



MEASUREMENT REPORT

FCC PART 15.231(a) / RSS-210

FCC ID: VBA-EF301T

IC: 7098A-EF301T

APPLICANT: EverFlourish Electrical Co., Ltd.

Application Type: Certification

Product: Remote Control Transmitter

Model No.: EMW301T

Brand Name: EverFlourish

FCC Classification: FCC Part 15 Security/Remote Control Transmitter (DSC)

FCC Rule Part(s): Part 15.231

IC Rule(s): RSS-210 Issue 9

Test Procedure(s): ANSI C63.10-2013

Test Date: December 30, 2016 ~ January 08, 2017

Reviewed By : Robin Wu
(Robin Wu)

Approved By : Marlin Chen
(Marlin Chen)



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
1612RSU02101	Rev. 01	Initial report	01-16-2017	Valid

CONTENTS

Description	Page
1. INTRODUCTION	6
1.1. Scope	6
1.2. MRT Test Location	6
2. PRODUCT INFORMATION	7
2.1. Equipment Description	7
2.2. Test Standards	7
2.3. Test Methodology	7
2.4. EUT Setup and Test Mode	7
3. ANTENNA REQUIREMENTS	8
4. TEST EQUIPMENT CALIBRATION DATA	9
5. MEASUREMENT UNCERTAINTY	11
6. TEST RESULT	12
6.1. Summary	12
6.2. Radiated Emissions	13
6.2.1. Standard Applicable	13
6.2.2. Test Procedure	13
6.2.3. Test Setup	14
6.2.4. Test Results	15
6.3. 20dB Bandwidth	21
6.3.1. Standard Applicable	21
6.3.2. Test Procedure	21
6.3.3. Test Setup	21
6.3.4. Test Result	22
6.4. Release Time	23
6.4.1. Standard Applicable	23
6.4.2. Test Procedure	23
6.4.3. Test Setup	23
6.4.4. Test Result	24
6.5. Duty Cycle	25
6.5.1. Standard Applicable	25
6.5.2. Test Procedure	25
6.5.3. Test Setup	25
6.5.4. Test Result	26

7. CONCLUSION.....	28
--------------------	----

§2.1033 General Information

Applicant:	EverFlourish Electrical Co., Ltd.
Applicant Address:	Renjiu Village, Wuxiang Town, Yinzhou, Ningbo 315111 P.R.China
Manufacturer:	EverFlourish Electrical Co., Ltd.
Manufacturer Address:	Renjiu Village, Wuxiang Town, Yinzhou, Ningbo 315111 P.R.China
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
MRT FCC Registration No.:	809388
MRT IC Registration No.:	11384A
FCC Rule Part(s):	Part 15.231(a)
IC Rule(s):	RSS-210 Issue 9
Model No.	EMW301T
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering
FCC Classification:	FCC Part 15 Security/Remote Control Transmitter(DSC)

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.
- MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.
- MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.



1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on September 30, 2013.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Remote Control Transmitter
Model No.	EMW301T
Frequency Range	433.92 MHz
Type of modulation	ASK
Antenna Type	Integral Antenna
Antenna Gain	0dBi
Device Category	Portable Device

2.2. Test Standards

The following report is prepared on behalf of the **EverFlourish Electrical Co., Ltd.** in accordance with FCC Part 15, Subpart C, and section 15.231, 15.203, 15.205 and 15.209 of the Federal Communication Commission rules, and RSS-210 Issue 9 & RSS-Gen Issue 4 rules of IC rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.231, 15.203, 15.205 and 15.209 of the Federal Communication Commission rules, and RSS-210 Issue 9 & RSS-Gen Issue 4 rules of IC rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

2.3. Test Methodology

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013).

Deviation from measurement procedure.....None

2.4. EUT Setup and Test Mode

The EUT was operated at continuous transmitting mode that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
Mode 1	Transmitting	With modulation

3. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antenna of the **Remote Control Transmitter** is permanently attached.
- There are no provisions for connection to an external antenna.

Conclusion:

The Remote Control Transmitter **FCC ID: VBA-EF301T** unit complies with the requirement of §15.203.

4. TEST EQUIPMENT CALIBRATION DATA

Radiated Disturbance - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
MXE EMI Receiver	Agilent	N9038A	MRTSUE06125	1 year	2017/08/03
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06121	1 year	2017/12/10
TRILOG Antenna	Schwarzbeck	VULB9162	MRTSUE06022	1 year	2017/10/22
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2017/11/19
Loop Antenna	Schwarzbeck	FMZB1519	MRTSUE06025	1 year	2017/12/14
Digital Thermometer & Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2017/12/14
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2017/05/10

20dB Bandwidth - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
MXE EMI Receiver	Agilent	N9038A	MRTSUE06125	1 year	2017/08/03
TRILOG Antenna	Schwarzbeck	VULB9162	MRTSUE06022	1 year	2017/10/22
Digital Thermometer & Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2017/12/14
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2017/05/10

Release Time - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
EMI Test Receiver	R&S	ESR 3.6	MRTSUE06186	1 year	2017/04/28
TRILOG Antenna	Schwarzbeck	VULB9162	MRTSUE06022	1 year	2017/10/22
Digital Thermometer & Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2017/12/14
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2017/05/10

Duty Cycle - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
EMI Test Receiver	R&S	ESR 3.6	MRTSUE06186	1 year	2017/04/28
TRILOG Antenna	Schwarzbeck	VULB9162	MRTSUE06022	1 year	2017/10/22
Digital Thermometer & Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2017/12/14
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2017/05/10

Software	Version	Function
e3	V8.3.5	EMI Test Software

5. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Radiated Emission Measurement - AC2

Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$):

9kHz ~ 1GHz: 4.18dB

1GHz ~ 18GHz: 4.76dB

6. TEST RESULT

6.1. Summary

Company Name: EverFlourish Electrical Co., Ltd.

