APPLICATION CERTIFICATION
On Behalf of
Chuango Security Technology Corporation

PIR Motion Detector
Model No.: PIR-910, MD9100

FCC ID: RJYP910

Prepared for	:	Chuango Security Technology Corporation
Address	:	6-17, Overseas Students Pioneer Park, No.108, Jiangbin East Road, Economic & Technological Development Zone, Fuzhou 350015, 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	:	ATE20140705
Date of Test	:	May 05-15, 2014
Date of Report	:	May 15, 2014

TABLE OF CONTENTS

Description Page

Test Report Certification

Applicant	:	Chuango Security Technology Corporation
Manufacturer	:	Chuango Security Technology Corporation
EUT Description	:	PIR Motion Detector
		(A) MODEL NO.: PIR-910, MD9100
		(B) SERIAL NO.: N/A
		(C) POWER SUPPLY: DC 3.0V (Battery 2x)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.231(e)
ANSI C63.4-2009

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(e). 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 : May 05 -15, 2014

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

Approved & Authorized Signer :
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	PIR Motion Detector
Model Number	:	PIR-910, MD9100
Power Supply	:	DC 3.0V (battery 2x)
Modulation:	:	ASK
Operation Frequency	:	315MHz
Applicant	:	Chuango Security Technology Corporation
Address	:	6-17, Overseas Students Pioneer Park, No.108, Jiangbin East Road, Economic & Technological Development Zone, Fuzhou 350015, China.
Manufacturer	:	Chuango Security Technology Corporation
Address	:	6-17, Overseas Students Pioneer Park, No.108, Jiangbin East Road, Economic & Technological Development Zone, Fuzhou 350015, China.
Date of sample received	:	May 05, 2014
Date of Test	:	May 05-15, 2014

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 date	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 11, 2014	Jan. 10, 2015
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 11, 2014	Jan. 10, 2015
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 11, 2014	Jan. 10, 2015
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 11, 2014	Jan. 10, 2015
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2014	Jan. 14, 2015
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2014	Jan. 14, 2015
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2014	Jan. 14, 2015
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 15, 2014	Jan. 14, 2015
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 11, 2014	Jan. 10, 2015
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 11, 2014	Jan. 10, 2015

3. SUMMARY OF TEST RESULTS

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

The product is a manually operated PIR Motion Detector transmitter.

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

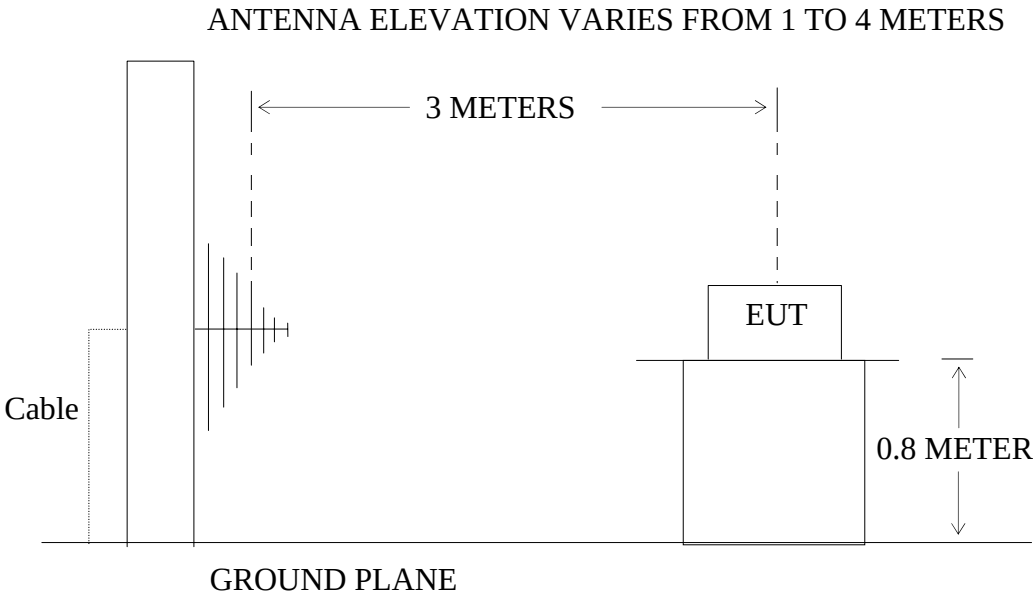
4.1.Block Diagram of Test Setup

4.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: PIR Motion Detector)

4.1.2.Semi-Anechoic Chamber Test Setup Diagram



(EUT: PIR Motion Detector)

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(e)

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emission (microvolts/meter)
40.66–40.70.	1,000	100
70–130	500	50
130–174	500 to 1,500 [1]	50 to 150 [1]
174–260	1,500	150
260–470	1,500 to 5,000 [1]	150 to 500 [1]
Above 470	5,000	500

[1] Linear interpolations.

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.

4.4. 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. 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 C63.4 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.

