

APPLICATION CERTIFICATION

On Behalf of
Le Yuan Kuo Enterprise Co., Ltd.

Remote Control
Model No.: LY-CY-RC

FCC ID: US5LYCY315MHZ
IC ID: 6847ALYCY315

Prepared for : Le Yuan Kuo Enterprise Co., Ltd.
Address : 10 Fang Tong Road, Wen-Jin Village Fang Yuan,
Chang-Hwa, Taiwan

Prepared by : ACCURATE TECHNOLOGY CO. LTD
Address : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.
Science & Industry Park, Nanshan, Shenzhen, Guangdong
P.R. China

Tel: (0755) 26503290
Fax: (0755) 26503396

Report Number : ATE20062448
Date of Test : November 28, 2006
Date of Report : November 29, 2006

TABLE OF CONTENTS

Description	Page
Test Report Certification	
1. GENERAL INFORMATION	4
1.1. Description of Device (EUT).....	4
1.2. Description of Test Facility	4
1.3. Measurement Uncertainty	4
2. MEASURING DEVICE AND TEST EQUIPMENT	5
3. THE FIELD STRENGTH OF RADIATION EMISSION	6
3.1. Block Diagram of Test Setup.....	6
3.2. The Field Strength of Radiation Emission Measurement Limits.....	6
3.3. Configuration of EUT on Measurement	7
3.4. Operating Condition of EUT	7
3.5. Test Procedure	7
3.6. The Field Strength of Radiation Emission Measurement Results	8
4. 20DB OCCUPIED BANDWIDTH	10
4.1. Block Diagram of Test Setup.....	10
4.2. The Bandwidth of Emission Limit According To FCC Part 15 Section 15.231(c).....	10
4.3. EUT Configuration on Measurement	11
4.4. Operating Condition of EUT	11
4.5. Test Procedure	11
4.6. Measurement Result	12
5. 99% OCCUPIED BANDWIDTH.....	13
5.1. Block Diagram of Test Setup.....	13
5.2. The Bandwidth of Emission Limit According To RSS-210 A1.1.3	13
5.3. EUT Configuration on Measurement	14
5.4. Operating Condition of EUT	14
5.5. Test Procedure	14
5.6. Measurement Result	15
6. RELEASE TIME MEASUREMENT.....	16
6.1. Block Diagram of Test Setup.....	16
6.2. Release Time Measurement According To FCC Part 15 Section 15.231(a)& RSS-210 A1.1.1	16
6.3. EUT Configuration on Measurement	17
6.4. Operating Condition of EUT	17
6.5. Test Procedure	17
6.6. Measurement Result	18
7. AVERAGE FACTOR MEASUREMENT	19
7.1. Block Diagram of Test Setup.....	19
7.2. Average factor Measurement.....	19
7.3. EUT Configuration on Measurement	20
7.4. Operating Condition of EUT	20
7.5. Test Procedure	20
7.6. Measurement Result	21
APPENDIX I (TEST CURVES) (10pages)	

Test Report Certification

Applicant : Le Yuan Kuo Enterprise Co., Ltd.
 Manufacturer : Le Yuan Kuo Enterprise Co., Ltd.
 EUT Description : Remote Control
 (A) MODEL NO.: LY-CY-RC
 (B) SERIAL NO.: N/A
 (C) POWER SUPPLY: 12V DC ("23AE" battery Type×1)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.231: 2006
 RSS-210 Issue 6 September 2005

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.231, RSS-210 Issue 6 September 2005 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : November 28, 2006

Prepared by : 
 (Engineer)

Reviewer : 
 (Quality Manager)

Approved & Authorized Signer : 
 (Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : Remote Control

Model Number : LY-CY-RC

Power Supply : 12V DC ("23AE" battery Type×1)

Applicant : Le Yuan Kuo Enterprise Co., Ltd.
Address : 10 Fang Tong Road, Wen-Jin Village Fang Yuan,
Chang-Hwa, Taiwan

Manufacturer : Le Yuan Kuo Enterprise Co., Ltd.
Address : 10 Fang Tong Road, Wen-Jin Village Fang Yuan,
Chang-Hwa, Taiwan

Date of sample received : November 23, 2006
Date of Test : November 28, 2006

1.2. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen, May 10, 2004
Accredited by FCC, May 10, 2004
The Certificate Registration Number is 253065
Accredited by Industry Canada, May 18, 2004
The Certificate Registration Number is IC 5077

Name of Firm : ACCURATE TECHNOLOGY CO. LTD
Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.
Science & Industry Park, Nanshan, Shenzhen, Guangdong
P.R. China

1.3. Measurement Uncertainty

Conducted emission expanded uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 4.12dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	03.31.2007
EMI Test Receiver	Rohde&Schwarz	ESI26	838786/013	01.02.2007
Bilog Antenna	Schwarzbeck	VULB9163	9163-194	03.31.2007
Bilog Antenna	Chase	CBL6112B	2591	03.31.2007
Horn Antenna	Rohde&Schwarz	HF906	100013	01.02.2007
Spectrum Analyzer	Anritsu	MS2651B	6200238856	03.31.2007
Pre-Amplifier	Agilent	8447D	2944A10619	03.31.2007

3. THE FIELD STRENGTH OF RADIATION EMISSION

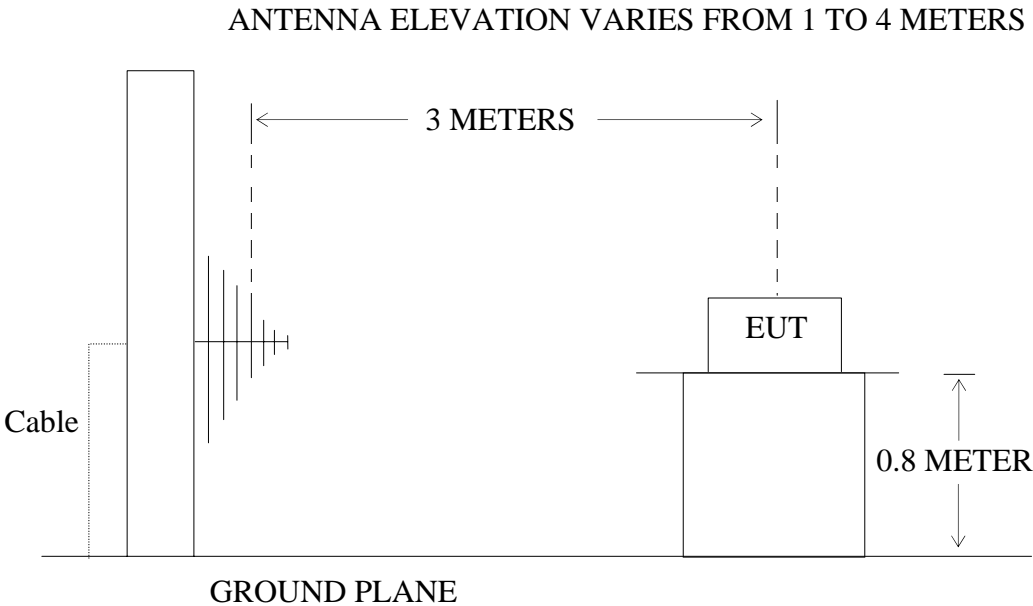
3.1. Block Diagram of Test Setup

3.1.1. Block diagram of connection between the EUT and simulators



(EUT: Remote Control)

3.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Remote Control)

3.2. The Field Strength of Radiation Emission Measurement Limits

3.2.1 Radiation Emission Measurement Limits According to FCC Part 15 Section 15.231(b) & RSS-210 Table 4

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Average] [$\mu\text{V/m}$]	Field Strength of Spurious Emission [Average] [$\mu\text{V/m}$]
40.66-40.70	2250	225
70-130	1250	125
130-174	1250-3750	125-375
174-260	3750	375
260-470	3750-12500	375-1250

Above 470	12500	1250
-----------	-------	------

Where F is the frequency in MHz, The formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174MHz, $\mu\text{V/m}$ at 3 meters= $56.81818(F)-6136.3636$; For the band 260-470MHz, $\mu\text{V/m}$ at 3 meters= $41.6667(F)-7083.3333$. The maximum permissible unwanted emission level is 20dB below the maximum permitted fundamental level.

