



Test Report No. 8912337336 Rev.1

Applicant: Alvarion Ltd

BreezeNETB 300

Model: BU/RB-B300-5X

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



ACCLASS Accreditation Services

Certificate Number: IT-1359



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Title: BreezeNETB 300

Model: BU/RB-B300-5X

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FCC ID: LKT-BNETB-49

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1. Applicant information

Applicant:	Alvarion Ltd
Address:	21A Habarzel str, Tel-Aviv, 69710, Israel
Sample for test selected by:	The customer
The date of tests:	15 – 21 June 2009

Equipment under test information

Description of Equipment Under Test (EUT):	BreezeNETB 300
Model:	BU/RB-B300-5X
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, part 1 §1.1310

Reference Documents:

CFR 47 FCC:	Rules and Regulations; Part 15. "Radio frequency devices"; Subpart C: "Intentional radiators"
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This Test Report contains 61 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.
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3. Summary of test

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

Transmitter characteristics	Subclasses
Minimum 6 dB bandwidth	15.247(a)(2)
Maximum output power	15.247(b)(3)
Spurious emissions at antenna terminal	15.247(d)
Out of band spurious emissions radiated	15.205, 15.247(d)
Peak power spectral density	15.247(e)
Conducted emissions on AC power line	15.207
Unwanted radiated emissions below 1 GHz	15.209

Test performed by:Mr. Michael Feldman
Test technicianTest report approved by:Mr. Yuri Rozenberg.
Head of EMC Branch


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*The customer provided description.

4.1 General description

The BNB-300 is designed as an adaptable platform, for high availability, high capacity and long range wireless services, in the unlicensed and licensed frequency spectrum. The platform architecture and software framework will enable various product configurations, providing a rich suite of applications and system deployment models.

The generic platform is based on a state-of-the-art technology, with robust capabilities including Orthogonal Frequency Division Multiplexing (OFDM), Time Division Duplexing (TDD) and Spectrum Management, the BNB-300 will offer line-of-sight (LOS) as well as non-line-of-sight (NLOS) operation, such as for drive through trees, foliage and around buildings.

EUT technical characteristics

Transmitter technical characteristics.			Note
Stand-alone/fixed use			
Assigned frequency range	5725 MHz – 5850 MHz		
Operating frequency range	5730 MHz – 5845 MHz		5 MHz/10 MHz EBW
	5740 MHz – 5840 MHz		20 MHz EBW
	5750 MHz – 5830 MHz		40 MHz EBW
RF channel spacing	5/10/20/40 MHz		
Maximum rated output power	18 dBm		
Antenna connection	N-type for external antenna		Professional installation
Type of modulation	QPSK, 4QAM, 16QAM, 64QAM		
Type of multiplexing	OFDM		
Modulating test signal (baseband)	PRBS		
Antenna information			
Type	Manufacturer	Model	Gain, dBi
Dish, dual polarized	MTI	P/N 850101	28
Flat panel , dual polarized	MTI	P/N 850102	23

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5. Environmental evaluation and exposure limit according to FCC part 1, §1.1307, §1.1310

Limit for power density for general population/uncontrolled exposure is $1(\text{mW}/\text{cm}^2)$ or $10 (\text{W}/\text{m}^2)$.

The power density calculation is $S = (P_t / 4\pi r^2)$.

Where:

P_t - The transmitted power (EIRP) (mW)

r - The distance from the unit. (cm)

The limit $1(\text{mW}/\text{cm}^2)$ can be calculated from the above based on the following data:

P_t - the transmitted power which is equal to the peak output power 23.7 dBm plus external antenna gain 28 dBi . The maximum peak EIRP = 51.7 dBm = 147910 mW

Maximum allowed distance “ r ”, where RF exposure limits may not be exceeded,

$r = \text{SQRT}(147910/4\pi)$ and is more than 108.6 cm from the antenna.

6. EUT test configuration

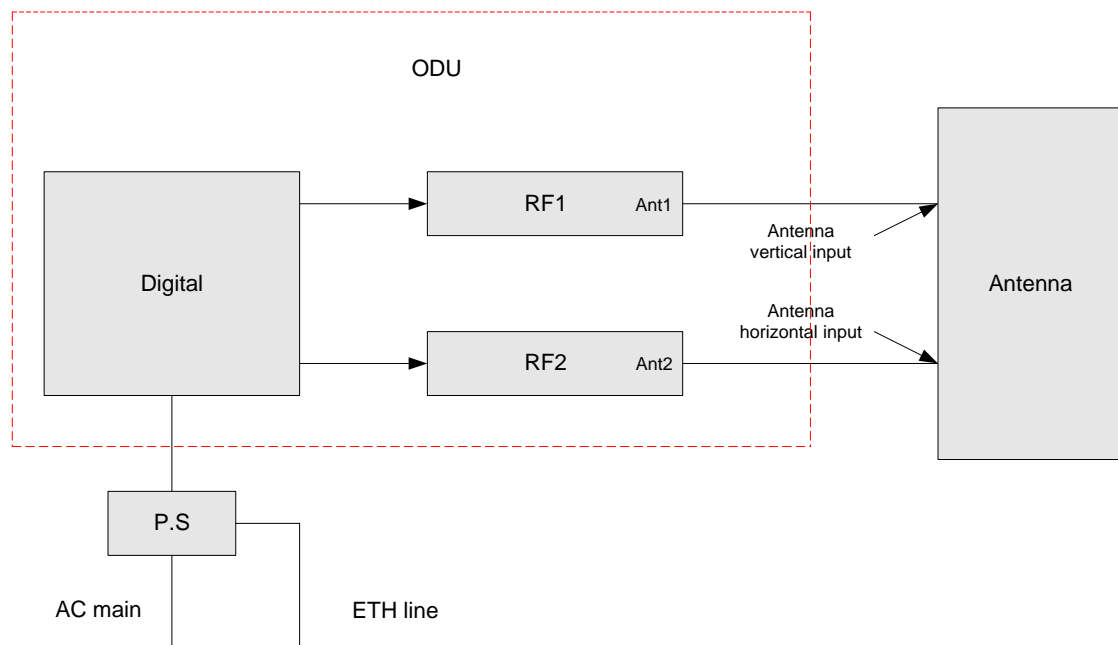


Fig. 1. EUT block diagram.

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7. Test results

7.1 Transmitter characteristics

7.1.1 Occupied 6 dB bandwidth for digitally systems.

Method of measurement FCC March 23, 2005 procedure
Operating Frequency Range 5730 – 5845 MHz
Ambient Temperature 23⁰ C Relative Humidity 49% Air Pressure 1011 hPa

5 MHz emission bandwidth

Carrier frequency MHz	Measured 6 dB bandwidth, MHz	Reference to plots
5730	4.496	#1
5790	4.484	#2
5845	4.477	#3

LIMIT

Minimum allowed bandwidth - 500 kHz @ 6 dBc

TEST PROCEDURE

The measurements were performed in normal (transmitting) mode of operation for carrier (channel) frequency at bottom, middle and at the top of 5725 – 5850 MHz frequency band 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	4	5			
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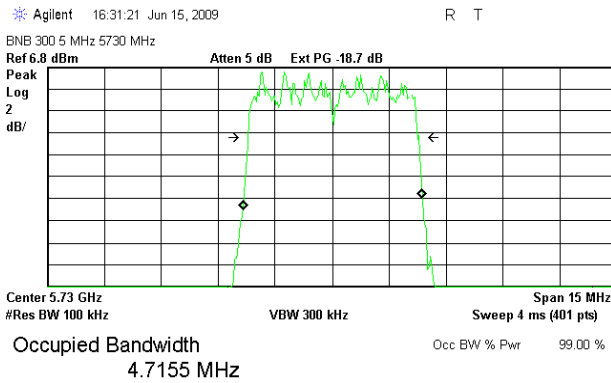
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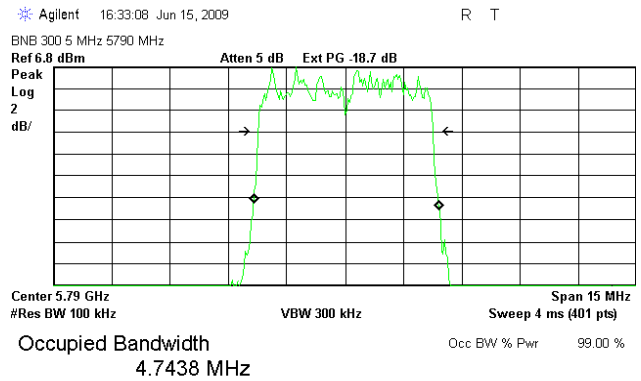
FCC ID: LKT-BNETB-49



Transmit Freq Error 21.924 kHz

x dB Bandwidth 4.496 MHz

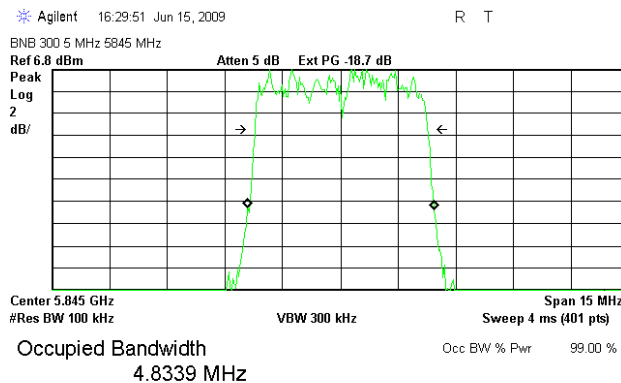
Plot # 1



Transmit Freq Error 28.341 kHz

x dB Bandwidth 4.484 MHz

Plot # 2



Transmit Freq Error 20.110 kHz

x dB Bandwidth 4.477 MHz

Plot # 3

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Method of measurement FCC March 23, 2005 procedure
Operating Frequency Range 5730 – 5845 MHz
Ambient Temperature 23⁰ C Relative Humidity 49% Air Pressure 1011 hPa

5 MHz emission bandwidth

Carrier frequency MHz	26 dB emission bandwidth MHz	Measured Peak output power, dBm	Reference to plots
5730	7.52	22.0	#4, 7
5790	7.73	22.5	#5, 8
5845	7.74	22.6	#6, 9

10 MHz emission bandwidth

Carrier frequency MHz	26 dB emission bandwidth MHz	Measured Peak output power, dBm	Reference to plots
5730	11.50	21.99	#10, 13
5790	11.69	22.15	#11, 14
5845	11.27	22.25	#12, 15

20 MHz emission bandwidth

Carrier frequency MHz	26 dB emission bandwidth MHz	Measured Peak output power, dBm	Reference to plots
5740	23.92	23.03	#16, 19
5780	23.23	22.97	#17, 20
5840	22.19	23.66	#18, 21

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Carrier frequency MHz	26 dB emission bandwidth MHz	Measured Peak output power, dBm	Reference to plots
5750	40.58	17.9	#22, 25
5790	40.72	17.7	#23, 26
5830	40.38	18.8	#24, 27

LIMIT

For systems using digital modulation in the 5725 – 5850 MHz band: 1W (30 dBm).

Systems used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

TEST PROCEDURE

The measurements were performed in normal (transmitting) mode of operation for carrier (channel) frequency at bottom, middle and the top of the 5725 – 5850 MHz frequency band 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	4	5			
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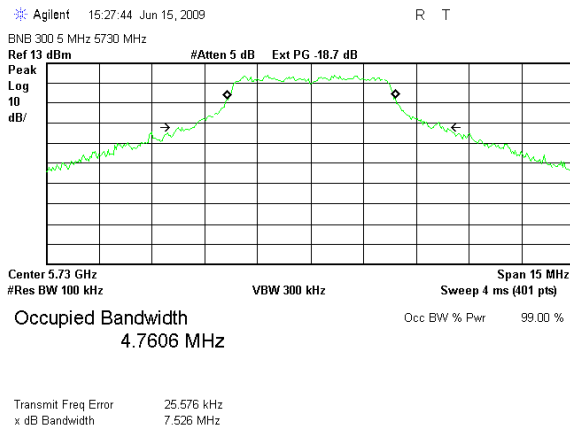
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Model: BU/RB-B300-5X

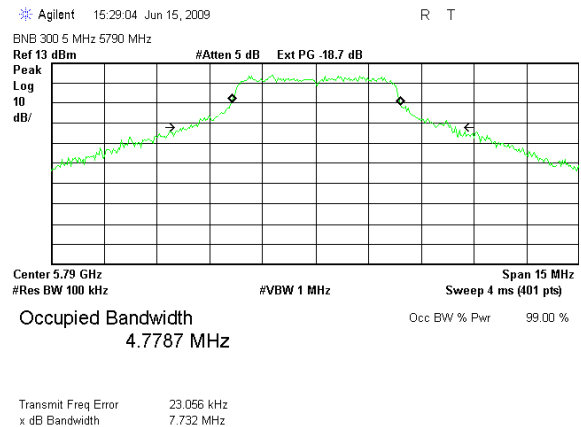
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FCC ID: LKT-BNETB-49

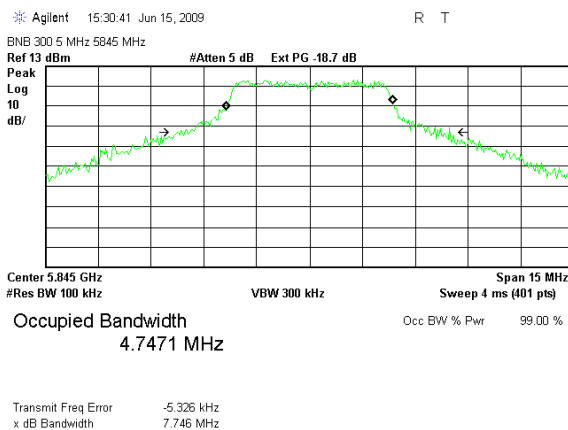
5 MHz EBW option, 26 dB bandwidth test result



Plot # 4



Plot # 5



Plot # 6



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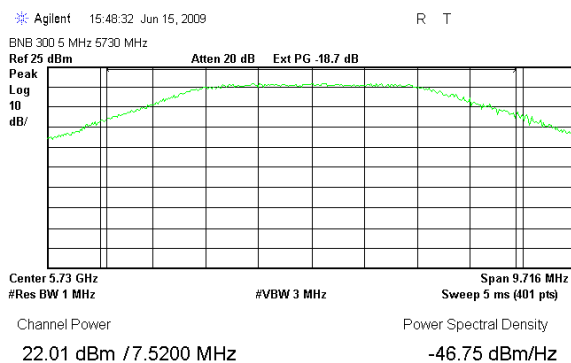
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Model: BU/RB-B300-5X

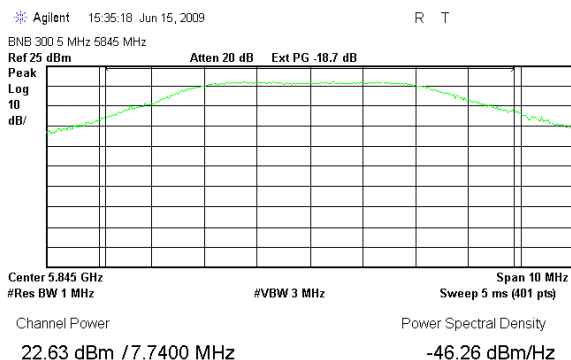
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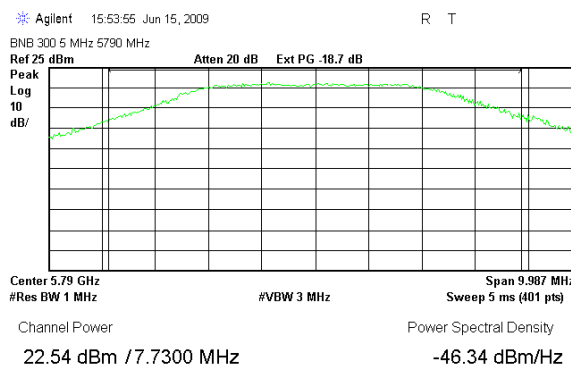
5 MHz EBW option. Peak output power results



Plot # 7



Plot # 9



Plot # 8

Insertion loss of external attenuator, directional coupler and cable = 18.7 dB



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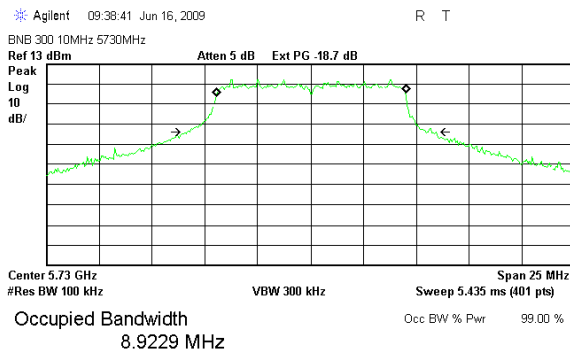
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Model: BU/RB-B300-5X

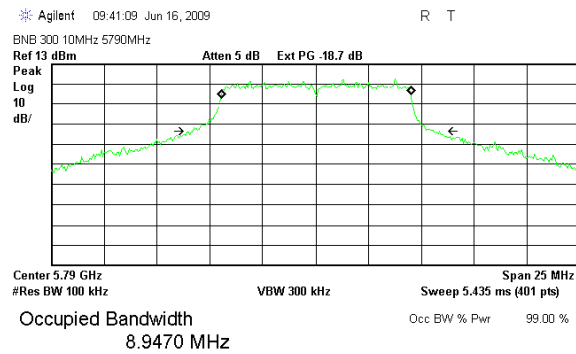
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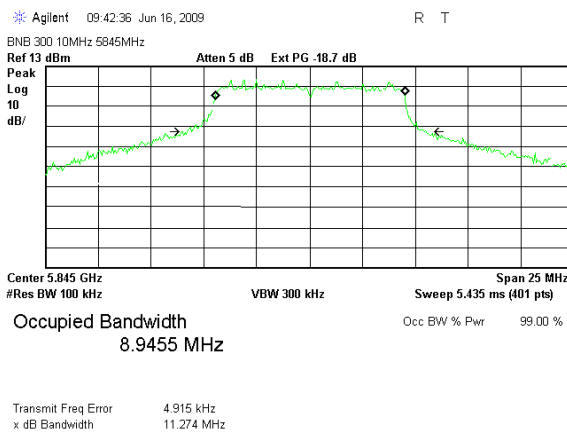
10 MHz EBW option, 26 dB bandwidth test result



Plot # 10



Plot # 11



Plot # 12



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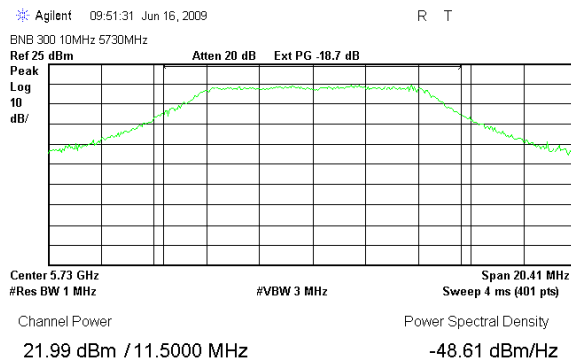
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Model: BU/RB-B300-5X