Date of Test:	May 06, 2014	Temperature:	25°C
EUT:	PIR Motion Detector	Humidity:	50%
Model No.:	PIR-910	Power Supply:	DC 3.0V
Test Mode:	TX	Test Engineer:	Alen

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	**89.96**	**-17.52**	**-7.706**	**64.73**	**72.44**	**67.70**	**87.70**	**2.97**	**15.26**	
945.44	49.61	-5.45	-7.706	36.45	44.16	47.70	67.70	11.25	23.54	
1575.7	61.05	-9.40	-7.706	43.94	51.65	47.70	67.70	3.76	16.05	Horizontal
2206.9	59.66	-7.26	-7.706	44.69	52.40	47.70	67.70	3.01	15.3	
2521.0	58.99	-6.43	-7.706	44.85	52.56	47.70	67.70	2.85	15.14	
315	**83.23**	**-17.52**	**-7.706**	**58.00**	**65.71**	**67.70**	**87.70**	**9.70**	**21.99**	
945.44	47.75	-5.45	-7.706	34.59	42.30	47.70	67.70	13.11	25.4	
1575.7	61.18	-9.40	-7.706	44.07	51.78	47.70	67.70	3.63	15.92	Vertical
2521.0	57.52	-6.43	-7.706	43.38	51.09	47.70	67.70	4.32	16.61	
3151.4	57.02	-4.51	-7.706	44.80	52.51	47.70	67.70	2.90	15.19	

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. *: Denotes restricted band of operation.

   Measurements were made using a peak detector. Any emission 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.
3. 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
4. The spectral diagrams in appendix I display the measurement of peak values.
5. Average value= PK value + Average Factor (duty factor)
6. Pulse Desensitization Correction Factor

   Pulse Width (PW) = 41.18ms

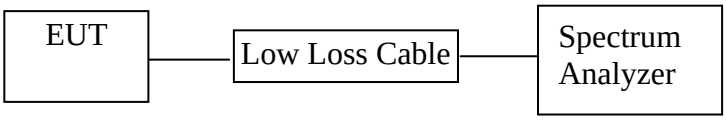
   1/PW = 1/41.18ms = 0.02kHz

RBW (100 kHz) > 1/PW (0.02 kHz)

Therefore PDCF is not needed

5. 20DB OCCUPIED BANDWIDTH

5.1. Block Diagram of Test Setup



(EUT: PIR Motion Detector)

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.

5.4. 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

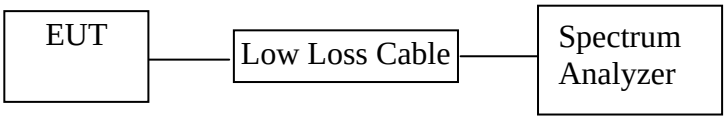
The EUT does meet the FCC requirement.

-20 dB bandwidth = 48.0 kHz <315MHz*0.25% = 787.5KHz.

The spectral diagrams in appendix I.

6. RELEASE TIME MEASUREMENT

6.1.Block Diagram of Test Setup



(EUT: PIR Motion Detector)

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

Section 15.231(e) devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

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.

6.4. 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.

6.5.2.Set EUT as normal operation.

6.5.3.Set SPA View. Delta Mark time.

6.6. Measurement Result

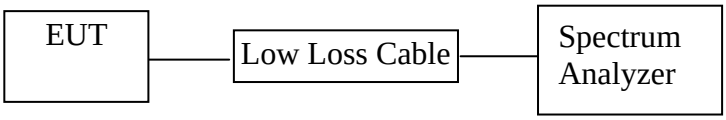
Test result: pass

Period Time = 26.6s
Duration time = 0.84s
Silent time = 26.6-0.84s = 25.76s>10s
Silent time = 26.6-0.84s = 25.76s>30*0.84s=25.2s

The spectral diagrams in appendix I.

7. AVERAGE FACTOR MEASUREMENT

7.1.Block Diagram of Test Setup



(EUT: PIR Motion Detector)

7.2.Average factor Measurement according to ANSI C63.4-2009

ANSI C63.4-2009 Section 13.4.2 Devices transmitting pulsed emissions and subject to a limit requiring an average detector function for radiated emissions shall initially be measured with an instrument that uses a peak detector. A radiated emission measured with a peak detector may then be corrected to a true average using the appropriate factor for emission duty cycle. This correction factor relates the measured peak level to the average limit and is derived by averaging absolute field strength over one complete pulse train that is 0.1 s, or less, in length. If the pulse train is longer than 0.1 s, the average shall be determined from the average absolute field strength during the 0.1 s interval in which the field strength is at a maximum.

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.

7.4. 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 = 100 kHz, VBW

= 300 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:

Effective period of the cycle = (0.62×21) + (1.76×16)ms=41.18 ms

DC = 41.18ms/100ms=41.18%

Therefore, the average factor is found by 20log0.4118= -7.706dB

The spectral diagrams in appendix I.

