment

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

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Spectrum Analyzer	Agilent	N9030A-526	MY53310269	2014. 11. 08	1 Year
2	Wide Band Antenna	Diamond	RH799	N/A	N.C.R	N.C.R

6.2. Block Diagram of Test Setup



6.3. 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.

6.4. Emission Bandwidth Measurement Results

PASS.

Fundamental Frequency: 304MHz

Test Date: 2015. 03. 0

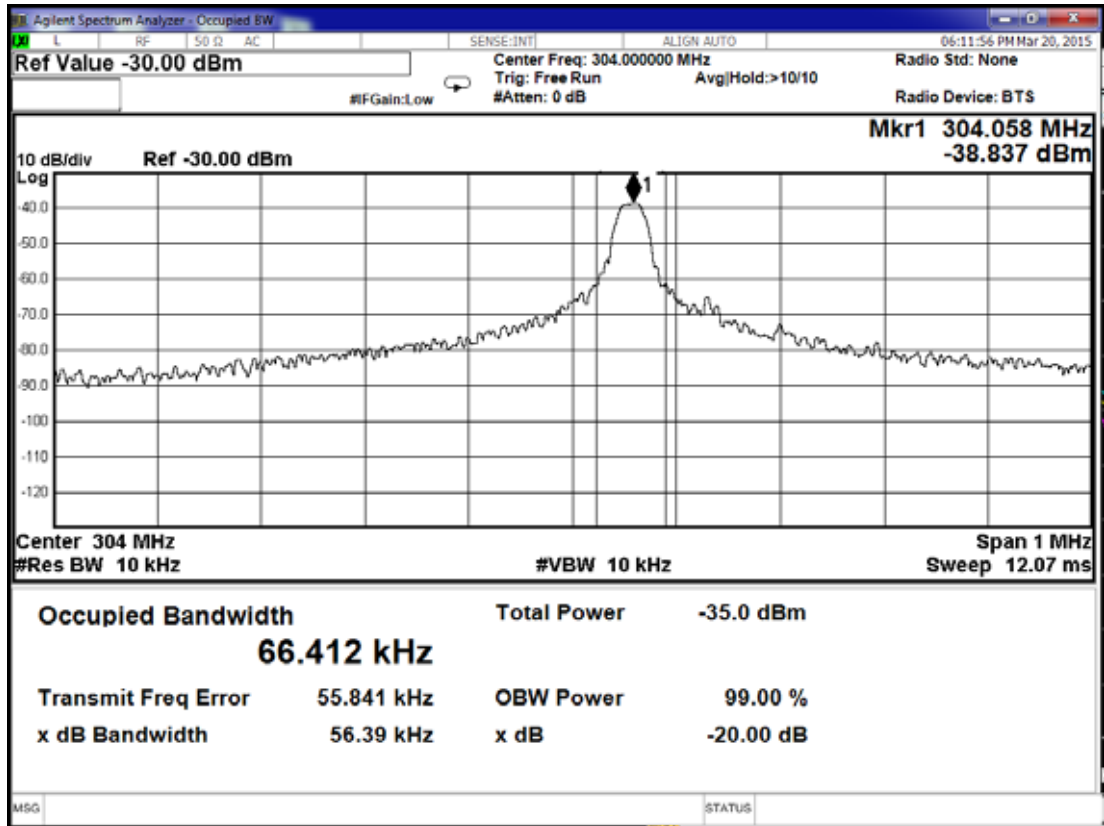
Temperature: 25

Humidity: 38%

No.	Center Frequency	Bandwidth	Tolerance	Limited
1.	304.25 MHz	0.05639 MHz	0.019 %	0.25%

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

Graph of Bandwidth Measurement



7. PERIODIC OPERATED MEASUREMENT

7.1. Test Equipment

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

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1	Spectrum Analyzer	Agilent	N9030A-526	MY53310269	2014. 11. 08	1 Year
2	Wide Band Antenna	Diamond	RH799	N/A	N.C.R	N.C.R

7.2. Block Diagram of Test Setup



7.3. 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).

7.4. Periodic Operated Measurement Results

PASS.

