

APPLICATION FOR CERTIFICATION
On Behalf of
Chungear Industrial Co., Ltd.
Fan-Light Remote Controller (Transmitter)
Model : JY610
FCC ID : KUJCE9201

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

Prepared By : Audix Corporation
Technical Division EMC Department
No. 53-11, Tin-Fu Tsun, Lin-Kou,
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Date of Report : May 27, 2003

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TEST REPORT CERTIFICATION

Applicant : Chungear Industrial Co., Ltd.
 Manufacturer #1 : Chungear Industrial Co., Ltd.
 Manufacturer #2 : Satellite Electronic (Zhongshan) Ltd.
 EUT Description : Fan-Light Remote Controller (Transmitter)
 FCC ID : KUJCE9201
 (A) MODEL NO. : JY610
 (B) SERIAL NO. : N/A
 (C) POWER SUPPLY : DC 9V

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, MAY 2002
AND ANSI C63.4/1992

The device described above was tested by Audix 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 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 Corporation.

Date of Test : May 19 ~ 20, 2003

Prepared by : Monica Chang May 28, 2003
(Monica Chang/Officer)

Test Engineer : Allen Wang May 28, 2003
(Allen Wang/Deputy Manager)

Approve & Authorized Signer : Leon Liu May 29, 2003
(Leon Liu/Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Fan-Light Remote Controller (Transmitter)
Model Number	:	JY610
FCC ID	:	KUJCE9201
Applicant	:	Chungear Industrial Co., Ltd. 160 Kanho Rd., Taichung, Taiwan, R.O.C.
Manufacturer #1	:	Chungear Industrial Co., Ltd. 160 Kanho Rd., Taichung, Taiwan, R.O.C.
Manufacturer #2	:	Satellite Electronic (Zhongshan) Ltd. No. 15, Zhongshan Torch Hi-Tech Industrial Development Zone, Zhongshan City, Cuangdong Province 528437 China
Fundamental Frequency	:	304MHz
Power Supply	:	DC 9V
Date of Receipt of Sample	:	May 15, 2003
Date of Test	:	May 19 ~ 20, 2003

Fan/Light Remote Control -Receiver
 Model No.: JY326B
 FCC ID : By DoC

Remark:

Antenna requirement: This EUT's transmitter antenna is soldered to 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

Site Description (Semi-Anechoic Chamber) : May 16, 2003 Re-File on Federal Communication Commission Registration Number: 90993

Test Site : Semi-Anechoic Chamber

Name of Firm : Audix Corporation
 Technical Division EMC Department
 No. 53-11, Tin-Fu Tsun, Lin-Kou,
 Taipei Hsien, Taiwan, R.O.C.

Site Location #1 : No. 53-11, Tin-Fu Tsun, Lin-Kou,
 Taipei Hsien, Taiwan, R.O.C.

Site Location #2 : No. 67-4, Tin-Fu Tsun, Lin-Kou,
 Taipei Hsien, Taiwan, R.O.C.

NVLAP Lab. Code : 200077-0
 (NVLAP is a NATA accredited body under Mutual Recognition Agreement)

1.3. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conduction Test	150KHz~30MHz	±2.66dB
Radiation Test (Distance: 3m)	30MHz~300MHz	+4.26dB / -4.22dB
	300MHz~1000MHz	+5.28dB / -4.0dB

Remark : Uncertainty = $K\mu c(y)$

2. POWERLINE CONDUCTED TEST

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

3. RADIATED EMISSION TEST

3.1. Test Equipment

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

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

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep. 23, 02'	1 Year
2.	Test Receiver	R&S	ESVP	879691/036	Jul. 09, 02'	1 Year
3.	Pre-Amplifier	HP	8447D	2944A06305	Mar. 13, 03'	1 Year
4.	Computer	--	PC-486	N/A	N/A	NA
5.	Printer	NEC	P5200	603095067	N/A	N/A
6.	Broadband Antenna	Schwarzbeck	BBA 9106	A3L	Feb. 23, 03'	1 Year
7.	Broadband Antenna	Schwarzbeck	UHALP9108-A	0138	Feb. 23, 03'	1 Year

