

FCC DoC TEST REPORT

According to

FCC Part 15 Subpart B

Test Item : SWITCHING HUB 8-PORT

Model No. : ES-3108P V7.0, GS-D08P

Responsible Party : EDIMAX TECHNOLOGY CO., LTD.

Address : 7, LANE 116, WU-KUNG SECOND ROAD, WU-KU INDUSTRIAL PARK, TAIWAN, R. O. C.

Test Engineer : FISH YU

Test Date : NOV. 29, 2002

Issued Date : JAN. 27, 2003

NVLAP Signature : Peter Kao
Peter Kao / Director

The test report shall not be reproduced except in full, without the written approval of the laboratory.

The report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States government.

This report is only for item test which described in page 5.

The testing result in this report are traceable to national and international standard .

PEP TESTING LABORATORY

*12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL : 8862-26922097 FAX : 8862-26956236*

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1. Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under ET Docket 95-19 Declaration of Conformity(DoC).

Responsible Party*: EDIMAX TECHNOLOGY CO., LTD.

Address: 7, LANE 116, WU-KUNG SECOND ROAD, WU-KU INDUSTRIAL PARK, TAIPEI HSIEN, TAIWAN, R. O. C.

Contact Person: TRACY CHENG / ASSISTANT

Phone No.: 886-2-22995648 **Fax No.:** 886-2-22995647

- ◇ Regulation: FCC Part 15 & Part 2; Docket 95-19
- ◇ Limitation: CISPR 22 CLASS B
- ◇ Test Procedure: ANSI C63.4(1992)
- ◇ Test Item: SWITCHING HUB 8-PORT
- ◇ Model No.: ES-3108P V7.0, GS-D08P
- ◇ Serial No.: N/A
- ◇ Place of Test: PEP Testing Laboratory
12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih, Taipei Hsien, Taiwan, R. O. C.
TEL : 8862-26922097 FAX : 8862-26956236

2. Product Information

- a. **EUT Name:** SWITCHING HUB 8-PORT
- b. **Model No. :** ES-3108P V7.0
- c. **Chipset Type:** VT6508X
- d. **System Speed :** 25 MHz
- e. **Crystal/Oscillator(s) :** 25 MHz
- f. **Port/Connector(s) :** UTP
- g. **Memory Expansion :** N/A
- h. **Power Rating :** Adapter -----
 Model No. : AD41-1200500DU
 Input : AC 120V 60Hz 200mA
 Output : DC 12V 500mA
- i. **Chassis Used :** PLASTIC (ABS V0)
- j. **Condition of the EUT :** Prototype Sample Engineering Sample
 Production Sample
- k. **Test Item Receipt Date :** NOV. 27, 2002

3. EUT Description and test methods

The equipment under test (EUT) is SWITCHING HUB 8-PORT model ES-3108P V7.0/GS-D08P. The EUT that contains eight RJ-45 ports is used for networking. It supports 10/100Mbps auto-negotiation on all RJ-45 ports. AC-DC switching power adaptor supplies EUT DC 12V from AC main power. For more detail specification about the EUT, please refer to the user's manual.

Test method: The EUT configuration was setup by the following steps for test.

- (A) Connect EUT one RJ-45 port to host PC LAN card on turntable.
- (B) Connect EUT another RJ-45 port to remote PC LAN card off turntable.
- (C) Terminate all the rest of EUT RJ-45 ports by free-ended data cables.

All corresponding peripherals to host PC I/O ports and EUT on turntable were setup to proceed with the test. After respectively pre-testing EUT at 10-10Mbps and 100-100Mbps, we took the worst-case test mode: 100-100Mbps for final test, and the worst-case test result was recorded and provided in this report.

As pre-scan, we took radiated emission first. EUT configuration including peripheral devices placement and data cables coupling was compliant with ANSI C63.4 requirement. Test engineer tried to find the worst data cables coupling in order to perform the final test that conducted emission and radiated emission would keep the same configuration under test.

Conducted emission test:

The system was setup with the EMI diagnostic software running. The power line conducted EMI tests were run on the line and neutral conductors of the power cord and the results were recorded. The effect of varying the position of the interface cables has been investigated to find the worst-case configuration that produces maximum emission.

