

FCC PART 15B TEST REPORT
On Behalf of
Pismo Labs Technology Limited

Pepwave Wireless Product
Model No.: Pismo 325, Surf series, AP series, Mesh Connector series, MAX series

Prepared for : Pismo Labs Technology Limited
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Prepared By : Anbotek Compliance Laboratory Limited
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Report Number : 201106797F
Date of Test : Jul. 01~09, 2011
Date of Report : Jul. 19, 2011

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TEST REPORT VERIFICATION

Applicant : Pismo Labs Technology Limited
Manufacturer : Pismo Labs Technology Limited
EUT : Pepwave Wireless Product
Model No. : Pismo 325, Surf series, AP series, Mesh Connector series, MAX series
Rating : 12V $\overline{=}$, 1A
Trade Mark : Pepwave

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart B 2010 & FCC / ANSI C63.4-2009

The device described above is tested by Anbotek Compliance Laboratory Limited To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and Anbotek Compliance Laboratory Limited Is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Anbotek Compliance Laboratory Limited

Date of Test : Jul. 01~09, 2011

Prepared by : Well Wang
(Engineer/ Well Wang)

Reviewer : Coco Xiang
(Project Manager/ Coco Xiang)

Approved & Authorized Signer : Henry Yang
(Manager/ Henry Yang)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	: Pepwave Wireless Product
Model Number	: Pismo 325, Surf series, AP series, Mesh Connector series, MAX series (Note: All samples are the same except the model number & software of appliances, so we prepare “Pismo 325” for EMC test only.)
Test Power Supply	: 120V~, 60Hz for Adapter
Switching Adapter	: Model: DSA-12G-12 FUS 120120 Input: 100~240V~ 50/60Hz 0.3A Output: 12V--- 1A UL, FCC
Antenna Gain	: 5dBi
Antenna Type	: Detachable antenna with a unique reverse SMA connector
Applicant	: Pismo Labs Technology Limited
Address	: Room 1703A, 17/F, Park Building 476 Castle Peak Road, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer	: Pismo Labs Technology Limited
Address	: Room 1703A, 17/F, Park Building 476 Castle Peak Road, Cheung Sha Wan, Kowloon, Hong Kong
Date of Sample received	: Jun. 30, 2011
Date of Test	: Jul. 01~09, 2011

1.2. Auxiliary Equipment Used during Test

PC	: Manufacturer: DELL M/N: OPTIPLEX 380 S/N: 1J63X2X CE , FCC: DOC
MONITOR	: Manufacturer: DELL M/N: E170Sc S/N: CN-00V539-64180-055-0UPS CE , FCC: DOC
KEYBOARD	: Manufacturer: DELL M/N: SK-8115 S/N: CN-0DJ313-71616-06C-02XN CE , FCC: DOC
MOUSE	: Manufacturer: DELL M/N: M-UARDEL7 S/N: N/A CE , FCC: DOC
USB Cable	: 0.5m, SHIELD

1.3. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS - LAB Code: L3503

Anbotech Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021

Anbotech Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 752021, August 20, 2010

IC-Registration No.: 8058A-1

Anbotech Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A-1, August 30, 2010

Test Location

All Emissions tests were performed

Anbotech Compliance Laboratory Limited. at 1/F, 1 /Build, SEC Industrial Park, No. 4 Qianhai Road, Nanshan District, Shenzhen, 518054, China

1.4. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.3dB

Conduction Uncertainty : Uc = 3.4dB

1.5. Test Summary

For the EUT described above. The standards used were FCC Part 15 Subpart B for Emissions.

Table 1 : Tests Carried Out Under FCC Part 15 Subpart B

Standard	Test Items	Status
FCC Part 15 Subpart B	Power Line Conducted Emission Test (150KHz To 30MHz)	√
FCC Part 15 Subpart B	Radiated Emission Test (30MHz To 1000MHz)	√

