

FCC Test Report

Product Name : Wireless Handy Scanner

Model No. : H410W

FCC ID. : HWFH410W

Applicant : Mustek Systems Inc.

Address : No.25, R&D Road II, Science-Based Industrial
Park, Hsin-Chu, Taiwan, R.O.C.

Date of Report : 2013/05/10

Report No. : 134421R-RFUSP42V01

Report Version : V1.0



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.

Test Report Certification

Date of Report : 2013/05/10




Report No. : 134421R-RFUSP42V01



Product Name : Wireless Handy Scanner
 Applicant : Mustek Systems Inc.
 Address : No.25, R&D Road II, Science-Based Industrial Park,
 Hsin-Chu, Taiwan, R.O.C.
 Manufacturer : (1) Mustek Systems Inc.
 (2) MUSTEK ELECTRONICS CO., LTD.
 Model No. : H410W
 FCC ID. : HWFH410W
 EUT Test Voltage : DC 6V (Power by Battery)
 Trade Name : Mustek
 Applicable Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.247: 2012
 ANSI C63.4: 2009
 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 : 
 (Carol Tsai / Engineering Adm. Specialist)
 Reviewed By : 
 (Quale Tang / Engineer)
 Approved By : 
 (Roy Wang / Manager)

Laboratory Information

We, **Quietek Corporation**, are an independent RF consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025 specified testing scopes:

Taiwan R.O.C.	:	TAF, Accreditation Number: 1313
USA	:	FCC, Registration Number: 365520
Canada	:	IC, Submission No: 150981

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site:<http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :
<http://www.quietek.com/>

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory:

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.

TEL:+886-3-592-8858 / FAX:+886-3-592-8859

E-Mail : service@quietek.com

LinKou Testing Laboratory:

No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.

TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789

E-Mail : service@quietek.com

TABLE OF CONTENTS

Description	Page
1. General Information.....	6
1.1. EUT Description	6
1.2. Operational Description.....	10
1.3. Test Mode	11
1.4. Tested System Details	12
1.5. Configuration of tested System	12
1.6. EUT Exercise Software	12
1.7. Test Facility.....	13
2. Peak Power Output	14
2.1. Test Equipment.....	14
2.2. Test Setup	14
2.3. Test procedures.....	14
2.4. Limits	14
2.5. Test Specification.....	14
2.6. Uncertainty	14
2.7. Test Result.....	15
3. Radiated Emission	23
3.1. Test Equipment.....	23
3.2. Test Setup	23
3.3. Limits	24
3.4. Test Procedure	24
3.5. Test Specification.....	24
3.6. Uncertainty	24
3.7. Test Result.....	25
3.8. Test Photo	41
4. RF antenna conducted test	43
4.1. Test Equipment.....	43
4.2. Test Setup	43
4.3. Limits	44
4.4. Test Procedure	44
4.5. Test Specification.....	44
4.6. Uncertainty	44
4.7. Test Result.....	45
5. Radiated Emission Band Edge.....	53

5.1.	Test Equipment.....	53
5.2.	Test Setup	53
5.3.	Limits	54
5.4.	Test Procedure	54
5.5.	Test Specification.....	54
5.6.	Uncertainty	54
5.7.	Test Result.....	55
6.	Occupied Bandwidth.....	71
6.1.	Test Equipment.....	71
6.2.	Test Setup	71
6.3.	Test Procedures	71
6.4.	Limits	71
6.5.	Test Specification.....	71
6.6.	Uncertainty	71
6.7.	Test Result.....	72
7.	Power Density	78
7.1.	Test Equipment.....	78
7.2.	Test Setup	78
7.3.	Limits	78
7.4.	Test Procedures	78
7.5.	Test Specification.....	78
7.6.	Uncertainty	78
7.7.	Test Result.....	79
Attachement.....		85
	EUT Photograph.....	85

1. General Information

1.1. EUT Description

Product Name	Wireless Handy Scanner
Product Type	WLAN (1TX, 1RX)
Trade Name	Mustek
Model No.	H410W
Frequency Range / Channel Number	2412~2462MHz / 11 Channels
Type of Modulation	Orthogonal Frequency Division Multiplexing (OFDM)
Data Speed (IEEE 802.11g)	6Mbps,9Mbps,12Mbps,18Mbps,24Mbps,36Mbps,48Mbps,54Mbps
Data Speed (IEEE 802.11n)	Support a subset of the combination of GI, MCS 0~MCS 7 and bandwidth defined in 802.11n
Antenna Gain	3.8dBi
Antenna Type	PCB Antenna

Component	
USB Cable	Shielded, 0.4m

ANT-TX / Rx & Bandwidth

ANT-TX / Rx	TX		Rx	
	20MHz	40MHz	20MHz	40MHz
IEEE802.11g	✓			
IEEE802.11n	✓		✓	

IEEE802.11n Spec.

MCS Index	Modulation	R	N _{BPSCS}	N _{CBPS}	N _{DBPS}	Data Rate(Mb/s)	
				20MHz	20MHz	800ns GI	400ns GI (Note1)
						20MHz	20MHz
0	BPSK	1/2	1	52	26	6.5	7.2
1	QPSK	1/2	2	104	52	13.0	14.4
2	QPSK	3/4	2	104	78	19.5	21.7
3	16-QAM	1/2	4	208	104	26.0	28.9
4	16-QAM	3/4	4	208	156	39.0	43.3
5	64-QAM	2/3	6	312	208	52.0	57.8
6	64-QAM	3/4	6	312	234	58.5	65.0
7	64-QAM	5/6	6	312	260	65.0	72.2

Table 1 – MCS parameters for TX Antenna number = 1

Symbol	Explanation
R	Code rate
N _{BPSCS}	Number of coded bits per single carrier
N _{CBPS}	Number of coded bits per symbol
N _{DBPS}	Number of data bits per symbol
GI	guard interval

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
001	2412 MHz	002	2417 MHz	003	2422 MHz	004	2427 MHz
005	2432 MHz	006	2437 MHz	007	2442 MHz	008	2447 MHz
009	2452 MHz	010	2457 MHz	011	2462 MHz		

Note:

1. This device is a Wireless Handy Scanner including 2.4GHz g/n transmitting and receiving function
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart C Paragraph 15.247.
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 receiving function receiving was tested and its test report number is 134421R-RFUSP37V02 under Declaration of Conformity.

1.3. Test Mode

QuieTek has verified the construction and function in typical operation. The preliminary tests were performed in different data rate, and to find the worst condition, which was shown in this test report. The following table is the final test mode.

TX	Mode 1: Transmit
----	------------------

Test Items	Mode	Channel	Result
Conducted Emission	11n(20MHz)	6	Complies
Peak Power Output	g	1/ 6/ 11	Complies
	11n(20MHz)	1/ 6/ 11	Complies
Radiated Emission	g	1/ 6/ 11	Complies
	11n(20MHz)	1/ 6/ 11	Complies
RF antenna conducted test	g	1/ 11	Complies
	11n(20MHz)	1/ 11	Complies
Radiated Emission Band Edge	g	1/ 11	Complies
	11n(20MHz)	1/ 11	Complies
Occupied Bandwidth	g	1/ 6/ 11	Complies
	11n(20MHz)	1/ 6/ 11	Complies
Power Density	g	1/ 6/ 11	Complies
	11n(20MHz)	1/ 6/ 11	Complies

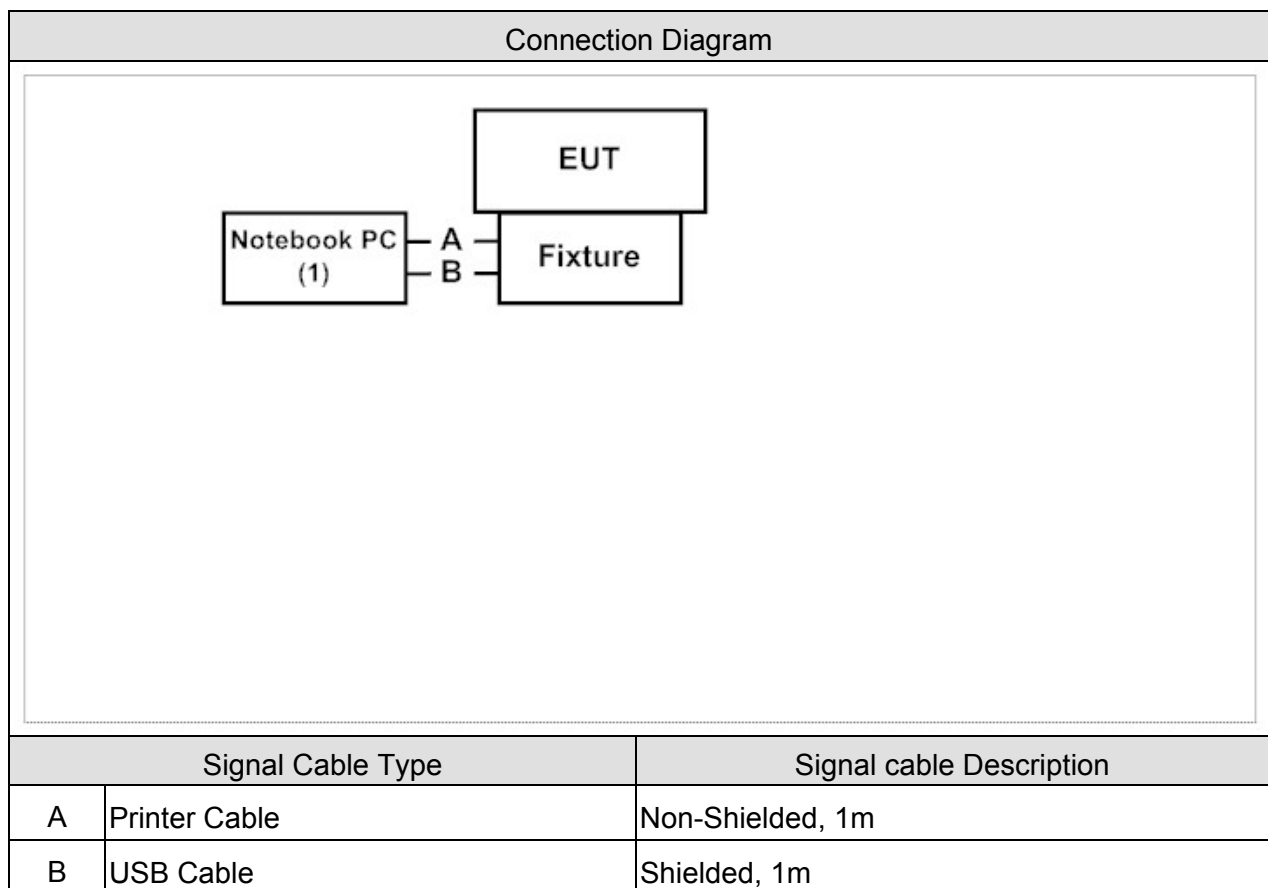
Conducted Emission: Owing to the DC operation of EUT, this test item is not performed.

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	HP Compaq	NX6320FF	CNU7020BXT	DoC	Non-Shielded, 1.8m

1.5. Configuration of tested System



1.6. EUT Exercise Software

1	Setup the EUT as shown in Section 1.5.
2	Execute the test program “UnitTest V7.2.1.5” on the notebook.
3	Configure the test mode, the test channel, and the data rate.
4	Press “Start TX” to start the continuous transmitting.
5	Verify that the EUT works properly.

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 C 15.247 Peak Power Output (ODFM)	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Radiated Emission (ODFM)	15 - 35	20
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 RF antenna conducted test (ODFM)	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Band Edge (ODFM)	15 - 35	20
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Occupied Bandwidth (ODFM)	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Power Density (ODFM)	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000

2. Peak Power Output

2.1. Test Equipment

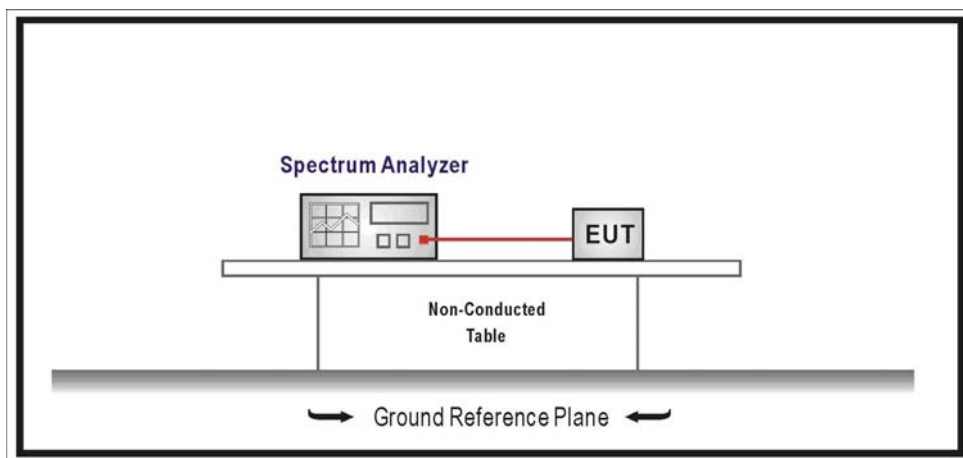
The following test equipments are used during the test:

Peak Power / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
EXA Signal Analyzer	Agilent	N9010A-EXA	US47140172	2013/07/31

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

2.2. Test Setup



2.3. Test procedures

The EUT was tested according to DTS test procedure of Jan. 2012 KDB558074, Section 5.2.1.2 Measurement Procedure PK2 for compliance to FCC 47CFR 15.247 requirements.

2.4. Limits

The maximum peak power shall be less 1 Watt.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

2.6. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB.

2.7. Test Result

Product	Wireless Handy Scanner		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2013/04/27	Test Site	SR7

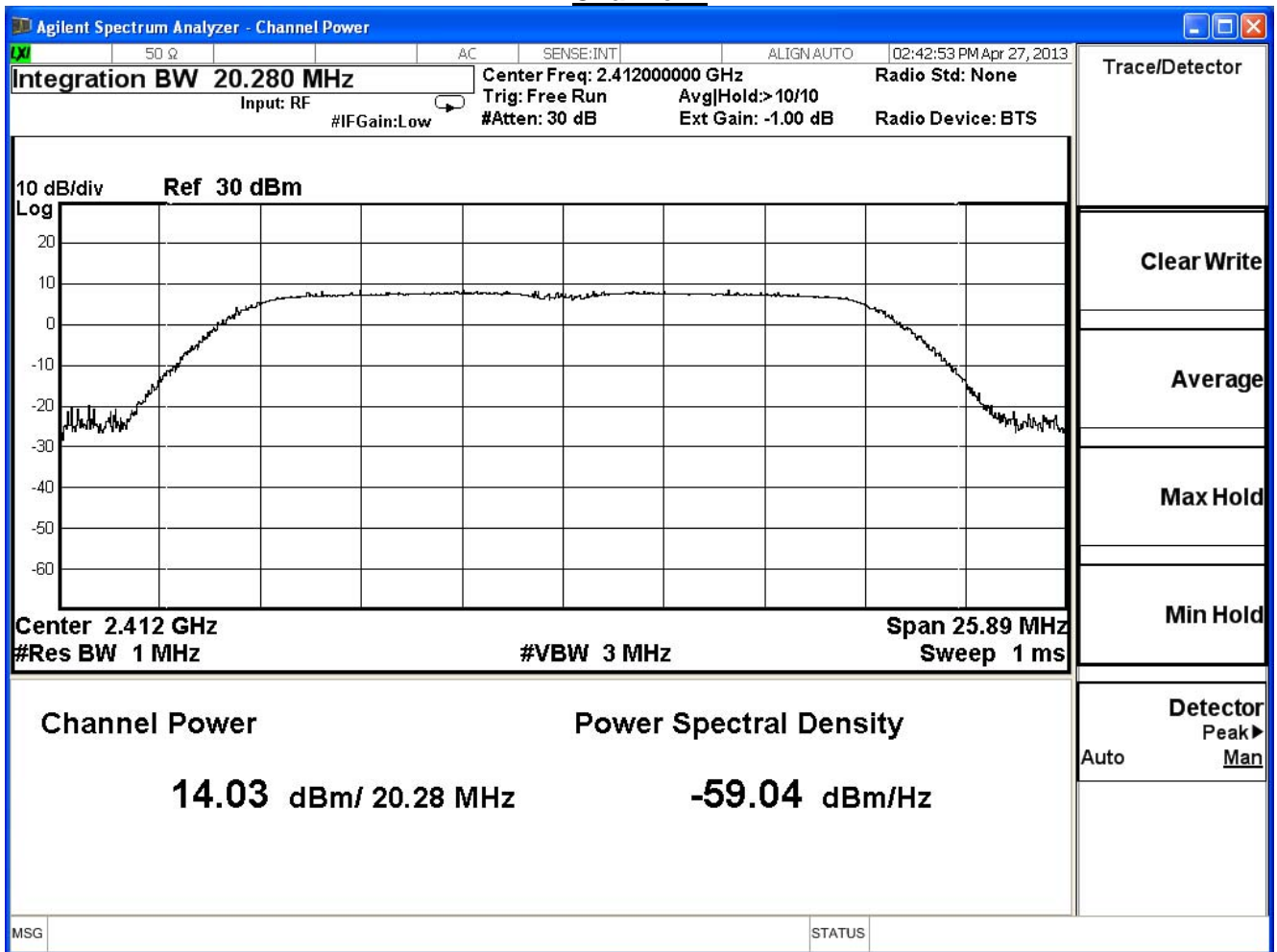
IEEE 802.11g				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	14.03	30	Pass
6	2437	14.50	30	Pass
11	2462	14.62	30	Pass

The worst emission of data rate is 6Mbps.

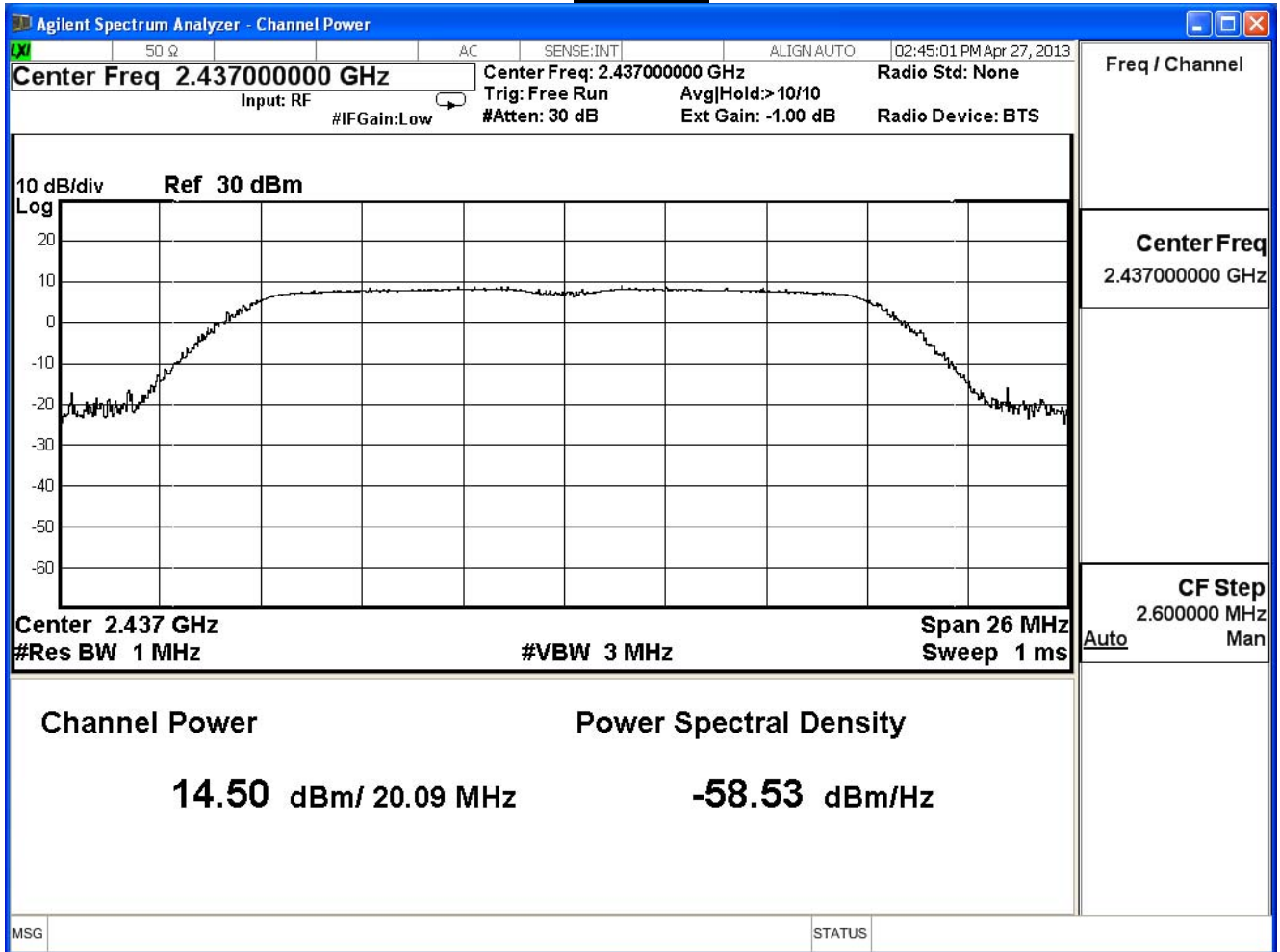
Peak Power Output Value(dBm)									
Channel No.	Frequency (MHz)	Data Rate (Mbps)							Required Limit
		6	12	18	24	36	48	54	
1	2412	14.04	--	--	-	--	--	-	30 dBm
6	2437	14.50	14.49	14.48	14.46	14.45	14.44	14.43	30 dBm
11	2462	14.62	--	--	-	--	--	-	30 dBm

Note: Measure Level =Reading value + cable loss

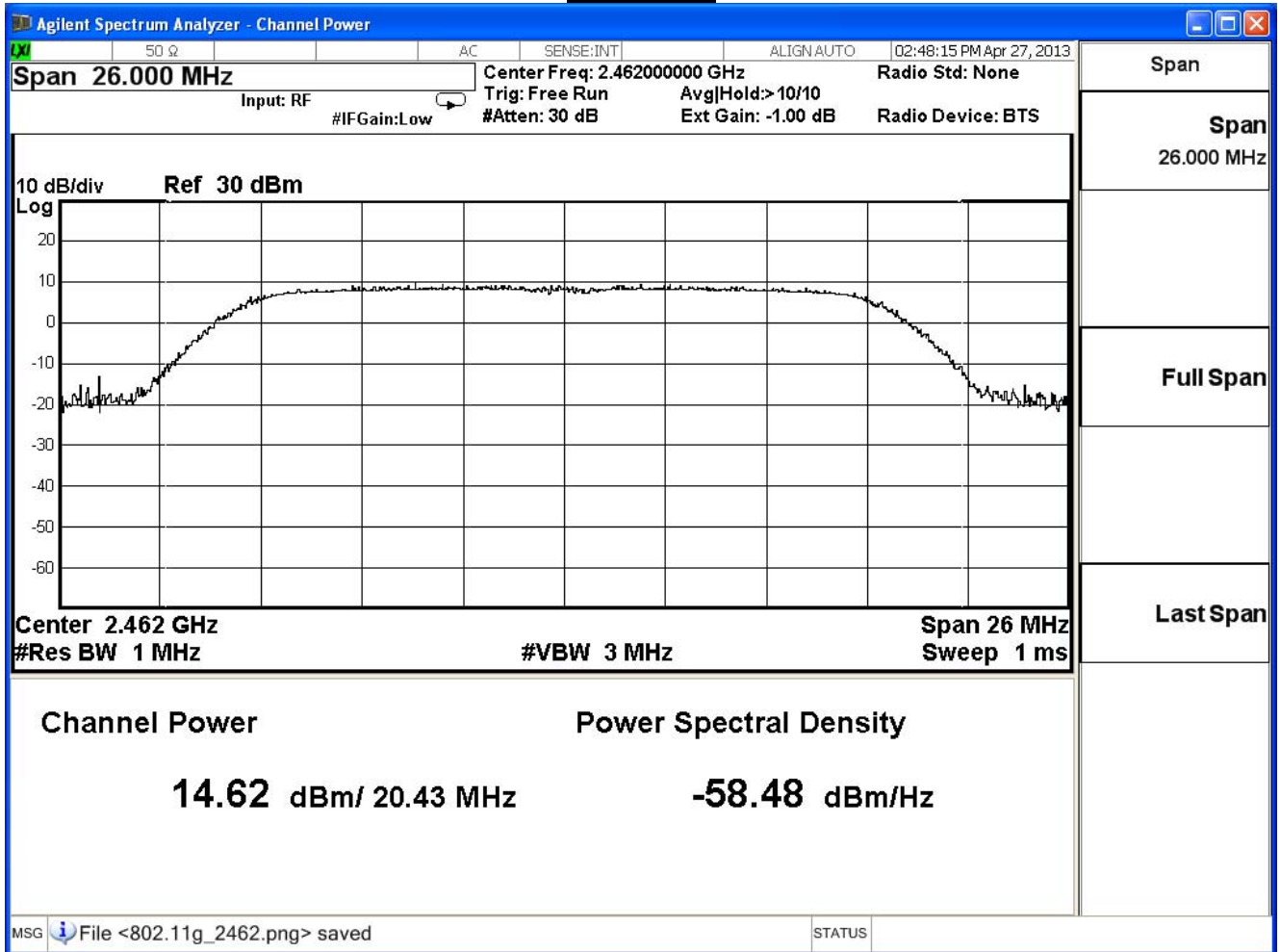
Channel 1



Channel 6



Channel 11



Product	Wireless Handy Scanner		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2013/04/27	Test Site	SR7

