

FCC REPORT

Applicant: i-Mobile Technology corporation

Address of Applicant: 3F #8 Alley 15 Lane 120 Sec. 1 Neihu Road, Neihu District,
Taipei City 114, Taiwan

Equipment Under Test (EUT)

Product Name: RFID Module

Model No.: UHF-006

Trade mark: @mobile

FCC ID: XZO-RFID

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: 11 Feb., 2015

Date of Test: 11 Feb., to 11 Mar., 2015

Date of report issued: 12 Mar., 2015

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	12 Mar., 2015	Original

Prepared by:

Sera Xiang

Date:

12 Mar., 2015

Report Clerk

Reviewed by:

Wimer Zhang

Date:

12 Mar., 2015

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.

5 General Information

5.1 Client Information

Applicant:	i-Mobile Technology corporation
Address of Applicant:	3F #8 Alley 15 Lane 120 Sec. 1 Neihu Road, Neihu District, Taipei City 114, Taiwan
Manufacturer:	i-Mobile Technology corporation
Address of Manufacturer:	3F #8 Alley 15 Lane 120 Sec. 1 Neihu Road, Neihu District, Taipei City 114, Taiwan

5.2 General Description of E.U.T.

Product Name:	RFID Module
Model No.:	UHF-006
Operation Frequency:	903.24MHz~926.76MHz
Number of channel:	50
Modulation type:	GFSK
Modulation technology:	FHSS
Antenna Type:	PCB Antenna
Antenna gain:	-2.89dBi
Power supply:	DC 5V

Operation Frequency each of channel for GFSK							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	903.24MHz	13	909.48MHz	26	915.72MHz	39	921.96MHz
1	903.72MHz	14	909.96MHz	27	916.20MHz	40	922.44MHz
2	904.20MHz	15	910.44MHz	28	916.68MHz	41	922.92MHz
3	904.68MHz	16	910.92MHz	29	917.16MHz	42	923.40MHz
4	905.16MHz	17	911.40MHz	30	917.64MHz	43	923.88MHz
5	905.64MHz	18	911.88MHz	31	918.12MHz	44	924.36MHz
6	906.12MHz	19	912.36MHz	32	918.60MHz	45	924.84MHz
7	906.60MHz	20	912.84MHz	33	919.08MHz	46	925.32MHz
8	907.08MHz	21	913.32MHz	34	919.56MHz	47	925.80MHz
9	907.56MHz	22	913.80MHz	35	920.04MHz	48	926.28MHz
10	908.04MHz	23	914.28MHz	36	920.52MHz	49	926.76MHz
11	908.52MHz	24	914.76MHz	37	921.00MHz		
12	909.00MHz	25	915.24MHz	38	921.48MHz		
Remark: Channel 0, 24 &49 selected for GFSK.							

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
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5.6 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
DELL	PC	OPTIPLEX745	N/A	DoC
DELL	MONITOR	E178FPC	N/A	DoC
DELL	KEYBOARD	SK-8115	N/A	DoC
DELL	MOUSE	MOC5UO	N/A	DoC
HP	Printer	CB495A	05257893	DoC
MERCURY	Wireless router	MW150R	12922104015	DoC

5.7 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 Semi- Anechoic Chamber	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2017
2	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	04-19-2014	04-19-2015
3	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	04-19-2014	04-19-2015
4	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
5	Amplifier(10kHz-1.3GHz)	HP	8447D	CCIS0003	04-01-2014	03-31-2015
6	Amplifier(1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	06-09-2014	06-05-2015
7	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	04-01-2014	03-31-2015
8	Horn Antenna	ETS-LINDGREN	3160	GTS217	03-30-2014	03-29-2015
9	Printer	HP	HP LaserJet P1007	N/A	N/A	N/A
10	Positioning Controller	UC	UC3000	CCIS0015	N/A	N/A
11	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP	CCIS0023	04-19-2014	04-19-2015
12	EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	04-01-2014	03-31-2015
13	Loop antenna	Laplace instrument	RF300	EMC0701	04-01-2014	03-31-2015
14	Universal radio communication tester	Rhode & Schwarz	CMU200	CCIS0069	05-29-2014	05-28-2015
15	Signal Analyzer	Rohde & Schwarz	FSIQ3	CCIS0088	04-19-2014	04-19-2015

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	11-10-2012	11-09-2015
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	04-10-2014	04-09-2015
3	LISN	CHASE	MN2050D	CCIS0074	04-10-2014	04-10-2015
4	Coaxial Cable	CCIS	N/A	CCIS0086	04-01-2014	03-31-2015
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

6 Test results and Measurement Data

6.1 Antenna requirement

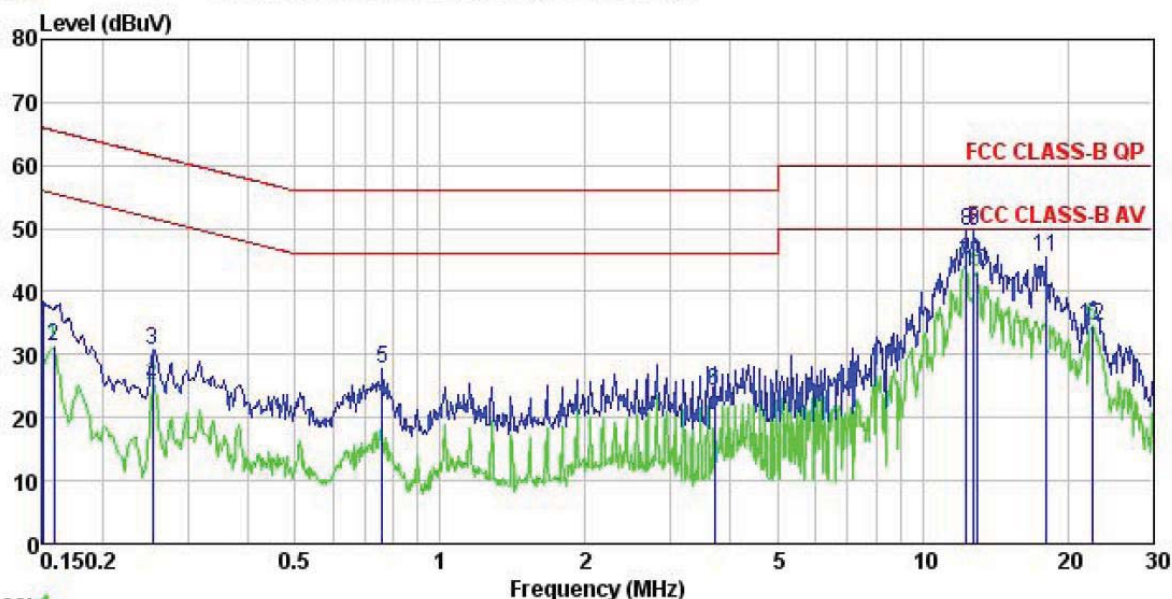
Standard requirement:	FCC Part 15 C Section 15.203 /247(c)
15.203 requirement: <i>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses 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> 15.247(B) (4) requirement: <i>(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this The conducted output power limit specified in paragraph (b) of this section is based on the use The conducted output power limit specified in paragraph (b) of this section is based on the use (2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</i>	
E.U.T Antenna:	
<i>The antenna is an integral antenna which permanently attached, and the best case gain of the antenna is -2.89 dBi.</i>	

6.2 Conducted Emissions

Test Requirement:	FCC Part 15 C Section 15.207																
Test Method:	ANSI C63.4:2009																
Test Frequency Range:	150 kHz to 30 MHz																
Class / Severity:	Class B																
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto																
Limit:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table> * Decreases with the logarithm of the frequency.			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
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															
Test setup:	Reference Plane Test table/Insulation plane <i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance 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 C63.4:2009 on conducted measurement.																
Test Instruments:	Refer to section 5.7 for details																
Test mode:	Continuous transmitting mode																
Test results:	Pass																

Measurement Data

Line:

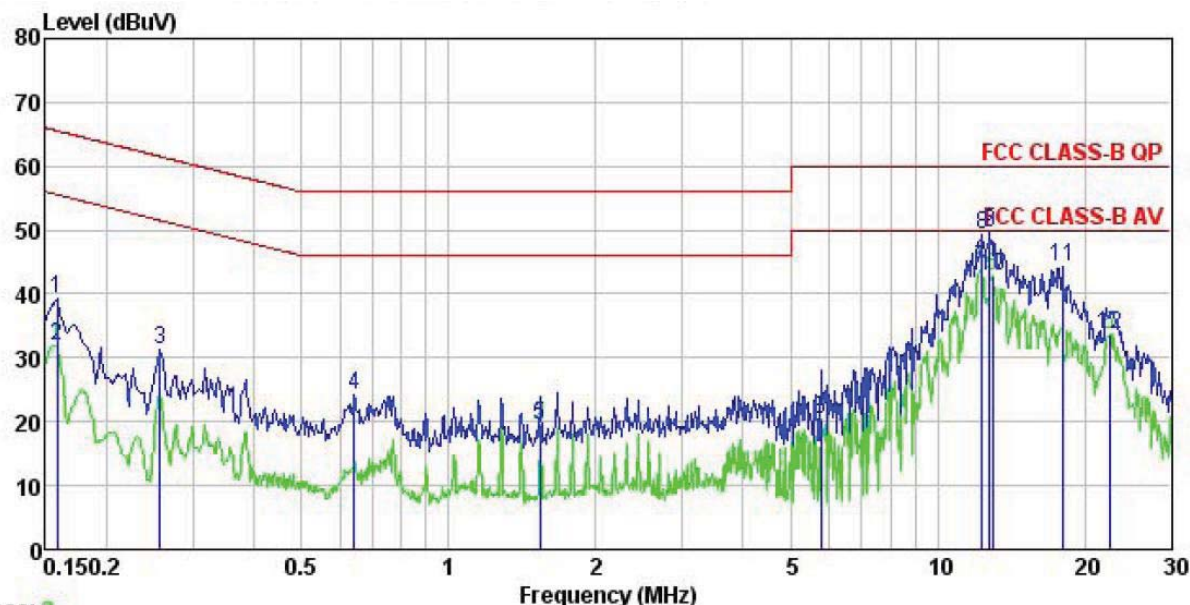


Trace: 1

Site : CCIS Shielding Room
 Condition : FCC CLASS-B QP LISN LINE
 Job No. : 108RF
 EUT : RFID Module
 Model : UHF-006
 Test Mode : On mode
 Power Rating : AC 120/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: MT
 Remark :

	Freq	Read	LISN	Cable	Level	Limit	Over	
	MHz	Level	Factor	Loss	Level	Line	Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	27.28	0.27	10.78	38.33	66.00	-27.67	QP
2	0.158	20.27	0.27	10.78	31.32	55.56	-24.24	Average
3	0.253	19.78	0.27	10.75	30.80	61.64	-30.84	QP
4	0.253	14.00	0.27	10.75	25.02	51.64	-26.62	Average
5	0.759	16.80	0.23	10.80	27.83	56.00	-28.17	QP
6	3.700	12.91	0.28	10.90	24.09	46.00	-21.91	Average
7	12.253	33.12	0.31	10.92	44.35	50.00	-5.65	Average
8	12.318	38.48	0.31	10.92	49.71	60.00	-10.29	QP
9	12.784	38.30	0.32	10.91	49.53	60.00	-10.47	QP
10	12.920	31.84	0.32	10.91	43.07	50.00	-6.93	Average
11	17.944	34.25	0.33	10.90	45.48	60.00	-14.52	QP
12	22.416	23.11	0.43	10.90	34.44	50.00	-15.56	Average

Neutral:



Trace: 3

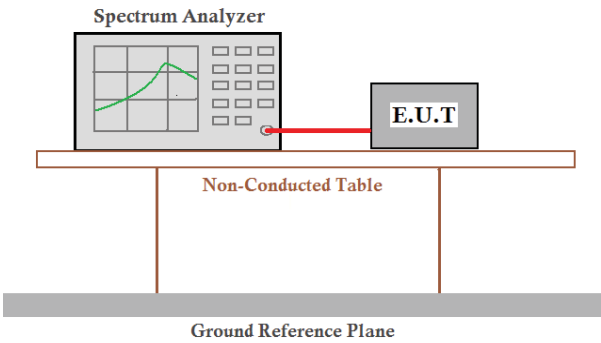
Site : CCIS Shielding Room
 Condition : FCC CLASS-B QP LISN NEUTRAL
 Job No. : 108RF
 EUT : RFID Module
 Model : UHF-006
 Test Mode : On mode
 Power Rating : AC 120/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: MT
 Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.158	28.22	0.25	10.78	39.25	65.56	-26.31	QP
2	0.158	20.97	0.25	10.78	32.00	55.56	-23.56	Average
3	0.258	20.30	0.26	10.75	31.31	61.51	-30.20	QP
4	0.641	13.35	0.21	10.77	24.33	56.00	-31.67	QP
5	1.535	8.27	0.26	10.93	19.46	46.00	-26.54	Average
6	5.774	9.21	0.27	10.83	20.31	50.00	-29.69	Average
7	12.253	32.87	0.25	10.92	44.04	50.00	-5.96	Average
8	12.318	38.17	0.25	10.92	49.34	60.00	-10.66	QP
9	12.784	38.37	0.25	10.91	49.53	60.00	-10.47	QP
10	12.920	31.67	0.25	10.91	42.83	50.00	-7.17	Average
11	17.944	33.21	0.26	10.90	44.37	60.00	-15.63	QP
12	22.416	22.50	0.37	10.90	33.77	50.00	-16.23	Average

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

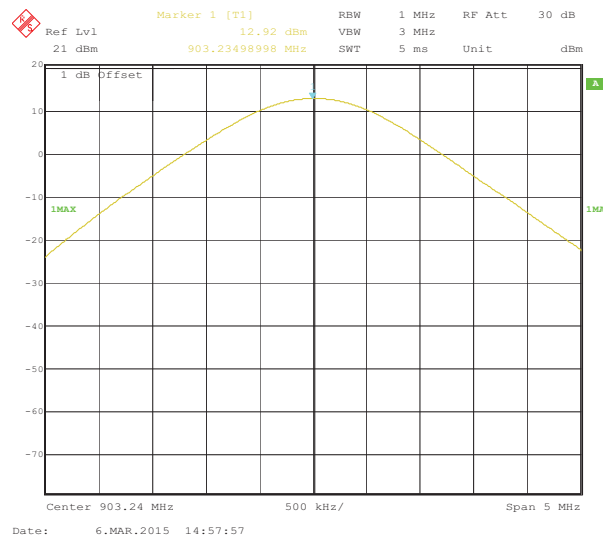
6.3 Conducted Output Power

Test Requirement:	FCC Part 15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.4:2009
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:	1W(30 dBm)
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 a Ground Reference Plane.
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode
Test results:	Pass

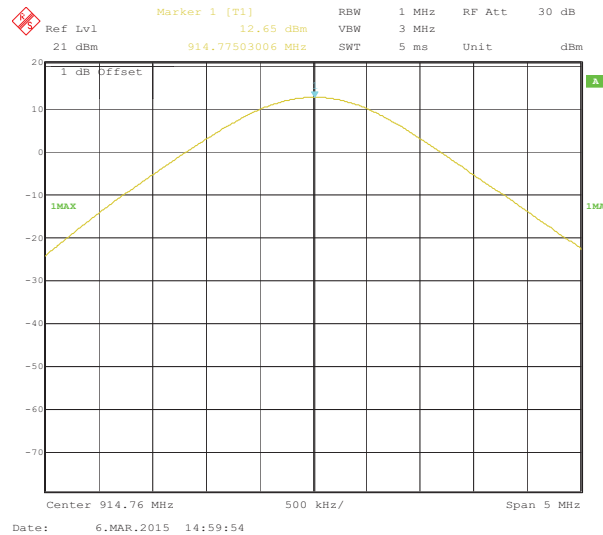
Measurement Data

Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	12.92	30.00	Pass
Middle	12.65	30.00	Pass
Highest	12.42	30.00	Pass