√ Indicates that the test is applicable

x Indicates that the test is not applicable

2. POWER LINE CONDUCTED MEASUREMENT

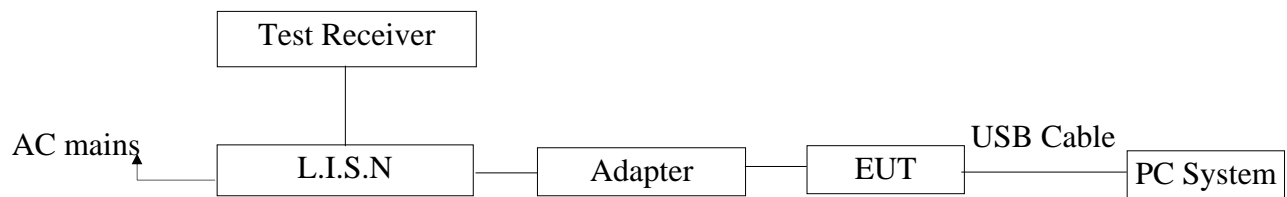
2.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Nov. 12, 2010	1 Year
2.	Two-Line V-network	Rohde & Schwarz	ENV216	10055	May 19, 2011	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 19, 2011	1 Year
4.	EMI Test Software	ES-K1	N/A	N/A	N/A	N/A

2.2. Block Diagram of Test Setup

2.2.1. Block diagram of connection between the EUT and simulators



(EUT: Pepwave Wireless Product)

2.3. Power Line Conducted Emission Measurement Limits (FCC Part 15

Class B)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

2.4. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

EUT : Pepwave Wireless Product
Model Number : Pismo 325
Applicant : Pismo Labs Technology Limited

2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown as Section 2.2.

2.5.2. Turn on the power of all equipment.

2.5.3. Let the EUT work in test mode (Ping Test) and measure it.

2.6. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.4-2009 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test result are reported on Section 2.7.

2.7. Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150KHz to 30 MHz is investigated.

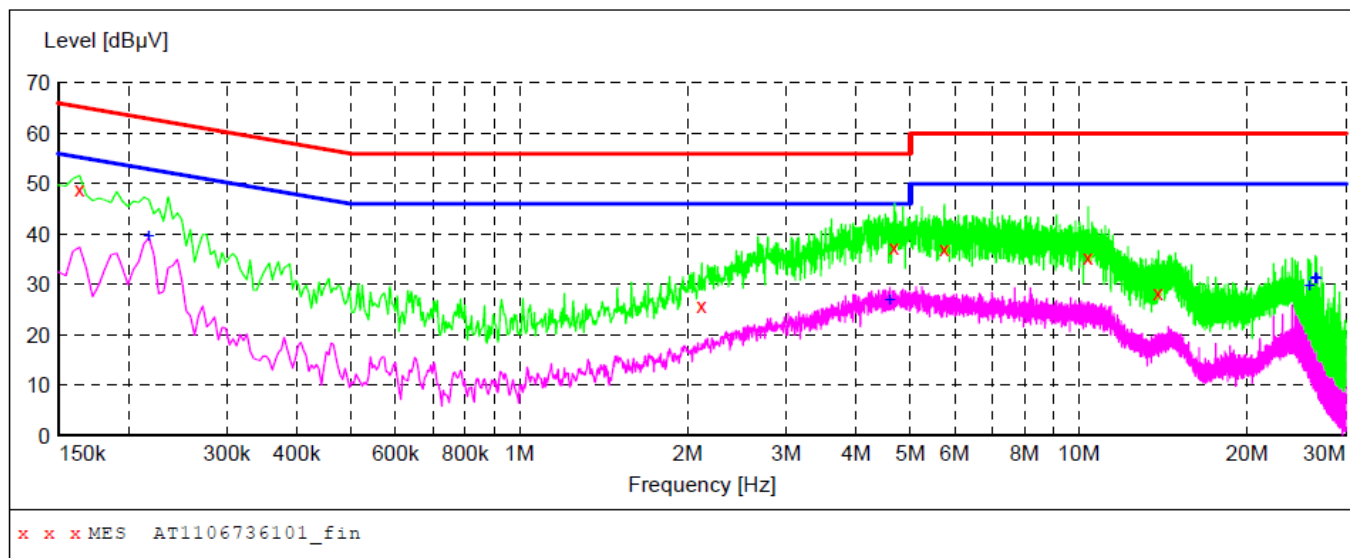
The test curves are shown in the following pages.

