



PHILIPS

Philips Electronics Industries (Taiwan) Ltd - EMC Lab. 5, Tze Chiang 1 Road, Chungli Industrial Park, Chungli, Taoyuan, Taiwan Tel.: +886-3-454-9862 Fax.: +886-3-454-9887 E-mail: ronnie.yang@philips.com	FCC Test Report	Report No.: TYR87-2005 Date : 12 March, 2002 Page : 1 of 24
Customer : Philips Electronics Industries Name : Mr. S.T. Huang – EE LCD Address : 5, Tze Chiang 1 Road, Zip/City : Chungli Industrial Park, Country : Chungli, Taiwan, R.O.C.		
Equipment Under Test (including peripherals) : FCC ID. : A3KM101 Model Name : 6634-0AN Serial Number : TY0105729 Description : 19" XGA monitor, Max. resolution 1600x1200/75Hz		
EMC Standards : FCC Part 15 of October 01,1999 Class B ANSI C63.4-1992 Result : PASSED the limits/test-levels in the standards. Note : The results in this report apply only to the sample(s) and mode(s) tested. It is the manufacturer's responsibility to assume the continued EMC compliance of production models.		
Date of receipt of EUT : 08 Feb. 2002 Date of performance of test : 15 Feb., 2002 to 17 Feb., 2002		
 C.C. Wu - EMC Test Engineer  Ronnie Yang - EMC Manager NVLAP Signatory		

Philips Electronics Industries (Taiwan) Ltd

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Table of contents

1. Summary of test results.....	3
2. General information of EUT.....	4
3. Test equipment.....	5
4. Test configuration of EUT and peripherals.....	6
5. Test procedure.....	7
6. Measurement uncertainty.....	9
7. Conducted emissions test.....	10
8. Radiated emissions test.....	15
9. Photographs of test set-up.....	20
10. References.....	24

1. Summary of test results

Test	Standard	Result	Note
Emission, ANSI C63.4-1992			
Conducted emission	FCC Part 15	Passed	
Radiated emission	FCC Part 15	Passed	

Remark:

The test sample fully complies with the requirements set forth in : FCC Part 15 Class B.

2. General Information of EUT

The EUT, 19" color monitor :

Model No. : 6634-0AN

FCC ID : A3KM101

Brand : IBM

The color monitor automatically scans horizontal frequencies between 30KHz and 96KHz , and vertical frequencies between 50Hz and 160Hz. This color monitor displays sharp and brilliant images of text and graphics with a maximum resolution up to 1600x1200 pixels.

The monitor has 10 factory-preset modes as indicated in the following table:

#	Resolution	Hor (kHz)	Ver (Hz)	H-pol	V-pol
1	720x400	31.469	70.087	-	+
2	640 x 480	31.469	59.940	-	-
3	640 x 480	43.269	85.008	-	-
4	800 x 600	46.875	75.000	+	+
5	800 x 600	53.674	85.061	+	+
6	1024 x 768	60.023	75.029	+	+
7	1024 x 768	68.677	84.997	+	+
8	1280 x 1024	79.976	75.024	+	+
9	1280 x 1024	91.146	85.024	+	+
10	1600 x 1200	93.750	75.000	+	+

3. Test Equipment

Test equipment used for line Conducted and Radiated emissions as following.
All equipment were calibrated according to ANSI C63.4-1992 and ISO-9000 requirement unless otherwise specified.

Traceability to R.O.C. and international standards is assured by using calibrated all equipment.

- For Conducted Emissions Test:

Test Equipment	Model No.	Serial No.	Last Calibrate	Next Calibrate
Spectrum	HP8568B	2415A00346	05/16/2001	05/16/2002
EMI Receiver	R & S ESCS30	830245/026	06/09/2001	06/08/2002
LISN	EMCO 3825/2	9311-2153	12/04/2001	06/04/2002
LISN	EMCO 3825/2	9311-2154	12/04/2001	06/04/2002
RF Cable	8-meter	N/A	05/28-2001	05/28/2002

- For Radiated Emissions Test:

Test Equipment	Model No.	Serial No.	Last Calibrate	Next Calibrate
Spectrum	HP8568B	2415A00346	08/15/2001	08/15/2002
RF Preselector	HP85685A	2901A00946	08/15/2001	08/15/2002
QP Adapter	HP85650A	2043A00366	08/15/2001	08/15/2002
EMI Receiver	HP85460A	3441A00199	09/11/2001	09/11/2002
RFI Filter Section	HP85460A	3330A00177	09/11/2001	09/11/2002
EMI Receiver	R & S ESVS30	841977/006	05/28/2001	05/28/2002
Biconical Antenna	EMCO 3110B	3222	04/27/2001	04/27/2002
Biconical Antenna	EMCO 3110B	3224	04/27/2001	04/27/2002
Log-Periodic Antenna	EMCO 3146A	1424	04/27/2001	04/27/2002
Log-Periodic Antenna	EMCO 3146A	1425	04/27/2001	04/27/2002
Turn Table	EMCO 1060	1068	05/26/2001	05/26/2002
Antenna Tower	EMCO 1050	1113	05/26/2001	05/26/2002
RF Cable	M17/75-RG214-NE	N/A	05/26/2001	05/26/2002

4. Test Configuration of EUT and Peripherals

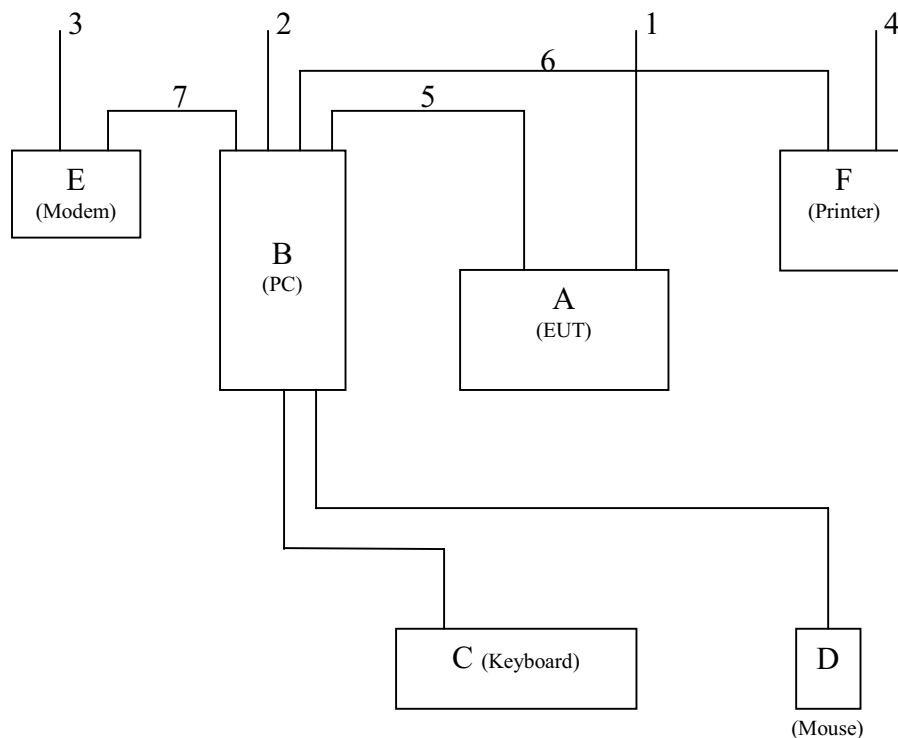
The system was configured for testing in a typical fashion (as a customer would normally use it) according to ANSI C63.4-1992, please see the photographs for detail. For system measurement, the EUT “6634-0AN” were connected to:

	Description	Brand/ Model No.	Serial No.	FCC ID	Remark
A	15” LCD monitor	Philips 6634-0AN	TY0105729	A3KM101	EUT
B	PC	IBM Aptiva V66M	11S8138A	FCC logo	
C	Keyboard	IBM KB-7993	0017954	FCC Logo	
D	Mouse	IBM 12J3619	23-034616	DZL211120	
E	Modem	USRobotics 268	2680559278575	CJE-0318	
F	Printer	HP 2225C	3145S02419	DSI6XU2225	

Connected Cables

No.	Description	Manufacturer	Length	Shielded	Remark
1	Power Cord	Long Shine	1.8 meters	No	for EUT
2	Power Cord	Acer	1.8 meters	No	for PC
3	Power Cord	Aceex	2.0 meters	No	for Modem
4	Power Cord	HP	1.8 meters	No	for Printer
5	Video Cable	Long Shine	1.5 meters	Yes	
6	Printer Cable	HP	1.8 meters	Yes	
7	Modem Cable	Aceex	1.5 meters	Yes	

System Block Diagram of Test Configuration



5. Test Procedure

Test was performed by:

PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.
CONSUMER ELECTRONICS DIVISION
- EMC LAB

5, Tze Chiang 1 Road, Chungli Industrial Park
P.O. Box 123, Chungli, Taoyuan, Taiwan
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The test was performed in accordance with ANSI C63.4-1992, "AMERICAN NATIONAL STANDARD FOR MEASUREMENT OF RADIO-NOISE EMISSION FROM LOW-VOLTAGE ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE RANGE OF 9KHz TO 40GHz"

Both conducted and radiated testing were performed according to the procedure in ANSI C63.4-1992. Conducted testing was performed in screen room and radiated testing was performed in open site at an antenna to EUT distance of 3-meter on horizontal and vertical polarization.

