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Report No.: 1709RSU00101
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MEASUREMENT REPORT

FCC PART 15.231(a)

FCC ID: 2ANHJGDR12

APPLICANT: Shanghai shengzhen commercial & trade Ltd company

Application Type: Certification

Product: Remote Control

Model No.: GD-R12

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

FCC Rule Part(s): Part 15.231(a)

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

Test Date: September 01~ September 14, 2017

Reviewed By : Kevin Guo
(Kevin Guo)

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
1709RSU00101	Rev. 01	Initial report	09-14-2017	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	8
3. ANTENNA REQUIREMENTS	9
4. TEST EQUIPMENT CALIBRATION DATA	10
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	16
6.3. 20dB Bandwidth	22
6.3.1. Standard Applicable	22
6.3.2. Test Procedure.....	22
6.3.3. Test Setup.....	22
6.3.4. Test Result.....	23
6.4. Release Time.....	24
6.4.1. Standard Applicable	24
6.4.2. Test Procedure.....	24
6.4.3. Test Setup.....	24
6.4.4. Test Result.....	25
6.5. Duty Cycle	26
6.5.1. Standard Applicable	26
6.5.2. Test Procedure.....	26
6.5.3. Test Setup.....	26
6.5.4. Test Result.....	27

CONCLUSION.....	28
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§2.1033 General Information

Applicant:	Shanghai shengzhen commercial & trade Ltd company
Applicant Address:	Xinlong road No.1373 Room 606 Minhang Distirct Shanghai China
Manufacturer:	Shanghai shengzhen commercial & trade Ltd company
Manufacturer Address:	Xinlong road No.1373 Room 606 Minhang Distirct Shanghai China
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
MRT Registration No.:	893164
FCC Rule Part(s):	Part 15.231(a)
Model No.	GD-R12
FCC ID:	2ANHJGDR12
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. 893164) 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
Model No.	GD-R12
Frequency Range	390 MHz
Type of modulation	ASK
Antenna Type	Integral Antenna
Antenna Gain	0 dBi

2.2. Test Standards

The following report is prepared on behalf of the Shanghai shengzhen commercial & trade Ltd company 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.

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.

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** is permanently attached.
- There are no provisions for connection to an external antenna.

Conclusion:

The Remote Control **FCC ID: 2ANHJGDR12** unit complies with the requirement of §15.203.

4. TEST EQUIPMENT CALIBRATION DATA

Radiated Disturbance – AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
MXE EMI Receiver	Agilent	N9038A	MRTSUE06125	1 year	2018/08/03
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2018/03/28
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2017/11/19
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06023	1 year	2017/10/22
Loop Antenna	Schwarzbeck	FMZB1519	MRTSUE06025	1 year	2017/11/21
Digital Thermometer & Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2017/11/29
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2018/05/10

20dB Bandwidth – AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
MXE EMI Receiver	Agilent	N9038A	MRTSUE06125	1 year	2018/08/03
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2017/11/19
Digital Thermometer & Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2017/11/29
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2018/05/10

Release Time – AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
MXE EMI Receiver	Agilent	N9038A	MRTSUE06125	1 year	2018/08/03
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2017/11/19
Digital Thermometer & Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2017/11/29
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2018/05/10

Duty Cycle – AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
MXE EMI Receiver	Agilent	N9038A	MRTSUE06125	1 year	2018/08/03
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2017/11/19
Digital Thermometer & Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2017/11/29
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2018/05/10

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 – AC1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 18GHz: 4.76dB
Release Time Measurement – AC1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.09ms

6. TEST RESULT

6.1. Summary

Company Name: Shanghai shengzhen commercial & trade Ltd company

FCC ID: 2ANHJGDR12

FCC Part Section(s)	Test Description	Test Condition	Test Result
15.205 15.231(b)	Radiated Spurious Emissions	Radiated	Pass
15.231(c)	20dB Bandwidth		Pass
15.231(a)(1)	Release Time		Pass
15.231(b)	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) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- 4) 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.

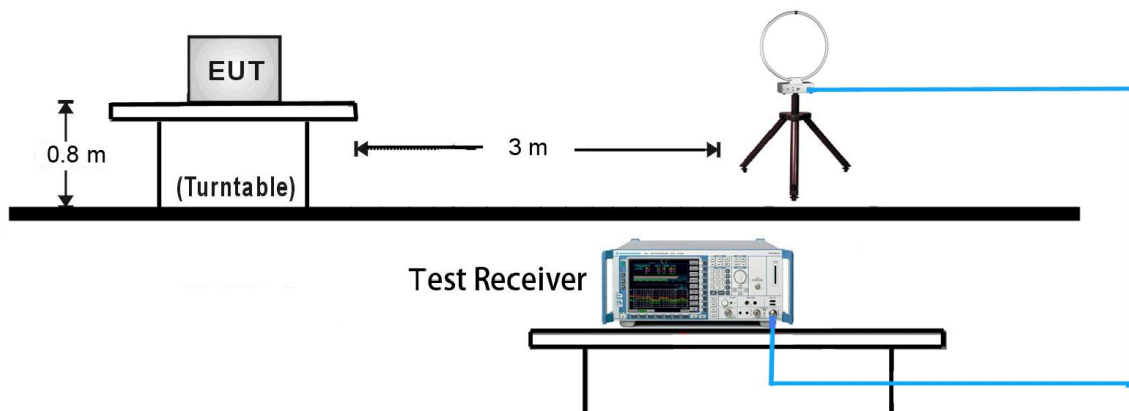
6.2.2. Test Procedure

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.