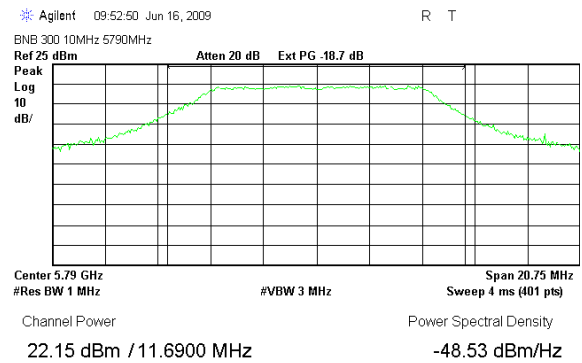
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FCC ID: LKT-BNETB-49

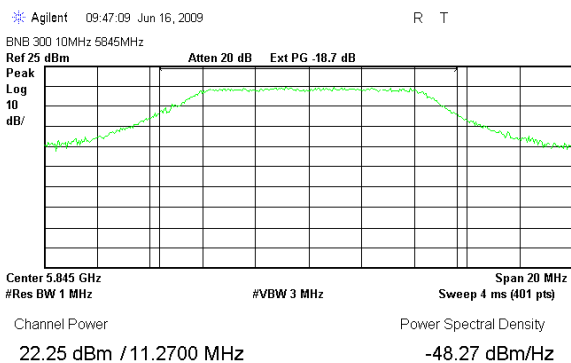
10 MHz EBW option. Peak output power results



Plot # 13



Plot # 14



Plot # 15



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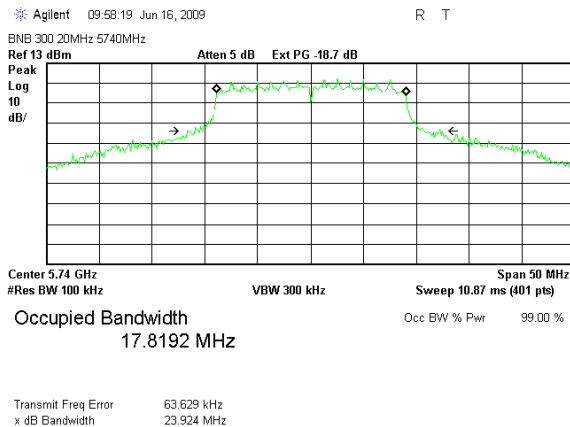
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Model: BU/RB-B300-5X

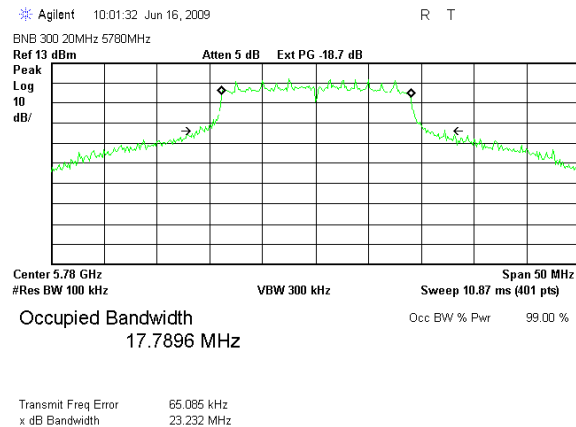
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FCC ID: LKT-BNETB-49

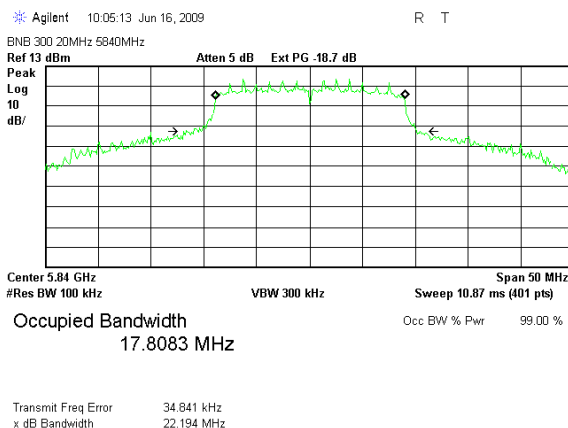
20 MHz EBW option, 26 dB bandwidth test result



Plot # 16



Plot # 17



Plot # 18



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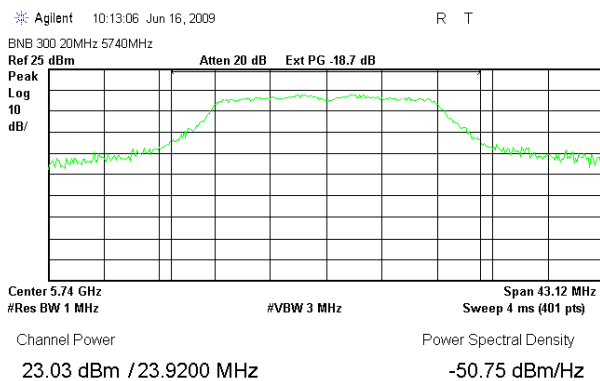
Title: BreezeNETB 300

Model: BU/RB-B300-5X

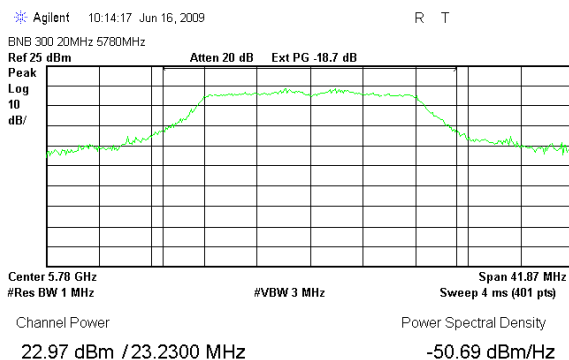
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FCC ID: LKT-BNETB-49

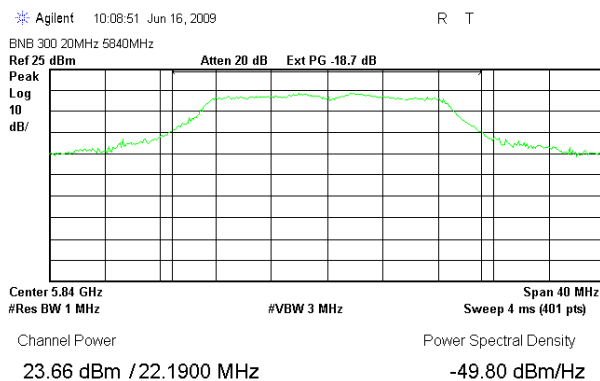
20 MHz EBW option. Peak output power results



Plot # 19



Plot # 20



Plot # 21

Insertion loss of external attenuator, directional coupler and cable = 18.7 dB



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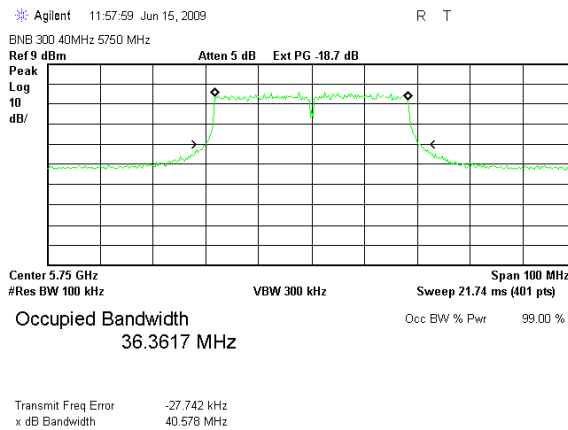
Title: BreezeNETB 300

Model: BU/RB-B300-5X

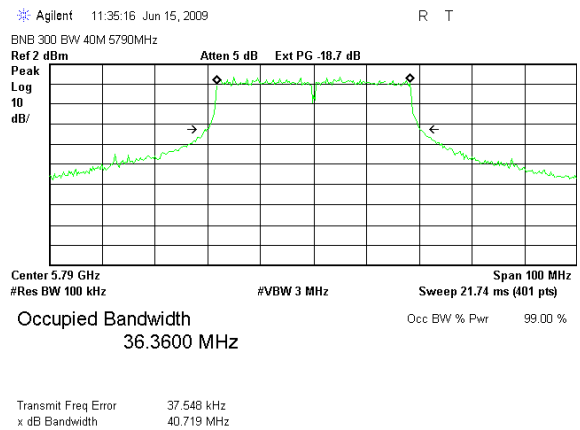
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FCC ID: LKT-BNETB-49

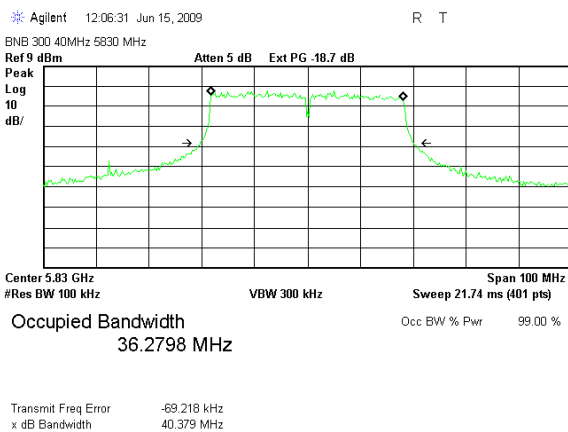
40 MHz BW option, 26 dB bandwidth test result



Plot # 22



Plot # 23



Plot # 24



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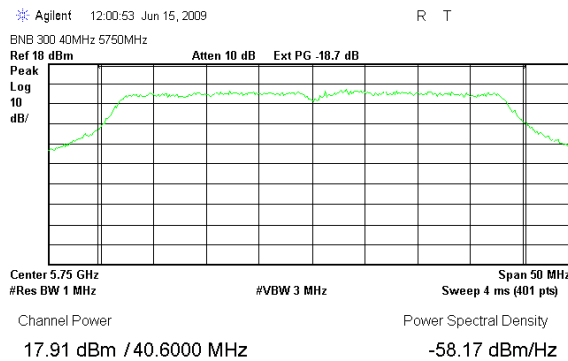
Title: BreezeNETB 300

Model: BU/RB-B300-5X

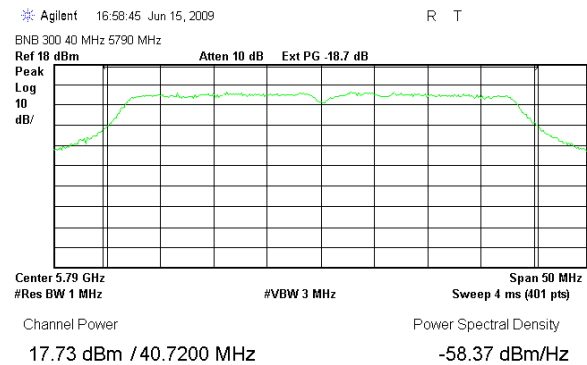
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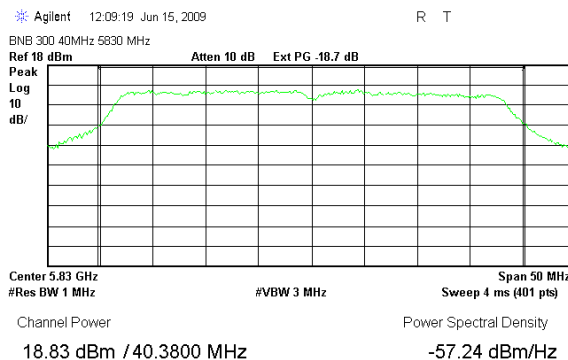
40 MHz BW option. Peak output power results



Plot # 25



Plot # 26



Plot # 27

Insertion loss of external attenuator, directional coupler and cable = 18.7 dB

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Method of measurement	FCC March 23, 2005 procedure
Operating Frequency Range	5730 – 5845 MHz
Ambient Temperature	23 ⁰ C
Relative Humidity	49%
Air Pressure	1009 hPa

The frequency spectrum was investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz and up to 40 GHz. The emission levels of the EUT in peak mode more than 20 dB lower than the specified limit were not recorded in the table. For the test results refer to plots ## 31-42 in this section.

LIMIT

In any 100 kHz bandwidth, outside the frequency band, in which the 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 PROCEDURE

The test was performed at worse case emission bandwidth and output power options. The measurements were performed in normal (transmitting) mode of operation for carrier (channel) frequency at bottom, middle and the top of the 5725 – 5850 MHz frequency band 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:

1	3	4	5			
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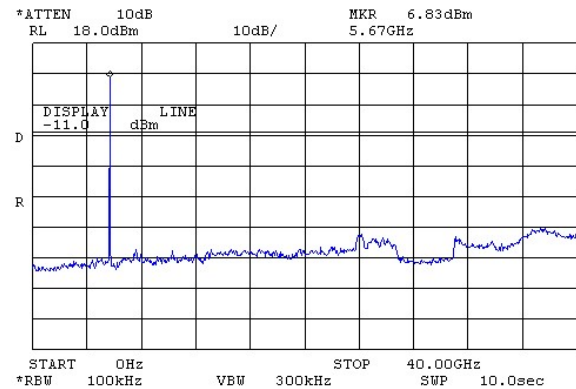
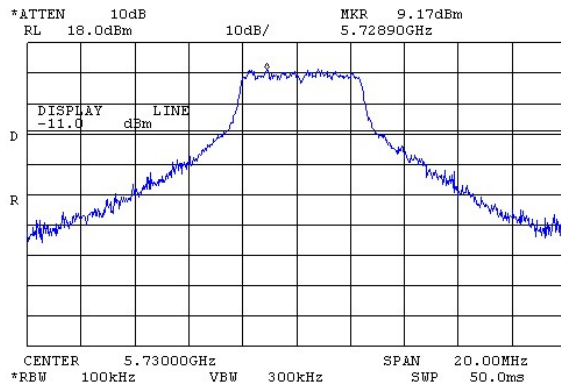
Title: BreezeNETB 300

Model: BU/RB-B300-5X

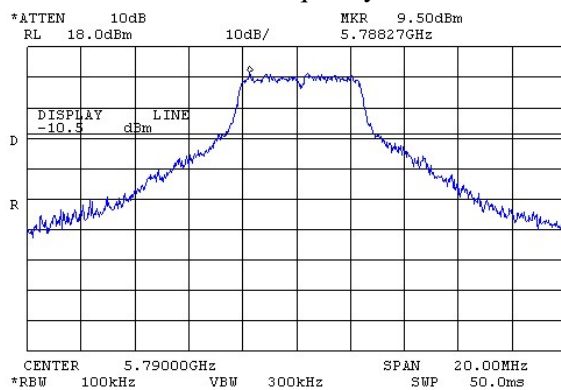
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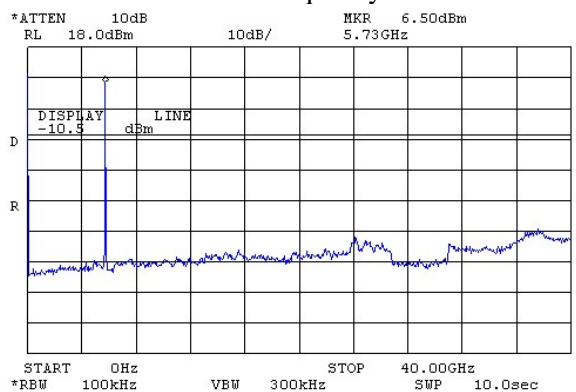
5 MHz emission bandwidth



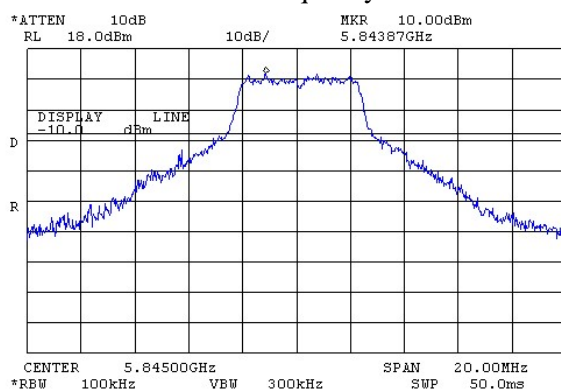
Plot # 28. Carrier frequency 5730 MHz.



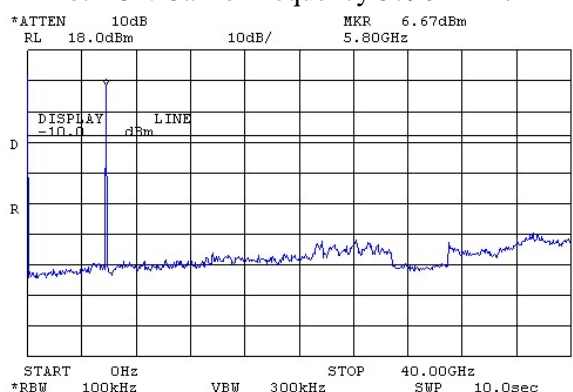
Plot # 29. Carrier frequency 5730 MHz..



Plot # 30. Carrier frequency 5790 MHz.



Plot # 31. Carrier frequency 5790 MHz.



