

MPE TEST REPORT

Product : 802.11 bg Wireless Mini Card

Model(s): VNT6656GEV00

Brand: VIA

Applicant: VIA Technologies, Inc.

**Address: 8F,533,Chung-Cheng Road,
Hsin-Tien,Taipei 231,
Taiwan, R. O. C.**

Test Performed by:

International Standards Laboratory

<Lung-Tan LAB>

*Site Registration No.

BSMI: SL2-IN-E-0013; TAF: 0997; NVLAP: 200234-0;

IC: IC4164-1; VCCI: R-1435, C-1440, T-299; NEMKO: ELA 113B

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1. General

1.1 Certification of Accuracy of Test Data

Standards: CFR 47 Part 15 Subpart B Class B
CFR 47 Part 15 Subpart C (Section 15.247)

Test Procedure: ANSI C63.4:2003

Equipment Tested: 802.11 BG Wireless Module

Model: VNT6656GEV00

Applied by: VIA Technologies, Inc.

Sample received Date: 2007/11/08

Final test Date : 2007/11/23

Test Result PASS

Test Site: Chamber 02, Conduction 02

Temperature Refer to each site test data

Humidity: Refer to each site test data

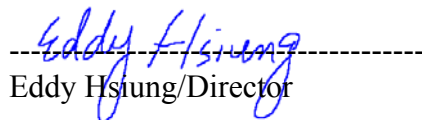
Test Engineer:


Jerry Chion

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Approve & Signature


Eddy Hsiung/Director

Test results given in this report apply only to the specific sample(s) tested under stated test conditions. This report shall not be reproduced other than in full without the explicit written consent of ISL. This report totally contains 13 pages, including 1 cover page, 1 contents page, and 11 pages for the test description. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government.

This test data shown below is traceable to NIST or national or international standard. International Standards Laboratory certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

2. Description of Equipment Under Test (EUT)

Description: 802.11 BG Wireless Module
 Model No.: VNT6656GEV00
 Brand: VIA
 Frequency Range 802.11b/g: 2400~2483.5 MHz
 Support channel:
 802.11b/g 11 Channels

Modulation Skill:
 802.11b DBPSK(1Mbps), DQPSK(2Mbps),
 CCK(5.5/11Mbps)
 802.11g OFDM (6M - 54Mbps)

Antenna List:

No.	Manufacturer	Model or P/N	Type	Connector	Length	Max. Gain	New
1	FAVORTRON CO., LTD	6-23-7M59K-021	PIFA	IPX-MHF	576mm±3mm	-0.01dBi (2.4GHz)	No
2	FAVORTRON CO., LTD	6-23-7M59K-011	PIFA	IPX-MHF	896mm±3mm	-0.97dBi (2.4GHz)	No
3	VSO ELECTRIC CO., LTD	13-130-F14911	PIFA	IPX-MHF	383mm±2mm	-4.4dBi (2.4GHz)	No
4	VSO ELECTRIC CO., LTD	13-130-F14931	PIFA	IPX-MHF	398mm±3mm	-4.4dBi (2.4GHz)	No
5	VSO ELECTRIC CO., LTD	13-130-F53021	PIFA	IPX-MHF	Black 860±3mm	-6.03dBi (2.4GHz)	No
					Grey 1065±3mm	-3.37dBi (2.4GHz)	
6	VSO ELECTRIC CO., LTD	13-130-F62011	PIFA	IPX-MHF	543mm±5mm	-0.22dBi (2.4GHz)	No
7	VSO ELECTRIC CO., LTD	13-130-F62021	PIFA	IPX-MHF	688.5mm±5mm	-0.22dBi (2.4GHz)	No
8	VSO ELECTRIC CO., LTD	14-211-F66021	PIFA	IPX-MHF	550mm±5mm	-0.31dBi (2.4GHz)	No
9	VSO ELECTRIC CO., LTD	14-211-F66041	PIFA	IPX-MHF	570mm±5mm	-1.55dBi (2.4GHz)	No
10	FAVORTRON CO., LTD	K05008004451	PIFA	IPX-MHF	750mm±2mm	0.79dBi (2.4GHz)	No
11	FAVORTRON CO., LTD	K05008004351	PIFA	IPX-MHF	530mm±2mm	-0.80dBi (2.4GHz)	No
12	FAVORTRON CO., LTD	K05008003651	PIFA	IPX-MHF	820mm±2mm	0.74dBi (2.4GHz)	No
13	FAVORTRON CO., LTD	K05008003751	PIFA	IPX-MHF	570mm±2mm	0.18dBi (2.4GHz)	No
14	FAVORTRON CO., LTD	K05004002251	PIFA	IPX-MHF	Black 500±3mm	2.80dBi (2.4GHz)	No
					Grey 710±3mm	1.68dBi (2.4GHz)	

