

DATE: 29 November 2006


I.T.L. (PRODUCT TESTING) LTD.
FCC EMC/Radio Test Report
for
Alvarion Ltd.

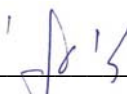
Equipment under test:

Broadband Wireless Access System

BreezeMAX 2500 CPE Selfinstall
BMAX-CPE-Si-2.5

Written by: 
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Approved by: 
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Approved by: 
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This report relates only to items tested.



**Measurement/Technical Report for
Alvarion Ltd.**

Broadband Wireless Access System

BreezeMAX 2500 CPE Selfinstall

BMAX-CPE-Si-2.5

FCC ID: LKT-BMAX-SI-25

29 November 2006

This report concerns: Original Grant Class II change

Class B verification Class A verification Class I change

Equipment type: Licensed Non-Broadcast Station Transmitter

Request Issue of Grant:
 Immediately upon completion of review

Limits used:
CISPR 22 Parts 15; 27

Measurement procedure used is ANSI C63.4-2003.

Substitution Method used as in ANSI/TIA-603-B: 2002

Application for Certification prepared by: Applicant for this device:
(different from "prepared by")

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1. General Information

1.1 Administrative Information

Manufacturer: Alvarion Ltd.

Manufacturer's Address: 21A Habarzel St.
Tel Aviv, 69710
Israel
Tel: +972-3-645-6262
Fax: +972-3-645-6290

Manufacturer's Representative: Avner Ruta
Nissim Gabay

Equipment Under Test (E.U.T): Broadband Wireless Access System

Equipment Model No.: BreezeMAX 2500 CPE Selfinstall
BMAX-CPE-Si-2.5

Equipment Serial No.: Not designated

Date of Receipt of E.U.T: 31.07.06

Start of Test: 31.07.06

End of Test: 21.09.06

Test Laboratory Location*: I.T.L (Product Testing) Ltd.
Kfar Bin Nun,
ISRAEL 99780

Test Specifications: FCC Part 15, Sub-part B,
FCC Part 27, Sub-parts C, M

* Antenna port conducted tests were performed at Alvarion Ltd. under ITL's supervision.

1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), File No. IC 4025.
6. TUV Product Services, England, ASLLAS No. 97201.
7. Nemko (Norway), Authorization No. ELA 207.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 Product Description

The Self Install Si CPE is a compact Subscriber Unit (SU) that is intended for indoor installations.

The Si CPE includes embedded capabilities and supplementary tools that support easy installation by a non-professional user, supporting fully automated network-entry, authentication and services provisioning. The Base Station equipment and the Si CPE also include advanced capabilities that significantly increase the link budget in both directions to ensure optimal performance in indoors installations, providing a highly effective solution for self-installation by end-users.

The Si CPE includes 6 internal antennas providing full 360° coverage, and a connection to an optional wall/window detached antenna. The Si CPE connects to the end-user equipment through either a 10/100 BaseT Ethernet interface (E model) or a USB interface (U model).

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing August 22, 2006).

I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

1.6 Measurement Uncertainty

Radiated Emission

The Open Site complies with the ± 4 dB Normalized Site Attenuation requirements of ANSI C63.4-2003. In accordance with Paragraph 5.4.6.1 of this standard, this tolerance includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.

2. Product Labeling

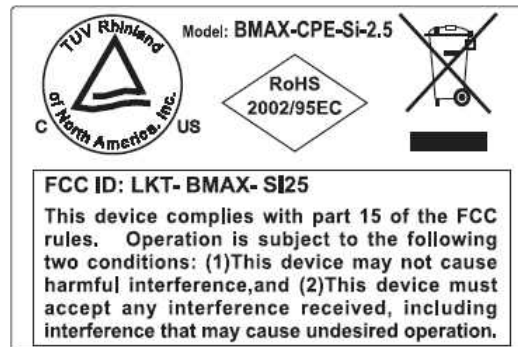


Figure 1. FCC Label



Figure 2. Location of Label on EUT

3. System Test Configuration

3.1 *Justification*

The system was configured for testing in a typical fashion (as a customer would normally use it). The EUT was powered from an external AC/DC power supply adaptor.

During radio testing the unit was configured the way that the radio port was connected to external SMA antenna connector port. Radio parameters control during testing were made from the Ethernet port , by use of a laptop and snmp software support . In a normal use the laptop or PC is connected to the same Ethernet port

For emission testing the EUT's antenna port was terminated by 50 ohm impedance as required by regulation. Ethernet port was connected to a laptop exercising high speed data traffic via long UTP cable . All digital parts were activated which represented the normal use of the unit in worst-case condition.

3.2 *EUT Exercise Software*

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

On power on, processor addresses the FLASH memory and downloads the software to SDRAM where the operating system for EUT is found. The initial testing of hardware is made . Next step is Networking registration, and connection to internet. From now the user is connected to internet . The complete cycle takes about 20 seconds . From now on software performs a routine responsible for signal level control (RF) , formatting data packets , sending and receiving data .

For conducted and radiated emission tests the digital activities described above, represent worst case condition.

3.3 *Special Accessories*

No special accessories were needed to achieve compliance.

3.4 *Equipment Modifications*

No modifications were needed to achieve compliance.

3.5 Configuration of Tested System

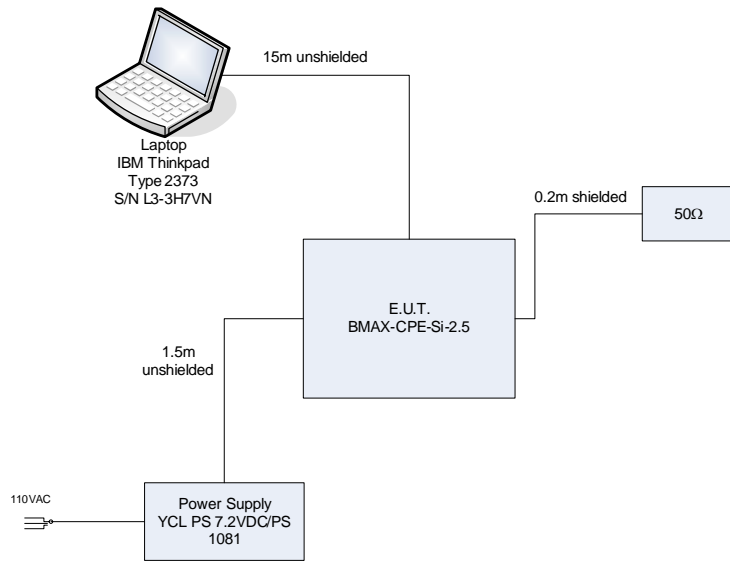


Figure 3. Tests Set-up

4. Block Diagram

4.1 *Schematic Block/Connection Diagram*

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4.2 *Theory of Operation*

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5. Conducted Emission From AC Mains Test Data

5.1 Test Specification

FCC, Part 15, Subpart B: Class B

5.2 Test Procedure

The E.U.T operation mode and test set-up are as described in Section 4. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on an 0.8 meter high wooden table, 0.4 meter from the room's vertical wall.

The E.U.T was powered from 115 V AC / 60 Hz via 50 Ohm / 50 μ Hn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T

The center of the E.U.T AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission.

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver via a 3.5" floppy disk and are displayed on the receiver's spectrum display.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, and using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

5.3 Test Data


JUDGEMENT: Passed by 7.5 dB

The margin between the emission levels and the specification limit is, in the worst case, 7.5 dB for the phase line at 3.13 MHz and 5.3 dB at 1.29 MHz for the neutral line.

The EUT met the FCC Part 15, Subpart B, Class B specification requirements.

The details of the highest emissions are given in Figure 4 to Figure 9.

TEST PERSONNEL:

Tester Signature: 

Date: 07.11.06

Typed/Printed Name: E. Pitt

Conducted Emission

E.U.T Description Broadband Wireless Access System
 Type BreezeMAX 2500 CPE Selfinstall
 BMAX-CPE-Si-2.5
 Serial Number: Not designated

Specification: FCC Part 15, Subpart B, Class **B**
 Lead: Phase
 Detectors: Peak, Quasi-peak, Average

Frequency (MHz)	Peak Amplitude (dB μ V)	Quasi-peak Amplitude (dB μ V)	Specification (dB μ V)	Pass/Fail	Margin (dB)
0.28	35.3	32.9	61.0	Pass	-28.1
1.01	39.4	36.7	56.0	Pass	-19.3
3.13	40.1	39.0	56.0	Pass	-17.0
6.74	38.1	36.7	60.0	Pass	-23.3
15.38	38.3	36.1	60.0	Pass	-23.9
21.51	39.7	37.4	60.0	Pass	-22.6

Figure 4. Conducted Emission: PHASE. Detectors: Peak, QUASI-PEAK

Frequency (MHz)	Peak Amplitude (dB μ V)	Average Amplitude (dB μ V)	Specification (dB μ V)	Pass/Fail	Margin (dB)
0.28	35.3	29.5	51.0	Pass	-21.5
1.01	39.4	33.9	46.0	Pass	-12.1
3.13	40.1	38.5	46.0	Pass	-7.5
6.74	38.1	35.6	50.0	Pass	-14.4
15.38	38.3	30.7	50.0	Pass	-19.3
21.51	39.7	35.6	50.0	Pass	-14.4

Figure 5. Detectors: Peak, AVERAGE .

Conducted Emission

E.U.T Description Broadband Wireless Access System
 Type BreezeMAX 2500 CPE Selfinstall
 BMAX-CPE-Si-2.5
 Serial Number: Not designated

Specification: FCC Part 15, Subpart B, Class B
 Lead: Phase
 Detectors: Peak, Quasi-peak, Average

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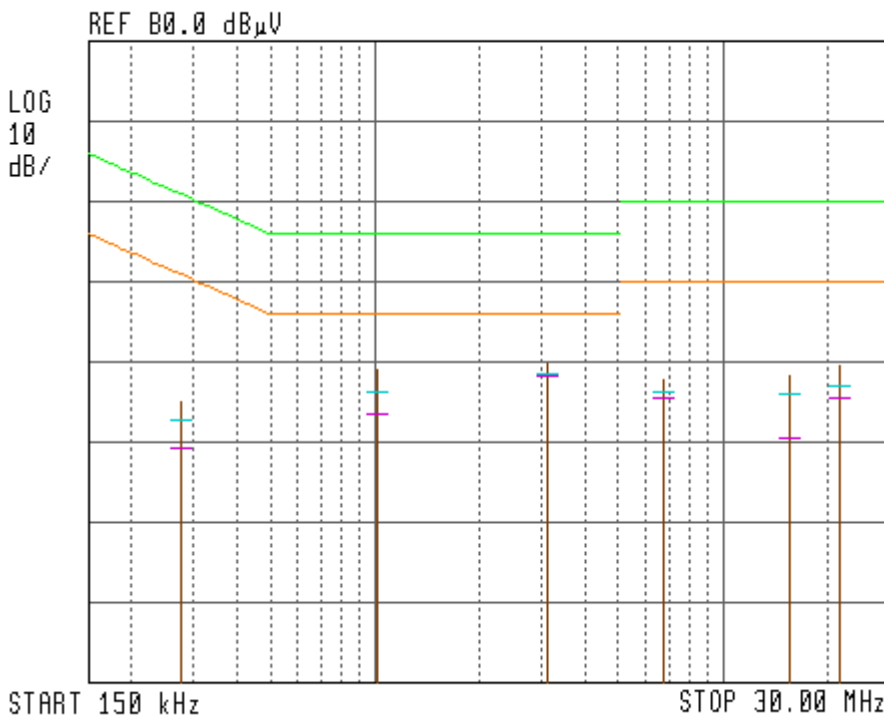


Figure 6. Detectors: Peak, Quasi-peak, Average

Notes:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB μ V).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.
5. Average detection is designated by the second dash mark (from the top) of each vertical line.

Conducted Emission

E.U.T Description Broadband Wireless Access System
 Type BreezeMAX 2500 CPE Selfinstall
 BMAX-CPE-Si-2.5
 Serial Number: Not designated

Specification: FCC Part 15, Subpart B, Class B
 Lead: Neutral
 Detectors: Peak, Quasi-peak, Average

Frequency (MHz)	Peak Amplitude (dB μ V)	Quasi-peak Amplitude (dB μ V)	Specification (dB μ V)	Pass/Fail	Margin (dB)
0.28	35.9	33.4	61.0	Pass	-27.6
0.90	35.3	32.7	56.0	Pass	-23.3
1.29	46.4	43.1	56.0	Pass	-12.9
6.29	39.4	37.8	60.0	Pass	-22.2
15.38	40.9	38.8	60.0	Pass	-21.2
22.58	35.2	32.5	60.0	Pass	-27.5

Figure 7. Detectors: Peak, QUASI-PEAK

Frequency (MHz)	Peak Amplitude (dB μ V)	Average Amplitude (dB μ V)	Specification (dB μ V)	Pass/Fail	Margin (dB)
0.28	35.9	28.9	51.0	Pass	-22.1
0.90	35.3	32.3	46.0	Pass	-13.7
1.29	46.4	40.7	46.0	Pass	-5.3
6.29	39.4	36.3	50.0	Pass	-13.7
15.38	40.9	36.1	50.0	Pass	-13.9
22.58	35.2	27.8	50.0	Pass	-22.2

Figure 8. Detectors: Peak, AVERAGE

5.4 Test Instrumentation Used, Conducted Measurement

Instrument	Manufacturer	Model	Serial No.	Calibration	Period
LISN	Fischer	FCC-LISN-2A	127	March 20, 2006	1 year
LISN	Fischer	FCC-LISN-2A	128	March 20, 2006	1 year
Receiver	HP	85420E/85422E	3427A00103/34	March 22, 2006	1 year
Printer	HP	ThinkJet2225	2738508357	N/A	N/A

6. Radiated Emission, per FCC Part 15

6.1 Test Specification

30MHz-13000 MHz, FCC, Part 15, Subpart B

6.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground.

The E.U.T. highest frequency source or used frequency is
 $F_{LO}=F_{Car}-140=2687.5-140=2547.5$ MHz

The frequency range 30-13000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 2.9-13 GHz, a spectrum analyzer including a low noise amplifier was used. The test distance was 3 meters. During peak measurements, the I.F. bandwidth was 1 MHz, and video bandwidth 3 MHz. During average measurements, the I.F. bandwidth was 1 MHz and video bandwidth was 100 Hz. The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization. Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.)

The emissions were measured at a distance of 3 meters.

6.3 Test Data

JUDGEMENT: Passed by 4.3 dB


The E.U.T met the requirements of the FCC Part 15, Subpart B, Class B specification.

The margin between the emission level and the specification limit is 4.3 dB in the worst case at the frequency of 2047.98 MHz, horizontal polarization.

