APPLICATION CERTIFICATION
On Behalf of
Carewell Electric Technology (Zhongshan) Co., Ltd.

REMOTE CONTROL
Model No.: FAN61T-3S

FCC ID: 2AAZPFAN61T3S

Prepared for	:	Carewell Electric Technology (Zhongshan) Co., Ltd.
Address	:	Torch Development Zone, No.2, Ouya Road, Zhongshan, Guangdong, China
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	:	ATE20151428
Date of Test	:	Jul 01-14,2015
Date of Report	:	Jul 14,2015

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Test Report Certification

Applicant	:	Carewell Electric Technology (Zhongshan) Co., Ltd.
Manufacturer	:	Carewell Electric Technology (Zhongshan) Co., Ltd.
EUT Description	:	REMOTE CONTROL
		(A) MODEL NO.: FAN61T-3S
		(B) SERIAL NO.: N/A
		(C) POWER SUPPLY: DC 3V (Battery 2x AAA)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.231a
ANSI C63.10-2013

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 15.231a. 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 : July 01, 2015-July 14, 2015
Date of Report : July 14, 2015

Prepared by : Tim Zhang
(Tim.zhang, Engineer)

Approved & Authorized Signer :
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	REMOTE CONTROL
Model Number	:	FAN61T-3S
Power Supply	:	DC 3V (battery 2x AAA)
Modulation:	:	ASK
Operation Frequency	:	315MHz
Applicant	:	Carewell Electric Technology (Zhongshan) Co., Ltd.
Address	:	Torch Development Zone, No.2, Ouya Road, Zhongshan, Guangdong, China
Manufacturer	:	Carewell Electric Technology (Zhongshan) Co., Ltd.
Address	:	Torch Development Zone, No.2, Ouya Road, Zhongshan, Guangdong, China
Date of sample received	:	Jul 01, 2015
Date of Test	:	Jul 01-14,2015

1.2.Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen Listed by FCC The Registration Number is 752051 Listed by Industry Canada The Registration Number is 5077A-2 Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L3193
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 (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Cal. Interval
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 10, 2015	One Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 10, 2015	One Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 10, 2015	One Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 10, 2015	One Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2015	One Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2015	One Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2015	One Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1067	Jan. 15, 2015	One Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 10, 2015	One Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 10, 2015	One Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 10, 2015	One Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 10, 2015	One Year

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission	N/A
Section 15.231(b)	Radiated Emission	Compliant
Section 15.231(c)	20dB Bandwidth	Compliant
Section 15.231(a)(1)	Release Time Measurement	Compliant
Section 15.203	Antenna Requirement	Compliant

The product is a manually operated transmitter.
Section 15.231 (a) (2), (3), (4) and (5) are not applicable.

All normal using modes of the normal function were tested but only the worst test data of the worst mode is recorded by this report.

4. THE FIELD STRENGTH OF RADIATION EMISSION

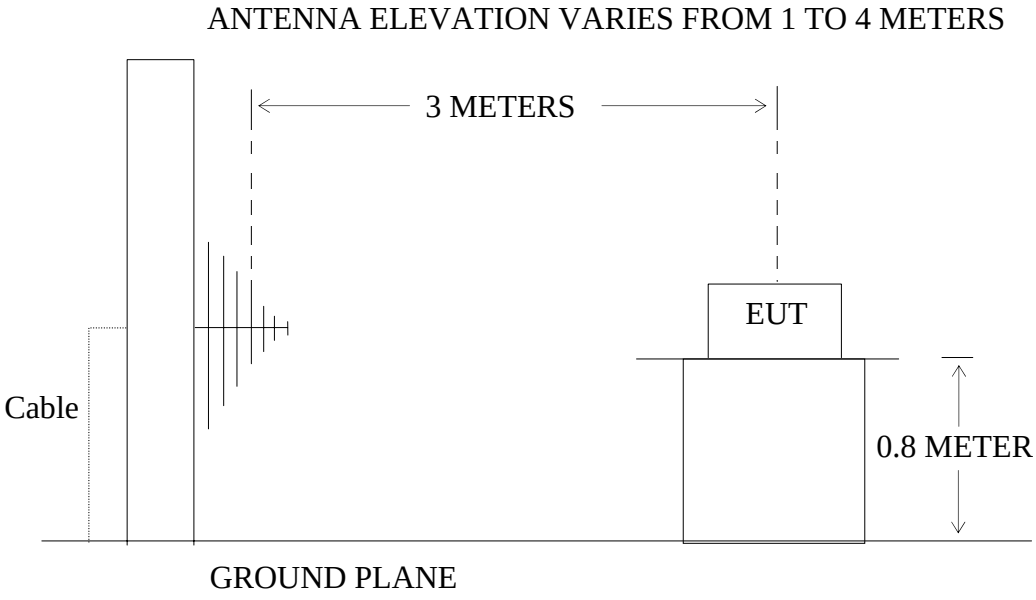
4.1.Block Diagram of Test Setup

4.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: REMOTE CONTROL)

4.1.2.Semi-Anechoic Chamber Test Setup Diagram



(EUT: REMOTE CONTROL)

4.2. The Field Strength of Radiation Emission Measurement Limits

4.2.1. Radiation Emission Measurement Limits According to FCC Part 15 Section 15.231(b)

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Average] [μV/m]	Field Strength of Spurious Emission [Average] [μV/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 130-174 MHz, uV/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

4.2.2. Restricted Band Radiation Emission Measurement Limits According to FCC part 15 Section 15.205 and Section15.209.

4.3. Configuration of EUT on Measurement

The following equipment is 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.

4.3.1. REMOTE CONTROL (EUT)

Model Number : FAN61T-3S
Serial Number : N/A
Manufacturer : Carewell Electric Technology (Zhongshan) 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 TX mode measure it.

