PTEC

TEST REPORT

Equipment Under Test:	Computer
EUT Number:	46-064
Trade Name:	Optimax
Client:	Worldnet Integrator Company Limited. 89/630 Nawamin Rd., Buengkum, Klongkum, Bangkok 10240.
Manufactured by:	Worldnet Integrator Company Limited.
Model:	MAX
Serial Number:	1.5-021101-722
Receipt Date:	20 December 2002
Date of Test:	20 December 2002 to 21 December 2002
Issued Date of Report:	29 January 2003

Approved by

_____

MR. Montri Pannarut
Operation Manager
_____/_____/_____

This test report is test results from the EUT only, not the product's quality certificate.

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1. SUMMARY OF TESTING

THIS PRODUCT WAS TESTED WITH FOLLOWING SPECIFICATION STANDARD

- FCC part 15 Class B

Test Emission / Immunity	Reference Standard Method	Class/Criteria	Test Method Document No.	Result
Conducted Emission	FCC part 15	B	-	**Pass**
Radiated Emission	FCC part 15	B	-	**Pass**

Note: -

Approved by

_____

MR. Montri Pannarut
Operation Manager
_____/_____/_____

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2. TEST PLAN

No.	Test Item	Input Voltage	Mode	Test Port	Test Spec.
1	Conducted Emission	110 V_{AC}	A	AC input	FCC part 15, Section 15.107(a)
2	Radiated Emission	110 V_{AC}	A	Enclosure	FCC part 15, Section 15.109(a)

Note: -

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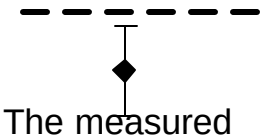
3. TEST CONDITIONS

3.1 Operation Mode

- **A:** The burnin test software was used for operating.

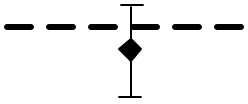
3.2 Standard rules for judging compliance testing result for emission testing (According to the NIS 81)

Pass
Case A



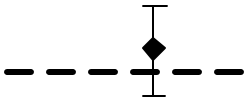
The measured result is within the limit, even when extended by the uncertainty interval. The product therefore complies with the specification

Unjudged in
Case B



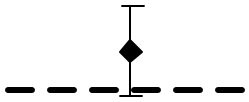
The measured result is below the upper limit, but by a margin less than half of the uncertainty interval; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance is more probable than non-compliance.

Unjudged in
Case C



The measured result is above the upper limit, but by a margin less than half of the uncertainty interval; it is therefore not possible to state non-compliance based on the 95% level of confidence. However, the result indicates that non-compliance is more probable than compliance.

Fail
Case D



The measured result is beyond the upper limit, even when extended downwards by half of the uncertainty interval. The product therefore does not comply with the specification

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4. EUT DESCRIPTION

4.1 Table of EUT Description

General Description	
EUT Name	Computer
Model	MAX
Technical Description	
Voltage	110 V_{AC} 60 Hz
Clock/Oscillator	1.5 GHz

4.2 EUT Configuration

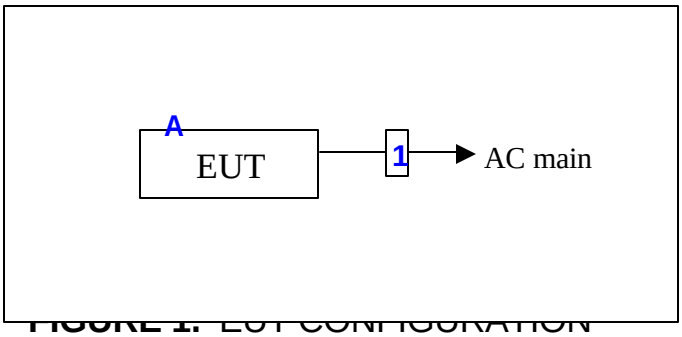

FIGURE 1: EUT CONFIGURATION

4.3 EUT and Peripherals

Diagram	Description	Brand Name	Model / Part	Serial Number
A	Computer	Optimax	MAX	1.5-021101-722

4.4 Cables

Ref	Cable Type	Shield	Length (meters)	Ferrite	Connector	Connection Point 1	Connection Point 2
1	**Power Line**	**No**	**1.5 m**	**No**	**AC**	**A**	**AC main**

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5. TEST SYSTEM CONFIGURATION

5.1 EUT Exercise Software

Burnin test

5.2 EUT Modifications

-

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6. TEST SETUP AND RESULT

6.1 Conducted Emission

Test Specification

EUT Input Power:	110 V_{AC}, 60Hz
Operation Mode	A (See 3.1)
Reference Standard:	FCC part 15
Classification Limit:	B

Measurement Equipment

Equipment Name	Manufacturer	Model	S/N	Traceability	Cal date
EMI Test Receiver (Display Unit)	HP	8572A	3340A21373	NIST	28-06-2002
EMI Test Receiver (Analyzer Unit)	HP	8572A	3340A08152	NIST	28-06-2002
LISN	Rohde & Schwarz	ESH2-Z5	831886/009	PTB/DKD	22-07-2002

Test Location: TRM - 001

Test Setup

The conducted emission measurement was performed with EMI receiver to observe the emission characteristic and identify the frequency of emission that has the highest amplitude relative to limit by operating the EUT with a typical configuration. The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.

The EUT was placed on the 80 cm height non-metallic table in-side shielded room. The EUT was set on a real operation mode, read-write disk, hard disk, memory, display on the screen and simulate the communication signal. The Burn In software was used for control the functions of the EUT. The power cord of the EUT was connected to a LISN. The signal noises from the EUT were transferred to the EMI receiver in control room. The testing method and the EUT setup were performed according to ANSI C63.4. The EUT configuration setup is shown in figures 2 and 3,respectively.