At the frequencies where the peak values of the emission exceeded the quasi-peak limit, the emissions were also measured with the quasi-peak detectors. The average detector also measured the emission either (A) quasi-peak values were under quasi-peak limit but exceeded average limit, or (B) peak values were under quasi-peak limit but exceeded average limit.

Radiated emission test:

The maximum readings were found by varying the height of antenna and then rotating the turntable. Both polarization of antenna, horizontal and vertical, are measured. The effect of varying the position of the interface cables has been investigated to find the configuration that produces maximum emission.

The highest emissions were also analyzed in details by operating the spectrum analyzer in fixed tuned quasi-peak mode to determine the precise amplitude of the emissions. While doing so, the antenna height was varied between one and four meters, and the turntable was slowly rotated, to maximize the emission.

4. Modification(s):

N/A

5. Test Software Used

(A) PING.EXE was the command used to deliver signals between two PCs via EUT during the test.

5.Modem (MOD1) × 2**FCC ID : IFAXDM1414****Manufacturer : ACEEX****Model Number : 1414****Power Supply : Linear, 9Vac O/P****Power Cable : Non-Shielded , Detachable,1.7m****Data Cable : 1 > Shielded , Detachable,1m****2 > Back Shell : Metal****6.Mouse (MOUS/1 PS/2)****FCC ID : DZL211106****Manufacturer : ACER****Model Number : M-S42****Power Supply : +5Vdc from PS2 of PC****Power Cord : N/A****Data Cable : 1 > Shielded , Non-detachable,1.8m****2 > Back Shell : Metal****7.Lan Card (LC1)****FCC ID : N/A****Manufacturer : D-Link****Model Number : DFE-530TX****Power Supply : N/A****Power Cord : N/A****Data Cable : N/A**

7. Description of Conducted Emissions Test

7.1 Conducted Emissions Limits

Frequency	Maximum RF Line Voltage dB(uV)			
	Class A		Class B	
MHz	QUASI-PEAK	AVERAGE	QUASI-PEAK	AVERAGE
0.15 - 0.50	79	66	66-56	56-46
0.50 - 5.0	73	60	56	46
5.0 - 30	73	60	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

