Test Report

Product Name ： UHF USB Reader Module
Model No. ： UEE005
FCC ID. ： WQH-UEE005

Applicant ： ClarIDy Solutions, Inc.
Address ： 7F, No.9, Park Avenue II Rd., Hsinchu Science Park, Hsinchu 300, Taiwan, R.O.C.

Date of Receipt ： 2008/10/08
Issued Date ： 2009/05/04
Report No. ： 08A102R-RFUSP43V01
Report Version ： V1.0

Test Report Certification

Issued Date : 2009/05/04
Report No. : 08A102R-RFUSP43V01

Product Name	:	UHF USB Reader Module
Applicant	:	ClarIDy Solutions, Inc.
Address	:	7F, No.9, Park Avenue II Rd., Hsinchu Science Park, Hsinchu 300, Taiwan, R.O.C.
Manufacturer	:	ClarIDy Solutions, Inc.
Model No.	:	UEE005
FCC ID.	:	WQH-UEE005
Rated Voltage	:	AC 120 V / 60 Hz
EUT Voltage	:	AC 100-240V
Trade Name	:	ClarIDy
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C Section 15.247: 2008
Test Result	:	Complied

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Documented By : Sandy Chuang
(Sandy Chuang / Adm. Specialist)

Tested By : Lucia Lu
(Lucia Lu / Assistant Engineer)

Approved By : Roy Wang
(Roy Wang / Manager)

TABLE OF CONTENTS

1. General Information

1.1. EUT Description

Product Name	UHF USB Reader Module
Trade Name	ClarIDy
Model No.	UEE005
Frequency Range	902.75MHz~927.25MHz
Channel Number	50
Type of Modulation	ASK
Antenna Type	PIFA
Antenna Gain	0.36dBi

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	902.75	01	903.25	02	903.75	03	904.25
04	904.75	05	905.25	06	905.75	07	906.25
08	906.75	09	907.25	10	907.75	11	908.25
12	908.75	13	909.25	14	909.75	15	910.25
16	910.75	17	911.25	18	911.75	19	912.25
20	912.75	21	913.25	22	913.75	23	914.25
24	914.75	25	915.25	26	915.75	27	916.25
28	916.75	29	917.25	30	917.75	31	918.25
32	918.75	33	919.25	34	919.75	35	920.25
36	920.75	37	921.25	38	921.75	39	922.25
40	922.75	41	923.25	42	923.75	43	924.25
44	924.75	45	925.25	46	925.75	47	926.25
48	926.75	49	927.25				

Note:

1. This device is a UHF USB Reader Module included a 2.4GHz transmitting function, and 2.4GHz receiving function.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regards to the frequency band operation; the lowest、middle and highest frequency of channel were selected to perform the test, and then shown on this report.
4. This device is a composite device in accordance with Part 15 regulations. The function receiving was measured and made a test report that the report number is 08A102R-RFUSP01V02 under Declaration of Conformity.

1.3. Test Mode

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-Test Mode	
EMI	Mode 1: Transmit
Final Test Mode	
EMI	Mode 1: Transmit

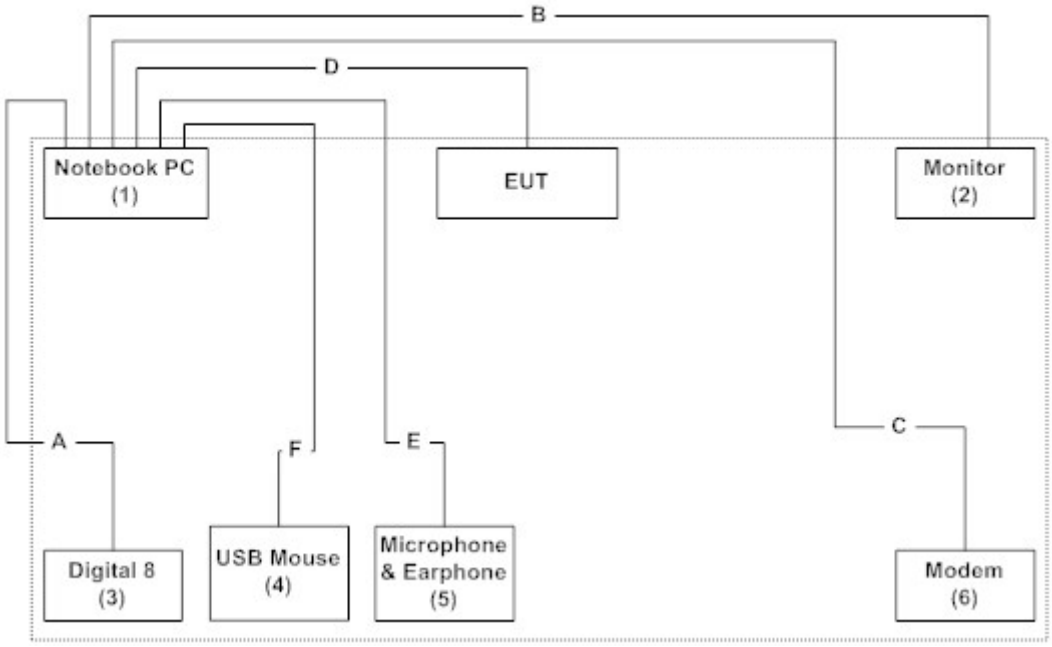
Emission	
Conducted Emission	Yes
Peak Power Output	Yes
Radiated Emission	Yes
Band Edge	Yes
Channel of Number	Yes
Channel Separation	Yes
Occupied Bandwidth	Yes
Dwell Time	Yes

1.4. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Notebook PC	DELL	LATITUDE D400	HK43D1S	DoC	Non-shielded, 1.7m, a ferrite core bonded
2	Monitor	CHI MEI	A170E1-09	3UC120954XA0131	DoC	Non-shielded, 1.8m
3	Digital 8	SONY	DCR-TRV110	P35209	DoC	--
4	USB Mouse	Logitech	M-UV83	LZE35005973	DoC	--
5	Microphone & Earphone	TOKTO	SX-MI	N/A	DoC	--
6	Modem	ACEEX	DM-1414	980033037	DoC	Non-shielded, 1.6m

1.5. Configuration of tested System

Connection Diagram


Signal Cable Type		Signal cable Description
A	1394 Cable	Shielded, 1.0m
B	VGA Cable	Shielded, 1.8m, two ferrite cores bonded.
C	Modem Cable	Shielded, 1.5m
D	USB Cable	Shielded, 1.0m, two ferrite cores bonded.
E	Microphone & Earphone Cable	Non-Shielded, 1.2m
F	USB Mouse Cable	Shielded, 1.0m

1.6. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.5
2	Turn on the power of all equipment.
3	Data will communicate between the tag and the reader.
4	The personal computer’s monitor will show the receiving characteristics when the communication is success.
5	Repeat at the above procedure (3) to (4)

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 B 15.107 Conducted Emission	15 - 35	25
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Peak Power Output (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	58
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Radiated Emission (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	54
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Band Edge (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Channel Of Number (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	53
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Channel Separation (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	54
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Occupied Bandwidth (FHSS)	15 - 35	24
Humidity (%RH)		25 - 75	57
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Dwell Time (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	58
Barometric pressure (mbar)		860 - 1060	950-1000

Site Description:

January 24, 2005 File on
Federal Communications Commission
Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 365520

Accredited by TAF
Accreditation Number: 1313
Effective through: December 27, 2010

Accredited by NVLAP
NVLAP Lab Code: 200347-0
Effective through: September 30, 2009

Site Name: Quietek Corporation

Site Address: No.75-1, Wang-Yeh Valley, Yung-Hsing,
Chiung-Lin, Hsin-Chu County,
Taiwan, R.O.C.
TEL : 886-3-592-8858 / FAX : 886-3-592-8859
E-Mail : service@quietek.com

2. Conducted Emission

2.1. Test Equipment

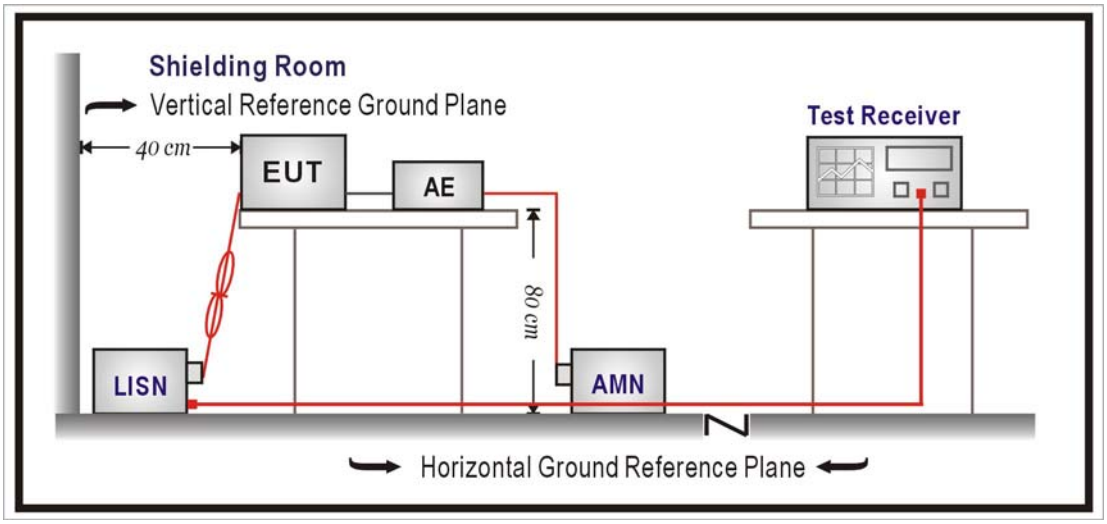
The following test equipment are used during the test:

Conducted Emission / SR2

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
4-Wire ISN	R & S	ENY 41	837032/001	2009/04/15
Artificial Mains Network	R & S	ENV4200	848411/010	2009/03/13
Double 2-Wire ISN	R & S	ENY 22	835354/008	2009/04/15
LISN	R & S	ESH3-Z5	825562/002	2009/03/31
Pulse Limiter	R & S	ZSH3Z2	357.8810.54	2008/07/19
Test Receiver	R & S	ESCS 30	100122	2009/02/21

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT was setup and tested according to ANSI C63.4, 2003.

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /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 refers 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: 2003 on conducted measurement.

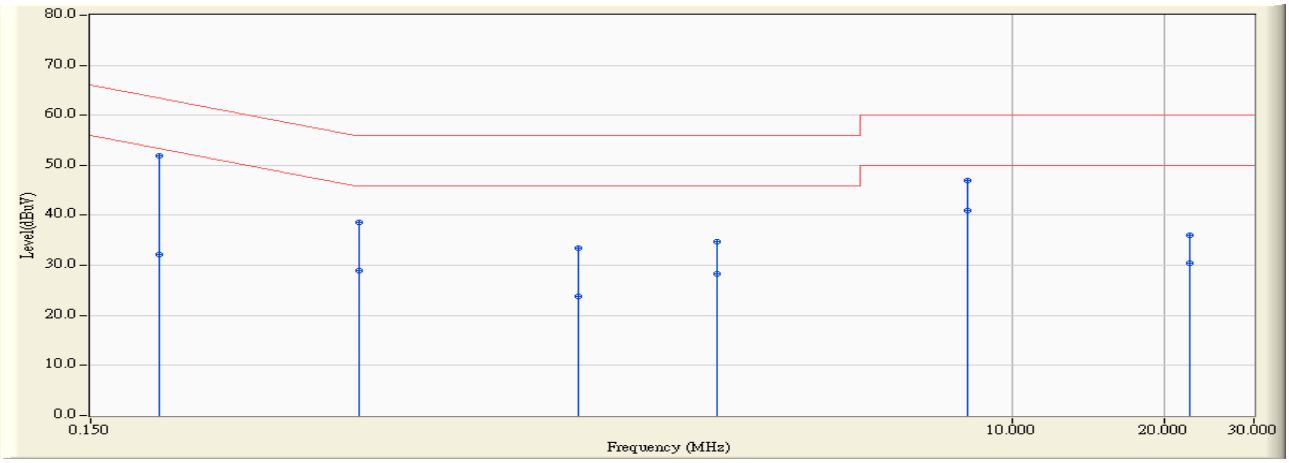
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.207: 2008

2.6. Test Result

Site : SR2	Time : 2009/04/09 - 10:27
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-LISN(16A) - Line1	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : TX

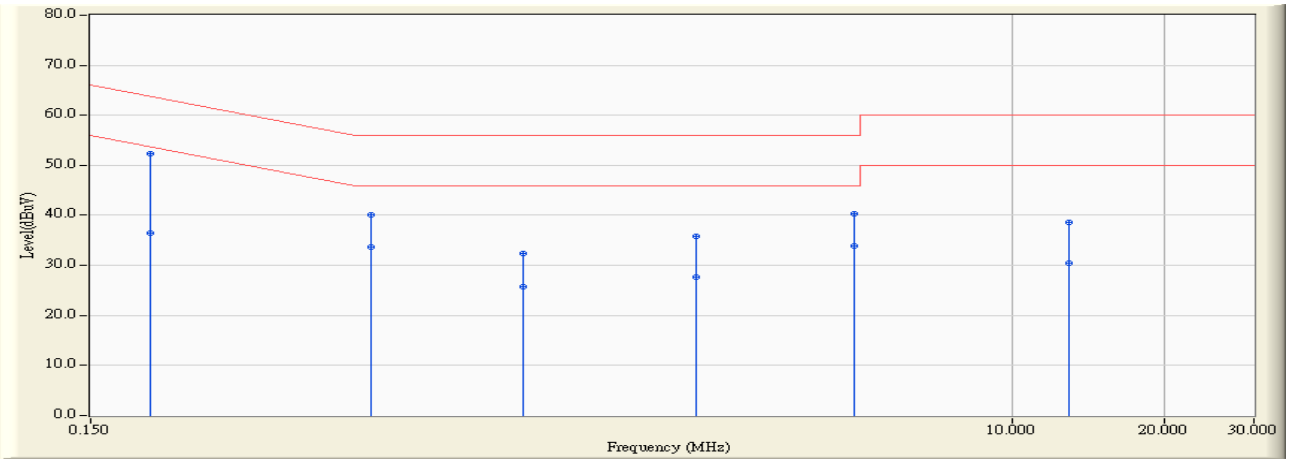


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.205	9.663	42.330	51.993	-11.425	63.418	QUASIPEAK
2		0.205	9.663	22.540	32.203	-21.215	53.418	AVERAGE
3		0.509	9.818	28.790	38.608	-17.392	56.000	QUASIPEAK
4		0.509	9.818	19.080	28.898	-17.102	46.000	AVERAGE
5		1.380	9.816	23.580	33.396	-22.604	56.000	QUASIPEAK
6		1.380	9.816	13.890	23.706	-22.294	46.000	AVERAGE
7		2.603	9.818	24.840	34.658	-21.342	56.000	QUASIPEAK
8		2.603	9.818	18.530	28.348	-17.652	46.000	AVERAGE
9		8.119	10.004	36.920	46.923	-13.077	60.000	QUASIPEAK
10	*	8.119	10.004	31.060	41.063	-8.937	50.000	AVERAGE
11		22.365	10.359	25.580	35.939	-24.061	60.000	QUASIPEAK
12		22.365	10.359	20.110	30.469	-19.531	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR2	Time : 2009/04/09 - 10:30
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-LISN(16A) - Line2	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : TX



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.197	9.689	42.540	52.229	-11.512	63.741	QUASIPEAK
2		0.197	9.689	26.830	36.519	-17.222	53.741	AVERAGE
3		0.537	9.810	30.230	40.040	-15.960	56.000	QUASIPEAK
4		0.537	9.810	23.830	33.640	-12.360	46.000	AVERAGE
5		1.076	9.812	22.600	32.412	-23.588	56.000	QUASIPEAK
6		1.076	9.812	15.960	25.772	-20.228	46.000	AVERAGE
7		2.369	9.831	25.900	35.731	-20.269	56.000	QUASIPEAK
8		2.369	9.831	17.920	27.751	-18.249	46.000	AVERAGE
9		4.873	9.840	30.400	40.240	-15.760	56.000	QUASIPEAK
10		4.873	9.840	24.010	33.850	-12.150	46.000	AVERAGE
11		12.892	10.142	28.500	38.642	-21.358	60.000	QUASIPEAK
12		12.892	10.142	20.370	30.512	-19.488	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

3. Peak Power Output

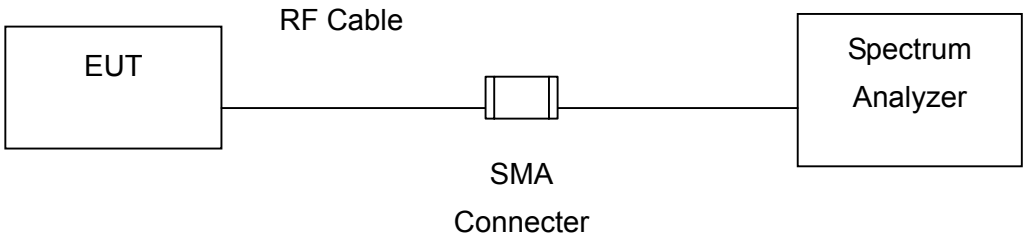
3.1. Test Equipment

The following test equipments are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2009
2	No.1 OATS			Sep., 2008

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

3.2. Test Setup



3.3. Test procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

3.4. Limits

For frequency hopping systems operating in the 902-928 MHz band: 1 Watt for systems employing at least 50 hopping channels; and, 0.25 Watts for systems employing less than 50 hopping channels.