CONDUCTED EMISSION TEST DATA

EUT: Pepwave Wireless Product M/N:Pismo 325
 Operating Condition: Ping Test
 Test Site: 1# Shielded Room
 Operator: WELL WANG
 Test Specification: 120V~, 60Hz for Adapter
 Comment: L
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages

**MEASUREMENT RESULT: "AT1106736101_fin"**

7/4/2011 9:32AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.163500	48.90	10.2	65	16.4	QP	L1	GND
2.116500	25.90	10.4	56	30.1	QP	L1	GND
4.678500	37.50	10.5	56	18.5	QP	L1	GND
5.749500	37.00	10.5	60	23.0	QP	L1	GND
10.393500	35.50	10.6	60	24.5	QP	L1	GND
13.872000	28.40	10.8	60	31.6	QP	L1	GND

MEASUREMENT RESULT: "AT1106736101_fin2"

7/4/2011 9:32AM

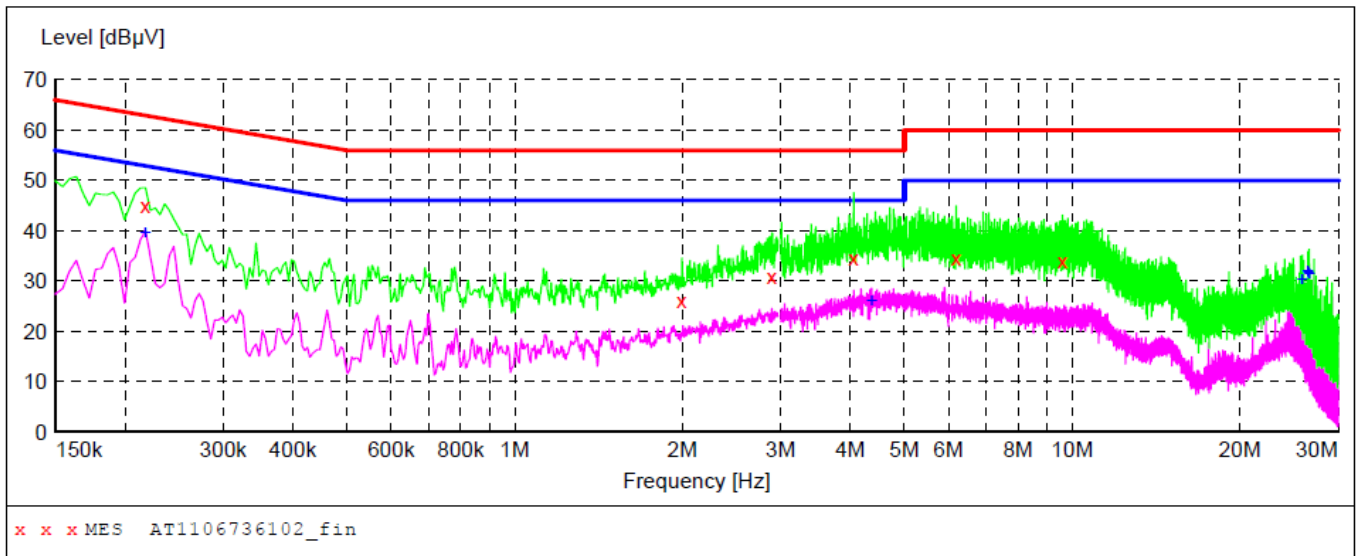
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.217500	39.60	10.2	53	13.3	AV	L1	GND
4.593000	26.90	10.5	46	19.1	AV	L1	GND
25.878000	29.80	11.0	50	20.2	AV	L1	GND
26.485500	31.30	11.0	50	18.7	AV	L1	GND
26.548500	31.50	11.0	50	18.5	AV	L1	GND
26.611500	31.20	11.0	50	18.8	AV	L1	GND

CONDUCTED EMISSION TEST DATA

EUT: Pepwave Wireless Product M/N:Pismo 325
 Operating Condition: Ping Test
 Test Site: 1# Shielded Room
 Operator: WELL WANG
 Test Specification: 120V~, 60Hz for Adapter
 Comment: N
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages

**MEASUREMENT RESULT: "AT1106736102_fin"**

7/4/2011 9:38AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.217500	45.10	10.2	63	17.8	QP	N	GND
1.995000	26.10	10.4	56	29.9	QP	N	GND
2.890500	31.00	10.4	56	25.0	QP	N	GND
4.053000	34.60	10.5	56	21.4	QP	N	GND
6.190500	34.50	10.6	60	25.5	QP	N	GND
9.601500	33.90	10.6	60	26.1	QP	N	GND