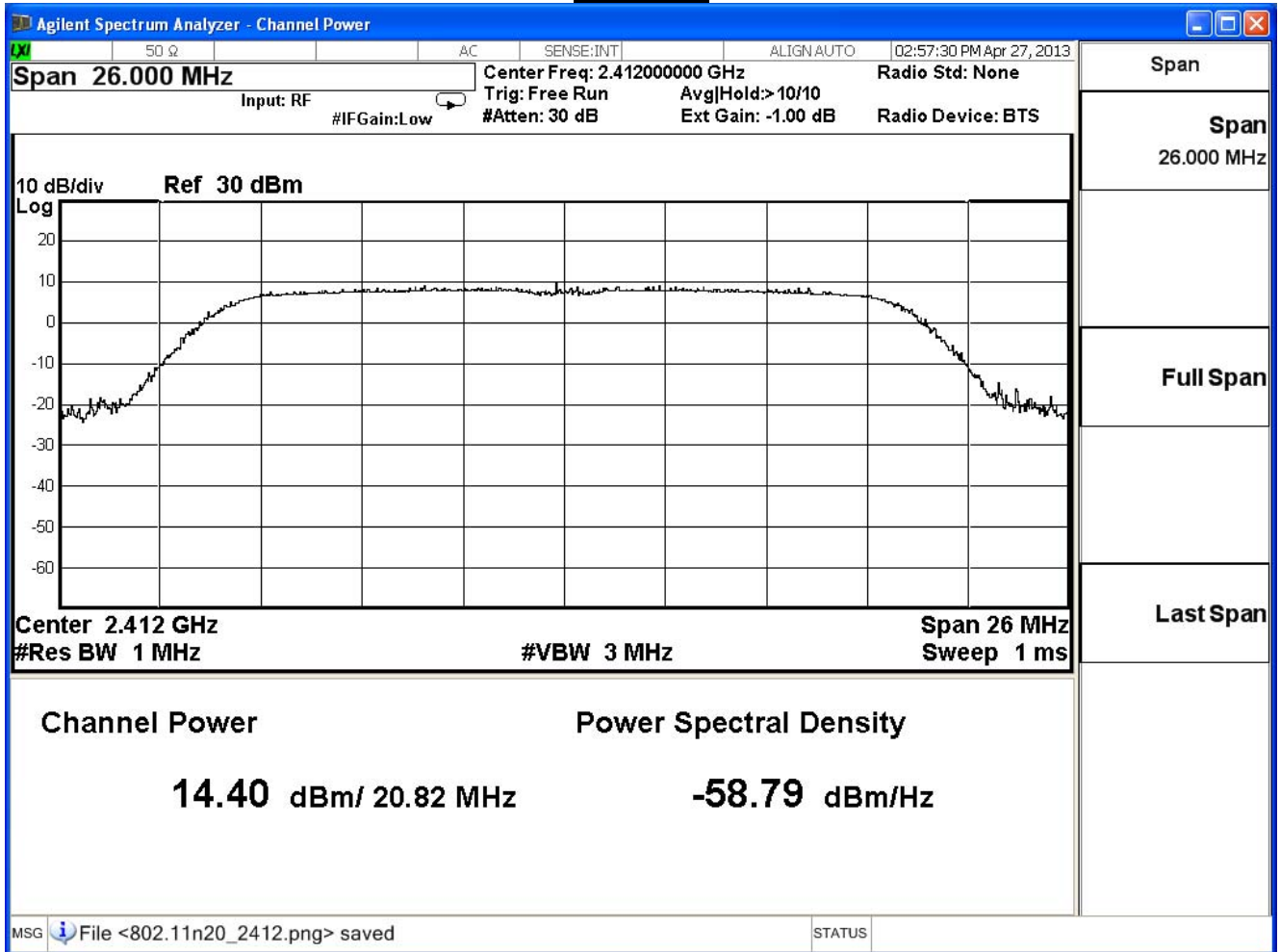
IEEE 802.11n 20MHz

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	14.40	30	Pass
6	2437	14.05	30	Pass
11	2462	14.35	30	Pass

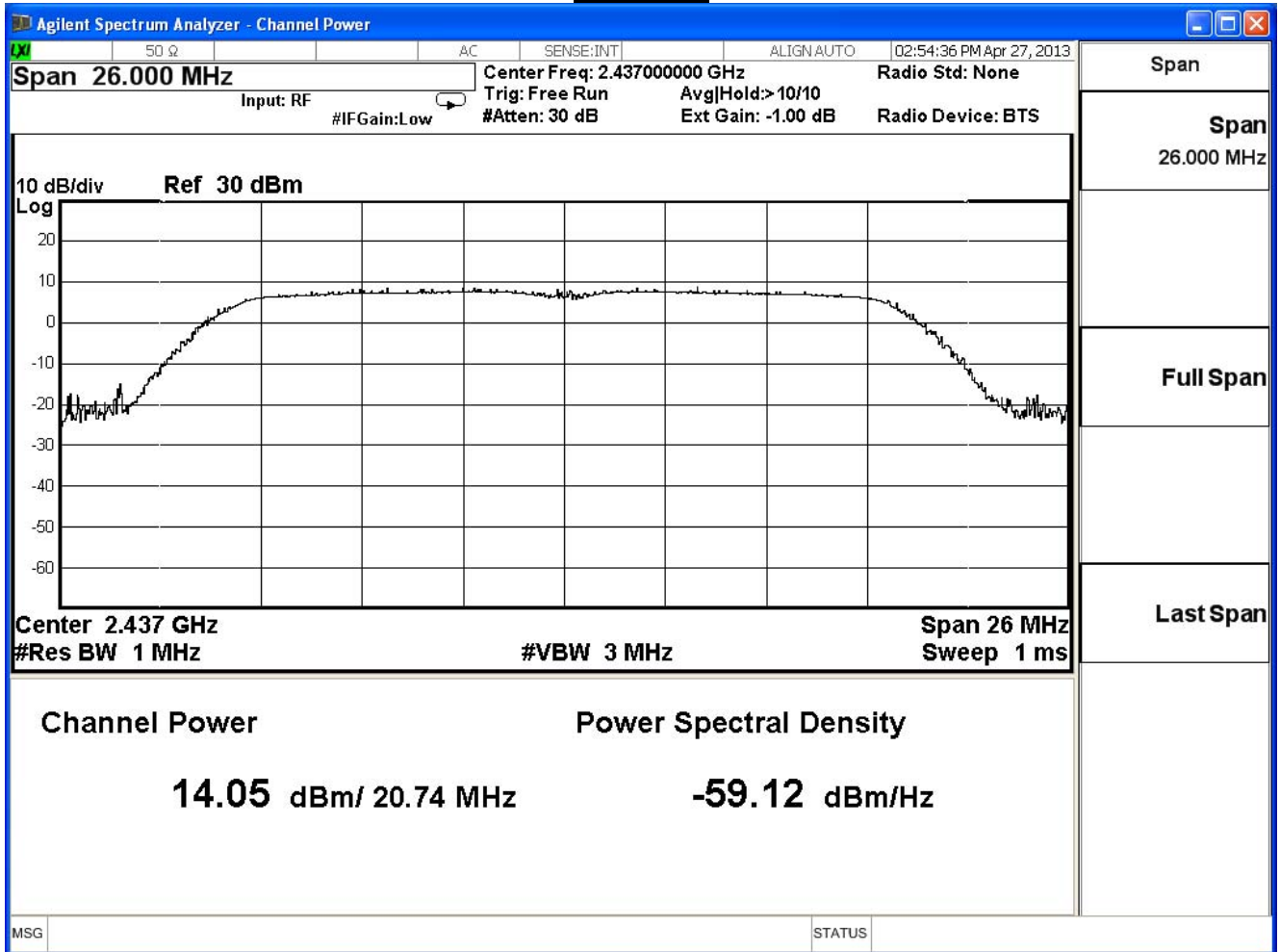
The worst emission of data rate is 6.5 Mbps.

Peak Power Output (dBm)										
MCS Index		0	1	2	3	4	5	6	7	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		6.5	13.0	19.5	26.0	39.0	52.0	58.5	65.0	
1	2412	14.40	--	--	-	--	--	-	--	30dBm
6	2437	14.05	14.04	14.03	14.02	14.01	14.00	13.39	13.38	30dBm
11	2462	14.35	--	--	-	--	--	-	--	30dBm

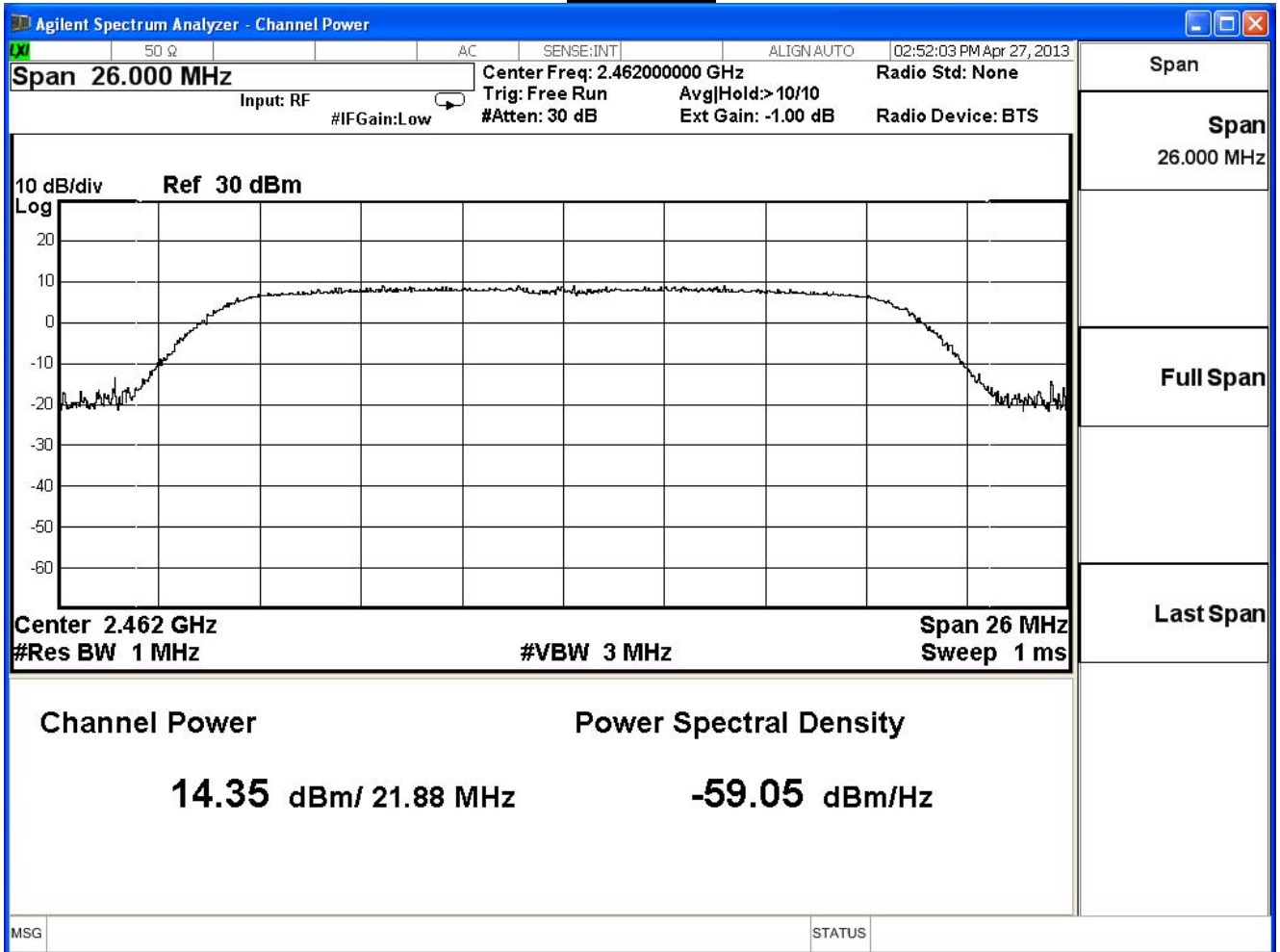
Channel 1



Channel 6



Channel 11



3. Radiated Emission

3.1. Test Equipment

The following test equipments are used during the test:

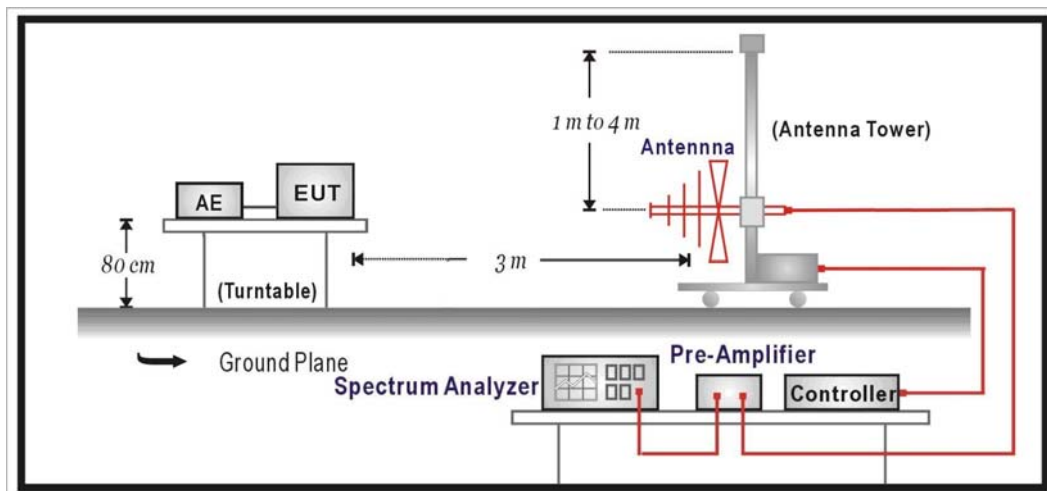
Radiated Emission / CB3

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Bilog Antenna	SCHAFFNER	CBL6112B	2895	2013/08/14
Double Ridged Guide Horn Antenna	Schwarzback	BBHA 9120	D743	2014/02/17
Pre-Amplifier	MITEQ	AMF-4D-005180-24-10P	888003	2013/12/02
Pre-Amplifier	QuieTek	AP-025C	CHM-0706049	2014/02/19
Spectrum Analyzer	Agilent	E4440A	MY46187335	2014/01/27
k Type Cable	Huber Suhner	Sucoflex 102	25623/2	2014/02/21

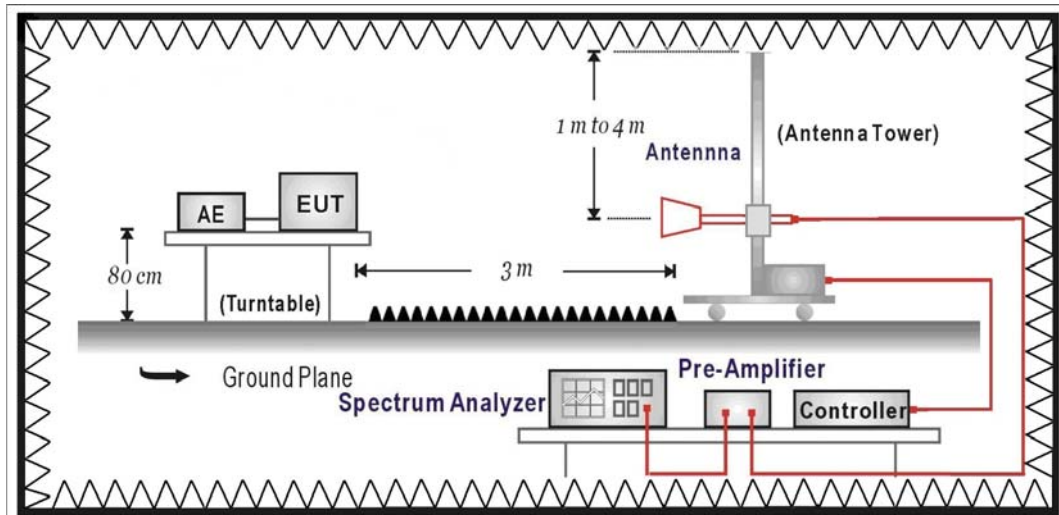
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

3.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



3.3. 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	dBuV/m	dBuV/m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks: E field strength (dBuV/m) = 20 log E field strength (uV/m)

3.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2009 and tested according to DTS test procedure of Jan. 2012 KDB558074 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 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: 2009 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.

3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

3.6. Uncertainty

The measurement uncertainty

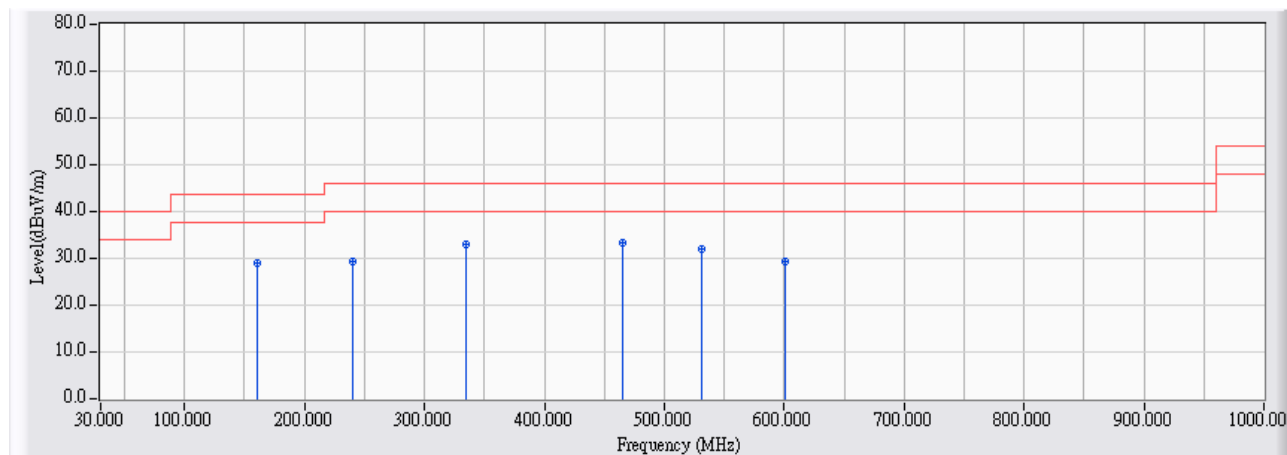
30MHz~1GHz as ±3.43dB

1GHz~26.5Ghz as ±3.65dB

3.7. Test Result

30MHz-1GHz Spurious

Site : CB3	Time : 2013/04/30 - 08:55
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB3_FCC_EFS_30-1G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2437MHz

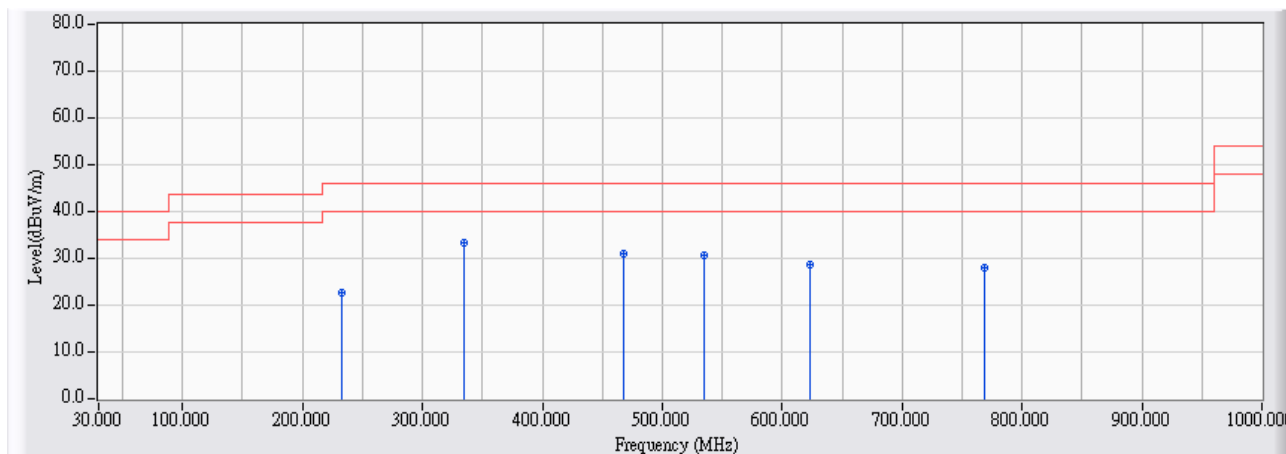


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	159.980	-13.560	42.625	29.065	-14.435	43.500	QUASPEAK
2	240.490	-11.569	40.935	29.365	-16.635	46.000	QUASPEAK
3	334.580	-9.099	42.129	33.031	-12.969	46.000	QUASPEAK
4	* 465.530	-5.927	39.336	33.408	-12.592	46.000	QUASPEAK
5	531.490	-4.848	36.800	31.952	-14.048	46.000	QUASPEAK
6	600.360	-4.122	33.358	29.236	-16.764	46.000	QUASPEAK

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 : CB3	Time : 2013/04/30 - 08:54
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB3_FCC_EFS_30-1G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2437MHz

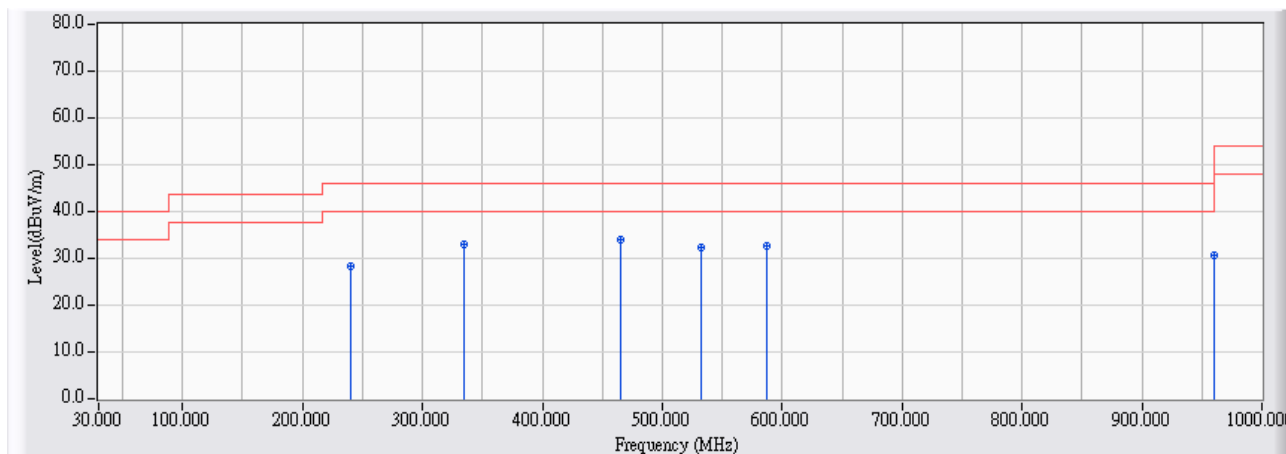


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	232.730	-12.131	34.748	22.617	-23.383	46.000	QUASPEAK
2	* 334.580	-9.099	42.467	33.369	-12.631	46.000	QUASPEAK
3	467.470	-5.888	36.774	30.887	-15.113	46.000	QUASPEAK
4	534.400	-4.816	35.373	30.558	-15.442	46.000	QUASPEAK
5	623.640	-4.038	32.624	28.586	-17.414	46.000	QUASPEAK
6	768.170	-2.855	30.755	27.900	-18.100	46.000	QUASPEAK

