



***Test Report No. 8712313898***

***For Alvarion Ltd.***

***Equipment Under Test:  
Broadband Wireless Access  
BreezeACCESS VL 5.4 System  
Subscriber unit***

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



***Certificate No. 1487-01***

**Test Report No: 8712313898****Page 1 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

<b>Order placed by:</b>	Alvarion Ltd.
<b>Address:</b>	21A Habarzel str, Tel-Aviv, 69710, Israel
<b>Sample for test selected by:</b>	The customer
<b>The date of test:</b>	February 2007

**Description of Equipment****Under Test (EUT):** BreezeACCESS VL 5.4 System Subscriber unit**Manufactured by:** Alvarion Ltd.**Reference Documents:**

- ❖ CFR 47 FCC: Rules and Regulations; Part 15. "Radio frequency devices"; Subpart C: "Intentional radiators", Subpart E: "UNII devices"

**Test Results:** The EUT was found meeting with the relevant requirements of CFR 47 FCC Part 15 Sections: 15.205, 15.207, 15.209, and 15.407.

This Test Report contains 83 pages  
and may be used only in full.

This Test Report applies only to the specimen tested and may not  
be applied to other specimens of the same product.

**Test Report No: 8712313898**

**Page 2 of 83 Pages**

**Title: Test on Broadband Wireless Access system:**

**BreezeACCESS VL 5.4 System Subscriber unit**

**FCC ID: LKT-VL-54**

## **Table of Contents**

<b>1. Scope</b>	<b>3</b>
1.1. Applicant information _____	3
1.2. Test performance _____	3
<b>2. General description</b>	<b>4</b>
<b>3. Test configuration:</b>	<b>7</b>
<b>4. Test specification, Methods and Procedures</b>	<b>8</b>
<b>5. Measurements, examinations and derived results</b>	<b>8</b>
5.1. Location of the Test Site: _____	8
5.2. Normal test condition: _____	8
5.3. Conducted emission test (per Section 15.207): _____	9
5.4. Radiated emission test, general requirements (per section 15.209): _____	11
5.5. Radiated emission test on Radio Unit – spurious (per Section 15.209): _____	13
5.6. Radiated emission test on Radio Unit - restricted bands (per Section 15.205): _____	16
<b>6. Radio Unit measurements 15.407</b>	<b>18</b>
6.1. Maximum peak transmit power _____	18
6.2. The peak emissions outside of the frequency bands of operation. _____	18
6.3. 26dB bandwidth _____	19
6.4. Peak power spectral density _____	19
6.5. Peak excursion _____	19
<b>7. Compliance with specification</b>	<b>20</b>
<b>8. Appendix 1: Test equipment used</b>	<b>21</b>
<b>9. Appendix 2: Antenna Factor and Cable Loss</b>	<b>21</b>
<b>10. Appendix 3: Test results (plots)</b>	<b>24</b>
10.1. Peak Transmit Power test 15.407a (2) _____	30
10.2. Peak Power Spectral Density 15.407a (2) _____	36
10.3. BA VL transmitter time duration for the ratio of the Peak Execution measurements 15.407a (6) _____	42
10.4. Ratio of the Peak Execution 15.407a (6) _____	43
10.5. Peak Emissions outside of the frequency band 15.407b (3). _____	46
10.6. Radiated Spurious Emissions 15.407b (7) _____	53
<b>11. Appendix 4: Test configuration illustration</b>	<b>81</b>

**Test Report No: 8712313898****Page 3 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

## 1. Scope

Test item: BreezeACCESS VL 5.4 System Subscriber unit.

Manufacturer: Alvarion LTD

Types (Models): Subscribe unit:  
SU-A-5.4-3/6/54-B/1D-VL Complete system  
IDU: Universal indoor unit, Model: PS1073

Base station ODU unit AU-E-SA-VL (rev. C) and Subscriber ODU unit SU-A-5.4-54-54-BD-VL (rev. E) contains identical radio circuits. The difference is in the enclosure. Therefore the EMC test end radio spurious emissions tests for SU-A-5.4-54-BD-VL (rev. E) were made separately.

### 1.1. Applicant information

Company: Alvarion LTD  
P.O.B.: 13139  
Postal code: 61131  
City: Tel Aviv  
Country: Israel  
Telephone number: +972 3 6456262  
Telefax number: +972 3 6456222

### 1.2. Test performance

Location: SII EMC Section  
Alvarion LTD  
Purpose of test: Apparatus compliance verification in accordance with  
CFR 47 FCC Requirement  
Test specification: CFR 47 FCC Part 15 Sections: 15.205, 15.207, 15.209, 15.407

**Test Report No: 8712313898****Page 4 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

## 2. General description

BreezeACCESS VL is a high capacity, IP services oriented Broadband Wireless Access system.

The BreezeAccess VL is digital modulated TDD system operating in the 5470 MHz up to 5725 MHz band. The system contains a base station unit and a subscriber unit. The system is operating with software selectable bandwidth of 10MHz, and 20MHz.

The base station and subscriber radio are identical radio hardware.

The basic system configuration is a two-box configuration that contains

1. Indoor unit that contains a power supply and an Ethernet 10Base-T bypass.
2. Outdoor unit containing the entire radio and digital section.
3. A single CAT5 cable connecting the indoor and outdoor unit carrying the DC power and the data.

The subscriber indoor unit is a single power supply (55VDC) and Ethernet 10Base-T bypass. The base station indoor unit is a 19" rack containing several indoor units cards were there is one main power supply for all units or a single power supply supporting only one outdoor unit.

The subscriber unit is typically supplied with a 20 dBi antenna

The Base station unit is typically supplied with a 17 dBi antenna for point to multi point application or with a high gain antenna for point-to-point application.

The measurements are done for the worst-case high output power for the subscriber and base station applications. For high gain antenna the output power is attenuated automatically to maintain the 30dBm EIRP limit.

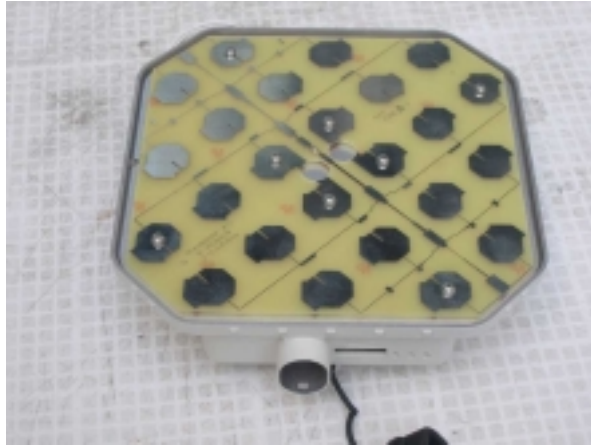
**Test Report No:** 8712313898

**Page 5 of 83 Pages**

**Title:** Test on Broadband Wireless Access system:

**BreezeACCESS VL 5.4 System Subscriber unit**

**FCC ID:** LKT-VL-54



**Photo # 1. Radio Unit. Antenna view.**



**Photo # 2. Radio Unit. PWB component side**



**Test Report No:** 8712313898

Page 6 of 83 Pages

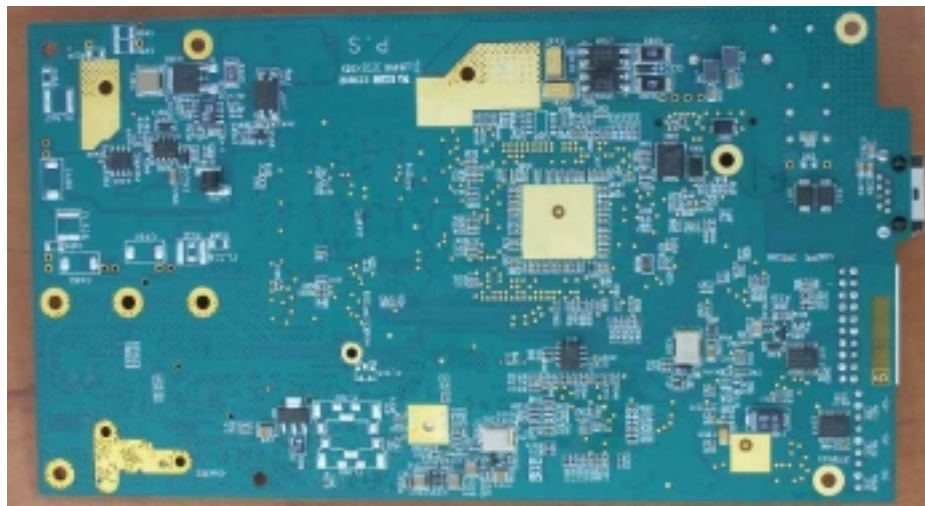
**Title:** Test on Broadband Wireless Access system:

**BreezeACCESS VL 5.4 System Subscriber unit**

**FCC ID:** LKT-VL-54



**Photo # 3. Radio Unit. PCB component side**



**Photo # 4. Radio Unit. PCB print side**

**Test Report No: 8712313898** **Page 7 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

### 3. Test configuration:

1. For Radiated emission measurements per sec. 15.407 requirements the Subscriber Unit and the Base Station Unit were configured for tests as shown in Figures 1, 2.
2. For Radiated emission measurements per sec. 15.407 requirements the Radio unit was tested with two various antennas, as shown in table:

No	Name	Freq. Range [GHz]	Gain dBi	P/N or Model	Type
1	MTI (SU)	5.15 - 5.875	20	AN 1303	Integrated Flat panel antenna

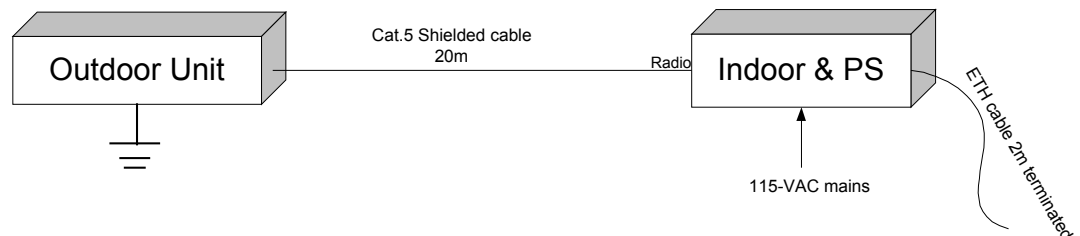
Environmental evaluation and exposure limit according to FCC CFR 47part 1, §1.1307, §1.1310  
 Limit for power density for general population/uncontrolled exposure is 1 mW/cm<sup>2</sup>.  
 The power density P (mW/cm<sup>2</sup>) = Pt/4π.r<sup>2</sup>  
 Where:

PT - The transmitted power (EIRP) (mW)  
 r - The distance from the unit. (cm)

The 1(mW/cm<sup>2</sup>) limit can be calculated from the above based on the following data:  
 Pt = 30dBm (maximum EIRP) 1000mW

$$r = \text{SQRT}(1000/4\pi) = 8.92\text{cm}$$

The allowed distance “r”, where RF exposure limits may not be exceeded, is 8.92 cm from the unit antenna main lobe.



**Figure 1. Subscriber Unit test setup**



**Test Report No: 8712313898**

**Page 8 of 83 Pages**

**Title: Test on Broadband Wireless Access system:**

**BreezeACCESS VL 5.4 System Subscriber unit**

**FCC ID: LKT-VL-54**

## 4. Test specification, Methods and Procedures

### Test Specification:

- ❖ CFR 47 FCC: Rules and Regulations; Part 15. "Radio frequency devices"; Subpart E: "Intentional radiators" (2006)

### Methods and Procedures:

- ❖ ANSI C63.4:2003: "American National Standard for Method of Measurement of Radio Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range 9 kHz to 40 GHz".

## 5. Measurements, examinations and derived results

### **5.1. Location of the Test Site:**

The tests were conducted in the EMC laboratory of the Standards Institution of Israel in Tel-Aviv and at open test site located at Kibbutz Native Halamed Hai in Emek HaEla, Israel.

### **5.2. Normal test condition:**

Temperature: 22 °C

Humidity: 56 %

**Test Report No: 8712313898****Page 9 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54****5.3. Conducted emission test (per Section 15.207):****5.3.1. Requirements:**

EUTs conducted emission within the band 150 kHz to 30 MHz shall not exceed value required in section 15.207 (a).

**5.3.2. Tested units:**

The measurements were performed on:

- Subscriber Unit - on Universal Indoor unit AC power adaptor PS 1073

**5.3.3. Test procedure:**

Each EUT was placed on a non-metallic table in a shielded chamber at a height of 80 cm from the floor and 40 cm from the nearest wall.

The EUT was operated to transmitting through the customer software.

First, initial scans were performed. Final measurements were performed at the frequencies where emission exceeded the tolerance limit.

Test equipment (EMI receiver) setup was as follow:

**Initial scan:**

Detector type	Peak
Mode	Max hold
Bandwidth	9 kHz
Step size	Continuous sweep
Sweep time	>100 msec

**Measurements**

Detector type	Quasi-peak, Avg (CISPR)
Bandwidth	9 kHz
Measurement time	200 seconds/MHz
Observation	>15 seconds

**5.3.4. Test results:**

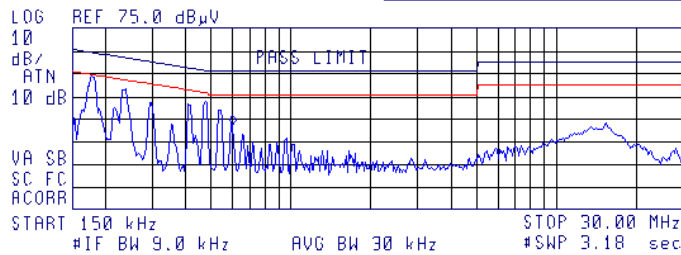
Subscriber Unit. Test results are shown in Plots #1, 2.

**Test Report No: 8712313898** **Page 10 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

14:17:58 FEB 14, 2007 120VAC Line PH  
 Alvarion EUT-BM VL 5.4 rev E

Signal	Freq (MHz)	PK Amp	QP Amp	AV Amp	AV $\Delta$ L2
1	0.180587	54.7	54.2	43.4	-11.1
2	0.240238	48.0	47.2	37.0	-15.2
3	0.422451	41.5	40.6	37.5	-9.9
4	0.480212	43.4	42.6	41.1	-5.3
5	0.542372	39.5	38.5	36.7	-9.3

FREQ 602.2 kHz  
 PEAK 34.5 dB $\mu$ V  
 QP 33.3 dB $\mu$ V  
 AVG 31.1 dB $\mu$ V

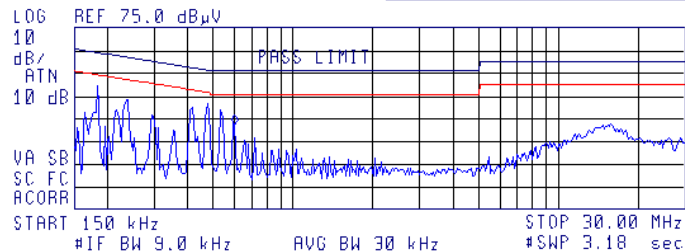


**Plot 1. Subscriber Unit**  
**Conducted emissions measurement result on 120 VAC power line: phase**

14:23:01 FEB 14, 2007 120VAC Line N  
 Alvarion EUT-BM VL 5.4 rev E

Signal	Freq (MHz)	PK Amp	QP Amp	AV Amp	AV $\Delta$ L2
1	0.180584	54.3	53.6	44.0	-10.5
2	0.240239	48.8	48.1	39.3	-12.9
3	0.422458	42.6	41.7	39.3	-8.1
4	0.480206	43.0	41.7	40.2	-6.2
5	0.542367	39.7	38.9	37.2	-8.8

FREQ 603.9 kHz  
 PEAK 33.5 dB $\mu$ V  
 QP 32.6 dB $\mu$ V  
 AVG 30.2 dB $\mu$ V



**Plot 2. Subscriber Unit**  
**Conducted emissions measurement result on 120 VAC power line: neutral**

**Test Report No: 8712313898****Page 11 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54****5.4. Radiated emission test, general requirements (per section 15.209):****5.4.1. Requirements:**

EUT's radiated emission shall not exceed value required in section 15.209.

**5.4.2. Test description:**

The measurements were performed at the Open Area Test Site.

The test configuration is shown in Fig.1, 2.

The EUT was arranged on a non-metallic 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 2 GHz.

The measurements were performed at each frequency at which the signal was 10 dB below the limit or less.

The level were 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. The measuring equipment settings were:

**Initial scan:**

Detector type	Peak
Mode	Max hold
Bandwidth	120 kHz
Step size	Continuous sweep
Sweep time	>1 seconds/MHz

**Measurements:**

Detector type	Quasi-peak (CISPR 16)
Bandwidth	120 kHz
Measurement time	20 seconds/MHz
Observation	>15 seconds

**5.4.3. Radiated emission test results:**

Test results are presented in Table 1.

**Test Report No:** 8712313898 **Page 12 of 83 Pages**  
**Title:** Test on Broadband Wireless Access system:  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID:** LKT-VL-54

**Table 1. Radiated emission test results**  
**EUT: BreezeACCESS VL 5.4 System**

Frequency (MHz)	Turn- table Angle (°)	Antenna Polariz.	Antenna Height (m)	Emission Level Note 1 (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin Note 2 (dB)	Results
34.5	239	V	1.0	23.8	40.0	-16.2	Complies
66.5	243	V	1.0	23.0	40.0	-17.0	Complies
250.0	25	H	3.8	26.4	46.0	-19.6	Complies
355.8	232	H	3.8	26.9	46.0	-19.1	Complies
375.0	130	H	2.3	29.0	46.0	-17.0	Complies
400.0	302	H	1.6	30.9	46.0	-15.1	Complies

Note 1: Emission level = E Reading (dBμV) + Cable loss (dB) + Antenna Factor (dB/m)  
 For Cable Loss and Antenna Factor refer to Appendix 2.

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

**Test Report No: 8712313898**

**Page 13 of 83 Pages**

**Title: Test on Broadband Wireless Access system:**

**BreezeACCESS VL 5.4 System Subscriber unit**

**FCC ID: LKT-VL-54**

**5.5. Radiated emission test on Radio Unit – spurious (per Section 15.209):**

**5.5.1. Requirements:**

The levels of any unwanted emission shall not exceed value required in section 15.209.

**5.5.2. EUT configuration:**

The radio unit was tested with antennas:

- Integrated Flat panel antenna - AN 1303 for Subscriber unit (SU)

The output power was adjusted according to 15.407 (a)(2) requirement:

Subscriber unit – antenna 20 dBi, EBW – 10 MHz – 21-(20-6) = 7 dBm

Subscriber unit – antenna 20 dBi, EBW – 20 MHz – 24-(20-6) = 10 dBm

**5.5.3. Test procedure:**

The measurements were performed in the anechoic chamber.

The EUT was arranged on a non-metallic table 0.8 m placed on the turntable.

Measuring antennas used: Up to 18 GHz - Double Ridge EMCO model 3115  
above 18 GHz - Alpha TRG model A361

Antenna height = 1 m.

Polarization: Vertical/Horizontal

Measurement distance = 1m.

The frequency range was investigated up to 40 GHz.

The measurements were performed in vertical and horizontal polarization, the maximum reading recorded.

Measuring detector function and bandwidths:

Detector type	Peak	Average
RBW	1 MHz	1 MHz
VBW	3 MHz	3 kHz

**5.5.4. Radiated emission test results and calculation ratio:**

The test results are shown in Tables ## 2, 3.

The emission level was calculated as:

E Reading (dBμV) + measuring cable loss (dB) + measuring antenna factor (dB/m)

For measuring cable loss and measuring antenna factor refer to Appendix 2.

Limit distance correction factor = 10 dB (an extrapolation factor from 1 m measuring distance to 3m specified distance).

**Test Report No:** 8712313898 **Page 14 of 83 Pages**  
**Title:** Test on Broadband Wireless Access system:  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID:** LKT-VL-54

**Table 2. Spurious emissions test results**

Antenna used: 20 dBi. EBW 10 MHz

Frequency (GHz)	Emission Level (dB $\mu$ V/m)		Limit @ 1m (dB $\mu$ V/m)		Margin (dB)		Results
	Peak	Average	Peak	Average	Peak	Average	
<b><u>LOW 5.485 GHz</u></b>							
10.97	70.2	56.4	84	64	13.8	7.6	Complies
16.45	69.7	60.0			14.3	4.0	Complies
21.94	Noise floor	Noise floor			-	-	Complies
27.42	Noise floor	Noise floor			-	-	Complies
32.91	Noise floor	Noise floor			-	-	Complies
38.39	Noise floor	Noise floor			-	-	Complies
<b><u>MIDDLE 5.600 GHz</u></b>							
11.2	64.7	57.2	84	64	17.3	6.8	Complies
16.8	69.7	61.5			14.3	2.5	Complies
22.4	Noise floor	Noise floor			-	-	Complies
28.0	Noise floor	Noise floor			-	-	Complies
33.6	Noise floor	Noise floor			-	-	Complies
39.2	Noise floor	Noise floor			-	-	Complies
<b><u>HIGH 5.710 GHz</u></b>							
11.42	66.7	57.1	84	64	17.3	6.9	Complies
17.13	72.8	62.9			11.2	1.1	Complies
22.84	Noise floor	Noise floor			-	-	Complies
28.55	Noise floor	Noise floor			-	-	Complies
34.36	Noise floor	Noise floor			-	-	Complies
39.97	Noise floor	Noise floor			-	-	Complies



<b>Test Report No: 8712313898</b> <b>Title: Test on Broadband Wireless Access system:</b> <b>BreezeACCESS VL 5.4 System Subscriber unit</b> <b>FCC ID: LKT-VL-54</b>	<b>Page 15 of 83 Pages</b>
---	----------------------------

**Table 3. Spurious emissions test results**

**Antenna used: 20 dBi. EBW 20 MHz**

Frequency (GHz)	Emission Level (dB $\mu$ V/m)		Limit @ 1m (dB $\mu$ V/m)		Margin (dB)		Results
	Peak	Average	Peak	Average	Peak	Average	
<b>LOW 5.500 GHz</b>							
11.0	64.0	56.6	84	64	20.0	6.4	Complies
16.5	67.7	60.0			16.3	4.0	Complies
22.0	Noise floor	Noise floor			-	-	Complies
27.5	Noise floor	Noise floor			-	-	Complies
33.0	Noise floor	Noise floor			-	-	Complies
38.5	Noise floor	Noise floor			-	-	Complies
<b>MIDDLE 5.600 GHz</b>							
11.2	64.6	57.1	84	64	19.4	6.9	Complies
16.8	69.0	61.5			15.0	2.5	Complies
22.4	Noise floor	Noise floor			-	-	Complies
28.0	Noise floor	Noise floor			-	-	Complies
33.6	Noise floor	Noise floor			-	-	Complies
39.2	Noise floor	Noise floor			-	-	Complies
<b>HIGH 5.700 GHz</b>							
11.4	66.0	57.7	84	64	18.0	6.3	Complies
17.1	71.7	63.0			12.3	1.0	Complies
22.8	Noise floor	Noise floor			-	-	Complies
28.5	Noise floor	Noise floor			-	-	Complies
34.3	Noise floor	Noise floor			-	-	Complies
39.9	Noise floor	Noise floor			-	-	Complies

**5.6. Radiated emission test on Radio Unit - restricted bands (per Section 15.205):**

**5.6.1. Requirements:**

Radiated emission in restricted bands should meet the requirements sec. 15.205. The following frequency bands should be measured:

Frequency carrier, GHz		Harmonic Frequency, GHz	Restricted band to be tested GHz
LOW	5.485	10.97, 11.0	10.6 – 12.7
	5.500		
MIDDLE	5.600	11.2	10.6 – 12.7
		22.4	22.01 – 23.12
HIGH	5.700	11.4, 11.42	10.6 – 12.7
	5.710	22.8, 22.84	22.01 – 23.12

**5.6.2. EUT configuration:**

The measurements were performed with four various antennas.

**5.6.3. Test procedure:**

The measurements were performed in the anechoic chamber. The EUT was arranged on a non-metallic table 0.8 m placed on the turntable. Measuring antennas used: Up to 18 GHz - Double Ridge **EMCO** model 3115 above 18 GHz - Alpha TRG model A361

Antenna height = 1 m.

Measurement distance = 1m.

Measuring detector function and bandwidths:

Detector type	Peak	Average
RBW	1 MHz	1 MHz
VBW	3 MHz	3 kHz

All measurements were compared with the limit.

**Test Report No: 8712313898**

**Page 17 of 83 Pages**

**Title: Test on Broadband Wireless Access system:**

**BreezeACCESS VL 5.4 System Subscriber unit**

**FCC ID: LKT-VL-54**

**5.6.4. Test results and calculation ratio:**

The test results are shown in Plots #60 to #99; see tables below:

**Antenna 20 dBi**

Frequency carrier, GHz		Harmonic Frequency, GHz	Restricted band	Antenna name
				AN 1303
LOW	5.485	10.97, 11.0	10.6 – 12.7	#62, 63
	5.500			#82, 83
MIDDLE	5.600	11.2	10.6 – 12.7	#68, 69 #88, 89
		22.4	22.01 – 23.12	#72, #92
HIGH	5.700	11.4, 11.42	10.6 – 12.7	#75, 76 #95, 96
	5.710	22.8, 22.84	22.01 – 23.12	#79, #99

Notes: The AVG limit line 64 dB $\mu$ V/m (at 1m distance) is not shown in the plots.  
All measurements in restricted bands on frequency ranges above 22 GHz not exceed the SA noise floor level.