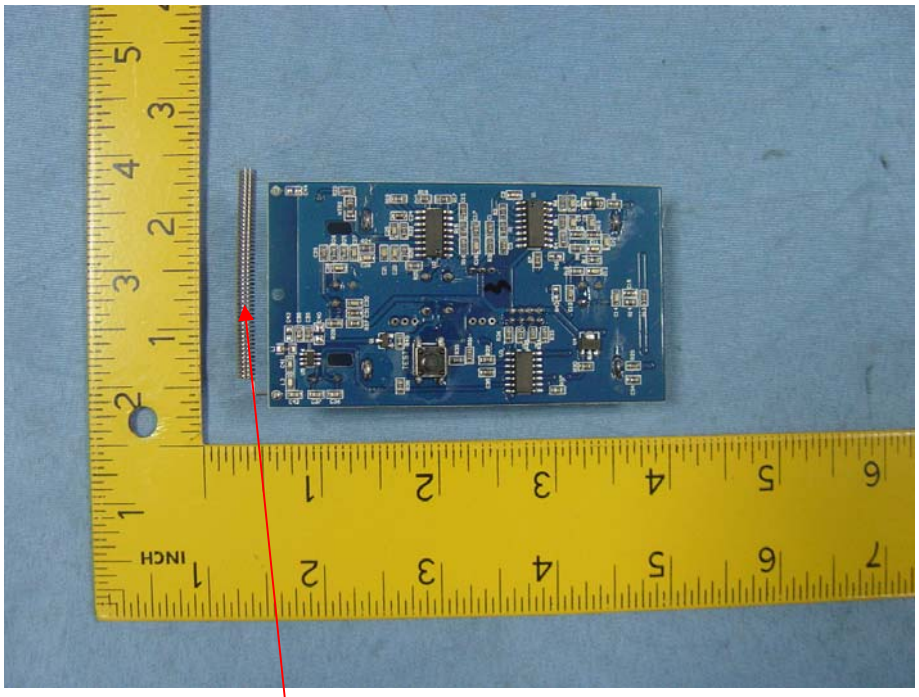
8. ANTENNA REQUIREMENT

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.



Antenna

APPENDIX I

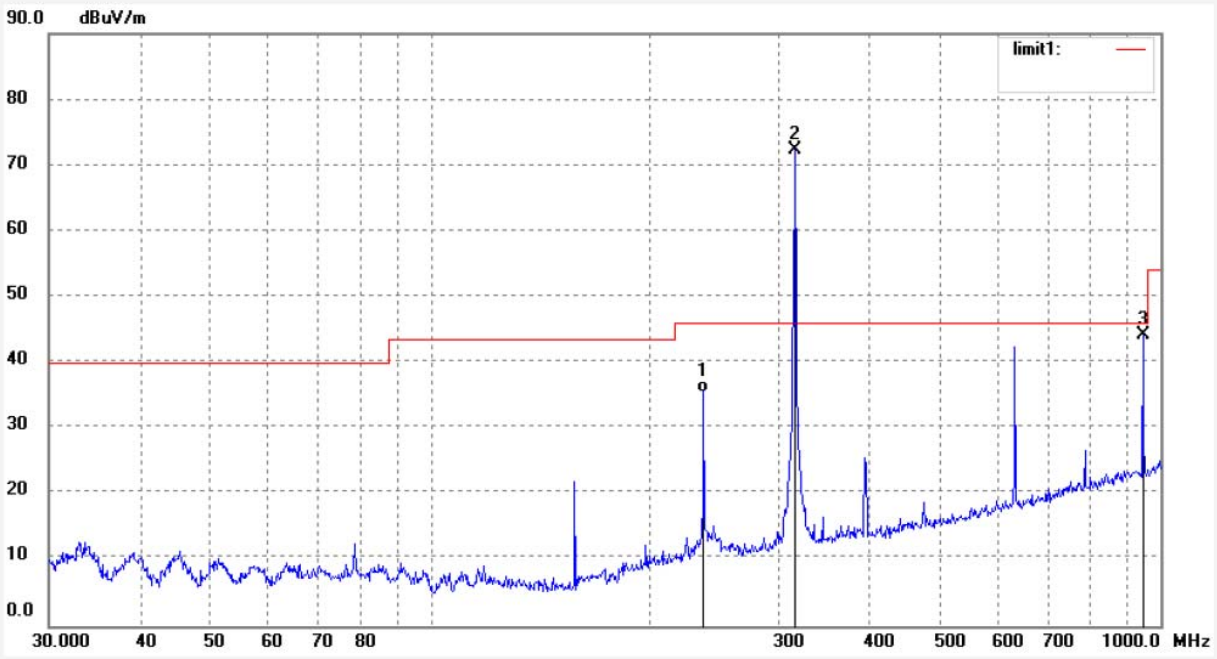
(Test Curves)

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.: alen #4049
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: PIR Motion Detector
Mode: TX 315MHz
Model: PIR-910
Manufacturer: Chuango