4.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground(Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). 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 C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The bandwidth of test receiver is set at 120 kHz in 30-1000 MHz, and 1 MHz in 1000-4000 MHz.

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

4.6. The Field Strength of Radiation Emission Measurement Results

PASS.

The frequency range 30MHz to 4000MHz is investigated.

EUT:	REMOTE CONTROL		
Model No.:	FAN61T-3S	Power Supply:	DC 3V
Test Mode:	TX	Test Engineer:	Star

Frequency (MHz)	Reading (dBμV/m)	Factor Corr.	Average Factor	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	PEAK	(dB)	(dB)	AV	PEAK	AV	PEAK	AV	PEAK	
315	**97.60**	**-15.91**	**-6.97**	**74.72**	**81.69**	**75.62**	**95.62**	**-0.90**	**-13.93**	Horizontal
630	69.06	-9.28	-6.97	52.81	59.78	55.62	75.62	-2.81	-15.84	
945	60.81	-3.48	-6.97	50.36	57.33	55.62	75.62	-5.26	-18.29	
1260	64.42	-12.03	-6.97	45.42	52.39	55.62	75.62	-10.20	-23.23	
1575	59.79	-11.02	-6.97	41.80	48.77	55.62	75.62	-13.82	-26.85	
315	**87.52**	**-15.91**	**-6.97**	**64.64**	**71.61**	**75.62**	**95.62**	**-10.98**	**-24.01**	Vertical
630	66.52	-9.28	-6.97	50.27	57.24	55.62	75.62	-5.35	-18.38	
945	56.18	-3.48	-6.97	45.73	52.70	55.62	75.62	-9.89	-22.92	
1260	60.98	-12.03	-6.97	41.98	48.95	55.62	75.62	-13.64	-26.67	
1575	61.24	-11.02	-6.97	43.25	50.22	55.62	75.62	-12.37	-25.40	

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
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 μV/m =75.62 μV/m
4. The spectral diagrams in appendix I display the measurement of peak values.
5. Average value= PK value + Average Factor (duty factor)
6. If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.
7. The EUT is tested radiation emission in three axes(X,Y,Z). The worst emissions are reported in three axes.

8. Pulse Desensitization Correction Factor

Pulse Width (PW) = 0.3768ms

2/PW = 2/0.3768ms = 5.308kHz

RBW (100 kHz) > 2/PW (5.308 kHz)

Therefore PDCF is not needed

5. 20DB OCCUPIED BANDWIDTH

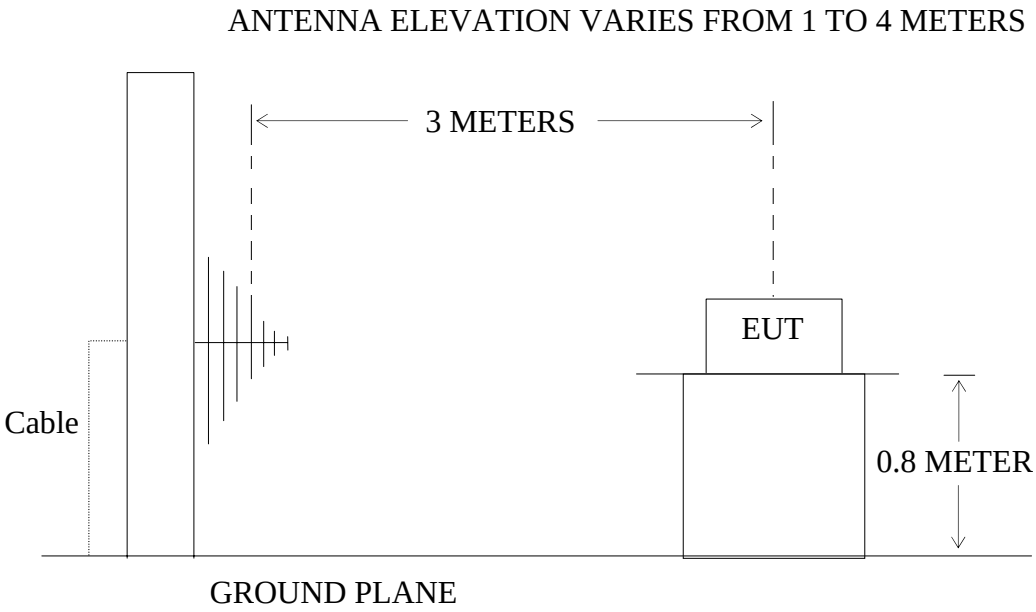
5.1.Block Diagram of Test Setup

5.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: REMOTE CONTROL)

5.1.2.Semi-Anechoic Chamber Test Setup Diagram



(EUT: REMOTE CONTROL)

5.2.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 MHz×0.25% = 787.5 kHz. Bandwidth is determined at the two points 20 dB down from the top of modulated carrier.

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	:	FAN61T-3S
Serial Number	:	N/A
Manufacturer	:	Carewell Electric Technology (Zhongshan) Co., Ltd.

5.4.Operating Condition of EUT

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

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in TX mode measure it.

5.5.Test Procedure

5.5.1. Set SPA Center Frequency = Fundamental frequency, RBW = 10 kHz, VBW = 30 kHz, Span = 1MHz.

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

5.6.Measurement Result

The EUT does meet the FCC requirement.

-20 dB bandwidth = 52.68 kHz <787.5 kHz.

The spectral diagrams in appendix I.

