FCC PART 15.247

EMI MEASUREMENT AND TEST REPORT

For

Newcont Ele Co., Ltd.

Unit D, 40/F., Block C, Electronics Science & Technology Bldg
Shennan Middle Road, Futian District, Shenzhen, Guangdong Province, P.R.China

FCC ID: QFENTP-6451A

This Report Concerns:	**Equipment Type:**
☒ Original Report	2.4GHz Digital Cordless Telephone

Test Engineer:	James Ma
Report No.:	R0509123
Report Date:	2005-09-27
Reviewed By:	Richard Lee
Prepared By:	Bay Area Compliance Laboratory Corporation (BACL) 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732 9164

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Newcont Ele Co., Ltd.*, FCC ID: *QFENTP-6451A,* or the "EUT" as referred to in this report is a 2.4GHz Digital Cordless Telephone. The base part of the EUT measures approximately 5.75"L x 2.00" W x 1.00"H, and the handset part of the EUT measures approximately 6.00"L x 5.00" W x 1.75"H. The emission designators are 777KG7D for Base and 845KG7D for Handset.

** The test data gathered are from a production sample, S/N: 001, provided by the manufacturer.*

Objective

This type approval report is prepared on behalf of *Newcont Ele Co., Ltd*. in accordance with Part 2, Subpart J, Part 15, Subparts A, B, C.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003& TIA/EIA-603.

Test Facility

The Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA with registration number: 90464.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to ANSI C63.4-2003.

The EUT was tested in the normal (native) operating mode to represent *worst*-case results during the final qualification test.

Special Accessories

As shown in following test block diagram, all interface cables used for compliance testing are shielded.

Schematics / Block Diagram

Please refer to Appendix A.

Equipment Modifications

No modifications were made to the EUT.

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Southern Telecom	Telephone	None	None	None
Teltone Corp	Simulator	TLS-3B-01	80071	None

External I/O Cabling List and Details

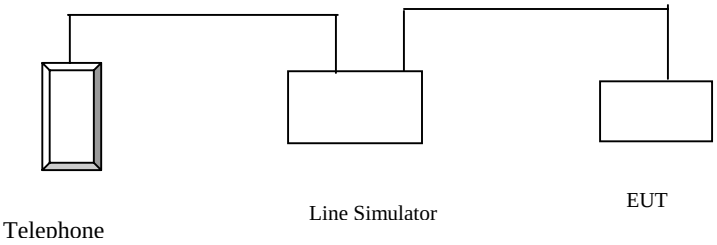
Cable Description	Length (M)	Port/From	To
None-Shielded Telephone Cable	2.0	RJ11 Port/EUT	Telephone Simulator RJ11 Port
None-Shielded Telephone Cable	2.0	RJ11 Port/Simulator	Telephone RJ11 Port/Panasonic

Power Supply Information

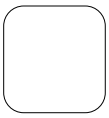
Manufacturer	Description	Model	Serial Number	FCC ID
Ktec	AC/DC Adapter	KA12D090075044U	none	None

Configuration of Test System

Conducted Emission

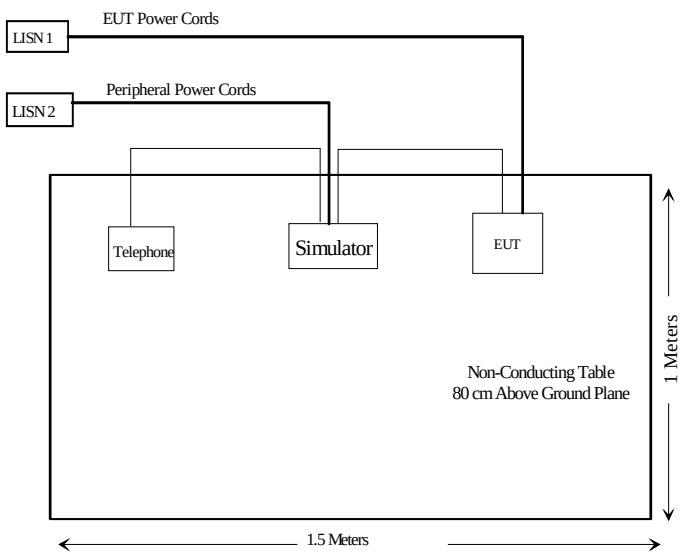


Radiated Emission

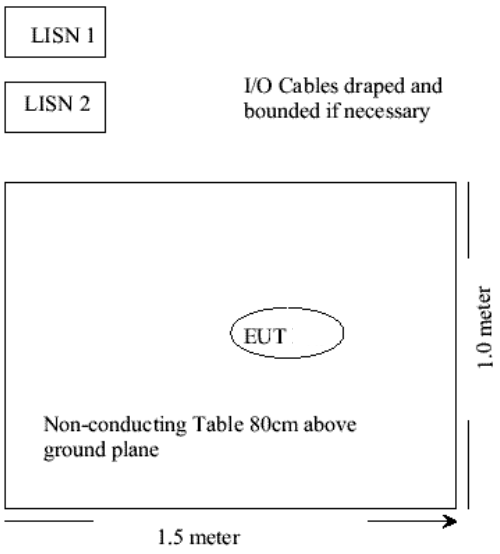


Test Setup Block Diagram

Conducted Emission



Radiated Emission



SUMMARY OF TEST RESULTS FOR FCC PART 15

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§ 15.205	Restricted Bands	Compliant
§15.207 (a)	Conducted Emission	Compliant
§15.209	Radiated Emission	Compliant*
§15.247 (a) (1)	Hopping Channel Separation	Compliant
§15.247 (a) (1)	Channel Bandwidth	Compliant
§15.247 (a) (1) (iii)	Number of Hopping Frequencies Used	Compliant
§15.247 (a) (1) (iii)	Dwell Time of Each Frequency within a 35.2 Second Period of time (0.4 x Number of Channel)	Compliant
§15.247 (b) (1)	Maximum Peak Output Power	Compliant
§ 15.247 (b)(4) § 2.1093	RF Safety Requirements	Compliant
§ 15.247 (d)	100 kHz Bandwidth of Frequency Band Edge	Compliant
§ 2.1051	Spurious Emission at Antenna Port	Compliant

**The data was within the measurement of uncertainty.*

ANTENNA REQUIREMENT

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to § 15.247 (1), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The antenna connectors are designed with permanent attachment and no consideration of replacement.

The antenna gain is 1.2 dBi as prescribed by the manufacturer.

§15.207(a) - CONDUCTED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are receiver, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at BACL is ±2.4 dB.

Test Setup

The measurement was performed at shield room, using the same setup per ANSI C63.4 – 2003 measurement procedure. The specification used was FCC Class B limits.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The EUT was connected with LISN-1.

Receiver Setup

The EMI receiver was set to investigate the spectrum from 150 kHz to 30MHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
R&S	Receiver, EMI Test	ESCS30	100176	2005-09-15
R&S	Artificial Mains Network	ESH2-Z5	871884/039	2005-08-16

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the power cord of the EUT was connected to the mains outlet of the LISN-1.

Maximizing procedure were performed on the six (6) highest emissions of the EUT.

All data was recorded in the peak detection mode, quasi-peak and average. Qusi-Peak readings are distinguished with an "QP". Average readings are distinguished with an "Ave".

Environmental Conditions

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1016 mbar

**The testing was performed by James Ma on 2005-09-22.*

Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC Conducted limit for a Class B device, with the *worst* margin reading of:

-26.4 dB at **17.900 MHz** in the **Neutral** conductor

Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC CLASS B	
Frequency MHz	Amplitude dBμV	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dBμV	Margin dB
17.900	23.6	Ave	Neutral	50.00	-26.4
0.150	37.7	QP	Neutral	66.00	-28.3
0.205	30.3	QP	Neutral	63.41	-33.1
13.300	15.6	Ave	Line	50.00	-34.4
0.160	28.8	QP	Line	65.46	-36.7
17.900	22.8	QP	Neutral	60.00	-37.2
0.230	20.8	QP	Line	62.45	-41.6
13.300	14.9	QP	Line	60.00	-45.1
0.150	10.6	Ave	Neutral	56.00	-45.4
0.205	6.8	Ave	Neutral	53.41	-46.6
0.230	4.5	Ave	Line	52.45	-47.9
0.160	6.6	Ave	Line	55.46	-48.9

Plot of Conducted Emissions Test Data

Plot(s) of Conducted Emissions Test Data is presented in the following page as reference.

>Bay Area Compliance LABoratory Corp 22. Sep 05 16:58

Class B

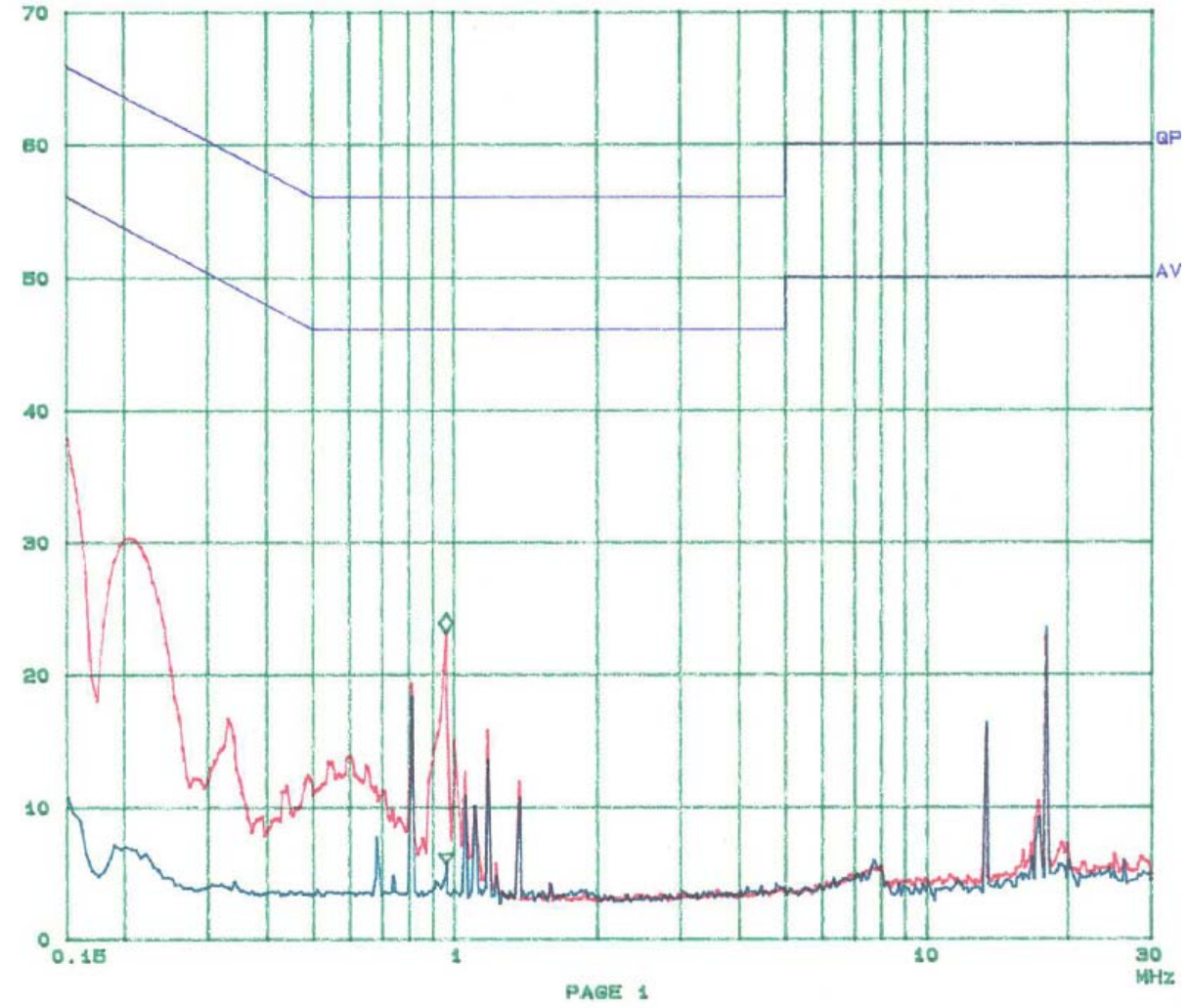
EUT: 2.4GHZ CORDLESS PHONE
Manuf: NEW CONT
Op Cond: Normal
Operator: JAMES
Comment: N
120 VAC
File name: CLASSB.SPC

Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	1M	5k	9k	QP+AV	20ms	15dBLN	OFF
1M	5M	10k	9k	QP+AV	1ms	15dBLN	OFF
5M	30M	100k	9k	QP+AV	1ms	15dBLN	OFF

Jamshu 22 Sept 05

◊ Mkr : 955.00 kHz 23.2 dBuV
▽ Mkr : 955.00 kHz 5.7 dBuV



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>Bay Area Compliance LABoratory Corp 22. Sep 05 16:29

Class B

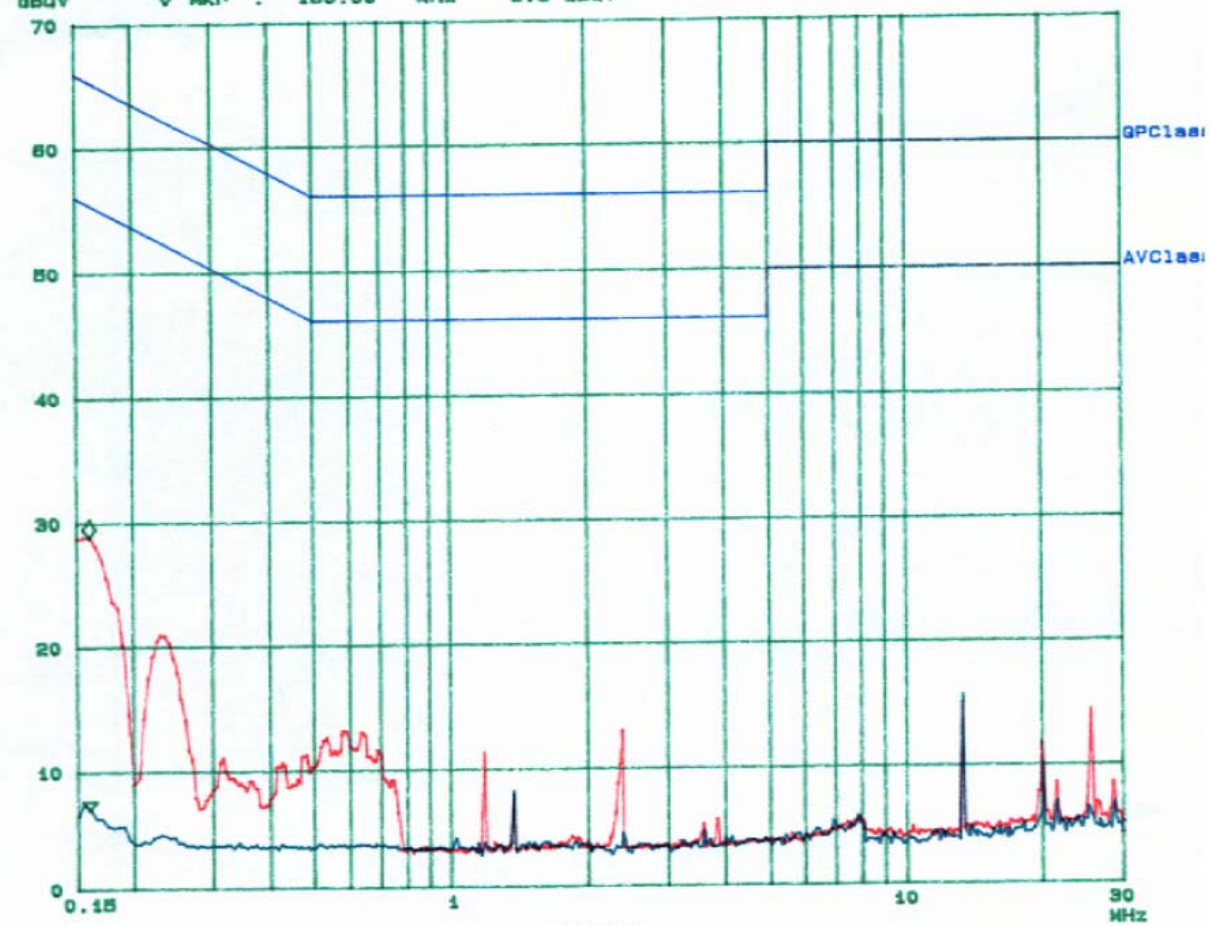
EUT: 2.4GHZ CORDLESS PHONE
Manuf: NEW CONT
Op Cond: Normal
Operator: JAMES
Comment: L
120 VAC
File name: CLASSB.SPC

Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	1M	5k	9k	QP+AV	20ms	15dBLN	OFF
1M	5M	10k	9k	QP+AV	1ms	15dBLN	OFF
5M	30M	100k	9k	QP+AV	1ms	15dBLN	OFF

James 22 Sept 05

◊ Mkr : 160.00 kHz 28.8 dBuV
▽ Mkr : 160.00 kHz 6.6 dBuV



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§15.205 & §15.209 - RADIATED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is $\pm$4.0 dB.