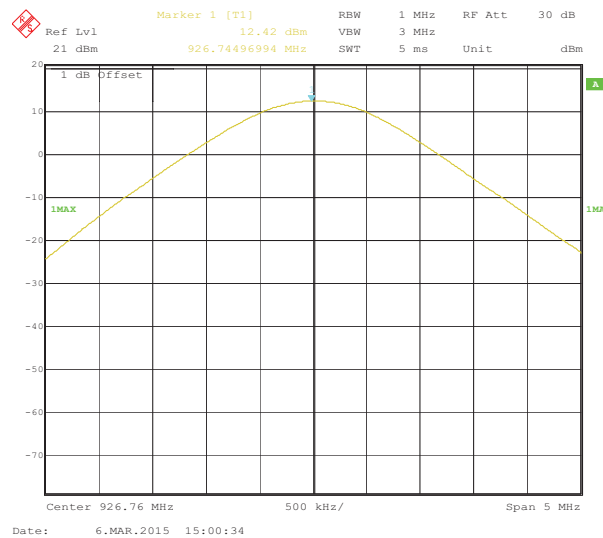
Test plot as follows:



Lowest channel

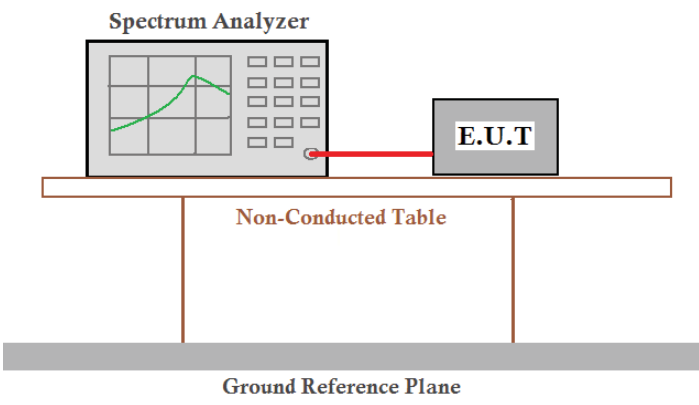


Middle channel



Highest channel

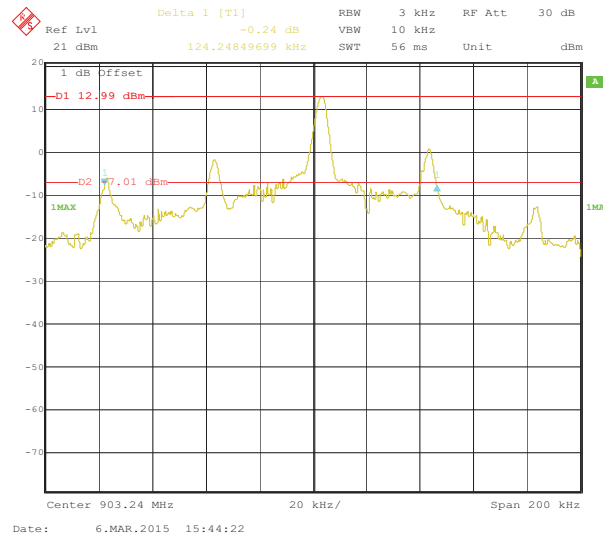
6.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2009
Receiver setup:	RBW=3 kHz, VBW=10 kHz, detector=Peak
Limit:	500 kHz
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:	Non-hopping mode
Test results:	Pass

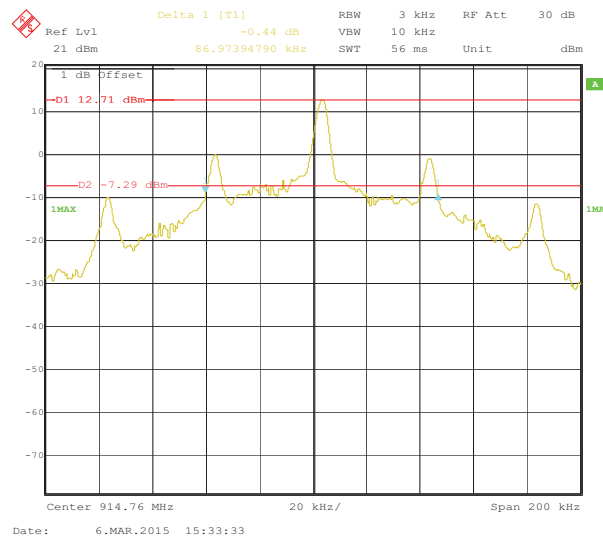
Measurement Data

Test channel	20dB Occupy Bandwidth (kHz)	Limit (kHz)
Lowest	124.25	500
Middle	86.97	500
Highest	86.97	500

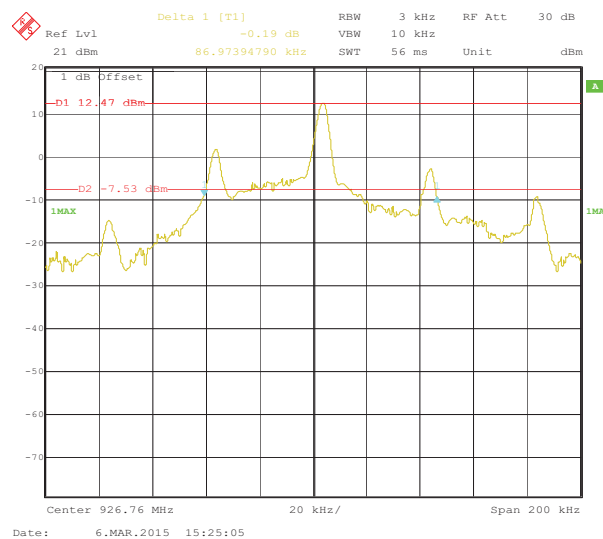
Test plot as follows:



Lowest channel

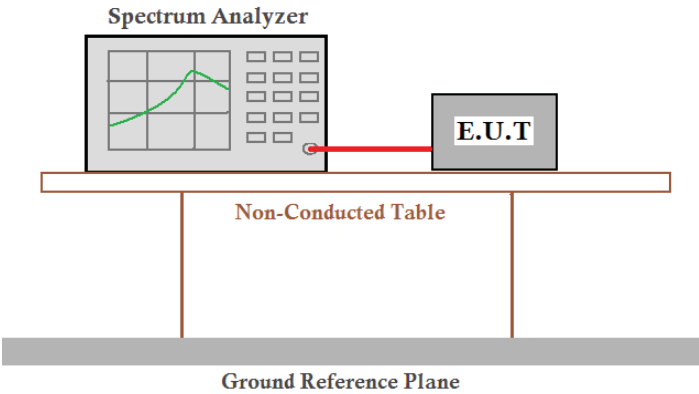


Middle channel



Highest channel

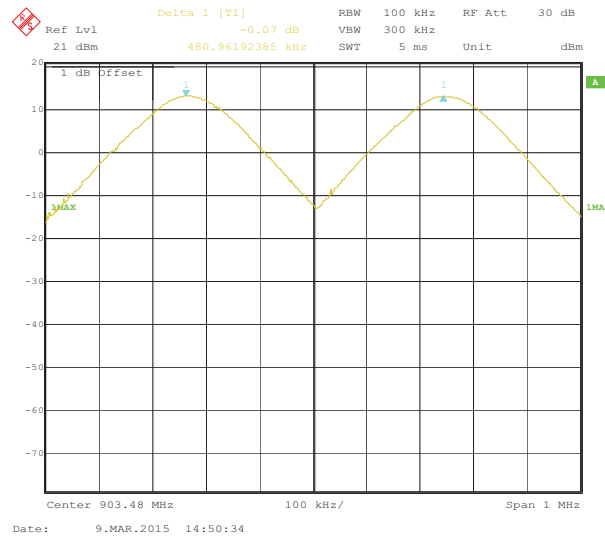
6.5 Carrier Frequencies Separation

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2009
Receiver setup:	RBW=100 kHz, VBW=300 kHz, detector=Peak
Limit:	N/A
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 a Ground Reference Plane.
Test Instruments:	Refer to section 5.7 for details
Test mode:	Hopping mode
Test results:	Pass

