



Test Report No. 8812319768

For ALVARION Ltd.

Equipment Under Test:

**BreezeAccess VL 900
Broadband Wireless Access System**

**From The Standards Institution
Of Israel
Industry Division
Electronics & Telematics Laboratory
EMC Section**



Certificate No. 1487-01



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Title: BreezeAccess VL 900 Broadband Wireless Access System	
Model: BA VL 900	FCC ID: LKT-VL-900

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Title: BreezeAccess VL 900 Broadband Wireless Access System**Model:** BA VL 900

FCC ID: LKT-VL-900

1. Applicant information

Order placed by:	Alvarion Ltd
Address:	21A Habarzel str, Tel-Aviv, 69710, Israel
Sample for test selected by:	The customer
The date of test:	May 2008

Equipment under test information

Description of Equipment Under Test (EUT):	Transmitter BA VL 900
Model:	BreezeAccess VL 900
Serial Number:	NA
Manufactured by:	Alvarion Ltd

2. Test performance

Location:	SII EMC Section
Purpose of test:	Apparatus compliance verification in accordance with emission requirements
Test specifications:	47CFR part 15.247, 15.205 15.207. 15.209 and part 1 §1.1310

This Test Report contains 50 pages and may be used only in full.
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This Test Report applies only to the specimen tested and may not be applied to other specimens of the same product.

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3. Summary of test:

The EUT was found to be in compliance with requirements of: 47CFR Part 15 §§ 15.247 and 15.205, 15.207, 15.209 and part 2 §§ 2.1049

Parameter	47CFR part 15 subclasses
<i>Transmitter characteristics</i>	
Occupied bandwidth	15.247(a)(2)
Peak output power	15.247(b)(3)(4)
Spurious emissions at antenna terminal	15.247(d)
Spurious emissions radiated	15.247(d), 15.205
Main conducted emissions	15.207
Radiated emissions	15.209

Test performed by: Mr. Michael Feldman test technician

Test report prepared by: Mr. Michael Feldman test technician

Test report approved by: Mr. Yuri Rozenberg. Head of EMC Branch



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4. Equipment under test description.

*The customer provided description.

4.1 General description

BreezeACCESS VL 900MHz is a high capacity, IP services oriented Broadband Wireless Access system. The system contains a base station unit and a subscriber unit. Both base station and subscriber radio structures are identical. BA VL 900MHz is a digitally modulated TDD system operating in the 902MHz - 928MHz band, with 5MHz channel bandwidth. Channel center frequency is controlled by embedded SW from 905MHz to 925MHz in 0.5MHz steps. The basic system is a two-box configuration made up of:

1. Indoor unit that contains a power supply (PS1073) and an Ethernet 10/100BaseT (RJ 45) interface.
2. Outdoor unit containing the entire radio and digital sections.
3. A single CAT5 cable connecting the indoor and outdoor unit serves for carrying the data as well as for transferring power, management and control signals.

The subscriber indoor unit is a single power supply (55VDC) and Ethernet 10/100BaseT (RJ 45) interface. The base station indoor unit is a 19" rack containing several indoor unit cards and a single main power supply for all units. Base station radio unit, Stand-alone unit and Subscriber radio unit are identical hardware units in design and construction. The system configurations are distinguished by software application only.

Base station configuration	
Complete system	AU-E-BS-900-VL AUS-E-BS-900-VL
Shelf	BS-SH-VL (Generic)
Power supply AC	BS-PS-AC-VL
BS-AU-VL	Indoor card
Outdoor units	AU-E-BS-900-ODU-VL AUS-E-BS-900-ODU-VL
Base station. Stand alone	
Outdoor units	AU-E-SA-900-ODU-VL AUS-E-SA-900-ODU-VL
Subscriber unit configuration	
Complete system	SU-A/E-900-3-BD-VL

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EUT technical characteristics

Transmitter technical characteristics.		Note	
Stand-alone/fixed use			
Assigned frequency range	902 – 928MHz		
Operating frequency range	905 - 925 MHz		
RF channel spacing	5 MHz		
Maximum rated output power	28 dBm – antenna Omni 7 dBi gain 23 dBm – antenna Flat panel 13 dBi gain.	At transmitter 50 Ω RF output connector	
Antenna connection	*N-type connector	External antenna	
Transmitter 99% power bandwidth	5 MHz		
Type of multiplexing	OFDM		
Modulating test signal (baseband)	PRBS		
Maximum transmitter duty cycle in normal use	50 %		
Transmitter duty cycle supplied for test	100 %		
Antenna information			
Type	Manufacturer	Model	Gain
Omni	MAXRAD	AN 1247 AU-Ant-0.9G-7-Omni	7 dBi
Flat Panel	MARS	AU-Ant-0.9G-12-120	13 dBi
Cable to external antenna	NA	LMR-400(CB1123)	0.7 dB cable loss

* According to FCC p.15.203 transmitter with standard type connector is subject of professional installation and responsibility.

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4.1.1 Environmental evaluation and exposure limit according to FCC CFR 47 part 1, §1.1307, §1.1310

Limit for power density for general population/uncontrolled exposure is $0.6(\text{mW}/\text{cm}^2)$

The power density calculation is $S = [(Pt/0.6) / 4\pi r^2]$.

Where

Pt - The transmitted power (EIRP) (mW)

r - The distance from the unit. (cm)

The $0.6 (\text{mW}/\text{cm}^2)$ limit can be calculated from the above based on the following data:

Pt- the transmitted power which is equal to the output power 28 dBm plus external antenna gain 7 dBi . The maximum EIRP = 35 dBm = 3162 mW.

Maximum allowed distance “r”, where RF exposure limits may not be exceeded, = $\text{SQRT}(5270/4\pi)$ and is more than 20.5 cm from the unit antenna.

4.2 EUT test configuration

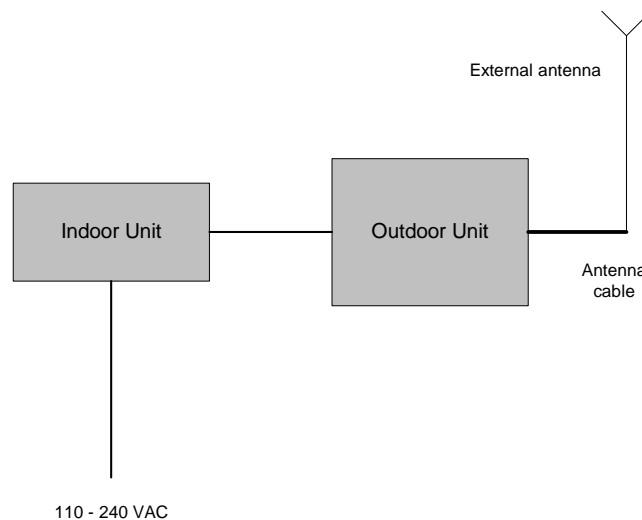


Fig. 1 BA VL 900 test configuration.



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5. Test results

5.1 Transmitter characteristics

5.1.1 6 dB occupied bandwidth according to § 15.247(a)(2)

Method of measurement	ANSI 63.4 §13.1.7		
Operating frequency's	905 MHz, 915 MHz, 925 MHz		
Ambient Temperature	22 ⁰ C	Relative Humidity	52% Air Pressure 1012 hPa

Carrier frequency MHz	Measured occupied bandwidth, MHz	Reference to plot number
905.0	5.0	#1
915.0	4.7	#2
925.0	4.8	#3

TEST PROCEDURE

The measurements were performed in normal (transmitting) mode at all transmitted carrier (channel) frequencies 905 MHz, 915 MHz and 925 MHz under maximum data transfer bit rate. The EUT RF output was connected to the Spectrum Analyzer through appropriate attenuator and accounted with cable loss in SA settings.

TEST EQUIPMENT USED:

2	3	11				
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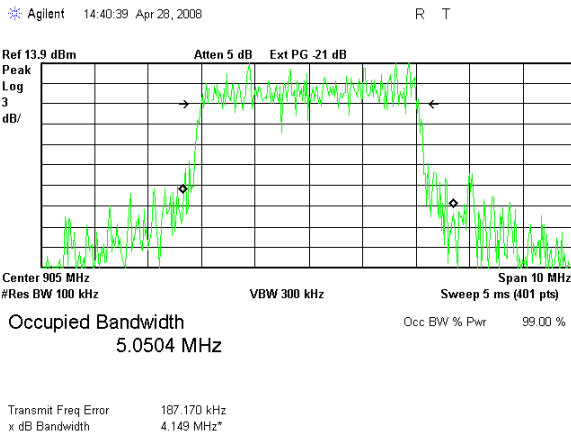
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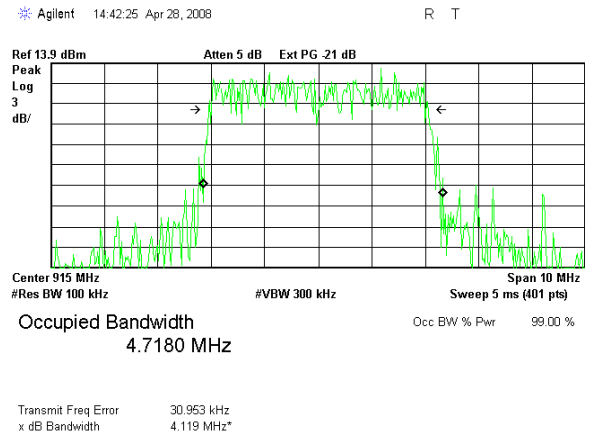
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FCC ID: LKT-VL-900

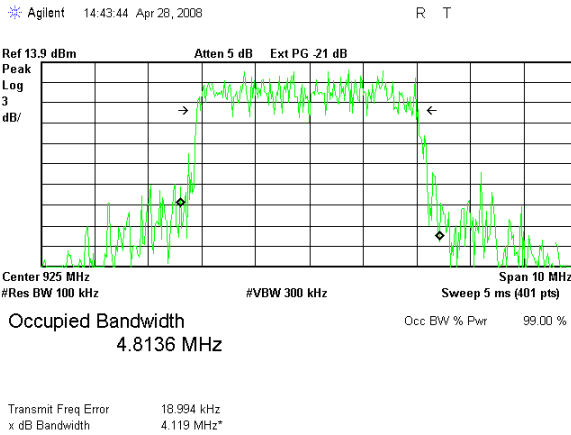
6 dB occupied bandwidth test results.



Plot # 1. Carrier Frequency 905 MHz



Plot # 2. Carrier Frequency 915 MHz



Plot # 3. Carrier Frequency 925 MHz



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5.1.2 Peak output power test § 15.247(b)(3)(4)

Operating Frequency Range 905 – 925 MHz
 Ambient Temperature 22° C Relative Humidity 49% Air Pressure 1012 hPa

The systems using digital modulation in 902 - 928 MHz bands 1 Watt power limit apply. This limit is based on the use of antennas with directional gain that do not exceed 6 dBi. Amount of antenna gain shall be reduced below the stated output power value.

Carrier frequency MHz	Peak output power. dBm	Peak output power limit (Antenna Omni - 7 dBi gain) dBm
905.0	26.6	29.0
915.0	28.0	29.0
925.0	26.1	29.0

Carrier frequency MHz	Peak output power. dBm	Peak output power limit (Antenna Flat panel - 13 dBi gain) dBm
905.0	22.4	23.0
915.0	23.0	23.0
925.0	22.1	23.0

TEST PROCEDURE

The measurements were performed in normal (transmitting) mode at three transmitted carrier (channel) frequencies 905 MHz, 915 MHz and 925 MHz under maximum data transfer bit rate. The EUT RF output was connected to the Spectrum Analyzer via antenna cable. For test setup of peak power output measurements refer to fig 1.

Measurement of peak power was performed as follow:

Step #1 – Measured by oscilloscope DC value at tested frequency noted.

Step #2 – BA VL 900 was substituted by signal generator and its CW output level increased up to noted in step #1 DC level.

Signal generator output level was verified by power meter.

Step 3 - Calculation of peak output power result:

Peak output power = Pout sign. gen. + 26 dB (attenuator).