3.2.2 Restricted Band Radiation Emission Measurement Limits According to FCC part 15 Section 15.205 and Section 15.209; RSS-210 table 1.

3.3. Configuration of EUT on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.3.1. Remote Control (EUT)

Model Number : LY-CY-RC
 Serial Number : N/A
 Manufacturer : Le Yuan Kuo Enterprise Co., Ltd.

3.4. Operating Condition of EUT

3.4.1. Setup the EUT and simulator as shown as Section 3.1.

3.4.2. Turn on the power of all equipment.

3.4.3. Let the EUT work in measuring modes (TX) measure it.

3.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI 63.4 on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120KHz in 30-1000MHz, and 1MHz in 1000-4000MHz.

The frequency range from 30MHz to 4000MHz is checked.

3.6.The Field Strength of Radiation Emission Measurement Results

PASS.

The frequency range 30MHz to 4000MHz is investigated.

Date of Test:	<u>November 28, 2006</u>	Temperature:	<u>22°C</u>
EUT:	<u>Remote Control</u>	Humidity:	<u>53%</u>
Model No.:	<u>LY-CY-RC</u>	Power Supply:	<u>12V DC (“23AE” battery Type×1)</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>Andy</u>

Frequency (MHz)	Reading (dBμV/m)	Factor Corr.	Average Factor	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	PEAK	(dB)	(dB)	AV	PEAK	AV	PEAK	AV	PEAK	
315.030	86.0	-18.8	-8.1	59.1	67.2	75.6	95.6	16.5	28.4	Horizontal
630.061	68.4	-13.9	-8.1	46.4	54.5	55.6	75.6	9.2	21.1	
945.100	61.8	-11.6	-8.1	42.1	50.2	55.6	75.6	13.5	25.4	
1260.121	54.7	-7.3	-8.1	39.3	47.4	55.6	75.6	16.3	28.2	
*1575.152	57.4	-6.3	-8.1	43.0	51.1	54	74	11.0	22.9	
1890.180	55.1	-5.3	-8.1	41.7	49.8	55.6	75.6	13.9	25.8	
*2205.212	52.6	-4.3	-8.1	40.2	48.3	54	74	13.8	25.7	
2520.243	50.8	-3.2	-8.1	39.5	47.6	55.6	75.6	16.1	28.0	
*2835.274	48.7	-2.3	-8.1	38.3	46.4	54	74	15.7	27.6	
3150.303	44.2	-1.4	-8.1	34.7	42.8	55.6	75.6	20.9	32.8	
3465.333	44.6	-0.6	-8.1	35.9	44.0	55.6	75.6	19.7	31.6	
*3780.362	37.8	0.4	-8.1	30.1	38.2	54	74	23.9	35.8	
315.030	90.8	-18.8	-8.1	63.9	72.0	75.6	95.6	11.7	23.6	Vertical
630.061	71.3	-13.9	-8.1	49.3	57.4	55.6	75.6	6.3	18.2	
945.100	63.7	-11.6	-8.1	44.0	52.1	55.6	75.6	11.6	23.5	
1260.121	57.3	-7.3	-8.1	41.9	50.0	55.6	75.6	13.7	25.6	
*1575.152	58.7	-6.3	-8.1	44.3	52.4	54	74	9.7	21.6	
1890.180	57.3	-5.3	-8.1	43.9	52.0	55.6	75.6	11.7	23.6	
*2205.212	54.5	-4.3	-8.1	42.1	50.2	54	74	11.9	23.8	
2520.243	50.7	-3.2	-8.1	39.4	47.5	55.6	75.6	16.2	28.1	
*2835.274	48.4	-2.3	-8.1	38.0	46.1	54	74	16.0	27.9	
3150.303	44.5	-1.4	-8.1	35.0	43.1	55.6	75.6	20.6	32.5	
3465.333	42.9	-0.6	-8.1	34.2	42.3	55.6	75.6	21.4	33.3	
*3780.362	39.6	0.4	-8.1	31.9	40.0	54	74	22.1	34.0	

Note:

1. *: Denotes restricted band of operation.

Measurements were made using a peak detector and average detector. Any emission Above 1000MHz and falling within the restricted bands of FCC Part 15 Section 15.205 were compliance with the emission limit of FCC Part 15 Section 15.209.

2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

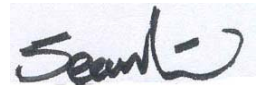
Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

3. FCC Limit for Average Measurement = $41.6667(315) - 7083.3333 = 6041.6772\mu\text{V/m}$
 $= 75.6\text{dB}\mu\text{V/m}$

4. The spectral diagrams in appendix I display the measurement of peak values.

Reviewer :



4. 20DB OCCUPIED BANDWIDTH

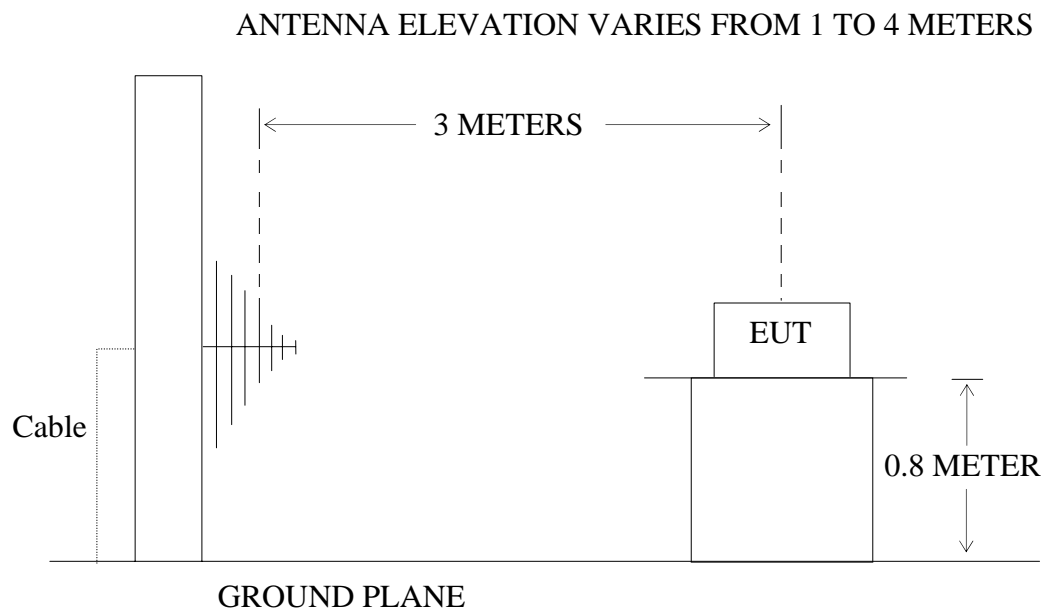
4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



(EUT: Remote Control)

4.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Remote Control)

4.2. The Bandwidth of Emission Limit According To FCC Part 15 Section

15.231(c)

The bandwidth of emission shall be no wider than 0.25% of the center frequency. Therefore, the bandwidth of the emission limit is $315\text{MHz} \times 0.25\% = 787.5\text{KHz}$. Bandwidth is determined at the two points 20 dB down from the top of modulated carrier.

4.3.EUT Configuration on Measurement

The following equipment are installed on the bandwidth of emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.3.1.Remote Control (EUT)

Model Number : LY-CY-RC
Serial Number : N/A
Manufacturer : Le Yuan Kuo Enterprise Co., Ltd.

4.4.Operating Condition of EUT

4.4.1.Setup the EUT and simulator as shown as Section 4.1.

4.4.2.Turn on the power of all equipment.

4.4.3.Let the EUT work in measuring mode (TX) measure it.