Polarization: Horizontal
Power Source: DC 3.0V
Date: 14/05/07/
Time: 10/25/07
Engineer Signature:
Distance: 3m

Note: Report No:ATE20140705



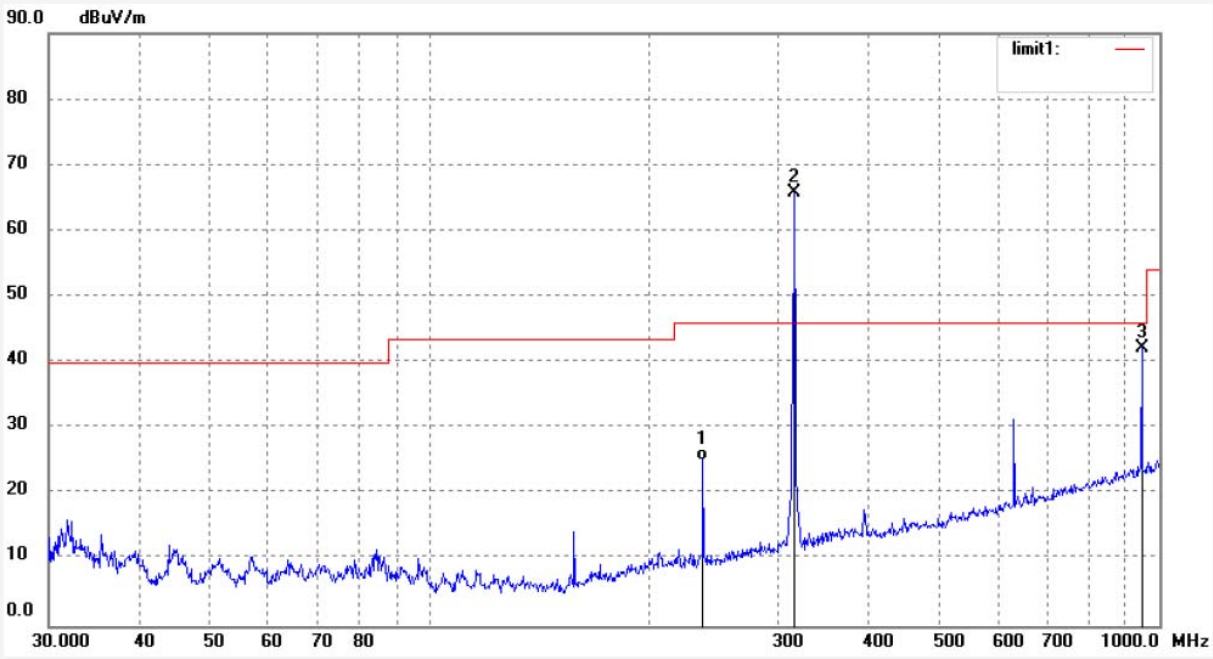
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	236.6447	55.35	-19.82	35.53	46.00	-10.47	QP			
2	315.4806	89.96	-17.52	72.44			peak			
3	945.4397	49.61	-5.45	44.16			peak			

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.: alen #4048
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: PIR Motion Detector
Mode: TX 315MHz
Model: PIR-910
Manufacturer: Chuango

Polarization: Vertical
Power Source: DC 3.0V
Date: 14/05/07/
Time: 10/22/42
Engineer Signature:
Distance: 3m

Note: Report No:ATE20140705



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	236.6447	44.89	-19.82	25.07	46.00	-20.93	QP			
2	315.4806	83.23	-17.52	65.71			peak			
3	945.4398	47.75	-5.45	42.30			peak			

