FCC REPORT

(RFID)

Applicant:	Radiant Sensors LLC
Address of Applicant:	11340 Lakefield Drive, Suite 200, Johns Creek, GEORGIA, USA

Equipment Under Test (EUT)

Product Name:	UHF Fixed Reader
Model No.:	RSWR-400
FCC ID:	2AMX9RSWR-400
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	04 Jan., 2016
Date of Test:	04 Jan., to 29 Apr., 2016
Date of report issued:	03 May 2016
Test Result:	PASS *

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

Authorized Signature:

Bruce Zhang
Laboratory Manager

2 Version

Version No.	Date	Description
00	*03 May 2016*	*UHF Fixed Reader Main board with wireless module (FCC ID: RVZHYM750) and same antenna were used by the device, only conducted emission and Radiated emission were re-tested.*

Tested by: Carey Chen ***Date:*** *03 May 2016*

Test Engineer

Reviewed by: RYan.Lee ***Date:*** *03 May 2016*

Project Engineer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna Requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(1)	Pass*
20dB Occupied Bandwidth	15.247 (a)(1)	Pass*
Carrier Frequencies Separation	15.247 (a)(1)	Pass*
Hopping Channel Number	15.247 (a)(1)	Pass*
Dwell Time	15.247 (a)(1)	Pass*
Radiated Emission	15.205/15.209	Pass
Band Edge	15.247(d)	Pass*

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

Pass: The test data refer to FCC ID: RVZHYM750.*

5 General Information

5.1 Client Information

Applicant:	Radiant Sensors LLC
Address of Applicant:	11340 Lakefield Drive, Suite 200, Johns Creek, GEORGIA, USA
Manufacturer:	Radiant Sensors LLC
Address of Manufacturer:	11340 Lakefield Drive, Suite 200, Johns Creek, GEORGIA, USA

5.2 General Description of E.U.T.

Product Name:	UHF Fixed Reader
Model No.:	RSWR-400
Operation Frequency:	902.75MHz-927.25MHz
Number of channel:	50
Modulation type:	GFSK
Modulation technology:	FHSS
Antenna Type:	External Antenna
Antenna gain:	0dBi
AC adapter:	Model: AD9045 Input: AC100-240V 50/60Hz 1.2A Output: DC 12V, 4A

Antenna Type: External Antenna with reversed polarity Non standard antenna portAntenna gain: 0dBi
Antenna port： 4
Note：4 Antennas can not transmit simultaneously， only have SISO mode

Operation Frequency each of channel for GFSK							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	902.75MHz	14	909.25MHz	27	915.75MHz	40	922.25MHz
2	903.25MHz	15	909.75MHz	28	916.25MHz	41	922.75MHz
3	903.75MHz	16	910.25MHz	29	916.75MHz	42	923.25MHz
4	904.25MHz	17	910.25MHz	30	9178.25MHz	43	923.75MHz
5	90.4.75MHz	18	911.25MHz	31	917.75MHz	44	924.25MHz
6	905.25MHz	19	911.75MHz	32	918.25MHz	45	924.75MHz
7	905.75MHz	20	912.25MHz	33	918.75MHz	46	925.25MHz
8	906.25MHz	21	912.75MHz	34	919.25MHz	47	925.75MHz
9	906.75MHz	22	913.25MHz	35	919.75MHz	48	926.25MHz
10	907.25MHz	23	913.75MHz	36	920.25MHz	49	926.75MHz
11	907.75MHz	24	914.25MHz	37	920.75MHz	50	927.25MHz
12	908.25MHz	25	914.75MHz	38	921.25MHz		
13	908.75MHz	26	915.25MHz	39	921.75MHz		
Remark: Channel 1, 25 &50 selected for GFSK.							

NOTE:Use RFID Module with FCC ID: RVZHYM750, so except conducted emission and radiated emission， other data are from FCC ID: RVZHYM750 module report .

5.3 Test mode

Transmitting mode:	Keep the EUT in transmitting mode with worst case data rate.
The sample was placed 0.8m 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 with a fresh battery, 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.	

5.4 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 out 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.

5.5 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

5.6 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	08-22-2017
2	BiConiLog Antenna	SCHWARZBECK	VULB9163	CCIS0005	03-25-2016	03-25-2017
3	Horn Antenna	SCHWARZBECK	BBHA9120D	CCIS0006	03-25-2016	03-25-2017
4	Pre-amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	04-01-2016	03-31-2017
5	Pre-amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	04-01-2016	03-31-2017
6	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	04-01-2016	03-31-2017
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	04-01-2016	03-31-2017
8	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP30	CCIS0023	03-28-2016	03-28-2017
9	EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	03-28-2016	03-28-2017
10	Loop antenna	Laplace instrument	RF300	EMC0701	04-01-2016	03-31-2017
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	08-23-2014	08-22-2017
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	03-24-2016	03-24-2017
3	LISN	CHASE	MN2050D	CCIS0074	03-26-2016	03-26-2017
4	Coaxial Cable	CCIS	N/A	CCIS0086	04-01-2016	03-31-2017
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