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 : CB3	Time : 2013/04/30 - 08:58
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB3_FCC_EFS_30-1G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2437MHz

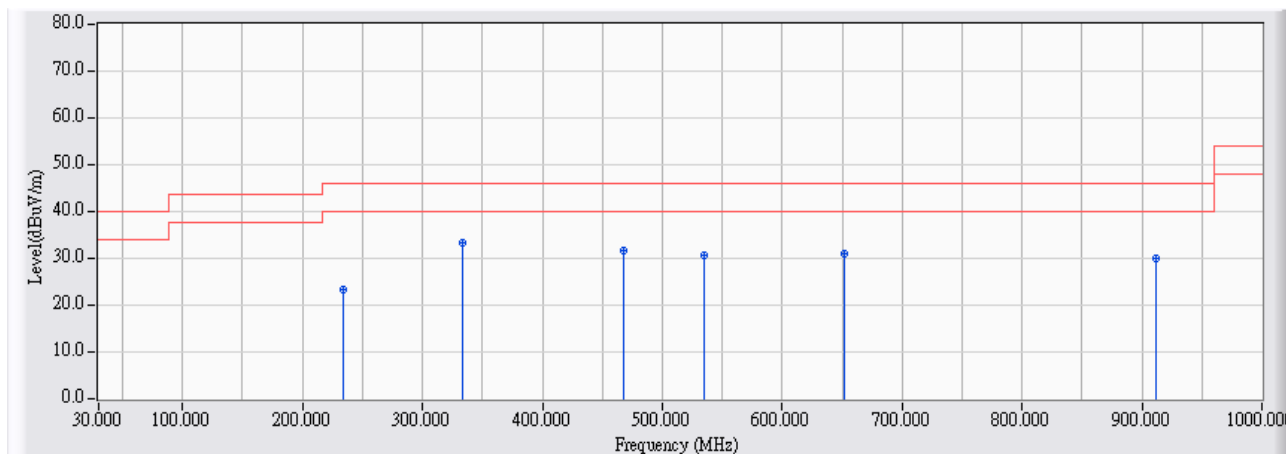


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	240.490	-11.569	39.785	28.215	-17.785	46.000	QUASPEAK
2	334.580	-9.099	42.260	33.162	-12.838	46.000	QUASPEAK
3	* 465.530	-5.927	39.864	33.936	-12.064	46.000	QUASPEAK
4	532.460	-4.838	37.079	32.242	-13.758	46.000	QUASPEAK
5	586.780	-4.260	37.061	32.801	-13.199	46.000	QUASPEAK
6	960.230	-1.157	31.859	30.702	-23.298	54.000	QUASPEAK

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 : CB3	Time : 2013/04/30 - 09:01
Limit : FCC_CLASS_B_03M_QP	Margin : 6
Probe : CB3_FCC_EFS_30-1G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2437MHz



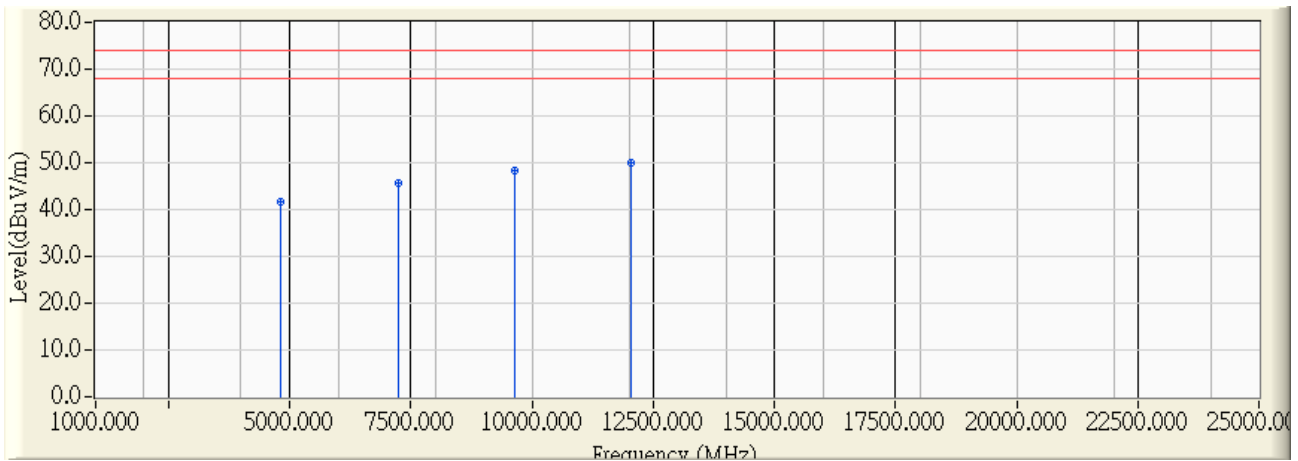
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	233.700	-12.061	35.543	23.482	-22.518	46.000	QUASPEAK
2	* 333.610	-9.126	42.377	33.252	-12.748	46.000	QUASPEAK
3	467.470	-5.888	37.586	31.699	-14.301	46.000	QUASPEAK
4	534.400	-4.816	35.320	30.505	-15.495	46.000	QUASPEAK
5	651.770	-3.937	35.025	31.088	-14.912	46.000	QUASPEAK
6	911.730	-1.699	31.812	30.113	-15.887	46.000	QUASPEAK

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.

Above 1GHz Spurious

Site : CB3	Time : 2013/04/28 - 10:16
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2412MHz

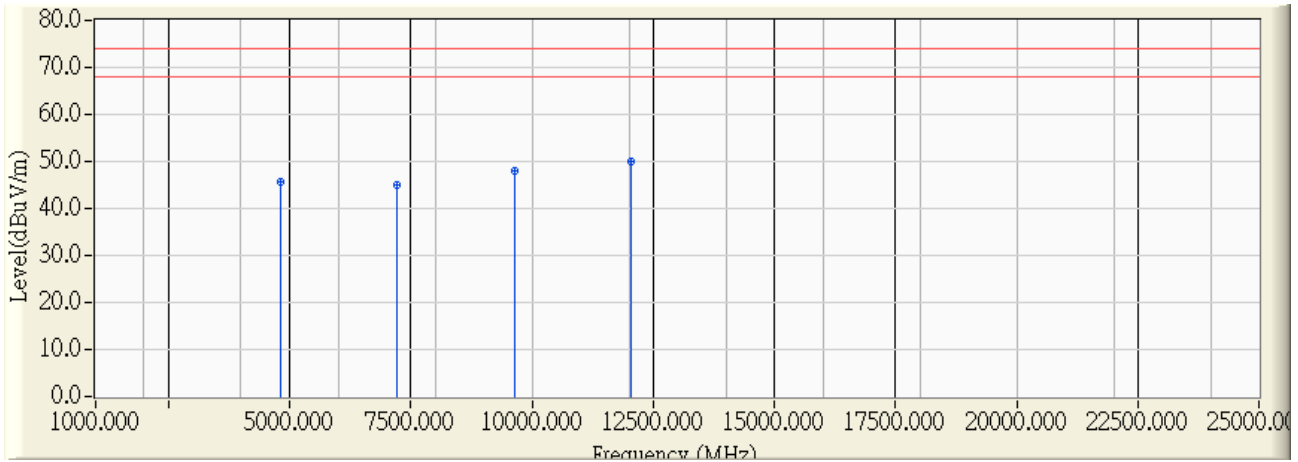


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4817.250	-0.821	42.400	41.579	-32.421	54.000	74.000	PEAK
2	7257.250	5.549	40.100	45.648	-28.352	54.000	74.000	PEAK
3	9644.500	9.206	39.220	48.425	-25.575	54.000	74.000	PEAK
4	* 12038.920	11.533	38.630	50.163	-23.837	54.000	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 18GHz were not included is because their levels are too low.

Site : CB3	Time : 2013/04/28 - 10:26
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2412MHz

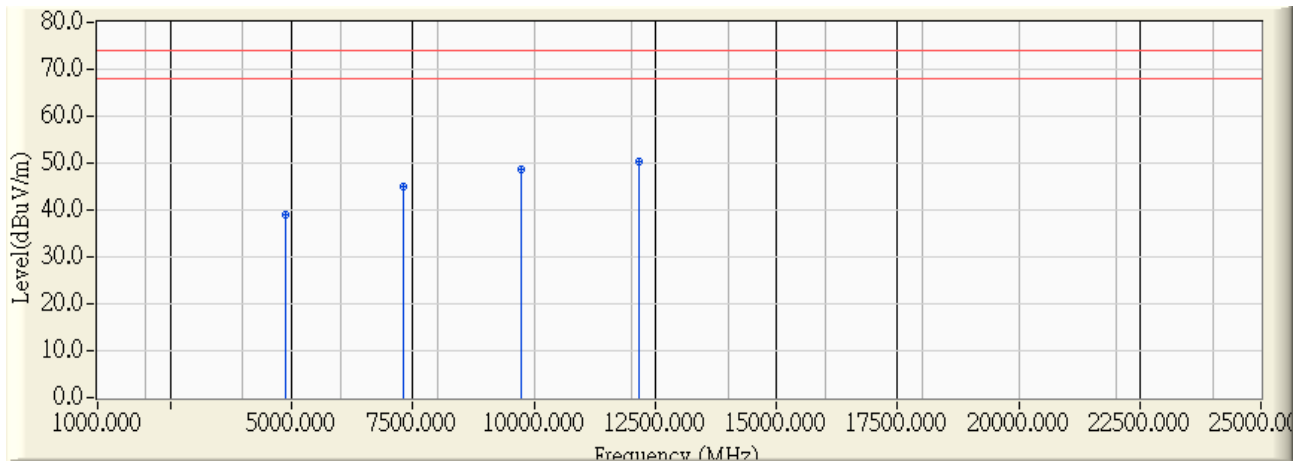


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4819.080	-0.816	46.410	45.594	-28.406	54.000	74.000	PEAK
2	7212.000	5.439	39.670	45.109	-28.891	54.000	74.000	PEAK
3	9634.420	9.133	38.810	47.942	-26.058	54.000	74.000	PEAK
4	* 12054.000	11.527	38.520	50.047	-23.953	54.000	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 18GHz were not included is because their levels are too low.

Site : CB3	Time : 2013/04/28 - 10:34
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2437MHz

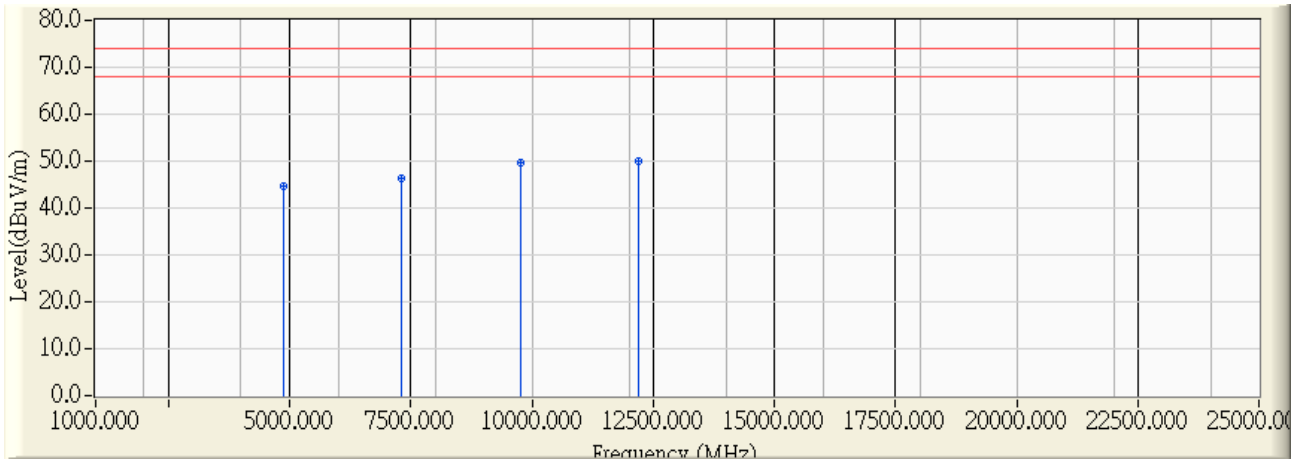


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4862.830	-0.701	39.840	39.139	-34.861	54.000	74.000	PEAK
2	7294.330	5.637	39.380	45.017	-28.983	54.000	74.000	PEAK
3	9724.080	9.782	38.910	48.692	-25.308	54.000	74.000	PEAK
4	* 12170.830	11.487	38.900	50.386	-23.614	54.000	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 18GHz were not included is because their levels are too low.

Site : CB3	Time : 2013/04/28 - 10:40
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2437MHz

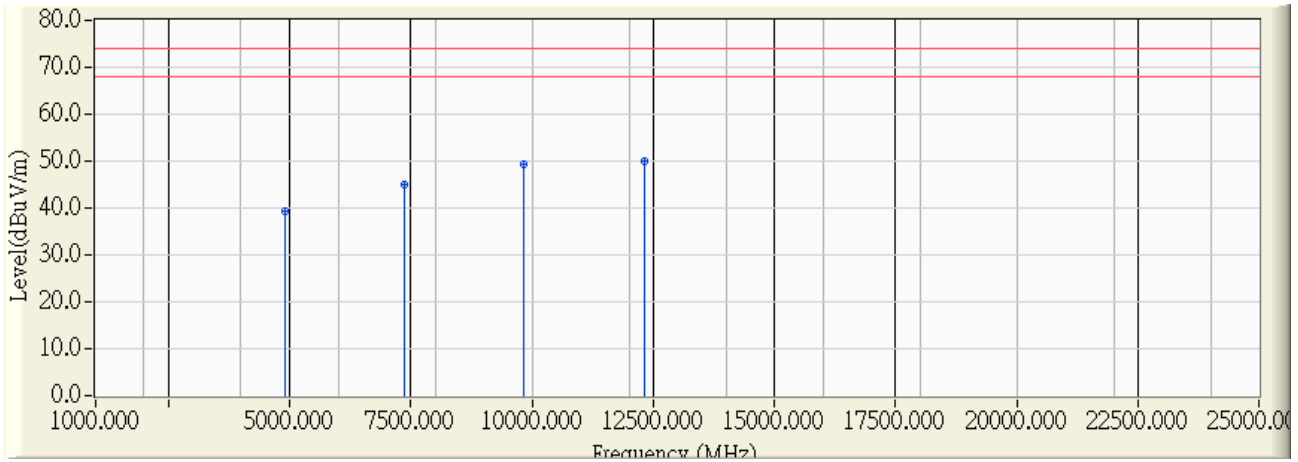


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4875.170	-0.669	45.230	44.561	-29.439	54.000	74.000	PEAK
2	7311.750	5.679	40.820	46.499	-27.501	54.000	74.000	PEAK
3	9757.000	10.021	39.540	49.561	-24.439	54.000	74.000	PEAK
4	* 12206.720	11.474	38.590	50.063	-23.937	54.000	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 18GHz were not included is because their levels are too low.

Site : CB3	Time : 2013/04/28 - 10:49
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2462MHz

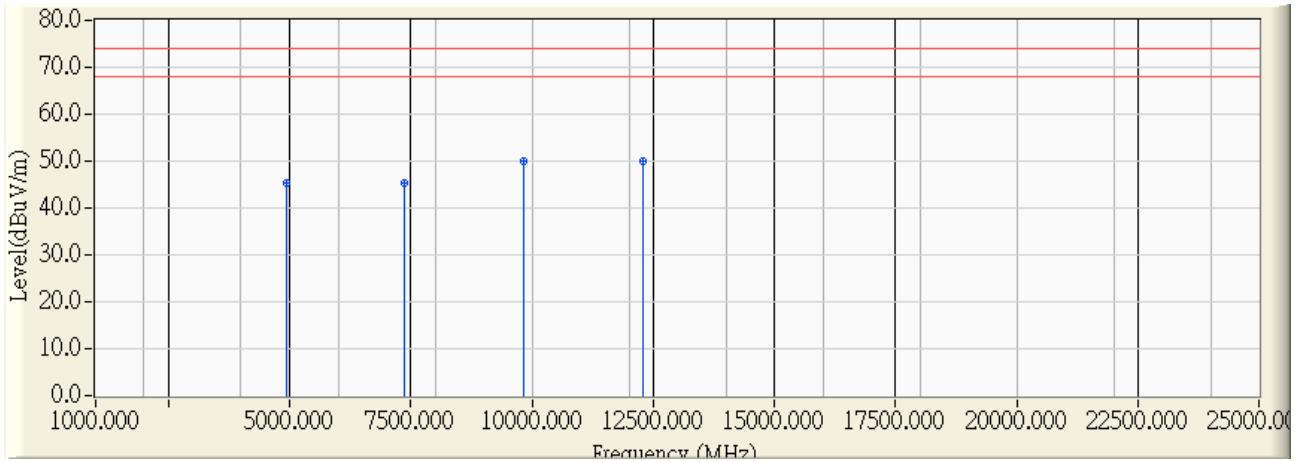


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4919.580	-0.552	39.760	39.208	-34.792	54.000	74.000	PEAK
2	7366.750	5.813	39.130	44.942	-29.058	54.000	74.000	PEAK
3	9824.330	10.509	38.850	49.359	-24.641	54.000	74.000	PEAK
4	* 12314.920	11.435	38.520	49.955	-24.045	54.000	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 18GHz were not included is because their levels are too low.

Site : CB3	Time : 2013/04/28 - 10:54
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2462MHz

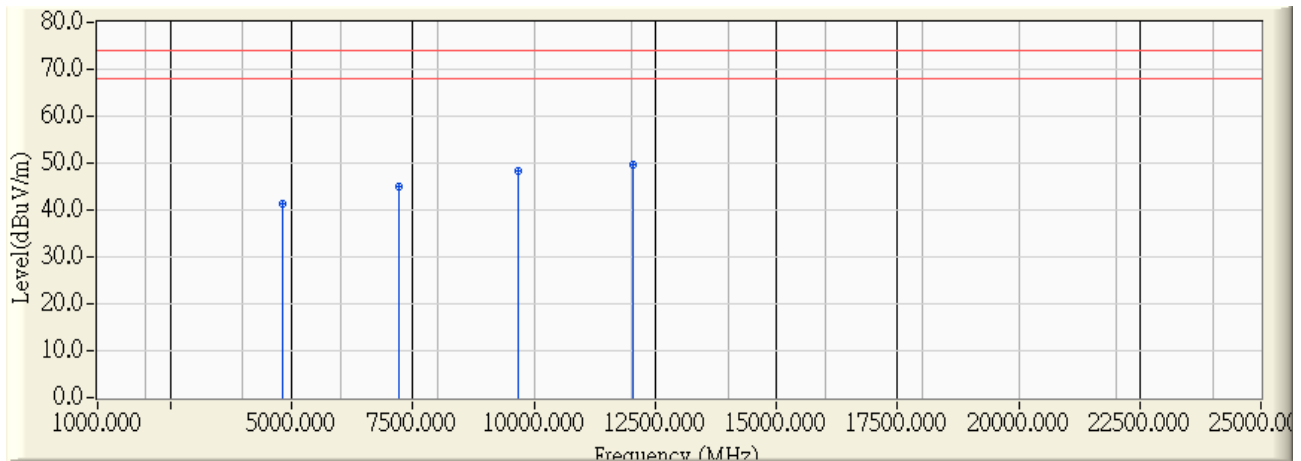


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4929.000	-0.528	45.800	45.272	-28.728	54.000	74.000	PEAK
2	7372.250	5.826	39.450	45.275	-28.725	54.000	74.000	PEAK
3	9823.500	10.502	39.530	50.033	-23.967	54.000	74.000	PEAK
4	* 12306.830	11.437	38.720	50.158	-23.842	54.000	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 18GHz were not included is because their levels are too low.

Site : CB3	Time : 2013/04/28 - 11:04
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2412MHz

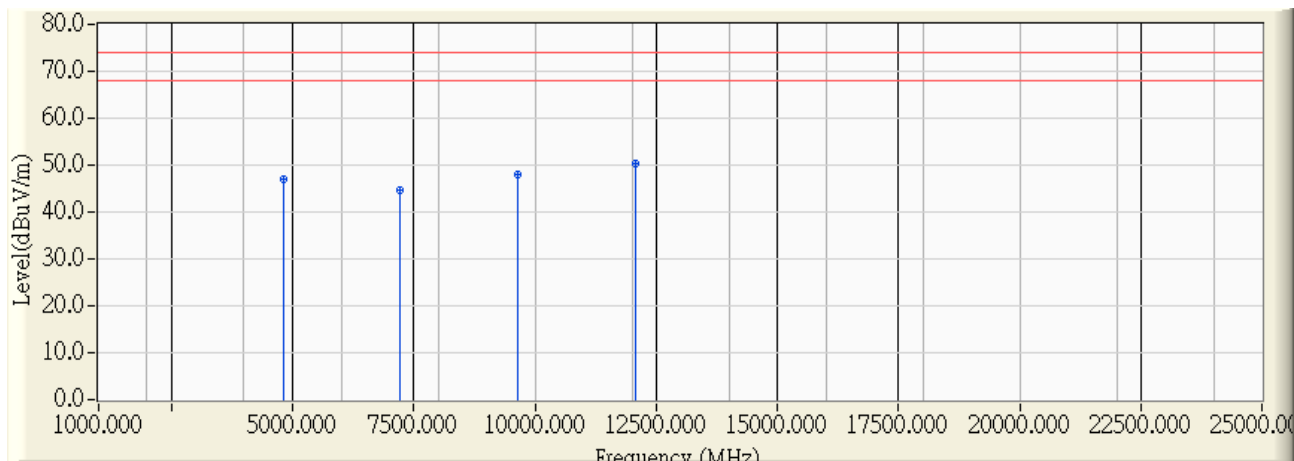


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4821.330	-0.811	42.190	41.380	-32.620	54.000	74.000	PEAK
2	7222.920	5.465	39.390	44.855	-29.145	54.000	74.000	PEAK
3	9664.830	9.353	39.020	48.373	-25.627	54.000	74.000	PEAK
4	* 12058.000	11.526	38.300	49.826	-24.174	54.000	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 18GHz were not included is because their levels are too low.

Site : CB3	Time : 2013/04/28 - 11:10
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2412MHz

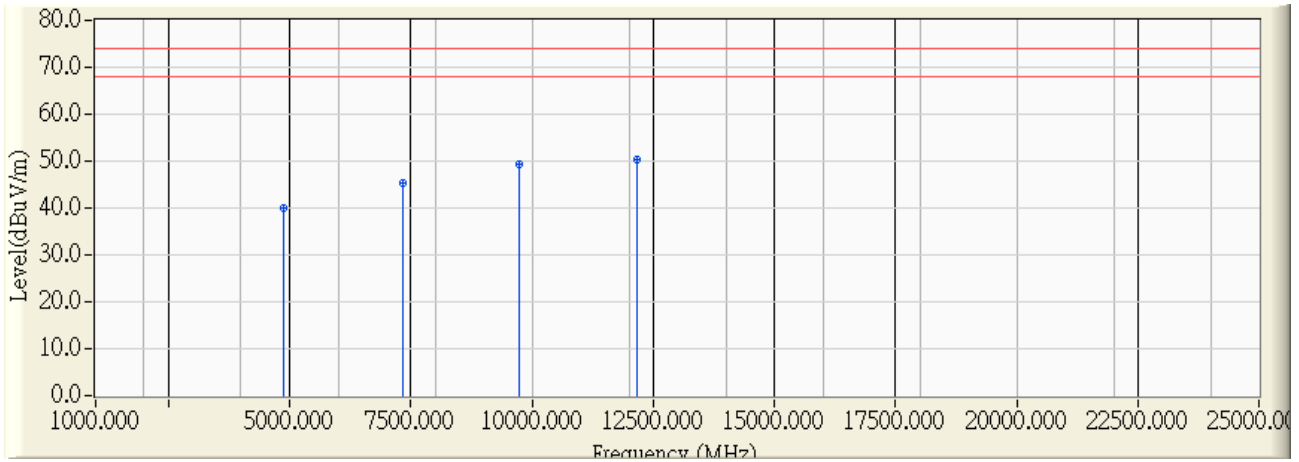


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4819.920	-0.814	47.890	47.076	-26.924	54.000	74.000	PEAK
2	7224.500	5.469	39.160	44.629	-29.371	54.000	74.000	PEAK
3	9646.830	9.222	38.870	48.092	-25.908	54.000	74.000	PEAK
4	* 12061.670	11.525	38.940	50.465	-23.535	54.000	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 18GHz were not included is because their levels are too low.

