

FCC/IC REPORT

Applicant: Lightwave Technology

Address of Applicant: 400 Rue Wright, Saint-Laurent, Quebec, Canada, H4N 1M6

Equipment Under Test (EUT)

Product Name: Connected, CarLink

Model No.: RX3200, CL3200

FCC ID: 2ABSL3200

Canada IC: 11732A-LWRTX3200

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247
RSS-Gen Issue 4, November 2014
RSS-247 Issue 2, February 2017

Date of sample receipt: 19 Jan., 2018

Date of Test: 22 Jan., 27 to Feb., 2018

Date of report issued: 28 Feb., 2018

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	28 Feb., 2018	Original

Tested by:

YT Yang

Test Engineer

Date:

28 Feb., 2018

Reviewed by:

Wimer Zhang

Project Engineer

Date:

28 Feb., 2018

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4 Test Summary

Test Items	Section		Result
	FCC	IC	
Antenna Requirement	15.203/15.247 (c)	/	Pass
AC Power Line Conducted Emission	15.207	RSS-GEN Section 8.8	Pass
Conducted Peak Output Power	15.247 (b)(3)	RSS-247 Section 5.4 (d)	Pass
6dB Emission Bandwidth 99% Occupied Bandwidth	15.247 (a)(2)	RSS-247 Section 5.2 (a)	Pass
Power Spectral Density	15.247 (e)	RSS-247 Section 5.2 (b)	Pass
Band Edge	15.247(d)	RSS-GEN Section 8.10 RSS-247 Section 5.5	Pass
Conducted and Radiated Spurious Emission	15.205 & 15.209	RSS-GEN Section 6.13 RSS-247 Section 5.5	Pass
Pass: The EUT complies with the essential requirements in the standard.			

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

5 General Information

5.1 Client Information

Applicant:	Lightwave Technology
Address:	400 Rue Wright, Saint-Laurent, Quebec, Canada, H4N 1M6
Manufacturer/ Factory:	DONGGUAN PORTMAN ELECTRONIC SCIENCE AND TECHNOLOGY CO., LTD
Address:	NO.10, LUYI 2 ROAD, TANGXIA TOWN, DONGGUAN CITY, GUANGDONG PROVINCE CHINA

5.2 General Description of E.U.T.

Product Name:	Connected, CarLink
Model No.:	RX3200, CL3200
Operation Frequency:	911.85 MHz
Channel numbers:	1
Modulation technology:	CSS
Antenna Type:	Internal Antenna
Antenna gain:	911.85MHz: 0.5dBi
Power supply:	Rechargeable Li-ion Battery DC3.7V, 130mAh
Remark:	The No.: Rx3200, CL3200, Advanced were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being product name, model name and shell, for different customer

5.3 Test environment and mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Operation mode	Keep the EUT in continuous transmitting with modulation
The sample was placed 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.	

5.4 Description of Support Units

N/A

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
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)

5.6 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations: ● FCC - Registration No.: 727551 Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551. ● 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. ● A2LA - Registration No.: 4346.01 This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.7 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 Tel: +86-755-23118282, Fax: +86-755-23116366 Email: info@ccis-cb.com, Website: http://www.ccis-cb.com
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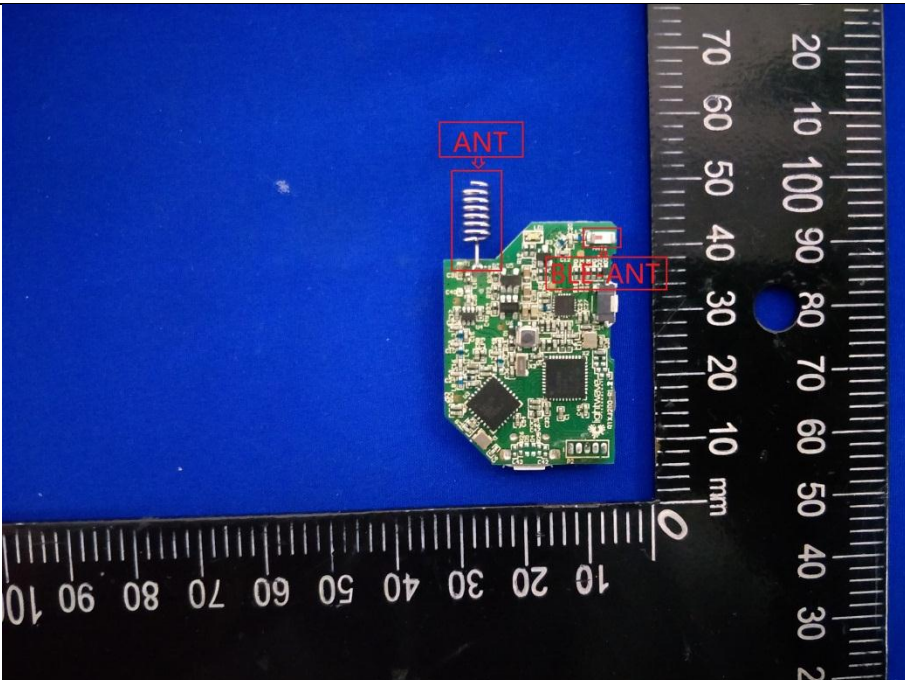
5.8 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	3m SAC	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2020
2	BiConiLog Antenna	SCHWARZBECK	VULB9163	CCIS0005	02-25-2017 02-20-2018	02-24-2018 02-19-2019
3	Horn Antenna	SCHWARZBECK	BBHA9120D	CCIS0006	02-25-2017 02-20-2018	02-24-2018 02-19-2019
4	Pre-amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	02-25-2017 02-20-2018	02-24-2018 02-19-2019
5	Pre-amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	02-25-2017 02-20-2018	02-24-2018 02-19-2019
6	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	02-25-2017 02-20-2018	02-24-2018 02-19-2019
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	02-25-2017 02-20-2018	02-24-2018 02-19-2019
8	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP30	CCIS0023	02-25-2017 02-20-2018	02-24-2018 02-19-2019
9	EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	02-25-2017 02-20-2018	02-24-2018 02-19-2019
10	Loop antenna	Laplace instrument	RF300	EMC0701	02-25-2017 02-20-2018	02-24-2018 02-19-2019
11	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

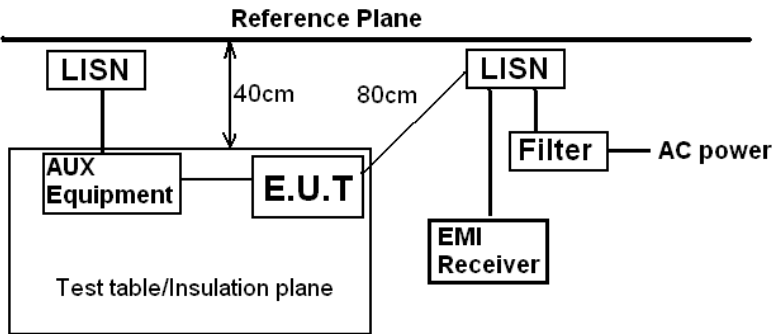
Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	07-22-2017	07-21-2020
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	02-25-2017 02-20-2018	02-24-2018 02-19-2019
3	LISN	CHASE	MN2050D	CCIS0074	02-25-2017 02-20-2018	02-24-2018 02-19-2019
4	LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2017	07-20-2018
5	Coaxial Cable	CCIS	N/A	CCIS0086	02-25-2017 02-20-2018	02-24-2018 02-19-2019
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Power Sensor	D.A.R.E	RPR3006W	17I00015SNO27	11-10-2017	11-09-2018
8	Power Sensor	D.A.R.E	RPR3006W	17I00015SNO28	11-10-2017	11-09-2018