4.5.Test Procedure

4.5.1. Set SPA Center Frequency = Fundamental frequency, RBW = 10kHz, VBW = 10kHz, Span = 500kHz.

4.5.2. Set SPA Max hold. Mark peak, -20dB

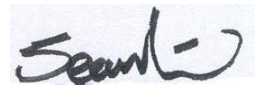
4.6. Measurement Result

The EUT does meet the FCC requirement.

-20dB bandwidth = 49KHz < 787.5KHz.

The spectral diagrams in appendix I.

Reviewer :

A handwritten signature in black ink, appearing to read "Sean", is written over a light blue rectangular background. The signature is stylized with a large, sweeping 'S' and a checkmark-like flourish at the end.

5. 99% OCCUPIED BANDWIDTH

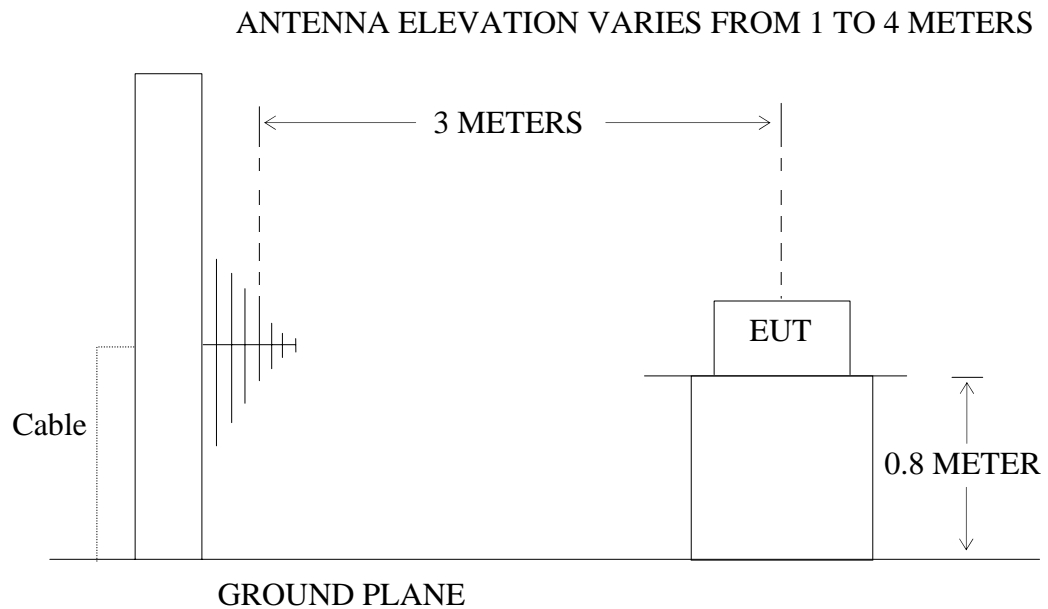
5.1. Block Diagram of Test Setup

5.1.1. Block diagram of connection between the EUT and simulators



(EUT: Remote Control)

5.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Remote Control)

5.2. The Bandwidth of Emission Limit According To RSS-210 A1.1.3

The 99% bandwidth shall be no wider than 0.25% of the center frequency for device operating between 70-900MHz. Therefore, the bandwidth of the emission limit is $315\text{MHz} \times 0.25\% = 787.5\text{KHz}$.

5.3.EUT Configuration on Measurement

The following equipment are installed on the bandwidth of emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.3.1.Remote Control (EUT)

Model Number : LY-CY-RC
Serial Number : N/A
Manufacturer : Le Yuan Kuo Enterprise Co., Ltd.

5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 4.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in measuring mode (TX) measure it.

5.5.Test Procedure

5.5.1. Set SPA Center Frequency = Fundamental frequency, RBW = 10kHz, VBW = 10kHz, Span = 500kHz.

5.5.2.Set SPA Max hold. Mark peak.

5.5.3.Set SPA “Meas” function, Select “Occupied Bandwidth” function, Select “99% Power Bandwidth”. The frequency of the upper and lower markers indicating the edges of the transmitters “99% Power” emission bandwidth shall be recorded to automate by SPA.

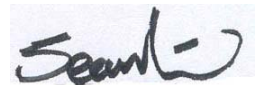
5.6. Measurement Result

The EUT does meet the RSS-210 requirement.

99% Power bandwidth = 192KHz < 787.5KHz.

The spectral diagrams in appendix I.

Reviewer :

A handwritten signature in black ink, appearing to read "Sean", followed by a horizontal line.

6. RELEASE TIME MEASUREMENT

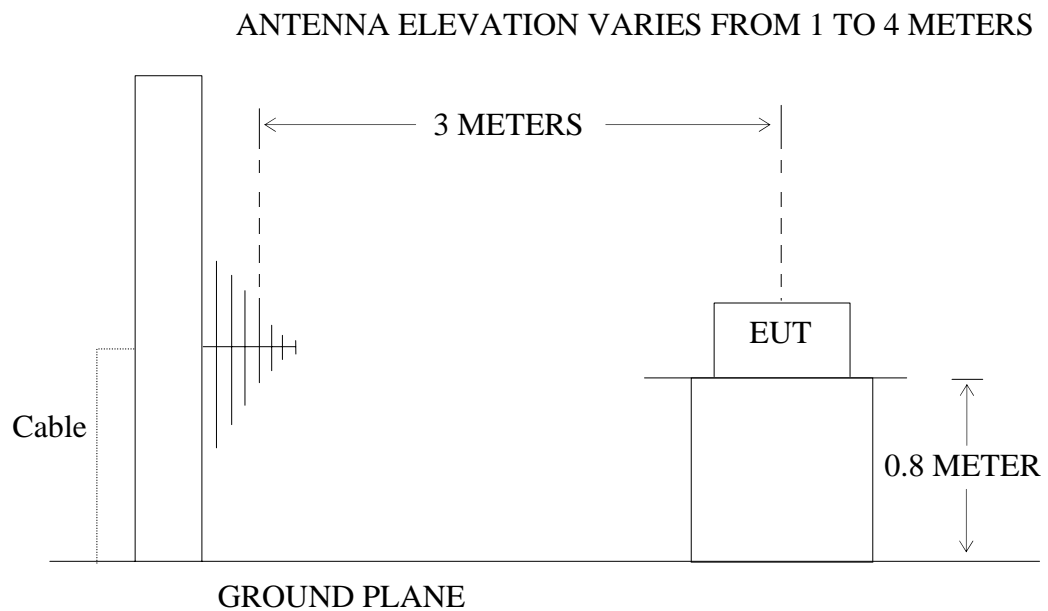
6.1. Block Diagram of Test Setup

6.1.1. Block diagram of connection between the EUT and simulators



(EUT: Remote Control)

6.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Remote Control)

6.2. Release Time Measurement According To FCC Part 15 Section 15.231(a)&

RSS-210 A1.1.1

Section 15.231(a) (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

A1.1.1 (1) A manually operated transmitter shall employ a push-to-operate switch and be under manual control at all transmission times. When released, the transmitter shall cease transmission.(holdover time of up to 5 seconds if permitted) (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

6.3.EUT Configuration on Measurement

The following equipment are installed on Release Time Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.3.1. Remote Control (EUT)

Model Number : LY-CY-RC
Serial Number : N/A
Manufacturer : Le Yuan Kuo Enterprise Co., Ltd.

6.4.Operating Condition of EUT

6.4.1.Setup the EUT and simulator as shown as Section 5.1.

6.4.2.Turn on the power of all equipment.

6.4.3.Let the EUT work in measuring mode (TX) measure it.

6.5.Test Procedure

6.5.1. Set SPA Center Frequency = Fundamental frequency, RBW = 100kHz, VBW = 100kHz, Span = 0Hz. Sweep time = 5seconds.

6.5.2. Set EUT as normal operation and press Transmitter button.

6.5.3. Set SPA View. Delta Mark time.

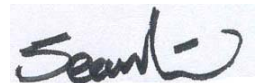
6.6. Measurement Result

The release time less than 5 seconds.

Release Time= 332 ms

The spectral diagrams in appendix I.

