

TEST REPORT FOR CERTIFICATION
On Behalf of
Chungear Industrial Co., Ltd
Ceiling Fan Remote Controller (Transmitter)
Model No.: TR191A
FCC ID: KIJCE10301

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

Prepared By : AUDIX Technology Corporation
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Date of Report : 2014. 04. 22

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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 : KIJCE10301
 (A) Model No. : TR191A
 (B) Serial No. : N/A
 (C) Power Supply : DC 3V (Battery)
 (D) Test Voltage : DC 3V

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 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 : 2014. 03. 27 ~ 04. 21 Date of Report : 2014. 04. 22

Producer : 
 (Tina Huang/Administrator)

Signatory: 
 (Ben Cheng/Manager)

1. DESCRIPTION OF VERSION

| Edition No. | Date of Rev. | Revision Summary | Report No. |
|-------------|--------------|------------------|------------|
| 0 | 2014. 04. 22 | Original Report. | EM-F140232 |

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

| | | |
|---------------------------|---|---|
| Description | : | Ceiling Fan Remote Controller (Transmitter) |
| Model Number | : | TR191A |
| FCC ID | : | KIJCE10301 |
| 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 | : | 303.875MHz |
| Power Supply | : | DC 3V |
| Date of Receipt of Sample | : | 2014. 03. 26 |
| Date of Test | : | 2014. 03. 27 ~ 04. 21 |

* 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.: 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

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.

2.2. 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 (Semi-AC) | : | 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 |

2.3. Measurement Uncertainty

| Test Item | Frequency Range | Uncertainty (dB) |
|----------------------------------|-----------------|------------------|
| Radiation Test (Distance: 3m) | 30MHz~300MHz | ± 2.91dB |
| | 300MHz~1000MHz | ± 2.94dB |
| | Above 1GHz | ± 4.35dB |

Remark : Uncertainty = $ku_c(y)$

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

3. CONDUCTED EMISSION MEASUREMENT

【The EUT only employs battery power for operation, no conductive emission limits are required according to FCC Part 15 Section §15.207】

4. RADIATED EMISSION MEASUREMENT

4.1. Test Equipment

The following test equipment was 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. Due Date |
|------|-------------------|--------------|------------|------------|---------------|
| 1. | Spectrum Analyzer | Agilent | N9030A-544 | US51350140 | 2014. 07. 29 |
| 2. | Test Receiver | R & S | ESCS30 | 100338 | 2014. 06. 30 |
| 3. | Amplifier | HP | 8447D | 2944A06305 | 2015. 02. 17 |
| 4. | Bilog Antenna | CHASE | CBL6112D | 33821 | 2014. 08. 07 |

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

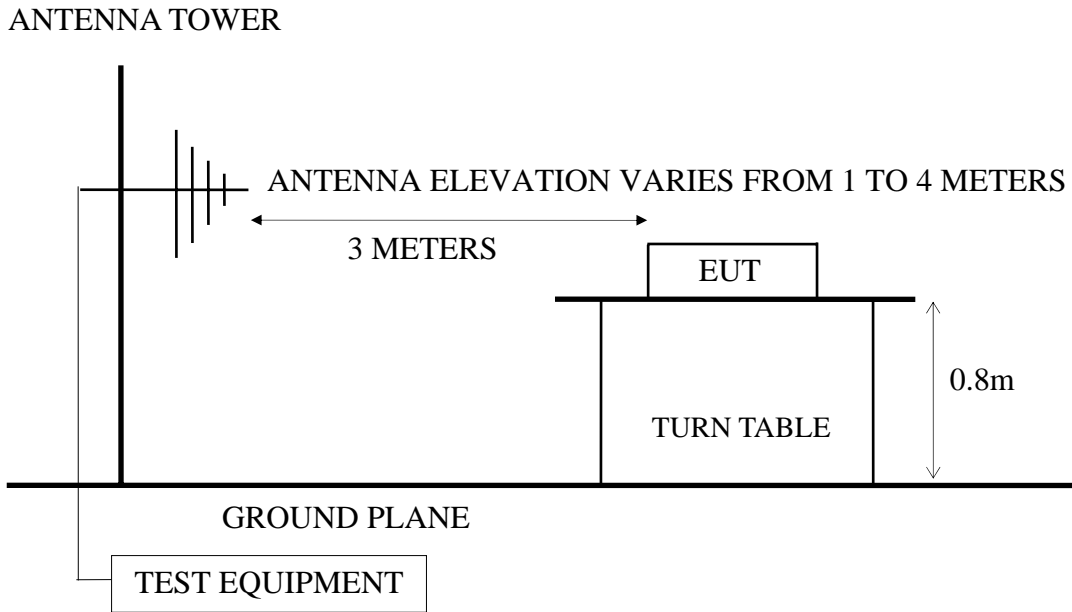
| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Due Date |
|------|-------------------|--------------|------------|------------|---------------|
| 1. | Spectrum Analyzer | Agilent | N9030A-544 | US51350140 | 2014. 07. 29 |
| 2. | Amplifier | Agilent | 8449B | 3008A02676 | 2015. 02. 20 |
| 3. | Horn Antenna | EMCO | 3115 | 9609-4927 | 2014. 06. 16 |