First, pre-scan all modes in screen room then select **2 higher modes** (worst case) were tested and reported.

The line conductive interference was tested with 110VAC and 220VAC receptively. Unshielded power cord was used during test.

D-sub I/F cable with two ferrite cores was used.

Tested and reported modes as following:

File No.	Resolution	Frequencies	I/F Cable	Figure	
				Conducted	Radiated
EMI02-004	1600x1200	93.7KHz/75Hz	D-sub	Figure 1, 2	Figure 5
EMI02-004A	1280x1024	91.1KHz/85Hz	D-sub	Figure 3, 4	Figure 6

Set up the EUT and all peripherals as chapter 6 of ANSI C63.4-1992 for AC power line conducted emissions testing and radiated emissions testing.

Turn on the power of EUT and all peripherals, select an appropriate displaying mode using the "setup" software. Then run an EMI test program "HTEST.EMI" as a basic software to execute the EUT operating under test. A pattern of scrolling H's should be displayed on the monitor.

Step 1 : Run the "HTEST.EMI" on personal computer then sends "H" character to monitor continuously until full screen.

Step 2 : Personal computer sends a complete line of continuously repeating “H” to HP 2225C printer.

Step 3 : Personal computer sends a file of “H” pattern to floppy disk then read a file of “H” pattern from floppy disk.

Step 4 : Personal computer sends a file of “H” pattern to hard disk then read a file of “H” pattern from hard disk.

Step 5 : Personal computer sends a file of “H” pattern to USRobotics 268 modem.

Step 6 : Return to step 1

All data in this report are “PEAK” value within 15dB margin unless otherwise noted.

6. Measurement Uncertainty

The system uncertainty listed below are based on the instrument absolute specifications, and do not include uncertainties of the equipment under test.

Uncertainty for Radiated Emissions Test at 3 meters Test Site.

Source of Measurement Uncertainty	Uncertainty/dB
Antenna factor calibration	+/-2.0
Cable loss calibration	+/-0.5
Receiver specification	+/-1.0
Antenna position ver.	+/-2.0
Measurement distance ver.	+/-0.5
Site imperfections	+/-2.0
Mismatch	+/-1.1
System repeatability	+/-0.5

Uncertainty for Conducted Emissions Test at 3 meters Test Site.

Source of Measurement Uncertainty	Uncertainty/dB
LISN specification	+/-2.0
Cable loss calibration	+/-0.5
Receiver specification	+/-1.0
Pulse limiter Spec.	+/-0.3
Measurement distance ver.	+/-0.5
Site imperfections	+/-2.0
System repeatability	+/-0.5

Conducted Emissions		
FCC Part 15		
Operating conditions EUT:		
EUT powered on with scrolling “H” pattern.		
Limits:		
Frequency range (MHz)	Class A (dBuv) QP	Class B (dBuv) QP
0.45 – 1.705	60.0	48.0
1.705 – 30.0	69.5	48.0
Test Result :		
Passed FCC Class B Limits		
Option: The following option may be employed if the conducted emissions exceed the limits, as appropriate, when measured using instrumentation employing a quasi-peak detector function: If the level of the emission measured using the quasi-peak instrumentation is 6dB, or, more higher than the level of the same emission measured with instrumentation having an average detector and a 9KHz minimum bandwidth, that emission is considered broadband and the level obtained with the quasi-peak detector may be reduced by 13dB for comparison to the limits.		
Remark:		
Date of Test	: 15 Feb., 2002 to 17 Feb., 2002	
Test Engineer	: C.C.Wu	
For detail measurement results see next pages.		