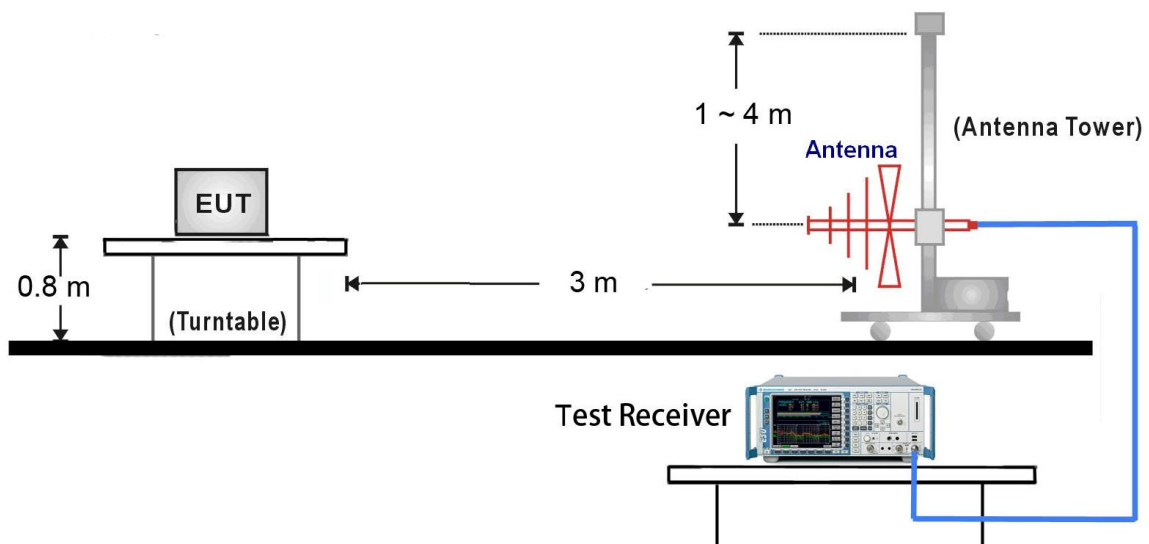
6.2.3. Test Setup

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

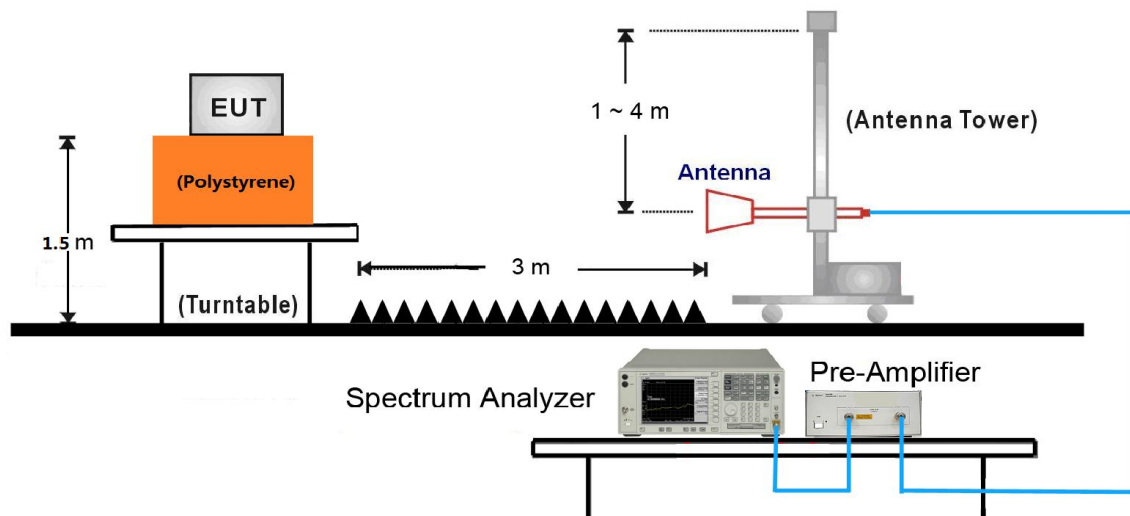
9kHz ~ 30MHz Test Setup:



30MHz ~ 1GHz Test Setup:

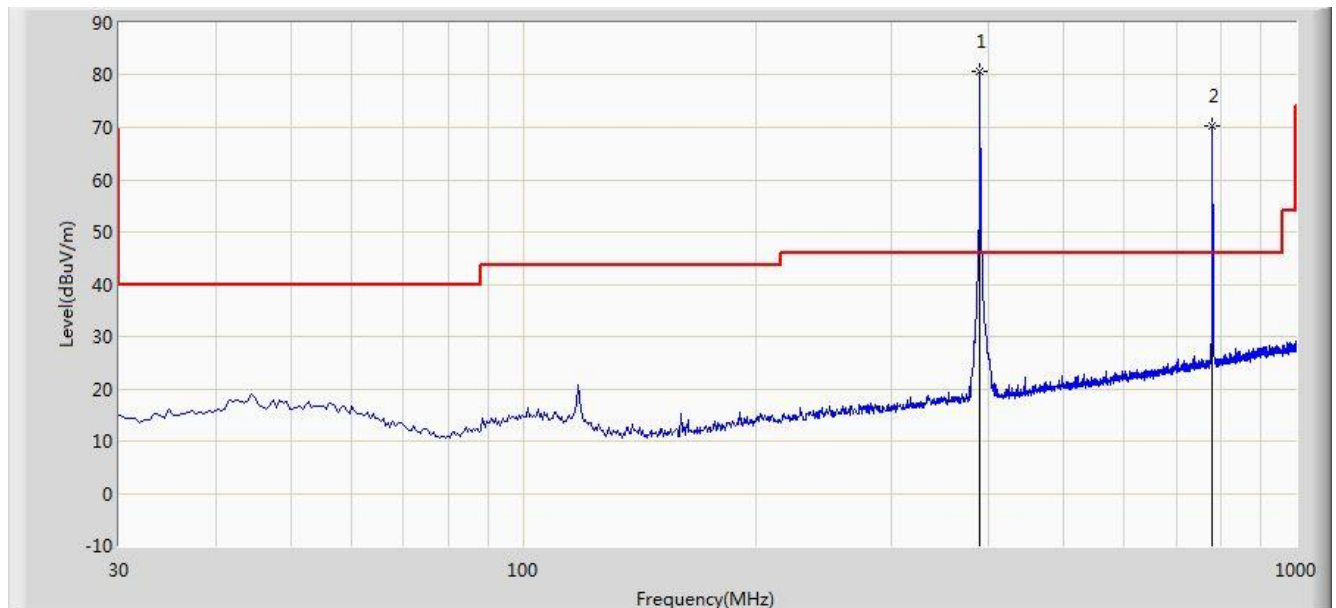


1GHz ~ 18GHz Test Setup:



6.2.4. Test Results

Site: AC1	Time: 2017/09/15 - 14:42
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168 _20-2000MHz	Polarity: Horizontal
EUT: Remote Control	Power: By Battery
Note: Transmit at Channel 390MHz	



No	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
1	389.870	64.359	16.498	N/A	80.857	99.244	-18.387	PK
	389.870	64.359	16.498	14.368	66.489	79.244	-12.755	AV
2	780.295	47.626	22.630	N/A	70.257	79.244	-8.987	PK
	780.295	47.626	22.630	14.368	55.889	59.244	-3.355	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.

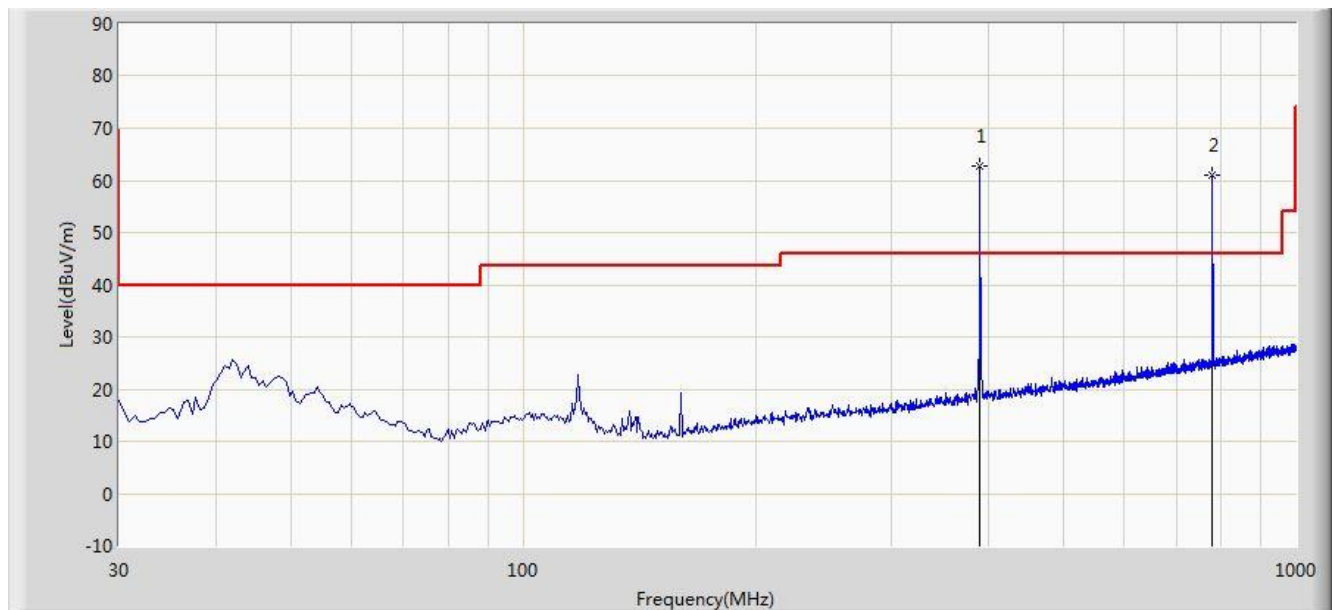
Note 2: The fundamental frequency is 390MHz, so the fundamental and spurious emissions radiated limit base on the operating frequency 390MHz.