Plot # 32. Carrier frequency 5845 MHz

Plot # 33. Carrier frequency 5845 MHz



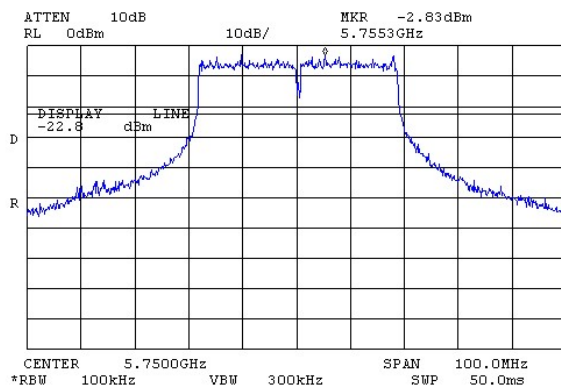
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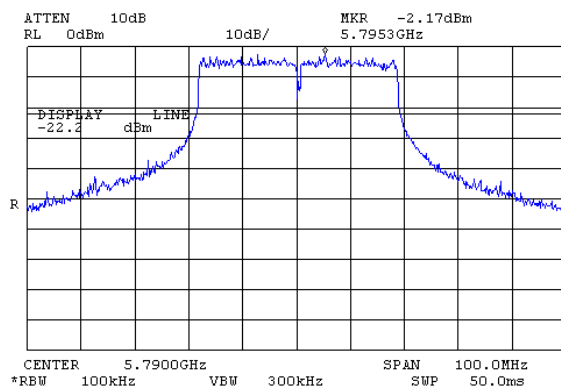
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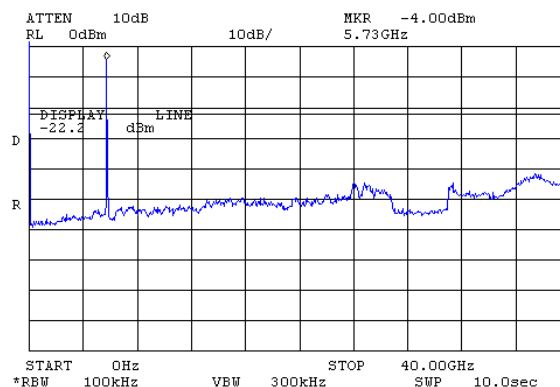
FCC ID: LKT-BNETB-49

40 MHz emission bandwidth

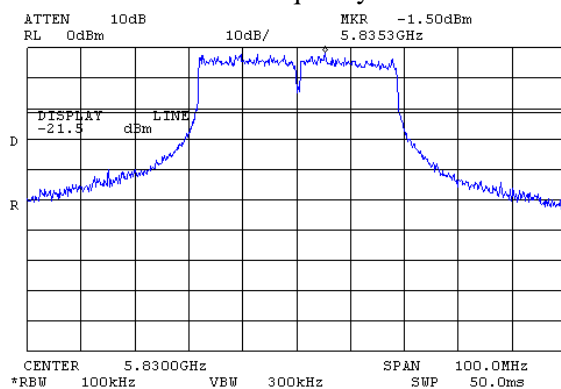
Plot # 34. Carrier frequency 5730 MHz.



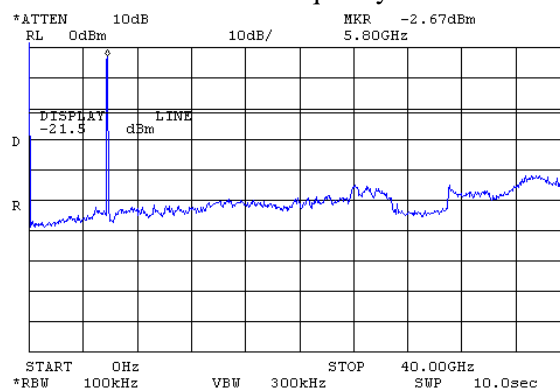
Plot # 35. Carrier frequency 5730 MHz.



Plot # 36. Carrier frequency 5787.5 MHz



Plot # 37. Carrier frequency 5787.5 MHz



Plot # 38. Carrier frequency 5845 MHz

Plot # 39. Carrier frequency 5845 MHz

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7.1.4 Radiated emissions out of band test according to §15.247(d), 15.205

Method of measurement FCC March 23, 2005 procedure
 Operating Frequency Range 5730 – 5845 MHz
 Ambient Temperature 23⁰ C Relative Humidity 56% Air Pressure 1011 hPa

The frequency spectrum was investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz and up to 40 GHz. The emission levels of the EUT more than 20 dB lower than the specified limit were not recorded in the tables. For the test results refer to tables and plots in this section. Test results in 30 – 1000 MHz frequency range are recorded in section 5.2.

External dish antenna

5 MHz emission bandwidth

Carrier frequency 5730 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5393	64.0	74	-	10.0	Detector peak
5393	50.6	-	54	3.4	Detector Average.

Carrier frequency 5790 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5415	64.3	74	-	9.7	Detector peak
5382	51.0	-	54	3.0	Detector Average.

Carrier frequency 5845 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5382	65.6	74	-	8.4	Detector peak
5382	46.4	-	54	7.6	Detector Average.

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10 MHz emission bandwidth

Carrier frequency 5730 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5372	65.1	74	-	8.9	Detector peak
5394	49.6	-	54	4.4	Detector Average.

Carrier frequency 5790 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5393	63.5	74	-	10.5	Detector peak
5404	49.9	-	54	4.1	Detector Average.

Carrier frequency 5845 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5382	64.8	74	-	9.2	Detector peak
5393	49.1	-	54	4.9	Detector Average.

**Test report N: 8912337336 Rev.1****Page 23 of 61****Title: BreezeNETB 300****Model: BU/RB-B300-5X****FCC ID: LKT-BNETB-49**40 MHz emission bandwidth

Carrier frequency 5750 MHz

Frequency, MHz	Radiated emissions, dB ($\mu\text{V/m}$)	Peak limit dB ($\mu\text{V/m}$)	Avg limit, dB ($\mu\text{V/m}$)	Margin, dB	Note
5404	70.7	74	-	3.3	Detector peak
5384	50.7	-	54	3.3	Detector Average.

Carrier frequency 5790 MHz

Frequency, MHz	Radiated emissions, dB ($\mu\text{V/m}$)	Peak limit dB ($\mu\text{V/m}$)	Avg limit, dB ($\mu\text{V/m}$)	Margin, dB	Note
5393	65.4	74	-	8.6	Detector peak
5382	51.4	-	54	2.6	Detector Average.

Carrier frequency 5830 MHz

Frequency, MHz	Radiated emissions, dB ($\mu\text{V/m}$)	Peak limit dB ($\mu\text{V/m}$)	Avg limit, dB ($\mu\text{V/m}$)	Margin, dB	Note
5371	64.9	74	-	9.1	Detector peak
5382	46.3	-	54	7.7	Detector Average.

Test report N: 8912337336 Rev.1

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Title: BreezeNETB 300

Model: BU/RB-B300-5X

FCC ID: LKT-BNETB-49

External flat panel antenna.

5 MHz emission bandwidth

Carrier frequency 5730 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5360	63.8	74	-	10.2	Detector peak
5148	50.1	-	54	3.9	Detector Average.

Carrier frequency 5790 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5360	64.1	74	-	9.9	Detector peak
5114	50.8	-	54	3.2	Detector Average.

Carrier frequency 5845 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5415	63.2	74	-	10.8	Detector peak
5114	49.3	-	54	4.7	Detector Average.

**Test report N: 8912337336 Rev.1****Page 25 of 61****Title: BreezeNETB 300****Model: BU/RB-B300-5X****FCC ID: LKT-BNETB-49**10 MHz emission bandwidth

Carrier frequency 5730 MHz

Frequency, MHz	Radiated emissions, dB ($\mu\text{V/m}$)	Peak limit dB ($\mu\text{V/m}$)	Avg limit, dB ($\mu\text{V/m}$)	Margin, dB	Note
5148	63.7	74	-	10.3	Detector peak
5148	49.6	-	54	4.4	Detector Average.

Carrier frequency 5790 MHz

Frequency, MHz	Radiated emissions, dB ($\mu\text{V/m}$)	Peak limit dB ($\mu\text{V/m}$)	Avg limit, dB ($\mu\text{V/m}$)	Margin, dB	Note
5148	63.9	74	-	10.1	Detector peak
5148	50.3	-	54	3.7	Detector Average.

Carrier frequency 5845 MHz

Frequency, MHz	Radiated emissions, dB ($\mu\text{V/m}$)	Peak limit dB ($\mu\text{V/m}$)	Avg limit, dB ($\mu\text{V/m}$)	Margin, dB	Note
5415	63.2	74	-	10.8	Detector peak
5148	50.3	-	54	3.7	Detector Average.

Test report N: 8912337336 Rev.1

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Title: BreezeNETB 300

Model: BU/RB-B300-5X

FCC ID: LKT-BNETB-49

40 MHz emission bandwidth

Carrier frequency 5750 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5360	65.5	74	-	9.5	Detector peak
5393	51.0	-	54	3.0	Detector Average.

Carrier frequency 5790 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5150	68.3	74	-	5.7	Detector peak
5406	50.9	-	54	3.1	Detector Average.

Carrier frequency 5830 MHz

Frequency, MHz	Radiated emissions, dB (μV/m)	Peak limit dB (μV/m)	Avg limit, dB (μV/m)	Margin, dB	Note
5371	63.8	74	-	10.2	Detector peak
5116	48.0	-	54	6.0	Detector Average.

**Test report N: 8912337336 Rev.1****Page 27 of 61****Title: BreezeNETB 300****Model: BU/RB-B300-5X****FCC ID: LKT-BNETB-49****TEST PROCEDURE**

The test was performed at three emissions bandwidths 5 MHz, 10 MHz and 40 MHz that is worse case power and band-edge options with two antenna configurations: external dish and external sector. The measurements were performed at three transmitted carrier (channel) frequencies at bottom, middle and top of the 5725 – 5850 MHz frequency band under maximum data transfer bit rate. To find maximum radiation the turntable was rotated 360°, measuring antenna height was changed from 1 to 4 m, and the antenna polarization was changed from vertical to horizontal.

LIMIT

In any 100 kHz bandwidth outside the frequency band the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below in band highest level desired power. Radiated emissions, which fall in the restricted bands, must comply with the radiated emissions limit specified in section 15.205(c).

TEST SAMMARY

All emissions outside of the 5725 – 5850 MHz band were found below 15.247(d) limit. No emissions were found above SA noise floor in 6.5 – 40 GHz frequency band that is at least 40 dB under the limit.

TEST EQUIPMENT USED:

1	5	6	7	9	14	
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Test report N: 8912337336 Rev.1

Title: BreezeNETB 300

Model: BU/RB-B300-5X

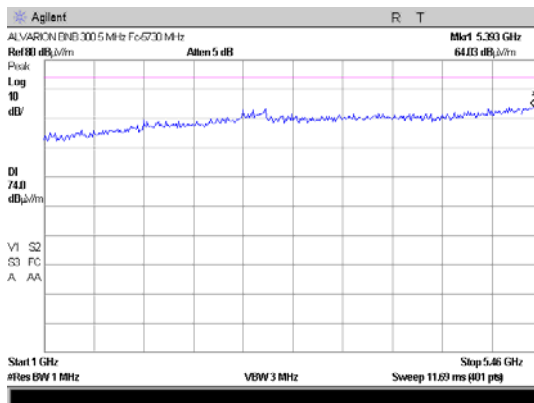
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FCC ID: LKT-BNETB-49

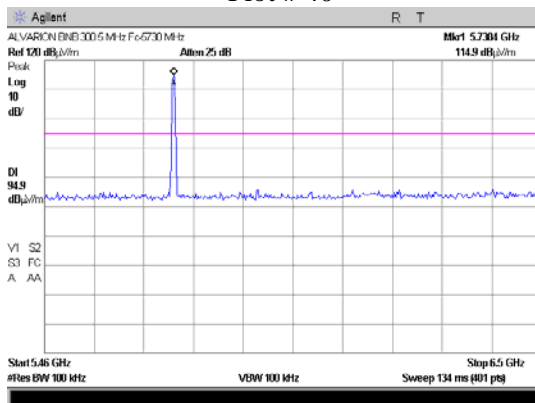
Dish antenna option.

5 MHz emission bandwidth

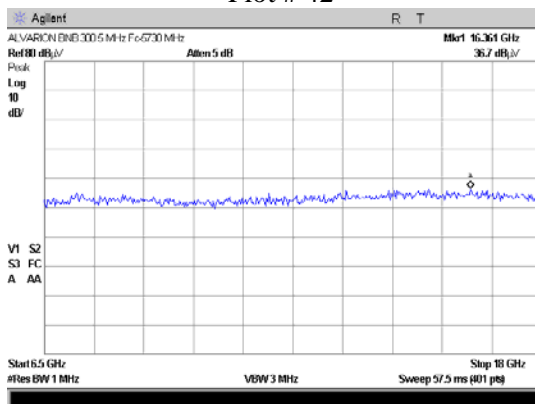
Carrier frequency – 5730 MHz



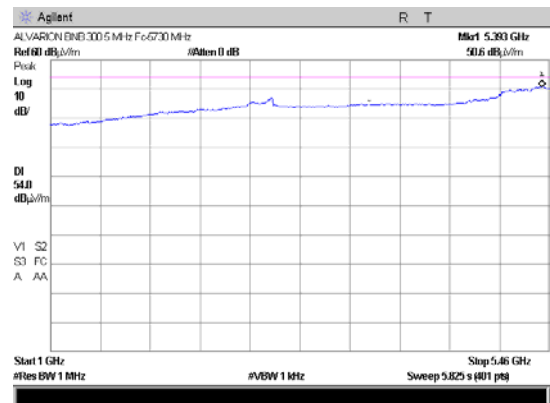
Plot # 40



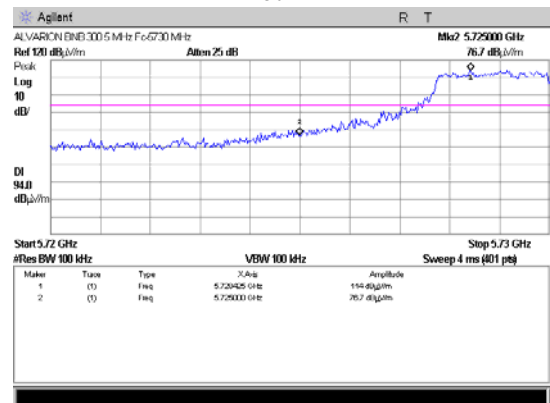
Plot # 42



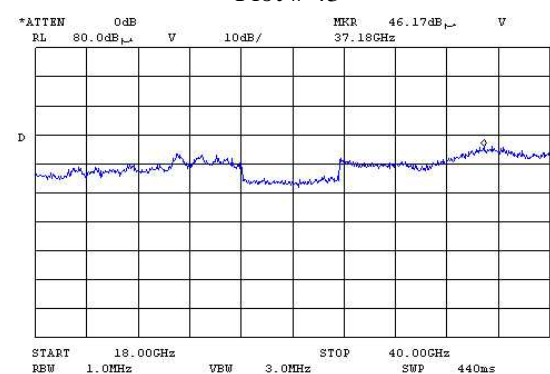
Plot # 44



Plot # 41



Plot # 43



Plot # 45



Test report N: 8912337336 Rev.1

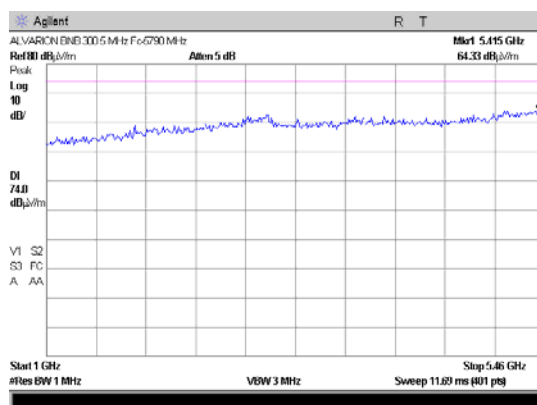
Title: BreezeNETB 300

Model: BU/RB-B300-5X

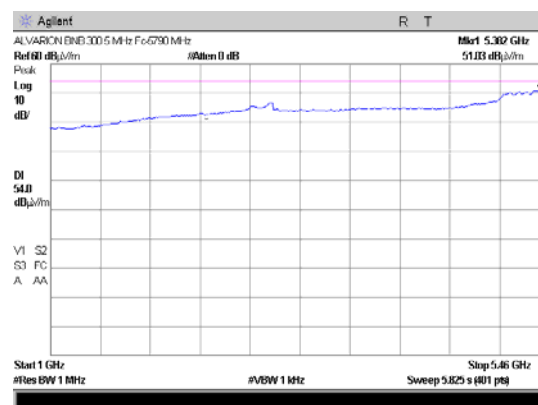
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FCC ID: LKT-BNETB-49

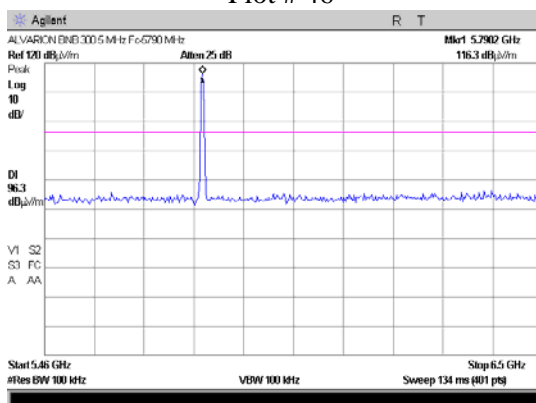
Carrier frequency – 5790 MHz



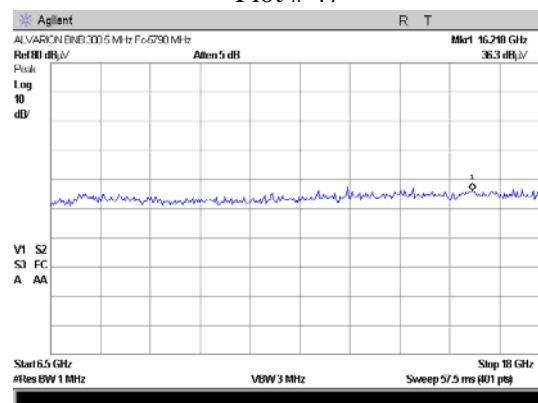
Plot # 46



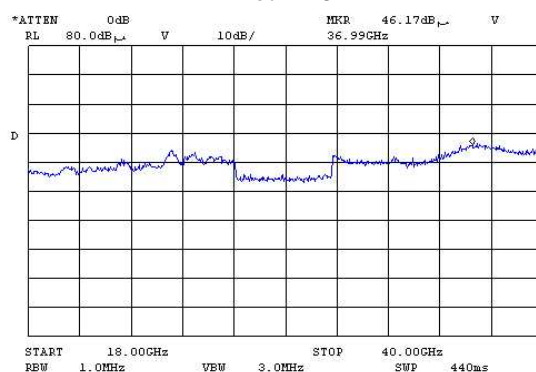
Plot # 47



Plot # 48



Plot # 49



Plot # 50



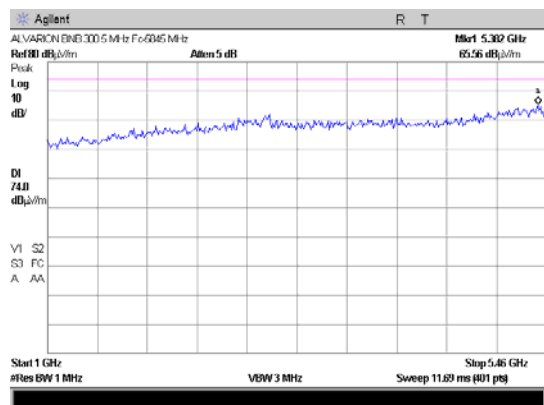
Test report N: 8912337336 Rev.1

Title: BreezeNETB 300

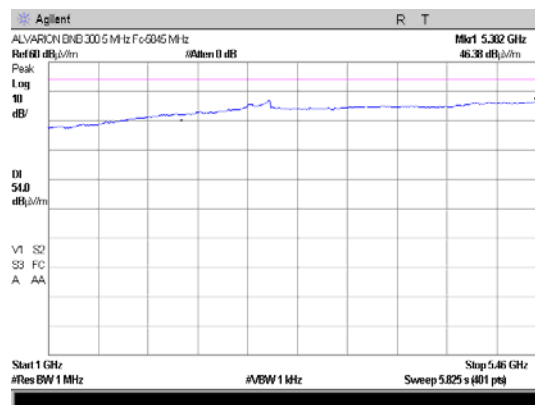
Model: BU/RB-B300-5X

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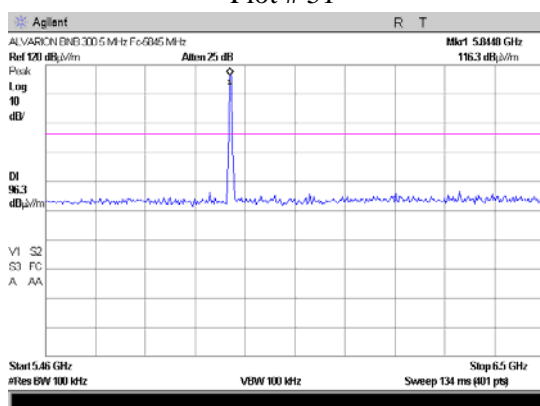
FCC ID: LKT-BNETB-49