Figure 1

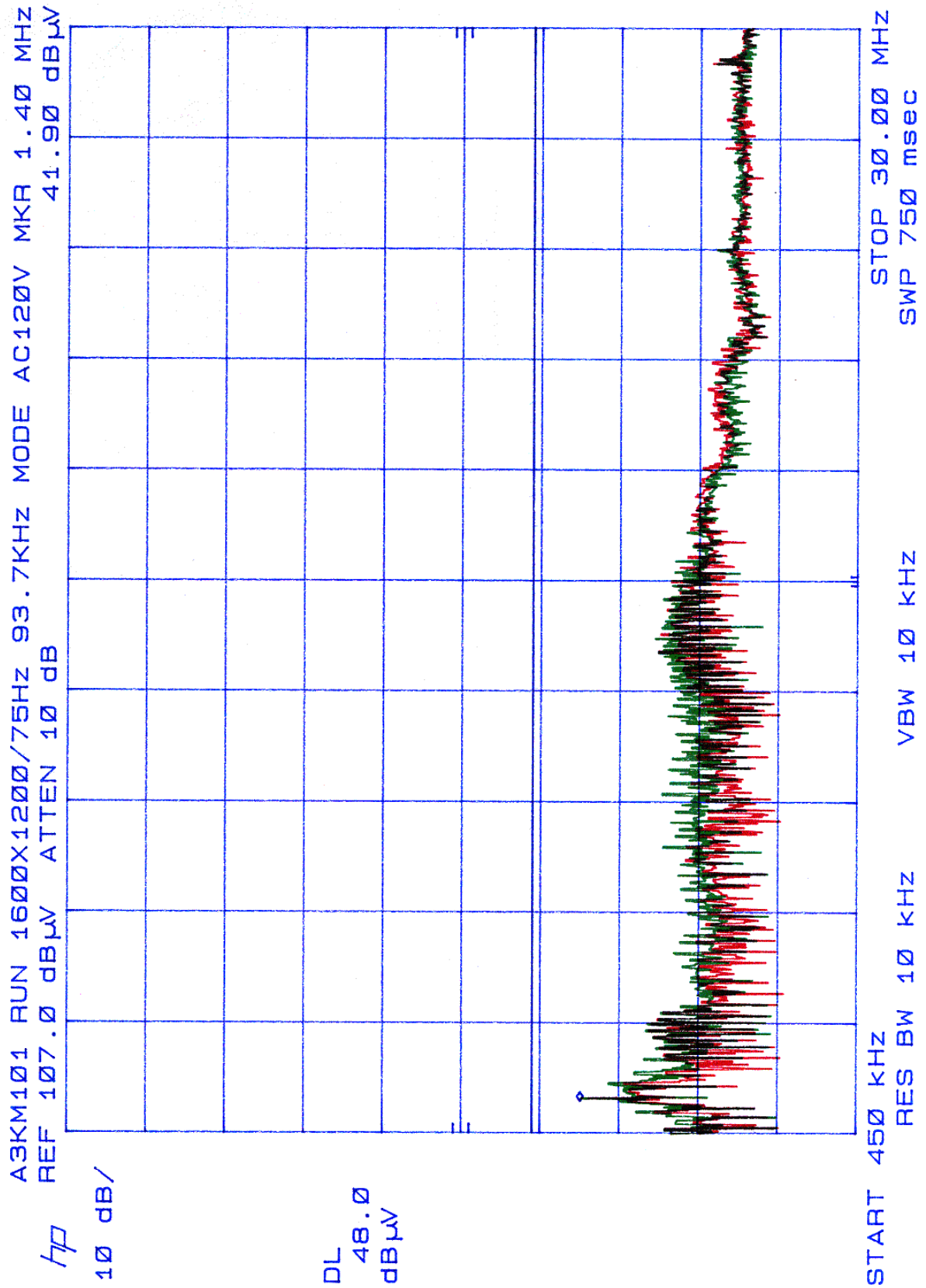


Figure 2