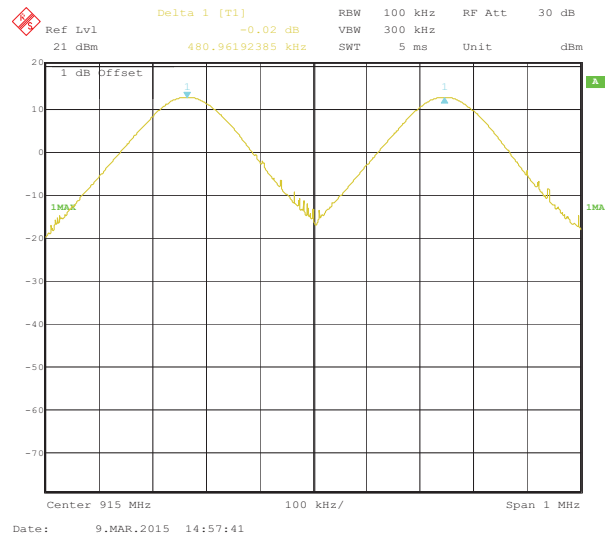
Measurement Data

Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)
Lowest	480.96	N/A
Middle	480.96	N/A
Highest	480.96	N/A

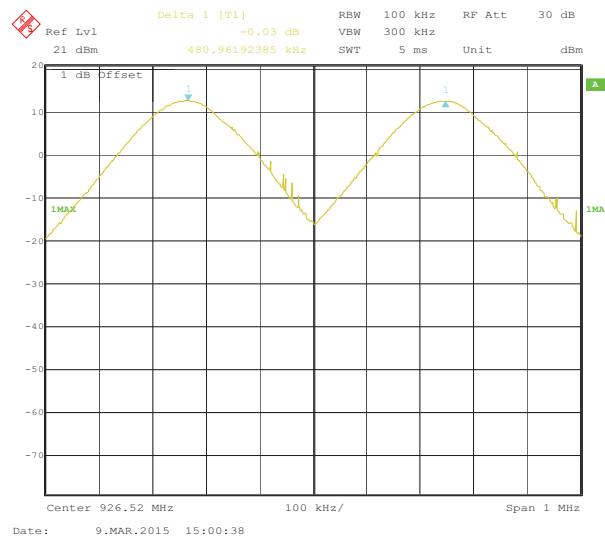
Test plot as follows:



Lowest channel

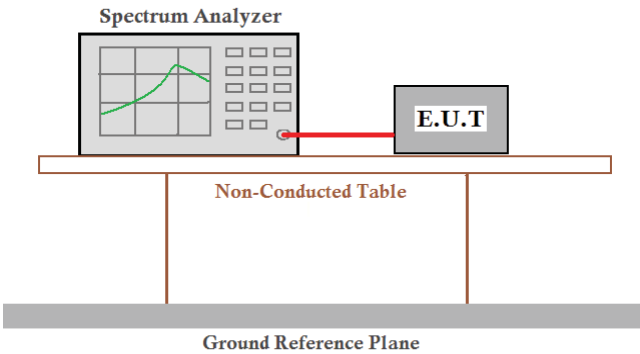


Middle channel



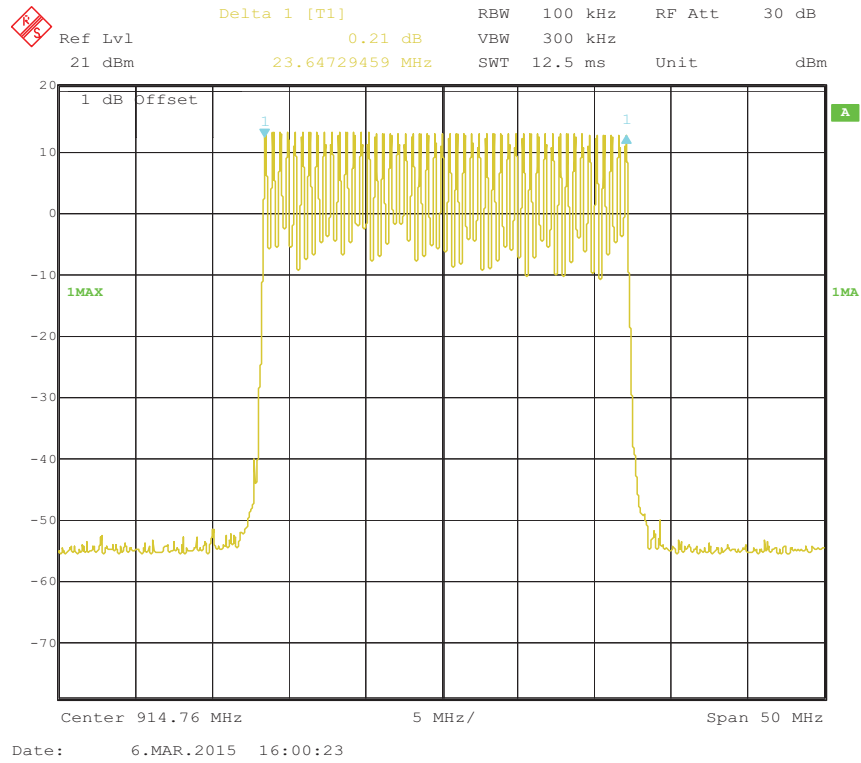
Highest channel

6.6 Hopping Channel Number

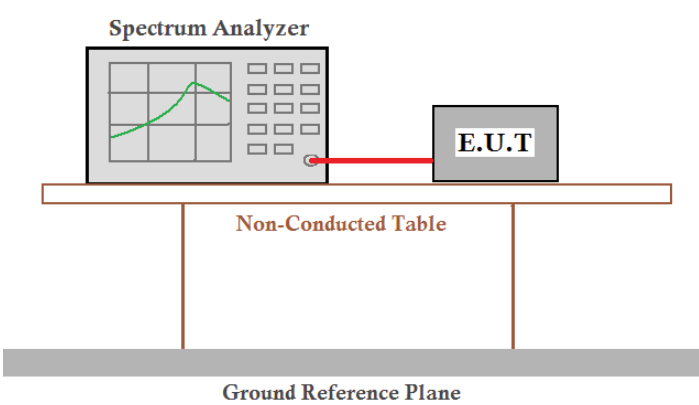
Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2009
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	25 channels $\leq$ Hopping number < 50 channels (If 250 kHz $\leq$ 20dB bandwidth $\leq$ 500kHz) Hopping number $\geq$ 50 channels (If 20 dB bandwidth < 250 kHz)
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:	Hopping mode
Test results:	Pass

Measurement Data:

Hopping channel numbers	Limit	Result
50	50	Pass



6.7 Dwell Time

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2009
Receiver setup:	RBW=1 MHz, VBW=1 MHz, Span=0 Hz, Detector=Peak
Limit:	0.4 Second (If 20 dB bandwidth < 250 kHz, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if 250 kHz ≤ 20 dB bandwidth ≤ 500kHz, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.)
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:	Hopping mode
Test results:	Pass