6 Test results and Measurement Data

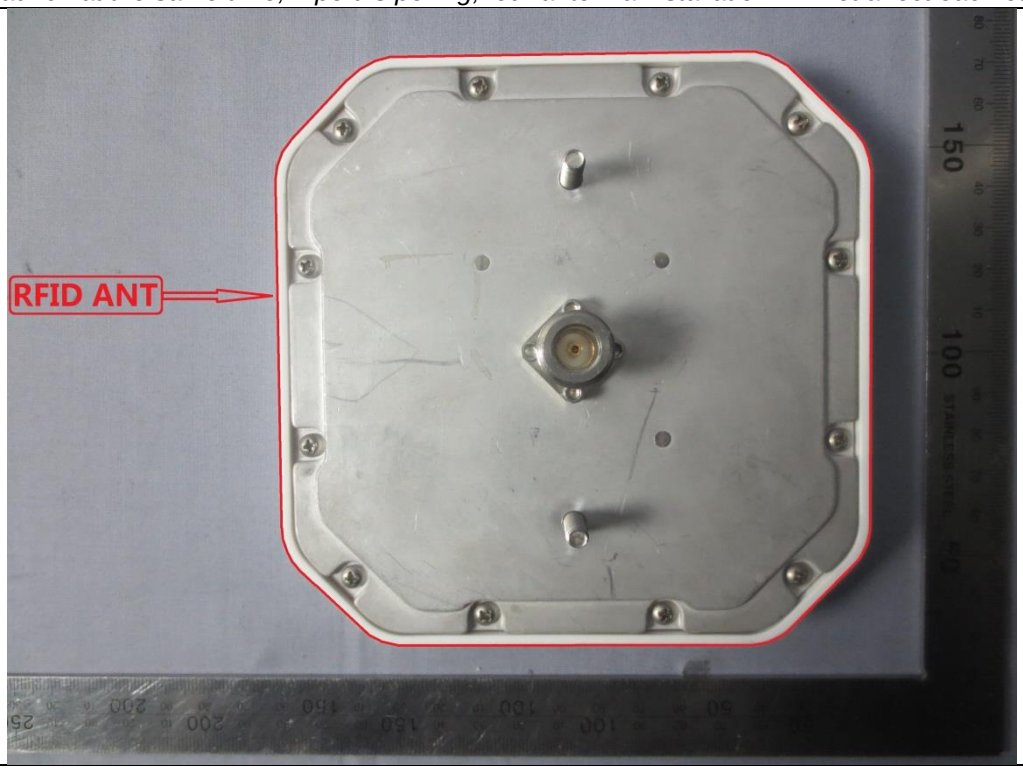
6.1 Antenna requirement

Standard requirement:	FCC Part 15 C Section 15.203 /247(c)

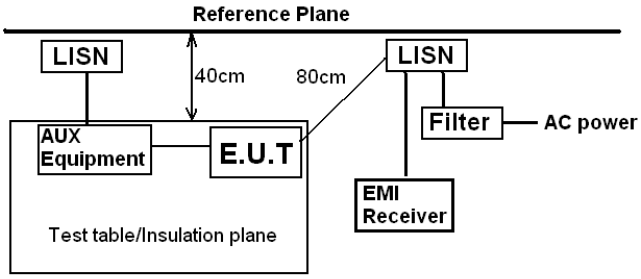
15.203 requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer 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.
15.247(c) (1)(i) requirement:
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

E.U.T Antenna:	

The RFID antenna is an external antenna, the best case gain of the antenna is 0dBi. Device is equipped with unique non-standard antenna connector and the recommended specific antenna by the manufacture. All the RF characteristics (such as power, bandwidth etc.) of the ports are identical, which can't launch at the same time, 4 port is polling, four antenna installation will not affect each other.

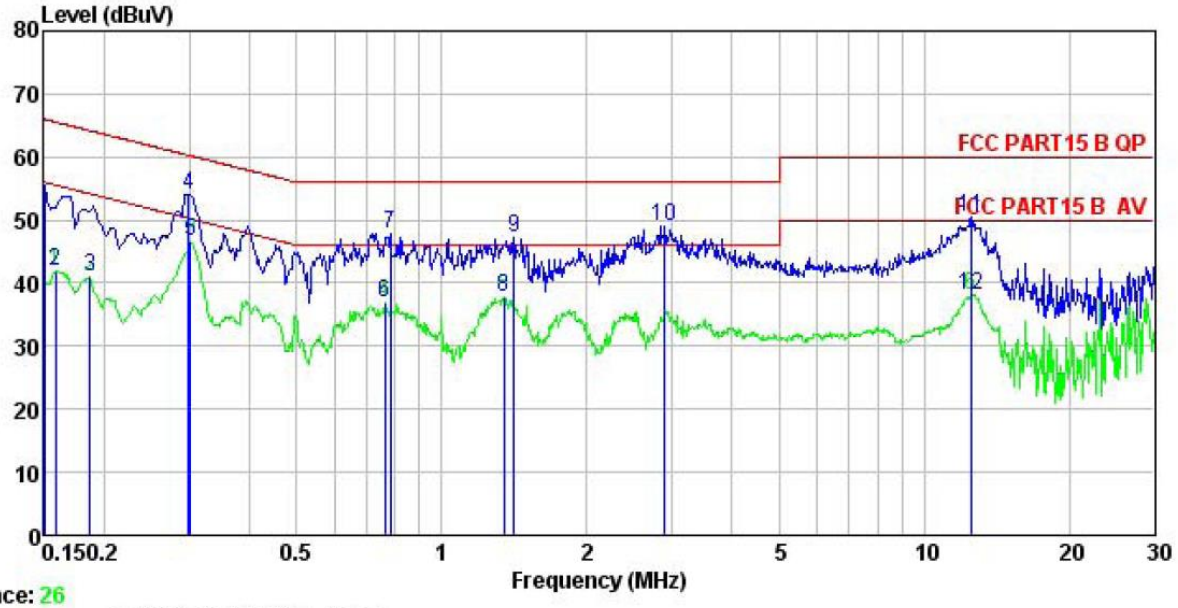


6.2 Conducted Emissions

Test Requirement:	FCC Part 15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150 kHz to 30 MHz
Class / Severity:	Class B
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto
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 setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. 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). 3. 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 Uncertainty:	±3.28 dB
Test Instruments:	Refer to section 5.7 for details
Test mode:	Bluetooth (Continuous transmitting) mode
Test results:	Pass