**Test Report No: 8712313898**

**Page 18 of 83 Pages**

**Title: Test on Broadband Wireless Access system:**

**BreezeACCESS VL 5.4 System Subscriber unit**

**FCC ID: LKT-VL-54**

## 6. Radio Unit measurements 15.407

### 6.1. Maximum peak transmit power

#### 6.1.1. Requirements:

The peak transmit power shall not exceed the lesser of 250mW(24dBm) or 11dBm+10logB, where B is the 26-dB emission bandwidth in MHz. as required in sec. 15.407 (a) (2).

Maximum output power limit is 11dBm+10log(10MHz) = 21 dBm for EBW=10 MHz and 24 dBm for EBW = 20 MHz.

#### 6.1.2. Test procedure:

The peak output power is measured according to method #3 as defined in the measurement procedure for peak transmit power in the Unlicensed National Information Infrastructure (U-NII) bands; Public Notice DA 02-2138 Aug-30-2002. Measurements were performed with maximum allowed output power without respect to antenna gain.

#### 6.1.3. Test results:

The measured maximum peak power is:

Frequency carrier, GHz	EBW 10 MHz	Measured power dBm	EBW 20 MHz	Measured power dBm
Low	5.485	20.93	5.500	23.57
Middle	5.600	20.39	5.600	23.25
High	5.710	20.47	5.700	22.84

The measured results are shown in Appendix 3, clause 10.1.

### 6.2. The peak emissions outside of the frequency bands of operation.

#### 6.2.1. Requirements:

All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz as required in sec. 15.407 (b) (3).

#### 6.2.2. Test results:

The measured results are shown in Appendix 3, clause 10.5.

**Test Report No: 8712313898****Page 19 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

### **6.3. 26dB bandwidth**

#### **6.3.1. Requirements:**

The signal bandwidth is defined at the  $-26\text{dBc}$  points from the signal peak as required in section 15.403 (i).

#### **6.3.2. Test results:**

The measured results are shown in clause 10.

### **6.4. Peak power spectral density**

#### **6.4.1. Requirements:**

The peak power spectral density shall not exceed  $11\text{dBm}$  in any  $1\text{MHz}$  band as required in section 15.407 (a) (2).

#### **6.4.2. Test results:**

Measurements were performed without respect to antenna gain with maximum output power. All measurements were found under the limit.

The measured results are shown in Appendix 3, clause 10.2.

### **6.5. Peak excursion**

#### **6.5.1. Requirements:**

The ratio of the peak excursion of the modulation envelope to the peak transmit power shall not exceed  $13\text{dB}$  across any  $1\text{MHz}$  bandwidth or the emission bandwidth whichever is less as required in sec. 15.407 (a) (6).

#### **6.5.2. Test results:**

The peak excursion is measured according to method as defined in the guidelines for assessing unlicensed national information infrastructure (U-NII) Devices-part 15,subpart E.

The measured results are shown in Appendix 3:

clause 10.3 - BA VL transmitter time duration for the ratio of the Peak Execution measurements;

clause 10.4 – the ratio of the Peak Execution result.

**Test Report No: 8712313898****Page 20 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

## 7. Compliance with specification

Test	FCC Part 15	Test result
Radiated emissions in restricted bands	Sec.15.205	Complies
Conducted emission	Sec.15.207	Complies
Radiated emission – general requirements	Sec.15.209	Complies
Maximum peak output power	Sec.15.407	Complies
Conducted spurious emissions	Sec.15.407	Complies
Peak power density	Sec.15.407	Complies
Peak excursion ratio	Sec 15.407	Complies



Telematics Laboratory

March 2007



Approved by: Yuri Rozenberg

Position: Head of EMC Branch

Tested by: Michael Feldman

Position: Testing Technician

**Test Report No: 8712313898** **Page 21 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

### 8. Appendix 1: Test equipment used

All measurements equipment is on SII calibration schedule with a recalibration interval not exceeding one year.

Instrument	Manufacturer	Model	Serial No.	Due calibration date
Spectrum analyzer 10 KHz-26.5 GHz	HP	E7405	SII 4944	04/07
Spectrum analyzer 9 KHz-50 GHz	HP	8565E	720A00699	07/07
Spectrum analyzer 9 KHz-26.5 GHz	Adjilent	E4407B	US40241729	01/08
Antenna Double Ridge 1-18 GHz	EMCO	3115	SII4873	04/07
Antenna Standard Gain Horn 18-40 GHz	WILTRON	Alpha TRG A361	861A/590	04/07
LISN 9 kHz – 30 MHz	FCC	LISN- 50/250-32-4- 16	SII 5023	05/06
Transient limiter 0.009-200 MHz	HP	11947A	31074A3105	05/07
Attenuator 20 dB DC – 18 GHz	Mini-Circuit	VAT-20	0134	05/07

### 9. Appendix 2: Antenna Factor and Cable Loss

**Antenna Factor**  
**Standard Gain Horn 26 – 40 GHz Alpha TRG Model A361**

Point	Frequency (MHz)	Antenna Factor (dB/m)
1	26000	35.22
2	27000	35.40
3	28000	35.52
4	29000	35.64
5	30000	35.76
6	31000	35.90
7	32000	36.07
8	33000	36.16
9	34000	36.31
10	35000	36.46
11	36000	36.60
12	37000	36.74
13	38000	36.93
14	39000	37.21
15	40000	37.28



**Test Report No: 8712313898****Page 22 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54****Biconilog Antenna, Model Number: CBL-6112B, S/N: 2531  
3 m calibration**

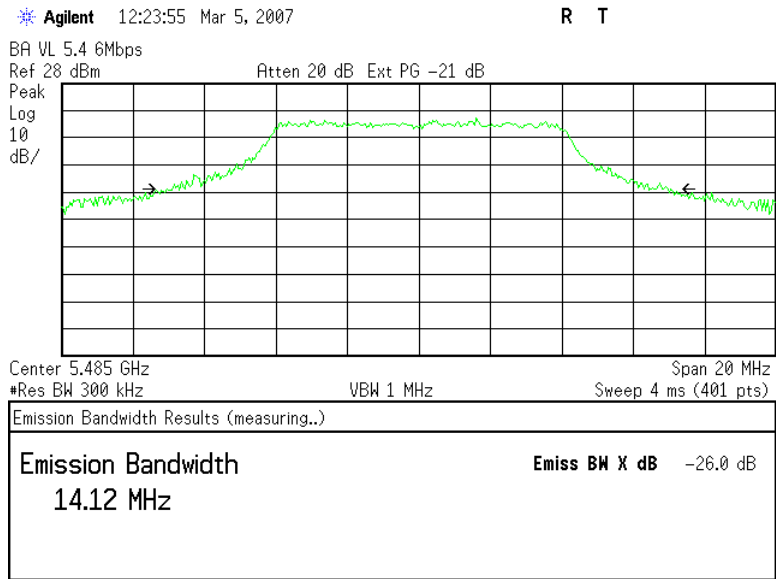
Frequency (MHz)	Antenna Factor (dB/m)	Frequency (MHz)	Antenna Factor (dB/m)	Frequency (MHz)	Antenna Factor (dB/m)	Frequency (MHz)	Antenna Factor (dB/m)
<b>Vertical Polarization</b>				<b>Horizontal Polarization</b>			
26.00	20.77	625.00	19.10	26.00	20.39	625.00	19.08
28.00	19.77	650.00	19.20	28.00	19.15	650.00	19.26
30.00	18.72	675.00	19.05	30.00	18.29	675.00	19.12
40.00	14.76	700.00	19.26	40.00	12.64	700.00	19.11
50.00	8.32	725.00	19.73	50.00	7.99	725.00	19.49
60.00	6.15	750.00	20.11	60.00	5.95	750.00	19.94
70.00	6.49	775.00	20.41	70.00	6.04	775.00	20.07
80.00	7.26	800.00	20.50	80.00	7.60	800.00	20.18
90.00	8.83	825.00	20.57	90.00	9.07	825.00	20.36
100.00	10.55	850.00	20.73	100.00	10.34	850.00	20.57
110.00	11.38	875.00	20.92	110.00	11.12	875.00	20.83
120.00	11.71	900.00	20.79	120.00	11.46	900.00	20.74
130.00	11.57	925.00	21.02	130.00	11.47	925.00	21.17
140.00	11.09	950.00	21.32	140.00	11.15	950.00	21.11
150.00	10.46	975.00	21.76	150.00	10.50	975.00	21.52
160.00	9.82	1,000.00	21.97	160.00	9.86	1,000.00	21.64
170.00	9.52	1,050.00	22.55	170.00	9.58	1,050.00	22.02
180.00	9.18	1,100.00	22.47	180.00	9.28	1,100.00	22.16
190.00	8.90	1,150.00	22.78	190.00	9.54	1,150.00	22.44
200.00	9.11	1,200.00	22.77	200.00	9.82	1,200.00	22.86
225.00	9.70	1,250.00	23.36	225.00	10.42	1,250.00	23.37
250.00	12.41	1,300.00	23.90	250.00	12.43	1,300.00	23.86
275.00	12.81	1,350.00	24.19	275.00	13.19	1,350.00	24.02
300.00	13.37	1,400.00	24.42	300.00	13.48	1,400.00	24.42
325.00	13.70	1,450.00	24.83	325.00	13.73	1,450.00	24.61
350.00	14.45	1,500.00	24.88	350.00	14.61	1,500.00	25.02
375.00	14.90	1,550.00	24.85	375.00	15.15	1,550.00	25.27
400.00	15.63	1,600.00	25.06	400.00	15.74	1,600.00	25.27
425.00	16.38	1,650.00	25.55	425.00	16.52	1,650.00	25.50
450.00	16.43	1,700.00	26.20	450.00	16.54	1,700.00	25.48
475.00	17.28	1,750.00	26.45	475.00	17.28	1,750.00	26.35
500.00	17.41	1,800.00	26.58	500.00	17.47	1,800.00	26.51
525.00	17.35	1,850.00	27.30	525.00	17.31	1,850.00	26.63
550.00	18.97	1,900.00	27.96	550.00	18.64	1,900.00	27.04
575.00	18.87	1,950.00	27.80	575.00	18.60	1,950.00	27.13
600.00	18.82	2,000.00	27.73	600.00	19.04	2,000.00	27.20

**Test Report No: 8712313898****Page 23 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54****Antenna Factor****Double Ridged Guide Antenna mfr EMCO model 3115 1m calibration**

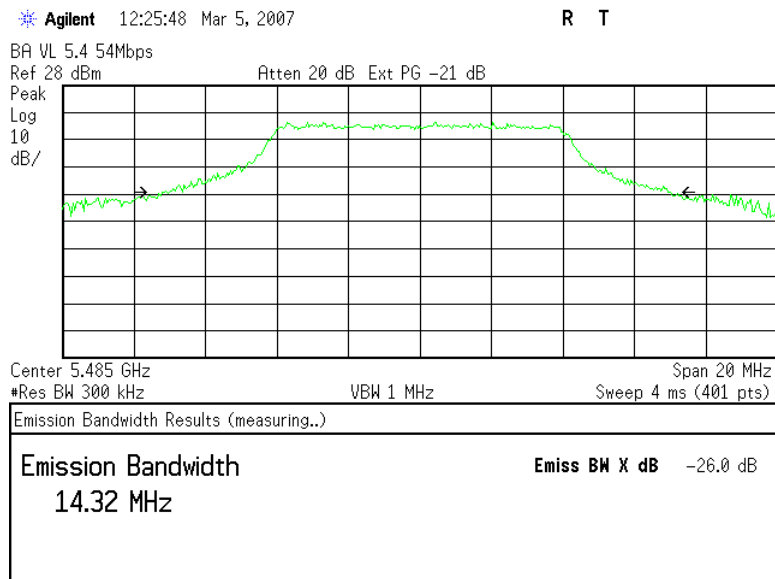
Point	Frequency (MHz)	Antenna Factor (dB/m)
1	1000	23.9
2	2000	28.3
3	3000	31.0
4	4000	33.1
5	4500	32.5
6	5000	32.4
7	6000	53.7
8	6500	35.6
9	7000	36.4
10	7500	36.9
11	8000	37.0
12	8500	38.0
13	9000	38.6
14	9500	38.4
15	10000	38.4
16	10500	38.4
17	11000	38.9
18	11500	39.6
19	12000	39.4
20	12500	39.2
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

**Test Report No: 8712313898** **Page 24 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

**10. Appendix 3: Test results (plots)**  
**26 dB - Emissions bandwidth test 15.407 a(2)**

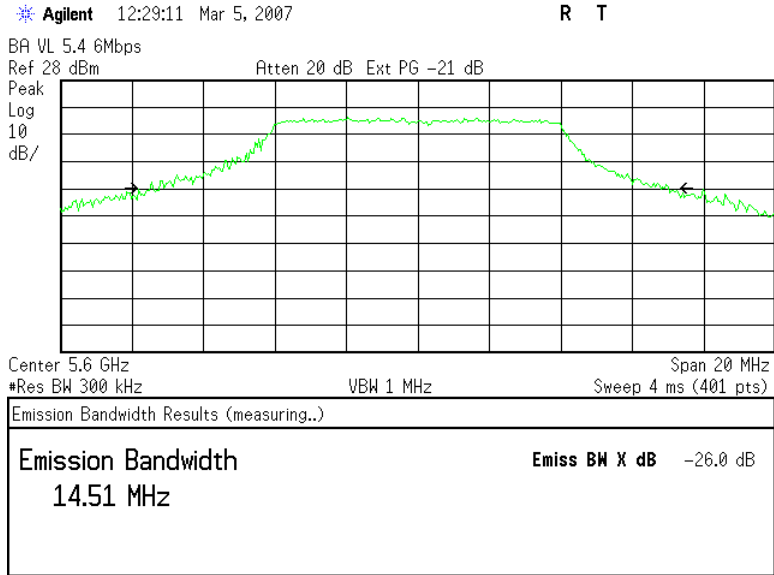


**Plot 3. Carrier Frequency 5.485 GHz, EBW 10 MHz, PRBS 6 Mbit/s**

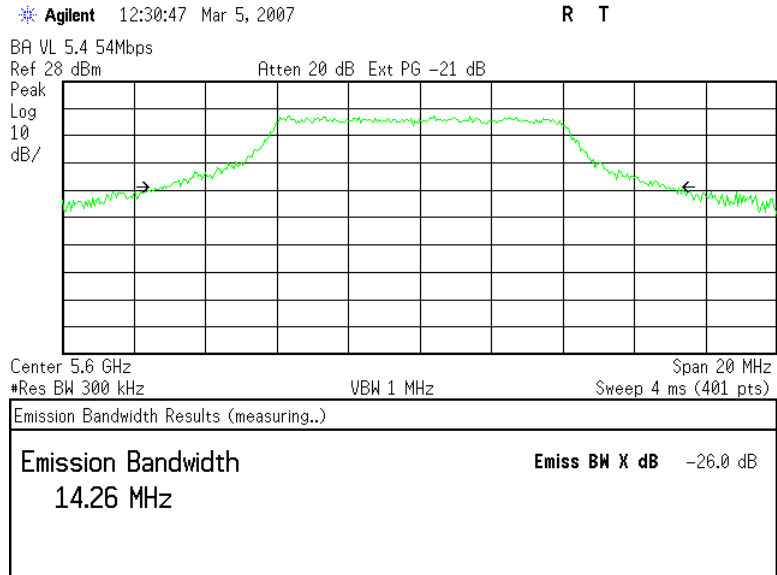


**Plot 4. Carrier Frequency 5.485 GHz , EBW 10 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 25 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

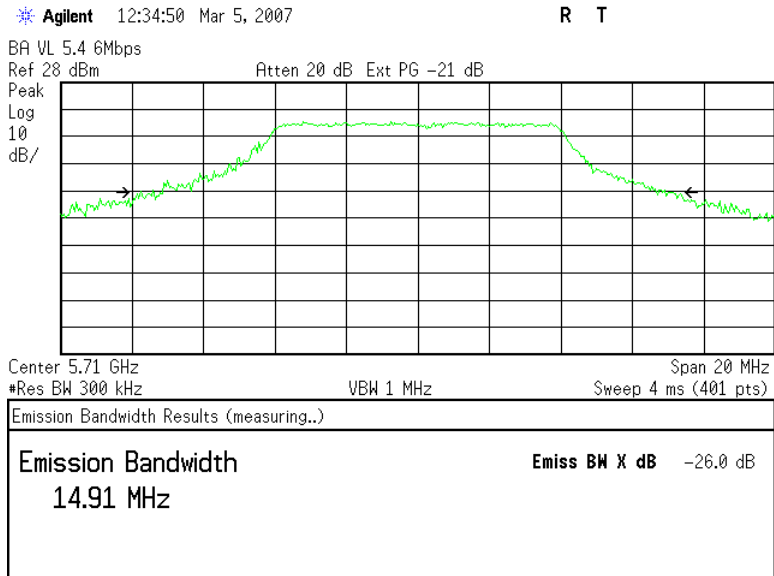


**Plot 5. Carrier Frequency 5.600 GHz, EBW 10 MHz, PRBS 6 Mbit/s**

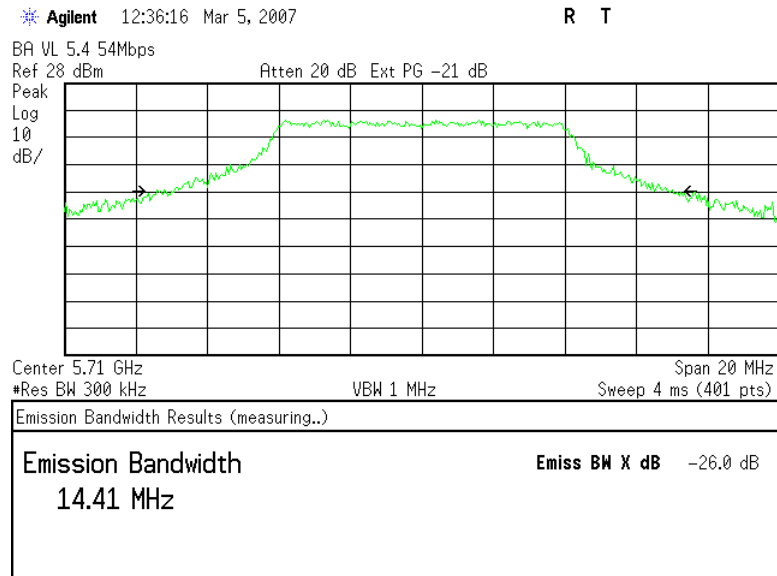


**Plot 6. Carrier Frequency 5.600 GHz, EBW 10 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 26 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

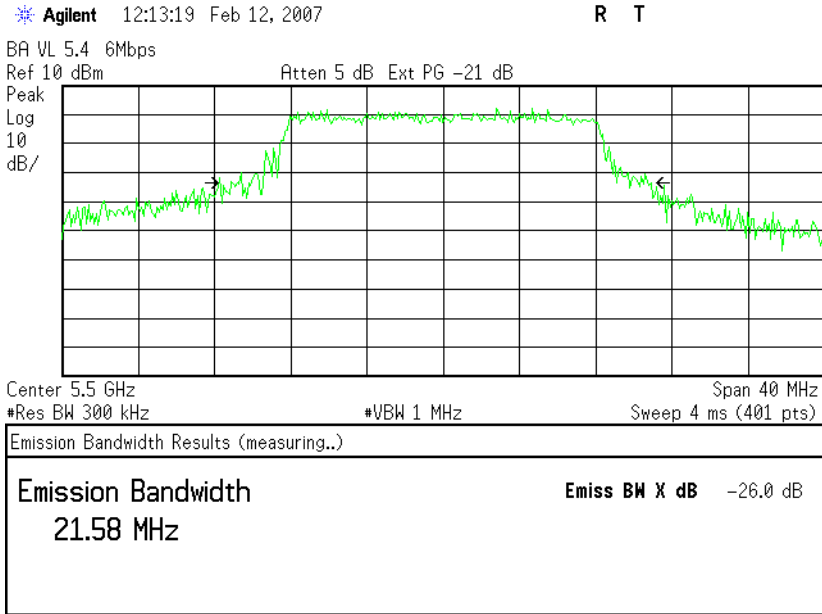


**Plot 7. Carrier Frequency 5.710 GHz, EBW 10 MHz, PRBS 6 Mbit/s**

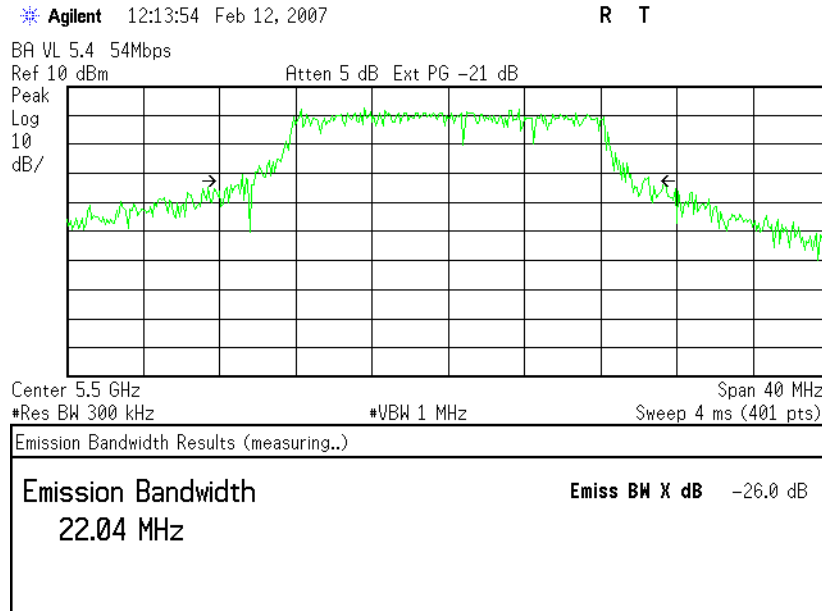


**Plot 8. Carrier Frequency 5.710 GHz, EBW 10 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 27 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

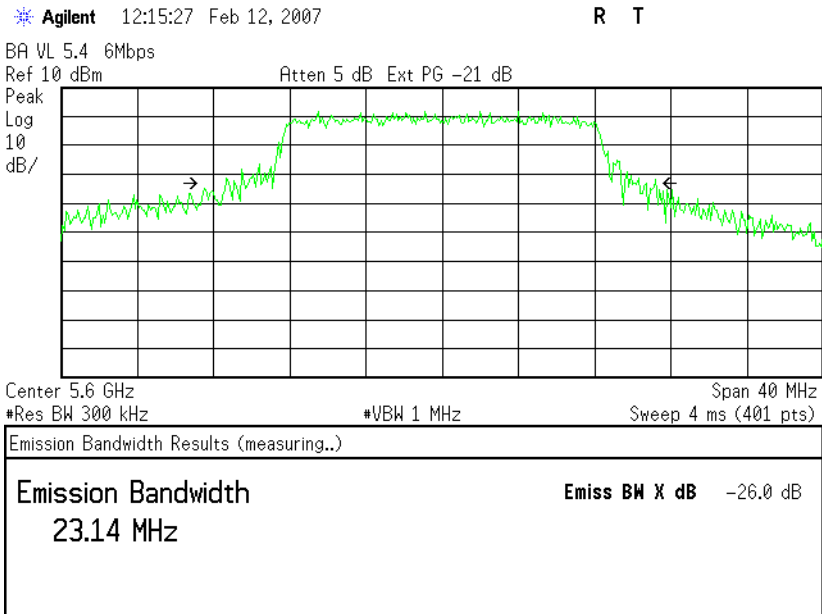


**Plot 9. Carrier Frequency 5.500 GHz, EBW 20 MHz, PRBS 6 Mbit/s**

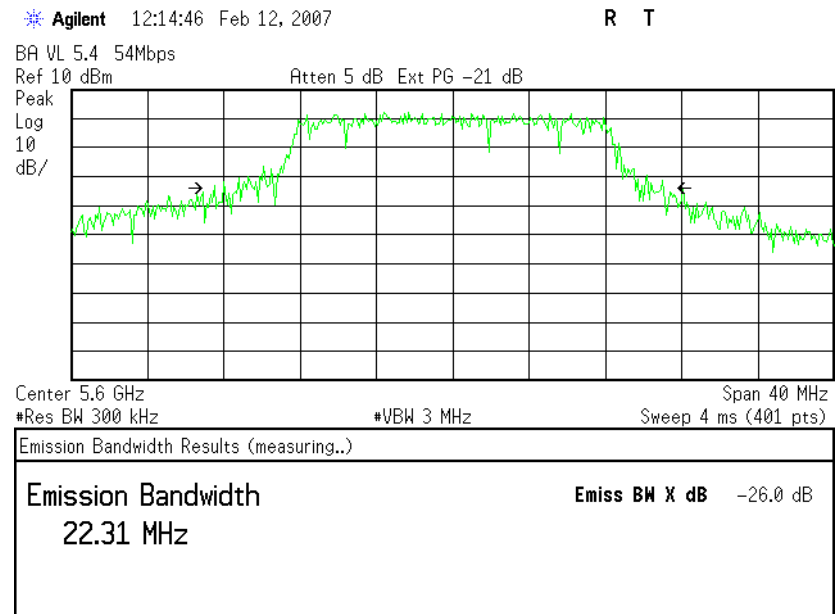


**Plot 10. Carrier Frequency 5.500 GHz, EBW 20 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 28 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



**Plot 11. Carrier Frequency 5.600 GHz, EBW 20 MHz, PRBS 6 Mbit/s**



**Plot 12. Carrier Frequency 5.600 GHz, EBW 20 MHz, PRBS 54 Mbit/s**



**Test Report No: 8712313898** **Page 29 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

Agilent 12:16:26 Feb 12, 2007

R T

BA VL 5.4 6Mbps

Ref 10 dBm

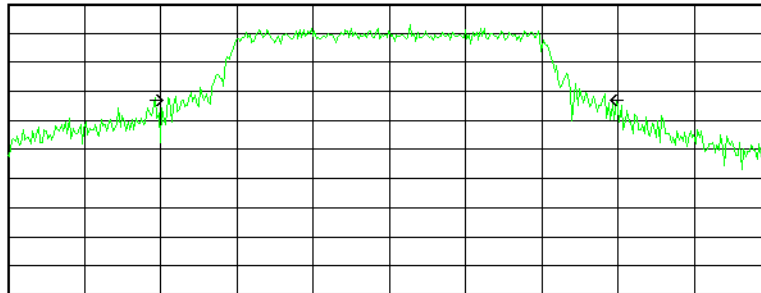
Atten 5 dB Ext PG -21 dB

Peak

Log

10

dB/



Center 5.7 GHz

Span 40 MHz

#Res BW 300 kHz

#VBW 1 MHz

Sweep 4 ms (401 pts)

Emission Bandwidth Results (measuring..)