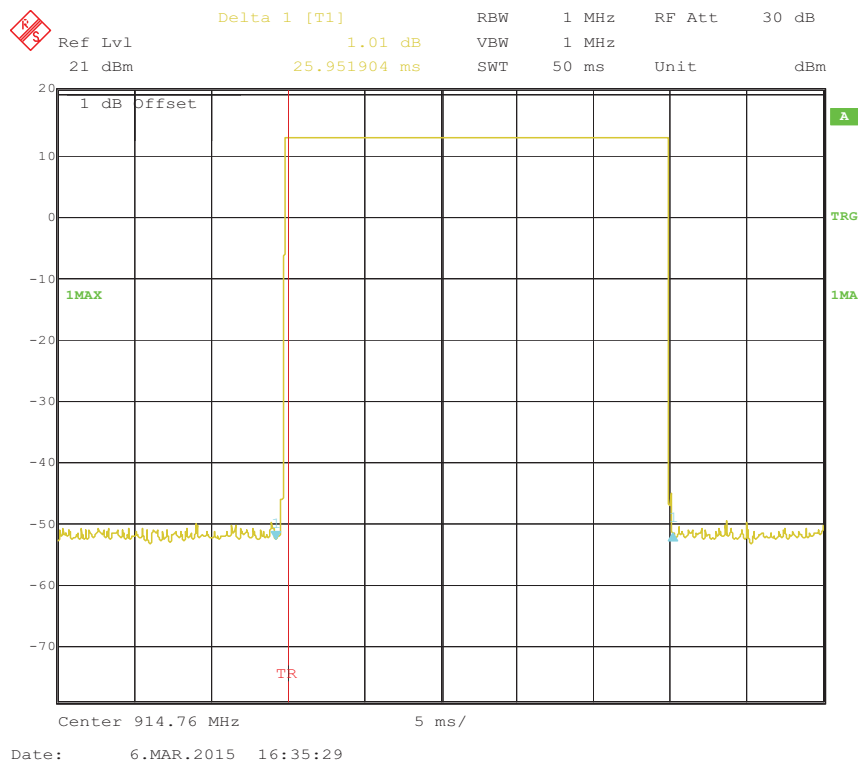
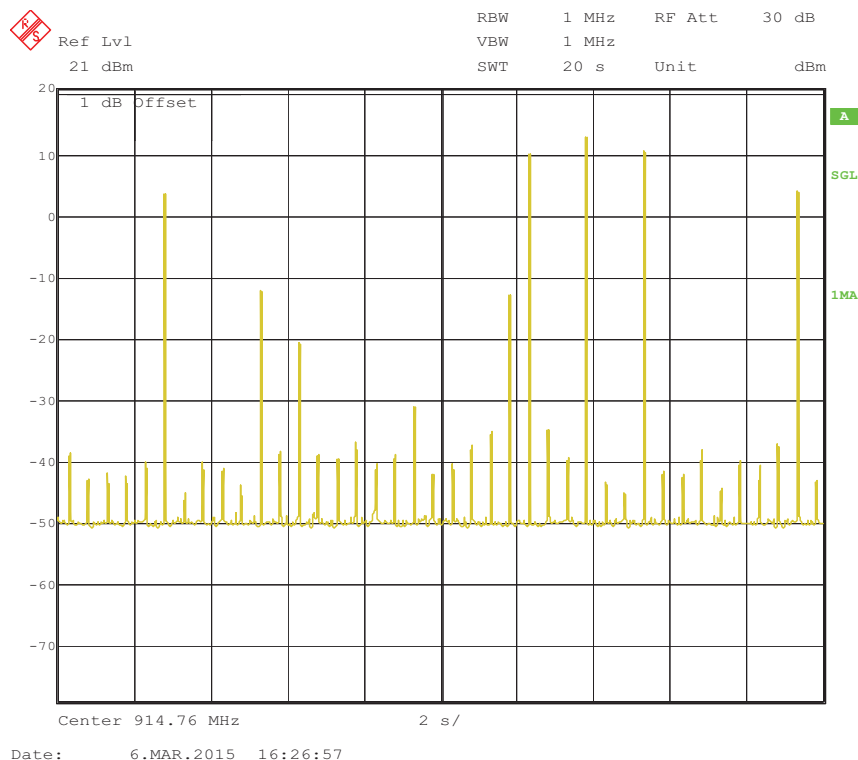
Measurement Data

Dwell time per hop (Second)	Hopping numbers	Dwell time in one period (Second)	Limit (Second)	Result
0.025952	9	0.234	0.4	Pass

Remark:

The test period: T= 20s

Test plot as follows:

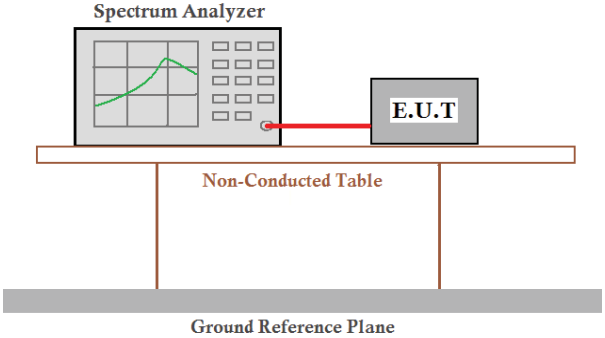


6.8 Pseudorandom Frequency Hopping Sequence

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1) requirement:
For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz	
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) <i>Linear Feedback Shift Register for Generation of the PRBS sequence</i> 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.	

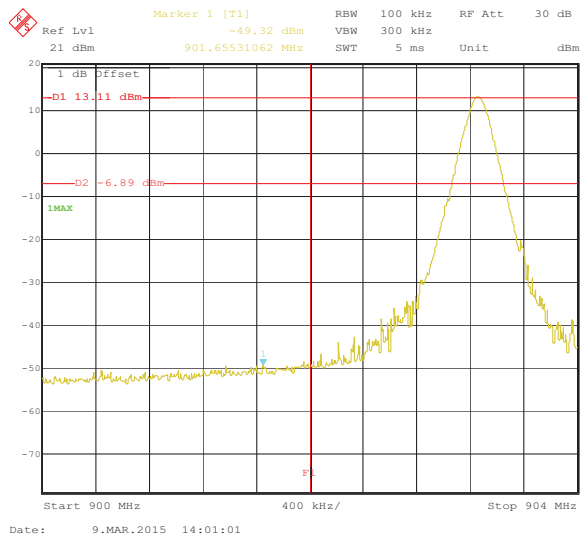
6.9 Band Edge

6.9.1 Conducted Emission Method

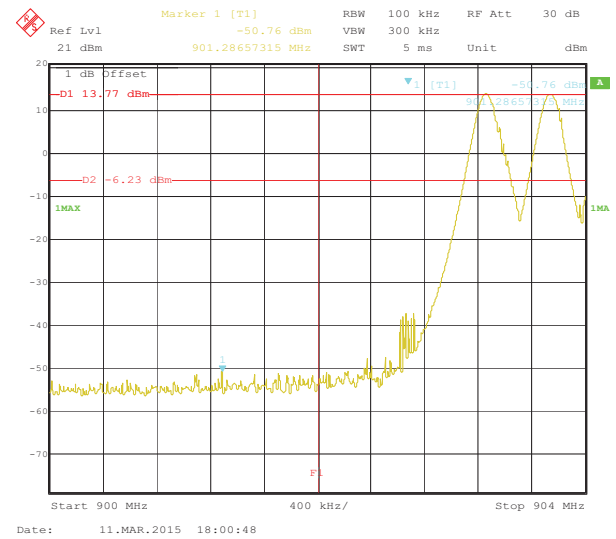
Test Requirement:	FCC Part 15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2009
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Detector=Peak
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced 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:	 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 a Ground Reference Plane.
Test Instruments:	Refer to section 5.7 for details
Test mode:	Non-hopping mode and hopping mode
Test results:	Pass

Test plot as follows:

Lowest Channel

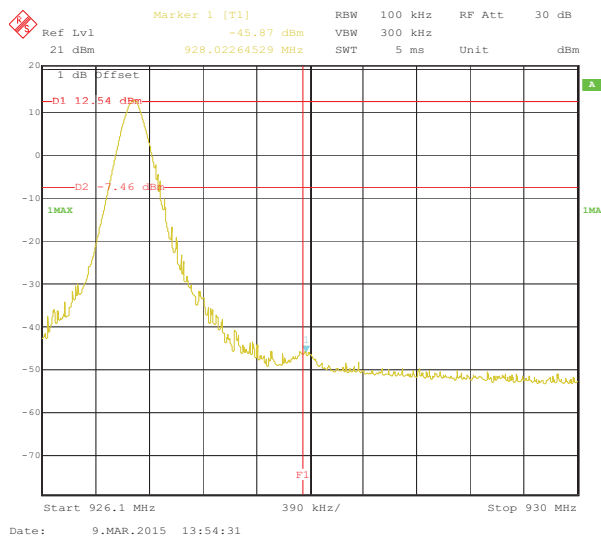


Non-hopping

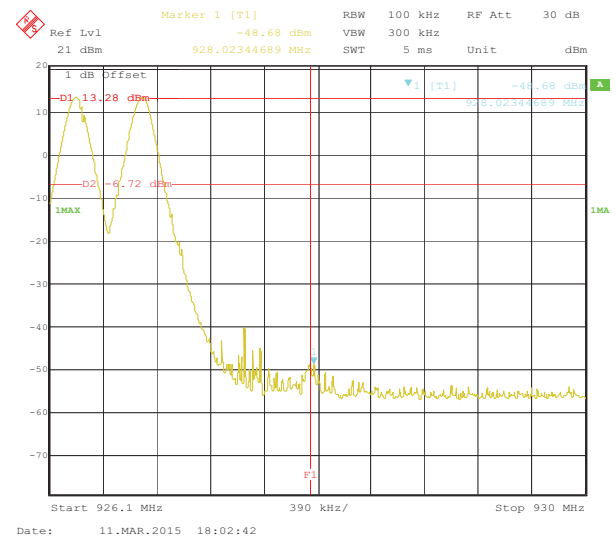


Hopping

Highest Channel

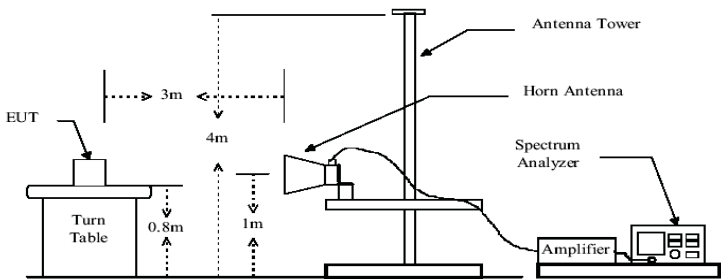


Non-hopping



Hopping

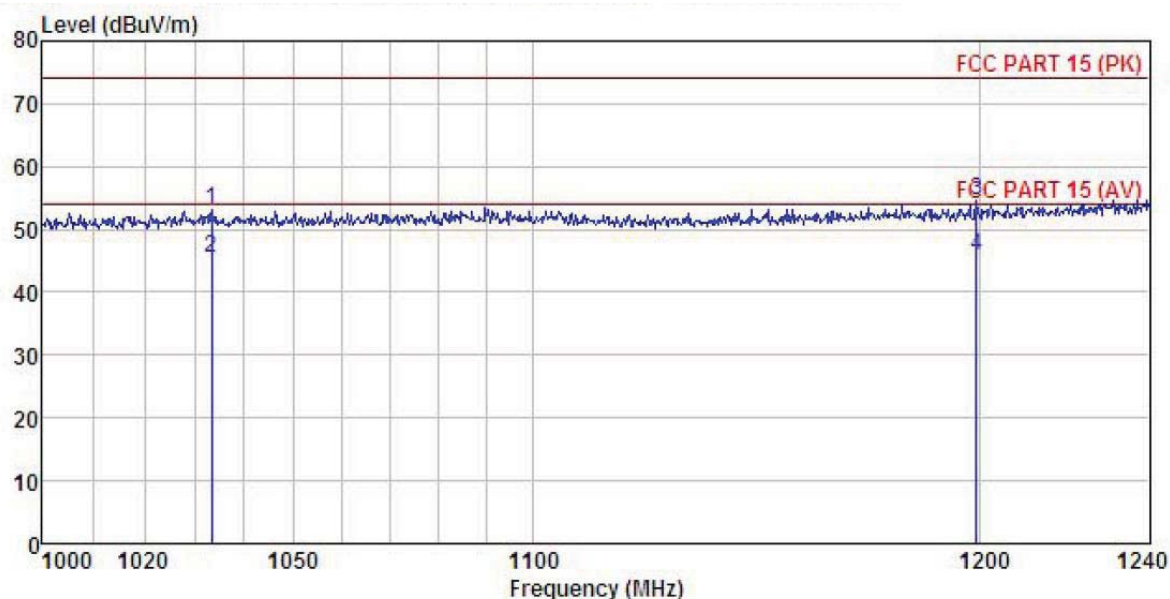
6.9.2 Radiated Emission Method

Test Requirement:	FCC Part 15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.4:2009				
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
		Peak	1MHz	10Hz	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:	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. Low mid high 3 channels all have been tested , only report worst case .

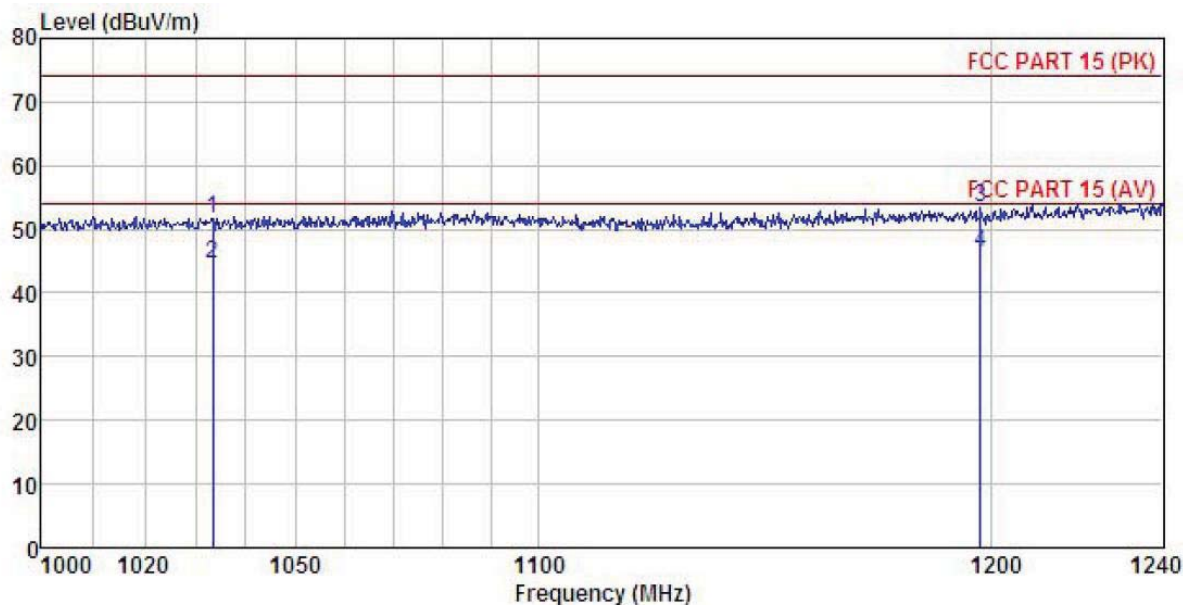
Horizontal:



Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 107RF ID
 EUT : RFID Module
 Model : UHF-006
 Test mode : Runing(TX) Mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: MT
 REMARK :

	Freq	ReadAntenna	Cable	Preamp	Limit	Over	
		Level	Factor	Loss	Factor	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m
1	1033.460	25.50	24.35	3.23	0.00	53.08	74.00
2	1033.460	17.78	24.35	3.23	0.00	45.36	54.00
3	1199.079	26.20	25.02	3.50	0.00	54.72	74.00
4	1199.079	17.34	25.02	3.50	0.00	45.86	54.00

Vertical:

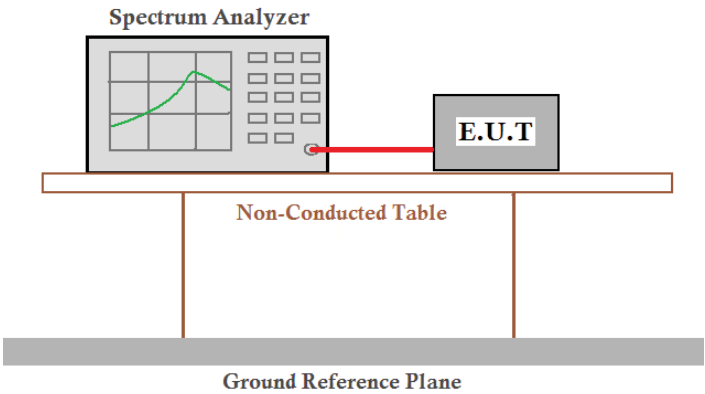


Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 107RF ID
 EUT : RFID Module
 Model : UHF-006
 Test mode : Runing(TX) Mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: MT
 REMARK :

