Test Report No. 8412302646

For Alvarion Ltd.

Equipment Under Test:
Point-to-point wireless bridge Outdoor Unit with antenna

Name: BreezeNET-B
Model: BU-B14/28/D-5.8 & RB-B14/28/D-5.8
Antenna P/N: AN1262

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

ACCREDITED

Certificate No. 1487-01

Test Report No.: 8412302646 **Page 1 of 16 Pages**

Title: Test on Point-to-point wireless bridge Outdoor Unit with antenna

Name: BreezeNET-B **Model: BU-B14/28/D-5.8 & RB-B14/28/D-5.8**

Order placed by:	Alvarion Ltd.
Address:	21A Habarzel str, Tel-Aviv, 69710, Israel
Sample for test selected by:	The customer
The date of test:	04/02/2004

Description of Equipment Under Test (EUT):	Point-to-point wireless bridge Outdoor Unit with antenna
Name:	BreezeNET-B
Model:	BU-B14/28/D-5.8 & RB-B14/28/D-5.8
Antenna P/N:	AN1262 (Radio-waves SP3-5.2)
Manufactured by:	Alvarion Ltd.

Reference Documents:

- CFR 47 FCC: Rules and Regulations; Part 15. “Radio frequency devices”; Subpart C: “Intentional radiators” (2002)

Test Results:

- The EUT meets the following requirements of CFR 47 FCC Part 15 Subpart C:
  - Spurious radiated emission Sec.15.209
  - Radiated emissions in restricted bands 15.205.

This Test Report contains 16 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.

Table of Contents

1. Scope

This test report contains results of spurious emissions and emission in restricted bands, performed on EUT: BreezeNET-B Outdoor Unit - Point-to-point wireless bridge (hereinafter: ODU), with Uni-Directional antenna (Type: Dish, P/N AN1262, gain 31.2 dBi) according to the relevant requirements of CFR 47 FCC Part 15 Subpart C.

2. Test specification, Methods and Procedures

- CFR 47 FCC: Rules and Regulations; Part 15. “Radio frequency devices”; Subpart C: “Intentional radiators” (2002)
- ANSI C63.4 -1992: "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz”.

3. Measurements, examinations and derived results

3.1. Location of the Test Site:

The tests were conducted in the EMC laboratory of the Standards Institution of Israel in Tel-Aviv .

3.2. Test condition:

Temperature: 23 °C.

Humidity: 63 %.

Atmospheric pressure: 1010 mbar.

3.3. Radiated emission test - spurious:

3.3.1. Requirements:

The radiated emission shall not exceed value required in section 15.209 Subpart C.

3.3.2. 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: 1 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
Resolution bandwidth	1MHz
Video bandwidth	1 MHz

Detector type	Average
Resolution bandwidth	1MHz
Video bandwidth	3 kHz

3.3.3. Test results and calculation ratio:

The test results are shown in Table #1.
The emission level was calculated as:
E (dBμV/m) = SA (dBμV) + CL (dB) + AF (dB/m) - DCF
Were

SA – spectrum analyzer reading (dBμV) (including CL - cable loss (dB))
AF measuring antenna factor (dB/m), refer to Appendix 2
DCF distance correction factor = 9.5 dB , used for extrapolation of results taken at 1m measuring distance to 3m specified distance.

Table 1. Spurious emissions test results
EUT: ODU with Antenna P/N AN1262

Frequency (GHz)	Emission Level (dBμV/m)		Limit @ 3m (dBμV/m)		Margin (dB)		Results
	Average	Peak	Average	Peak	Average	Peak	
LOW 5.740 GHz							
11.48	40.7	53.4	54	74	13.3	20.6	Complies
17.22	47.6	59			6.4	15.0	Complies
22.96	42.9	54.5			11.1	19.5	Complies
28.7	40.5	54.4			13.5	19.6	Complies
34.44	45.7	61			8.3	13.0	Complies
MIDDLE 5.785 GHz							
11.57	40.8	52.7	54	74	13.2	21.3	Complies
17.36	47.4	59.3			6.6	14.7	Complies
23.13	45.6	54			8.4	20.0	Complies
28.925	41.6	52.9			12.4	21.1	Complies
34.71	49.4	60.9			4.6	13.1	Complies
HIGH 5.835 GHz							
11.67	40.9	52	54	74	13.1	22.0	Complies
17.51	47.2	59.3			6.8	14.7	Complies
23.34	43.4	56.2			10.6	17.8	Complies
29.175	41.5	52.1			12.5	21.9	Complies
35.01	49.4	61.6			4.6	12.4	Complies