ACCURATE TECHNOLOGY CO., LTD.
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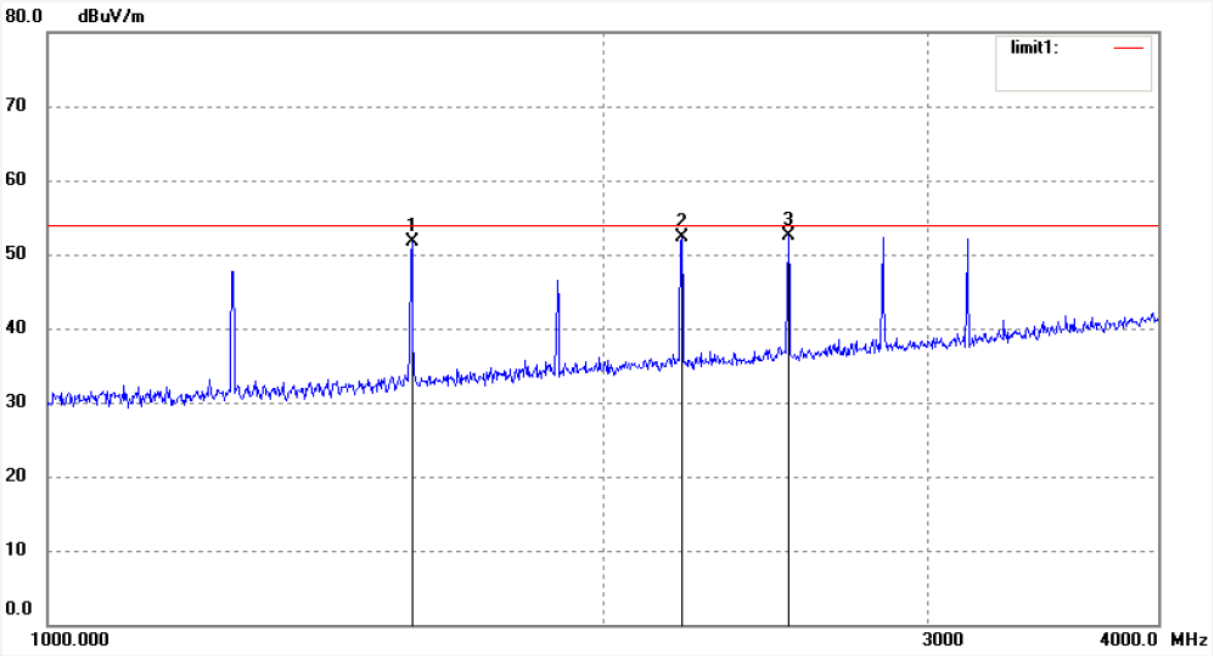
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: alen #4046	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 3.0V
Test item: Radiation Test	Date: 14/05/07/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/18/52
EUT: PIR Motion Detector	Engineer Signature:
Mode: TX 315MHz	Distance: 3m
Model: PIR-910	
Manufacturer: Chuango	

Note: Report No:ATE20140705



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1575.708	61.05	-9.40	51.65			peak			
2	2206.867	59.66	-7.26	52.40			peak			
3	2521.007	58.99	-6.43	52.56			peak			

ACCURATE TECHNOLOGY CO., LTD.
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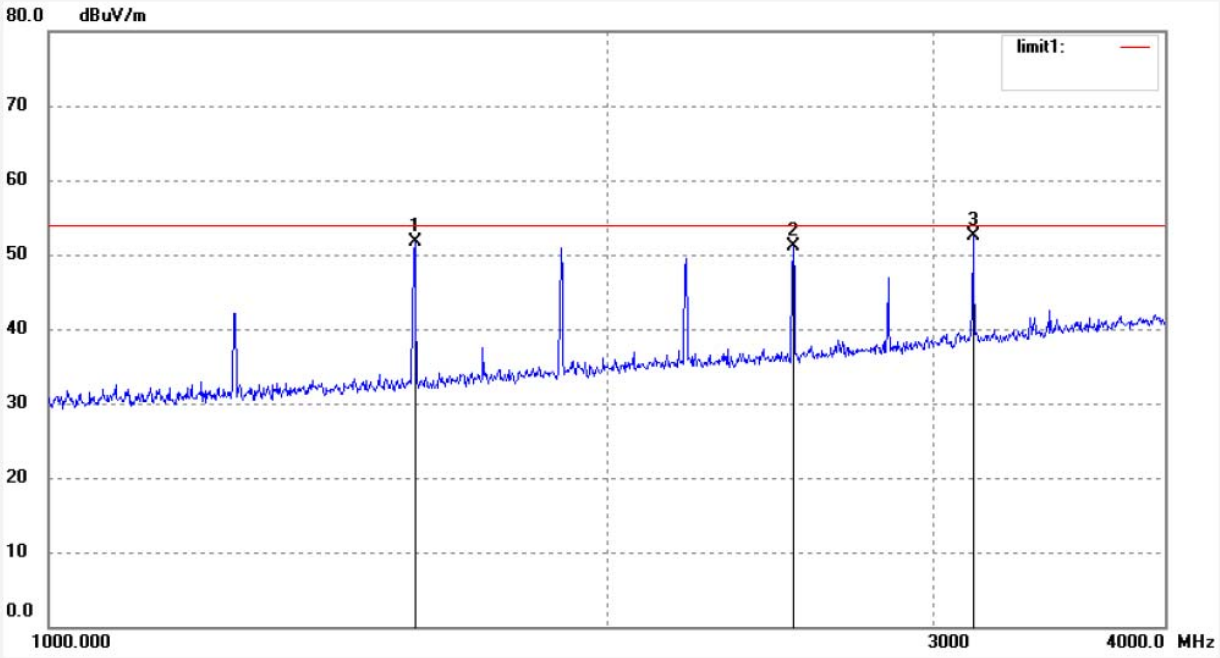
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