MEASUREMENT RESULT: "AT1106736102_fin2"

7/4/2011 9:38AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.217500	39.70	10.2	53	13.2	AV	N	GND
4.368000	26.00	10.5	46	20.0	AV	N	GND
25.878000	30.20	11.0	50	19.8	AV	N	GND
26.485500	32.00	11.0	50	18.0	AV	N	GND
26.548500	31.70	11.0	50	18.3	AV	N	GND
26.611500	31.40	11.0	50	18.6	AV	N	GND

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

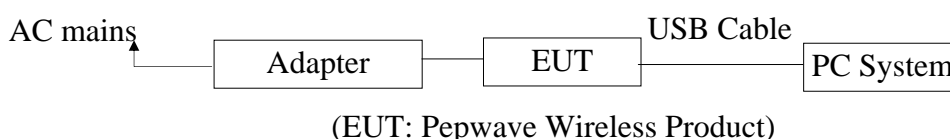
The following test equipments are used during the radiated emission measurement:

3.1.1. For Anechoic Chamber

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 12, 2010	1 Year
2	Bilog Broadband Antenna	Schwarzbeck	VULB9163	100015	May 17, 2011	1 Year
3	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 19, 2011	1 Year
4	EMI Test Software	ES-K1	N/A	N/A	N/A	N/A

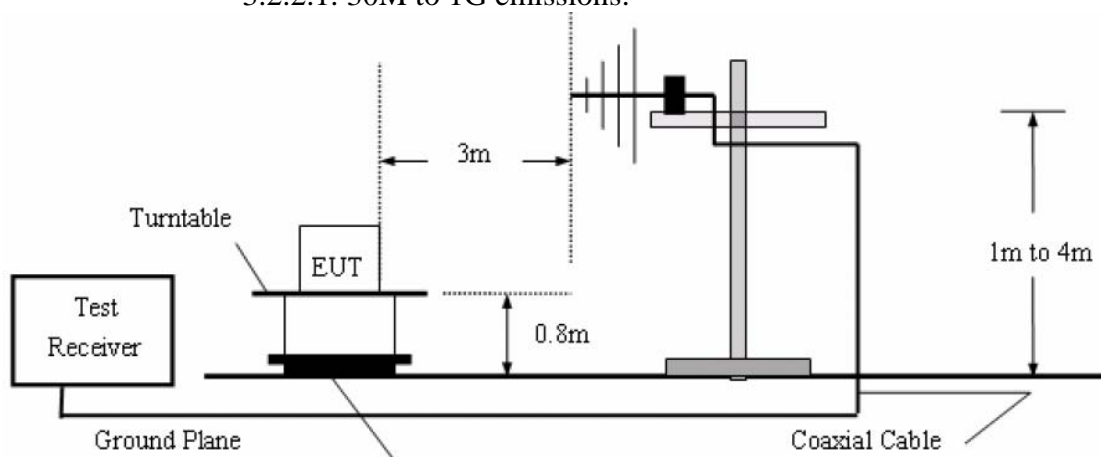
3.2. Block Diagram of Test Setup

3.2.1. Block diagram of connection between the EUT and simulators



3.2.2. Anechoic Chamber Test Setup Diagram

3.2.2.1. 30M to 1G emissions:



3.3. Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

All readings from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. The EUT is tested in 9*6*6 Chamber.

The test results are listed in Section 3.4.

3.4. Radiated Emission Measurement Results

PASS.

