

EMC/IMMUNITY TEST REPORT

REPORT NO. : F87011406

MODEL NO. : SG200A

DATE OF TEST : Jan. 20, 1998



誠信科技股份有限公司

ADVANCE DATA TECHNOLOGY CORP.



EMC

TEST REPORT

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MODEL NO. : SG200A
DATE OF TEST : Jan. 20, 1998

PREPARED FOR: APAC MULTIMEDIA CORP.

ADDRESS : NO. 31, 8F-1, LANE 169 KANG-NING ST.,
HIS-CHIH TAIPEI, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

12F, NO.1, SEC.4, NAN-KING EAST RD.,
TAIPEI, TAIWAN, R.O.C.

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1.

CERTIFICATION

Issue Date: May 1, 1998

Product : VGA CARD
Trade Name : APAC
Model No. : SG200A
Applicant : APAC MULTIMEDIA CORP.
Standard : FCC Part 15, Subpart B, Class B
ANSI C63.4-1992
CISPR 22: 1993 +A1+A2

We hereby certify that one sample of the designation has been tested in our facility on Jan. 20, 1998. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards

PREPARED BY: Sharon Hsiung , DATE: 5/1/98
(Sharon Hsiung)

TESTED BY: Leo Hong , DATE: 5/1/98
(Leo Hong)

APPROVED BY: Mike Su , DATE: 5/1/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION**NVLAP[®]**

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	VGA CARD
Model No.	:	SG200A
Power Supply	:	DC (from PC)
Data Cable	:	N/A

Note: The EUT is a high-performance 64-bit 2D/3D engine and integrated 170 MHz RAMDAC. It has high-quality 3D texture mapping, MIP-Mapping, Video texture mapping Bi-linear and tri-linear texture filtering, Z buffering. It provides RCA output jack (composite), and S-Video output port. It has 2 or 4 Mbyte SGRAM frame buffer and full hardware support VESA 2.0 DPMS and DDC2B.

For more detailed features, please refer to manufacturer's specification or User's Manual.



2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No	Product	Brand	Model No.	FCC ID	I/O Cable
1	PERSONAL COMPUTER	NTI	PII-233	DOC approved	Nonshielded Power (1.8m)
2	MONITOR	ADI	PD-959	DOC approved	Shielded Signal (1.8m) Nonshielded Power (1.8m)
3	TELEVISION	BT-H1490Y	N/A	N/A	Shielded AV Signal (1m) Shielded S Signal (2m) Nonshielded Power (2.1m)
4	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.2m) Nonshielded Power (1.9m)
5	MODEM	DATATRONICS	1200CK	E2O5OV1200CK	Shielded Signal (1.2m) Nonshielded Power (1.9m)
6	MOUSE	HP	M-S34	DZL211029	Shielded Signal (1.8m)
7	KEYBOARD	FORWARD	FDA-102A	F4Z4K3FDA-102A	Shielded Signal (1.2m)

2.3 TEST METHODOLOGY AND CONFIGURATION

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:1992. Radiated testing was performed at an antenna to EUT distance of 10 m on an open area test site. Please refer to the photos of test configuration in Item 5.



3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8594A	3144A00308	Sept. 1, 1998
HP Preamplifier	8447D	2944A08119	Aug. 2, 1998
HP Preamplifier	8347A	3307A01088	Sept. 4, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESVP	893496/030	July 17, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE Bilog Antenna	CBL6112	2086	Dec. 26, 1998
EMCO Turn Table	1060	1195	N/A
EMCO Tower	1051	1163	N/A
Open Field Test Site	Site 2	ADT-R02	Sept. 26, 1998

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months.
And the calibrations are traceable to NML/ROC and NIST/USA.

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESH3	893495/006	July 23, 1998
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 24, 1998
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	Aug. 1, 1998
EMCO-L.I.S.N.	3825/2	9204-1964	July 22, 1998
Shielded Room	Site 2	ADT-C02	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months.
And the calibrations are traceable to NML/ROC and NIST/USA.