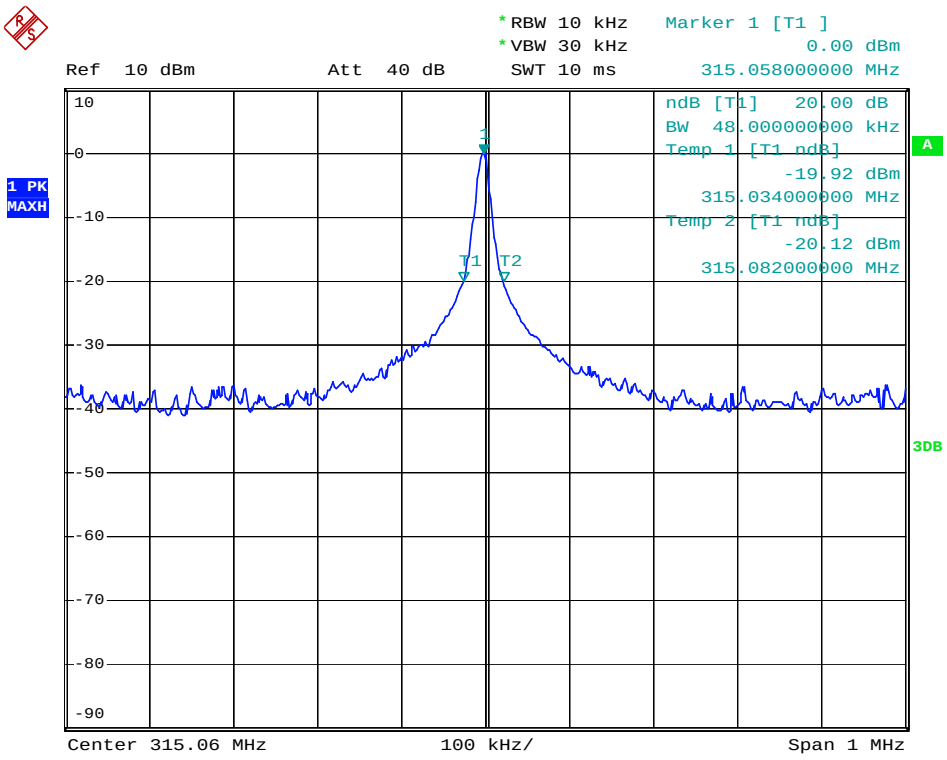
Job No.: alen #4047
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: PIR Motion Detector
Mode: TX 315MHz
Model: PIR-910
Manufacturer: Chuango

Polarization: Vertical
Power Source: DC 3.0V
Date: 14/05/07/
Time: 10/20/34
Engineer Signature:
Distance: 3m

Note: Report No:ATE20140705



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1575.708	61.18	-9.40	51.78			peak			
2	2521.007	57.52	-6.43	51.09			peak			
3	3151.416	57.02	-4.51	52.51			peak			



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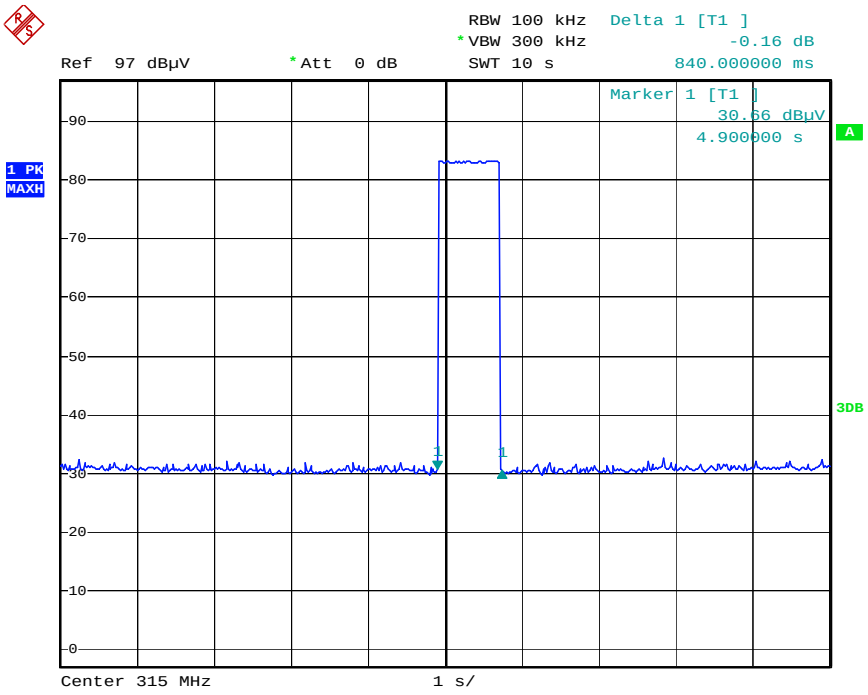