Reviewer :

A handwritten signature in black ink, appearing to read "Sean", followed by a stylized flourish or checkmark.

7. AVERAGE FACTOR MEASUREMENT

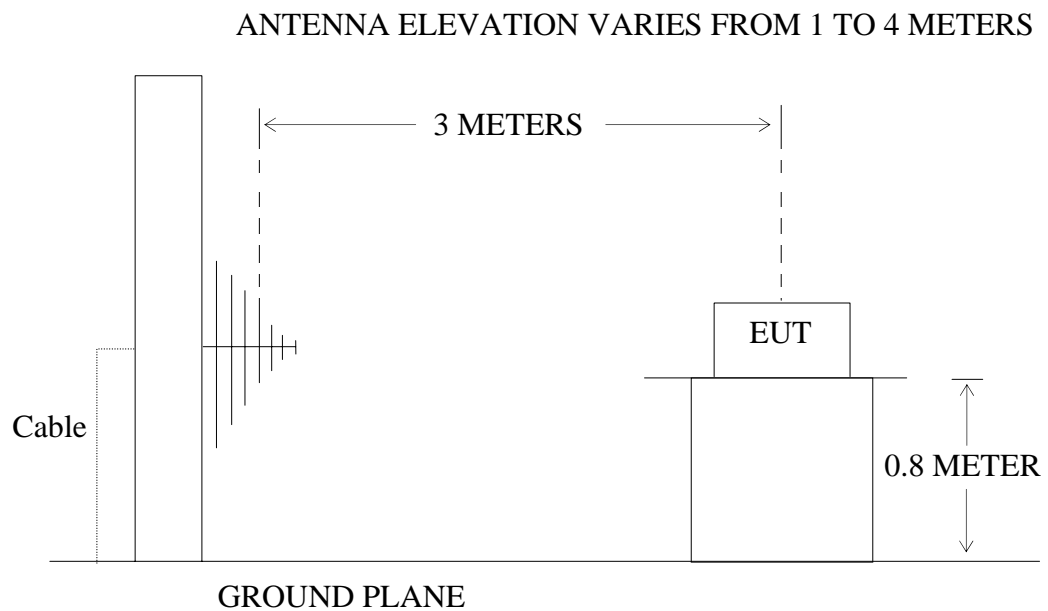
7.1. Block Diagram of Test Setup

7.1.1. Block diagram of connection between the EUT and simulators



(EUT: Remote Control)

7.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Remote Control)

7.2. Average factor Measurement

Average factor in dB = $20 \log (\text{duty cycle})$

7.2.1. The specification for output field strengths in accordance with the FCC rules specify measurements with an average detector. During testing, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

7.3.EUT Configuration on Measurement

The following equipment are installed on average factor Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.3.1. Remote Control (EUT)

Model Number : LY-CY-RC
Serial Number : N/A
Manufacturer : Le Yuan Kuo Enterprise Co., Ltd.

7.4.Operating Condition of EUT

7.4.1.Setup the EUT and simulator as shown as Section 5.1.

7.4.2.Turn on the power of all equipment.

7.4.3.Let the EUT work in measuring mode (TX) measure it.

7.5.Test Procedure

7.5.1. The time period over which the duty cycle is measured is 100 milliseconds, or the repetition cycle, whichever is a shorter time frame. The worst case (highest percentage on) duty cycle is used for the calculation.

7.5.2. Set EUT as normal operation.

7.5.3. Set SPA View. Delta Mark time.

7.6. Measurement Result

The duty cycle is simply the on time divided by the period:

The duration of one cycle = 25.972ms

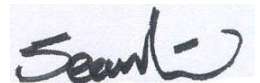
Effective period of the cycle = $(10 \times 0.634) + (15 \times 0.256)$ ms = 10.18ms

DC = $10.18\text{ms} / 25.972\text{ms} = 0.392$

Therefore, the average factor is found by $20\log 0.392 = -8.1\text{dB}$

The spectral diagrams in appendix I.

Reviewer :

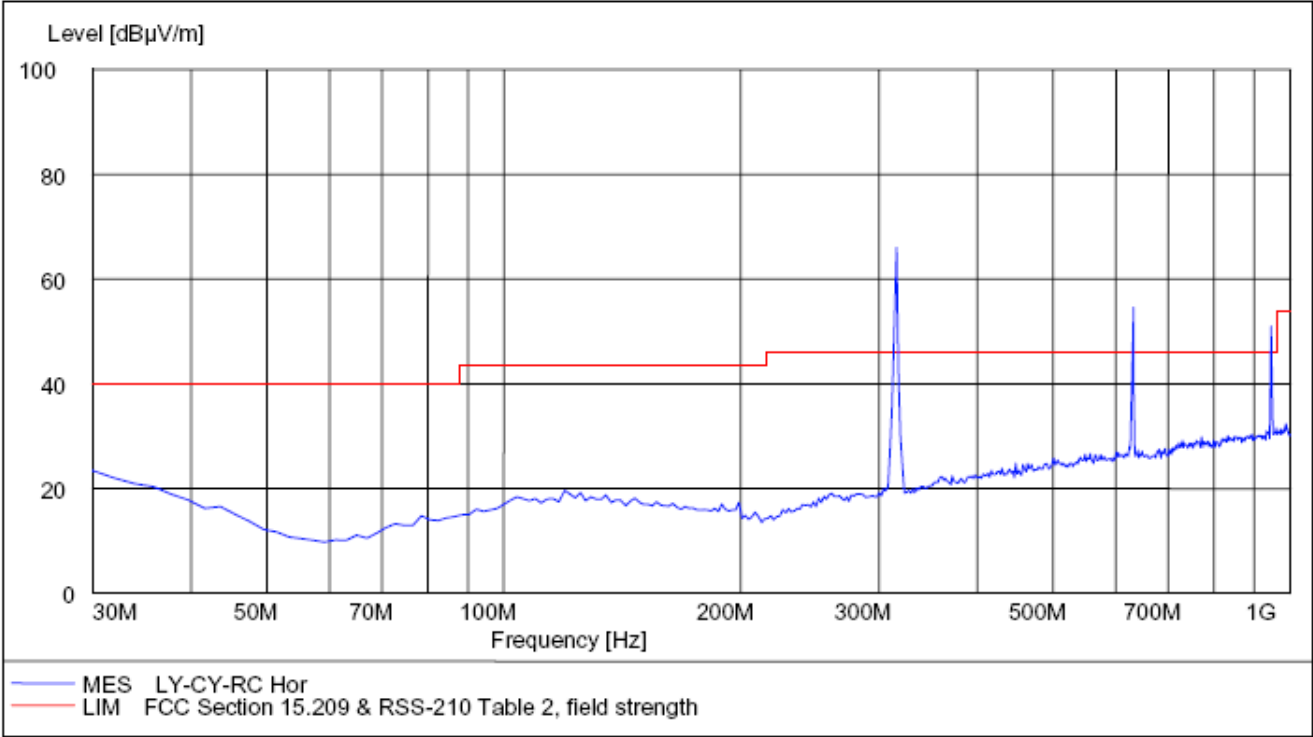


APPENDIX I (Test Curves)