3.1.2. For above 1GHz Frequency (at Semi-Anechoic Chamber)

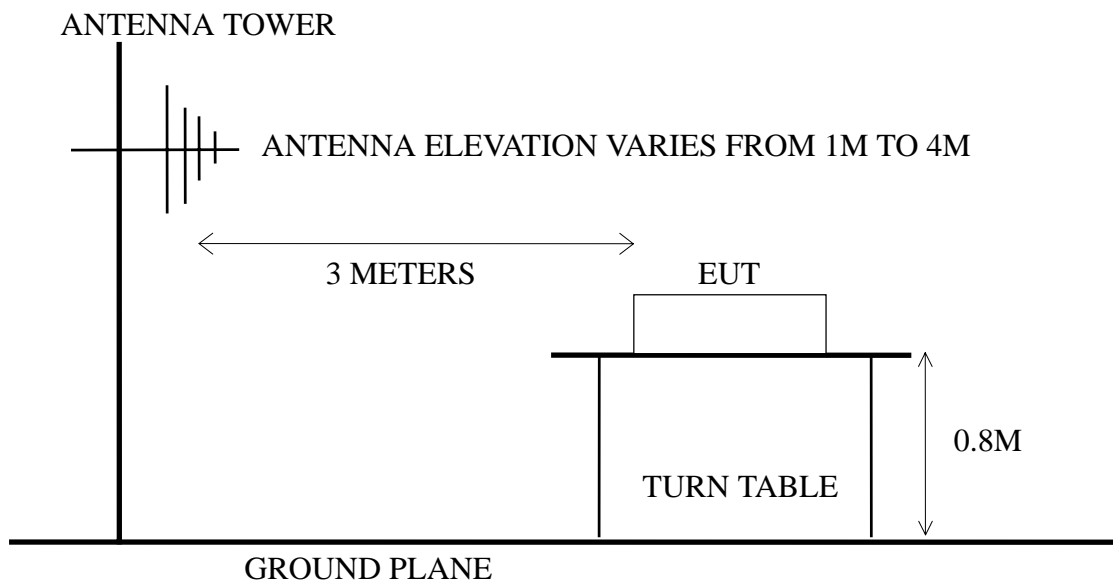
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep. 23, 02'	1 Year
2.	Pre-Amplifier	HP	8449B	3008A00529	Jan. 07, 03'	1 Year
3.	Horn Antenna	EMCO	3115	9112-3775	Apr. 21, 03'	1 Year

3.2. Test Setup

3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Open Field Test Site (3M) Setup Diagram



3.3. Radiation Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
Fundamental Freq.	3	5620.8	74.93 (Quasi-Peak)
Spurious Emission	3	562.08	54.93 (Quasi-Peak)
Above 1GHz	3	---	54.93 (Average)

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

(2) Where limit of Fundamental Freq. is calculated by :

$$41.6667 \times 304.9 - 7083.3333 = 5620.8 \mu\text{V/m}$$

$$= 74.93 \text{dB}\mu\text{V/m}$$

limit of spurious emission is :

$$74.93(\text{dB}\mu\text{V/m}) - 20 = 54.93 \text{dB}\mu\text{V/m}$$

- (3) The tighter limit applies at the band edges.
- (4) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- (5) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a) and Part 15.231(b).
- (6) The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

3.4. EUT's Configuration during Compliance Measurement

The following equipment was installed on radiated measurement to meet the commission requirement and operating in a manner which tended to maximize its emission characteristics in a normal application.

3.4.1. Fan-Light Remote Controller (Transmitter) (EUT)

Model Number	:	JY610
Serial Number	:	N/A
Manufacturer	:	Chungear Industrial Co., Ltd.
Fundamental Frequency	:	304MHz

3.5. Operating Condition of EUT

- 3.5.1. Setup the EUT and simulator as shown on 3.2.
- 3.5.2. Turned on the power of all equipment.
- 3.5.3. The EUT (Fan-Light Remote Controller (Transmitter)) emitted the fundamental frequency with data code.
- 3.5.4. The EUT was at working and on maximum transmitting status (high & Light on) during all testing.
- 3.5.5. Repeated the above procedures from 3.5.3 to 3.5.4.