3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	54.0

Note: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range : 0.15 - 30 MHz (Conducted Emission)
30 - 2000 MHz (Radiated Emission)
Input Voltage : 120 Vac, 60 Hz
Temperature : 21 °C
Humidity : 55 %
Atmospheric Pressure : 1060 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -13.3 dB at 0.156 MHz Minimum passing margin of radiated emission: -3.3 dB at 161.92 MHz

Note: The EUT was pretested under the following resolution & horizontal synchronization speed mode:

- * 1600x1200 mode (93.7kHz)
- * 1280x1024 mode (91.1kHz)
- * 640x480 mode (31.5kHz)

The worst emission levels were found in 1600x1200 (93.7kHz) and 640x480 (31.5kHz) modes, and the data of both modes are recorded in this report. Under 640x480 (31.5kHz) mode, the EUT could use either AV or S signal cable to communicate with a television set. Since the worst emission levels were found using S signal cable, the EUT was connected to a television by using S signal cable for the final test of 640x480 mode.

4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC runs a test program to enable all functions of EUT.
3. PC reads and writes from HDD and FDD.
4. PC sends "H" messages to monitor and television, and both display "H" messages on their screens.
5. PC sends "H" messages to printer, then printer prints them on paper.
6. PC sends "H" messages to modem.
7. Repeat steps 3-7.