6 Test results and Measurement Data

6.1 Antenna requirement:

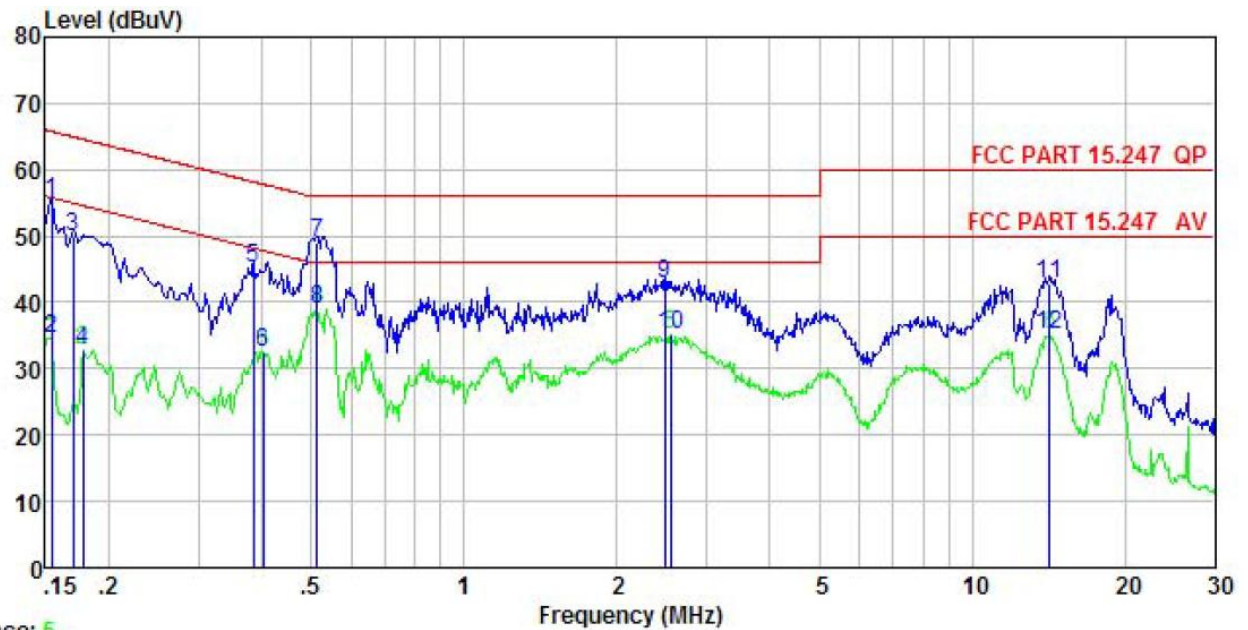
Standard requirement:	FCC Part15 C Section 15.203 /247(c)
<i>15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a 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.</i>	
E.U.T Antenna:	
<i>The antenna is an internal antenna which cannot replace by end-user, the best case gain of the antenna is 0.5 dBi.</i>	
	

6.2 Conducted Emission

Test Requirement:	FCC Part 15 C Section 15.207 RSS-GEN Section 8.8		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150 kHz to 30 MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9kHz, VBW=30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	* Decreases with the logarithm of the frequency.		
Test procedure	- The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.), which provides a 50ohm/50uH coupling impedance for the measuring equipment. - The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). - Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.		
Test setup:	 Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m		
Test Instruments:	Refer to section 5.8 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Data:

Neutral:



Trace: 5

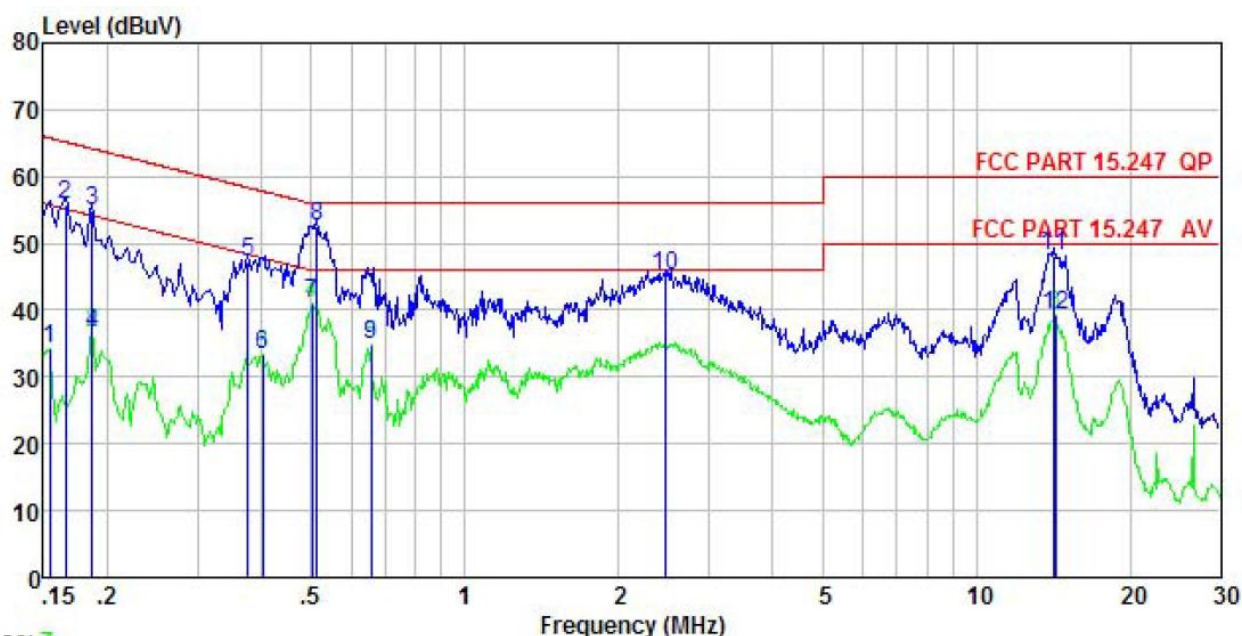
Site : CCIS Shielding Room
 Condition : FCC PART 15.247 QP LISN(RS) NEUTRAL
 EUT : Connected
 Model : RX3200
 Test Mode : TX mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23.5°C Humi:57% Atmos:101KPa
 Test Engineer: YT
 Remark :