3.6. Test Procedure

The EUT and its simulators were 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. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters above reference plane to find out the maximum emission level. Broadband antenna such as calibrated biconical and log- periodical antenna or horn antenna was used as a receiving antenna. Both horizontal and vertical polarizations 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 C63.4-1992 regulation. The frequency range were measured from 30MHz up to tenth harmonic of the highest fundamental frequency according to FCC Part 15.33(a)(1).

The bandwidth of test receiver using Q.P detector was set at 120kHz below 1GHz and resolution bandwidth of spectrum analyzer using Average detector was set at 1MHz above 1GHz.

EUT with three kinds of position (on Stand, Side, Lie) were done during radiated measurement and all the test results are listed in section 3.7.

3.7. Radiated Emission Noise Measurement Results

PASSED. The frequency range from 30 MHz up to tenth harmonic is investigated. All the emissions not reported below are too low against the FCC Part 15 official limits.

Date of Test : May 19, 2003 Temperature : 24

EUT : Fan-Light Remote Controller (Transmitter) Humidity : 71%

Test Position : EUT on Stand

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
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Fundamental Freq. (Quasi-Peak Value)

304.900	14.68	3.90	37.67	56.25	74.93	18.68
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Spurious / Harmonic Freq. (Below 1000MHz, Quasi-Peak Value)

157.980	21.02	2.70	-2.93	20.79	54.93	34.14
*3 255.450	24.80	3.56	-5.10	23.26	46.00	22.74
293.520	26.50	3.90	-3.32	27.08	54.93	27.85
608.400	19.41	6.20	2.93	28.54	54.93	26.39
912.500	23.10	7.40	-1.59	28.91	54.93	26.02

Spurious / Harmonic Freq. (Above 1GHz, Average Value)

*3 1216.462	25.30	4.61	-0.28	29.63	53.97	24.34
*3 1520.180	25.50	5.54	-2.00	29.04	53.97	24.93
1824.898	27.03	6.77	-5.68	28.12	54.93	26.81
2128.616	28.07	6.02	-6.01	28.08	54.93	26.85
2432.334	28.68	6.39	-7.19	27.88	54.93	27.05
*3 2736.420	29.78	6.84	-9.31	27.31	53.97	26.66
3040.088	30.88	7.26	-11.22	26.92	54.93	28.01

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 10th harmonic , but the emissions level were too low against the official limit and not report.
 3. The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

Date of Test : May 19, 2003 Temperature : 24

EUT : Fan-Light Remote Controller (Transmitter) Humidity : 71%

Test Position : EUT on Stand

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Quasi-Peak Value)						
304.900	14.60	3.90	26.49	44.99	74.93	29.94
Spurious / Harmonic Freq. (Below 1000MHz, Quasi-Peak Value)						
139.890	19.30	2.50	-0.26	21.54	54.93	33.39
199.290	22.64	3.00	-2.51	23.13	54.93	31.80
*3 255.990	25.59	3.56	-4.63	24.52	46.00	21.48
608.400	20.20	6.20	3.93	30.33	54.93	24.60
912.500	23.20	7.40	-1.91	28.69	54.93	26.24
Spurious / Harmonic Freq. (Above 1GHz, Average Value)						
*3 1216.462	25.30	4.61	0.26	30.17	53.97	23.80
*3 1520.180	25.50	5.54	-1.37	29.67	53.97	24.30
1824.898	27.03	6.77	-4.16	29.64	54.93	25.29
2128.616	28.07	6.02	-5.56	28.53	54.93	26.40
2432.334	28.68	6.39	-6.96	28.11	54.93	26.82
*3 2736.420	29.78	6.84	-9.90	26.72	53.97	27.25
3040.088	30.88	7.26	-11.84	26.30	54.93	28.63

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 10th harmonic , but the emissions level were too low against the official limit and not report.
 3. The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