FCC ID: VBA-EF301T

IC: 7098A-EF301T

FCC Part Section(s)	IC Section(s)	Test Description	Test Condition	Test Result
15.205 15.231(b)	RSS-210, A1.2	Radiated Spurious Emissions	Radiated	Pass
15.231(c)	RSS-210, A1.3	20dB Bandwidth		Pass
15.231(a)(1)	RSS-210, A1.1(a)	Release Time		Pass
15.231(b)	RSS-Gen, 6.10	Duty Cycle		Pass

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

6.2. Radiated Emissions

6.2.1. Standard Applicable

According to §15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 - 40.70	2250	225
70 - 130	1250	125
130 - 174	¹ 1250 to 3750	¹ 125 to 375
174 - 260	3750	375
260 - 470	¹ 3750 to 12500	¹ 375 to 1250
Above 470	12500	1250

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength.

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements start below or at the lowest crystal frequency.

Compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section.

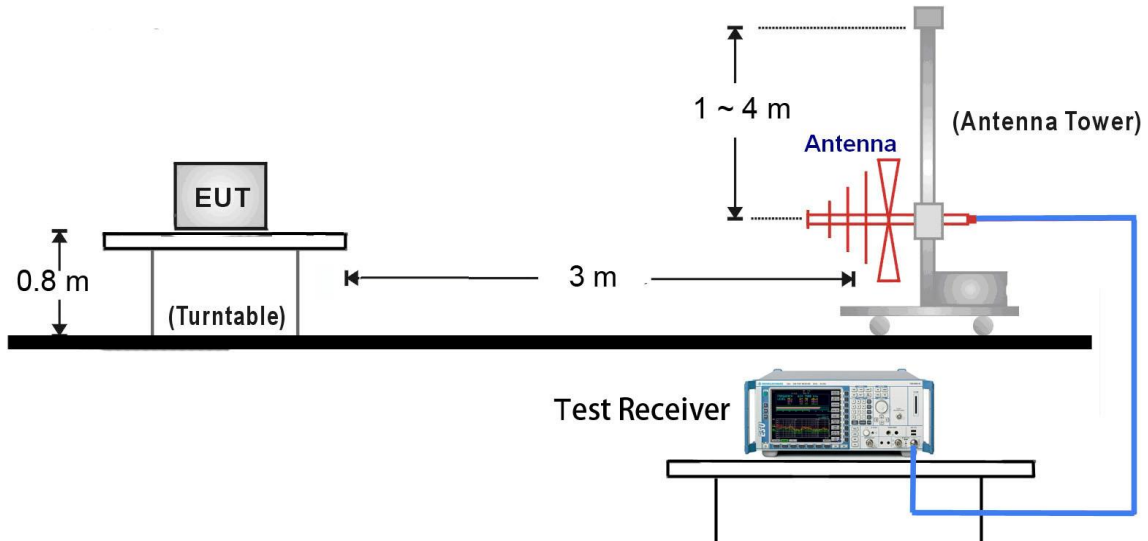
6.2.2. Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.231(b) and FCC Part 15.209 Limit.

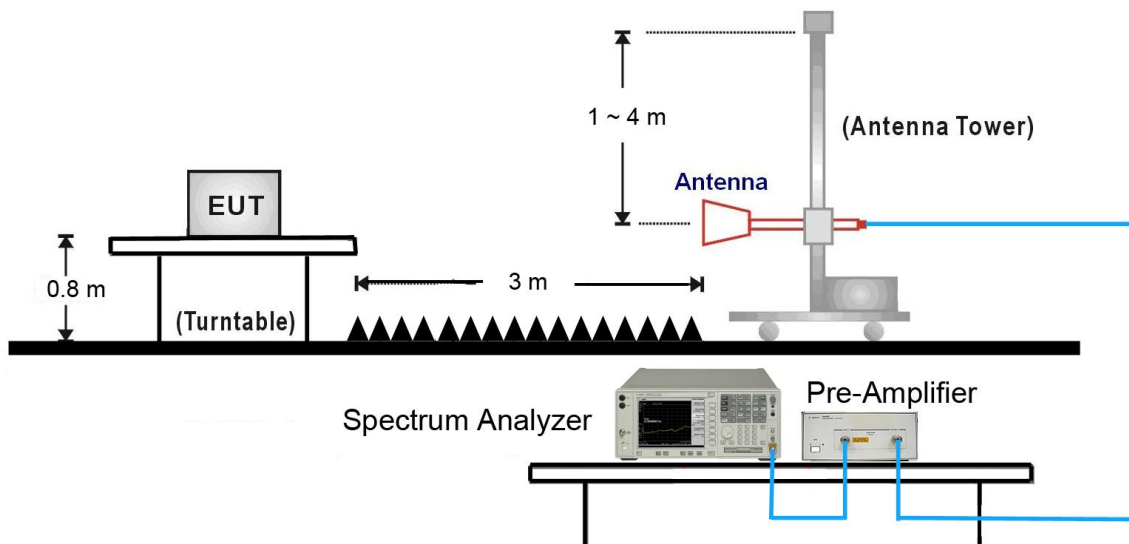
6.2.3. Test Setup

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.231(a) and FCC Part 15.209 Limit.