Radiated Disturbance

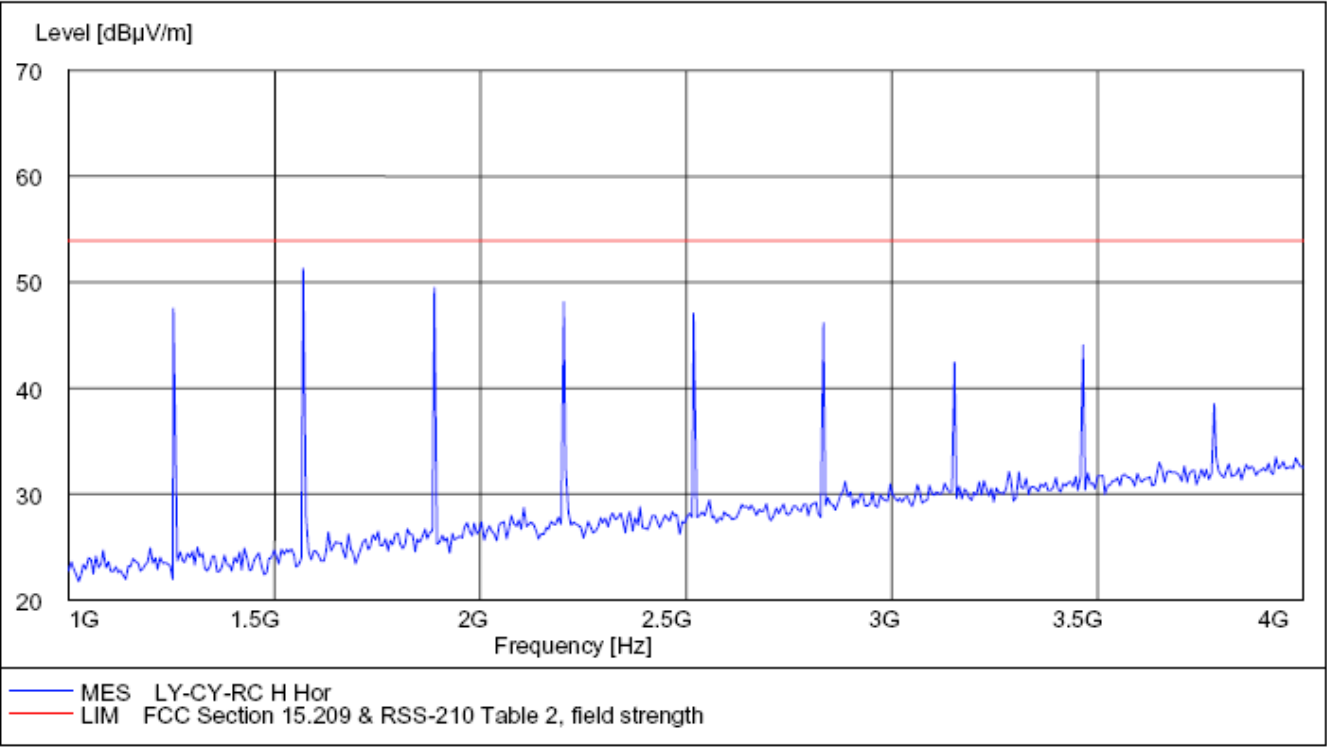
FCC PART 15

EUT: Remote Control M/N: LY-CY-RC
Manufacturer: Le Yuan Kuo Enterprise Co., Ltd.
Operating Condition: TX
Test Site: ATC EMC Lab.SAC
Operator: Andy
Test Specification: Horizontal
Comment: DC 12V
:



FCC PART 15

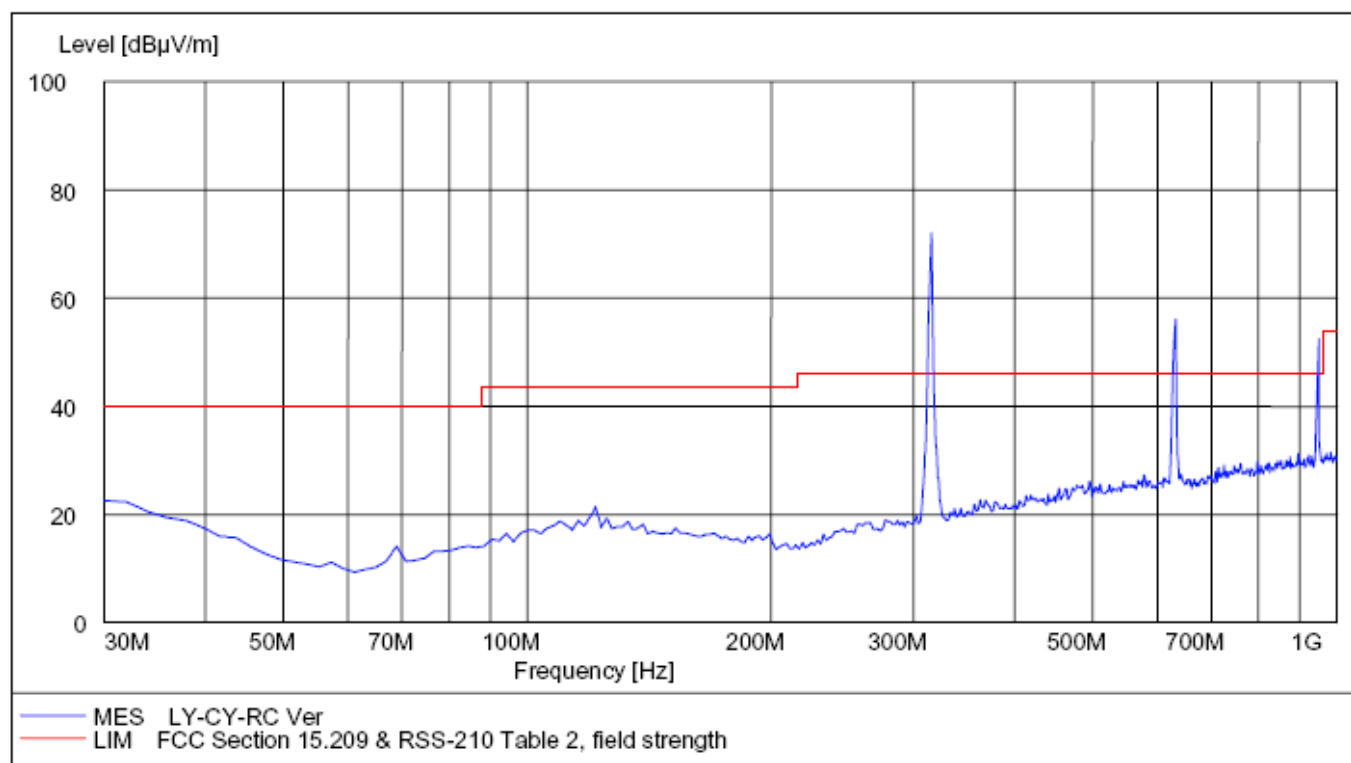
EUT: Remote Control M/N: LY-CY-RC
Manufacturer: Le Yuan Kuo Enterprise Co., Ltd.
Operating Condition: TX
Test Site: ATC EMC Lab.SAC
Operator: Andy
Test Specification: Horizontal
Comment: DC 12V
:



Radiated Disturbance

FCC PART 15

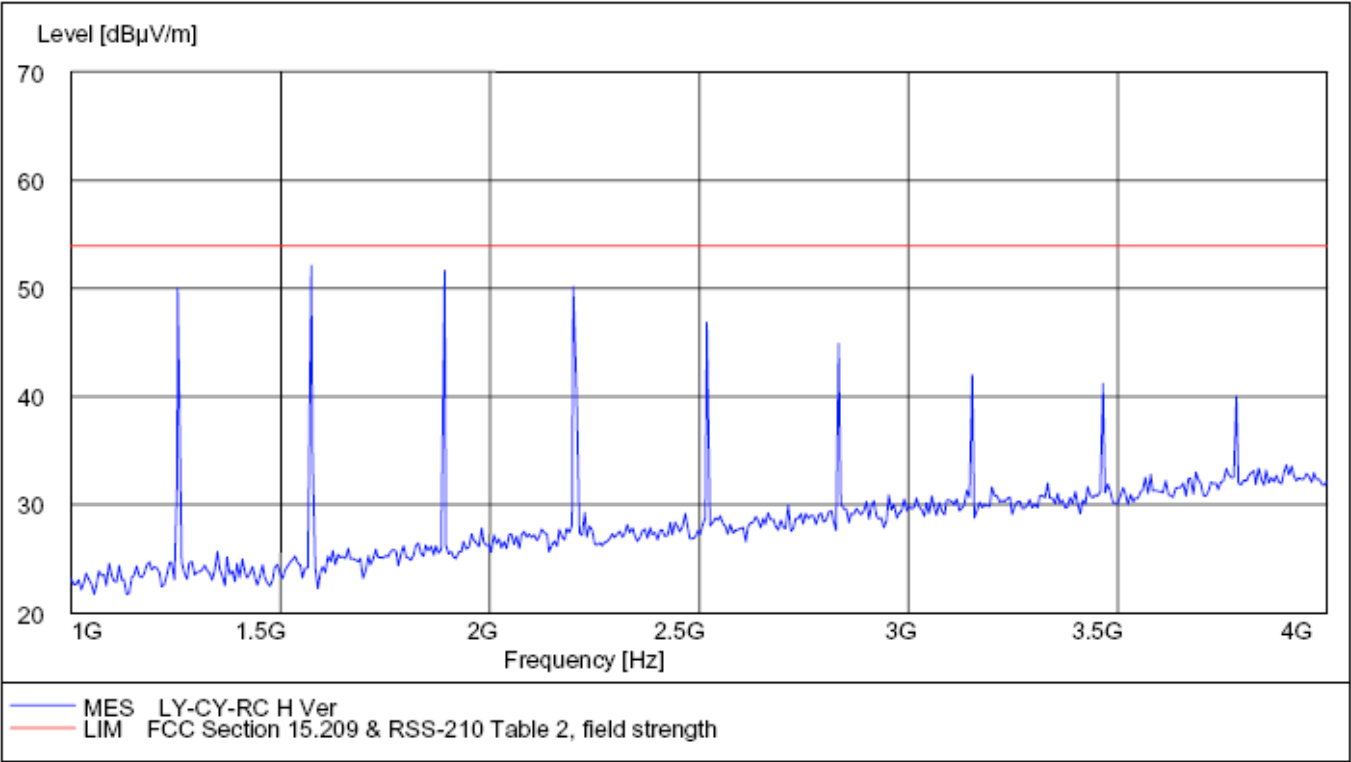
EUT: Remote Control M/N: LY-CY-RC
 Manufacturer: Le Yuan Kuo Enterprise Co., Ltd.
 Operating Condition: TX
 Test Site: ATC EMC Lab.SAC
 Operator: Andy
 Test Specification: Vertical
 Comment: DC 12V
 :



FCC PART 15

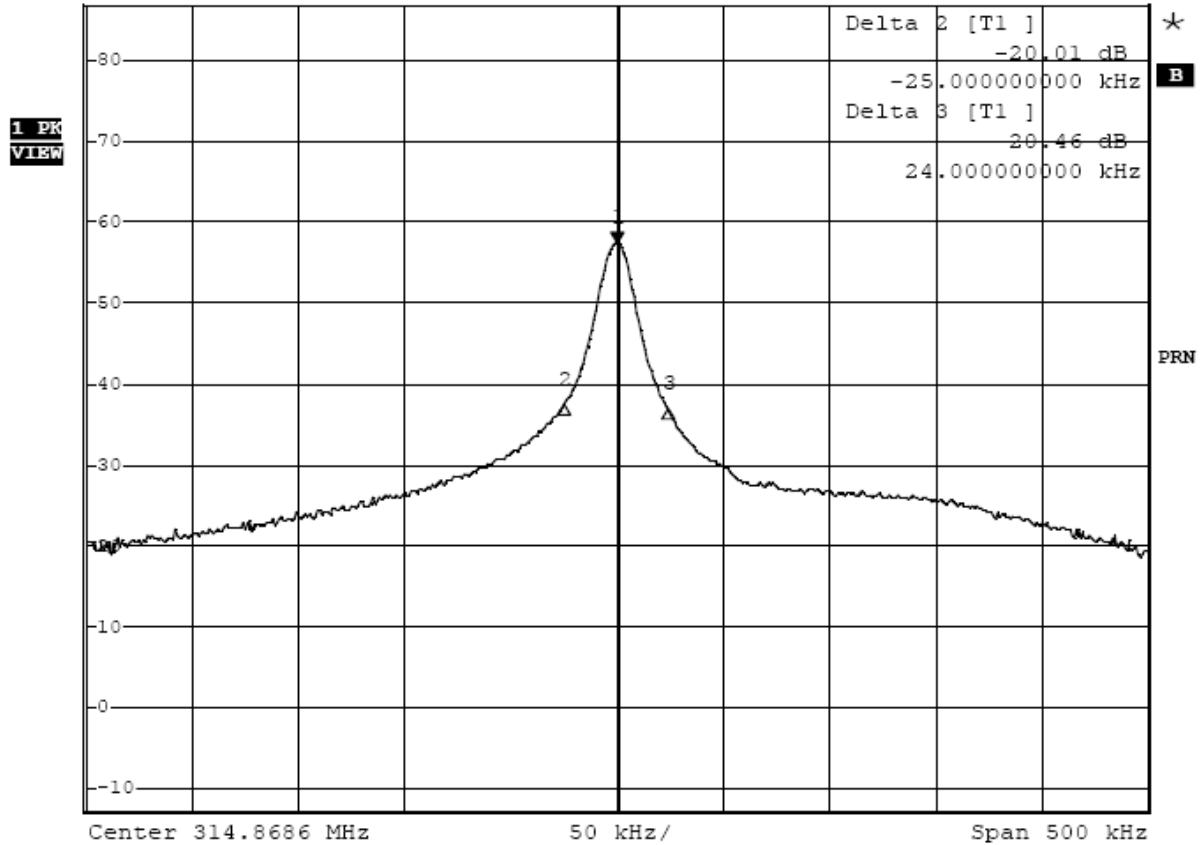
EUT: Remote Control M/N: LY-CY-RC
Manufacturer: Le Yuan Kuo Enterprise Co., Ltd.
Operating Condition: TX
Test Site: ATC EMC Lab.SAC
Operator: Andy
Test Specification: Vertical
Comment: DC 12V

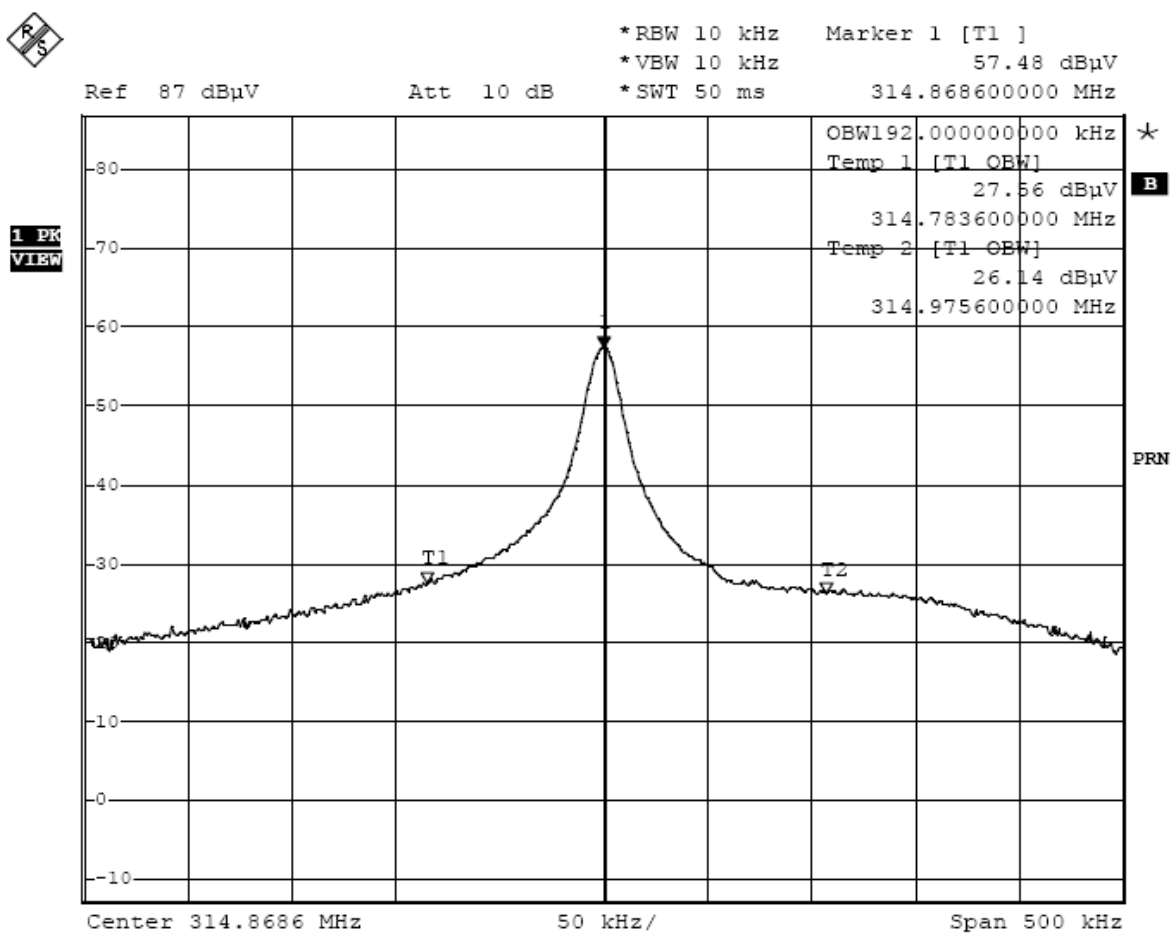
:

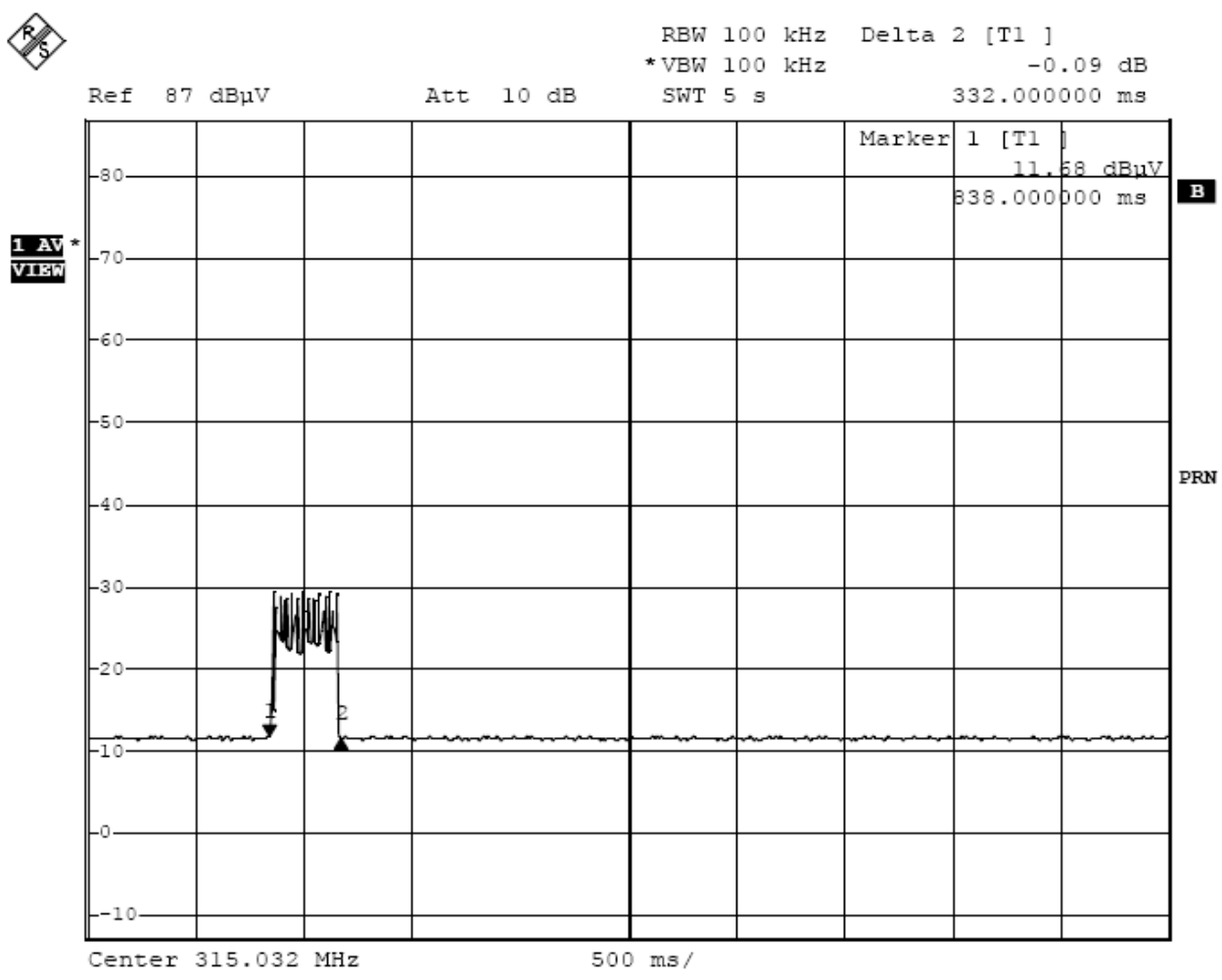


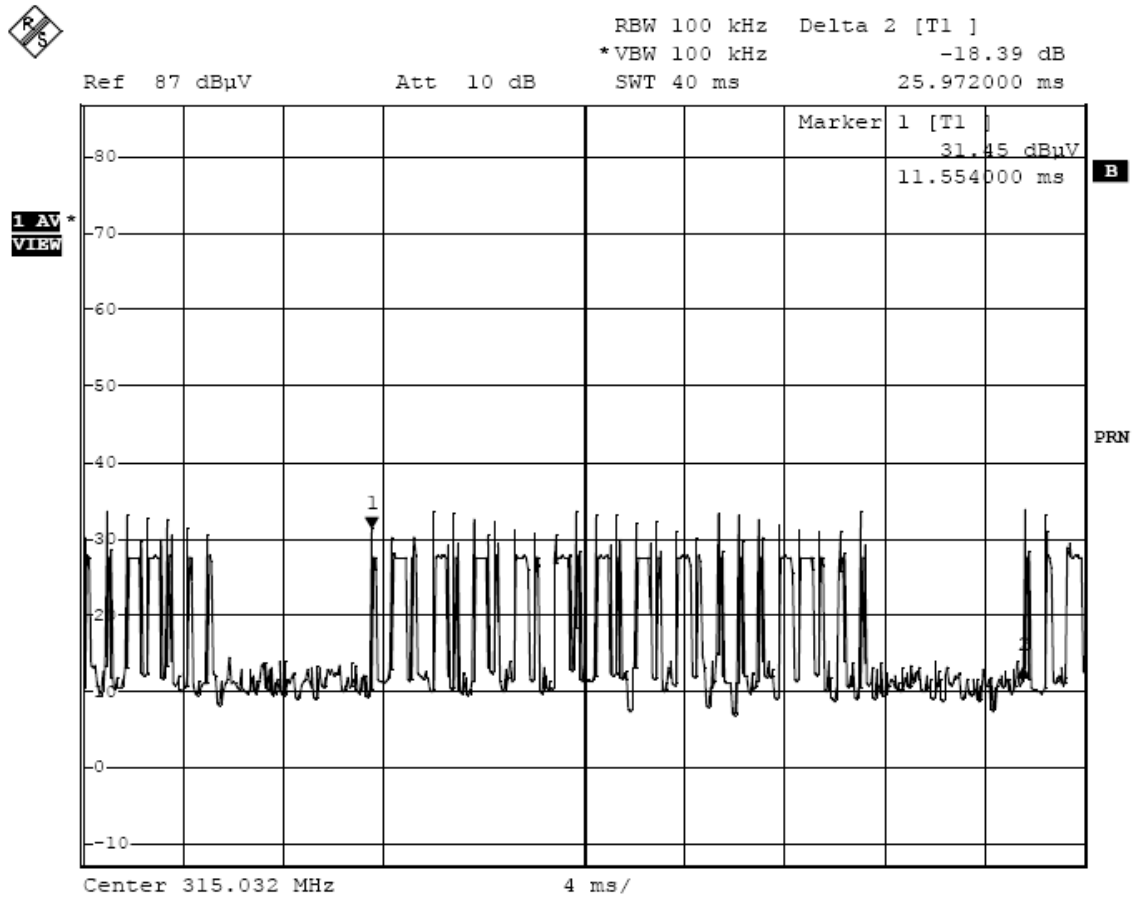


Ref 87 dBuV Att 10 dB *RBW 10 kHz Marker 1 [T1]
*VBW 10 kHz 57.48 dBuV
*SWT 50 ms 314.868600000 MHz