Emission Bandwidth

Emiss BW X dB -26.0 dB

22.04 MHz

**Plot 13. Carrier Frequency 5.700 GHz, EBW 20 MHz, PRBS 6 Mbit/s**

Agilent 12:17:17 Feb 12, 2007

R T

BA VL 5.4 54Mbps

Ref 10 dBm

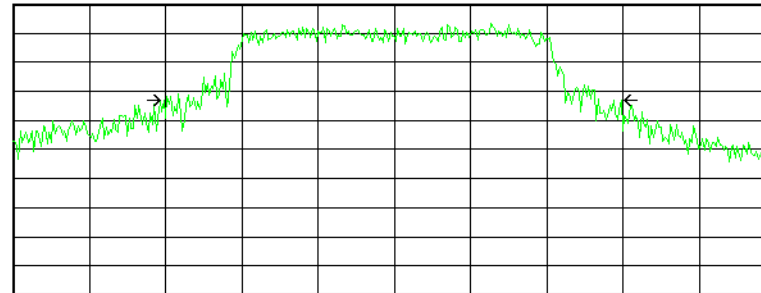
Atten 5 dB Ext PG -21 dB

Peak

Log

10

dB/



Center 5.7 GHz

Span 40 MHz

#Res BW 300 kHz

#VBW 1 MHz

Sweep 4 ms (401 pts)

Emission Bandwidth Results (measuring..)

Emission Bandwidth

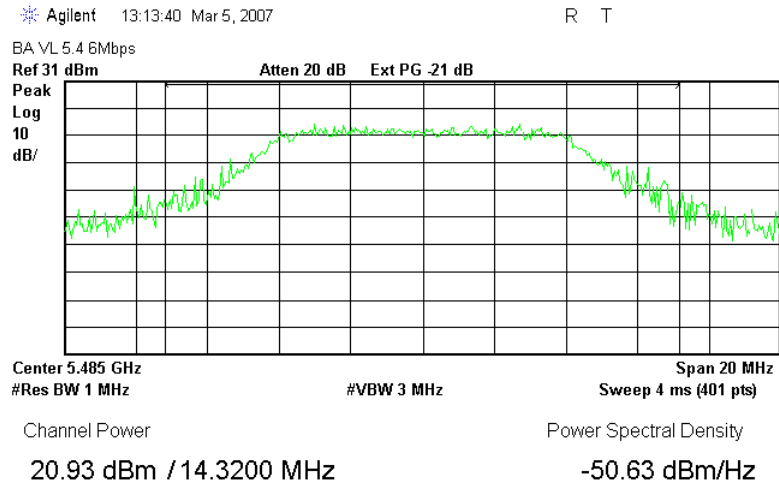
Emiss BW X dB -26.0 dB

23.03 MHz

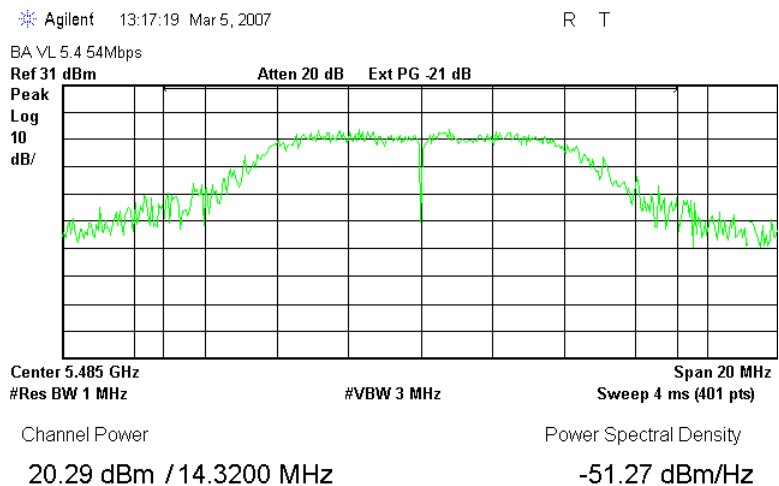
**Plot 14. Carrier Frequency 5.700 GHz, EBW 20 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 30 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

**10.1. Peak Transmit Power test 15.407a (2)**

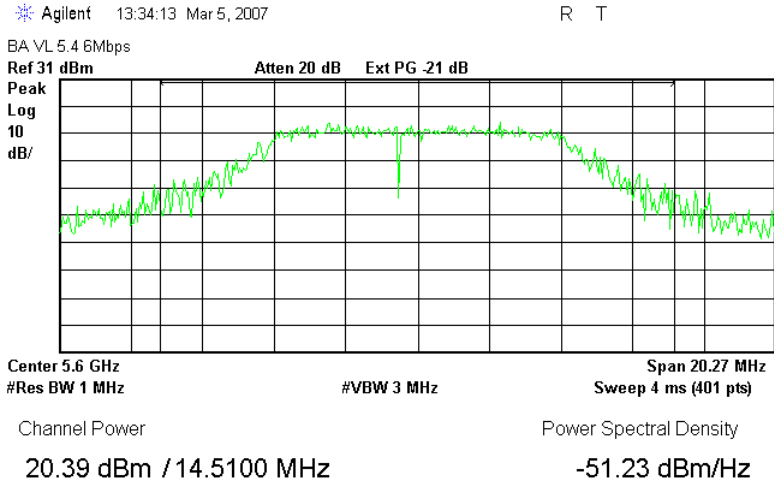


**Plot 15. Carrier Frequency 5.485 GHz, EBW 10 MHz, PRBS 6 Mbit/s**

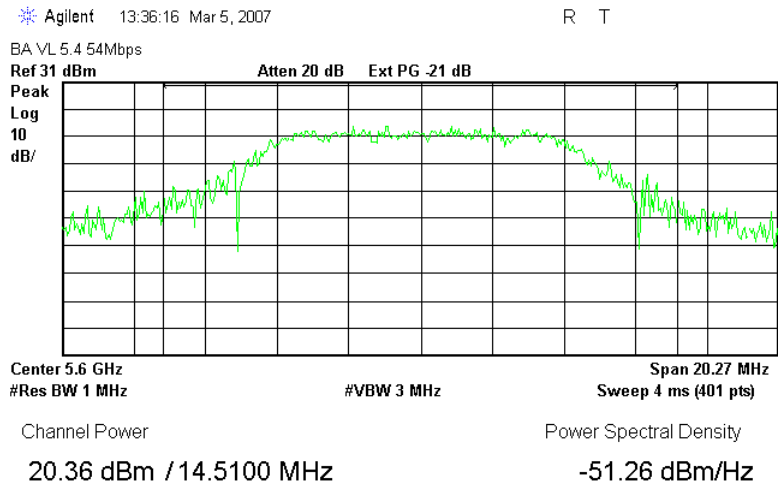


**Plot 16. Carrier Frequency 5.485 GHz, EBW 10 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 31 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

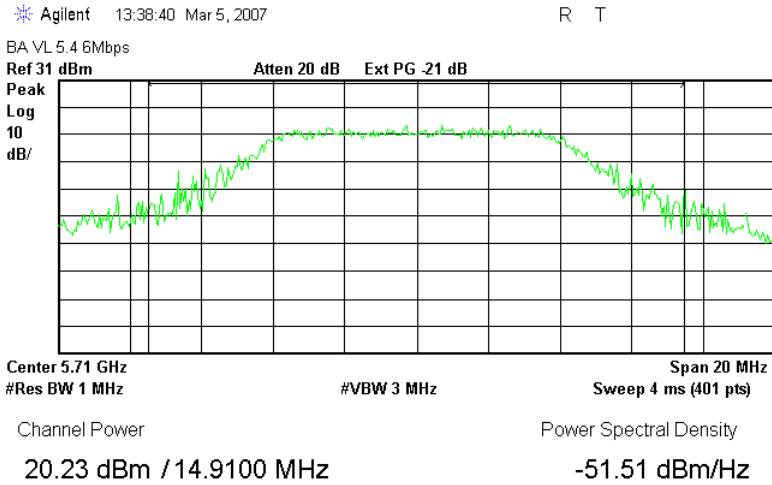


**Plot 17. Carrier Frequency 5.600 GHz, EBW 10 MHz, PRBS 6 Mbit/s**

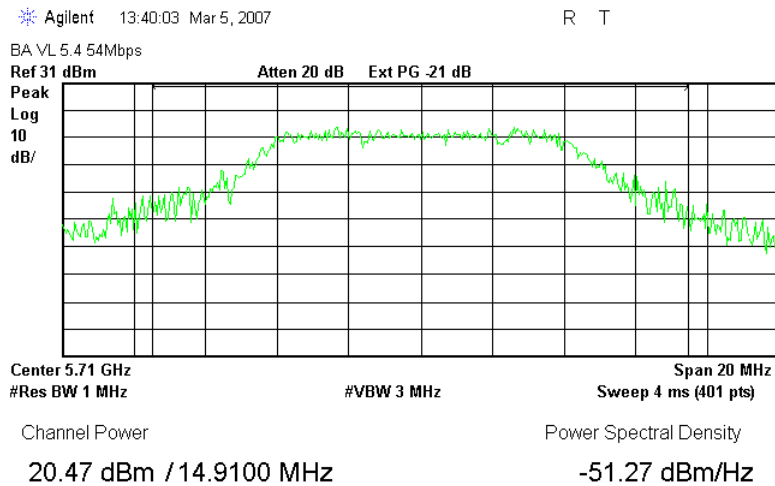


**Plot 18. Carrier Frequency 5.600 GHz, EBW 10 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 32 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

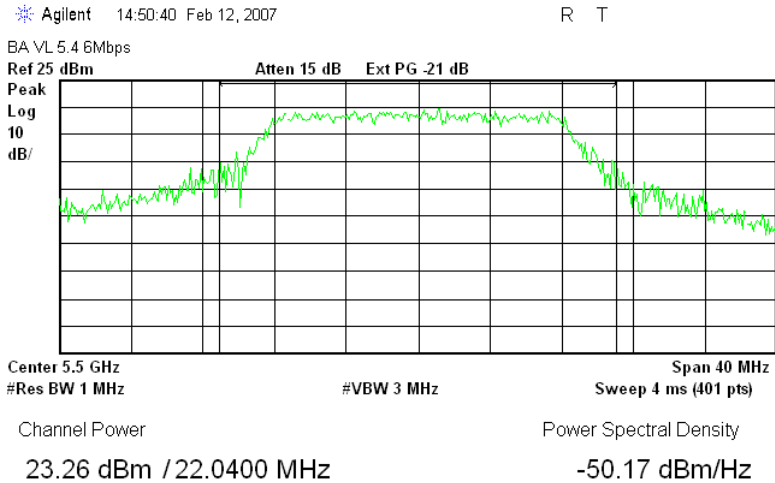


**Plot 19. Carrier Frequency 5.710 GHz, EBW 10 MHz, PRBS 6 Mbit/s**

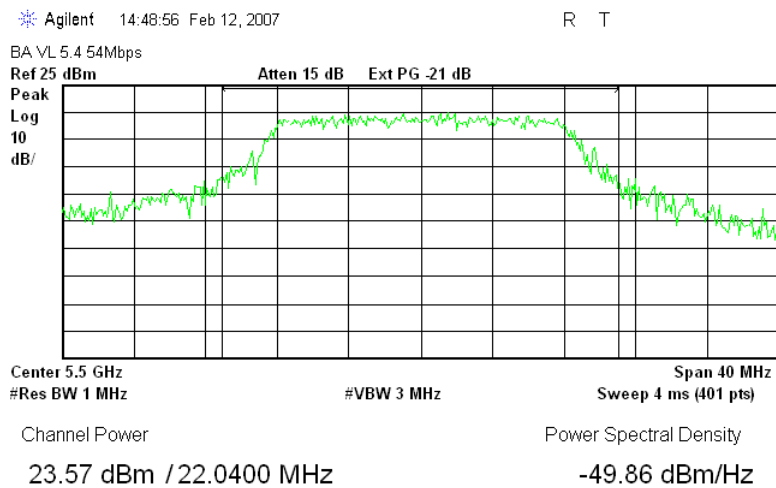


**Plot 20. Carrier Frequency 5.710 GHz, EBW 10 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 33 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

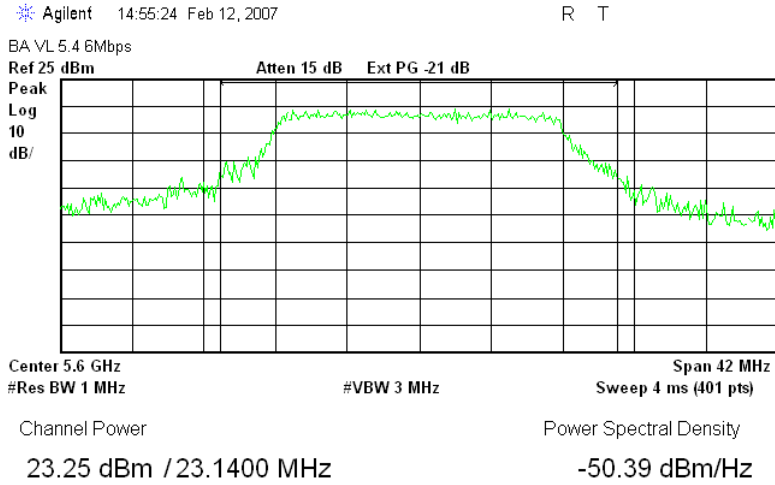


**Plot 21. Carrier Frequency 5.500 GHz, EBW 20 MHz, PRBS 6 Mbit/s**

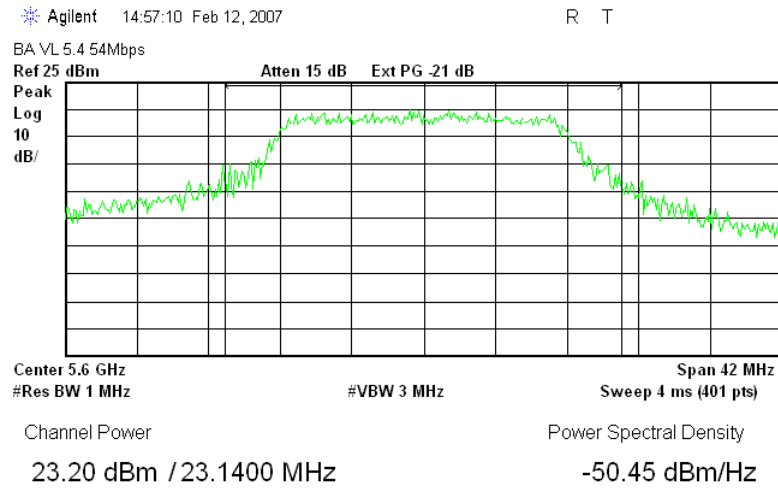


**Plot 22. Carrier Frequency 5.500 GHz, EBW 20 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 34 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

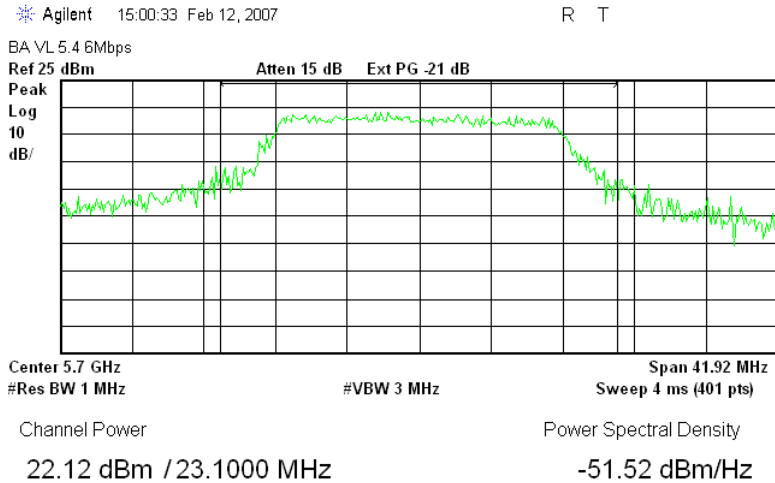


**Plot 23. Carrier Frequency 5.600 GHz, EBW 20 MHz, PRBS 6 Mbit/s**

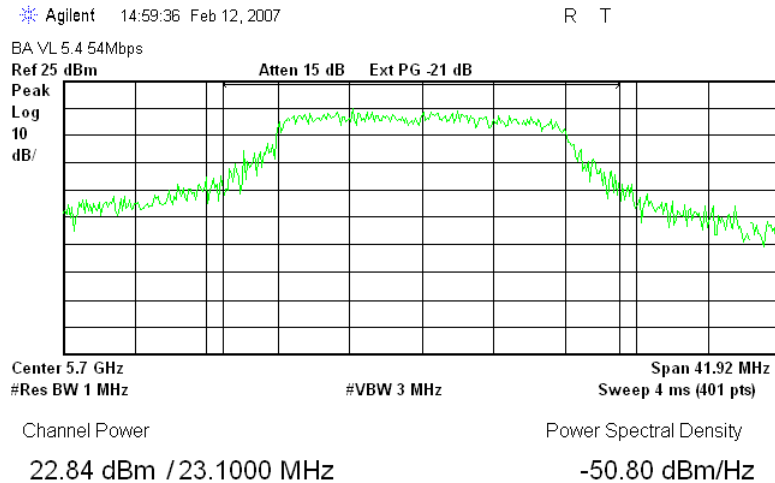


**Plot 24. Carrier Frequency 5.600 GHz, EBW 20 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 35 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