30MHz ~ 1GHz Test Setup:

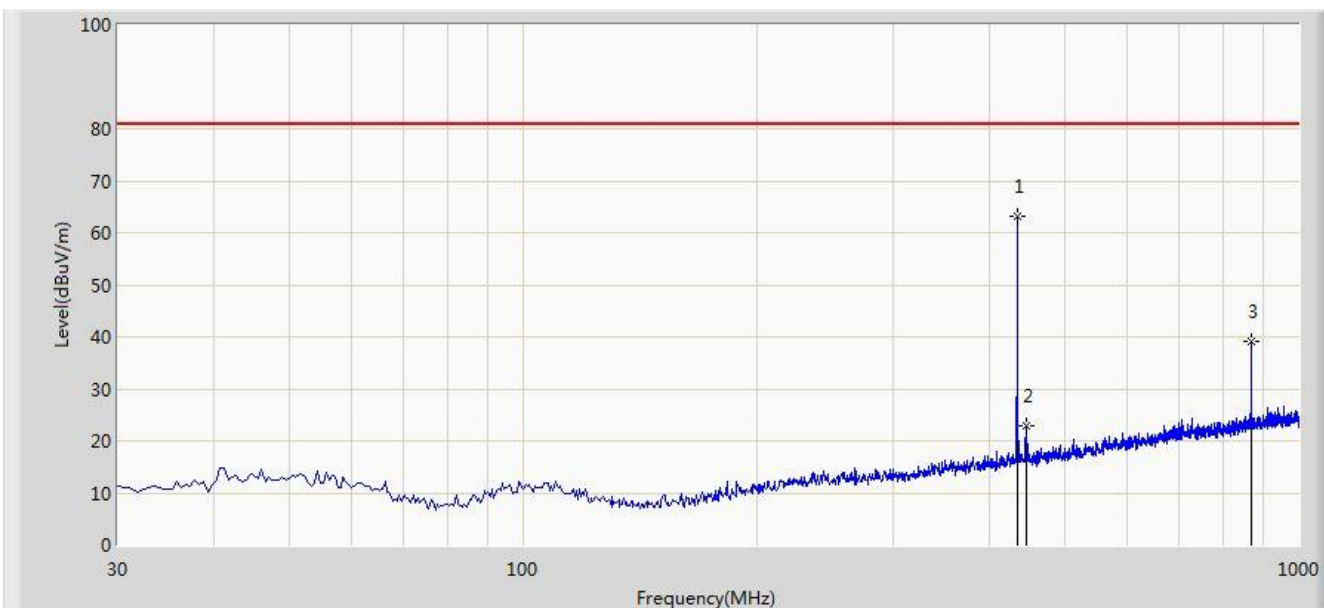


1GHz ~ 5GHz Test Setup:



6.2.4. Test Results

Site: AC2	Time: 2016/12/31 - 02:16
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT: Remote Control Transmitter	Power: By Battery
Note: Transmit	



No	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
1	433.920	46.004	17.196	N/A	63.200	100.825	-37.625	PK
	433.920	46.004	17.196	-9.650	53.550	80.825	-27.275	AV
2	445.645	5.553	17.356	N/A	22.909	80.825	-57.916	PK
	445.645	5.553	17.356	-9.650	13.259	60.825	-47.566	AV
3	867.595	15.407	23.864	N/A	39.271	80.825	-41.554	PK
	867.595	15.407	23.864	-9.650	29.621	60.825	-31.204	AV

Note 1: Testing is carried out with frequency rang 9 kHz to the tenth harmonics. There is the ambient noise within frequency range 9 kHz ~ 30 MHz, the permissible value is not show in the report.

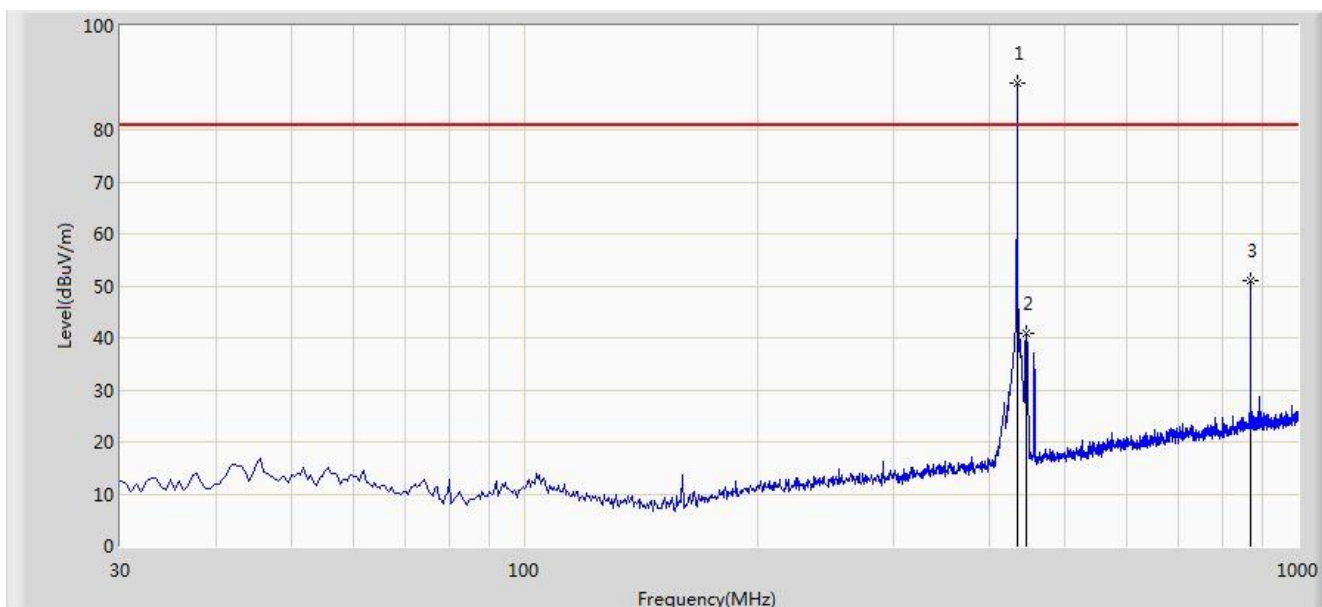
Note 2: The fundamental frequency is 433.92MHz, so the fundamental and spurious emissions radiated limit base on the operating frequency 433.92MHz.