Measurement Data

Line:

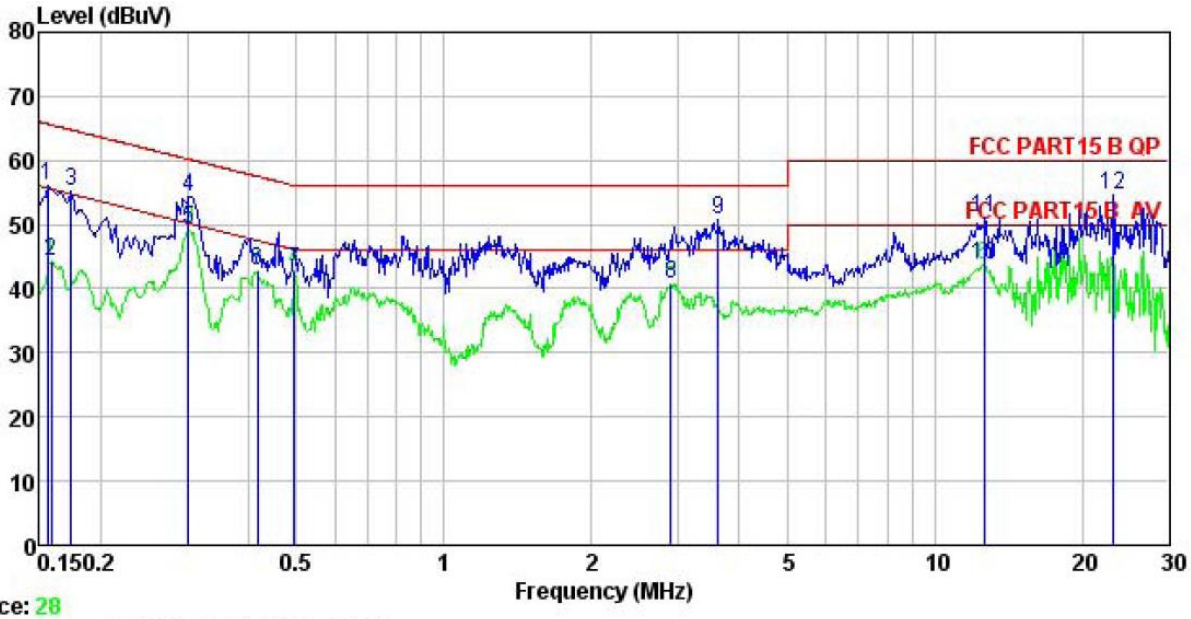


Trace: 26

Site : CCIS Shielding Room
Condition : FCC PART15 B QP LISN LINE
EUT : UHF Fixed Reader
Model : RSWR-400
Test Mode : RFID mode
Power Rating : AC 120/60Hz
Environment : Temp: 23 'C Huni:56% Atmos:101KPa
Test Engineer: steven
Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	44.60	0.14	10.78	55.52	66.00	-10.48	QP
2	0.158	31.02	0.14	10.78	41.94	55.56	-13.62	Average
3	0.186	30.01	0.15	10.76	40.92	54.20	-13.28	Average
4	0.299	43.19	0.16	10.74	54.09	60.28	-6.19	QP
5	0.302	35.62	0.16	10.74	46.52	50.19	-3.67	Average
6	0.763	25.86	0.31	10.80	36.97	46.00	-9.03	Average
7	0.783	36.85	0.30	10.81	47.96	56.00	-8.04	QP
8	1.345	26.48	0.29	10.91	37.68	46.00	-8.32	Average
9	1.411	36.11	0.29	10.91	47.31	56.00	-8.69	QP
10	2.900	37.72	0.33	10.92	48.97	56.00	-7.03	QP
11	12.516	39.17	0.27	10.91	50.35	60.00	-9.65	QP
12	12.516	27.04	0.27	10.91	38.22	50.00	-11.78	Average

Neutral:



Trace: 28

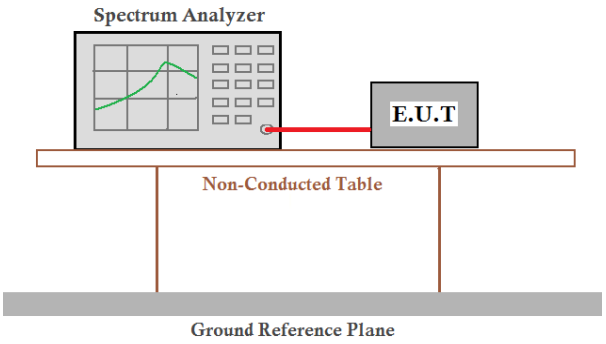
Site : CCIS Shielding Room
Condition : FCC PART15 B QP LISN NEUTRAL
EUT : UHF Fixed Reader
Model : RSWR-400
Test Mode : RFID mode
Power Rating : AC 120/60Hz
Environment : Temp: 23 ℃ Huni:56% Atmos:101KPa
Test Engineer: steven
Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.156	45.27	0.12	10.78	56.17	65.69	-9.52	QP
2	0.158	33.46	0.13	10.78	44.37	55.56	-11.19	Average
3	0.174	44.21	0.14	10.77	55.12	64.77	-9.65	QP
4	0.302	43.39	0.19	10.74	54.32	60.19	-5.87	QP
5	0.302	38.45	0.19	10.74	49.38	50.19	-0.81	Average
6	0.417	31.72	0.23	10.73	42.68	47.51	-4.83	Average
7	0.497	31.73	0.24	10.76	42.73	46.05	-3.32	Average
8	2.900	29.40	0.30	10.92	40.62	46.00	-5.38	Average
9	3.623	39.49	0.33	10.90	50.72	56.00	-5.28	QP
10	12.582	32.51	0.25	10.91	43.67	50.00	-6.33	Average
11	12.649	39.99	0.25	10.91	51.15	60.00	-8.85	QP
12	23.140	43.47	0.25	10.89	54.61	60.00	-5.39	QP

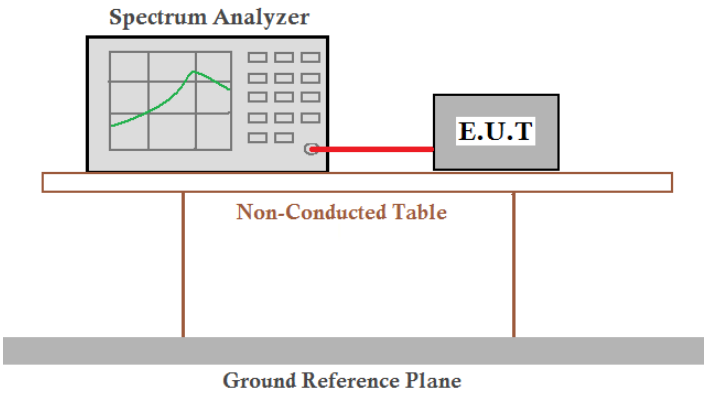
Notes:

1. An initial pre-scan was performed on the line 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

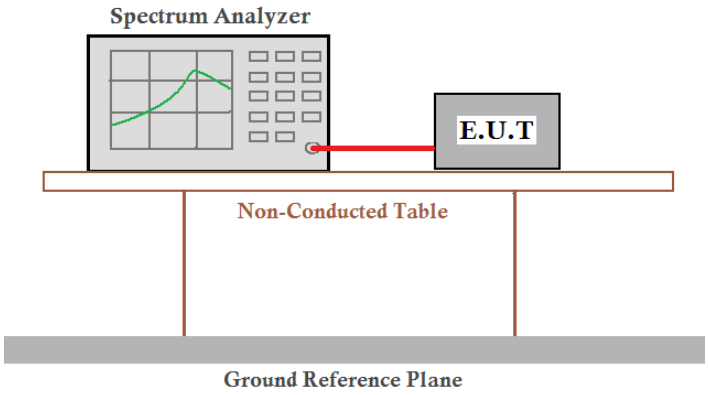
6.3 Conducted Output Power

Test Requirement:	FCC Part 15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=1MHz, VBW=3MHz, Detector=Peak (If 20dB BW ≤1 MHz) RBW=3MHz, VBW=10MHz, Detector=Peak (If 20dB BW > 1 MHz and < 3MHz)
Limit:	125 mW(21 dBm)
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode
Test results:	Refer to FCC ID: RVZHYM750

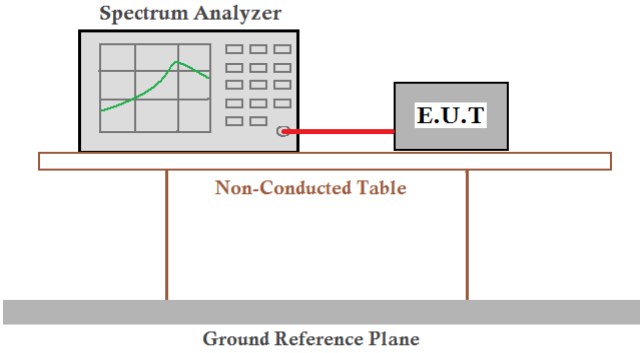
6.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=30 kHz, VBW=100 kHz, detector=Peak
Limit:	NA
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode
Test results:	Refer to FCC ID: RVZHYM750

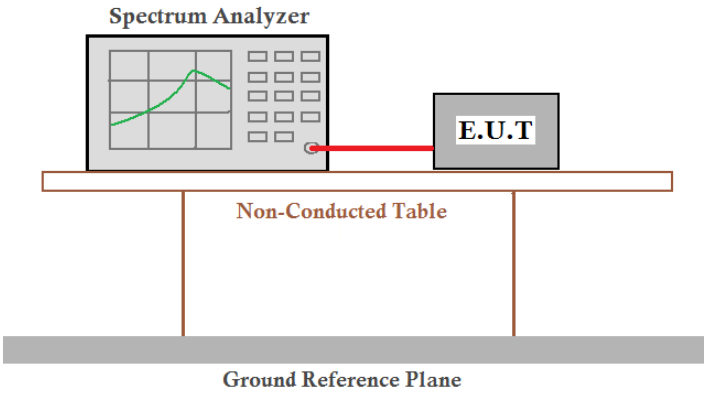
6.5 Carrier Frequencies Separation

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, detector=Peak
Limit:	0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Hopping mode
Test results:	Refer to FCC ID: RVZHYM750