6. RELEASE TIME MEASUREMENT

6.1.Block Diagram of Test Setup

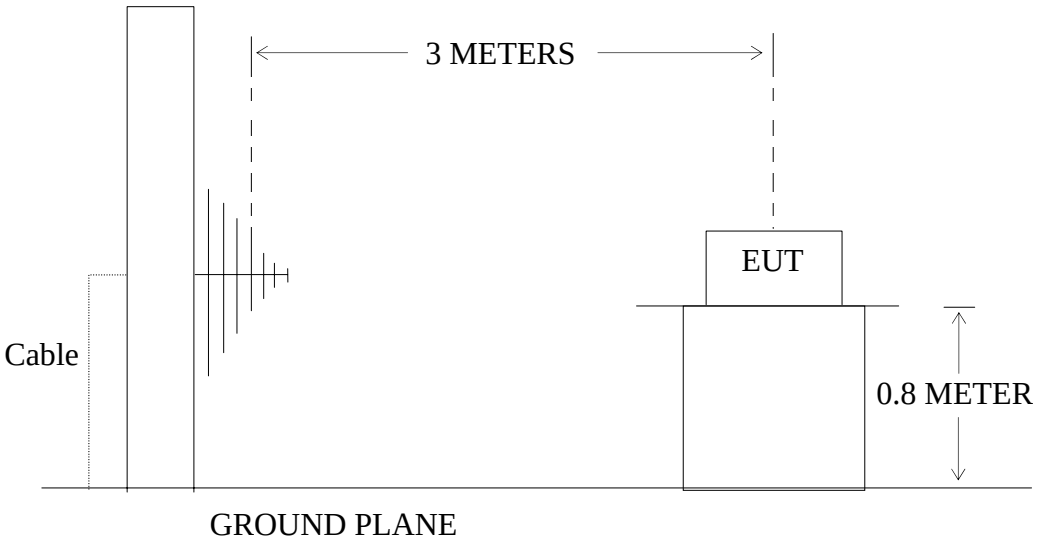
6.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: REMOTE CONTROL)

6.1.2.Semi-Anechoic Chamber Test Setup Diagram

ANTENNA ELEVATION VARIES FROM 1 TO 4 METERS



(EUT: REMOTE CONTROL)

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

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.

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	:	FAN61T-3S
Serial Number	:	N/A
Manufacturer	:	Carewell Electric Technology (Zhongshan) Co., Ltd.

6.4.Operating Condition of EUT

6.4.1.Setup the EUT and simulator as shown as Section 6.1.

6.4.2.Turn on the power of all equipment.

6.4.3.Let the EUT work in TX mode measure it.

6.5.Test Procedure

6.5.1. Set SPA Center Frequency = Fundamental frequency, RBW = 100 kHz, VBW = 300 kHz, Span = 0 Hz. Sweep time = 5 s.

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 = 1.54s

The spectral diagrams in appendix I.

7. AVERAGE FACTOR MEASUREMENT

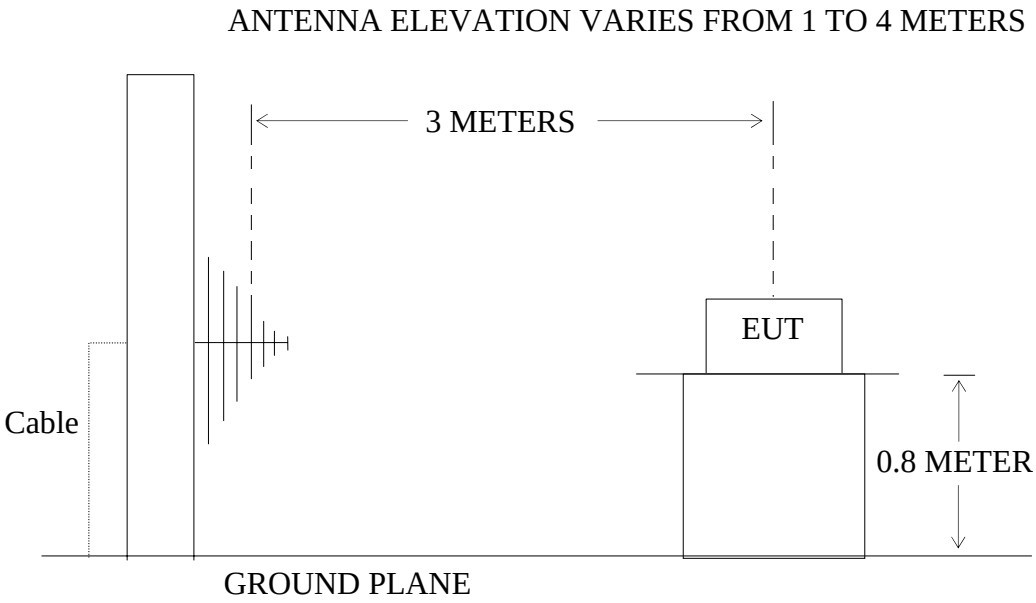
7.1.Block Diagram of Test Setup

7.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: REMOTE CONTROL)

7.1.2.Semi-Anechoic Chamber Test Setup Diagram



7.2.Average factor Measurement according to ANSI C63.10-2013

ANSI C63.10-2013 Section 7.5 Unless otherwise specified, when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 s (100 ms). In cases where the pulse train exceeds 0.1 s, the measured field strength shall be determined during a 0.1 s interval.64 The following procedure is an example of how the average value may be determined. The average field strength may be found by measuring the peak pulse amplitude (in log equivalent units) and determining the duty cycle correction factor (in dB) associated with the pulse modulation as shown in Equation (10):

Average factor in dB = 20 log (duty cycle)

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

Model Number	:	FAN61T-3S
Serial Number	:	N/A
Manufacturer	:	Carewell Electric Technology (Zhongshan) Co., Ltd.

7.4.Operating Condition of EUT

7.4.1.Setup the EUT and simulator as shown as Section 7.1.

7.4.2.Turn on the power of all equipment.

7.4.3.Let the EUT work in TX mode 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 SPA Center Frequency = Fundamental frequency, RBW = 1000 kHz, VBW = 1000 kHz, Span = 0 Hz.

7.5.3.Set EUT as normal operation.