Test Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with ANSI C63.4-2003. The specification used was the FCC 15 Subpart C limits.

Spectrum Analyzer Setup

According to FCC Rules, 47 CFR §15.33 (a) (1), the system was tested to 25GHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Range	***RBW***	***Video B/W***
Below 30MHz	10kHz	10kHz
30 – 1000MHz	100kHz	100kHz
Above 1000MHz	1MHz	1MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Amplifier, Pre (1~26.5GHz)	8449B	3147A00400	2004-10-05
Sunol Science	Antenna	JB1	A013105-3	2005-02-11
HP	Analyzer, Spectrum	8565EC	3946A00131	2005-08-06
HP	Pre, Amplifier (1~1300MHz)	8447D	2944A10198	2005-08-20
A.H, Systems	Antenna, Horn, DRG	SAS-200/571	261	2005-04-20
Rohde & Schwarz	Receiver, EMI Test	ESCI1166.595 0K03	100044	2004-09-29

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1016 mbar

**The testing was performed by James Ma on 2005-09-22.*

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limits), and are distinguished with a "**Qp**" in the data table.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. - Class B Limit

Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247, and had the worst margin of:

Base: **-6.2 dB** at **4803.6160 MHz** in the **Vertical** polarization, Low Channel, 3 meters

-3.8 dB at **4880.2500 MHz** in the **Horizontal** polarization, Middle Channel, 3 meters*

-1.2 dB at **4958.8020 MHz** in the **Vertical** polarization, High Channel, 3 meters*

- 7.0 dB at **876.00 MHz** in the **Horizontal** polarization, Unintentional Emission, 3 meters

Handset: **-8.1 dB** at **4803.6160 MHz** in the **Vertical** polarization, Low Channel, 3 meters

-6.0 dB at **4880.3180 MHz** in the **Vertical** polarization, Middle Channel, 3 meters

-9.7 dB at **4958.8020 MHz** in the **Horizontal** polarization, High Channel, 3 meters

-7.0 dB at **876.00 MHz** in the **Horizontal** polarization, Unintentional Emission, 3 meters

**The data was within the measurement of uncertainty.*

3 Meters Radiated Emission Test Data for Base

Indicated			Antenna	Antenna		Correction Factor			FCC 15.247		
Freqency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin	Comments
MHz	dBμV/m	Degree	Meter	H/V	dB	dB	dB	dBμV/m	dBμV/m	dB	
Low Channel											
2401.8080		90	1.0	V	28.7	2.0	35.8	-5.2			Fund/Peak
2401.8080		0	1.2	H	28.7	2.0	35.8	-5.2			Fund/Peak
2401.8080		180	1.2	V	28.7	2.0	35.8	-5.2			Ave
2401.8080		0	1.2	H	28.7	2.0	35.8	-5.2			Ave
4803.6160	67.0	270	2.4	V	32.5	3.1	34.8	67.8	74	-6.2	Peak
4803.6160	61.9	180	2.3	H	32.5	3.1	34.8	62.7	74	-11.3	Peak
7205.4240	35.9	180	2.0	V	36.7	4.3	34.7	42.2	54	-11.8	Ave
7205.4240	35.4	90	2.0	H	36.7	4.3	34.7	41.7	54	-12.3	Ave
4803.6160	38.1	270	2.4	V	32.5	3.1	34.8	38.9	54	-15.1	Ave
7205.4240	51.2	90	2.0	V	36.7	4.3	34.7	57.5	74	-16.5	Peak
4803.6160	35.8	180	2.3	H	32.5	3.1	34.8	36.6	54	-17.5	Ave
7205.4240	49.8	180	2.0	H	36.7	4.3	34.7	56.1	74	-17.9	Peak
Middle Channel											
2440.1580				V	28.7	2.0	35.8	-5.2			Fund/Peak
2440.1580				H	28.7	2.0	35.8	-5.2			Fund/Peak
2440.1580				V	28.7	2.0	35.8	-5.2			Ave
2440.1580				H	28.7	2.0	35.8	-5.2			Ave
4880.2500	69.4	180	2.2	H	32.5	3.1	34.8	70.2	74	-3.8*	Peak
4880.2500	68.7	270	2.4	V	32.5	3.1	34.8	69.5	74	-4.5	Peak
7320.0000	37.5	270	2.4	V	36.7	4.3	34.7	43.8	54	-10.2	Ave
7320.0000	36.1	180	2.1	H	36.7	4.3	34.7	42.4	54	-11.6	Ave
4880.2500	39.7	180	2.2	H	32.5	3.1	34.8	40.5	54	-13.5	Ave
7320.0000	53.3	270	2.4	V	36.7	4.3	34.7	59.6	74	-14.4	Peak
4880.2500	38.6	270	2.4	V	32.5	3.1	34.8	39.4	54	-14.6	Ave
7320.0000	52.0	180	2.3	H	36.7	4.3	34.7	58.3	74	-15.7	Peak
2073.0000	36.8	270	2.4	V	28.7	2.0	35.8	31.6	54	-22.4	Ave
2073.0000	36.7	180	2.1	H	28.7	2.0	35.8	31.5	54	-22.5	Ave
2073.0000	52.7	270	2.4	V	28.7	2.0	35.8	47.5	74	-26.5	Peak
2073.0000	51.4	180	2.3	H	28.7	2.0	35.8	46.2	74	-27.8	Peak
High Channel											
2479.4010				V	28.7	2.0	35.8	-5.2			Fund/Peak
2479.4010				H	28.7	2.0	35.8	-5.2			Fund/Peak
2479.4010				V	28.7	2.0	35.8	-5.2			Ave
2479.4010				H	28.7	2.0	35.8	-5.2			Ave
4958.8020	72.0	270	2.4	V	32.5	3.1	34.8	72.8	74	-1.2*	Peak
7438.2030	66.5	270	2.4	V	36.7	4.3	34.7	72.8	74	-1.2*	Peak
7438.2030	39.7	270	2.4	V	36.7	4.3	34.7	46.0	54	-8.0	Ave
4958.8020	62.8	90	2.1	H	32.5	3.1	34.8	63.6	74	-10.4	Peak
7438.2030	35.8	90	2.1	H	36.7	4.3	34.7	42.2	54	-11.8	Ave
4958.8020	40.2	270	2.4	V	32.5	3.1	34.8	41.0	54	-13.0	Ave
4958.8020	38.4	90	2.1	H	32.5	3.1	34.8	39.2	54	-14.8	Ave
7438.2030	50.9	90	2.1	H	36.7	4.3	34.7	57.2	74	-16.8	Peak

Unintentional Emission

Indicated			Antenna	Antenna		Correction Factor			FCC 15.247	
Frequency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/V	dB	dB	dB	dBμV/m	dBμV/m	dB
876.00	32.0	280	2.8	H	22.4	7.0	27.7	39.0	46.0	-7.0
147.00	37.0	270	3.2	H	12.7	2.5	28.0	34.1	43.5	-9.4
147.00	35.9	75	1.8	V	12.7	2.5	28.0	33.8	43.5	-9.7
876.00	32.0	250	1.0	V	22.4	7.0	27.7	36.3	46.0	-9.7
294.00	31.0	330	1.2	V	13.5	3.6	27.4	31.9	46.0	-14.1
294.00	30.0	270	2.1	H	13.5	3.6	27.4	27.8	46.0	-18.3

3 Meters Radiated Emission Test Data for Handset

Low Channel

Indicated			Antenna	Antenna		Correction Factor			FCC 15.247		
Freqency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin	Comments
MHz	dBμV/m	Degree	Meter	H/V	dB	dB	dB	dBμV/m	dBμV/m	dB	
2401.8080		90	1.0	V	28.7	2.0	35.8	-5.2			Fund/Peak
2401.8080		0	1.2	H	28.7	2.0	35.8	-5.2			Fund/Peak
2401.8080		180	1.2	V	28.7	2.0	35.8	-5.2			Ave
2401.8080		0	1.2	H	28.7	2.0	35.8	-5.2			Ave
4803.6160	65.1	90	2.4	V	32.5	3.1	34.8	65.9	74	-8.1	Peak
4803.6160	65.1	90	2.3	H	32.5	3.1	34.8	65.9	74	-8.1	Peak
7205.4240	35.2	90	2.0	H	36.7	4.3	34.7	41.5	54	-12.5	Ave
2387.9500	65.9	90	2.0	V	28.7	2.0	35.8	60.7	74	-13.3	Peak
7205.4240	34.0	90	2.0	V	36.7	4.3	34.7	40.3	54	-13.7	Ave
4803.6160	37.7	90	2.4	V	32.5	3.1	34.8	38.5	54	-15.5	Ave
4803.6160	36.8	90	2.3	H	32.5	3.1	34.8	37.6	54	-16.4	Ave
2387.9500	37.8	90	2.0	V	28.7	2.0	35.8	32.6	54	-21.4	Ave
7205.4240	42.3	90	2.0	H	36.7	4.3	34.7	48.6	74	-25.4	Peak
2387.9500	33.8	90	2.0	H	28.7	2.0	35.8	28.6	54	-25.4	Ave
7205.4240	42.0	90	2.0	V	36.7	4.3	34.7	48.3	74	-25.7	Peak
1794.0700	34.9	90	2.0	H	24.8	1.9	36.3	25.2	54	-28.8	Ave
1794.0700	34.8	90	2.0	V	24.8	1.9	36.3	25.1	54	-28.9	Ave
1794.0700	52.0	90	2.0	H	24.8	1.9	36.3	42.3	74	-31.7	Peak
1794.0700	51.2	90	2.0	V	24.8	1.9	36.3	41.5	74	-32.5	Peak
2387.9500	41.2	90	2.0	H	28.7	2.0	35.8	36.0	74	-38.0	Peak

Note:

FUND: Fundemental
AVG: Average

Middle Channel

Indicated			Antenna	Antenna		Correction Factor			FCC 15.247		
Freqency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin	Comments
MHz	dBμV/m	Degree	Meter	H/V	dB	dB	dB	dBμV/m	dBμV/m	dB	
2440.1590				V	28.7	2.0	35.8	-5.2			Fund/Peak
2440.1590				H	28.7	2.0	35.8	-5.2			Fund/Peak
2440.1590				V	28.7	2.0	35.8	-5.2			Ave
2440.1590				H	28.7	2.0	35.8	-5.2			Ave
4880.3180	67.2	270	2.4	V	32.5	3.1	34.8	68.0	74	-6.0	Peak
7320.4770	35.7	270	2.4	V	36.7	4.3	34.7	42.0	54	-12.0	Ave
7320.4770	35.0	180	2.1	H	36.7	4.3	34.7	41.3	54	-12.7	Ave
4880.3180	37.6	270	2.4	V	32.5	3.1	34.8	38.4	54	-15.6	Ave
4880.3180	37.1	180	2.2	H	32.5	3.1	34.8	37.9	54	-16.1	Ave
7320.4770	50.0	270	2.4	V	36.7	4.3	34.7	56.3	74	-17.7	Peak
7320.4770	49.0	180	2.3	H	36.7	4.3	34.7	55.3	74	-18.7	Peak
2073.0000	35.8	180	2.1	H	28.7	2.0	35.8	30.7	54	-23.4	Ave
2073.0000	35.2	270	2.4	V	28.7	2.0	35.8	30.0	54	-24.0	Ave
2073.0000	53.2	270	2.4	V	28.7	2.0	35.8	48.0	74	-26.0	Peak
2073.0000	52.8	180	2.3	H	28.7	2.0	35.8	47.6	74	-26.4	Peak
4880.3180	41.3	180	2.2	H	32.5	3.1	34.8	42.1	74	-31.9	Peak

High Channel

Indicated			Antenna	Antenna		Correction Factor			FCC 15.247		
Freqency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin	Comments
MHz	dBμV/m	Degree	Meter	H/V	dB	dB	dB	dBμV/m	dBμV/m	dB	
2479.4010				V	28.7	2.0	35.8	-5.2			Fund/Peak
2479.4010				H	28.7	2.0	35.8	-5.2			Fund/Peak
2479.4010				V	28.7	2.0	35.8	-5.2			Ave
2479.4010				H	28.7	2.0	35.8	-5.2			Ave
4958.8020	63.5	90	2.1	H	32.5	3.1	34.8	64.3	74	-9.7	Peak
7438.2030	36.0	270	2.4	V	36.7	4.3	34.7	42.3	54	-11.7	Ave
7438.2030	35.5	90	2.1	H	36.7	4.3	34.7	41.8	54	-12.2	Ave
4958.8020	60.1	270	2.4	V	32.5	3.1	34.8	60.9	74	-13.1	Peak
4958.8020	37.7	270	2.4	V	32.5	3.1	34.8	38.5	54	-15.5	Ave
4958.8020	37.1	90	2.1	H	32.5	3.1	34.8	37.9	54	-16.1	Ave
7438.2030	47.8	270	2.4	V	36.7	4.3	34.7	54.1	74	-19.9	Peak
7438.2030	46.9	90	2.1	H	36.7	4.3	34.7	53.2	74	-20.8	Peak

Note:

FUND: Fundemental
AVG: Average

Unintentional Emission

Indicated			Antenna	Antenna		Correction Factor			FCC 15.247	
Frequency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/V	dB	dB	dB	dBμV/m	dBμV/m	dB
876.00	32.0	280	2.8	H	22.4	7.0	27.7	39.0	46.0	-7.0
147.00	37.0	270	3.2	H	12.7	2.5	28.0	34.1	43.5	-9.4
147.00	35.9	200	1.8	V	12.7	2.5	28.0	33.8	43.5	-9.7
876.00	32.0	250	1.0	V	22.4	7.0	27.7	36.3	46.0	-9.7
294.00	31.0	330	1.2	V	13.5	3.6	27.4	31.9	46.0	-14.1
294.00	30.0	270	2.1	H	13.5	3.6	27.4	27.8	46.0	-18.3

§15.247 (a) (1) - HOPPING CHANNEL SEPARATION

Standard Applicable

According to §15.247(a)(1), frequency hopping system 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. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies.

Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on a bench without connection to measurement instrument Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the Max-Hold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function, and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

Test Equipment

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2005-08-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1016 mbar

**The testing was performed by James Ma on 2005-09-22.*

Measurement Results

Base

Channel	Frequency MHz	Channel Separation (MHz)
Low	2401.81	915
Mid	2440.16	905
High	2479.40	896

Handset

Channel	Frequency MHz	Channel Separation (MHz)
Low	2401.81	895
Mid	2440.16	925
High	2479.40	920

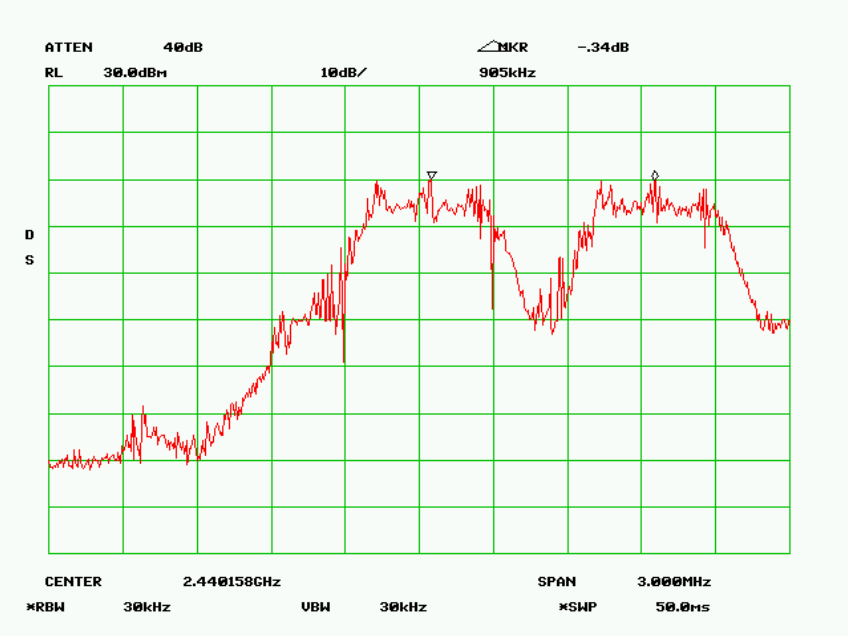
Plots of Hopping Channel Separation

Please refer to the following plots.

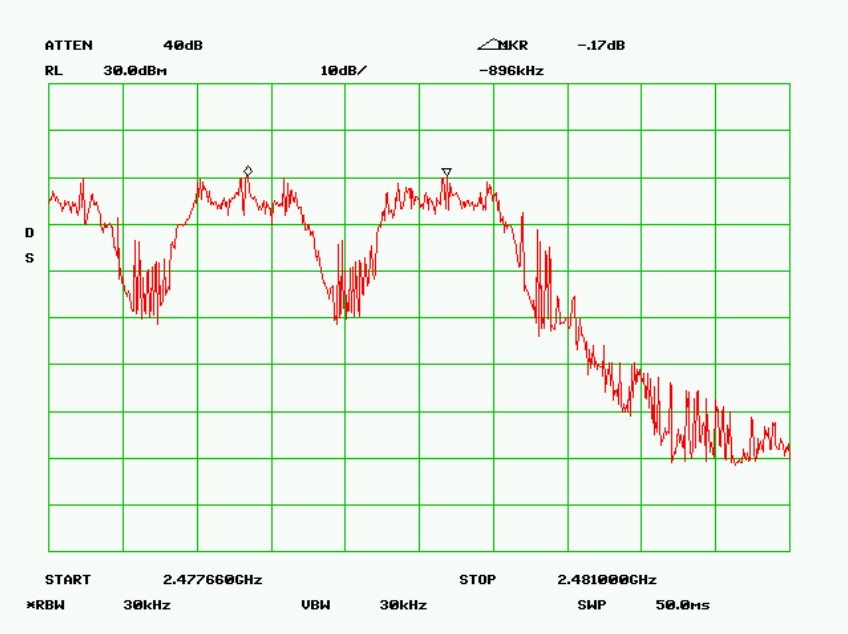
Base

Low Channel

Middle Channel

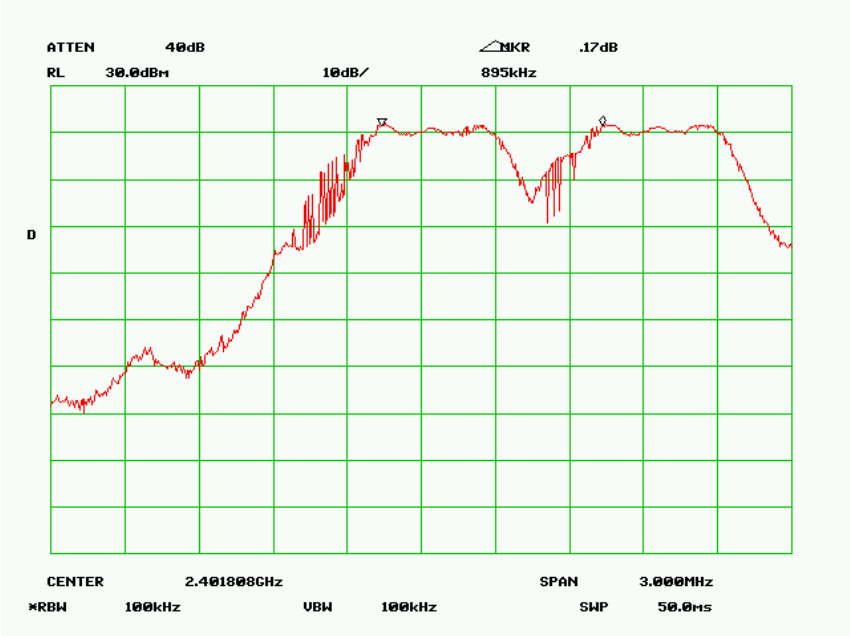


High Channel

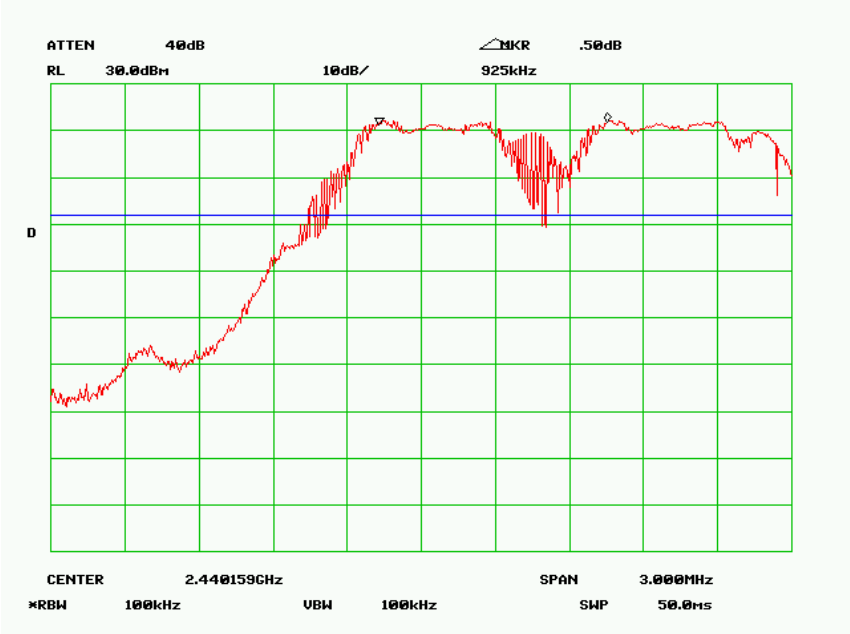


Handset

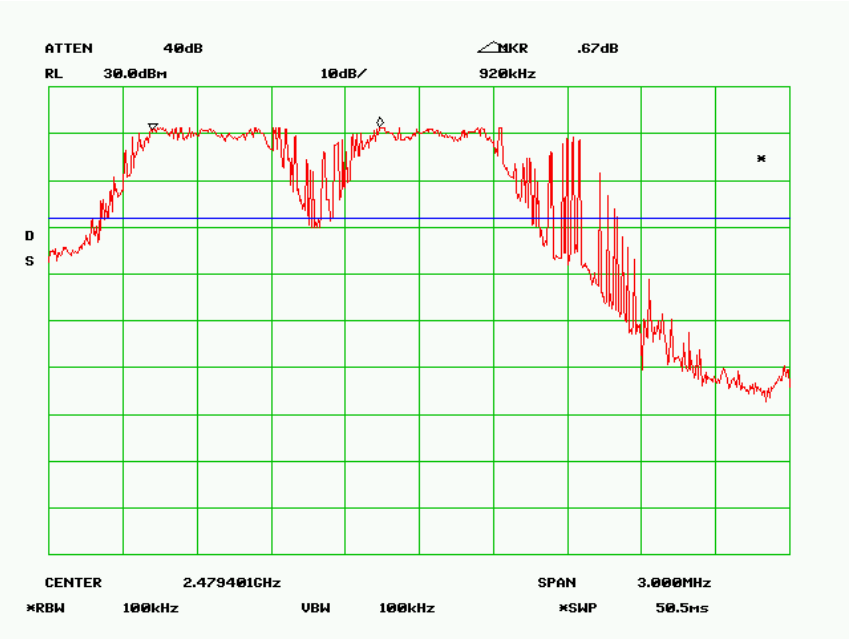
Low Channel



Middle Channel



High Channel



§15.247 (a) (1) - CHANNEL BANDWIDTH

Standard Applicable

According to §15.247(a)(l), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2005-08-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1016 mbar

**The testing was performed by James Ma on 2005-09-22.*

Measurement Result

Base

Channel	Frequency MHz	Channel Bandwidth (KHz)	Limit KHz
Low	2401.81	720	<1000
Mid	2440.16	743	<1000
High	2479.40	777	<1000

Handset

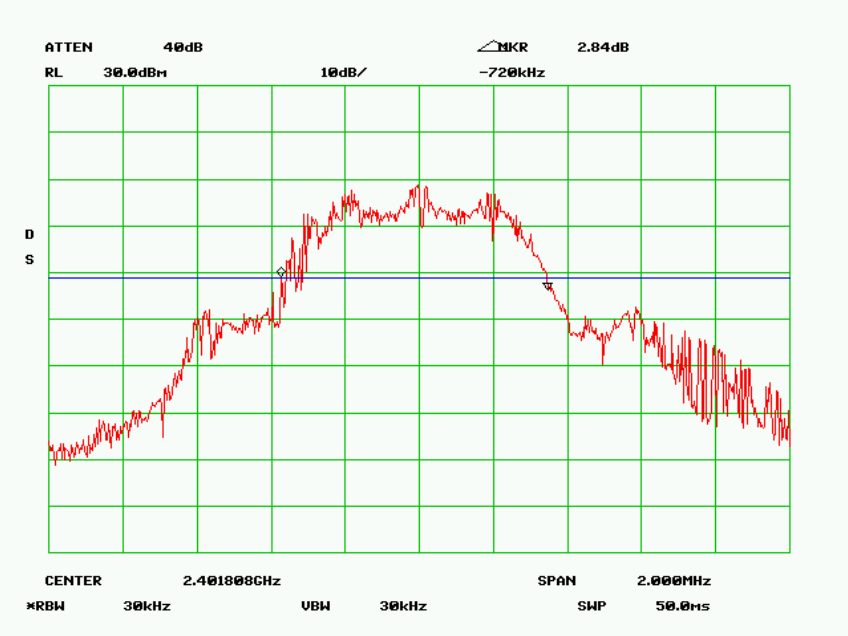
Channel	Frequency MHz	Channel Bandwidth (KHz)	Limit KHz
Low	2401.81	845	<1000
Mid	2440.16	815	<1000
High	2479.40	820	<1000