4.2. Test Setup

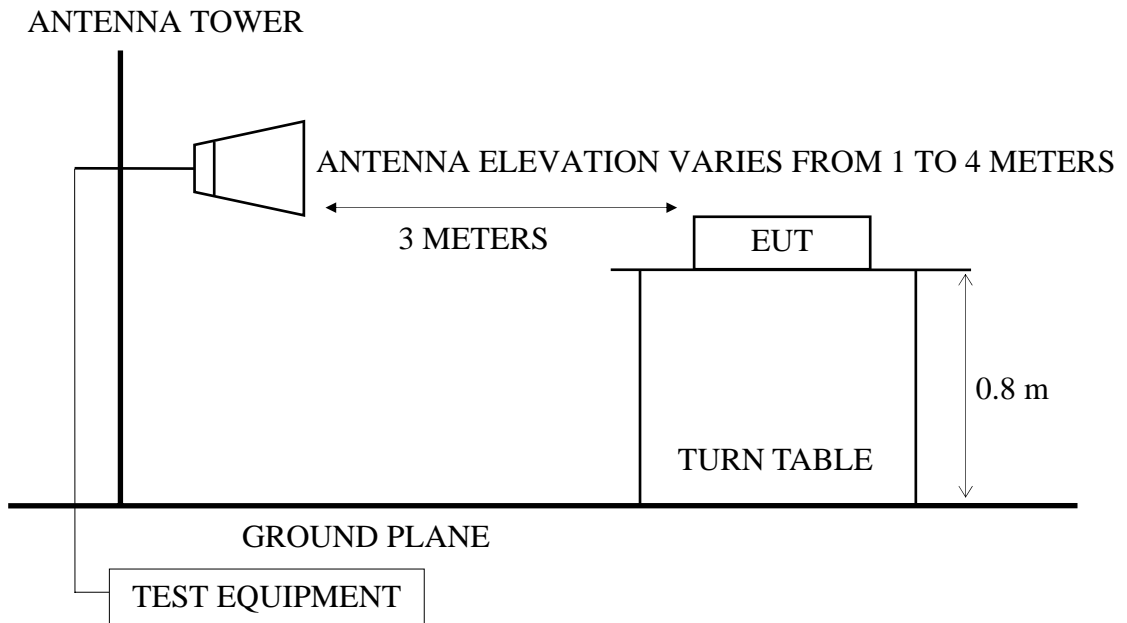
4.2.1. Block Diagram of connection between EUT and simulators

| |
|--|
| CEILING FAN REMOTE CONTROLLER (TRANSMITTER) (EUT) |
|--|

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



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



4.3. Radiation Emission Limits (§15.209)

4.3.1. Spurious Emission Limit (§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 {Ceiling Fan Remote Controller (Transmitter)}** 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 {Ceiling Fan Remote Controller (Transmitter)}** 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 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 (Up to 10th harmonics from fundamental frequency) was checked. 30MHz to 1000MHz was measured with Quasi-Peak detector. Pursuant to ANSI 6.3.4 4.2.2, peak detector is an alternate option for frequency from 30MHz to 1000MHz.