Carrier frequency – 5845 MHz

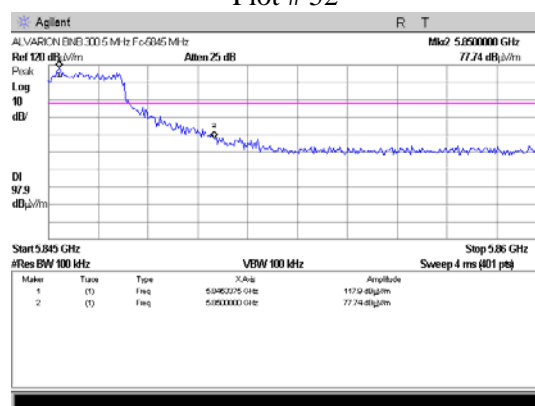
Plot # 51



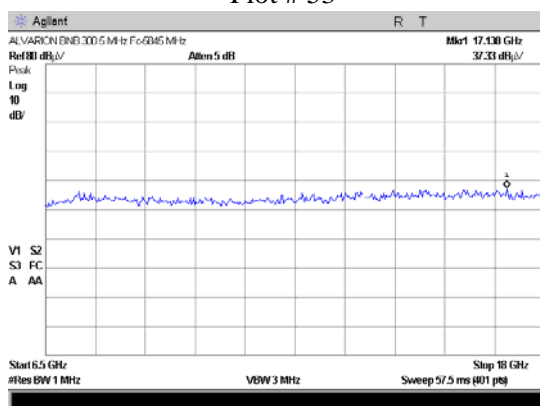
Plot # 52



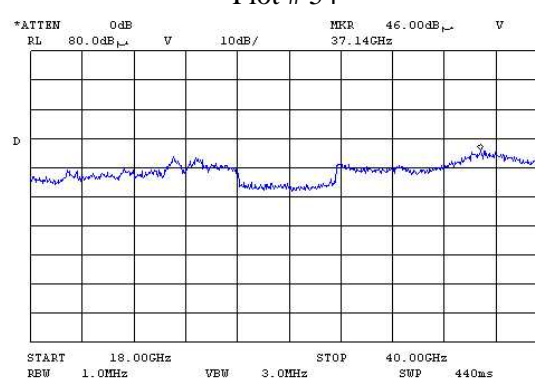
Plot # 53



Plot # 54



Plot # 55



Plot # 56



Test report N: 8912337336 Rev.1

Title: BreezeNETB 300

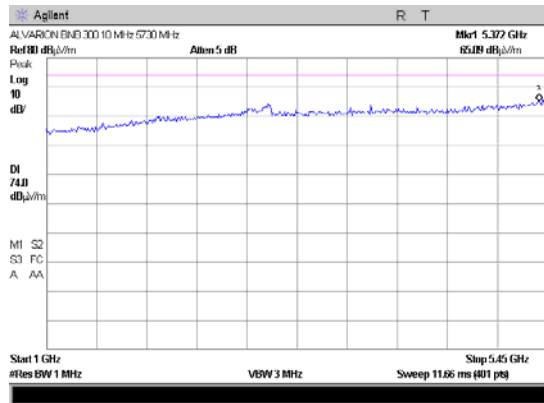
Model: BU/RB-B300-5X

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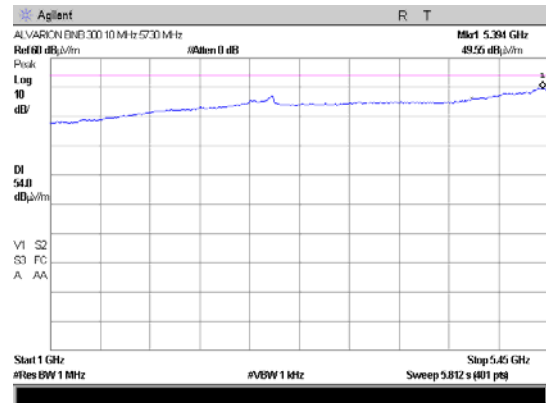
FCC ID: LKT-BNETB-49

10 MHz emission bandwidth

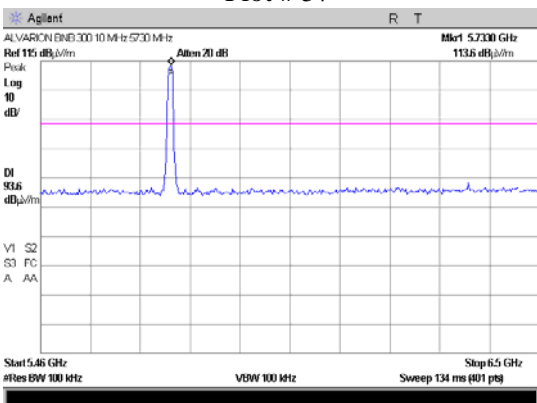
Carrier frequency - 5730 MHz



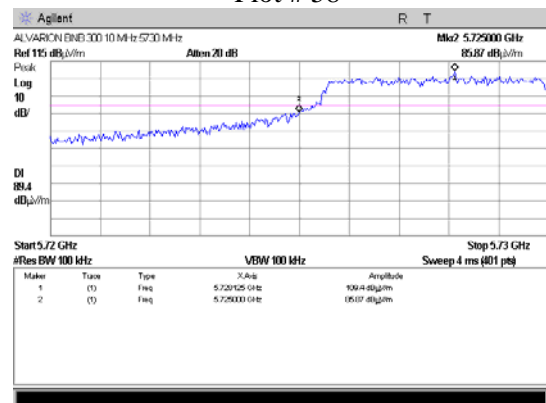
Plot # 57



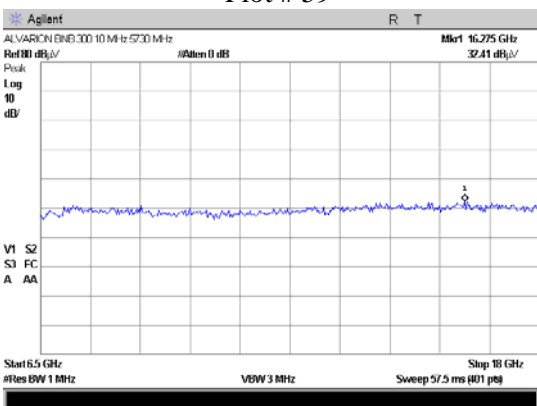
Plot # 58



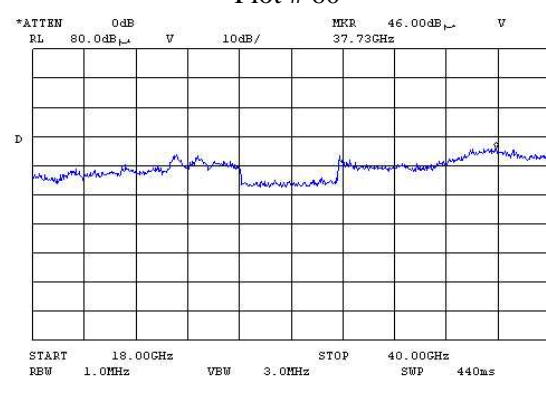
Plot # 59



Plot # 60



Plot # 61



Plot # 62

Test report N: 8912337336 Rev.1

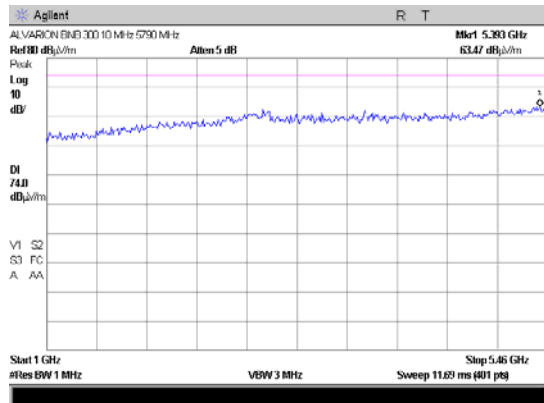
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Title: BreezeNETB 300

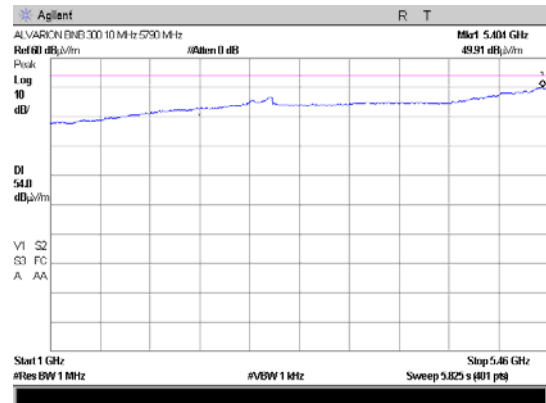
Model: BU/RB-B300-5X

FCC ID: LKT-BNETB-49

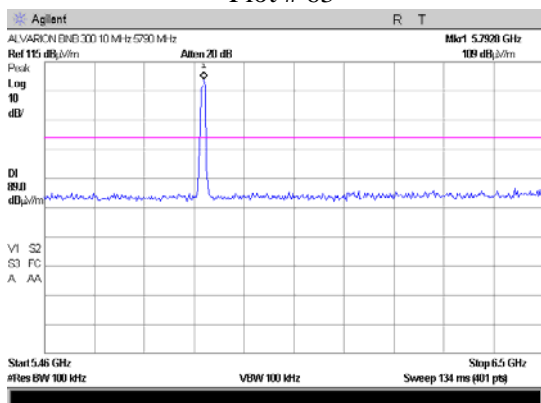
Carrier frequency – 5790 MHz



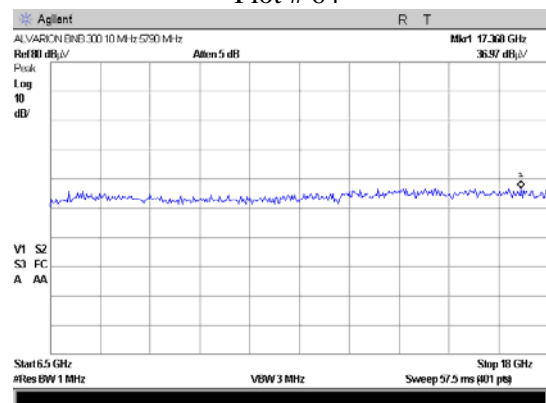
Plot # 63



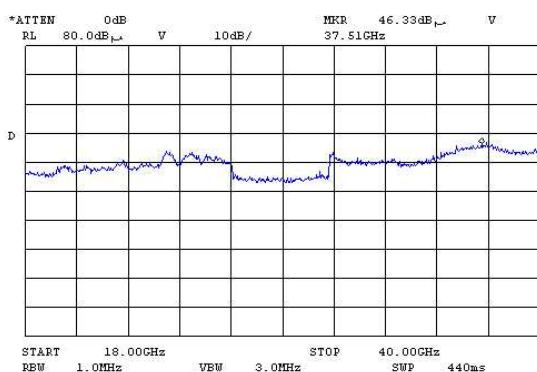
Plot # 64



Plot # 65



Plot # 66



Plot # 67



Test report N: 8912337336 Rev.1

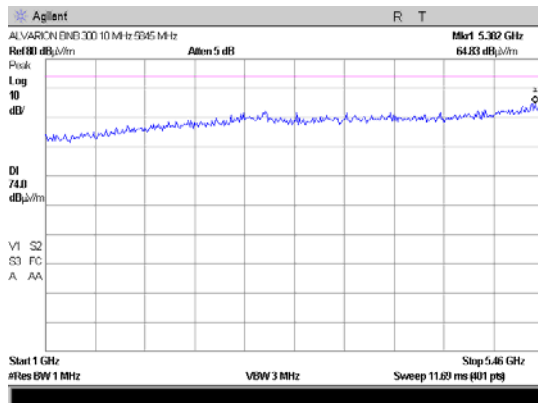
Title: BreezeNETB 300

Model: BU/RB-B300-5X

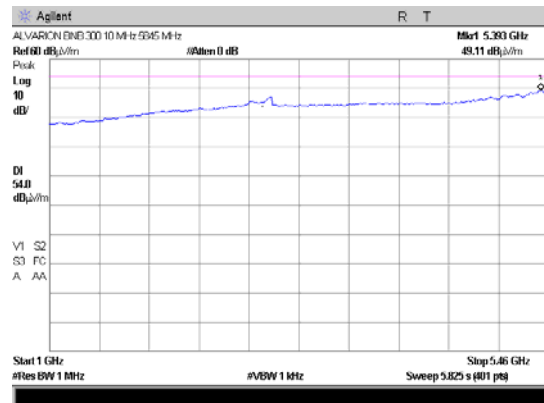
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FCC ID: LKT-BNETB-49

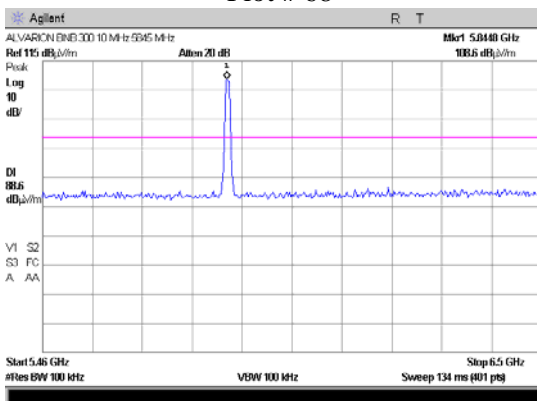
Carrier frequency 5845 MHz



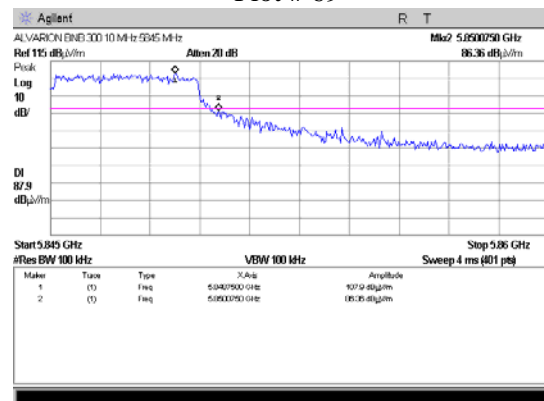
Plot # 68



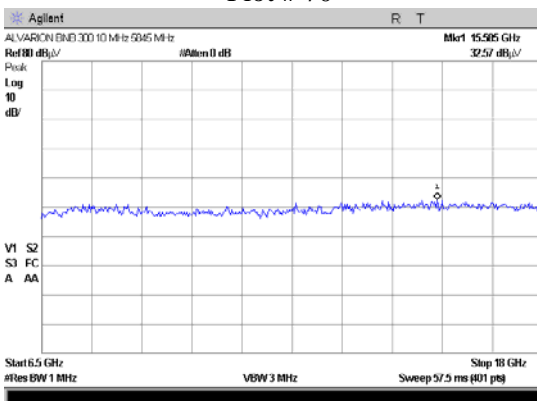
Plot # 69



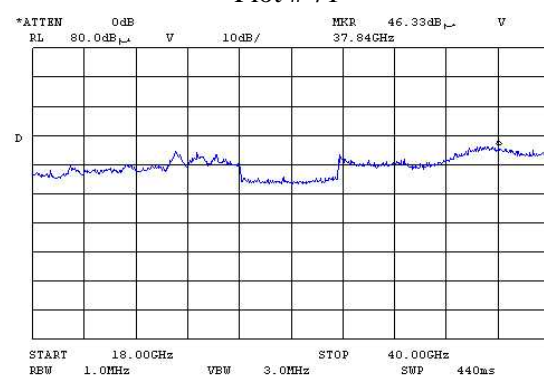
Plot # 70



Plot # 71



Plot # 72



Plot # 73



Test report N: 8912337336 Rev.1

Title: BreezeNETB 300

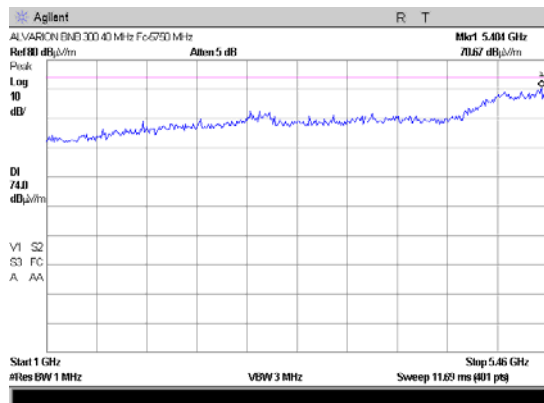
Model: BU/RB-B300-5X

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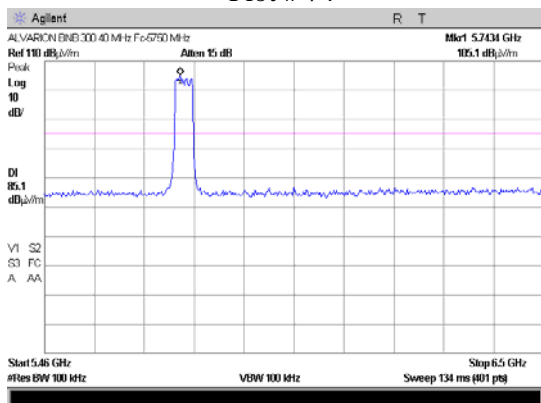
FCC ID: LKT-BNETB-49