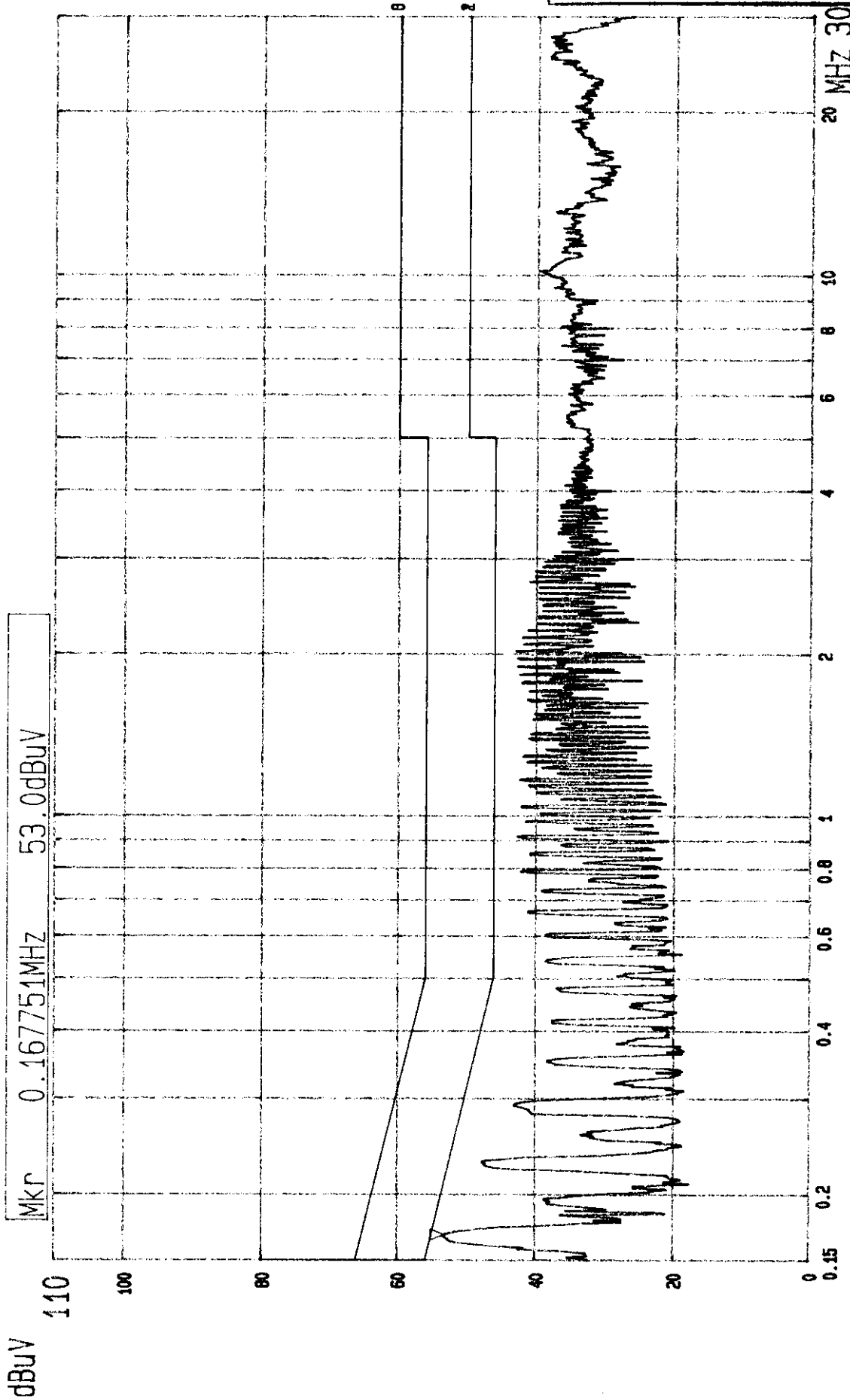


4.2 TEST DATA OF CONDUCTED EMISSION (A)

EUT: VGA CARDMODEL: SG200AMODE: 1600x1200 (93.7kHz)6 dB Bandwidth: 10 kHzTEST PERSONNEL: Joe Hong

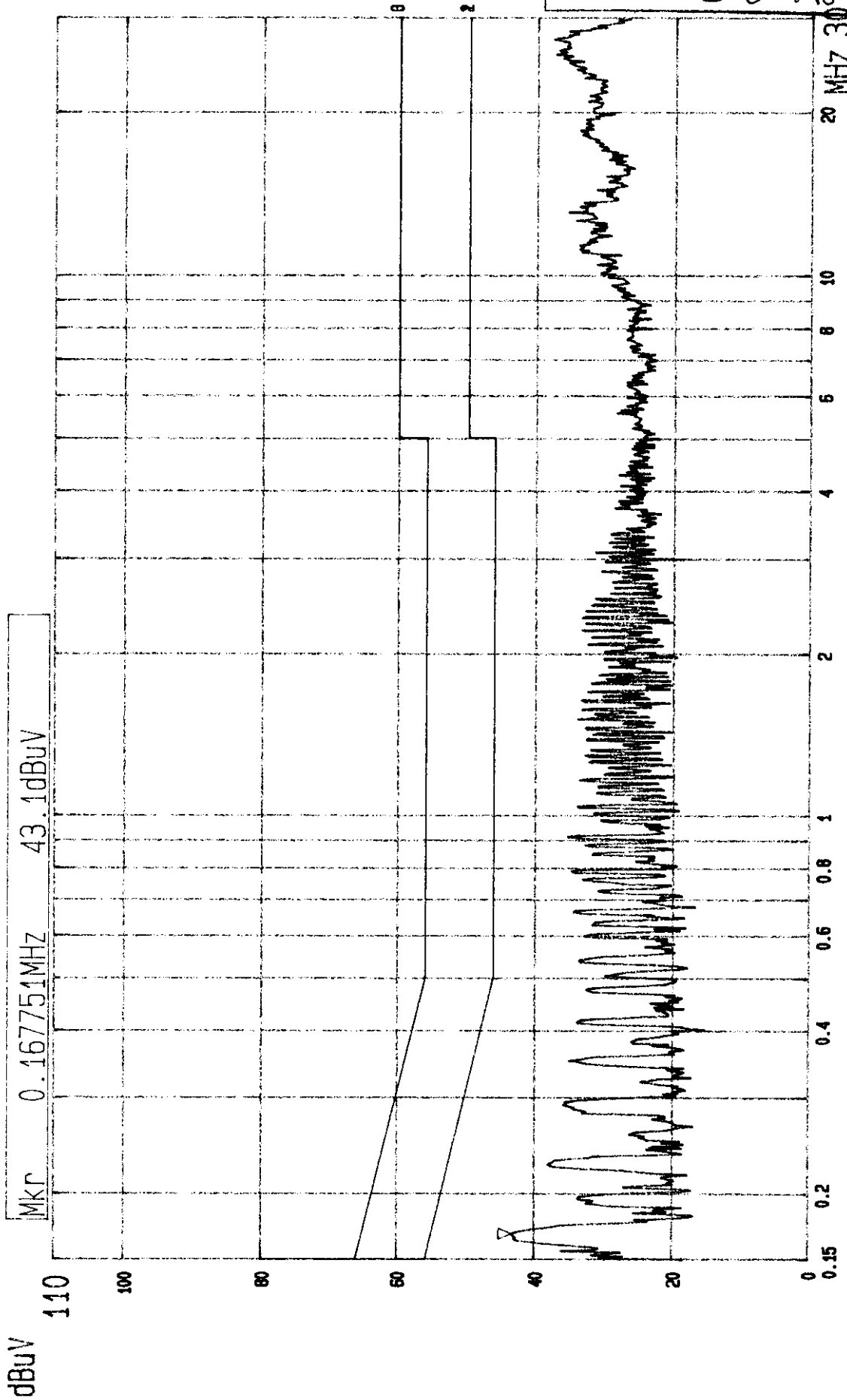
Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.156	52.40	-	42.00	-	65.65	55.65	-13.3	-	-23.7	-
0.223	46.50	-	37.50	-	62.68	52.68	-16.2	-	-25.2	-
0.851	39.60	-	31.20	-	56.00	46.00	-16.4	-	-24.8	-
1.481	38.40	-	34.00	-	56.00	46.00	-17.6	-	-22.0	-
1.885	41.30	-	31.90	-	56.00	46.00	-14.7	-	-24.1	-
6.765	38.00	-	33.00	-	60.00	50.00	-22.0	-	-27.0	-