Site : CB3	Time : 2013/04/28 - 11:19
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2437MHz

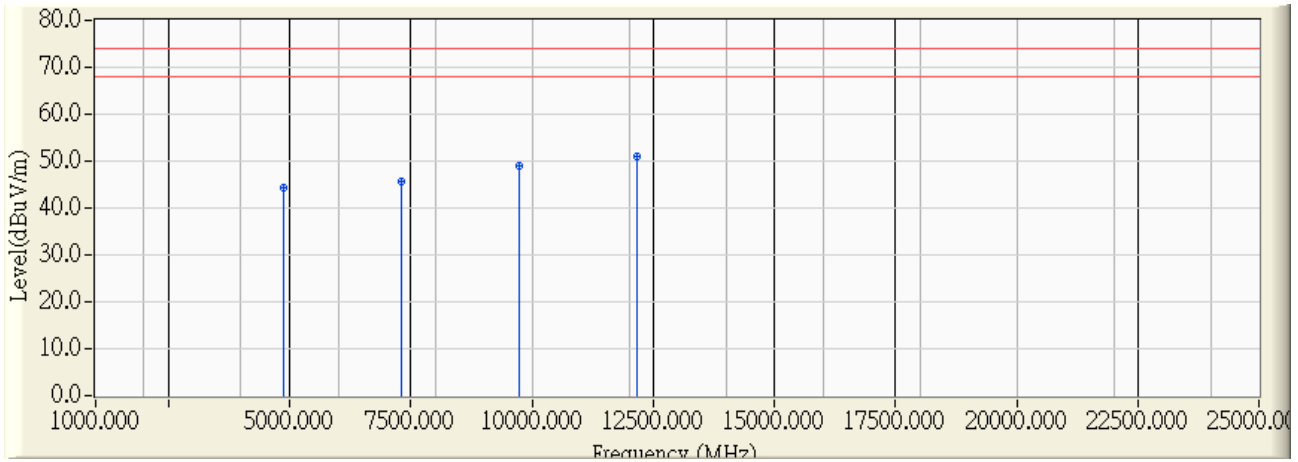


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4868.830	-0.685	40.600	39.914	-34.086	54.000	74.000	PEAK
2	7329.250	5.721	39.690	45.411	-28.589	54.000	74.000	PEAK
3	9728.080	9.810	39.520	49.331	-24.669	54.000	74.000	PEAK
4	* 12180.080	11.483	38.800	50.283	-23.717	54.000	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 18GHz were not included is because their levels are too low.

Site : CB3	Time : 2013/04/28 - 11:25
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2437MHz

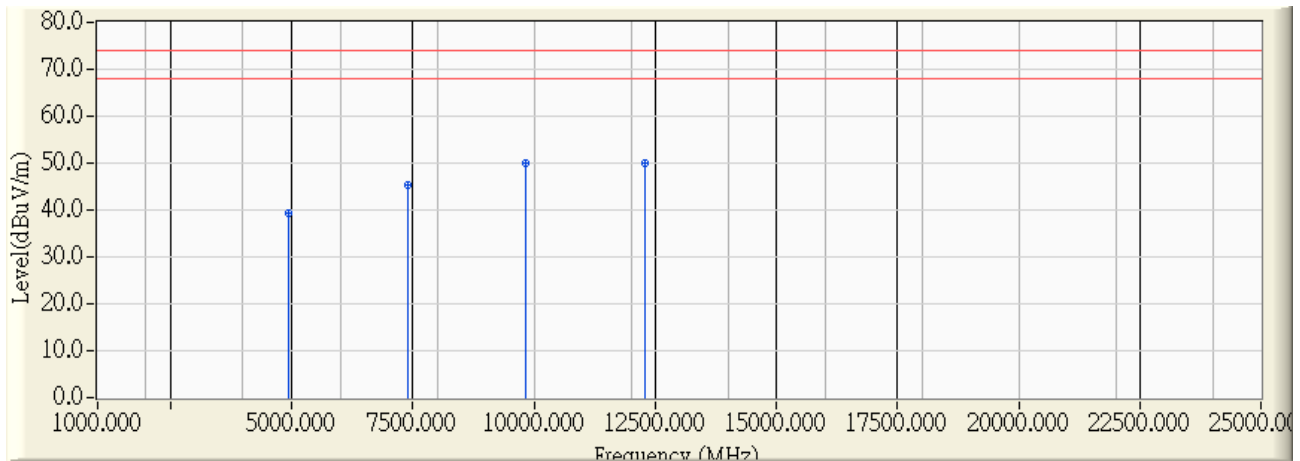


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4863.500	-0.699	44.970	44.271	-29.729	54.000	74.000	PEAK
2	7300.580	5.652	39.930	45.582	-28.418	54.000	74.000	PEAK
3	9737.080	9.876	39.140	49.016	-24.984	54.000	74.000	PEAK
4	* 12182.920	11.482	39.420	50.902	-23.098	54.000	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 18GHz were not included is because their levels are too low.

Site : CB3	Time : 2013/04/28 - 11:31
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2462MHz

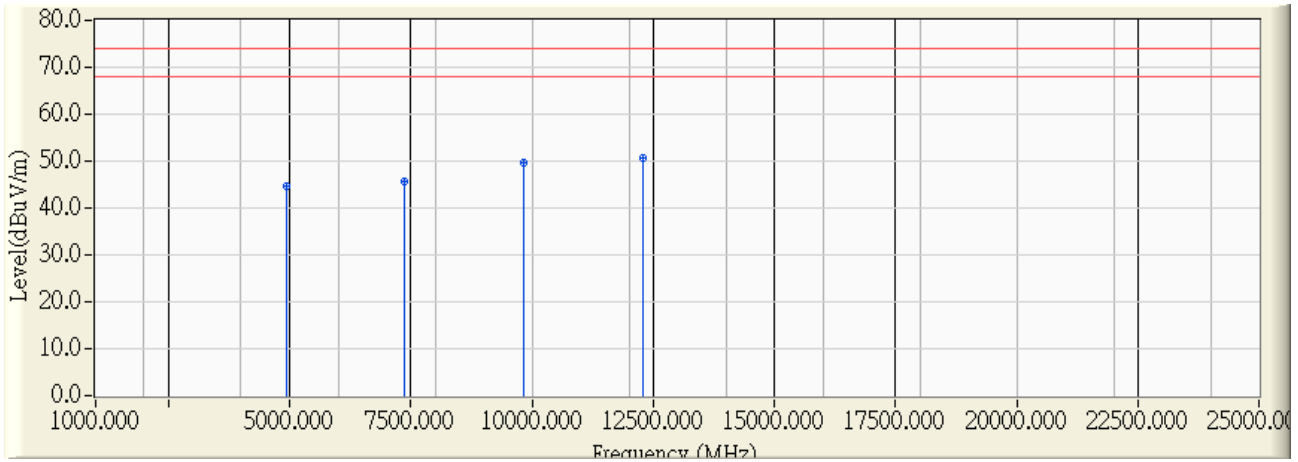


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4933.750	-0.515	39.730	39.215	-34.785	54.000	74.000	PEAK
2	7386.920	5.861	39.320	45.181	-28.819	54.000	74.000	PEAK
3	9835.170	10.587	39.330	49.917	-24.083	54.000	74.000	PEAK
4	* 12295.750	11.443	38.590	50.032	-23.968	54.000	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 18GHz were not included is because their levels are too low.

Site : CB3	Time : 2013/04/28 - 11:37
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
Probe : CB3_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2462MHz



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Peak Limit (dBuV/m)	Detector Type
1	4925.080	-0.538	45.370	44.832	-29.168	54.000	74.000	PEAK
2	7366.580	5.812	39.960	45.771	-28.229	54.000	74.000	PEAK
3	9838.580	10.611	39.050	49.662	-24.338	54.000	74.000	PEAK
4	* 12301.080	11.440	39.070	50.510	-23.490	54.000	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 18GHz were not included is because their levels are too low.

4. RF antenna conducted test

4.1. Test Equipment

The following test equipments are used during the test:

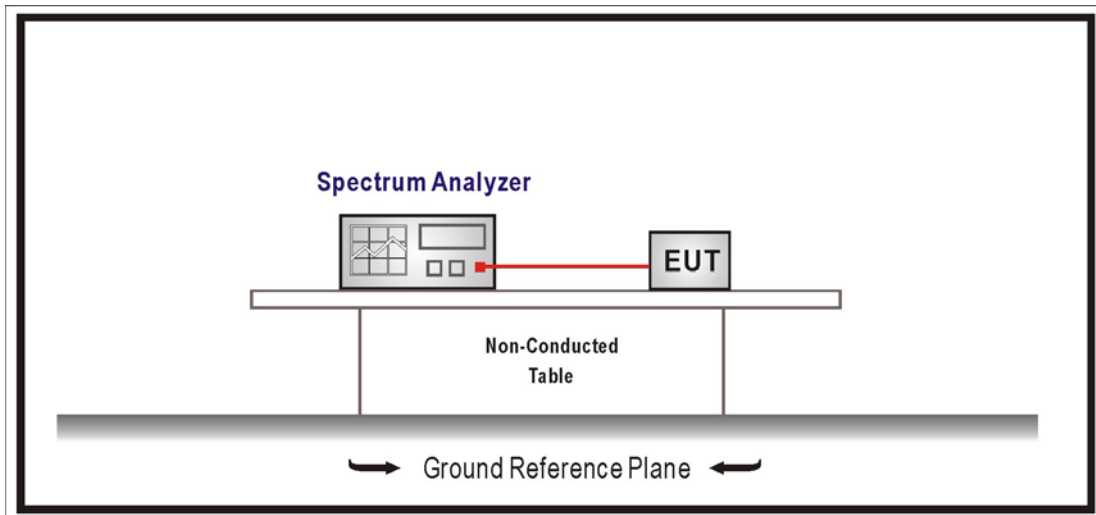
RF antenna conducted test / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
EXA Signal Analyzer	Agilent	N9010A-EXA	US47140172	2013/07/31

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

4.2. Test Setup

RF Antenna Conducted Measurement:



4.3. 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 an RF conducted or 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)).

4.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2009 and tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

4.6. Uncertainty

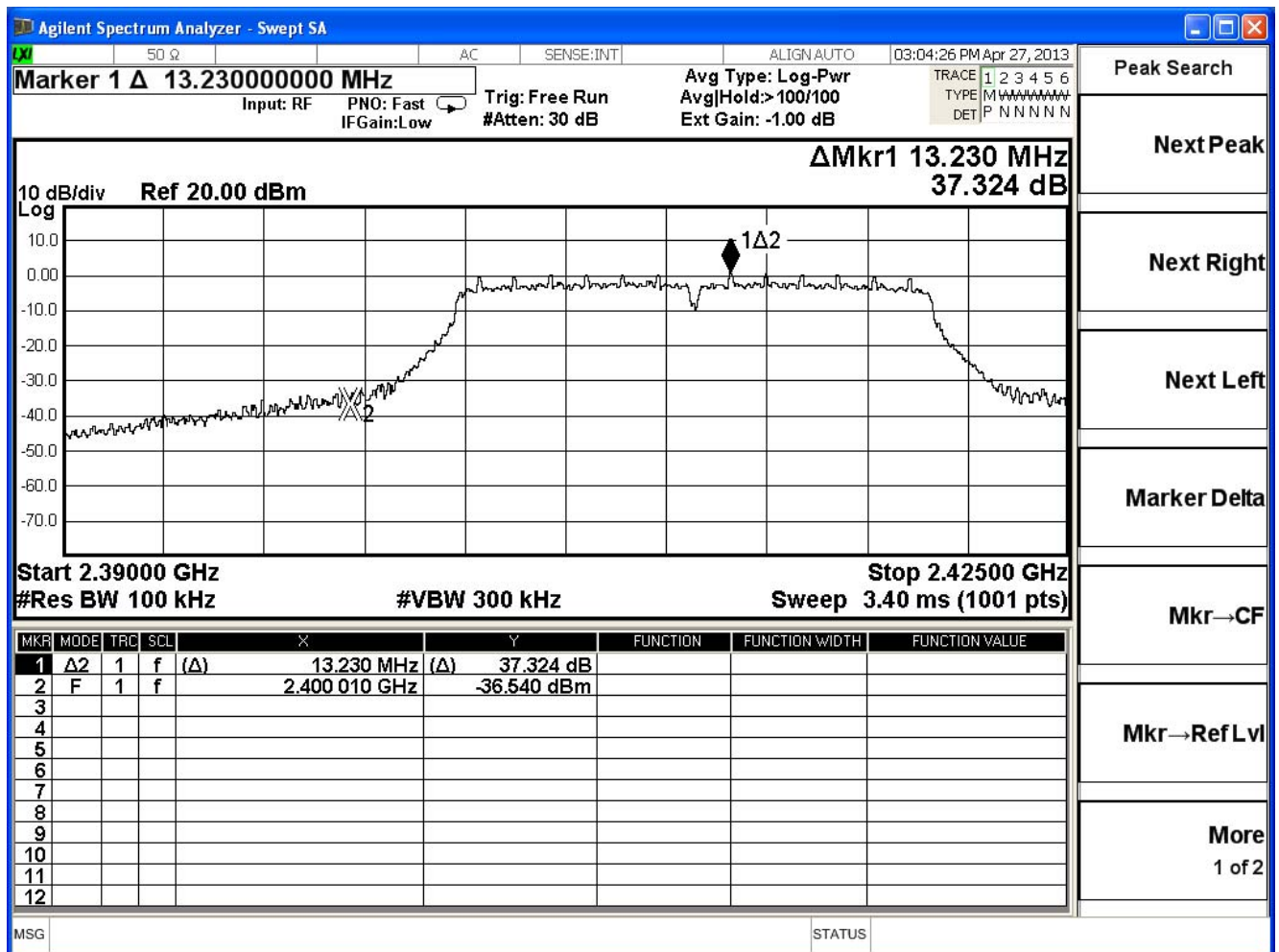
Conducted is defined as $\pm 1.27\text{dB}$

4.7. Test Result

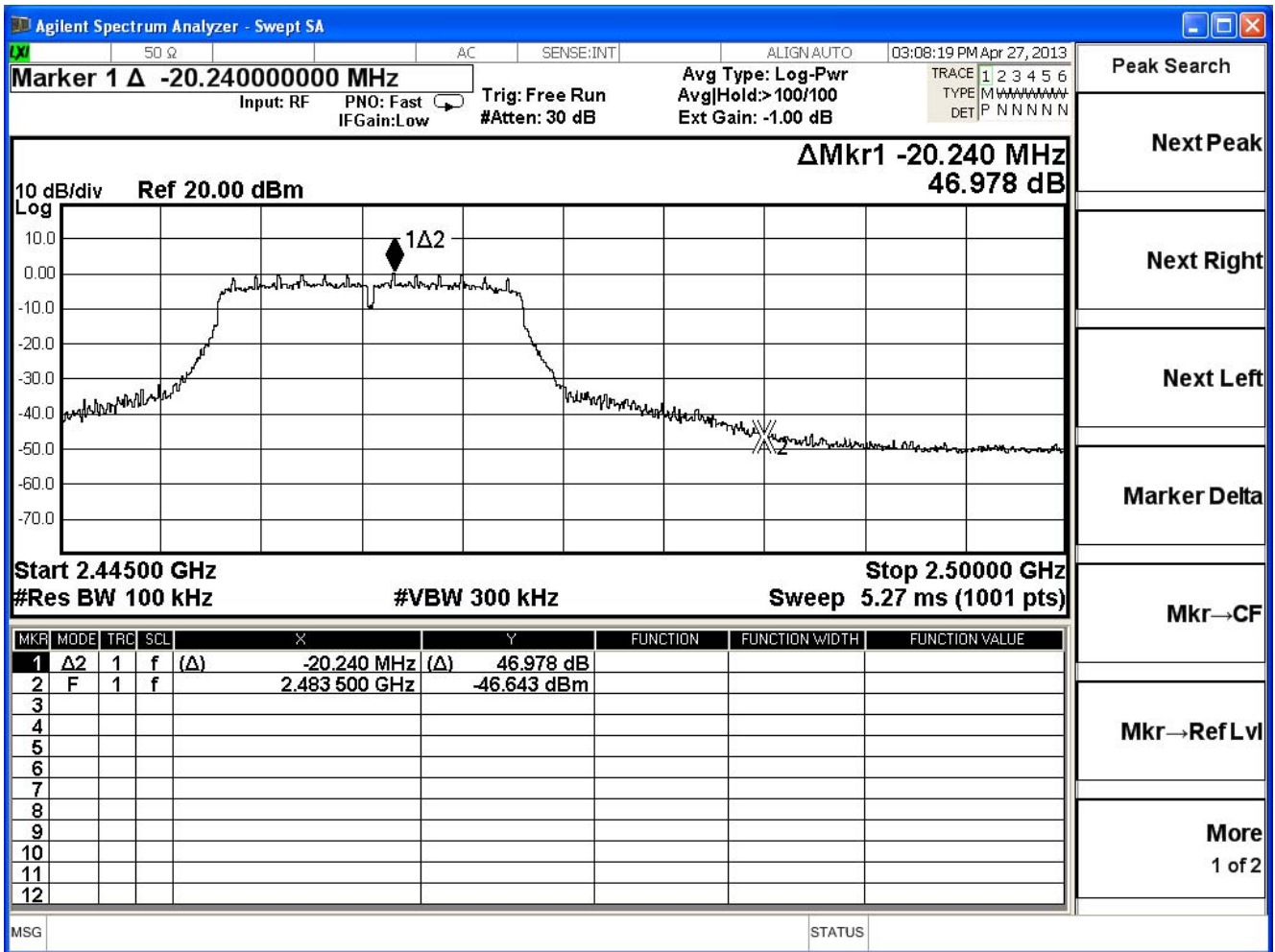
Product	Wireless Handy Scanner		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit		
Date of Test	2013/04/27	Test Site	SR7

IEEE 802.11g, Antenna Gain: 3.8dBi Duty Cycle: 1				
Channel No.	Frequency (MHz)	Measure Level (dBc)	Limit (dBc)	Result
1	2412	37.324	≥20	Pass
11	2462	46.978	≥20	Pass

Channel 01 (2412MHz)



Channel 11 (2462MHz)

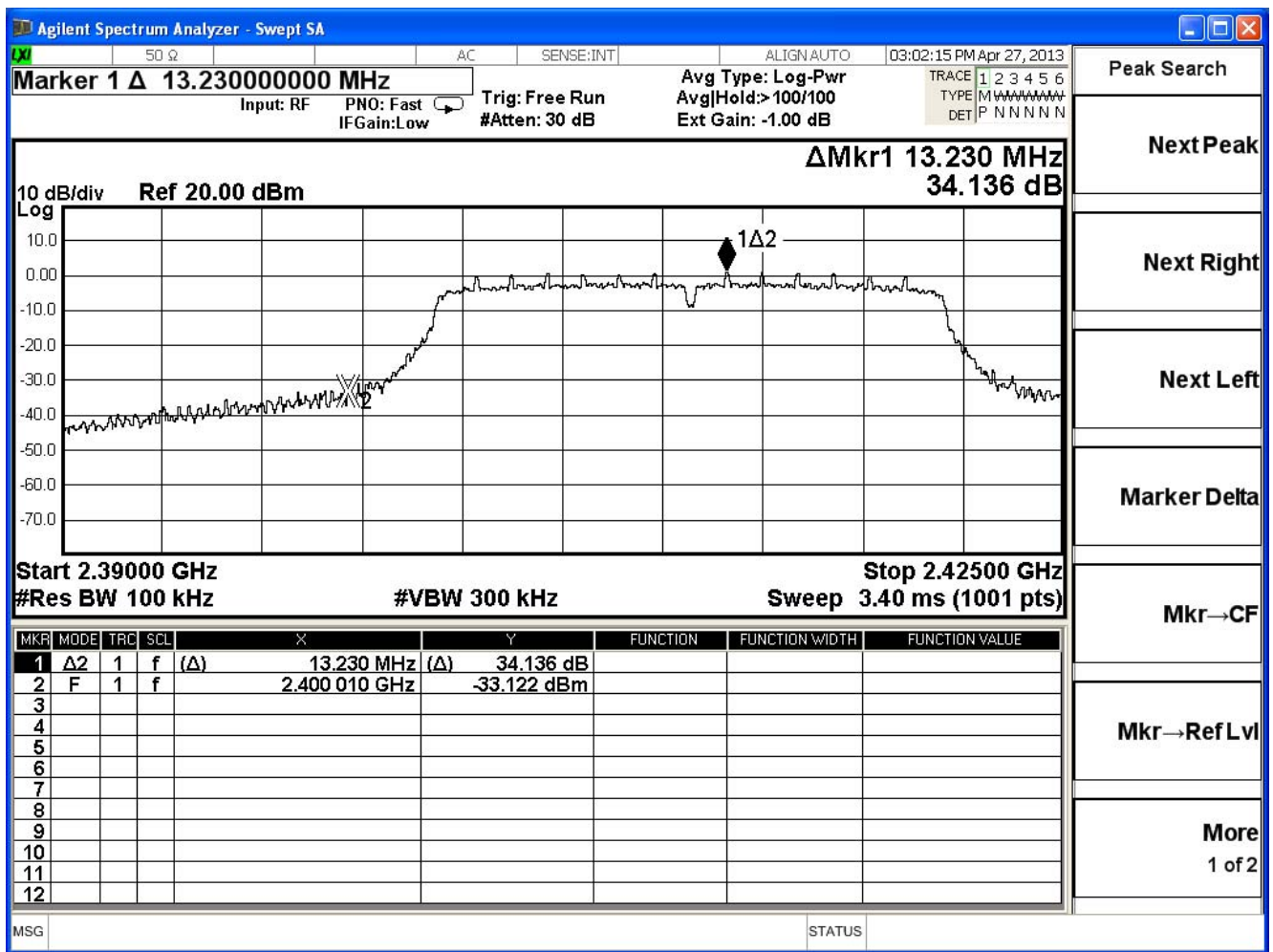


- Peak Search
- Next Peak
- Next Right
- Next Left
- Marker Delta
- Mkr→CF
- Mkr→Ref Lvl
- More
1 of 2