	Freq	Read	LISN	Cable	Level	Limit	Over	
	MHz	Level	Factor	Loss	dBuV	Line	Limit	Remark
		dBuV	dB	dB		dBuV	dB	
1	0.154	43.66	0.70	10.78	55.14	65.78	-10.64	QP
2	0.154	23.09	0.70	10.78	34.57	55.78	-21.21	Average
3	0.170	38.35	0.70	10.77	49.82	64.94	-15.12	QP
4	0.178	21.39	0.66	10.77	32.82	54.59	-21.77	Average
5	0.385	33.89	0.62	10.72	45.23	58.17	-12.94	QP
6	0.402	21.26	0.62	10.72	32.60	47.81	-15.21	Average
7	0.513	37.58	0.61	10.76	48.95	56.00	-7.05	QP
8	0.513	27.69	0.61	10.76	39.06	46.00	-6.94	Average
9	2.487	31.18	0.68	10.94	42.80	56.00	-13.20	QP
10	2.554	23.63	0.68	10.94	35.25	46.00	-10.75	Average
11	14.213	31.32	0.69	10.91	42.92	60.00	-17.08	QP
12	14.213	23.67	0.69	10.91	35.27	50.00	-14.73	Average

Notes:

1. An initial pre-scan was performed on the live and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

Line:



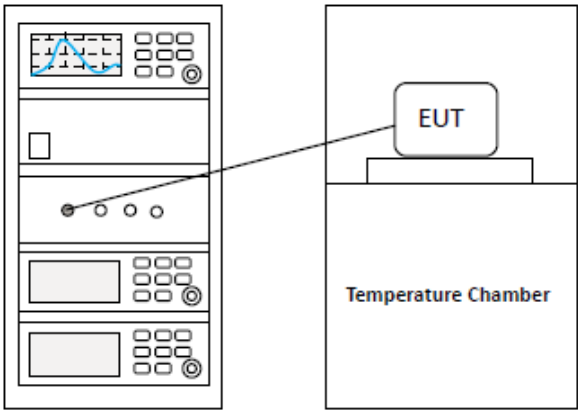
Site : CCIS Shielding Room
 Condition : FCC PART 15.247 QP LISN(RS) LINE
 EUT : Connected
 Model : RX3200
 Test Mode : TX mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23.5°C Humi:57% Atmos:101KPa
 Test Engineer: YT
 Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.154	22.65	0.71	10.78	34.14	55.78	-21.64	Average
2	0.166	44.45	0.71	10.77	55.93	65.16	-9.23	QP
3	0.186	43.40	0.73	10.76	54.89	64.20	-9.31	QP
4	0.186	25.19	0.73	10.76	36.68	54.20	-17.52	Average
5	0.377	35.70	0.75	10.72	47.17	58.34	-11.17	QP
6	0.402	21.93	0.75	10.72	33.40	47.81	-14.41	Average
7	0.502	29.65	0.76	10.76	41.17	46.00	-4.83	Average
8	0.513	41.15	0.76	10.76	52.67	56.00	-3.33	QP
9	0.654	23.29	0.77	10.77	34.83	46.00	-11.17	Average
10	2.474	33.37	0.78	10.94	45.09	56.00	-10.91	QP
11	14.138	36.62	0.70	10.91	48.23	60.00	-11.77	QP
12	14.288	27.52	0.70	10.90	39.12	50.00	-10.88	Average

Notes:

1. An initial pre-scan was performed on the live and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

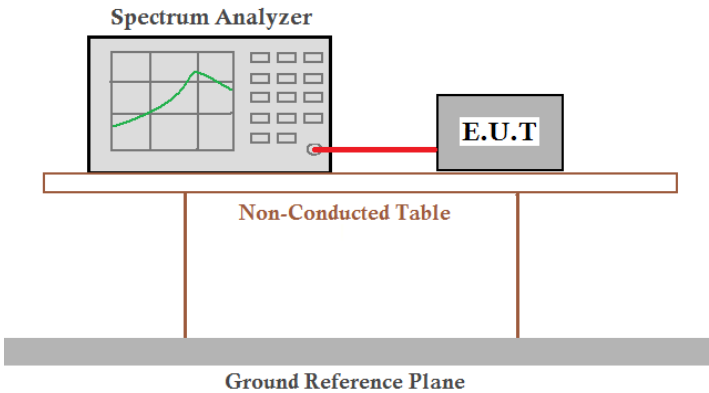
6.3 Conducted Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3) RSS-247 section 5.4(d)
Test Method:	ANSI C63.10:2013 and 558074
Limit:	30dBm
Test setup:	 The diagram illustrates the test setup. On the left is a spectrum analyzer with a blue line graph on its screen. A cable connects the spectrum analyzer to a Temperature Chamber on the right. Inside the chamber, the Equipment Under Test (EUT) is placed on a stand.
Test procedure:	1. Use a fast power sensor suitable for 2,4 GHz and capable of 1 MS/s. 2. Connect the power sensor to the transmit port, sample the transmit signal and store the raw data, every channel 25 bursts. Use these stored samples in all following steps. 3. Find the start and stop times of each burst in the stored measurement samples. 4. Between the start and stop times of each individual burst calculate the RMS power over the burst. Save these P_{burst} values, as well as the start and stop times for each burst. 5. The highest of all P_{burst} values (value "A" in dBm) will be used for maximum e.i.r.p. calculations. Add the (stated) antenna assembly gain "G" in dBi of the individual antenna. The RF Output Power (P) shall be calculated using the formula below: $P = A + G$
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Test Frequency	Maximum Conducted Output Power (dBm)	Limit(dBm)	Result
911.85 MHz	20.40	30.00	Pass

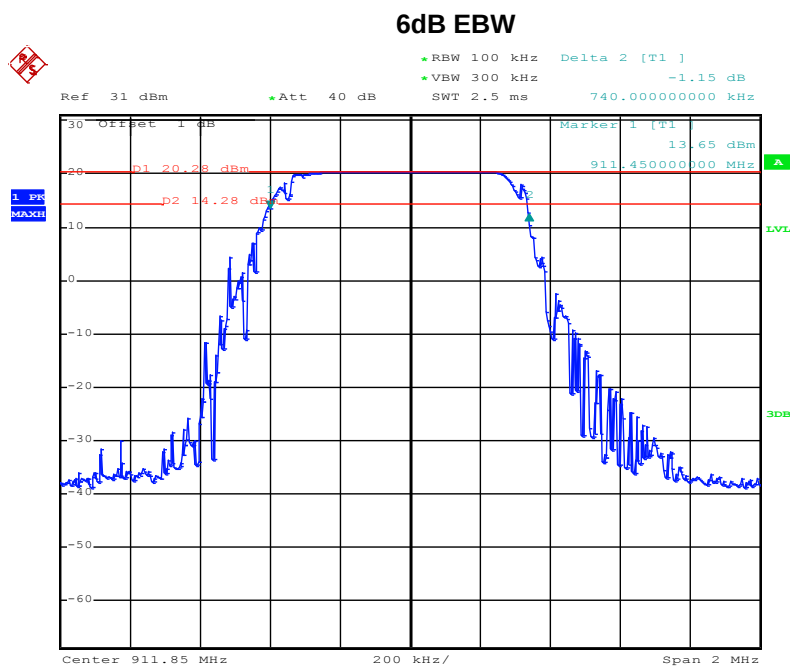
6.4 Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(2) RSS-247 section 5.2(a)
Test Method:	ANSI C63.10:2013 and 558074
Limit:	>500kHz
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 are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