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: AC1	Time: 2017/09/15 - 14:43
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168 _20-2000MHz	Polarity: Vertical
EUT: Remote Control	Power: By Battery
Note: Transmit at Channel 390MHz	



No	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
1	389.870	46.345	16.498	N/A	62.843	99.244	-36.401	PK
	389.870	46.345	16.498	14.368	48.475	79.244	-30.769	AV
2	780.295	38.440	22.630	N/A	61.071	79.244	-18.173	PK
	780.295	38.440	22.630	14.368	46.703	59.244	-12.541	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.

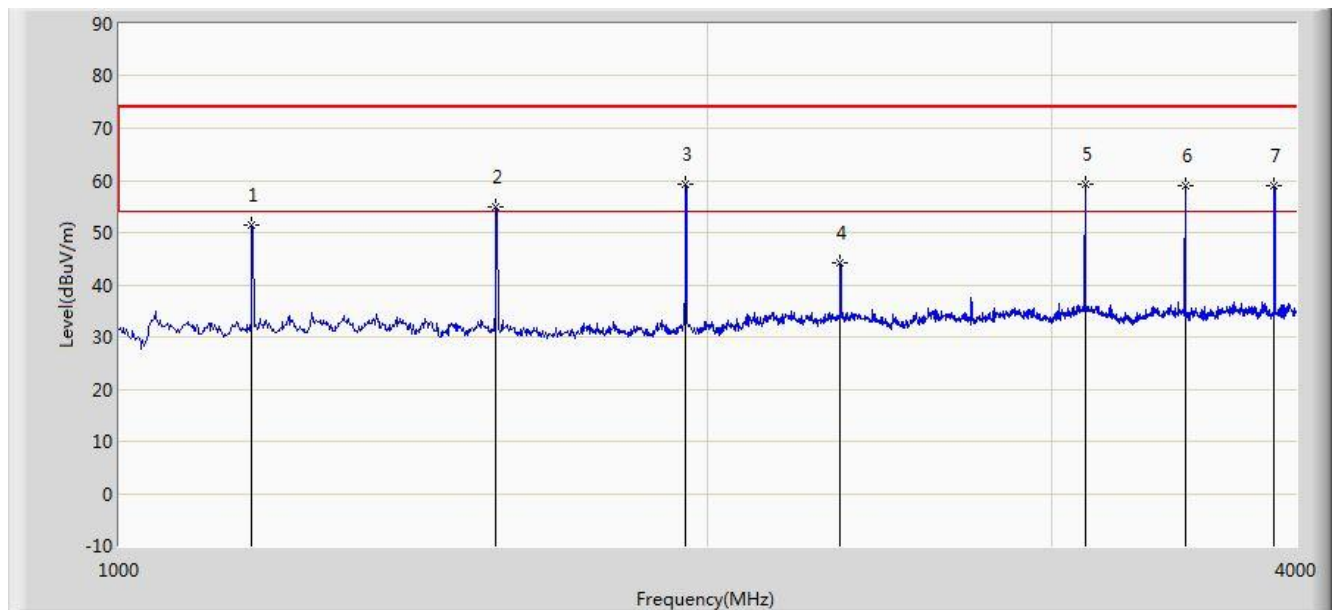
Note 2: The fundamental frequency is 390MHz, so the fundamental and spurious emissions radiated limit base on the operating frequency 390MHz.

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: AC1	Time: 2017/09/08 - 05:05
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Remote Control	Power: By Battery
Note: Transmit at Channel 390MHz	



No	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
1	1169.500	58.312	-6.835	N/A	51.477	79.244	-27.767	PK
	1169.500	58.312	-6.835	14.368	37.109	59.244	-22.135	AV
2	1559.500	60.918	-6.065	N/A	54.854	79.244	-24.390	PK
	1559.500	60.918	-6.065	14.368	40.486	59.244	-18.758	AV
3	1949.500	64.181	-4.885	N/A	59.296	79.244	-19.948	PK
	1949.500	64.181	-4.885	14.368	44.928	59.244	-14.316	AV
4	2339.500	46.697	-2.387	N/A	44.310	79.244	-34.934	PK
	2339.500	46.697	-2.387	14.368	29.942	59.244	-29.302	AV
5	3119.500	61.975	-2.807	N/A	59.168	79.244	-20.076	PK
	3119.500	61.975	-2.807	14.368	44.800	59.244	-14.444	AV
6	3509.500	60.255	-1.413	N/A	58.842	79.244	-20.402	PK
	3509.500	60.255	-1.413	14.368	44.474	59.244	-14.770	AV
7	3899.500	59.662	-0.618	N/A	59.044	79.244	-20.200	PK
	3899.500	59.662	-0.618	14.368	44.676	59.244	-14.568	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.