In the band 2.9 – 13 GHz, the emission levels were more than 20 dB below the specification limit.

The details of the highest emissions are given in Figure 10 to Figure 19.

TEST PERSONNEL:

Tester Signature: 

Date: 07.11.06

Typed/Printed Name: E. Pitt

Radiated Emission

E.U.T Description Broadband Wireless Access System
 Type BreezeMAX 2500 CPE Selfinstall
 BMAX-CPE-Si-2.5
 Serial Number: Not designated

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal
 Antenna: 3 meters distance

Frequency range: 30 MHz to 1000 MHz
 Detectors: Peak, Quasi-peak

Frequency (MHz)	Peak Amp (dB μ V/m)	QP Amp (dB μ V/m)	Correction (dB)	Specification (dB μ V/m)	Margin (dB)
200.47	41.6	36.4	17.1	43.5	-7.1
300.71	37.4	33.4	15.6	46.0	-12.6
334.14	41.6	39.1	16.8	46.0	-6.9
367.56	37.3	32.9	18.0	46.0	-13.1
400.01	37.9	32.4	19.1	46.0	-13.6
467.79	41.2	37.1	20.0	46.0	-8.9
601.43	42.3	38.1	23.9	46.0	-7.9

**Figure 10. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detectors: Peak, Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description Broadband Wireless Access System
 Type BreezeMAX 2500 CPE Selfinstall
 BMAX-CPE-Si-2.5
 Serial Number: Not designated

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal
 Antenna: 3 meters distance

Frequency range: 1.0 GHz to 2.9 GHz
 Detectors: Peak

Frequency (MHz)	Peak Amp (dBμV/m)	Correction (dB)	Specification (dBμV/m)	Margin (dB)
1152.00	52.4	32.9	74.0	-21.6
1600.00	56.0	36.6	74.0	-18.0
1664.00	53.7	37.1	74.0	-20.3
1792.00	54.9	38.1	74.0	-19.1
1920.00	55.8	39.1	74.0	-18.2
2047.98	55.0	40.1	74.0	-19.0

**Figure 12. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detectors: Peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description Broadband Wireless Access System
 Type BreezeMAX 2500 CPE Selfinstall
 BMAX-CPE-Si-2.5
 Serial Number: Not designated

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal
 Antenna: 3 meters distance

Frequency range: 1.0 GHz to 2.9 GHz
 Detectors: Average

Frequency (MHz)	Avg Amp (dBμV/m)	Correction (dB)	Specification (dBμV/m)	Margin (dB)
1152.00	40.8	32.9	54.0	-13.2
1600.00	44.0	36.6	54.0	-10.0
1664.00	44.2	37.1	54.0	-9.8
1792.00	45.6	38.1	54.0	-8.4
1920.00	45.3	39.1	54.0	-8.7
2047.98	49.7	40.1	54.0	-4.3

**Figure 13. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detectors: Average**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

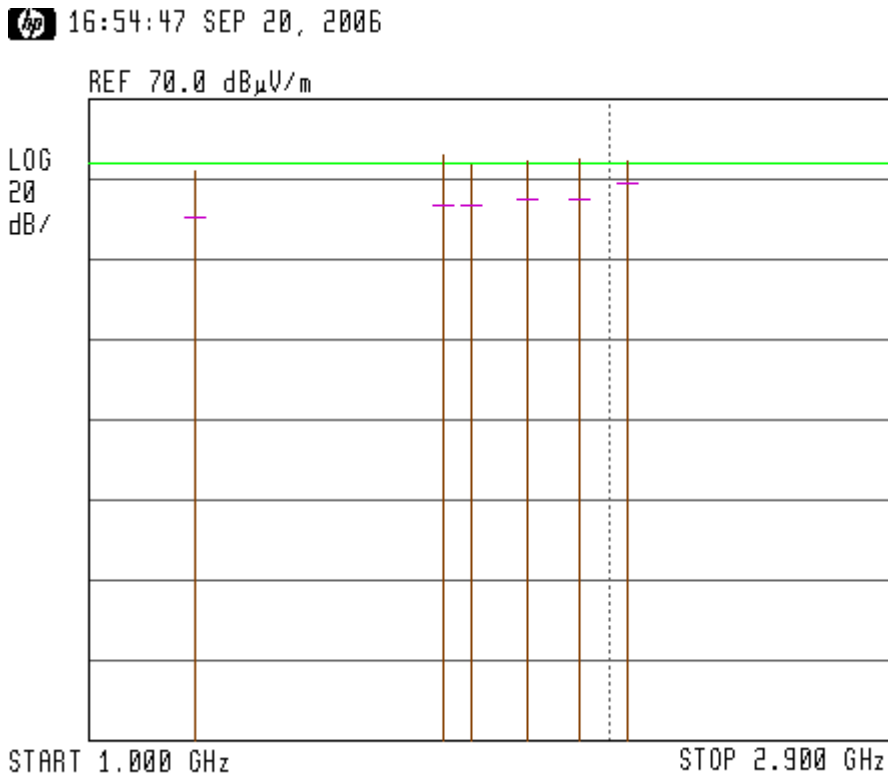
Radiated Emission

E.U.T Description	Broadband Wireless Access System
Type	BreezeMAX 2500 CPE Selfinstall BMAX-CPE-Si-2.5
Serial Number:	Not designated

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal
Antenna: 3 meters distance

Frequency range: 1.0 GHz to 2.9 GHz
Detectors: Peak, Average



**Figure 14. Radiated Emission. Antenna Polarization: HORIZONTAL
Detectors: Peak, Average**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB μ V/m).
3. Peak detection is designated by the top of each vertical line.
4. Average detection is designated by the first dash mark (from the top) of each vertical line.

Radiated Emission

E.U.T Description Broadband Wireless Access System
 Type BreezeMAX 2500 CPE Selfinstall
 BMAX-CPE-Si-2.5
 Serial Number: Not designated

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical
 Antenna: 3 meters distance

Frequency range: 30 MHz to 1000 MHz
 Detectors: Peak, Quasi-peak

Frequency (MHz)	Peak Amp (dB μ V/m)	QP Amp (dB μ V/m)	Correction (dB)	Specification (dB μ V/m)	Margin (dB)
167.06	38.38	34.93	15.05	43.5	-8.6
250.00	37.67	32.53	20.28	46.0	-13.5
400.02	36.66	32.23	19.10	46.0	-13.8
467.78	40.17	36.50	19.98	46.0	-9.5
625.02	41.65	34.94	24.10	46.0	-11.1
783.99	40.34	35.96	25.61	46.0	-10.0

**Figure 15. Radiated Emission. Antenna Polarization: VERTICAL.
 Detectors: Peak, Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

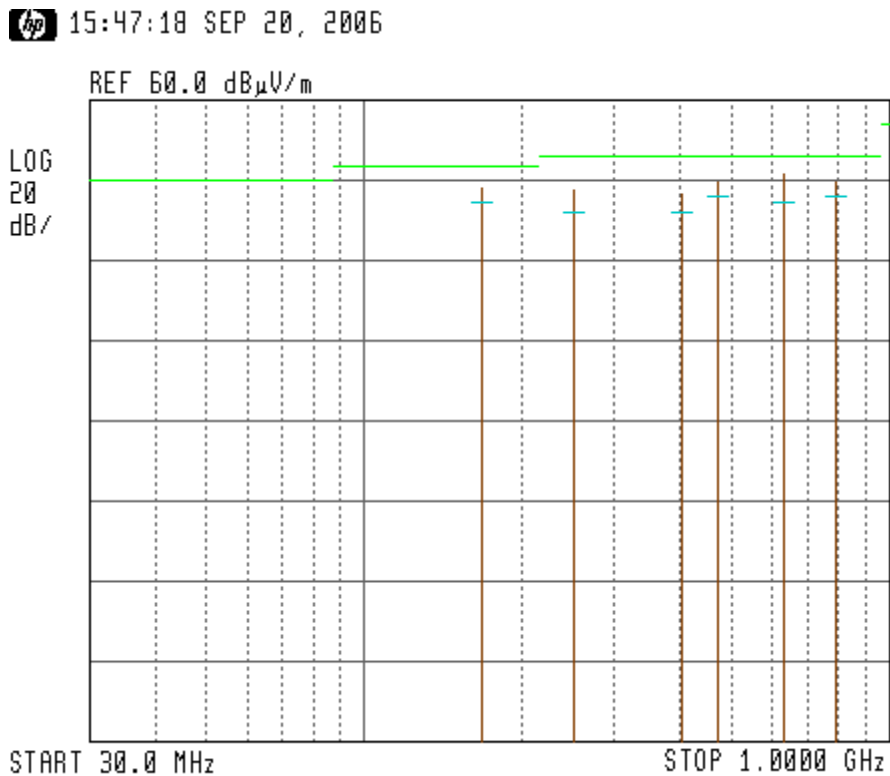
Radiated Emission

E.U.T Description Broadband Wireless Access System
 Type BreezeMAX 2500 CPE Selfinstall
 BMAX-CPE-Si-2.5
 Serial Number: Not designated

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical
 Antenna: 3 meters distance

Frequency range: 30 MHz to 1000 MHz
 Detectors: Peak, Quasi-peak



**Figure 16. Radiated Emission. Antenna Polarization: VERTICAL.
 Detectors: Peak, Quasi-peak**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB μ V/m).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.

Radiated Emission

E.U.T Description Broadband Wireless Access System
 Type BreezeMAX 2500 CPE Selfinstall
 BMAX-CPE-Si-2.5
 Serial Number: Not designated

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical
 Antenna: 3 meters distance

Frequency range: 1.0 GHz to 2.9 GHz
 Detectors: Peak

Frequency (MHz)	Peak Amp (dBμV/m)	Correction (dB)	Specification (dBμV/m)	Margin (dB)
1088.01	55.5	15.1	74.0	-18.5
1152.01	50.0	20.3	74.0	-24.0
1279.98	49.1	19.1	74.0	-24.9
1663.98	52.4	20.0	74.0	-21.6
1791.99	53.4	24.1	74.0	-20.6
1919.98	52.7	25.6	74.0	-21.3

**Figure 17. Radiated Emission. Antenna Polarization: VERTICAL.
 Detectors: Peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description Broadband Wireless Access System
 Type BreezeMAX 2500 CPE Selfinstall
 BMAX-CPE-Si-2.5
 Serial Number: Not designated

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical
 Antenna: 3 meters distance

Frequency range: 1.0 GHz to 2.9 GHz
 Detectors: Average

Frequency (MHz)	Avg Amp (dB μ V/m)	Correction (dB)	Specification (dB μ V/m)	Margin (dB)
1088.01	32.4	15.1	54.0	-21.6
1152.01	32.9	20.3	54.0	-21.1
1279.98	34.0	19.1	54.0	-20.0
1663.98	37.1	20.0	54.0	-16.9
1791.99	38.1	24.1	54.0	-15.9
1919.98	39.1	25.6	54.0	-14.9

**Figure 18. Radiated Emission. Antenna Polarization: VERTICAL.
 Detectors: Average**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

6.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3411A00102	March 22, 2006	1 year
RF Section	HP	85420E	3427A00103	March 22, 2006	1 year
Antenna Bioconical	ARA	BCD 235/B	1041	March 19, 2006	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	November 17, 2005	1 year
Antenna-Log Periodic	A.H.System	SAS-200/511	253	January 24, 2005	2 year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 15, 2006	2 year
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	October 16, 2005	1 year
Spectrum Analyzer	HP	8592L	3926A01204	February 6, 2006	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet 2225	2738508357.0	N/A	N/A

6.5 *Field Strength Calculation*

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$FS = RA + AF + CF$$

FS:	Field Strength [dB μ v/m]
RA:	Receiver Amplitude [dB μ v]
AF:	Receiving Antenna Correction Factor [dB/m]
CF:	Cable Attenuation Factor [dB]

No external pre-amplifiers are used in the frequency range up to 2.9 GHz.

7. Out of Band Emissions (Radiated) per FCC 27.53

7.1 Test Specification

FCC, Part 27.53 (l), FCC Part 2.1053

7.2 Test Procedure

The test method was based on ANSI/TIA-603-C, Unwanted Emissions: Radiated Spurious. The power of any emission outside of the authorized operating frequency ranges (2496-2690 MHz) must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB, yielding – 13dBm.

- (a) The E.U.T. operation mode and test set-up are as described in Section 3. A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 1.5 meters above the ground. The configuration tested is shown in Figure 3.

The frequency range 9 kHz-27 GHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization. The emissions were measured at a distance of 3 meters.

- (b) The E.U.T. was replaced by a substitution antenna (dipole 30MHz-1GHz, Horn Antenna above 1GHz) driven by a signal generator. The height was readjusted for maximum reading. The signal generator level was adjusted to obtain the same reading on the EMI receiver as in step (a).

The signals observed in step (a) were converted to radiated power using:
$$\text{EIRP(dBm)} = P_g(\text{dBm}) - \text{Cable Loss (dB)} + \text{Substitution Antenna Gain (dBi)}$$

P_g = Signal generator output level.


7.3 Test Data

JUDGEMENT: Passed

The E.U.T met the requirements of the FCC, Part 27.53(l), FCC Part 2.1053 specifications.

The signals in the band 9.0 kHz – 27.0 GHz were below the spectrum analyzer noise level, which is at least 40dB below the specification limit.

TEST PERSONNEL:

Tester Signature: 

Date: 07.11.06

Typed/Printed Name: E. Pitt

7.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3411A00102	March 22, 2006	1 year
RF Section	HP	85420E	3427A00103	March 22, 2006	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 17, 2005	1 year
Antenna Bioconical	ARA	BCD 235/B	1041	March 19, 2006	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	November 17, 2005	1 year
Antenna-Log Periodic	A.H.System	SAS-200/511	253	January 24, 2005	2 year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 15, 2006	2 year
Horn Antenna	ARA	SWH-28	1007	October 28, 2005	2 year
Horn Antenna	Narda	V637	0410	November 19, 2004	2 year
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	October 16, 2005	1 year
Low Noise Amplifier	Sophia Wireless	LNA28-B	232	February 8, 2006	1 year
Spectrum Analyzer	HP	8592L	3926A01204	February 6, 2006	1 year
Signal Generator	HP	8648C	3623A04126	April 6, 2005	1 year
Signal Generator	HP	86722	2352A03681	February 6, 2006	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet 2225	2738508357.0	N/A	N/A

8. Antenna Gain

The antenna gain is 11.5 ± 0.5 dBi.