TEST EQUIPMENT USED:

3	4	5	6	7	14	15
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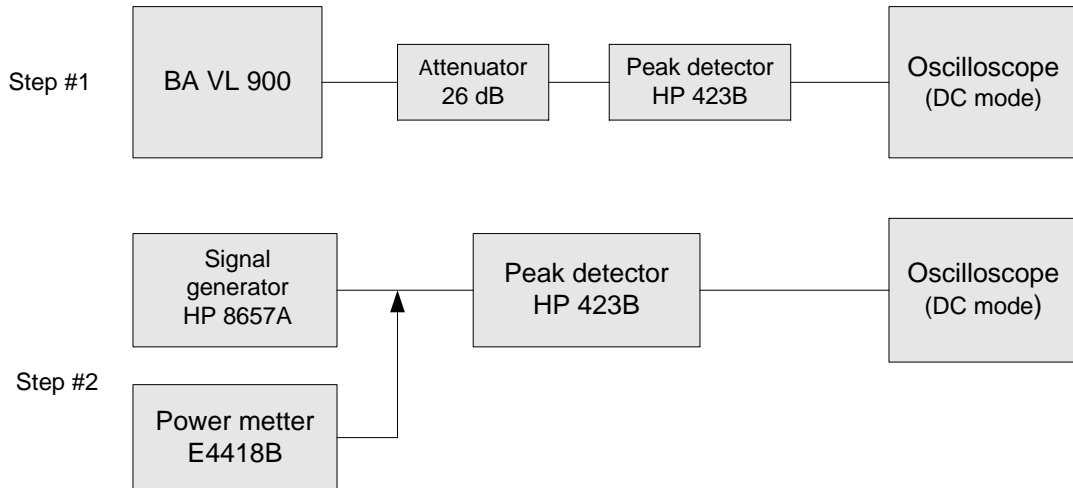


Fig.1 Peak output power test setup.



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5.1.3 Spurious emissions at antenna terminal § 15.247(d)

Operating Frequency Range 905 – 925 MHz
Ambient Temperature 22⁰ C Relative Humidity 52% Air Pressure 1012 hPa

TEST PROCEDURE

The frequency spectrum was investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency. The emission levels of the EUT in peak mode more than 20 dB lower than the specified limit were not recorded in the tables.

The measurements were performed in normal (transmitting) mode at 3 transmitted carrier (channel) frequencies 905 MHz, 915 MHz and 925 MHz under maximum data transfer bit rate. The EUT RF output was connected to the Spectrum Analyzer through appropriate attenuator and accounted with cable loss in SA settings.

REQUIREMENTS OF STANDARD

In any 100 kHz bandwidth outside the frequency band in which the digitally modulated 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.

TEST RESULT

Results in 3 carrier (channel) frequencies are presented in plots ## 13 – 21.
No emissions close than 20 dB to limit were found.

TEST EQUIPMENT USED:

1	2	3	15			
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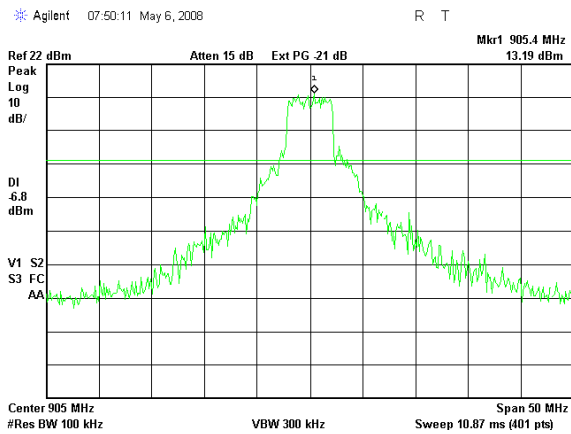
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Model: BA VL 900

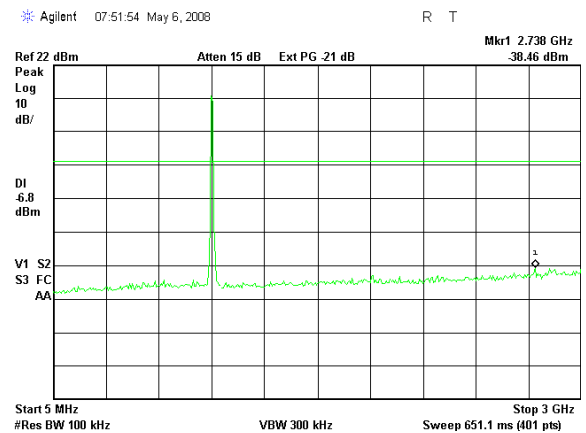
FCC ID: LKT-VL-900

Spurious emissions at antenna terminal test results.

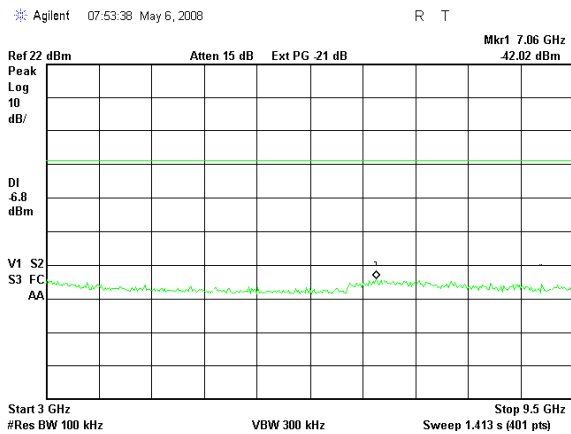
Frequency carrier 905 MHz.



Plot # 4



Plot # 5



Plot # 6

Used external attenuator = 20 dB
Cable loss = 1.0 dB.



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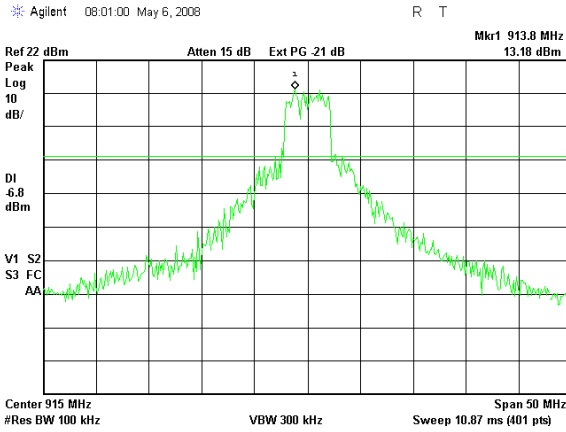
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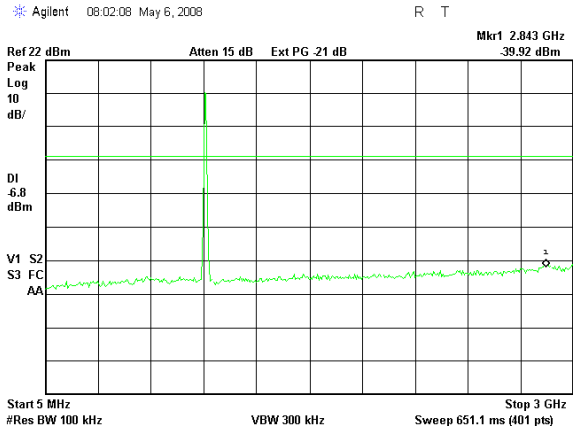
Model: BA VL 900

FCC ID: LKT-VL-900

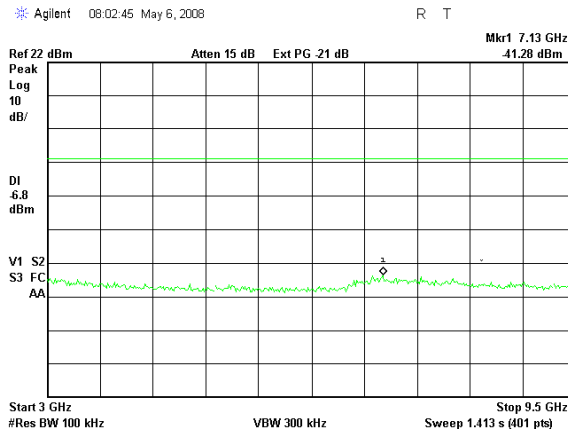
Frequency carrier 915 MHz.



Plot # 7



Plot # 8



Plot # 9.



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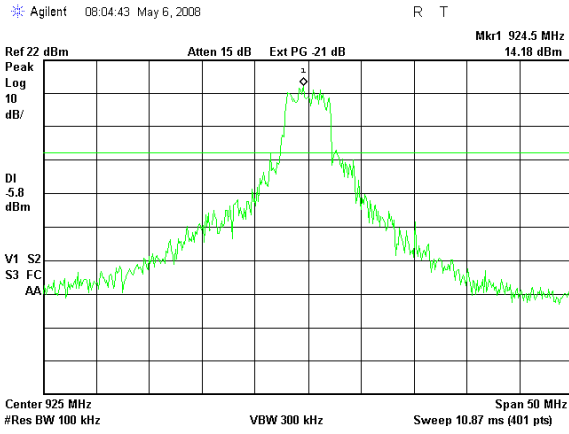
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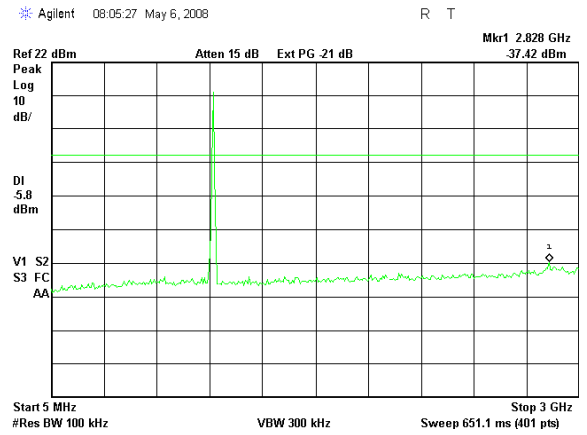
Model: BA VL 900

FCC ID: LKT-VL-900

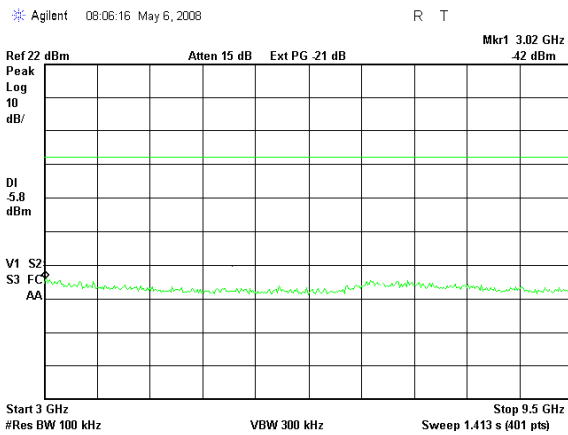
Frequency carrier 925 MHz.



Plot # 10.



Plot # 11



Plot # 12

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Operating Frequency Range 905 – 925 MHz
 Ambient Temperature 21⁰ C Relative Humidity 54% Air Pressure 1006 hPa

TEST PROCEDURE

The frequency spectrum was investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency. The emission levels of the EUT more than 20 dB lower than the specified limit were not recorded in the tables. To prevent saturation mode measured receiver was connected to double ridged guide antenna via 6 dB external attenuator. For the test results refer to the tables and plots in this section.

Carrier frequency = 905 MHz. Antenna 13 dBi.

Frequency, MHz	Radiated emissions, dB (µV/m)	Limit, dB (µV/m)	Margin, dB	Note	Reference to Plot number
989.1	35.3	54.0	18.7	Noise floor	#15
2.7149	53.5	74.0	20.5	Detector peak	#16
2.7149	40.3	54.0	13.7	Detector average	#17
9.370	58.9	74.0	15.1	Noise floor	#18

Carrier frequency = 915 MHz. Antenna 13 dBi.