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Test Picture

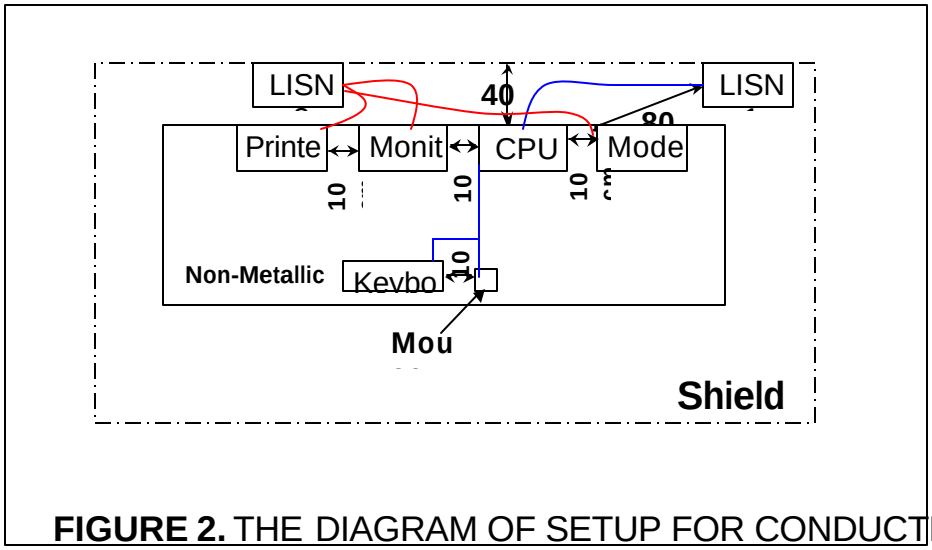

FIGURE 2. THE DIAGRAM OF SETUP FOR CONDUCTED EMISSIONS TESTING

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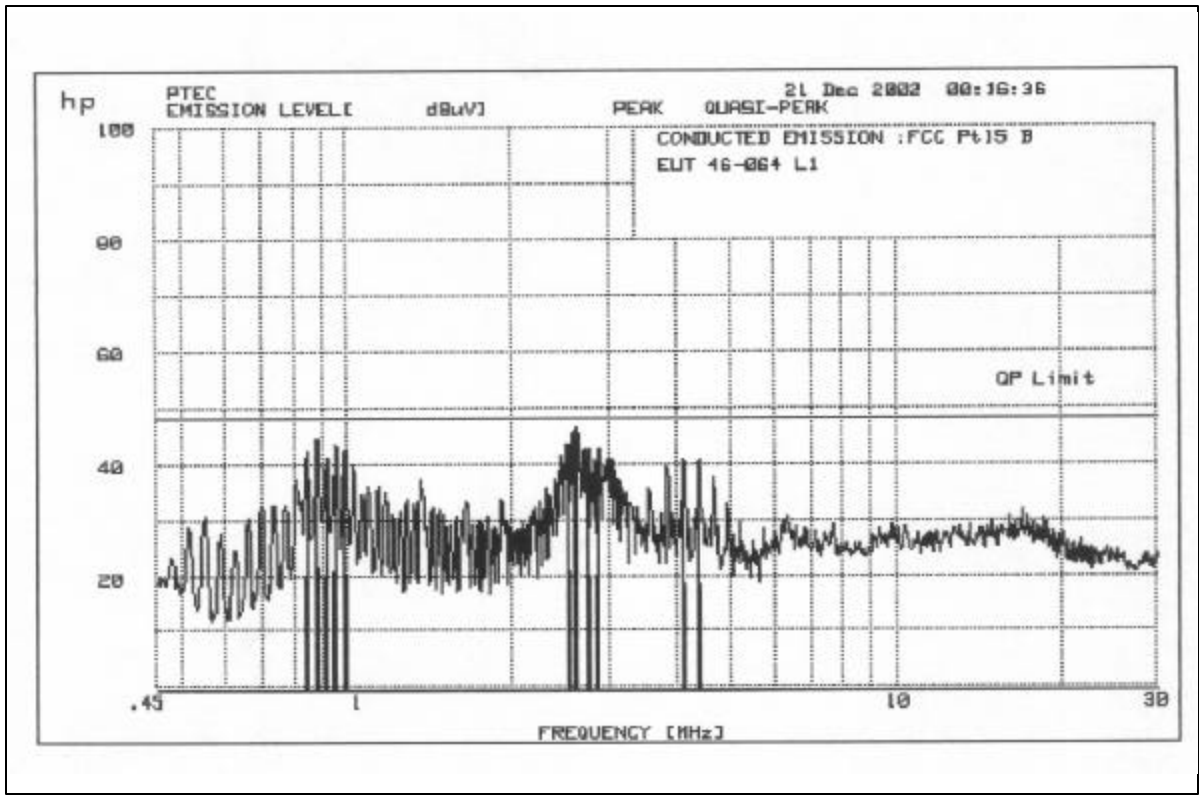
Conducted Emission Test Result (Line)

Test Standard	Reference Standard:	FCC part 15	Test Condition	Operation Mode:	A (See 3.1)
	Specification:	FCC part 15		Classification:	B

Measurement Uncertainty: ± 1.75 dB **Temp (°c):** 22 **Humidity (%):** 52



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MEASUREMENT RESULT OF QUASI-PEAK DETECTOR

Frequency (MHz)	Level (dBµV)	Limit (dBµV)	Margin (dB)	Line
0.8479	40.5	47.9	7.4	Line
0.8842	43.8	47.9	4.1	Line
0.9183	40.0	47.9	7.9	Line
0.9536	41.8	47.9	6.1	Line
0.9945	41.0	47.9	6.9	Line

Frequency (MHz)	Level (dBµV)	Limit (dBµV)	Margin (dB)	Line
2.5350	42.0	47.9	5.9	Line
2.6100	41.8	47.9	6.1	Line
2.7560	39.6	47.9	8.3	Line
2.8630	40.3	47.9	7.6	Line
4.1060	37.6	47.9	10.3	Line
4.3730	37.7	47.9	10.2	Line

Note: -

Result*: *Pass

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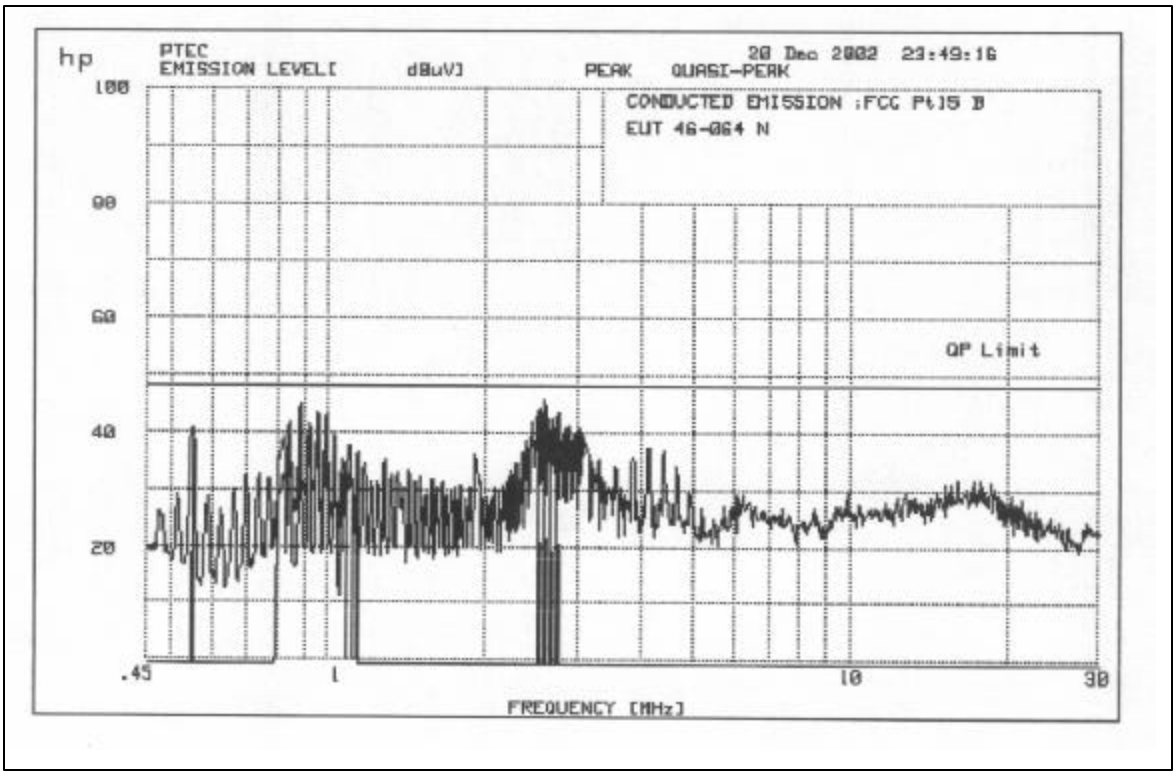
Conducted Emission Test Result (Neutral)

Test Standard	Reference Standard:	FCC part 15	Test Condition	Operation Mode:	A (See 3.1)
	Specification:	FCC part 15		Classification:	B

Measurement Uncertainty: ± 1.75 dB **Temp (°c):** 24 **Humidity (%):** 53



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MEASUREMENT RESULT OF QUASI-PEAK DETECTOR

Frequency (MHz)	Level (dBµV)	Limit (dBµV)	Margin (dB)	Line
0.5527	38.3	47.9	9.6	Neutral
0.8234	32.4	47.9	15.5	Neutral
0.8444	40.6	47.9	7.3	Neutral
0.8842	43.6	47.9	4.3	Neutral
0.9183	40.2	47.9	7.7	Neutral
0.9536	42.0	47.9	5.9	Neutral

Frequency (MHz)	Level (dBµV)	Limit (dBµV)	Margin (dB)	Line
0.9986	42.0	47.9	5.9	Neutral
1.0330	38.1	47.9	9.8	Neutral
1.0720	33.1	47.9	14.8	Neutral
1.1000	32.6	47.9	15.3	Neutral
1.1420	32.8	47.9	15.1	Neutral
2.5350	42.0	47.9	5.9	Neutral
2.6100	43.4	47.9	4.5	Neutral
2.6770	39.0	47.9	8.9	Neutral
2.7560	41.2	47.9	6.7	Neutral

Note: -

Result*: *Pass

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Tested By: Mr. Anake Meemoosor

6.2 Radiated Emission

Test Specification

EUT Input Power:	110 V_{AC}, 60Hz
Operation Mode	A (See 3.1)
Reference Standard:	FCC part 15
Classification Limit:	B

Measurement Equipment

Equipment Name	Manufacturer	Model	S/N	Traceability	Cal date
EMI Test Receiver (Display Unit)	HP	8572A	3340A21373	NIST	28-06-2002
EMI Test Receiver (Analyzer Unit)	HP	8572A	3340A08152	NIST	28-06-2002
Bilog Antenna	Schaffner-Chase EMC LTd.	CBL6141A	4146	UK National standard	03-09-2002
Double Rigid Horn Antenna	EMCO	3115	96104996	NIST	24-12-2002

Test Location: TRM - 002

Test Setup

The radiated emission measurement was performed with EMI receiver to observe the emission characteristic and identify the frequency of emission that has the highest amplitude relative to limit by operating the EUT with a typical configuration. The EUT configuration, cable configurations of operation are determined for producing the maximum level of emissions.