MTI PART NUMBER	8.1 AL - 362010/S
REGULATORY COMPLIANCE	RoHS , CE 0682
ELECTRICAL	
FREQUENCY RANGE	2.3-2.7 GHz
GAIN	11.5±0.5 dBi
VSWR	2:1 (max)
3 dB BEAMWIDTH	Azimuth: 80° (min) Elevation: 20° (typ)
POLARIZATION	Vertical
F/B RATIO	-20dB (typ)
INPUT IMPEDANCE	50 (ohm)
INPUT POWER	3W (max)

9. R.F Exposure/Safety

The E.U.T. is a fixed installation transmitter. The typical distance between the E.U.T. and the general population is 20 cm.

Calculation of Maximum Permissible Exposure (MPE)

Based on Section 1.1307(b)(1) Requirements

(a) FCC limits at 2593 MHz is: $1 \frac{mW}{cm^2}$

Using table 1 of Section 1.1310 limit for general population/uncontrolled exposures, the above level is an average over 30 minutes.

(b) The power density produced by the E.U.T. is

$$S = \frac{P_t G_t}{4\pi R^2}$$

P_t - Transmitted Power 104.7mW (Peak) (23.2- 3 = 20.2 dBm)*

G_t - Antenna Gain, 14.13 = 11.5 dBi

R- Distance from Transmitter using 20cm worst case

* Loss of coax connecting the antenna and EUT RF output connector is 3dB (See page 56 of this report).

(c) The peak power density is :

$$S_p = \frac{104.7 \times 14.13}{4\pi(20)^2} = 0.294 \frac{mW}{cm^2}$$

(d) The E.U.T. transmission in actual worst case is 50%.

The average power over 30 minutes is:

$$P_{AV} = \frac{104.7 \times 50}{100} = 52.35mW$$

(e) The averaged power density of the E.U.T. is:

$$S_{AV} = \frac{52.35 \times 14.13}{4\pi(20)^2} = 0.15 \frac{mW}{cm^2}$$

(f) This is 1 order of magnitude below the FCC limit.

10. APPENDIX A - CORRECTION FACTORS

10.1 Correction factors for CABLE
from EMI receiver
to test antenna
at 3 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3	1200.0	7.3
20.0	0.6	1400.0	7.8
30.0	0.8	1600.0	8.4
40.0	0.9	1800.0	9.1
50.0	1.1	2000.0	9.9
60.0	1.2	2300.0	11.2
70.0	1.3	2600.0	12.2
80.0	1.4	2900.0	13.0
90.0	1.6		
100.0	1.7		
150.0	2.0		
200.0	2.3		
250.0	2.7		
300.0	3.1		
350.0	3.4		
400.0	3.7		
450.0	4.0		
500.0	4.3		
600.0	4.7		
700.0	5.3		
800.0	5.9		
900.0	6.3		
1000.0	6.7		

NOTES:

1. The cable type is RG-214.
2. The overall length of the cable is 27 meters.
3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".

10.2 Correction factors for CABLE
from EMI receiver
to test antenna
at 3 meter range.

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

NOTES:

- 1. The cable type is RG-8.*
- 2. The overall length of the cable is 10 meters.*

10.3 Correction factors for CABLE

**from Spectrum Analyzer
to test antenna above 2.9 GHz**

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

NOTES:

- 1. The cable type is SUCOFLEX 104 E manufactured by SUHNER.*
- 2. The cable is used for measurements above 2.9 GHz.*
- 3. The overall length of the cable is 10 meters.*

10.4 Correction factors for

LOG PERIODIC ANTENNA

Type LPD 2010/A

at 3 and 10 meter ranges.

Distance of 3 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.1
250.0	10.2
300.0	12.5
400.0	15.4
500.0	16.1
600.0	19.2
700.0	19.4
800.0	19.9
900.0	21.2
1000.0	23.5

Distance of 10 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.0
250.0	10.1
300.0	11.8
400.0	15.3
500.0	15.6
600.0	18.7
700.0	19.1
800.0	20.2
900.0	21.1
1000.0	23.2

NOTES:

1. Antenna serial number is 1038.
2. The above lists are located in file number 38M30.ANT for a 3 meter range, and file number 38M100.ANT for a 10 meter range.
3. The files mentioned above are located on the disk marked "Radiated Emission Test EMI Receiver".

10.5 Correction factors for

LOG PERIODIC ANTENNA

**Type SAS-200/511
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

NOTES:

1. Antenna serial number is 253.
2. The above lists are located in file number SAS3M0.ANT for a 3 meter range.
3. The files mentioned above are located on the disk marked "Antenna Factors".

10.6 Correction factors for BICONICAL ANTENNA

**Type BCD-235/B,
at 3 and 10 meter ranges**

3 meter range

FREQUENCY (MHz)	AFE (dB/m)
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13
180.0	13.5
190.0	14
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9

10 meter range

FREQUENCY (MHz)	AFE (dB/m)
30.0	12.1
40.0	10.6
50.0	10.6
60.0	8.9
70.0	8.5
80.0	9.6
90.0	9.4
100.0	9.6
110.0	10.3
120.0	10.7
130.0	12.6
140.0	12.7
150.0	12.7
160.0	13.8
170.0	13.7
180.0	14.9
190.0	13.4
200.0	13.1
210.0	14.0
220.0	14.5
230.0	15.8
240.0	16.0
250.0	16.6
260.0	16.7
270.0	18.3
280.0	18.5
290.0	19.3
300.0	20.9

NOTES:

1. Antenna serial number is 1041.
2. The above list is located in file 41BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".

10.7 Correction factors for ACTIVE LOOP ANTENNA

Model 6502

S/N 9506-2950

FREQUENCY (MHz)	Magnetic Antenna Factor (dB)	Electric Antenna Factor (dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2

10.8 Correction factors for Double-Ridged Waveguide Horn

**Model: 3115, S/N 29845
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENN A Gain (dBi)	FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)
1.0	24.8	5.4	10.0	38.8	11.4
1.5	26.1	7.6	10.5	38.9	11.8
2.0	28.6	7.7	11.0	39.0	12.1
2.5	29.8	8.4	11.5	39.6	11.8
3.0	31.4	8.4	12.0	39.8	12.0
3.5	32.4	8.7	12.5	39.6	12.5
4.0	33.7	8.6	13.0	40.0	12.5
4.5	33.4	9.9	13.5	39.8	13.0
5.0	34.5	9.7	14.0	40.2	13.0
5.5	35.1	9.9	14.5	40.6	12.9
6.0	35.4	10.4	15.0	41.3	12.4
6.5	35.6	10.8	15.5	39.5	14.6
7.0	36.2	10.9	16.0	38.8	15.5
7.5	37.3	10.4	16.5	40.0	14.6
8.0	37.7	10.6	17.0	41.4	13.4
8.5	38.3	10.5	17.5	44.8	10.3
9.0	38.5	10.8	18.0	47.2	8.1
9.5	38.7	11.1			

10.9 Correction factors for

Horn Antenna

**Model: SWH-28
at 1 meter range.**

FREQUENCY (GHz)	AFE (dB /m)	Gain (dB1)
18.0	40.3	16.1
19.0	40.3	16.3
20.0	40.3	16.1
21.0	40.3	16.3
22.0	40.4	16.8
23.0	40.5	16.4
24.0	40.5	16.6
25.0	40.5	16.7
26.0	40.6	16.4

10.10 Correction factors for

**Horn Antenna
Model: V637**

FREQUENCY (GHz)	AFE (dB /m)	Gain (dB1)
26.0	43.6	14.9
27.0	43.7	15.1
28.0	43.8	15.3
29.0	43.9	15.5
30.0	43.9	15.8
31.0	44.0	16.0
32.0	44.1	16.2
33.0	44.1	16.4
34.0	44.1	16.7
35.0	44.2	16.9
36.0	44.2	17.1
37.0	44.2	17.4
38.0	44.2	17.6
39.0	44.2	17.8
40.0	44.2	18.0



11. Alvarion Test report



BreezeCOM and Floware unite.
Title: BreezeMAX2500 Broadband Wireless Access System
Model: BMAX-CPE-Si-2.5
FCC ID: LKT-BMAX-SI-25

Alvarion Ltd
21A HaBarzel Street
Tel Aviv 69710 ISRAEL
Tel: + 972-3-6456262
Fax: + 972-3-6456290
www.alvarion.com

Test Report No. BMAX2500-003

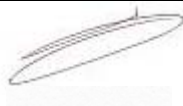

For ALVARION Ltd.

Equipment Under Test:

Broadband Wireless Access System

Name: BreezeMAX 2500 CPE Selfinstall

Model: BMAX-CPE-Si-2.5

	Function/Title	Name	Signature	Date
Prepared By	Q&C Eng.	Nissim Gabay		September 2006
Approved by	Q&C Team Manager	Avner Ruta		September 2006



BreezeCOM and Floware unite.
Title: BreezeMAX2500 Broadband Wireless Access System
Model: BMAX-CPE-Si-2.5
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BreezeCOM and Floware unite.
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BreezeCOM and Floware unite.
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Model: BMAX-CPE-Si-2.5
FCC ID: LKT-BMAX-SI-25

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Tel Aviv 69710 ISRAEL
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Fax: + 972-3-6456290
www.alvarion.com

12. Applicant information

Company: Alvarion Ltd.
Address: 21A Habarzel str, Tel-Aviv, 69710, Israel
The date of test: May –June 2006

Equipment under test information

Test items: Subscriber unit of BreezeMAX 2500 System.
Manufacturer: Alvarion Ltd
Model: BMAX-CPE-Si-2.5
Equipment serial number: N/A

13. Test performance

Location: Alvarion Q&C Section

Purpose of test: Apparatus compliance verification in accordance with emission requirements

Test specifications: 47CFR, part 27.50 (h) (2) , part 27.50 (h) (2) part 27.53 (2) ,part 27.54 part 2.1049, 2.1046 ,2.1055



BreezeCOM and Floware unite.
 Title: BreezeMAX2500 Broadband Wireless Access System
 Model: BMAX-CPE-Si-2.5
 FCC ID: LKT-BMAX-SI-25

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 Tel Aviv 69710 ISRAEL
 Tel: + 972-3-6456262
 Fax: + 972-3-6456290
 www.alvarion.com

14. Summary of test:

The EUT was found to be in compliance with requirements of: part 27, and part 2 §§
 27.50, 27.53, 27.54, 2.1055, 2.1046, 2.1049

Parameter	Subclasses	Date tested	Remarks
Transmitter characteristics			
Occupied bandwidth	2.1049	08 2006	
Output power	27.50(h) (2) 2.1046	08 2006	
Spurious emissions at antenna terminal	27.53	08 2006	
Frequency stability	27.54 2.1055	08 2006	

15. Equipment Under Test description

15.1 General description

BreezeMAX 2500 is Alvarion's WiMAX platform for the licensed 2.5 GHz MMDS frequency band.

It is digital modulated TDD system operating in the 2496MHz up to 2690MHz band with OFDM modulation. The basic system configuration is a one-box configuration that contains a power supply, an Ethernet 10/100BaseT (RJ 45) interface, radio and digital section. In addition it contains an internal array of 6 antennas. In some application an external antenna can be added for better link budget.

Table 1EUT technical characteristics

Transmitter technical characteristics.		Note	
Stand-alone/fixed use		Always at a distance more than 2 m from all people	
Assigned frequency range	2496MHz-2690MHz		
Operating frequency range	2498.5MHz-2687.5MHz		
RF channel spacing	5 MHz		
Maximum rated output power	23 dBm	At transmitter 50 Ω RF output connector	
Antenna connection	Standard connector: SMA-TYPE	Professional installation	
channel bandwidth	5 MHz		
Type of modulation	BPSK, 4QAM, 16QAM, 64QAM		
Type of multiplexing	OFDM		
Modulating test signal (baseband)	PRBS		
Maximum transmitter duty cycle in normal use	50 %		
Transmitter duty cycle supplied for test	100 %		
Antenna information			
Type	Manufacturer	Model	Gain
Internal	Raytron	AN1351	7 dBi
Flat panel	MTI	LA3620110/s	11.5 dBi*

*Note: Cable loss of external antenna 3db see table below

#	MTI P/N	Cable length	Free end conn.	Attenuation @ 2.5GHz
1	MT-850001/M/A	2 Meter	MCX male	3 dB

15.2 EUT test configuration

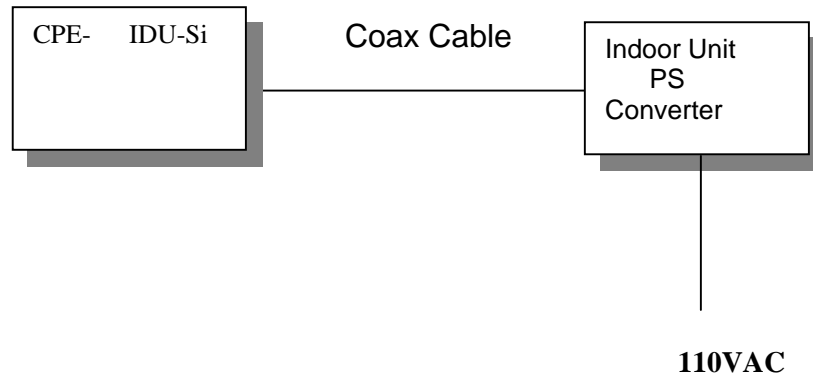


Figure 20CPE station test setup

16. Test results

16.1 Transmitter characteristics

16.1.1. Occupied bandwidth according to § 2.1049

Method of measurement ANSI 63.4 §13.1.7
Ambient Temperature 23⁰ C Relative Humidity 49% Air Pressure 1009 hPa
Operating Frequency Range 2.496 – 2.690 GHz

Table 2 Occupied bandwidth

Carrier frequency MHz	Measured occupied bandwidth, MHz	Reference to Figure number
2498.5	4.71	#2
2593.0	4.74	#3
2687.5	4.74	#4

TEST PROCEDURE

The measurements were performed in transmitting mode at 3 transmitted carrier (minimum, middle and maximum) of the 2496MHz-2690MHz frequency ranges 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	5				
---	---	---	--	--	--	--

Occupied bandwidth test results.