6.6 Hopping Channel Number

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	15 channels
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Hopping mode
Test results:	Refer to FCC ID: RVZHYM750

6.7 Dwell Time

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013 and KDB DA00-705
Receiver setup:	RBW=1 MHz, VBW=1 MHz, Span=0 Hz, Detector=Peak
Limit:	0.4 Second
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Hopping mode
Test results:	Refer to FCC ID: RVZHYM750

6.8 Pseudorandom Frequency Hopping Sequence

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1) requirement:

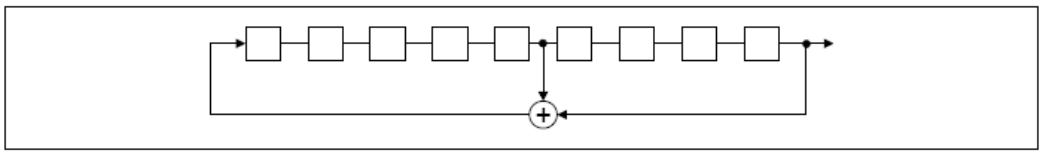
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively. Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

EUT Pseudorandom Frequency Hopping Sequence

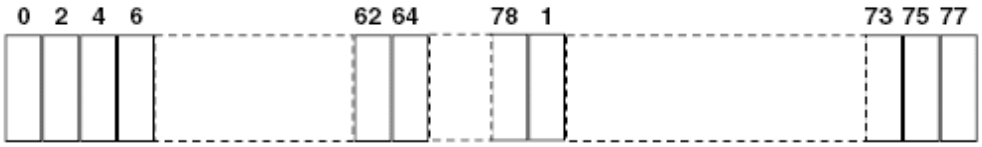
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

- *Number of shift register stages: 9*
- *Length of pseudo-random sequence: 2^9 -1 = 511 bits*
- *Longest sequence of zeros: 8 (non-inverted signal)*



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:

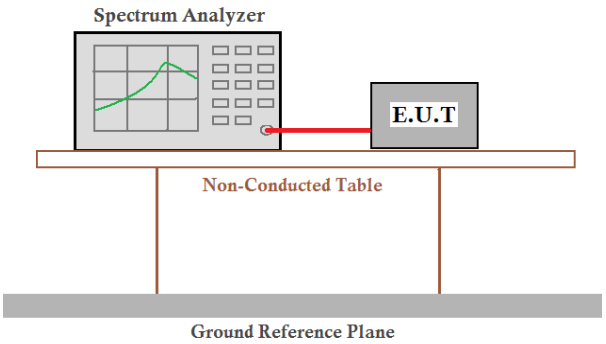


Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

6.9 Band Edge

6.9.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and DA00-705
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Detector=Peak
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:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode and hopping mode
Test results:	Refer to FCC ID: RVZHYM750

6.9.2 Radiated Emission Method

Test Requirement:	FCC Part 15 C Section 15.209 and 15.205
Test Method:	ANSI C63.10: 2013
Test Frequency Range:	2.3GHz to 2.5GHz
Test site:	Measurement Distance: 3m

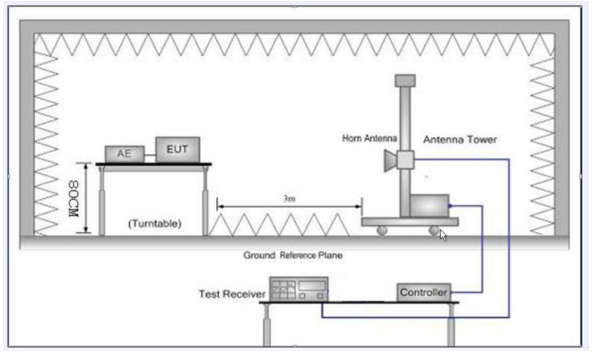
Receiver setup:

Frequency	Detector	RBW	VBW	Remark
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	RMS	1MHz	3MHz	Average Value

Limit:

Frequency	Limit (dBuV/m @3m)	Remark
Above 1GHz	54.00	Average Value
	74.00	Peak Value

Test setup:



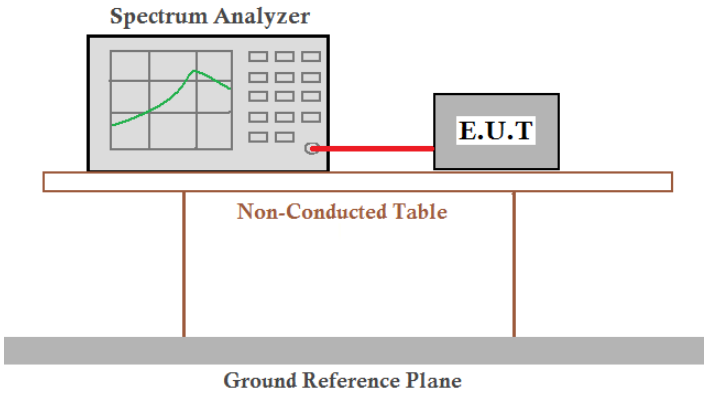
Test Procedure:

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. 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 rota 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 Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode
Test results:	Refer to FCC ID: RVZHYM750

6.10 Spurious Emission

6.10.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and DA00-705
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:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode
Test results:	Refer to FCC ID: RVZHYM750