40 MHz emission bandwidth

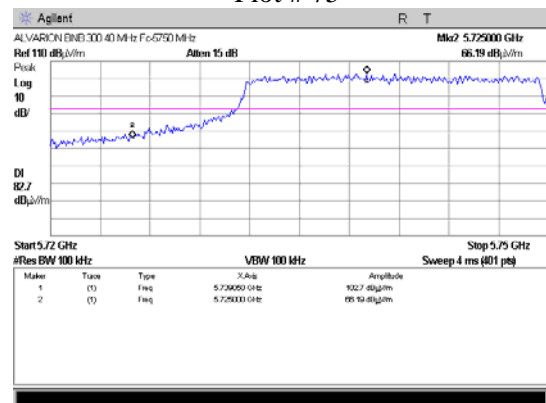
Carrier frequency – 5750 MHz



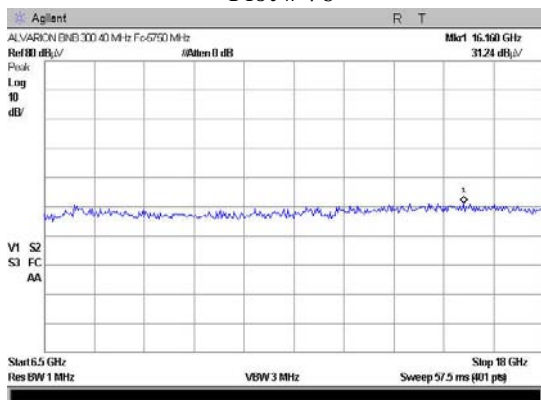
Plot # 74



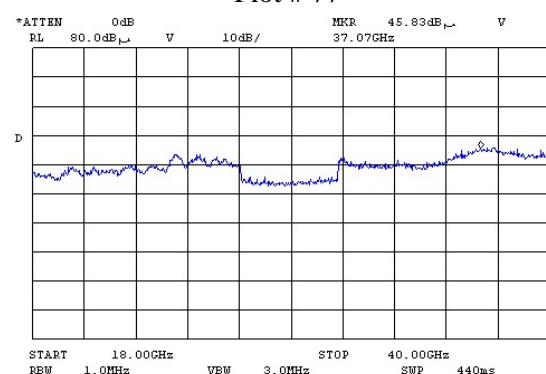
Plot # 75



Plot # 76



Plot # 77



Plot # 78

Plot # 79



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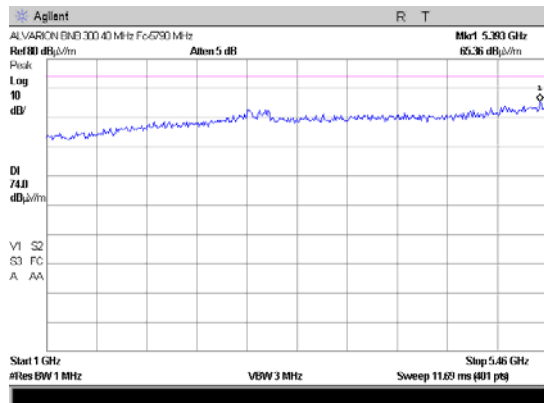
Title: BreezeNETB 300

Model: BU/RB-B300-5X

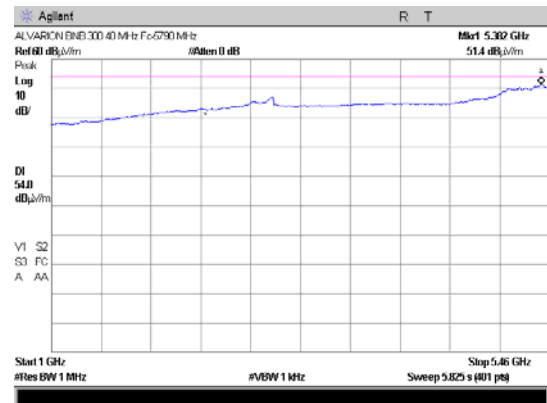
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FCC ID: LKT-BNETB-49

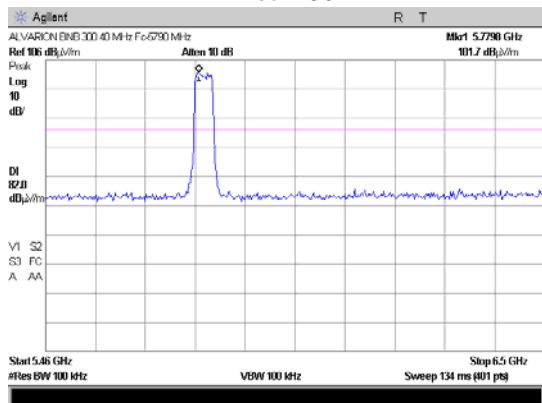
Carrier frequency – 5790 MHz



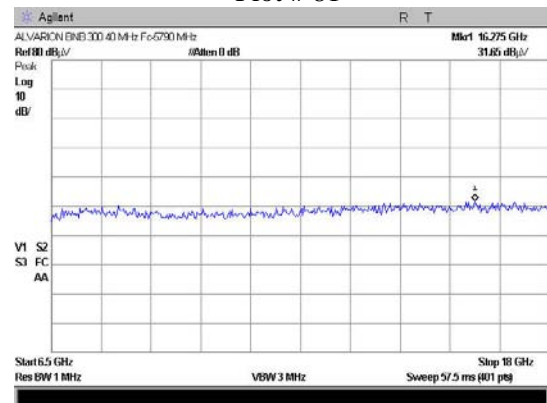
Plot # 80



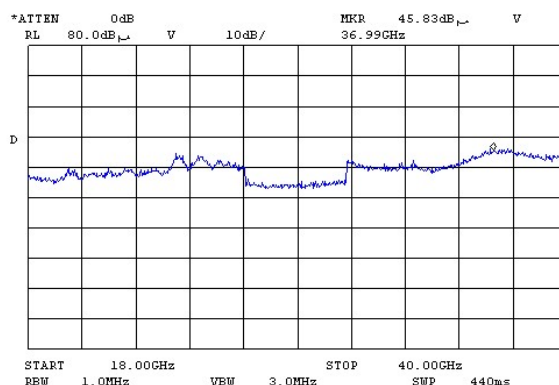
Plot # 81



Plot # 82



Plot # 83



Plot # 84



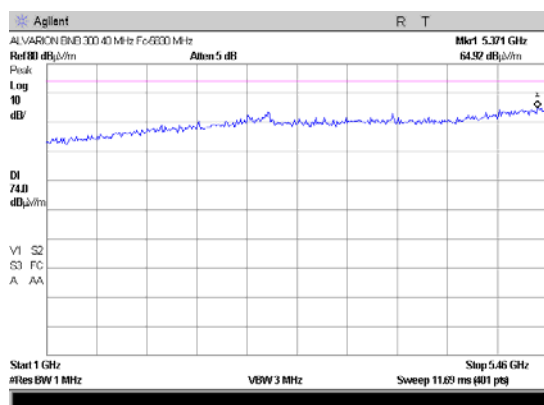
Test report N: 8912337336 Rev.1

Title: BreezeNETB 300

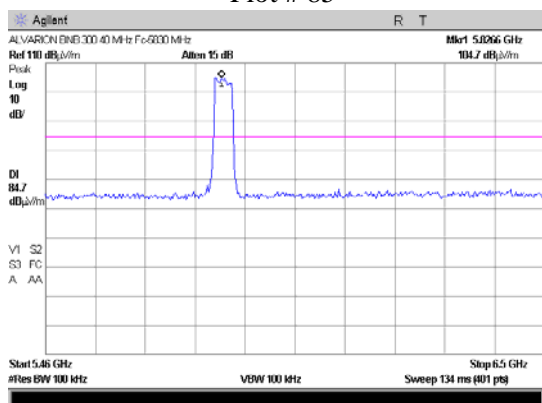
Model: BU/RB-B300-5X

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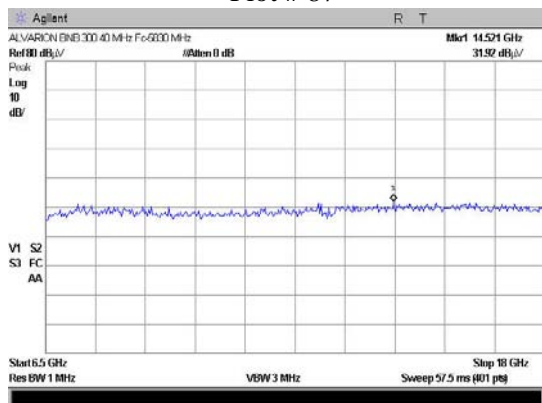
FCC ID: LKT-BNETB-49

Carrier frequency – 5830 MHz

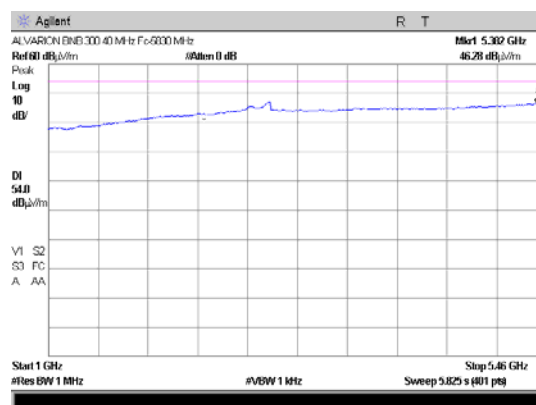
Plot # 85



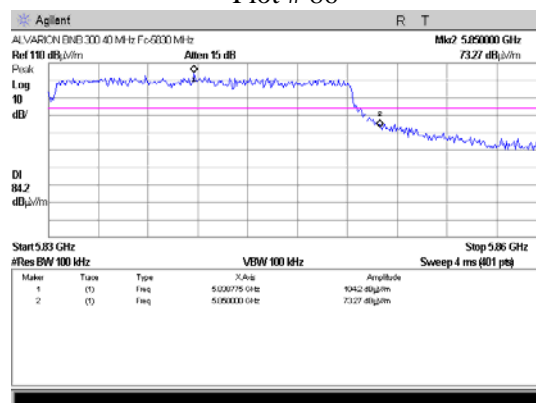
Plot # 87



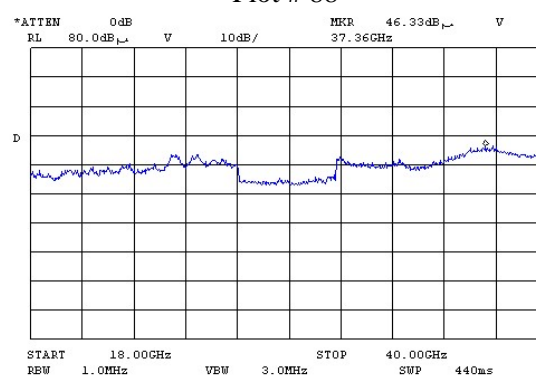
Plot # 89



Plot # 86



Plot # 88



Plot # 90



Test report N: 8912337336 Rev.1

Title: BreezeNETB 300

Model: BU/RB-B300-5X

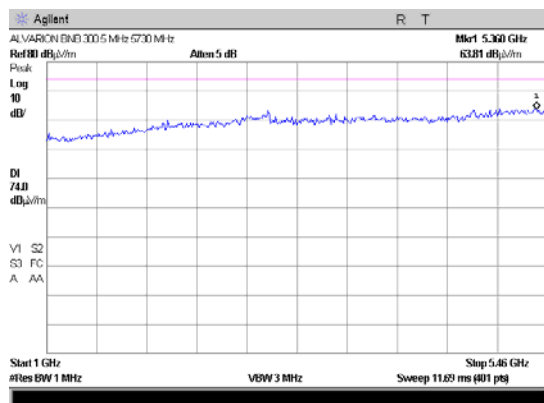
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FCC ID: LKT-BNETB-49

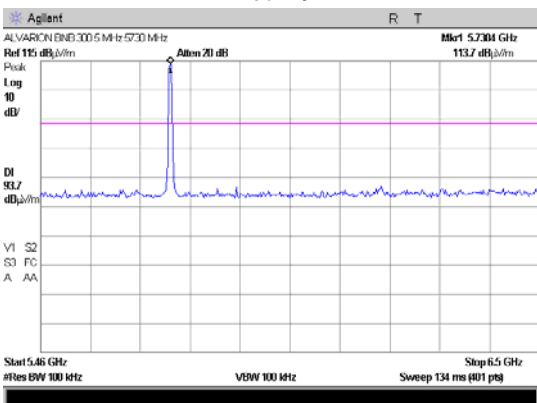
External flat panel antenna test.

5 MHz emission bandwidth

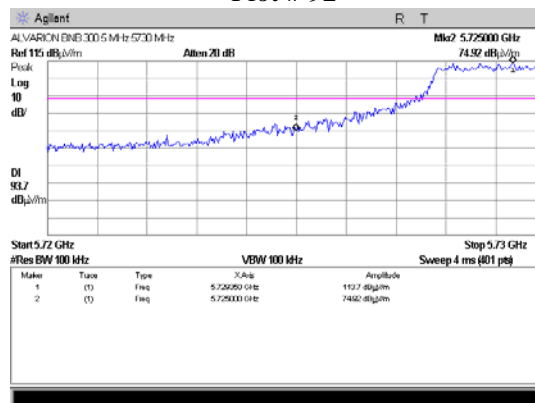
Carrier frequency – 5730 MHz



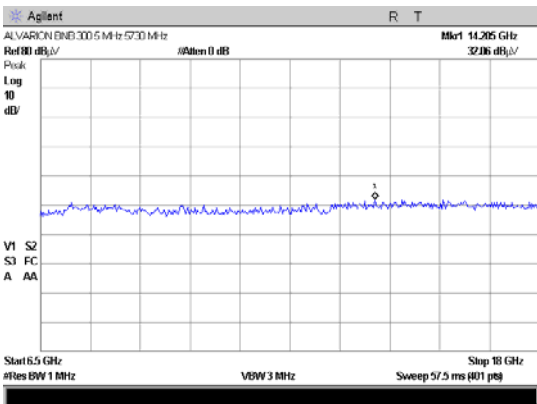
Plot # 91



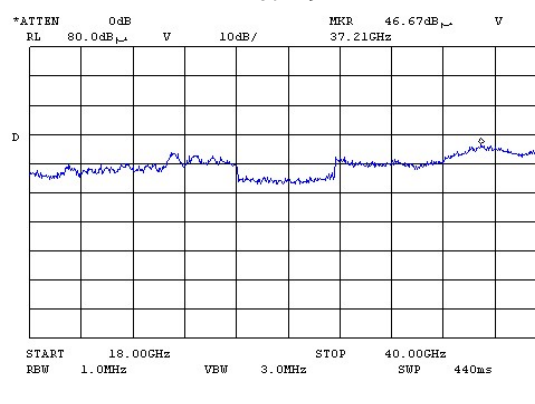
Plot # 92



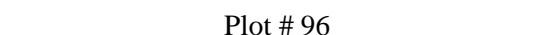
Plot # 93



Plot # 94



Plot # 95



Plot # 96



Test report N: 8912337336 Rev.1

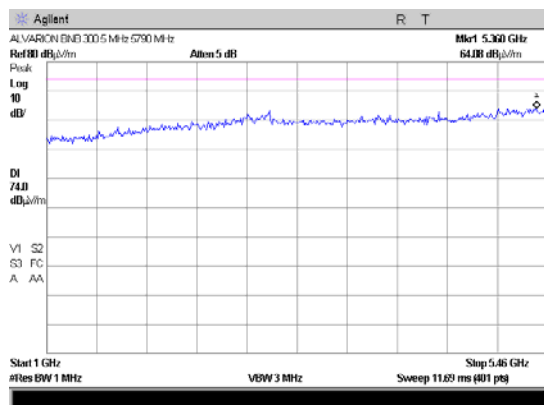
Title: BreezeNETB 300

Model: BU/RB-B300-5X

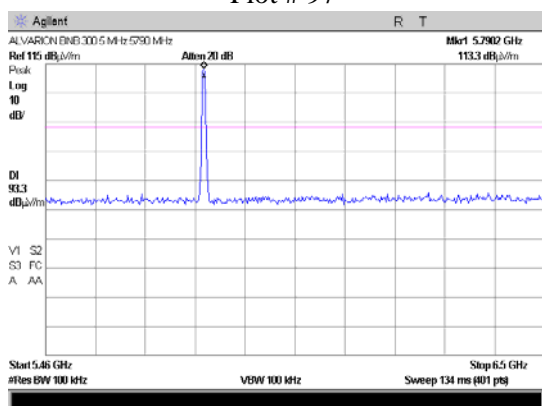
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FCC ID: LKT-BNETB-49

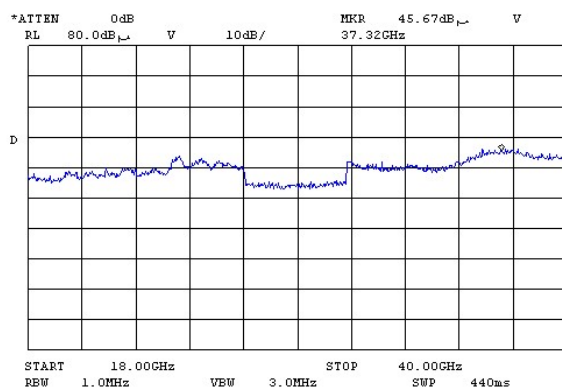
Carrier frequency – 5790 MHz



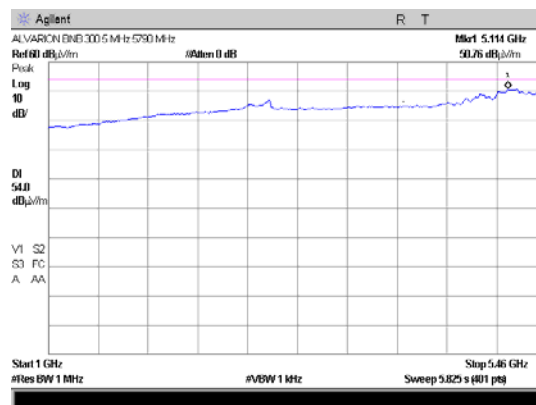
Plot # 97



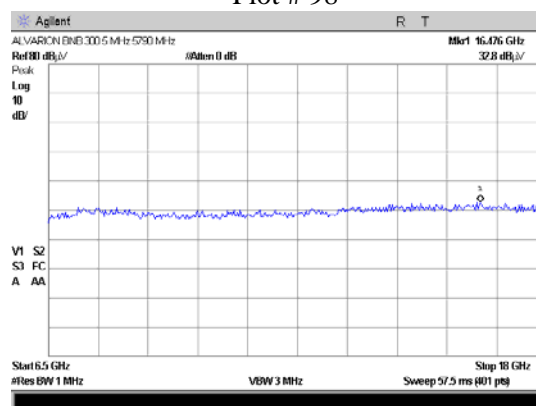
Plot # 99



Plot # 101



Plot # 98



Plot # 100



Test report N: 8912337336 Rev.1

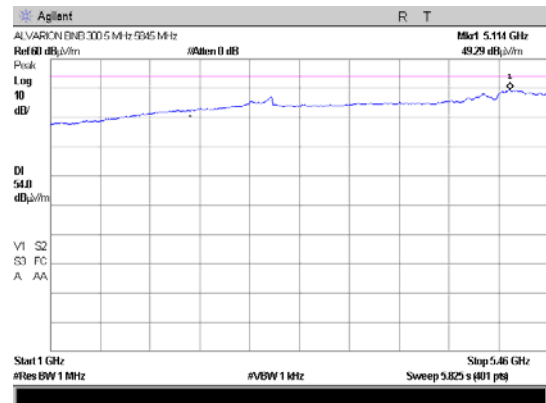
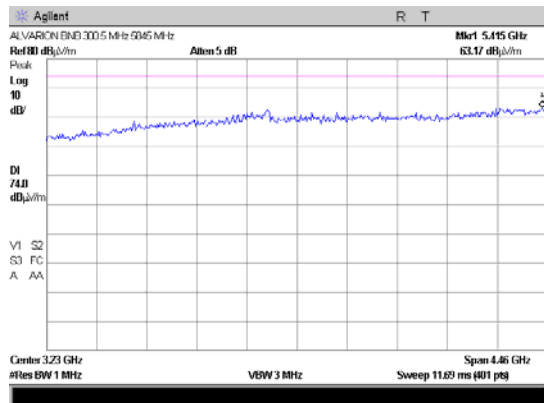
Title: BreezeNETB 300