Frequency, MHz	Radiated emissions, dB (µV/m)	Limit, dB (µV/m)	Margin, dB	Note	Reference to Plot number
971.8	35.4	54.0	18.6	Noise floor	#22
2744	55.0	74.0	19.0	Detector peak	#23
2745	42.4	54.0	11.6	Detector average	#24
8070	61.3	74.0	12.7	Noise floor	#25

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Frequency, MHz	Radiated emissions, dB (μ V/m)	Limit, dB (μ V/m)	Margin, dB	Note	Reference to Plot number
974.2	28.0	54.0	29.0	Noise floor	#29
2774	54.7	74.0	19.3	Detector peak	#30
2775	42.1	54.0	11.9	Detector average	#31
9370	60.5	74.0	13.5	Noise floor	#32

Carrier frequency = 905 MHz. Antenna 7.0 dBi.

Frequency, MHz	Radiated emissions, dB (μ V/m)	Limit, dB (μ V/m)	Margin, dB	Note	Reference to Plot number
901.7	92.9	94.1	1.2	Limit -20 dBc	#36
965.5	35.5	54.0	18.5	Noise floor	#37
2715.0	64.2	74.0	9.8	Detector peak	#38
2715.0	52.5	54.0	1.5	Detector average	#39

Carrier frequency = 915 MHz. Antenna 7.0 dBi.

Frequency, MHz	Radiated emissions, dB (μ V/m)	Limit, dB (μ V/m)	Margin, dB	Note	Reference to Plot number
971.8	35.4	54.0	18.6	Noise floor	#43
2743.7	59.8	74.0	14.2	Detector peak	#44
2744.7	49.4	54.0	4.6	Detector average	#45
7245.0	27.4	54.0	26.6	Noise floor	#46



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Carrier frequency = 925 MHz. Antenna 7.0 dBi.

Frequency, MHz	Radiated emissions, dB (µV/m)	Limit, dB (µV/m)	Margin, dB	Note	Reference to Plot number
928.4	91.7	93.4	1.7	Limit -20dBc	#49
2774.7	57.7	74.0	16.3	Detector peak	#50
2774.7	48.4	54.0	5.6	Detector average	#51
7546	26.5	54.0	27.5	Noise floor	#52

LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

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).

TEST EQUIPMENT USED:

1	4	8	9	13	16	
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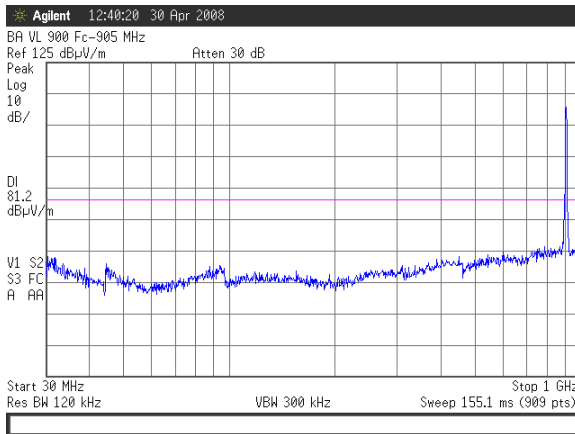
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Title: BreezeAccess VL 900 Broadband Wireless Access System

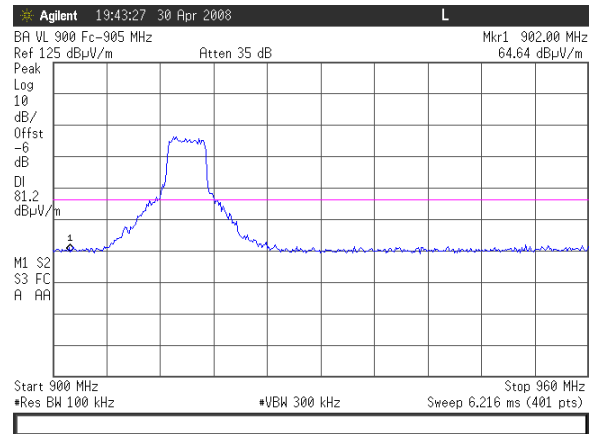
Model: BA VL 900

FCC ID: LKT-VL-900

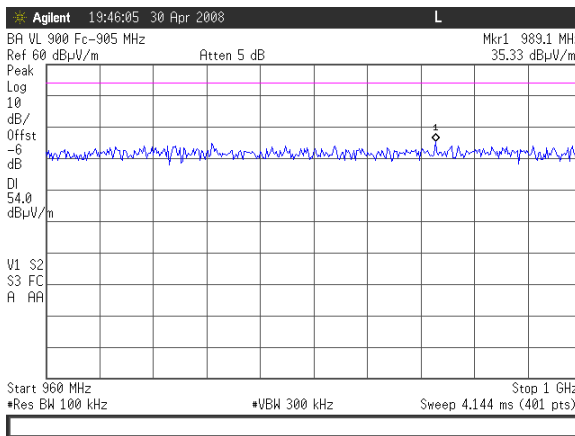
Frequency carrier 905 MHz. Antenna 13 dBi.



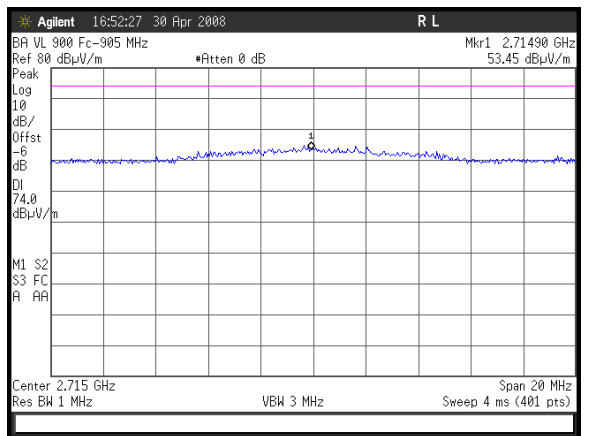
Plot # 13



Plot # 14



Plot # 15



Plot # 16



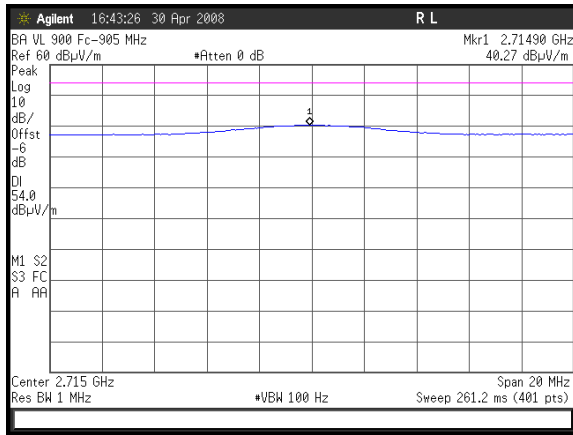
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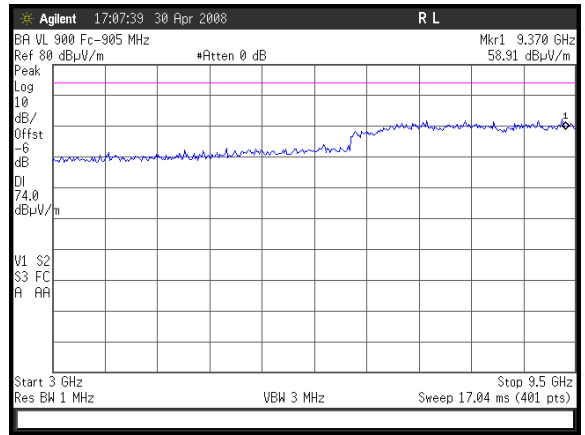
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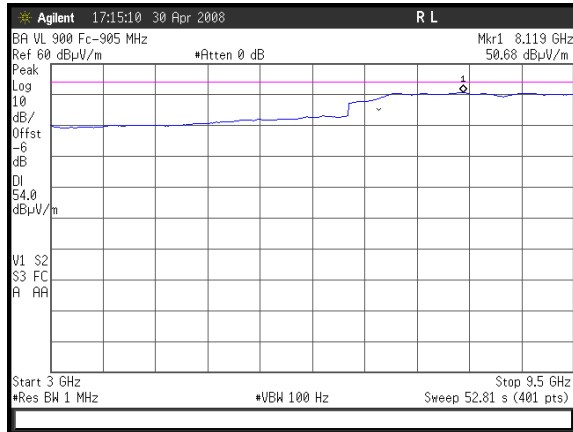
FCC ID: LKT-VL-900



Plot # 17



Plot # 18



Plot # 19



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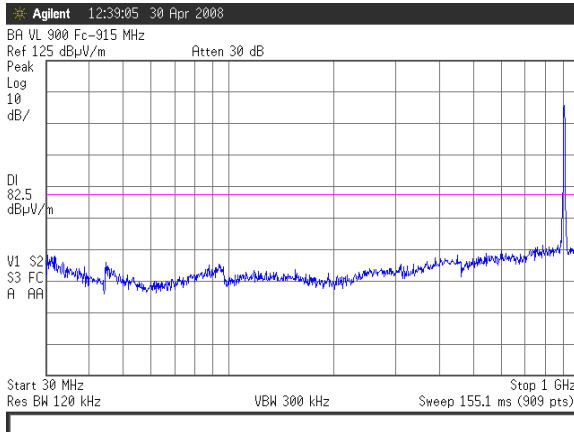
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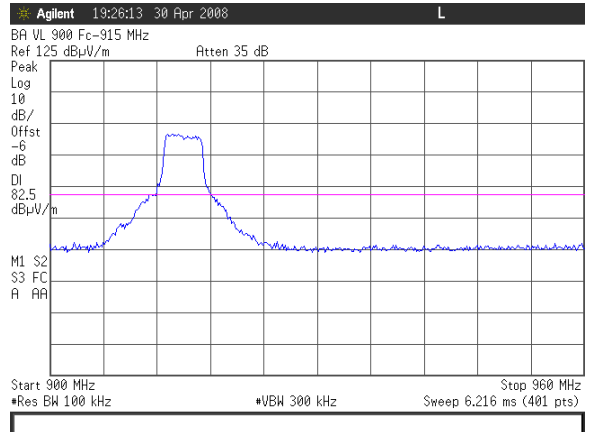
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FCC ID: LKT-VL-900

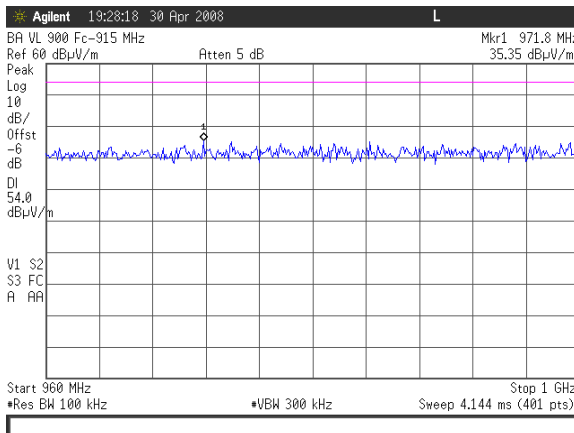
Frequency carrier 915 MHz. Antenna 13 dBi.