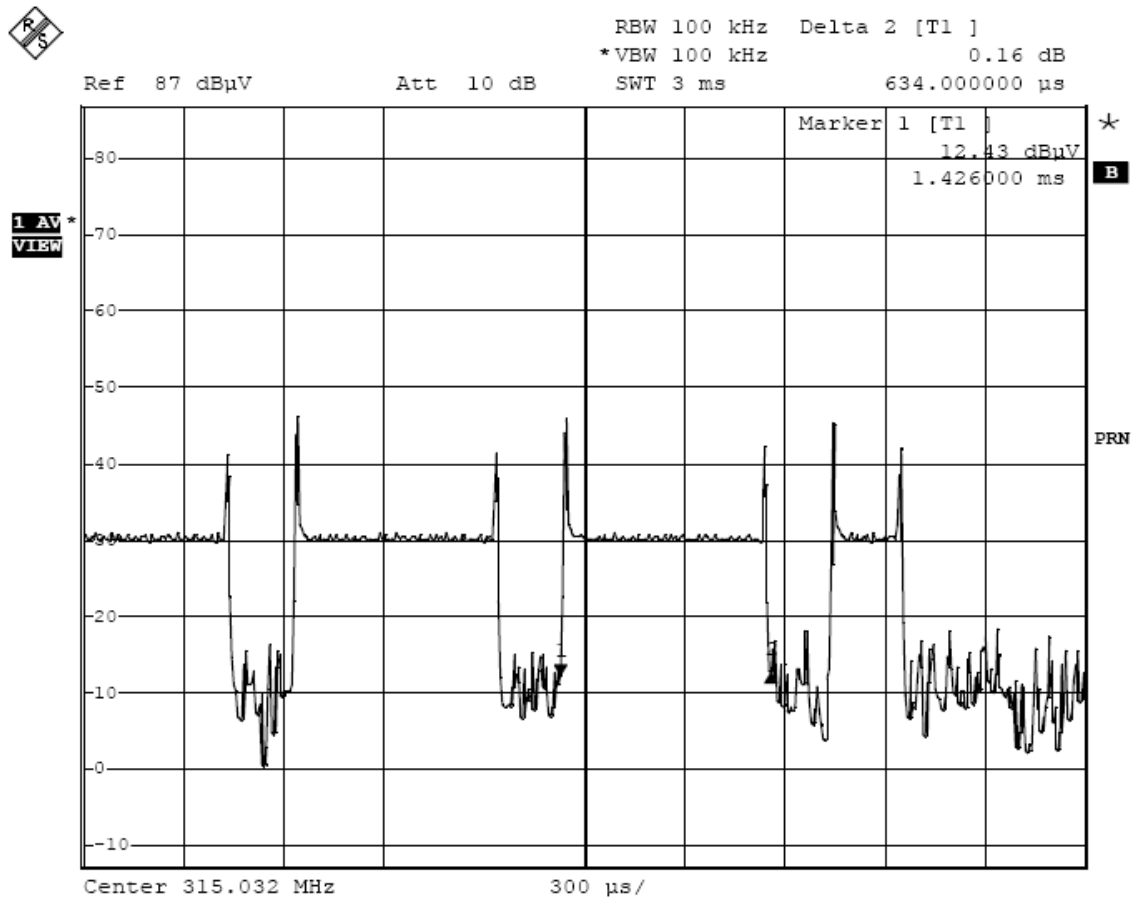




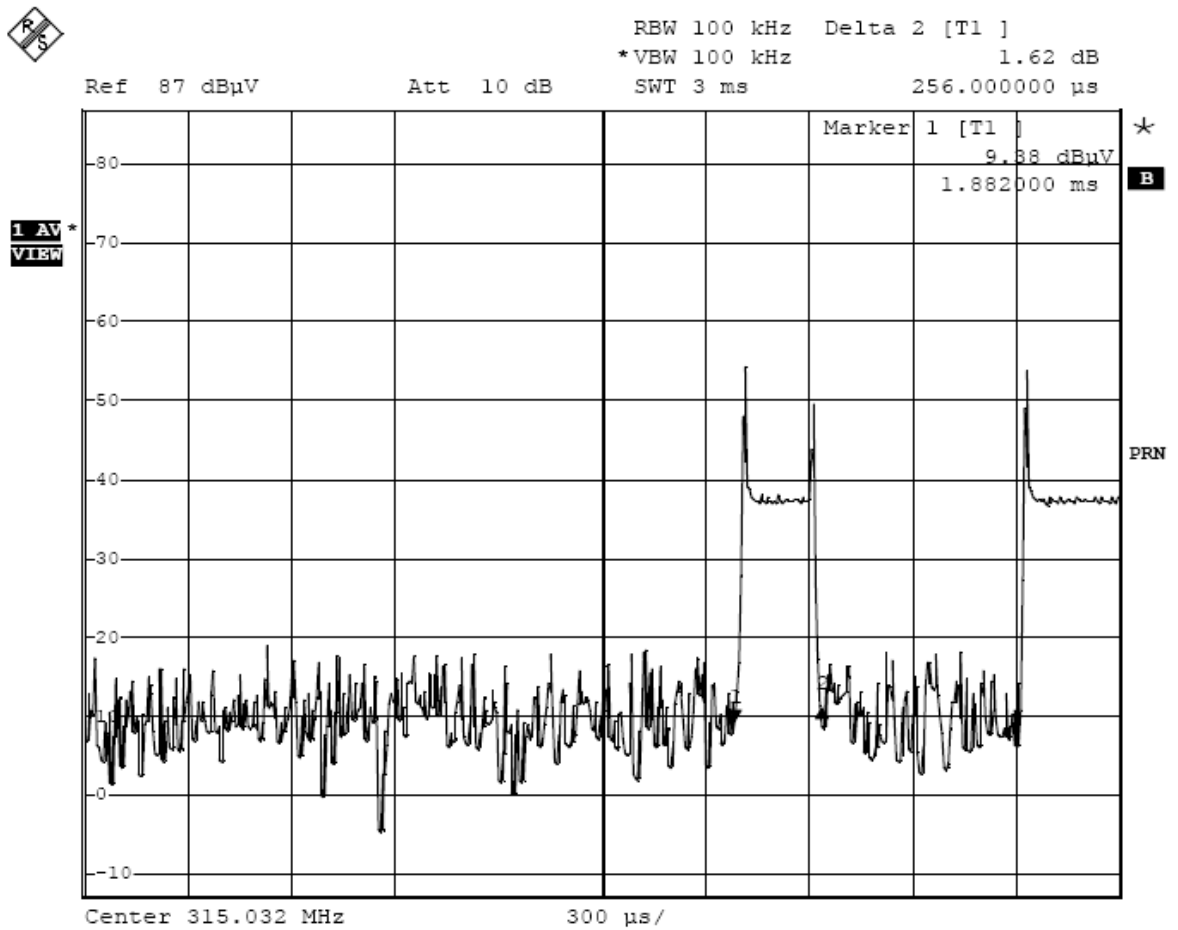




The graph shows the pattern of coding during the signal transmission.
The time interval of one coding period starts from marker 1 to marker 2,
Hence the total time of one period is 25.972ms.
It sums of 10 long 'on' signals and 15 short 'on' signals.



The graph show the duration of long 'on' signal. From marker 1 to marker 2, duration is 0.634ms.



The graph show the duration of short 'on' signal. From marker 1 to marker 2, duration is 0.256ms.