Date of Test : May 19, 2003 Temperature : 24

EUT : Fan-Light Remote Controller (Transmitter) Humidity : 71%

Test Position : EUT on Side

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Quasi-Peak Value)						
304.900	14.68	3.90	43.73	62.31	74.93	12.62
Spurious / Harmonic Freq. (Below 1000MHz, Quasi-Peak Value)						
157.980	21.02	2.70	-2.70	21.02	54.93	33.91
*3 255.450	24.80	3.56	-4.68	23.68	46.00	31.25
293.520	26.50	3.90	-3.43	26.97	54.93	27.96
608.400	19.41	6.20	5.64	31.25	54.93	23.68
912.500	23.10	7.40	-0.38	30.12	54.93	24.81
Spurious / Harmonic Freq. (Above 1GHz, Average Value)						
*3 1216.462	25.30	4.61	1.34	31.25	53.97	22.72
*3 1520.180	25.50	5.54	-0.63	30.41	53.97	23.56
1824.898	27.03	6.77	-4.79	29.01	54.93	25.92
2128.616	28.07	6.02	-5.57	28.52	54.93	26.41
2432.334	28.68	6.39	-7.44	27.63	54.93	27.30
*3 2736.420	29.78	6.84	-9.56	27.06	53.97	26.91
3040.088	30.88	7.26	-10.88	27.26	54.93	27.67

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 10th harmonic, but the emissions level were too low against the official limit and not report.
 3. The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

Date of Test : May 19, 2003 Temperature : 24

EUT : Fan-Light Remote Controller (Transmitter) Humidity : 71%

Test Position : EUT on Side

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Quasi-Peak Value)						
304.900	14.60	3.90	30.82	49.32	74.93	25.61
Spurious / Harmonic Freq. (Below 1000MHz, Quasi-Peak Value)						
139.890	19.30	2.50	-0.25	21.55	54.93	33.38
199.290	22.64	3.00	-2.38	23.26	54.93	31.67
*3 255.990	25.59	3.56	-5.54	23.61	46.00	22.39
608.400	20.20	6.20	5.65	32.05	54.93	22.88
912.500	23.20	7.40	-1.48	29.12	54.93	25.81
Spurious / Harmonic Freq. (Above 1GHz, Average Value)						
*3 1216.462	25.30	4.61	1.41	31.32	53.97	22.65
*3 1520.180	25.50	5.54	-0.77	30.27	53.97	23.70
1824.898	27.03	6.77	-3.65	30.15	54.93	24.78
2128.616	28.07	6.02	-5.02	29.07	54.93	25.86
2432.334	28.68	6.39	-6.72	28.35	54.93	26.58
*3 2736.420	29.78	6.84	-9.17	27.45	53.97	18.55
3040.088	30.88	7.26	-11.10	27.04	54.93	27.89

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 10th harmonic , but the emissions level were too low against the official limit and not report.
 3. The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

Date of Test : May 19, 2003 Temperature : 24

EUT : Fan-Light Remote Controller (Transmitter) Humidity : 71%

Test Position : EUT on Lie

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Quasi-Peak Value)						
304.900	14.68	3.90	40.74	59.32	74.93	15.61
Spurious / Harmonic Freq. (Below 1000MHz, Quasi-Peak Value)						
157.980	21.02	2.70	-2.90	20.82	54.93	34.11
*3 255.450	24.80	3.56	-4.92	23.44	46.00	22.56
293.520	26.50	3.90	-3.51	26.89	54.93	28.04
608.400	19.41	6.20	4.50	30.11	54.93	24.82
912.500	23.10	7.40	-0.94	29.56	54.93	25.37
Spurious / Harmonic Freq. (Above 1GHz, Average Value)						
*3 1216.462	25.30	4.61	0.20	30.11	53.97	23.86
*3 1520.180	25.50	5.54	-1.41	29.63	53.97	24.34
1824.898	27.03	6.77	-5.35	28.45	54.93	26.48
2128.616	28.07	6.02	-5.78	28.31	54.93	26.62
2432.334	28.68	6.39	-7.48	27.59	54.93	27.34
*3 2736.420	29.78	6.84	-8.26	28.36	53.97	25.61
3040.088	30.88	7.26	-11.13	27.01	54.93	27.92