- Remarks:
1. "***": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 4. The emission level of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value



ADT CORP.
LISN: L

---- Date 20.JAN.'98 Time 10:52:38
CISPR 22 CLASS B CONDUCTION TEST
MODEL: SG200A 1600X1200 75HZ 93.7KHZ CRT MODE



--- Date 20.JAN.'98 Time 10:50:13
CISPR 22 CLASS B CONDUCTION TEST
MODEL: SG200A 1600X1200 75Hz 93.7KHz CRT MODE
ADT CORP.
LISN: N



4.3 TEST DATA OF CONDUCTED EMISSION (B)

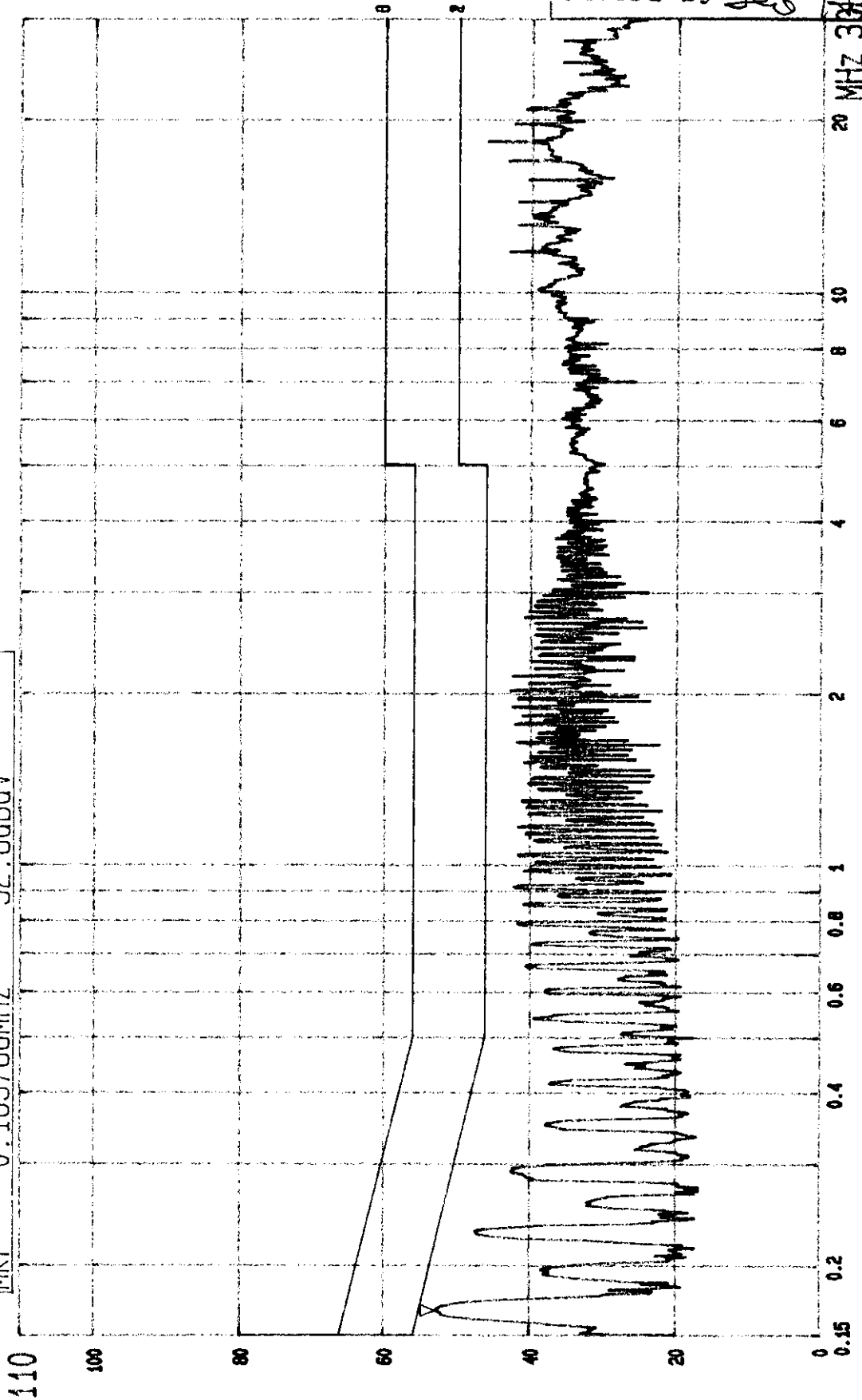
EUT: VGA CARDMODEL: SG200AMODE: 640x480 (31.5kHz)6 dB Bandwidth: 10 kHzTEST PERSONNEL: Leo Wong

Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.154	52.20	-	42.20	-	65.77	55.77	-13.6	-	-23.6	-
0.219	45.80	-	37.60	-	62.83	52.83	-17.0	-	-25.2	-
0.661	39.50	-	33.80	-	56.00	46.00	-16.5	-	-22.2	-
1.627	41.50	-	33.90	-	56.00	46.00	-14.5	-	-22.1	-
6.453	34.10	-	30.70	-	60.00	50.00	-25.9	-	-29.3	-
18.404	32.60	-	32.20	-	60.00	50.00	-27.4	-	-27.8	-

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 4. The emission level of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value