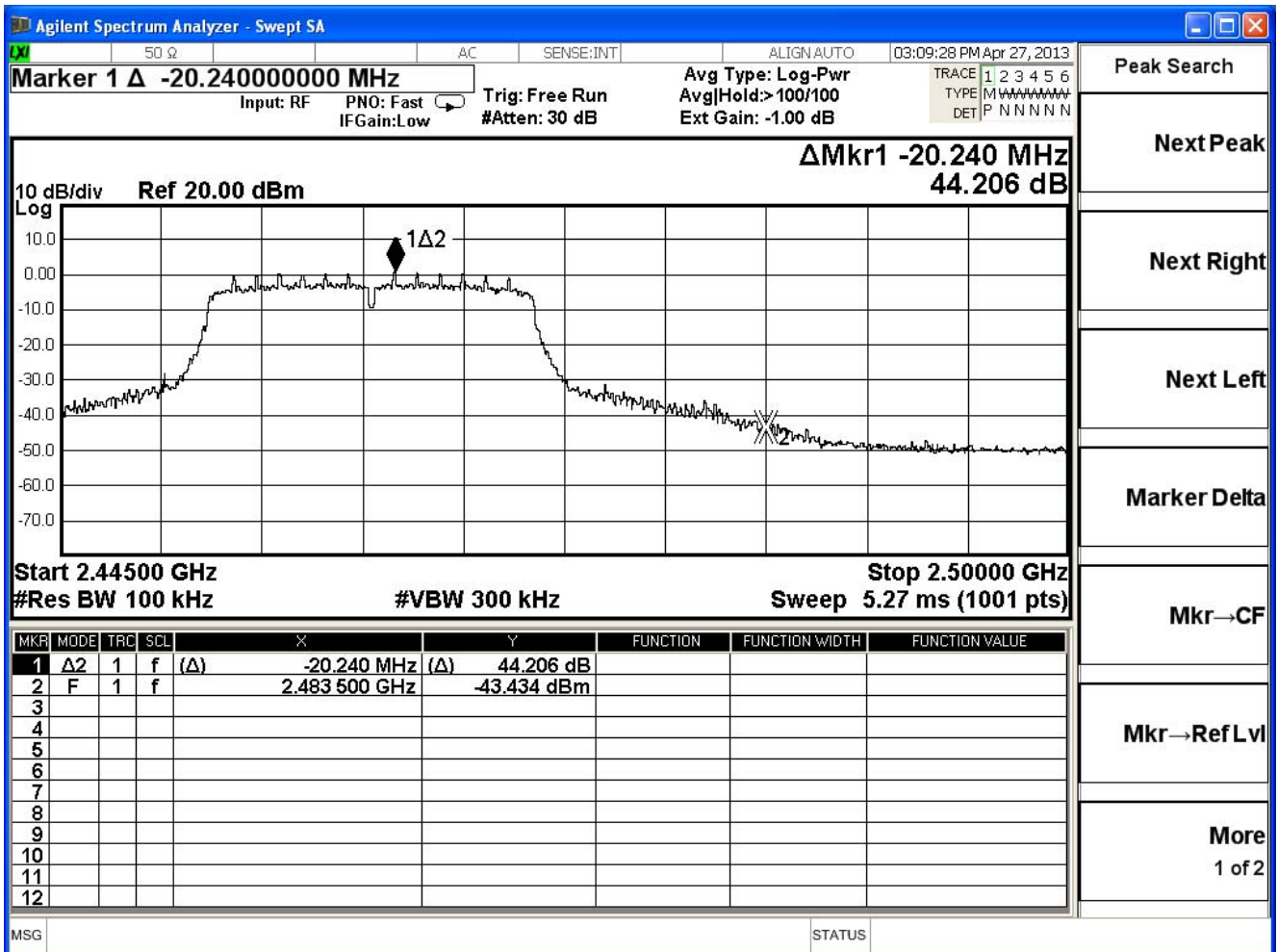
Product	Wireless Handy Scanner		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit		
Date of Test	2013/04/27	Test Site	SR7

IEEE 802.11n (20MHz), Antenna Gain: 2dBi Duty Cycle: 1				
Channel No.	Frequency (MHz)	Measure Level (dBc)	Limit (dBc)	Result
1	2412	34.136	≥20	Pass
11	2462	44.206	≥20	Pass

Channel 1 (2412MHz)



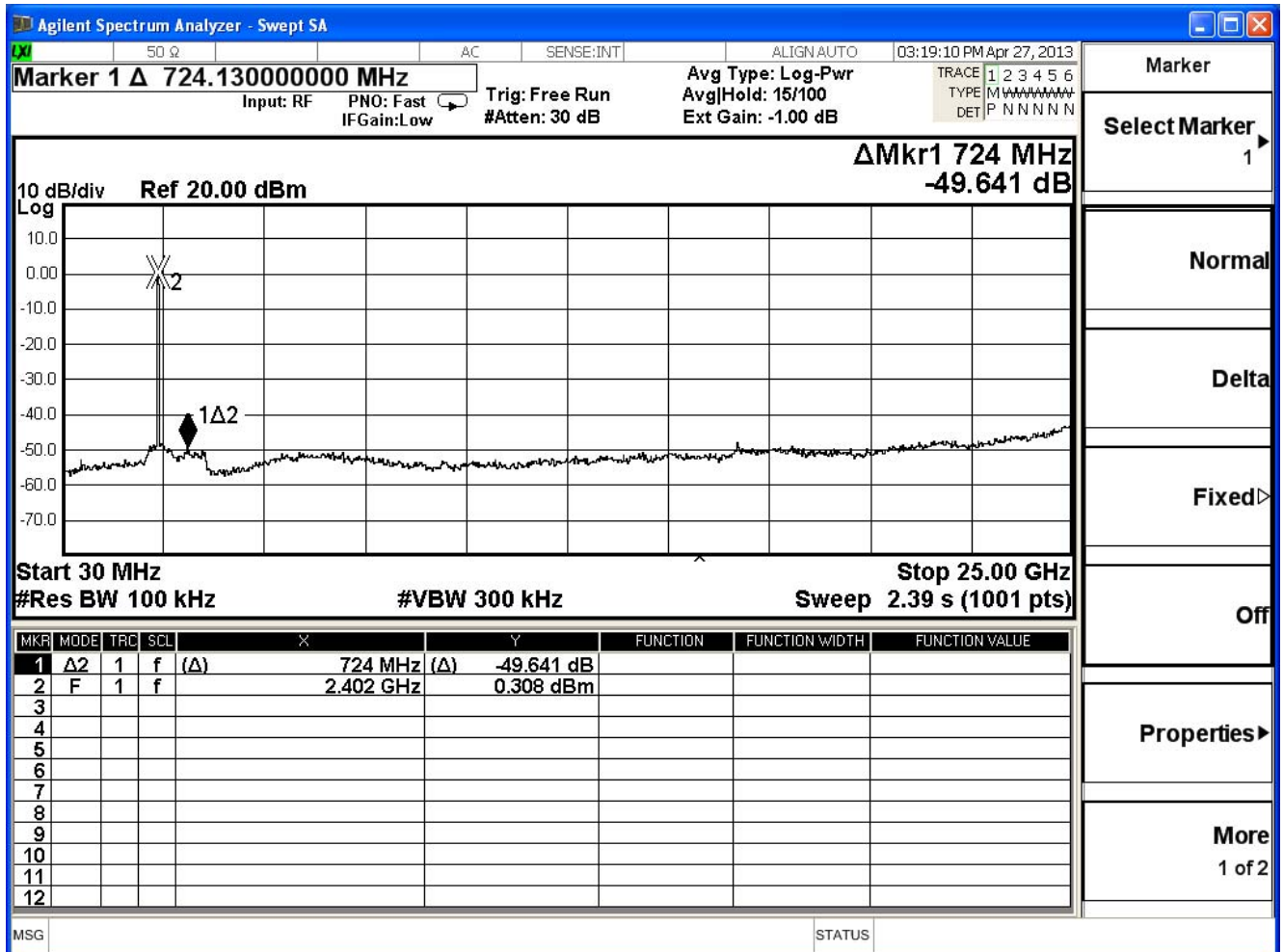
Channel 11 (2462MHz)



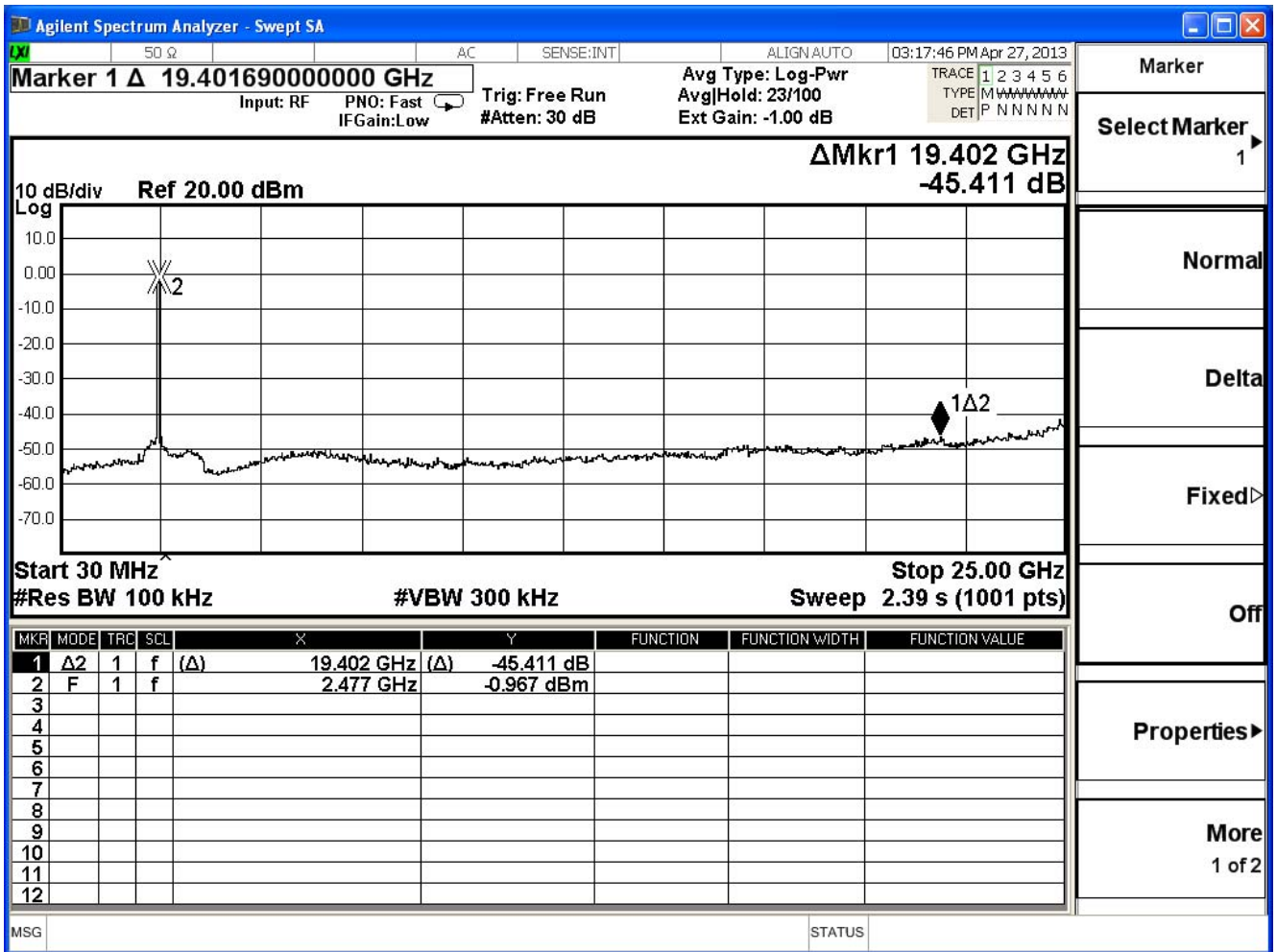
- Peak Search
- Next Peak
- Next Right
- Next Left
- Marker Delta
- Mkr→CF
- Mkr→Ref Lvl
- More
1 of 2

Product	Dual Band 3x3 802.11ac PCI-E Adapter		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit		
Date of Test	2013/04/27	Test Site	SR7

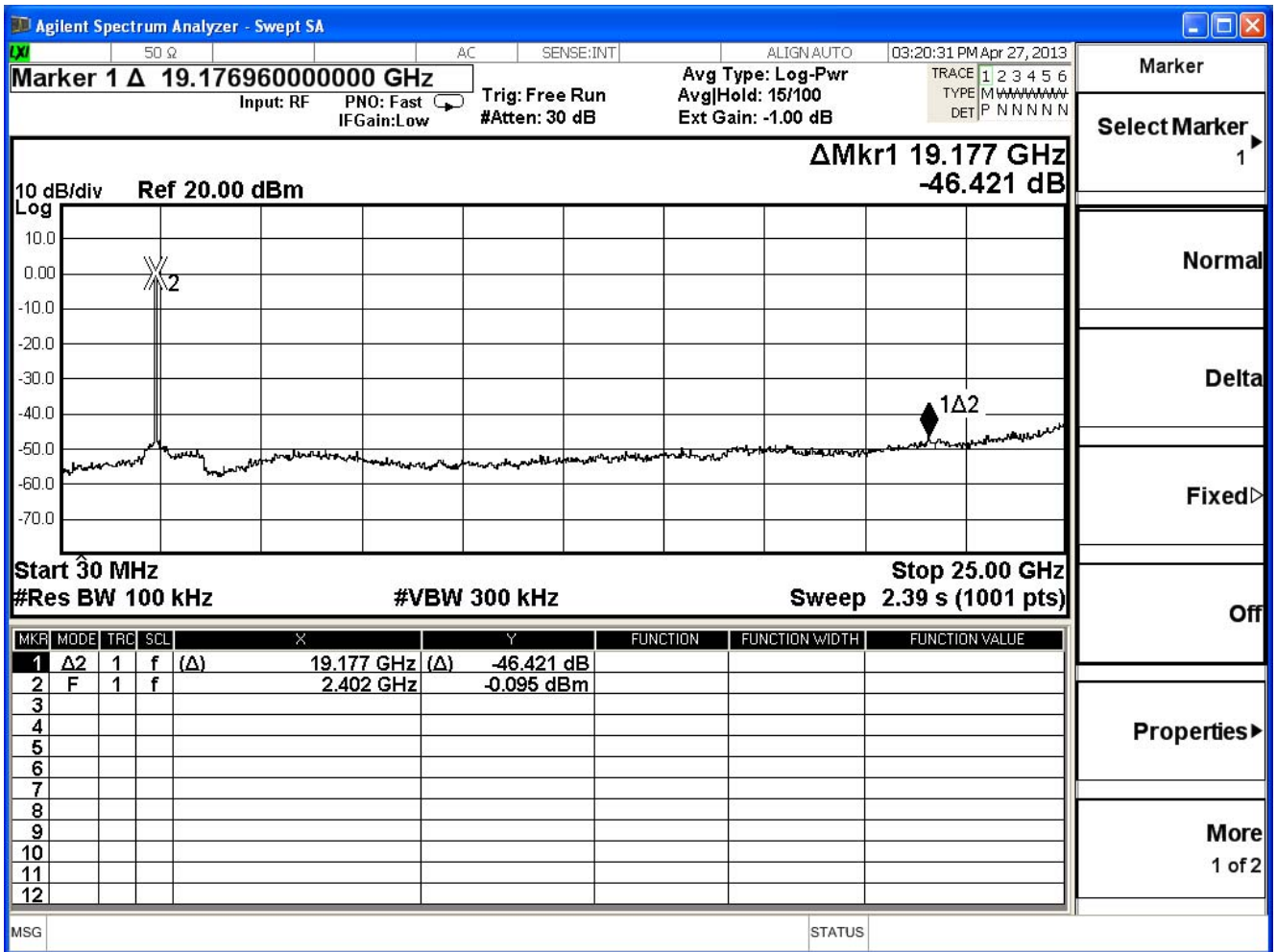
2412MHz (30MHz-25GHz)-802.11g



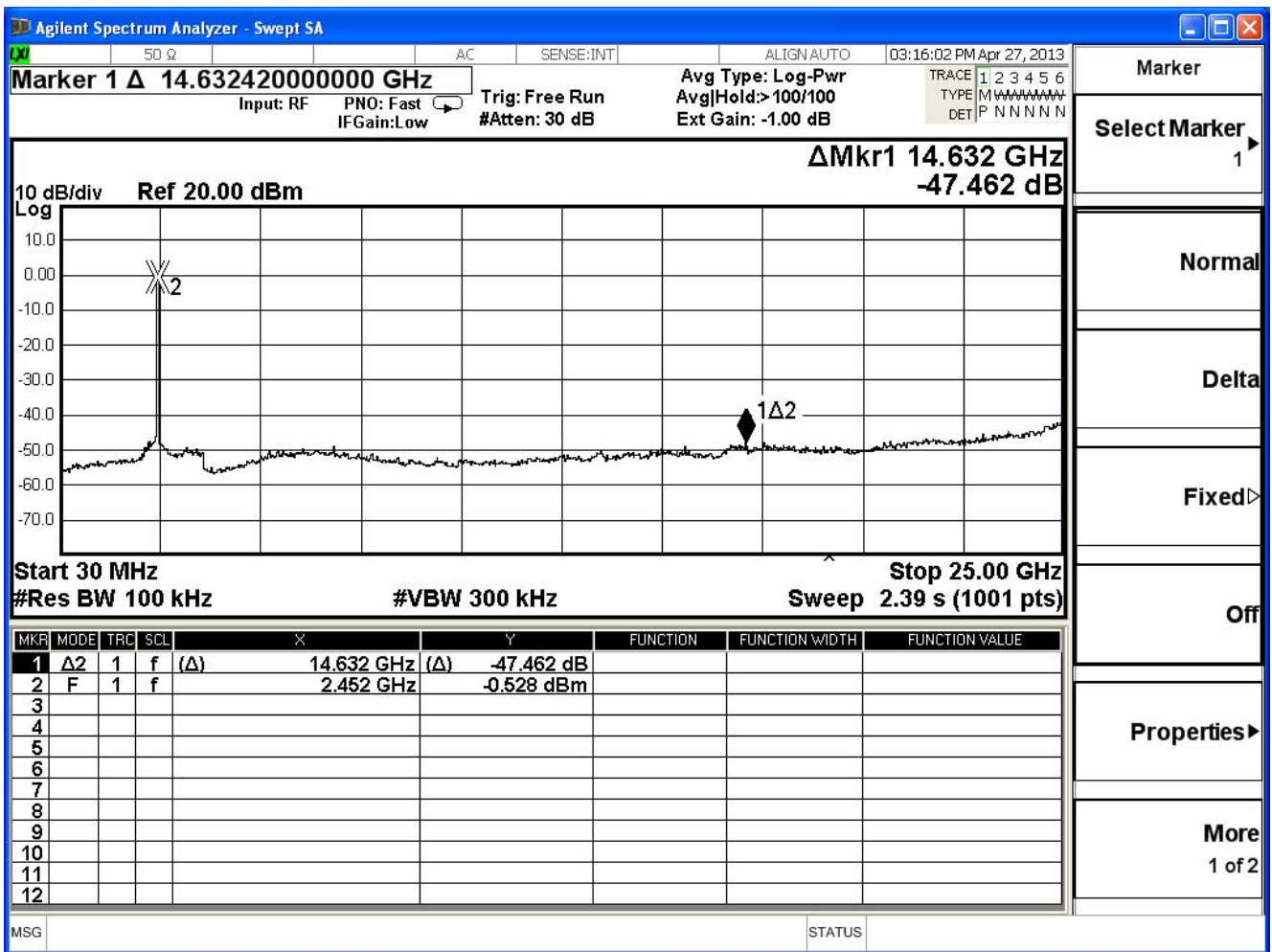
2462MHz (30MHz-25GHz) -802.11g



2412MHz (30MHz-25GHz)-802.11n(20MHz)



2462MHz (30MHz-25GHz) -802.11n(20MHz)



5. Radiated Emission Band Edge

5.1. Test Equipment

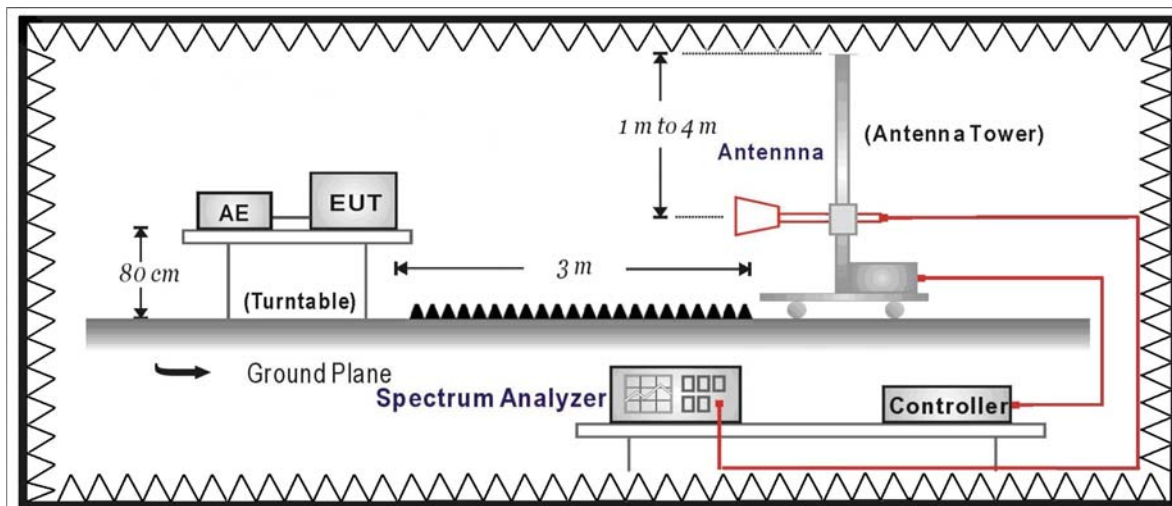
The following test equipments are used during the test:

Radiated Emission Band Edge / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Double Ridged Guide Horn Antenna	Schwarzback	BBHA 9120	D743	2014/02/17
Spectrum Analyzer	Agilent	E4440A	MY46187335	2014/01/27
k Type Cable	Huber Suhner	Sucoflex 102	25623/2	2014/02/21

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

5.2. Test Setup



5.3. 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.

5.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2009 and tested according to DTS test procedure of Jan. 2012 KDB558074 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: 2009 on radiated measurement.

5.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

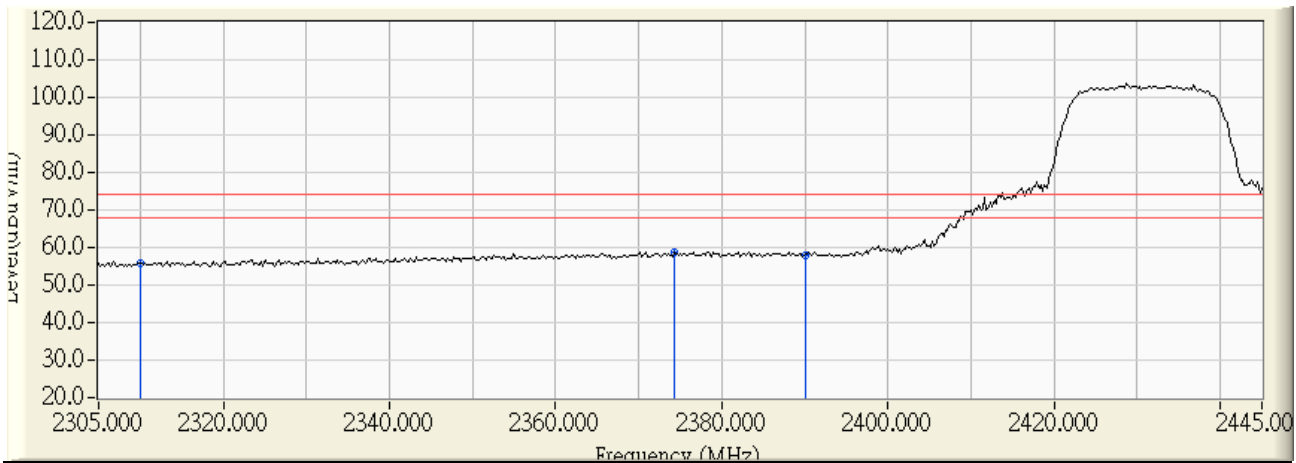
5.6. Uncertainty

The measurement uncertainty
 ± 3.9 dB above 1GHz

5.7. Test Result

Radiated is defined as

Site : CB1	Time : 2013/04/27 - 10:10
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2412MHz

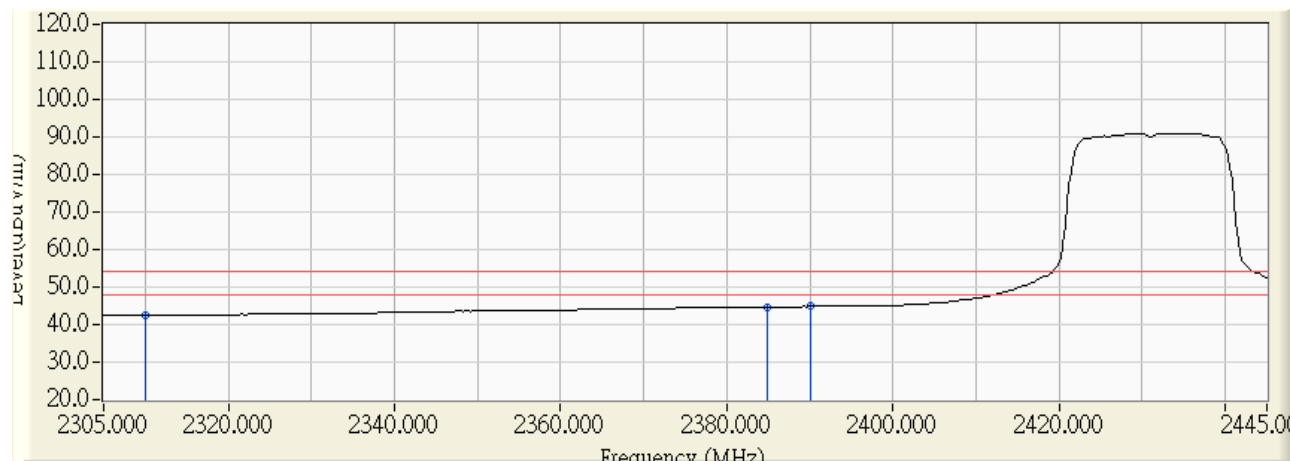


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.779	26.025	55.804	-18.196	74.000	PEAK
2	* 2374.300	30.422	28.322	58.743	-15.257	74.000	PEAK
3	2390.000	30.578	27.429	58.007	-15.993	74.000	PEAK

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.