The EUT was placed on the 80 cm height non-metallic table on 1 m radius turntable. The EUT was set on a real operation-mode, read-write disk, hard disk, memory, display on the screen and simulate the communication signal. The Burn-in software was used for control the functions of the EUT.

6.2.1 Frequencies below 1000MHz

The Bi-Log antenna (30 MHz - 2GHz) was used for received the noise of EUT and put on the antenna mast, which they were in side the semi-anechoic chamber. The testing method and the EUT setup were performed according to ANSI C63.4.The EUT configuration setup is shown in figures 4 and 5,respectively.

6.2.2 Frequencies above 1000MHz

The Double Rigid Horn antenna (1GHz-18GHz) was used for received the noise at EUT and put on the antenna 1 m above ground plane (Cause of the antenna bandwidth is less than 30 degree, therefore the measurement above 1m don't necessary to test). They were in side the semi-anechoic

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chambers. The testing method and the EUT setup were performed according to ANSI C63.4. The EUT configuration setup is shown in figures 6 and 7,respectively

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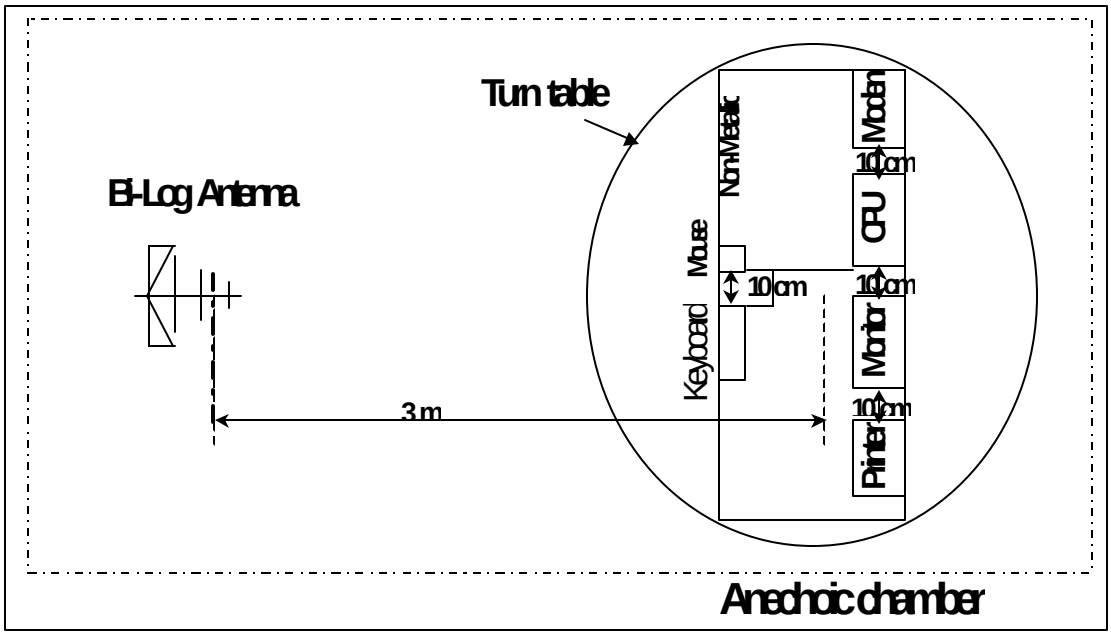
6.2.1 Frequencies below 1GHz

Test Picture



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GURE 4. THE DIAGRAM OF SETUP FOR RADIATED EMISSIONS TESTING

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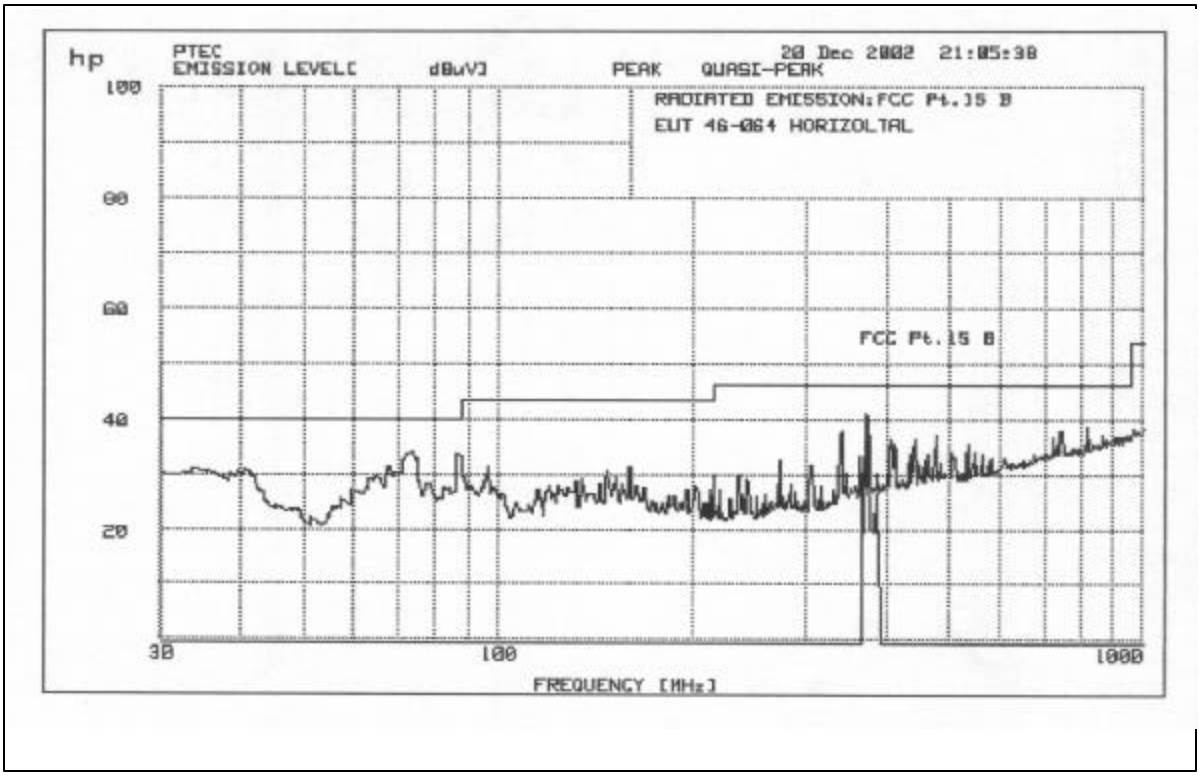
Radiated Emission Test Result (Horizontal)

Test Standard	Reference Standard:	FCC part 15	Test Condition	Operation Mode:	A (See 3.1)
	Specification:	FCC part 15		Classification:	B

Measurement Uncertainty: ± 6.04 dB Temp (°c): 25 Humidity (%): 58



MEASUREMENT RESULT OF QUASI-PEAK DETECTOR

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV)	Margin (dB)
365.91	30.3	46.00	15.7
372.37	40.0	46.00	6.0
384.30	26.5	46.00	19.5

Result*: *Pass

Tested By: Mr. Anake Meemoon
Date: .....