Note 3: Peak Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB).

AV Measure Level = Peak Measure Level + Duty Cycle Factor.

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC2	Time: 2016/12/31 - 02:17
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT: Remote Control Transmitter	Power: By Battery
Note: Transmit	



No	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
1	433.920	71.850	17.196	N/A	89.046	100.825	-11.779	PK
	433.920	71.850	17.196	-9.650	79.396	80.825	-1.429	AV
2	445.645	23.577	17.356	N/A	40.933	80.825	-39.892	PK
	445.645	23.577	17.356	-9.650	31.283	60.825	-29.542	AV
3	867.595	27.010	23.864	N/A	50.874	80.825	-29.951	PK
	867.595	27.010	23.864	-9.650	41.224	60.825	-19.601	AV

Note 1: Testing is carried out with frequency rang 9 kHz to the tenth harmonics. There is the ambient noise within frequency range 9 kHz ~ 30 MHz, the permissible value is not show in the report.

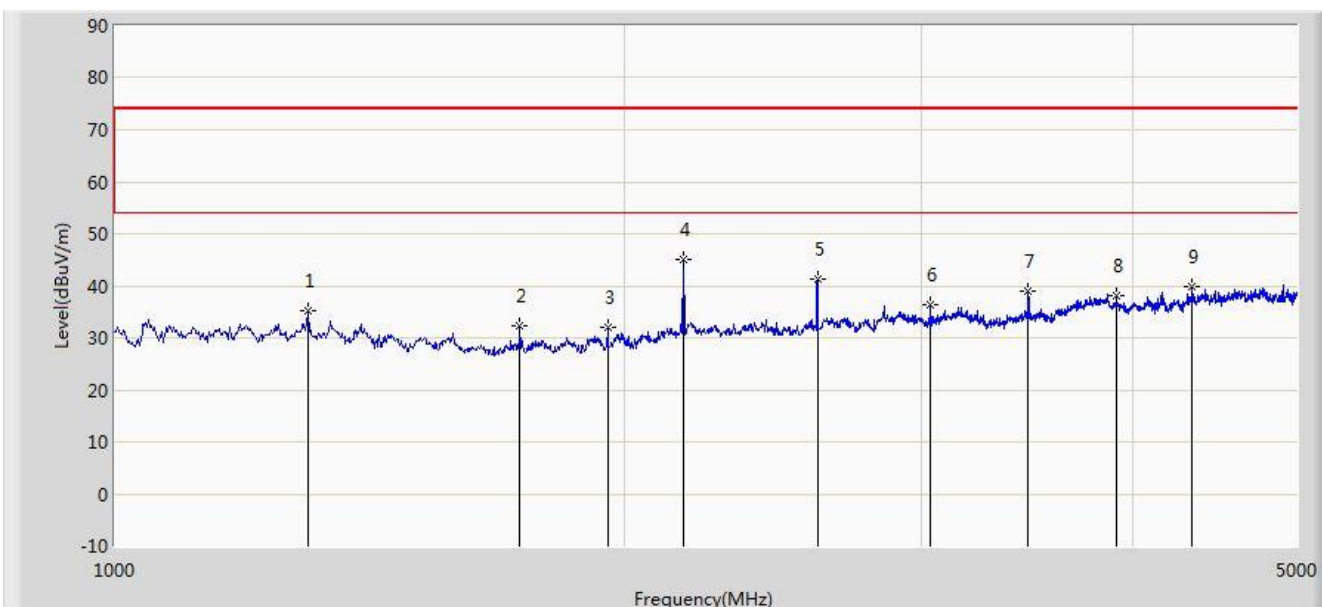
Note 2: The fundamental frequency is 433.92MHz, so the fundamental and spurious emissions radiated limit base on the operating frequency 433.92MHz.

Note 3: Peak Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB).

AV Measure Level = Peak Measure Level + Duty Cycle Factor.

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC2	Time: 2016/12/31 - 03:22
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Remote Control Transmitter	Power: By Battery
Note: Transmit	



No	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Dutycycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
1	1302.000	40.540	-5.363	N/A	35.177	74.000	-38.823	PK
	1302.000	40.540	-5.363	-9.650	25.527	54.000	-28.473	AV
2	1736.000	38.542	-6.082	N/A	32.460	80.825	-48.365	PK
	1736.000	38.542	-6.082	-9.650	22.810	60.825	-38.015	AV
3	1958.000	36.742	-4.809	N/A	31.933	80.825	-48.892	PK
	1958.000	36.742	-4.809	-9.650	22.283	60.825	-38.542	AV
4	2170.000	47.939	-2.813	N/A	45.126	80.825	-35.699	PK
	2170.000	47.939	-2.813	-9.650	35.476	60.825	-25.349	AV
5	2604.000	44.199	-2.790	N/A	41.409	80.825	-39.416	PK
	2604.000	44.199	-2.790	-9.650	31.759	60.825	-29.066	AV
6	3036.000	39.158	-2.869	N/A	36.289	80.825	-44.536	PK
	3036.000	39.158	-2.869	-9.650	26.639	60.825	-34.186	AV
7	3470.000	40.700	-1.574	N/A	39.126	80.825	-41.699	PK
	3470.000	40.700	-1.574	-9.650	29.476	60.825	-31.349	AV
8	3912.000	38.556	-0.537	N/A	38.019	74.000	-35.981	PK
	3912.000	38.556	-0.537	-9.650	28.369	54.000	-25.631	AV

9	4338.000	38.829	1.082	N/A	39.911	74.000	-34.089	PK
	4338.000	38.829	1.082	-9.650	30.261	54.000	-23.739	AV

Note 1: Testing is carried out with frequency rang 9 kHz to the tenth harmonics. There is the ambient noise within frequency range 9 kHz ~ 30 MHz, the permissible value is not show in the report.