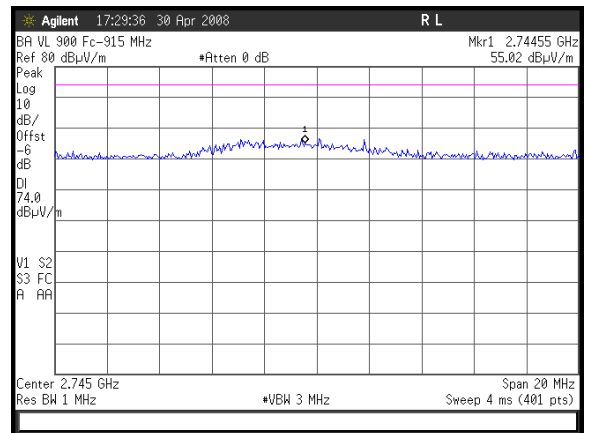
Plot # 20



Plot # 21



Plot # 22



Plot # 23



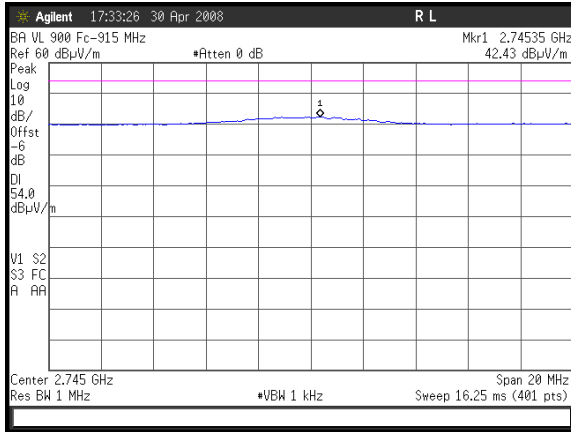
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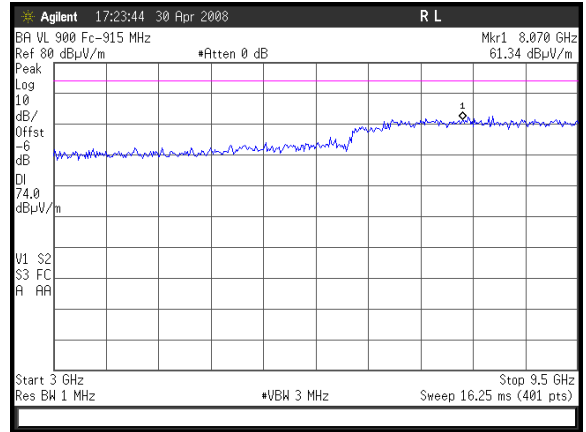
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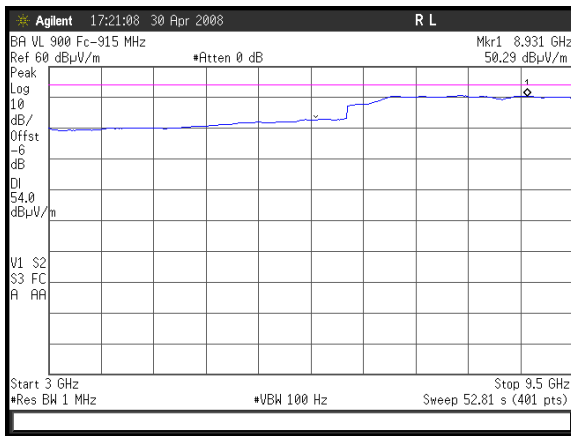
FCC ID: LKT-VL-900



Plot # 24



Plot # 25



Plot # 26



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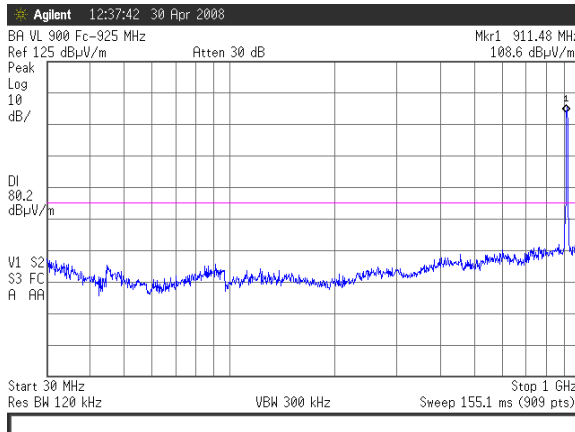
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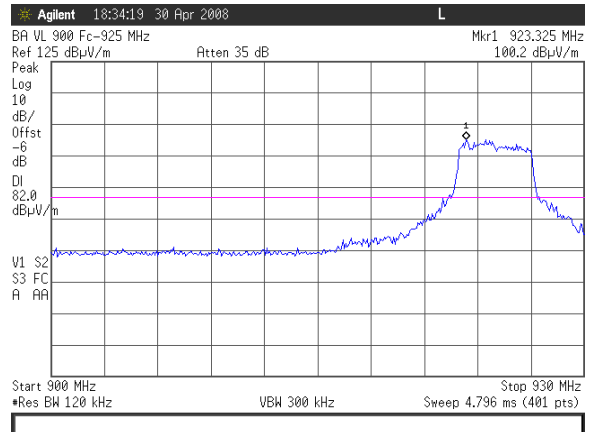
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FCC ID: LKT-VL-900

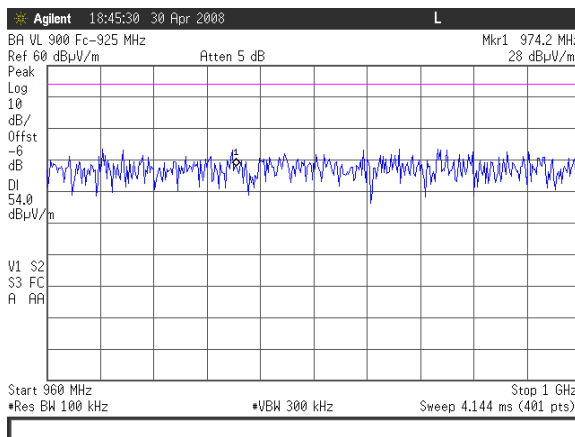
Frequency carrier 925 MHz. Antenna 13 dBi.



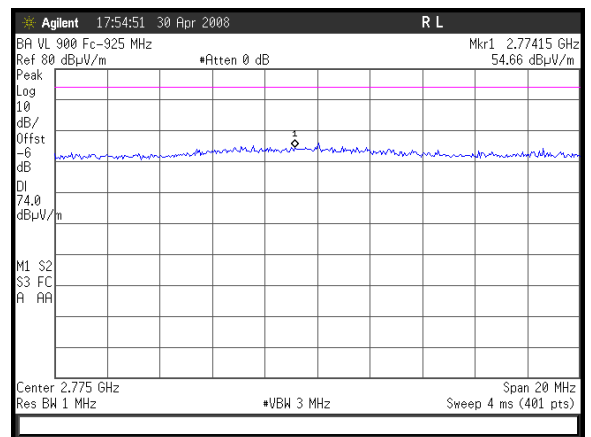
Plot # 27



Plot # 28



Plot # 29



Plot # 30



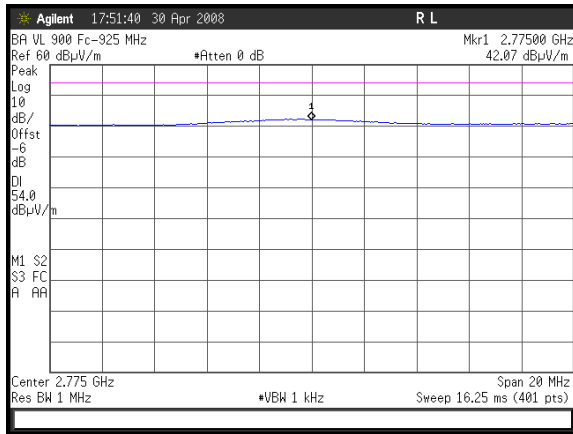
Test report No: 8812319768

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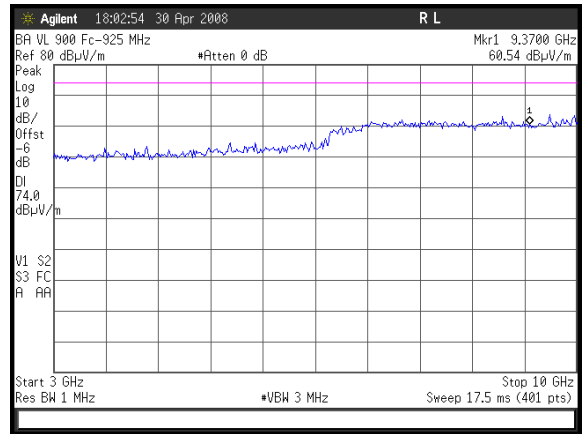
Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

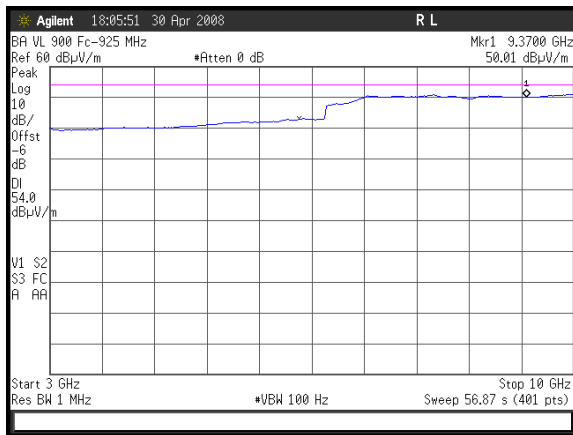
FCC ID: LKT-VL-900



Plot # 31



Plot # 32



Plot # 33



Test report No: 8812319768

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Title: BreezeAccess VL 900 Broadband Wireless Access System

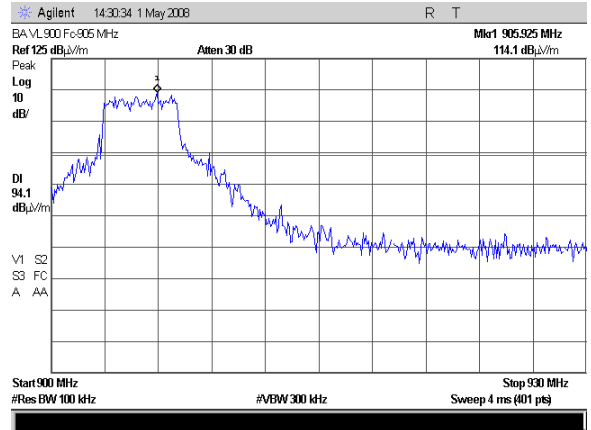
Model: BA VL 900

FCC ID: LKT-VL-900

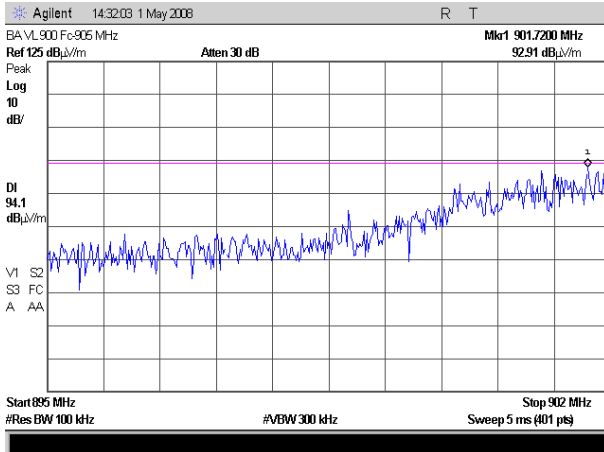
Frequency carrier 905 MHz. Antenna 7 dBi.