Model: BU/RB-B300-5X

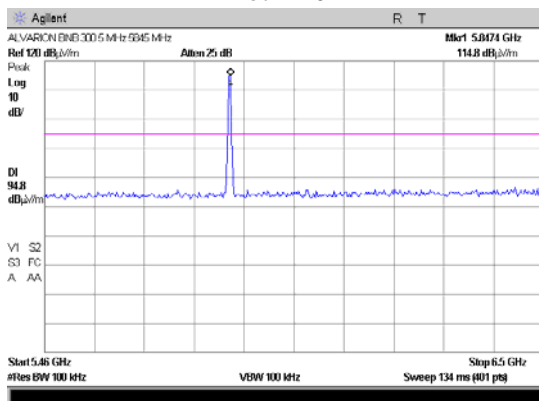
Page 39 of 61

FCC ID: LKT-BNETB-49

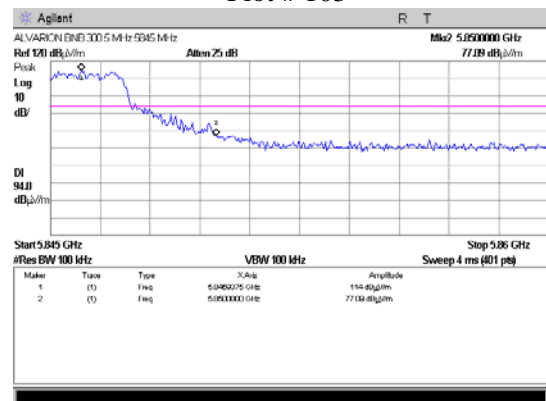
Carrier frequency – 5845 MHz



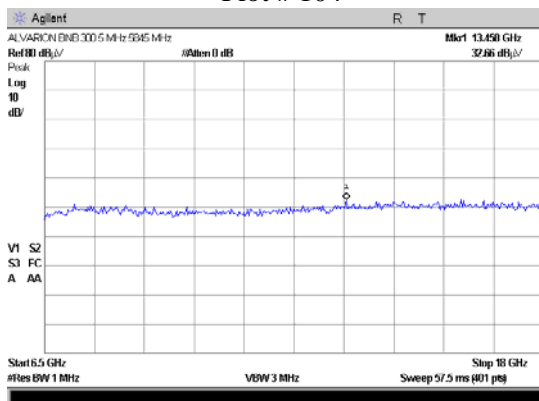
Plot # 102



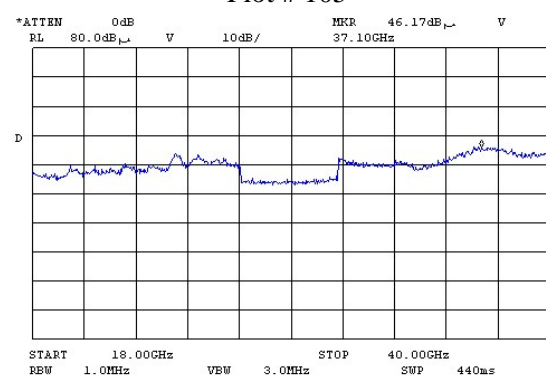
Plot # 103



Plot # 104



Plot # 105



Plot # 106

Plot # 107



Test report N: 8912337336 Rev.1

Title: BreezeNETB 300

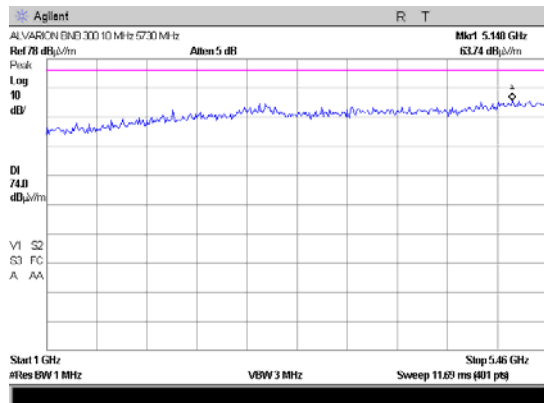
Model: BU/RB-B300-5X

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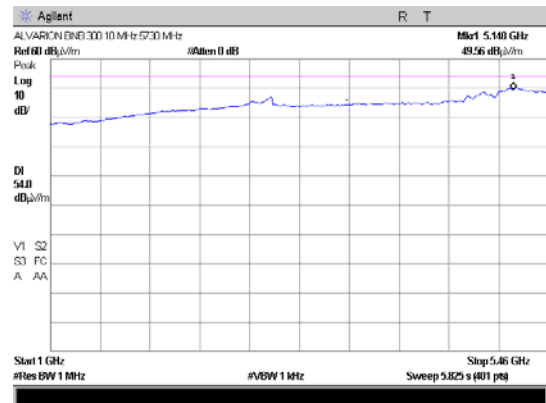
FCC ID: LKT-BNETB-49

10 MHz emission bandwidth

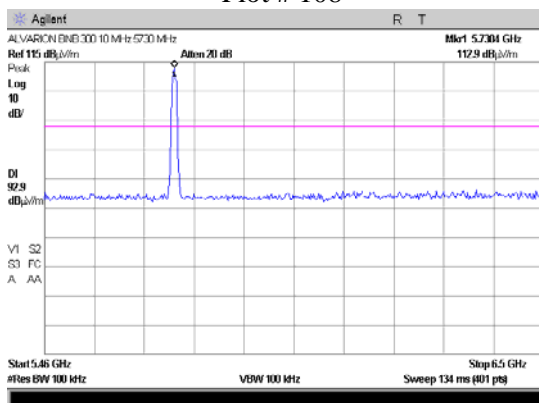
Carrier frequency – 5730 MHz



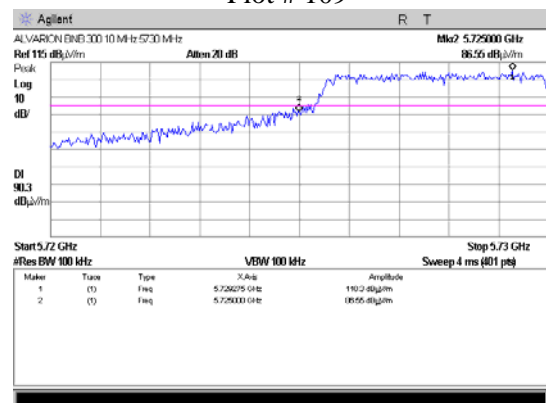
Plot # 108



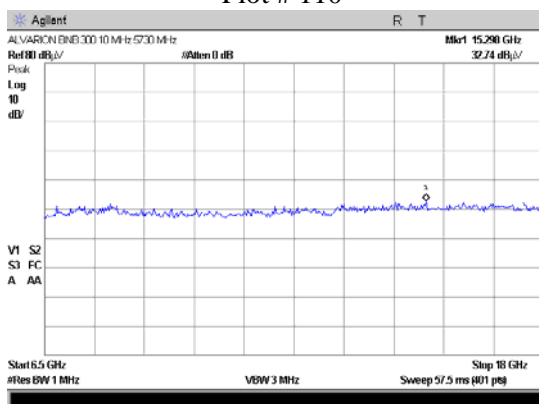
Plot # 109



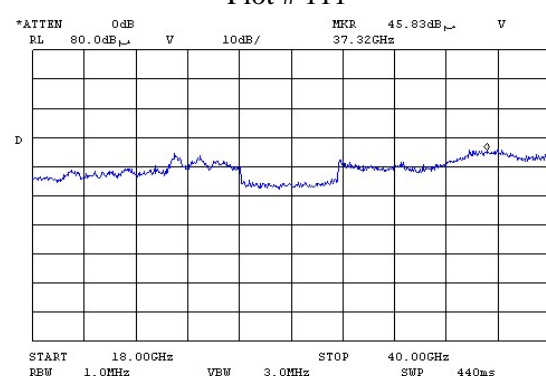
Plot # 110



Plot # 111



Plot # 112



Plot # 113

Test report N: 8912337336 Rev.1

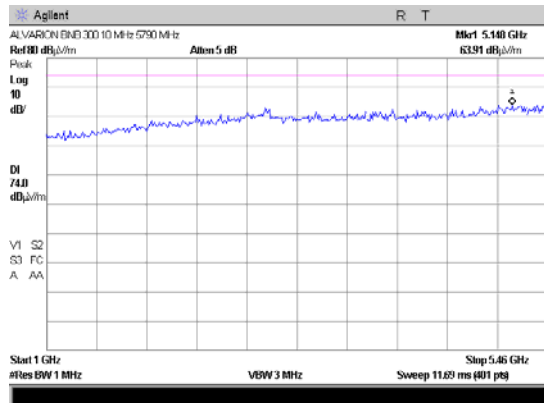
Title: BreezeNETB 300

Model: BU/RB-B300-5X

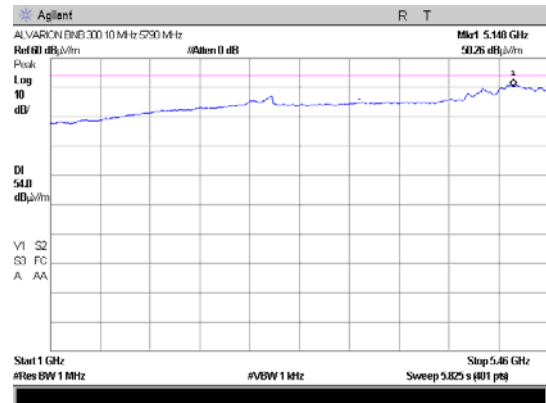
Page 41 of 61

FCC ID: LKT-BNETB-49

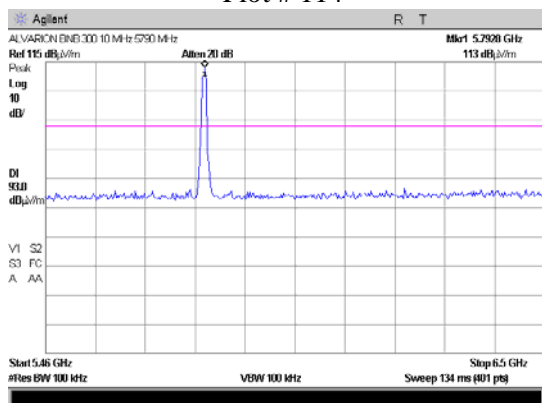
Carrier frequency – 5790 MHz



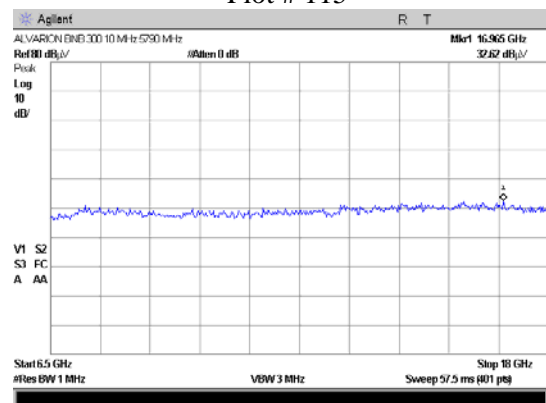
Plot # 114



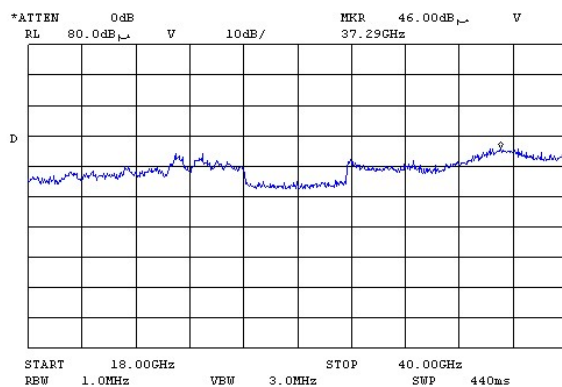
Plot # 115



Plot # 116



Plot # 117



Plot # 118

Test report N: 8912337336 Rev.1

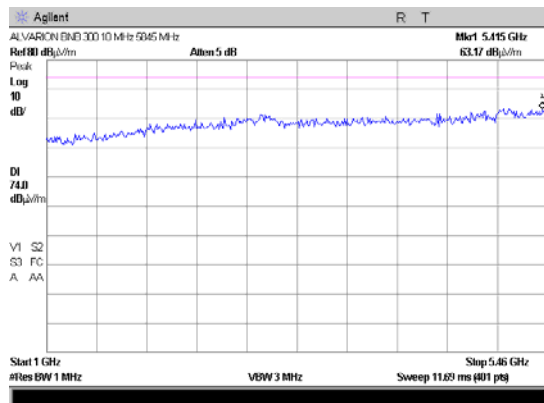
Title: BreezeNETB 300

Model: BU/RB-B300-5X

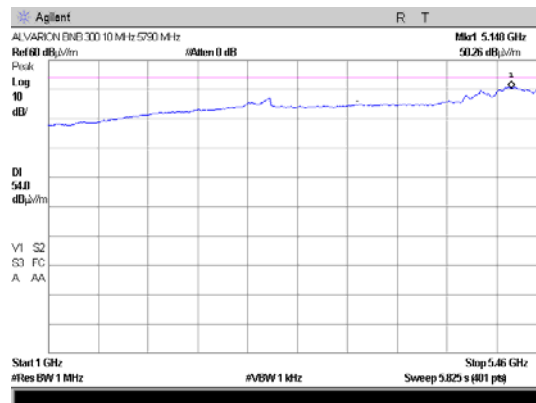
Page 42 of 61

FCC ID: LKT-BNETB-49

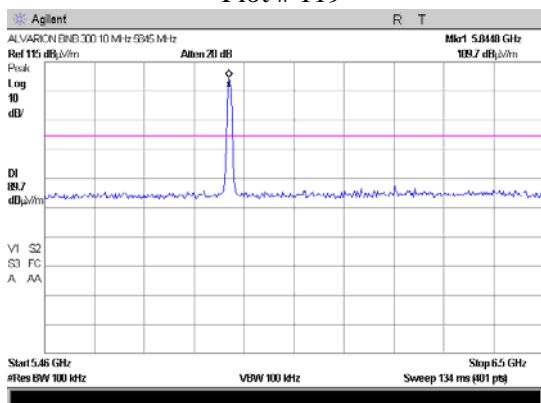
Carrier frequency – 5845 MHz



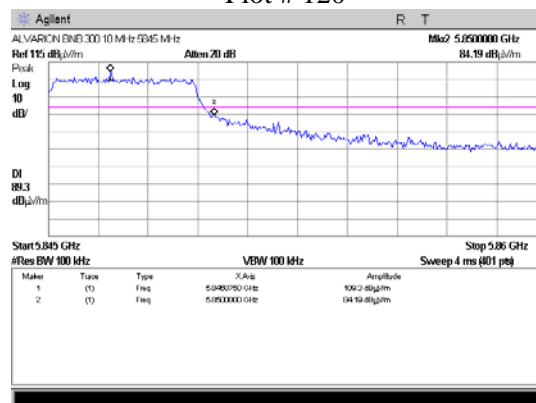
Plot # 119



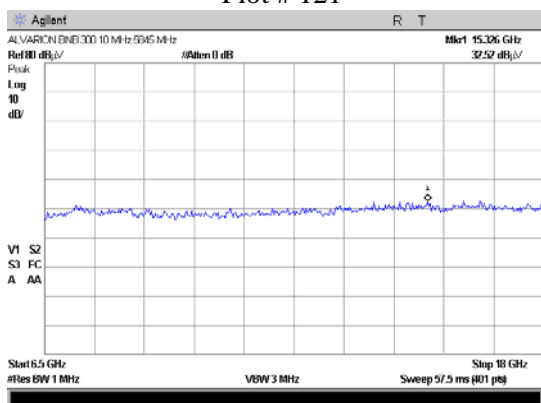
Plot # 120



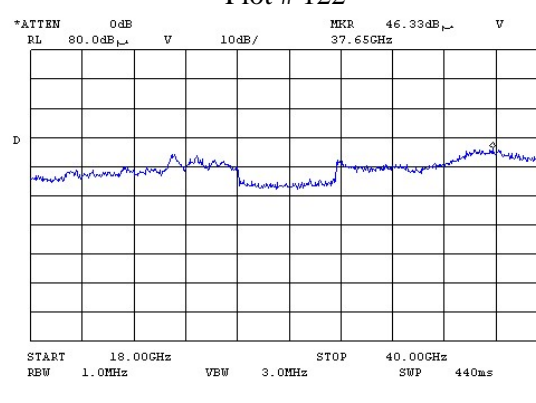
Plot # 121



Plot # 122



Plot # 123



Plot # 124



Test report N: 8912337336 Rev.1

Title: BreezeNETB 300

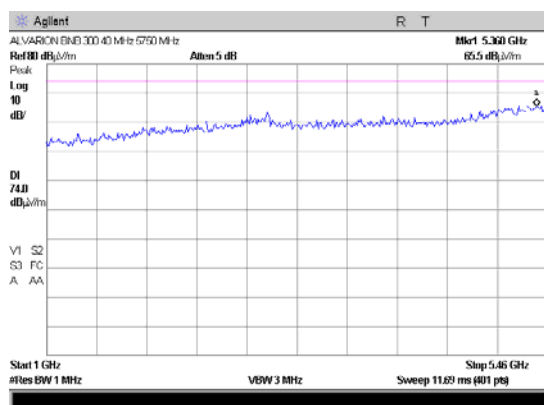
Model: BU/RB-B300-5X

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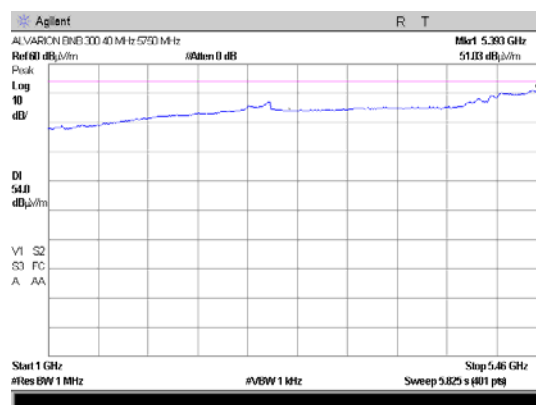
FCC ID: LKT-BNETB-49