4.6. Radiated Emission Noise Measurement Results

4.6.1. 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 : 2014. 04. 21 Temperature : 23

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

Test Mode : Transmit, Frequency: 303.875MHz

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading Horizontal (dBμV) | Emission Level Horizontal (dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|--------------------------|-----------------------|-----------------|---------------------------------|------------------------------------|-----------------|-------------|
| 30.97 | 19.24 | 1.10 | 0.55 | 20.89 | 40.00 | 19.11 |
| 497.54 | 17.76 | 6.43 | 18.63 | 42.82 | 46.00 | 3.18 |
| * 911.73 | 21.72 | 7.40 | 14.80 | 43.92 | 46.00 | 2.08 |

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. "*" is Harmonic Frequency

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading Vertical (dBμV) | Emission Level Vertical (dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|--------------------------|-----------------------|-----------------|-------------------------------|----------------------------------|-----------------|-------------|
| 115.36 | 12.31 | 2.30 | 17.57 | 32.18 | 43.50 | 11.32 |
| 497.54 | 17.76 | 6.43 | 9.75 | 33.94 | 46.00 | 12.06 |
| * 911.73 | 21.72 | 7.40 | 4.02 | 33.14 | 46.00 | 12.86 |

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. "*" is Harmonic Frequency

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

Date of Test : 2014. 04. 21 Temperature : 23
 EUT : Ceiling Fan Remote Controller Humidity : 42%
 (Transmitter)
 Test Mode : Transmit, Frequency: 303.875MHz

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading Horizontal (dBμV) | Emission Level Horizontal (dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|--------------------------|-----------------------|-----------------|---------------------------------|------------------------------------|-----------------|-------------|
| 1493.92 | 25.70 | 5.41 | 19.60 | 50.71 | 54.00 | 3.29 |
| *1823.20 | 26.90 | 6.80 | 14.42 | 48.12 | 54.00 | 5.88 |
| *2127.28 | 27.87 | 6.02 | 14.06 | 47.95 | 54.00 | 6.05 |
| *2431.36 | 28.55 | 6.39 | 18.02 | 52.96 | 54.00 | 1.04 |
| *2735.44 | 29.49 | 6.84 | 12.69 | 49.02 | 54.00 | 4.98 |

- Remarks:
1. Emission level=Antenna Factor + Cable Loss + Reading.
 2. For measurements above 1GHz, the peak measured value complies with the average limit, it is unnecessary to perform an average measurement. (According to ANSI C63.4-2003 section 8.3.1.2)
 3. "*" is Harmonic Frequency

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading Vertical (dBμV) | Emission Level Vertical (dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|--------------------------|-----------------------|-----------------|-------------------------------|----------------------------------|-----------------|-------------|
| *1520.80 | 25.83 | 5.58 | 13.24 | 44.65 | 54.00 | 9.35 |

- Remarks:
1. Emission level=Antenna Factor + Cable Loss + Reading.
 2. For measurements above 1GHz, the peak measured value complies with the average limit, it is unnecessary to perform an average measurement. (According to ANSI C63.4-2003 section 8.3.1.2)
 3. "*" is Harmonic Frequency