No.	Manufacturer	Model or P/N	Type	Connecter	Length	Max. Gain	New
15	FAVORTRON CO., LTD	K05004002351	PIFA	IPX-MHF	Black 525±3mm	0.93dBi (2.4GHz)	No
					Grey 843±3mm	1.26dBi (2.4GHz)	
16	Hon Hai Precision Industry Co.,Ltd (Brand:FOXCONN)	WDAN-U1L41001-DF	PIFA	IPX-MHF	Black 745±3mm	-1.38dBi (2.4GHz)	No
					Grey 530±3mm	0dBi (2.4GHz)	
17	Hon Hai Precision Industry Co.,Ltd (Brand:FOXCONN)	WDAN-U1L51002-DF	PIFA	IPX-MHF	Black 820±3mm	-1.99dBi (2.4GHz)	No
					Grey 570±3mm	-1.4dBi (2.4GHz)	
18	Well Green Technology Co., Ltd	H12V-R	PIFA	IPX-MHF	Black 533±3mm	0.03dBi (2.4GHz)	Yes
		H12V-L			Brown 653±3mm	-0.42dBi (2.4GHz)	
19	Well Green Technology Co., Ltd	S14Y-R	PIFA	IPX-MHF	Black 315±3mm	-1.13dBi (2.4GHz)	Yes
		S14Y-L			Grey 505±3mm	-4.29dBi (2.4GHz)	
20	Tyco Electronics	S-37	PIFA	IPX-MHF	400mm±3mm	0.61dBi (2.4GHz)	Yes
21	FAVORTRON CO., LTD	M73XT	PIFA	IPX-MHF	Black 585±3mm	-1.47dBi (2.4GHz)	Yes
					Grey 500±3mm	0.42dBi (2.4GHz)	
22	FAVORTRON CO., LTD	M76XT	PIFA	IPX-MHF	Black 650±3mm	2.01dBi (2.4GHz)	Yes
					Grey 385±3mm	-2.39dBi (2.4GHz)	
23	FAVORTRON CO., LTD	6-23-7M54S-010	PIFA	IPX-MHF	Black 545±3mm	-0.23dBi (2.4GHz)	Yes
		6-23-7M54S-020			Grey 440±3mm	0.15dBi (2.4GHz)	

Antenna Connected: The antenna is connected to the RF connector of the WLAN adapter.

WLAN Power Type : 3.3V DC from the EUT

The channel and the operation frequency of 802.11b and 802.11g is listed below:

Channel	Frequency(MHz)	Channel	Frequency (MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437		

During the test, the EUT was tested as a modular device of a notebook PC using a USB extender board to extend the EUT outside the notebook PC enclosure.

The reason of change on this application is the EUT was added 6 new antennas, and modified some circuits and component under no influence on radio frequency characteristic

There are 23 PIFA antennas in the EUT:

The antenna 1~17 has already been tested in the original application. Please refer to ISL report-07LR001FC. The antenna 18~23 are newly-increased.

All of antennas have been tested. Only the worst data as following configuration is listed in this test report:

VNT6656GEV00	PIFA Antenna
802.11b/g	Antenna 14

3. Description of Support Equipment

3.1 Appendix E: Description of Support Equipment

3.1.1 Description of Support Equipment

Support Unit 1.

Description:	DELL USB Mouse
Model Number:	M-UR69
Serial Number:	LNA24412741
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	(Complied with FCC DOC)

Support Unit 2.

Description:	DELL 19" LCD Monitor
Model:	2000FP
AC Adapter:	DELL(ADP-70EB)
Serial Number:	N/A
DSUB In:	One 15 Pins
DVI In:	One Pins
S-Video In:	One7 Pins
Power Cord:	Non-shielded, Detachable
FCC ID:	(Complied with FCC DOC)

Support Unit 3.

Description:	VNT Mini-Card Extender Board
Model:	VNO131D
Serial Number:	N/A
USB2.0 Connector:	one
Mini-Card Slot:	one

Support Unit 4.

