

FCC REPORT

Applicant: HONG KONG WIRELESS TECHNOLOGY CO.,LIMITED

Address of Applicant: ROOM 2103, 21/F., EASEY COMMERCIAL BUILDING 253-261 HENNESSY ROAD WAN CHAI, HONGKONG

Equipment Under Test (EUT)

Product Name: keyless transmitter

Model No.: WTCH

FCC ID: 2AMCPWTCH

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.231(a)

Date of sample receipt: 02 Jun., 2017

Date of Test: 02 Jun., to 08 Jun., 2017

Date of report issue: 09 Jun., 2017

Test Result: PASS*

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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2 Version

Version No.	Date	Description
00	09 Jun., 2017	Original

Prepared By:



Test Engineer

Date:

09 Jun., 2017

Check By:



Project Engineer

Date:

09 Jun., 2017

3 Contents

	Page
1 COVER PAGE.....	1
2 VERSION	2
3 CONTENTS	3
4 TEST SUMMARY.....	4
5 GENERAL INFORMATION.....	5
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF E.U.T.....	5
5.3 TEST MODE	5
5.4 DESCRIPTION OF SUPPORT UNITS.....	5
5.5 LABORATORY FACILITY.....	6
5.6 LABORATORY LOCATION	6
5.7 MEASUREMENT UNCERTAINTY.....	6
5.8 TEST INSTRUMENTS LIST.....	7
6 TEST RESULTS AND MEASUREMENT DATA	8
6.1 ANTENNA REQUIREMENT	8
6.2 RADIATED EMISSION	9
6.2.1 Field Strength Of The Fundamental Signal	11
6.2.2 Spurious Emissions	12
6.3 20dB BANDWIDTH.....	14
6.4 DURATION TIME.....	16
7 TEST SETUP PHOTOS.....	18
8 EUT CONSTRUCTIONAL PHOTOS.....	19

4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Field strength of the fundamental signal	15.231 (a)	Pass
Spurious emissions	15.231 (b)/15.209	Pass
20dB Bandwidth	15.231 (c)	Pass
Dwell time	15.231 (a)	Pass
Conducted Emission	15.107	N/A

Remarks:

N/A: The EUT not applicable of the test item.

Pass: The EUT complies with the essential requirements in the standard.

TEST ACCORDING TO ANSI C63.4:2014 AND ANSI C63.10:2013.

5 General Information

5.1 Client Information

Applicant:	HONG KONG WIRELESS TECHNOLOGY CO.,LIMITED
Address of Applicant:	ROOM 2103, 21/F.,EASEY COMMERCIAL BUILDING 253-261 HENNESSY ROAD WAN CHAI, HONGKONG
Manufacturer/ Factory:	HONG KONG WIRELESS TECHNOLOGY CO.,LIMITED
Address of Manufacturer/ Factory:	ROOM 2103, 21/F.,EASEY COMMERCIAL BUILDING 253-261 HENNESSY ROAD WAN CHAI, HONGKONG

5.2 General Description of E.U.T.

Product Name:	keyless transmitter
Model No.:	WTCH
Operation Frequency:	315MHz
Channel numbers:	1
Modulation type:	ASK
Antenna Type:	PCB antenna
Antenna gain:	0dBi
Power supply:	DC 3V CR2032 battery

5.3 Test mode

Transmitting mode:	Keep the EUT in transmitting mode with modulation （new battery used）		
Pre-Test Mode:			
CCIS has verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:			
Axis	X	Y	Z
Field Strength(dBuV/m)	79.56	78.35	77.59
Final Test Mode:			
According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup”: X axis (see the test setup photo)			

5.4 Description of Support Units

N/A

5.5 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC - Registration No.: 817957**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 817957, February 27, 2012.

● **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

5.6 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China
Website: <http://www.ccis-cb.com>
Tel: +86-755-23118282
Fax: +86-755-23116366
Email: info@ccis-cb.com

5.7 Measurement Uncertainty

Items	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 30MHz)	2.14 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	4.24 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	4.35 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	4.44 dB (k=2)
Radiated Emission (18GHz ~ 26.5GHz)	4.56 dB (k=2)