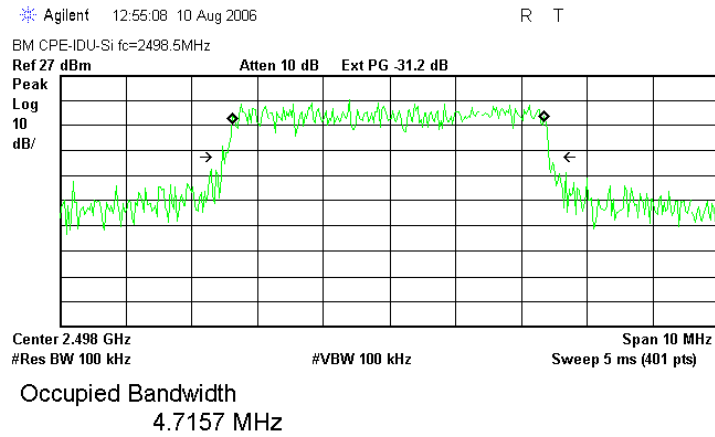


Figure 21 Carrier Frequency 2498.5 MHz

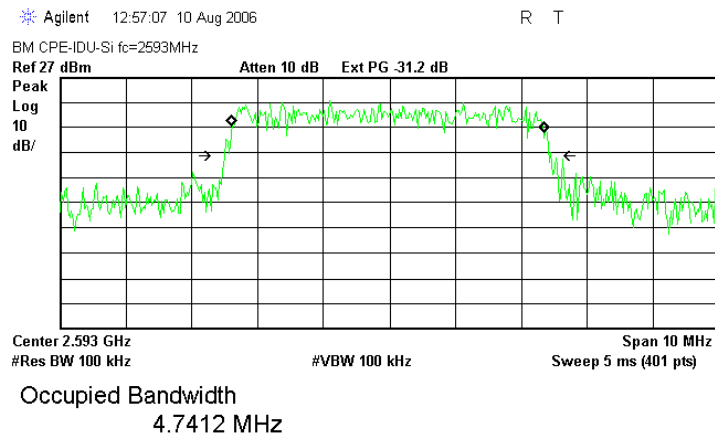


Figure 22 Carrier Frequency 2593 MHz

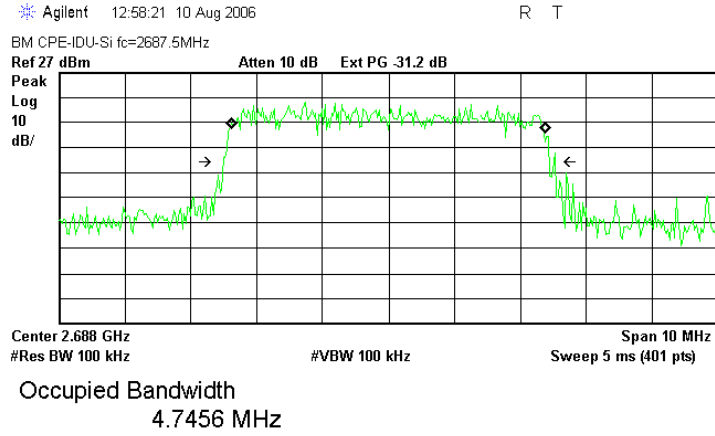


Figure 23 Carrier Frequency 2687.5 MHz



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 FCC ID: LKT-BMAX-SI-25

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16.1.2 Output power test § 27.50(h)(2), 2.1046

Ambient Temperature 23⁰ C Relative Humidity 49% Air Pressure 1009 hPa
 Operating Frequency Range 2496 – 2690 MHz

Table 3 Output power test § 27.50

Carrier frequency MHz	Output power. dBm	Limit power output dBm	Reference to plot number
2498.5	23.2	24.5	#5
2593.0	23.1	24.5	#6
2687.5	23.2	24.5	#7

The following power limits apply to the 2496 – 2690 MHz bands:

Fixed station transmitting are limited to 2W (33 dBm) peak equivalent isotropically radiated power.

Power output at antenna connector=EIRP-Gant max+Cable loss to antenna=33dBm-11.5dBi+3dB=24.5dBm

TEST PROCEDURE

The measurements were performed in transmitting mode at 3 transmitted carrier (minimum, middle and maximum) of the 2.496 - 2.690 GHz frequency ranges 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	4	5				
---	---	---	--	--	--	--

Output power test results.

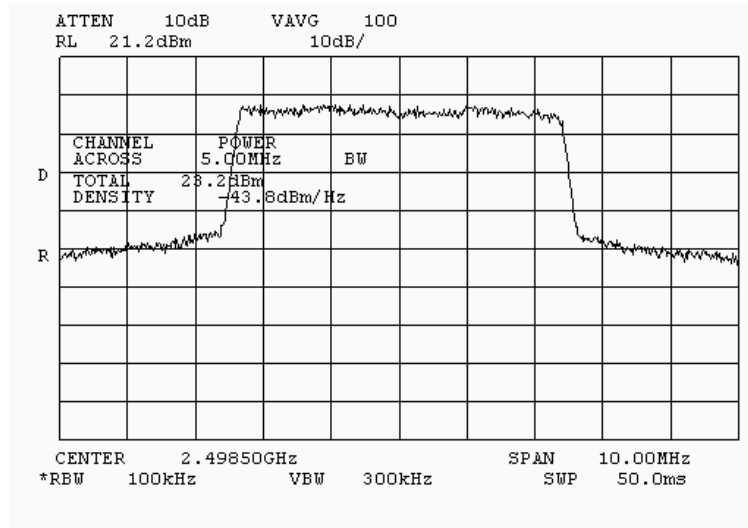


Figure 24 Carrier Frequency 2498.5 MHz

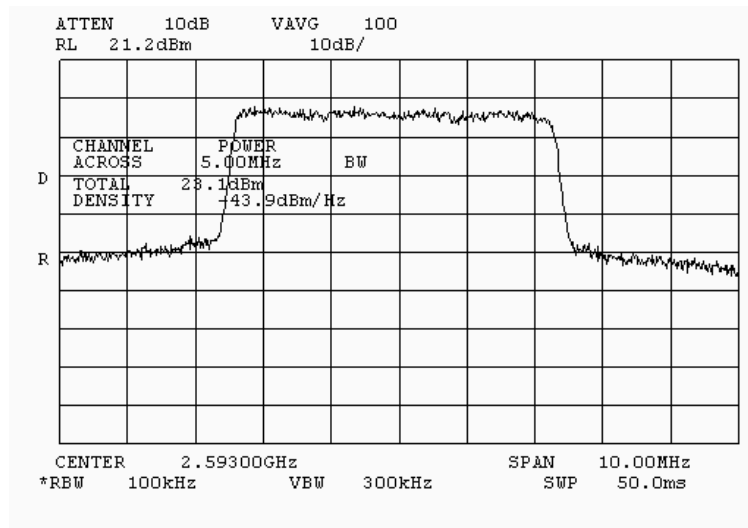


Figure 25 Carrier Frequency 2593.0 MHz

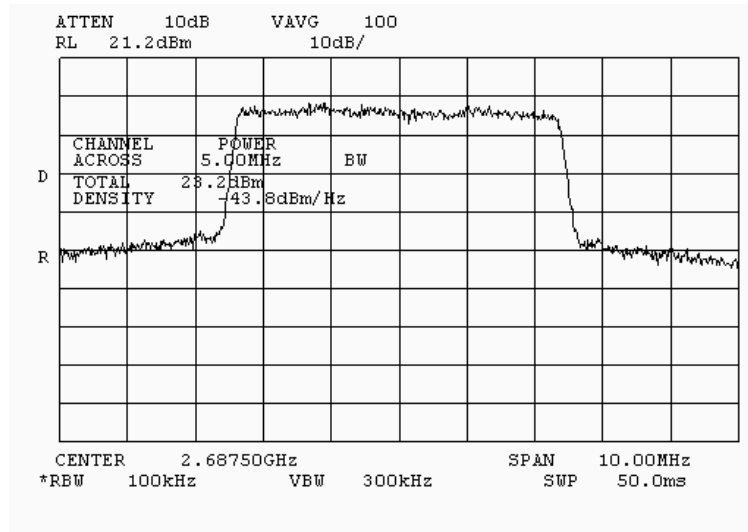


Figure 26 Carrier Frequency 2687.5 MHz.

16.1.3 Spurious emissions at antenna terminal § 27.53(4)

Ambient Temperature 23⁰ C Relative Humidity 49% Air Pressure 1009 hPa
Operating Frequency Range 2.496 – 2.690 GHz

Table 4 Spurious emissions (Carrier frequencies – 2498.5 MHz.)

Frequency, MHz	Spurious emission level, dBm	Spurious emissions calculated limit, dBm	Margin dB	Reference to Figure number
2490.3	-42.13	-13	-29.13	#10
2493.983	-19.97	-13	-6.97	#11
2494-2495	-21.9	-13	-8.9	#12
2495-2496	-16.5	-13	-3.5	#13
2501-2502	-20.9	-13	-7.9	#14
2502-2503	-23.6	-13	-10.6	#15
2503.041	-20.3	-13	-7.3	#16
2506.97	-41.3	-13	-28.3	#17

Table 5 Spurious emissions Carrier (frequencies – 2593 MHz.)

Frequency, MHz	Spurious emission level, dBm	Spurious emissions calculated limit, dBm	Margin dB	Reference to Figure number
2585	-40.97	-13	-27.97	#23
2588.477	-19.13	-13	-6.13	#24
2589.5-2590.5	-17.2	-13	-4.2	#25
2595.5-2596.5	-22.5	-13	-9.5	#26
2596.5-2597.5	-25.4	-13	-12.4	#27
2601	-42.97	-13	-29.97	#29
3573	-53.63	-13	-40.63	#30

Table 6 Spurious emissions (Carrier frequencies – 2687.5 MHz.)

Frequency, MHz	Spurious emission level, dBm	Spurious emissions calculated limit, dBm	Margin dB	Reference to Figure number
2682.983	-18.63	-13	-5.63	#36
2683.76	-29.8	-13	-16.8	#37
2684-2685	-16.2	-13	-3.2	#38
2690-2691	-21.5	-13	-8.5	#39
2691-2692	-24.1	-13	-11.1	#40
2696	-49.47	-13	-36.47	#42
7170	-52.3	-13	-39.3	#43



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* The frequency spectrum was investigated from the lowest radio frequency signal generated in the equipment, without going below 5MHz, up to the tenth harmonic of the highest fundamental frequency. The emission levels of the EUT in average mode 20 dB lower than the specified limit were not recorded in the table above. For the test results refer to Plots in figures: 08-45

The EUT RF output was connected to the Spectrum Analyzer through appropriate attenuator and accounted with cable loss in SA settings.

LIMIT

For operation in the bands 2496 –2690 MHz, the power of any emissions outside the licensed frequency band(s) of operation shall be attenuated outside of permitted frequency band ,measured in watts, as follow: $43+10\log(P)$ dB =-13 dBm

TEST PROCEDURE

The measurements were performed in transmitting mode at 3 transmitted carrier (minimum, middle and maximum) of the 2.496 - 2.690 GHz frequency ranges 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	4	5				
---	---	---	--	--	--	--

Spurious emissions at antenna terminal test results.

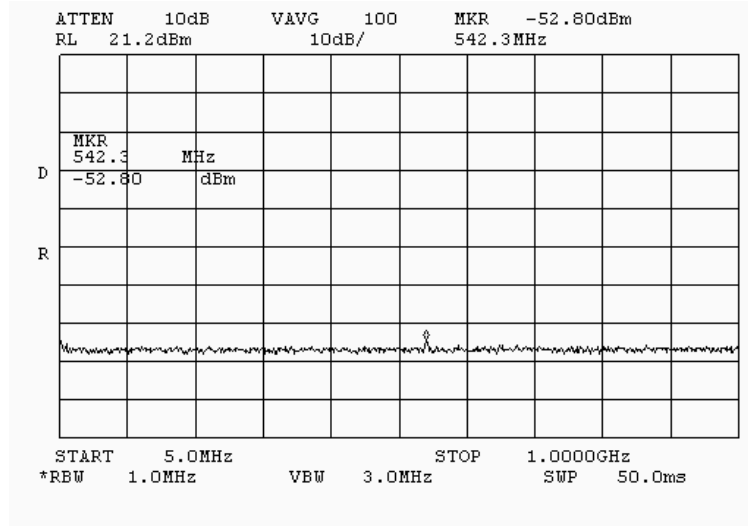


Figure 27 Frequency carriers 2498.5 MHz.

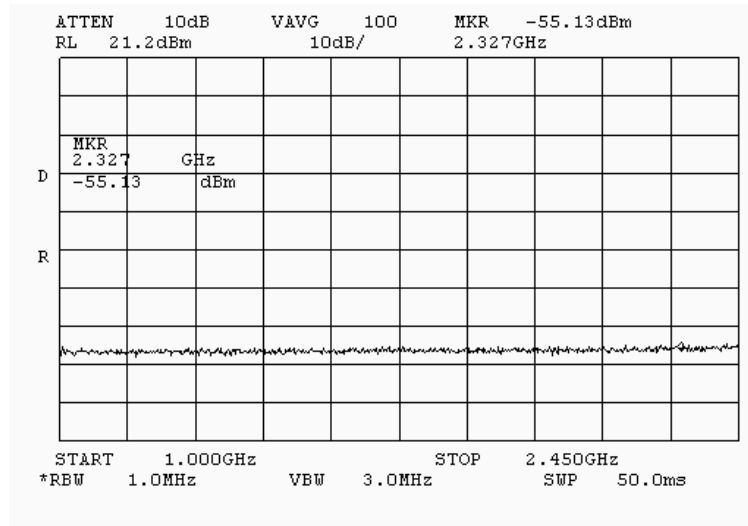


Figure 28 Frequency carriers 2498.5 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB.

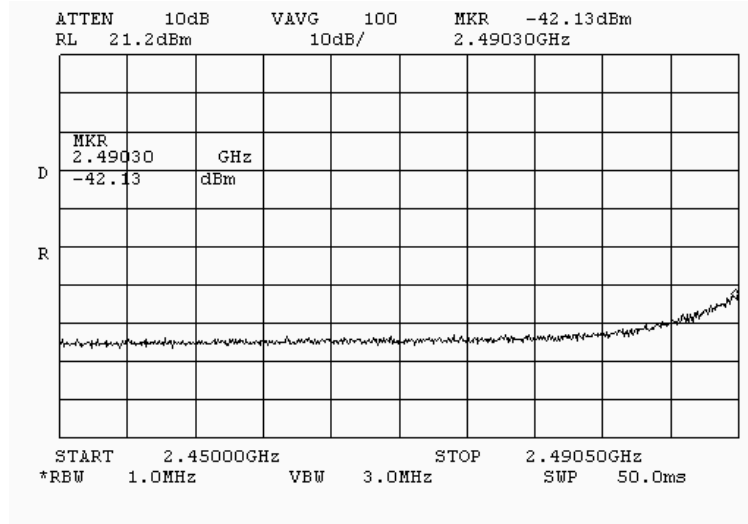


Figure 29 Frequency carriers 2498.5 MHz.