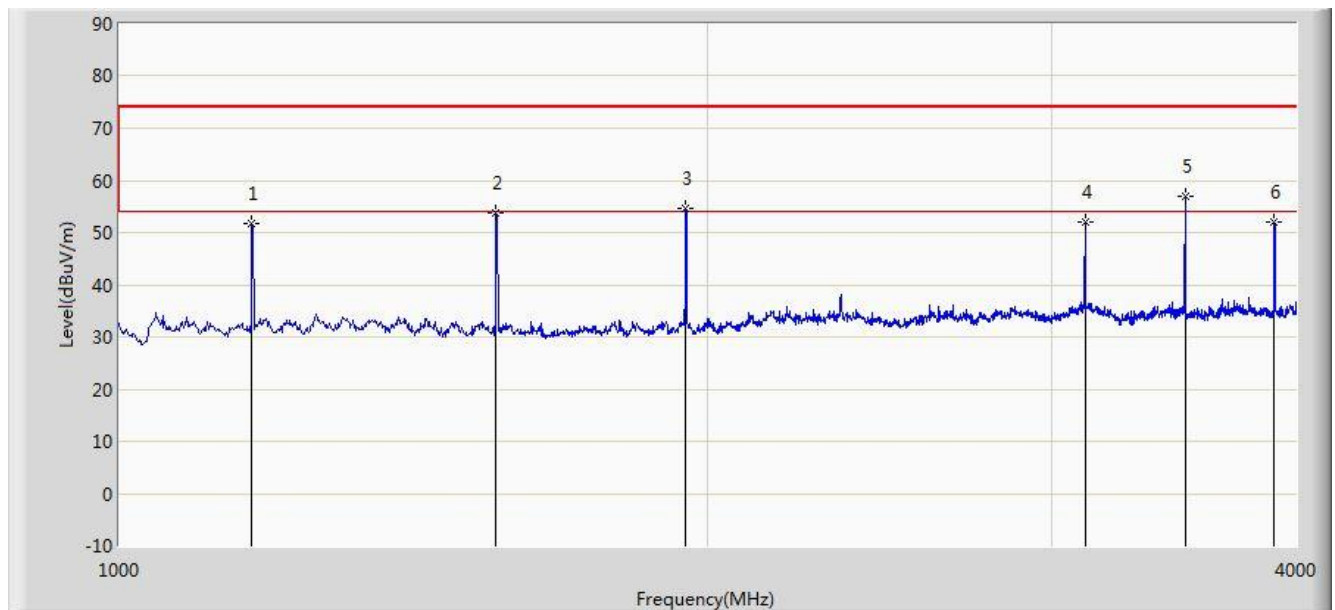
Note 2: The fundamental frequency is 390MHz, so the fundamental and spurious emissions radiated limit base on the operating frequency 390MHz.

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).

Site: AC1	Time: 2017/09/08 - 05:28
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Remote Control	Power: By Battery
Note: Transmit at Channel 390MHz	



No	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
1	1169.500	58.500	-6.835	N/A	51.665	79.244	-27.579	PK
	1169.500	58.500	-6.835	14.368	37.297	59.244	-21.947	AV
2	1559.500	59.755	-6.065	N/A	53.691	79.244	-25.553	PK
	1559.500	59.755	-6.065	14.368	39.323	59.244	-19.921	AV
3	1949.500	59.597	-4.885	N/A	54.712	79.244	-24.532	PK
	1949.500	59.597	-4.885	14.368	40.344	59.244	-18.900	AV
4	3119.500	54.765	-2.807	N/A	51.958	79.244	-27.286	PK
	3119.500	54.765	-2.807	14.368	37.590	59.244	-21.654	AV
5	3509.500	58.482	-1.413	N/A	57.069	79.244	-22.175	PK
	3509.500	58.482	-1.413	14.368	42.701	59.244	-16.543	AV
6	3899.500	52.767	-0.618	N/A	52.149	79.244	-27.095	PK
	3899.500	52.767	-0.618	14.368	37.781	59.244	-21.463	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 390MHz, so the fundamental and spurious emissions radiated limit base on the operating frequency 390MHz.