Description:	IBM Notebook Personal Computer
Model:	2371
Serial Number:	N/A
Power Supply Type:	Switching AC Adapte 56W Lite-On (Model: 02K6809) 3 pins
CPU Type:	Intel Pentium-M 1.2 GHz
Hard Disk Device:	Hitachi 20GB (Model: HTC424020F7AT00)
DDR: 256MB	Infineon (Model: HYB25D256160BT-6)
BT/MODEM card:	Actiontec (Model: BMDC200)
Wireless card: WW)	Phillips (Model: WLAN 802.11ABG 930700811107)
DC-In:	one
VGA Port:	one
USB2.0 Connector:	two
LAN Connector:	one
Modem Port:	one
PCIMCIA Connector:	one
SD Connector	one
Docking Connector:	one
Battery:	Sanyo 4 cell (Model: 92P0999)
Power Cord:	Shielded 3 PIN, 2 PIN
LCD:	Samsung 12.1" XGA TFT (Model: LTN121XA-L01)
Maximum display Resolution:	1024X768 Non-interlaced

3.1.2 Software for Controlling Support Unit

Test programs exercising various part of EUT were used. The programs were executed as follows:

- A. Read and write to the disk drives.
- B. The RF software makes the transmitter continuously sending RF signals
- C. Repeat the above steps.

	Filename	Issued Date
WLAN test software (2.16.0.1)	MP Tool.exe	2006/01/06

3.1.3 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cord	110V (~240V) to AC Power Cord Inlet (3-pin)	1.8M	Nonshielded, Detachable	Plastic Head
LCD Monitor D- SUB Data Cable	LCD Monitor to EUT D-SUB Port	1.6M	Shielded, Detachable	Metal Head
LCD Monitor DVI Data Cable	LCD Monitor to EUT DVI Port	1.6M	Shielded, Detachable	Metal Head
LCD Monitor S Data Cable	LCD Monitor to EUT S Port	1.6M	Shielded, Detachable	Metal Head
Mouse Data Cable	Mouse to PC Mouse port	1.8M	Shielded, Un-detachable	Metal Head

3.2 General Test Conditions

1. During the test, the EUT was set in continuously transmitting mode with a duty cycle of 99%.for 802.11b.
2. The EUT was set in continuously transmitting mode with a duty cycle of 99%.for 802.11g.
3. The channel 1, 6, 11 of 802.11b/g of EUT were all tested.

4. RF Exposure Measurement [Section 15.247(b)(4) & 1.1307(b)]

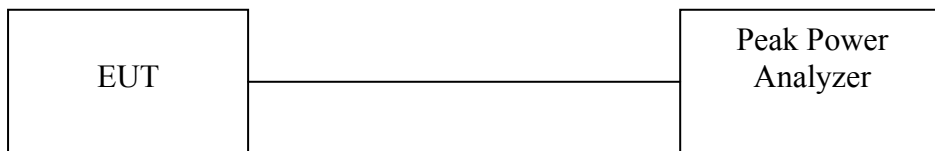
4.1 Applied Standards

FCC PART 1.1307, 1.1310, 2.1091, 2.1093 RF EXPOSURE

4.2 Test Procedure

The Transmitter output of EUT was connected to the Peak Power Analyzer

4.3 Test Setup



4.4 Calculation for Maximum Permissible Exposure (MPE)

From FCC 1.1310 Table 1B, the maximum permissible RF exposure for an uncontrolled environment is 1 mW/cm². The actual power density for the EUT with the antenna is calculated as shown below.

$$S = (P \times G) / (4 \times \pi \times d^2)$$

where:

S = power density

P = transmitter conducted power in (W)

G = antenna numeric gain

d = distance to radiation center (m)

<<DATA>>

802.11b

Antenna Manufacturer	Antenna Type	Gain (dBi)	Numeric Gain	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (cm)	Power Density (W/m ²)	Power Density (mW/cm ²)
FAVORTRON CO., LTD Model: K05004002251	PIFA in Metal	2.80	1.91	2412	19.43	87.70	20	0.3325	0.03325
				2437	19.37	86.50	20	0.3279	0.03279
				2462	19.09	81.10	20	0.3074	0.03074

802.11g

Antenna Manufacturer	Antenna Type	Gain (dBi)	Numeric Gain	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (cm)	Power Density (W/m ²)	Power Density (mW/cm ²)
FAVORTRON CO., LTD Model: K05004002251	PIFA in Metal	2.80	1.91	2412	18.23	66.53	20	0.2522	0.02522
				2437	18.26	66.99	20	0.2539	0.02539
				2462	18.09	64.42	20	0.2442	0.02442

WARNING:

It is the responsibility of the installer to ensure that the EUT is a WLAN module and a specified antenna inside. Only the specified antennas listed above may be used. The use of any other antenna is expressly forbidden in accordance with FCC rules CFR 47 part 15.204.

NOTICE:

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits for an uncontrolled environment when installed as directed. This equipment should be installed and operated with the specified antenna listed in this report.

5. Appendix : Test Equipment

5.1 Test Equipment List

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Rad. Above 1Ghz	Peak Power Analyzer	HP	8990A	3621A01269	01/02/2008	01/02/2009

Note: Calibration traceable to NIST or national or international standards.