7.5.4.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 = 34.493ms

Effective period of the cycle = (0.3768×9) + (0.7101×17)ms =15.4629 ms

DC =15.4629ms/34. 493ms=0.448

Therefore, the average factor is found by 20log0.448= -6.97dB

The spectral diagrams in appendix I.

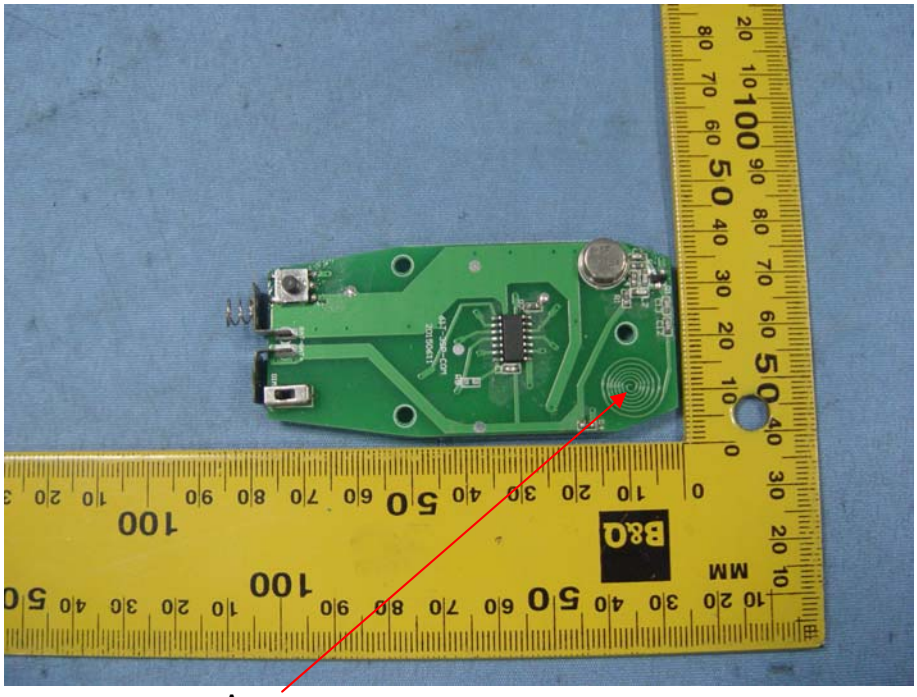
8. ANTENNA REQUIREMENT

8.1. The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2. Antenna Construction

Device is equipped with unique antenna, which isn't displaced by other antenna. Therefore, the equipment complies with the antenna requirement of Section 15.203.



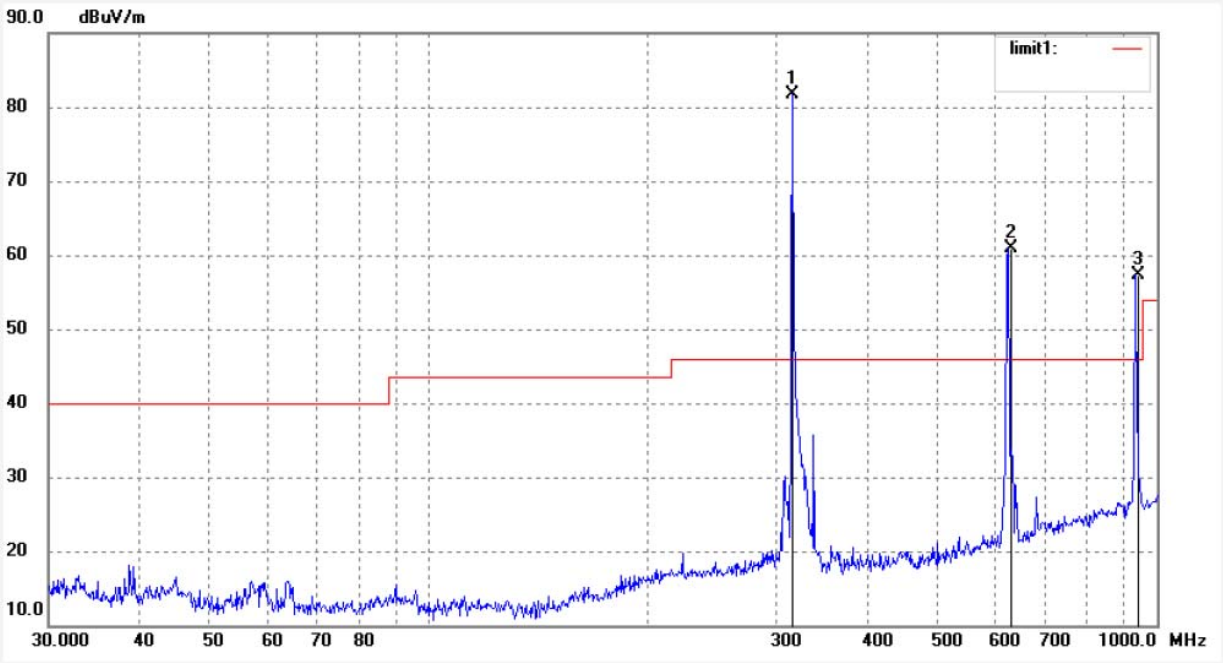
APPENDIX I
(Test Curves)

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2015 #1138
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: REMOTE CONTROL
Mode: TX
Model: FAN61T-3S
Manufacturer: Carewell

Polarization: Horizontal
Power Source: DC 3V
Date: 15/07/04/
Time: 8/57/23
Engineer Signature:
Distance: 3m