**Plot 25. Carrier Frequency 5.700 GHz, EBW 20 MHz, PRBS 6 Mbit/s**

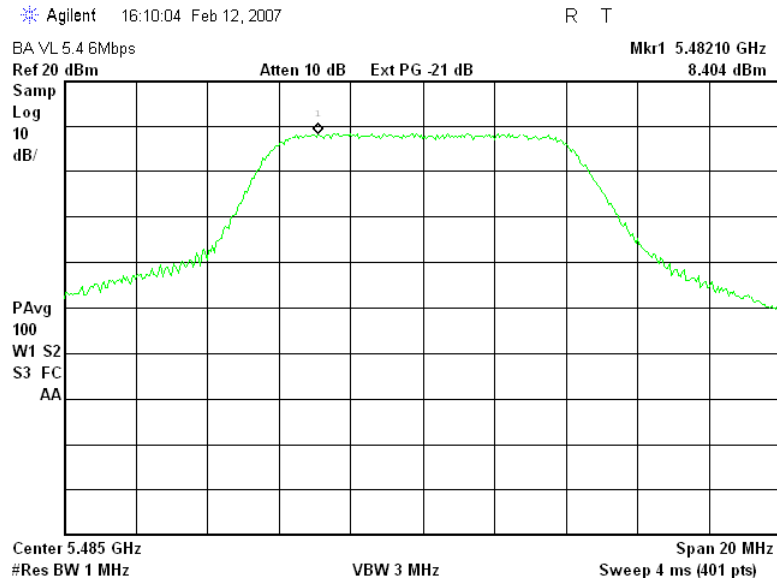


**Plot 26. Carrier Frequency 5.700 GHz, EBW 20 MHz, PRBS 54 Mbit/s**

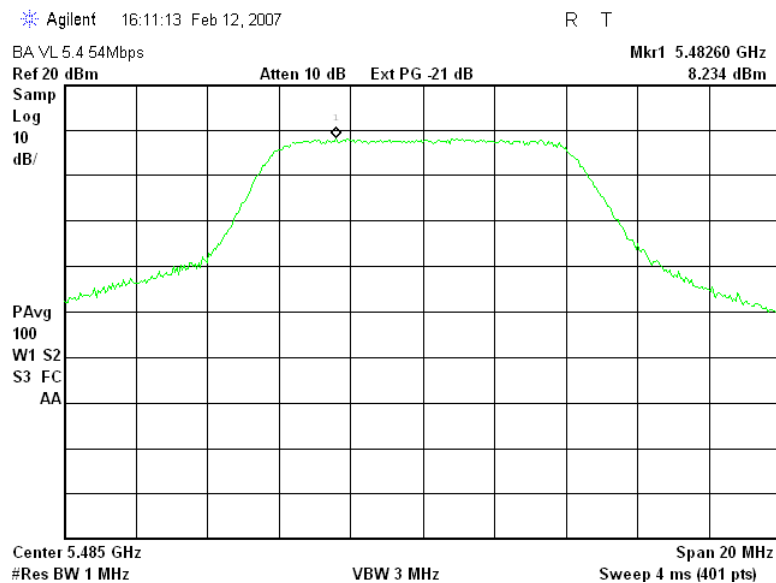


**Test Report No: 8712313898****Page 36 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

### 10.2. Peak Power Spectral Density 15.407a (2)

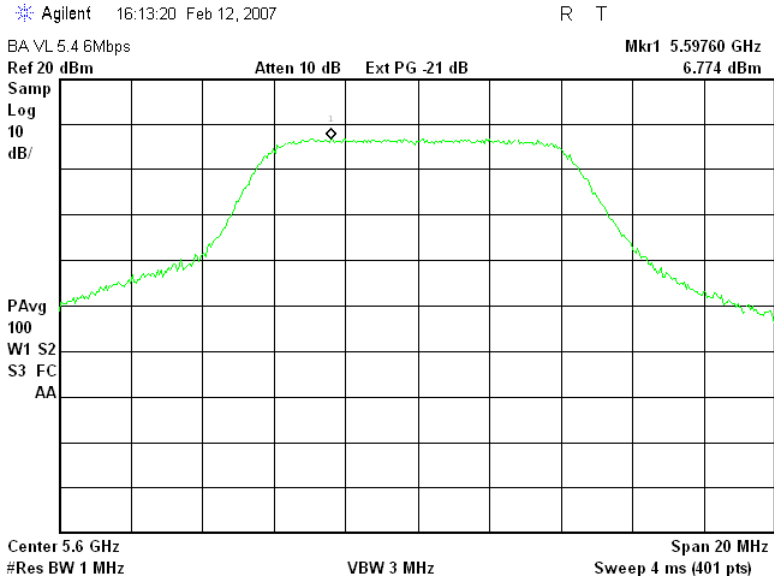


**Plot 27. Carrier Frequency 5.485 GHz, EBW 10 MHz, PRBS 6 Mbit/s**

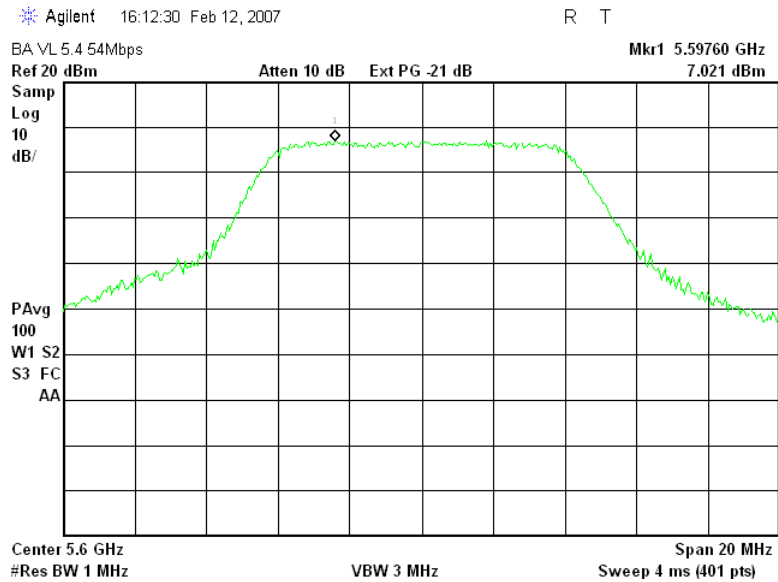


**Plot 28. Carrier Frequency 5.485 GHz, EBW 10 MHz, PRBS 54 Mbit/s**

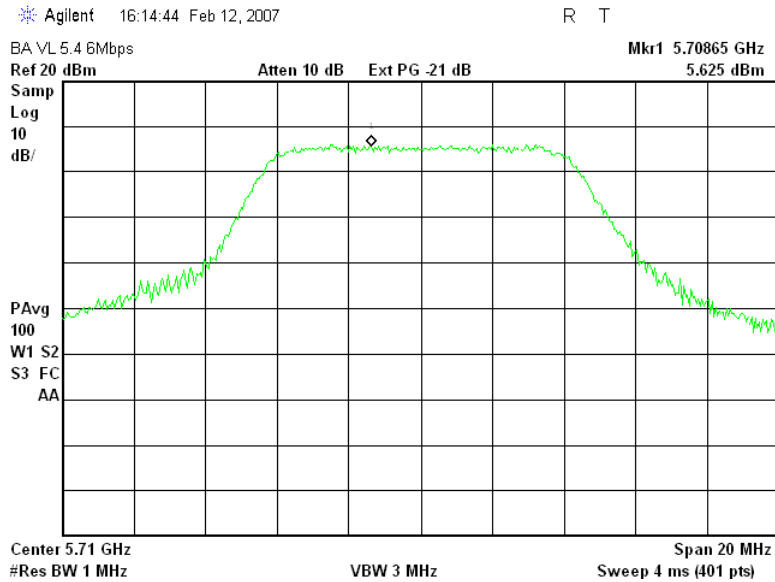
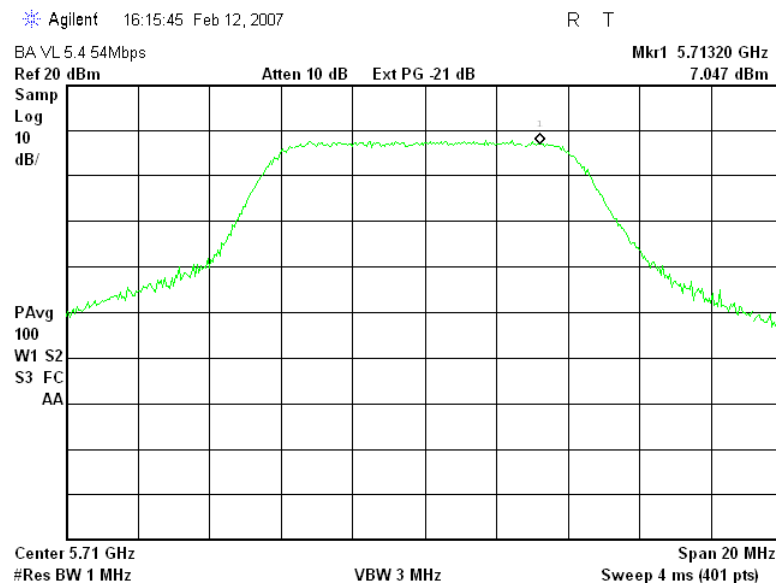
**Test Report No: 8712313898** **Page 37 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



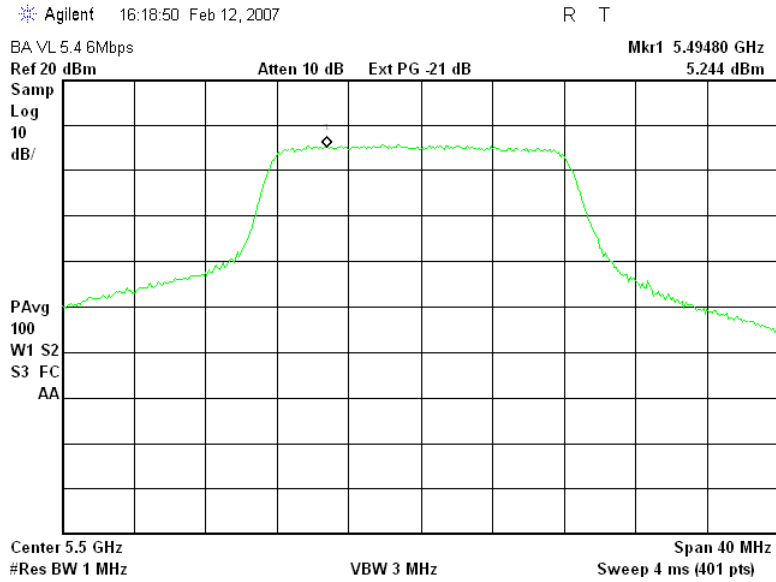
**Plot 29. Carrier Frequency 5.600 GHz, EBW 10 MHz, PRBS 6 Mbit/s**



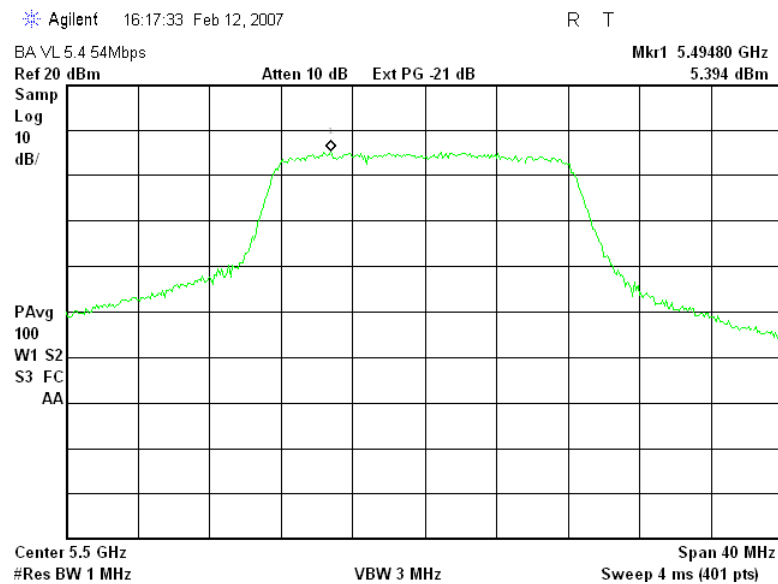
**Plot 30. Carrier Frequency 5.600 GHz, EBW 10 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898****Page 38 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54****Plot 31. Carrier Frequency 5.710 GHz, EBW 10 MHz, PRBS 6 Mbit/s****Plot 32. Carrier Frequency 5.710 GHz, EBW 10 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 39 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

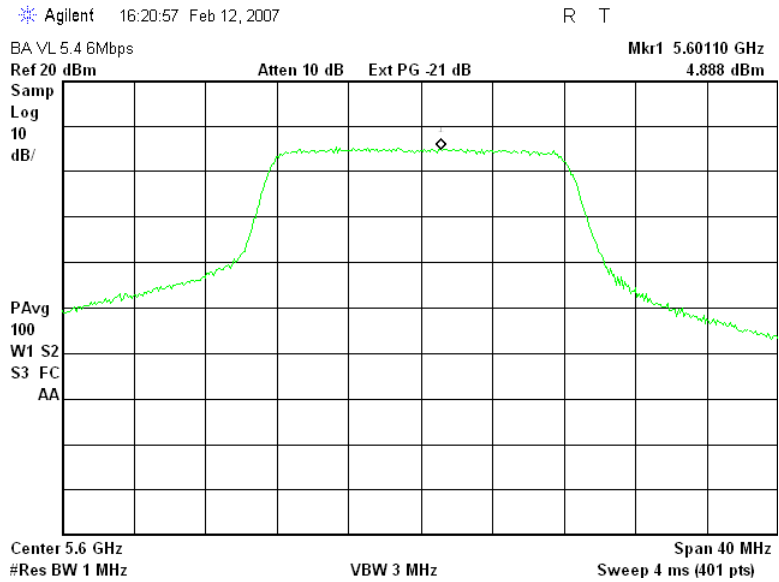


**Plot 33. Carrier Frequency 5.500 GHz, EBW 20 MHz, PRBS 6 Mbit/s**

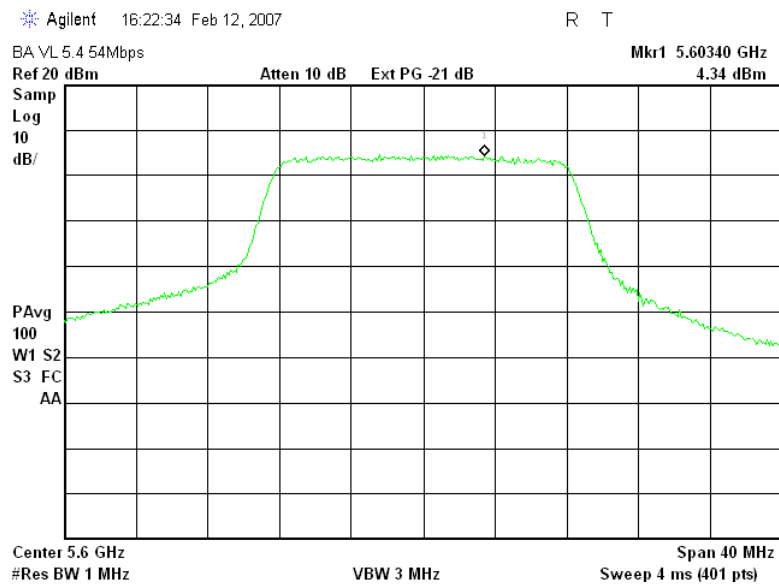


**Plot 34. Carrier Frequency 5.500 GHz, EBW 20 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 40 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

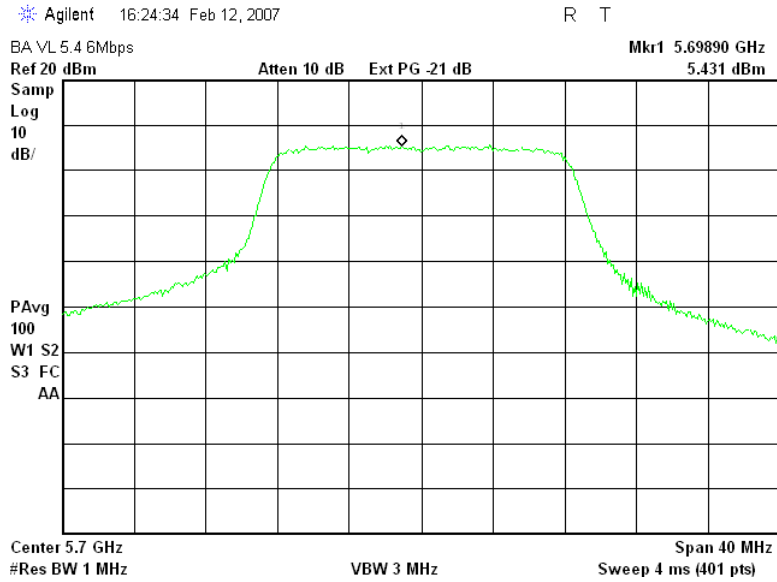


**Plot 35. Carrier Frequency 5.600 GHz, EBW 20 MHz, PRBS 6 Mbit/s**

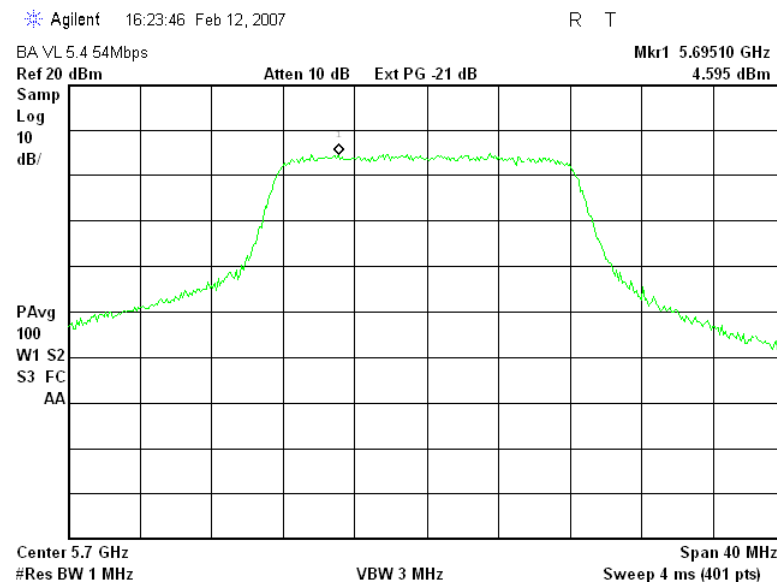


**Plot 36. Carrier Frequency 5.600 GHz, EBW 20 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 41 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



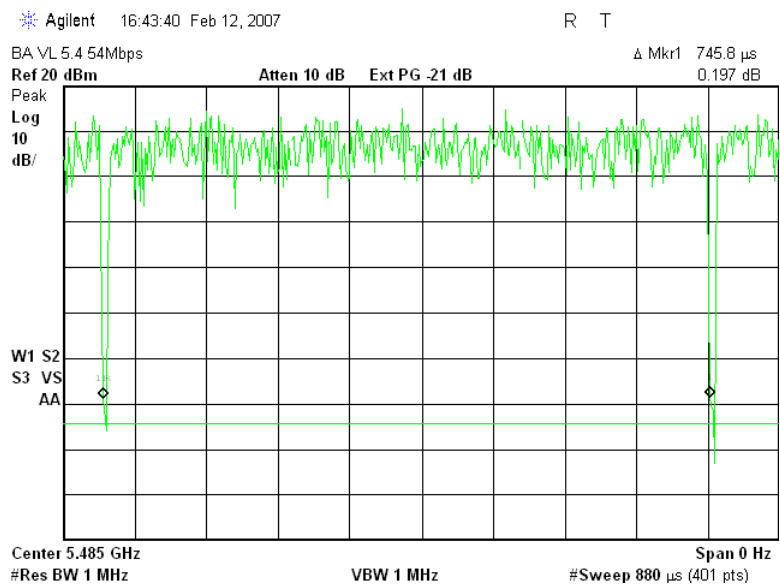
**Plot 37. Carrier Frequency 5.700 GHz, EBW 20 MHz, PRBS 6 Mbit/s**



**Plot 38. Carrier Frequency 5.700 GHz, EBW 20 MHz, PRBS 54 Mbit/s**

**Test Report No: 8712313898** **Page 42 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

**10.3. BA VL transmitter time duration for the ratio of the Peak Execution measurements 15.407a (6)**



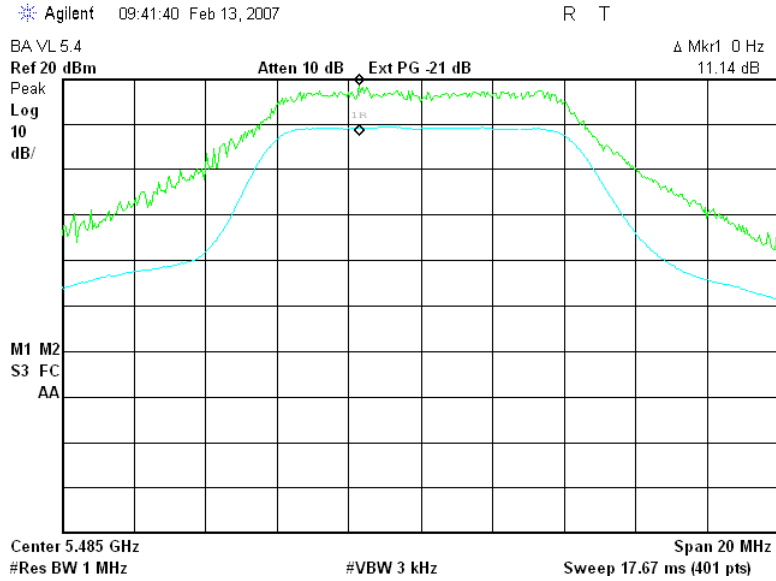
**Plot 39.**

Video bandwidth was calculated from maximum usable pulse duration T, shown in plot

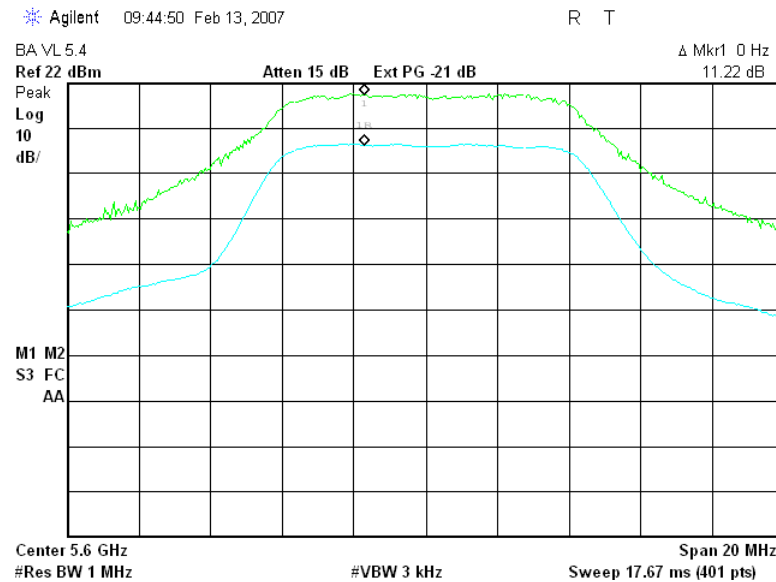
$VBW \geq 1/T = 1/0.746 \text{ ms} = 1.3 \text{ kHz.}$   
 Calculated VBW = 3 kHz

**Test Report No: 8712313898** **Page 43 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

**10.4. Ratio of the Peak Execution 15.407a (6)**



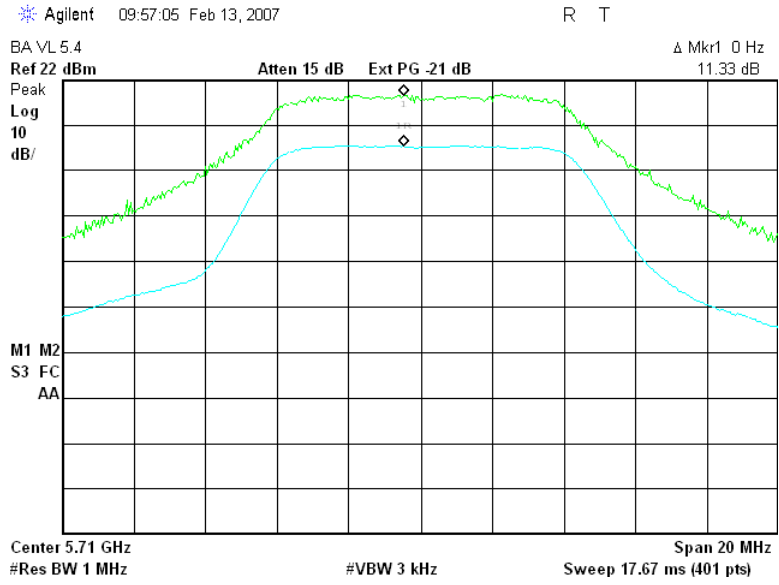
**Plot 40. Carrier Frequency 5.485 GHz, EBW 10 MHz**



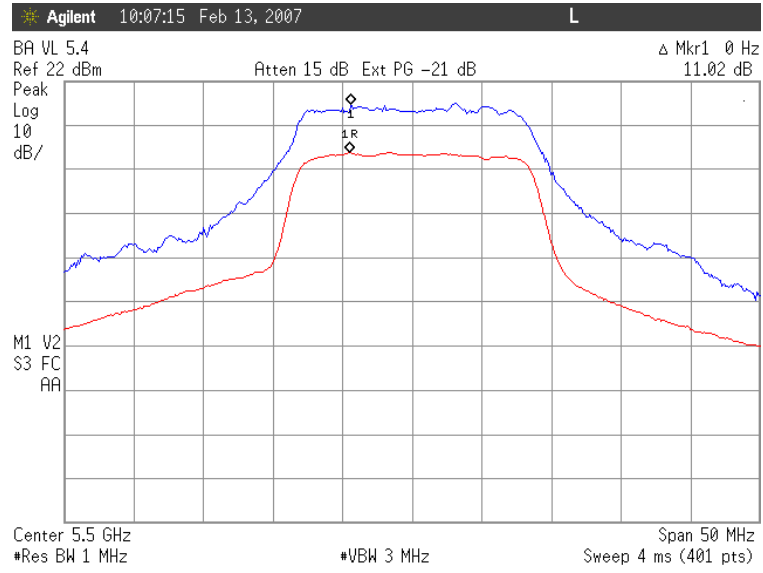
**Plot 41. Carrier Frequency 5.600 GHz, EBW 10 MHz**



**Test Report No: 8712313898** **Page 44 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

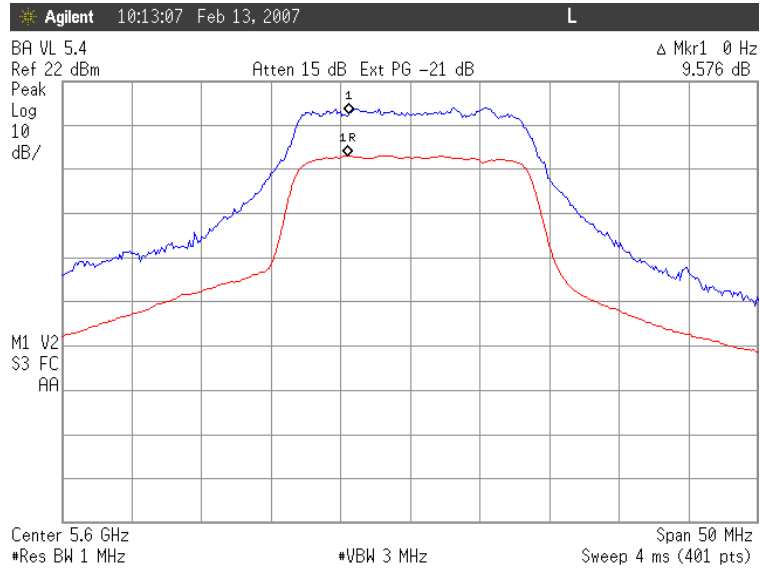


**Plot 42. Carrier Frequency 5.710 GHz, EBW 10 MHz**

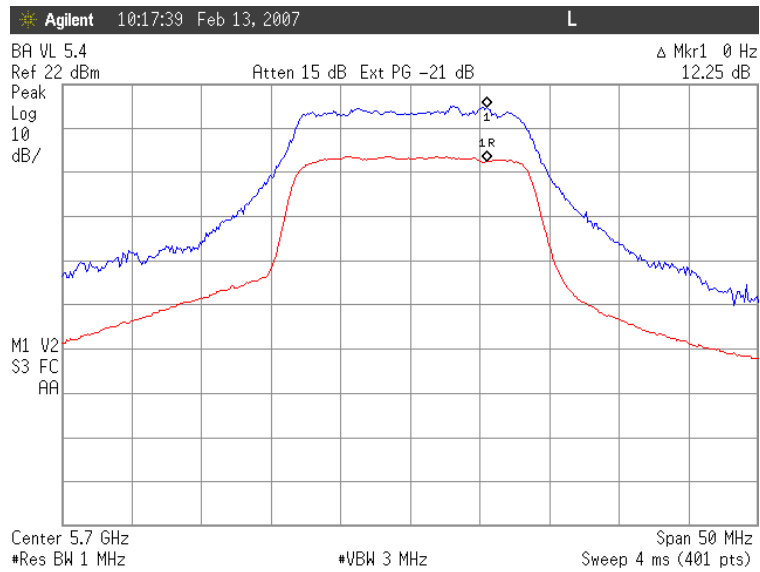


**Plot 43. Carrier Frequency 5.500 GHz, EBW 20 MHz**

**Test Report No: 8712313898** **Page 45 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



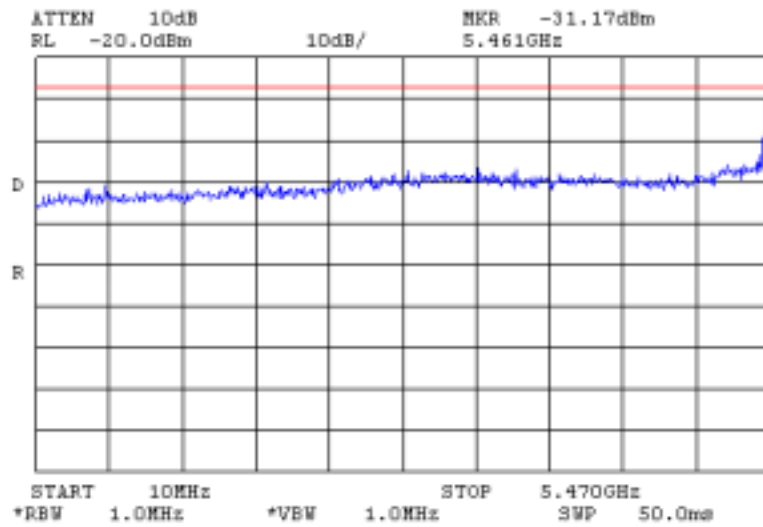
**Plot 44. Carrier Frequency 5.600 GHz, EBW 20 MHz**