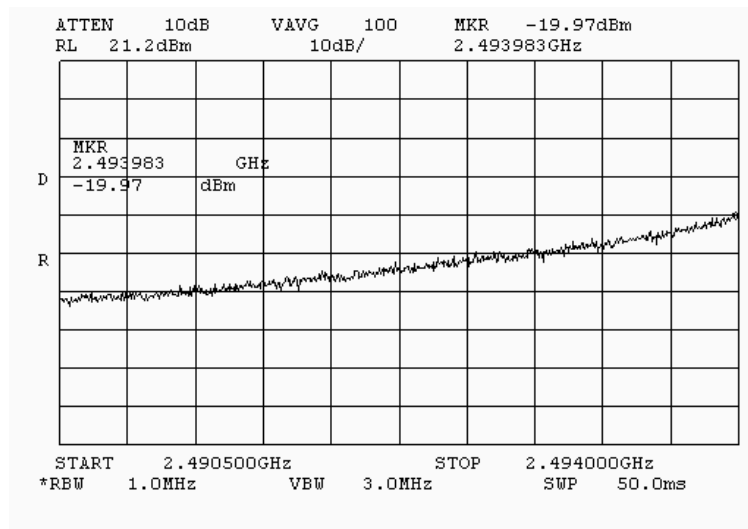


Figure 30 Frequency carriers 2498.5 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB.

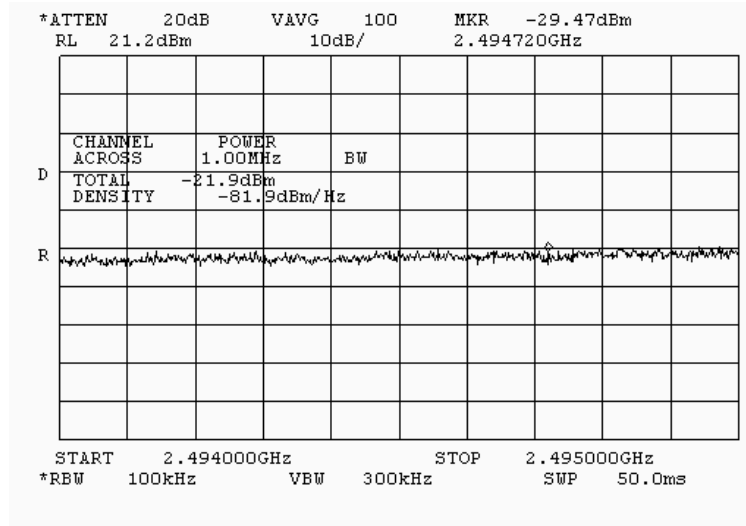


Figure 31 Frequency carriers 2498.5 MHz.

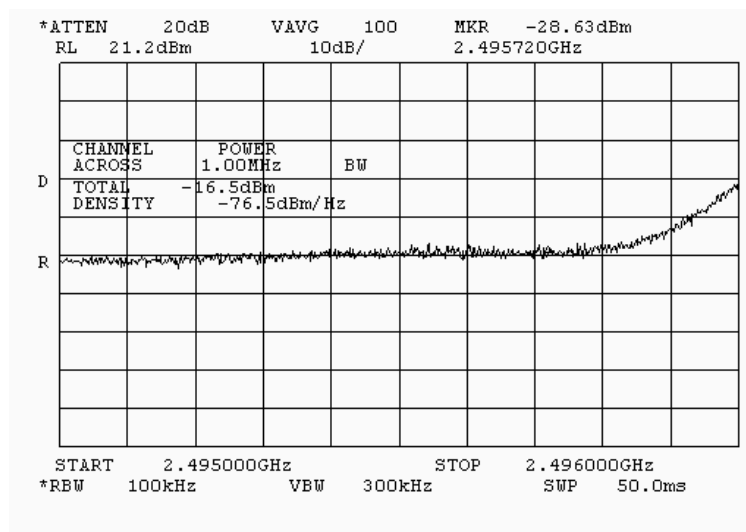


Figure 32 Frequency carriers 2498.5 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB.

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FCC ID: LKT-BMAX-SI-25

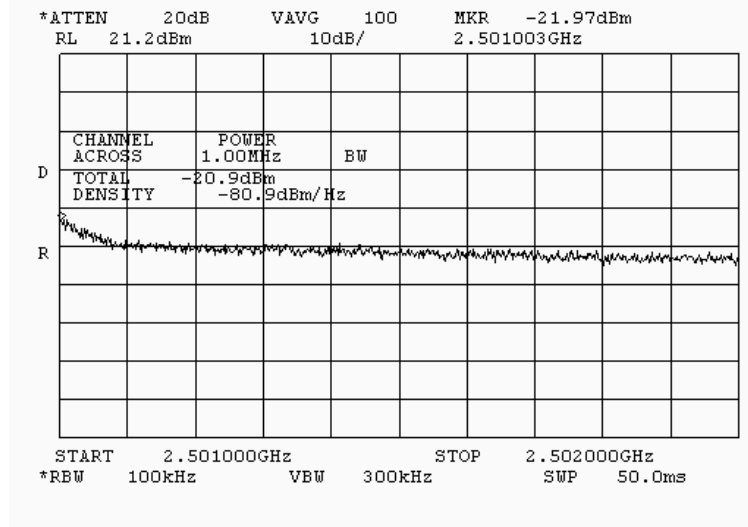


Figure 33 Frequency carriers 2498.5 MHz.

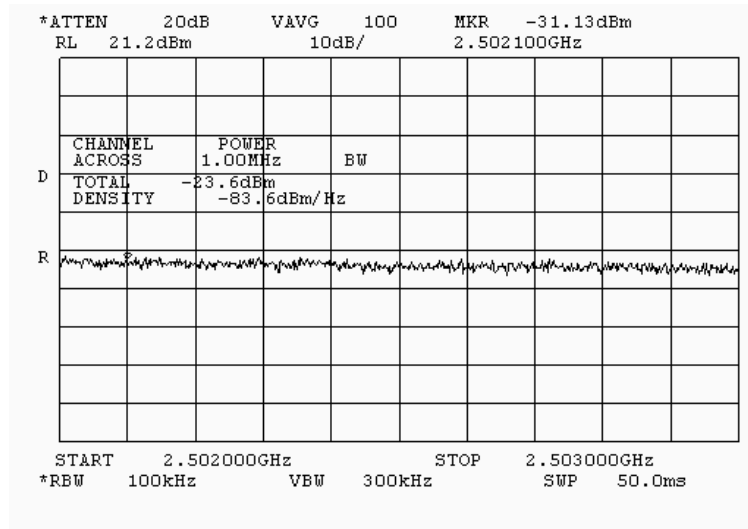


Figure 34 Frequency carriers 2498.5 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB.

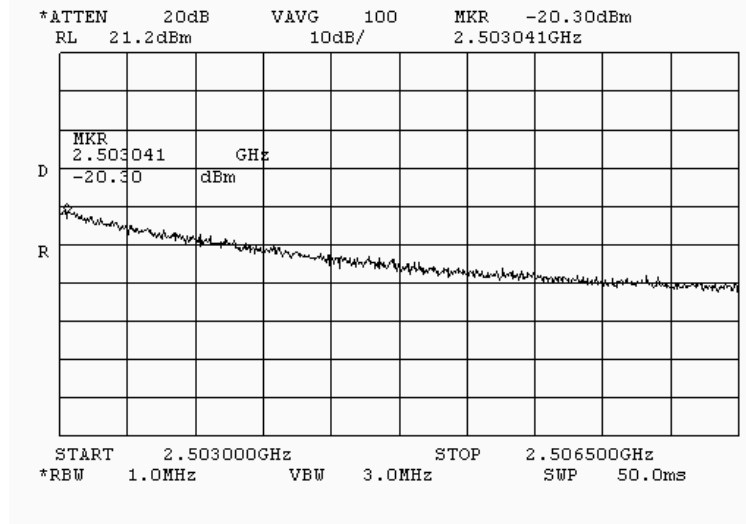


Figure 35 Frequency carriers 2498.5 MHz.

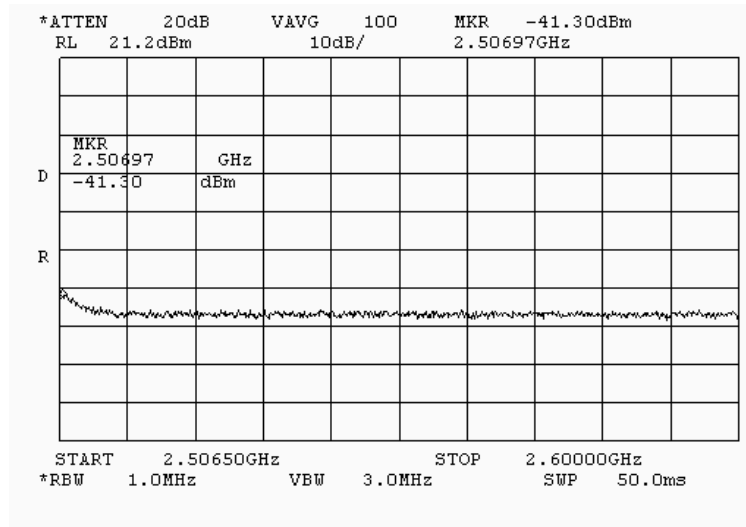


Figure 36 Frequency carriers 2498.5 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB

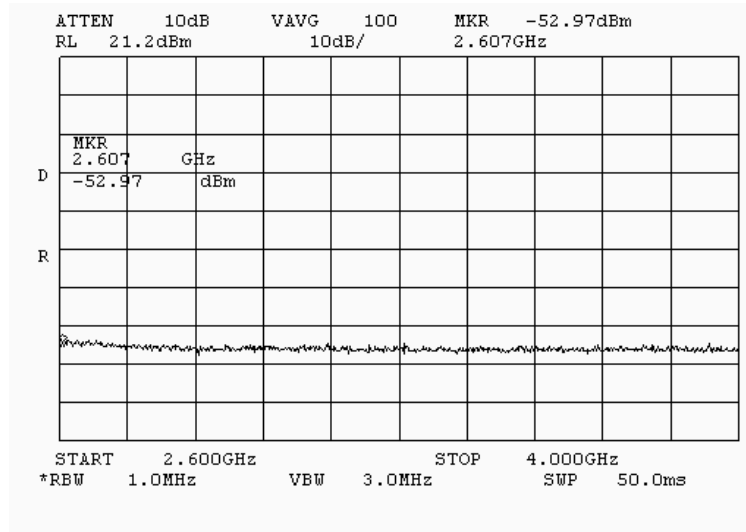


Figure 37 Frequency carriers 2498.5 MHz.

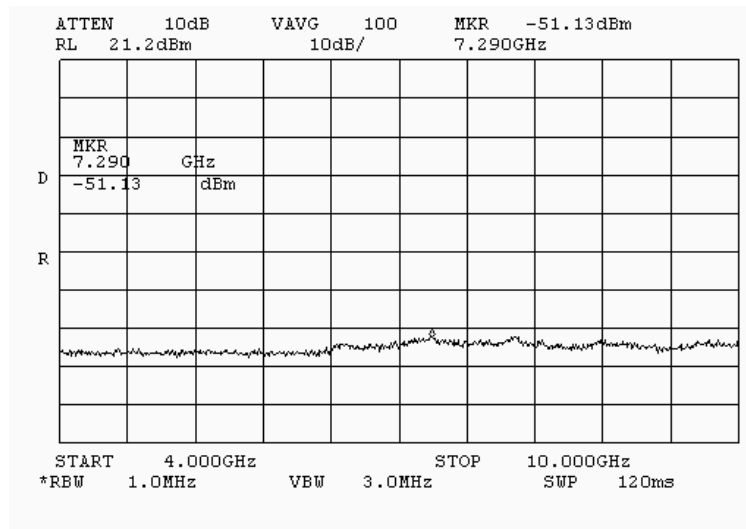


Figure 38 Frequency carriers 2498.5 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB

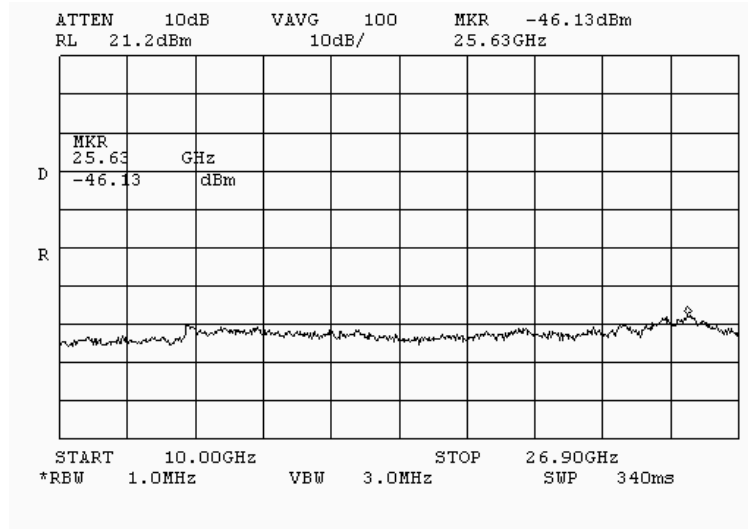


Figure 39 Frequency carriers 2498.5 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB

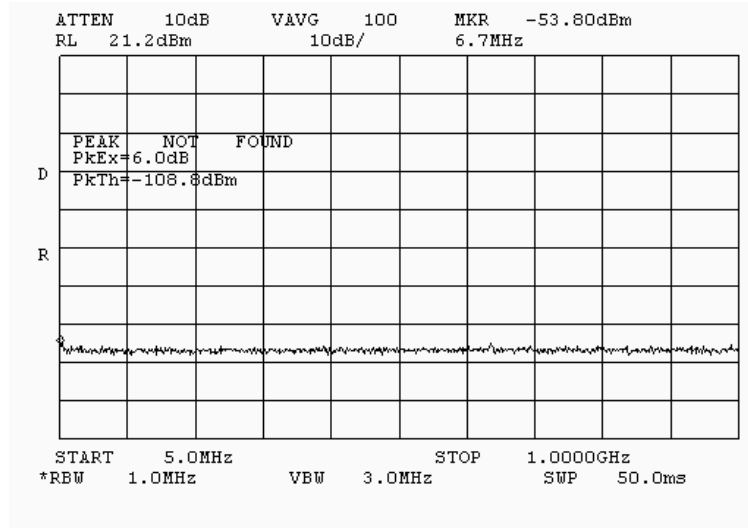


Figure 40 Frequency carriers 2593 MHz.