For frequency hopping systems in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1Watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 Watt.

3.5. Test Specification

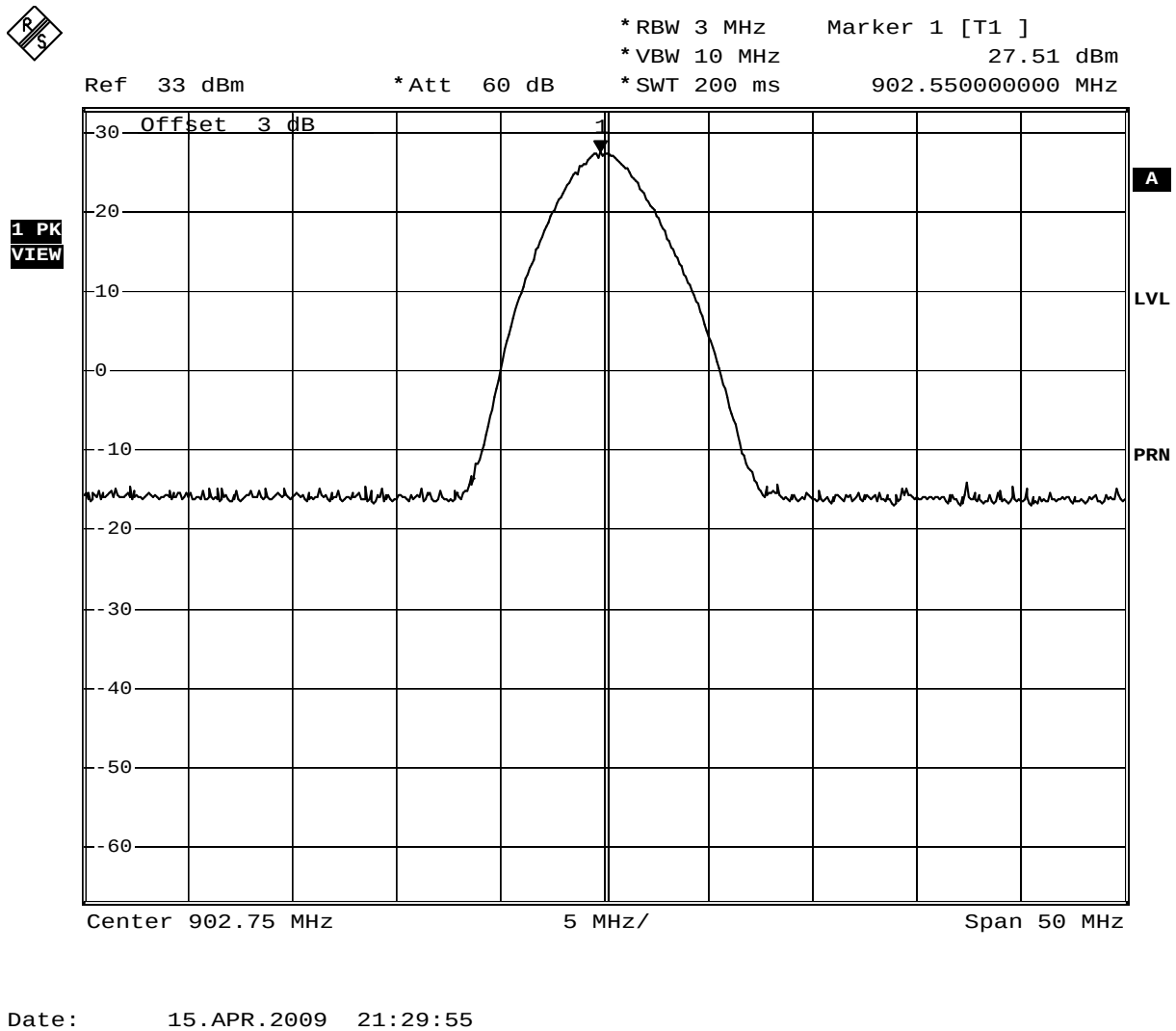
According to FCC Part 15 Subpart C Paragraph 15.247: 2008

3.6. Test Result

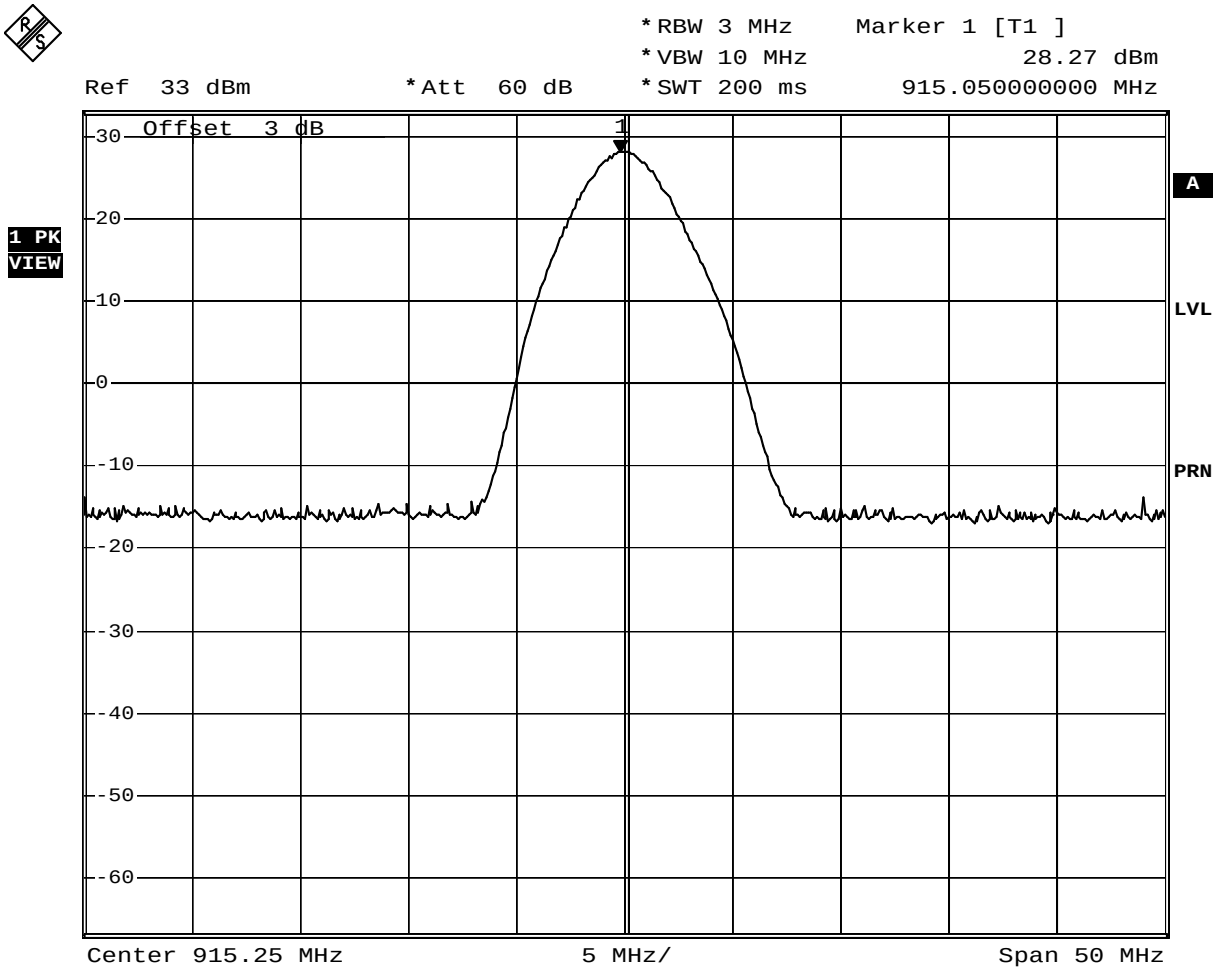
Product	UHF USB Reader Module		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2009/04/15	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	902.75	27.51	1Watt= 30 dBm	Pass
25	915.25	28.27	1Watt= 30 dBm	Pass
49	927.25	28.70	1Watt= 30 dBm	Pass

Channel 00

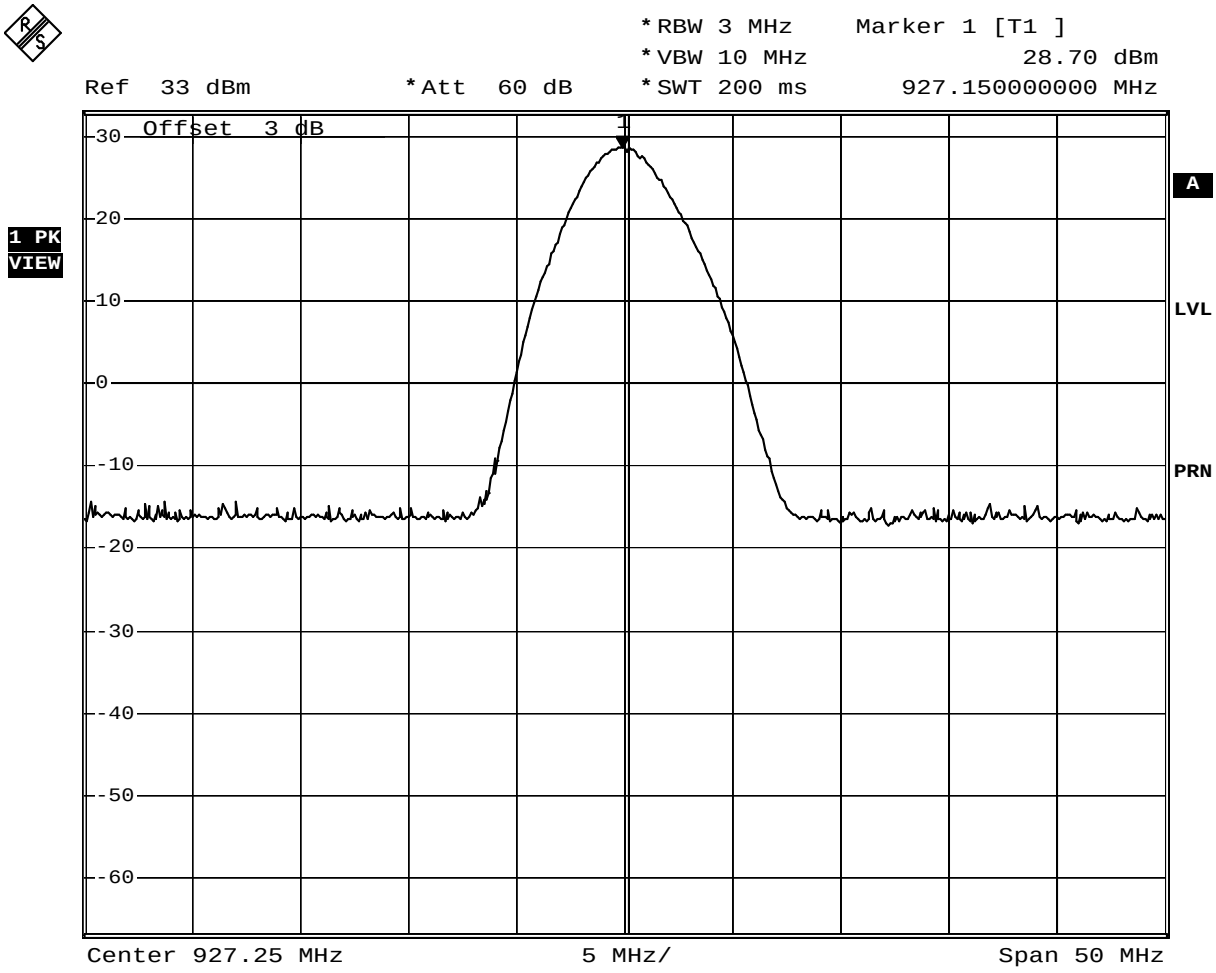


Channel 25



Date: 15.APR.2009 21:28:58

Channel 49



Date: 15.APR.2009 21:27:05

4. Radiated Emission

4.1. Test Equipment

The following test equipment are used during the test:

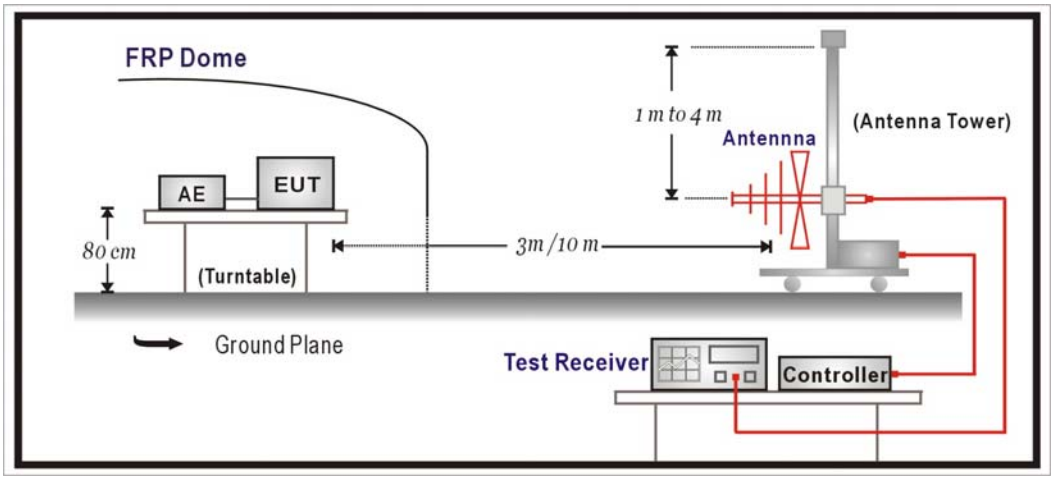
Radiated Emission / Site1

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Bilog Antenna	Schaffner Chase	CBL6112B	2895	2008/09/03
Horn Antenna	Electro Metrics	EM-6961	103325	2009/03/15
Pre-Amplifier	HP	8449B	3008A01123	2008/11/15
Pre-Amplifier	Quietek	AP-025C	N/A	N/A
Spectrum Analyzer	R & S	FSP40	100005	2008/08/25
Spectrum Analyzer	Advantest	R3162	120300649	2008/11/24
Test Receiver	R & S	ESCS 30	825442/017	2009/02/13

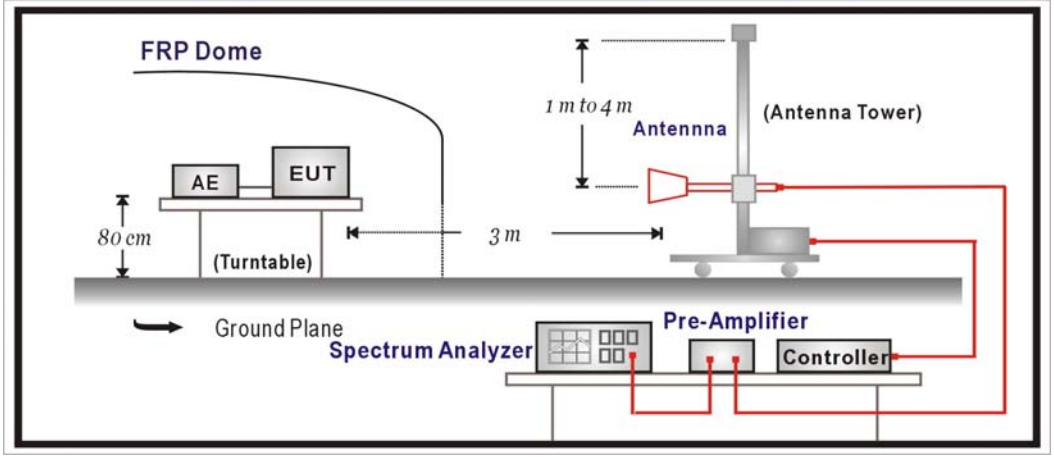
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. “N/A” Ca1.Date is used to Pre-test, not final test.