8. Description of Radiated Emissions Test

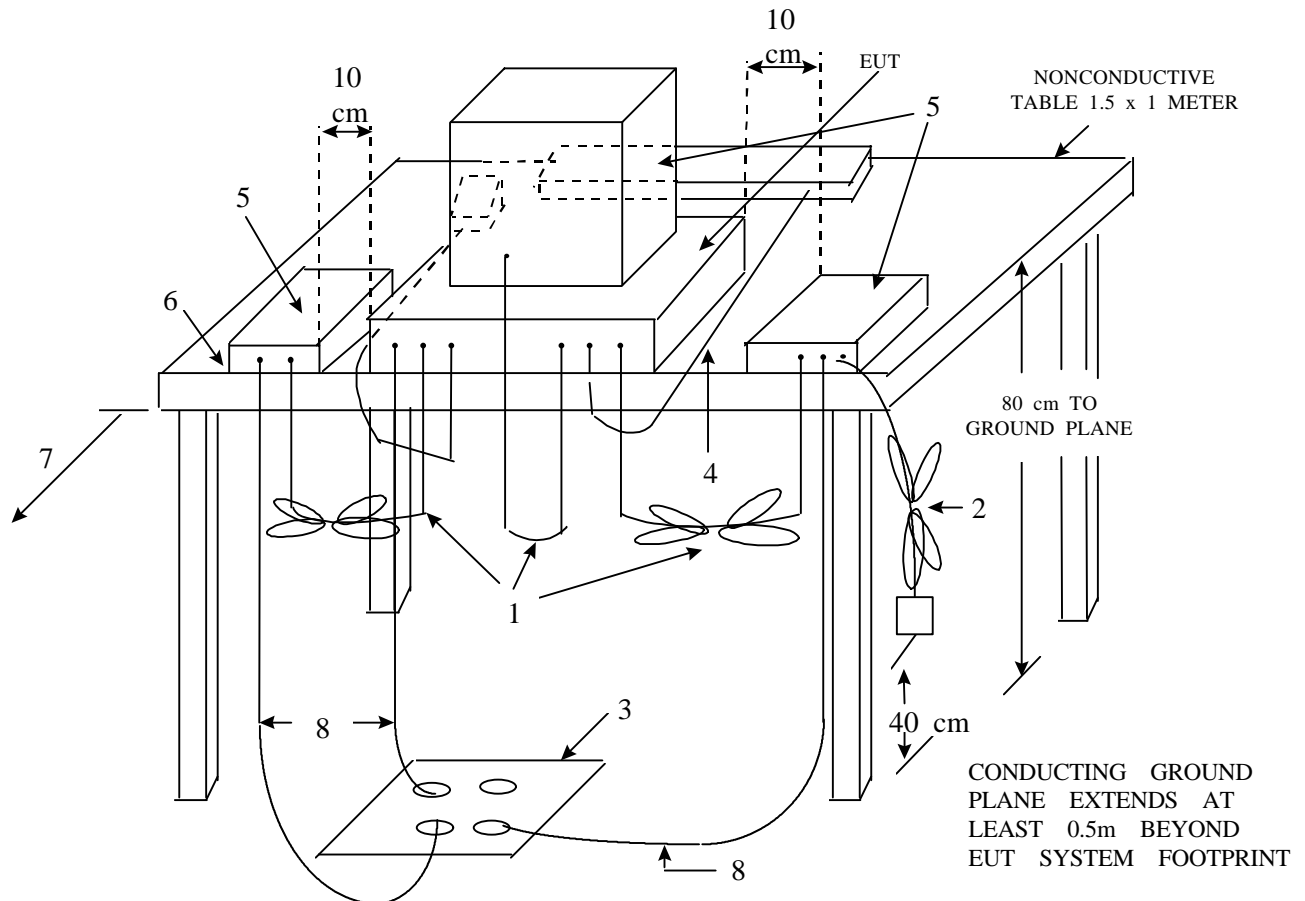
8.1 Radiated Emissions

Preliminary measurements were made indoors chamber at 3 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000 MHz using logbicon antenna. Above 1GHz, linearly polarized double ridge horn antenna was used.

Final measurements were made outdoors at 10-meter test range using logbicon antenna and horn antenna. The test equipment was placed on a wooden bench situated on a 1.5x1 meter area adjacent to the measurement area. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz.

The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet , if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in radiated emission test photo.

8.2 Test Configuration



LEGEND

1. Interconnecting cables which hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between ground plane and table.
2. I/O cables which are connected to a peripheral shall be bundled in center. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.
3. If LISN are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground if requires receptacle flush with the ground plane.
4. Cables of hand-operated devices, such as keyboards, KEYPADs, etc., have to be placed as close as possible to the controller.
5. Non-EUT components of EUT system being tested.
6. The rear of all components of the system under test shall be located flush with the rear of the table.
7. No vertical conducting wall used.
8. Power cords drape to the floor and are routed over to receptacle.

8.3 Radiated Emission Limits

Limits for radiated disturbance of Class A ITE at a measuring distance of 10 m

Frequency MHz	Field Strength dB(μ V/m)
30 to 230	40
230 to 1 000	47

NOTES

- 1 The lower limit shall apply at the transition frequency.
- 2 Additional provisions may be required for cases where interference occurs.

Limits for radiated disturbance of Class B ITE at a measuring distance of 10 m

Frequency MHz	Field Strength dB(μ V/m)
30 to 230	30
230 to 1 000	37

NOTES

- 1 The lower limit shall apply at the transition frequency.
- 2 Additional provisions may be required for cases where interference occurs.

9. Conducted Emissions Test Setup Photo.

< FRONT VIEW >



10. Conducted Emissions Test Data

Model No. : ES-3108P V7.0
Frequency range : 150KHz to 30MHz
Detector : Peak Value
Temperature : 21
Humidity : 60 %