Site : CB1	Time : 2013/04/27 - 10:14
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2412MHz

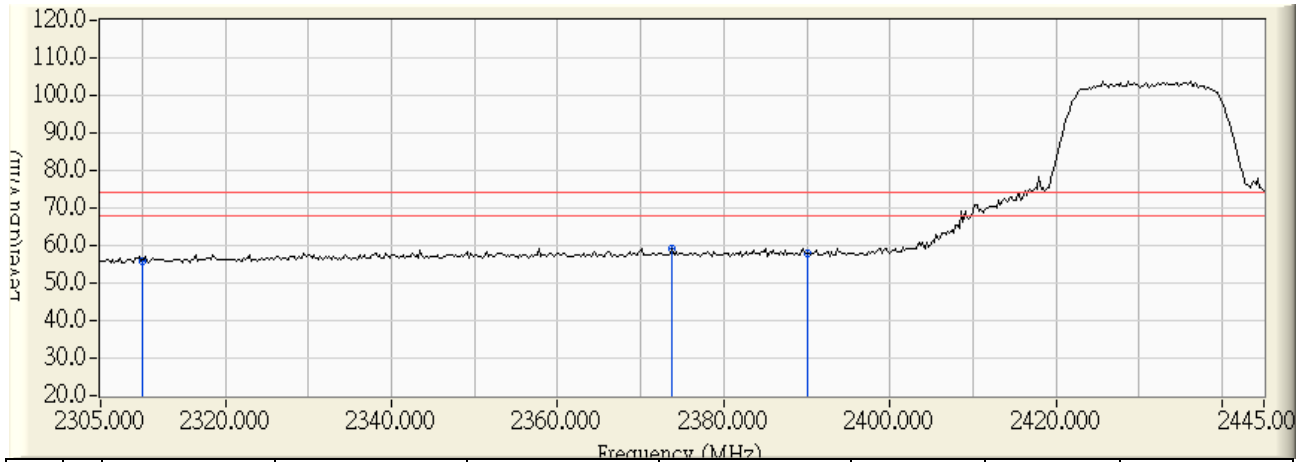


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.779	12.774	42.553	-11.447	54.000	AVERAGE
2	2384.800	30.526	14.181	44.707	-9.293	54.000	AVERAGE
3	* 2390.000	30.578	14.242	44.820	-9.180	54.000	AVERAGE

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.

Site : CB1	Time : 2013/04/27 - 10:18
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2412MHz

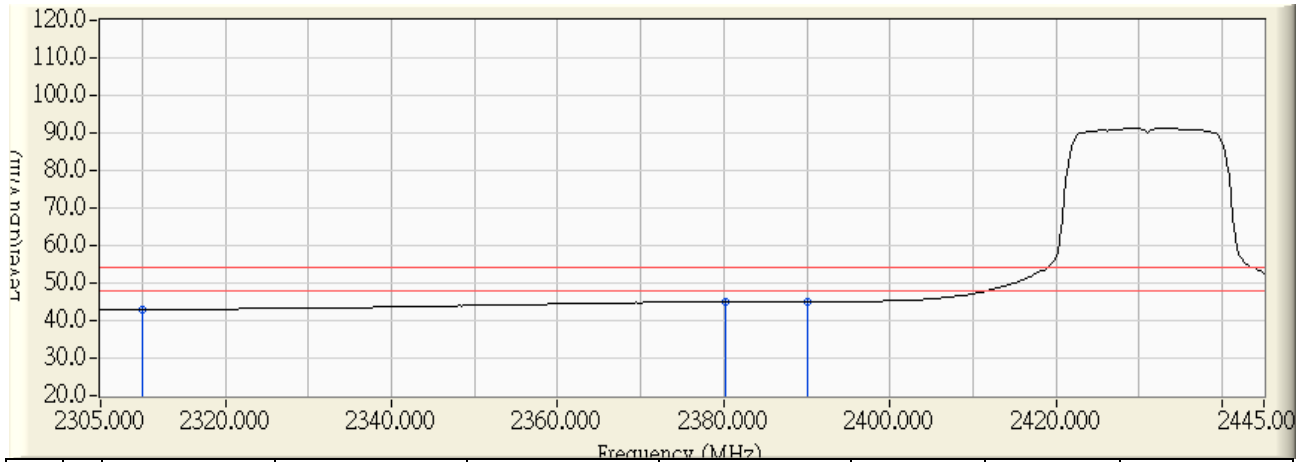


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.779	26.121	55.900	-18.100	74.000	PEAK
2	* 2373.833	30.416	28.831	59.247	-14.753	74.000	PEAK
3	2390.000	30.578	27.431	58.009	-15.991	74.000	PEAK

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.

Site : CB1	Time : 2013/04/27 - 10:20
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2412MHz

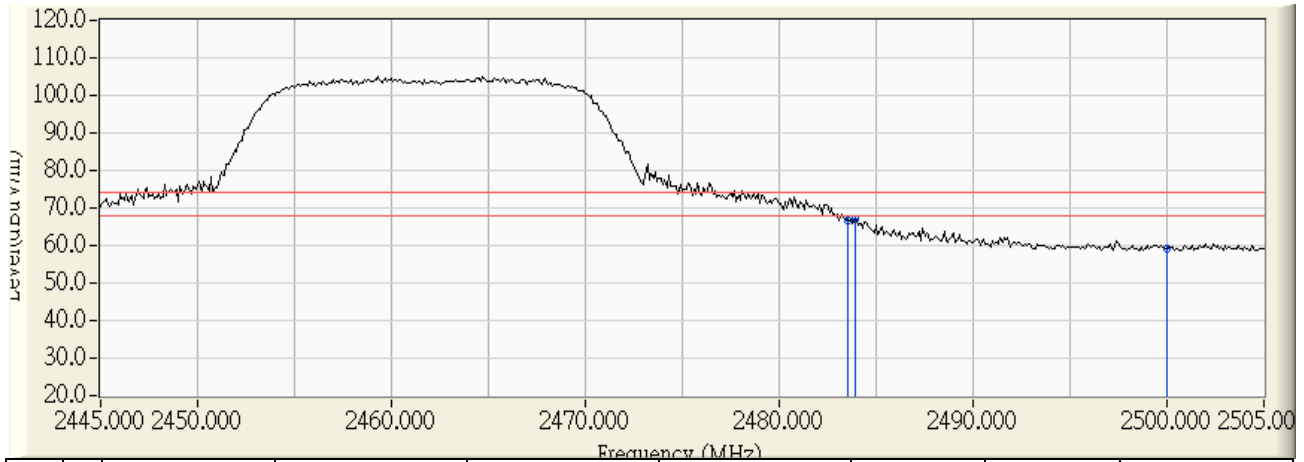


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.779	13.102	42.881	-11.119	54.000	AVERAGE
2	2380.133	30.479	14.526	45.005	-8.995	54.000	AVERAGE
3	* 2390.000	30.578	14.429	45.007	-8.993	54.000	AVERAGE

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.

Site : CB1	Time : 2013/04/27 - 10:28
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2462MHz

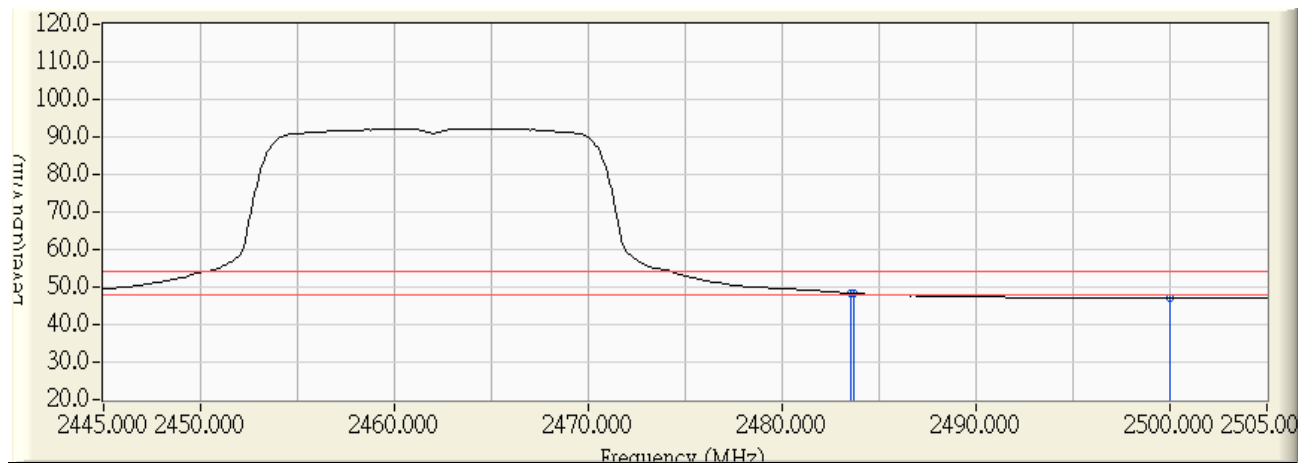


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2483.500	31.512	35.215	66.727	-7.273	74.000	PEAK
2	* 2483.900	31.516	35.530	67.046	-6.954	74.000	PEAK
3	2500.000	31.638	27.328	58.967	-15.033	74.000	PEAK

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.

Site : CB1	Time : 2013/04/27 - 10:29
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2462MHz

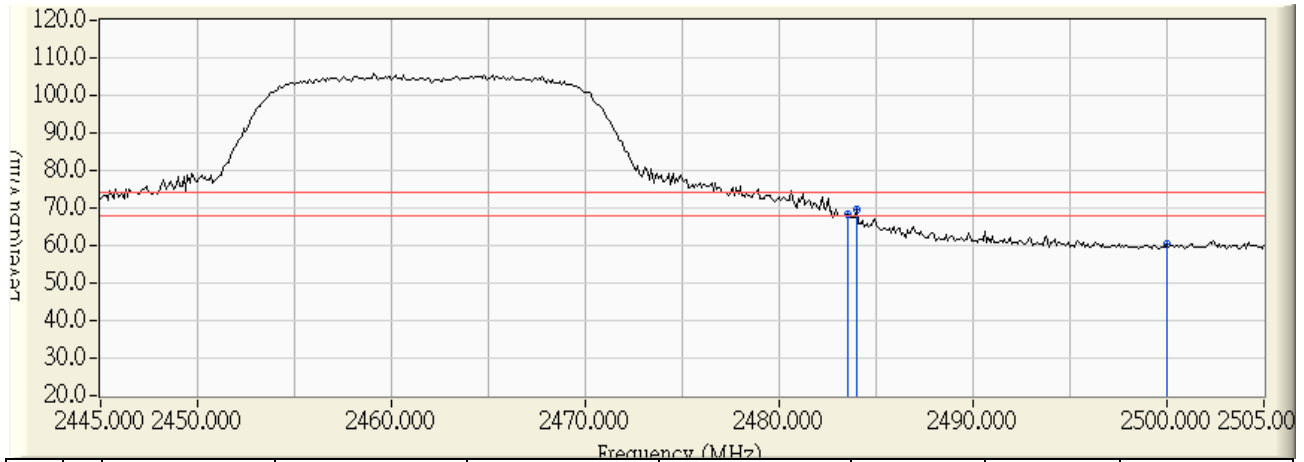


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2483.500	31.512	16.861	48.373	-5.627	54.000	AVERAGE
2		2483.700	31.514	16.775	48.289	-5.711	54.000	AVERAGE
3		2500.000	31.638	15.365	47.004	-6.996	54.000	AVERAGE

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.

Site : CB1	Time : 2013/04/27 - 10:25
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2462MHz

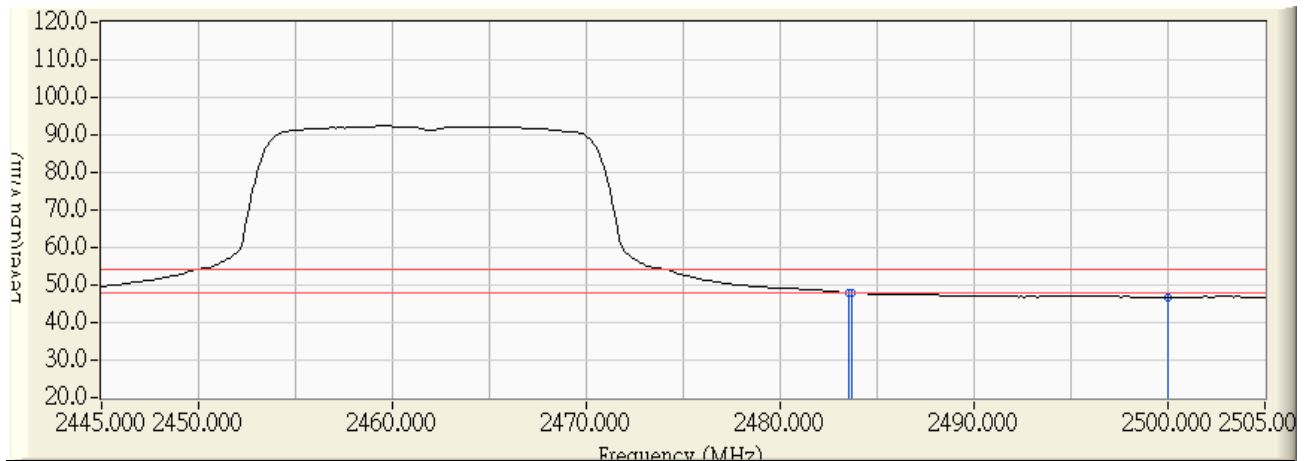


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2483.500	31.512	36.822	68.334	-5.666	74.000	PEAK
2	* 2484.000	31.517	38.013	69.530	-4.470	74.000	PEAK
3	2500.000	31.638	28.638	60.277	-13.723	74.000	PEAK

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.

Site : CB1	Time : 2013/04/27 - 10:26
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11g_2462MHz

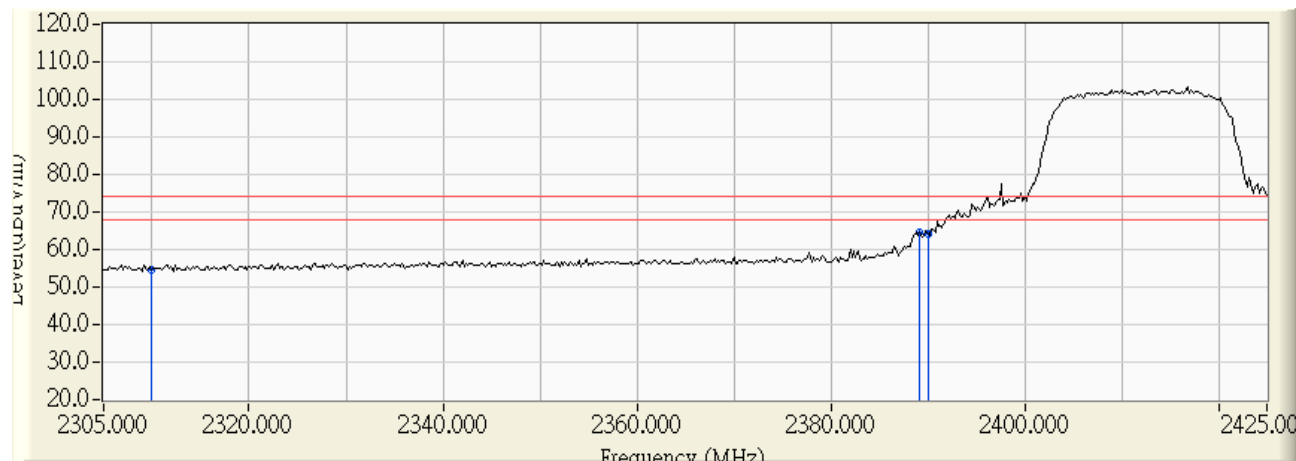


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2483.500	31.512	16.484	47.996	-6.004	54.000	AVERAGE
2		2483.700	31.514	16.431	47.945	-6.055	54.000	AVERAGE
3		2500.000	31.638	15.113	46.752	-7.248	54.000	AVERAGE

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.

Site : CB1	Time : 2013/04/27 - 10:42
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2412MHz

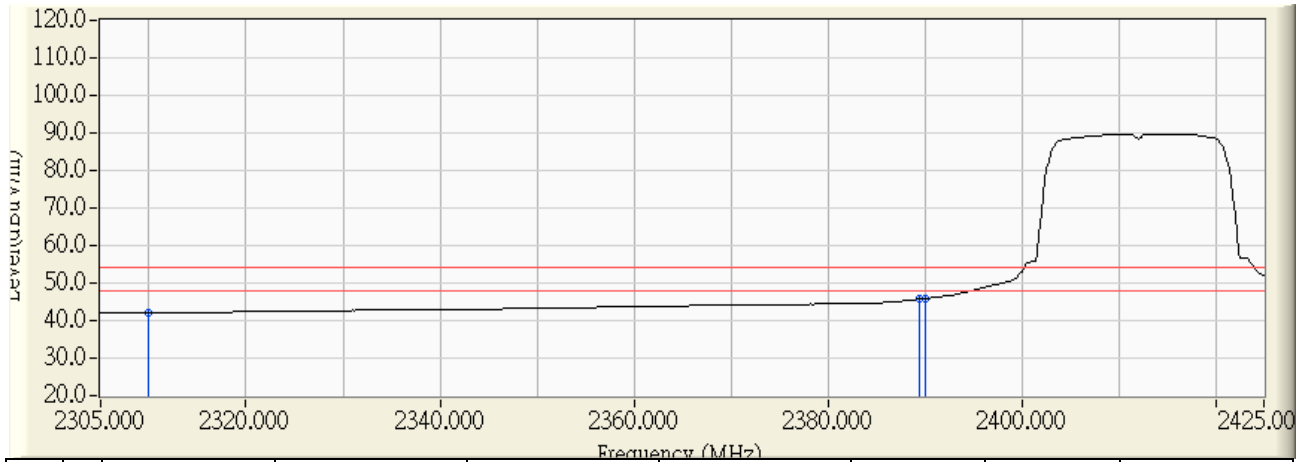


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.779	24.812	54.591	-19.409	74.000	PEAK
2	* 2389.200	30.570	34.164	64.734	-9.266	74.000	PEAK
3	2390.000	30.578	33.687	64.265	-9.735	74.000	PEAK

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.

Site : CB1	Time : 2013/04/27 - 10:44
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2412MHz

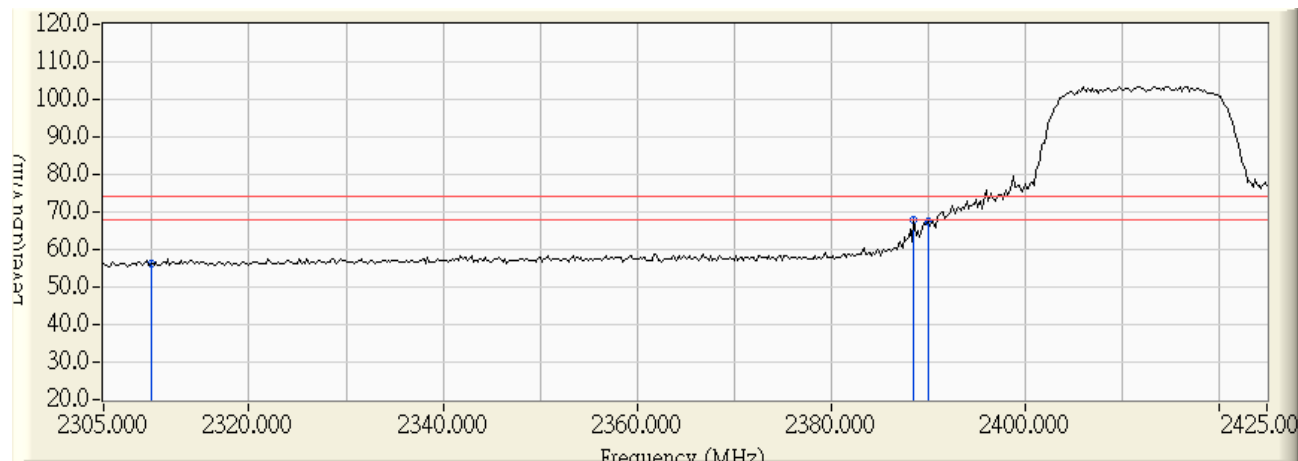


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.779	12.386	42.165	-11.835	54.000	AVERAGE
2	2389.400	30.571	15.113	45.685	-8.315	54.000	AVERAGE
3	* 2390.000	30.578	15.288	45.866	-8.134	54.000	AVERAGE

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.

Site : CB1	Time : 2013/04/27 - 10:39
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2412MHz

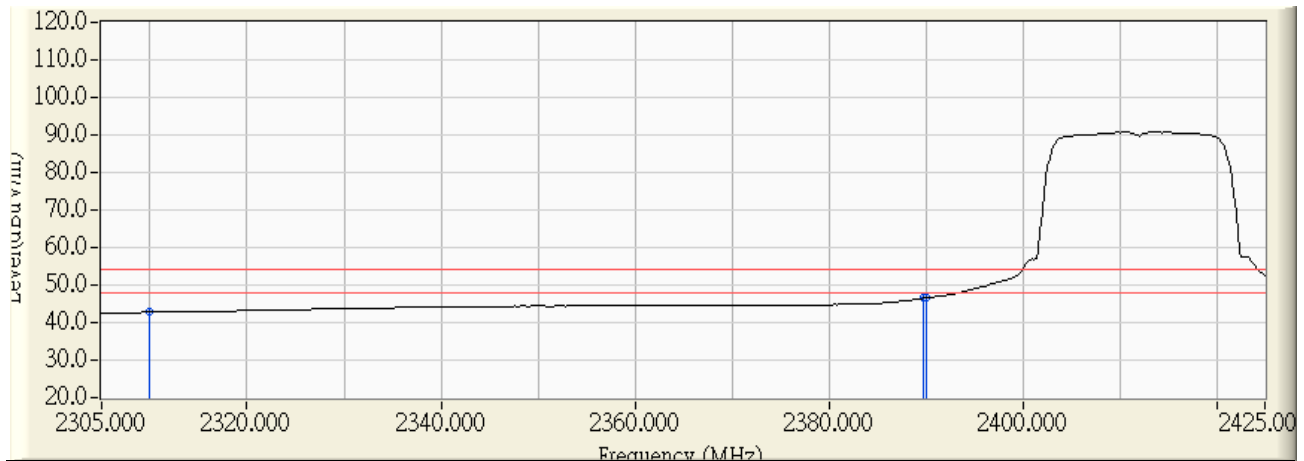


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.779	26.363	56.142	-17.858	74.000	PEAK
2	* 2388.600	30.564	37.533	68.097	-5.903	74.000	PEAK
3	2390.000	30.578	36.991	67.569	-6.431	74.000	PEAK

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.