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m	dBuV/m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks : 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit. The bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

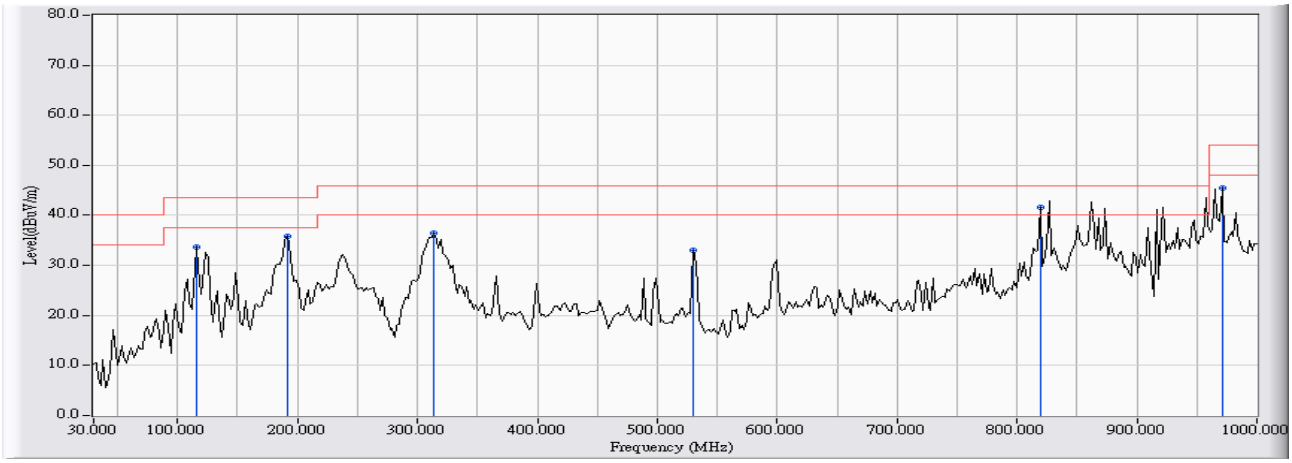
4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2008

4.6. Test Result

30MHz-1GHz Spurious:

Site : Site 1	Time : 2009/04/13 - 11:07
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB3_FCC_30-1G(2008-9) - HORIZONTAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : TX

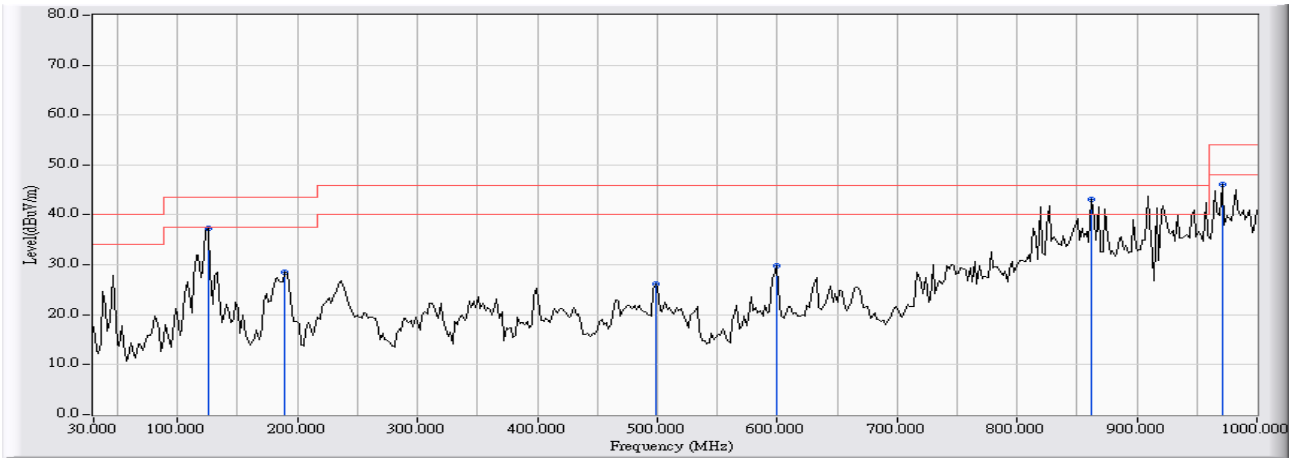


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		115.531	-13.792	47.544	33.751	-9.749	43.500	QUASIPEAK
2		191.343	-20.012	55.819	35.807	-7.693	43.500	QUASIPEAK
3		313.808	-8.623	45.032	36.408	-9.592	46.000	QUASIPEAK
4		529.579	-8.858	41.912	33.053	-12.947	46.000	QUASIPEAK
5	*	819.218	-4.003	45.548	41.545	-4.455	46.000	QUASIPEAK
6		970.842	2.269	43.285	45.554	-8.446	54.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : Site 1	Time : 2009/04/13 - 11:10
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB3_FCC_30-1G(2008-9) - VERTICAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : TX



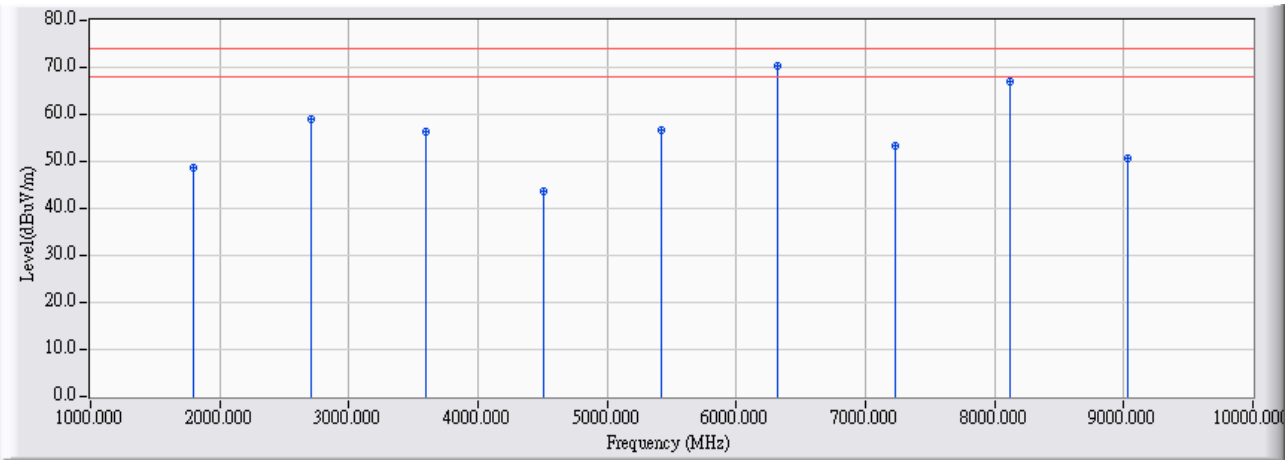
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		125.251	-11.114	48.493	37.380	-6.120	43.500	QUASIPEAK
2		189.399	-21.525	50.051	28.526	-14.974	43.500	QUASIPEAK
3		498.477	-5.949	32.203	26.254	-19.746	46.000	QUASIPEAK
4		599.559	-2.155	31.941	29.786	-16.214	46.000	QUASIPEAK
5	*	861.984	-1.913	44.942	43.029	-2.971	46.000	QUASIPEAK
6		970.842	-1.208	47.239	46.031	-7.969	54.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ * ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Harmonic & Spurious:

Site : Site 1	Time : 2009/04/24 - 14:26
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_1-18G(2009-01) - HORIZONTAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : FCC TX-902.25MHz

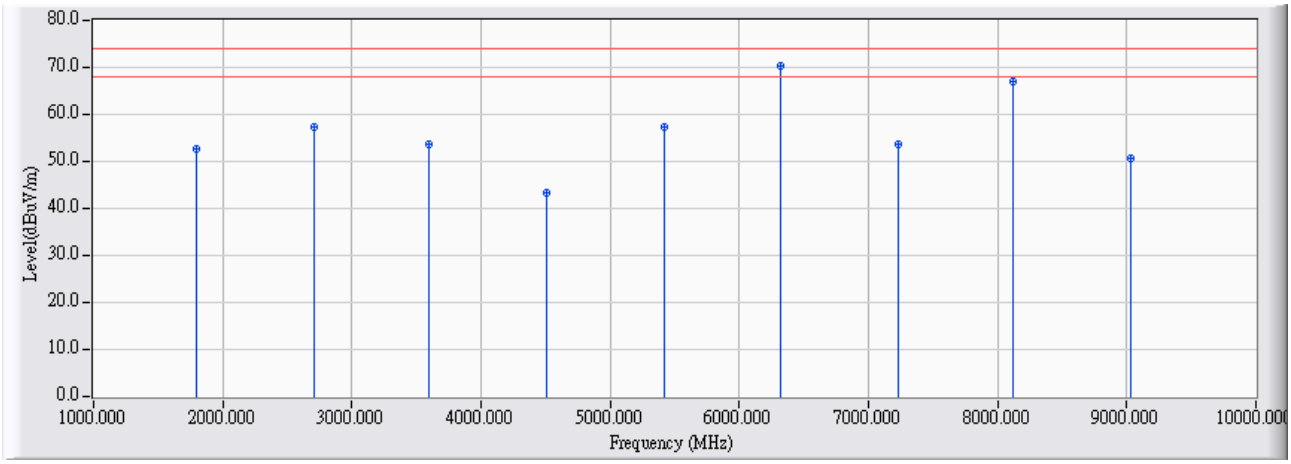


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		1793.587	-6.890	55.450	48.560	-25.440	74.000	54.000	PEAK
2		2707.415	-1.769	60.630	58.862	-15.138	74.000	54.000	PEAK
3		3597.194	1.385	55.050	56.434	-17.566	74.000	54.000	PEAK
4		4511.022	3.444	40.173	43.617	-30.383	74.000	54.000	PEAK
5		5424.850	5.045	51.635	56.680	-17.320	74.000	54.000	PEAK
6	*	6314.629	7.278	62.939	70.217	-3.783	74.000	54.000	PEAK
7		7228.457	10.342	43.063	53.405	-20.595	74.000	54.000	PEAK
8		8118.236	12.061	55.061	67.121	-6.879	74.000	54.000	PEAK
9		9032.064	12.569	38.245	50.813	-23.187	74.000	54.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : Site 1	Time : 2009/04/24 - 14:34
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_1-18G(2009-01) - VERTICAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : FCC TX-902.25MHz

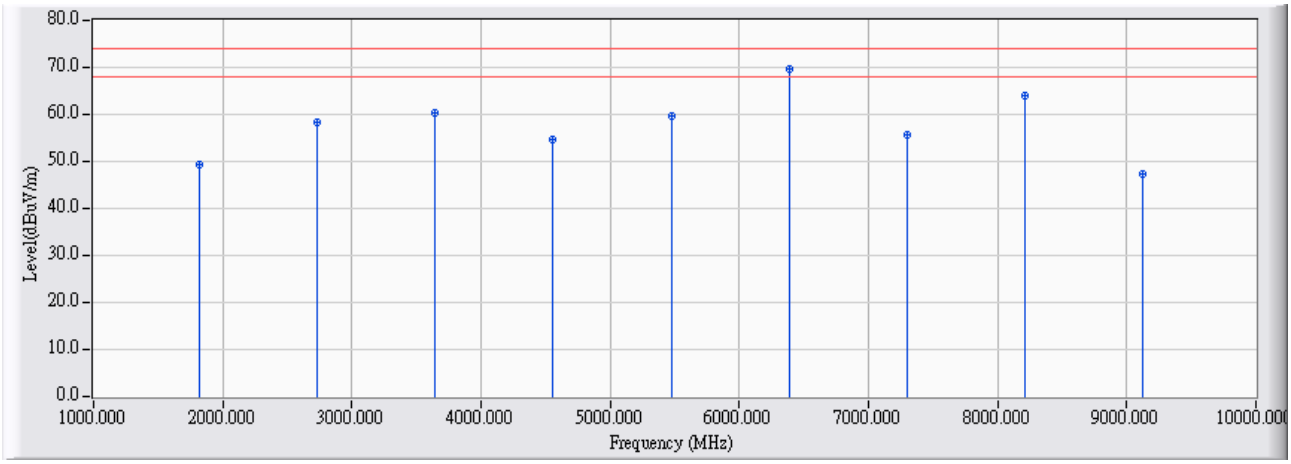


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		1793.587	-2.694	55.450	52.756	-21.244	74.000	54.000	PEAK
2		2707.415	-3.159	60.630	57.472	-16.528	74.000	54.000	PEAK
3		3597.194	-1.375	55.050	53.675	-20.325	74.000	54.000	PEAK
4		4511.022	3.009	40.173	43.182	-30.818	74.000	54.000	PEAK
5		5424.850	5.717	51.635	57.352	-16.648	74.000	54.000	PEAK
6	*	6314.629	7.023	63.239	70.262	-3.738	74.000	54.000	PEAK
7		7228.457	10.458	43.063	53.521	-20.479	74.000	54.000	PEAK
8		8118.236	11.837	55.061	66.898	-7.102	74.000	54.000	PEAK
9		9032.064	12.501	38.245	50.745	-23.255	74.000	54.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : Site 1	Time : 2009/04/24 - 14:36
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_1-18G(2009-01) - HORIZONTAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : FCC TX-915.25MHz duty=19(300)

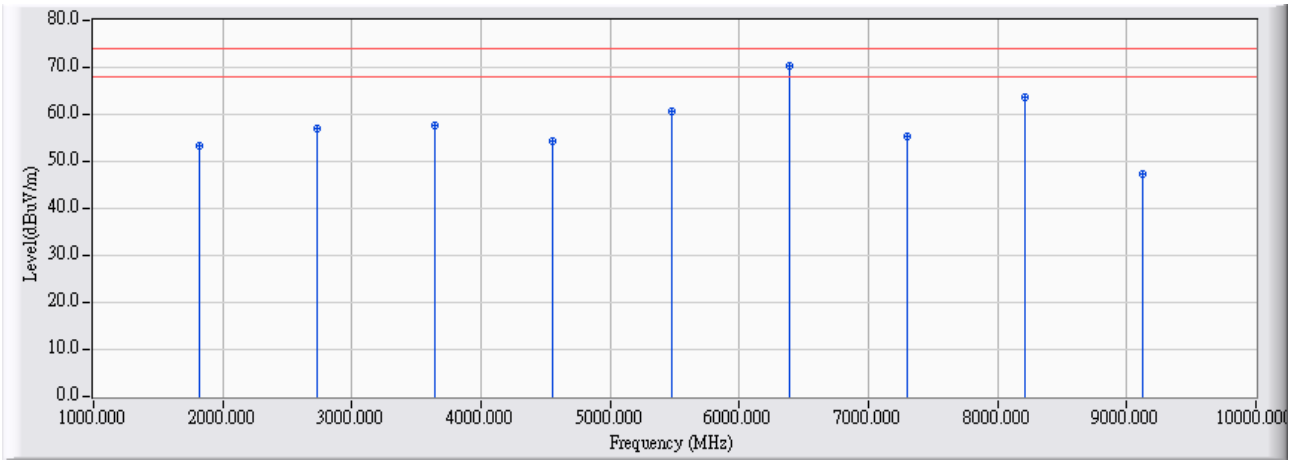


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		1817.635	-6.759	56.075	49.316	-24.684	74.000	54.000	PEAK
2		2731.463	-1.618	59.886	58.268	-15.732	74.000	54.000	PEAK
3		3645.291	1.590	58.598	60.188	-13.812	74.000	54.000	PEAK
4		4559.118	3.594	51.223	54.817	-19.183	74.000	54.000	PEAK
5		5472.946	5.055	54.764	59.819	-14.181	74.000	54.000	PEAK
6	*	6386.773	7.587	61.934	69.521	-4.479	74.000	54.000	PEAK
7		7300.601	10.727	44.851	55.579	-18.421	74.000	54.000	PEAK
8		8214.429	12.113	51.813	63.926	-10.074	74.000	54.000	PEAK
9		9128.257	12.730	34.534	47.264	-26.736	74.000	54.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : Site 1	Time : 2009/04/24 - 14:37
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_1-18G(2009-01) - VERTICAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : FCC TX-915.25MHz duty=19(300)