Test Data : # 815 < LINE >
 # 810 < NEUTRAL >

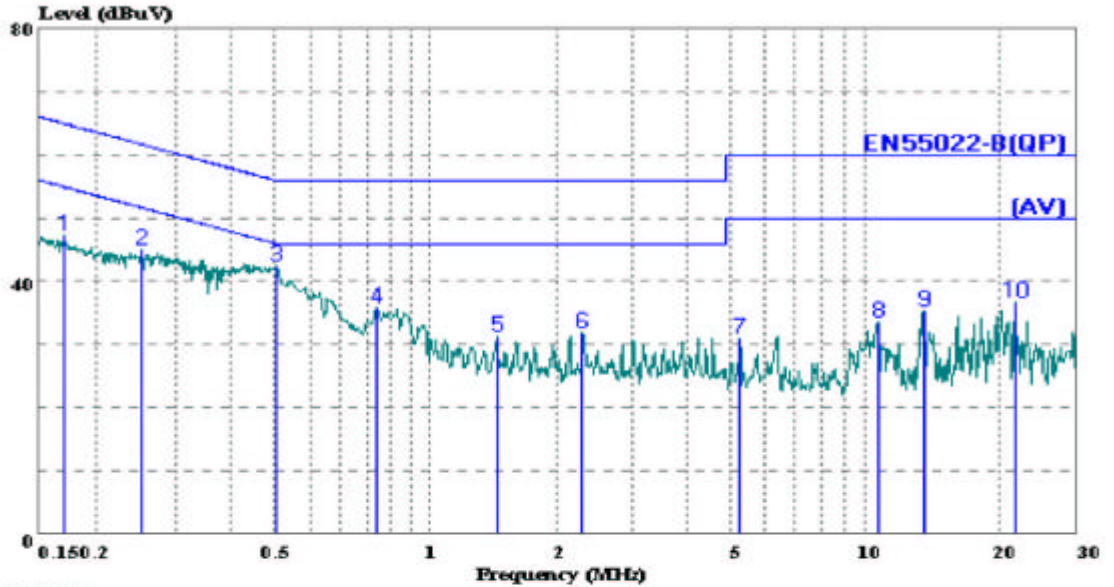
- Note
1. Level = Read Level + Cable Loss + Probe (LISN)
 2. Over Limit = Level – Limit = Margin



璋鑫科技有限公司

PEP Testing Laboratory

Data#: 815 File#: EN55022-B(QP).EMI Date: 2002-11-29 Time: 15:47:51



Trace: 814
 Site : Conduction No.2(Fish)-Linko site
 Condition: EN55022-B(QP) LISN.L(32A)-2002 LINE
 eut : E910739
 power : AC120V 60Hz
 memo : Peak Value

Page: 1

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.171	47.23	-17.67	64.90	46.92	0.10	0.21	
2	0.252	44.90	-16.79	61.69	44.53	0.10	0.27	
3	0.502	42.32	-13.68	56.00	41.72	0.10	0.50	
4	0.844	35.80	-20.20	56.00	35.10	0.10	0.60	
5	1.552	31.17	-24.83	56.00	30.35	0.16	0.66	
6	2.409	31.81	-24.19	56.00	30.96	0.20	0.65	
7	5.362	31.07	-28.93	60.00	30.07	0.23	0.77	
8	10.847	33.50	-26.50	60.00	32.56	0.34	0.60	
9	13.695	35.17	-24.83	60.00	34.12	0.45	0.60	
10	21.830	36.61	-23.39	60.00	35.23	0.78	0.60	

11. Radiated Emissions Test Setup Photo.

< FRONT VIEW >



< REAR VIEW >



12. Radiated Emissions Test Data

Model No. : ES-3108P V7.0
Frequency range : 30MHz to 1GHz **Detector** : Quasi-Peak Value
Frequency range : above 1GHz **Detector** : Quasi-Peak/Average Value
Temperature : 20° C **Humidity** : 62 %

Antenna polarization : HORIZONTAL ; **Test distance** : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (° angle)	Antenna High(m)
73.886	17.02	-12.98	30.00	29.01	6.17	2.58	20.74	327.0	4.0
124.973	20.48	-9.52	30.00	31.33	6.79	3.08	20.72	236.0	4.0
149.976	16.97	-13.03	30.00	27.67	6.53	3.49	20.72	248.0	4.0
299.987	21.62	-15.38	37.00	25.46	12.65	4.30	20.79	276.0	3.3
374.991	31.55	-5.45	37.00	31.53	15.82	4.84	20.64	250.0	2.3
499.990	30.73	-6.27	37.00	27.37	18.47	5.40	20.51	253.0	2.0
624.997	29.44	-7.56	37.00	22.65	21.16	5.87	20.24	282.0	1.6