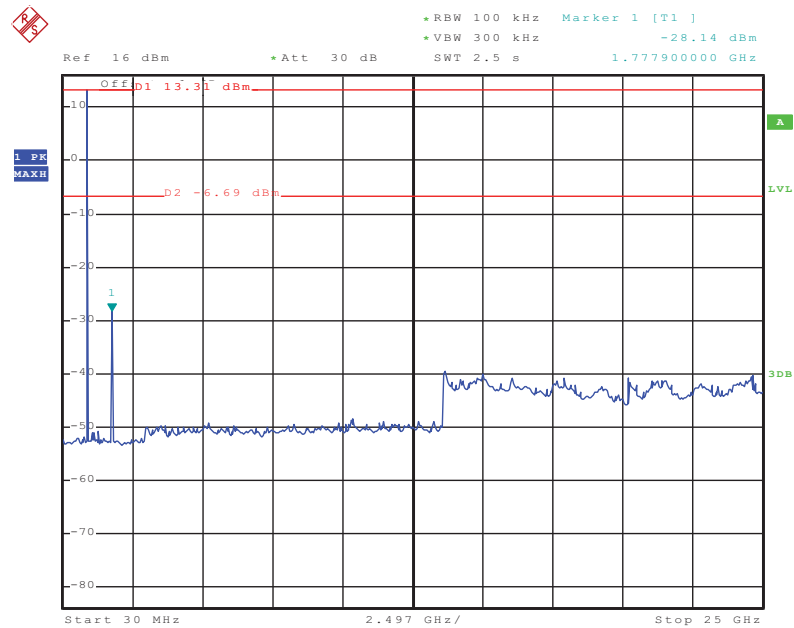
	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	
		Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1033.460	24.20	24.35	3.23	0.00	51.78	74.00	-22.22	Peak
2	1033.460	16.86	24.35	3.23	0.00	44.44	54.00	-9.56	Average
3	1197.275	25.04	24.88	3.50	0.00	53.42	74.00	-20.58	Peak
4	1197.275	17.93	24.88	3.50	0.00	46.31	54.00	-7.69	Average

6.10 Spurious Emission

6.10.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2009
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 5.7 for details
Test mode:	Non-hopping mode
Test results:	Pass

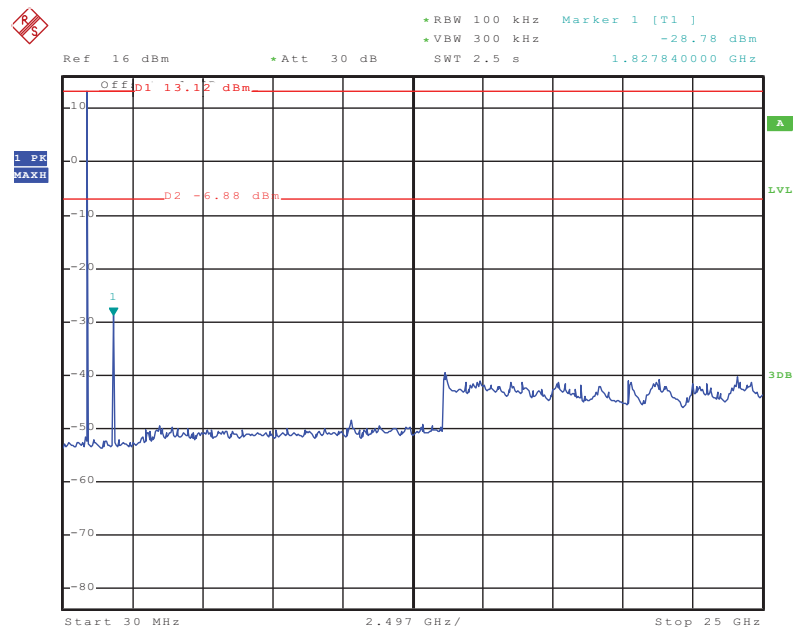
Lowest channel



Date: 9.MAR.2015 15:22:53

30MHz~25GHz

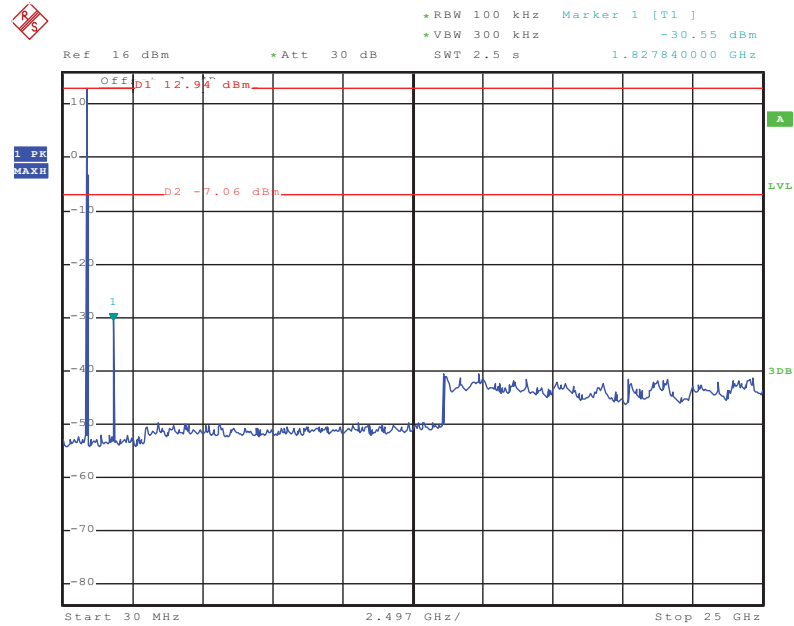
Middle channel



Date: 9.MAR.2015 15:25:51

30MHz~25GHz

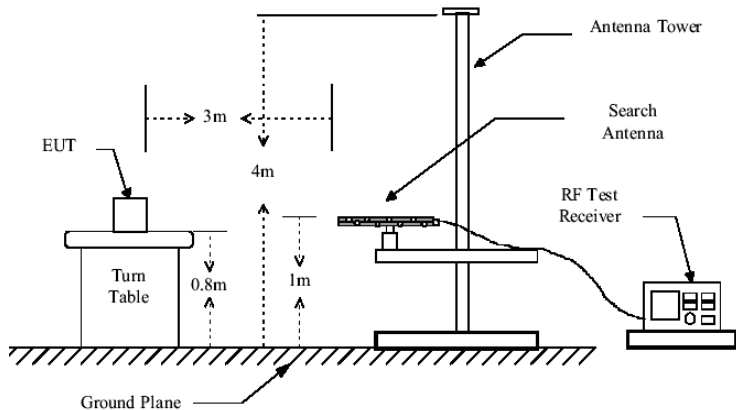
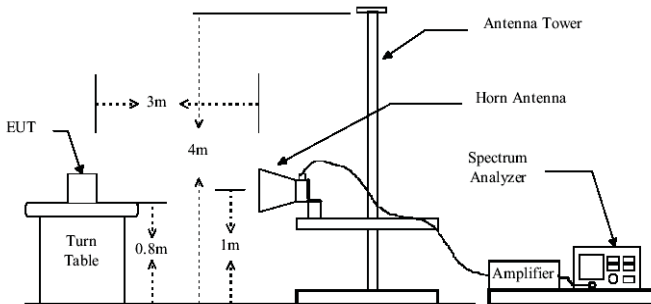
Highest channel