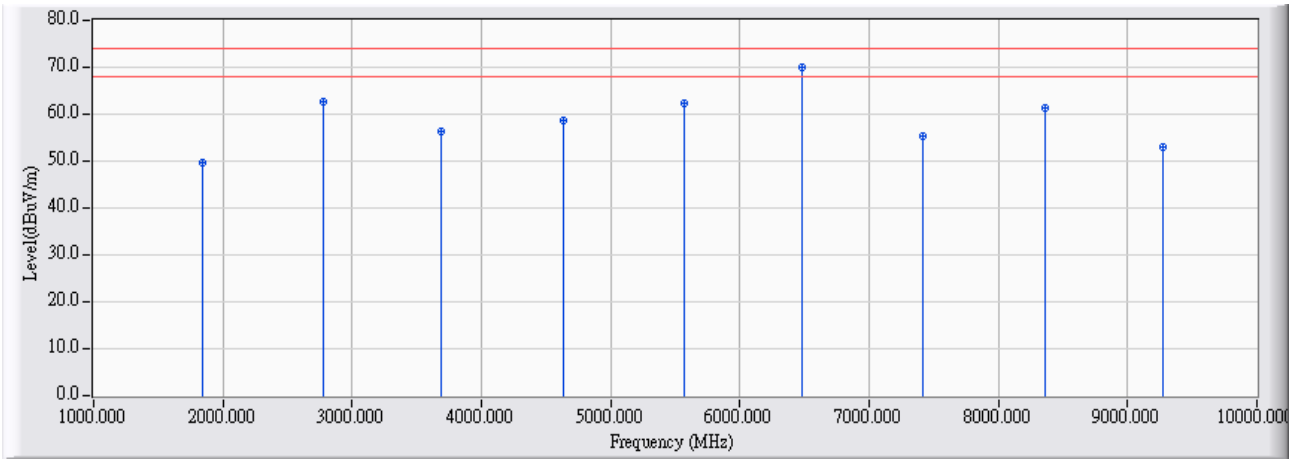


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		1817.635	-2.624	56.075	53.452	-20.548	74.000	54.000	PEAK
2		2731.463	-3.023	59.886	56.863	-17.137	74.000	54.000	PEAK
3		3645.291	-1.041	58.598	57.557	-16.443	74.000	54.000	PEAK
4		4559.118	3.208	51.223	54.431	-19.569	74.000	54.000	PEAK
5		5472.946	5.799	54.764	60.563	-13.437	74.000	54.000	PEAK
6	*	6386.773	7.307	63.134	70.441	-3.559	74.000	54.000	PEAK
7		7300.601	10.551	44.851	55.403	-18.597	74.000	54.000	PEAK
8		8214.429	11.972	51.813	63.785	-10.215	74.000	54.000	PEAK
9		9128.257	12.742	34.534	47.276	-26.724	74.000	54.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : Site 1	Time : 2009/04/24 - 14:37
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_1-18G(2009-01) - HORIZONTAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : FCC TX-927.2MHz duty=19(300)

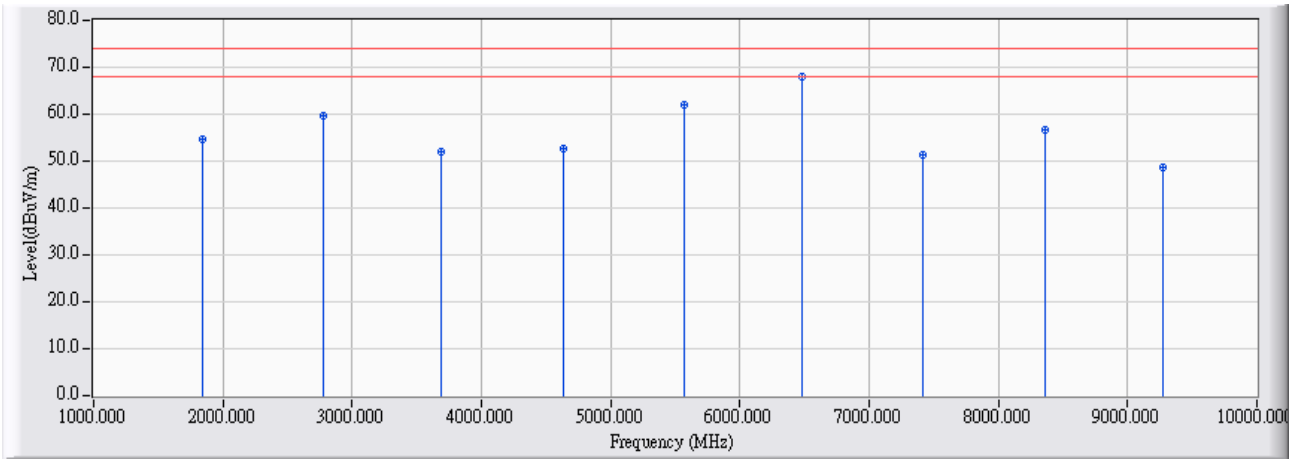


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		1841.683	-6.637	56.219	49.582	-24.418	74.000	54.000	PEAK
2		2779.559	-1.318	63.901	62.583	-11.417	74.000	54.000	PEAK
3		3693.387	1.785	54.676	56.461	-17.539	74.000	54.000	PEAK
4		4631.263	3.824	54.948	58.772	-15.228	74.000	54.000	PEAK
5		5569.138	5.173	57.015	62.188	-11.812	74.000	54.000	PEAK
6	*	6482.966	8.003	61.914	69.917	-4.083	74.000	54.000	PEAK
7		7420.842	11.381	44.023	55.404	-18.596	74.000	54.000	PEAK
8		8358.718	12.183	49.140	61.323	-12.677	74.000	54.000	PEAK
9		9272.545	12.984	40.002	52.986	-21.014	74.000	54.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : Site 1	Time : 2009/04/24 - 14:38
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_1-18G(2009-01) - VERTICAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : FCC TX-927.2MHz duty=19(300)



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		1841.683	-2.551	57.078	54.526	-19.474	74.000	54.000	PEAK
2		2779.559	-2.736	62.404	59.668	-14.332	74.000	54.000	PEAK
3		3693.387	-0.703	52.804	52.102	-21.898	74.000	54.000	PEAK
4		4631.263	3.511	49.183	52.694	-21.306	74.000	54.000	PEAK
5		5569.138	5.828	56.185	62.013	-11.987	74.000	54.000	PEAK
6	*	6482.966	7.699	60.175	67.874	-6.126	74.000	54.000	PEAK
7		7420.842	10.718	40.466	51.184	-22.816	74.000	54.000	PEAK
8		8358.718	12.175	44.587	56.762	-17.238	74.000	54.000	PEAK
9		9272.545	13.104	35.491	48.595	-25.405	74.000	54.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

TX Channel 0					
HORIZONTAL					
Frequency	RBW=1MHz VBW=10Hzl	Duty cycle	Average level	Margin	Limit
1793.587	42.11	0.336	32.637	-21.363	54
2707.415	50.962		41.489	-12.511	54
3597.194	49.664		40.191	-13.809	54
4511.022	33.887		24.414	-29.586	54
5424.85	49.09		39.617	-14.383	54
6314.629	59.447		49.974	-4.026	54
7228.457	45.184		35.711	-18.289	54
8118.236	60.351		50.878	-3.122	54
9032.064	42.063		32.590	-21.410	54

TX Channel 0					
VERTICAL					
Frequency	RBW=1MHz VBW=10Hz	Duty cycle	Average level	Margin	Limit
1793.587	46.306	0.336	36.833	-17.167	54
2707.415	49.572		40.099	-13.901	54
3597.194	46.905		37.432	-16.568	54
4511.022	33.452		23.979	-30.021	54
5424.85	49.762		40.289	-13.711	54
6314.629	59.492		50.019	-3.981	54
7228.457	45.3		35.827	-18.173	54
8118.236	60.128		50.655	-3.345	54
9032.064	41.995		32.522	-21.478	54

TX Channel 25					
HORIZONTAL					
Frequency	RBW=1MHz VBW=10Hzl	Duty cycle	Average level	Margin	Limit
1817.635	42.866	0.336	33.393	-20.607	54
2731.463	50.368		40.895	-13.105	54
3645.291	53.418		43.945	-10.055	54
4559.118	45.087		35.614	-18.386	54
5472.946	52.229		42.756	-11.244	54
6386.773	58.751		49.278	-4.722	54
7300.601	47.358		37.885	-16.115	54
8214.429	57.156		47.683	-6.317	54
9128.257	38.514		29.041	-24.959	54

TX Channel 25					
VERTICAL					
Frequency	RBW=1MHz VBW=10Hzl	Duty cycle	Average level	Margin	Limit
1817.635	47.002	0.336	37.529	-16.471	54
2731.463	48.963		39.490	-14.510	54
3645.291	50.787		41.314	-12.686	54
4559.118	44.701		35.228	-18.772	54
5472.946	52.973		43.500	-10.500	54
6386.773	59.671		50.198	-3.802	54
7300.601	47.182		37.709	-16.291	54
8214.429	57.015		47.542	-6.458	54
9128.257	38.526		29.053	-24.947	54

TX Channel 49					
HORIZONTAL					
Frequency	RBW=1MHz VBW=10Hzl	Duty cycle	Average level	Margin	Limit
1841.683	43.132	0.336	33.659	-20.341	54
2779.559	54.683		45.210	-8.790	54
3693.387	49.691		40.218	-13.782	54
4631.263	49.042		39.569	-14.431	54
5569.138	54.598		45.125	-8.875	54
6482.966	59.147		49.674	-4.326	54
7420.842	47.183		37.710	-16.290	54
8358.718	54.553		45.080	-8.920	54
9272.545	44.236		34.763	-19.237	54

TX Channel 49					
VERTICAL					
Frequency	RBW=1MHz VBW=10Hzl	Duty cycle	Average level	Margin	Limit
1841.683	48.076	0.336	38.603	-15.397	54
2779.559	51.768		42.295	-11.705	54
3693.387	45.332		35.859	-18.141	54
4631.263	42.964		33.491	-20.509	54
5569.138	54.423		44.950	-9.050	54
6482.966	57.104		47.631	-6.369	54
7420.842	42.963		33.490	-20.510	54
8358.718	49.992		40.519	-13.481	54
9272.545	39.845		30.372	-23.628	54

Average level ＝(RBW=1MHz VBW=10Hz)+ 20 log duty cycle

duty cycle = 33.6ms / 100ms = 0.336

5. RF Conducted Emission

5.1. Test Equipment

The following test equipments are used during the test:

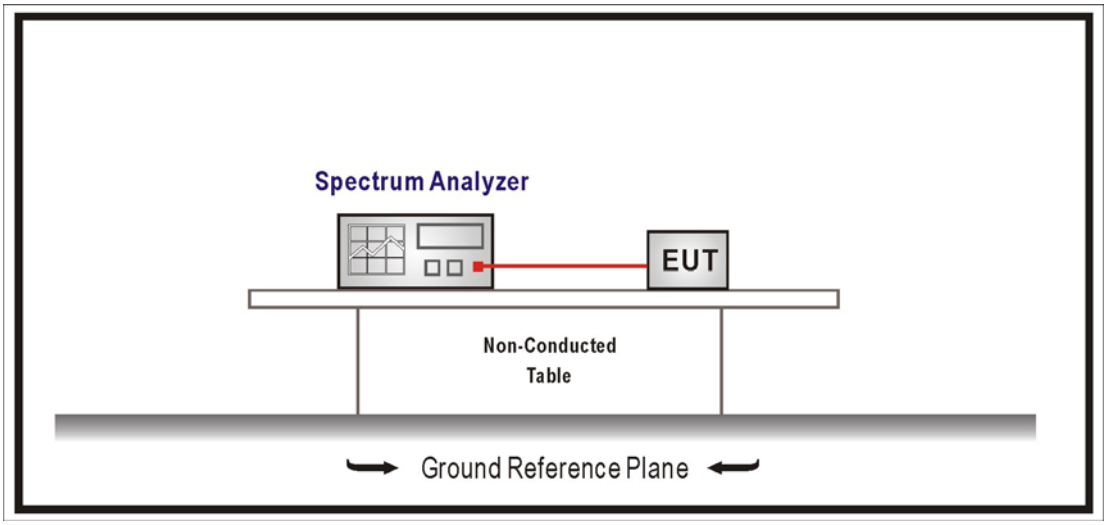
RF Conducted Measurement:				
Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2009
2	No.1 OATS			Sep., 2008

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

2. Mark “X” test instruments are used to measure the final test results.

5.2. Test Setup

RF Conducted Measurement:



5.3. Limits

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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

5.5. Test Specification

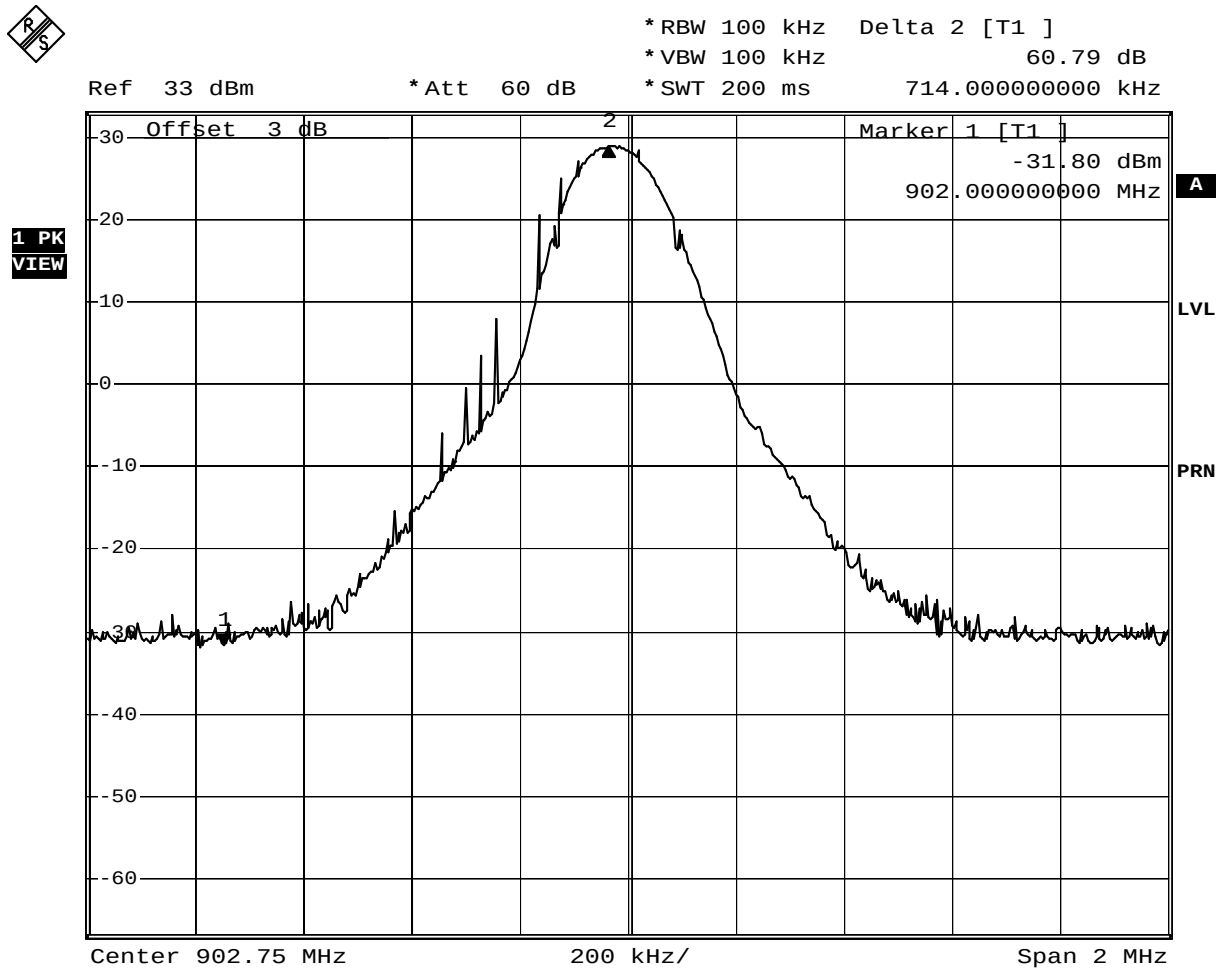
According to FCC Part 15 Subpart C Paragraph 15.247: 2008