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

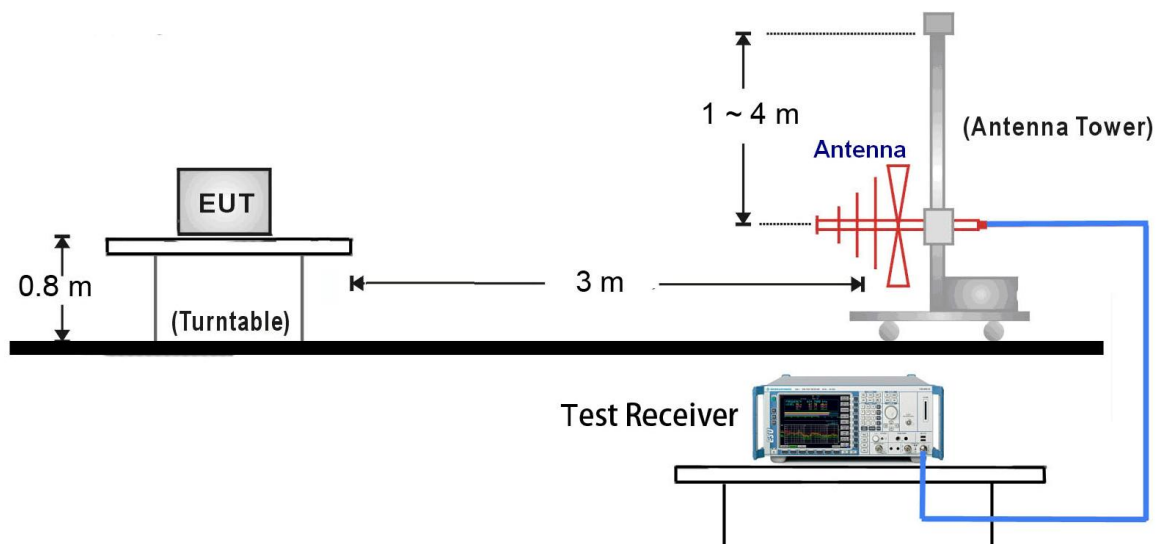
6.3.1. Standard Applicable

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.

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

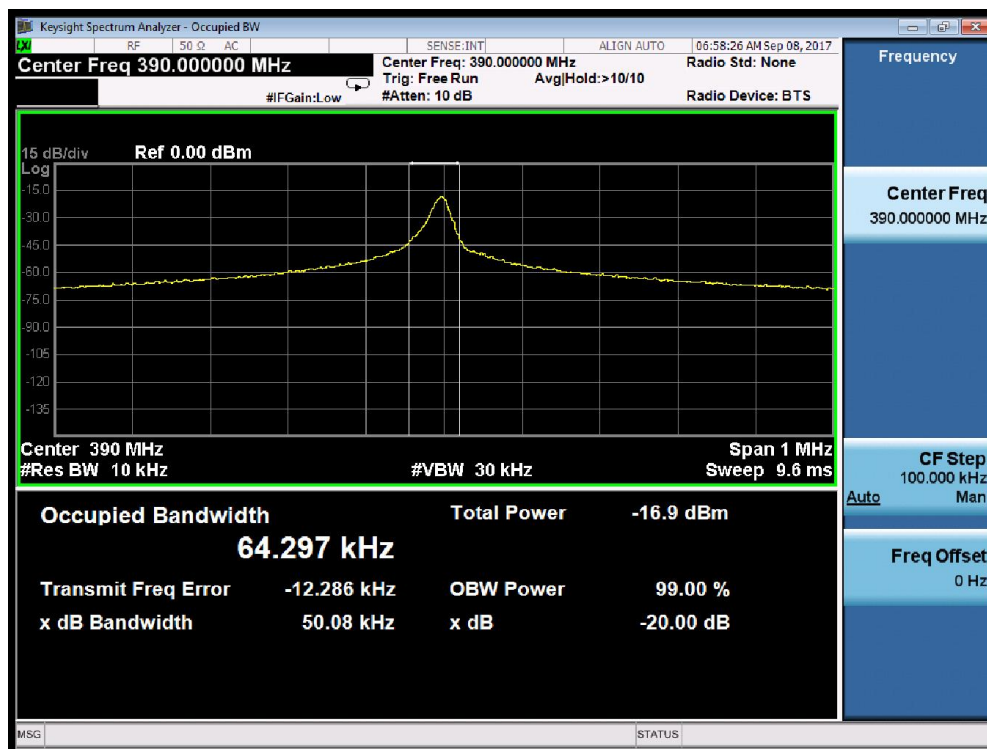


6.3.4. Test Result

Test Frequency (MHz)	20dB Bandwidth (KHz)	Limit (KHz)	Result
390	50.08	≤ 975	Pass