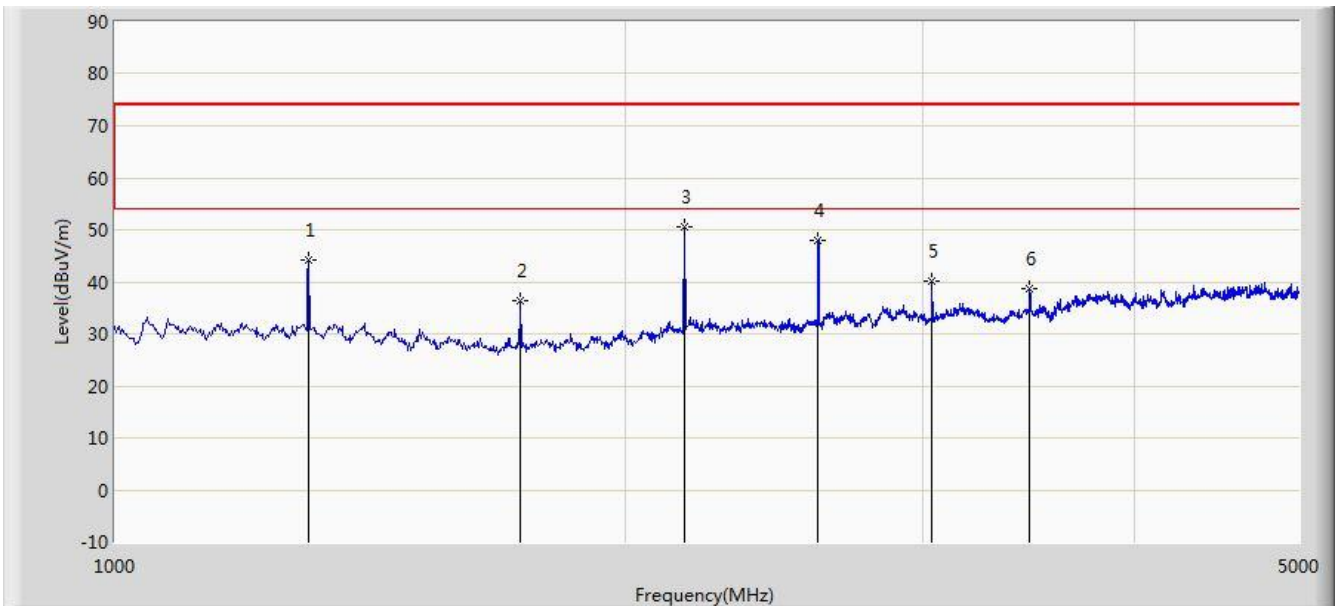
Note 2: The fundamental frequency is 433.92MHz, so the fundamental and spurious emissions radiated limit base on the operating frequency 433.92MHz.

Note 3: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB).

AV Measure Level = Peak Measure Level - Duty Cycle Factor.

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB).

Site: AC2	Time: 2016/12/31 - 03:23
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Remote Control Transmitter	Power: By Battery
Note: Transmit	



No	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Dutycycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
1	1302.000	49.618	-5.363	N/A	44.255	74.000	-29.745	PK
	1302.000	49.618	-5.363	-9.650	34.605	54.000	-19.395	AV
2	1736.000	42.480	-6.082	N/A	36.398	80.825	-44.427	PK
	1736.000	42.480	-6.082	-9.650	26.748	60.825	-34.077	AV
3	2170.000	53.438	-2.813	N/A	50.625	80.825	-30.200	PK
	2170.000	53.438	-2.813	-9.650	40.975	60.825	-19.850	AV
4	2602.000	50.735	-2.791	N/A	47.944	80.825	-32.881	PK
	2602.000	50.735	-2.791	-9.650	38.294	60.825	-22.531	AV
5	3036.000	43.010	-2.869	N/A	40.141	80.825	-40.684	PK
	3036.000	43.010	-2.869	-9.650	30.491	60.825	-30.334	AV
6	3470.000	40.127	-1.574	N/A	38.553	80.825	-42.272	PK
	3470.000	40.127	-1.574	-9.650	28.903	60.825	-31.922	AV

Note 1: Testing is carried out with frequency rang 9 kHz to the tenth harmonics. There is the ambient noise within frequency range 9 kHz ~ 30 MHz, the permissible value is not show in the report.

Note 2: The fundamental frequency is 433.92MHz, so the fundamental and spurious emissions radiated limit base on the operating frequency 433.92MHz.

Note 3: Peak Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB).

AV Measure Level = Peak Measure Level - Duty Cycle Factor.

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB).