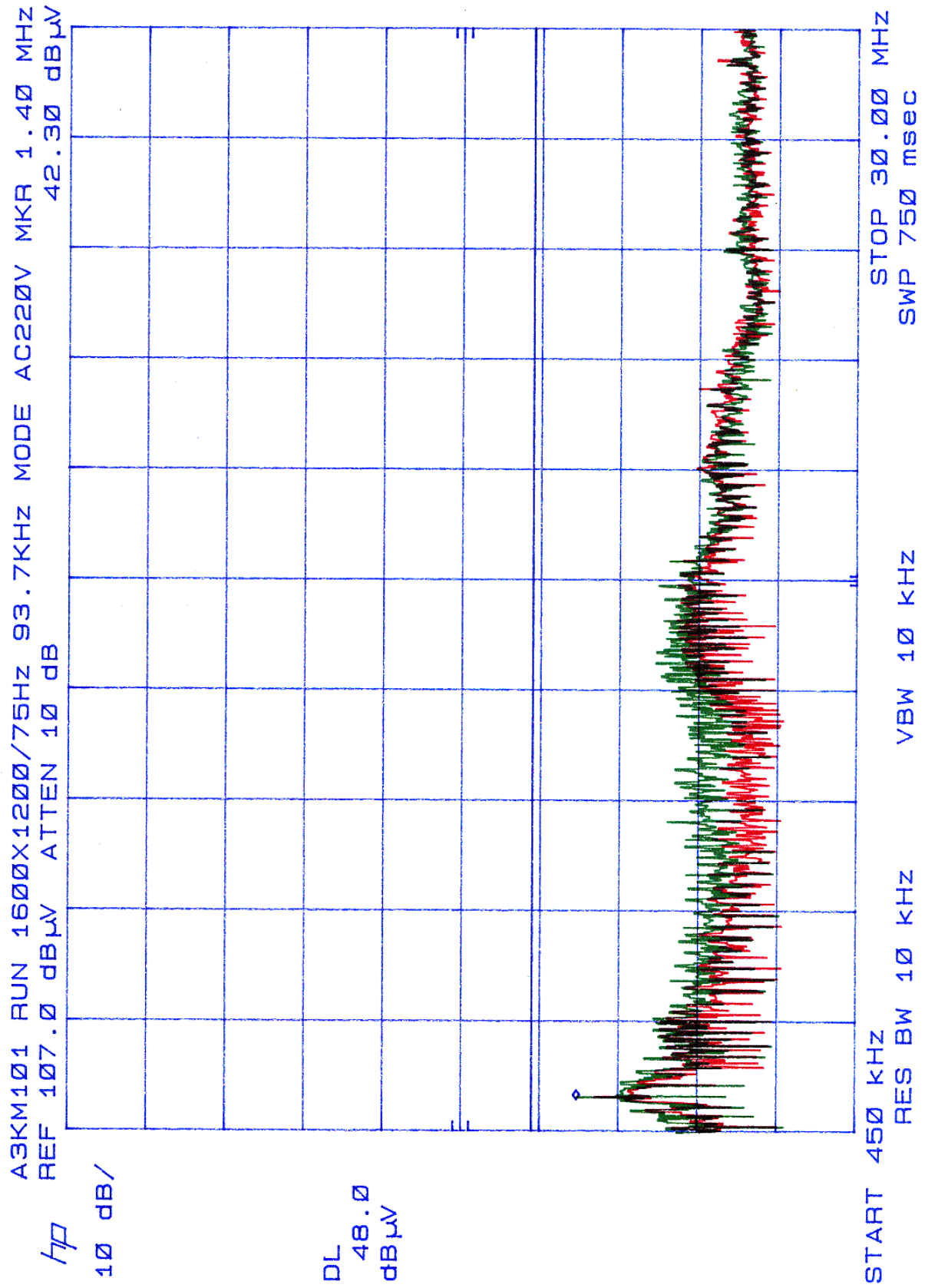


Figure 3