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

Model No. : ES-3108P V7.0
Frequency range : 30MHz to 1GHz **Detector** : Quasi-Peak Value
Frequency range : above 1GHz **Detector** : Quasi-Peak/Average Value
Temperature : 20° C **Humidity** : 62 %

Antenna polarization : VERTICAL ; **Test distance** : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (° angle)	Antenna High(m)
47.973	24.05	-5.95	30.00	35.14	7.34	2.31	20.74	332.0	1.0
72.296	18.80	-11.20	30.00	30.78	6.21	2.54	20.73	360.0	1.0
124.974	25.64	-4.36	30.00	36.49	6.79	3.08	20.72	326.0	1.0
199.974	19.21	-10.79	30.00	26.45	9.80	3.69	20.73	255.0	1.0
299.990	21.85	-15.15	37.00	25.69	12.65	4.30	20.79	249.0	1.1
374.992	23.43	-13.57	37.00	23.41	15.82	4.84	20.64	271.0	1.1
499.986	29.38	-7.62	37.00	26.02	18.47	5.40	20.51	338.0	2.1
624.994	27.61	-9.39	37.00	20.82	21.16	5.87	20.24	329.0	2.0

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

13. Listing of Measurement Facilities

Test Mode	Instrument	Model No.	Serial No.	Next Cal. Date	Cal. Interval
Conduction (No.2)	HP Spectrum	8591A	3225A03039	Jun. 10, 2003	1Year
	R & S LISN(EUT)	ESH2-Z5	831886/004	Apr. 26, 2003	1Year
	Kyoritsu LISN(2nd)	KNW-242	8-837-7	N/A	N/A
	RF Cable	No.4	N/A	Jul. 03, 2003	1Year
Radiation (OP No.3)	R & S Receiver	ESBI	845658/003	Jul. 29, 2003	1Year
	Schaffner Pre-Amp.	CPA-9232	1015	Jul. 03, 2003	1Year
	EMCO Antenna	3142B	9909-1428	Jul. 03, 2003	1Year
	COM-Power Horn Ant.	AH-118 (1GHz~18GHz)	10095	May 29, 2003	1Year
	RF Cable	No.2	N/A	Jul. 03, 2003	1Year
	SCHWARZBECK Precision Dipole Ant.	VHAP (30MHz~1GHz)	970+971 953+954	Jun. 27, 2003	3Year
	R & S Signal Generator	SMY02	839846/038	Jan. 30, 2003	1Year

14. Duties of The Responsible Party

The responsible party upon signing or accepting the Declaration of Conformity as specified in Section 2.906 of the FCC Rules hereby agrees to the duties listed below.

§ 2.1073(a).

The responsible party warrants that each unit of equipment marketed under DoC is identical to the unit tested and found acceptable with the standards and that the records maintained by the responsible party continue to reflect the equipment being produced is within the variation that can be expected due to quantity production and testing on a statistical basis.

§ 2.1073(b).

The responsible party must have a written statement from the manufacturer or accredited test laboratory that the equipment complies with the appropriate technical standards.

§ 2.1073(c).

In case of transfer of control of equipment, as in the case of sale or merger, the new responsible party shall bear the responsibility of continued compliance of the equipment.

§ 2.1073(d).

Equipment shall be retested if any modifications or changes are made that could adversely affect the emanation characteristics of the equipment.

§ 2.1073(e).

If any modifications or changes made by anyone other than the responsible party, the party making the modifications or changes, if located within the U.S., becomes the new responsible party. The new responsible party must comply with all provisions for the DoC, including having test data on file demonstrating that the product continues to comply with all of the applicable technical standards.

§ 2.1075(a)(1).

The responsible party shall maintain records of the original design drawings and specifications and all changes made to the product that may affect compliance.

§ 2.1075(a)(2).

The responsible party shall maintain records of the procedures used for production inspection and testing to insure the conformance with the FCC Rules.

§ 2.946(a)(1).

The test report data shall be provided to the FCC within 14 days of delivery of request. The test sample(s) shall be provided within 60 days of delivery of request.