3.4. Radiated emission test - restricted bands:

3.4.1. Requirements:

Radiated emission in restricted bands should meet the requirements sec. 15.205 Sub. C.

3.4.2. 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, distance = 1m. Measuring detector function and bandwidths:

Detector type	Peak
Resolution bandwidth	1MHz
Video bandwidth	1 MHz
Detector type	Average
Resolution bandwidth	1MHz
Video bandwidth	3 kHz*

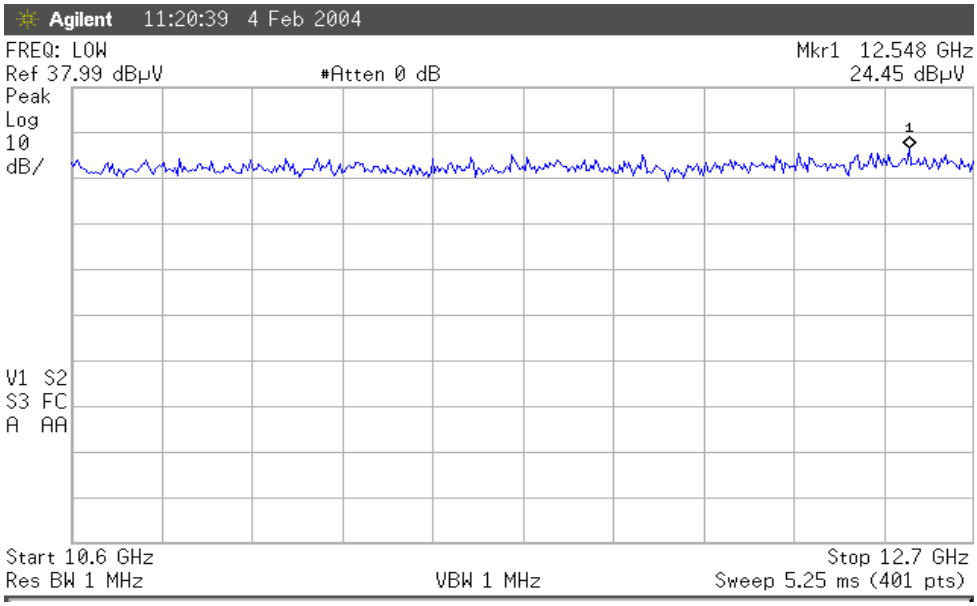
The measurements were performed with both AVG and Peak detector.

The spurious were found in following restricted bands:

1. 10.6-12.7 GHz (2-nd harmonic of the low, mid and high frequencies). The measurements were performed with two antennas; the worst results are demonstrated in the plots.
2. 22.01-23.12 GHz (4-th harmonic of the low frequency). The measurements were performed with two antennas; the worst results are demonstrated in the plots.