Mkr 0.165788MHz 52.8dBuV

dBuV



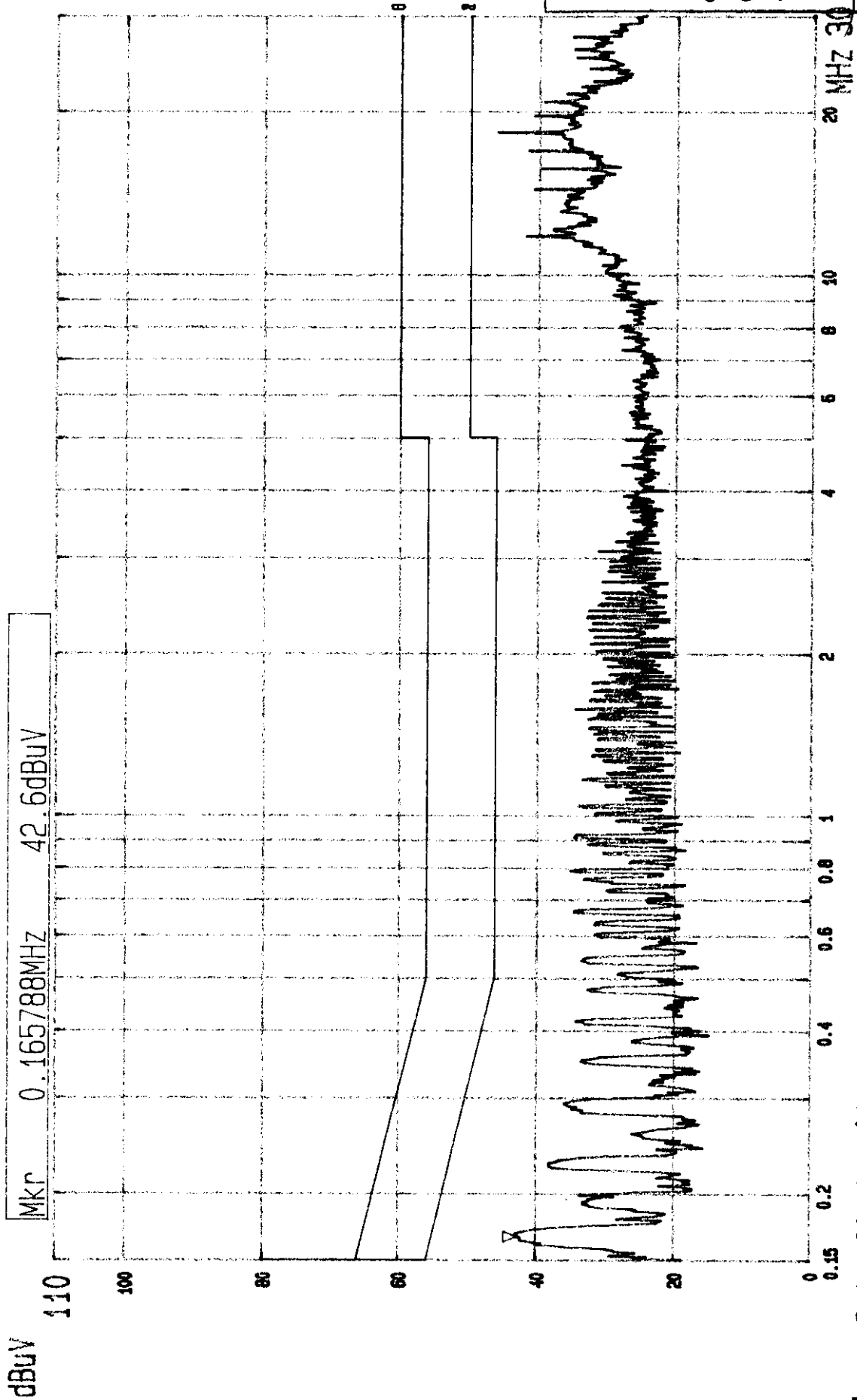
Report No. F87011406

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Tested by Leo H

ADT CORP.
LISN: L

--- Date 20.JAN.'98 Time 22:51:57
CISPR 22 CLASS B CONDUCTION TEST
MODEL: SG200A 640X480 31KHZ CRT+TV MODE



--- Date 20.JAN.'98 Time 22:53:35
CISPR 22 CLASS B CONDUCTION TEST
MODEL: SG200A 640X480 31KHZ CRT+TV MODE

ADT CORP.
LISN: N



4.4 TEST DATA OF RADIATED EMISSION (A)

EUT: VGA CARD MODEL: SG200A MODE: 1600x1200 (93.7 kHz)