§ 2.946(b)

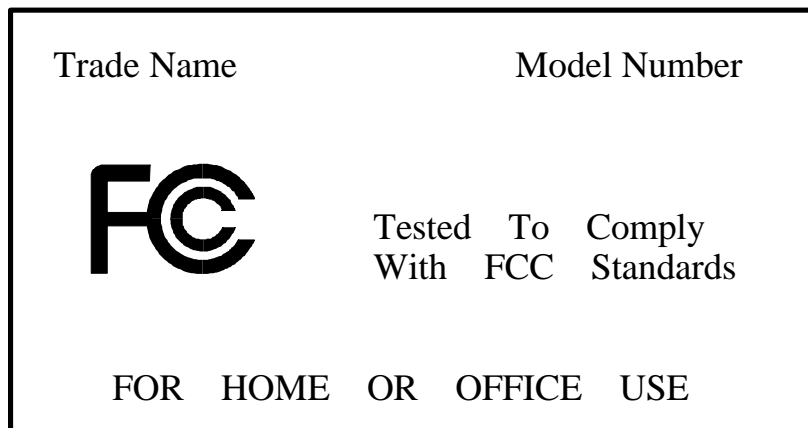
In case involving harmful interference or safety of life or property, the production sample must be provided within 60 days, but not less than 14 days. Failure to comply with such a request with the time frame shown may be cause for forfeiture, pursuant to Section 1.80 of Part 1 of the FCC Rules.

**The Responsible Party is the manufacturer, system integrator, or the importer as defined in Section 2.909 of the FCC Rules. The Rules. The Responsible Party for a DoC must be located within the United States as specified in Section 2.1077.*

15. Labelling Requirements

per §§ 2.1074 & 15.19; Docket 95-19

The sample label shown below shall be permanently affixed at a conspicuous location on the device, instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practicable, only the trade name, model number, and the FCC logo must be displayed on the device per Section § 15.19 (b)(2).



16. Information To The User

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Federal Communications Commission (FCC) Statement

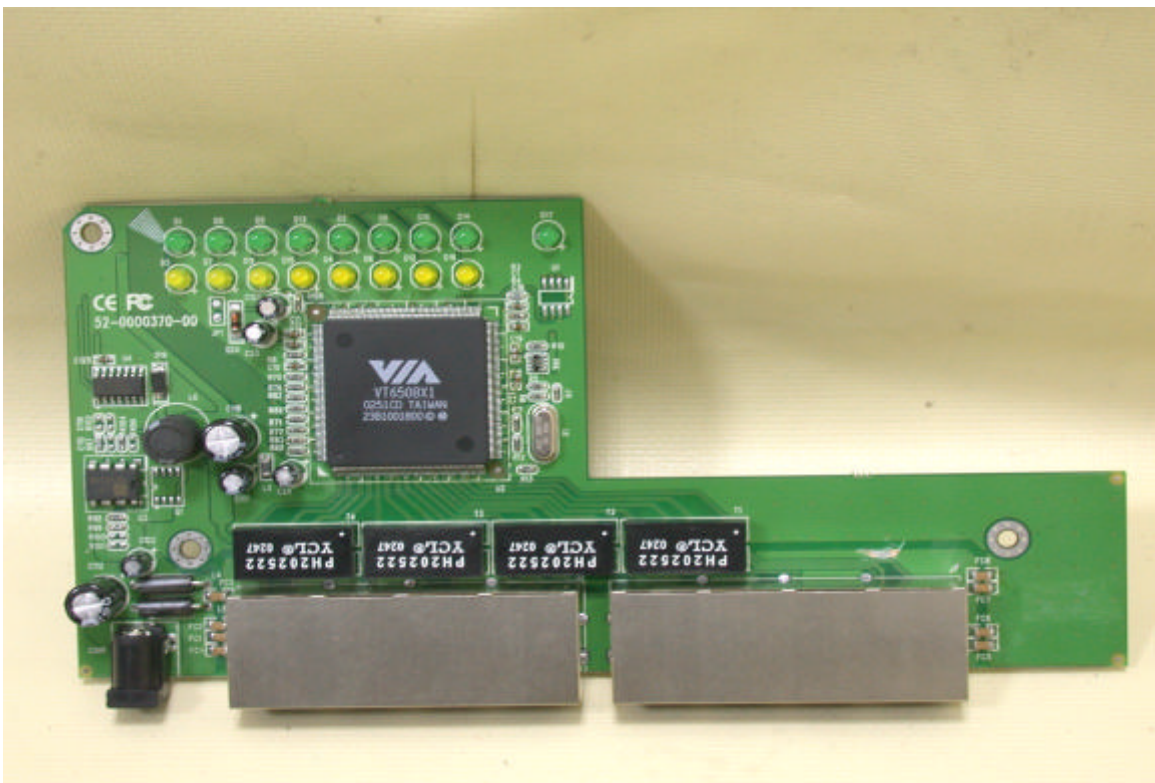
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