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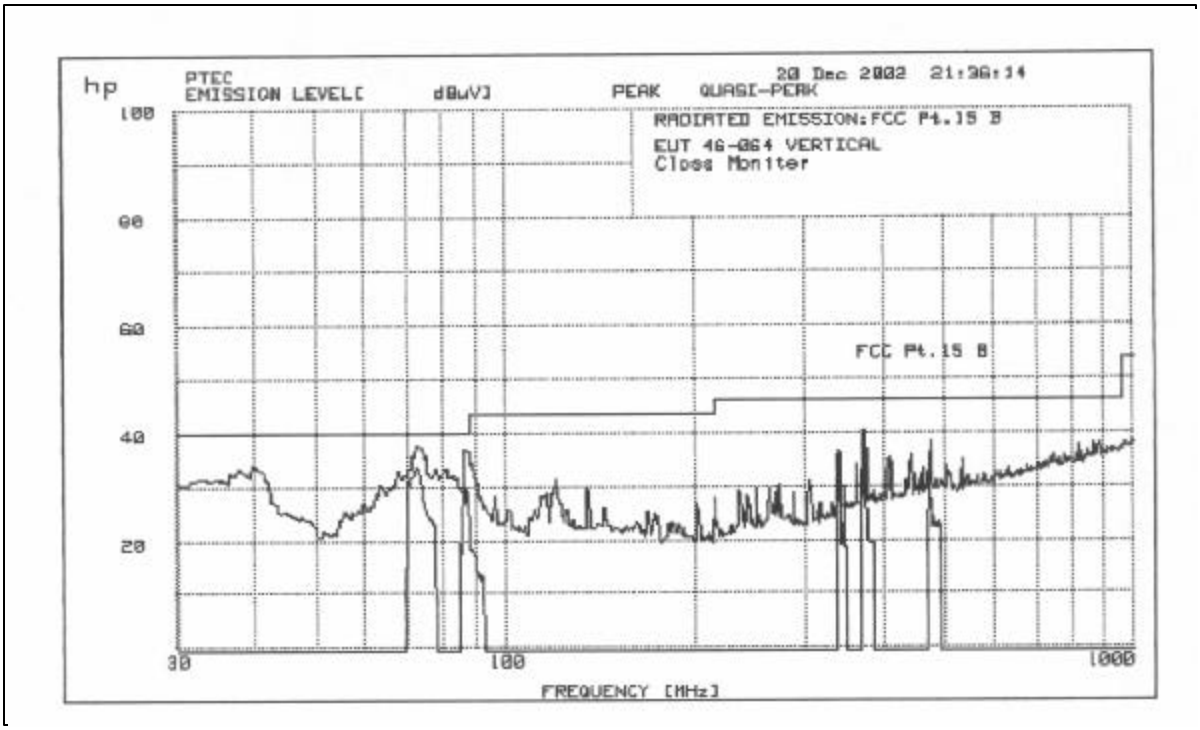
Radiated Emission Test Result (Vertical)

Test Standard	Reference Standard:	FCC part 15	Test Condition	Operation Mode:	A (See 3.1)
	Specification:	FCC part 15		Classification:	B

Measurement Uncertainty: ± 6.04 dB Temp (°c): 23 Humidity (%): 55



MEASUREMENT RESULT OF QUASI-PEAK DETECTOR

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV)	Margin (dB)
72.27	33.7	40.00	6.3
86.41	31.7	40.00	8.3
336.40	35.5	46.00	10.5
344.75	27.1	46.00	18.9
372.37	39.0	46.00	7.0
474.19	33.0	46.00	13.0

Result*: *Pass

.....
Tested By: Mr. Anake Meemongkon
Title:

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6.2.2 Frequencies above 1GHz

Test Picture

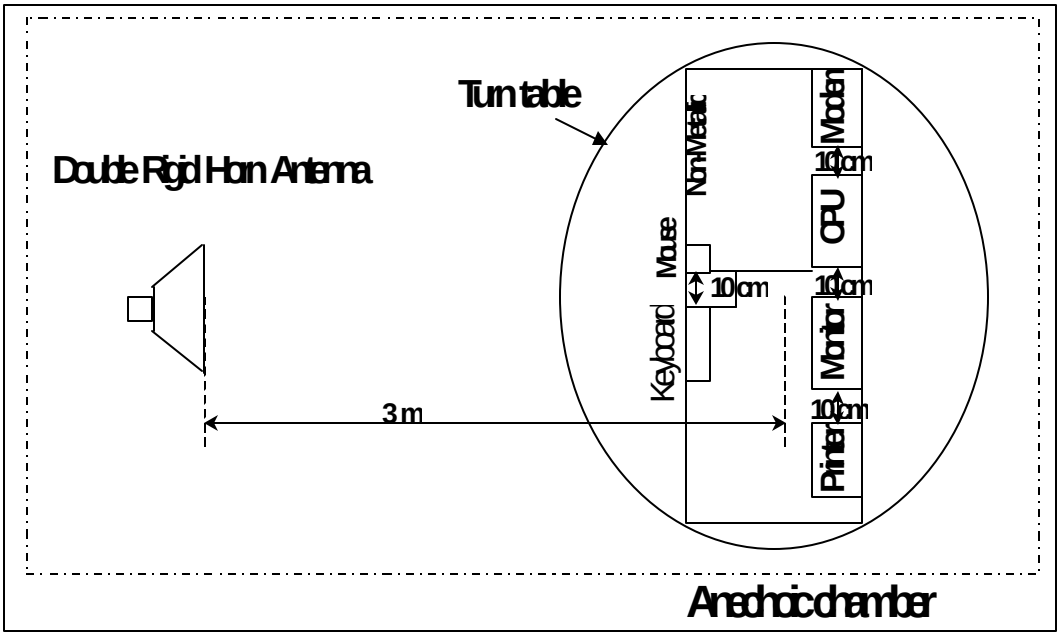

FIGURE 6. THE DIAGRAM OF SETUP FOR RADIATED EMISSIONS TESTING

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FIGURE 7. THE TEST SETUP PICTURE

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MEASUREMENT RESULT OF PEAK DETECTOR (Horizontal)

Frequency (GHz)	Level (dBµV/m)	Limit (dBµV)	Margin (dB)
1.008	37.1	53.9	10.7
1.056	40.0	53.9	7.7
1.145	38.3	53.9	9.2
1.152	37.9	53.9	9.6
1.246	37.4	53.9	9.9
1.099	31.1	53.9	16.5
2.291	31.1	53.9	13.2

Note

- The frequencies above 1 GHz up to fifth harmonic of the internal clock were measured.
- The level of frequencies above 2.7 GHz are very small compared to the noise floor level then the signal cannot display.

Result*: *Pass

……..
Tested By: Mr. Anake Meemoosor
Date:

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MEASUREMENT RESULT OF PEAK DETECTOR (Vertical)

Frequency (GHz)	Level (dBµV/m)	Limit (dBµV)	Margin (dB)
1.008	35.9	53.9	11.9
1.056	36.5	53.9	11.2
1.099	35.1	53.9	12.5
1.152	36.0	53.9	11.5
1.146	34.9	53.9	12.6
1.249	35.4	53.9	11.9
1.218	33.9	53.9	13.5
2.720	31.8	53.9	11.1

Note

- The frequencies above 1 GHz up to fifth harmonic of the internal clock were measured.
- The level of frequencies above 2.7 GHz are very small compared to the noise floor level then the signal cannot display.

Result*: *Pass

……..
Tested By: Mr. Anake Meemoosor
Date:

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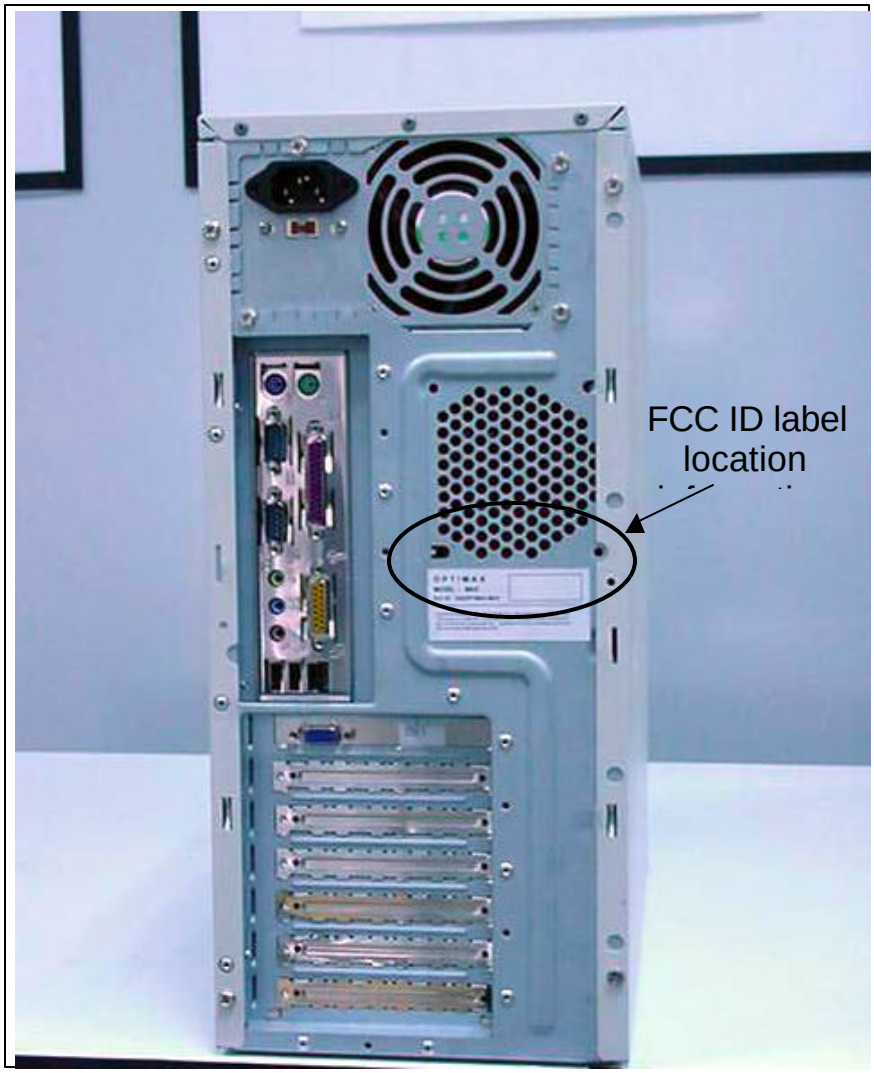
Appendix