Limit = Fundamental Frequency * 0.25% = 390MHz * 0.25% = 975KHz

20dB Bandwidth Test Plot



6.4. Release Time

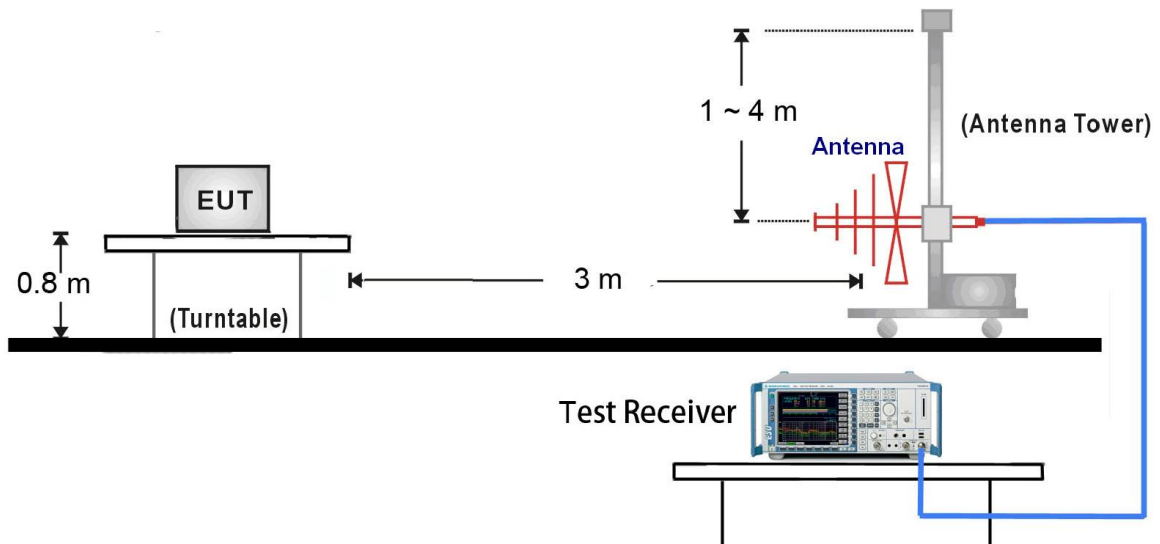
6.4.1. Standard Applicable

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 390MHz, 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