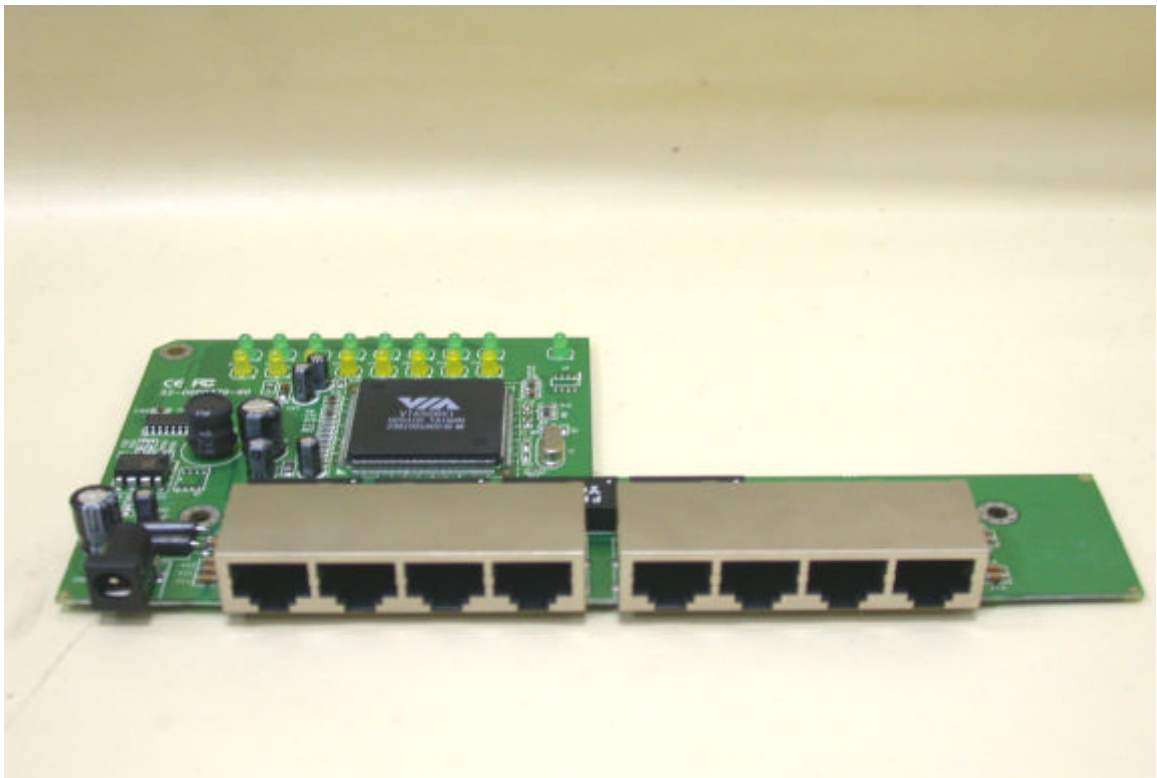
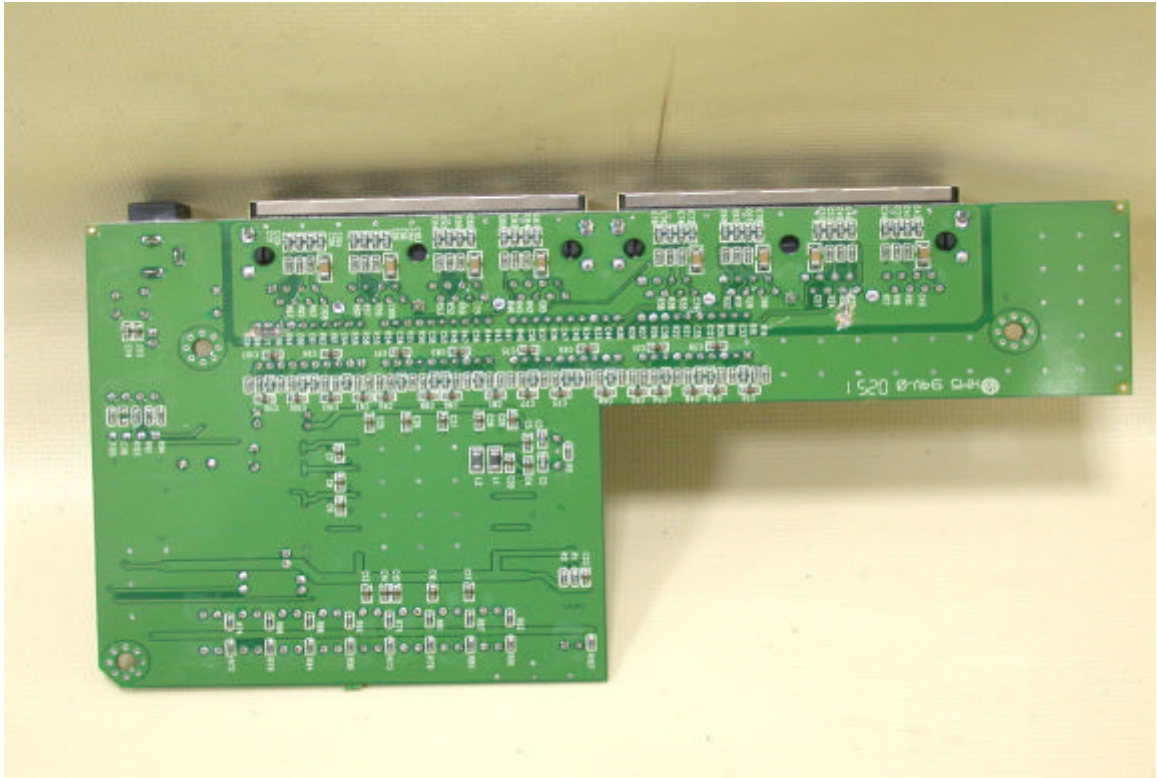
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver .
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected .
- Consult the dealer or an experienced radio / TV technician for help .