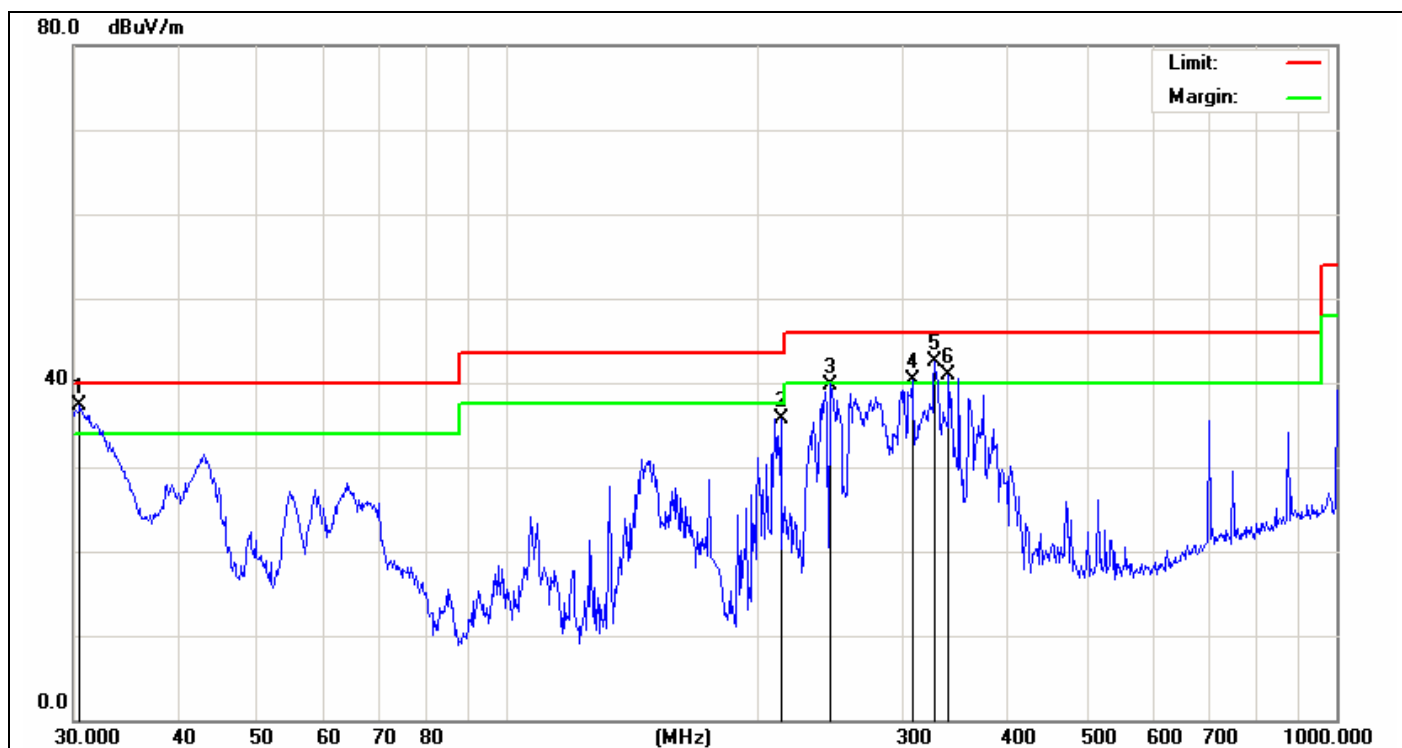
The test data Please refer the following pages.


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Job No.:	AT1106737F	Polarization:	Horizontal
Standard:	(RE)FCC PART 15 Subpart B class B	Power Source:	AC 120V/60Hz
	3m		
Test item:	Radiation Test	Date:	2011/07/04
Temp.(C)/Hum. (%RH):	24.3(C)/55%RH	Time:	21:54:28
EUT:	Pepwave Wireless Product	Test By:	HEISE CHEN
Model:	Pismo 325	Distance:	3m
Note:			