FCC ID label location information



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FCC ID label location Information

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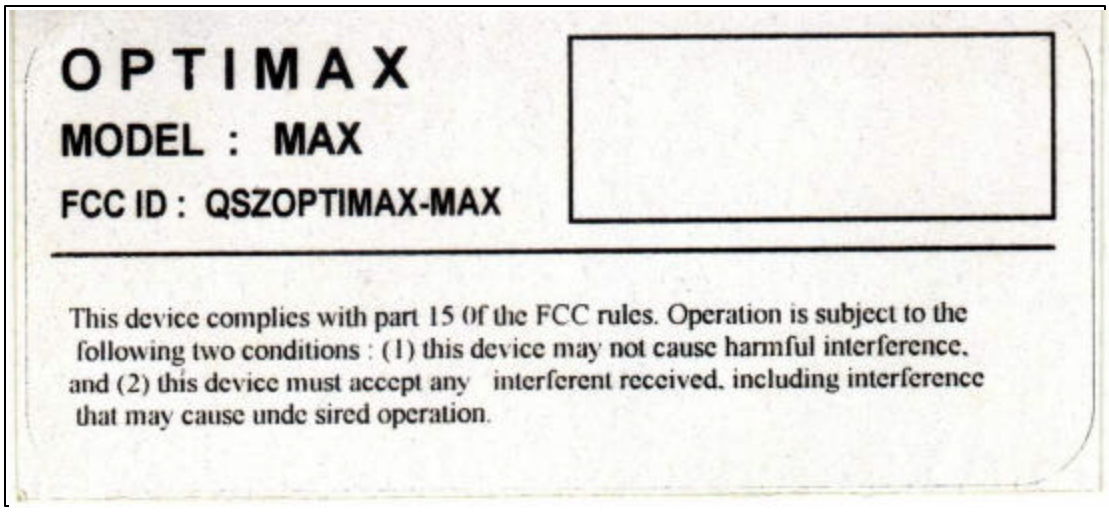

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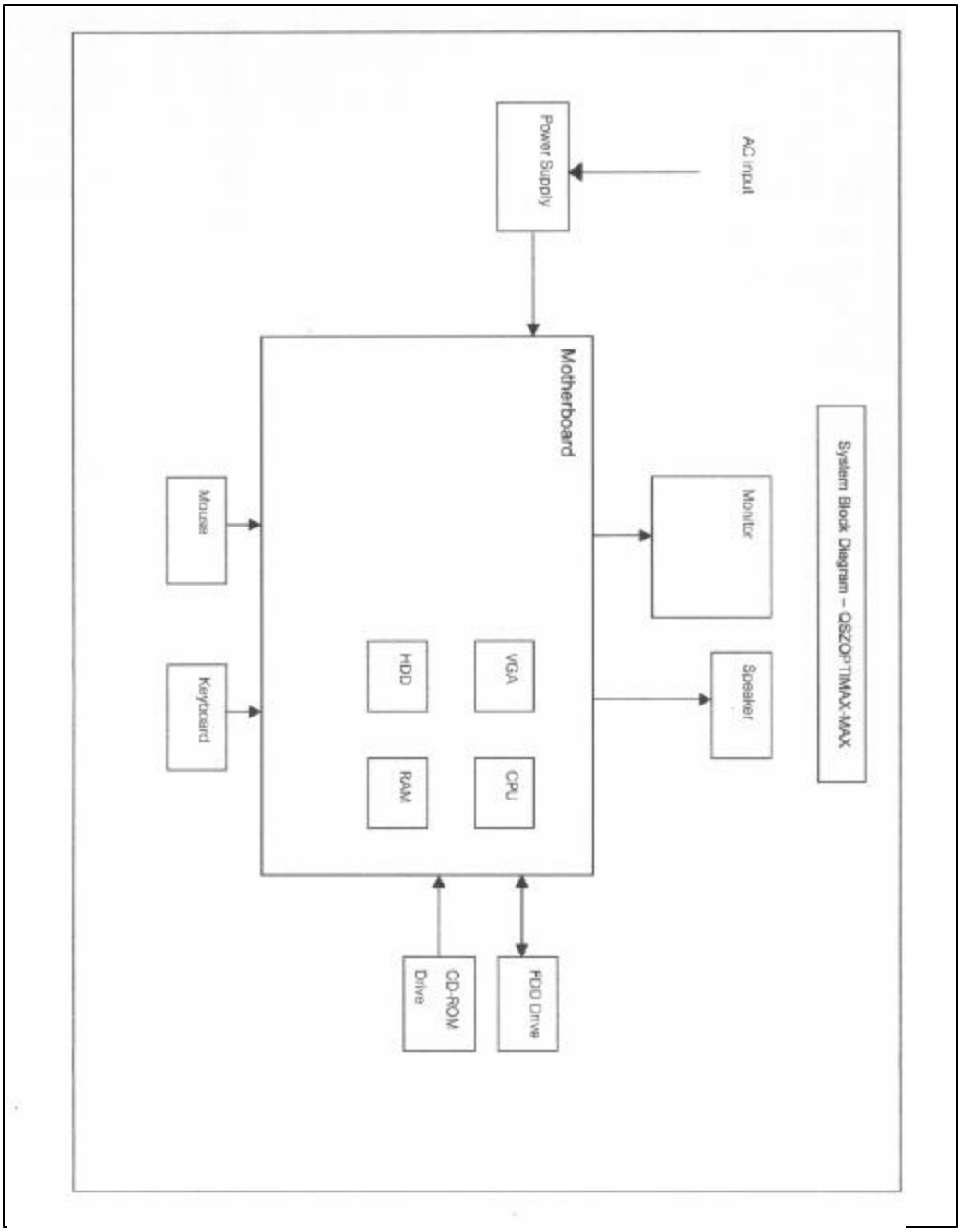