5.6. Test Result

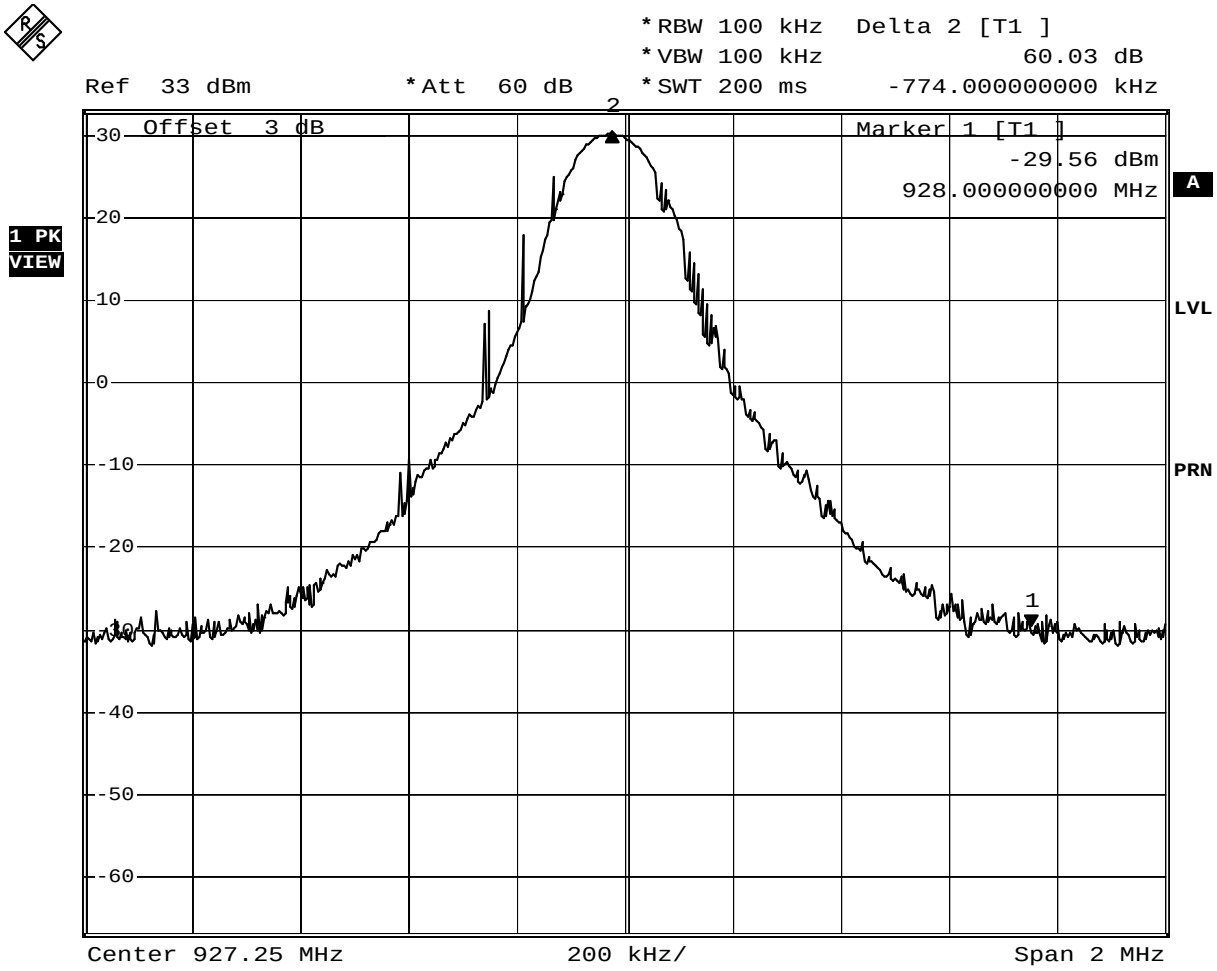
Product	UHF USB Reader Module		
Test Item	RF Conducted Emissions		
Test Mode	Mode 1: Transmit		
Date of Test	2009/04/15	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (dBc)	Required Limit (dBc)	Result
00	902.75	60.79	≥20	Pass
49	927.25	60.03	≥20	Pass

Channel 00



Channel 49



Date: 15.APR.2009 20:39:46

6. Band Edge

6.1. Test Equipment

The following test equipments are used during the test:

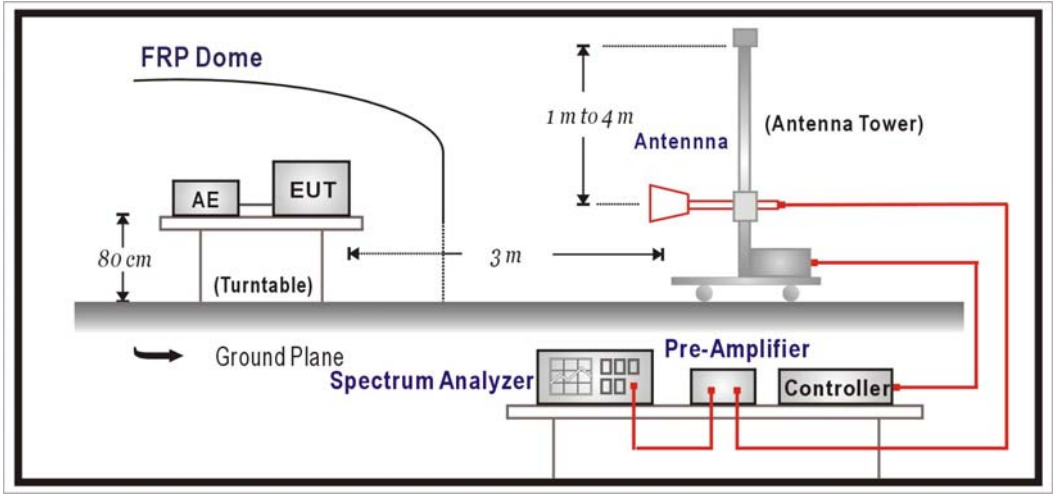
RF Radiated Measurement:					
Item	Equipment		Manufacturer	Model No. / Serial No.	Last Cal.
1	X	Spectrum Analyzer	R & S	FSP40 / 100005	Aug., 2008
2	X	Pre-Amplifier	HP	8449B / 3008A01123	Feb., 2009
3		Loop Antenna	R & S	HFH2-Z2 / 833799/004	Sep., 2008
4		BiconiLog Antenna	Schwarzbeck	VULB 9166 / 1061	Sep., 2008
5		Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2008
6	X	Horn Antenna	Schwarzbeck	BBHA 9120D / BBHA9120D312	Sep., 2008
7	No.1 OATS				Sep., 2008

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

2. Mark “X” test instruments are used to measure the final test results.

6.2. Test Setup

RF Radiated Measurement:



6.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

6.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

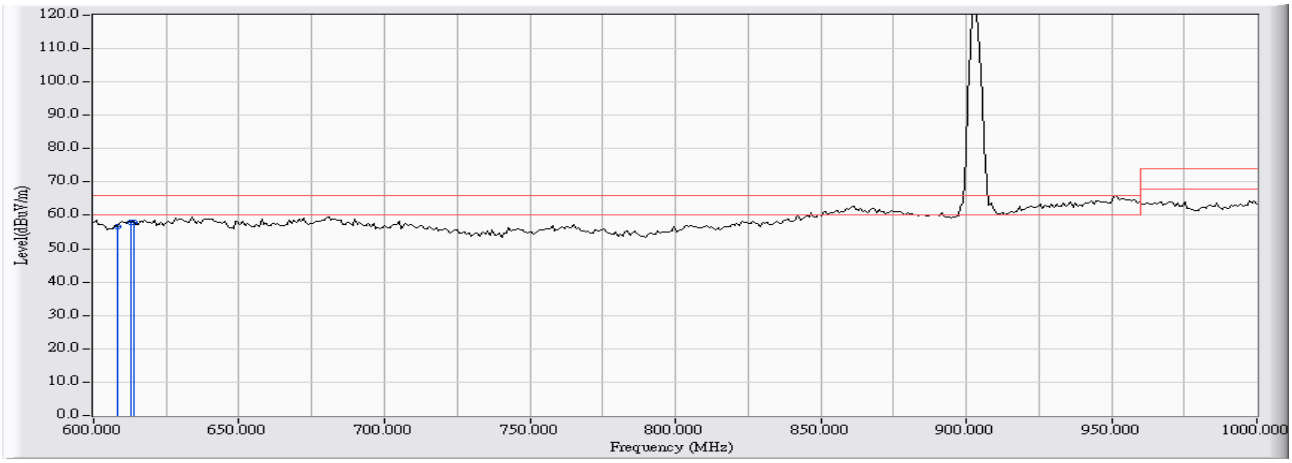
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

6.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2008

6.6. Test Result

Site : Site 1	Time : 2009/04/15 - 20:50
Limit : FCC_15.209(961011)_03M_PK	Margin : 6
Probe : CB3_FCC_30-1G(2008-9) - HORIZONTAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : FCC TX-902.75MHz duty=19(300)

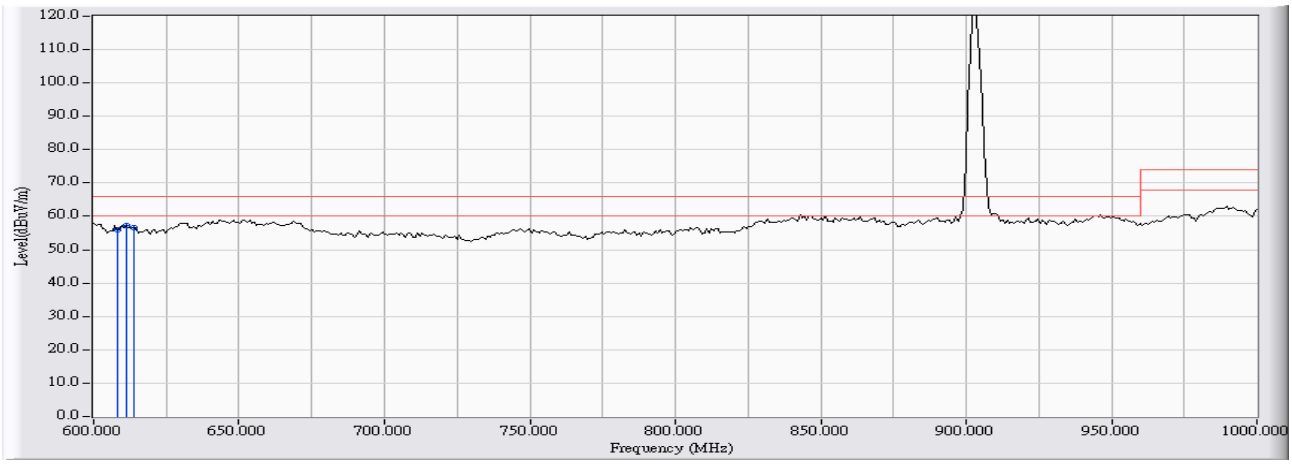


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		608.000	21.631	35.002	56.633	-9.387	66.020	PEAK
2	*	612.826	22.444	35.624	58.068	-7.952	66.020	PEAK
3		614.000	22.217	35.608	57.824	-8.196	66.020	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : Site 1	Time : 2009/04/15 - 20:58
Limit : FCC_15.209(961011)_03M_PK	Margin : 6
Probe : CB3_FCC_30-1G(2008-9) - VERTICAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : FCC TX-902.75MHz duty=19(300)

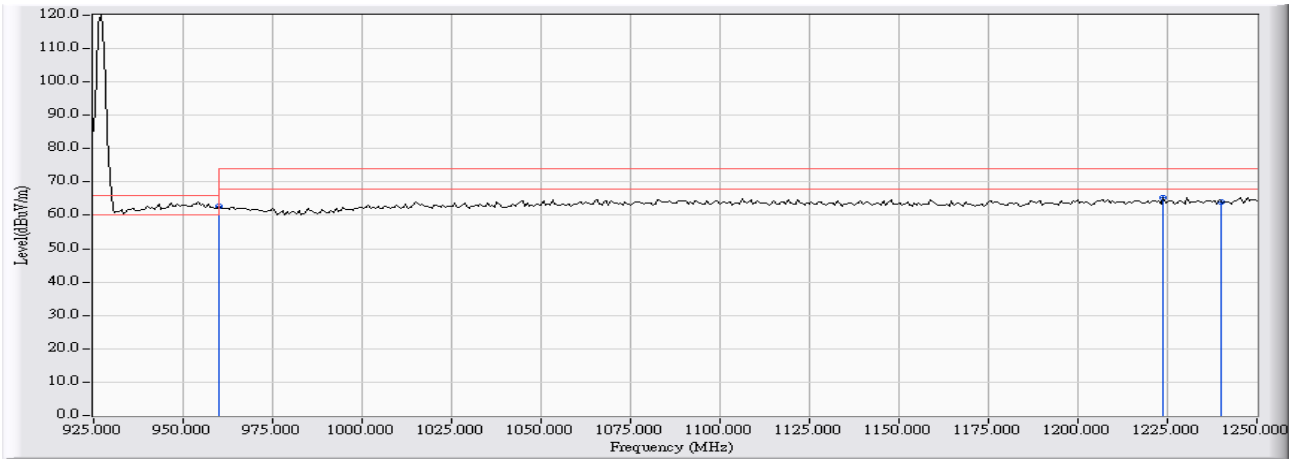


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		608.000	20.948	35.038	55.986	-10.034	66.020	PEAK
2	*	611.222	21.245	36.008	57.253	-8.767	66.020	PEAK
3		614.000	20.418	36.105	56.523	-9.497	66.020	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : Site 1	Time : 2009/04/15 - 21:30
Limit : FCC_15.209(961011)_03M_PK	Margin : 6
Probe : CB3_FCC_30-1G(2008-9) - HORIZONTAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : FCC TX-927.2MHz duty=19(300)

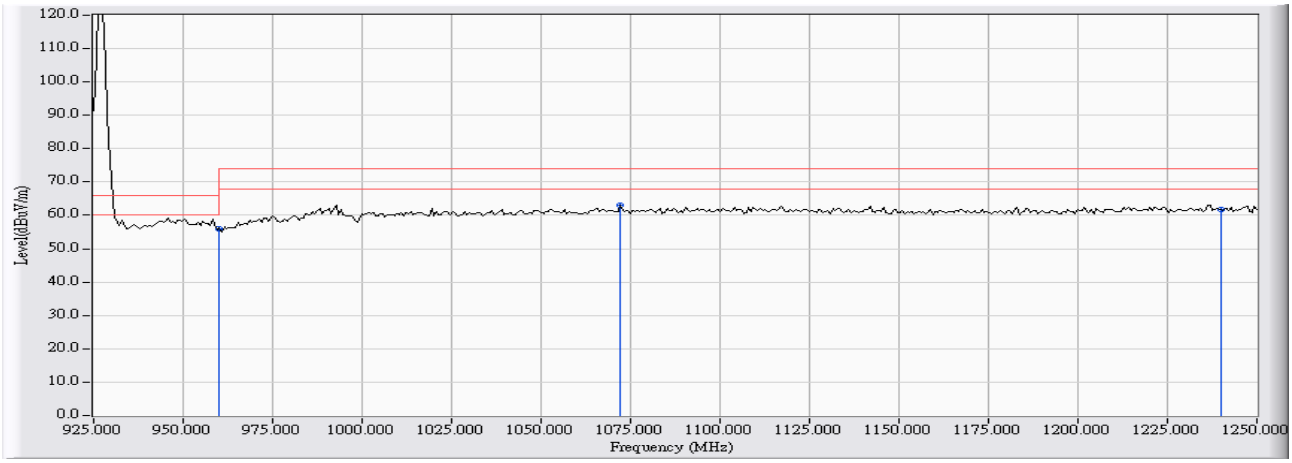


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	960.000	26.951	35.657	62.608	-3.412	66.020	PEAK
2		1223.948	27.502	37.828	65.330	-8.670	74.000	PEAK
3		1240.000	27.502	36.426	63.928	-10.072	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : Site 1	Time : 2009/04/15 - 21:38
Limit : FCC_15.209(961011)_03M_PK	Margin : 6
Probe : CB3_FCC_30-1G(2008-9) - VERTICAL	Power : AC 120V/60Hz
EUT: UHF USB Reader Module	Note : FCC TX-927.2MHz duty=19(300)



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	960.000	20.676	35.371	56.048	-9.972	66.020	PEAK
2		1072.194	25.393	37.666	63.059	-10.941	74.000	PEAK
3		1240.000	25.393	36.216	61.609	-12.391	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

7. Number of hopping frequency

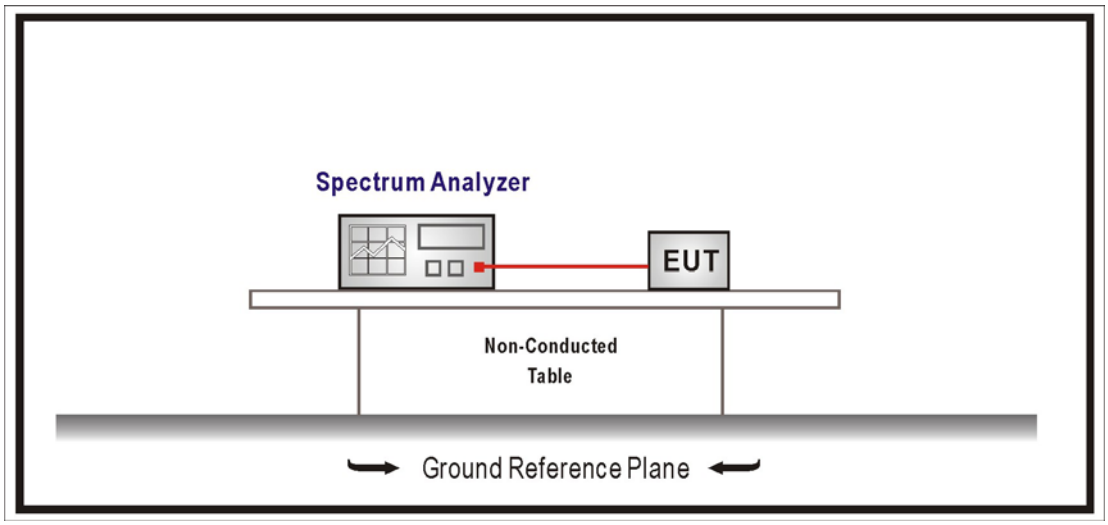
7.1. Test Equipment

The following test equipments are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2009
2	No.1 OATS			Sep., 2008

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

7.2. Test Setup



7.3. Limits

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.