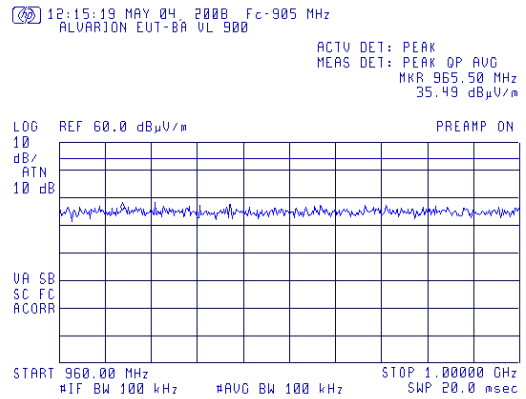
Plot # 34



Plot # 35



Plot # 36



Plot # 37



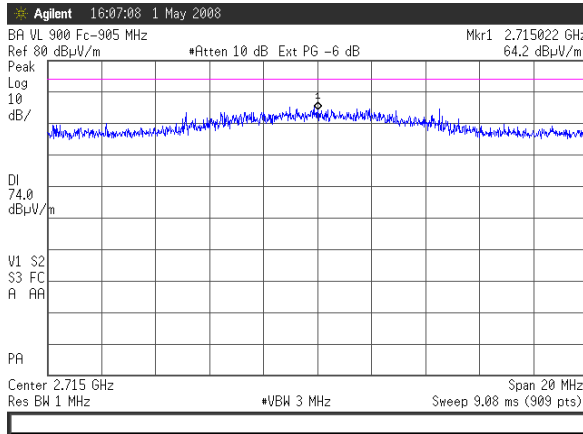
Test report No: 8812319768

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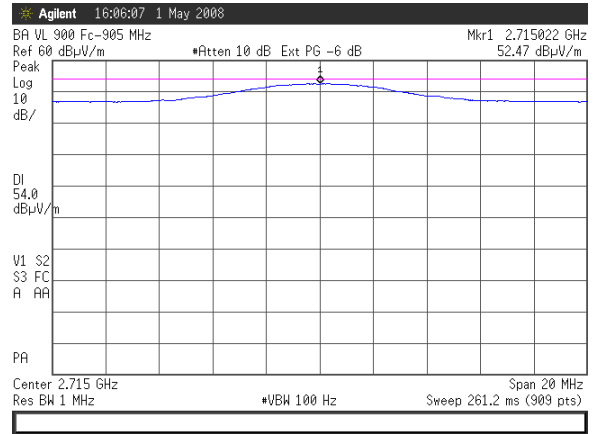
Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

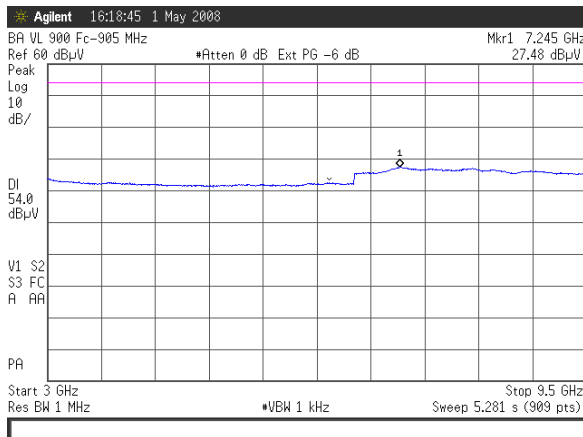
FCC ID: LKT-VL-900



Plot # 38



Plot # 39



Plot # 40



Test report No: 8812319768

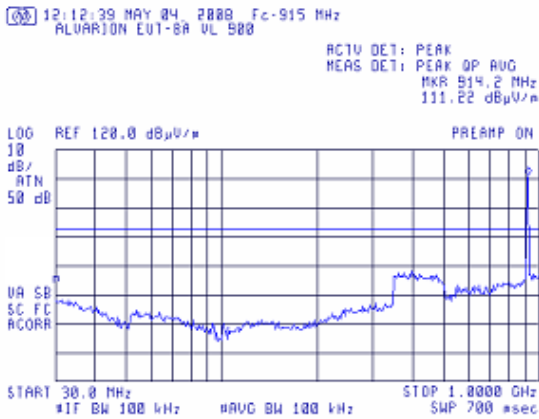
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Title: BreezeAccess VL 900 Broadband Wireless Access System

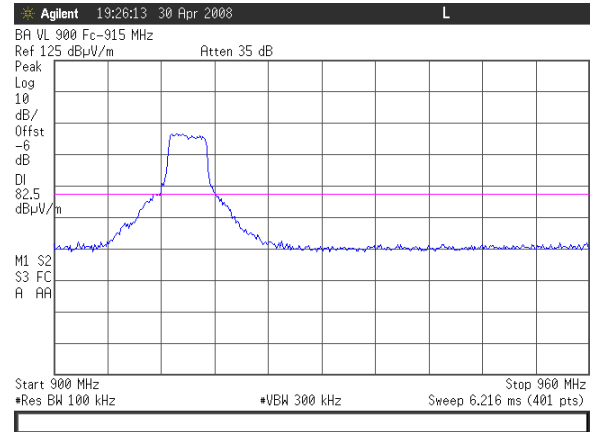
Model: BA VL 900

FCC ID: LKT-VL-900

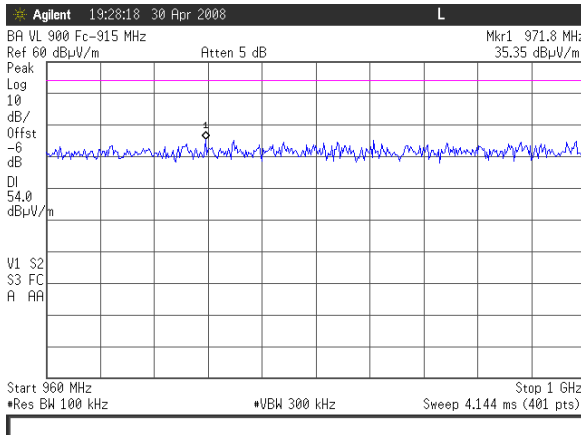
Frequency carrier 915 MHz. Antenna 7 dBi gain.



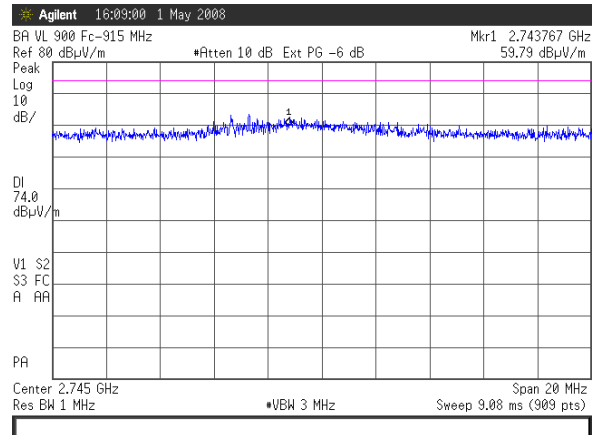
Plot # 41



Plot # 42



Plot # 43



Plot # 44



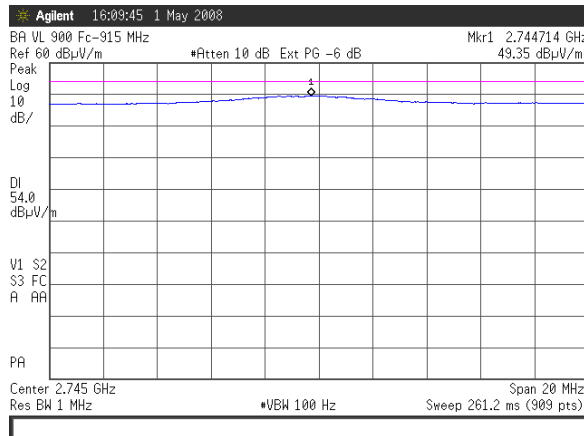
Test report No: 8812319768

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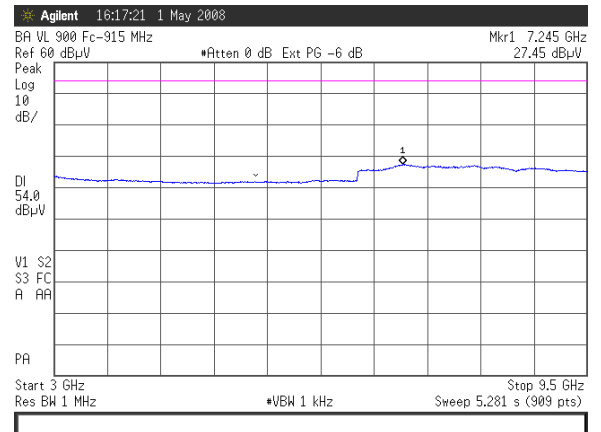
Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900



Plot # 45



Plot # 46



Test report No: 8812319768

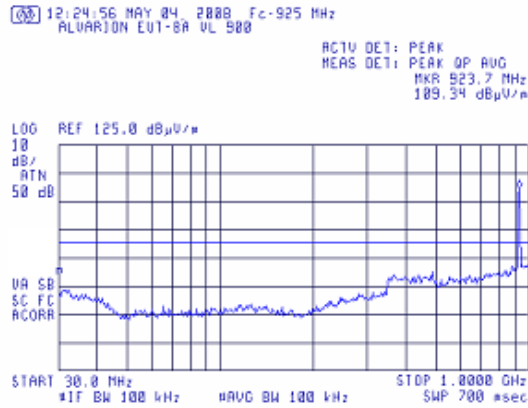
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Title: BreezeAccess VL 900 Broadband Wireless Access System

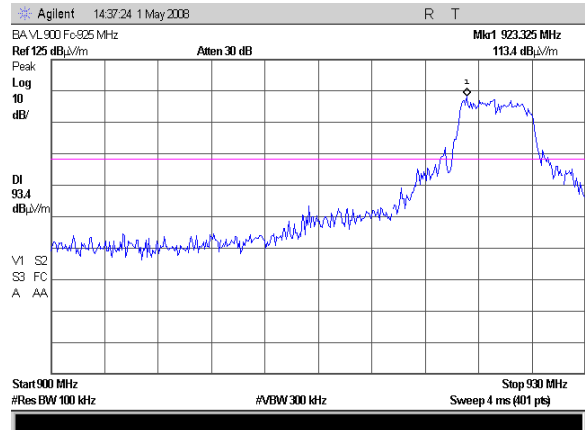
Model: BA VL 900

FCC ID: LKT-VL-900

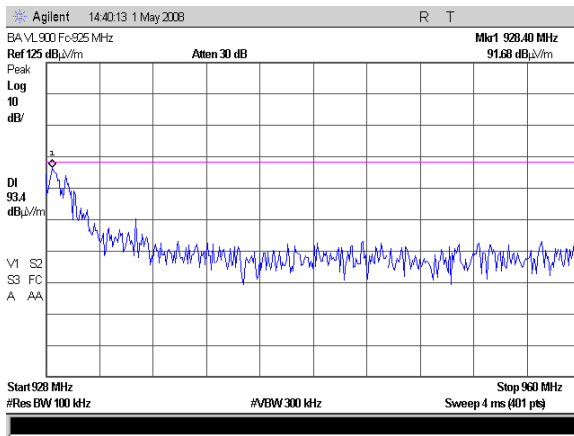
Frequency carrier 925 MHz. Antenna 7 dBi.