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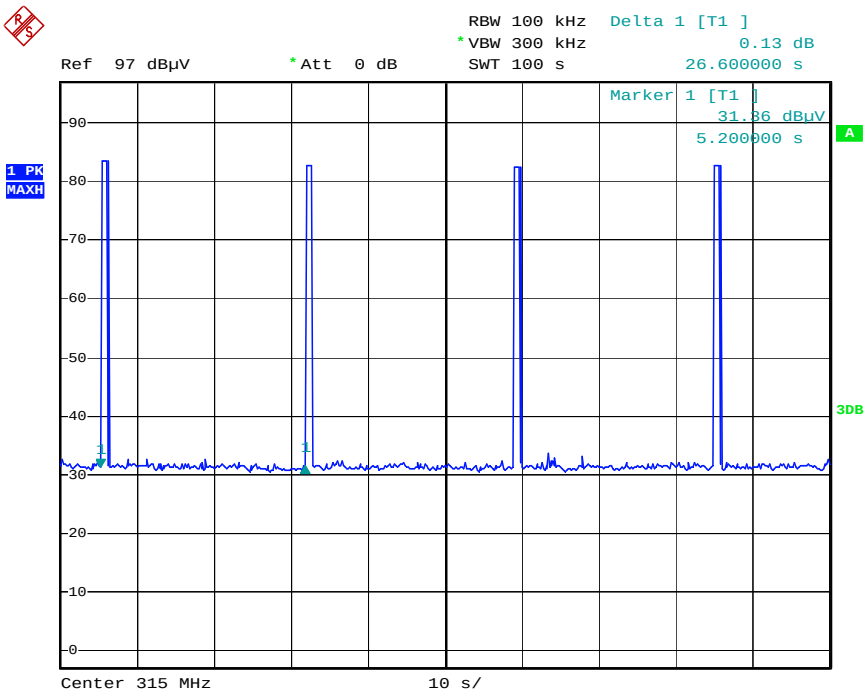

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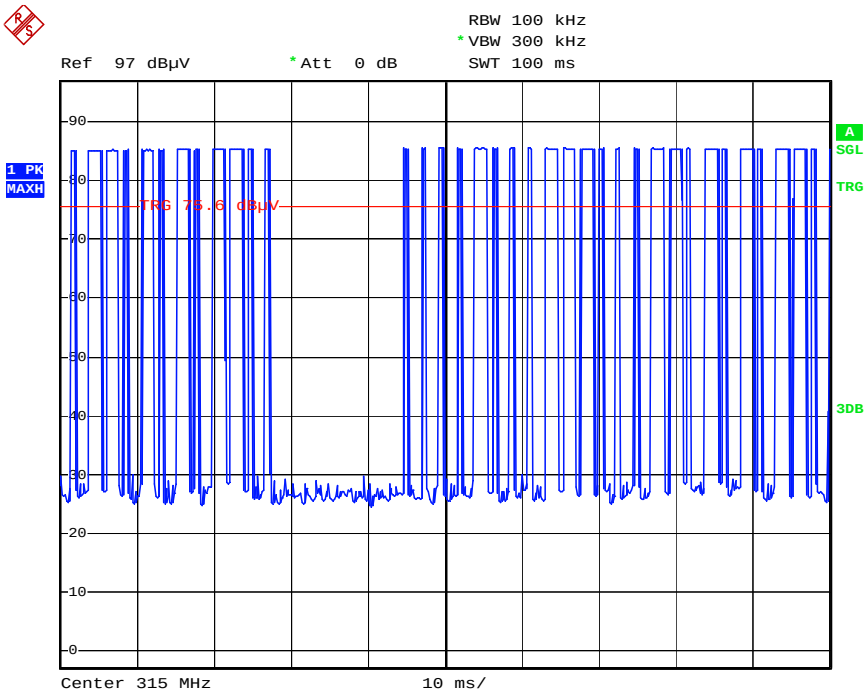
the duration of a transmission Time = 0.84s
the silent period between transmissions =(26.6-0.84)s=25.76s



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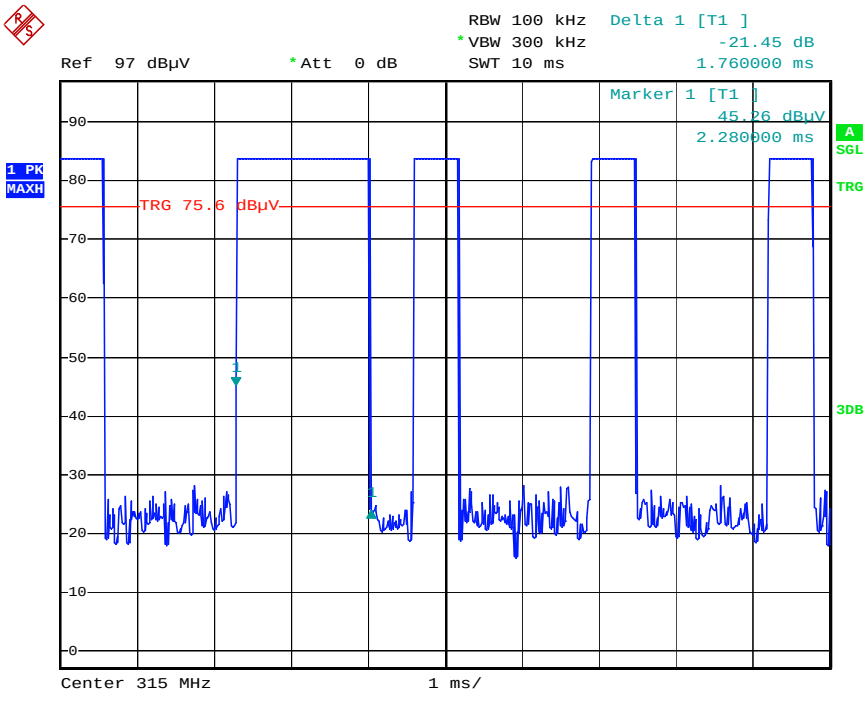