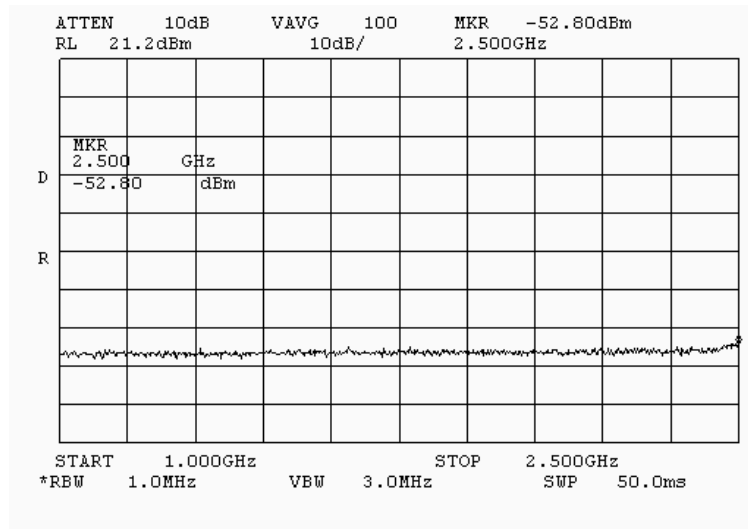


Figure 41 Frequency carriers 2593 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB

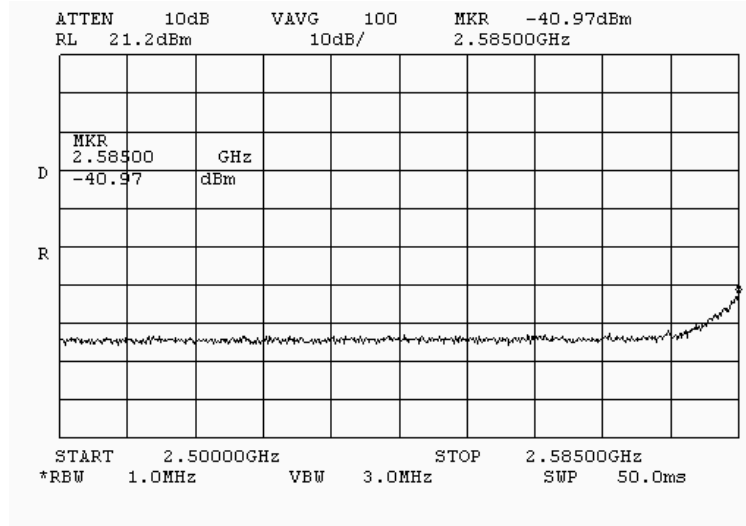


Figure 42 Frequency carriers 2593 MHz.

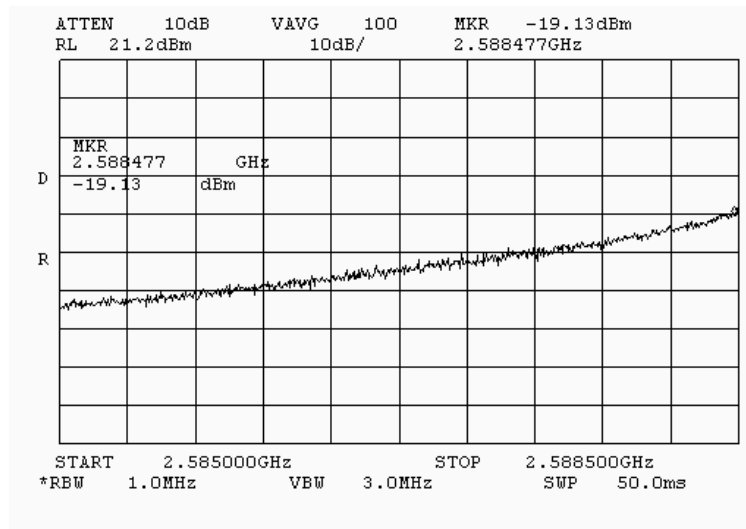


Figure 43 Frequency carriers 2593 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB

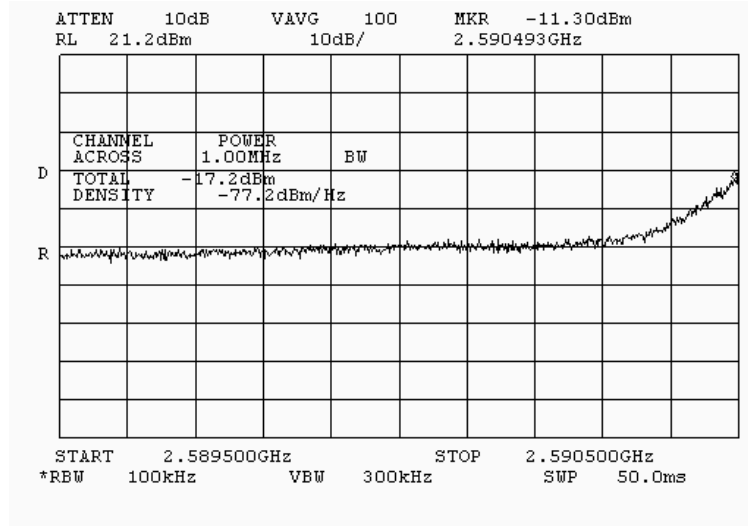


Figure 44 Frequency carriers 2593 MHz.

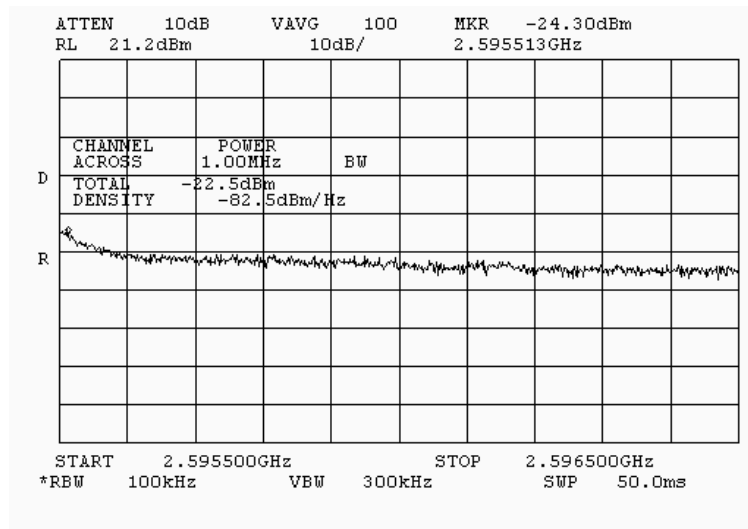


Figure 45 Frequency carriers 2593 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB

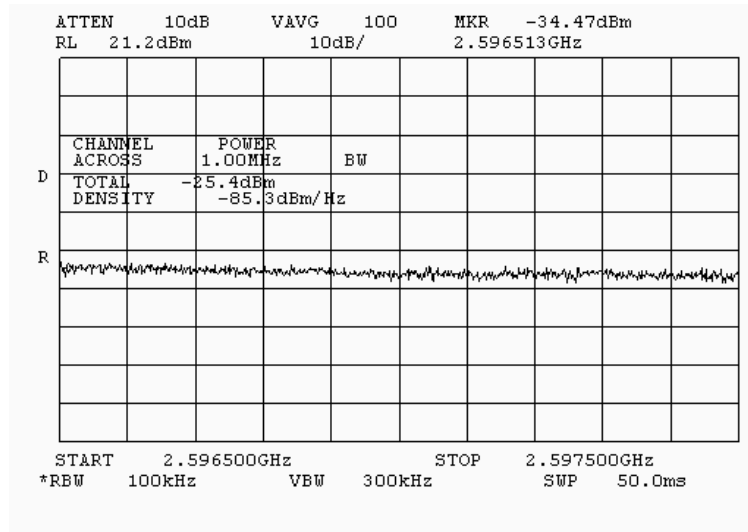


Figure 46 Frequency carriers 2593 MHz.

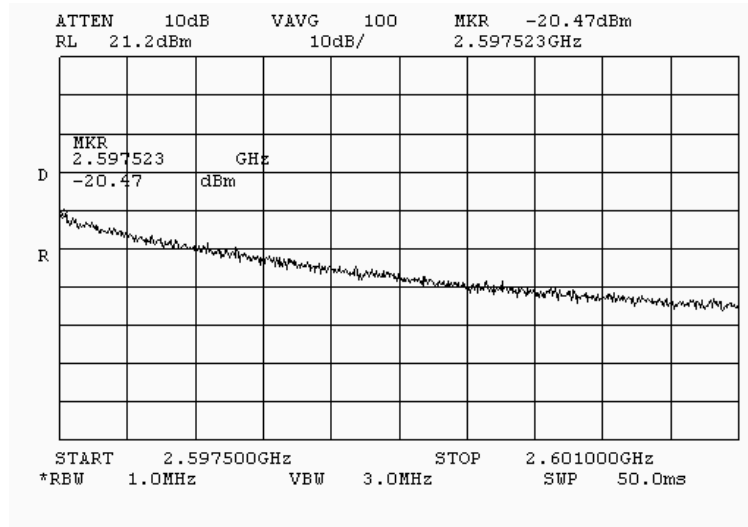


Figure 47 Frequency carriers 2593 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB

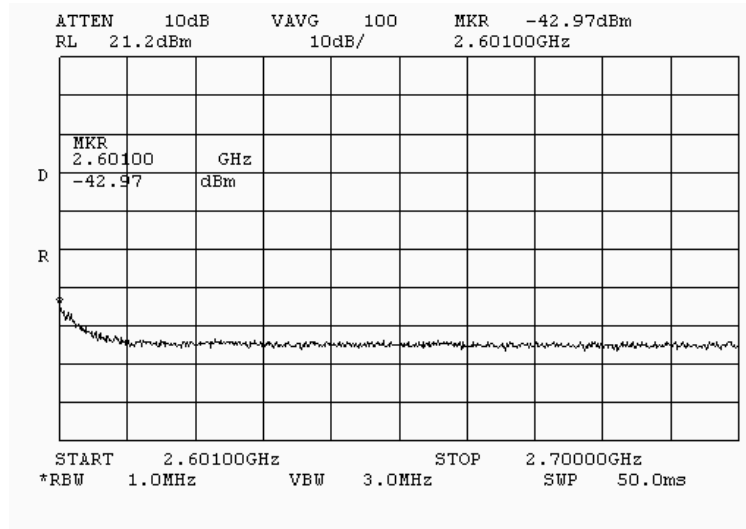


Figure 48 Frequency carriers 2593 MHz.

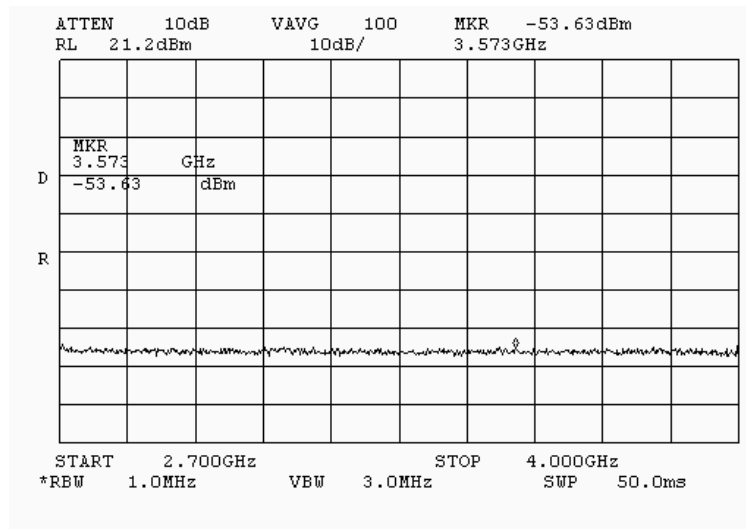


Figure 49 Frequency carriers 2593 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB

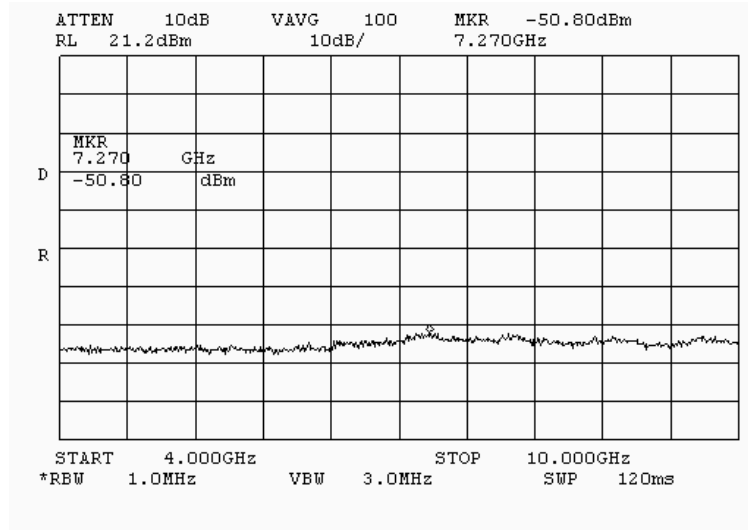


Figure 50 Frequency carriers 2593 MHz.

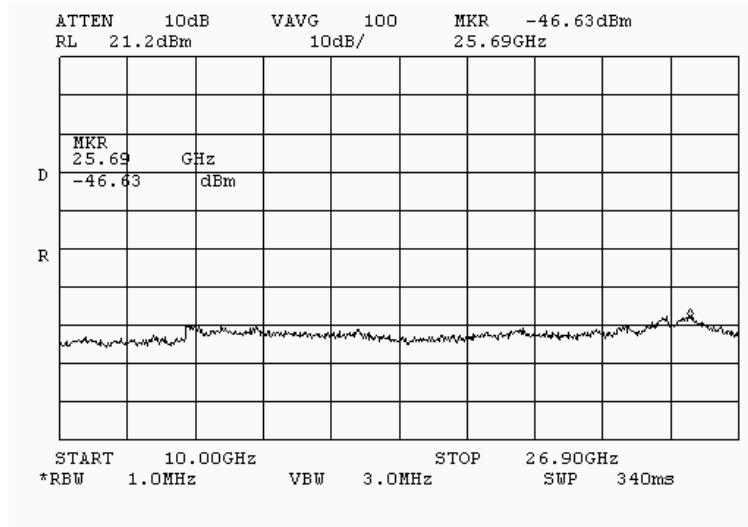


Figure 51 Frequency carriers 2593 MHz.