Note: Report No.:ATE20151428

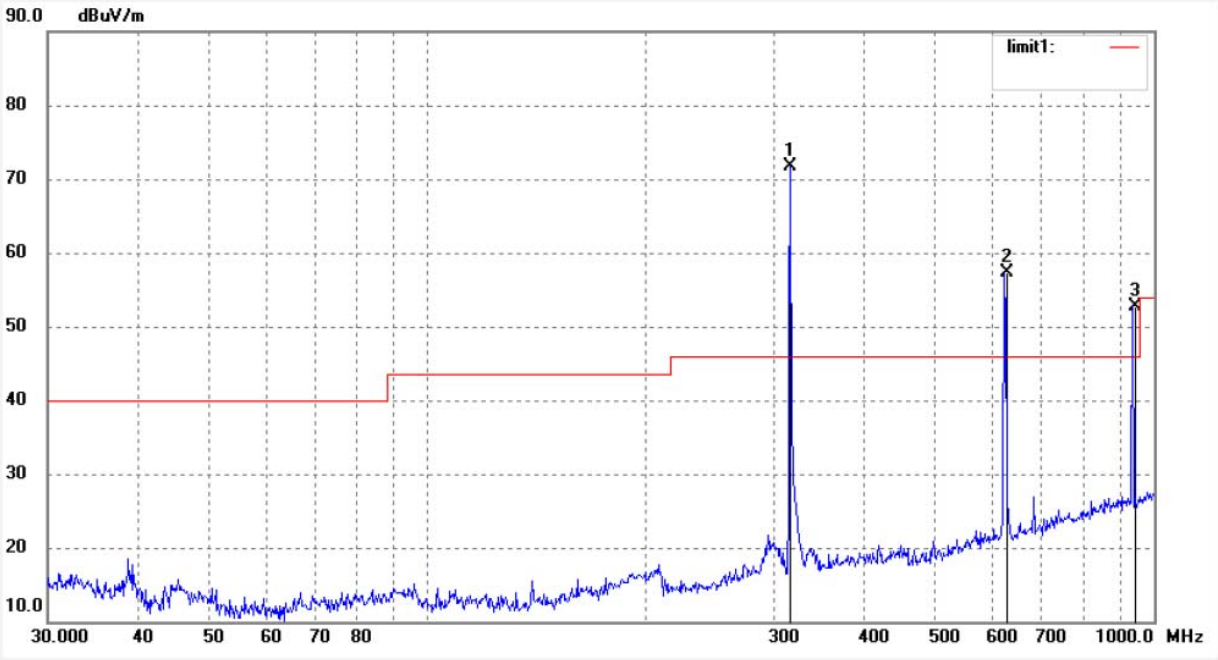


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	315.2599	97.60	-15.91	81.69	95.60	13.91	peak			
2	630.4895	69.06	-9.28	59.78	75.60	15.82	peak			
3	945.6212	60.81	-3.48	57.33	75.60	18.27	peak			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2015 #1137	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: DC 3V
Test item: Radiation Test	Date: 15/07/04/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/56/40
EUT: REMOTE CONTROL	Engineer Signature:
Mode: TX	Distance: 3m
Model: FAN61T-3S	
Manufacturer: Carewell	

Note: Report No.:ATE20151428

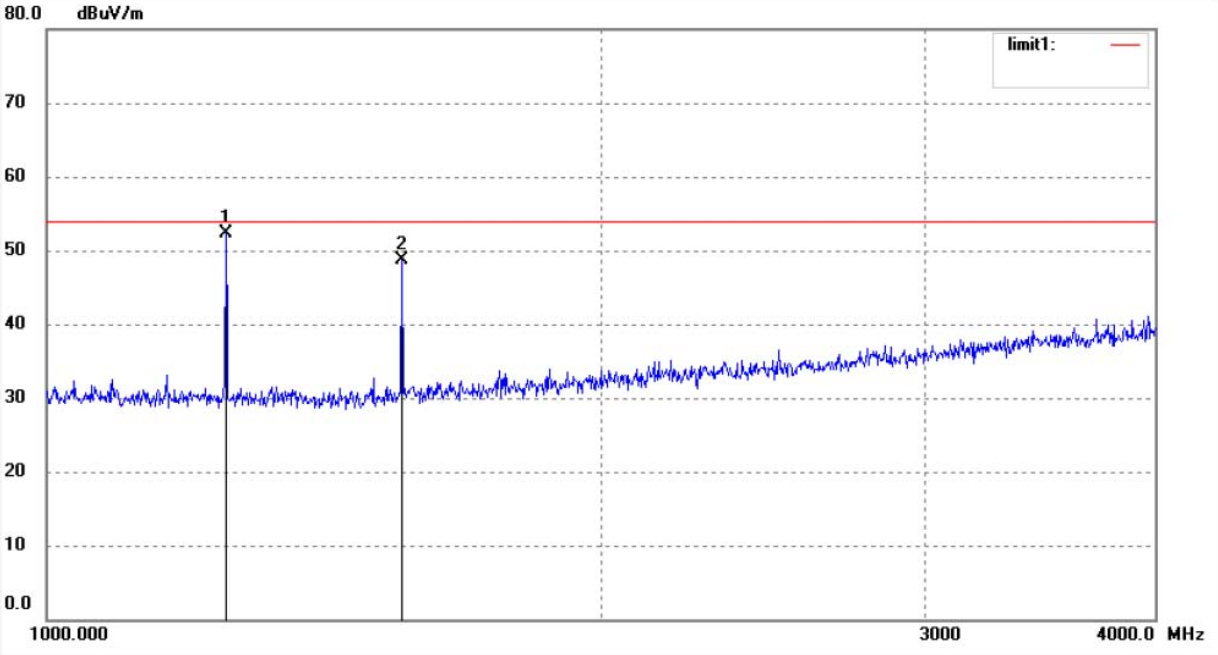


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	315.2599	87.52	-15.91	71.61	95.60	23.99	peak			
2	630.4993	66.52	-9.28	57.24	75.60	18.36	peak			
3	945.6211	56.18	-3.48	52.70	75.60	22.90	peak			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2015 #1140	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 3V
Test item: Radiation Test	Date: 15/07/04/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/01/02
EUT: REMOTE CONTROL	Engineer Signature:
Mode: TX	Distance: 3m
Model: FAN61T-3S	
Manufacturer: Carewell	