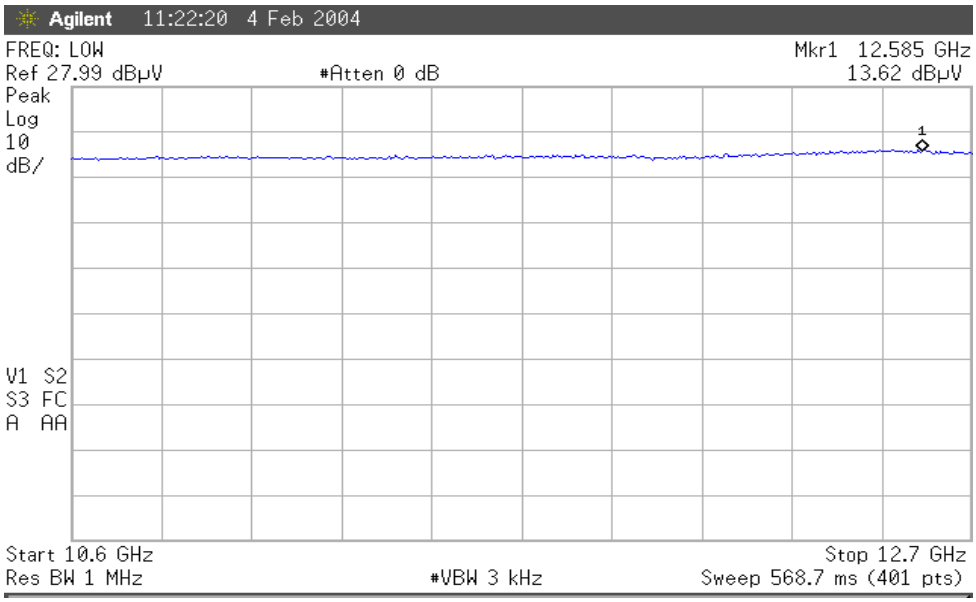
3.4.3. Test results :

The test results are shown in plots ## 1-6, the results do not contain Antenna factor. The maximum measured peak emission (29.4 dBμV) and maximum average emission (18.8 dBμV) being added with antenna factor (35.2 dB/m) are below Peak limit (84 dBμV/m) and below Average limit (64 dBμV/m) at 1 m distance.



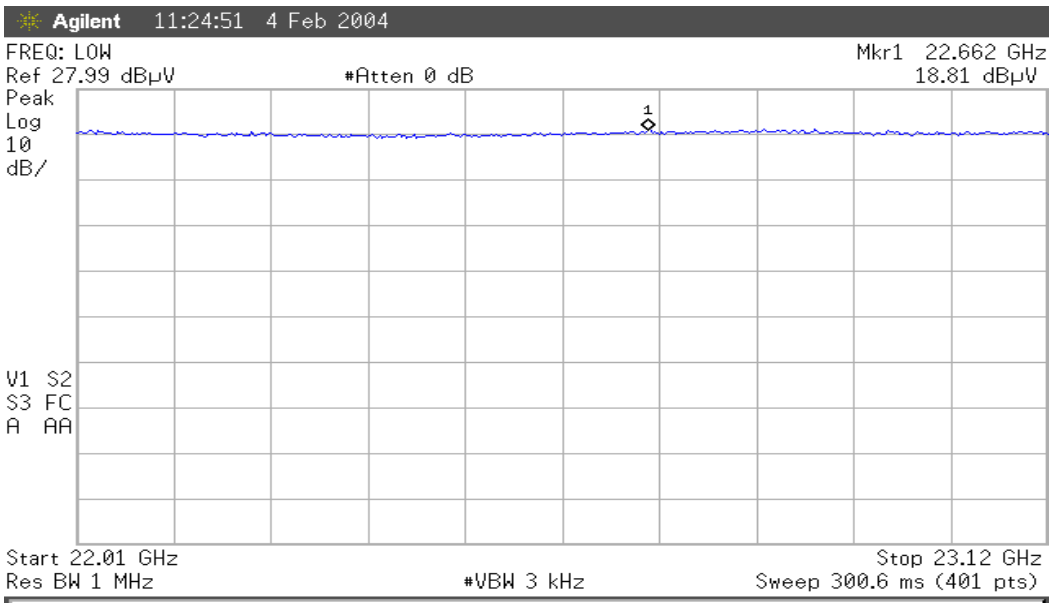
Plot #1

Radiated emission in restricted band 10.6-12.7 GHz/PEAK detector/LOW freq.