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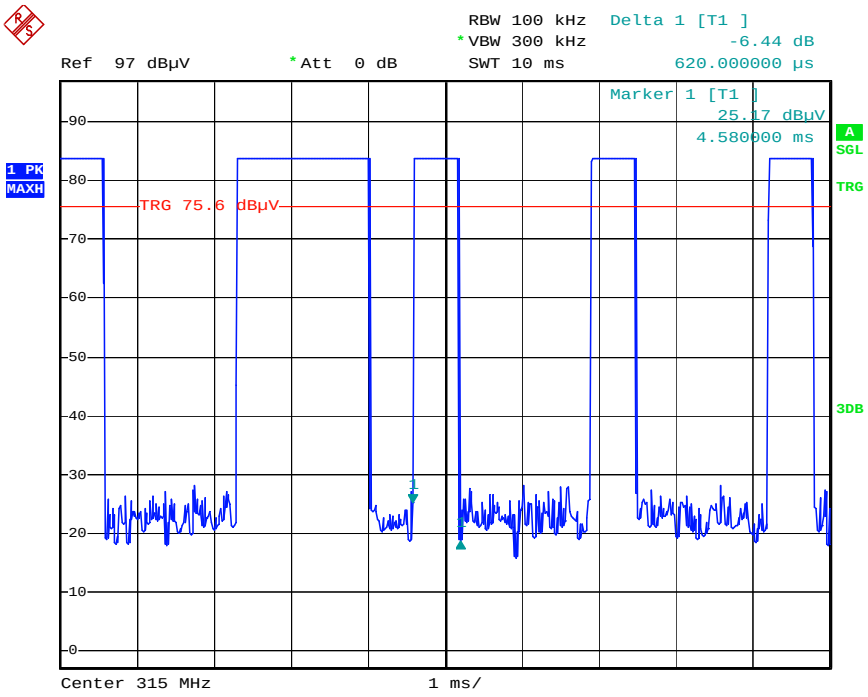
The graph shows the duration of ‘on’ signal. From marker 1 to Delta 1, duration is 1.76ms.



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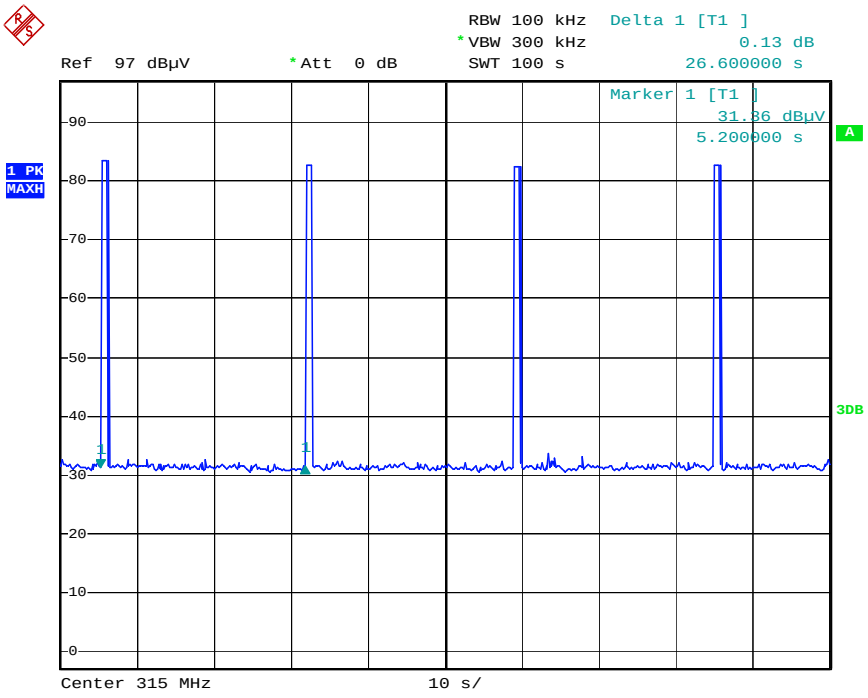
The graph shows the duration of ‘on’ signal. From marker 1 to Delta 1, duration is 0.62 ms.



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The graph shows the pattern of coding during the signal transmission.
The duration of one cycle = 26.6 s.