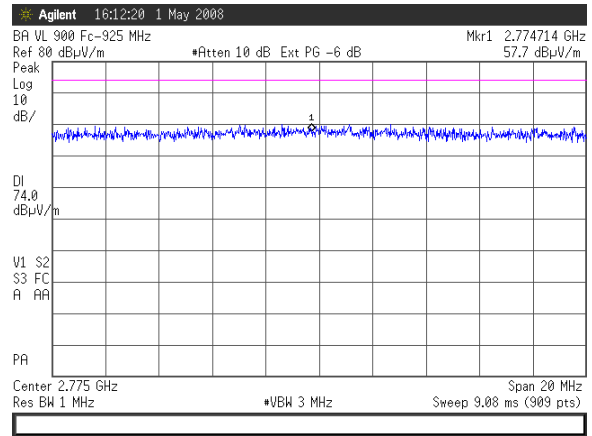
Plot # 47



Plot # 48



Plot # 49



Plot # 50



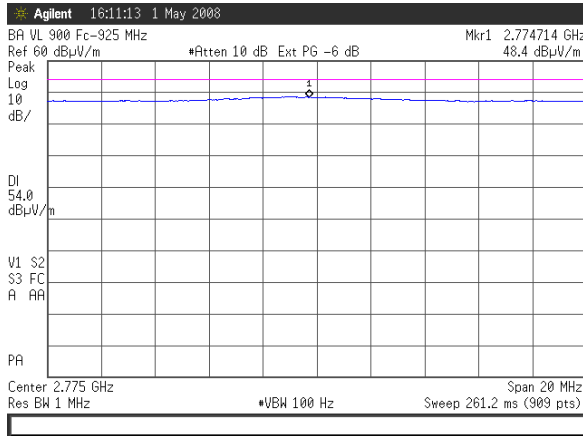
Test report No: 8812319768

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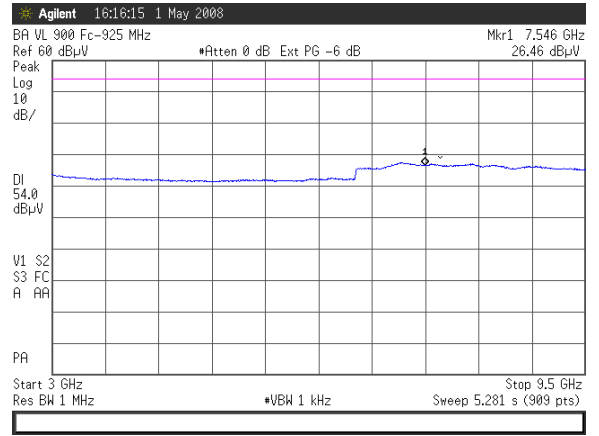
Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900



Plot # 51



Plot # 52

**Test report No: 8812319768****Page 30 of 50 Pages****Title: BreezeAccess VL 900 Broadband Wireless Access System****Model: BA VL 900****FCC ID: LKT-VL-900**

5.1.5 Power spectral density test § 15.247(e)

Operating Frequency Range 905 – 925 MHz
Ambient Temperature 22⁰ C Relative Humidity 52% Air Pressure 1012 hPa

Antenna Omni, 7 dBi gain

Channel frequency MHz	PSD dBm	Limit dBm	Margin dB	Refer. plot #
905	4.7	8	3.3	54
915	2.8	8	5.2	56
925	2.9	8	5.1	58

Antenna Flat panel, 13 dBi gain

Channel frequency MHz	PSD dBm	Limit dBm	Margin dB	Refer. plot #
905	2.9	8	5.1	60
915	1.6	8	6.4	62
925	1.0	8	7.0	64

TEST PROCEDURE

Measurements were performed according to FCC on March 23, 2005 procedure.

The transmitter was tested in normal (transmitting) mode at all transmitted carrier (channel) frequencies 905 MHz, 915 MHz and 925 MHz under maximum data transfer bit rate. The EUT RF output was connected to the Spectrum Analyzer through appropriate attenuator and accounted with cable loss in SA settings.



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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900

LIMIT

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST SUMMERY

EUT comply with FCC p. 15.247(d) requirements.

TEST EQUIPMENT USED:

2	3	15				
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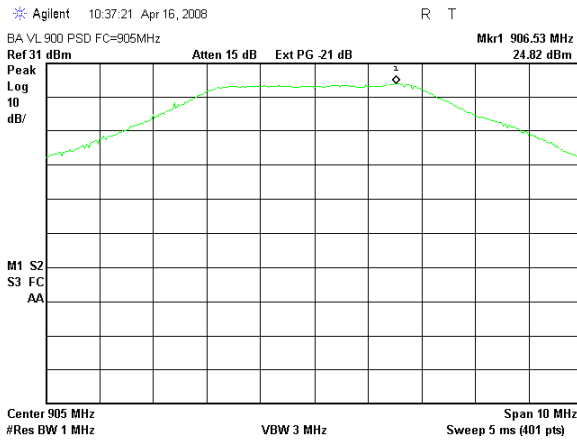
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Title: BreezeAccess VL 900 Broadband Wireless Access System

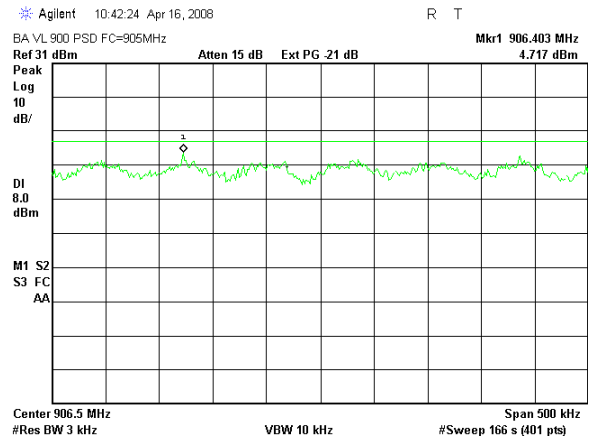
Model: BA VL 900

FCC ID: LKT-VL-900

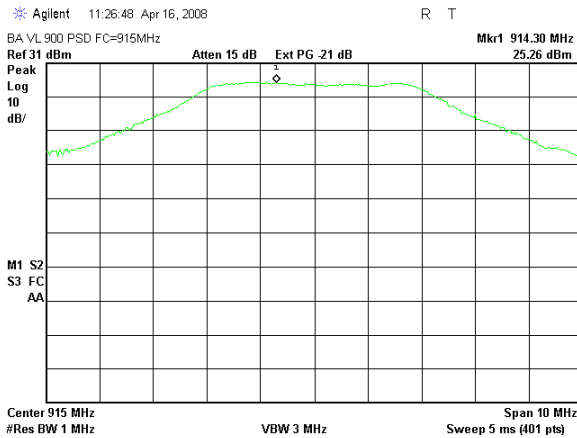
Frequency carriers 905, 915, 925 MHz. Antenna 7 dBi.



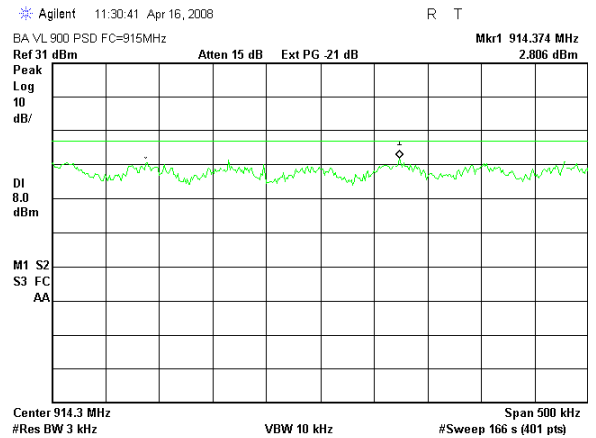
Plot # 53



Plot # 54



Plot # 55



Plot # 56



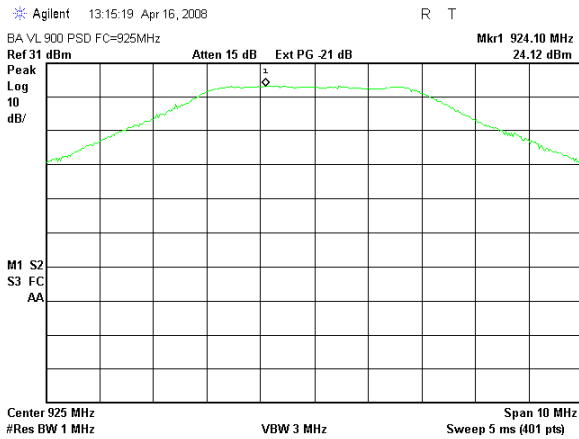
Test report No: 8812319768

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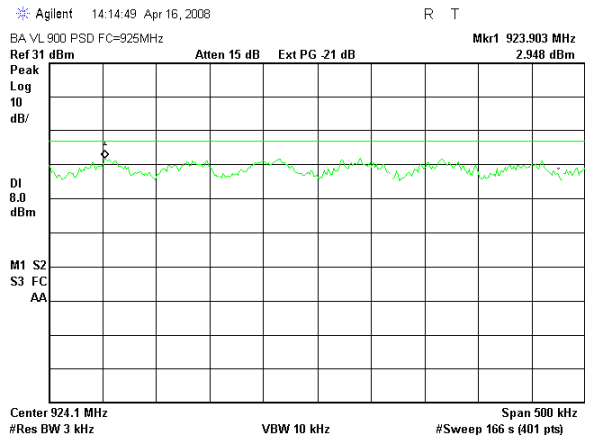
Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900

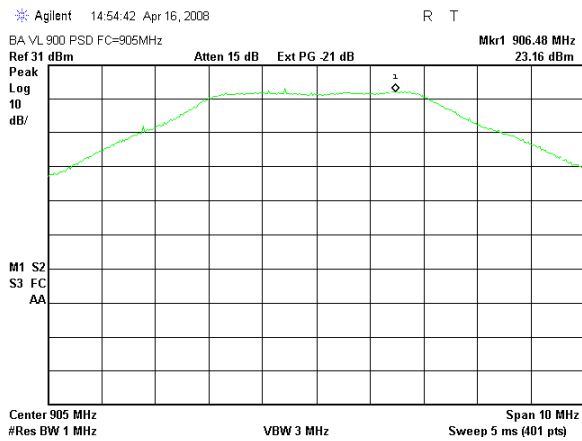


Plot # 57

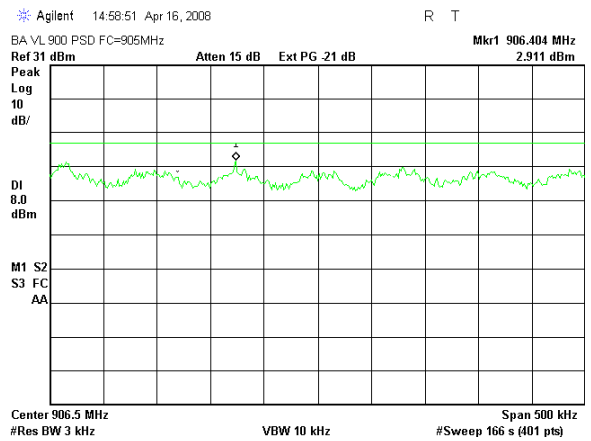


Plot # 58

Frequency carriers 905, 915, 925 MHz. Antenna 13 dBi.



Plot # 59



Plot # 60



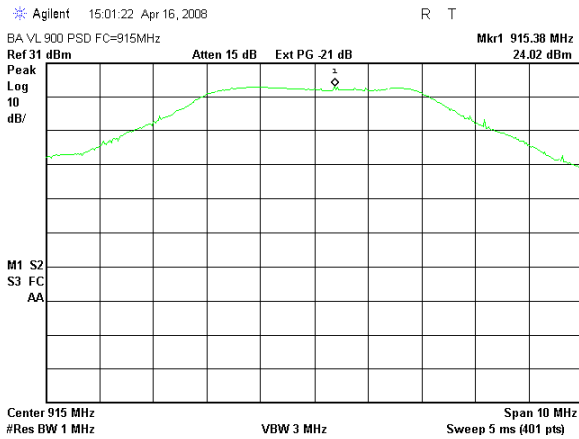
Test report No: 8812319768

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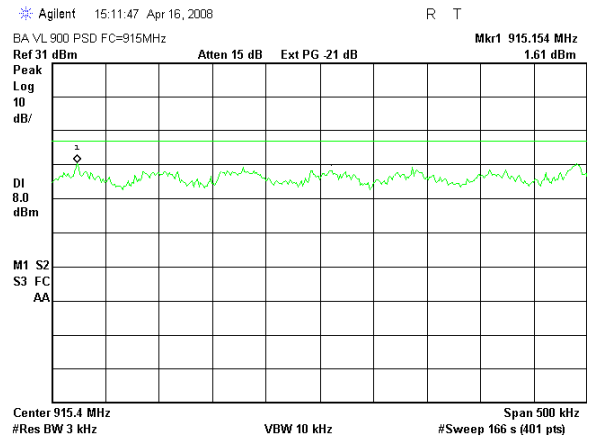
Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