5. FUNDAMENTAL MEASUREMENT

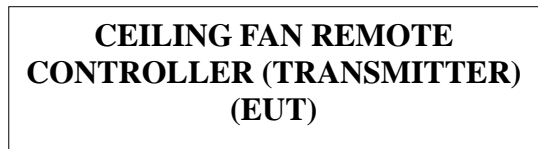
5.1. Test Equipment

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

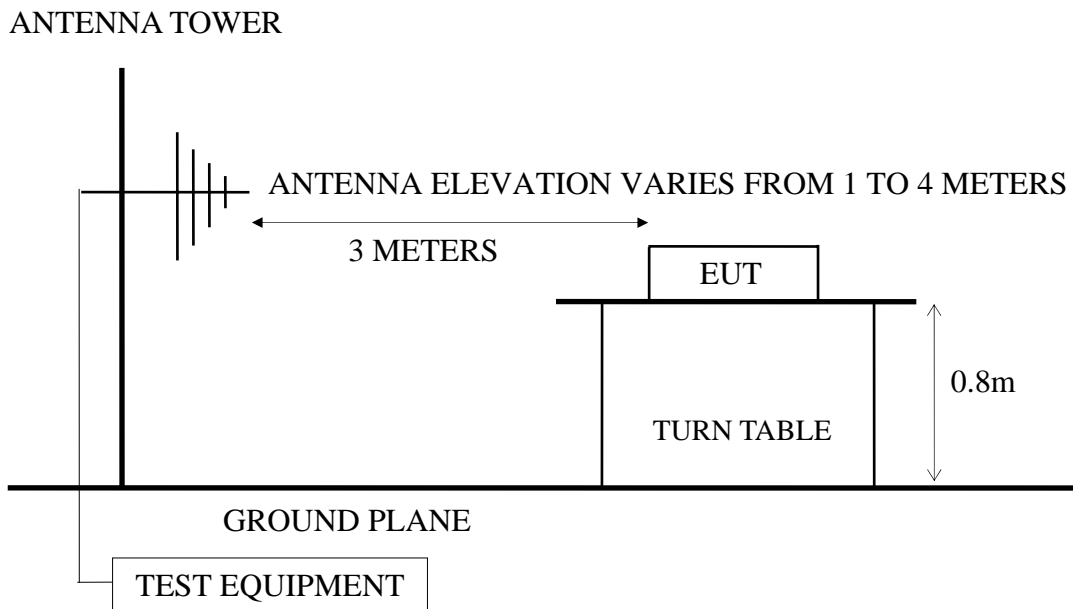
| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Due Date |
|------|-------------------|--------------|------------|------------|---------------|
| 1. | Spectrum Analyzer | Agilent | N9030A-544 | US51350140 | 2014. 07. 29 |
| 2. | Test Receiver | R & S | ESCS30 | 100338 | 2014. 06. 30 |
| 3. | Amplifier | HP | 8447D | 2944A06305 | 2015. 02. 17 |
| 4. | Bilog Antenna | CHASE | CBL6112D | 33821 | 2014. 08. 07 |

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)

5.3.1. Fundamental Frequency Emission Limit (§15.231)

| FREQUENCY MHz | DISTANCE Meters | FIELD STRENGTHS LIMITS | |
|-----------------------|--------------------|------------------------|--------------------------|
| | | $\mu\text{V/m}$ | $\text{dB}\mu\text{V/m}$ |
| Fundamental Frequency | 3 | 5583.34 | 74.93 (Quasi-Peak) |
| Harmonic | 3 | 558.468 | 54.93 (Quasi-Peak) |

- 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) Where limit of Fundamental Freq. is calculated by:
 $41.6667 \times 303.875 - 7083.3333 = 5578.1351 \mu\text{V/m} = 74.93 \text{dB}\mu\text{V/m}$
 - (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 {Ceiling Fan Remote Controller (Transmitter)}** and simulator as shown on 5.2.
- 5.4.2. Turn on the power.
- 5.4.3. 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)
- 5.4.4. The **EUT {Ceiling Fan Remote Controller (Transmitter)}** was operated on maximum transmitting status during all testing (lying condition).

5.5. Test Procedure

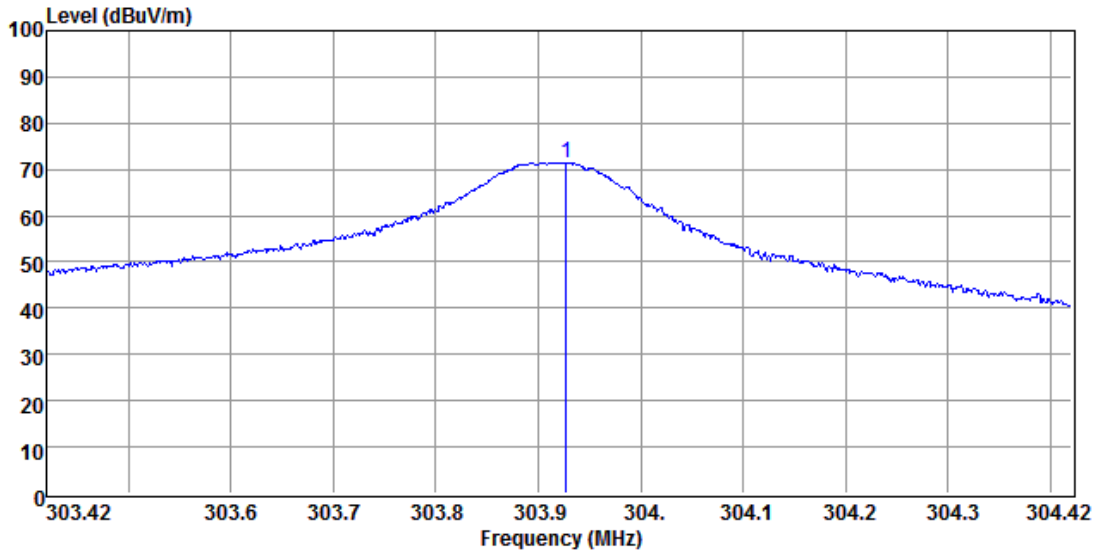
The EUT and was placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set to 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna could be moved up and down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