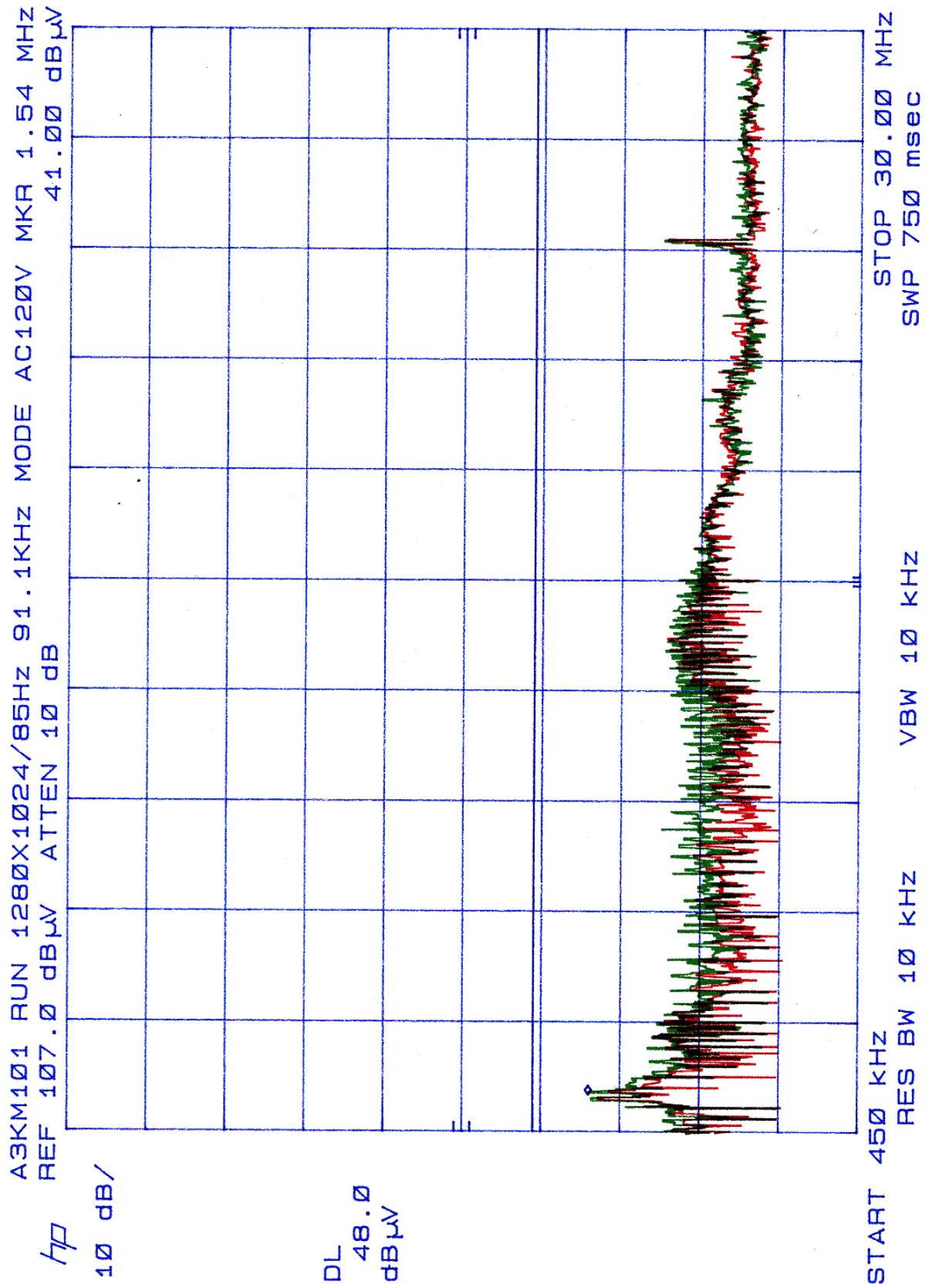
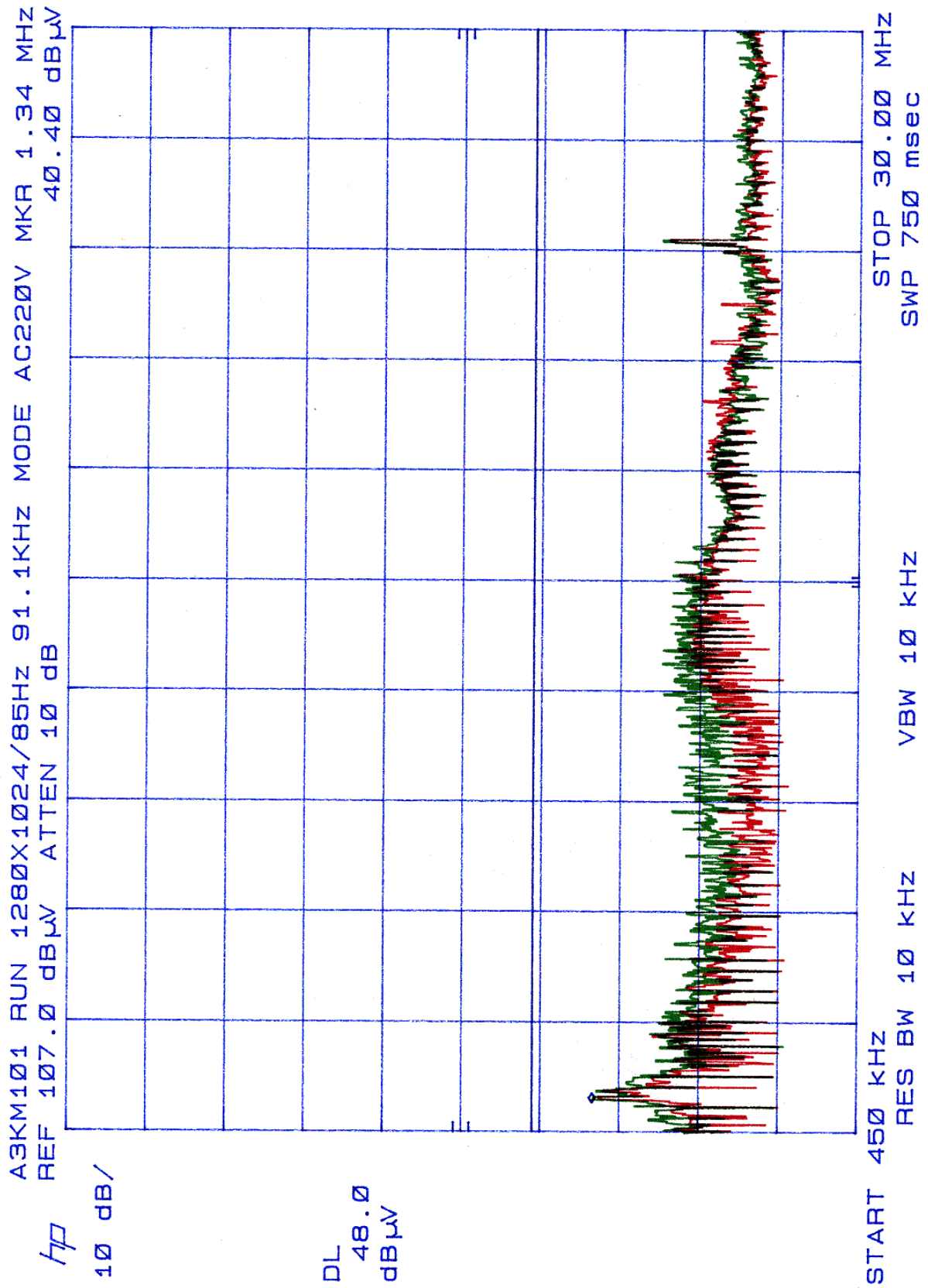