40 MHz emission bandwidth

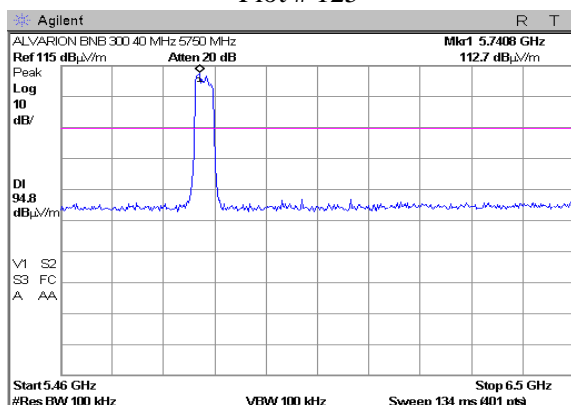
Carrier frequency - 5750 MHz



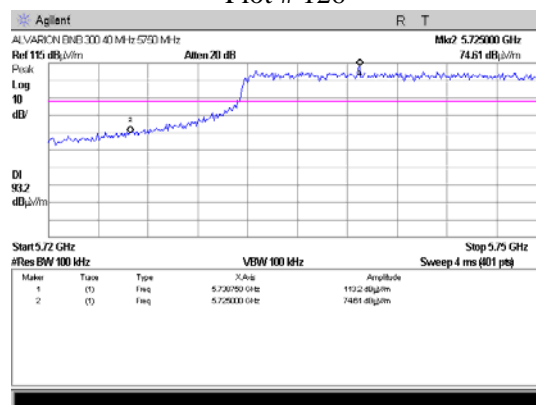
Plot # 125



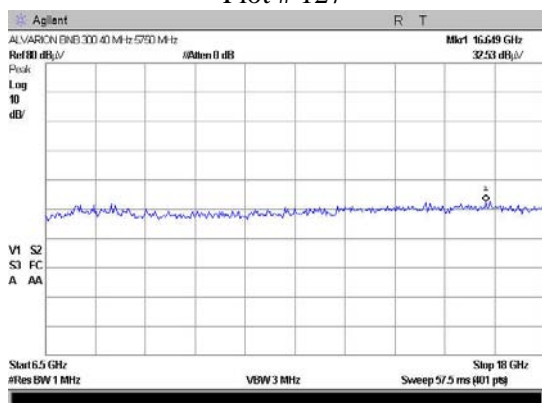
Plot # 126



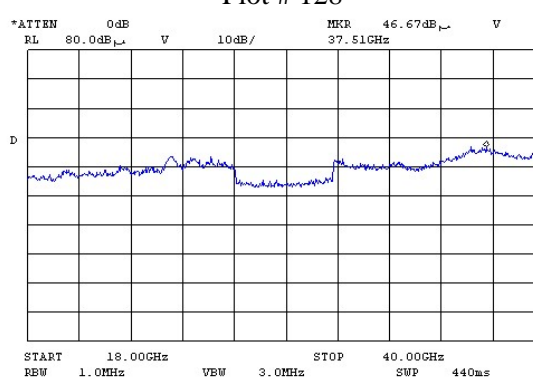
Plot # 127



Plot # 128



Plot # 129



Plot # 130

Test report N: 8912337336 Rev.1

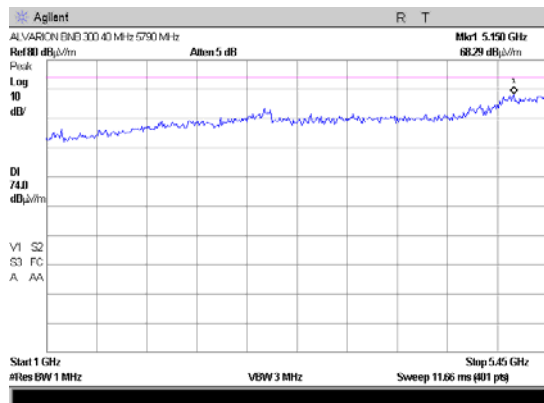
Title: BreezeNETB 300

Model: BU/RB-B300-5X

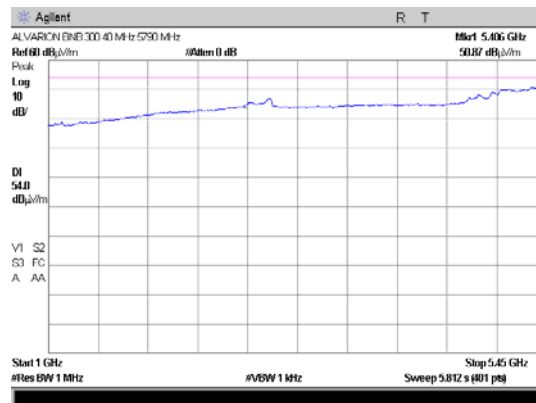
Page 44 of 61

FCC ID: LKT-BNETB-49

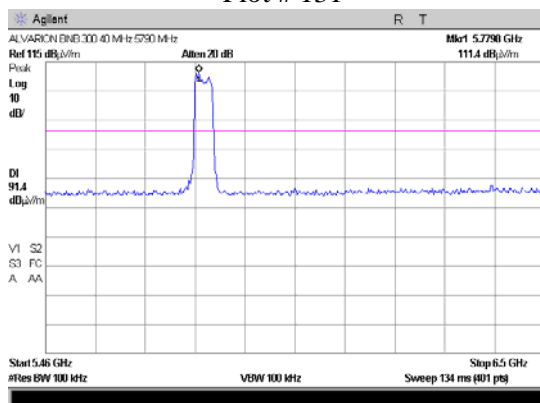
Carrier frequency – 5790 MHz



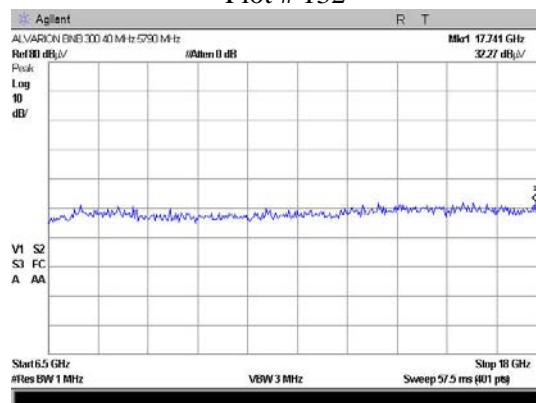
Plot # 131



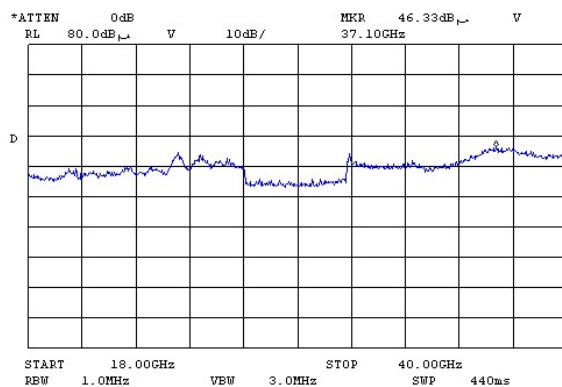
Plot # 132



Plot # 133



Plot # 134



Plot # 135



Test report N: 8912337336 Rev.1

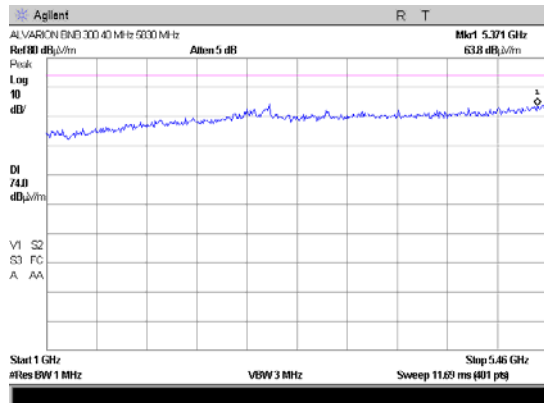
Title: BreezeNETB 300

Model: BU/RB-B300-5X

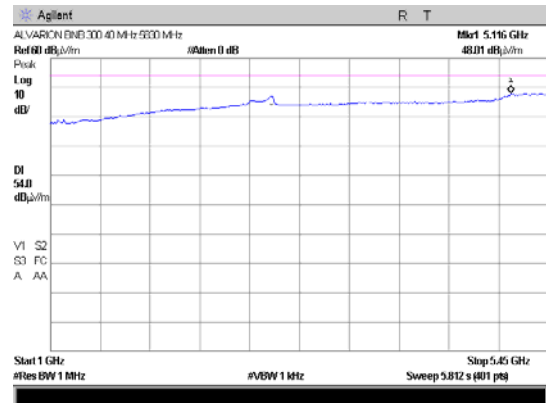
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FCC ID: LKT-BNETB-49

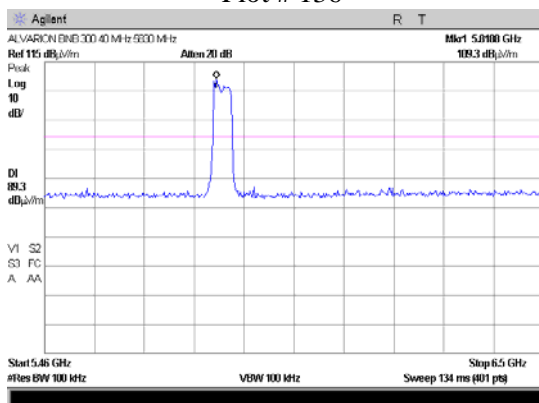
Carrier frequency – 5830 MHz



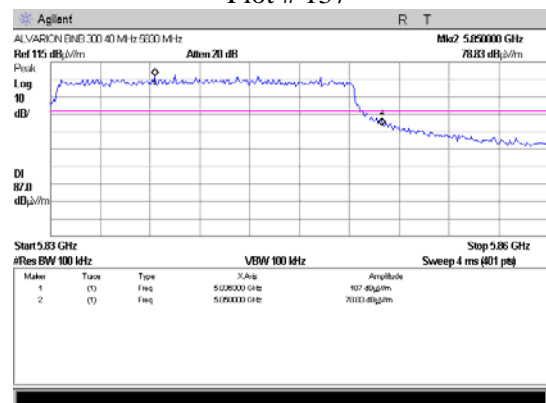
Plot # 136



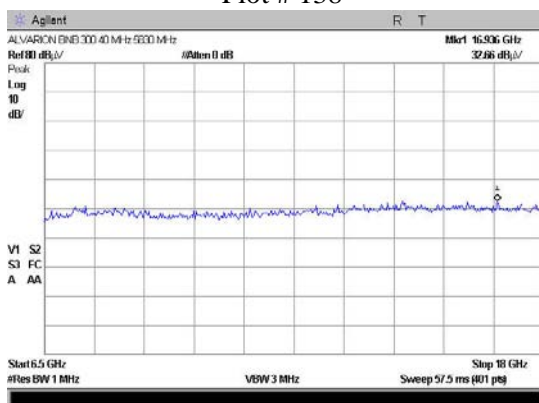
Plot # 137



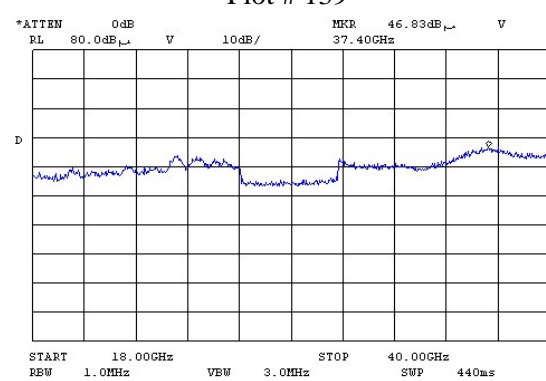
Plot # 138



Plot # 139



Plot # 140



Plot # 141

**Test report N: 8912337336 Rev.1****Page 46 of 61****Title: BreezeNETB 300****Model: BU/RB-B300-5X****FCC ID: LKT-BNETB-49****7.1.5 Power spectral density of digital modulated systems according to § 15.247(e)**

Method of measurement FCC March 23, 2005 procedure
 Operating Frequency Range 5730 – 5845 MHz
 Ambient Temperature 23⁰ C Relative Humidity 49% Air Pressure 1007 hPa

5 MHz emission bandwidth

Carrier frequency MHz	Measured PSD dBm	Specified limit dBm	Reference to plots
5730	-7.26	8	##142, 143
5790	-5.39	8	##144, 145
5845	-6.45	8	##146, 147

40 MHz emission bandwidth

Carrier frequency MHz	Measured PSD dBm	Specified limit dBm	Reference to plots
5750	-20.8	8	##148, 149
5790	-19.8	8	##150, 151
5830	-20.4	8	##152, 153

TEST PROCEDURE

The test was performed at the lowest and at the highest emission bandwidth options.
 The measurements were performed in normal (transmitting) mode of operation for carrier (channel) frequency at bottom, middle and the top of the 5725 – 5850 MHz frequency range 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

LIMIT

The peak 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 EQUIPMENT USED:

2	3	4	5			
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Test report N: 8912337336 Rev.1

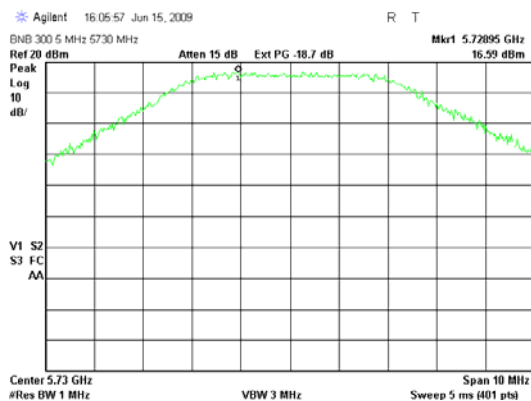
Title: BreezeNETB 300

Model: BU/RB-B300-5X

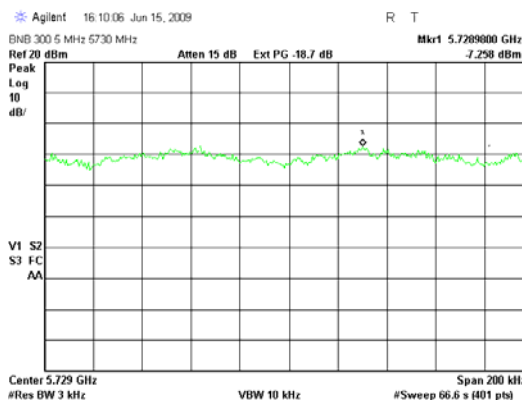
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FCC ID: LKT-BNETB-49

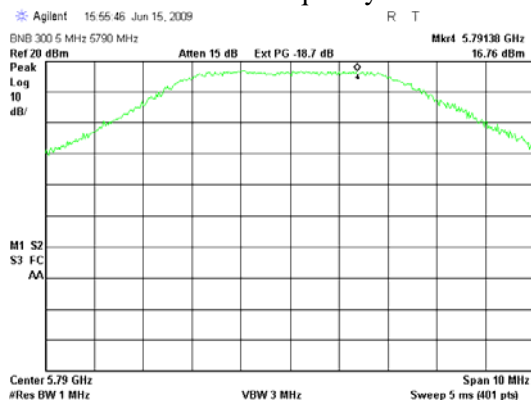
5 MHz emission bandwidth



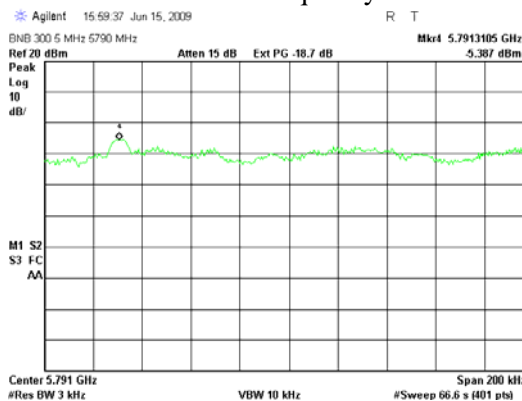
Plot # 142. Carrier frequency 5730 MHz.



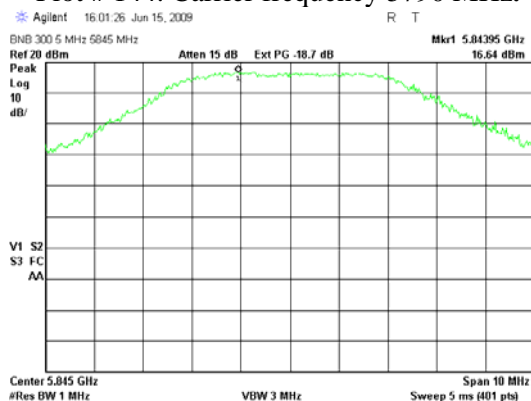
Plot # 143. Carrier frequency 5730 MHz.



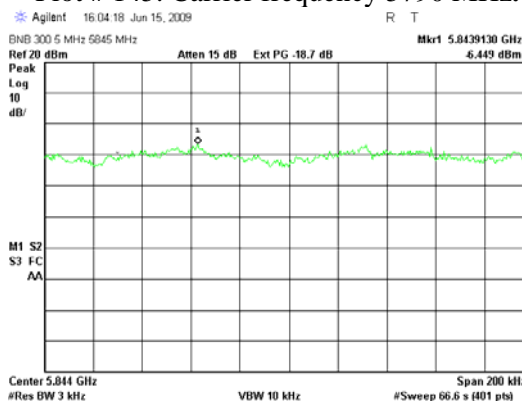
Plot # 144. Carrier frequency 5790 MHz.



Plot # 145. Carrier frequency 5790 MHz.