Site : CB1	Time : 2013/04/27 - 10:41
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2412MHz

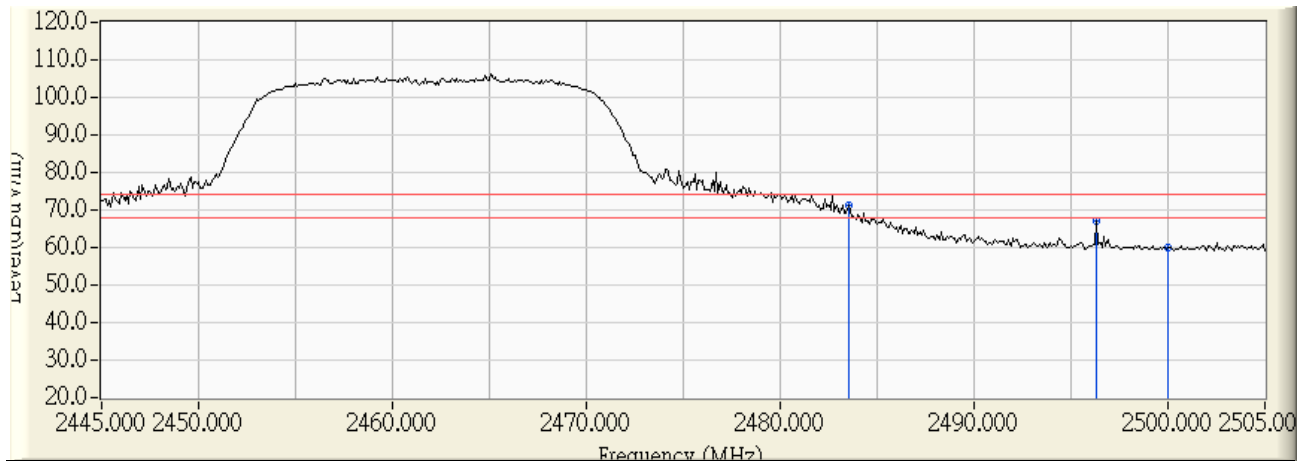


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2310.000	29.779	12.971	42.750	-11.250	54.000	AVERAGE
2	2389.800	30.576	15.895	46.471	-7.529	54.000	AVERAGE
3	* 2390.000	30.578	15.977	46.555	-7.445	54.000	AVERAGE

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.

Site : CB1	Time : 2013/04/27 - 10:32
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2462MHz

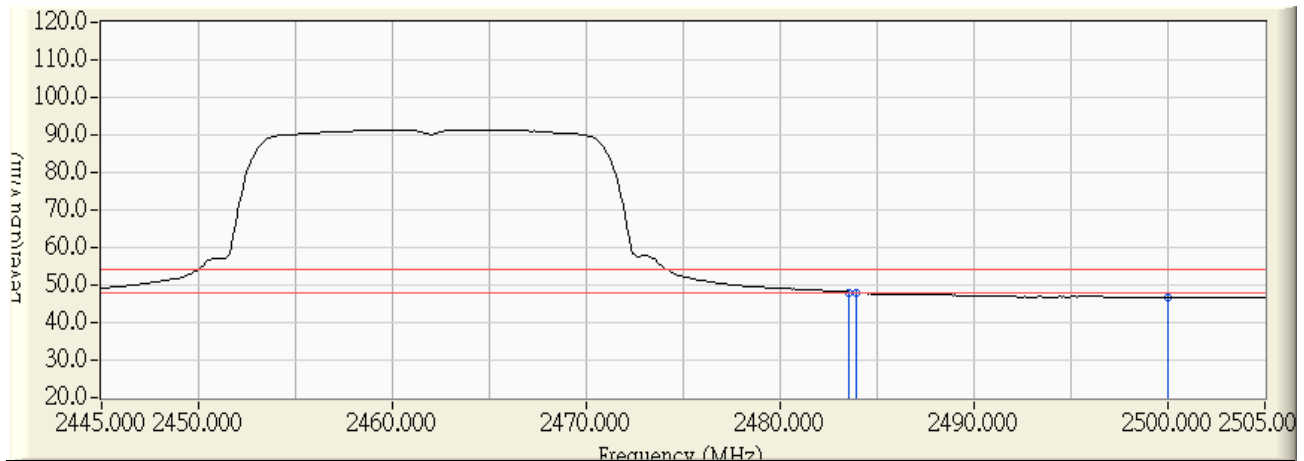


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2483.500	31.512	39.609	71.121	-2.879	74.000	PEAK
2		2496.300	31.637	35.497	67.134	-6.866	74.000	PEAK
3		2500.000	31.638	28.241	59.880	-14.120	74.000	PEAK

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.

Site : CB1	Time : 2013/04/27 - 10:33
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2462MHz

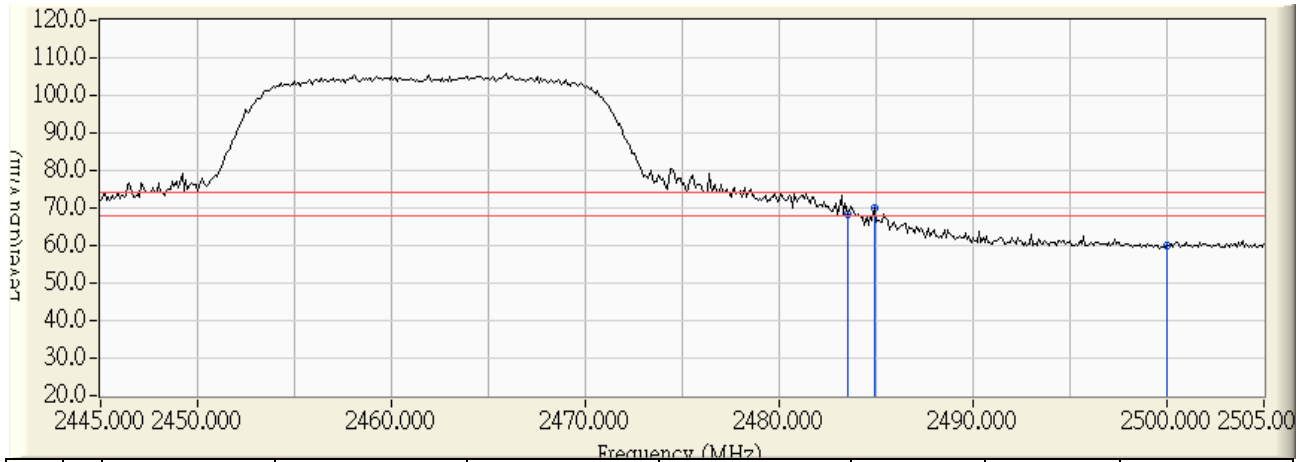


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2483.500	31.512	16.573	48.085	-5.915	54.000	AVERAGE
2		2483.900	31.516	16.400	47.916	-6.084	54.000	AVERAGE
3		2500.000	31.638	14.971	46.610	-7.390	54.000	AVERAGE

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.

Site : CB1	Time : 2013/04/27 - 10:35
Limit : FCC_SpartC_15.209_03M_PK	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2462MHz

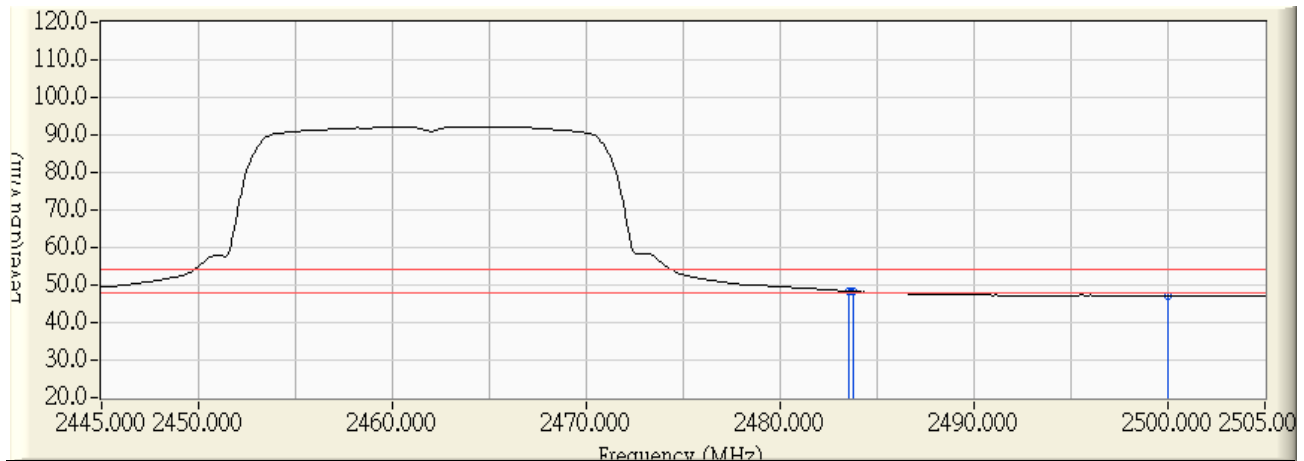


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	2483.500	31.512	36.628	68.140	-5.860	74.000	PEAK
2	* 2484.900	31.526	38.406	69.932	-4.068	74.000	PEAK
3	2500.000	31.638	28.214	59.853	-14.147	74.000	PEAK

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.

Site : CB1	Time : 2013/04/27 - 10:36
Limit : FCC_SpartC_15.209_03M_AV	Margin : 6
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	Power : DC 6V (Power by Battery)
EUT : Wireless Handy Scanner	Note : 802.11n20MHz_2462MHz



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2483.500	31.512	16.827	48.339	-5.661	54.000	AVERAGE
2		2483.800	31.515	16.775	48.290	-5.710	54.000	AVERAGE
3		2500.000	31.638	15.455	47.094	-6.906	54.000	AVERAGE

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.

6. Occupied Bandwidth

6.1. Test Equipment

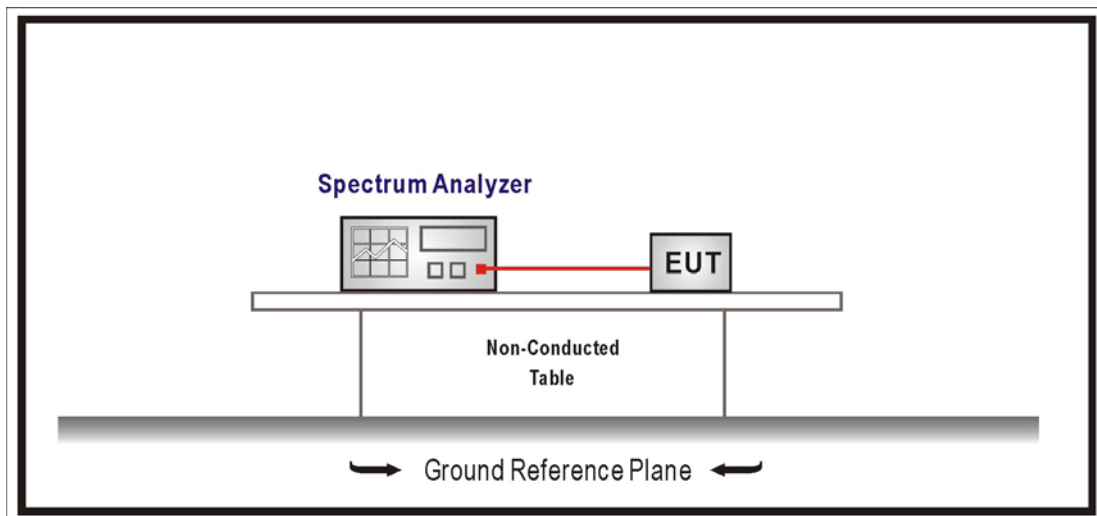
The following test equipments are used during the test:

Occupied Bandwidth / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
EXA Signal Analyzer	Agilent	N9010A-EXA	US47140172	2013/07/31

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

6.2. Test Setup



6.3. Test Procedures

The EUT was setup according to ANSI C63.4: 2009; tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements. Set RBW = 1% of EBW, Span greater than RBW.

6.4. Limits

The 6 dB bandwidth must be greater than 500 kHz.

6.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

6.6. Uncertainty

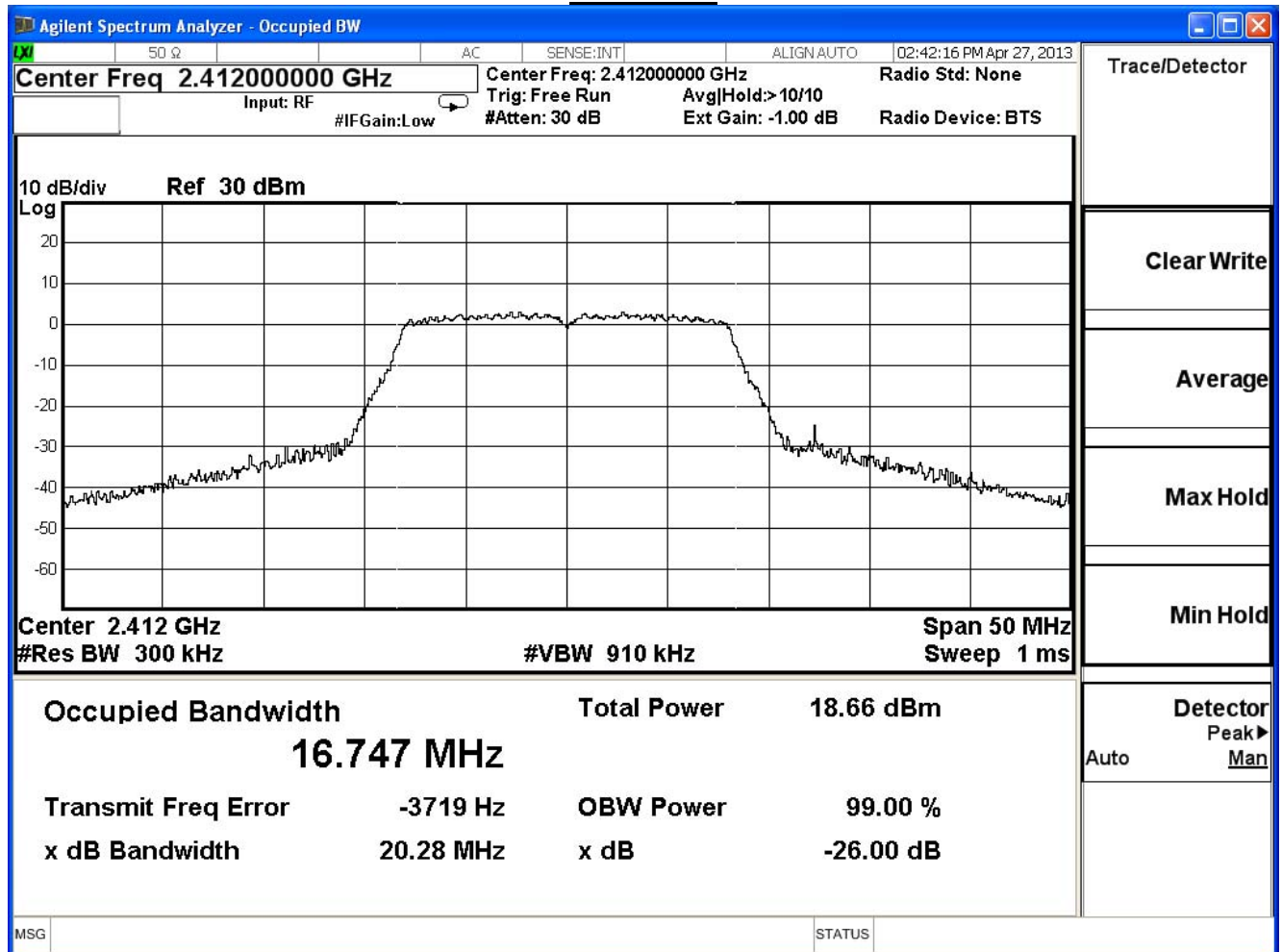
The measurement uncertainty is defined as $\pm 150\text{Hz}$

6.7. Test Result

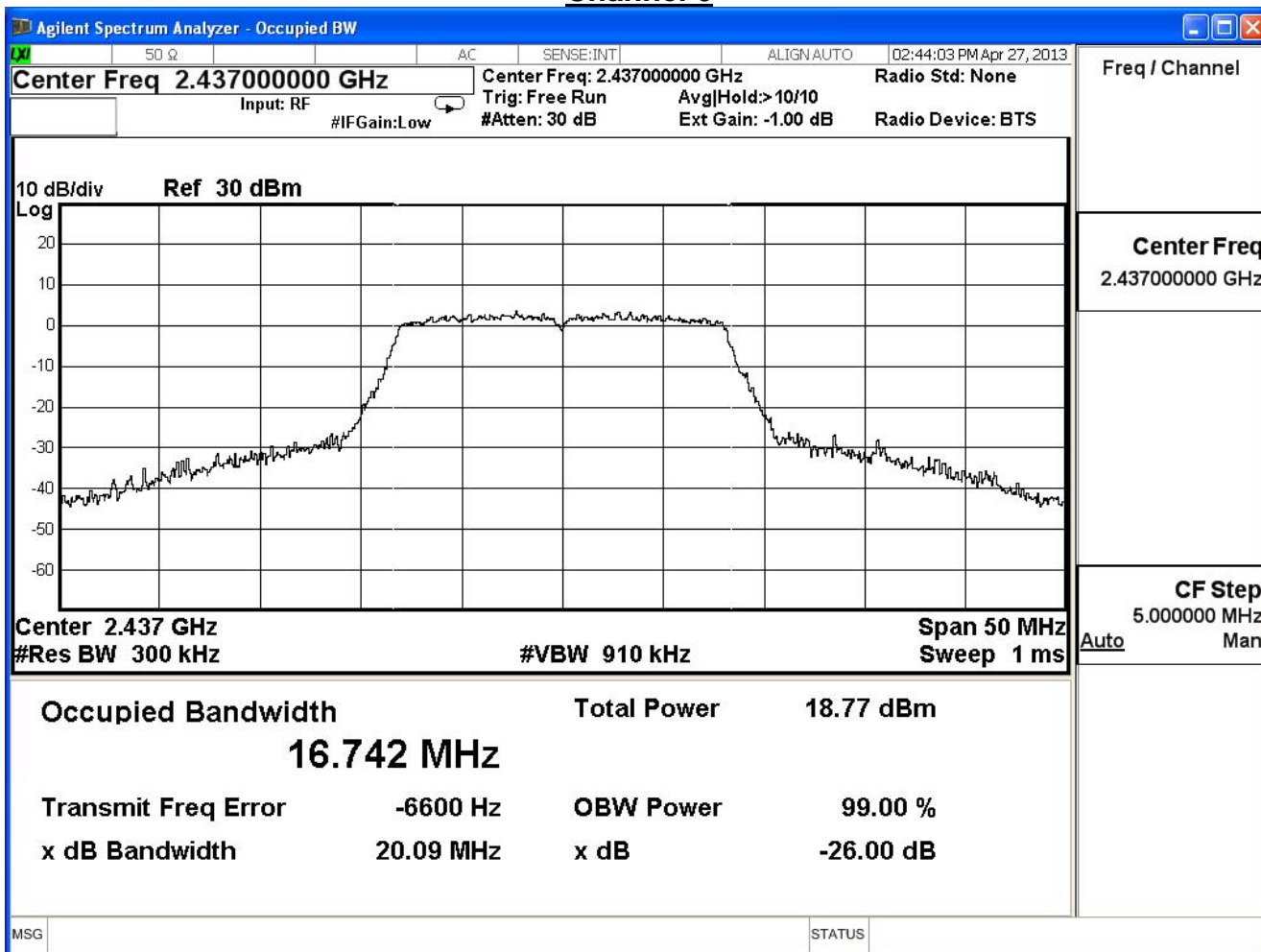
Product	Wireless Handy Scanner		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2013/04/27	Test Site	SR7

IEEE 802.11g				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
1	2412	20.28	≥ 0.5	Pass
6	2437	20.09	≥ 0.5	Pass
11	2462	20.43	≥ 0.5	Pass