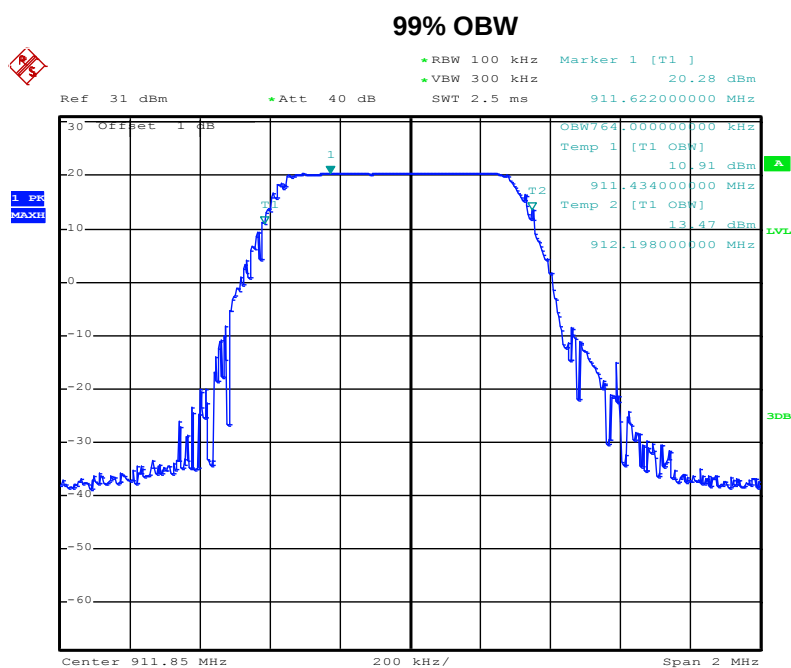
Measurement Data:

Test Frequency	6dB Emission Bandwidth (MHz)	Limit(kHz)	Result
911.85 MHz	0.740	>500	Pass
Test Frequency	99% Occupy Bandwidth (MHz)	Limit(kHz)	Result
911.85 MHz	0.764	N/A	N/A

Test plot as follows:

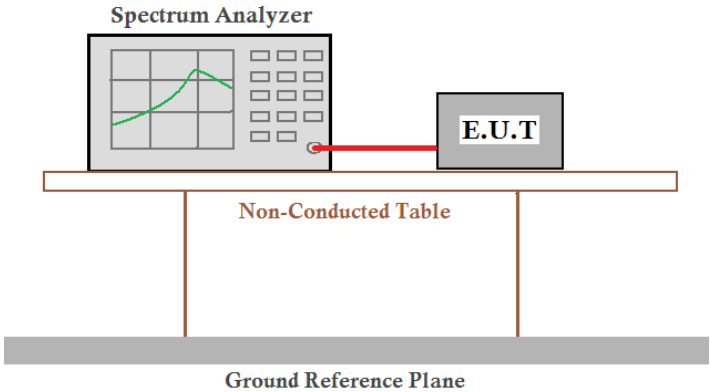


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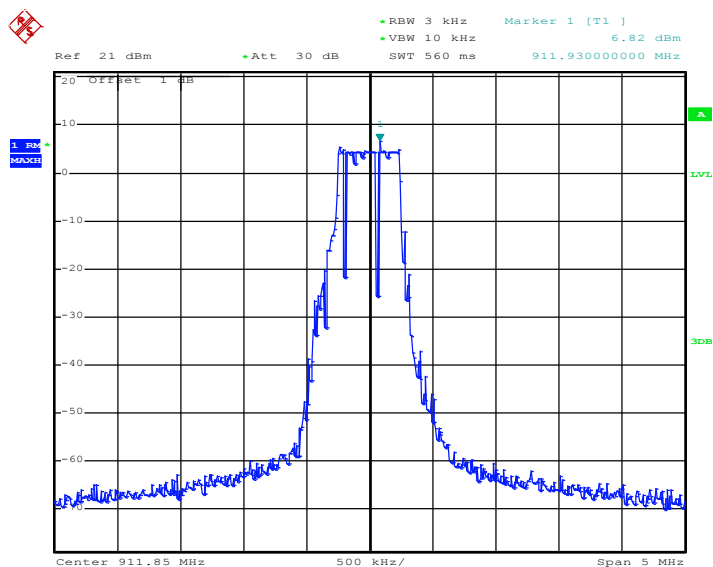
6.5 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e) RSS-247 section 5.2(b)
Test Method:	ANSI C63.10:2013 and 558074
Limit:	8dBm
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. The table is supported by two vertical legs. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Test Frequency	Power Spectral Density (dBm)	Limit(dBm)	Result
911.85 MHz	6.82	8.00	Pass

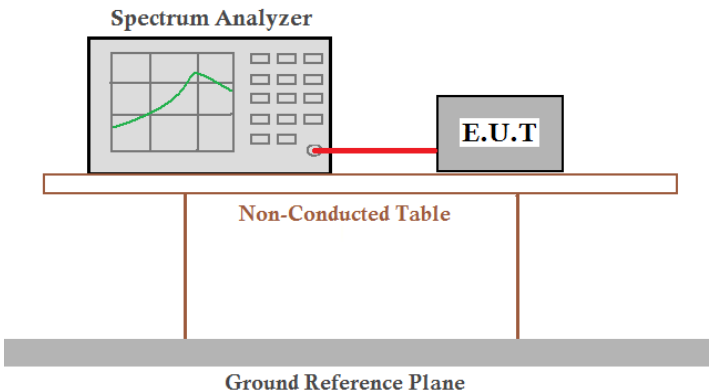
Test plots as follow:



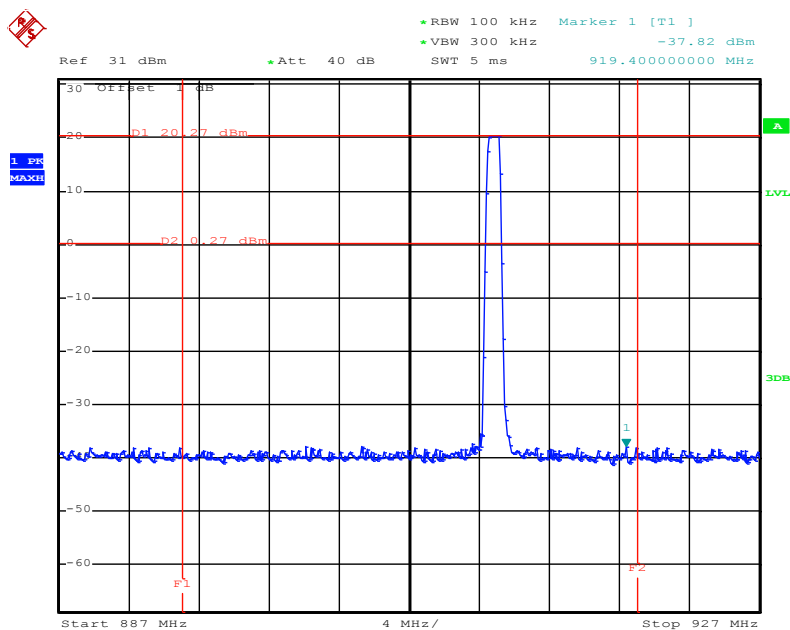
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6.6 Band Edge