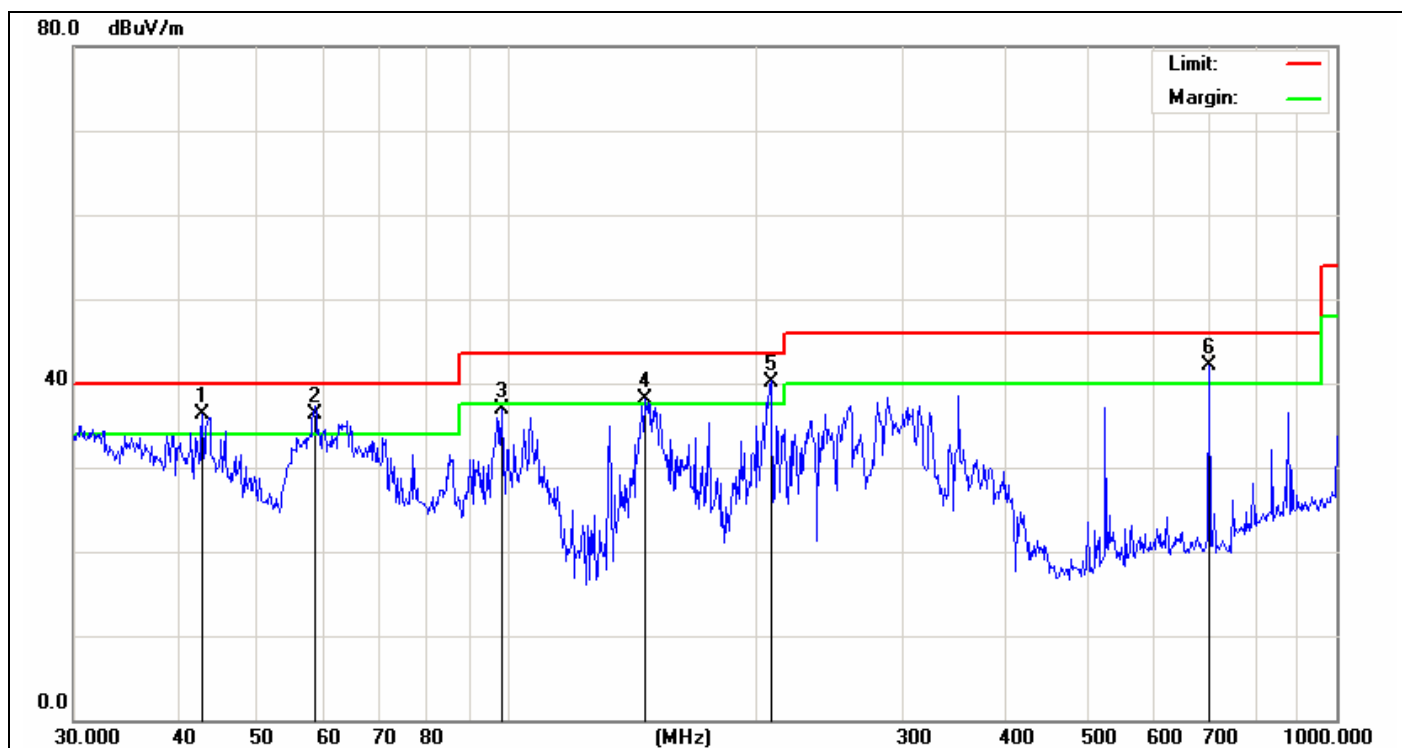
No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Detector	Height	Degree
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg)
1	30.5304	63.63	-26.30	37.33	40.00	-2.67	peak		
2	213.7632	64.64	-28.87	35.77	43.50	-7.73	peak		
3	245.0900	66.62	-26.82	39.80	46.00	-6.20	peak		
4	307.8312	65.61	-25.23	40.38	46.00	-5.62	peak		
5	327.8872	65.85	-23.39	42.46	46.00	-3.54	peak		
6	340.7817	63.61	-22.80	40.81	46.00	-5.19	peak		


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Job No.:	AT1106737F	Polarization:	Vertical
Standard:	(RE)FCC PART 15 Subpart B class B	Power Source:	AC 120V/60Hz
	3m		
Test item:	Radiation Test	Date:	2011/07/04
Temp.(C)/Hum.(%RH):	24.3(C)/55%RH	Time:	21:51:22
EUT:	Pepwave Wireless Product	Test By:	HEISE CHEN
Model:	Pismo 325	Distance:	3m
Note:			