Figure 4



Radiated Emissions FCC Part 15																				
Operating conditions EUT: EUT powered on with scrolling “H” pattern.																				
Limits: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Frequency range (MHz)</th> <th style="width: 33%;">Class A at 10m (dBuv) QP</th> <th style="width: 33%;">Class B at 3m (dBuv) QP</th> </tr> </thead> <tbody> <tr> <td>30.0 – 88.0</td> <td>39.0</td> <td>40.0 Quasi-Peak</td> </tr> <tr> <td>88.0 – 216.0</td> <td>43.5</td> <td>43.5 Quasi-Peak</td> </tr> <tr> <td>216.0 – 960.0</td> <td>46.5</td> <td>46.0 Quasi-Peak</td> </tr> <tr> <td>960.0 – 1000.0</td> <td>49.5</td> <td>54.0 Quasi-Peak</td> </tr> <tr> <td>Above 1000.0</td> <td>49.5</td> <td>54.0 Average</td> </tr> </tbody> </table>			Frequency range (MHz)	Class A at 10m (dBuv) QP	Class B at 3m (dBuv) QP	30.0 – 88.0	39.0	40.0 Quasi-Peak	88.0 – 216.0	43.5	43.5 Quasi-Peak	216.0 – 960.0	46.5	46.0 Quasi-Peak	960.0 – 1000.0	49.5	54.0 Quasi-Peak	Above 1000.0	49.5	54.0 Average
Frequency range (MHz)	Class A at 10m (dBuv) QP	Class B at 3m (dBuv) QP																		
30.0 – 88.0	39.0	40.0 Quasi-Peak																		
88.0 – 216.0	43.5	43.5 Quasi-Peak																		
216.0 – 960.0	46.5	46.0 Quasi-Peak																		
960.0 – 1000.0	49.5	54.0 Quasi-Peak																		
Above 1000.0	49.5	54.0 Average																		
Test Result : Passed FCC Class B Limits Remark:																				
Date of Test Test Engineer		: 15 Feb., 2002 to 17 Feb., 2002 : C.C.Wu																		
For detail measurement results see next pages.																				

Radiated RF Level – Peak Value

Frequency (MHz)	Horizontal (dBuv/m)	Vertical (dBuv/m)	FCC/B Limit (dBuv/m)
43.49	25.32	29.32	40
57.95	24.78	28.08	40
132.03	26.42	27.12	43.5
174.04	27.22	27.52	43.5
246.36	35.04	34.64	46
260.83	34.24	33.74	46
271.19	34.84	34.44	46
304.31	30.216	30.716	46
318.78	29.976	29.476	46
362.27	29.9	30.8	46
449.23	34.976	34.876	46
463.7	33.536	34.036	46
492.69	33.876	35.576	46
507.18	35.156	35.556	46
521.65	33.576	33.576	46
550.65	34.924	34.624	46
594.15	35.028	34.428	46
652.1	37.136	36.736	46

Spectrum Analyzer Setting:

RBW: 100KHz

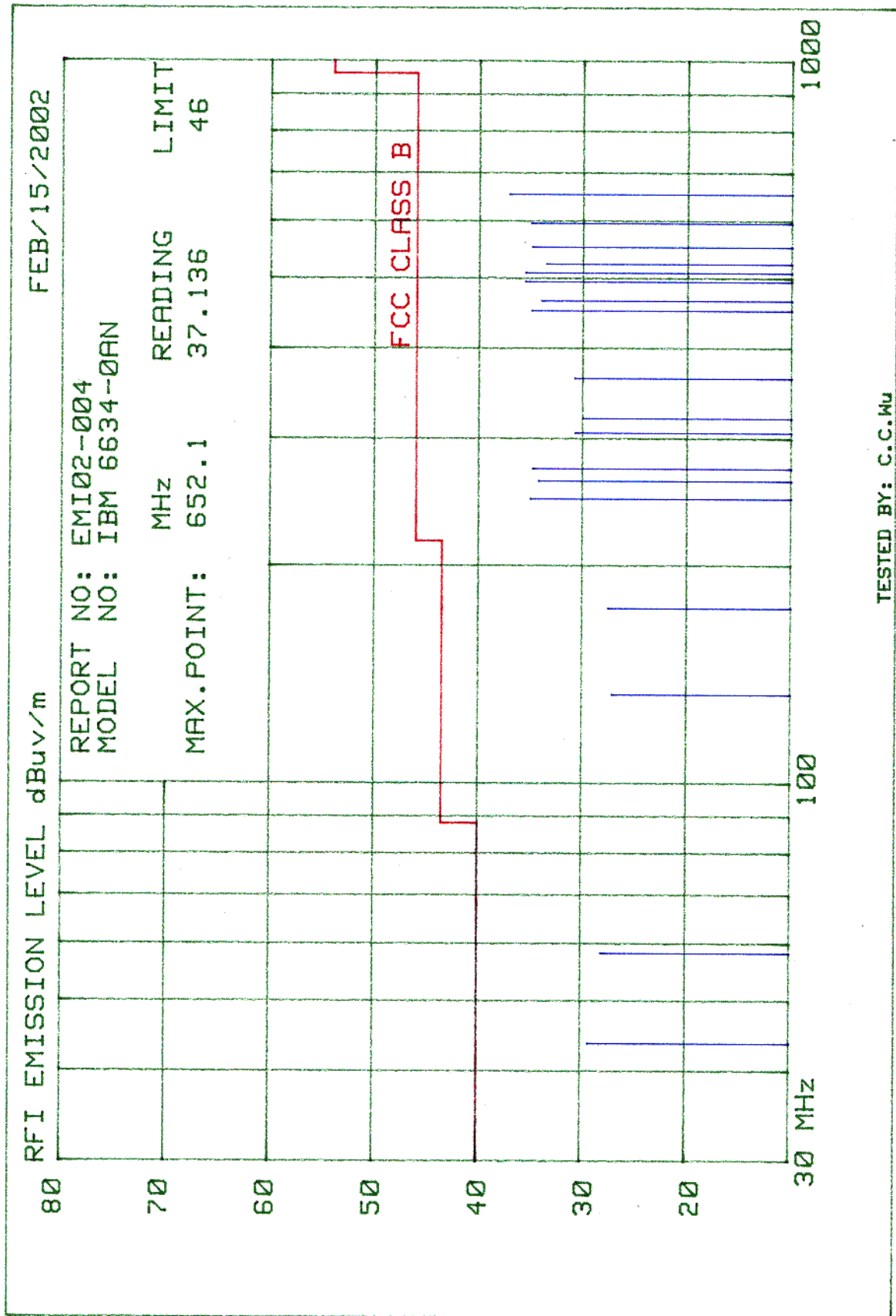
VBW: 100KHz

The spectrum was scanned from 30MHz to 1000MHz and the significant emissions were recorded.
Test distance between device under test and receiving antenna was 3-meter.

Sample of calculation:

Final value (dBuv/m) = Antenna Factor (dB) + Cable Loss (dB) + Reading value (dBuv/m)

Figure 5



Radiated RF Level – Peak Value

Frequency (MHz)	Horizontal (dBuv/m)	Vertical (dBuv/m)	FCC/B Limit (dBuv/m)
52.49	25.12	26.62	40
70	25.1	26.7	40
122.5	28.99	31.09	43.5
157.54	28.8	29.1	43.5
192.53	29.33	28.93	43.5
245.05	35	34	46
302.92	30.612	29.312	46
315.04	34.46	30.76	46
351.41	30.3	30.7	46
472.56	34.852	35.152	46
475.04	35.3	35.8	46
577.57	34.736	34.236	46

Spectrum Analyzer Setting:

RBW: 100KHz

VBW: 100KHz

The spectrum was scanned from 30MHz to 1000MHz and the significant emissions were recorded.
Test distance between device under test and receiving antenna was 3-meter.

Sample of calculation:

Final value (dBuv/m) = Antenna Factor (dB) + Cable Loss (dB) + Reading value (dBuv/m)

Figure 6