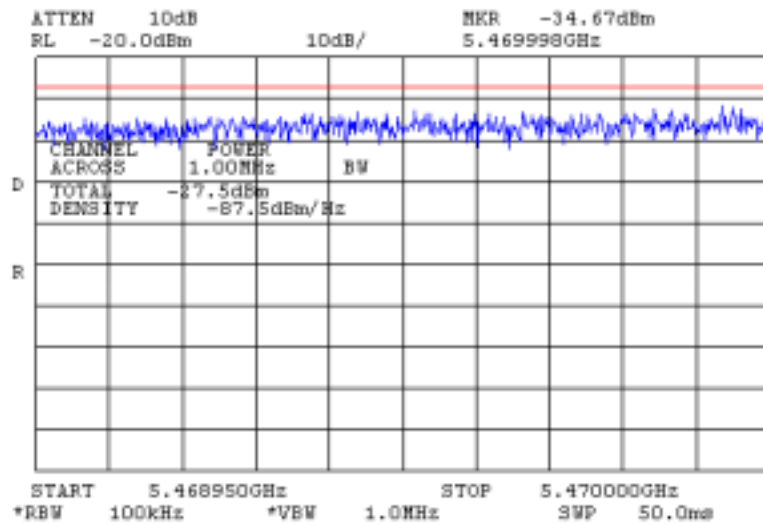
**Plot 45. Carrier Frequency 5.700 GHz, EBW 20 MHz**

**Test Report No: 8712313898** **Page 46 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

**10.5. Peak Emissions outside of the frequency band 15.407b (3).**  
**Limit line - -27 dBm/MHz**

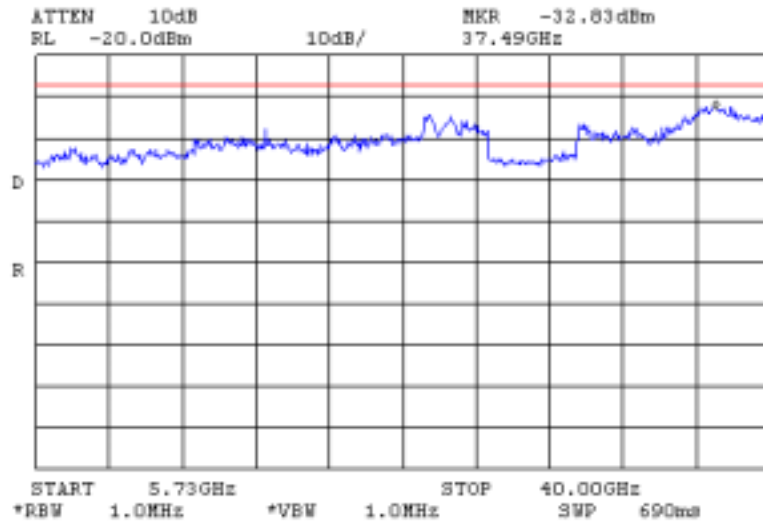


**Plot 46. Carrier Frequency 5.485 GHz, EBW 10 MHz, Output power 20 dBm**

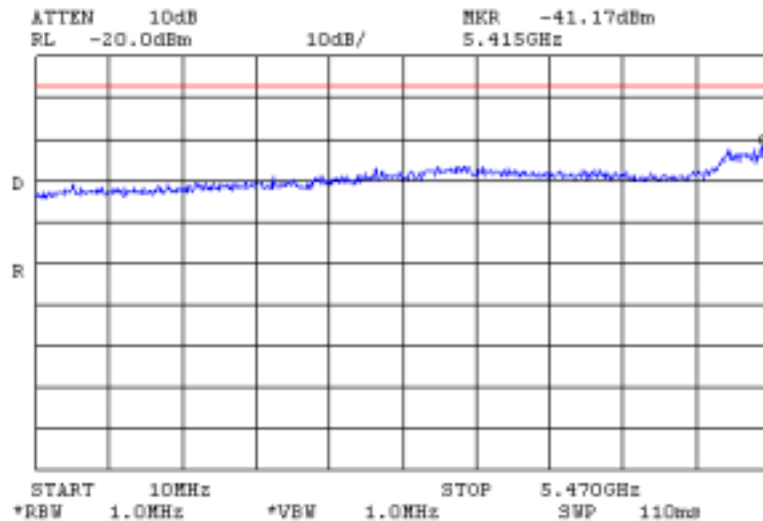


**Plot 47. Carrier Frequency 5.485 GHz, EBW 10 MHz**

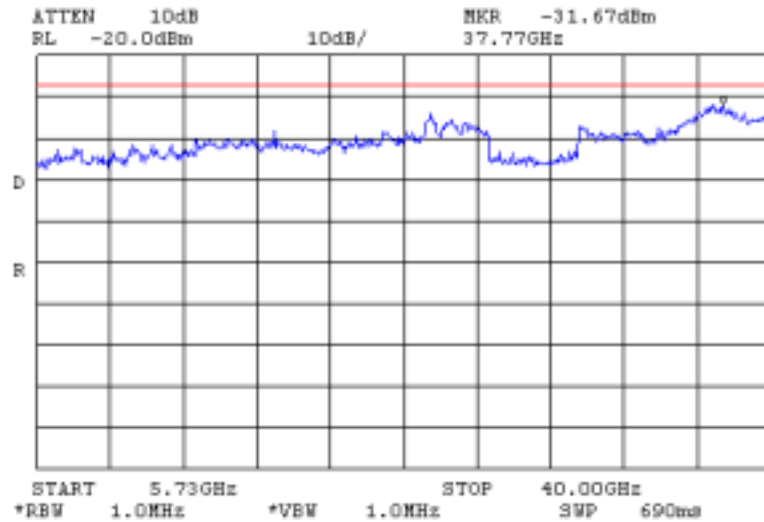
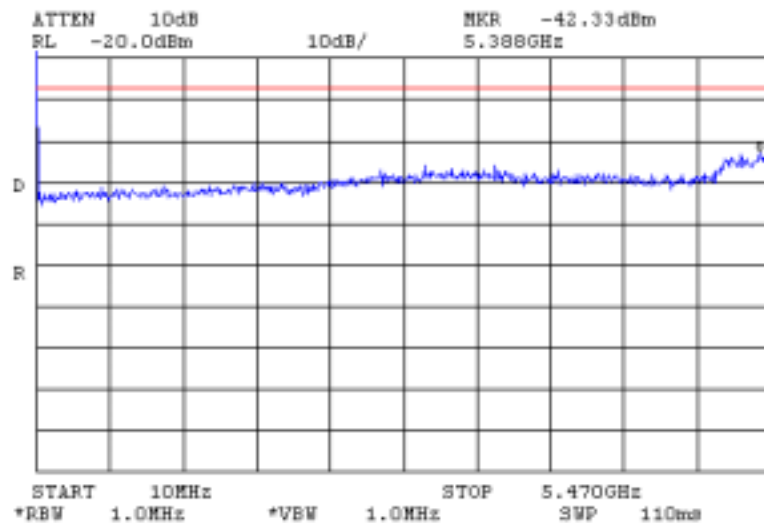
**Test Report No: 8712313898** **Page 47 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



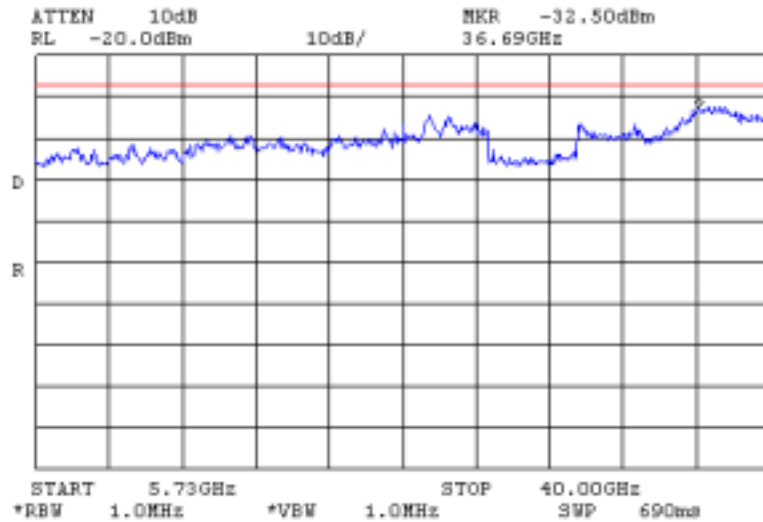
**Plot 48. Carrier Frequency 5.485 GHz, EBW 10 MHz**



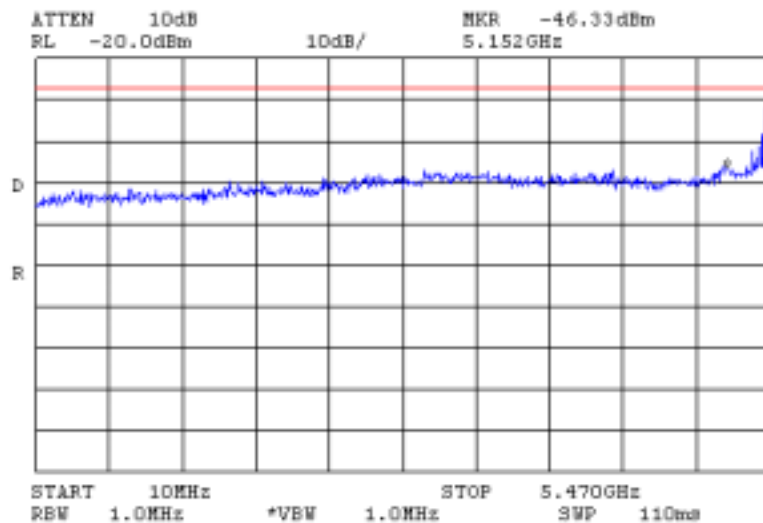
**Plot 49. Carrier Frequency 5.600 GHz, EBW 10 MHz**

**Test Report No: 8712313898****Page 48 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54****Plot 50. Carrier Frequency 5.600 GHz, EBW 10 MHz****Plot 51. Carrier Frequency 5.710 GHz, EBW 10 MHz**

**Test Report No: 8712313898** **Page 49 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

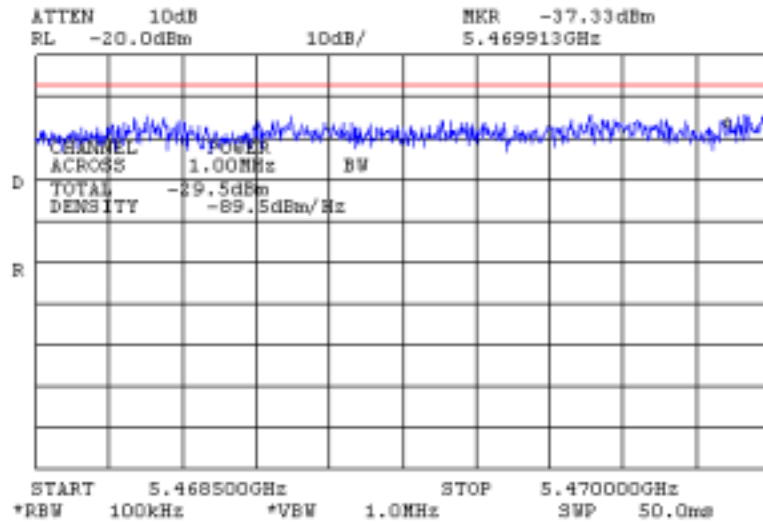


**Plot 52. Carrier Frequency 5.710 GHz, EBW 10 MHz**

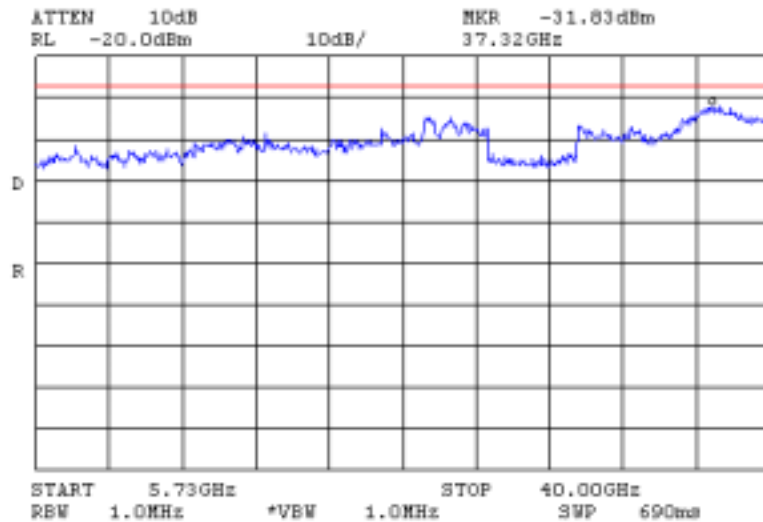


**Plot 53. Carrier Frequency 5.500 GHz, EBW 20 MHz**

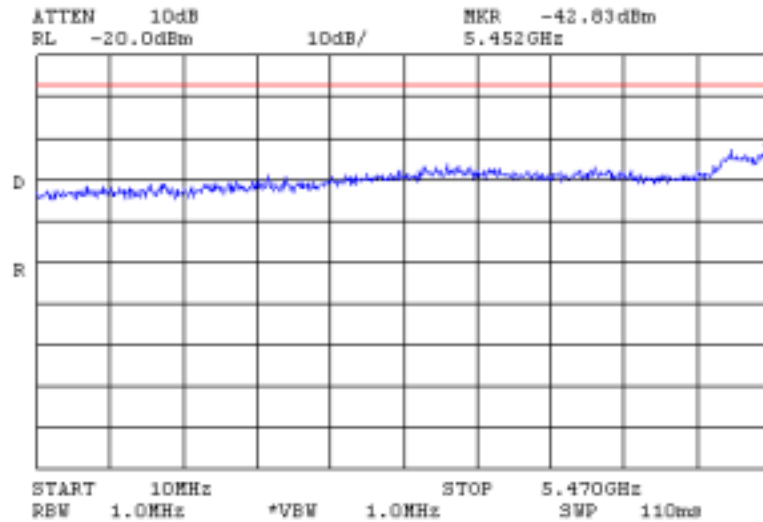
**Test Report No: 8712313898** **Page 50 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



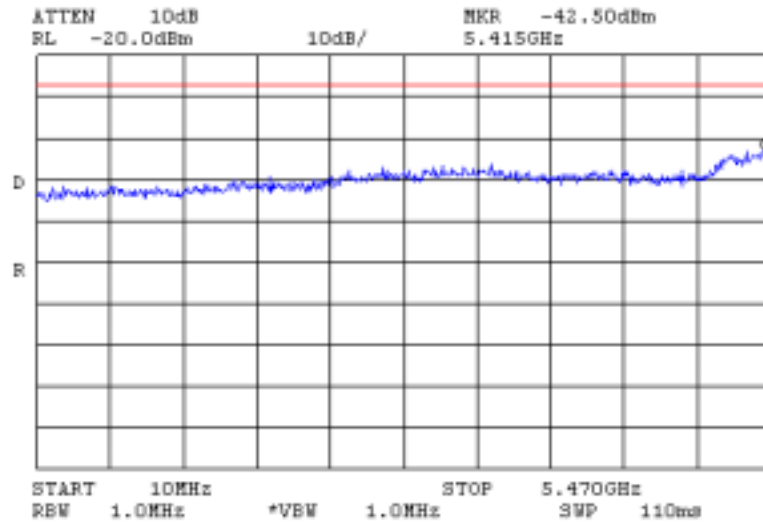
**Plot 54. Carrier Frequency 5.500 GHz, EBW 20 MHz**



**Plot 55. Carrier Frequency 5.500 GHz, EBW 20 MHz**

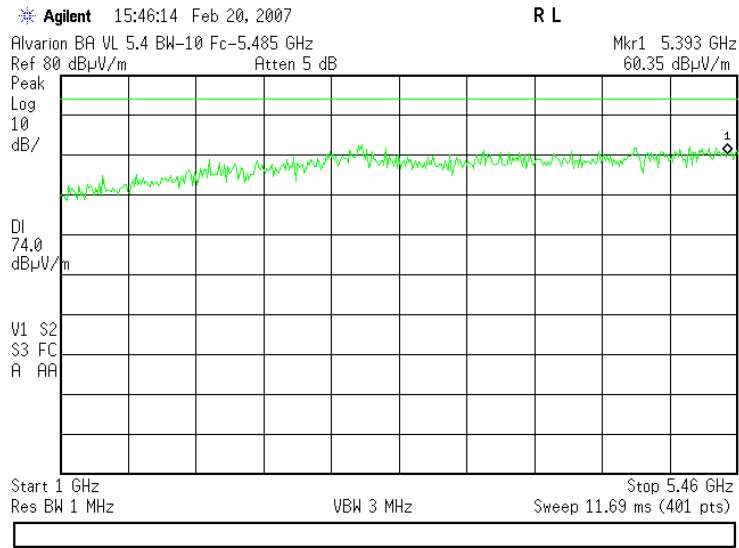
**Test Report No: 8712313898****Page 51 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54****Plot 56. Carrier Frequency 5.600 GHz, EBW 20 MHz****Plot 57. Carrier Frequency 5.600 GHz, EBW 20 MHz**



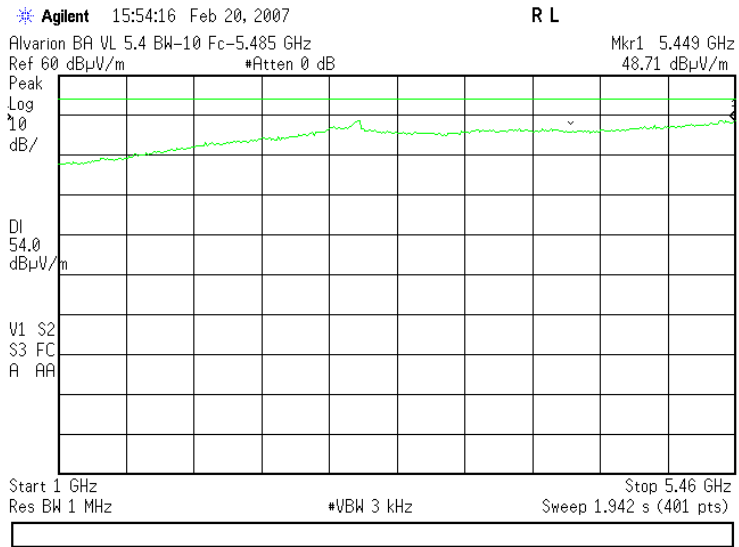
**Test Report No: 8712313898****Page 52 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54****Plot 58. Carrier Frequency 5.700 GHz, EBW 20 MHz****Plot 59. Carrier Frequency 5.700 GHz, EBW 20 MHz**

**Test Report No: 8712313898** **Page 53 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

**10.6. Radiated Spurious Emissions 15.407b (7)**  
**Antenna - 20 dBi. Output power 7 dBm.**

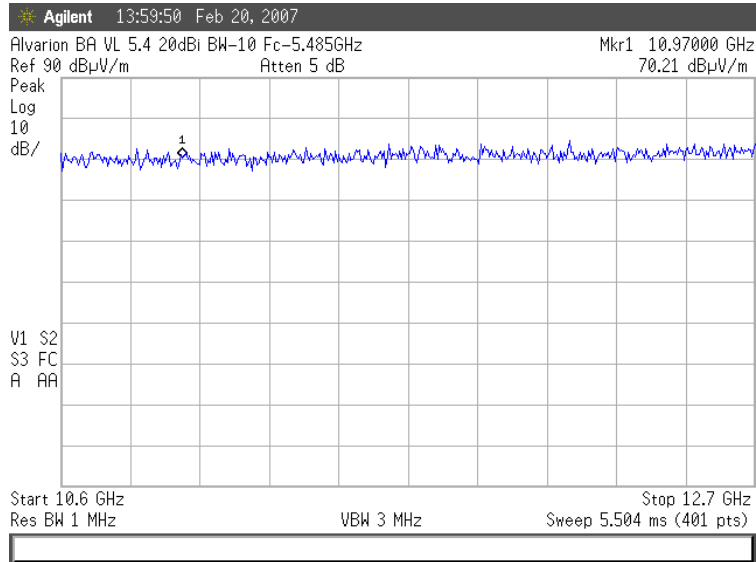


**Plot 60. Carrier Frequency 5.485 GHz, EBW-10 MHz, Antenna 20 dBi  
 Detector Peak**

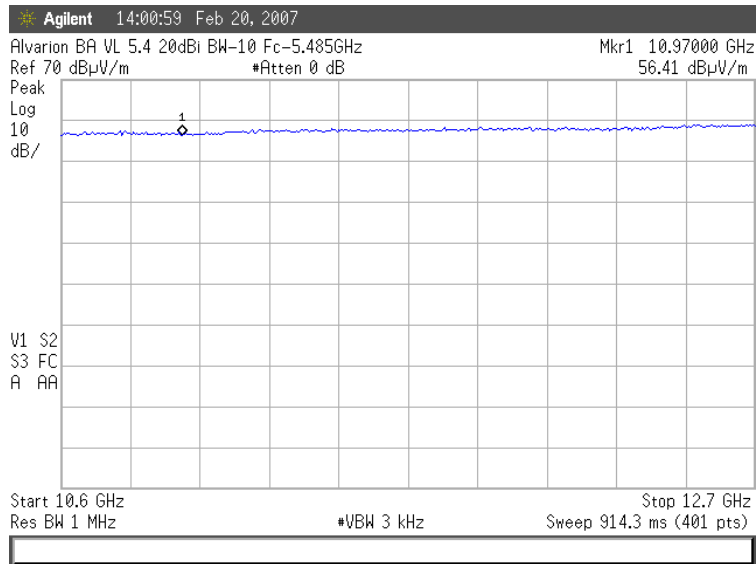


**Plot 61. Carrier Frequency 5.485 GHz, EBW 10 MHz, Antenna 20 dBi  
 Detector Average**

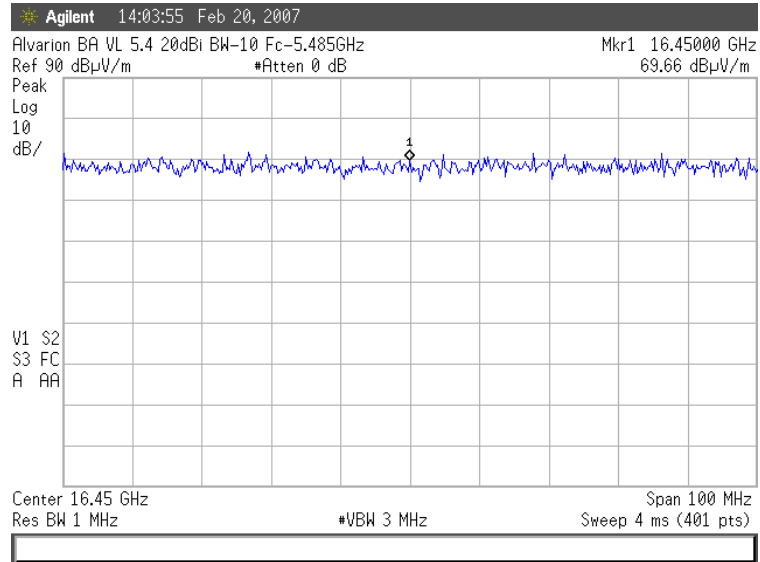
**Test Report No: 8712313898** **Page 54 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



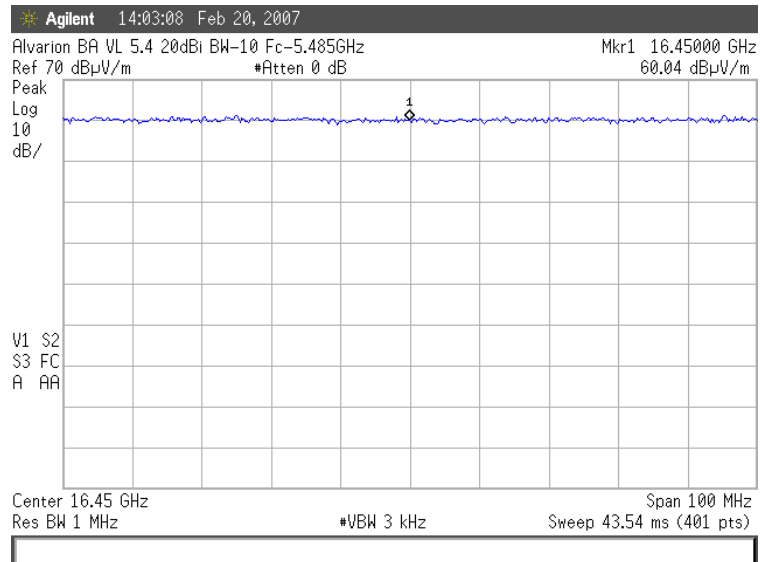
**Plot 62. Carrier Frequency 5.485 GHz, EBW-10 MHz, Antenna 20 dBi Detector Peak**