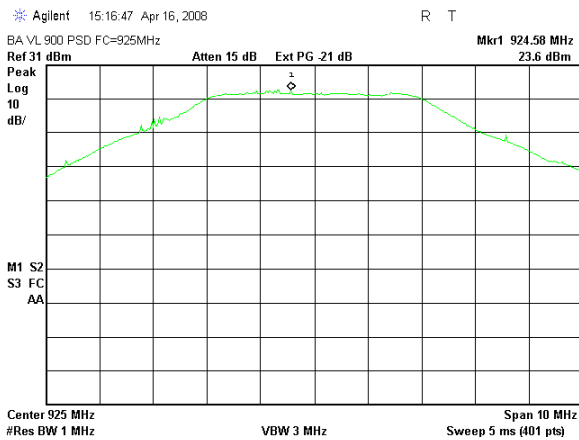
FCC ID: LKT-VL-900



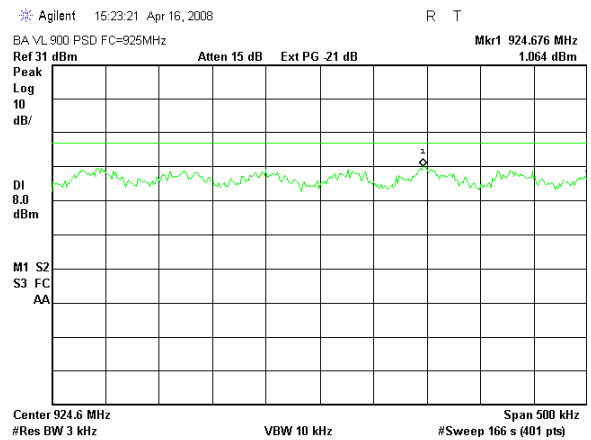
Plot # 61



Plot # 62



Plot # 63



Plot # 64



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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900

5.2 Radiated emissions test according to § 15.209

Method of measurement	ANSI 63.4 §13.1.4			
Ambient Temperature 24 ⁰ C	Relative Humidity	55%	Air Pressure	1012 hPa

TEST DESCRIPTION:

The measurements were performed at the Open Area Test Site. The test configuration is shown in Fig.1. The EUT was arranged on a wooden table 0.8 m placed on the turn - table. The measurements were performed at a 10 m measurement distance. The Biconilog 30 MHz-2 GHz antenna was used. The frequency range was investigated from 30 MHz to 1 GHz. The measurements were performed at each frequency at which the signal was 10 dB below the limit or less. The level was maximized by initially rotating turntable through 360°, varying the antenna height between 1 m and 4 m, rerouting EUT cables and changing antenna polarization from vertical to horizontal.

REQUIREMENTS:

EUT radiated emission shall not exceed value required in section 15.209

TEST RESULT:

Test results are presented in Table 1.
 Results more than 20 dB under the limit were not inserted in the table.

Test equipment used

4	8	9	13	16	
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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900

**Table #1. Radiated emission test result.
Subscribe unit configuration.**

Frequency (MHz)	Antenna Polariz. V/H	Antenna Height (m)	Turn- table Angle (°)	Emission Level Note 1 (dB μ V/m)	Limit @ 3 m (dB μ V/m)	Margin Note 2 (dB)	Result.
38.8	V	1.0	20	25.2	40.0	14.8	Pass
41.9	V	1.0	92	33.6	40.0	6.4	Pass
192.0	V	1.0	142	28.5	43.5	15.0	Pass
400.0	H	1.6	155	30.6	46.0	15.4	Pass
576.0	H	1.6	219	32.3	46.0	13.7	Pass
672.0	H	1.6	209	38.6	46.0	7.4	Pass

**Table #2. Radiated emission test result.
Base station configuration.**

Frequency (MHz)	Antenna Polariz. V/H	Antenna Height (m)	Turn- table Angle (°)	Emission Level Note 1 (dB μ V/m)	Limit @ 3 m (dB μ V/m)	Margin Note 2 (dB)	Result
33.7	V	1.0	150	25.2	40.0	14.8	Pass
192.0	V	1.0	142	28.5	43.5	15.0	Pass
250.0	H	2.0	204	38.7	46.0	7.3	Pass
400.0	H	1.8	325	35.7	46.0	10.3	Pass
576.0	H	1.8	295	36.7	46.0	9.3	Pass
672.0	H	1.6	307	38.4	46.0	7.6	Pass

Note 1: Emission level = E Reading (dB μ V) + Cable loss (dB) + Antenna Factor (dB/m) + 10 dB.
Where 10 dB is an extrapolation distance factor.
For Cable Loss and Antenna Factor refer to Appendix 2.

Note 2: Margin (dB) = Limit (dB μ V/m) – Emission level (dB μ V/m)



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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900

5.3 Conducted emissions according to § 15.207

Method of measurement ANSI 63.4 §13.1.3
Ambient Temperature 23° C Relative Humidity 52% Air Pressure 1008 hPa

Table with 3 columns: Frequency (MHz), QP, and AVRG. Rows show frequency ranges (0.15-0.5, 0.5-5, 5-30) and corresponding dB values.

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

EUT was placed on a wooden table in a shielded chamber at a height of 80 cm from the floor and 40 cm from the vertical reference plane. The measurements were performed at mains terminals by means of LISN, connected to spectrum analyzer. The measurements were made with quasi-peak (CISPR) detector. The position of the EUT cables was varied to determine maximum emission level.

TEST RESULT:

EUT meets FCC p.15.207 requirement.

Test results are shown in plots # 65, 66 for subscribe unit and in plots # 67, 68 for base station option.

Test equipment used

Table with 6 columns, containing numbers 10, 11, 12 and empty cells.



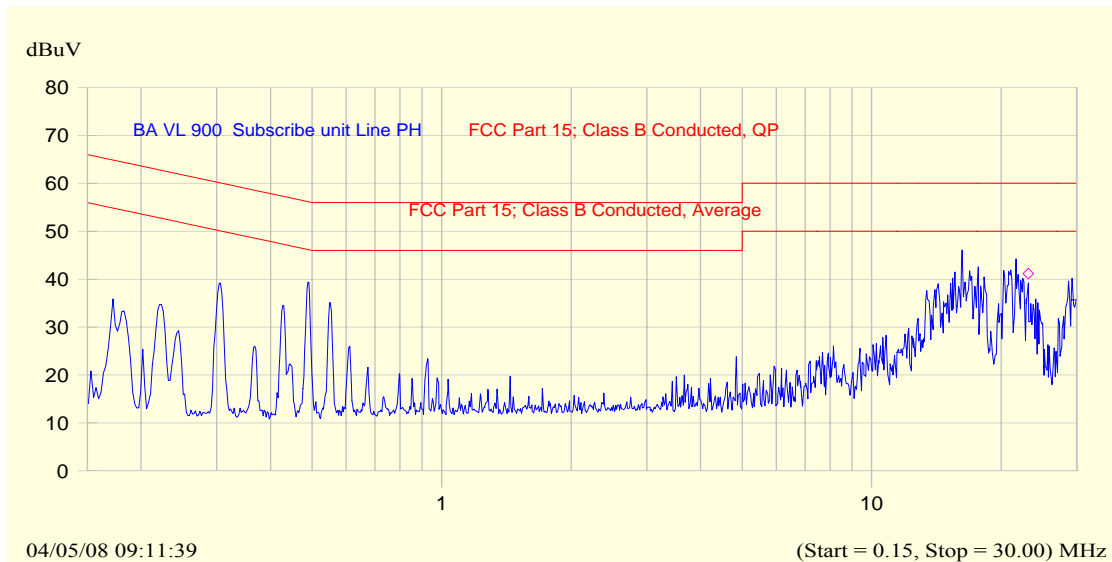
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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900



Frequency MHz	QP dB μ V	Average limit dB μ V	QP- Avg Limit dB	Result
0.195	51.1	53.8	-2.7	Pass
0.518	39.4	46.0	-6.6	Pass
16.166	44.3	50.0	-5.7	Pass
16.228	45.7	50.0	-4.3	Pass
21.662	44.1	50.0	-5.9	Pass
23.129	40.4	50.0	-9.6	Pass

Plot # 65. Conducted emissions test. Subscribe Unit P.S. Line PH



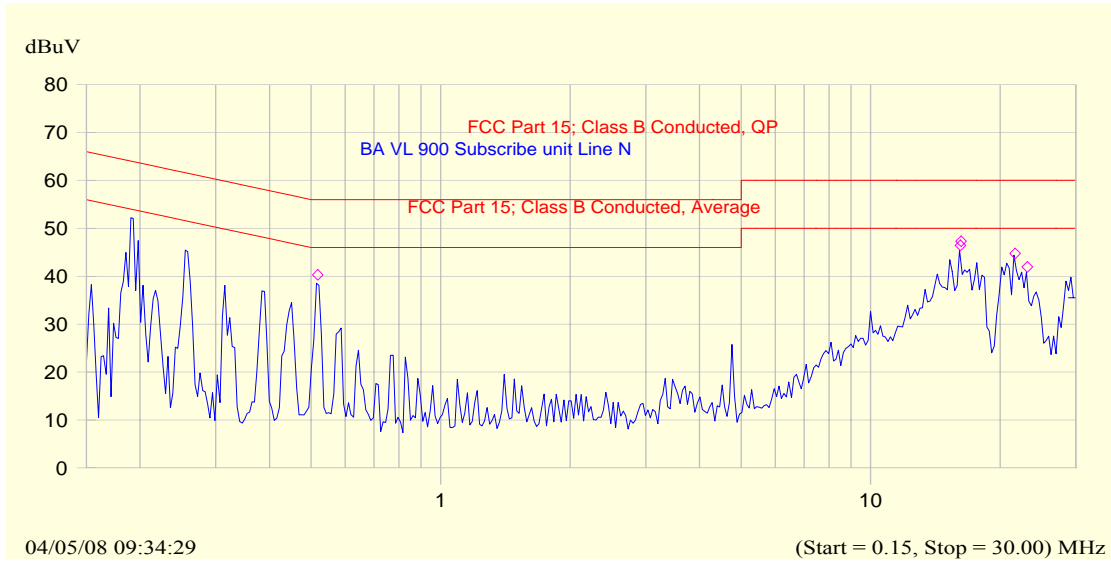
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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900



Frequency MHz	QP dB μ V	Average limit dB μ V	QP- Avg Limit dB	Result
0.195	51.8	53.8	-2.0	Pass
0.518	39.3	46.0	-6.7	Pass
16.167	44.6	50.0	-5.4	Pass
16.228	45.8	50.0	-4.2	Pass
21.662	43.9	50.0	-6.1	Pass
23.129	40.6	50.0	-9.4	Pass

Plot # 66. Conducted emissions test. Subscribe Unit power supply. Line N



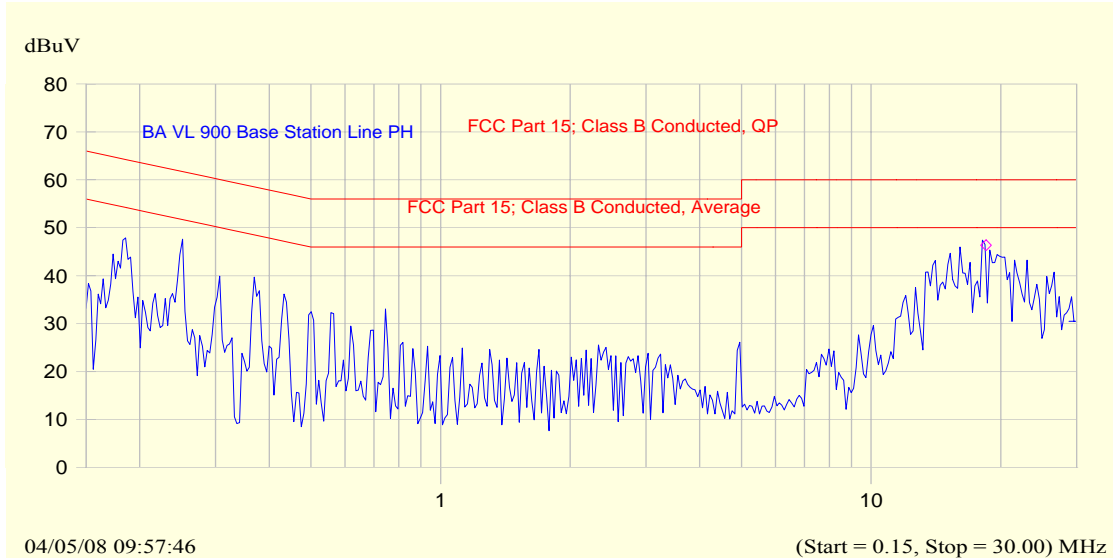
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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900