6.6.1 Conducted Emission Method

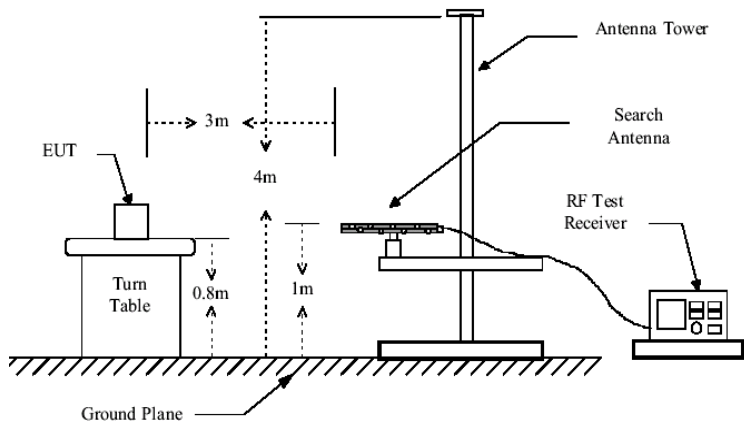
Test Requirement:	FCC Part15 C Section 15.247 (d) RSS-247 section 5.5
Test Method:	ANSI C63.10:2013 and 558074
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	 The diagram illustrates the test setup for conducted emission measurement. 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, which is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

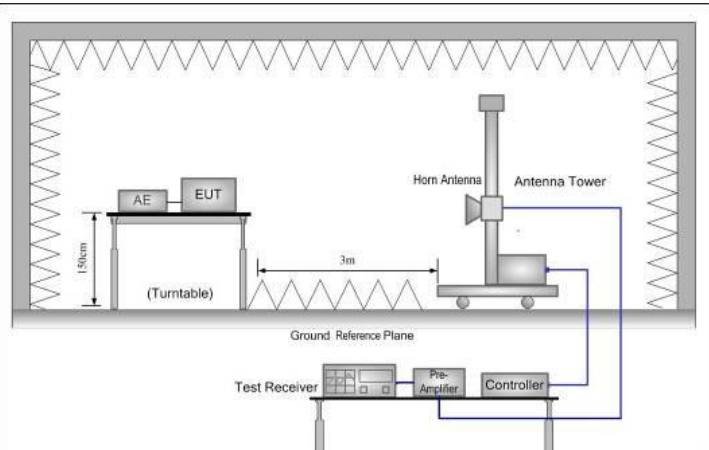
Test plots as follow:



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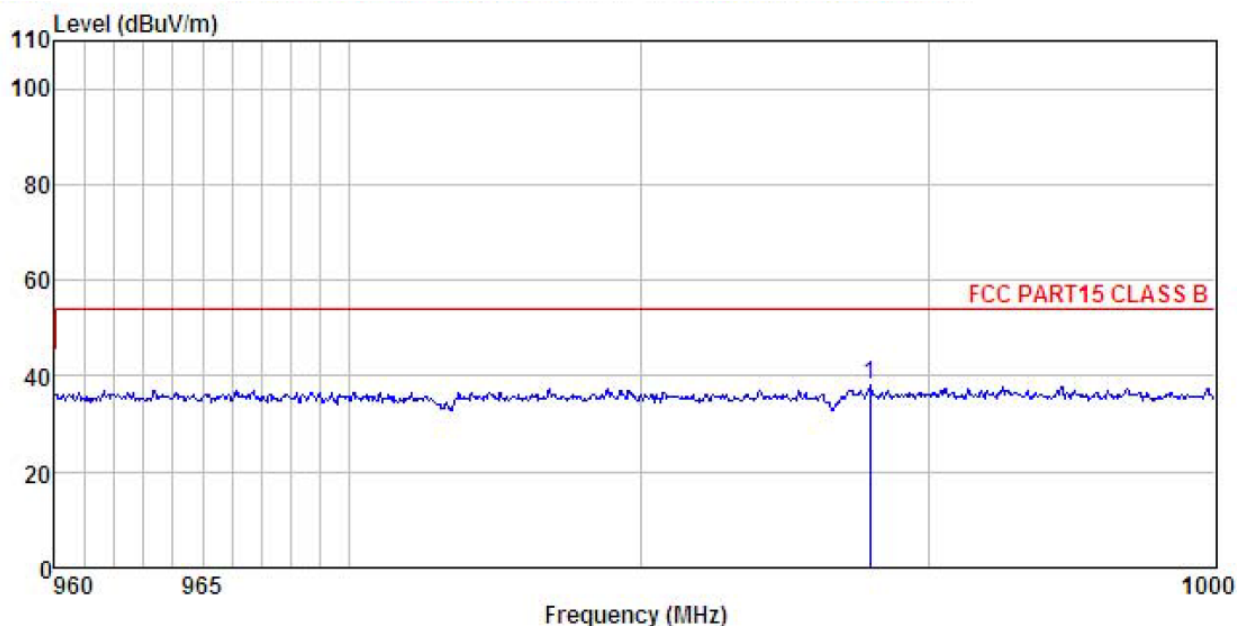
6.6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205 RSS-GEN section 8.10				
Test Method:	ANSI C63.10: 2013and 558074				
Test Frequency Range:	960MHz to 1.240GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	960MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Limit:	Frequency	Limit (dBuV/m @3m)			Remark
	960MHz-1GHz	54.00			Quasi-peak Value
	Above 1GHz	74.00			Peak Value
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz) /1.5m(above 1GHz) above the groundat a 3 meter chamber.The table was rotated 360 degrees todetermine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, whichwas mounted on the top of a variable-height antenna tower. 3. 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. 4. 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 rotatablewas turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limitspecified, then testing could be stopped and the peak values of the EUT wouldbe reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified andthen reported in a data sheet.				
Test setup:	Below 1GHz 				

	Above 1GHz 
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test channel: Lowest

Horizontal:

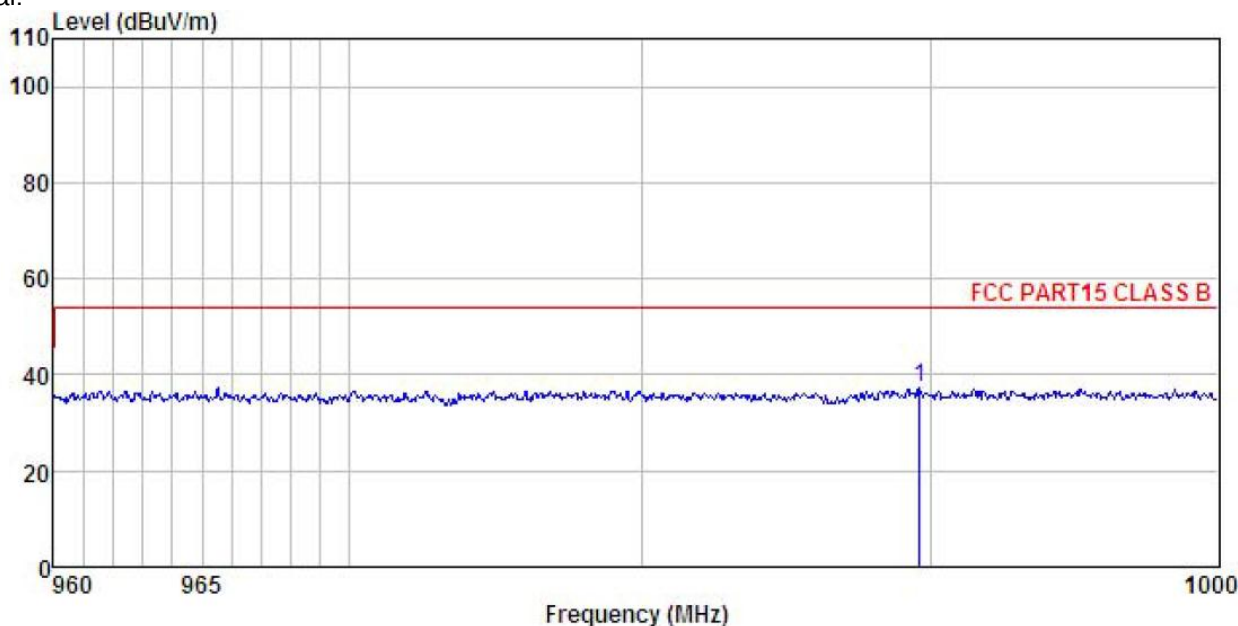


Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M2G) HORIZONTAL
 EUT : Connected
 Model : RX3200
 Test mode : TX mode
 Power Rating : DC 3.7V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: YT
 Remark :