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 10th harmonic , but the emissions level were too low against the official limit and not report.
 3. The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

Date of Test : May 19, 2003 Temperature : 24

EUT : Fan-Light Remote Controller (Transmitter) Humidity : 71%

Test Position : EUT on Lie

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Quasi-Peak Value)						
304.900	14.60	3.90	27.71	46.21	74.93	28.72
Spurious / Harmonic Freq. (Below 1000MHz, Quasi-Peak Value)						
139.890	19.30	2.50	-0.32	21.48	54.93	33.45
199.290	22.64	3.00	-2.40	23.24	54.93	31.69
*3 255.990	25.59	3.56	-5.64	23.51	46.00	22.49
608.400	20.20	6.20	4.85	31.25	54.93	23.68
912.500	23.20	7.40	-1.62	28.98	54.93	25.95
Spurious / Harmonic Freq. (Above 1GHz, Average Value)						
*3 1216.462	25.30	4.61	0.78	30.69	53.97	23.28
*3 1520.180	25.50	5.54	-1.17	29.87	53.97	24.10
1824.898	27.03	6.77	-4.03	29.77	54.93	25.16
2128.616	28.07	6.02	-5.40	28.69	54.93	26.24
2432.334	28.68	6.39	-6.64	28.43	54.93	26.50
*3 2736.420	29.78	6.84	-9.57	27.05	53.97	26.92
3040.088	30.88	7.26	-11.75	26.39	54.93	28.54

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 10th harmonic ,but the emissions level were too low against the official limit and not report.
 3. The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

2.

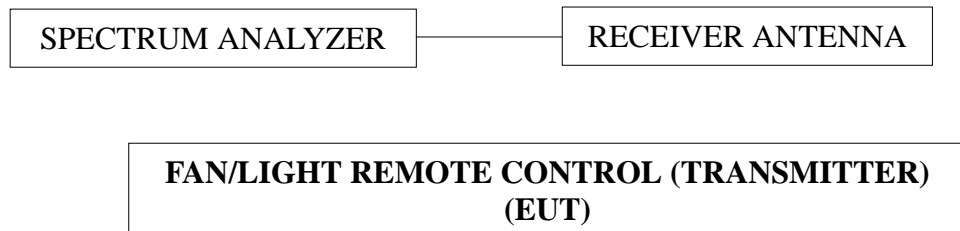
4. EMISSION BANDWIDTH TEST

4.1. Test Equipment

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

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8564EC	3946A00249	Aug. 09, 02'	1 Year
2.	Wide Band Antenna	DIAMOND	RH799	N/A	N/A	N/A

4.2. Block Diagram of Test Setup



4.3. 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.

4.4. EUT's Configuration during Compliance Measurement

The configuration of EUT were same as section 3.4.

4.5. Emission Bandwidth Measurement Results

PASSED.

Fundamental Frequency: 304MHz

(Test Date: Mar. 20, 2003, Temperature: 26 , Humidity: 65%)

No.	Center Frequency	Bandwidth	Tolerance (%)
1.	304MHz	43.3kHz	0.0142%

The graph of bandwidth measured is attached in next page.

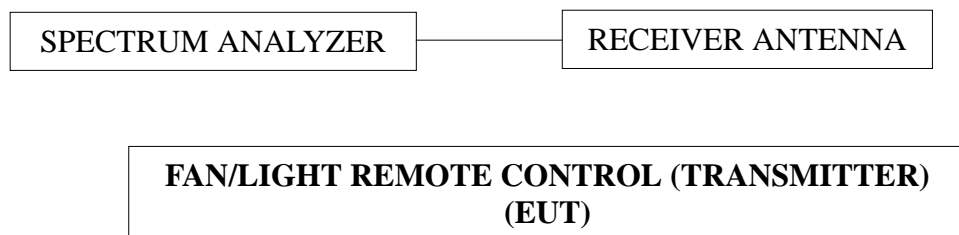
5. PERIODIC OPERATED TEST

5.1. Test Equipment

The following test equipment was used during the Periodic Operated Test :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8564EC	3946A00249	Aug. 09, 02'	1 Year
2.	Wide Band Antenna	DIAMOND	RH799	N/A	N/A	N/A

5.2. Block Diagram of Test Setup



5.3. 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).