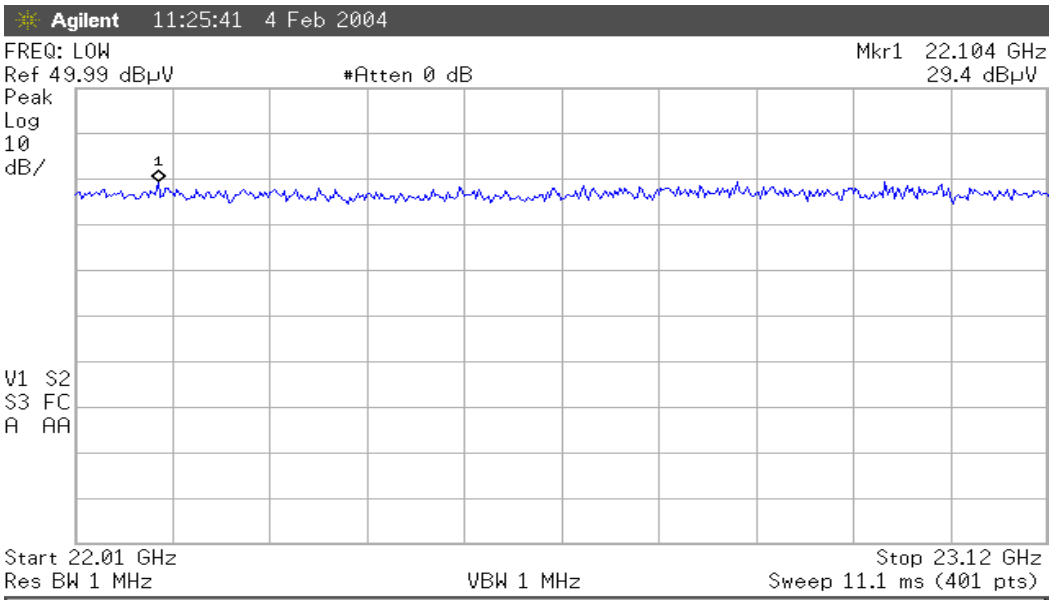
Plot #2

Radiated emission in restricted band 10.6-12.7 GHz/AVERAGE detector/LOW freq.



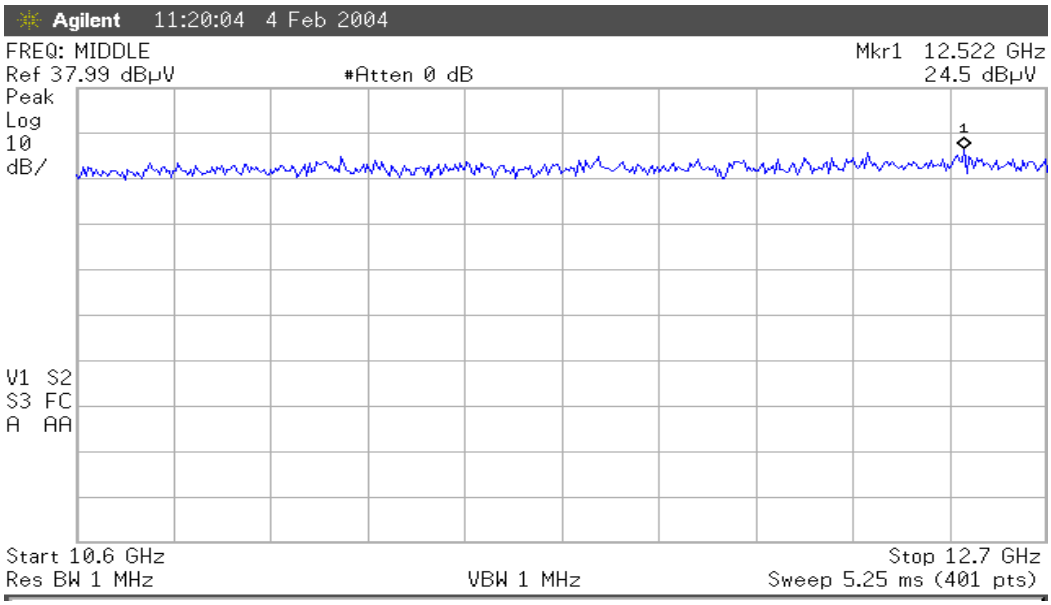
Plot #3

Radiated emission in restricted band 22.01-23.12 GHz / AVERAGE detector/LOW freq.