Plot of Channel Bandwidth

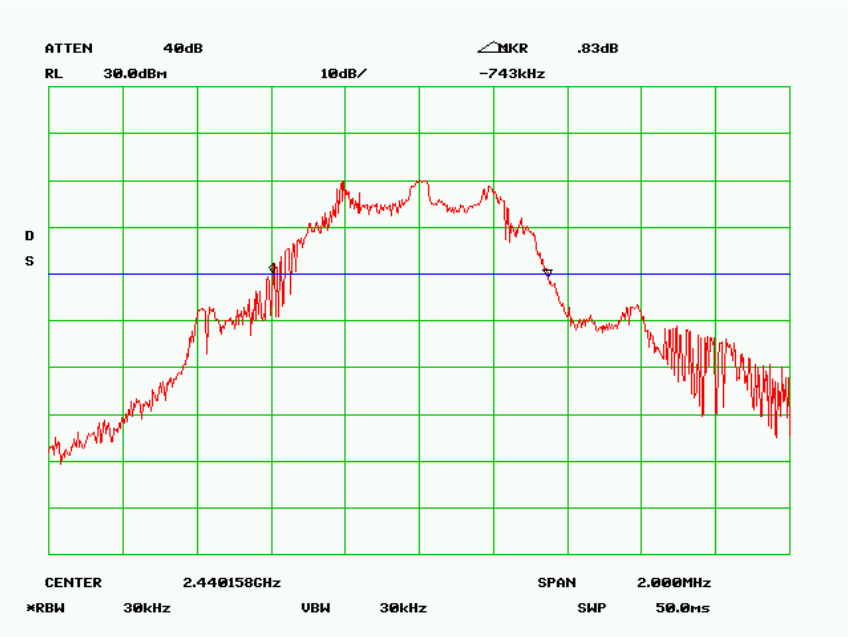
Please see the following plots

Base

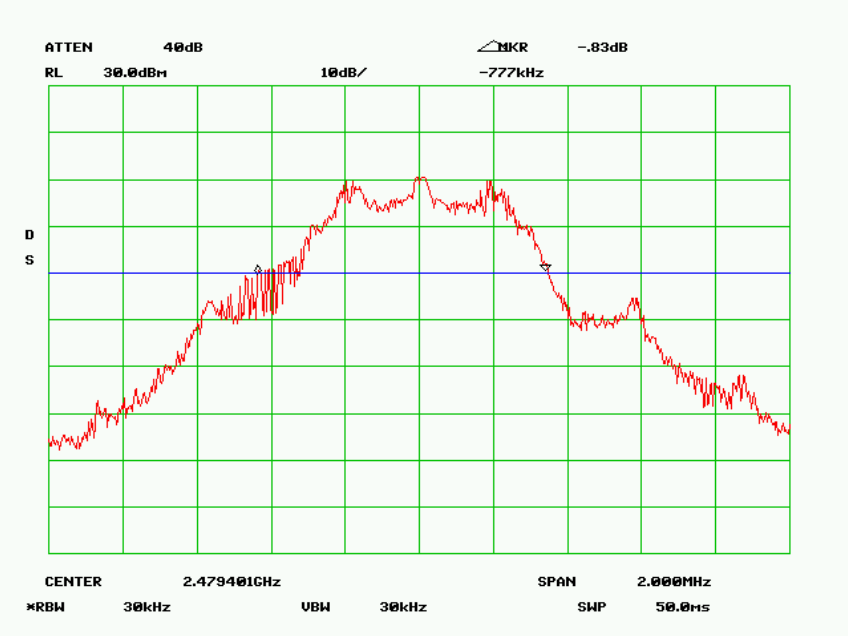
Low Channel



Middle Channel

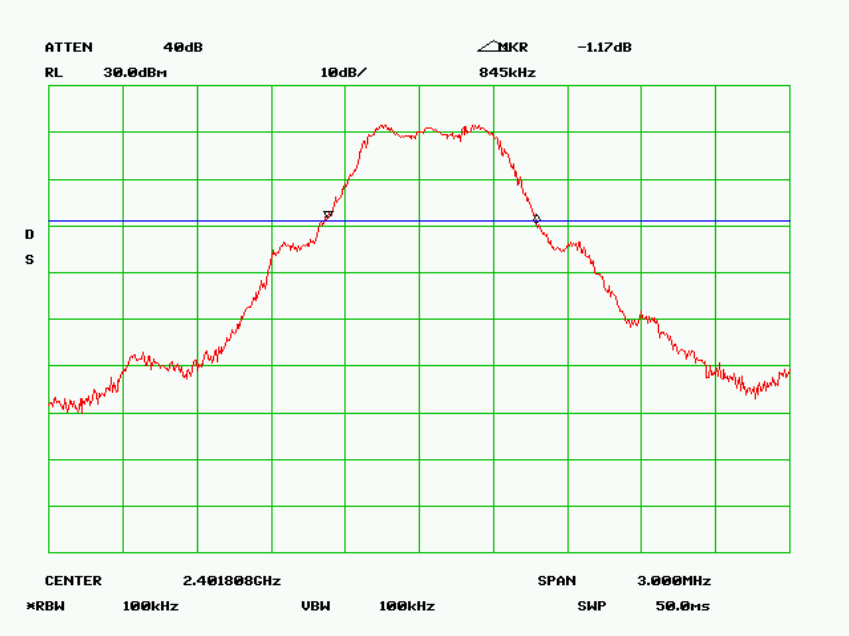


High Channel

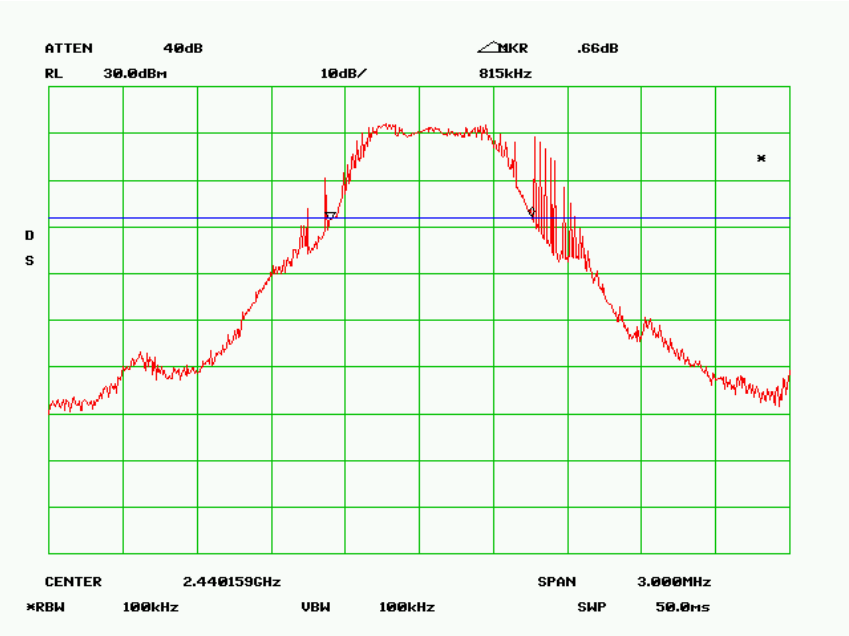


Handset

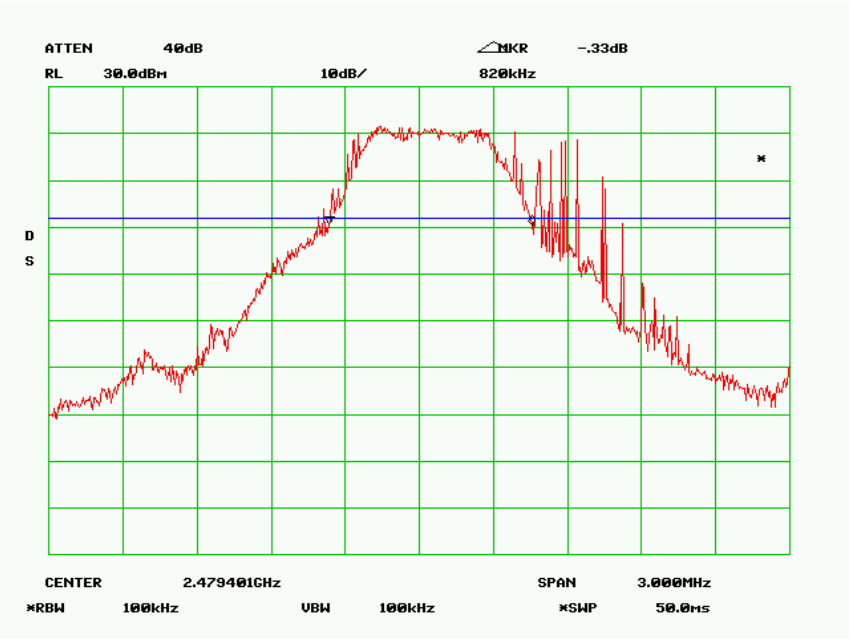
Low Channel



Middle Channel



High Channel



§15.247 (a) (1) (iii) - NUMBER OF HOPPING FREQUENCY USED

Standard Applicable

According to §15.247(a)(1)(iii), frequency-hopping systems operating in the 2400-2483.5Mhz band shall use at least 15 hopping frequencies.

Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the bench without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the SA on Max-Hold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

Test Equipment

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2005-08-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1016 mbar

**The testing was performed by James Ma on 2005-09-22.*

Measurement Results

Base

Measurement	Standard	Result
75	>15	Compliant

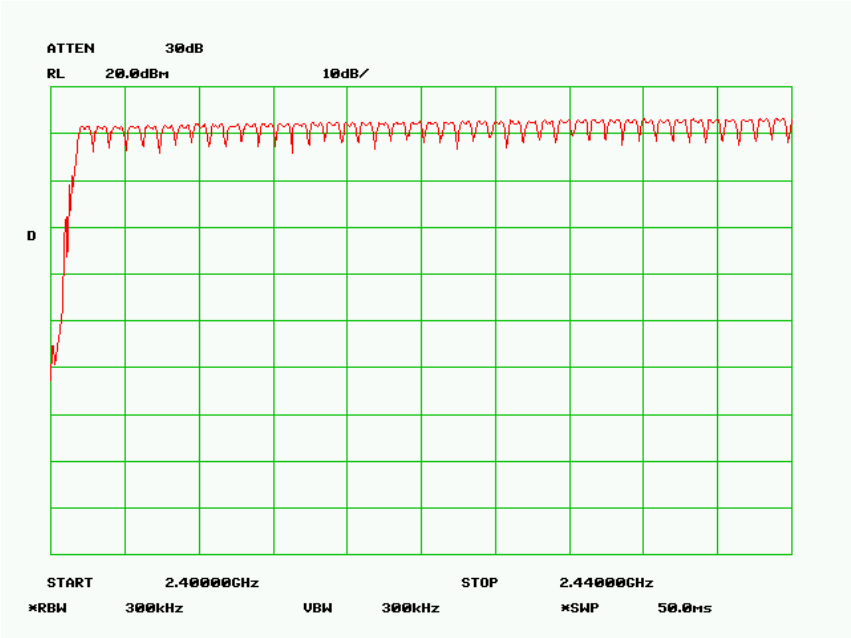
Handset

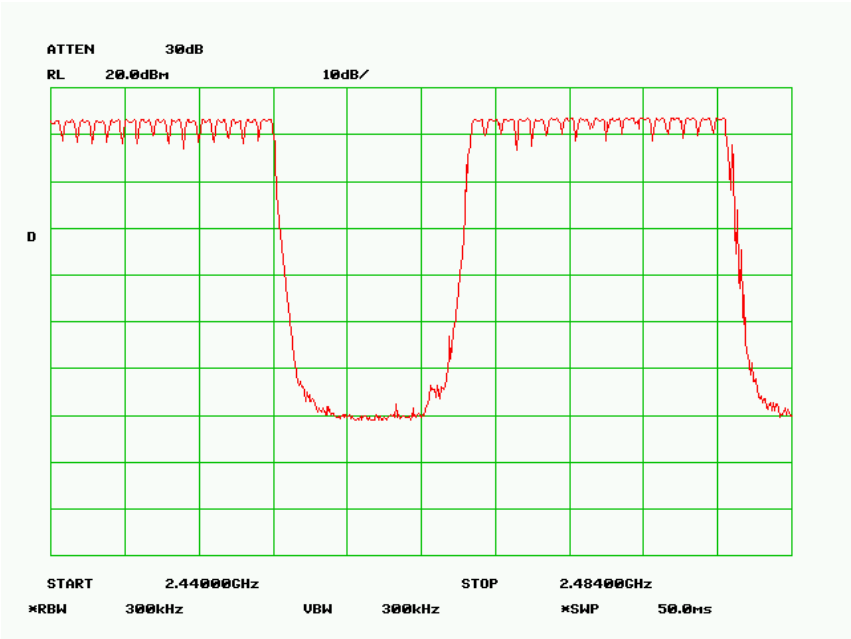
Measurement	Standard	Result
75	>15	Compliant

Plots of Number of Hopping Frequency

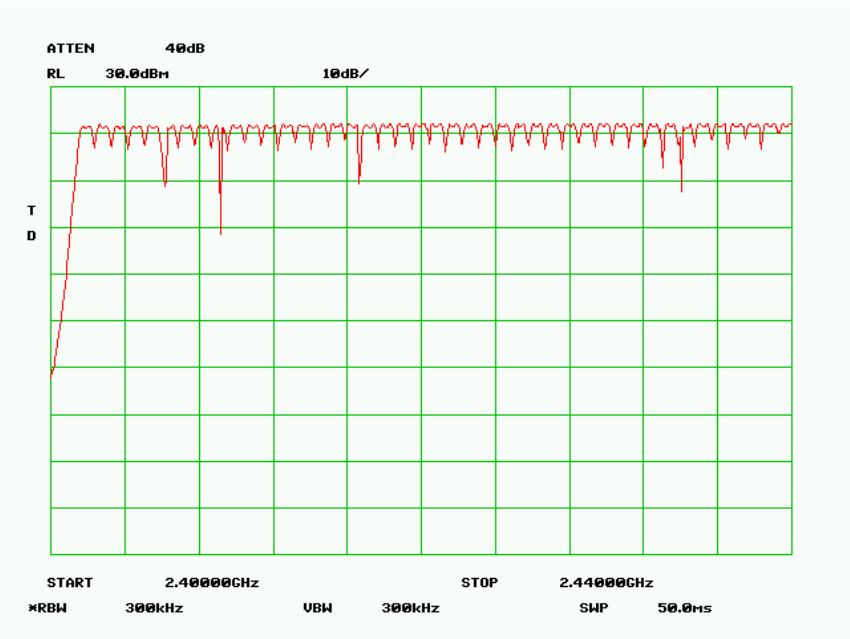
Please refer to the attached plots.

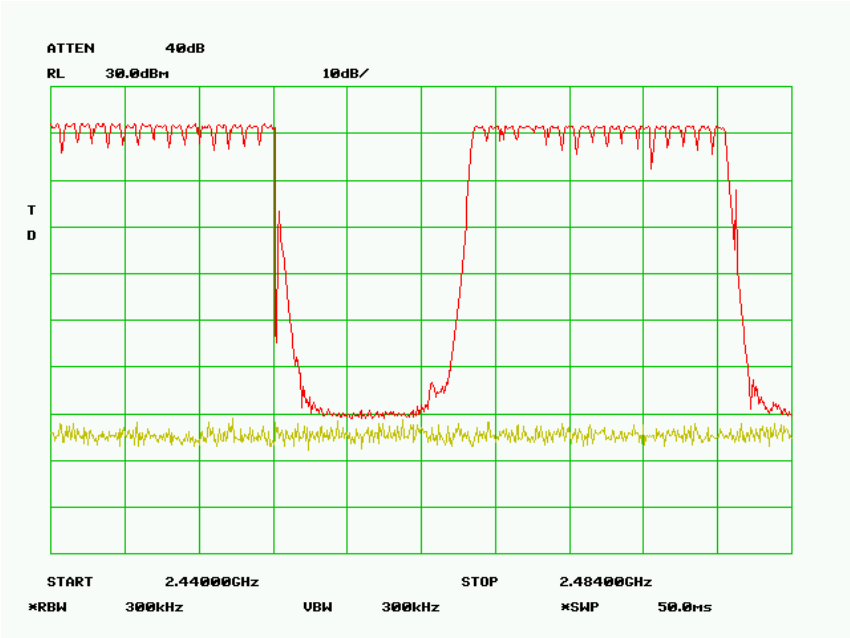
Base





Handset


ATTEN 40dB
RL 30.0dBm 10dB/
T
D
START 2.40000GHz STOP 2.44000GHz
*RBW 300kHz VBW 300kHz SWP 50.0ms


ATTEN 40dB
RL 30.0dBm 10dB/
T
D
START 2.44000GHz STOP 2.48400GHz
*RBW 300kHz VBW 300kHz *SWP 50.0ms

§15.247 (a) (1) (iii) - DWELL TIME

Standard Applicable

According to §15.247 (a)(1)(iii), 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.

Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
5. Repeat above procedures until all frequencies measured were complete.