External attenuator = 20 dB Cable loss = 1.2 dB

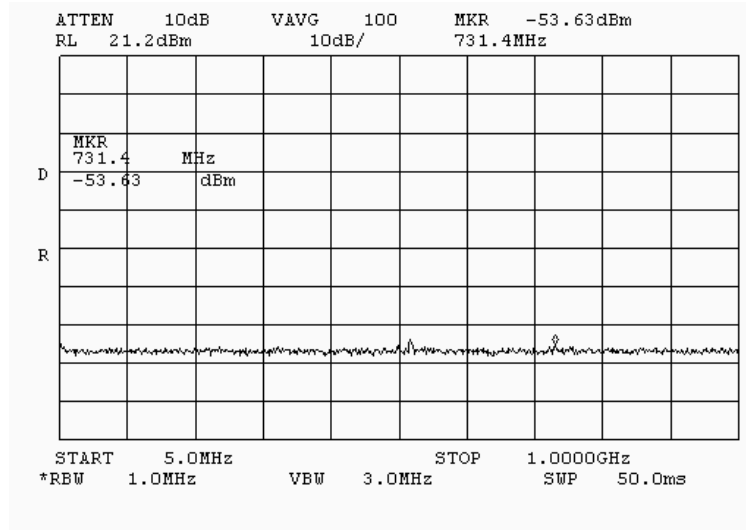


Figure 52 Frequency carriers 2687.5 MHz

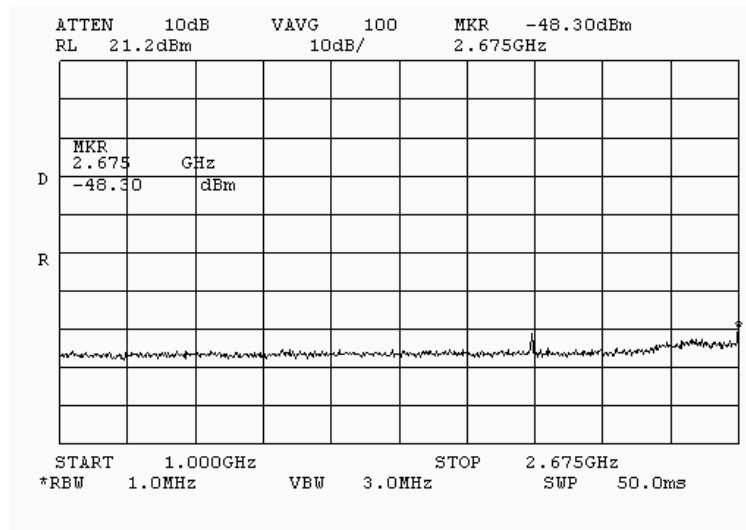


Figure 53 Frequency carriers 2687.5 MHz

External attenuator = 20 dB Cable loss = 1.2 dB

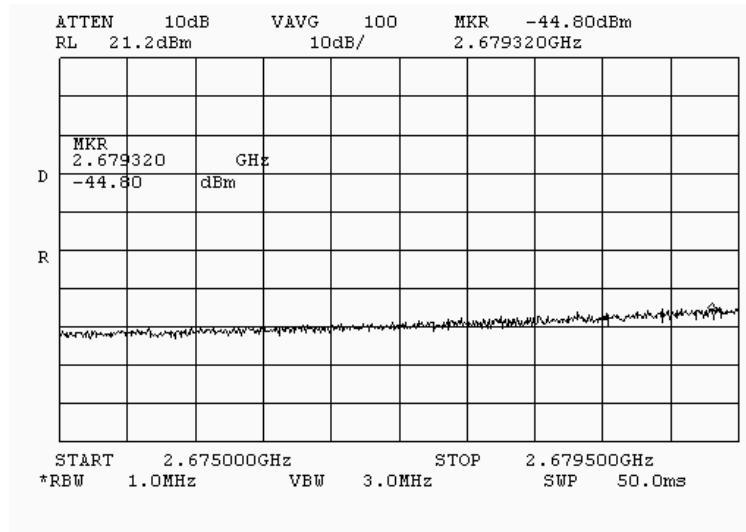


Figure 54 Frequency carriers 2687.5 MHz

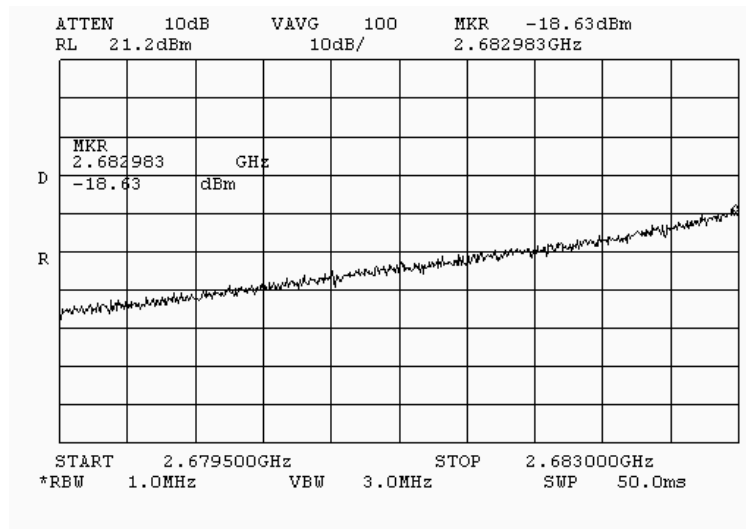


Figure 55 Frequency carriers 2687.5 MHz

External attenuator = 20 dB Cable loss = 1.2 dB

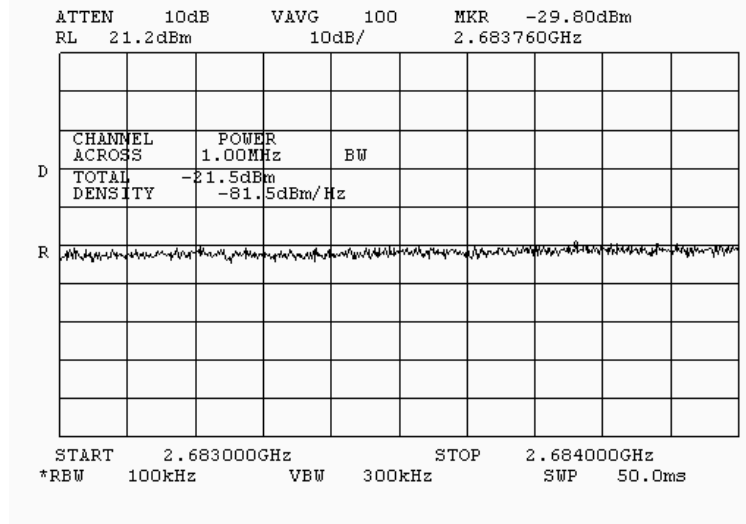


Figure 56 Frequency carriers 2687.5 MHz

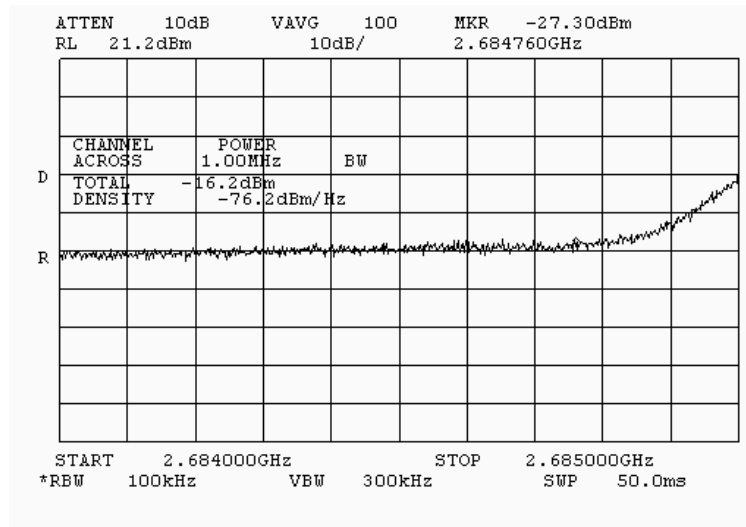


Figure 57 Frequency carriers 2687.5 MHz

External attenuator = 20 dB Cable loss = 1.2 dB

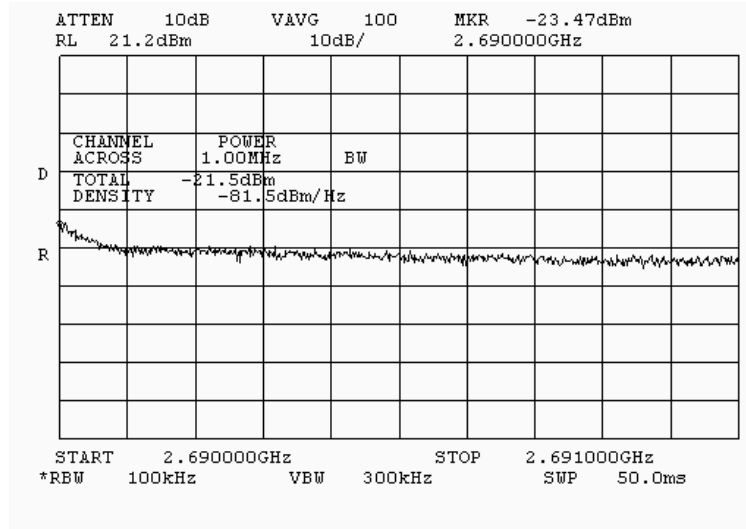


Figure 58 Frequency carriers 2687.5 MHz

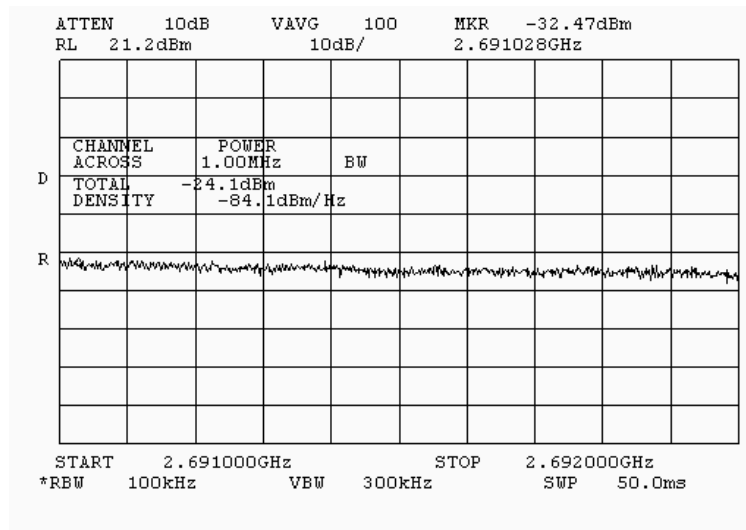


Figure 59 Frequency carriers 2687.5 MHz

External attenuator = 20 dB Cable loss = 1.2 dB

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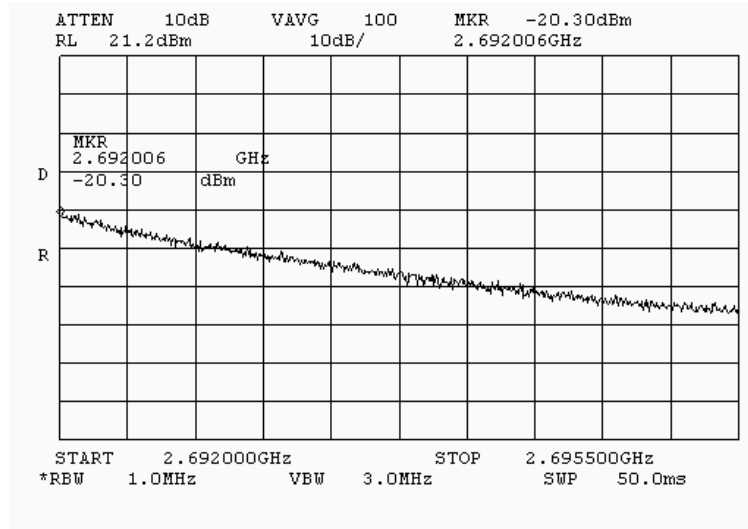


Figure 60 Frequency carriers 2687.5 MHz

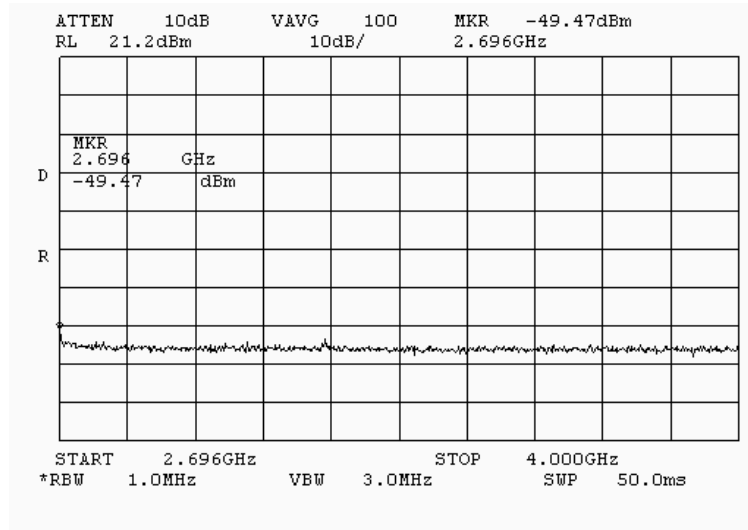


Figure 61 Frequency carriers 2687.5 MHz

External attenuator = 20 dB Cable loss = 1.2 dB

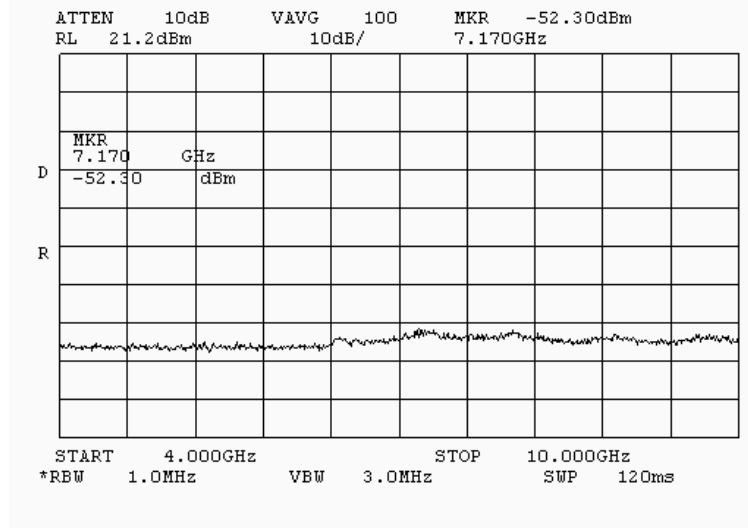


Figure 62 Frequency carriers 2687.5 MHz

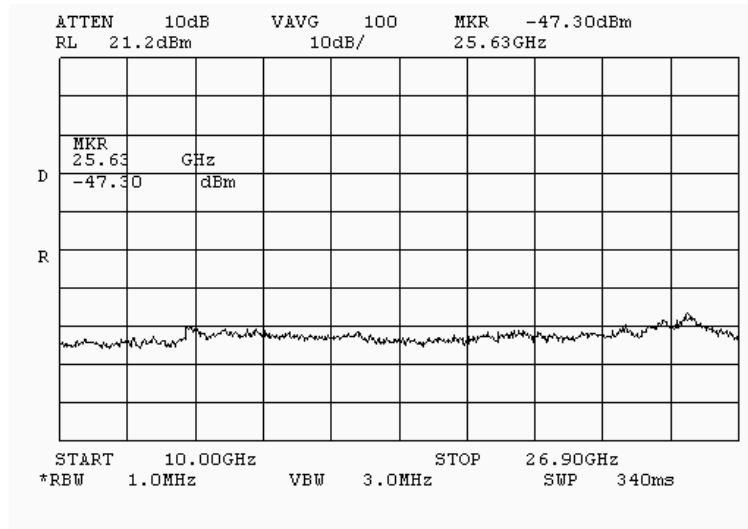


Figure 63 Frequency carriers 2687.5 MHz

External attenuator = 20 dB Cable loss = 1.2 dB



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16.1.4. Frequency stability test according to § 27.54,2.1055

Ambient Temperature 23⁰ C Relative Humidity 49% Air Pressure
 1009 hPa
 Operating Frequency Range 2.496 – 2.690 GHz.