	ReadAntenna	Cable	Preamp		Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1 987.909	12.01	21.65	4.41	0.00	38.07	54.00	-15.93

Test channel: Lowest

Vertical:

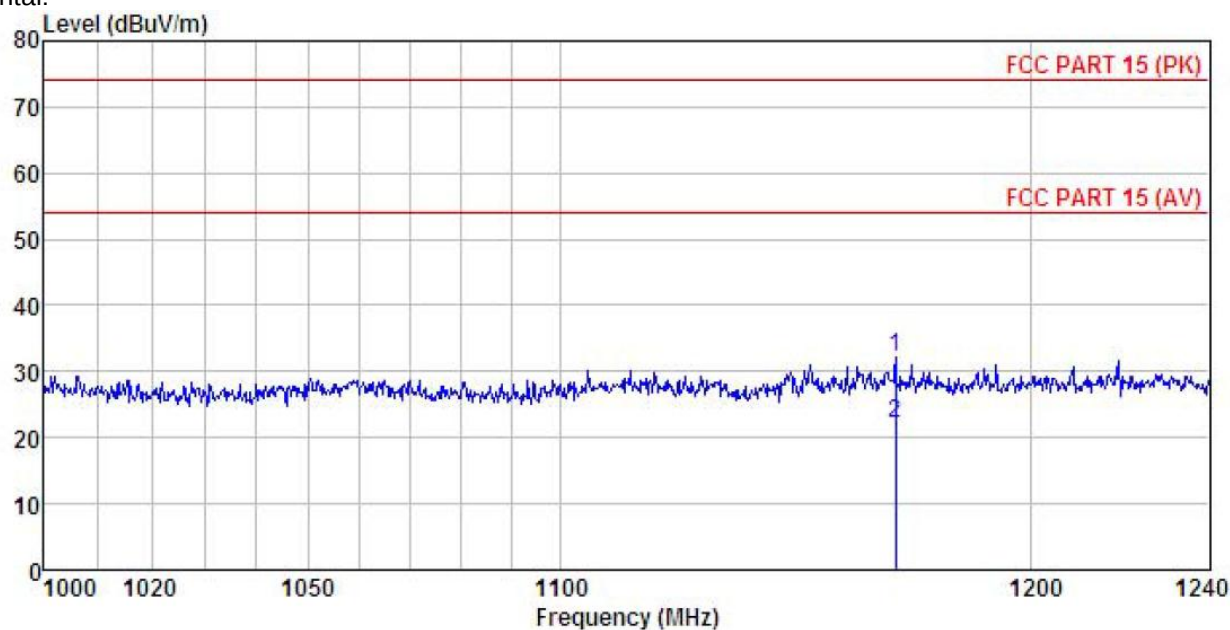


Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M2G) VERTICAL
 EUT : Connected
 Model : RX3200
 Test mode : TX mode
 Power Rating : DC 3.7V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: YT
 Remark :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier	Level	Limit	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	989.564	11.26	21.67	4.41	0.00	37.34	54.00	-16.66	QP

Test channel: Highest

Horizontal:

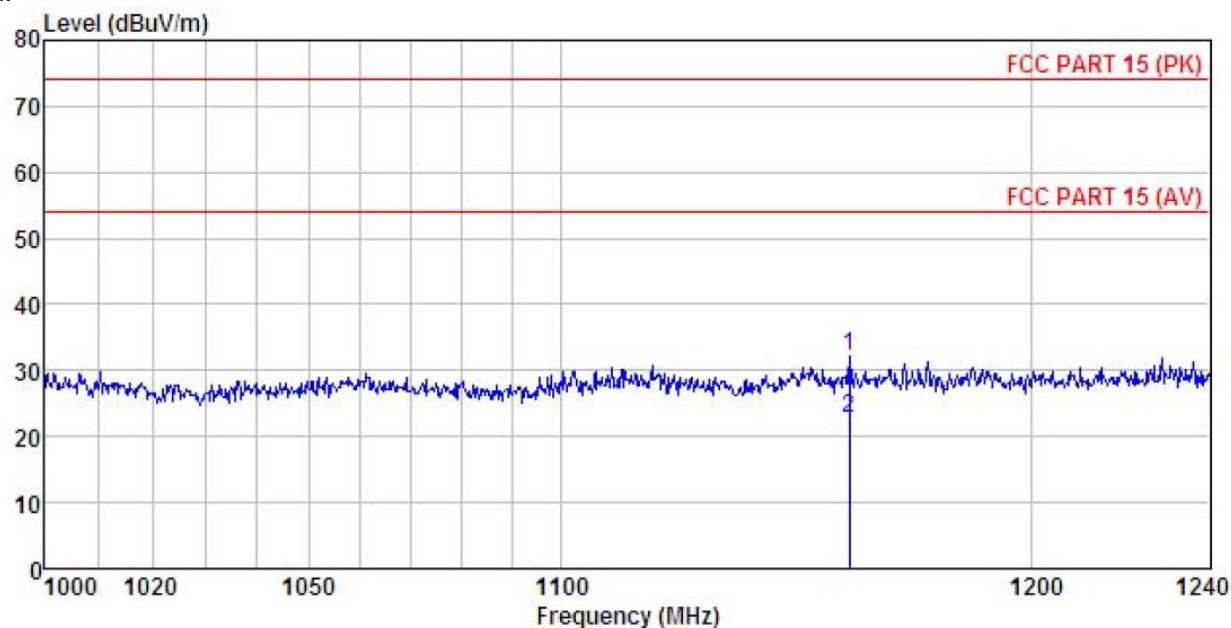


Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL
 EUT : Connected
 Model : RX3200
 Test mode : TX mode
 Power Rating : DC 3.7V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: YT
 Remark :

	Freq	ReadAntenna	Cable	Preamp		Limit	Over	
	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	1170.284	47.23	23.70	0.00	41.11	32.25	74.00	-41.75 Peak
2	1170.284	37.24	23.70	0.00	41.11	22.26	54.00	-31.74 Average

Test channel: Highest

Vertical:

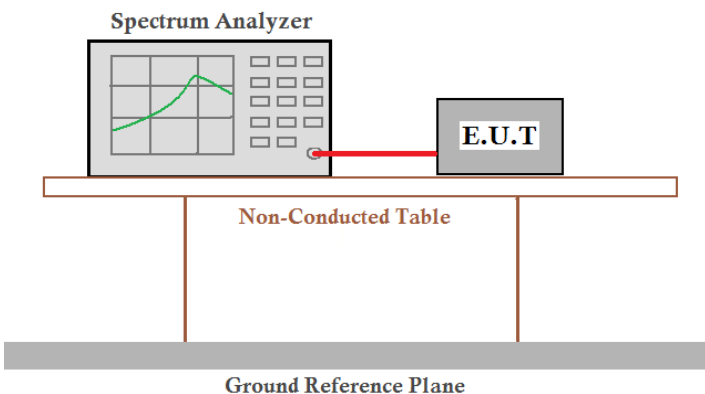


Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL
 EUT : Connected
 Model : RX3200
 Test mode : TX mode
 Power Rating : DC 3.7V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: YT
 Remark :

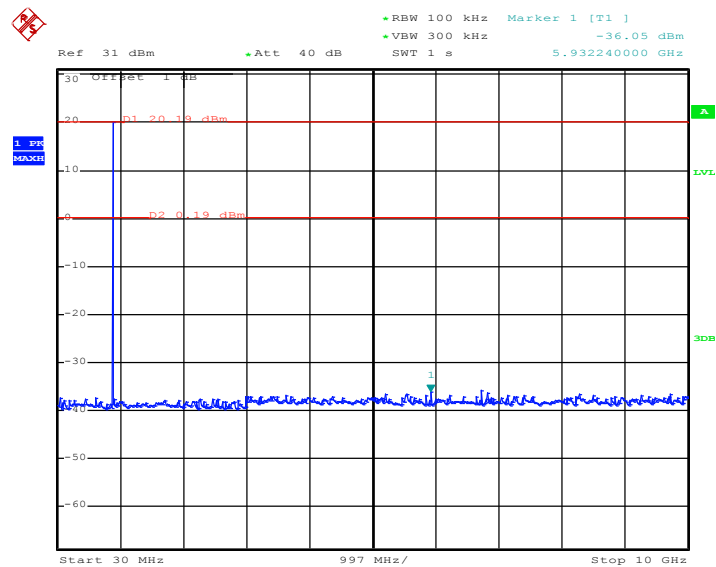
		ReadAntenna	Cable	Preamp		Limit	Over	
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	1160.257	47.02	23.75	0.00	41.12	32.05	74.00	-41.95 Peak
2	1160.257	37.64	23.75	0.00	41.12	22.67	54.00	-31.33 Average

6.7 Spurious Emission

6.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d) RSS-247 section 5.5
Test Method:	ANSI C63.10:2013 and 558074
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	 The diagram illustrates the test setup for conducted emission measurement. 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, which is positioned above a Ground Reference Plane.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plot as follows:

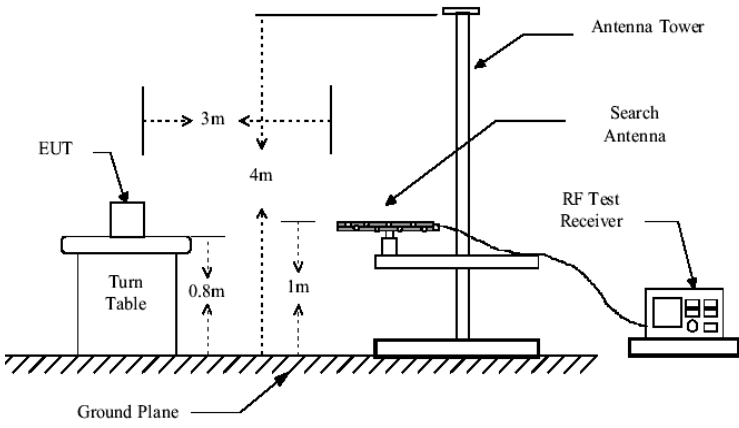
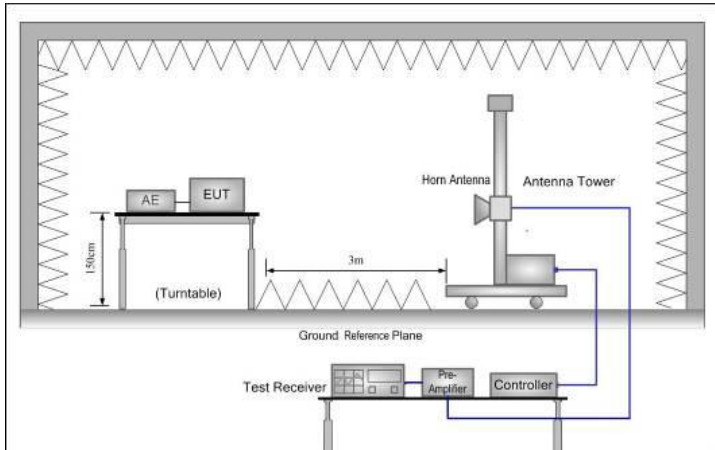


Date: 30.JAN.2018 05:54:12

30MHz~10GHz

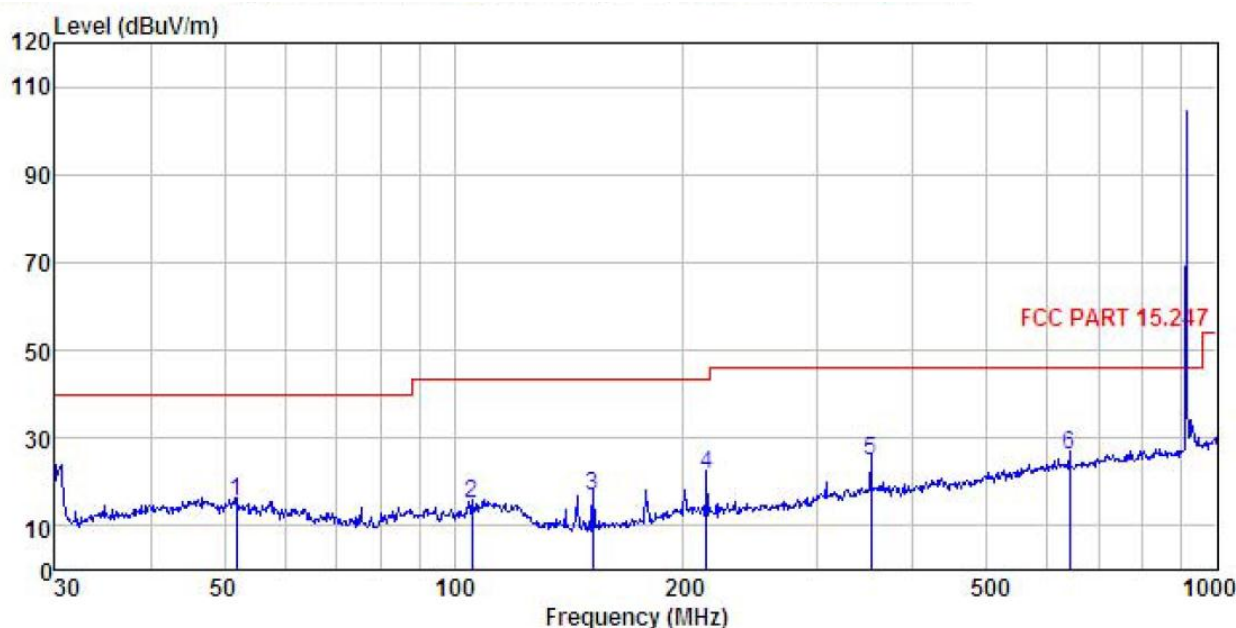
6.7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205 RSS-Gen section 6.13				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9KHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value
Limit:	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
Test Procedure:	1. 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. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. 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. 4. 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 rotating table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case. 2. 9 kHz to 30MHz is too low, so only shows the data of above 30MHz in this report.