6.3. 20dB Bandwidth

6.3.1. Standard Applicable

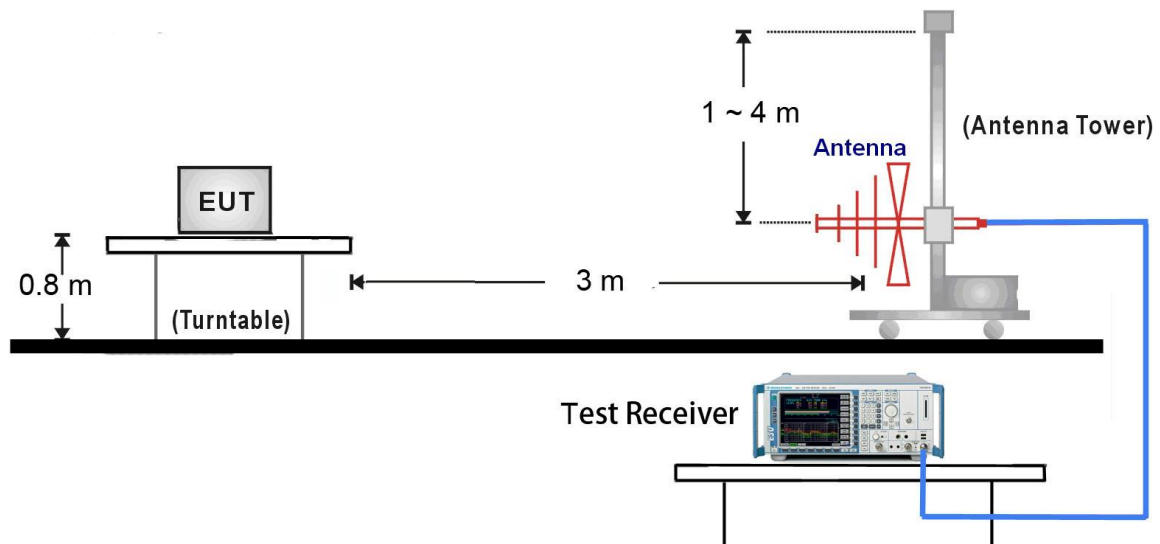
According to FCC Part 15.231(c), the bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

According to RSS-210, A1.3, the 99% bandwidth of momentarily operated devices shall be less or equal to 0.25% of the centre frequency for devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the 99% bandwidth shall be less or equal to 0.5% of the centre frequency.

6.3.2. Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna, which was connected to the spectrum analyzer with the START, and STOP frequencies set to the EUT's operation band.

6.3.3. Test Setup

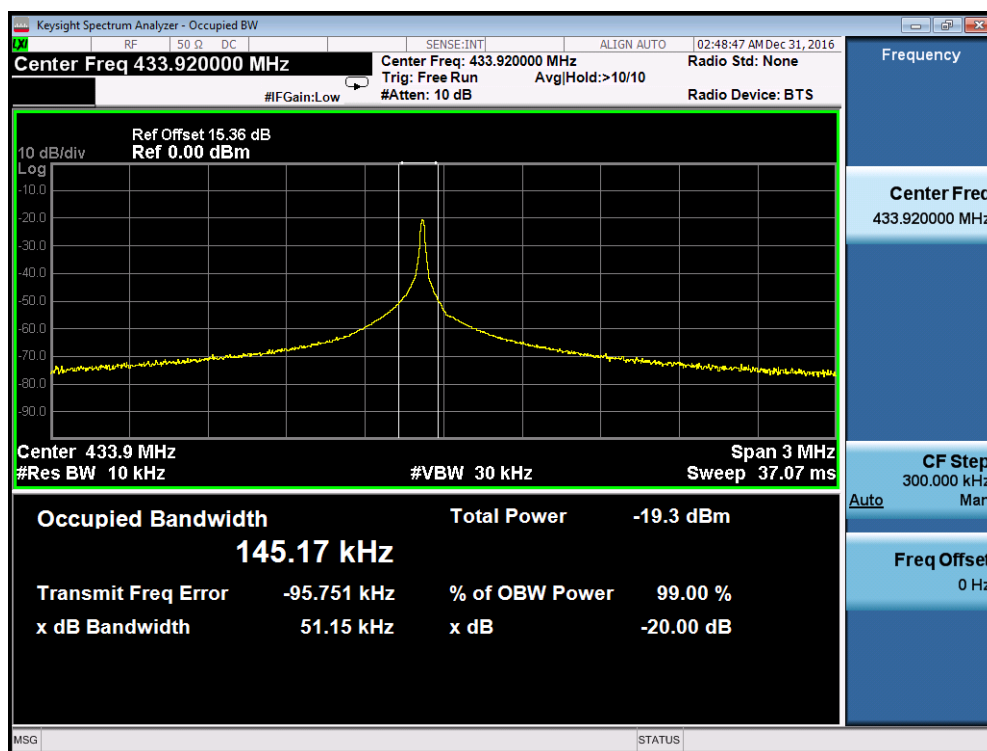


6.3.4. Test Result

Test Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Result
433.92	51.15	≤ 1084.80	Pass