17. EUT Photographs

Model No. : ES-3108P V7.0









DECLARATION OF CONFORMITY CERTIFICATE

Responsible Party : EDIMAX TECHNOLOGY CO., LTD.

Address : 7, LANE 116, WU-KUNG SECOND ROAD, WU-KU INDUSTRIAL PARK, TAIPEI HSIEN, TAIWAN, R. O. C.

Contact Person : TRACY CHENG / ASSISTANT

Equipment : SWITCHING HUB 8-PORT

Model No.: ES-3108P V7.0, GS-D08P

Traceability: FCC Part 15 & Part 2; Docket 95-19

Limitation: CISPR 22 CLASS B

Date of issued: JAN. 27, 2003

Report No.: E910739

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992. (See Test Report if any modifications were made for compliance.)

PEP certifies that no party to this application has been denied the NVLAP benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

Peter Kao

Peter Kao/NVLAP Signatory



DECLARATION OF CONFORMITY

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party: EDIMAX TECHNOLOGY CO., LTD.

Address: 7, LANE 116, WU-KUNG SECOND ROAD, WU-KU
INDUSTRIAL PARK, TAIPEI HSIEN, TAIWAN, R. O. C.

Contact Person: TRACY CHENG / ASSISTANT

Phone No.: 886-2-22995648 Fax No.: 886-2-22995647

Equipment : SWITCHING HUB 8-PORT
Model No. : ES-3108P V7.0, GS-D08P

We hereby declare that the equipment bearing the trade name and model number specified above was tested conforming to the applicable FCC Rules under the most accurate measurement standards possible, and that all the necessary steps have been taken and are in force to assure that production units of the same equipment will continue to comply with the Commission's requirements.



Signature

Date