Nominal voltage=115VAC

Table 7 Frequency stability test according to § 27.54

Temperature	Extreme Voltage/VAC	2.498490430	2.687490380
-30°C	97.75	2.498490470	2.687490180
	132.25	2.498487180	2.687485540
-20°C	97.75	2.498487090	2.687485710
	132.25	2.498480510	2.687479950
-10°C	97.75	2.498480590	2.687479790
	132.25	2.498477450	2.687475110
0°C	97.75	2.498477510	2.687475320
	132.25	2.498486390	2.687486570
10°C	97.75	2.498486620	2.687486200
	132.25	2.498474700	2.687472450
20°C	97.75	2.498474620	2.687472530
	132.25	2.498471360	2.687469510
30°C	97.75	2.498471330	2.687469380
	132.25	2.498470200	2.687467800
40°C	97.75	2.498470300	2.687467730
	132.25	2.498469070	2.687466690
50°C	97.75	2.498469080	2.687466680
	132.25	2.498490430	2.687490380

TEST PROCEDURE

The EUT was placed in a climatic chamber and allowed to stabilize at 20°C temperature and nominal voltage for at list 15 min. The reference carrier frequency was taken. The temperature in climatic chamber was varied from -30°C to +50°C and input voltage was changed from 85% of nominal to 115% in turn. Frequency changes were noted in table above.

LIMIT

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

TEST EQUIPMENT USED:

1	4	5	6			
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17. APPENDIX A Photos

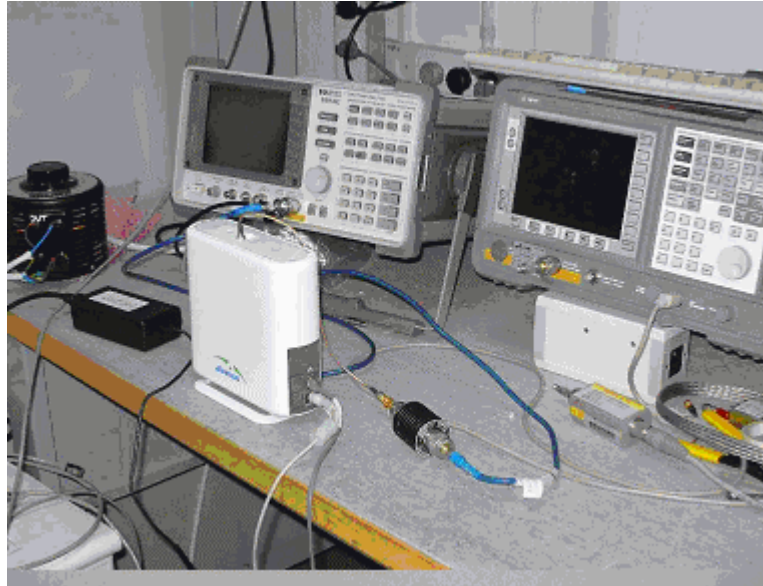


Photo1 Indoor unit. Test setup

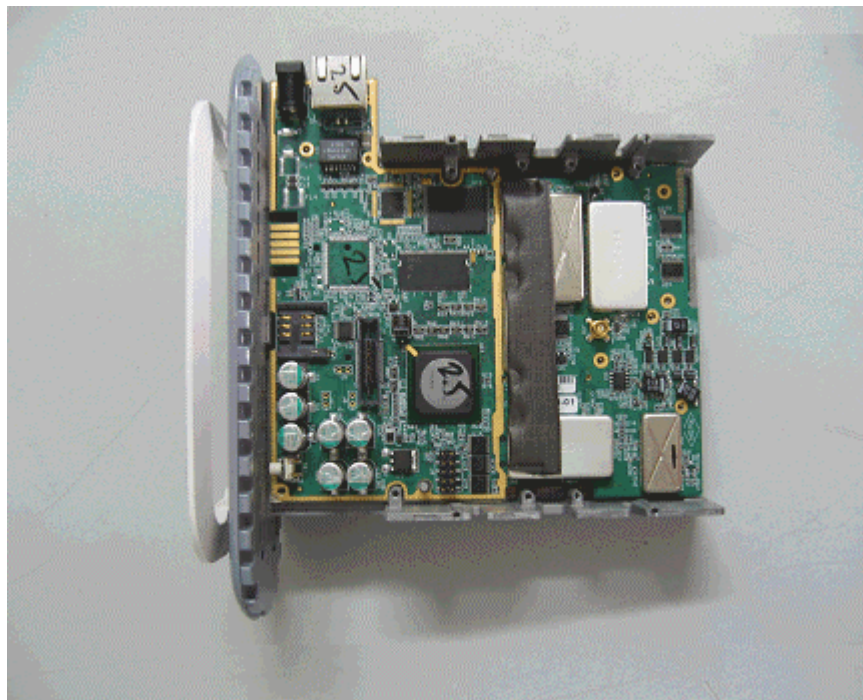


Photo 2 CPE Si internal view

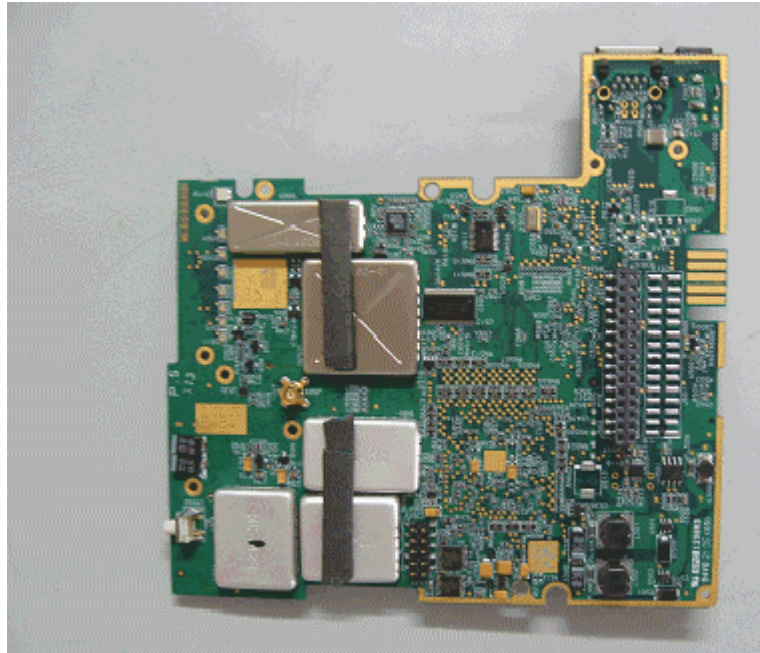


Photo 3 CPE Si internal view , PS with RF cover

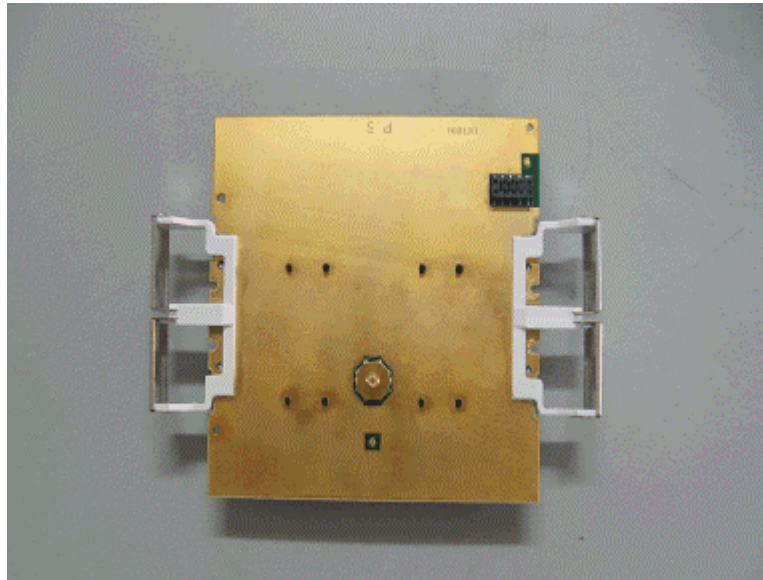


Photo 4 CPE Si internal antenna 1-4 PS view

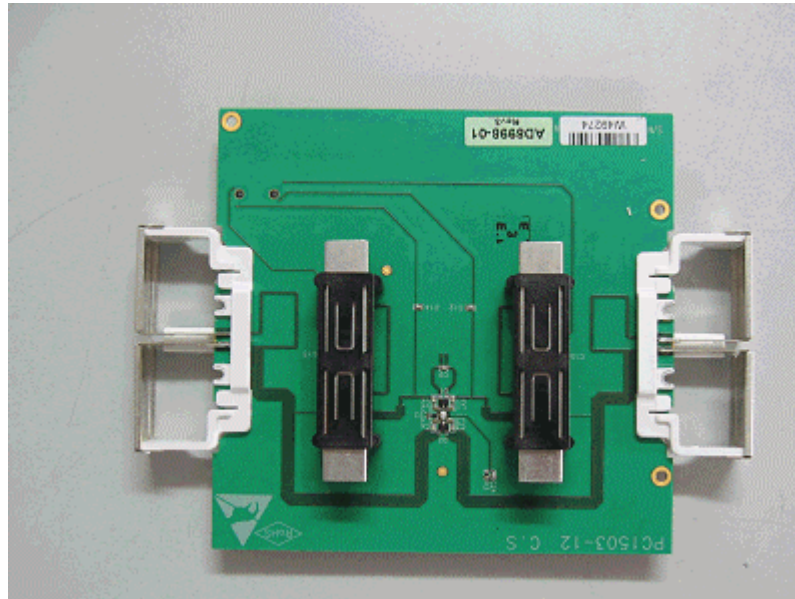


Photo 5 CPE Si internal antenna 1-4 CS view

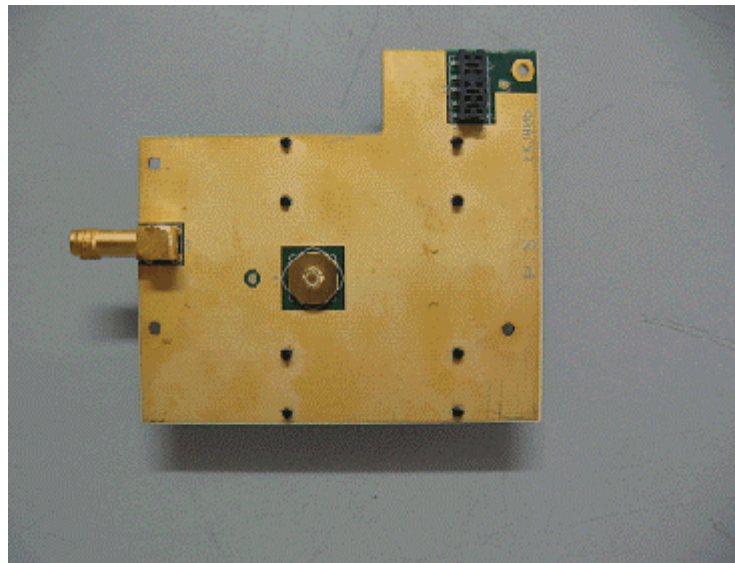


Photo 6 CPE Si internal antenna 5,6 PS view

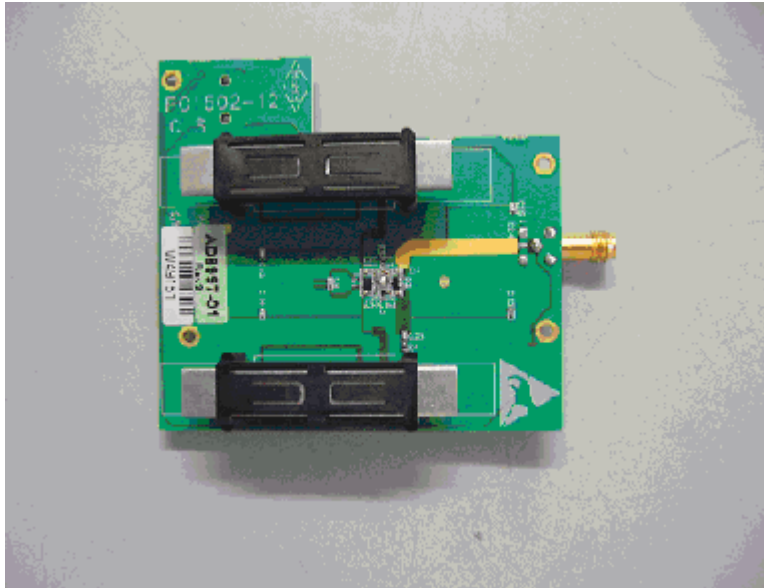


Photo 7CPE Si internal antenna 5,6 CS view



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18. APPENDIX B Equipment used

Table 8 Test equipment used

No	Description	Manufacturer information			Due Calibration date
		Name	Model No	Serial No	
1	Spectrum Analyzer 9 kHz - 26.5 GHz	Agilent	E4407B	40241724	July 2007
2	Spectrum analyzer 9 KHz-40 GHz	HP	8563E	A01508	July 2007
3	Attenuators 30 dB DC - 18 GHz	Weinshell Engineering	33-30-34	A3451	July 2007
4	Attenuators 20 dB DC - 18 GHz	MACOM	2082-6043- 20	NA	July 2007
5	Cable RF 2m	Huber- Suhner	Sucoflex 104	21324/4PE	NA
6	Variable Voltage Transformer	SLIDEUP	SB-2 500VA	980227	NA

19. APPENDIX C Abbreviations

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

Specification references

47 CFR part 2
Part 27

Radio Frequency Devices

ANSI C63.4: 2003

American National Standard for Method of
Measurements of Radio-Noise Emissions from
Low-Voltage Electrical and Electronic Equipment
in the Range of 9 kHz to 40 GHz