Test Equipment

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2005-08-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1016 mbar

**The testing was performed by James Ma on 2005-09-22.*

Measurement Results

Base

Channel	Frequency MHz	Pulse Wide uSec	Occupied time per 1 Sec	Dwell Time Sec	Limit Sec
Low	2401.81	1116.7	71	0.079	0.4
Mid	2440.16	1108.3	73	0.081	0.4
High	2479.40	1108.3	75	0.083	0.4

Handset

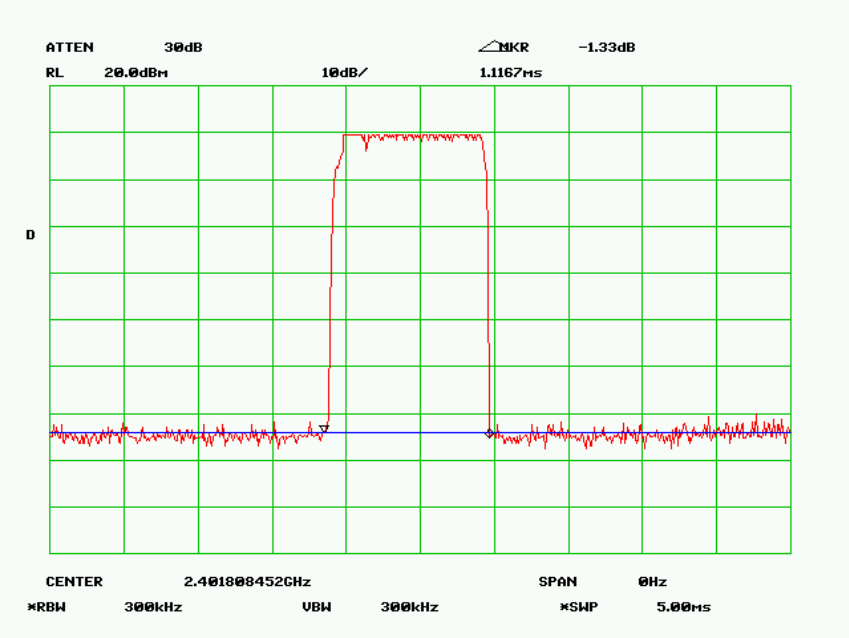
Channel	Frequency MHz	Pulse Wide uSec	Occupied time per 1 Sec	Dwell Time Sec	Limit Sec
Low	2401.81	1108.3	41	0.045	0.4
Mid	2440.16	1108.3	40	0.044	0.4
High	2479.40	1091.7	39	0.043	0.4

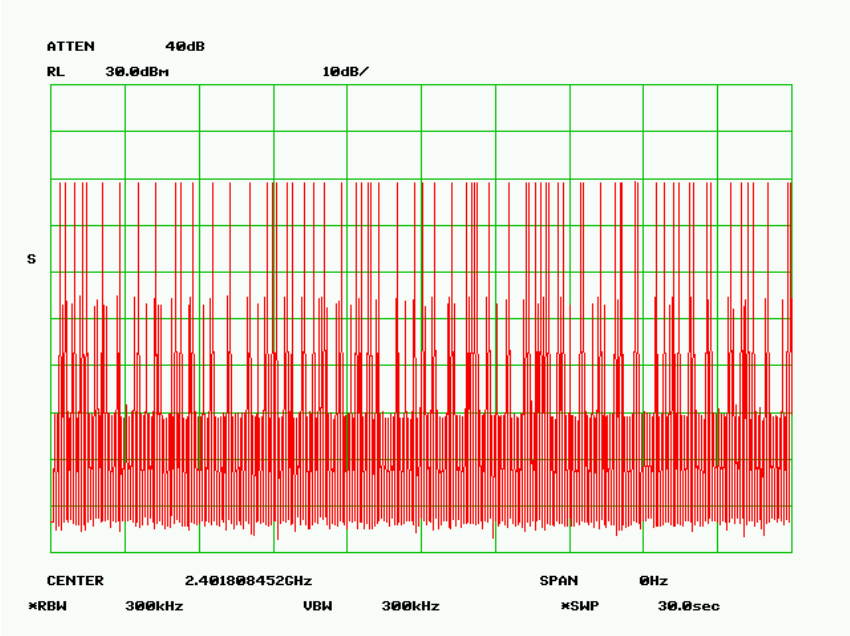
Plots of Dwell Time

Please refer the following plots.