Plot # 146. Carrier frequency 5845 MHz



Plot # 147. Carrier frequency 5845 MHz

Insertion loss of external attenuator, directional coupler and cable = 18.7 dB



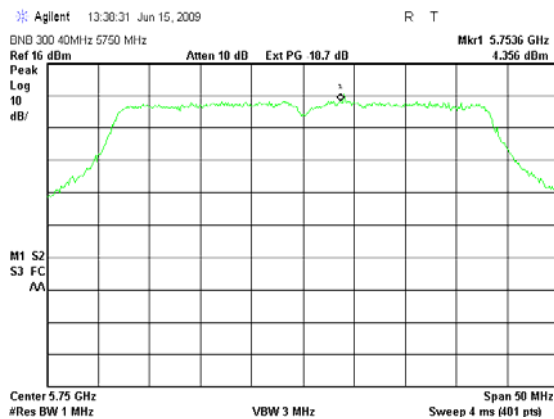
Test report N: 8912337336 Rev.1

Title: BreezeNETB 300

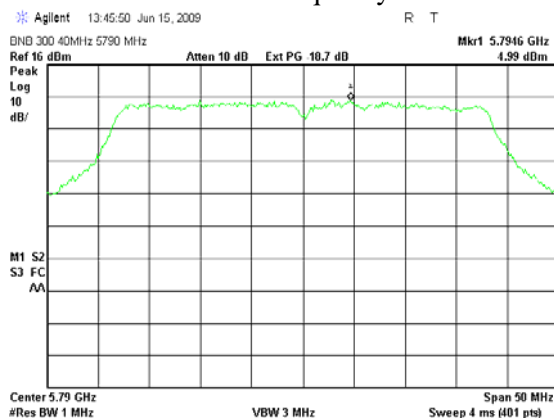
Model: BU/RB-B300-5X

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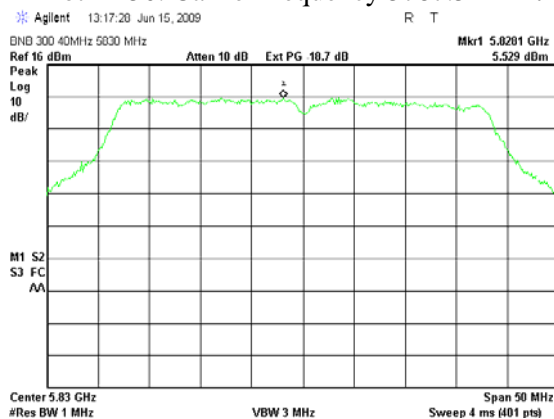
FCC ID: LKT-BNETB-49

40 MHz emission bandwidth

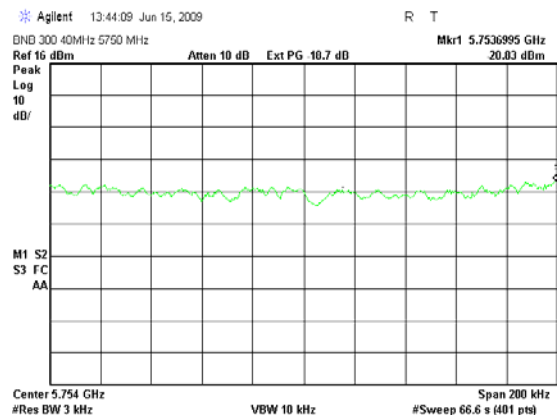
Plot # 148. Carrier frequency 5730 MHz.



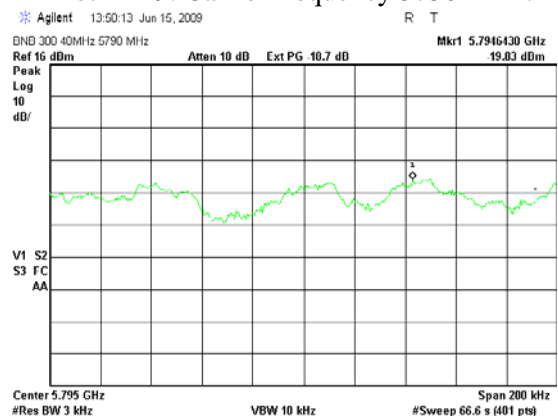
Plot # 150. Carrier frequency 5787.5 MHz.



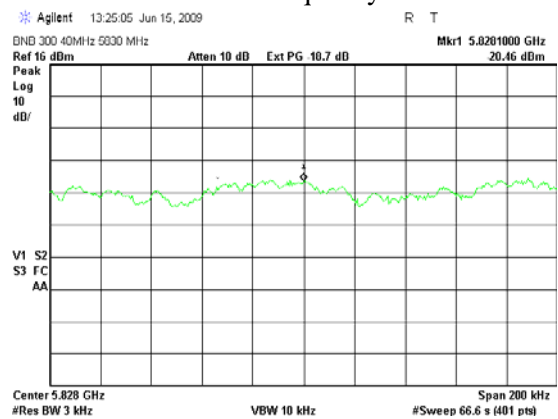
Plot # 152. Carrier frequency 5845 MHz



Plot # 149. Carrier frequency 5730 MHz.



Plot # 151. Carrier frequency 5787.5 MHz.



Plot # 153. Carrier frequency 5845 MHz

**Test report N: 8912337336 Rev.1****Title: BreezeNETB 300****Model: BU/RB-B300-5X****Page 49 of 61****FCC ID: LKT-BNETB-49****8. Radiated emissions test according to § 15.209**

Method of measurement	ANSI 63.4 §13.1.4				
Operating Frequency Range	5730 – 5845 MHz				
Ambient Temperature	23 ⁰ C	Relative Humidity	58%	Air Pressure	1009 hPa

TEST DESCRIPTION:

The measurements were performed at the Open Area Test Site at a 10 m test distance. EUT was arranged on a wooden table 0.8 m placed on the turn - table. The Biconilog antenna 30 MHz-2 GHz frequency range was used. The frequency range was investigated from 30 MHz to 1.0 GHz and 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. Measurements below 1000 MHz were performed according to FCC p.15.35 (a) with CISPR quasi-peak detector.

REQUIREMENTS:

EUT radiated emission shall not exceed value required in section 15.209

TEST RESULT:

Test results are presented in the table #1.

**Test report N: 8912337336 Rev.1****Page 50 of 61****Title: BreezeNETB 300****Model: BU/RB-B300-5X****FCC ID: LKT-BNETB-49****Table 1. Radiated emission test results.**

Frequency (MHz)	Antenna Polariz V/H	Turn- table Angle (°)	Antenna Height (m)	QP emission level Note 1 (dB μ V/m)	Limit @ 3m (dB μ V/m)	Margin Note 2 (dB)	Results
30.2	V	171	1.0	32.9	40.0	7.1	Pass
35.1	V	37	1.0	36.5	40.0	3.5	Pass
56.3	V	260	1.0	33.5	40.0	6.5	Pass
66.4	V	63	1.0	34.4	40.0	5.6	Pass
250.0	H	74	2.7	39.3	46.0	7.7	Pass
933.3	H	325	1.1	39.7	46.0	7.3	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)

TEST EQUIPMENT USED:

8	9					
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**Test report N: 8912337336 Rev.1****Title: BreezeNETB 300****Model: BU/RB-B300-5X****Page 51 of 61****FCC ID: LKT-BNETB-49****9. Conducted emissions according to § 15.207**

Method of measurement ANSI 63.4 §13.1.3
Operating Frequency Range 5730 – 5845 MHz
Ambient Temperature 21⁰ C Relative Humidity 54% Air Pressure 1008 hPa

Frequency, MHz	Class B equipment, dB (µV)	
	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50

* 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 in the frequency range as referred to in the table above. The measurements were made with quasi-peak (CISPR) and average detectors. The position of the EUT cables was varied to determine maximum emission level.

TEST RESULTS:

Test results present at plots # 154 for line Phase and # 155 for line Neutral.

TEST EQUIPMENT USED:

10	11	12				
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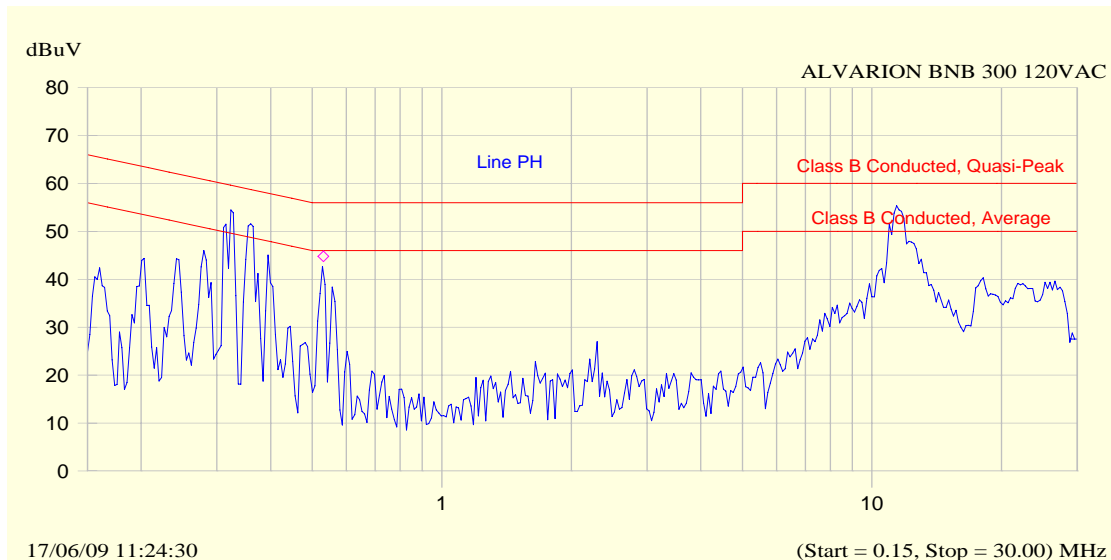
Test report N: 8912337336 Rev.1

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Title: BreezeNETB 300

Model: BU/RB-B300-5X

FCC ID: LKT-BNETB-49



Frequency MHz	QP dB μ V	QP Limit dB	QP-QP Limit dB	Avg dB μ V	Avg Limit dB	Avg-Avg Limit dB
0.326	53.4	59.6	-6.1	48.6	49.6	-1.0
0.363	53.1	58.7	-5.6	45.9	48.7	-2.8
0.531	43.0	56.0	-13.0	38.8	46.0	-7.2
11.481	52.5	60.0	-7.5	46.4	50.0	-3.6
11.832	49.7	60.0	-10.3	43.0	50.0	-7.0
12.312	45.1	60.0	-14.9	37.7	50.0	-12.3

Plot # 154. AC line conducted emissions test. Line Phase

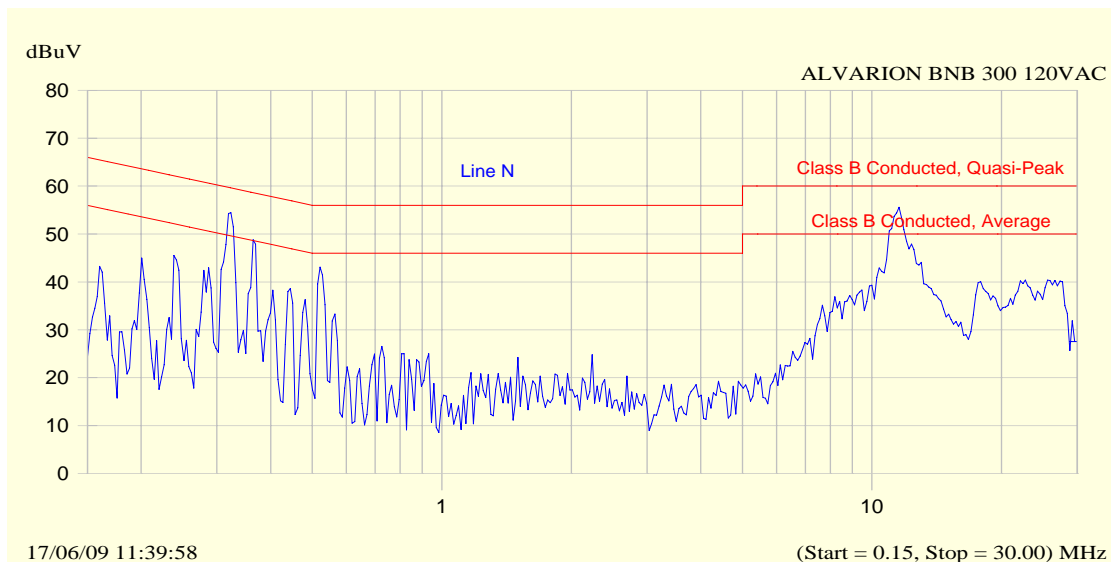
Test report N: 8912337336 Rev.1

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Title: BreezeNETB 300

Model: BU/RB-B300-5X

FCC ID: LKT-BNETB-49



Frequency MHz	QP dBμV	QP Limit dB	QP-QP Limit dB	Avg dBμV	Avg Limit dB	Avg-Avg Limit dB
0.326	53.5	59.6	-6.0	48.6	49.6	-1.0
0.363	52.8	58.7	-5.9	45.4	48.7	-3.2
0.531	42.0	56.0	-14.0	38.2	46.0	-7.8
11.502	52.5	60.0	-7.5	46.2	50.0	-3.8
11.833	49.8	60.0	-10.2	43.4	50.0	-6.6
12.312	44.8	60.0	-15.2	38.4	50.0	-11.6
18.073	36.9	60.0	-23.1	29.5	50.0	-20.5

Plot # 155. AC line conducted emissions test. Line Neutral

Test report N: 8912337336 Rev.1

Title: BreezeNETB 300

Model: BU/RB-B300-5X

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FCC ID: LKT-BNETB-49

10. APPENDIX A



Photo #1. RF conducted emissions test setup.



Photo #2. Radiated emissions test setup on OATS.

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Title: BreezeNETB 300

Model: BU/RB-B300-5X

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FCC ID: LKT-BNETB-49



Photo #3. Radiated emissions test setup with dish antenna.

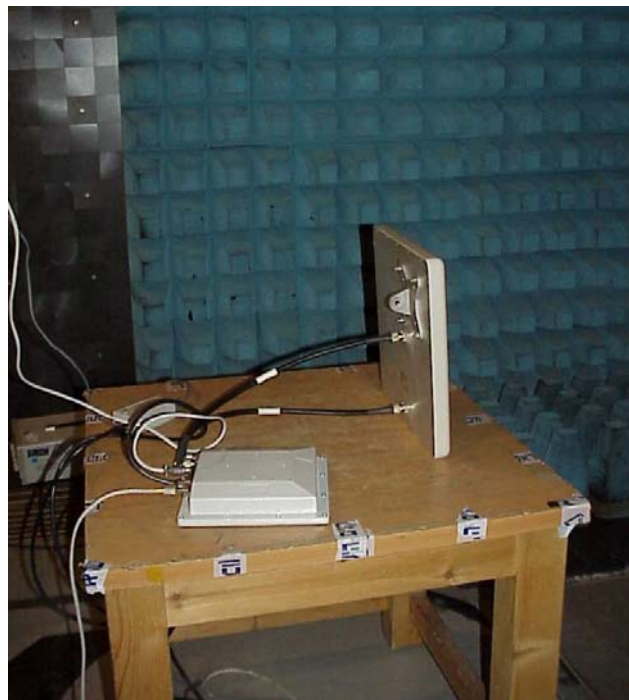


Photo #4. Radiated emissions test setup with flat panel antenna.

**Test report N: 8912337336 Rev.1****Page 56 of 61****Title: BreezeNETB 300****Model: BU/RB-B300-5X****FCC ID: LKT-BNETB-49****11. APPENDIX B****Test equipment used**

No	Description	Manufacturer information			Due Calibration date
		Name	Model No	Serial No	
1	Spectrum Analyzer 9 kHz - 40 GHz	HP	8565E	3835A01359	June 2010
2	Spectrum Analyzer 9 kHz - 26.5 GHz	Adjilient	4407B	US40241729	June 2010
3	Attenuators 20 dB DC – 8.5 GHz	Aeroflex/ Weinshel	33-30-34	A3451	June 2010
4	Power splitter 1.7 – 9 GHz	Mini-Circuits	ZN2PD-9G	0142	June 2010
5	Cable RF 1m	Huber-Suhner	Sucoflex 104	21324/4PE	October 2009
6	Double Ridged Guide Antenna 1 – 18 GHz	EMCO	3115	5802	Aug 2009
7	Broadband Horn antenna 15 – 40 GHz	Schwarzbeck Mess-Electronik	BBHA 9170	9170-341	Aug 2009
8	Antenna Biconilog 30 – 2000 MHz	Schaffner-Chase	CBL6112B	S/N 23181	Aug 2009
9	Spectrum analyzer 10 KHz-26.5 GHz	HP	E7405A	SII 4944	April 2010
10	EMI Receiver 9 kHz-6.5 GHz	HP	8546A+85460A	SII 4068	April 2010
11	LISN 9 kHz – 30 MHz	FCC	LISN 250-32-4-16	SII5023	October 2009
12	Transient limiter 0.009-200 MHz	HP	11947A	3107105	October 2009
13	Cable RF 4m	Huber-Suhner	Sucoflex 104PE	21328/4PE	October 2009
14	Cable RF 0.5m	Huber-Suhner	Multiflex 141	520201	October 2009

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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: BreezeNETB 300

Model: BU/RB-B300-5X

FCC ID: LKT-BNETB-49

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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Model: BU/RB-B300-5X

FCC ID: LKT-BNETB-49

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

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

Point	Frequency (GHz)	Cable Loss (dB)
1	0.0-1.0	1.7
2	1.0- 3.5	3.2
3	3.5- 5.5	4.0
4	5.5 - 7.5	4.7
5	7.5 - 9.5	5.3
6	9.5 - 10.5	5.6
7	10.5 - 12.5	6.2
8	12.5 - 14.5	6.8
9	14.5 - 16.5	7.5
10	16.5 - 18.0	8.1

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Antenna Factor
Broadband Horn Antenna model BBHA 9170 1m calibration

Point	Frequency (GHz)	Antenna Factor (dB/m)
1	15.0	38.5
2	16.0	37.7
3	17.0	38.1
4	18.0	37.9
5	19.0	38.0
6	20.0	38.0
7	21.0	37.9
8	22.0	38.2
9	23.0	39.6
10	24.0	39.6
11	25.0	39.3
12	26.0	39.5
13	27.0	39.6
14	28.0	39.6
15	30.0	40.1
16	32.0	41.2
17	34.0	41.5
18	35.0	41.9
19	36.0	42.2
20	38.0	43.8
21	40.0	43.2

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12. APPENDIX C

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
SA	spectrum analyzer
rms	root mean square
W	width

Specification references

47 CFR part 15: 2008	Radio Frequency Devices
ANSI C63.2: 1996	American National Standard for Instrumentation Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz Specifications.
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