Below 1GHz

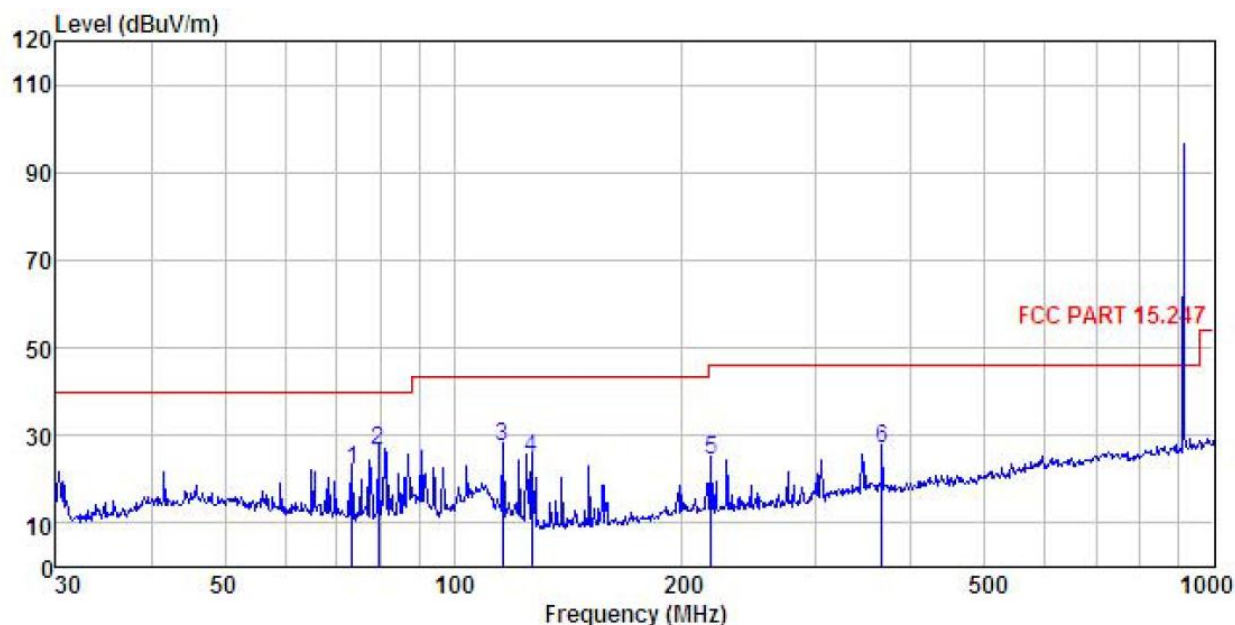
Horizontal:



Site : 3m chamber
 Condition : FCC PART 15.247 3m VULB9163(30M2G) HORIZONTAL
 EUT : Connected
 Model : RX3200
 Test mode : TX mode
 Power Rating : DC 3.7V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: YT
 Remark :

	ReadAntenna	Cable	Preamp		Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	51.843	29.93	14.08	1.27	29.81	15.47	40.00
2	105.642	30.41	12.12	2.00	29.49	15.04	43.50
3	152.130	35.16	8.52	2.53	29.20	17.01	43.50
4	214.514	36.13	11.30	2.85	28.74	21.54	43.50
5	351.708	35.62	14.77	3.10	28.57	24.92	46.00
6	640.611	32.32	18.54	3.88	28.81	25.93	46.00

Vertical:



Site : 3m chamber
 Condition : FCC PART 15.247 3m VULB9163(30M2G) VERTICAL
 EUT : Connected
 Model : RX3200
 Test mode : TX mode
 Power Rating : DC 3.7V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: YT
 Remark :

	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	dBuV/m	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	73.617	40.81	9.52	1.61	29.69	22.25	40.00	-17.75	QP
2	79.521	46.26	8.50	1.65	29.64	26.77	40.00	-13.23	QP
3	116.132	43.58	10.98	2.12	29.42	27.26	43.50	-16.24	QP
4	126.772	42.78	9.28	2.25	29.35	24.96	43.50	-18.54	QP
5	218.309	38.76	11.30	2.85	28.72	24.19	46.00	-21.81	QP
6	365.539	38.02	14.58	3.09	28.63	27.06	46.00	-18.94	QP

Above 1GHz

Peak value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1830.00	65.32	23.17	4.15	41.27	51.37	74.00	-22.63	Vertical
2745.00	62.15	24.67	5.08	41.72	50.18	74.00	-23.82	Vertical
3660.00	53.25	29.33	5.95	41.62	46.91	74.00	-27.09	Vertical
4575.00	46.25	34.89	6.87	42.12	45.89	74.00	-28.11	Vertical
5490.00	45.14	34.66	7.55	41.89	45.46	74.00	-28.54	Vertical
6405.00	47.69	35.91	8.24	41.92	49.92	74.00	-24.08	Vertical
1830.00	64.02	23.17	4.15	41.27	50.07	74.00	-23.93	Horizontal
2745.00	63.46	24.67	5.08	41.72	51.49	74.00	-22.51	Horizontal
3660.00	54.51	29.33	5.95	41.62	48.17	74.00	-25.83	Horizontal
4575.00	47.35	34.89	6.87	42.12	46.99	74.00	-27.01	Horizontal
5490.00	47.15	34.66	7.55	41.89	47.47	74.00	-26.53	Horizontal
6405.00	48.41	35.91	8.24	41.92	50.64	74.00	-23.36	Horizontal
Average value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1830.00	59.62	23.17	4.15	41.27	45.67	54.00	-8.33	Vertical
2745.00	58.15	24.67	5.08	41.72	46.18	54.00	-7.82	Vertical
3660.00	49.62	29.33	5.95	41.62	43.28	54.00	-10.72	Vertical
4575.00	45.25	34.89	6.87	42.12	44.89	54.00	-9.11	Vertical
5490.00	45.26	34.66	7.55	41.89	45.58	54.00	-8.42	Vertical
6405.00	46.39	35.91	8.24	41.92	48.62	54.00	-5.38	Vertical
1830.00	60.57	23.17	4.15	41.27	46.62	54.00	-7.38	Horizontal
2745.00	60.02	24.67	5.08	41.72	48.05	54.00	-5.95	Horizontal
3660.00	50.47	29.33	5.95	41.62	44.13	54.00	-9.87	Horizontal
4575.00	44.62	34.89	6.87	42.12	44.26	54.00	-9.74	Horizontal
5490.00	46.19	34.66	7.55	41.89	46.51	54.00	-7.49	Horizontal
6405.00	45.79	35.91	8.24	41.92	48.02	54.00	-5.98	Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.