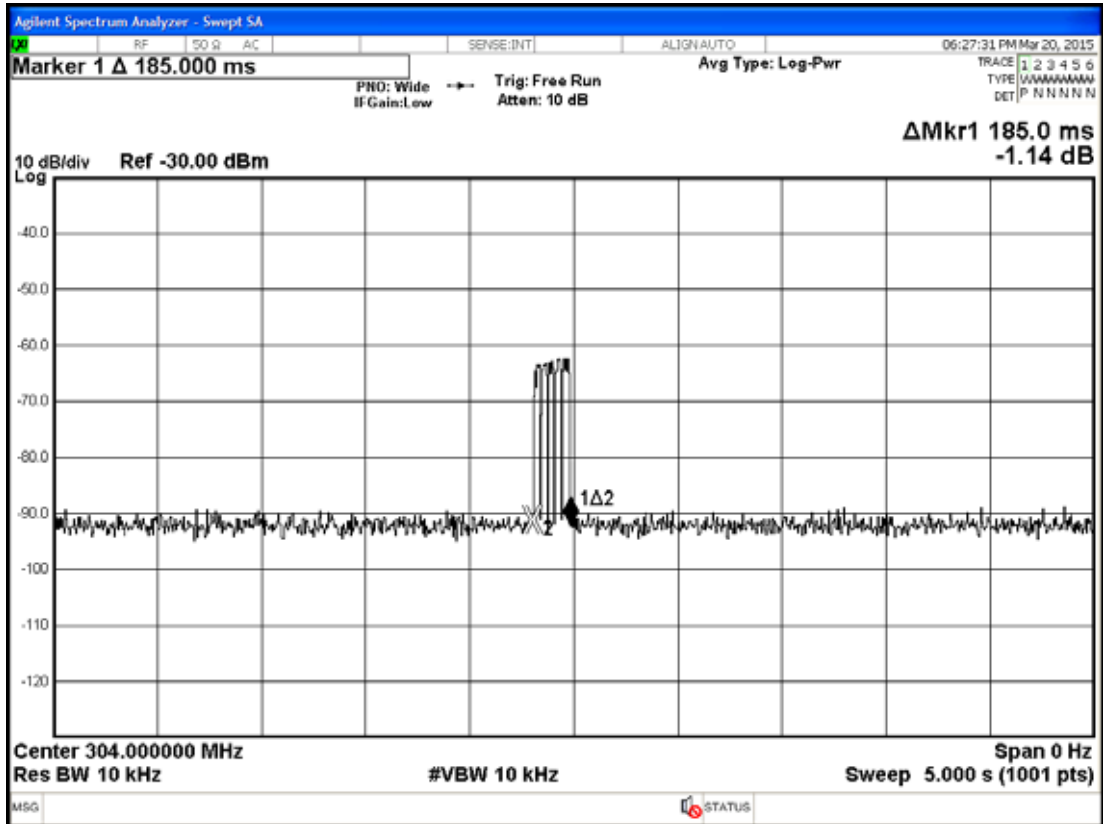
Fundamental Frequency: 304MHz

Test Date: 2015. 03. 0 Temperature: 25 Humidity: 38%

T = 0.185s. (< 5sec.)

The graph of testing is attached in next page.

Graph of Periodic Operated Measurement



8. DEVIATION TO TEST SPECIFICATIONS

【NONE】

9. PHOTOGRAPHS

9.1. Photos of Conducted Disturbance Measurement



FRONT VIEW OF CONDUCTED MEASUREMENT

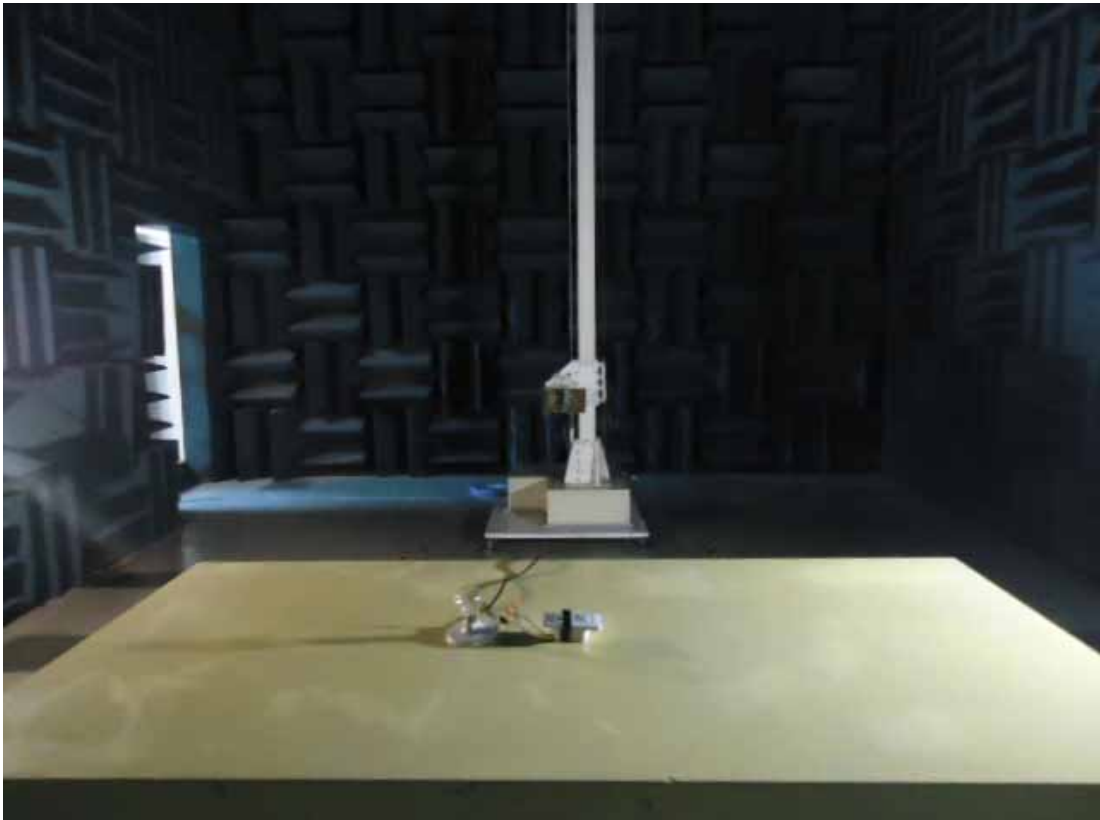


BACK VIEW OF CONDUCTED MEASUREMENT

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



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



9.4. Photo of Section RF Near Field Measurement