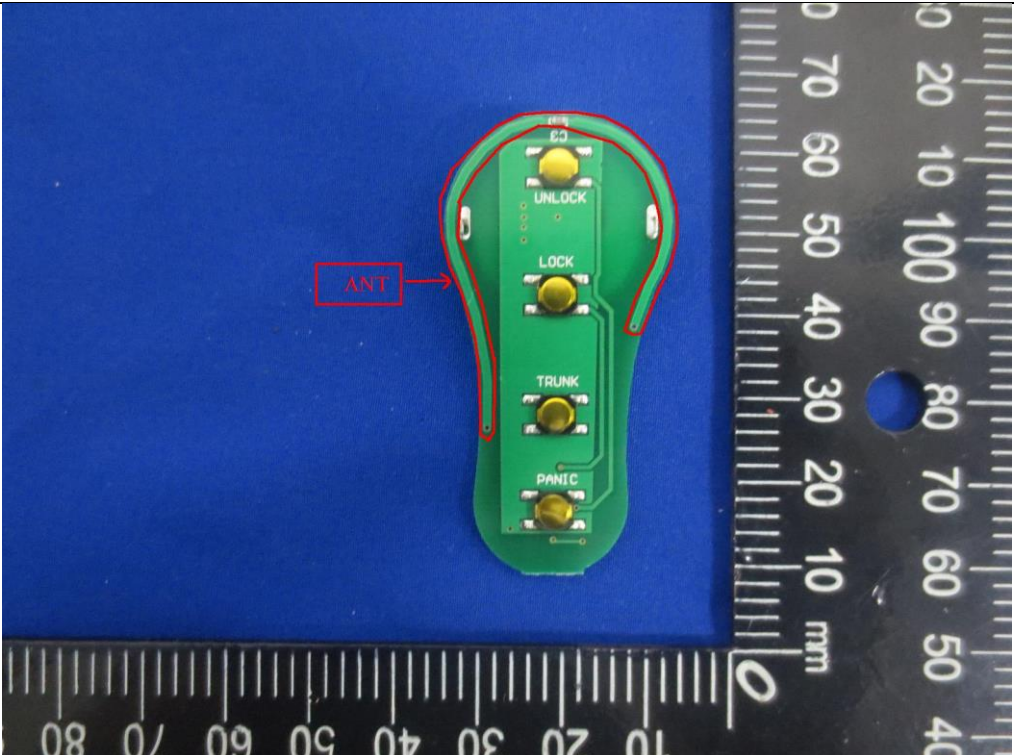
5.8 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	02-25-2017	02-24-2018
BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	02-25-2017	02-24-2018
Double-ridged waveguide horn antenna	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	02-25-2017	02-24-2018
Amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	02-25-2017	02-24-2018
Amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	02-25-2017	02-24-2018
Spectrum analyzer	Rohde & Schwarz	FSP	CCIS0023	02-25-2017	02-24-2018

Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	02-25-2017	02-24-2018
LISN	CHASE	MN2050D	CCIS0074	02-25-2017	02-24-2018

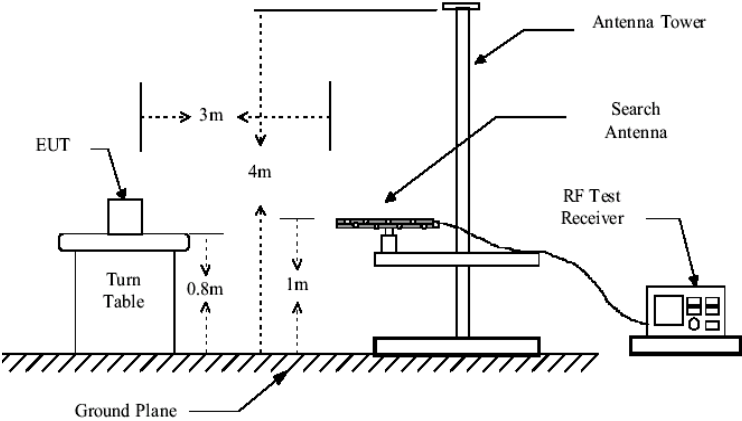
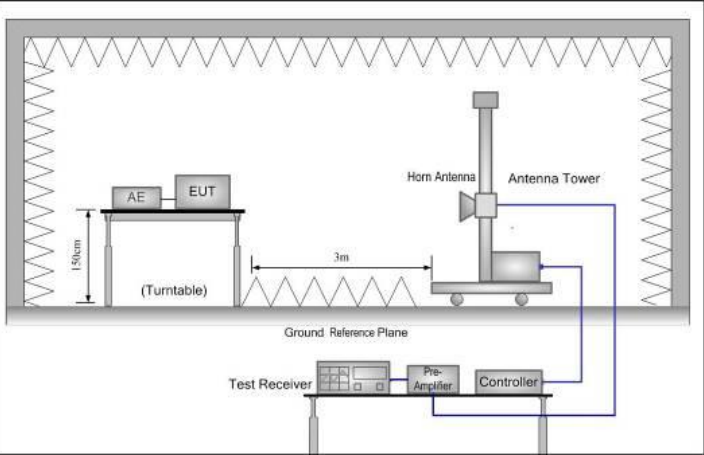
6 Test results and Measurement Data