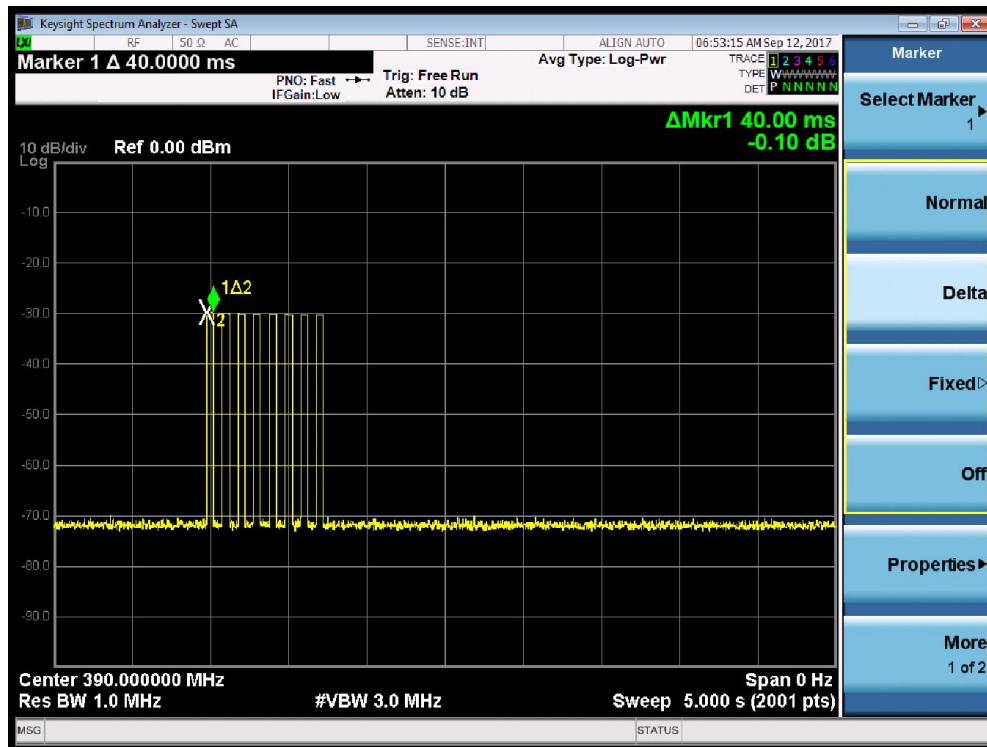


6.4.4. Test Result

Item	Measured Value	Limit	Result
Release Time	0.320 s	≤ 5 s	Pass

Measure Value = Release_(on time) = 40ms * 8 = 320ms

Release Time



6.5. Duty Cycle

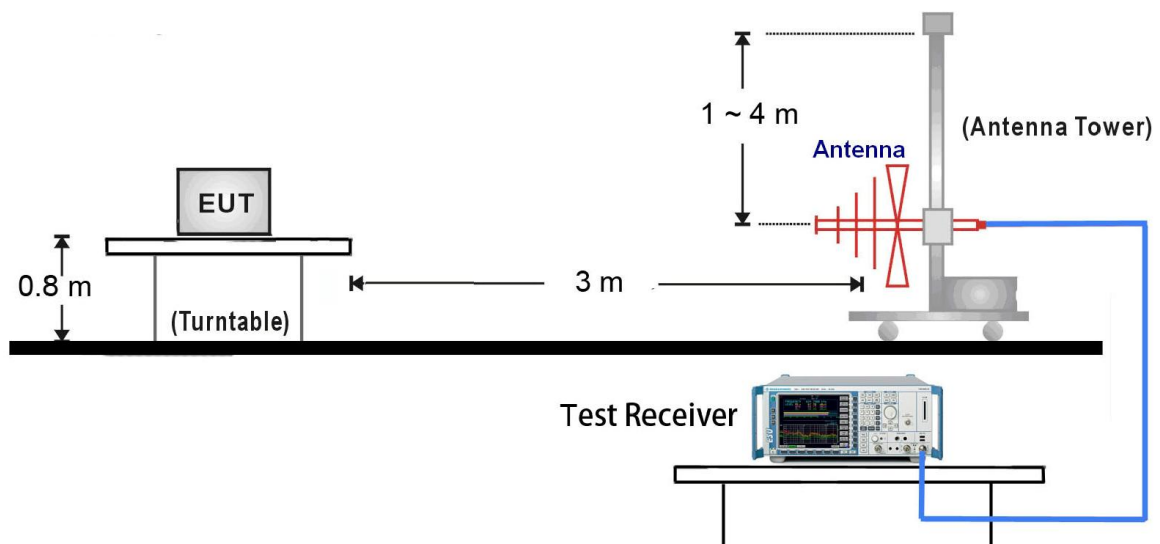
6.5.1. Standard Applicable

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 390MHz, 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



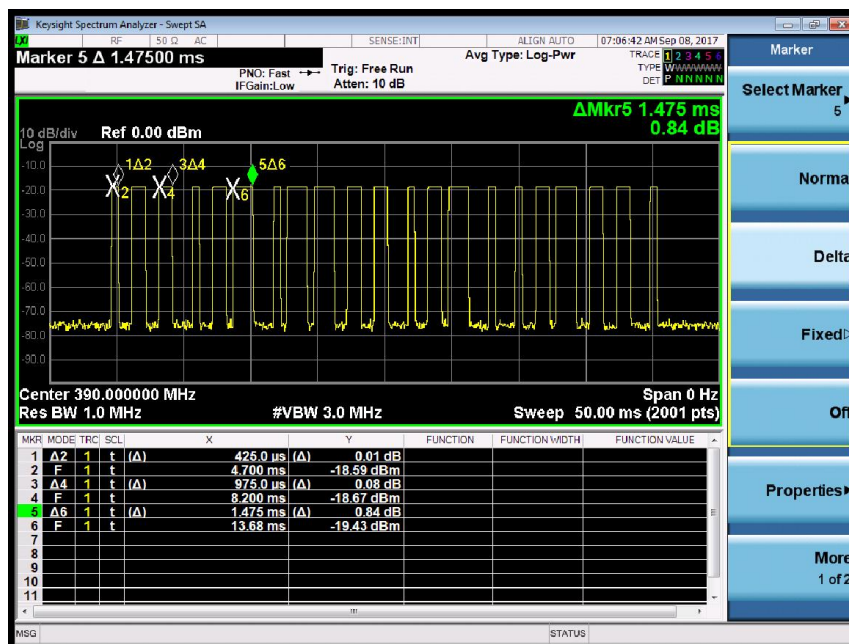
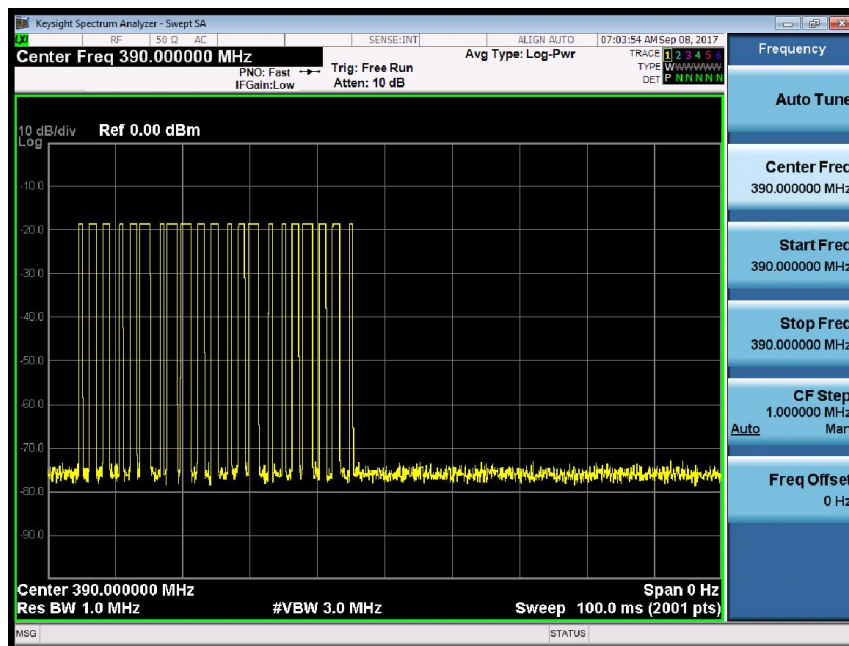
6.5.4. Test Result

Total Time (Ton) (ms)	The duration of one cycle (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
19.125	100	19.125	14.368

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

Total Time (T_{on})(ms)= $0.425 \cdot 7 + 0.975 \cdot 9 + 1.475 \cdot 5 = 19.125$ (ms)

Width of Pulse



CONCLUSION

The data collected relate only the item(s) tested and show that the **Remote Control FCC ID: 2ANHJGDR12** is in compliance with FCC Part 15.231(a) of the FCC Rules.

_____ The End _____