For frequency hopping systems operating in the 2400-2483.5 MHz bands, which use fewer than 75 hopping frequencies, may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels are used.

For frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies.

7.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Span = the frequency band of operation

RBW ≥ 1% of the span， VBW ≥ RBW

Sweep = auto, Detector function = peak, Trace = max hold

7.5. Test Specification

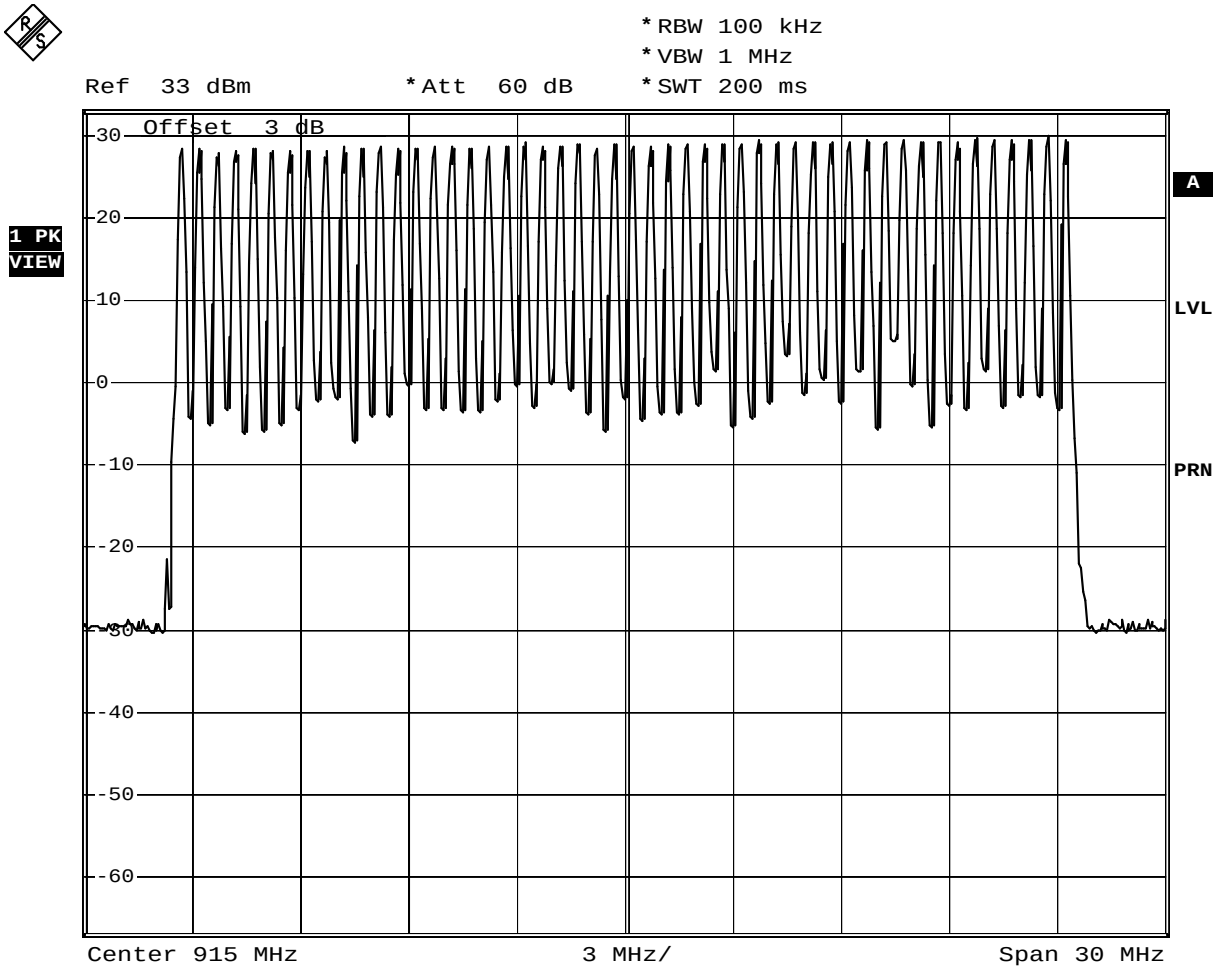
According to FCC Part 15 Subpart C Paragraph 15.247: 2008

7.6. Test Result

Product	UHF USB Reader Module		
Test Item	Number of hopping frequency		
Test Mode	Mode 1: Transmit		
Date of Test	2009/04/15	Test Site	No.1 OATS

Frequency Range (MHz)	Measure Level (Hopping Channel)	Limit (Hopping Channel)	Result
902~928	49	≥15	Pass

915MHz



8. Carrier Frequency Separation

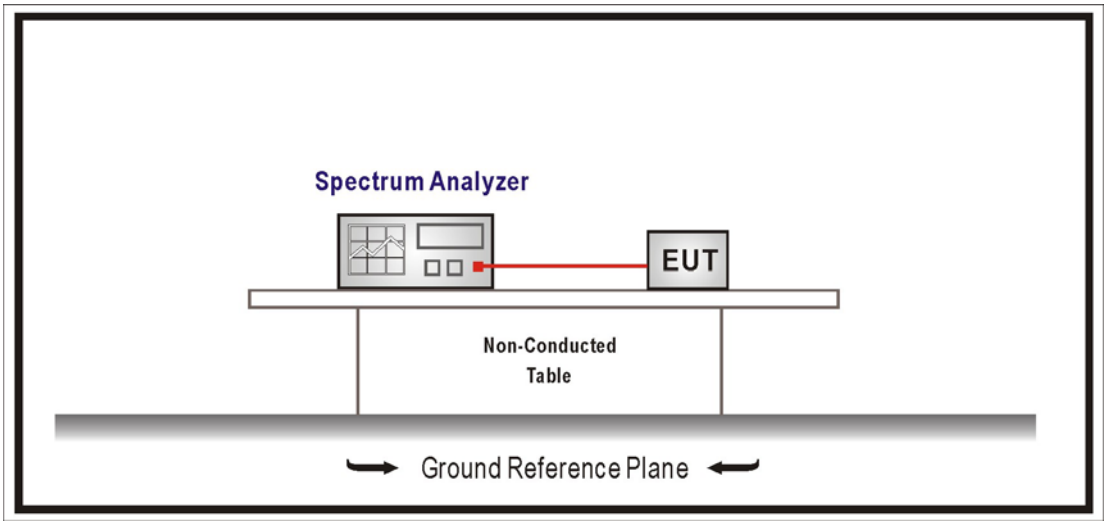
8.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2009
2	No.1 OATS			Sep., 2008

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

8.2. Test Setup



8.3. Limits

For 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.

8.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Span = wide enough to capture the peaks of two adjacent channels

Resolution Bandwidth (RBW) ≥ 1% of the span, VBW ≥ RBW

Sweep = auto, Detector function = peak, Trace = max hold

8.5. Test Specification

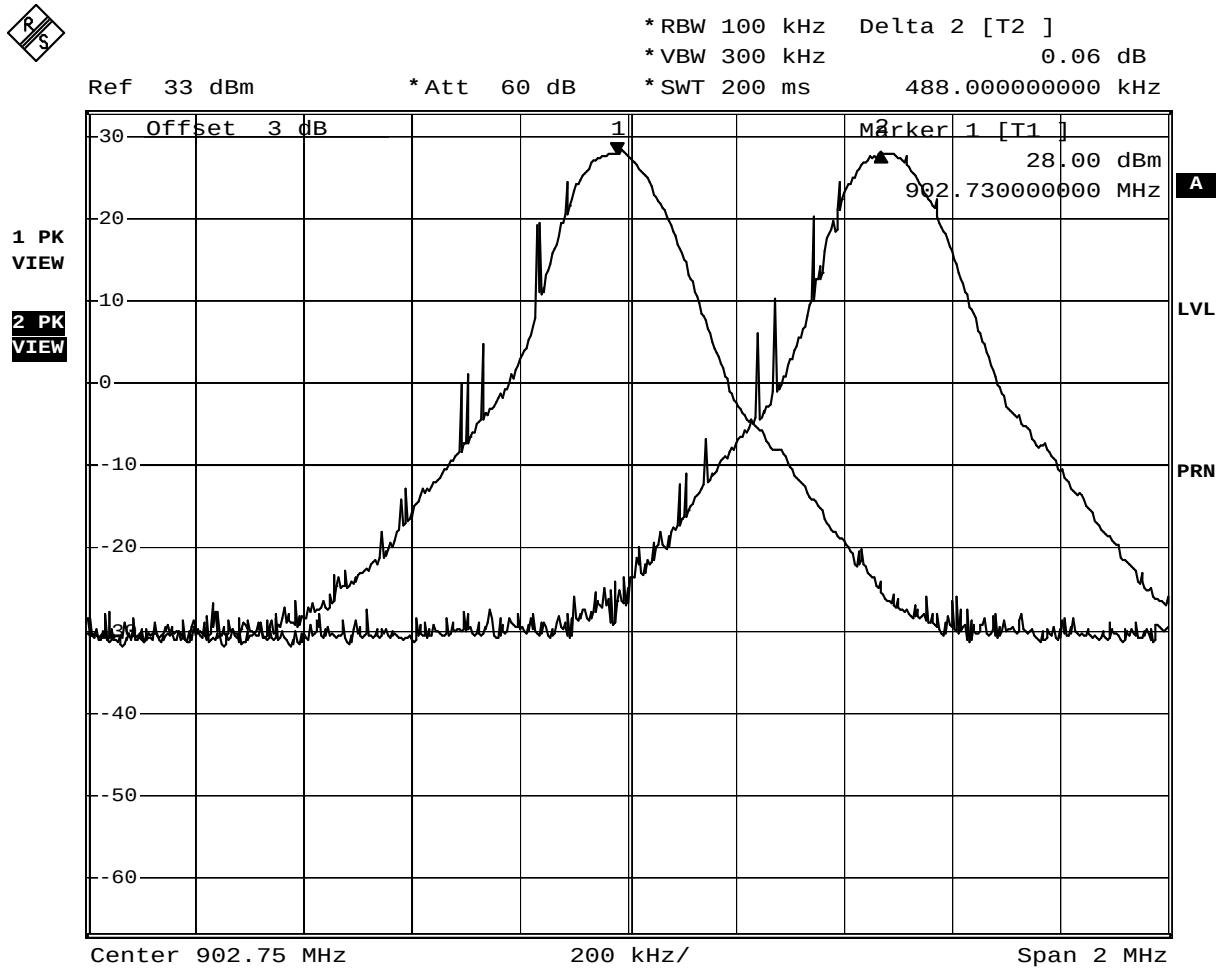
According to FCC Part 15 Subpart C Paragraph 15.247: 2008

8.6. Test Result

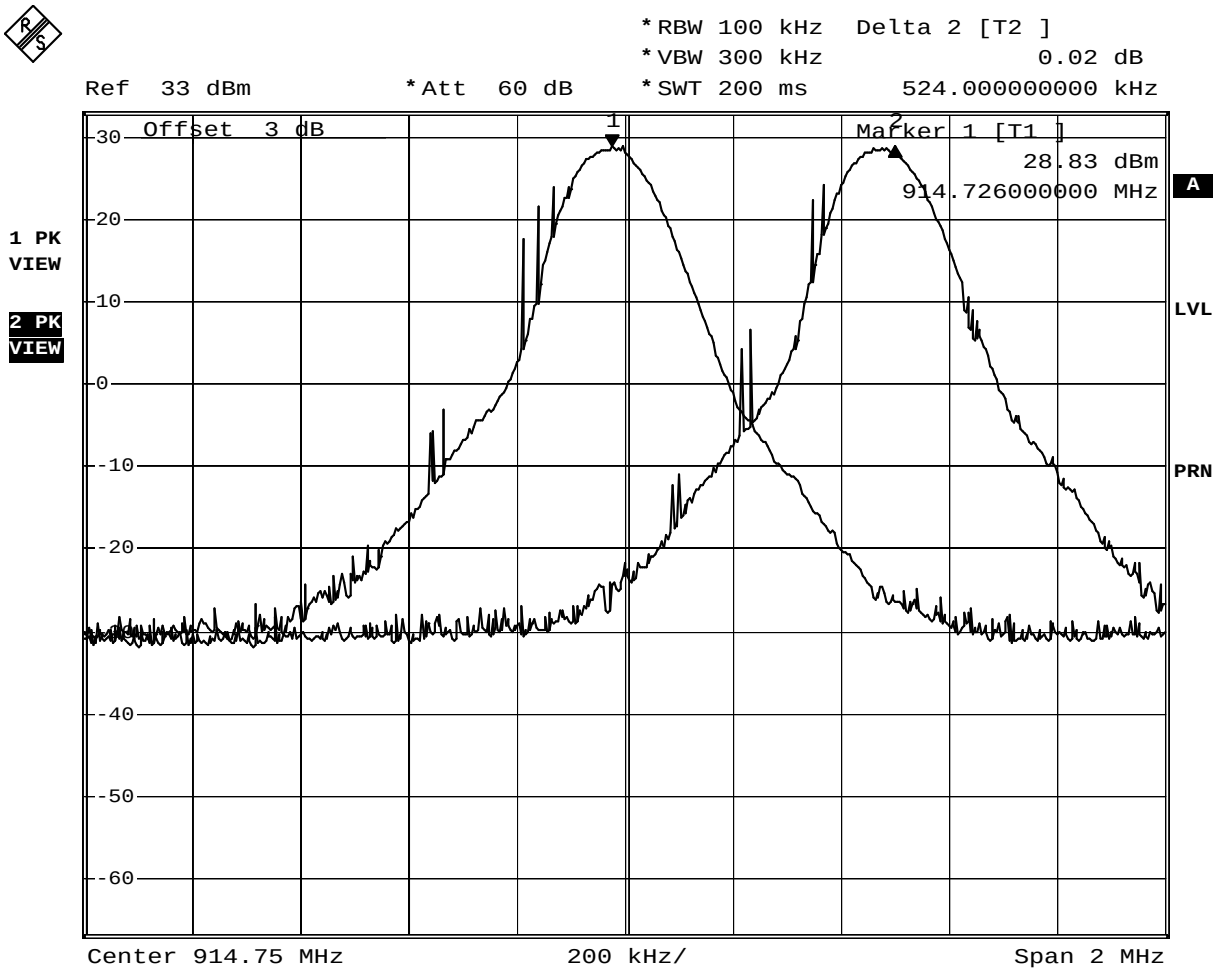
Product	UHF USB Reader Module		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit		
Date of Test	2009/04/15	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
0	902.75	488	>20dB Bandwidth	Pass
25	915.25	524	>20dB Bandwidth	Pass
49	927.25	516	>20dB Bandwidth	Pass