6.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
E.U.T Antenna:	
The EUT make use of an integrated antenna, The typical gain of the antenna is 0dBi.	
	

6.2 Radiated Emission

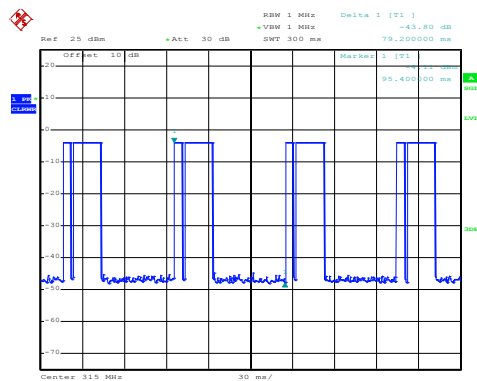
Test Requirement:	FCC Part15 C Section 15.231(a) and 15.209				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	30MHz to 5000MHz				
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Limit: (Field strength of the fundamental signal)	Frequency		Limit (dBuV/m @3m)		Remark
	315 MHz		75.62		Average Value
			95.62		Peak Value
Limit: (Spurious Emissions)	Frequency		Limit (dBuV/m @3m)		Remark
	30MHz-88MHz		40.0		Quasi-peak Value
	88MHz-216MHz		43.5		Quasi-peak Value
	216MHz-960MHz		46.0		Quasi-peak Value
	960MHz-1GHz		54.0		Quasi-peak Value
	Above 1GHz		54.0		Average Value
			74.0		Peak Value
Or The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level whichever limit permits higher field strength.					
Test Procedure:	a. The EUT was placed on the top of a rotating table 0.8m(below 1GHz) /1.5m(above 1GHz) above the ground at a 3 meter chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.				

Test setup:	Below 1GHz  Above 1GHz 
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

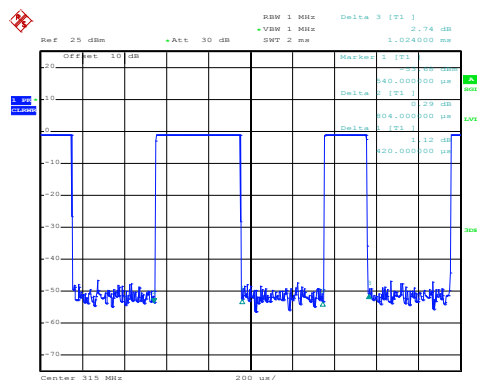
6.2.1 Field Strength Of The Fundamental Signal

Peak value							
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Polarization	Remark
315.00	54.21	13.17	2.99	70.37	95.62	Vertical	/
315.00	63.40	13.17	2.99	79.56	95.62	Horizontal	/
Average value							
Frequency (MHz)	Level (dBuV/m)	Duty Cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Polarization	Remark	
315.00	70.37	-17.41	52.96	75.62	Vertical	/	
315.00	79.56	-17.41	62.15	75.62	Horizontal	/	
Calculate Formula:		Average value = Peak value + Duty Cycle Factor					
		Duty cycle factor = 20log(Duty cycle)					
		Duty cycle = on time/ period					
Test data:		T on time = 0.42*19(ms)+0.22*25(ms)=13.48(ms)					
		T period = 100(ms)					
		Duty cycle = 13.48%					
		Duty cycle factor = 20log(Duty cycle) = -17.41					

T on time slot-1:

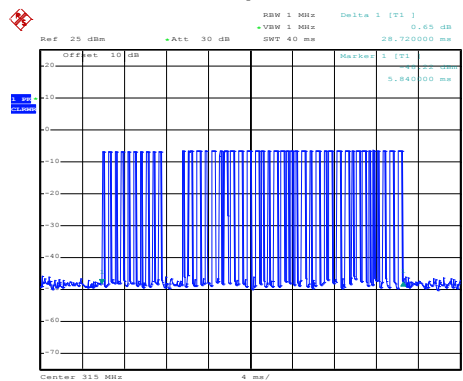


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T period:



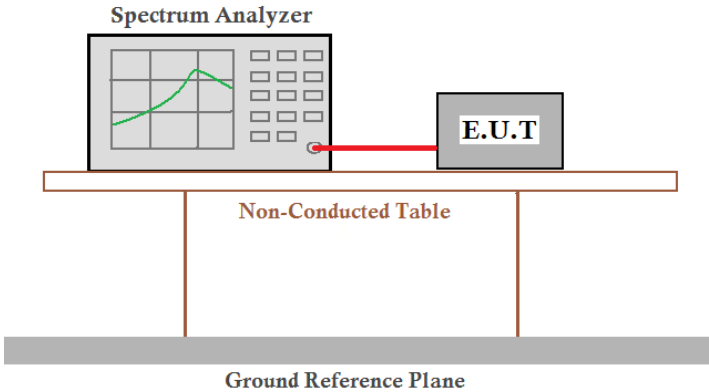
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Spurious Emissions

Below 1GHz (30MHz-1000MHz)									
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	polarization
40.14	16.62	16.93	1.22	0.00	34.77	40.00	-5.23	QP	Vertical
71.08	20.64	6.70	1.54	0.00	28.88	46.00	-11.12	QP	Vertical
630.00	40.59	18.69	3.89	0.00	63.17	75.62	-12.45	PK	Vertical
945.00	23.08	21.96	4.16	0.00	49.20	75.62	-26.42	PK	Vertical
40.85	15.98	17.04	1.22	0.00	34.24	40.00	-5.76	QP	Horizontal
120.28	15.98	11.83	2.17	0.00	29.98	43.50	-13.52	QP	Horizontal
630.00	30.25	18.69	3.89	0.00	52.83	75.62	-22.79	PK	Horizontal
945.00	36.83	21.96	4.16	0.00	62.95	75.62	-12.67	PK	Horizontal
Average value									
Frequency (MHz)	Level (dBuV/m)	Duty Cycle factor	Average value (dBuV/m)		Limit Line (dBuV/m)	Polarization	Remark		
630.00	63.17	-17.41	45.76		55.62	Vertical	/		
945.00	49.20	-17.41	31.79		55.62	Vertical	/		
630.00	52.83	-17.41	35.42		55.62	Horizontal	/		
945.00	62.95	-17.41	45.54		55.62	Horizontal	/		

Above 1GHz								
Peak value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	AV Limit (dBuV/m)	polarization	Remark
1260.00	56.10	21.47	3.41	41.05	39.93	55.62	Vertical	/
1575.00	68.72	22.44	3.82	41.03	53.95	55.62	Vertical	/
1890.00	67.09	23.11	4.12	41.22	53.10	55.62	Vertical	/
2205.00	62.72	23.63	4.45	41.67	49.13	55.62	Vertical	/
2520.00	51.48	23.79	4.85	41.90	38.22	55.62	Vertical	/
2835.00	48.51	24.97	5.16	41.64	37.00	55.62	Vertical	/
3150.00	48.37	26.31	5.40	41.43	38.65	55.62	Vertical	/
1260.00	62.41	21.47	3.41	41.05	46.24	55.62	Horizontal	/
1575.00	50.75	22.44	3.82	41.03	35.98	55.62	Horizontal	/
1890.00	55.64	23.33	4.22	41.42	41.77	55.62	Horizontal	/
2205.00	53.08	23.64	4.50	41.68	39.54	55.62	Horizontal	/
2520.00	46.66	23.79	4.85	41.90	33.40	55.62	Horizontal	/
2835.00	46.72	24.97	5.16	41.64	35.21	55.62	Horizontal	/
3150.00	50.02	26.02	5.38	41.46	39.96	55.62	Horizontal	/