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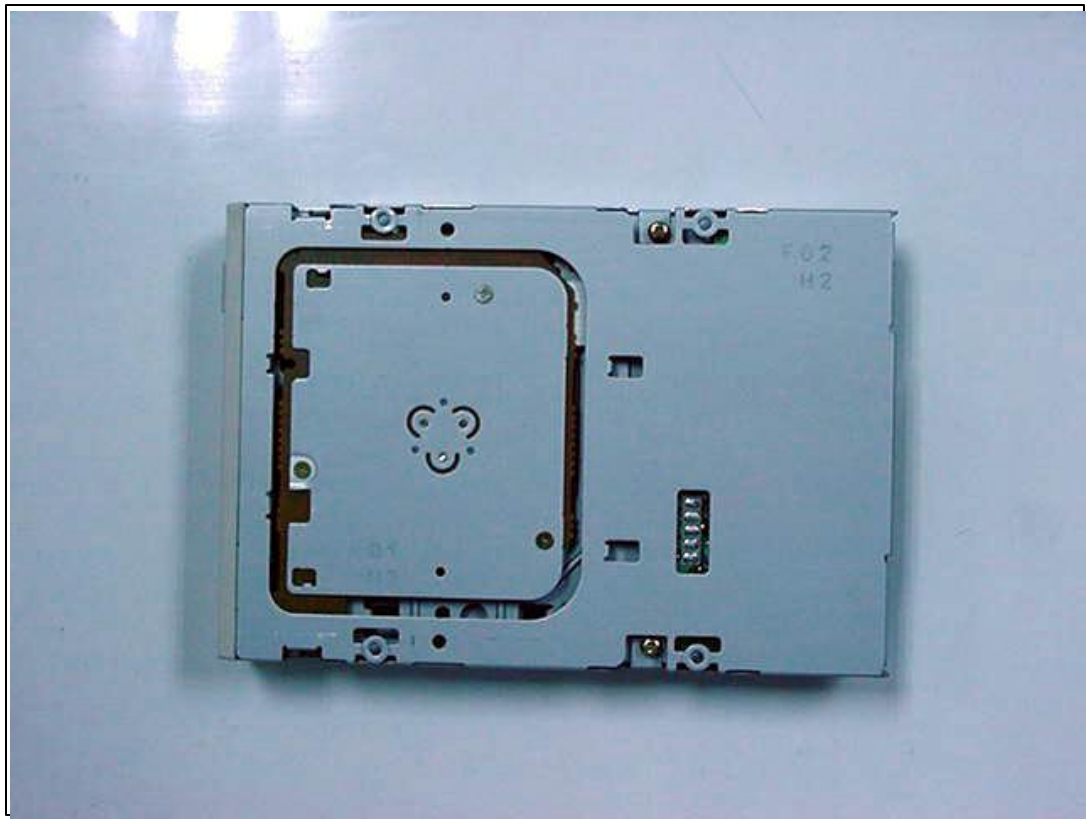

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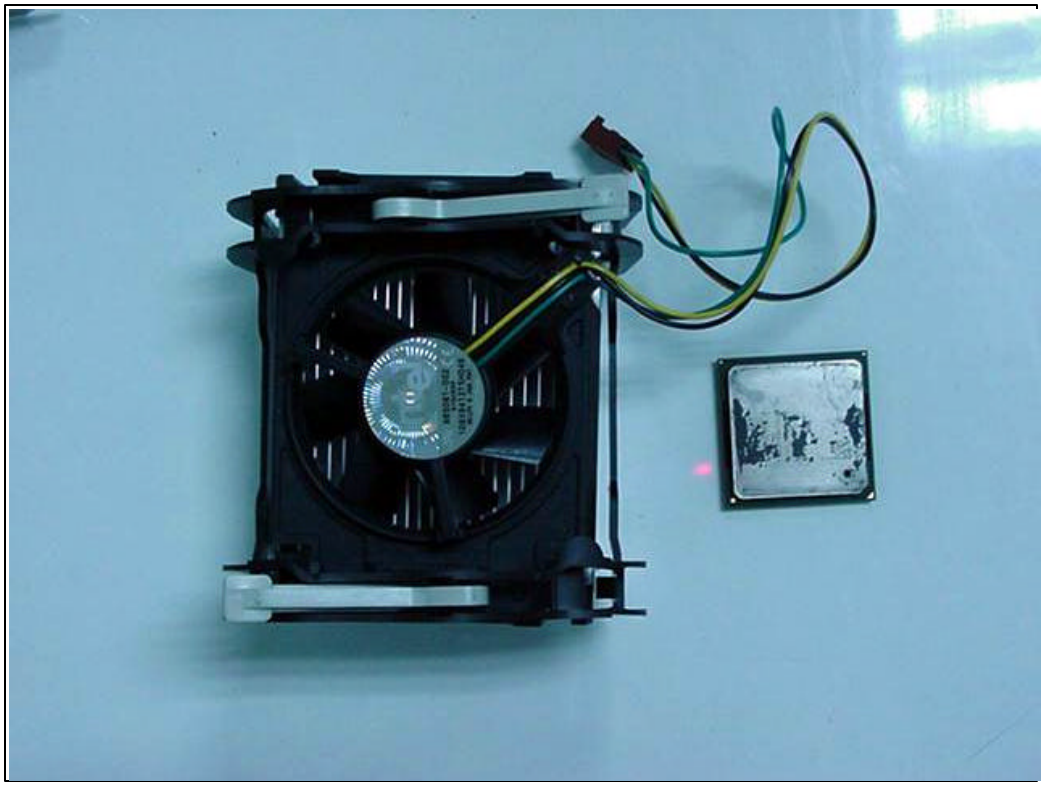

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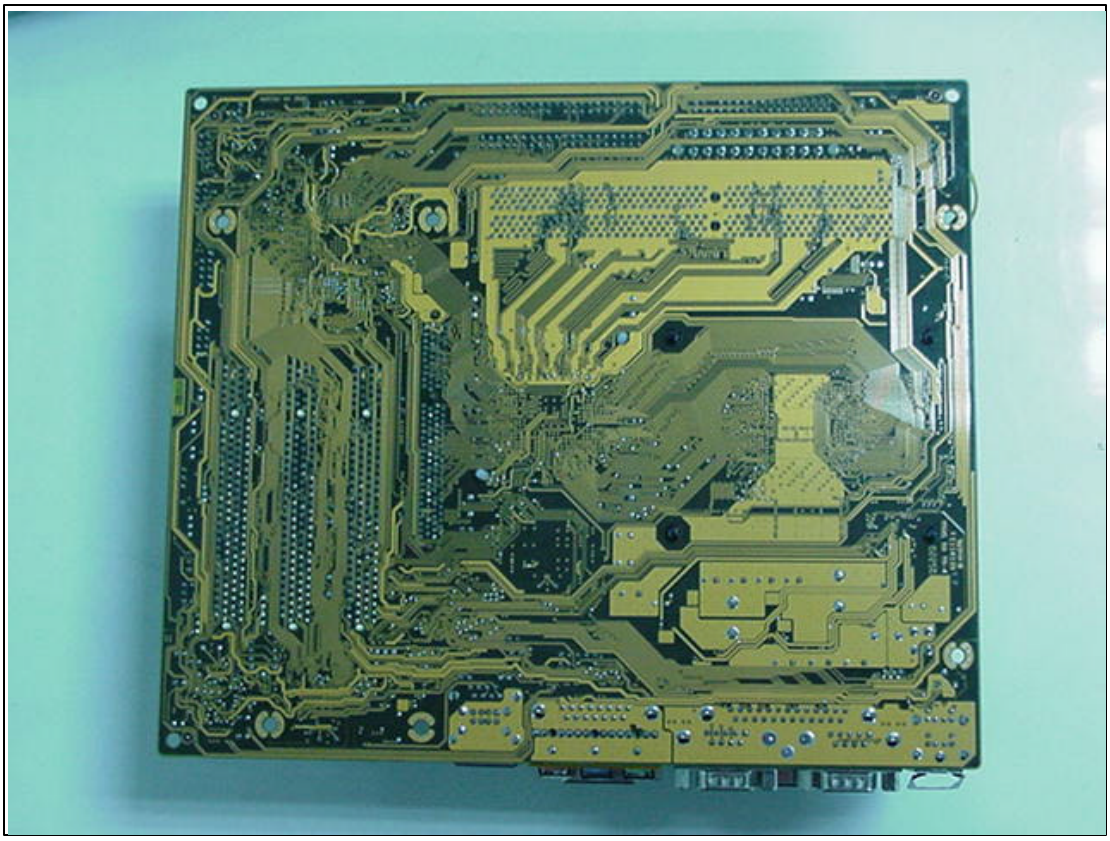