6.10.2 Radiated Emission Method

Test Requirement:	FCC Part 15 C Section 15.209
Test Method:	ANSI C63.10: 2013
Test Frequency Range:	9 kHz to 25 GHz
Test site:	Measurement Distance: 3m

Receiver setup:

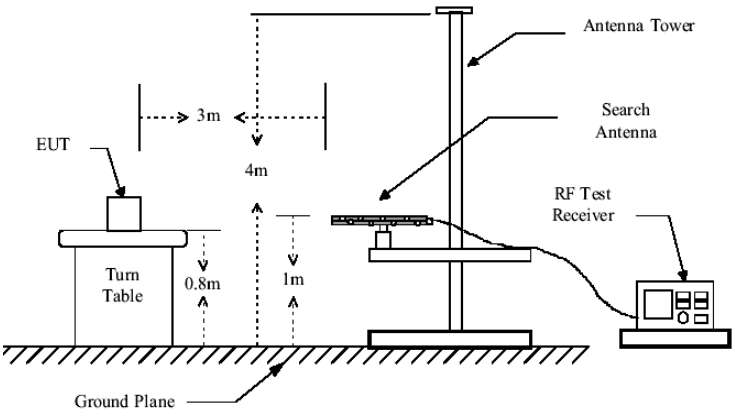
Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	RMS	1MHz	3MHz	Average Value

Limit:

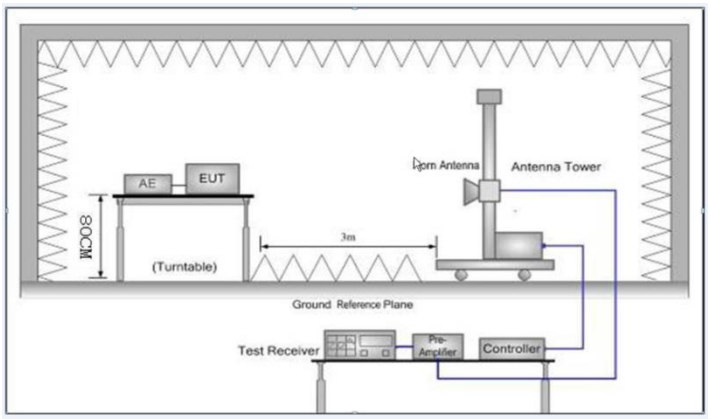
Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
	74.0	Peak Value

Test setup:

Below 1GHz



Above 1GHz



Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters 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 rota 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 Uncertainty:	±4.88 dB
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode
Test results:	Pass

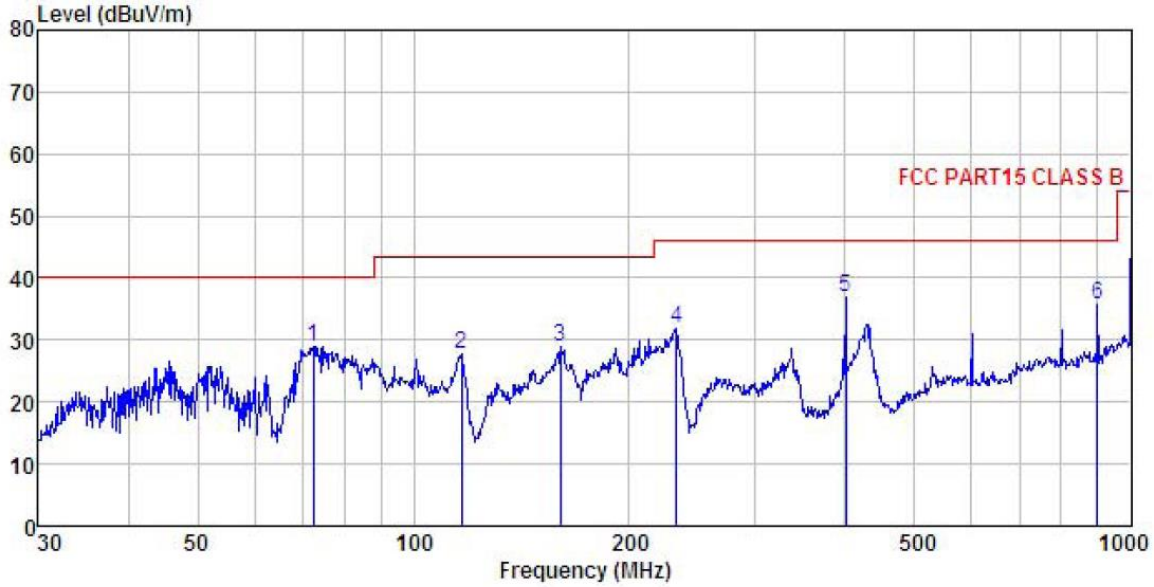
Remark:

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 30 MHz is noise floor, so only shows the data of above 30MHz in this report.*

Measurement data:

Below 1GHz

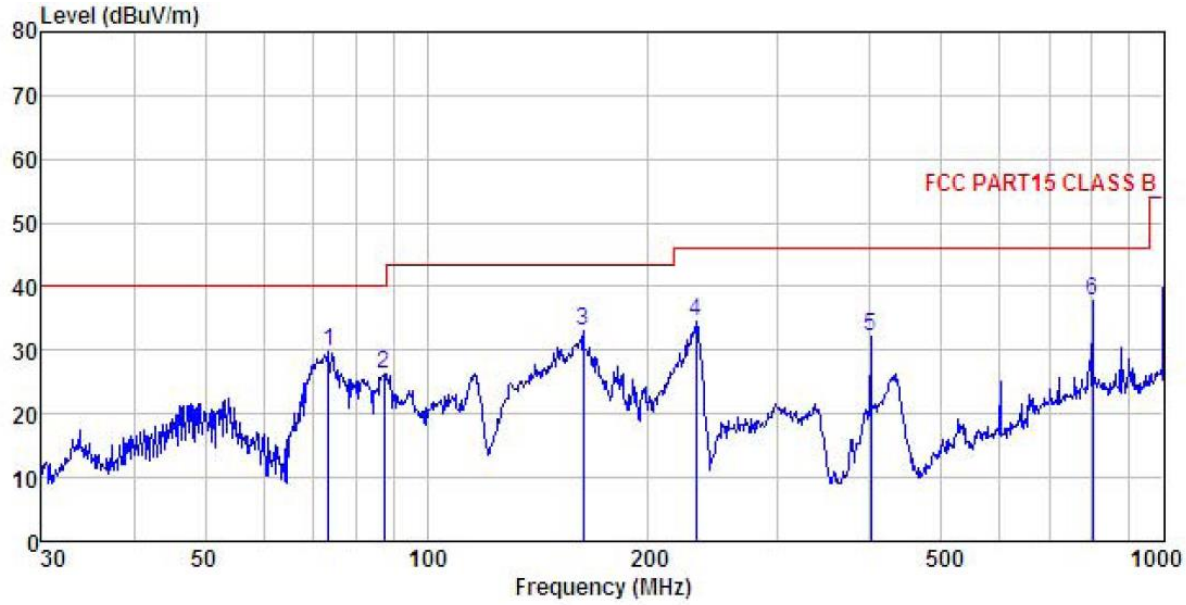
Vertical:



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) VERTICAL
EUT : UHF Fixed Reader
Model : RSWR-400
Test mode : RFID Mode
Power Rating : AC 230V/50Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: steven
REMARK :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	72.592	50.57	6.53	1.59	29.70	28.99	40.00	-11.01	QP
2	116.540	43.69	11.33	2.13	29.41	27.74	43.50	-15.76	QP
3	160.346	45.58	9.89	2.59	29.13	28.93	43.50	-14.57	QP
4	232.532	45.97	11.66	2.83	28.64	31.82	46.00	-14.18	QP
5	400.432	46.77	15.91	3.08	28.78	36.98	46.00	-9.02	QP
6	900.147	38.28	21.60	3.71	27.88	35.71	46.00	-10.29	QP

Horizontal:



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) HORIZONTAL
EUT : UHF Fixed Reader
Model : RSWR-400
Test mode : REID Mode
Power Rating : AC 230V/50Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: steven
REMARK :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	73.617	51.39	6.43	1.61	29.69	29.74	40.00	-10.26	QP
2	87.418	46.22	7.82	1.96	29.58	26.42	40.00	-13.58	QP
3	163.182	49.69	9.86	2.61	29.11	33.05	43.50	-10.45	QP
4	231.718	48.67	11.64	2.83	28.64	34.50	46.00	-11.50	QP
5	400.432	41.83	15.91	3.08	28.78	32.04	46.00	-13.96	QP
6	801.786	41.09	20.60	4.34	28.19	37.84	46.00	-8.16	QP

Above 1GHz:

Test channel:			Lowest		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1805.50	59.43	23.11	5.43	40.98	46.99	74.00	-27.01	Vertical
1805.50	53.84	23.11	5.43	40.98	41.40	74.00	-32.60	Horizontal
Test channel:			Lowest		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1805.50	51.64	23.11	5.43	40.98	39.20	54.00	-14.80	Vertical
1805.50	44.68	23.11	5.43	40.98	32.24	54.00	-21.76	Horizontal

Test channel:			Middle		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1829.50	58.45	23.17	5.46	40.96	46.12	74.00	-27.88	Vertical
1829.50	58.21	23.17	5.46	40.96	45.88	74.00	-28.12	Horizontal
Test channel:			Middle		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1829.50	50.12	23.17	5.46	40.96	37.79	54.00	-16.21	Vertical
1829.50	50.11	23.17	5.46	40.96	37.78	54.00	-16.22	Horizontal

Test channel:			Highest		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1854.50	60.76	23.22	5.50	40.94	48.54	74.00	-25.46	Vertical
1854.50	56.63	23.22	5.50	40.94	44.41	74.00	-29.59	Horizontal
Test channel:			Highest		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1854.50	51.23	23.22	5.50	40.94	39.01	54.00	-14.99	Vertical
1854.50	48.20	23.22	5.50	40.94	35.98	54.00	-18.02	Horizontal

Restriction band emission

Test channel:			Lowest band		Level:		QP	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
991.0	13.84	22.82	4.42	0.00	41.08	54.00	-12.92	Vertical
989.3	14.33	22.74	4.42	0.00	41.49	54.00	-12.51	Horizontal
Test channel:			Highest Band		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization

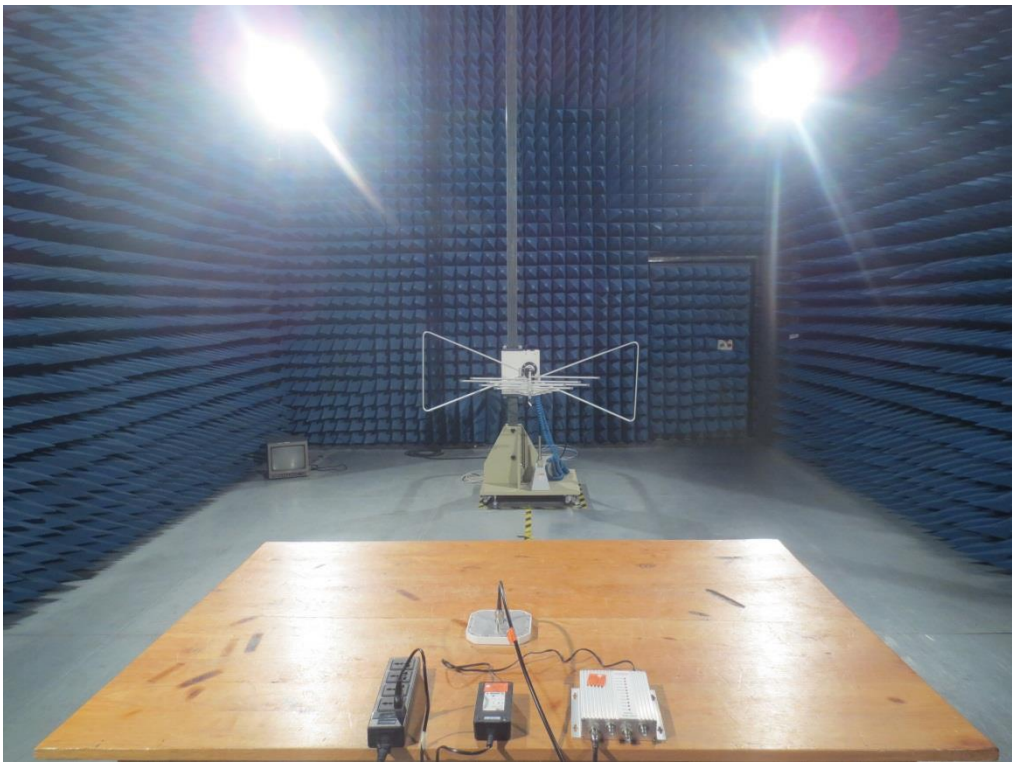
1139.2	9.10	21.17	3.27	0.00	33.54	74	-40.46	Vertical
1172.3	9.25	21.17	3.27	0.00	33.69	74	-40.31	Horizontal
Test channel:			Highest Band		Level:		Average	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1139.2	0.35	21.17	3.27	0.00	24.79	54	-29.21	Vertical
1172.3	0.42	21.17	3.27	0.00	24.86	54	-29.14	Horizontal

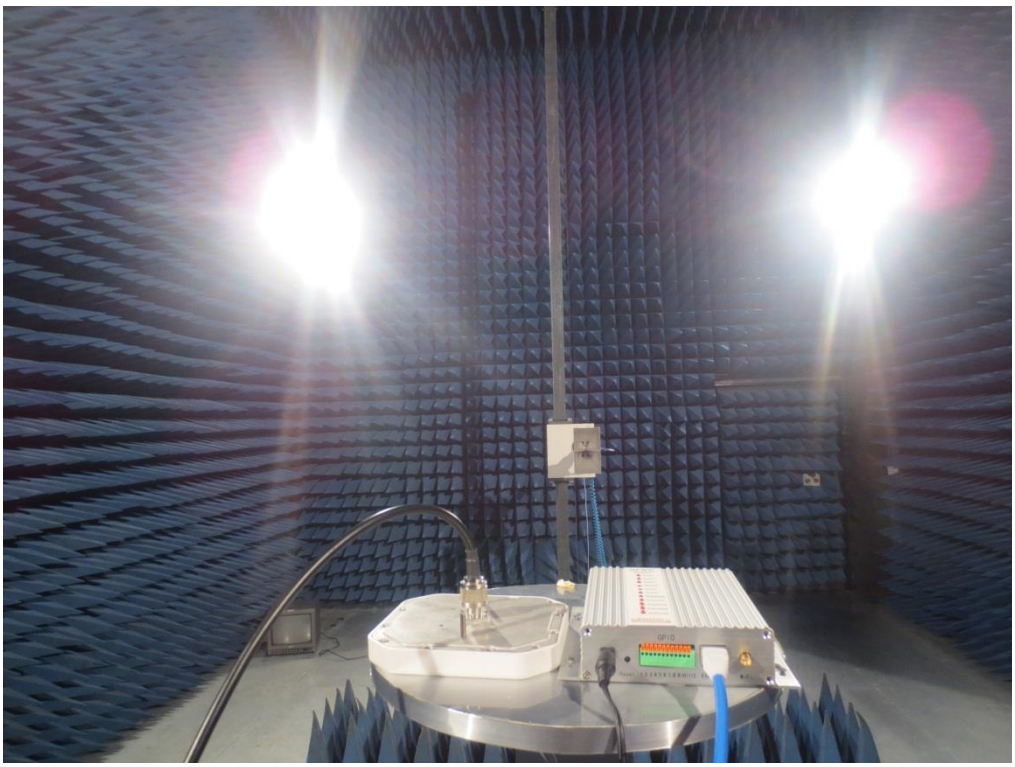
Remark:

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.*

7 Test Setup Photo

Radiated Spurious Emission





Conducted Emission

8 EUT Constructional Details

Reference to the test report No. CCIS15120100001

------End of report------