Date: 9.MAR.2015 15:27:19

30MHz~25GHz

6.10.2 Radiated Emission Method

Test Requirement:	FCC Part 15 C Section 15.209				
Test Method:	ANSI C63.4:2009				
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
		Peak	1MHz	10Hz	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 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:	Pass

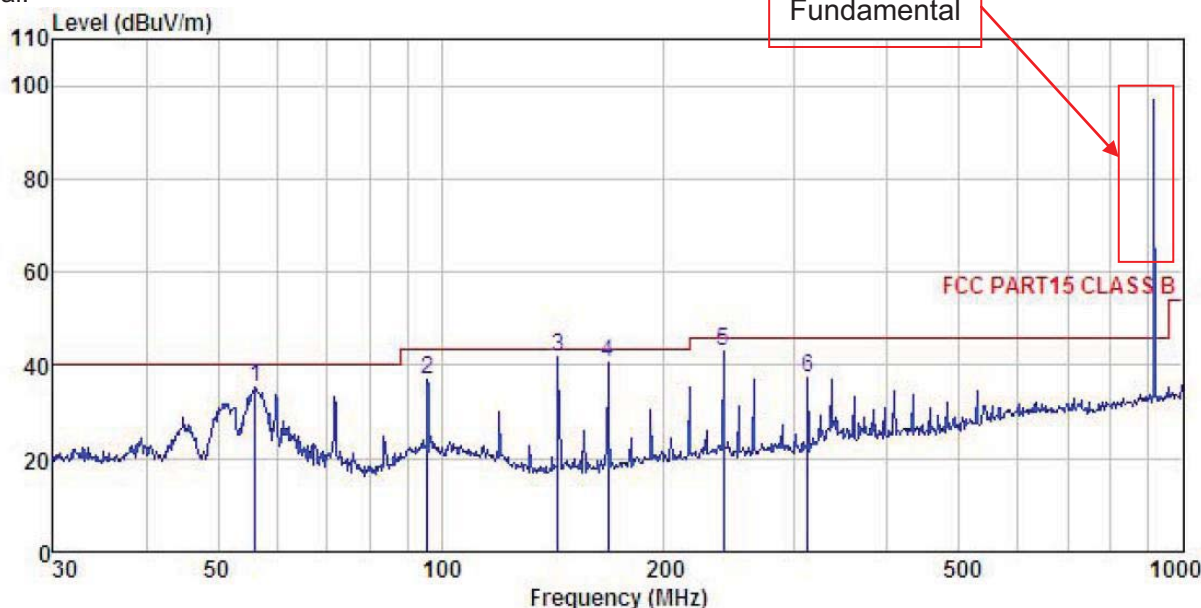
Remark:

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.
3. Low mid high 3 channels all have been tested for 30MHz to 1GHz , only report worst case .

Measurement data:

Below 1GHz

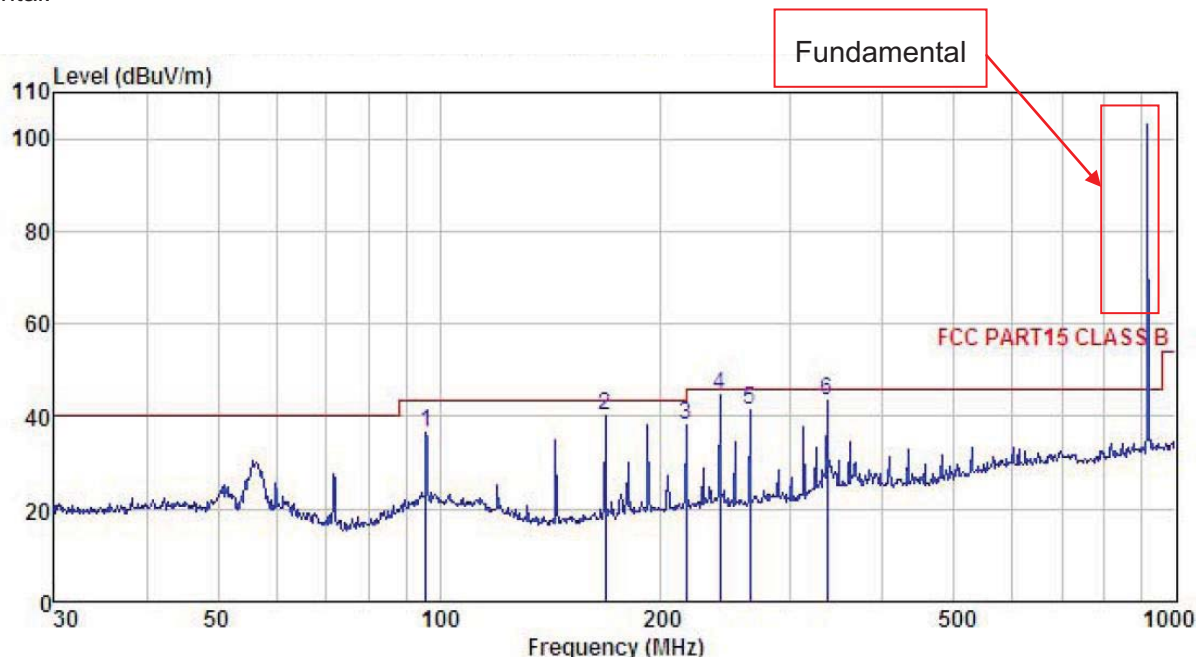
Vertical:



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) VERTICAL
 Job No. : 108RF
 EUT : RFID Module
 Model : UHF-006
 Test mode : On mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: MT
 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	56.197	21.76	12.95	0.66	0.00	35.37	40.00	-4.63 QP
2	95.762	22.92	12.90	0.93	0.00	36.75	43.50	-6.75 QP
3	143.830	32.41	8.22	1.28	0.00	41.91	43.50	-1.59 QP
4	167.824	30.40	8.90	1.34	0.00	40.64	43.50	-2.86 QP
5	239.987	29.17	12.09	1.58	0.00	42.84	46.00	-3.16 QP
6	312.179	22.33	13.22	1.81	0.00	37.36	46.00	-8.64 QP

Horizontal:



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) HORIZONTAL
 Job No. : 108RF
 EUT : RFID Module
 Model : UHF-006
 Test mode : On mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: MT
 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	95.762	22.75	12.90	0.93	0.00	36.58	43.50
2	167.824	29.91	8.90	1.34	0.00	40.15	43.50
3	216.024	25.77	11.07	1.46	0.00	38.30	46.00
4	239.987	31.12	12.09	1.58	0.00	44.79	46.00
5	263.819	27.57	12.17	1.66	0.00	41.40	46.00
6	336.035	27.38	13.99	1.89	0.00	43.26	46.00

Above 1GHz:

Test channel:			Lowest		Level:		Peak	
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
1806.48	42.65	31.53	8.90	40.24	42.84	74.00	-31.16	Vertical
1806.48	43.02	31.53	8.90	40.24	43.21	74.00	-30.79	Horizontal

Test channel:			Lowest		Level:		Average	
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
1806.48	33.41	31.53	8.90	40.24	33.60	54.00	-20.40	Vertical
1806.48	33.78	31.53	8.90	40.24	33.97	54.00	-20.03	Horizontal

Test channel:			Middle		Level:		Peak	
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
1829.52	42.86	31.58	8.98	40.15	43.27	74.00	-30.73	Vertical
1829.52	42.73	31.58	8.98	40.15	43.14	74.00	-30.86	Horizontal

Test channel:			Middle		Level:		Average	
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
1829.52	32.94	31.58	8.98	40.15	33.35	54.00	-20.65	Vertical
1829.52	33.41	31.58	8.98	40.15	33.82	54.00	-20.18	Horizontal

Test channel:			Highest		Level:		Peak	
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
1853.52	43.17	31.69	9.08	40.03	43.91	74.00	-30.09	Vertical
1853.52	43.02	31.69	9.08	40.03	43.76	74.00	-30.24	Horizontal

Test channel:			Highest		Level:		Average	
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
1853.52	33.77	31.69	9.08	40.03	34.51	54.00	-19.49	Vertical
1853.52	32.64	31.69	9.08	40.03	33.38	54.00	-20.62	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.