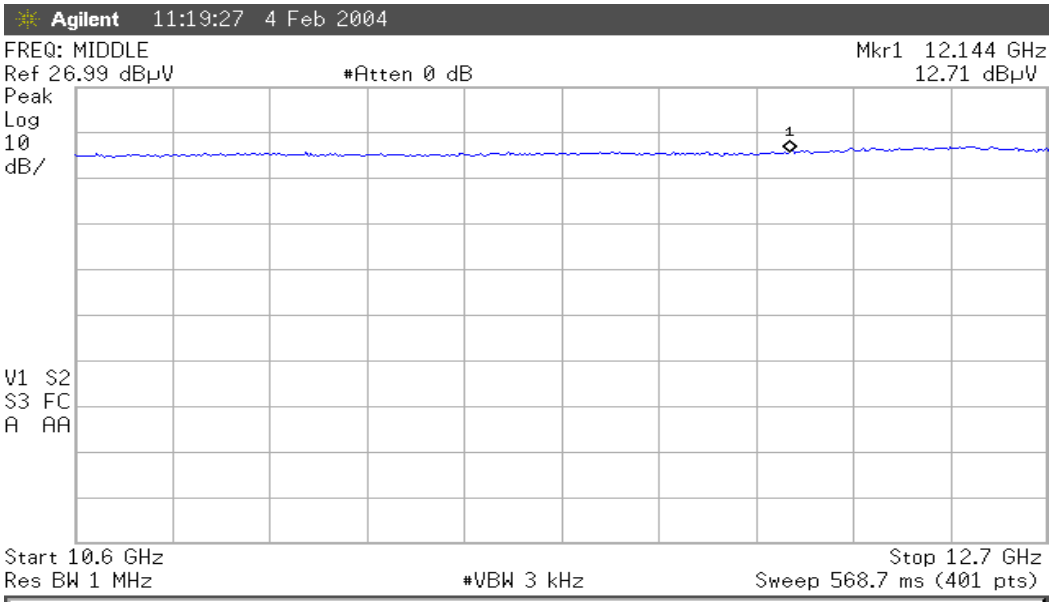
Plot #4

Radiated emission in restricted band 22.01-23.12 GHz /PEAK detector/LOW freq.



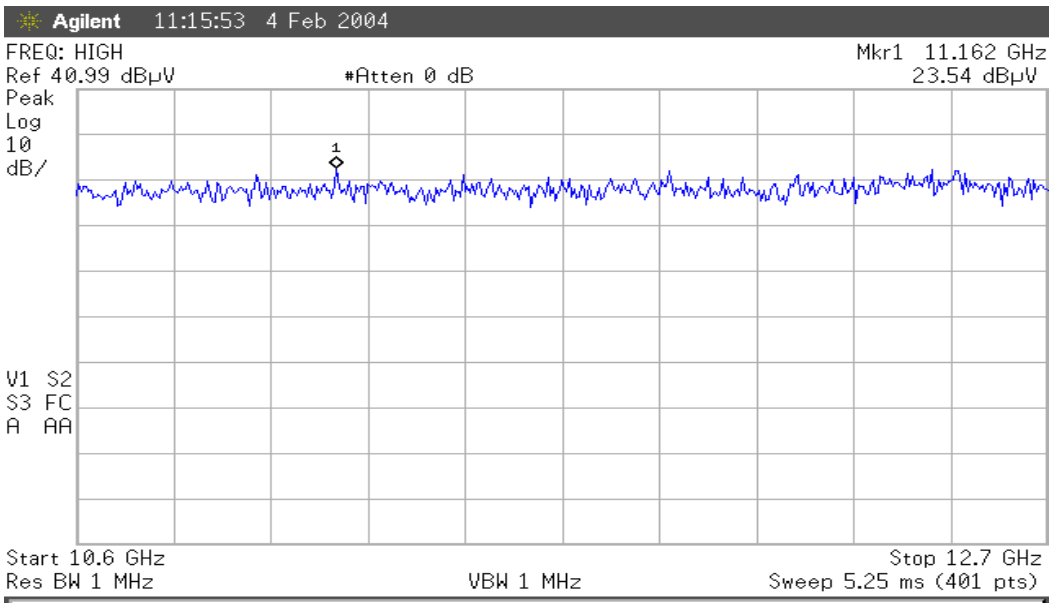
Plot #5

Radiated emission in restricted band 10.6-12.7 GHz/PEAK detector/MID freq.