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 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:temc@temc.com.

Data: 1 File: D:\RF案件\2014 03\C1M1403275_長益_TR191A (FCC)\C1M1403275_長益_TR191A (FCC) 3m\303.



```

Site no.       : Audix NO.1 Chamber
Dis. / Ant.   : 3m CBL6112D 33821
Limit         :
Env. / Ins.   : 23*C / 42% N9010A
EUT           : TR191A
Power Rating  : DC 3V
Test Mode     : TX
Data no.      : 1
Ant. pol.     : HORIZONTAL
Engineer      : Jerome_Chang
    
```

| | 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 | 303.93 | 14.01 | 3.90 | 53.59 | 71.50 | | | |

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.

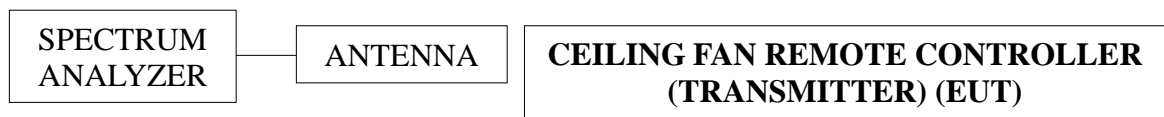
6. EMISSION BANDWIDTH MEASUREMENT

6.1. Test Equipment

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

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Due Date |
|------|-------------------|--------------|------------|------------|---------------|
| 1. | Spectrum Analyzer | Agilent | N9030A-544 | US51350140 | 2014. 07. 29 |
| 2. | Wide Band Antenna | Diamond | RH799 | N/A | 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.