Channel 00

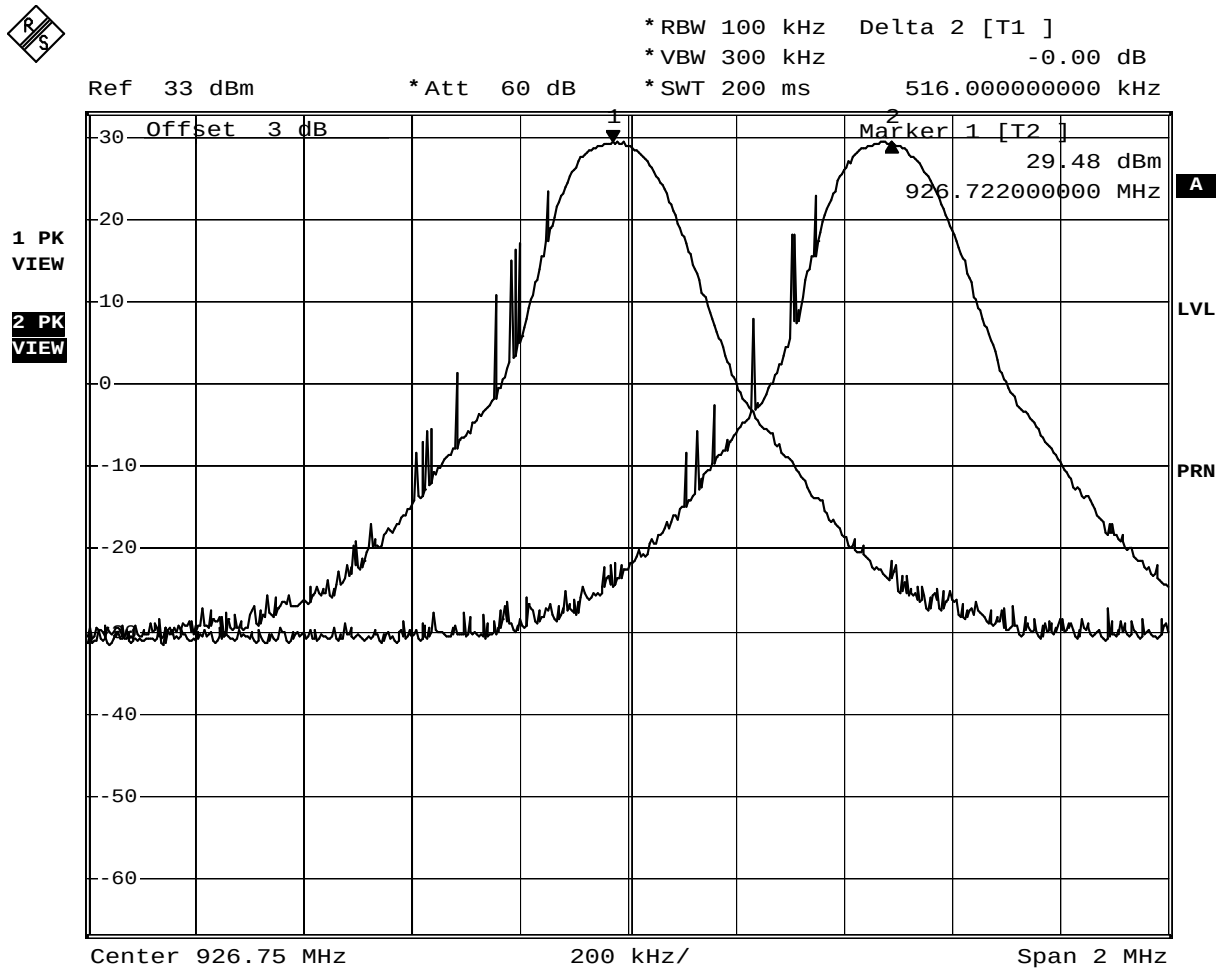


Channel 25



Date: 13.MAY.2009 21:52:49

Channel 49



Date: 13.MAY.2009 21:58:47

9. Occupied Bandwidth

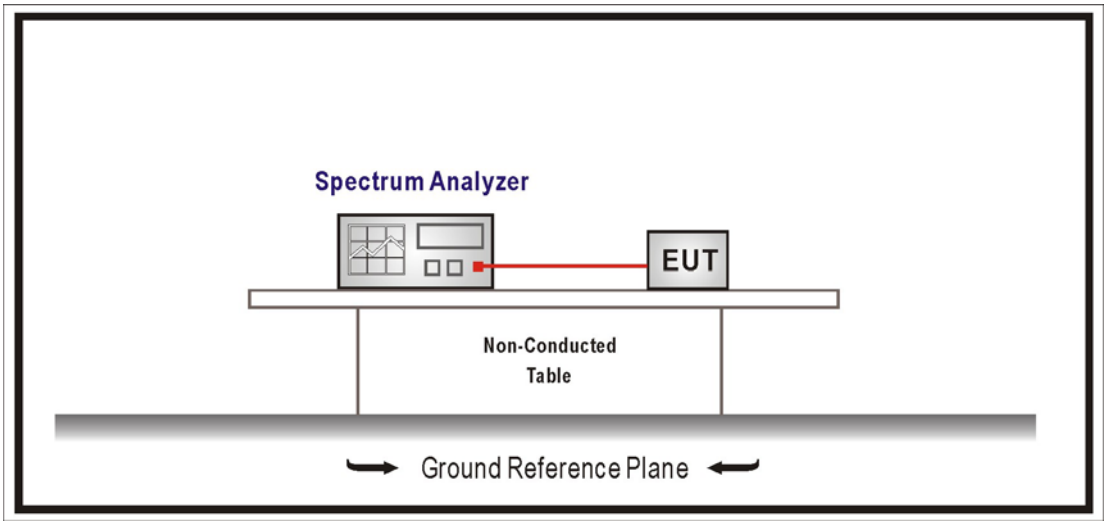
9.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2009
2	No.1 OATS			Sep., 2008

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

9.2. Test Setup



9.3. Limits

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.
For frequency hopping systems operating in the 5725-5850 MHz bands. The maximum 20 dB bandwidth of the hopping channel is 1 MHz.
For 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.

9.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
RBW ≥ 1% of the 20 dB bandwidth, VBW ≥ RBW
Sweep = auto, Detector function = peak, Trace = max hold
The EUT should be transmitting at its maximum data rate.

9.5. Test Specification

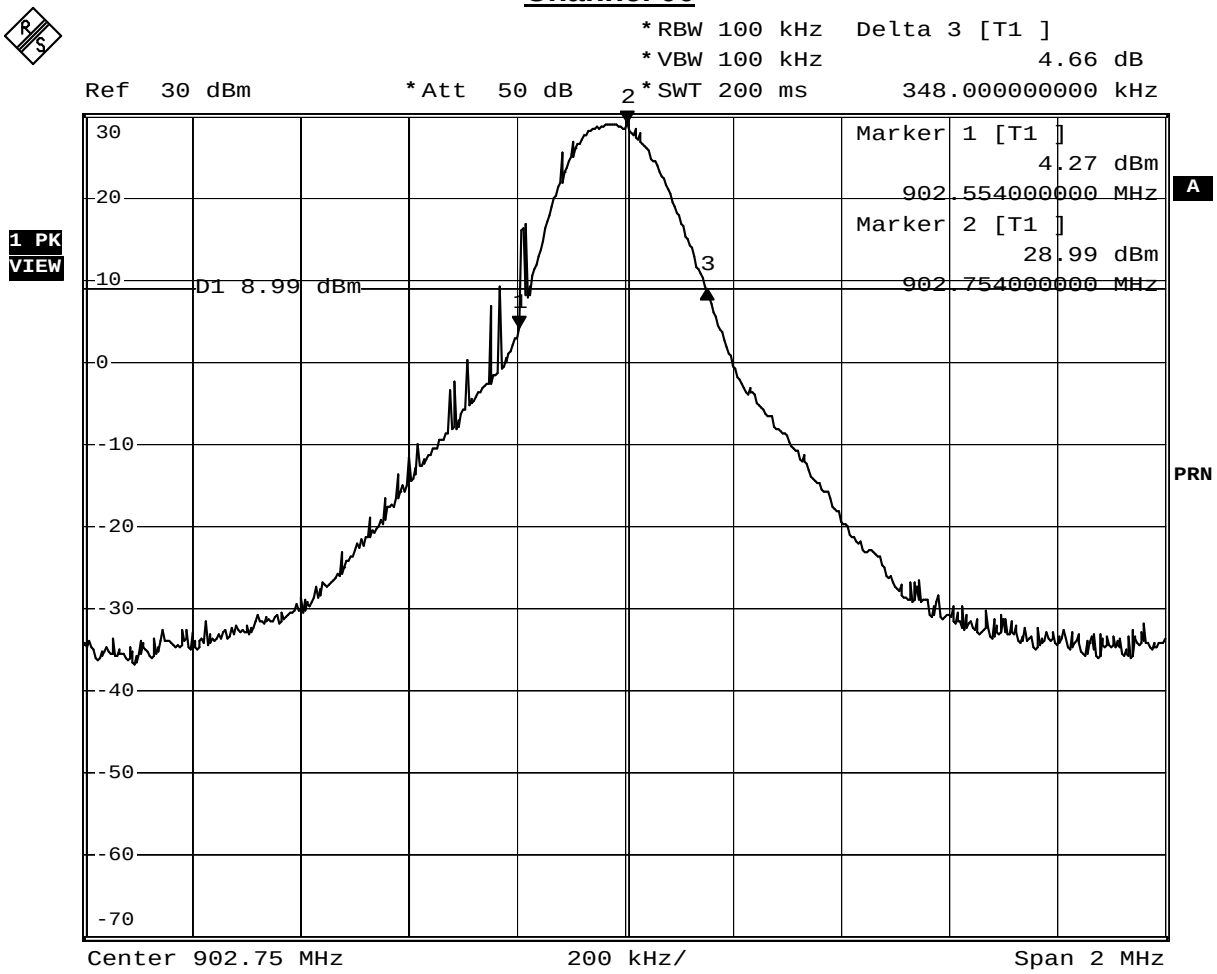
According to FCC Part 15 Subpart C Paragraph 15.247: 2008

9.6. Test Result

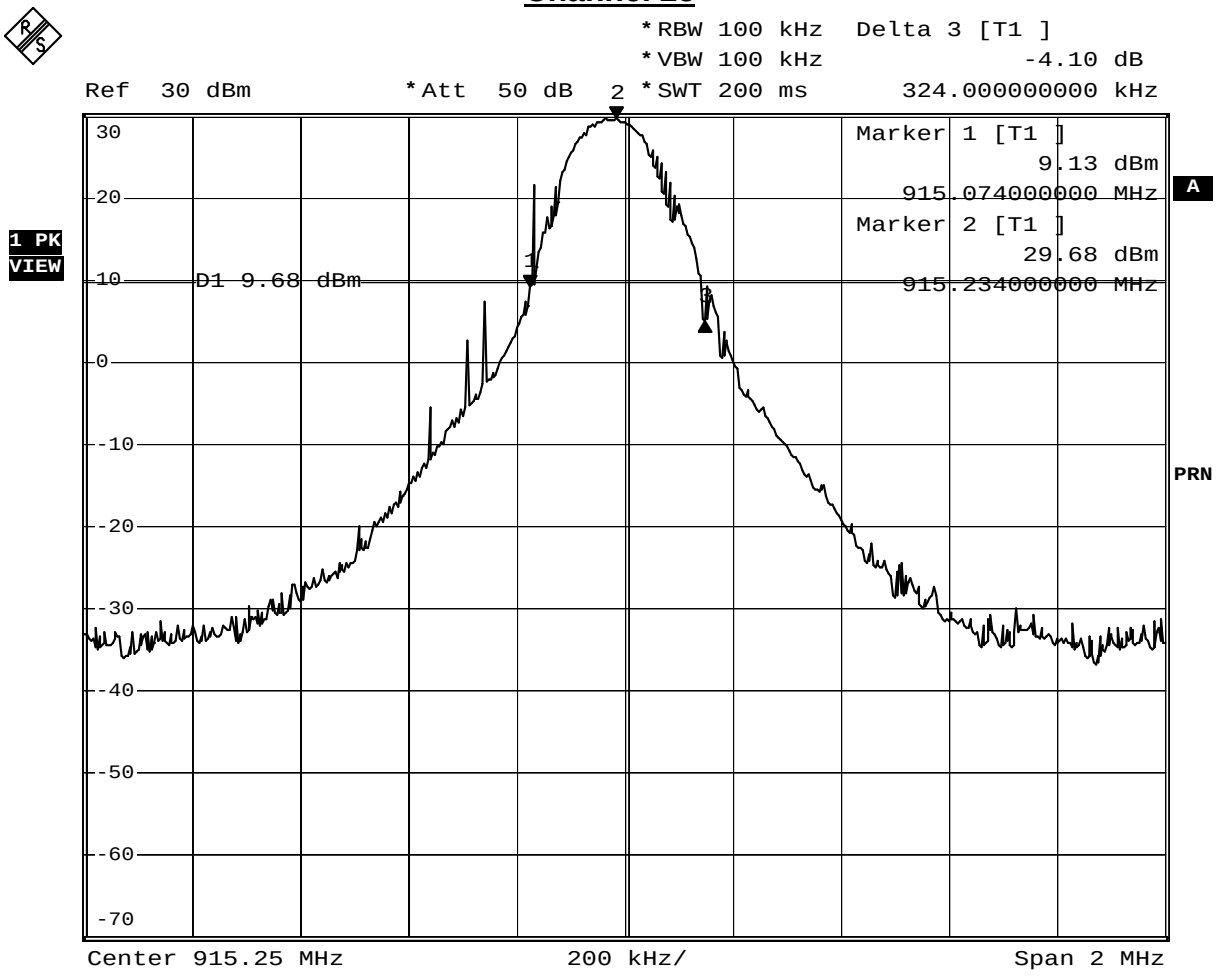
Product	UHF USB Reader Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/04/15	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
0	902.75	348	>250	Pass
25	915.25	324	>250	Pass
49	927.25	328	>250	Pass

Channel 00

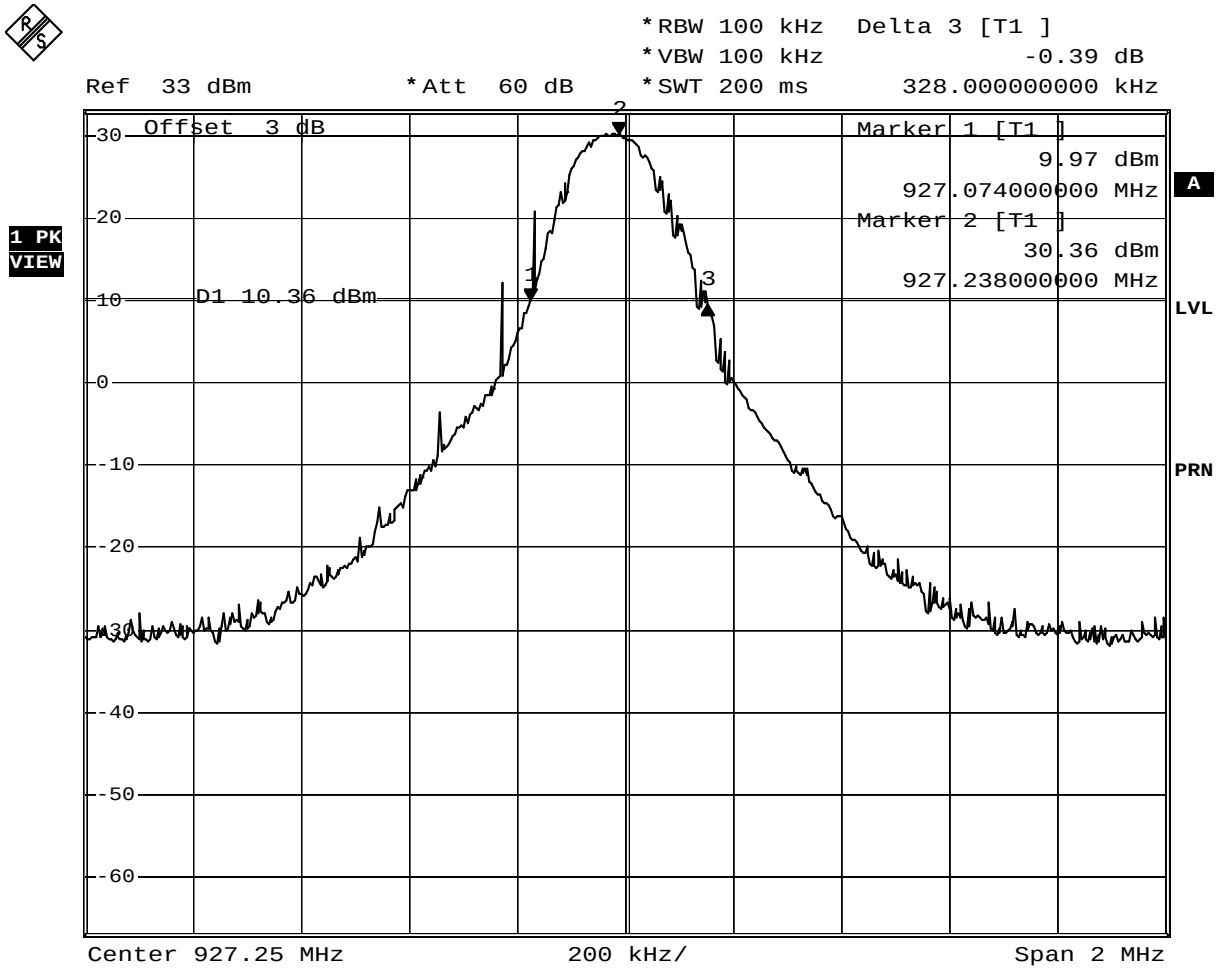


Channel 25



Date: 15.APR.2009 20:08:31

Channel 49


*RBW 100 kHz
*VBW 100 kHz
*SWT 200 ms
Delta 3 [T1]
-0.39 dB
328.000000000 kHz
Ref 33 dBm
*Att 60 dB
Offset 3 dB
Marker 1 [T1]
9.97 dBm
927.074000000 MHz
Marker 2 [T1]
30.36 dBm
927.238000000 MHz
D1 10.36 dBm
1 PK
VIEW
A
LVL
PRN
30
20
10
0
-10
-20
-30
-40
-50
-60
Center 927.25 MHz
200 kHz/
Span 2 MHz
Date: 15.APR.2009 20:13:57