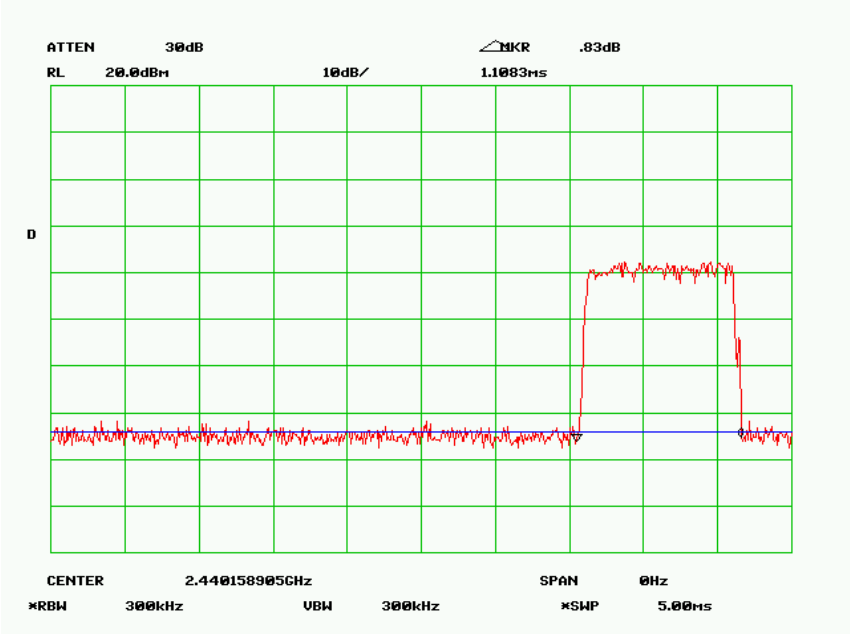
Base

Low Channel

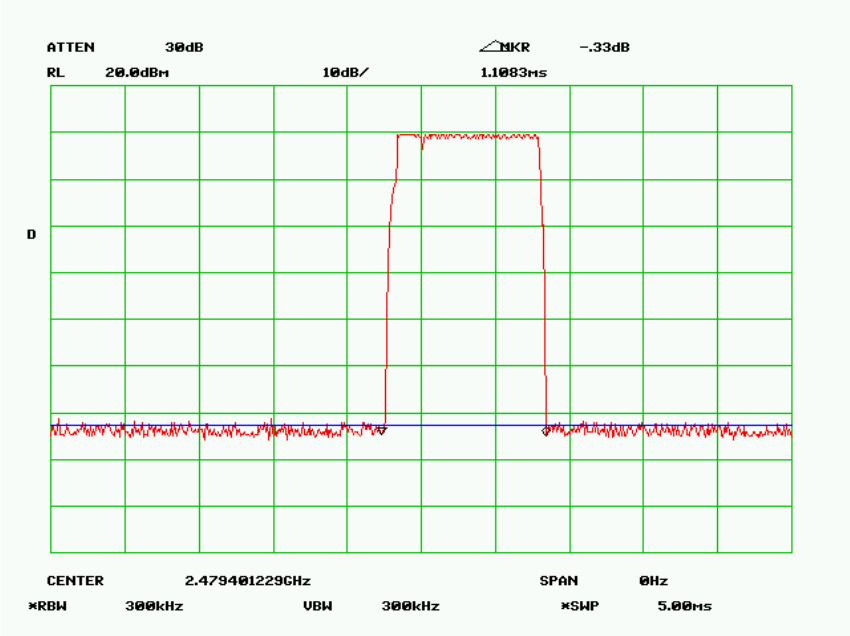




Middle Channel

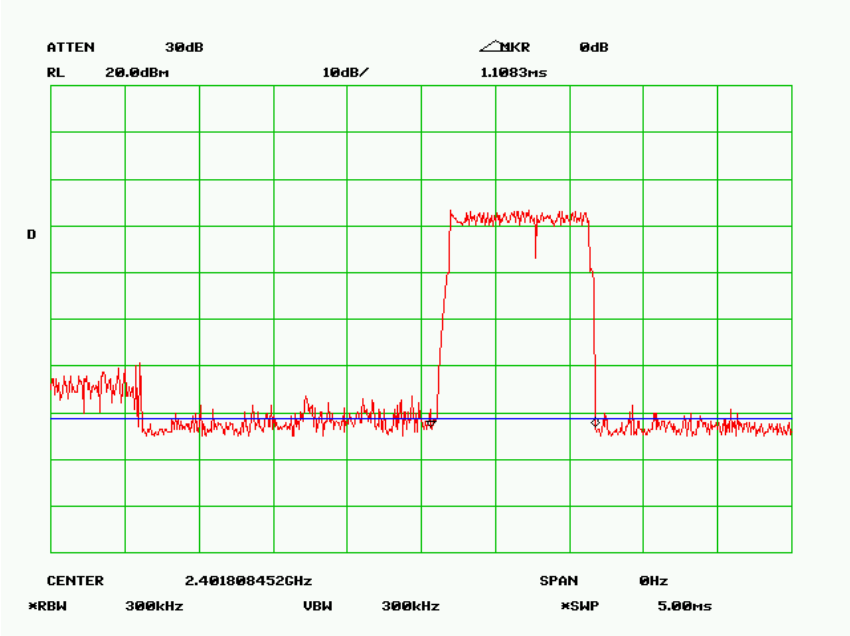


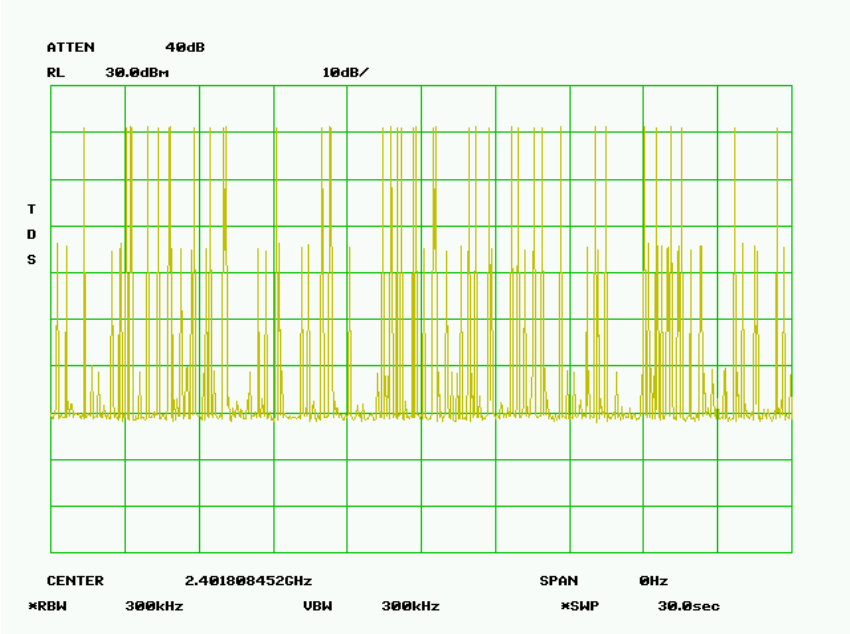
High Channel



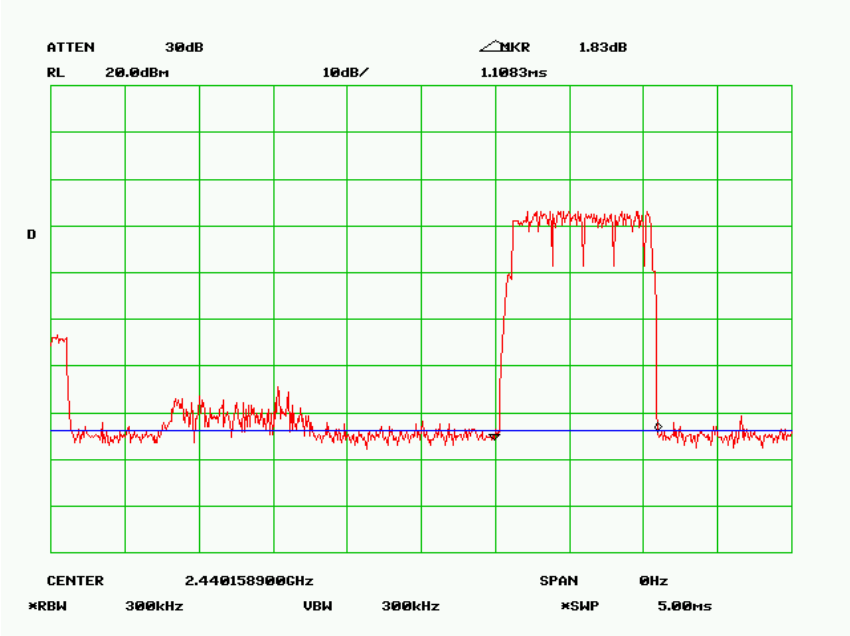
Handset

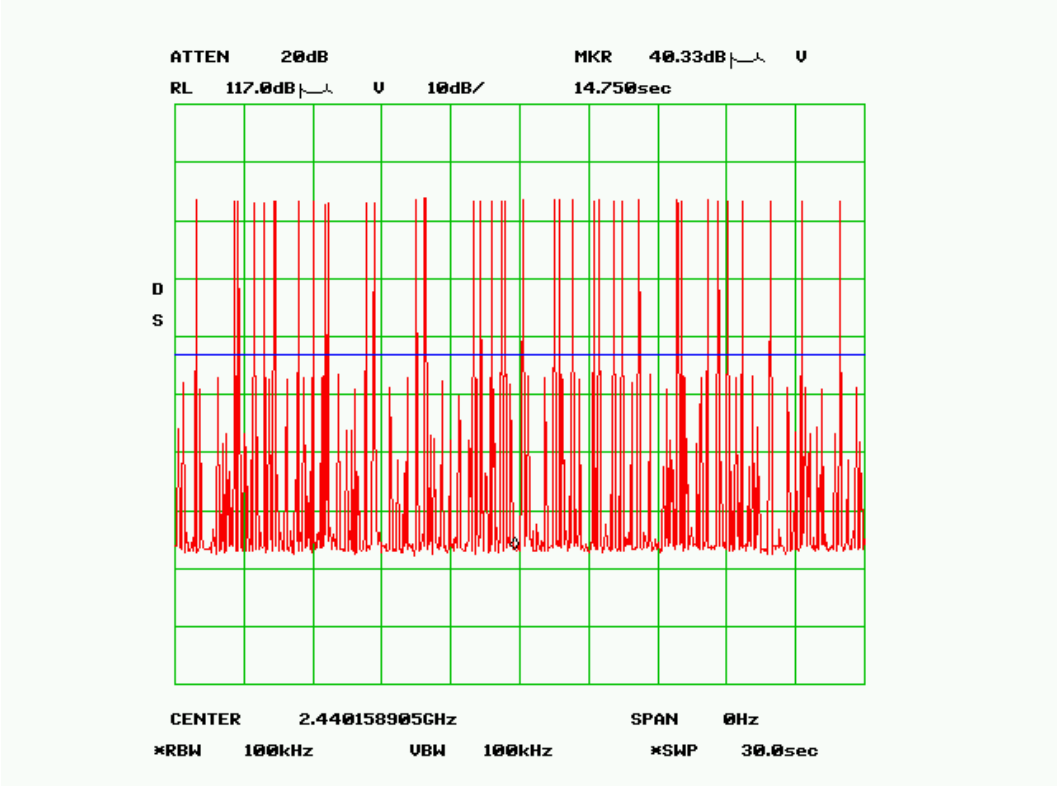
Low Channel



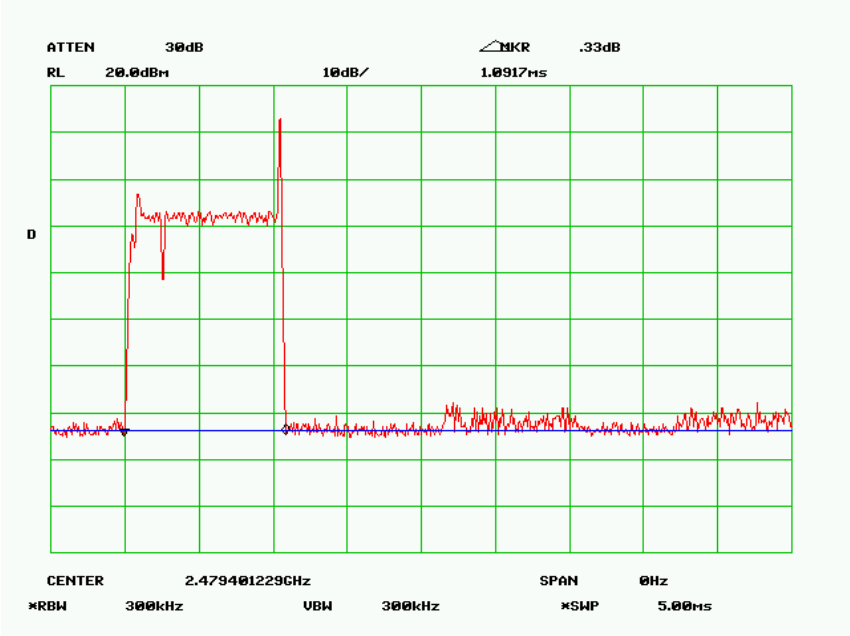


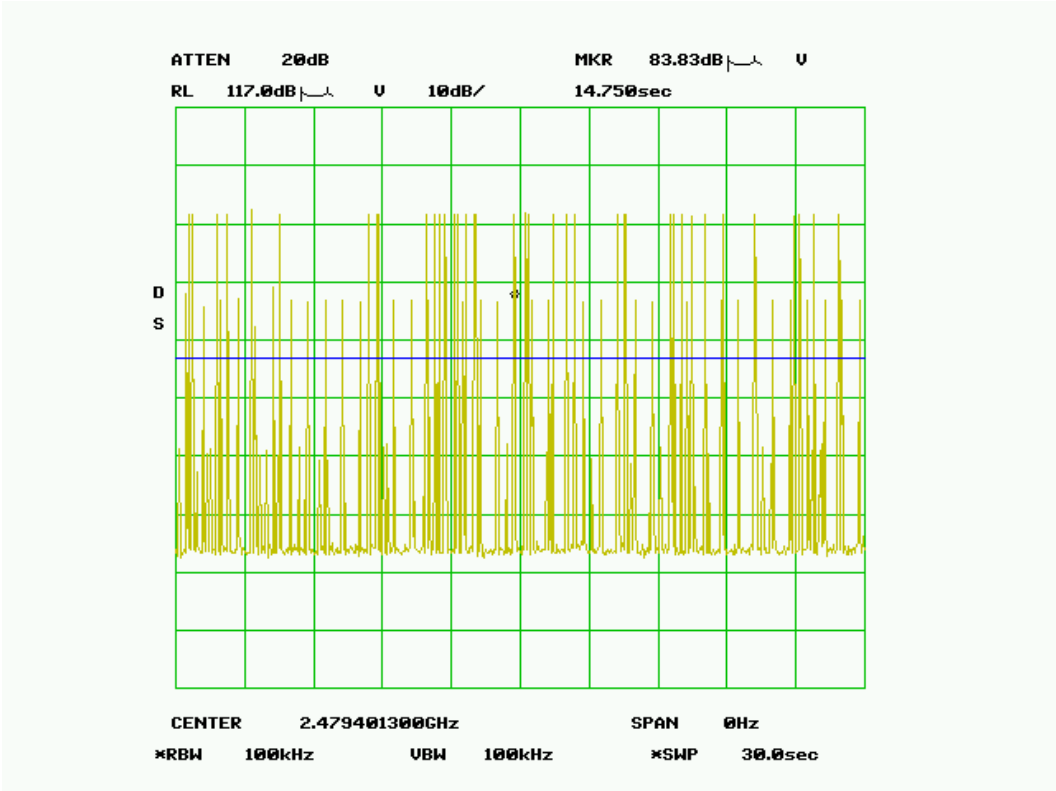
Middle Channel





High Channel





§15.247 (b) (1) - MAXIMUM PEAK OUTPUT POWER

Standard Applicable

According to §15.247(b) (1), for frequency hopping systems in the 2400-2483.5MHz band employing at least 75 hopping channels, and all direct sequence systems, the maximum peak output power of the transmitter shall not exceed 1 Watt.

Measurement Procedure

1. Place the EUT on the turntable and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Test Equipment

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2005-08-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1016 mbar

**The testing was performed by James Ma on 2005-09-22.*

Measurement Result

Base

Channel	Frequency MHz	Max Peak Output Power (dBm)	(mW)	Limit (mW)	Result
Low	2401.81	11.5	14.13	1000	pass
Mid	2440.16	13.17	20.75	1000	pass
High	2479.40	13.67	23.28	1000	pass

Handset

Channel	Frequency MHz	Max Peak Output Power (dBm)	(mW)	Limit (mW)	Result
Low	2401.81	20.33	107.89	1000	pass
Mid	2440.16	20.83	121.06	1000	pass
High	2479.40	19.83	96.16	1000	pass

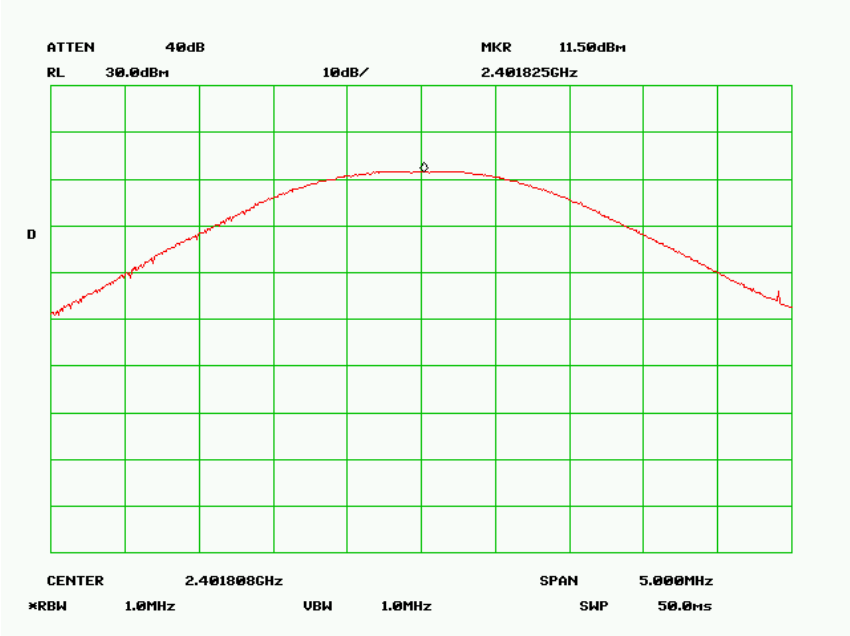
Offset = 0.5 dB (cable loss + connector)

Plots of Maximum Peak Output Power

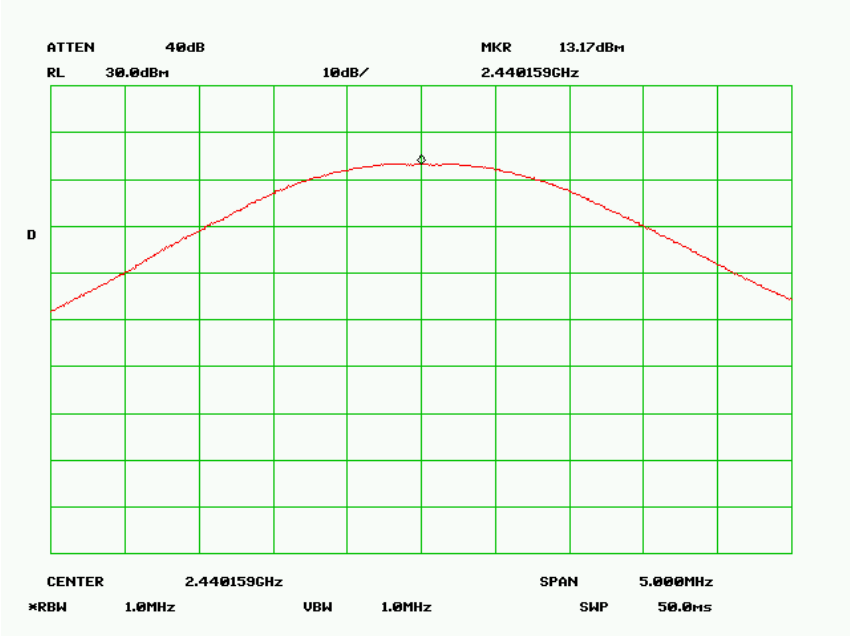
Please see the following plots

Base

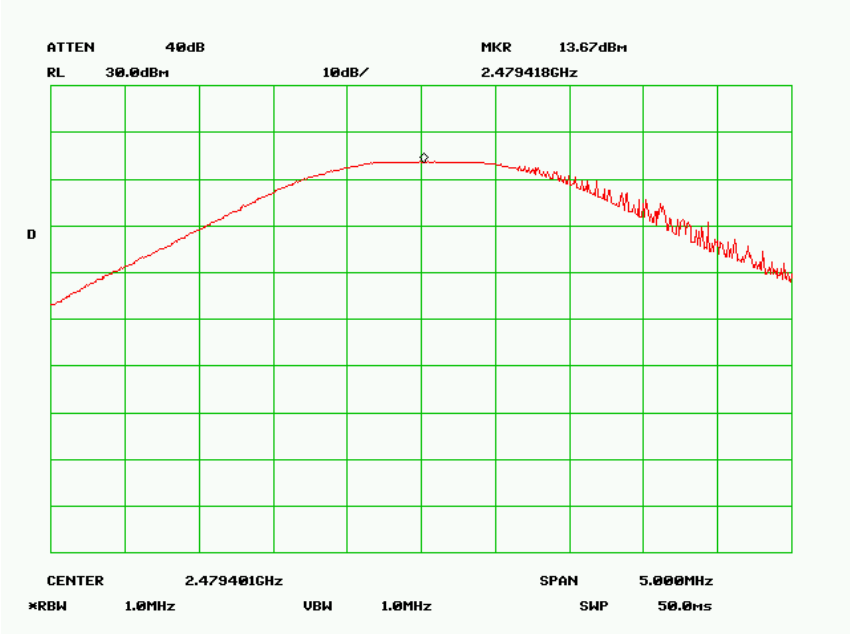
Low Channel



Middle Channel

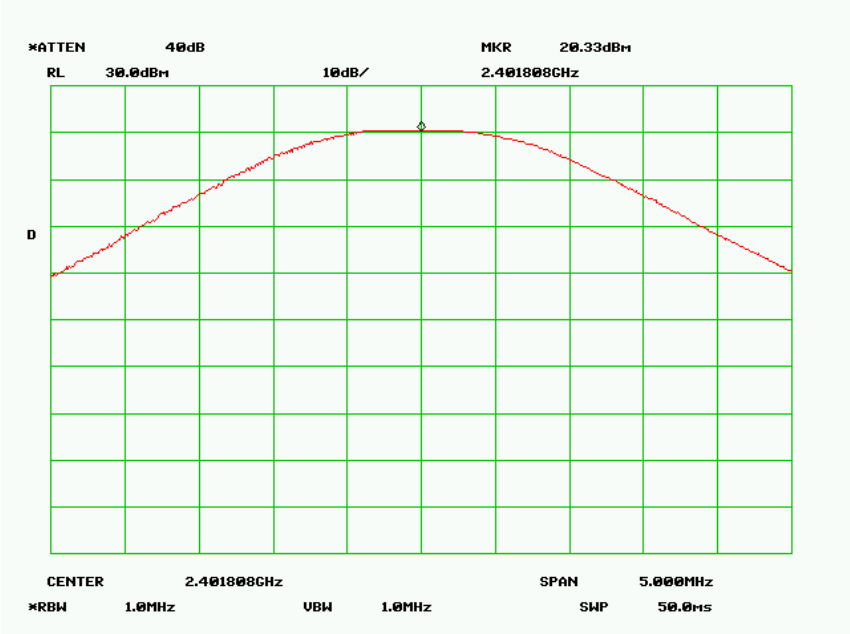


High Channel

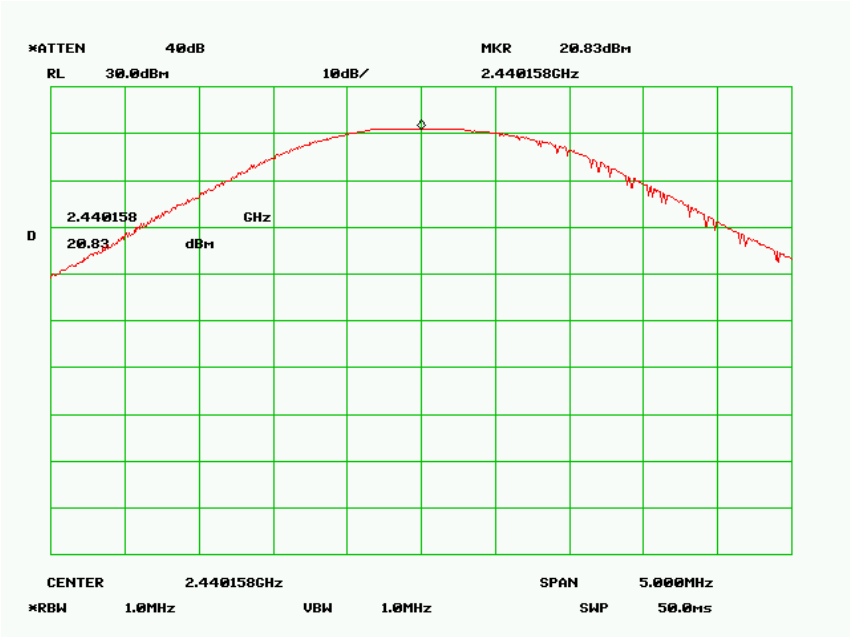


Handset

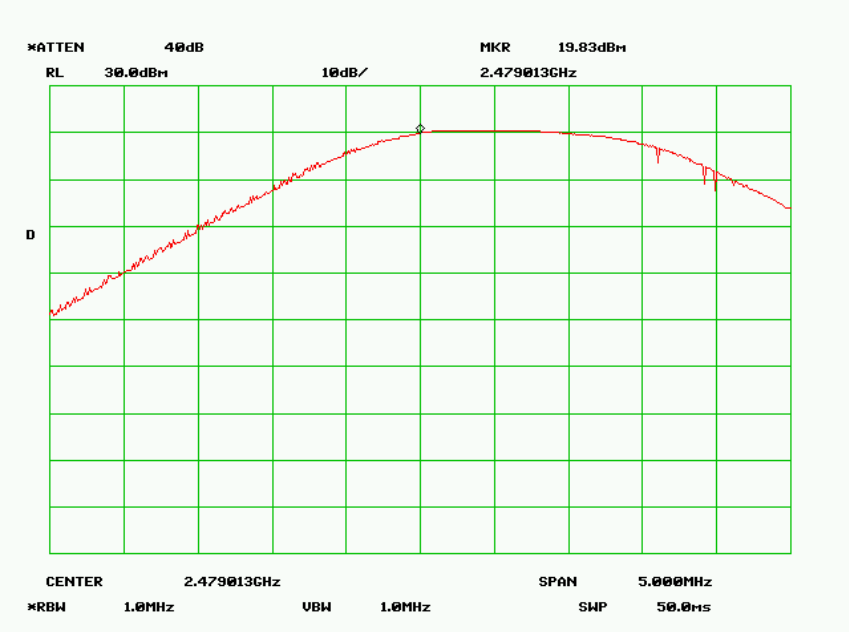
Low Channel



Middle Channel



High Channel



§15.247 (b)(5) - RF EXPOSURE

According to §15.247(b)(5) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-15000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