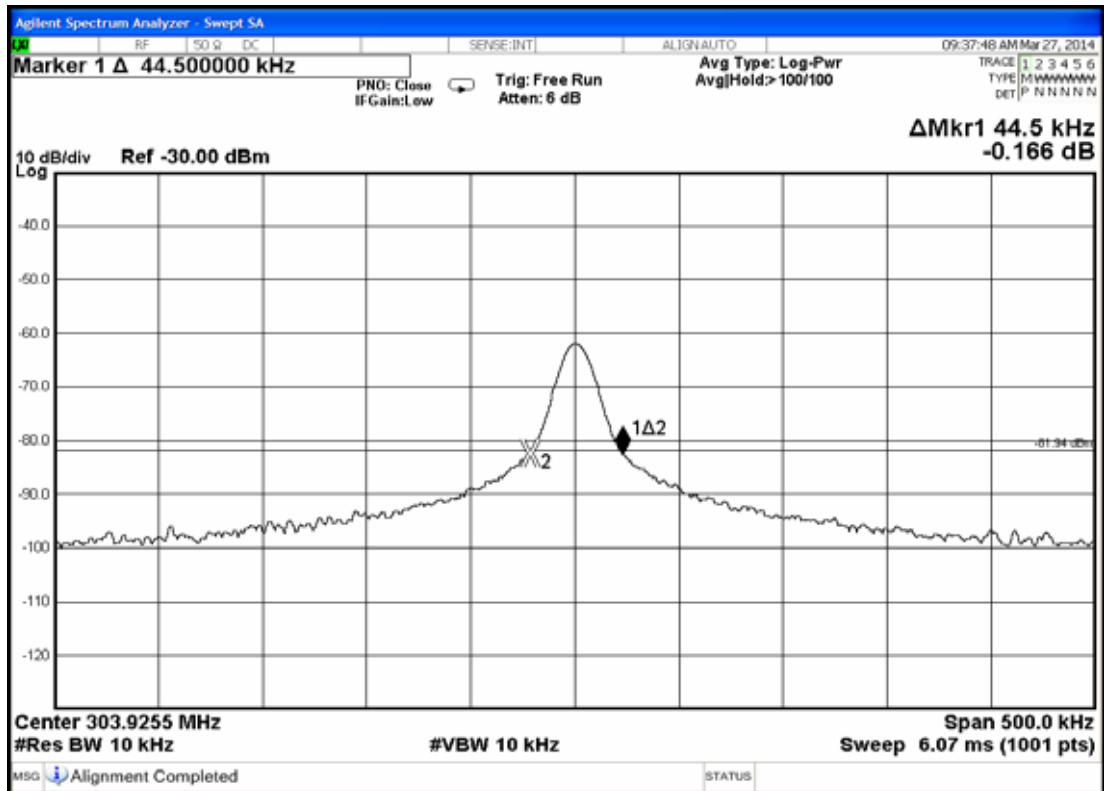
Fundamental Frequency: 303.875MHz

Test Date: 2014. 03. 27 Temperature: 22 Humidity: 45%

| No. | Center Frequency | Bandwidth | Tolerance |
|-----|------------------|-----------|-----------|
| 1. | 303.875MHz | 44.5kHz | 0.01025% |

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

Graph of Bandwidth Measurement



Note: “ \diamond ” The line is 20dB from the modulated carrier.

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. Due Date |
|------|-------------------|--------------|------------|------------|---------------|
| 1. | Spectrum Analyzer | Agilent | N9030A-544 | US51350140 | 2014. 07. 29 |
| 2. | Wide Band Antenna | Diamond | RH799 | N/A | 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

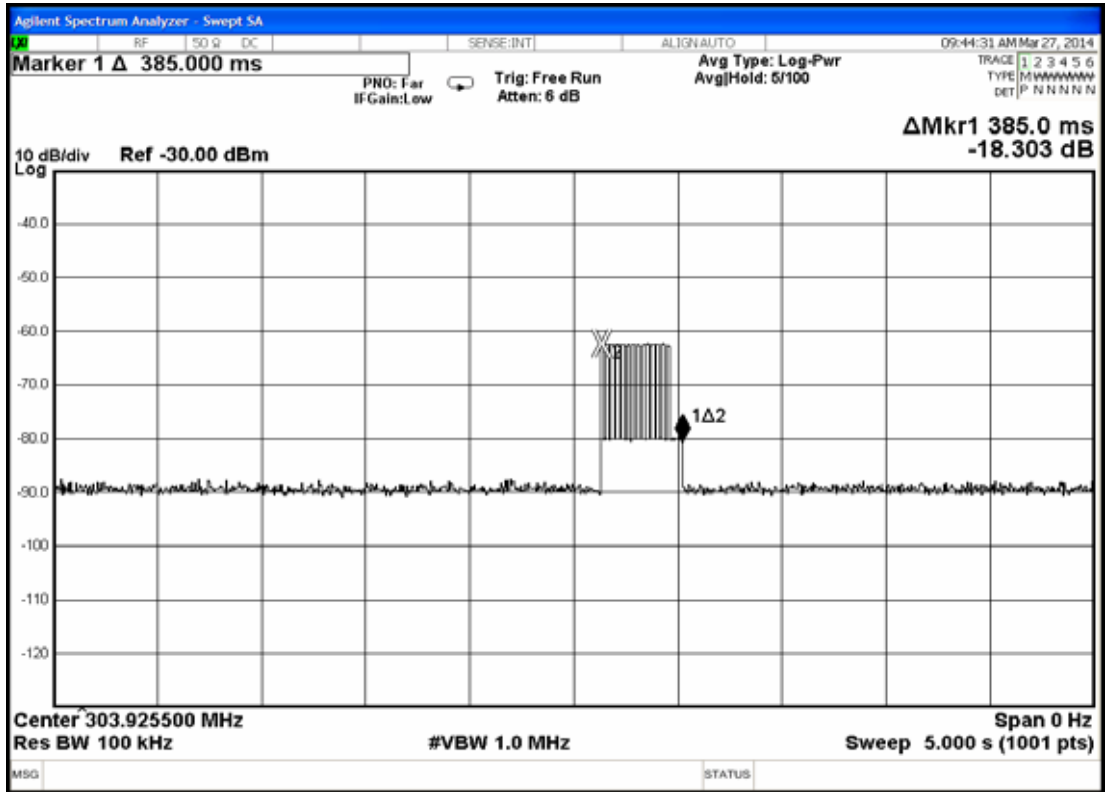
PASS. T = 0.385s. (< 5sec.)