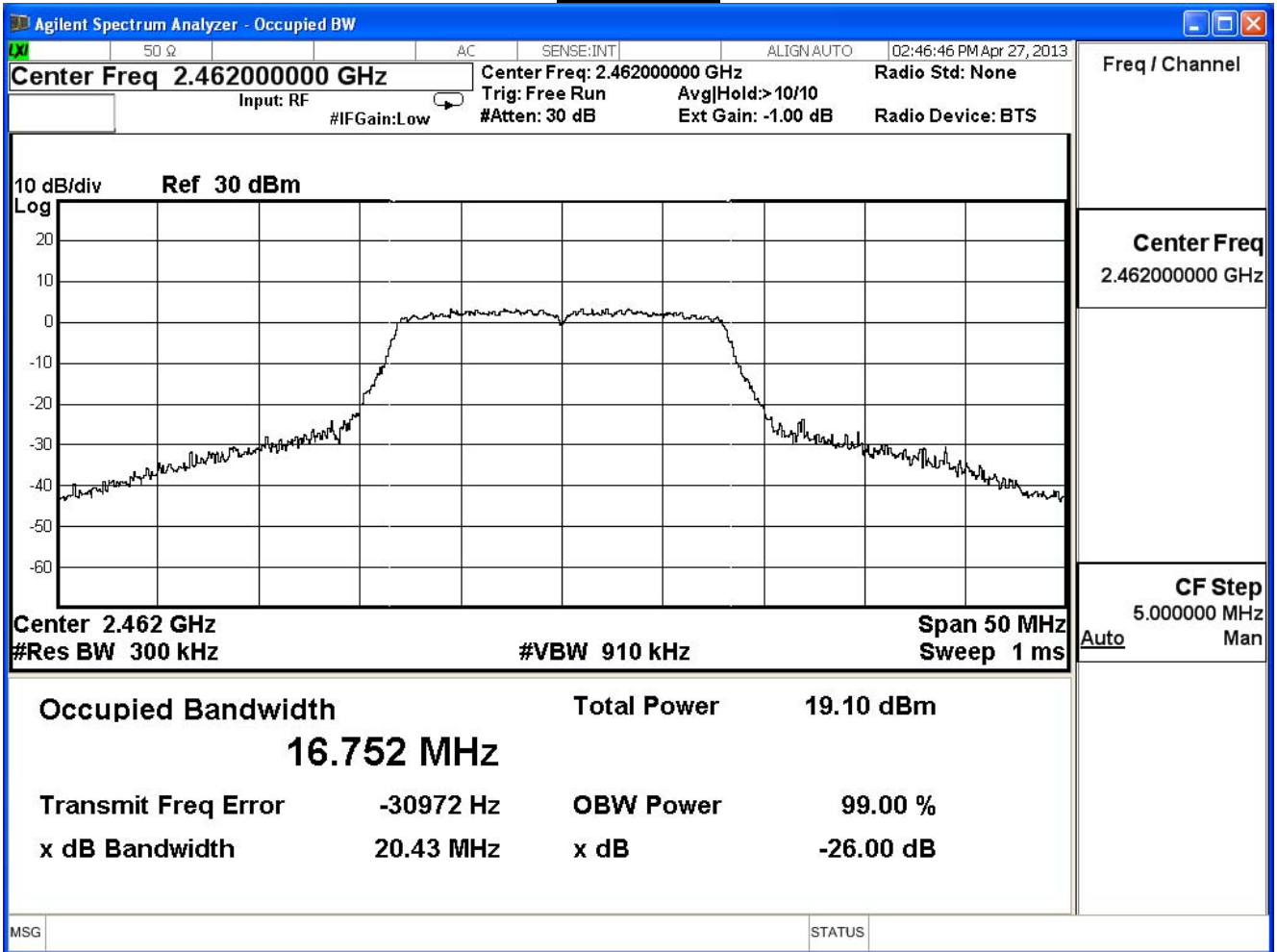
Channel 1



Channel 6



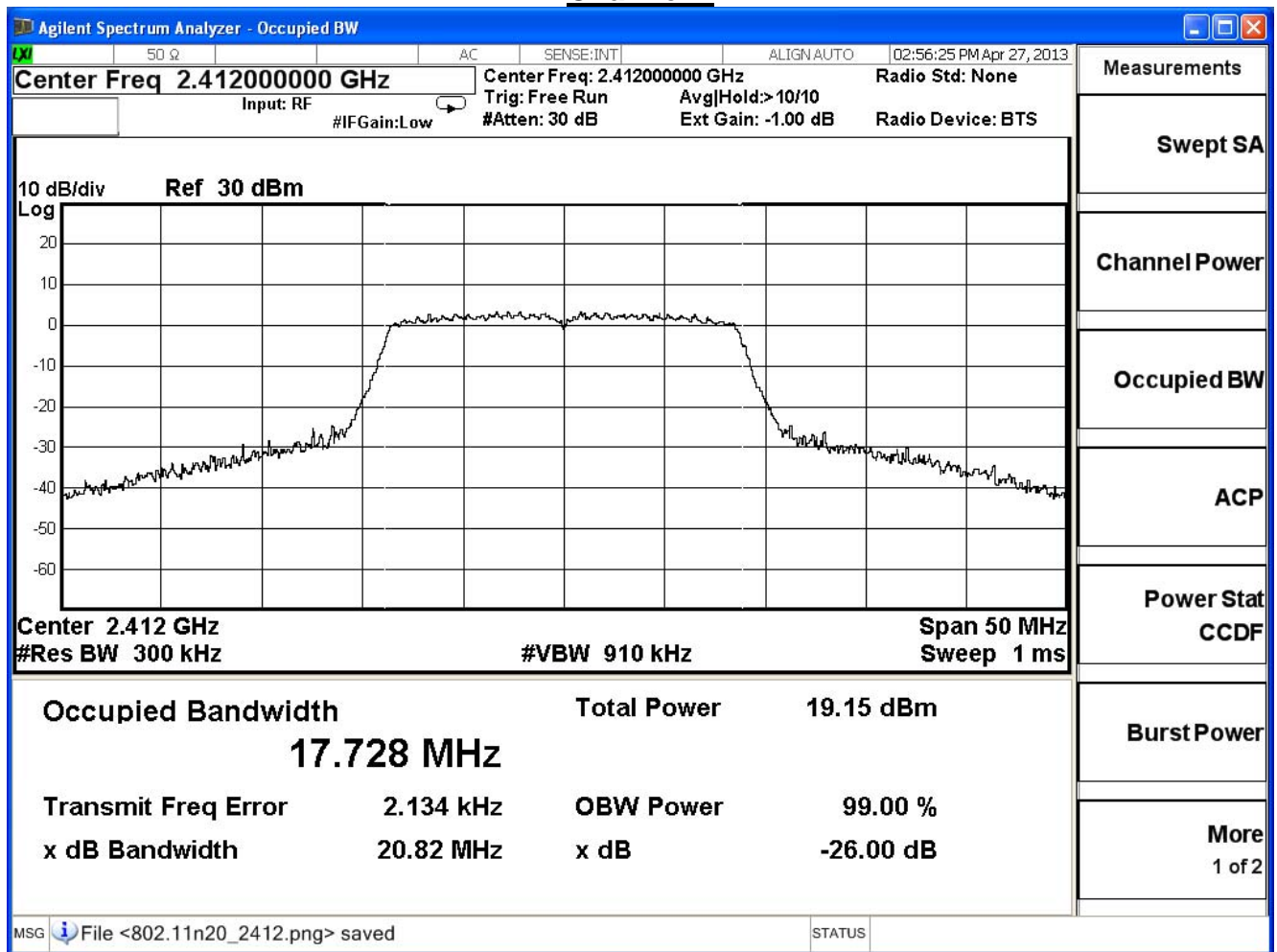
Channel 11



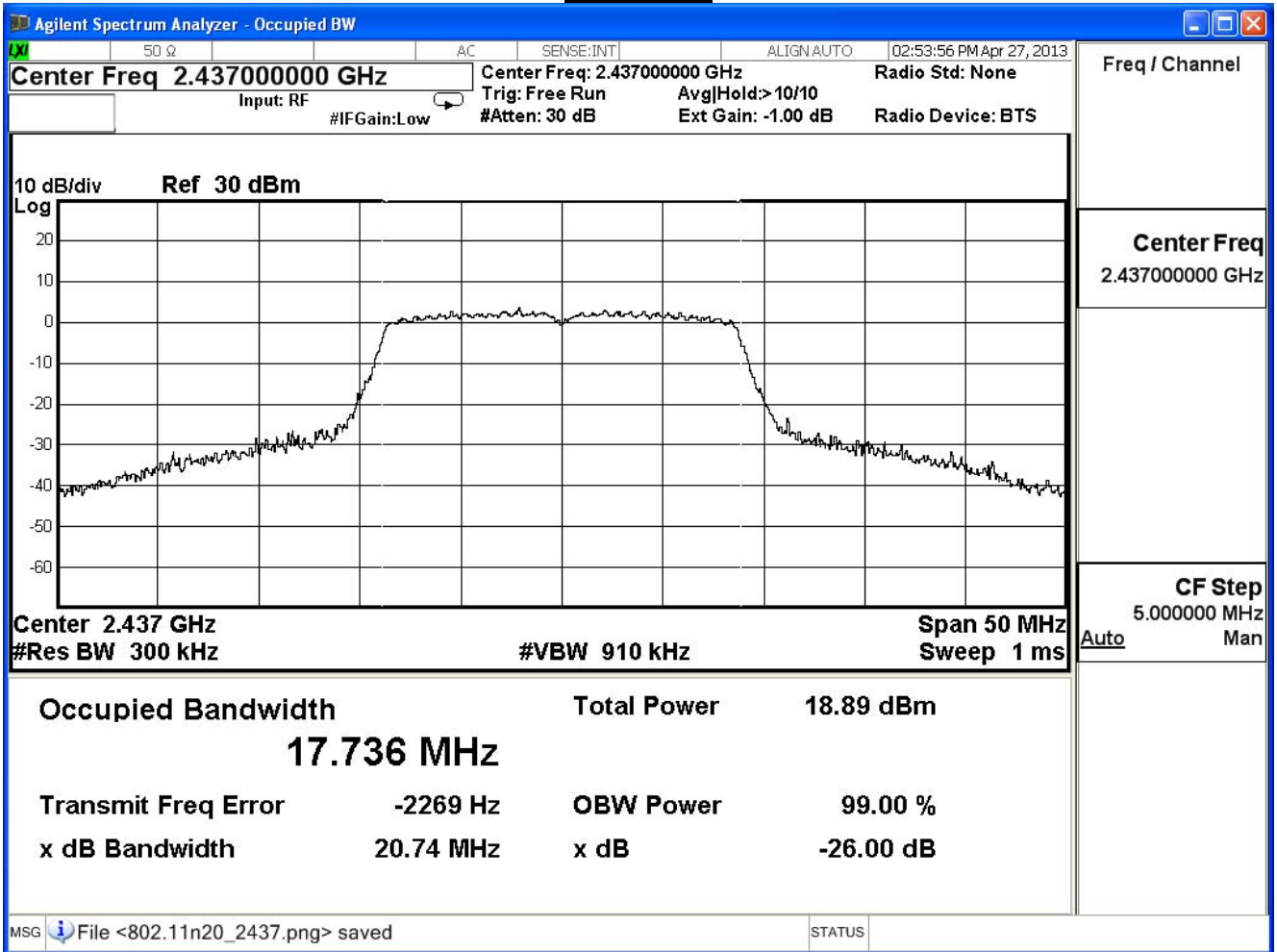
Product	Wireless Handy Scanner		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2013/04/27	Test Site	SR7

IEEE 802.11n (20MHz)				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
1	2412	20.82	≥ 0.5	Pass
6	2437	20.74	≥ 0.5	Pass
11	2462	21.88	≥ 0.5	Pass

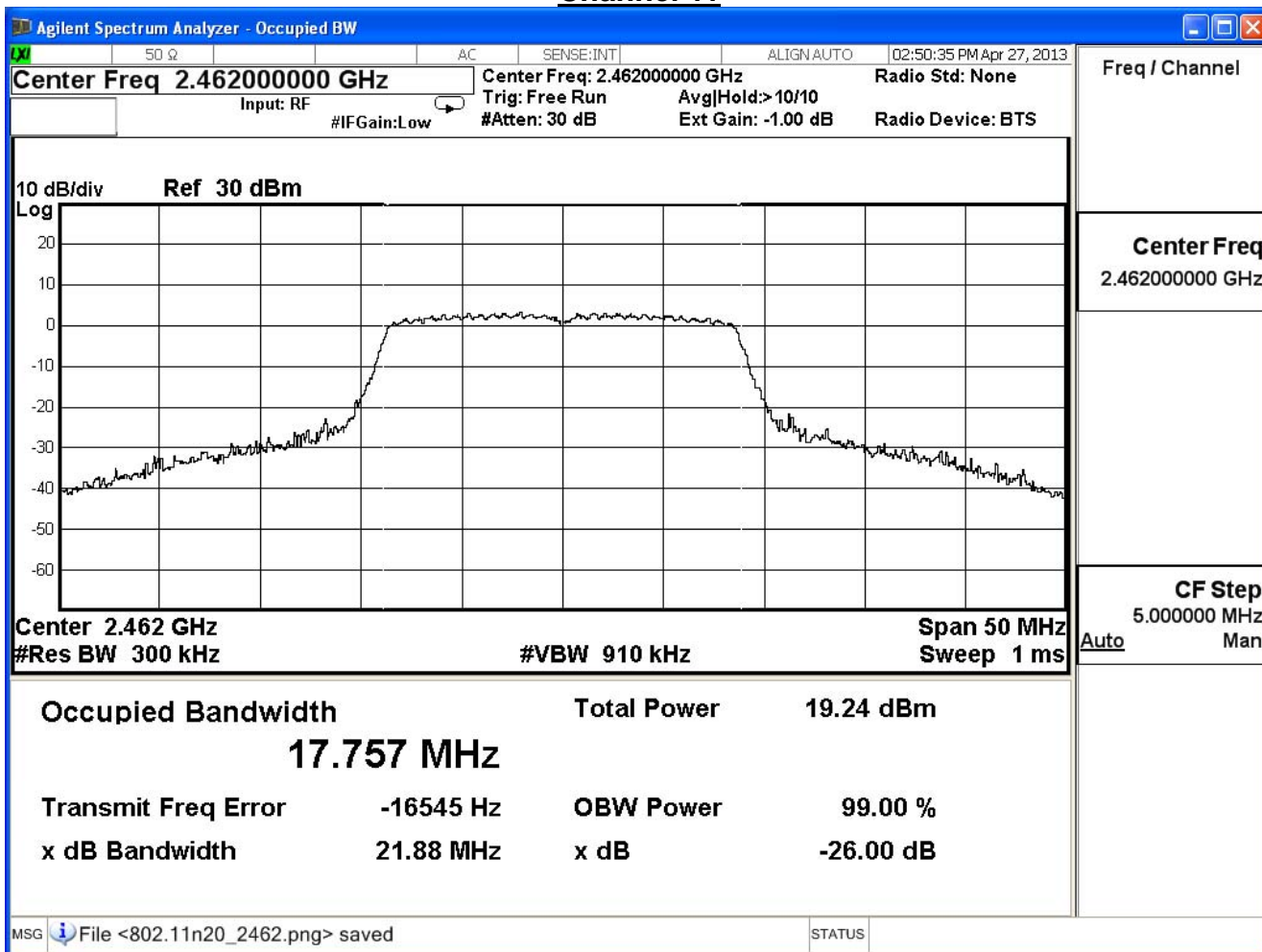
Channel 1



Channel 6



Channel 11



7. Power Density

7.1. Test Equipment

The following test equipment is used during the test:

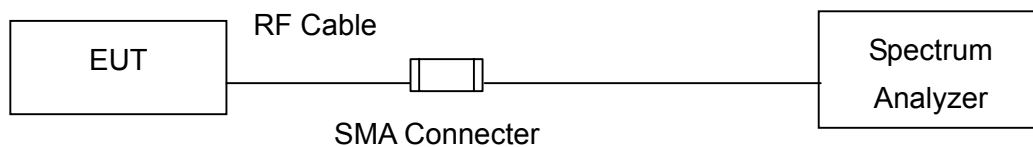
Power Density / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
EXA Signal Analyzer	Agilent	N9010A-EXA	US47140172	2013/07/31

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

7.2. Test Setup

IEEE 802.11 b / g / a / n (20M / 40M) MODE



7.3. Limits

The peak power spectral density conducted from the intentional radiated to the antenna shall not be greater than +8dBm in any 3kHz band during any time interval of continuous transmission.

7.4. Test Procedures

The EUT was setup according to ANSI C63.4: 2009; tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW= 100 kHz, Set VBW= 300 kHz, Sweep time=Auto, Set detector=Peak detector

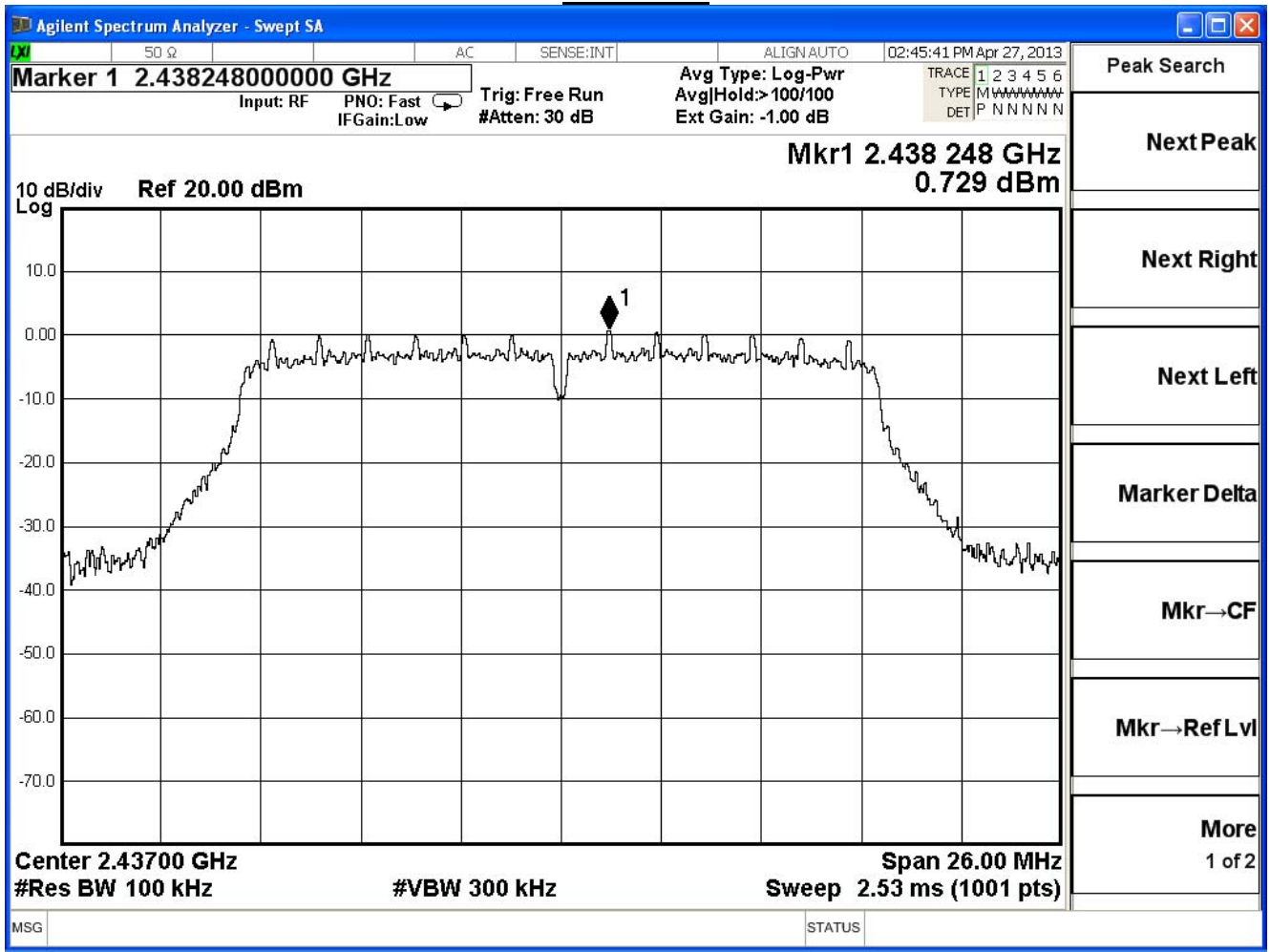
7.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

7.6. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB.

Channel 6

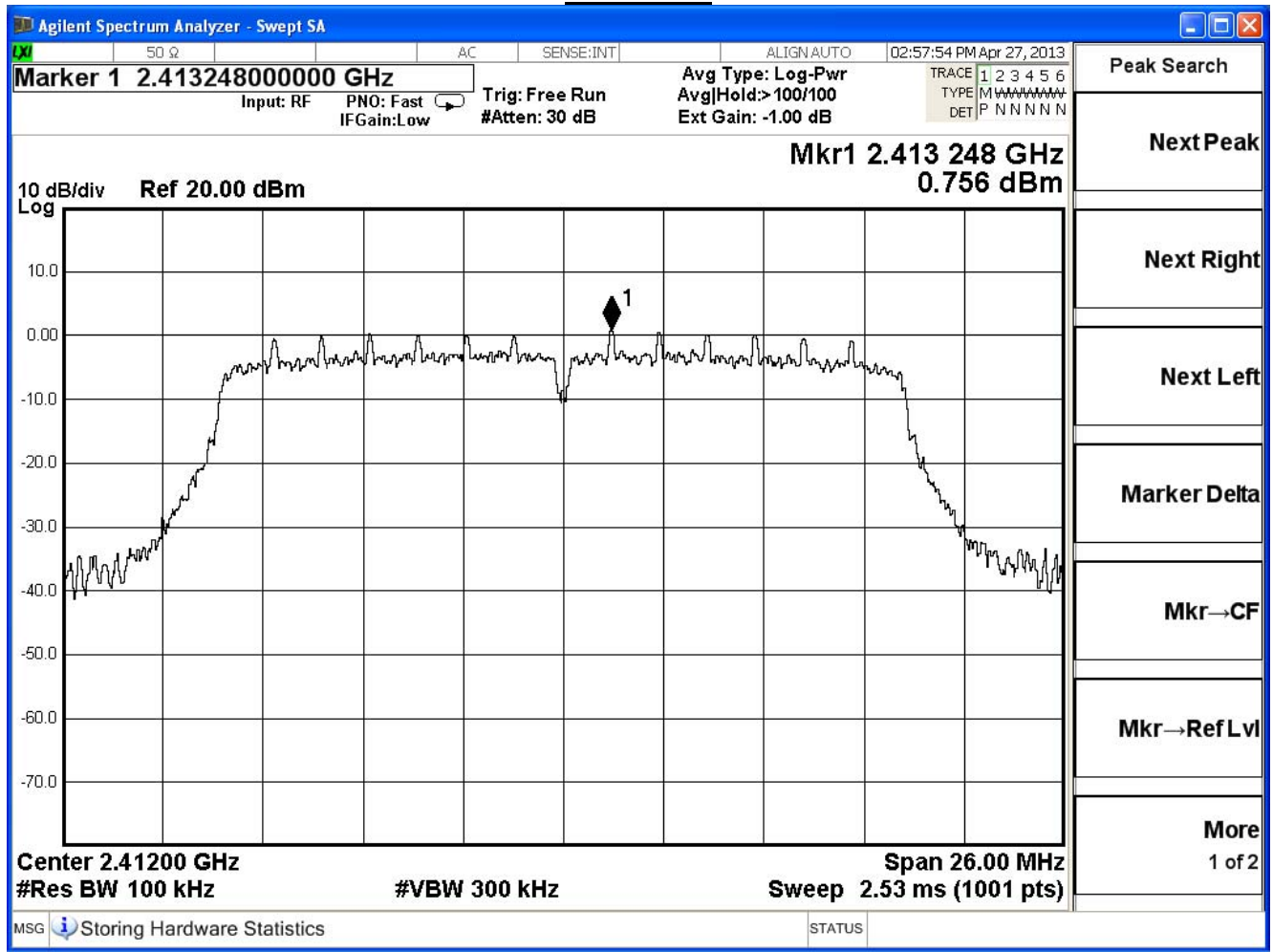


Product	Wireless Handy Scanner		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2013/04/27	Test Site	SR7

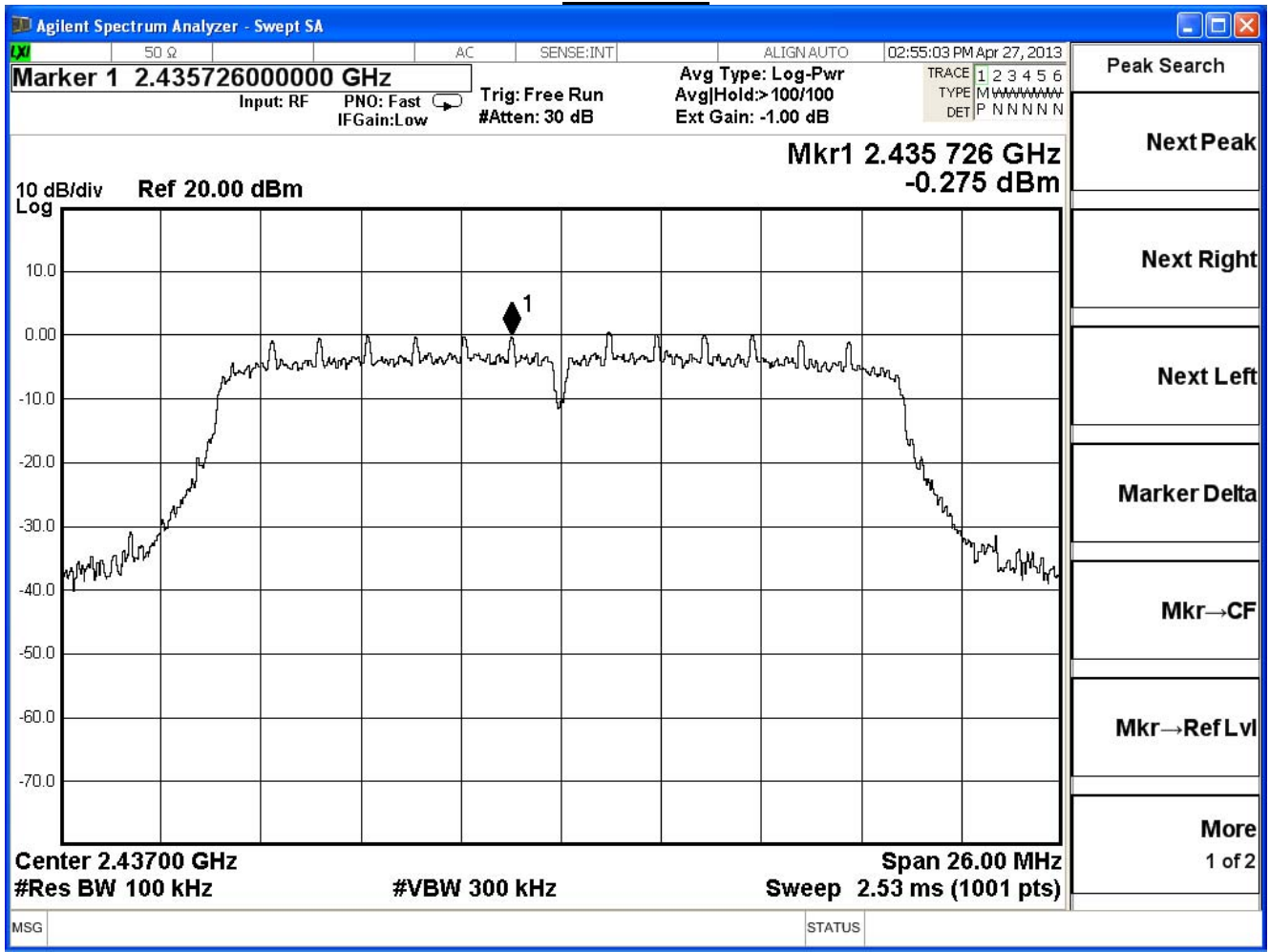
IEEE802.11n_20MHz					
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	0.756	-14.444	≤ 8	Pass
6	2437	-0.275	-15.475	≤ 8	Pass
11	2462	0.518	-14.682	≤ 8	Pass

Note: Measure Level = Reading level + BWCF = Reading level -15.2 dB
 Bandwidth correction factor (BWCF) = 10log (3 kHz/100kHz)

Channel 1



Channel 6



Channel 11