MPE Prediction

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S = PG/4\pi R^2$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

Base:

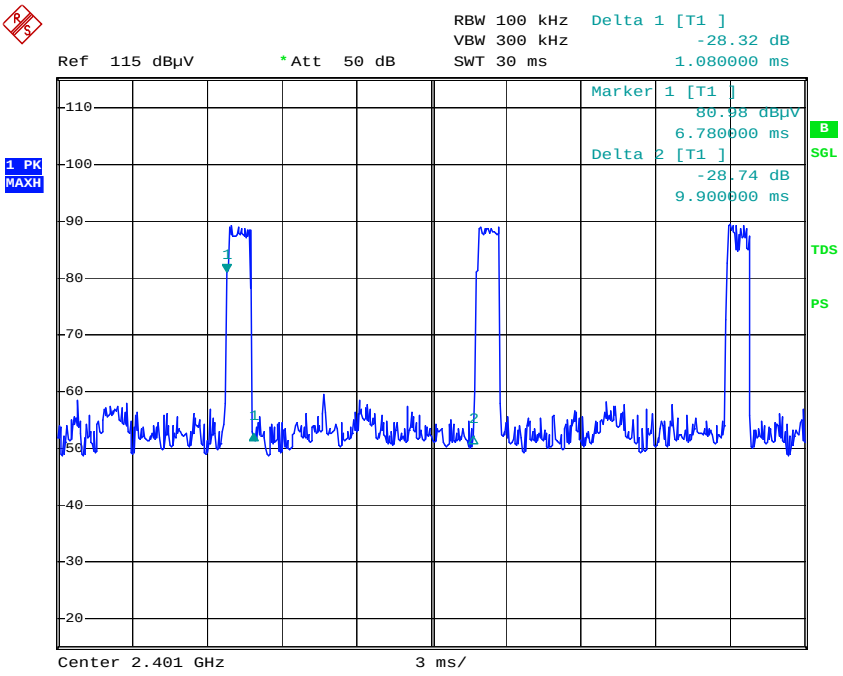
Maximum peak output power at antenna input terminal: 13.67 (dBm)
Maximum peak output power at antenna input terminal: 23.28 (mW)
Prediction distance: 20 (cm)
Predication frequency: 2400 (MHz)
Antenna Gain (typical): 1.2 (dBi)
Maximum antenna gain: 1.32 (numeric)
Power density at predication frequency at 20 cm: 0.006(mW/cm^2)
MPE limit for uncontrolled exposure at prediction frequency: 1.0 (mW/cm^2)

Test Result

The predicted power density level at 20 cm is 0.006 mW/cm^2. This is below the uncontrolled exposure limit of 1mW/cm^2 at 2400 MHz. The EUT is used at least 20cm away from user's body. It is determined as mobile equipment.

Handset:

Please see the plots hereinafter for duty cycle measurement.



Duty cycle of CH11

Date: 28.OCT.2005 17:01:36

Duty cycle = Tx on /Tx on +Tx off *100%= 1.08ms/9.9ms*100%= 10.9%

d < 2.5cm
Average Power = Peak Power x duty cycle = 121.06mW x 10.9% = 13.20 mW < (60/2.4) mW

Therefore, according to the exclusion list, no SAR testing is needed.

§15.247 (d) - 100 KHZ BANDWIDTH OF BAND EDGES

Standard Applicable

According to §15.247(c), 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 §15.209(a) is not required.

Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2005-08-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1016 mbar

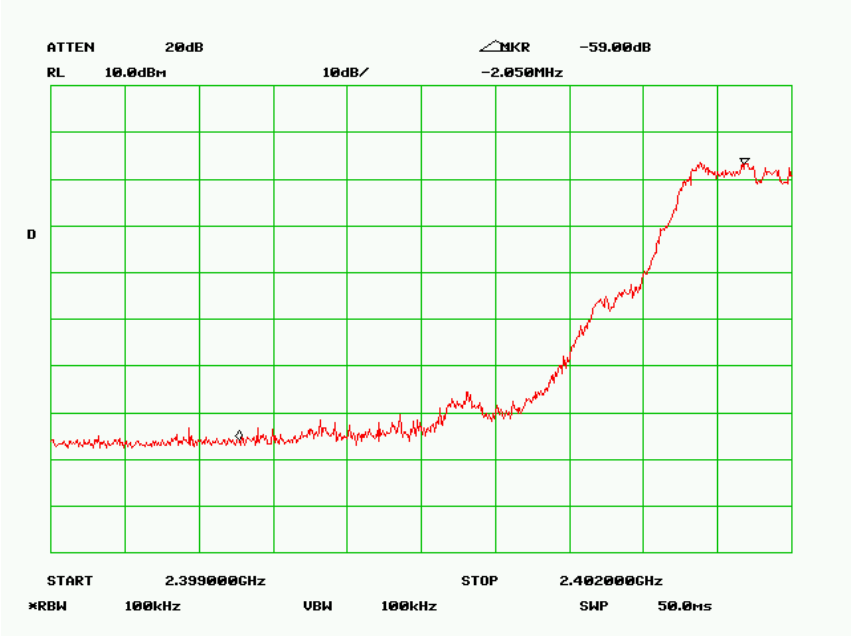
**The testing was performed by James Ma on 2005-09-22.*

Plots of 100kHz Bandwidth of Band Edge

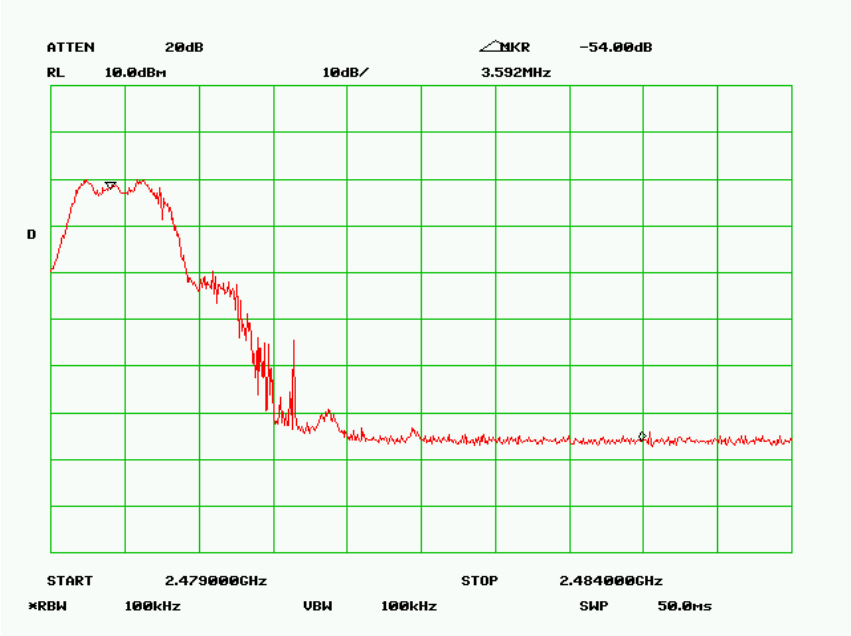
Please refer the following plots.

Base

Low Channel

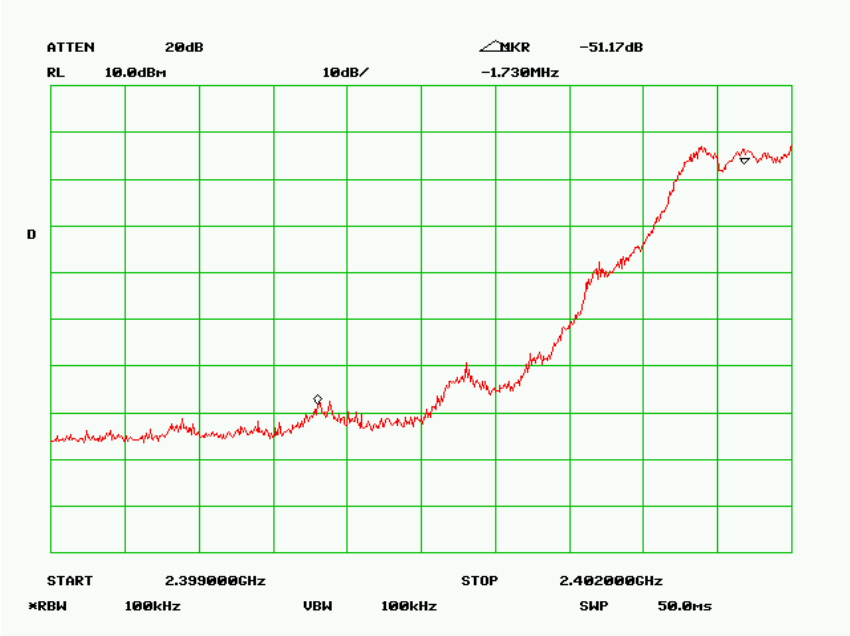


High Channel

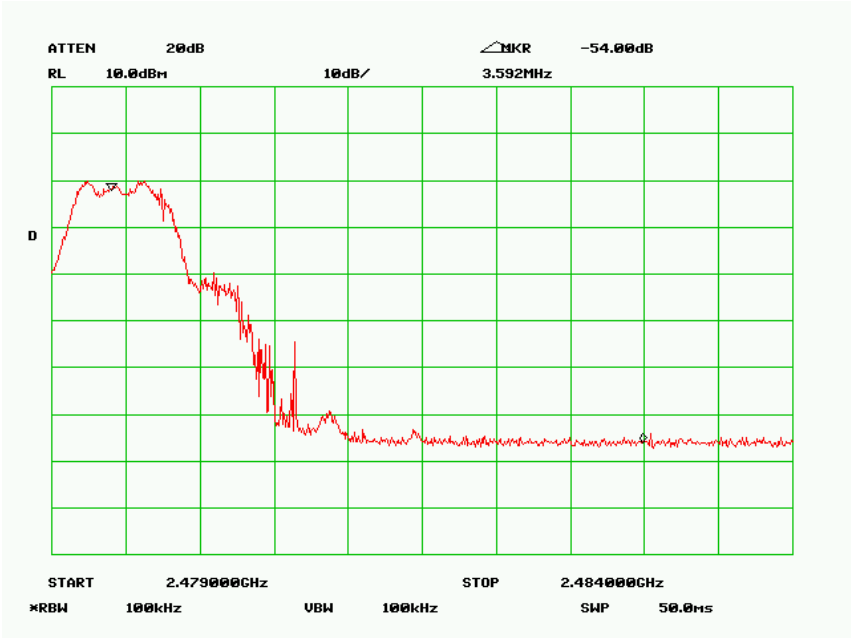


Handset

Low Channel



High Channel



§2.1051 - SPURIOUS EMISSION AT ANTENNA PORT

Standard Applicable

According to §15.209 (f) and §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit.

Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

2. Position the EUT on a bench without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.

3. Set the SA on Max-Hold Mode, and then keep the EUT in transmitting mode. Record all the signals from each channel until each one has been recorded.

4. Set the SA on View mode and then plot the result on SA screen.

5. Repeat above procedures until all frequencies measured were complete.

Test Equipment

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2005-08-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	25° C
Relative Humidity:	45%
ATM Pressure:	1016 mbar

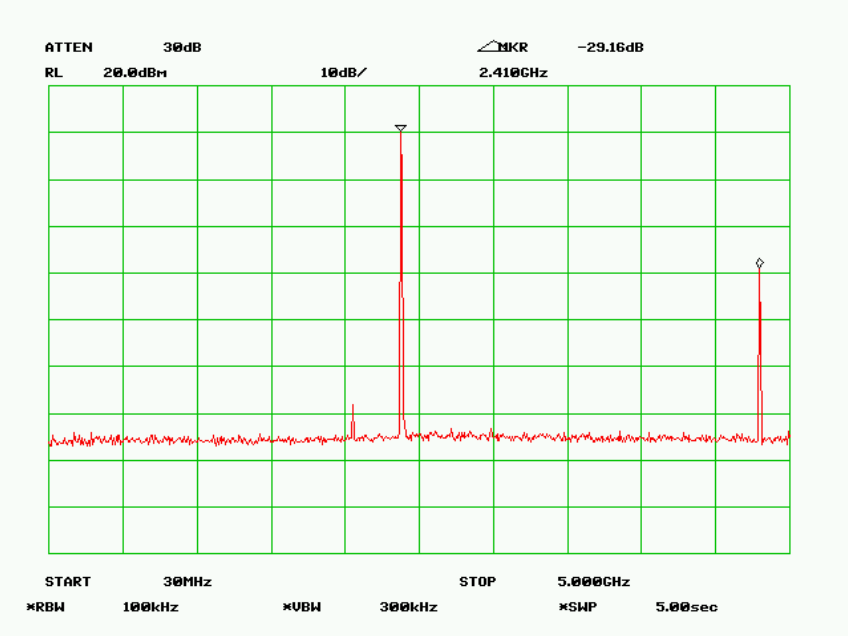
**The testing was performed by James Ma on 2005-09-22.*

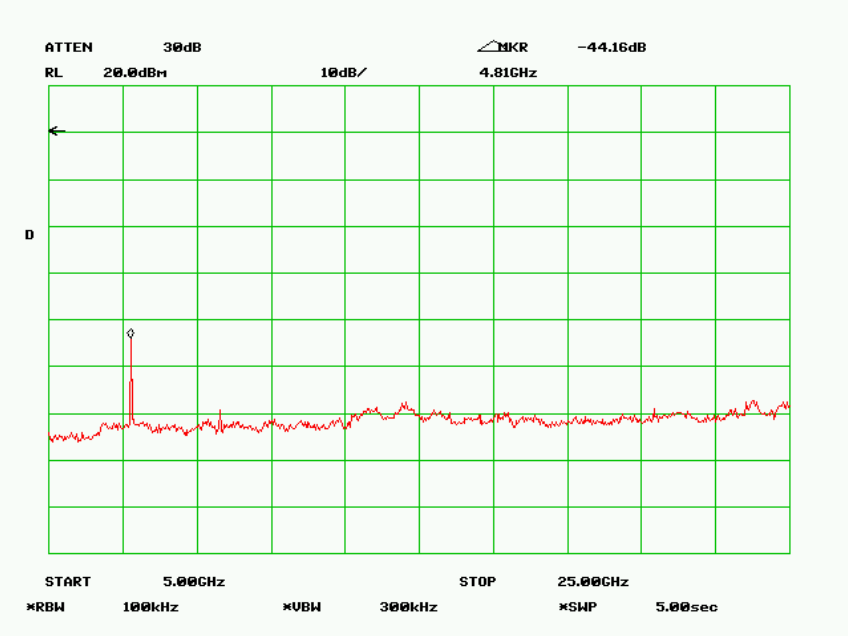
Measurement Results

Please refer to the following plots.