10. Dwell Time

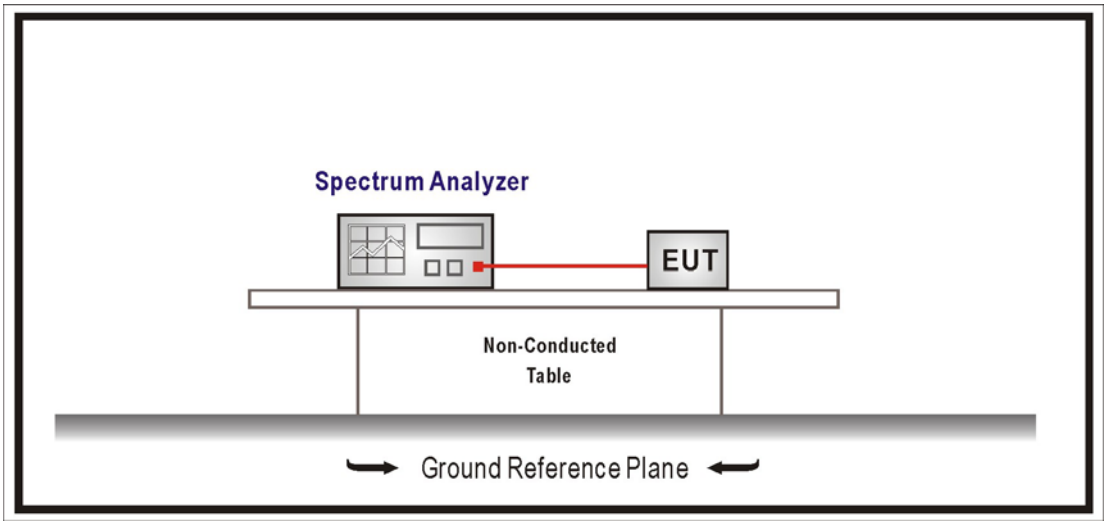
10.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2009
2	No.1 OATS			Sep., 2008

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

10.2. Test Setup



10.3. Limits

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.
For frequency hopping systems operating in the 2400-2483.5 MHz bands. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.
For frequency hopping systems operating in the 5725-5850 MHz bands. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

10.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Span = zero span, centered on a hopping channel
RBW = 1 MHz, VBW ≥ RBW
Sweep = as necessary to capture the entire dwell time per hopping channel
Detector function = peak, Trace = max hold

10.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2008

10.6. Test Result

Product	UHF USB Reader Module		
Test Item	Dwell Time		
Test Mode	Mode 1: Transmit		
Date of Test	2009/04/15	Test Site	No.1 OATS

Occupancy Time of Frequency Hopping System

A) 902.75MHz Test Time Period: 0.4*50=20sec，Hopping Times Within 1sec: 3/700msec=4.285 /sec

The Maximum Occupancy Time Within 20sec: 0.0336*(4.285/50)*20=0.0575sec。

B) 915.25MHz Test Time Period: 0.4*50=20sec，Hopping Times Within 1sec: 3/700msec=4.285 /sec

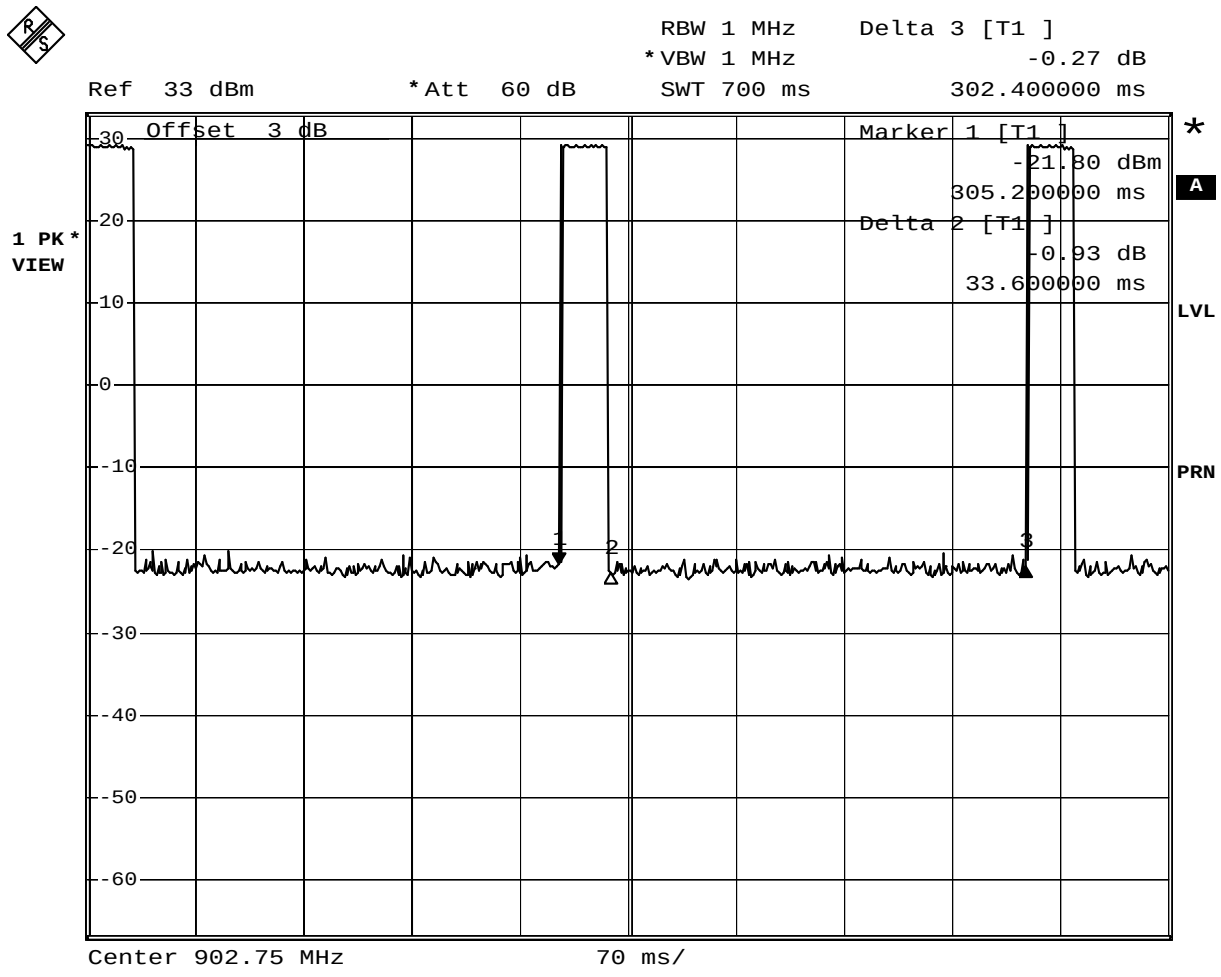
The Maximum Occupancy Time Within20sec: 0.0336*(4.285/50)*20=0.0575sec。

C) 927.25MHz Test Time Period: 0.4*50=20sec，Hopping Times Within 1sec: 3/700msec=4.285 /sec

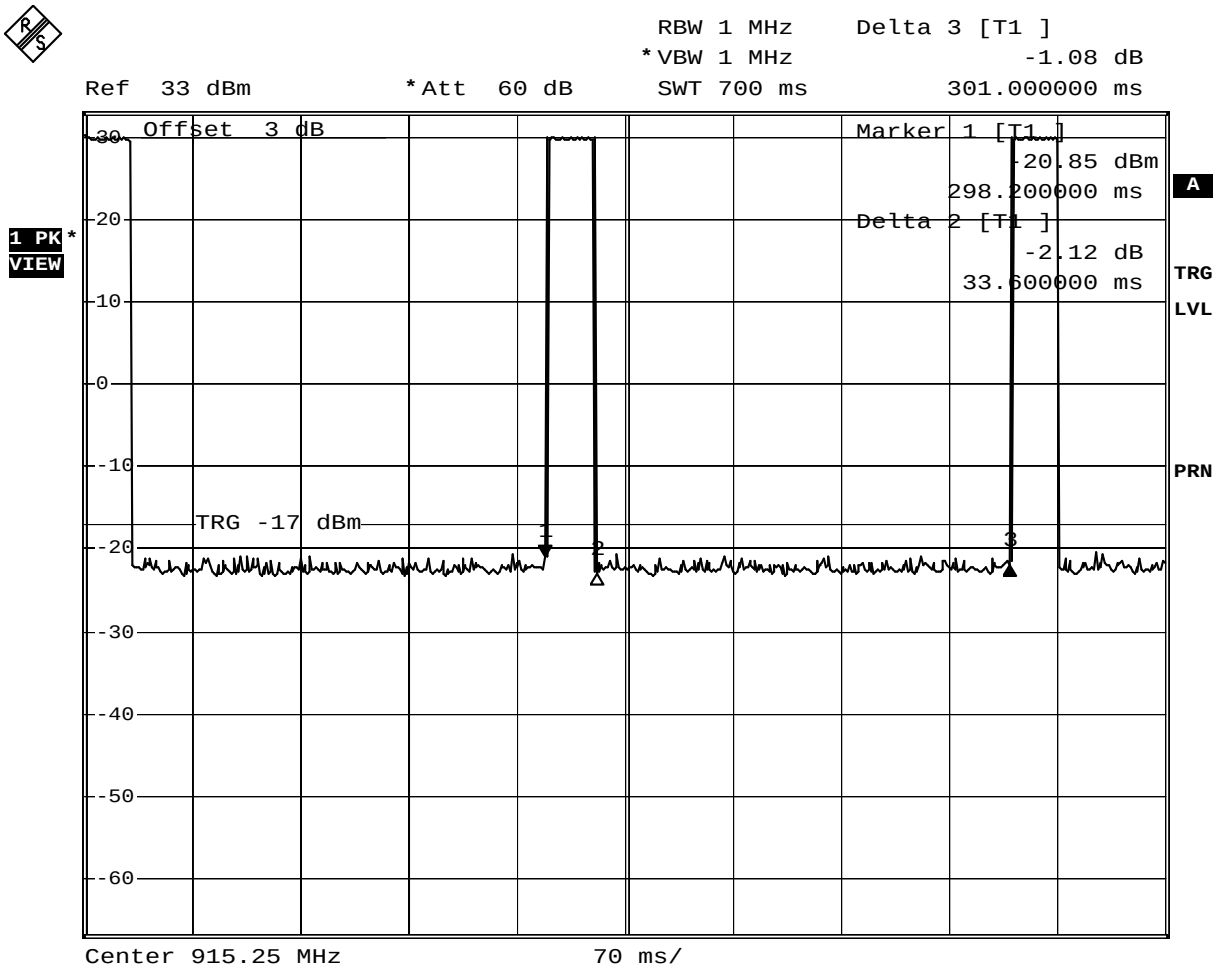
The Maximum Occupancy Time Within 20sec: 0.0336*(4.285/50)*20=0.0575sec。

Test Result: The Average Occupancy Time of Each Highest，Middle and Lowest Channel Is Less Than 0.4sec，And Corresponds to The Standard。

Hop rate-902.75MHz

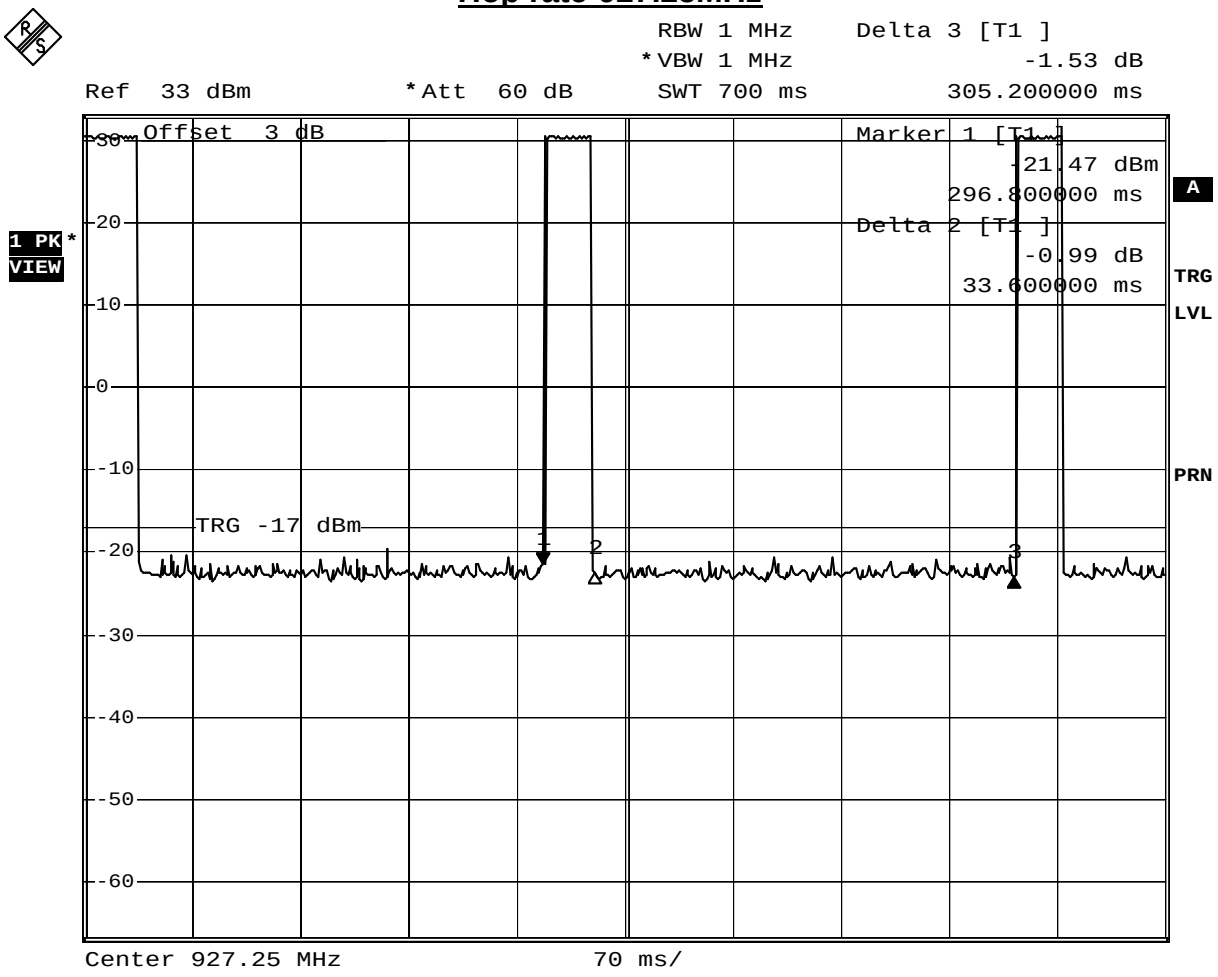


Hop rate-915.25MHz



Date: 15.APR.2009 21:11:18

Hop rate-927.25MHz



Note: Dwell time＝time slot length * hop rate / number of hopping channels * period