5.4. EUT's Configuration during Compliance Measurement

The configuration of EUT was same as section 3.4.

5.5. Periodic Operated Measurement Results

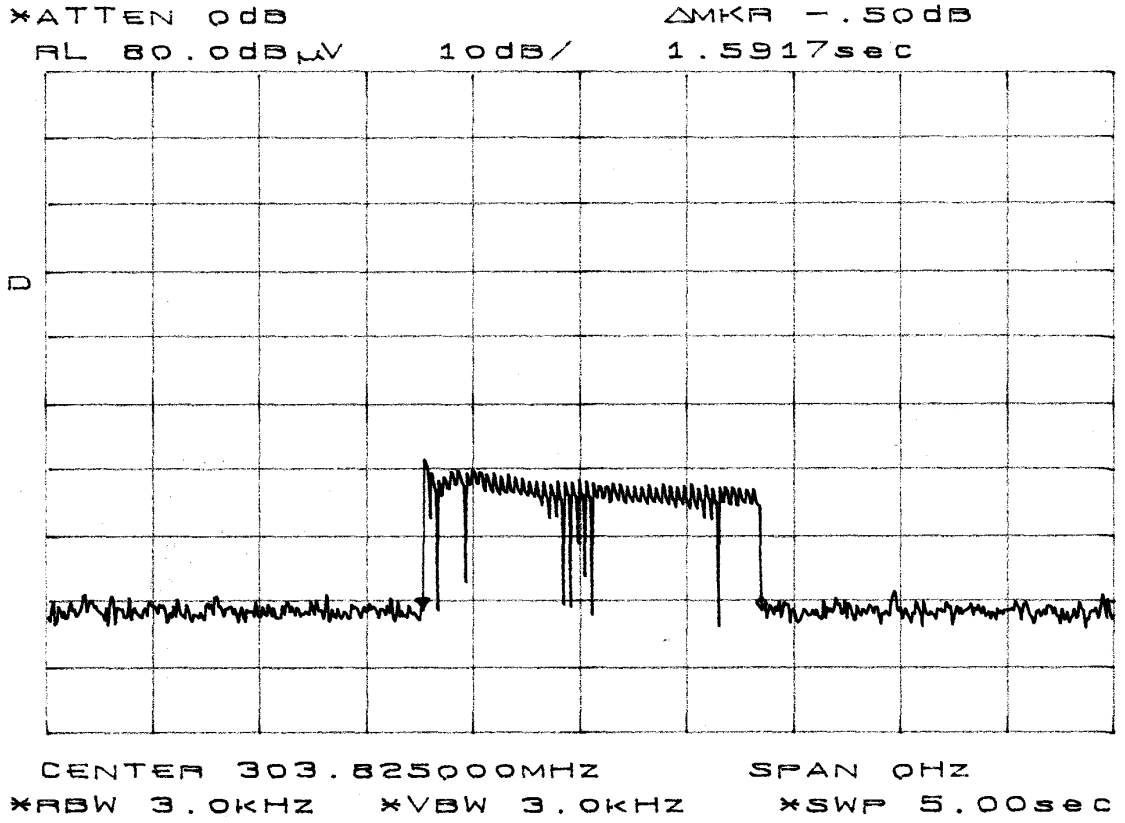
5.6. Periodic Operated Measurement Results

PASSED. T = 1.5917sec. (< 5sec.)

(Test Date: Mar. 20, 2003, Temperature: 26 , Humidity: 65%)

The graph of testing is attached in next page.

Graph of Periodic Operated Measurement



6. DEVIATION TO TEST SPECIFICATIONS

【NONE】