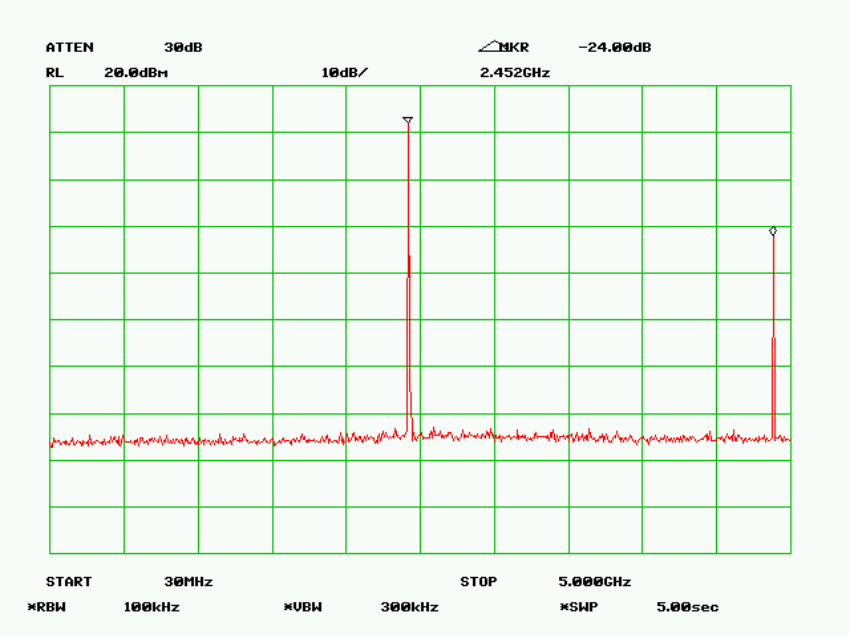
Base

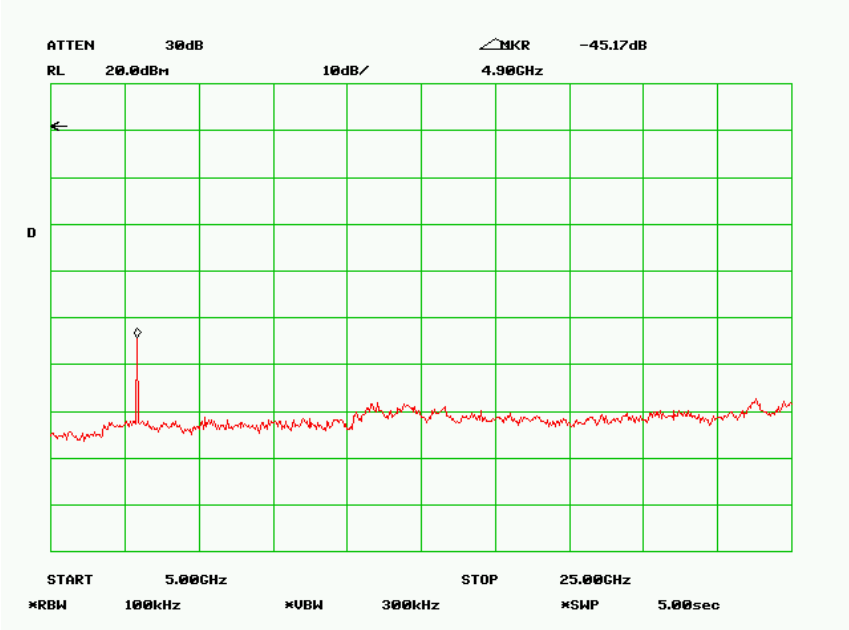
Low Channel



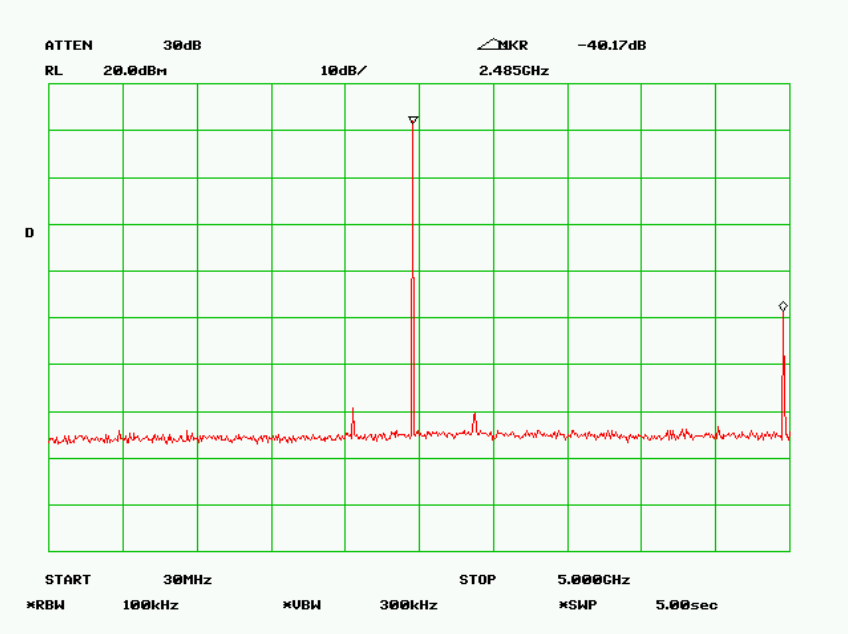


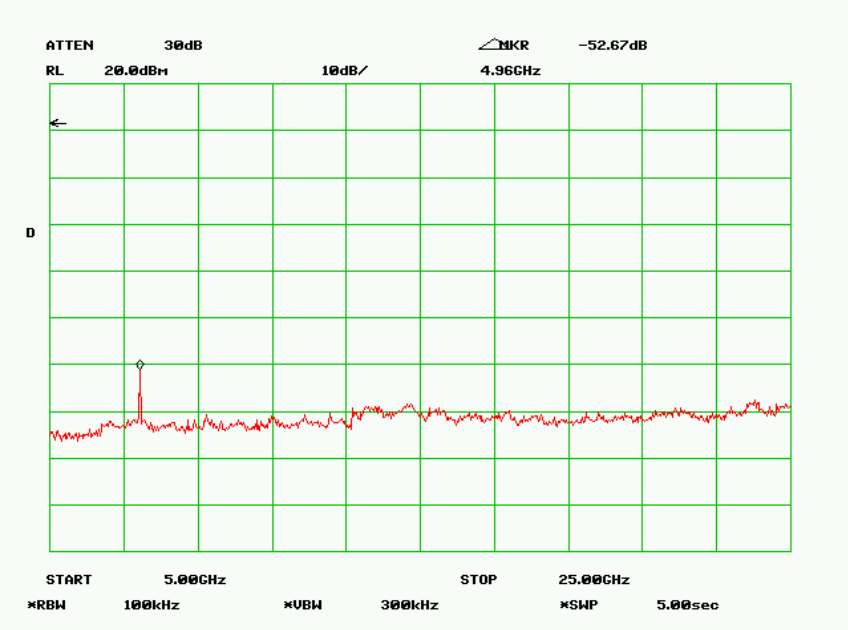
Mid Channel


ATTEN 30dB
MKR -24.00dB
RL 20.0dBm
10dB/
2.452GHz
START 30MHz
STOP 5.000GHz
*RBW 100kHz
*VBW 300kHz
*SWP 5.00sec


ATTEN 30dB
MKR -45.17dB
RL 20.0dBm
10dB/
4.90GHz
D
START 5.00GHz
STOP 25.00GHz
*RBW 100kHz
*VBW 300kHz
*SWP 5.00sec

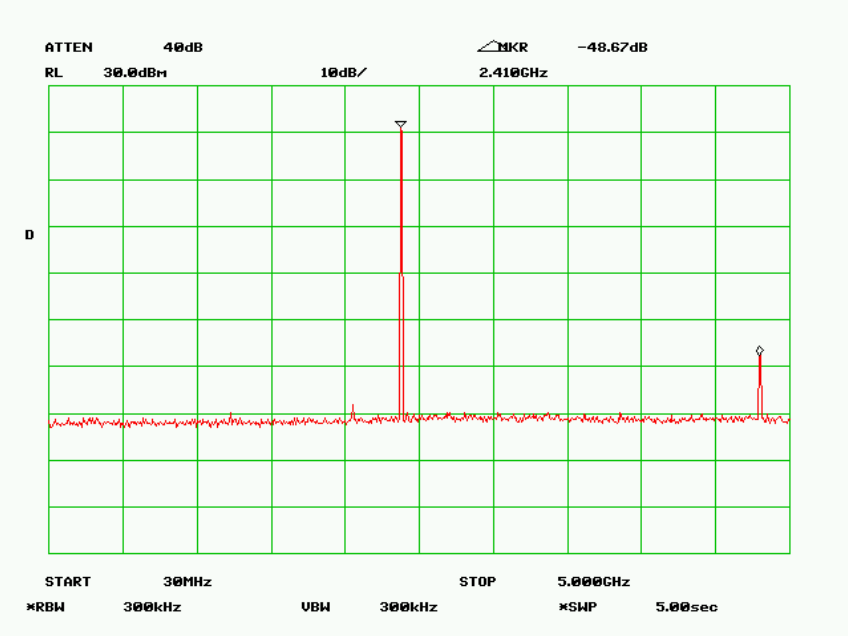
High Channel

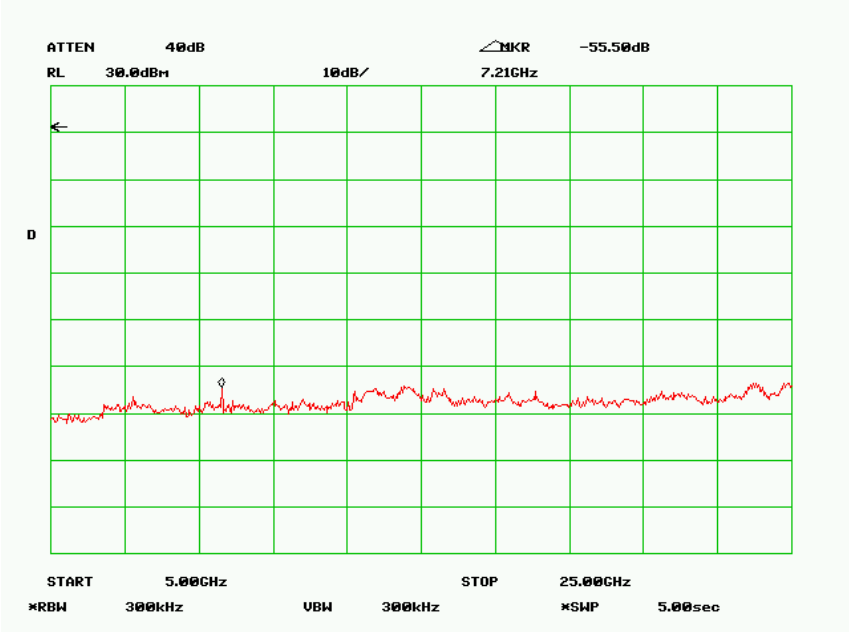




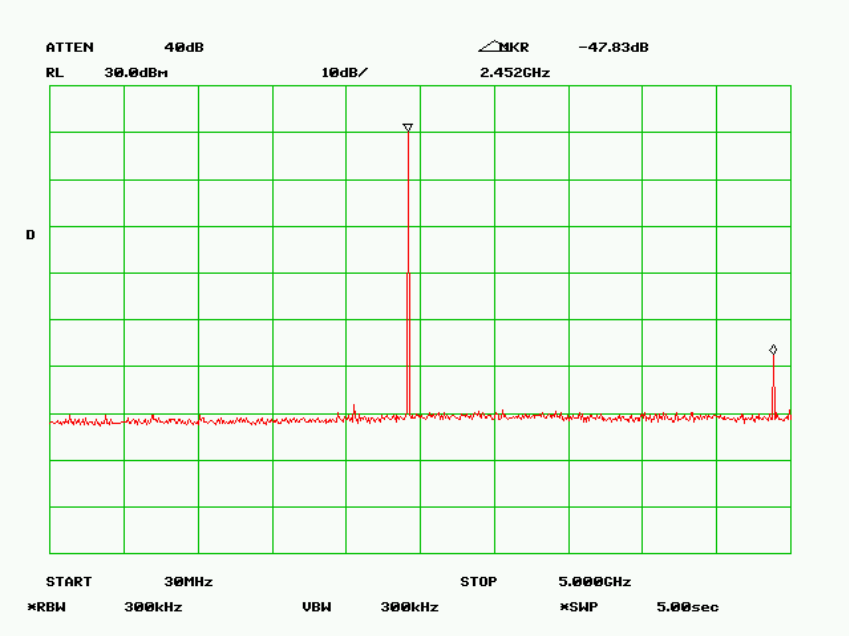
Handset

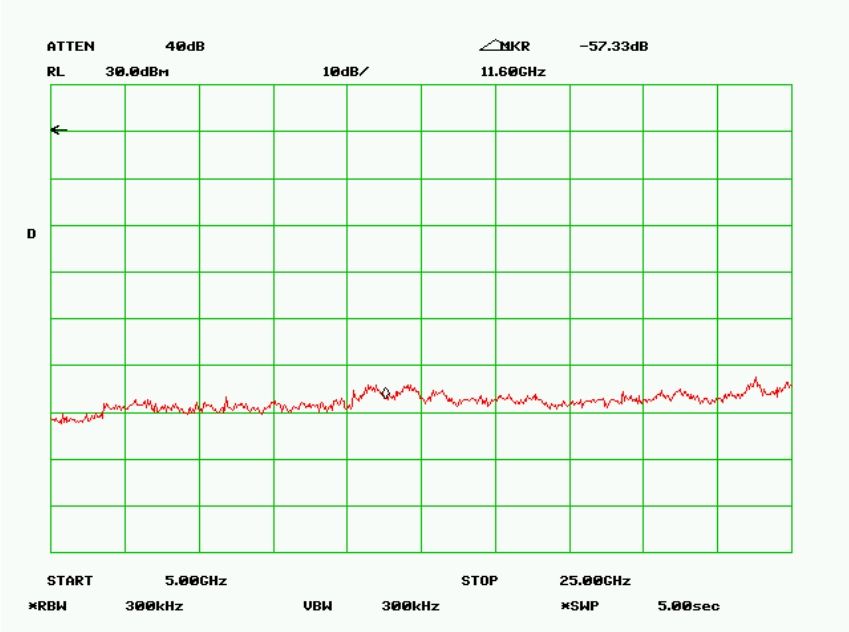
Low Channel





Mid Channel


ATTEN 40dB
MKR -47.83dB
RL 30.0dBm
10dB/
2.452GHz
D
START 30MHz
STOP 5.000GHz
*RBW 300kHz
VBW 300kHz
*SWP 5.00sec


ATTEN 40dB
MKR -57.33dB
RL 30.0dBm
10dB/
11.60GHz
D
START 5.00GHz
STOP 25.00GHz
*RBW 300kHz
VBW 300kHz
*SWP 5.00sec

High Channel