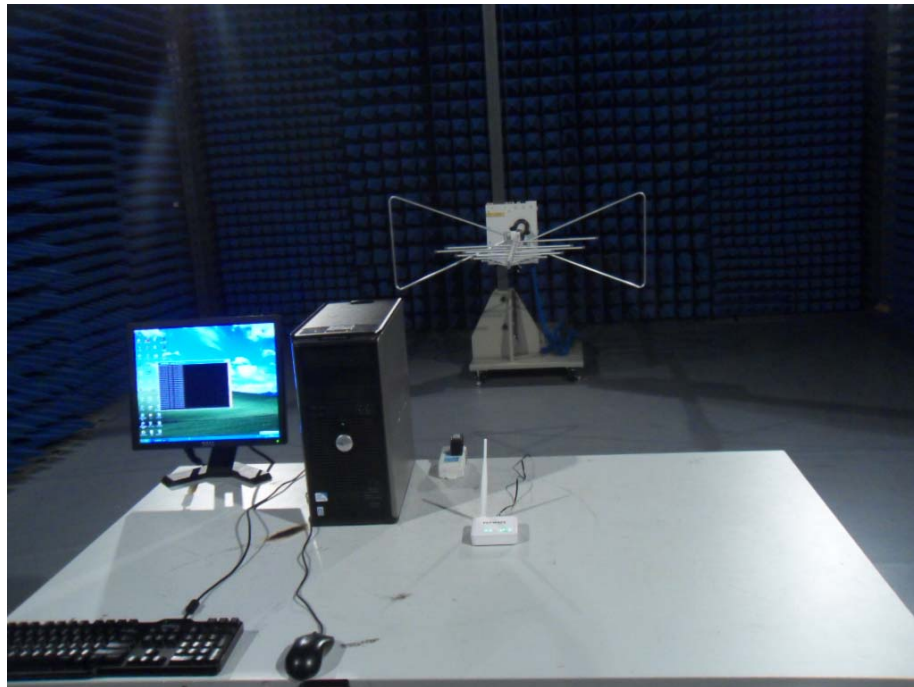
No.	Frequency	Reading	Correct	Result	Limit	Over Limit	Detector	Height	Degree
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg)
1	42.8997	61.03	-24.78	36.25	40.00	-3.75	QP		
2	58.6126	61.58	-25.35	36.23	40.00	-3.77	QP		
3	98.4865	61.56	-24.65	36.91	43.50	-6.59	peak		
4	146.3735	65.15	-27.04	38.11	43.50	-5.39	peak		
5	207.8497	64.29	-24.09	40.20	43.50	-3.30	QP		
6	701.7607	57.39	-15.38	42.01	46.00	-3.99	QP		

4. PHOTOGRAPH

4.1. Photo of Power Line Conducted Emission Test



4.2. Photo of Radiated Emission Test



APPENDIX I (Photos of EUT)

Figure 1
The EUT-Overall View



Figure 2
The EUT-Front View



Figure 3
The EUT-Back View



Figure 4
The EUT-Side View



Figure 5
PCB of the EUT-Front View(Shielding)