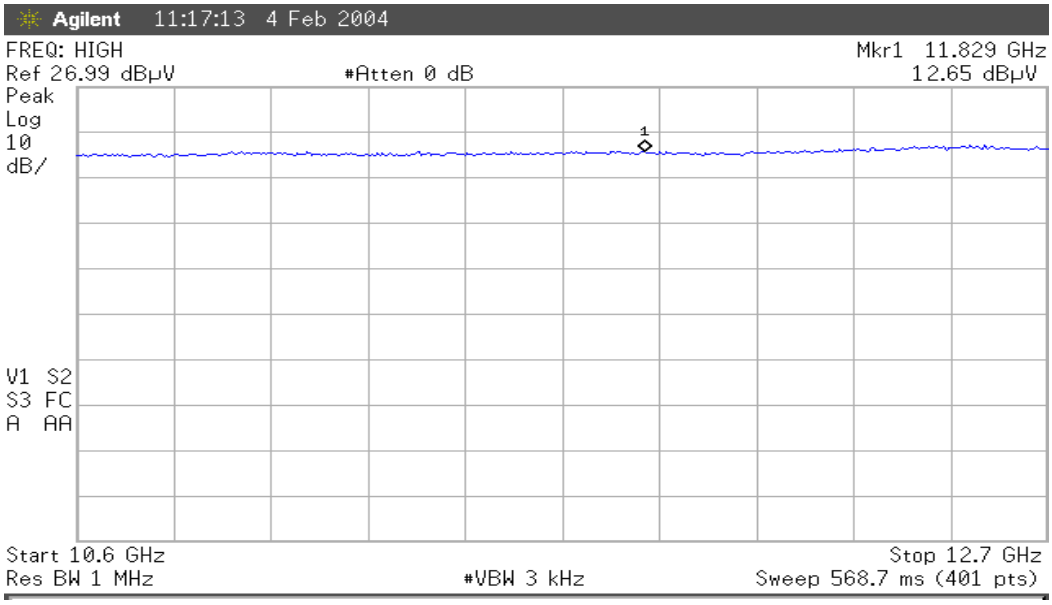
Plot #6

Radiated emission in restricted band 10.6-12.7 GHz/AVERAGE detector/MID freq.



Plot #7

Radiated emission in restricted band 10.6-12.7 GHz/PEAK detector/HIGH freq.



Plot #8

Radiated emission in restricted band 10.6-12.7 GHz/AVERAGE detector/HIGH freq.

4. Compliance with specification

Test	FCC Part 15	Test result
Spurious radiated emission	Sec.15.209	Complies
Radiated emissions in restricted bands	Sec.15.205	Complies

Telematics Laboratory
9 March 2004

Approved by: Eng. Yuri Rozenberg
Position: Head of EMC Branch

Tested by: Albert Herzenshtein
Position: Test Engineer

Written by: Rotenfeld Mariya
Position: Technical Writer

5. Appendix 1: Test equipment used

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

Instrument	MFR	Model	Serial No.	Last calibration date	Next calibration date
Spectrum analyzer 10 KHz-26.5 GHz	HP	E7405a	SII 4944	04/03	04/04
Spectrum analyzer 9 KHz-50 GHz	HP	8565E	3517A00347	07/03	07/04
Antenna Double Ridge 1-18 GHz	EMCO	3115	5802	10/03	10/04
Antenna Standard Gain Horn 18-40 GHz	WILTRON	Alpha TRG A361	861A/590	1/04	01/05
Coax cable	Huber & Suhn	Sucoflex 104P	21327/4PE	12/02	12/04