**Plot 63. Carrier Frequency 5.485 GHz, EBW 10 MHz, Antenna 20 dBi Detector Average**

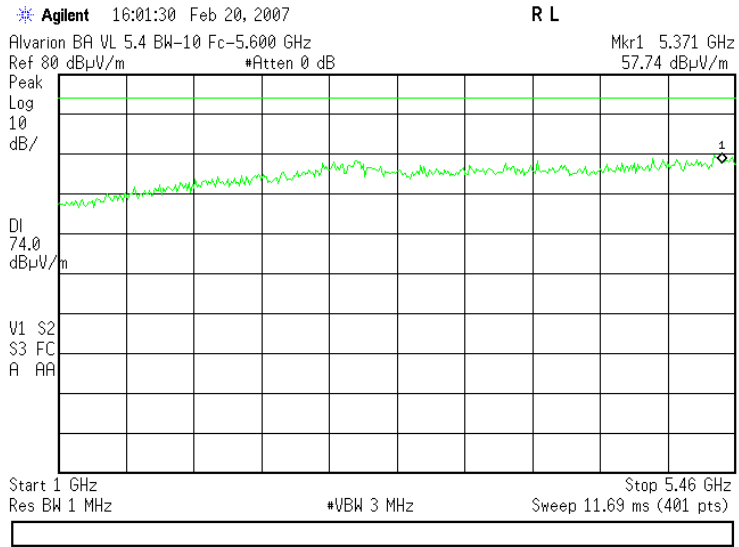
**Test Report No: 8712313898****Page 55 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

**Plot 64. Carrier Frequency 5.485 GHz, EBW-10 MHz, Antenna 20 dBi  
Detector Peak**

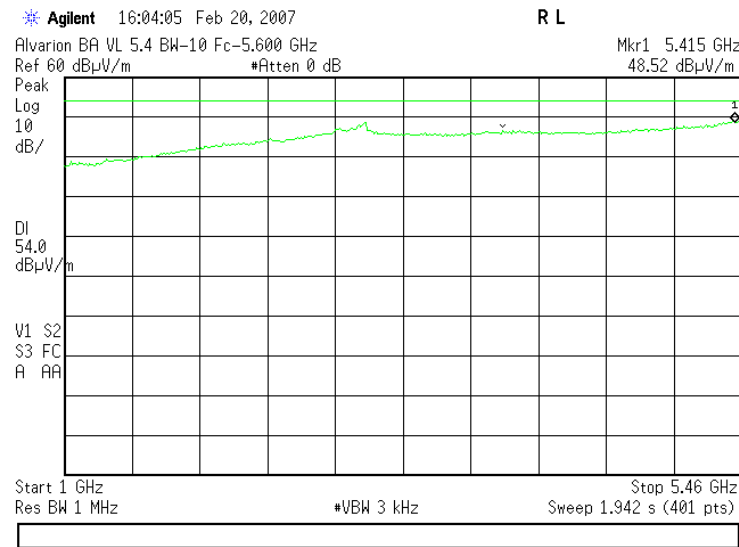


**Plot 65. Carrier Frequency 5.485 GHz, EBW 10 MHz, Antenna 20 dBi  
Detector Average**

**Test Report No: 8712313898** **Page 56 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

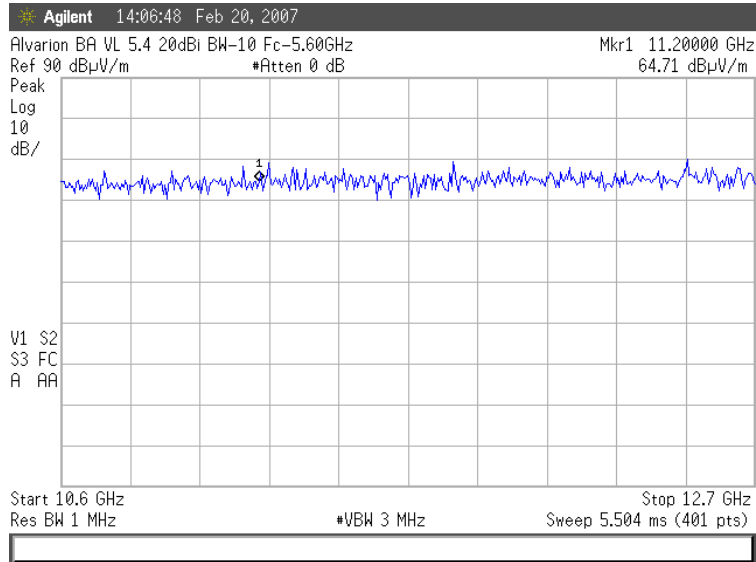


**Plot 66. Carrier Frequency 5.600 GHz, EBW-10 MHz, Antenna 20 dBi  
 Detector Peak**

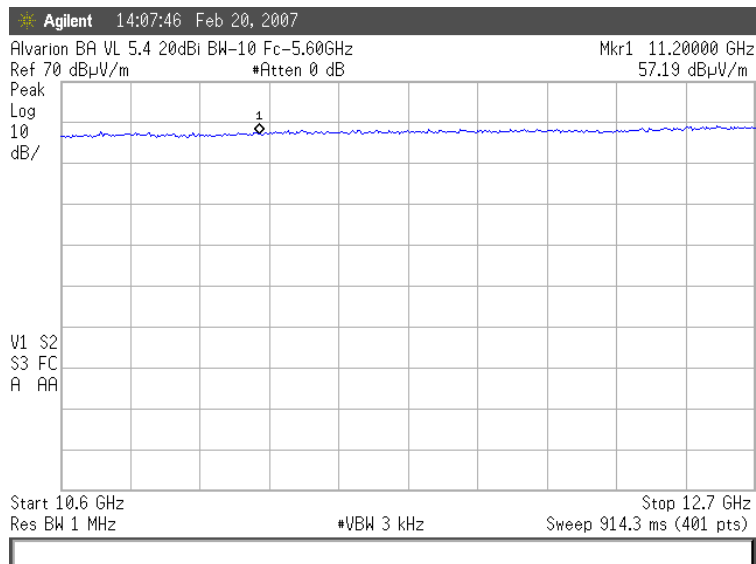


**Plot 67. Carrier Frequency 5.600 GHz, EBW 10 MHz, Antenna 20 dBi  
 Detector Average**

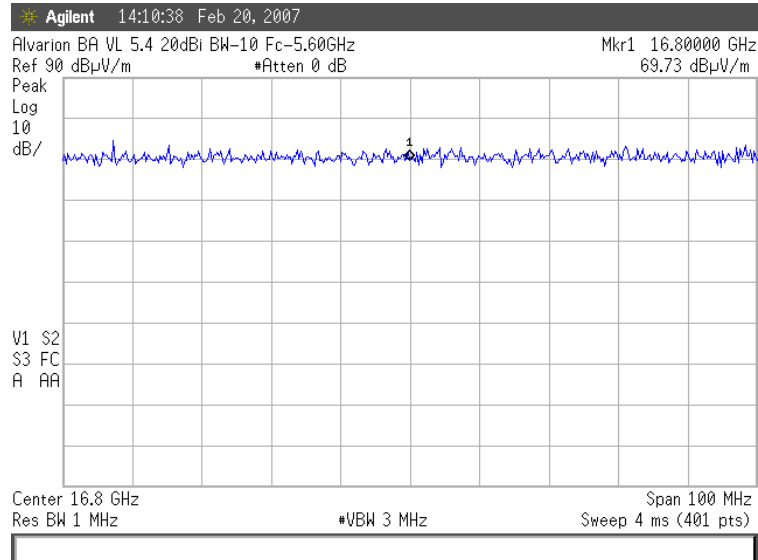
**Test Report No: 8712313898** **Page 57 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



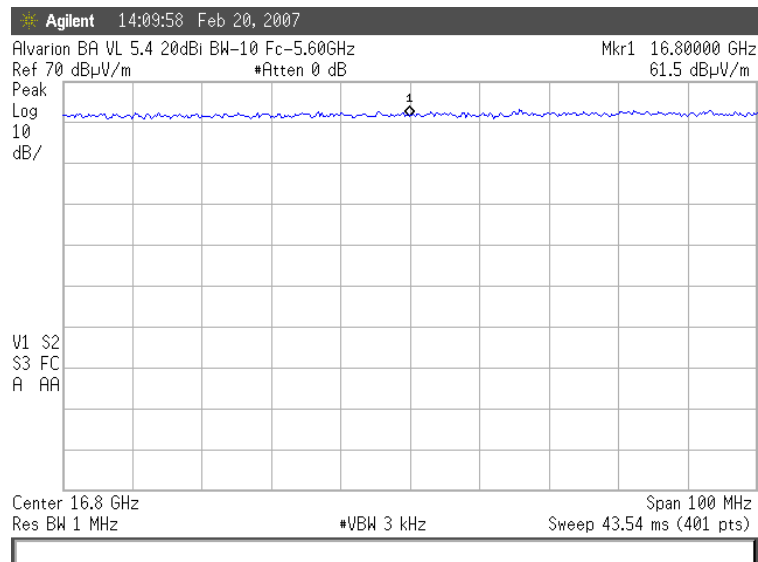
**Plot 68. Carrier Frequency 5.600 GHz, EBW-10 MHz, Antenna 20 dBi Detector Peak**



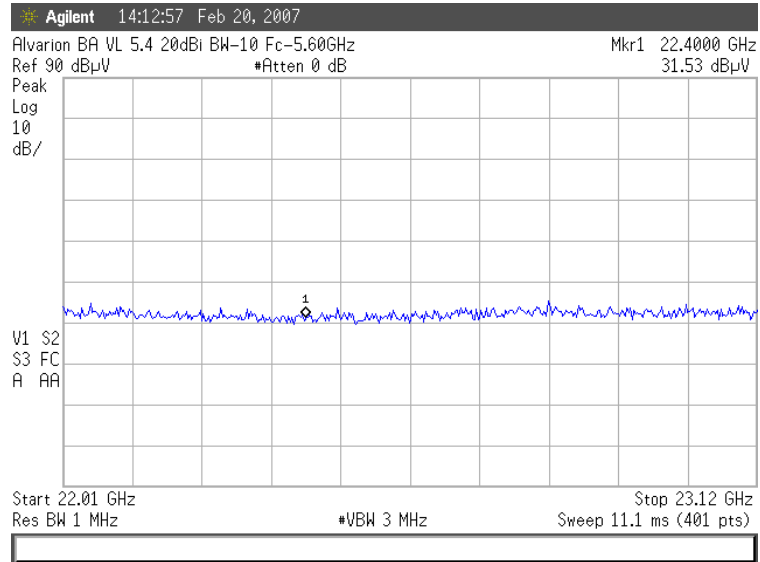
**Plot 69. Carrier Frequency 5.600 GHz, EBW 20 MHz, Antenna 20 dBi Detector Average**

**Test Report No: 8712313898****Page 58 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

**Plot 70. Carrier Frequency 5.600 GHz, EBW-10 MHz, Antenna 20 dBi  
Detector Peak**



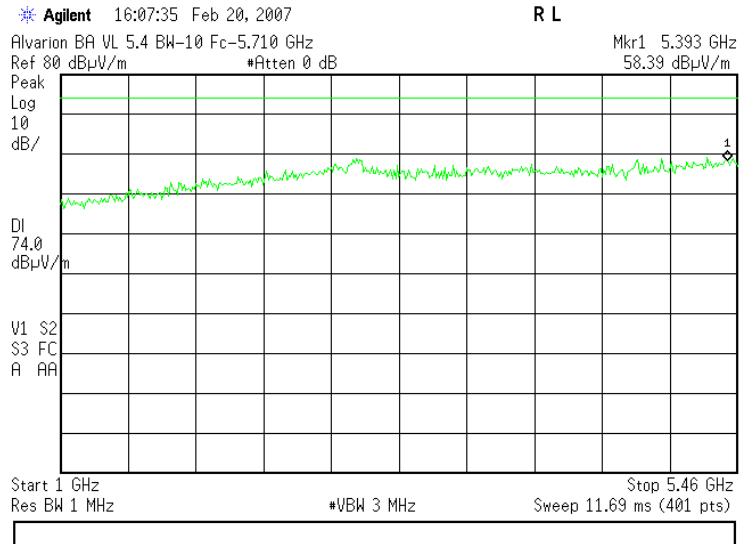
**Plot 71. Carrier Frequency 5.600 GHz, EBW 10 MHz, Antenna 20 dBi  
Detector Average**

**Test Report No: 8712313898****Page 59 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

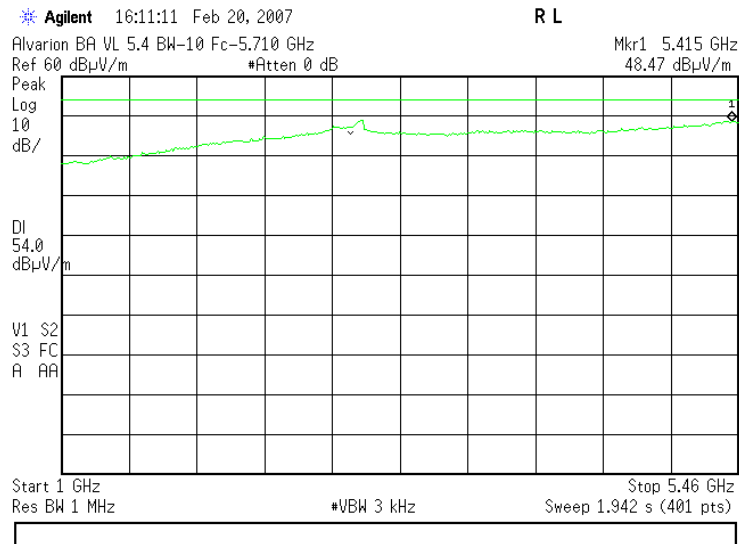
**Plot 72. Carrier Frequency 5.600 GHz, EBW-10 MHz, Antenna 20 dBi  
Detector Peak**



**Test Report No: 8712313898** **Page 60 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

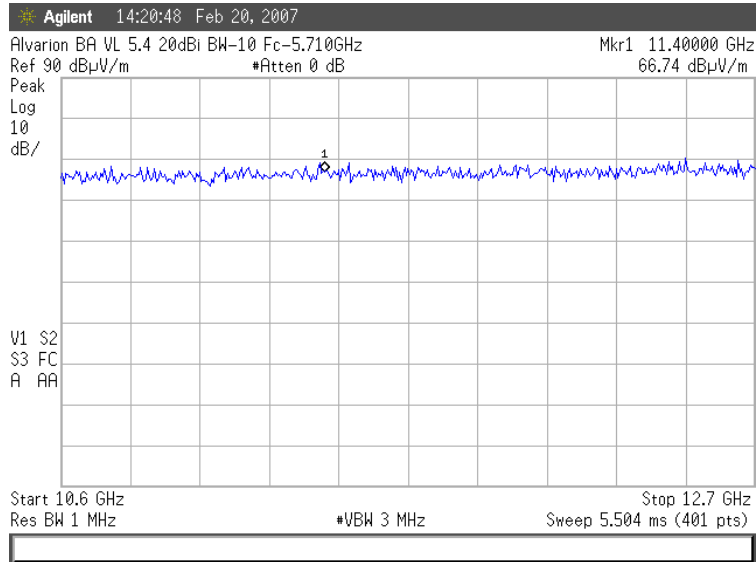


**Plot 73. Carrier Frequency 5.710 GHz, EBW-10 MHz, Antenna 20 dBi  
 Detector Peak**

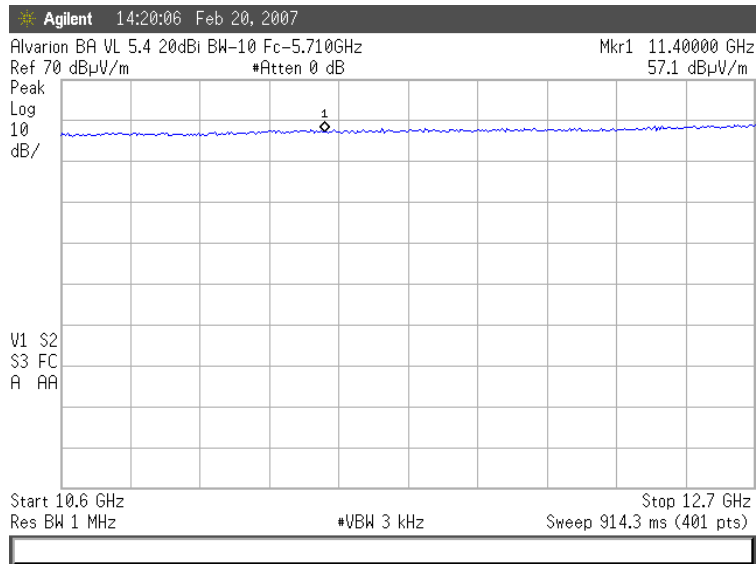


**Plot 74. Carrier Frequency 5.710 GHz, EBW 10 MHz, Antenna 20 dBi  
 Detector Average**

**Test Report No: 8712313898** **Page 61 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

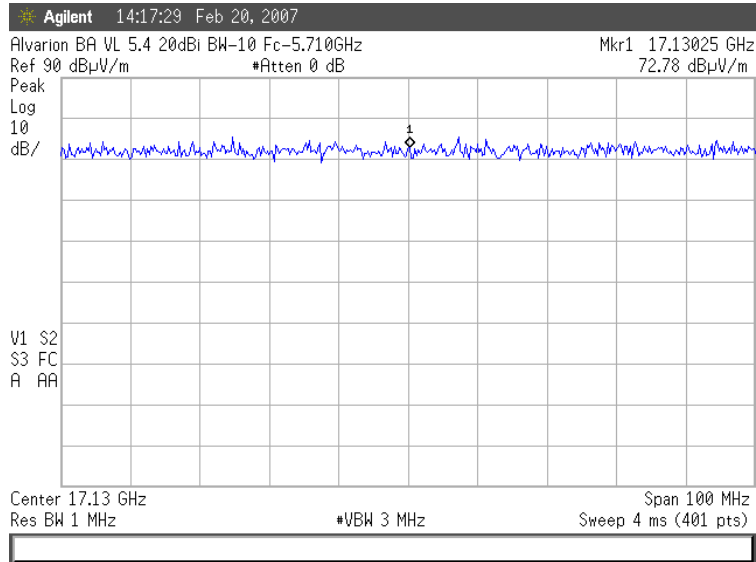


**Plot 75. Carrier Frequency 5.710 GHz, EBW-10 MHz, Antenna 20 dBi  
 Detector Peak**

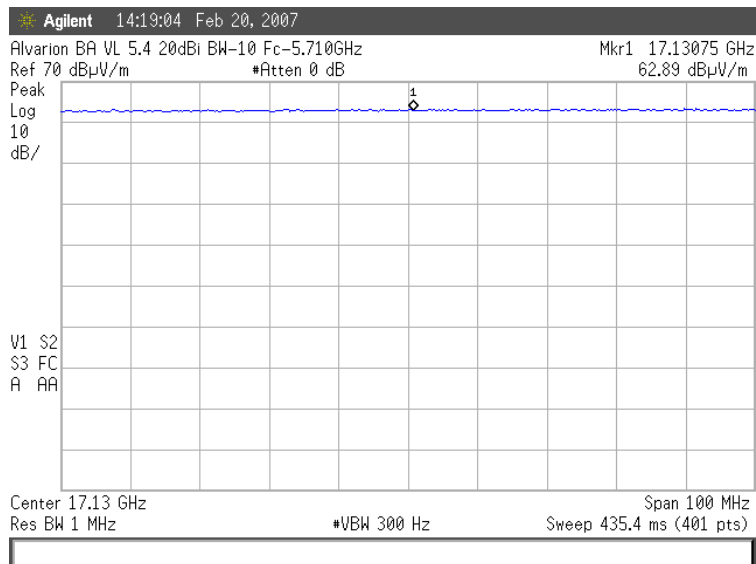


**Plot 76. Carrier Frequency 5.710 GHz, EBW 10 MHz, Antenna 20 dBi  
 Detector Average**

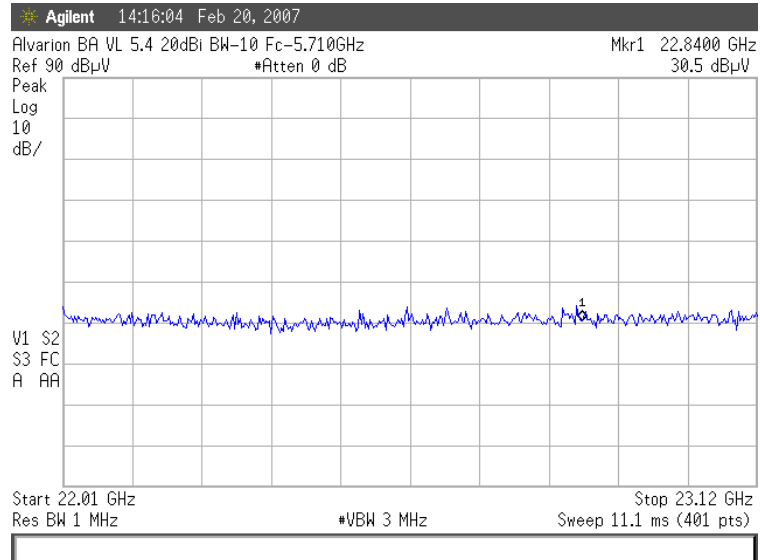
**Test Report No: 8712313898** **Page 62 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



**Plot 77. Carrier Frequency 5.710 GHz, EBW-10 MHz, Antenna 20 dBi Detector Peak**



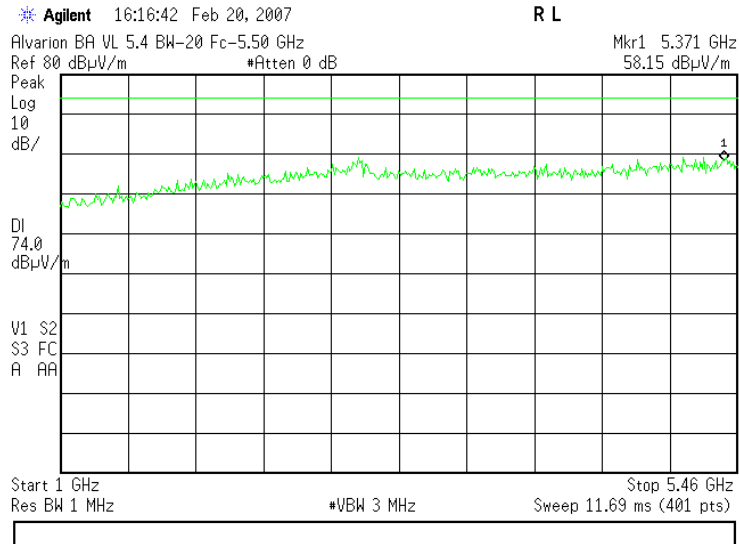
**Plot 78. Carrier Frequency 5.710 GHz, EBW 10 MHz, Antenna 20 dBi Detector Average**

**Test Report No: 8712313898****Page 63 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

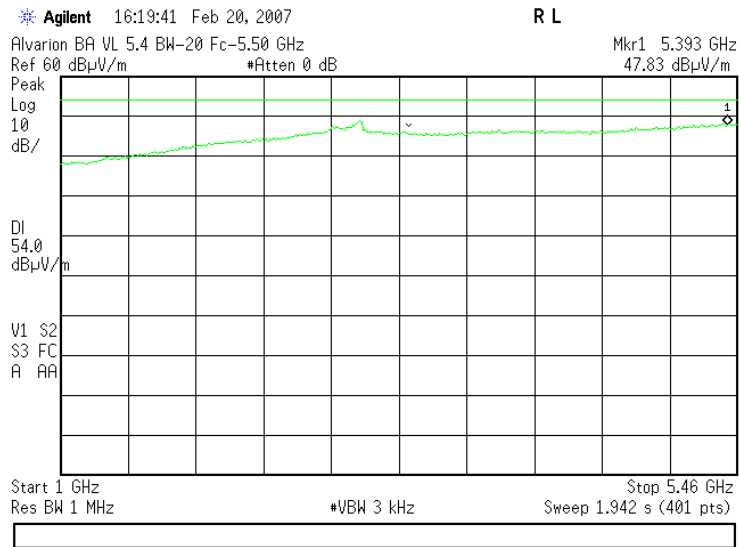
**Plot 79. Carrier Frequency 5.710 GHz, EBW-10 MHz, Antenna 20 dBi  
Detector Peak**