Limit = Fundamental Frequency * 0.25% = 433.92 MHz * 0.25% = 1084.80 kHz

20dB Bandwidth Test Plot



6.4. Release Time

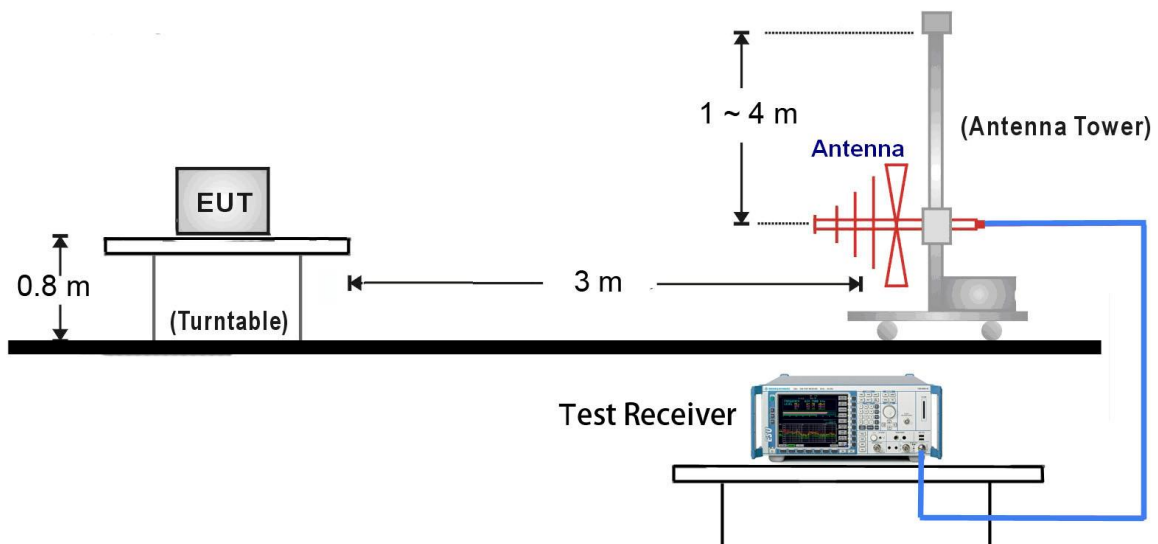
6.4.1. Standard Applicable

According to FCC 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.

6.4.2. Test Procedure

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer. Set the center frequency to 433.92MHz, then set the spectrum analyzer to Zero Span for the release time reading. During the testing, the switch was released then the EUT automatically deactivated.

6.4.3. Test Setup

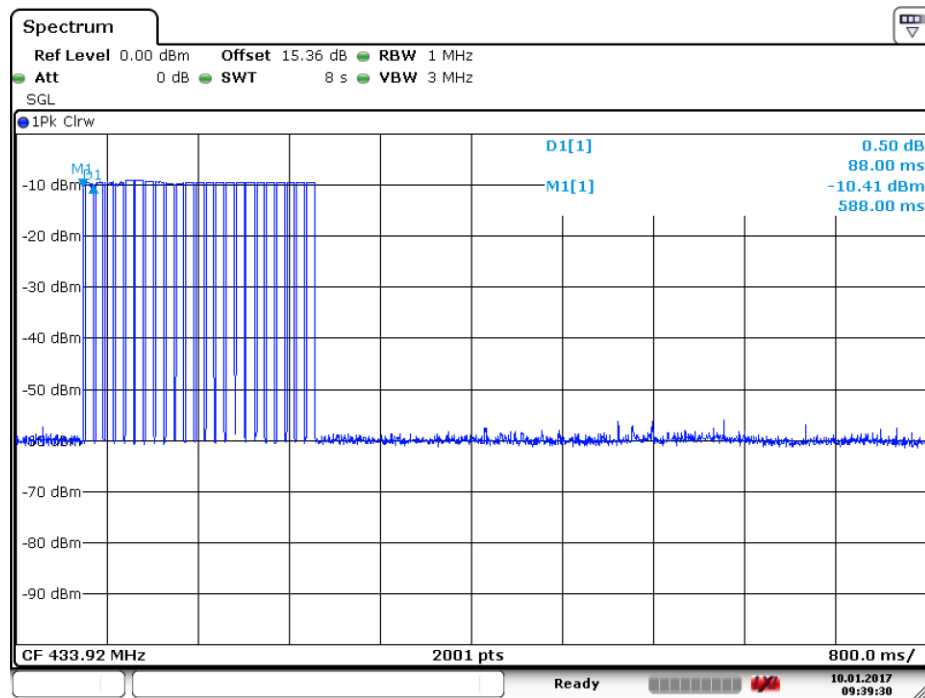


6.4.4. Test Result

Item	Measured Value	Limit	Result
Release Time	2.024 s	≤ 5 s	Pass

Release Time (s) = 0.088 * 23 = 2.024s

Release Time



Date: 10. JAN 2017 09:39:30

6.5. Duty Cycle

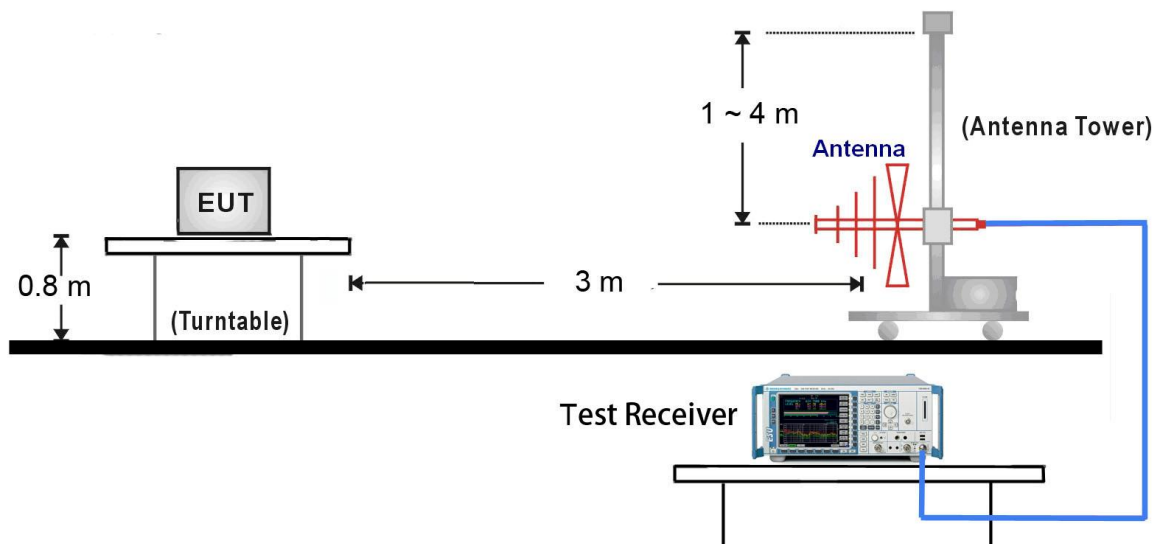
6.5.1. Standard Applicable

According to FCC Part 15.231(b) and 15.35(c), for pulse operation transmitter, the averaging pulsed emissions are calculated by peak value of measured emission plus duty cycle factor.