Note: Report No.:ATE20151428

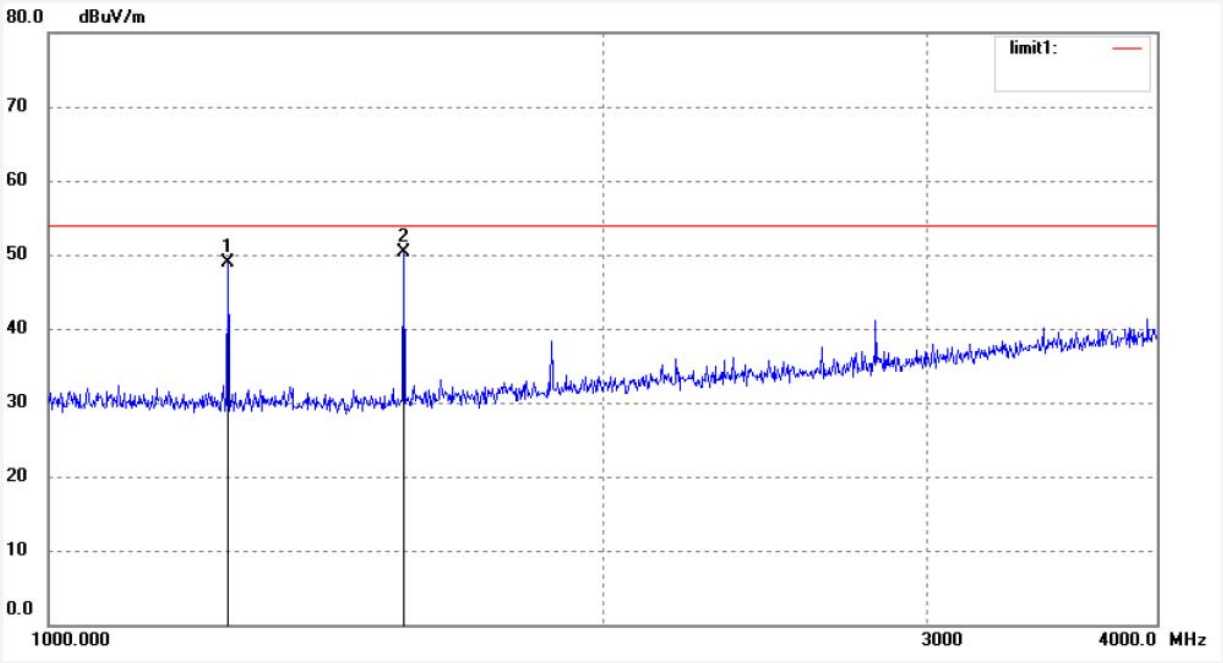


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1260.747	64.42	-12.03	52.39	74.00	-21.61	peak			
2	1575.330	59.79	-11.02	48.77	74.00	-25.23	peak			

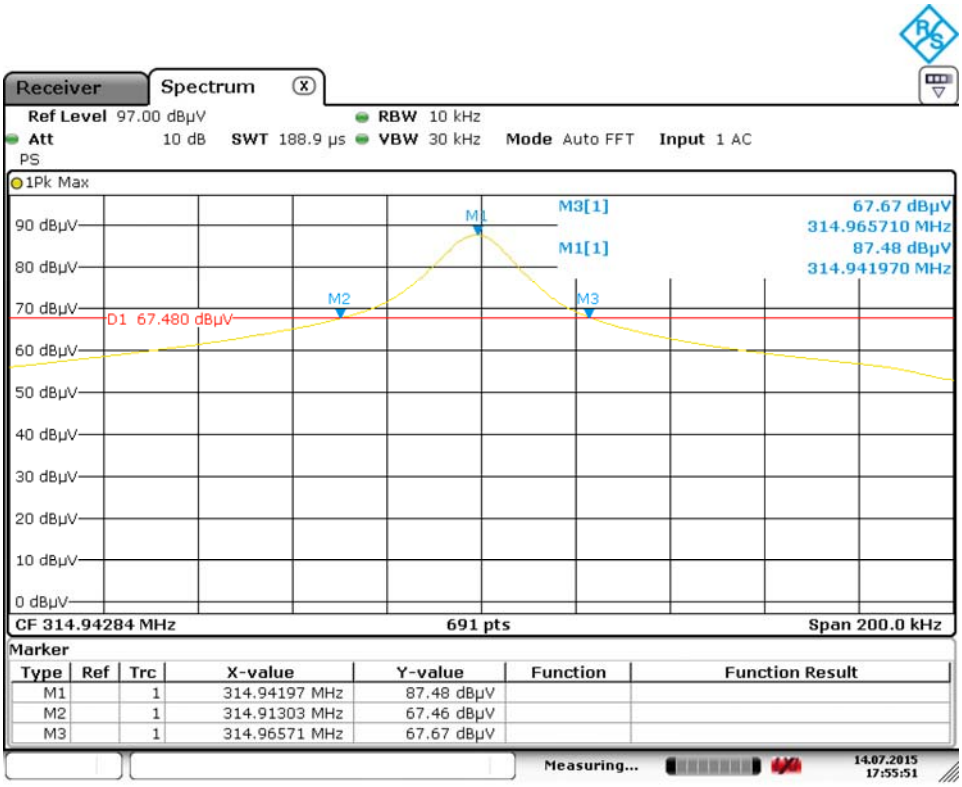
ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2015 #1139	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: DC 3V
Test item: Radiation Test	Date: 15/07/04/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/59/45
EUT: REMOTE CONTROL	Engineer Signature:
Mode: TX	Distance: 3m
Model: FAN61T-3S	
Manufacturer: Carewell	