ANTENNA: CHASE BILOG CBL 6111A POLARITY: Horizontal

DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

FREQUENCY RANGE: 1000-2000 MHz MEASURED DISTANCE: 3 M

TEST PERSONNEL: Leo Hong

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
60.76	7.9	12.3	20.2	30.0	-9.8
141.65	14.0	8.1	22.1	30.0	-7.9
162.09	12.4	11.5	23.9	30.0	-6.1
202.79	13.4	9.1	22.5	30.0	-7.5
222.70	14.4	10.3	24.7	30.0	-5.3
632.34	26.4	5.9	32.3	37.0	-4.7

REMARKS :

1. Emission level (dBuV/m) = Correction Factor(dB/m) + Meter Reading (dBuV).
2. Correction Factor(dB/m) = Ant. Factor(dB/m)+Cable loss(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value



TEST DATA OF RADIATED EMISSION (A)

EUT: VGA CARD MODEL: SG200A MODE: 1600x1200 (93.7 kHz)

ANTENNA: CHASE BILOG CBL 6111A POLARITY: Vertical

DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

FREQUENCY RANGE: 1000-2000 MHz MEASURED DISTANCE: 3 M

TEST PERSONNEL: Lee Hong

Frequency (MHz)	Correction Factor (dB/m)	Reading Data dBuV	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
141.65	14.9	11.5	26.4	30.0	-3.6
161.92	12.1	14.6	26.7	30.0	-3.3
202.43	13.7	12.8	26.5	30.0	-3.5
223.00	14.5	7.7	22.2	30.0	-7.8
263.54	16.3	12.8	29.1	37.0	-7.9
303.54	17.5	11.9	29.4	37.0	-7.6
632.28	25.7	7.5	33.2	37.0	-3.8

- REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) + Meter Reading (dBuV).
 2. Correction Factor(dB/m) = Ant. Factor(dB/m) + Cable loss(dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value



4.5 TEST DATA OF RADIATED EMISSION (B)

EUT: VGA CARD MODEL: SG200A MODE: 640x480 (31.5 kHz)

ANTENNA: CHASE BILOG CBL 6111A POLARITY: Horizontal

DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

FREQUENCY RANGE: 1000-2000 MHz MEASURED DISTANCE: 3 M

TEST PERSONNEL: Leo Hong

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
31.38	18.5	5.4	23.9	30.0	-6.1
57.76	8.5	13.1	21.6	30.0	-8.4
120.03	15.1	9.8	24.9	30.0	-5.1
167.58	12.3	11.9	24.2	30.0	-5.8
216.08	14.1	6.0	20.1	30.0	-9.9
405.01	21.8	4.3	26.1	37.0	-10.9

- REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) + Meter Reading (dBuV).
 2. Correction Factor(dB/m) = Ant. Factor(dB/m)+Cable loss(dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value



TEST DATA OF RADIATED EMISSION (B)

EUT: VGA CARD MODEL: SG200A MODE: 640x480 (31.5 kHz)

ANTENNA: CHASE BILOG CBL 6111A POLARITY: Horizontal

DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

FREQUENCY RANGE: 1000-2000 MHz MEASURED DISTANCE: 3 M

TEST PERSONNEL: Leo Hong

Frequency (MHz)	Correction Factor (dB/m)	Reading Data dBuV	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
56.38	8.6	10.9	19.5	30.0	-10.5
120.00	15.5	9.4	24.9	30.0	-5.1
167.48	12.6	8.1	20.3	30.0	-9.7
180.00	12.6	9.7	22.3	30.0	-7.7
192.95	13.3	5.4	18.7	30.0	-11.3
206.90	13.9	3.1	17.0	30.0	-13.0

- REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) + Meter Reading (dBuV).
 2. Correction Factor(dB/m) = Ant. Factor(dB/m) + Cable loss(dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value