6.3 20dB Bandwidth

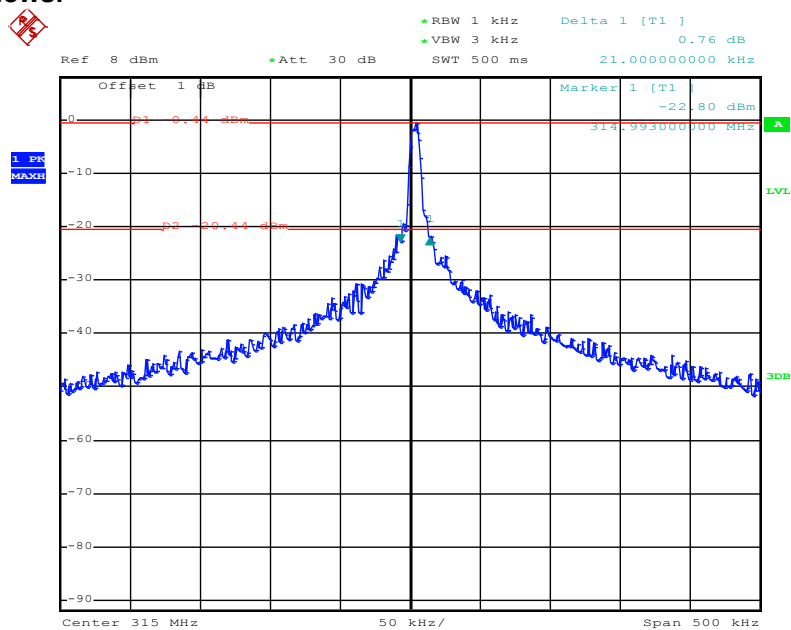
Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=1kHz, VBW=3kHz, detector: Peak
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
Test Procedure:	1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. 4. Read 20dB bandwidth.
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

20dB bandwidth (MHz)	Limit (MHz)	Results
0.021	0.7875	Passed

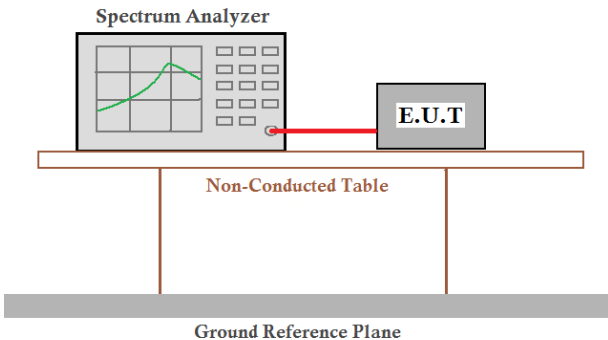
Note: Limit= Fundamental frequency× 0.25%=315× 0.25%=0.7875 MHz

Test plot as follows:



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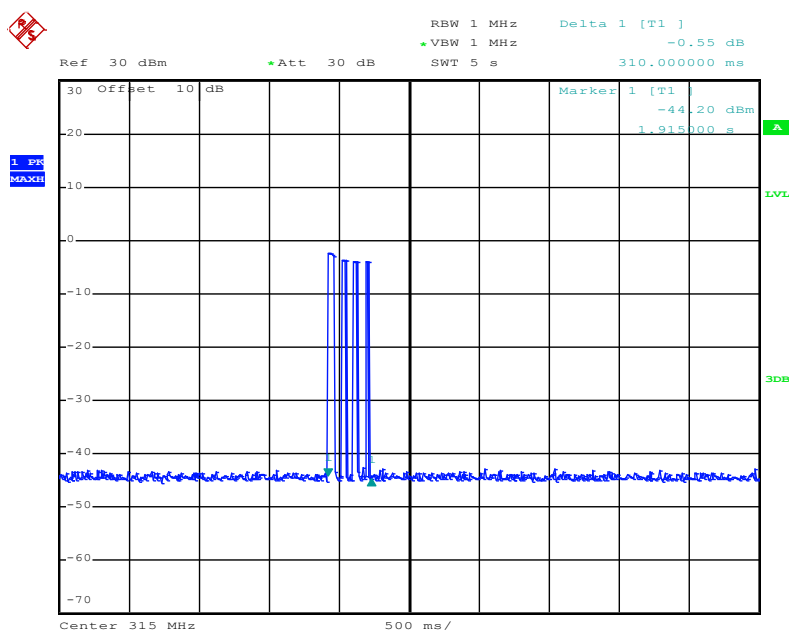
6.4 Duration Time

Test Requirement:	FCC Part15 C Section 15.231 (a) (1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100kHz, VBW=300kHz, span=0Hz, detector: Peak
Limit:	Not more than 5 seconds
Test mode:	Transmitting mode
Test Procedure:	1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Single scan the transmission, and read the transmission time.
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

Duration time (second)	Limit (second)	Result
0.31	<5.0	Pass

Test plot as follows:



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