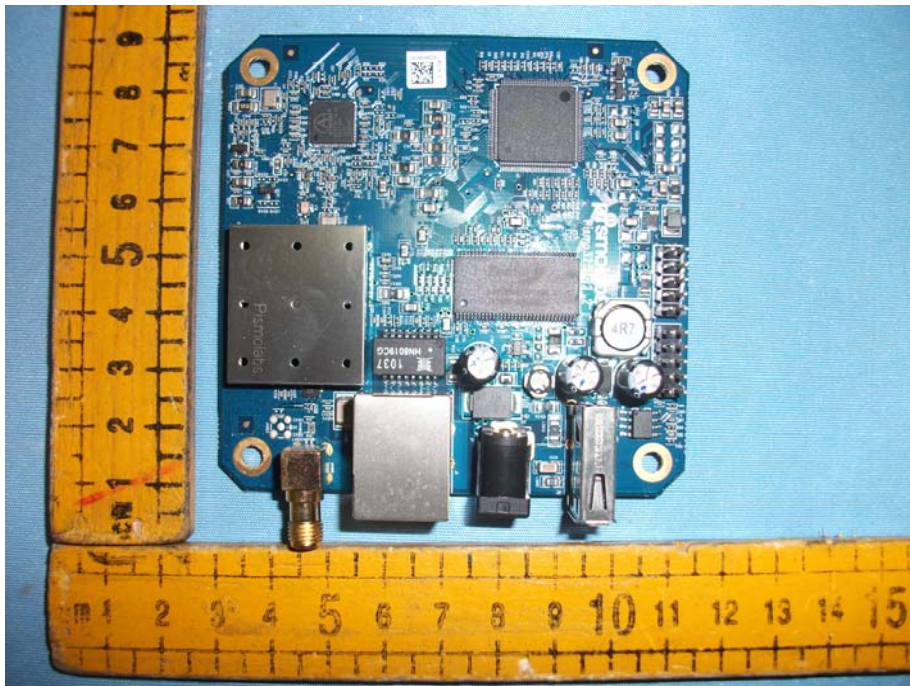


Figure 6
PCB of the EUT-Back View

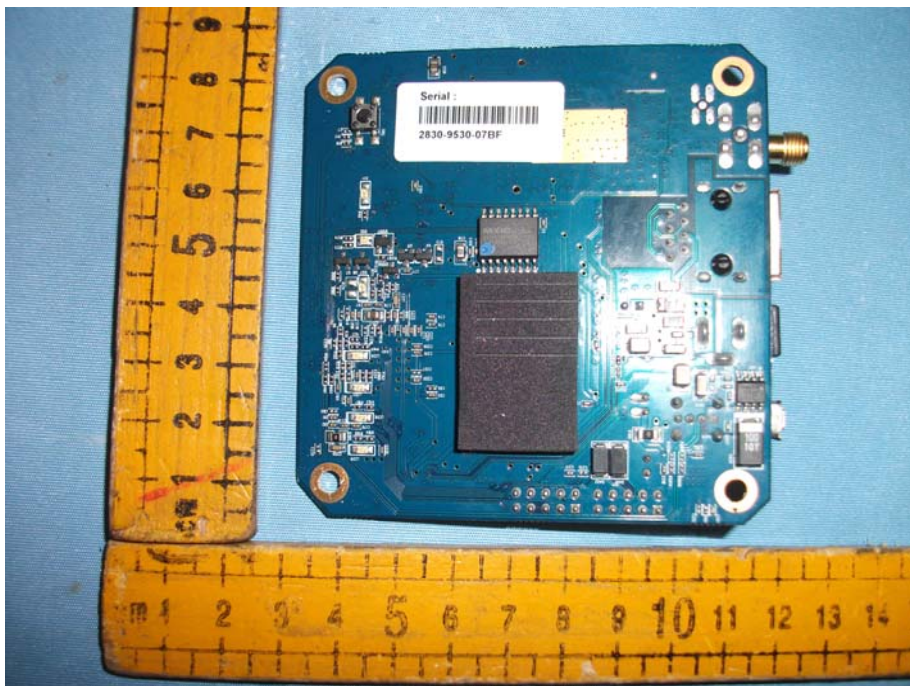


Figure 7
PCB of the EUT-Front View (unshielded)

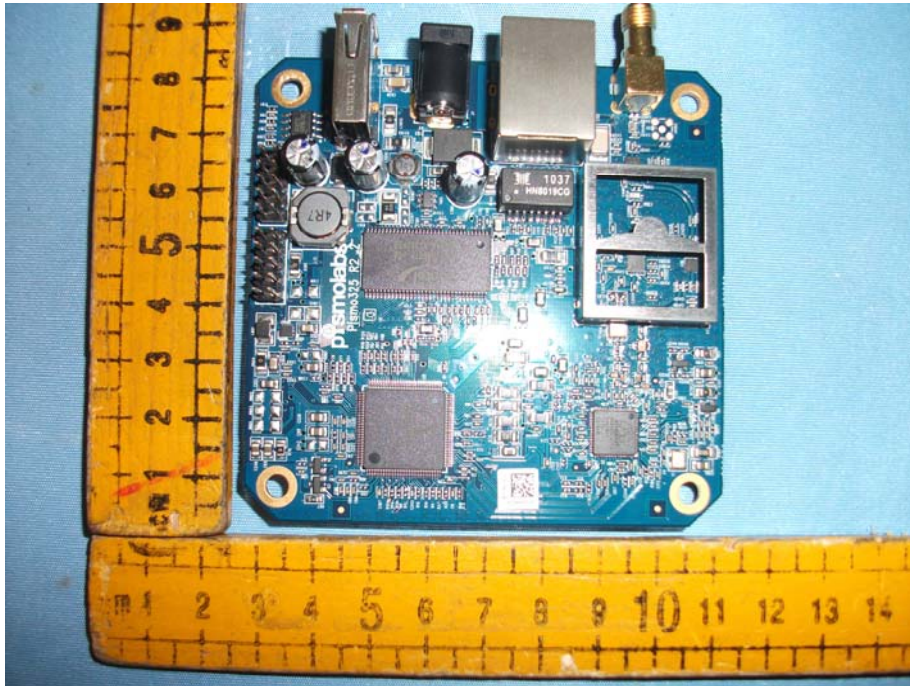


Figure 8
PCB of the EUT-Front View (WIFI Module)