**Test Report No: 8712313898** **Page 64 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

**Antenna - 20 dBi. Output power 10 dBm**

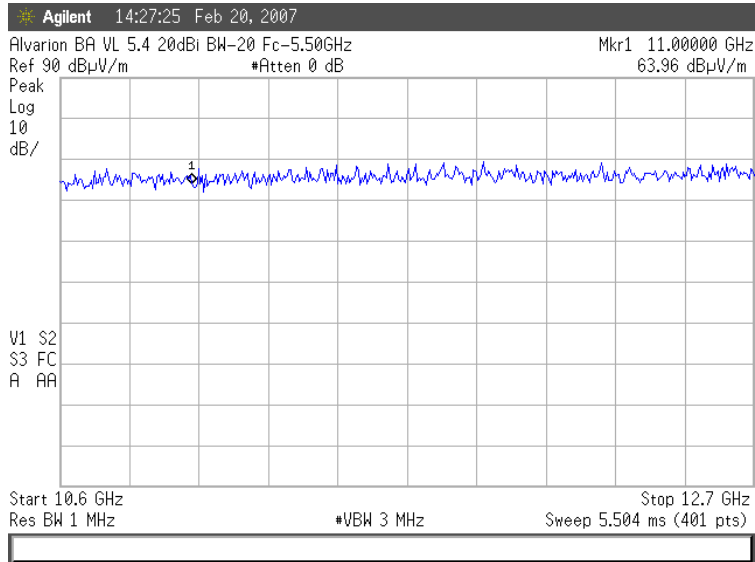


**Plot 80. Carrier Frequency 5.500 GHz, EBW-20 MHz, Antenna 20 dBi  
 Detector Peak**

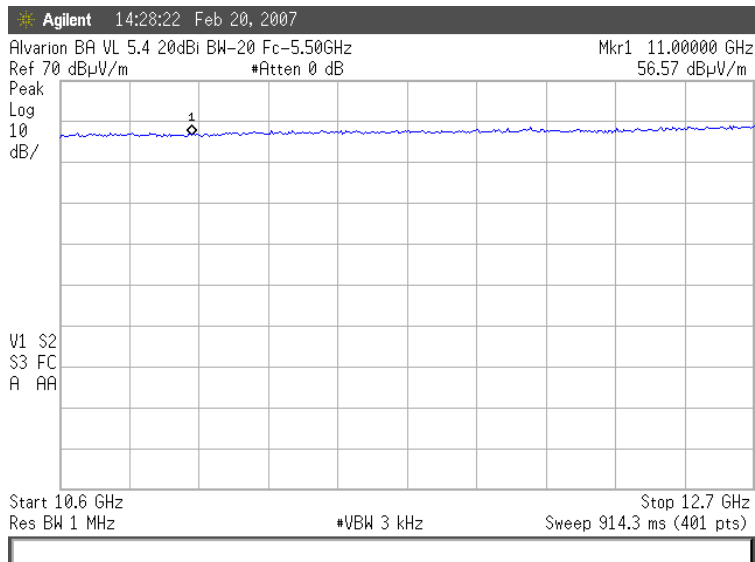


**Plot 81. Carrier Frequency 5.500 GHz, EBW 20 MHz, Antenna 20 dBi  
 Detector Average**

**Test Report No: 8712313898** **Page 65 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

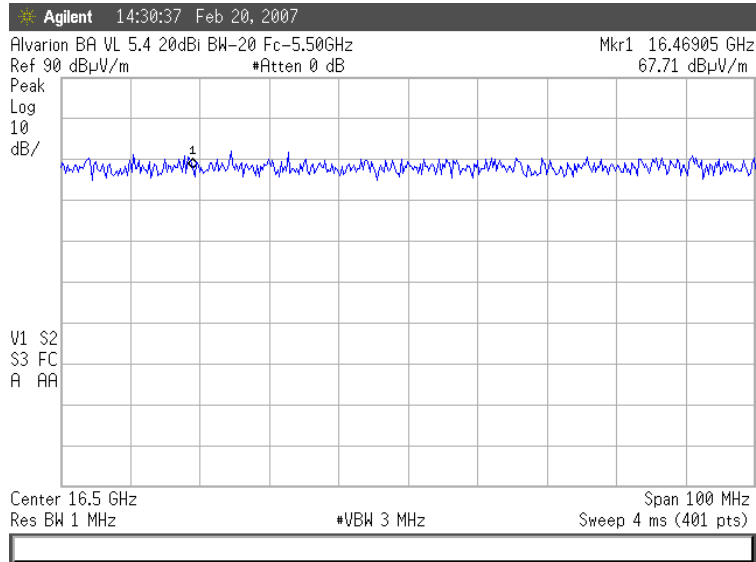


**Plot 82. Carrier Frequency 5.500 GHz, EBW-20 MHz, Antenna 20 dBi  
 Detector Peak**

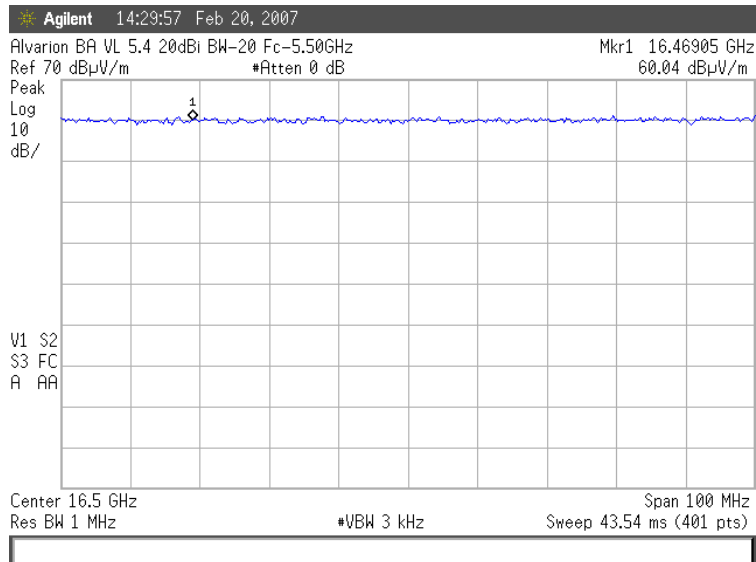


**Plot 83. Carrier Frequency 5.500 GHz, EBW 20 MHz, Antenna 20 dBi  
 Detector Average**

**Test Report No: 8712313898** **Page 66 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

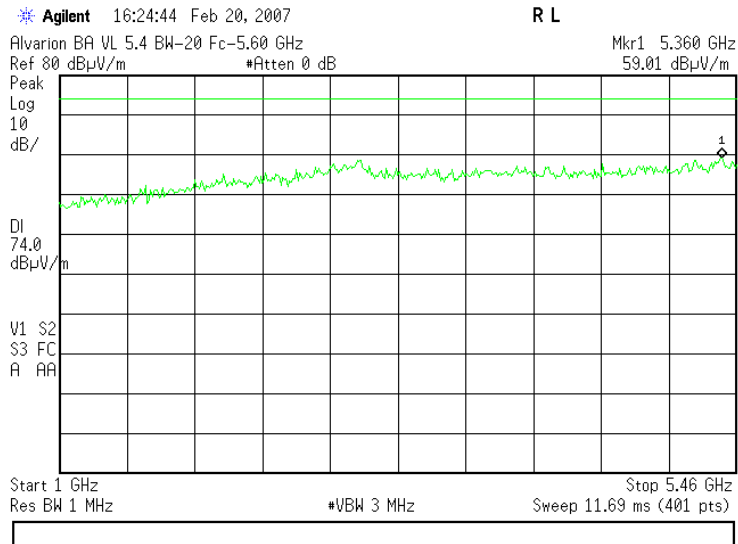


**Plot 84. Carrier Frequency 5.500 GHz, EBW-20 MHz, Antenna 20 dBi Detector Peak**

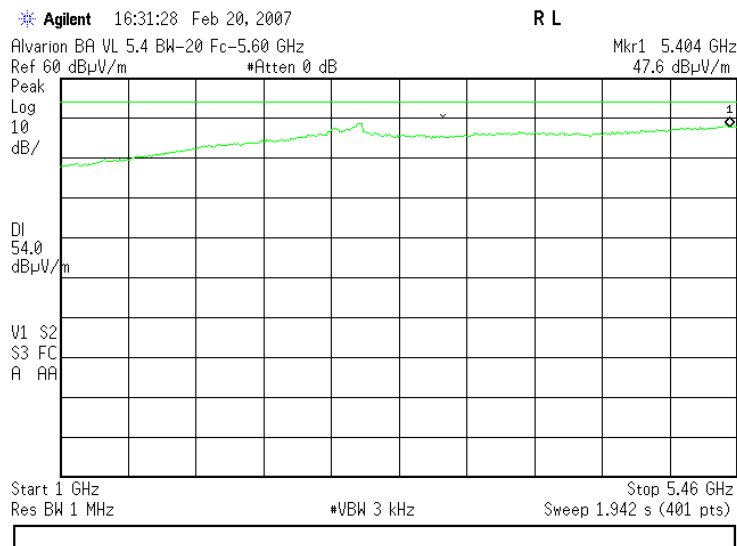


**Plot 85. Carrier Frequency 5.500 GHz, EBW 20 MHz, Antenna 20 dBi Detector Average**

**Test Report No: 8712313898** **Page 67 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

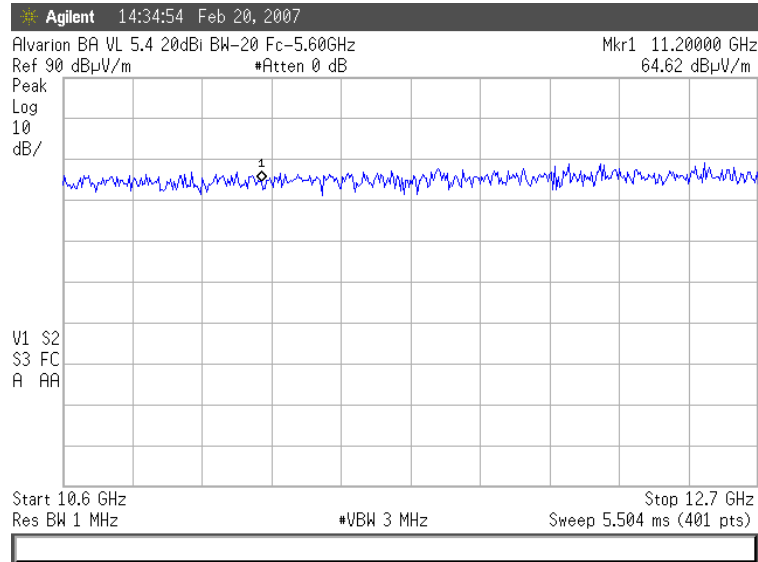


**Plot 86. Carrier Frequency 5.600 GHz, EBW-20 MHz, Antenna 20 dBi  
 Detector Peak**

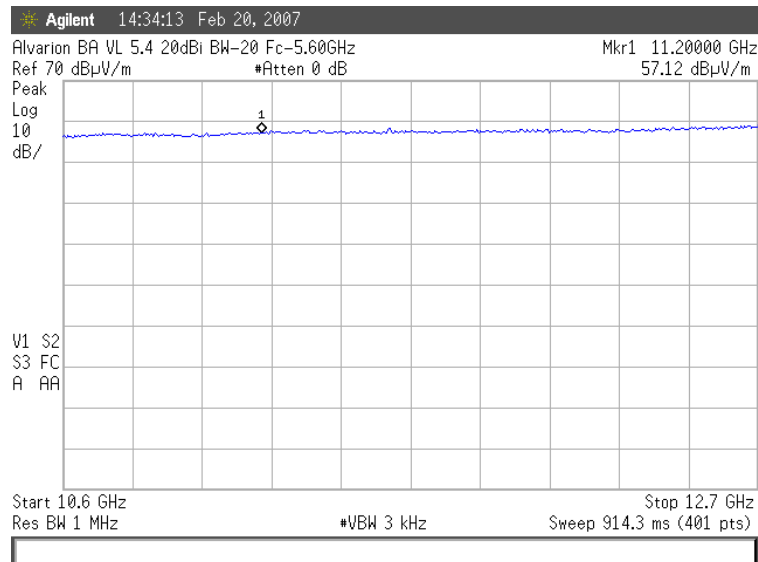


**Plot 87. Carrier Frequency 5.600 GHz, EBW 20 MHz, Antenna 20 dBi  
 Detector Average**



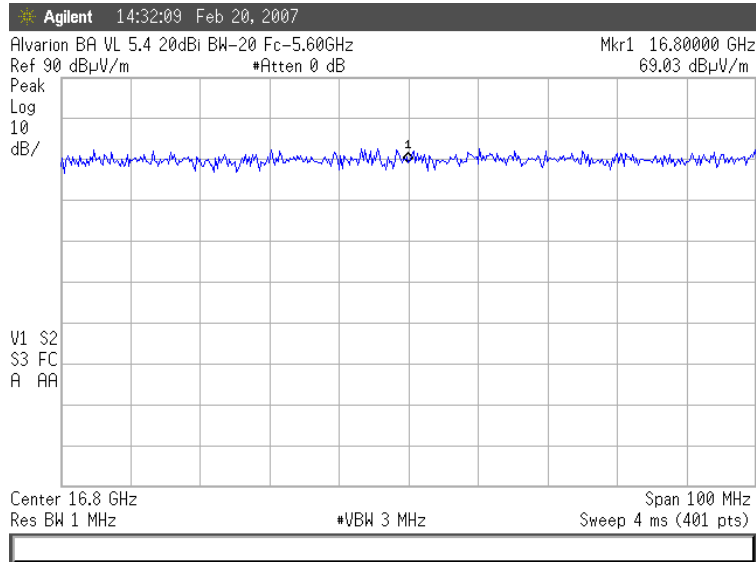
**Test Report No: 8712313898****Page 68 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

**Plot 88. Carrier Frequency 5.600 GHz, EBW-20 MHz, Antenna 20 dBi  
Detector Peak**

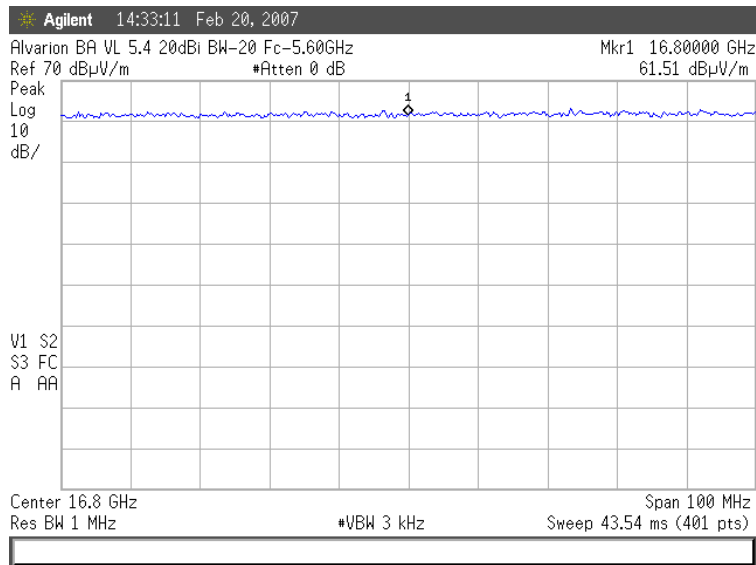


**Plot 89. Carrier Frequency 5.600 GHz, EBW 20 MHz, Antenna 20 dBi  
Detector Average**

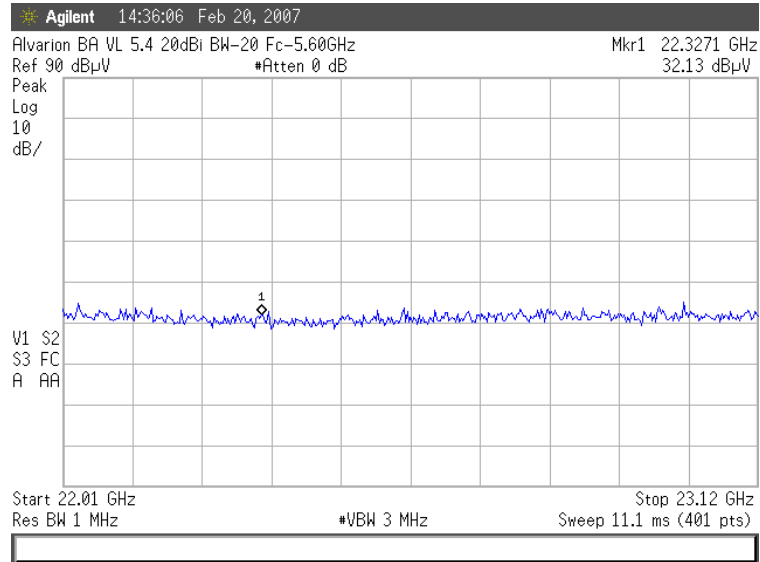
**Test Report No: 8712313898** **Page 69 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



**Plot 90. Carrier Frequency 5.600 GHz, EBW-20 MHz, Antenna 20 dBi Detector Peak**

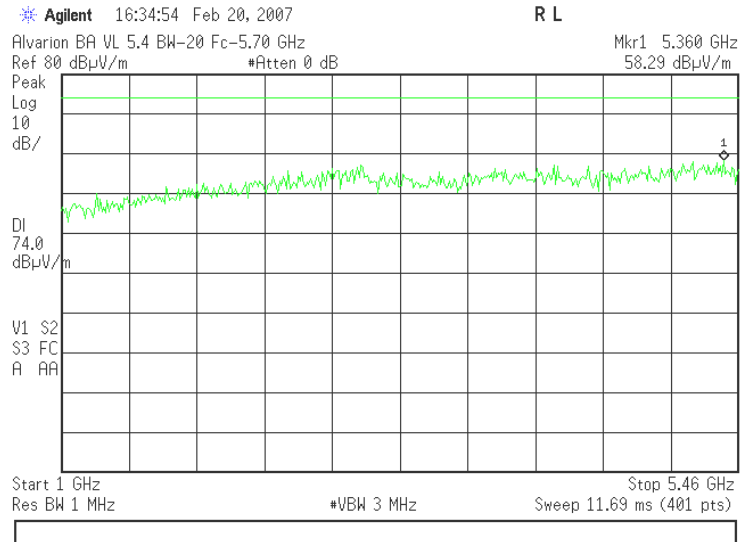


**Plot 91. Carrier Frequency 5.600 GHz, EBW 20 MHz, Antenna 20 dBi Detector Average**

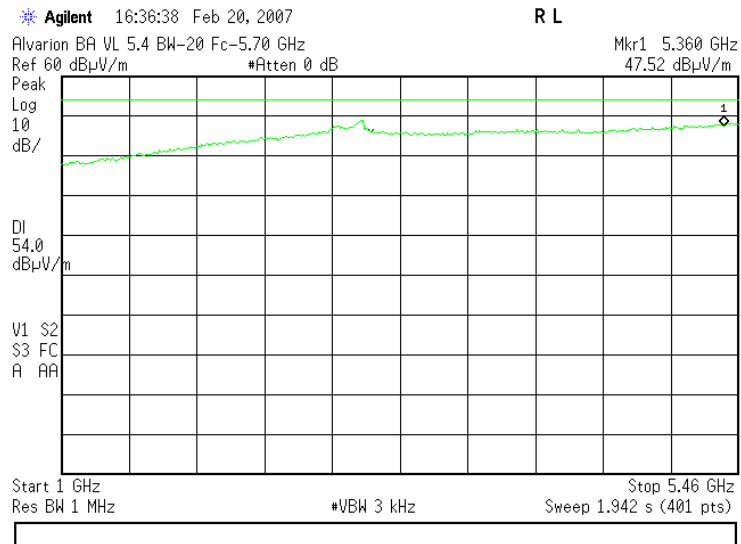
**Test Report No: 8712313898****Page 70 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

**Plot 92. Carrier Frequency 5.600 GHz, EBW-20 MHz, Antenna 20 dBi  
Detector Peak**

**Test Report No: 8712313898** **Page 71 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

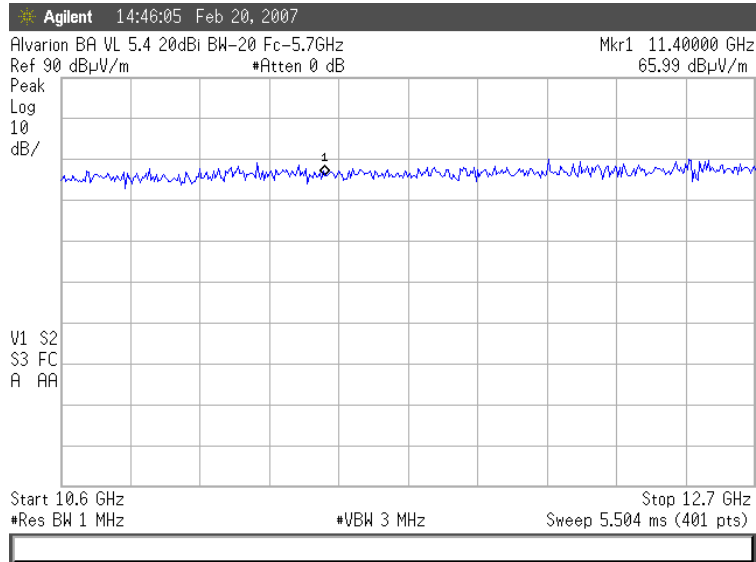


**Plot 93. Carrier Frequency 5.700 GHz, EBW-20 MHz, Antenna 20 dBi  
 Detector Peak**

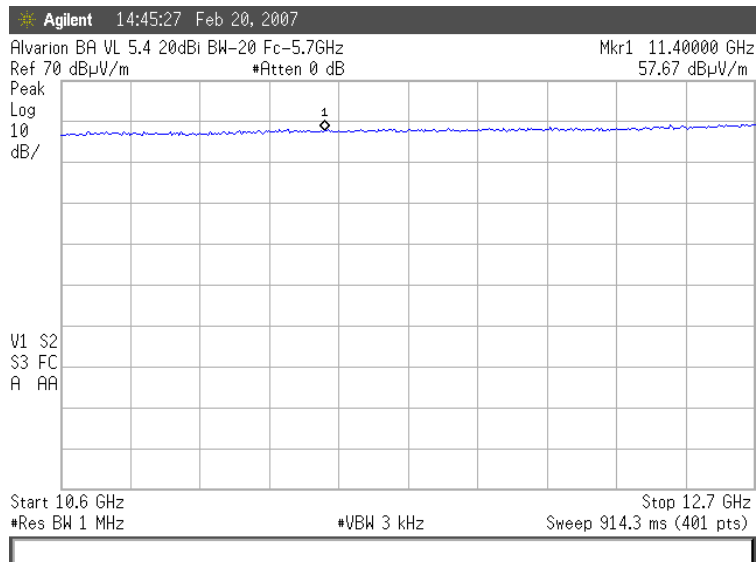


**Plot 94. Carrier Frequency 5.700 GHz, EBW 20 MHz, Antenna 20 dBi  
 Detector Average**

**Test Report No: 8712313898** **Page 72 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

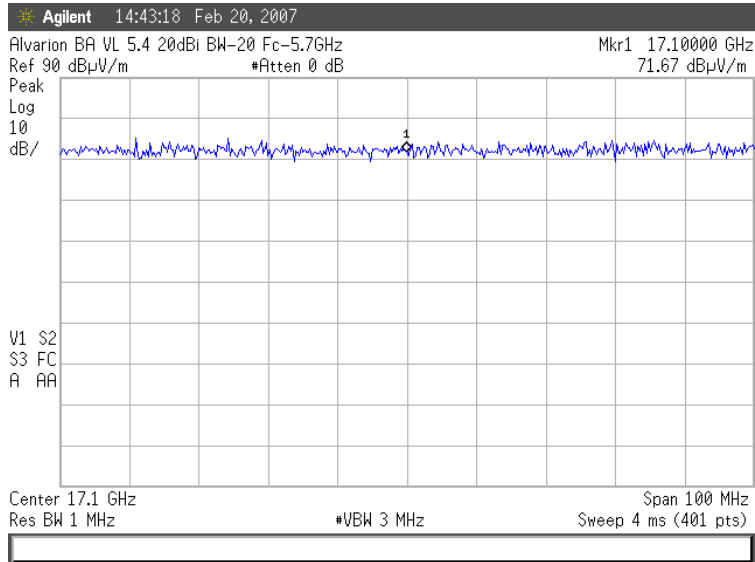


**Plot 95. Carrier Frequency 5.700 GHz, EBW-20 MHz, Antenna 20 dBi Detector Peak**

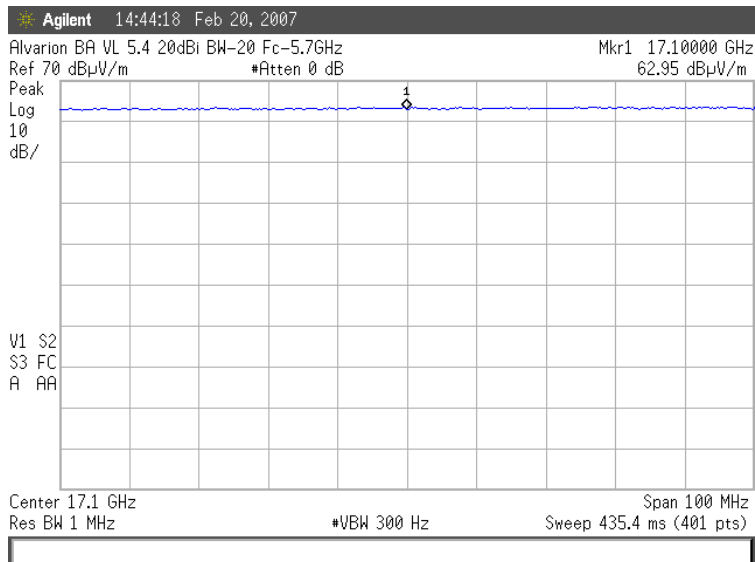


**Plot 96. Carrier Frequency 5.700 GHz, EBW 20 MHz, Antenna 20 dBi Detector Average**

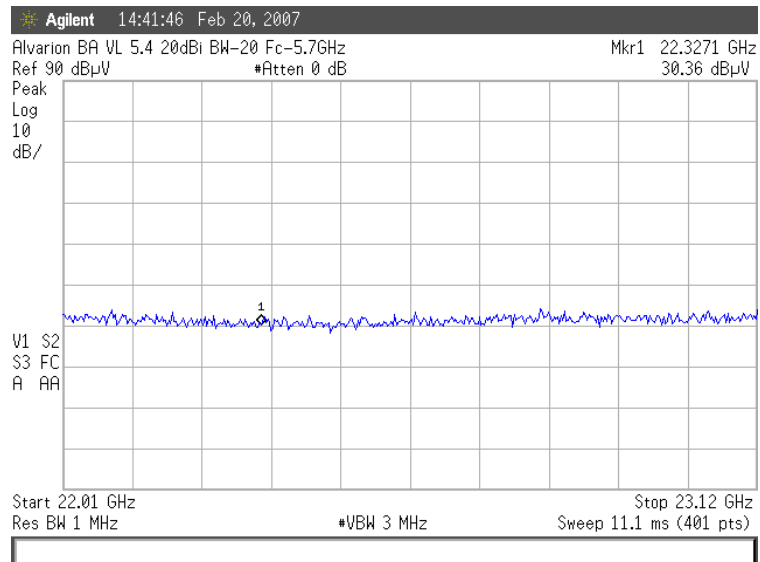
**Test Report No: 8712313898** **Page 73 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