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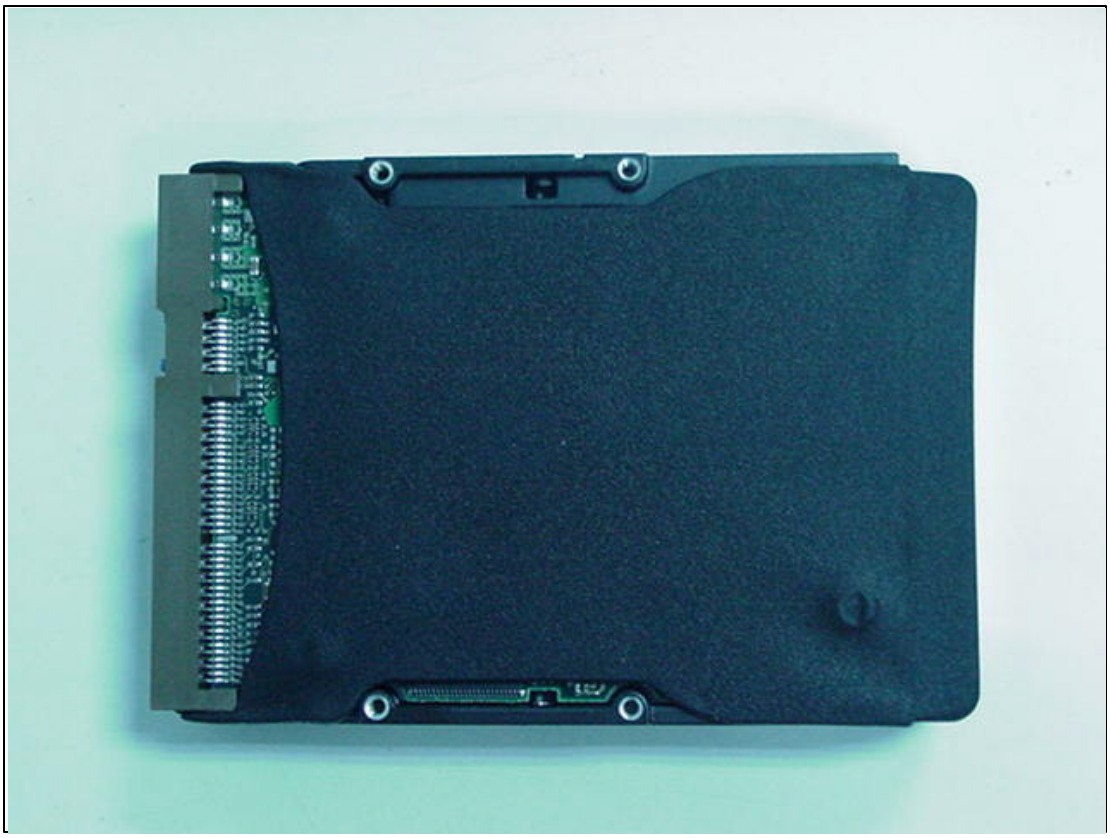

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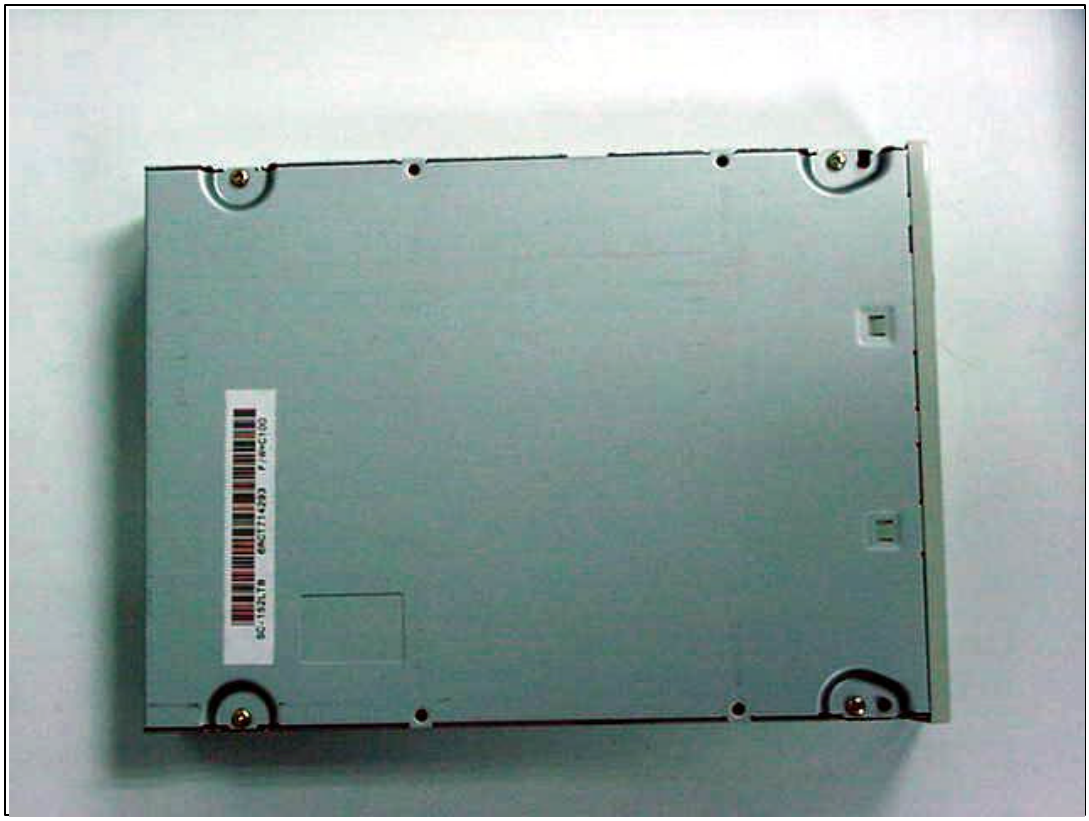

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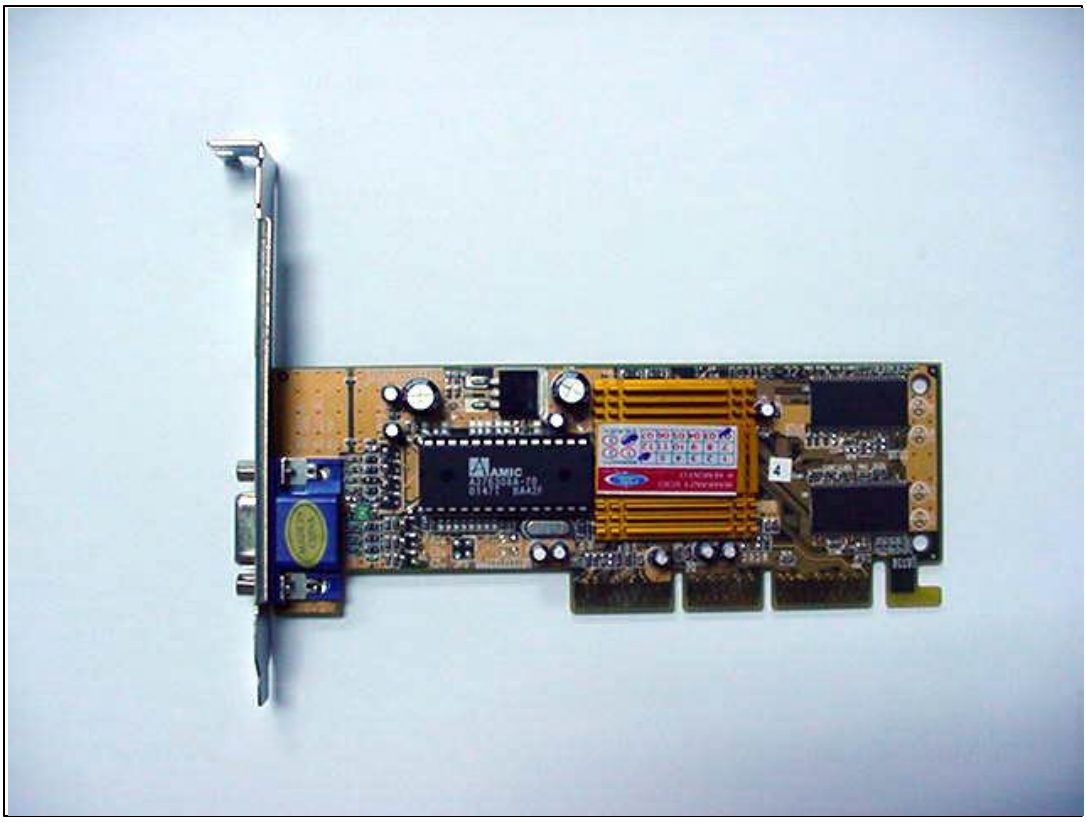