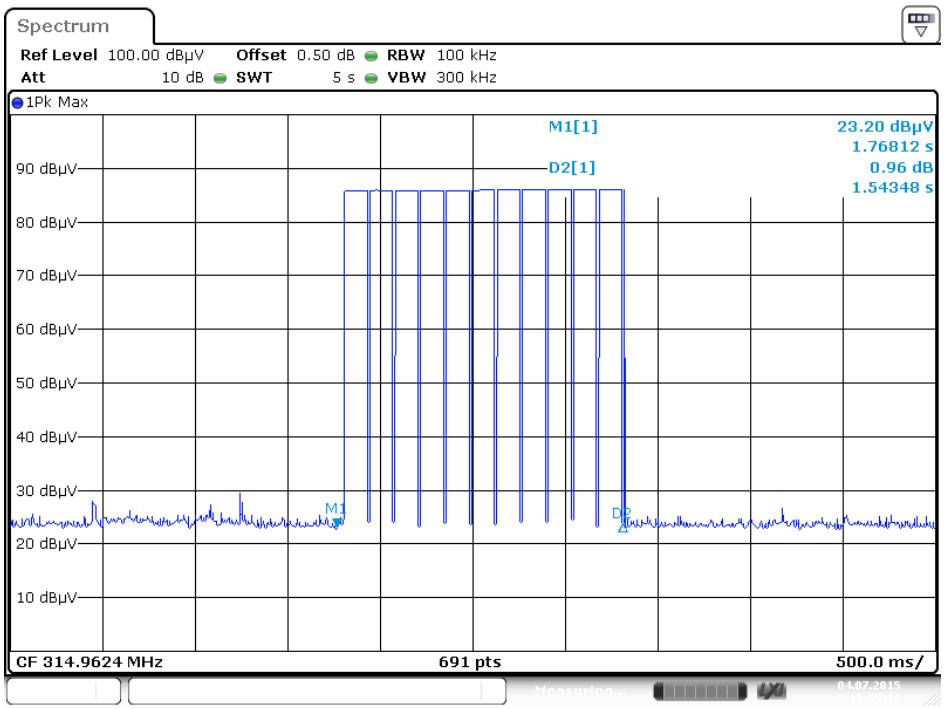
Note: Report No.:ATE20151428



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1260.747	60.98	-12.03	48.95	74.00	-25.05	peak			
2	1575.330	61.24	-11.02	50.22	74.00	-23.78	peak			