6.5.2. Test Procedure

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer. Set the center frequency to 433.92MHz, then set the spectrum analyzer to Zero Span for the release time reading. During the testing, the switch was released then the EUT automatically deactivated.

6.5.3. Test Setup



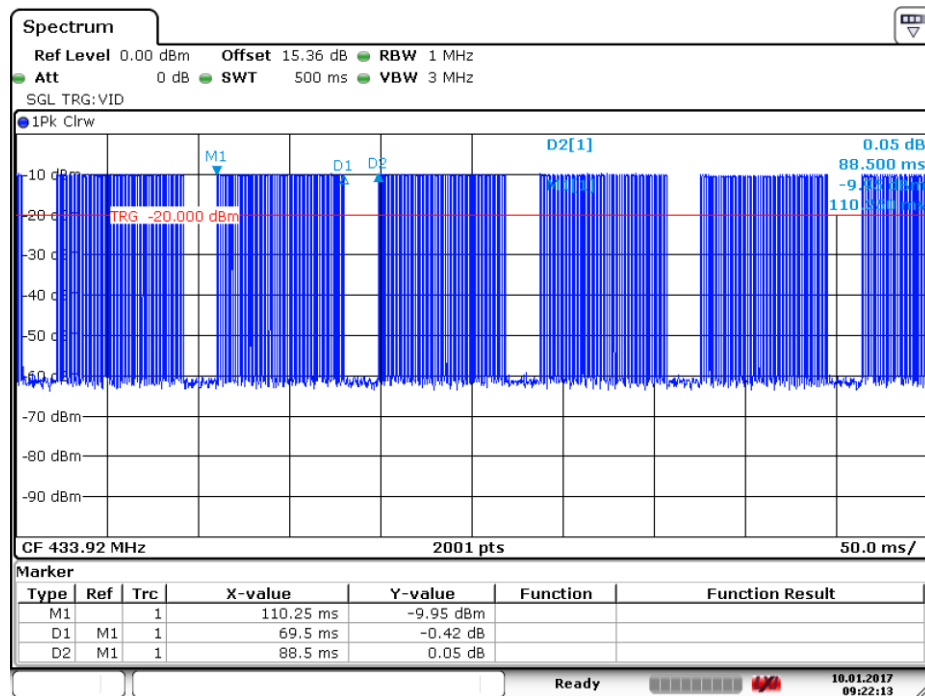
6.5.4. Test Result

Total Time (Ton) (ms)	The duration of one cycle (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
29.15	88.50	32.94	-9.65

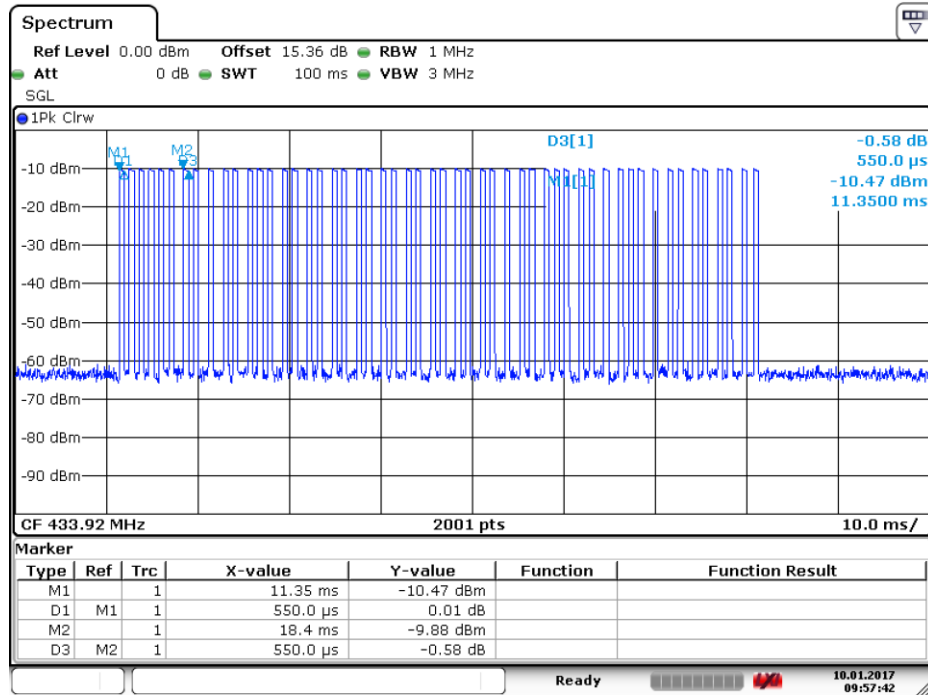
Note: Duty Cycle Factor = $20 \cdot \log(\text{Duty Cycle})$.

Total Time (Ton)(ms)= $0.55 \cdot 6 + 0.55 \cdot 47 = 29.15(\text{ms})$

Width of Pulse



Date: 10.JAN.2017 09:22:14



Date: 10.JAN.2017 09:57:43

7. CONCLUSION

The data collected relate only the item(s) tested and show that the **Remote Control Transmitter** **FCC ID: VBA-EF301T** is in compliance with FCC Part 15.231 of the FCC Rules and IC Rules.

The End