**Plot 97. Carrier Frequency 5.700 GHz, EBW-20 MHz, Antenna 20 dBi Detector Peak**



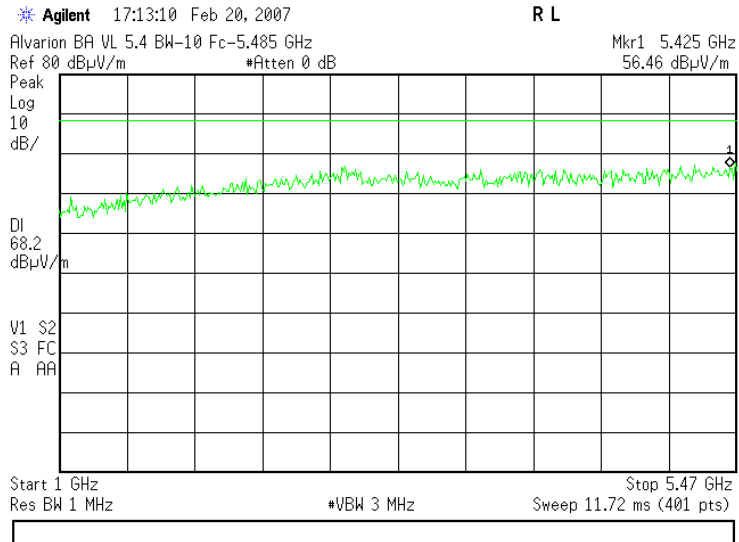
**Plot 98. Carrier Frequency 5.700 GHz, EBW 20 MHz, Antenna 20 dBi Detector Average**

**Test Report No: 8712313898****Page 74 of 83 Pages****Title: Test on Broadband Wireless Access system:****BreezeACCESS VL 5.4 System Subscriber unit****FCC ID: LKT-VL-54**

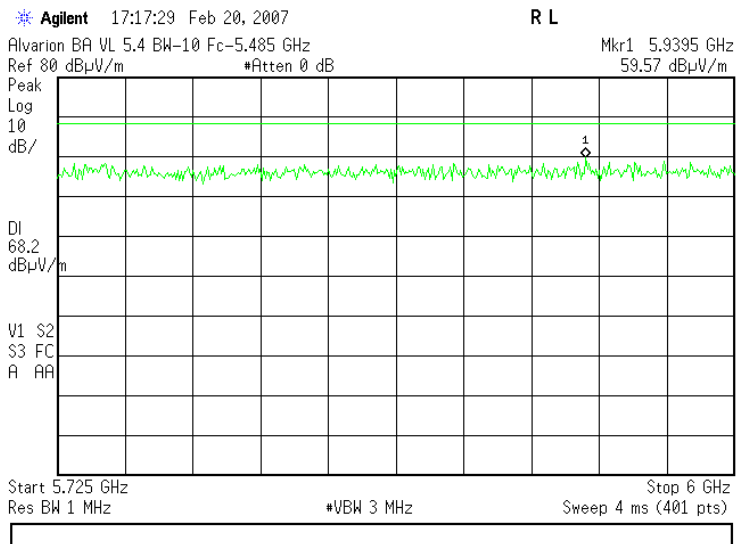
**Plot 99. Carrier Frequency 5.700 GHz, EBW-20 MHz, Antenna 20 dBi  
Detector Peak**

**Test Report No: 8712313898** **Page 75 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

**Out of band measurement according to 15.407(b)(3).**  
**Limit EIRP -27 dBm/MHz was converted to field strength limit 68.2 dBμV/m@3m distance and correlated by substitution method.**



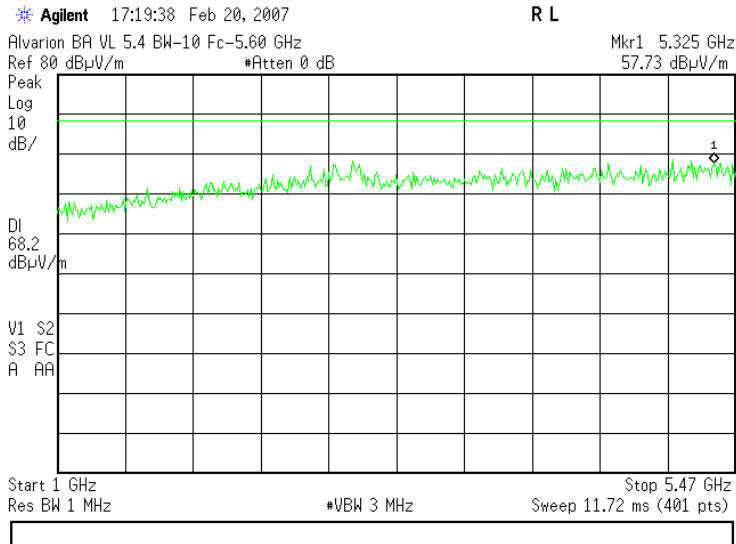
**Plot 100. Carrier Frequency 5.485 GHz, EBW-10 MHz, Antenna 20 dBi Detector Peak**



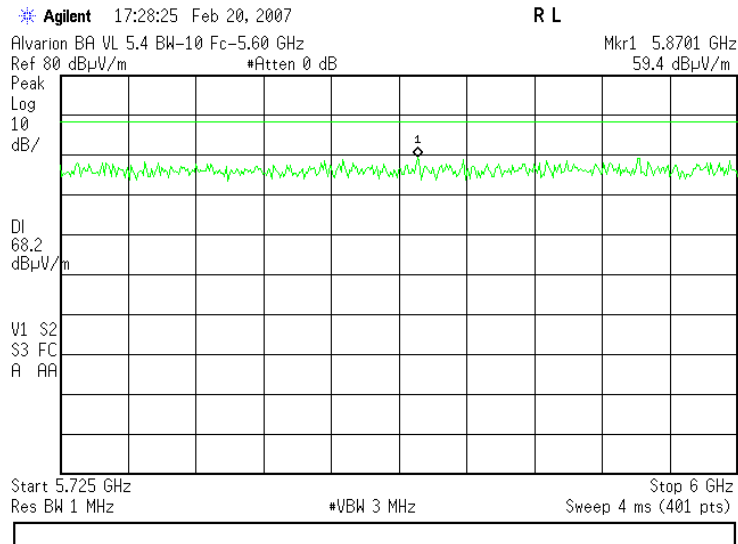
**Plot 101. Carrier Frequency 5.485 GHz, EBW-10 MHz, Antenna 20 dBi Detector Peak**



**Test Report No: 8712313898** **Page 76 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

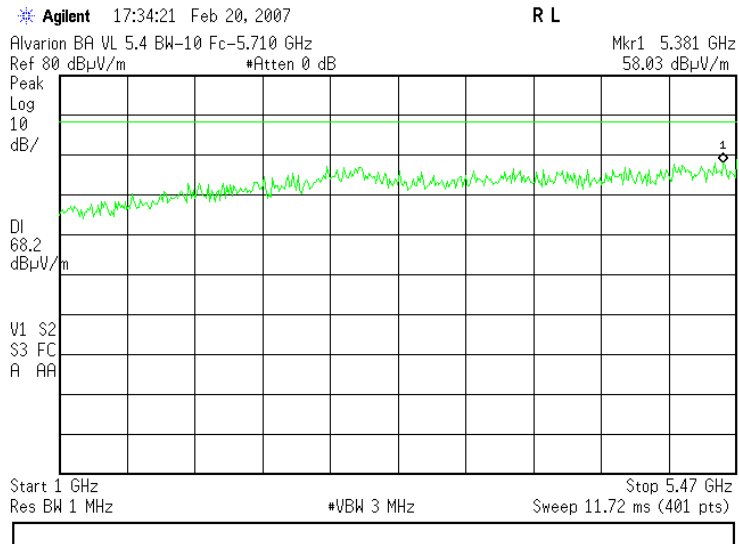


**Plot 102. Carrier Frequency 5.600 GHz, EBW-10 MHz, Antenna 20 dBi  
 Detector Peak**

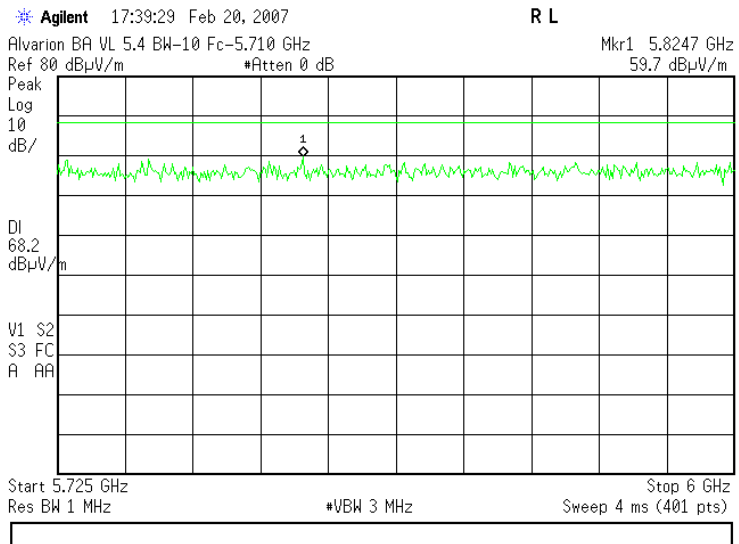


**Plot 103. Carrier Frequency 5.600 GHz, EBW-10 MHz, Antenna 20 dBi  
 Detector Peak**

**Test Report No: 8712313898** **Page 77 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

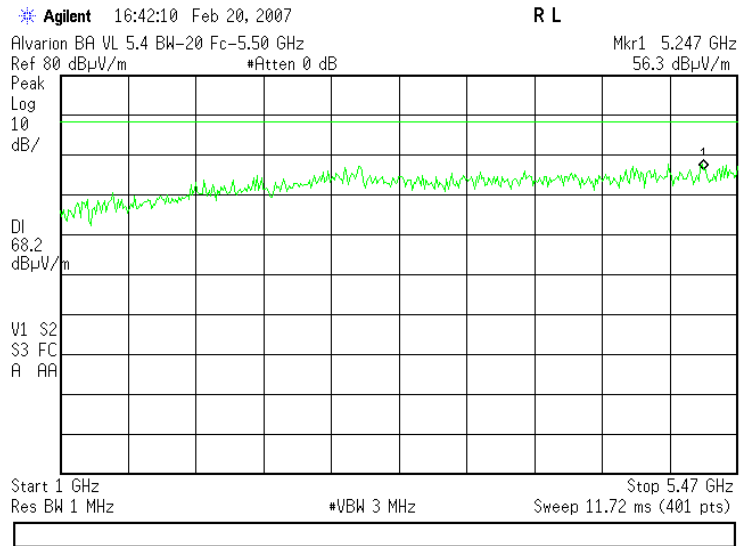


**Plot 104. Carrier Frequency 5.710 GHz, EBW-10 MHz, Antenna 20 dBi Detector Peak**

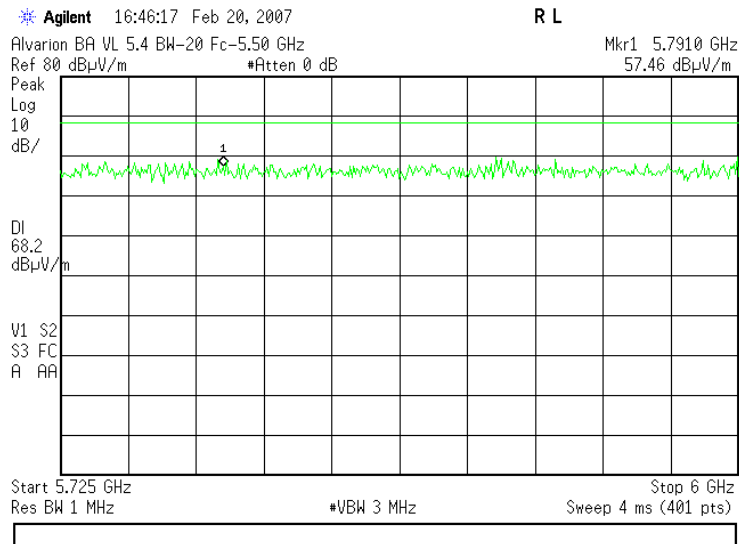


**Plot 105. Carrier Frequency 5.710 GHz, EBW-10 MHz, Antenna 20 dBi Detector Peak**

**Test Report No: 8712313898** **Page 78 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

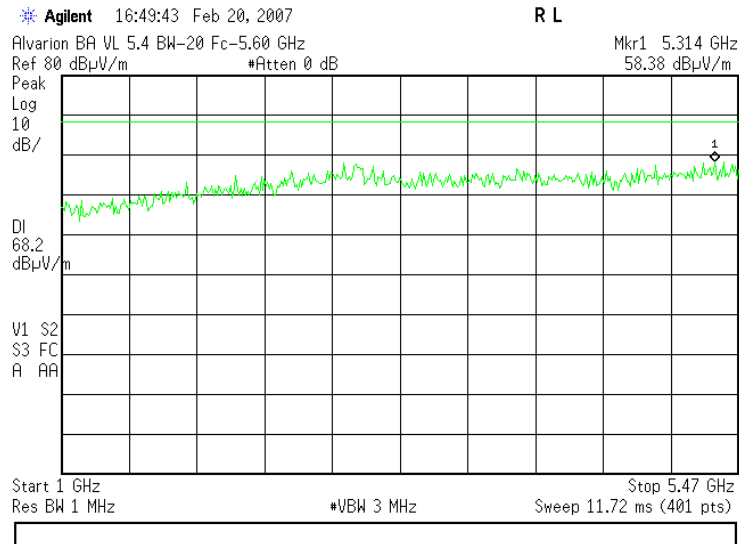


**Plot 106. Carrier Frequency 5.500 GHz, EBW-20 MHz, Antenna 20 dBi Detector Peak**

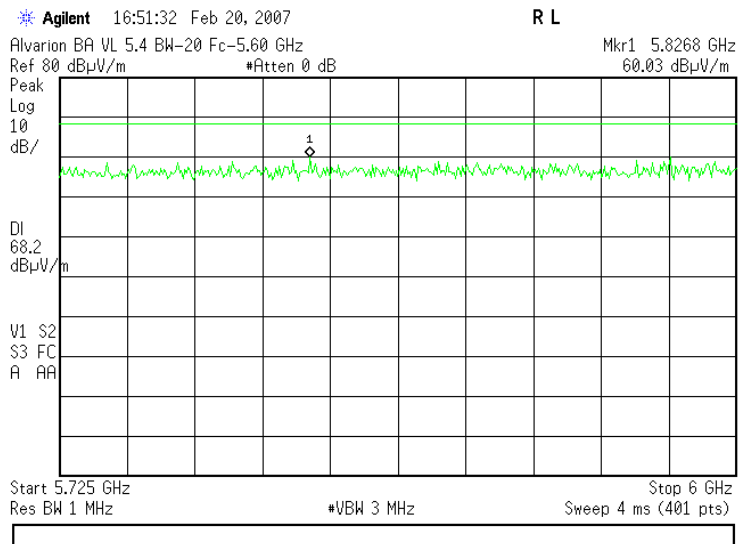


**Plot 107. Carrier Frequency 5.500 GHz, EBW-20 MHz, Antenna 20 dBi Detector Peak**

**Test Report No: 8712313898** **Page 79 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**

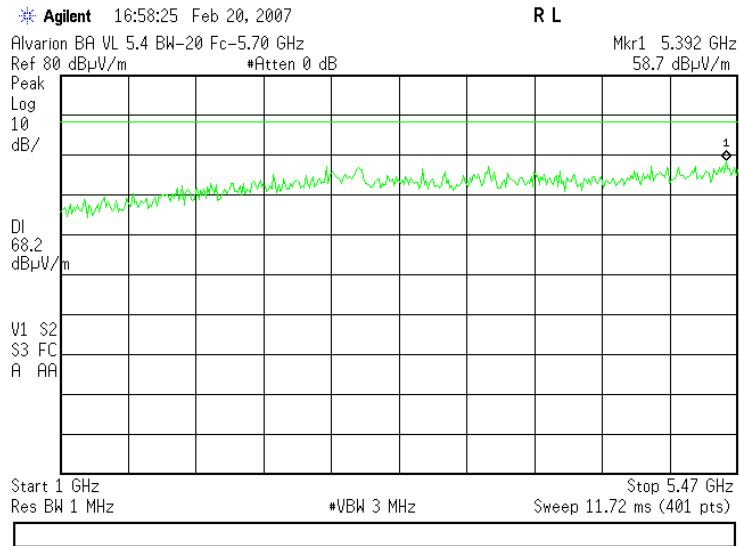


**Plot 108. Carrier Frequency 5.600 GHz, EBW-20 MHz, Antenna 20 dBi  
 Detector Peak**

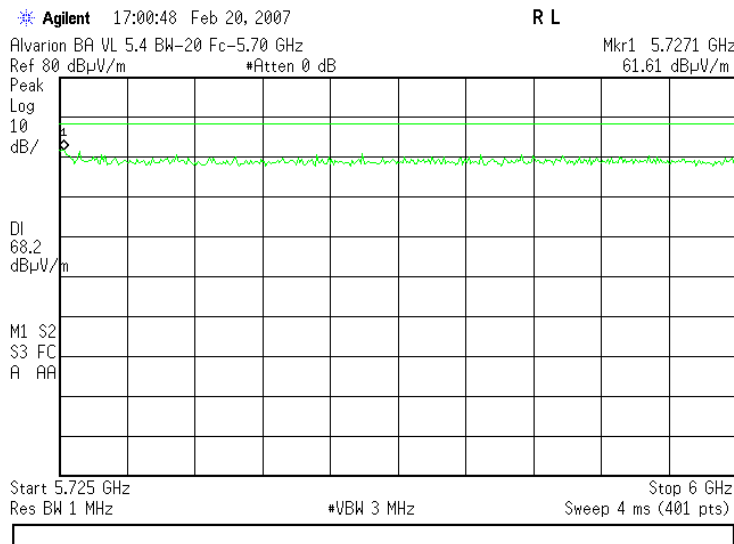


**Plot 109. Carrier Frequency 5.600 GHz, EBW-20 MHz, Antenna 20 dBi  
 Detector Peak**

**Test Report No: 8712313898** **Page 80 of 83 Pages**  
**Title: Test on Broadband Wireless Access system:**  
**BreezeACCESS VL 5.4 System Subscriber unit**  
**FCC ID: LKT-VL-54**



**Plot 110. Carrier Frequency 5.700 GHz, EBW-20 MHz, Antenna 20 dBi Detector Peak**



**Plot 111. Carrier Frequency 5.700 GHz, EBW-20 MHz, Antenna 20 dBi Detector Peak**

**Test Report No:** 8712313898

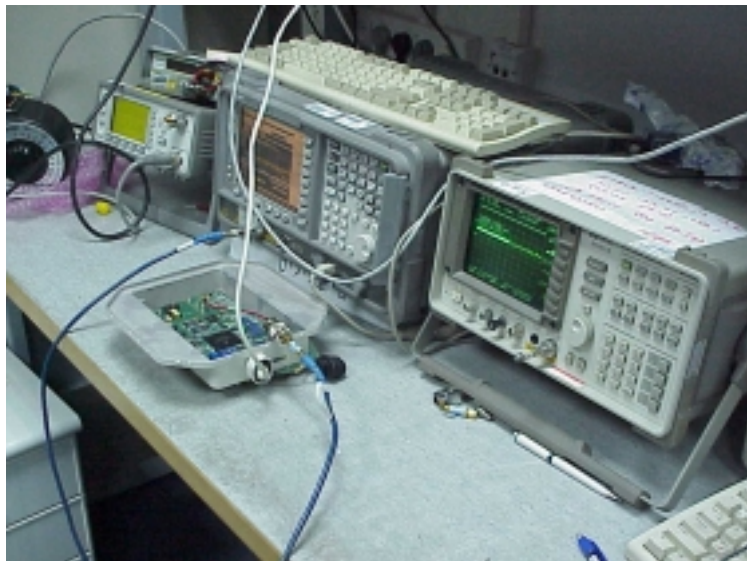
**Page 81 of 83 Pages**

**Title:** Test on Broadband Wireless Access system:

**BreezeACCESS VL 5.4 System Subscriber unit**

**FCC ID:** LKT-VL-54

## 11. Appendix 4: Test configuration illustration



**Photo # 5.**  
**Conducted measurements setup.**

**Test Report No: 8712313898**

**Page 82 of 83 Pages**

**Title: Test on Broadband Wireless Access system:**

**BreezeACCESS VL 5.4 System Subscriber unit**

**FCC ID: LKT-VL-54**



**Photo # 6. Subscriber Unit  
Radiated emission test on open site**



**Photo # 7. Subscriber Unit  
Radiated emission test on open site**



**Test Report No: 8712313898**

**Page 83 of 83 Pages**

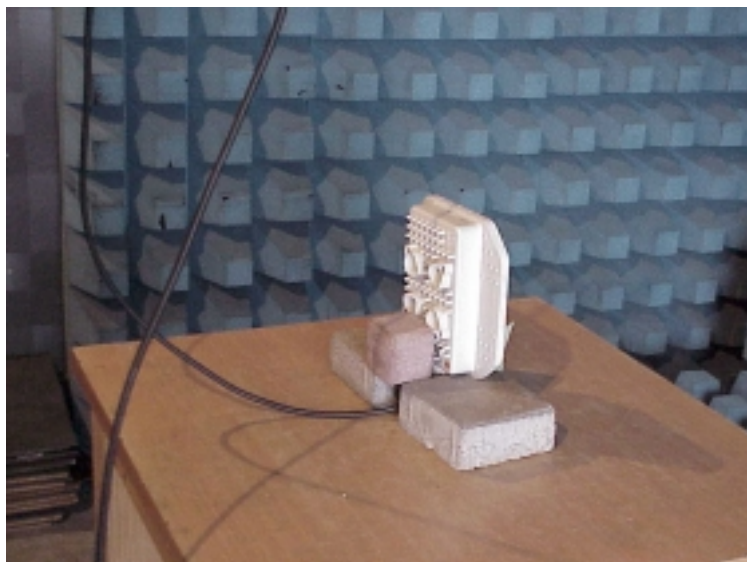
**Title: Test on Broadband Wireless Access system:**

**BreezeACCESS VL 5.4 System Subscriber unit**

**FCC ID: LKT-VL-54**



**Photo # 8.**



**Photo # 9.**

**Radio unit with MTI sector antenna AN1303 20 dBi  
Spurious emission test**