Fundamental Frequency: 303.875MHz

Test Date: 2014. 03. 27 Temperature: 22 Humidity: 45%

The graph of testing is attached in next page.

Graph of Periodic Operated Measurement



8. DEVIATION TO TEST SPECIFICATIONS

【NONE】

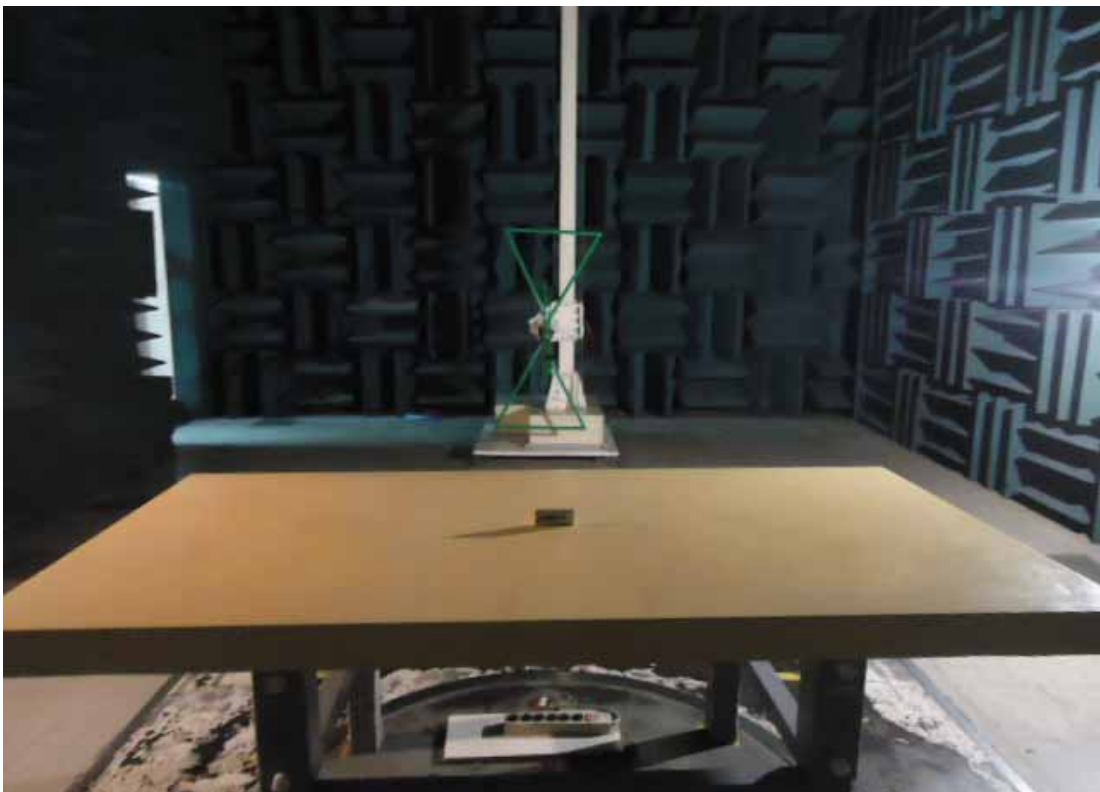
9. PHOTOGRAPHS

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

EUT on Stand



EUT on Side



EUT on Lying



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

EUT on Stand



EUT on Side



EUT on Lying



9.3. Photo of Section RF Near Field Measurement