Frequency MHz	QP dB μ V	Average limit dB μ V	QP- Avg Limit dB	Result
0.188	52.4	54.1	-1.7	Pass
0.250	49.2	51.8	-2.6	Pass
0.441	37.0	47.0	-10.1	Pass
18.243	47.0	50.0	-3.0	Pass
18.365	46.1	50.0	-3.9	Pass
18.487	45.8	50.0	-4.2	Pass

Plot # 67. Conducted emissions test. Base station. Line PH

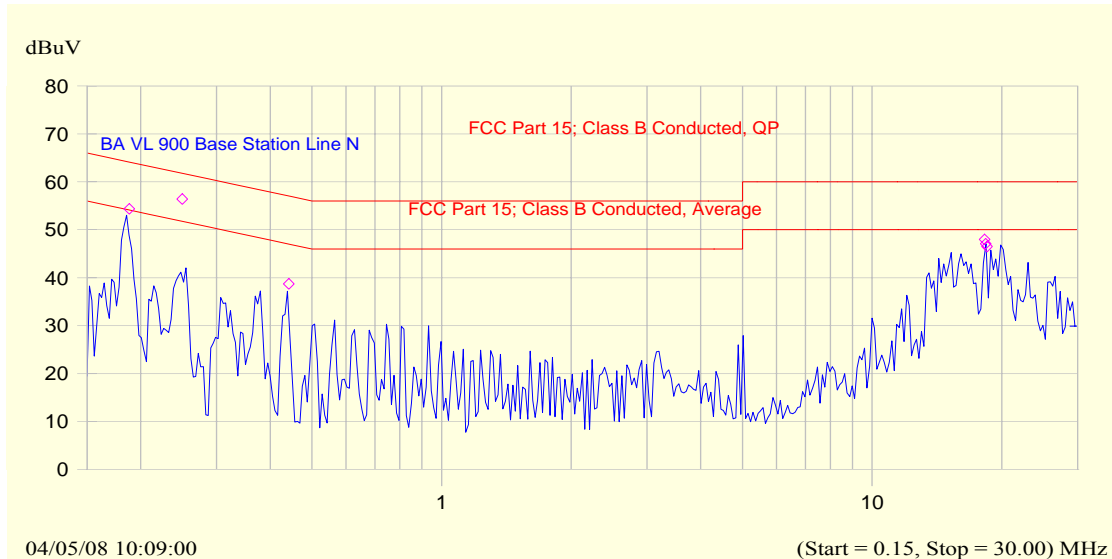
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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900



Frequency MHz	QP dB μ V	Average limit dB μ V	QP- Avg Limit dB	Result
0.188	52.0	54.1	-2.1	Pass
0.250	49.9	51.8	-1.9	Pass
0.442	37.1	47.0	-10.0	Pass
18.243	47.4	50.0	-2.6	Pass
18.365	46.5	50.0	-3.5	Pass
18.487	45.8	50.0	-4.2	Pass

Plot # 68. Conducted emissions test. Base station. Line N

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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900

APPENDIX A Photographs



Photo 1. Test setup on OATS. Subscribe unit configuration.

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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900



Photo 2. Test setup on OATS. Base station configuration.



Photo 3. Test setup on OATS. Antenna Omni.

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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900



Photo 4. Outdoor unit components side view.

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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900



Photo 5. Outdoor unit connector side view.

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No	Description	Manufacturer information			Due Calibration date
		Name	Model No	Serial No	
1	Spectrum Analyzer 9 kHz - 26.5 GHz	HP	8564E	3650A00701	June 2008
2	Spectrum Analyzer 9 kHz - 26.5 GHz	Adjilent	4407B	US40241729	July 2008
3	Attenuators 20 dB DC - 18 GHz	Weinshel Engineering	33-30-34	A3451	Aug 2008
4	Attenuator 50 Ohm 6 dB DC-18 GHz	HP	8491A	50455	May 2009
5	Power meter	Adjilent	4418B	GB39512058	July 2008
6	Power sensor 50 MHz – 50 GHz	Adjilent	8487A	3318a03115	July 2008
7	Crystal detector DC – 12.6 GHz	HP	423B	01186113	NA
8	Double Ridged Guide Antenna 1 – 18 GHz	EMCO	3115	5802	March 2009
9	Antenna Biconilog 30 – 2000 MHz	Schaffner- Chase	CBL6112B	S/N 23181	May 2009
10	EMI Receiver 9 kHz-6.5 GHz	HP	8546A+8546 0A	SII 4068	April 2009
11	LISN 9 kHz – 30 MHz	FCC	LISN 250- 32-4-16	SII5023	Feb 2009
12	Transient limiter 0.009-200 MHz	HP	11947A	3107105	March 2009
13	Spectrum analyzer 10 KHz-26.5 GHz	HP	E7405A	SII 4944	March 2009
14	Signal generator 0.1 – 1040 MHz	HP	8657A	SII 4917	March 2009
15	Cable RF 1m	Huber-Suhner	Sucoflex 104PE	21324/4PE	Aug 2008
16	Cable RF 3m	Huber-Suhner	Sucoflex 104PE	21328/4PE	Aug 2008

**Test report No: 8812319768****Page 47 of 50 Pages****Title: BreezeAccess VL 900 Broadband Wireless Access System****Model: BA VL 900****FCC ID: LKT-VL-900****Cable Loss (10m cable + Mast)**

Point	Frequency (MHz)	Cable Loss (dB)	Point	Frequency (MHz)	Cable Loss (dB)
1	30	0.53	21	1000	3.68
2	50	0.75	22	1100	3.82
3	100	1.08	23	1200	4.07
4	150	1.39	24	1300	4.24
5	200	1.61	25	1400	4.43
6	250	1.752	26	1500	4.6
7	300	2.00	27	1600	4.7
8	350	2.15	28	1700	4.85
9	400	2.26	29	1800	4.98
10	450	2.383	30	1900	5.19
11	500	2.52	31	2000	5.34
12	550	2.606	32	2100	5.51
13	600	2.75	33	2200	5.69
14	650	2.856	34	2300	5.89
15	700	3.06	35	2400	6.07
16	750	3.201	36	2500	6.22
17	800	3.27	37	2600	6.28
18	850	3.38	38	2700	6.41
19	900	3.46	39	2800	6.53
20	950	3.55	40	2900	6.84



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Title: BreezeAccess VL 900 Broadband Wireless Access System

Model: BA VL 900

FCC ID: LKT-VL-900

Biconilog Antenna, Model Number: CBL-6112D, S/N: 23181.

No.	f / MHz)	AF / dB/m)	f / MHz)	AF / dB/m)	f / MHz)	AF / dB/m)	f / MHz)	AF / dB/m)
1	30	17.90	170	9.40	530	17.70	1040	22.20
2	32	16.70	175	9.00	540	18.25	1060	22.50
3	34	15.55	180	8.50	550	18.60	1080	22.50
4	36	14.35	185	8.45	560	14.45	1100	22.40
5	38	13.30	190	8.60	570	18.40	1120	22.60
6	40	12.20	195	8.85	580	18.50	1140	22.45
7	42	11.05	200	8.95	590	18.60	1160	22.50
8	44	9.95	205	8.80	600	18.60	1180	22.40
9	46	8.90	210	8.50	610	18.80	1200	22.80
10	48	8.05	215	8.20	620	18.99	1220	22.95
11	50	7.30	220	8.50	630	19.05	1240	23.10
12	52	6.80	225	9.00	640	19.23	1260	23.40
13	54	6.45	230	9.65	650	19.10	1280	23.35
14	56	6.00	235	10.30	660	19.13	1300	23.62
15	58	5.70	240	11.00	670	19.04	1320	23.64
16	60	5.45	245	11.60	680	19.00	1340	23.86
17	62	5.30	250	12.00	690	19.17	1360	23.95
18	64	5.20	255	12.45	700	19.28	1380	23.90
19	66	5.30	260	12.85	710	19.25	1400	24.45
20	68	5.30	265	12.50	720	19.45	1420	24.74
21	70	5.35	270	12.45	730	19.75	1440	24.93
22	72	5.50	275	12.40	740	19.95	1460	25.03
23	74	5.80	280	12.55	750	20.07	1480	25.45
24	76	6.00	285	12.65	760	19.85	1500	25.30
25	78	6.60	290	12.75	770	19.80	1520	25.25
26	80	6.70	295	12.95	780	19.85	1540	25.36
27	82	7.15	300	13.00	790	19.95	1560	25.58
28	84	7.60	310	13.35	800	20.05	1580	25.50
29	86	8.10	320	13.75	810	20.10	1600	25.65
30	88	8.50	330	13.85	820	20.35	1620	25.60
31	90	8.90	340	14.10	830	20.40	1640	25.70
32	92	9.20	350	14.50	840	20.35	1660	25.83
33	94	9.75	360	14.70	850	20.46	1680	25.97
34	96	9.95	370	14.90	860	20.39	1700	26.10
35	98	10.20	380	15.10	870	20.29	1720	26.25
36	100	10.50	390	15.45	880	20.24	1740	26.04
37	105	11.25	400	16.00	890	20.35	1760	26.14
38	110	11.70	410	16.40	900	20.55	1780	26.20
39	115	11.70	420	16.70	910	20.45	1800	26.40
40	120	11.80	430	16.35	920	20.60	1820	26.64
41	125	11.80	440	16.30	930	20.60	1840	26.86
42	130	11.70	450	16.30	940	20.66	1860	27.12
43	135	11.35	460	16.70	950	20.88	1880	27.00
44	140	10.95	470	17.05	960	21.11	1900	27.25
45	145	10.35	480	17.20	970	20.93	1920	27.36
46	150	10.05	490	17.30	980	21.03	1940	27.68
47	155	9.70	500	17.40	990	21.05	1960	27.10
48	160	9.70	510	17.50	1000	21.10	1980	27.06
49	165	9.45	520	17.60	1020	21.40	2000	27.25

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Point	Frequency (MHz)	Antenna Factor (dB/m)
1	1000	23.9
2	2000	28.3
3	3000	31.0
4	4000	33.1
5	4500	32.5
6	5000	32.4
7	6000	53.7
8	6500	35.6
9	7000	36.4
10	7500	36.9
11	8000	37.0
12	8500	38.0
13	9000	38.6
14	9500	38.4
15	10000	38.4
16	10500	38.4
17	11000	38.9
18	11500	39.6
19	12000	39.4
20	12500	39.2
21	13000	40.3
22	13500	41.0
23	14000	41.2
24	14500	41.3
25	15000	40.0
26	15500	38.0
27	16000	38.1
28	16500	40.3
29	17000	42.2
30	17500	44.6
31	18000	46.2

Cable Loss**Type: Sucoflex 104PE; Ser.No.21328/4PE; 3 m length**

Point	Frequency (GHz)	Cable Loss (dB)
0	0.0-1.8	1.67
1	1.8 – 3.6	2.39
2	3.6 – 5.4	3.04
3	5.4-7.2	3.58
4	7.2-9.0	4.06
5	9.0-10.8	4.49
6	10.8-12.6	4.91
7	12.6-14.4	5.31
8	14.4-16.2	5.66
9	16.2-18.00	6.01

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APPENDIX C General information.

Abbreviations and acronyms

The following abbreviations and acronyms are applicable to this test report:

AC	alternating current
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μ V)	decibel referred to one microvolt
dB(μ V/m)	decibel referred to one microvolt per meter
EMC	electromagnetic compatibility
EUT	equipment under test
GHz	gigahertz
H	height
Hz	hertz
kHz	kilohertz
L	length
LNA	low noise amplifier
m	meter
Mbps	megabit per second
MHz	megahertz
NA	not applicable
OFDM	Orthogonal Frequency Division Multiple Access
PRBS	pseudo random binary sequence
QP	quasi-peak
RF	radio frequency
RE	radiated emission
rms	root mean square
W	width

Specification references

47 CFR part 15: 2006	Radio Frequency Devices
ANSI C63.4: 2003	American National Standard for Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communication Equipment Measurement and Performance.