6. Appendix 2: Antenna Factors

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

Gain and Antenna Factor for Double Ridged Guide Antenna

Model Number: 3115, S/N 5802, manufactured by EMC Test Systems

1.0 meter calibration, Polarization: Horizontal, Calibrated on 30/Dec/03

Frequency (MHz)	Antenna Factor (dB/m)	Gain Numeric	Gain (dBi)
1,000.00	24.30	3.90	5.91
1,500.00	25.50	6.65	8.23
2,000.00	27.77	7.01	8.46
2,500.00	28.83	8.59	9.34
3,000.00	30.68	8.08	9.07
3,500.00	31.84	8.41	9.25
4,000.00	33.14	8.14	9.11
4,500.00	32.61	11.66	10.67
5,000.00	34.17	10.04	10.02
5,500.00	34.63	10.92	10.38
6,000.00	35.15	11.54	10.62
6,500.00	35.14	13.59	11.33
7,000.00	35.86	13.34	11.25
7,500.00	37.21	11.22	10.50
8,000.00	37.64	11.57	10.63
8,500.00	38.18	11.52	10.62
9,000.00	38.17	12.96	11.13
9,500.00	38.37	13.77	11.39
10,000.00	38.73	14.05	11.48
10,500.00	38.79	15.30	11.85
11,000.00	38.98	16.06	12.06
11,500.00	39.77	14.63	11.65
12,000.00	39.58	16.64	12.21
12,500.00	39.51	18.36	12.64
13,000.00	40.87	14.50	11.61
13,500.00	41.46	13.65	11.35
14,000.00	42.04	12.85	11.09
14,500.00	41.42	15.90	12.01
15,000.00	39.78	24.84	13.95
15,500.00	38.55	35.25	15.47
16,000.00	38.90	34.65	15.40
16,500.00	39.84	29.65	14.72
17,000.00	42.09	18.76	12.73
17,500.00	45.12	9.89	9.95
18,000.00	46.90	6.94	8.42

Gain and Antenna Factor for Double Ridged Guide Antenna

Model Number: 3115, S/N 5802, manufactured by EMC Test Systems

1.0 meter calibration, Polarization: Vertical, Calibrated on 30/Dec/03

Frequency (MHz)	Antenna Factor (dB/m)	Gain Numeric	Gain (dBi)
1,000.00	24.08	4.10	6.13
1,500.00	25.63	6.46	8.10
2,000.00	27.88	6.85	8.35
2,500.00	29.01	8.23	9.15
3,000.00	30.65	8.12	9.10
3,500.00	32.01	8.09	9.08
4,000.00	33.07	8.28	9.18
4,500.00	32.81	11.14	10.47
5,000.00	34.09	10.22	10.10
5,500.00	34.84	10.43	10.18
6,000.00	34.97	12.02	10.80
6,500.00	35.34	12.98	11.13
7,000.00	36.33	11.98	10.78
7,500.00	37.54	10.41	10.17
8,000.00	37.82	11.11	10.46
8,500.00	38.28	11.28	10.52
9,000.00	38.33	12.48	10.96
9,500.00	38.55	13.22	11.21
10,000.00	38.76	13.98	11.45
10,500.00	38.65	15.79	11.98
11,000.00	39.06	15.76	11.97
11,500.00	39.63	15.10	11.79
12,000.00	39.52	16.87	12.27
12,500.00	39.57	18.09	12.57
13,000.00	40.80	14.74	11.69
13,500.00	41.76	12.77	11.06
14,000.00	42.10	12.67	11.03
14,500.00	41.49	15.66	11.95
15,000.00	40.02	23.49	13.71
15,500.00	38.40	36.41	15.61
16,000.00	38.23	40.40	16.06
16,500.00	39.71	30.55	14.85
17,000.00	41.86	19.75	12.96
17,500.00	44.89	10.42	10.18
18,000.00	46.26	8.05	9.06

7. Appendix 3: Test configuration illustration

Photo #1
BreezeNET B outdoor unit with Antenna AN1262.
Test setup (from left side)

Photo #2
BreezeNET B outdoor unit with Antenna AN1262.
Test setup (from right side)