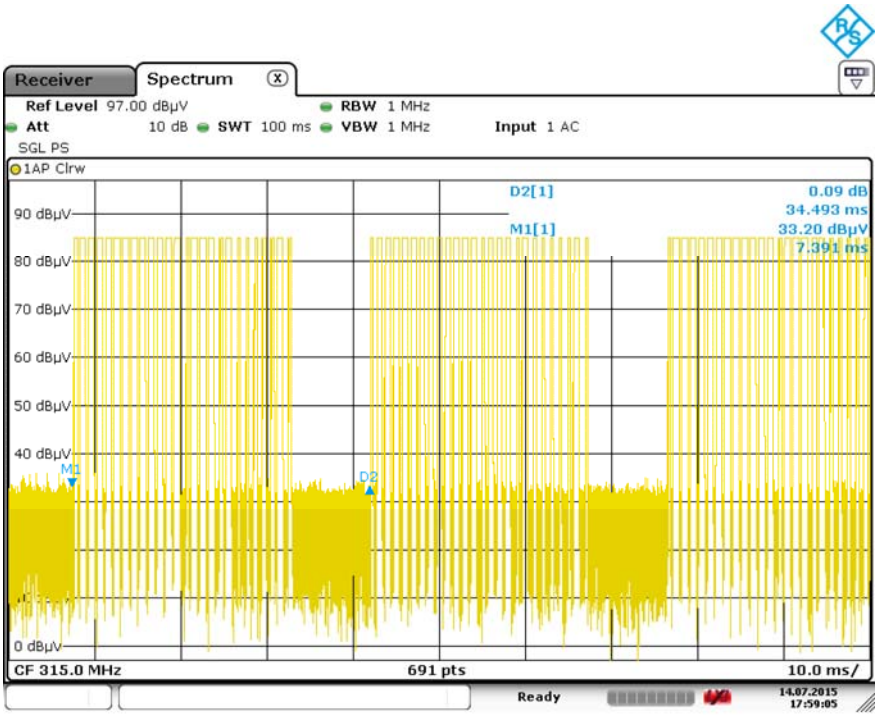


Date: 14.JUL.2015 17:55:51

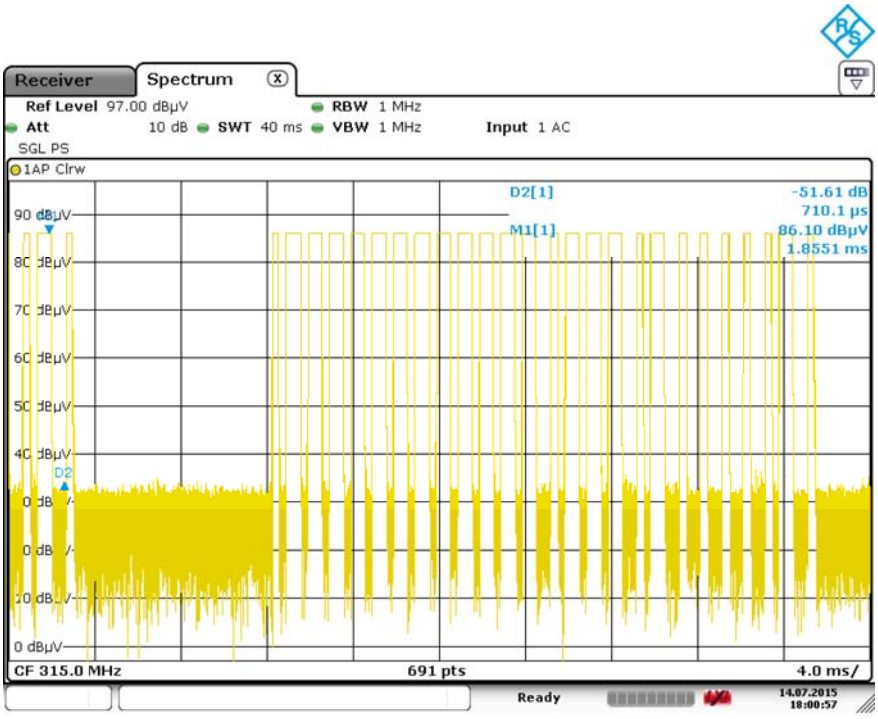


Release Time = 1.54348s

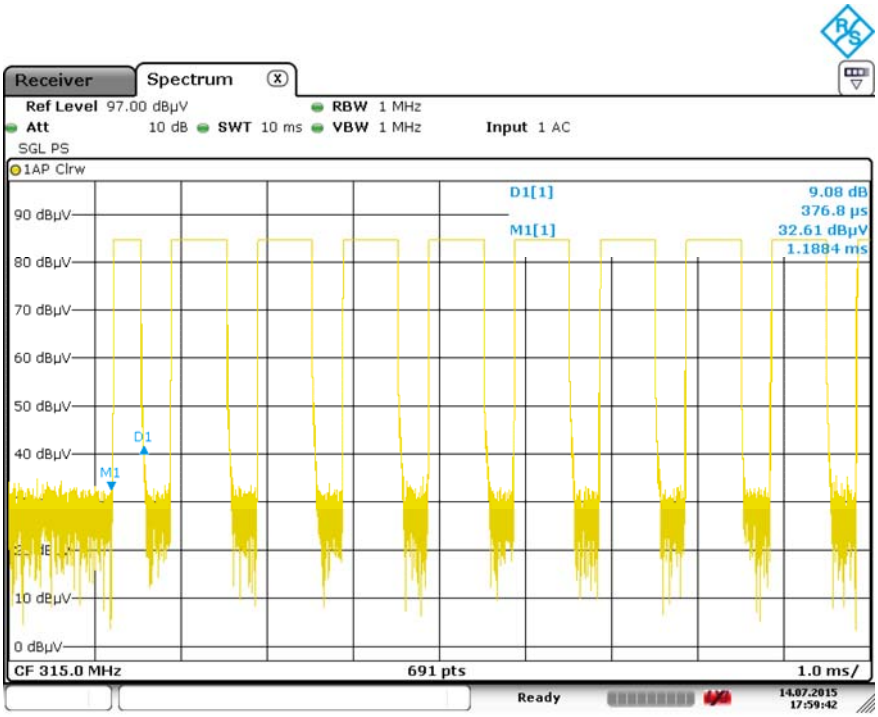
The graph shows the pattern of coding during the signal transmission.
The duration of one cycle = 34.493 ms.



Date: 14.JUL.2015 17:59:05

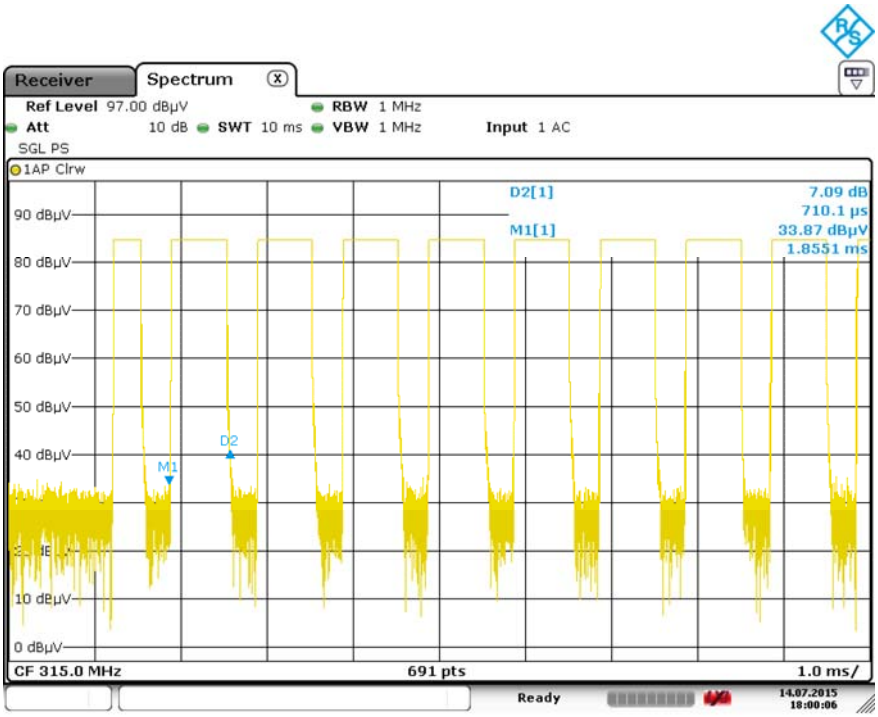


Date: 14.JUL.2015 18:00:58



Date: 14.JUL.2015 17:59:42

The graph shows the duration of ‘on’ signal. From marker 1 to marker 2, duration is 0.3768ms.



Date: 14.JUL.2015 18:00:07

The graph shows the duration of ‘on’ signal. From marker 1 to marker 2, duration is 0.7101ms.