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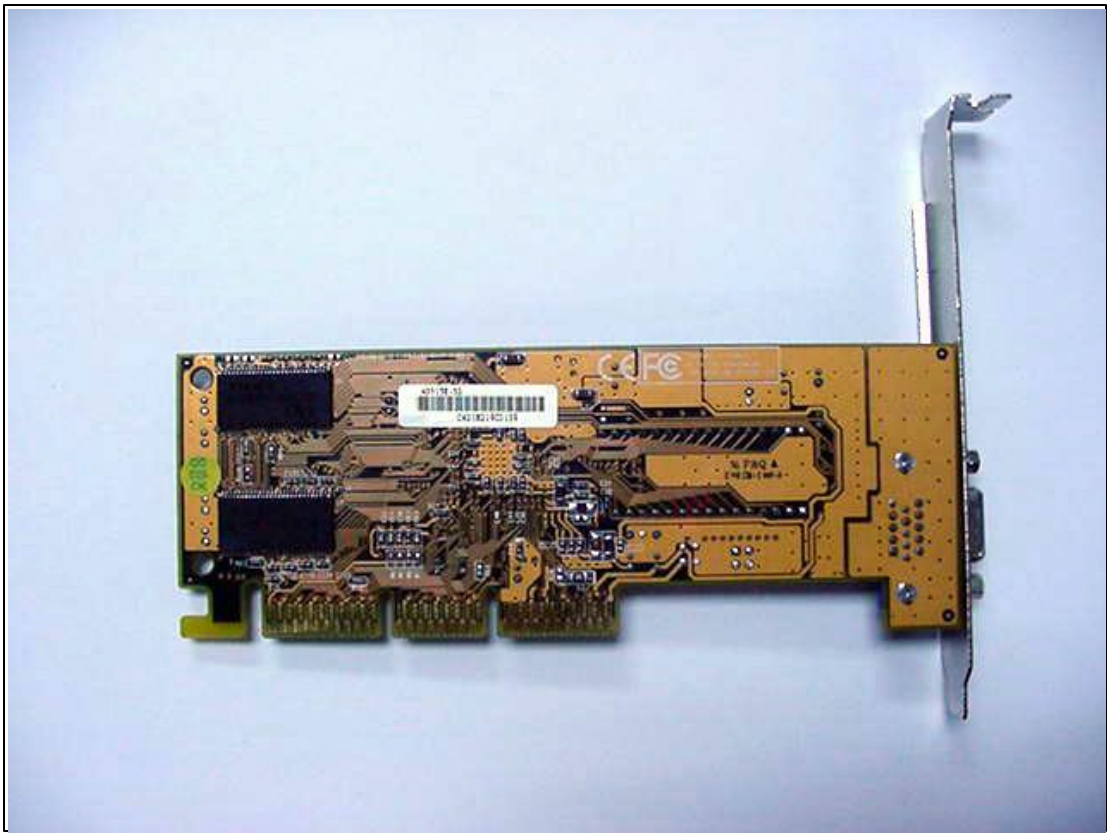

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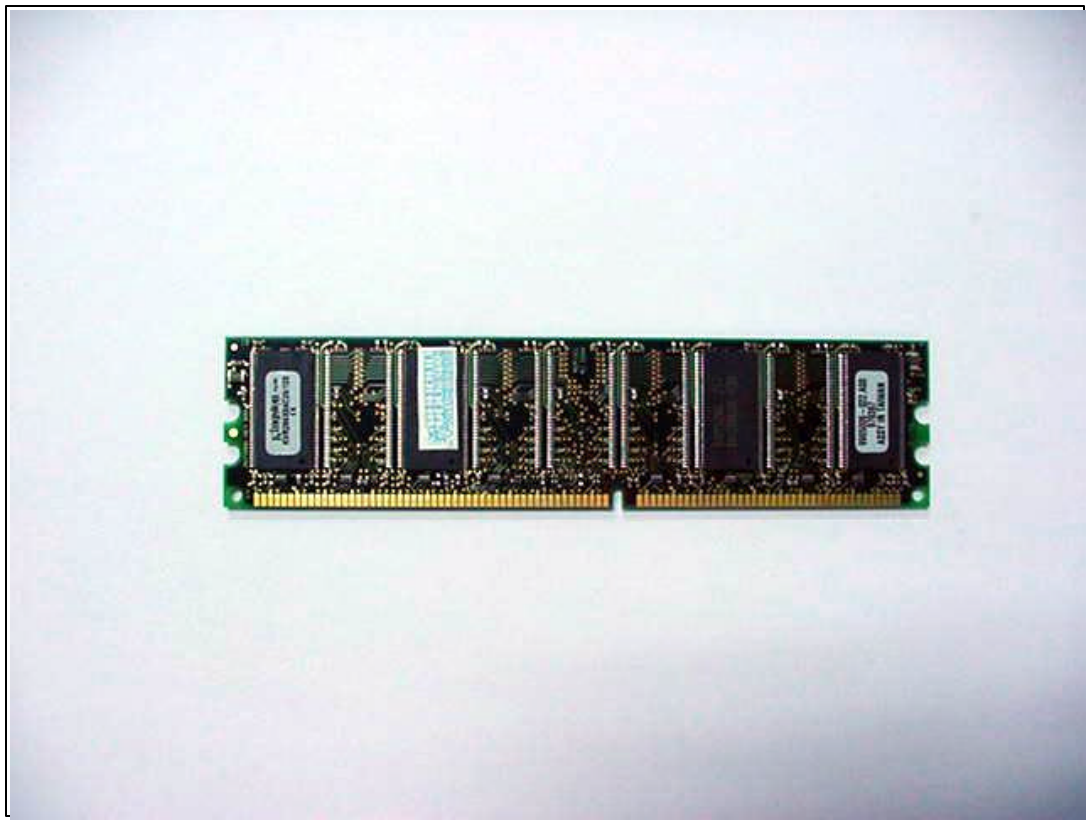

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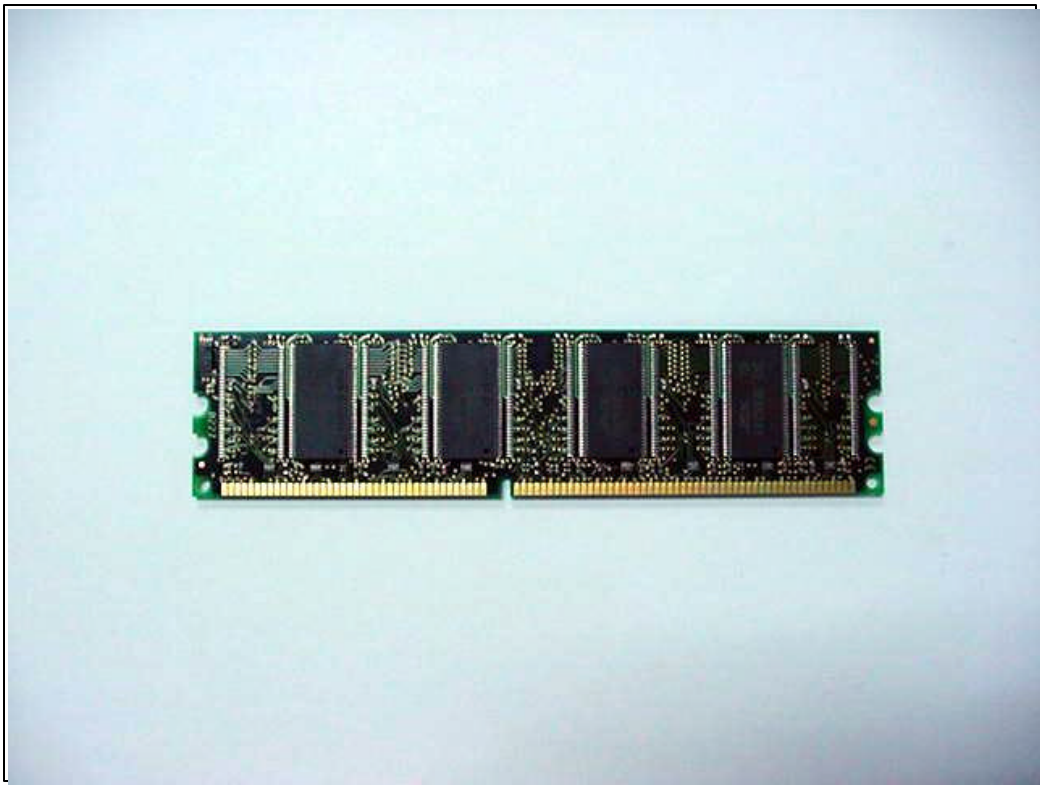

END OF REPORT

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