

FCC EVALUATION REPORT FOR CERTIFICATION

Manufacturer: D&T Inc.

Date of Issue : May 28, 2006

Daedeok Valley, 59-6, Jang-Dong, Yuseong-Gu,

Test Report No. : GETEC-E3-06-043

DaeJeon 305-343, Korea

**Test Site : Gumi College EMC Center
(Registration No.: 100749)**

FCC ID.: QVXAMM213TDS3

Applicant: ADVAN Int'l Corp.

47187 Fremont Blvd. Fremont, CA 94538, U.S.A

Rule Part(s) : FCC Part 15 Subpart B

Equipment Class : Class B computing device peripheral (JBP)

EUT Type : 21" FLAT PANEL MONITOR

Type of Authority : Certification

Model No. : 240-030-930, VISIONELECT

Trade name : STRYKER

This equipment has been shown to be in compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested by,



**Jae-Hoon Jeong, Senior Engineer
GUMI College EMC center**

Reviewed by,



**Tae-Sig Park, Technical Manager
GUMI College EMC center**

CONTENTS

1. GENERAL INFORMATION	3
2. INTRODUCTION	4
3. PRODUCT INFORMATION	5
3.1 DESCRIPTION OF EUT.....	5
3.2 SUPPORT EQUIPMENT / CABLES USED	6
3.3 MODIFICATION ITEM(S).....	7
4. DESCRIPTION OF TESTS	8
4.1 TEST CONDITION.....	8
4.2 CONDUCTED EMISSION	9
4.3 RADIATED EMISSION	10
5. CONDUCTED EMISSION.....	11
5.1 OPERATING ENVIRONMENT	11
5.2 TEST SET-UP.....	11
5.3 MEASUREMENT UNCERTAINTY	11
5.4 LIMIT	12
5.5 TEST EQUIPMENT USED	12
5.6 TEST DATA FOR POWER LINE CONDUCTED EMISSION	13
6. RADIATED EMISSION	15
6.1 OPERATING ENVIRONMENT	15
6.2 TEST SET-UP.....	15
6.3 MEASUREMENT UNCERTAINTY	15
6.4 LIMIT	16
6.5 TEST EQUIPMENT USED	16
6.6 TEST DATA FOR RADIATED EMISSION	17
7. SAMPLE CALCULATIONS.....	20
7.1 EXAMPLE 1 :	20
7.2 EXAMPLE 2 :	20
8. RECOMMENDATION & CONCLUSION.....	21
APPENDIX A – PLOTS OF CONDUCTED EMISSIONS	
APPENDIX B – ID SAMPLE LABEL & LOCATION	
APPENDIX C – BLOCK DIAGRAM	
APPENDIX D – TEST SET-UP PHOTOGRAPHS	
APPENDIX E – EXTERNAL PHOTOGRAPHS	
APPENDIX F –INTERNAL PHOTOGRAPHS	
APPENDIX G – USER'S MANUAL	
APPENDIX H – PHOTOS OF MODIFICATION ITEMS	

Scope: Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and / or unintentional radiators for compliance with technical rules and regulations of the Federal Communications Commission.

1. General Information

Applicant: ADVAN Int'l Corp.

Applicant Address: 47817 Fremont Blvd. Fremont, CA94538 U.S.A

Manufacturer: D&T Inc.

Manufacturer Address: Daedeok Valley, 59-6, Jang-Dong, Yuseong-Gu, DaeJeon 305-343, Korea

Contact Person: Dae-Sung Oh, General Manager

Tel. & Fax No.: Tel No.: +82-2-703-5197, Fax No.: +82-2-701-3064

- **FCC ID** QVXAMM213TDS3
- **EUT Type** 21" FLAT PANEL MONITOR
- **Model No.** 240-030-930, VISIONELECT
- **Trade Name** STRYKER
- **Serial No.** Prototype
- **Rule Part(s)** FCC Part 15 Subpart B
- **FCC Procedure** Certification
- **Test Procedure(s)** ANSI C63.4 (2003)
- **Dates of Test** May 19 ~ 26, 2006
- **Place of Test** Gumi College EMC Center (FCC Registration No.: 100749)
407, Bugok-Dong, Gumi-si, Gyeongsangbuk-Do, Korea
- **Test Report No.** GETEC-E3-06-043
- **Dates of Issue** May 28, 2006

2. Introduction

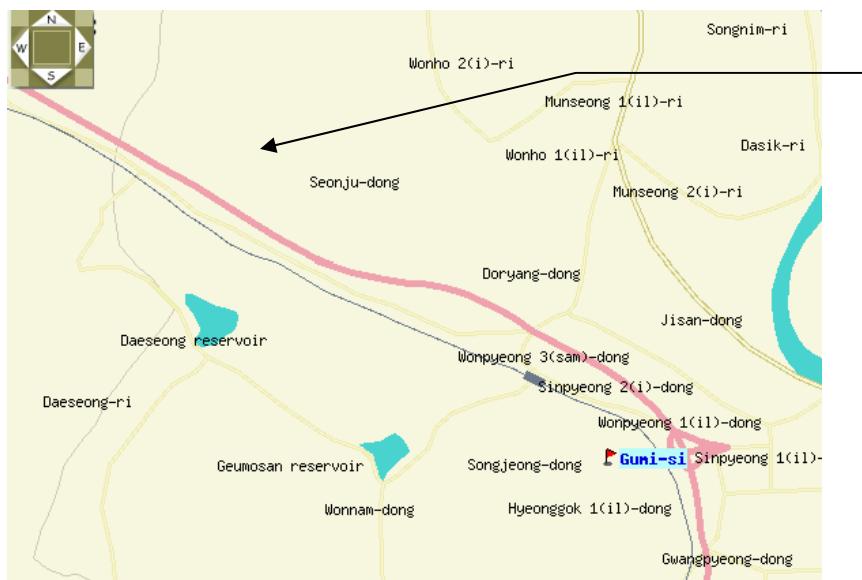
The measurement procedure described in American National Standard for Methods of Measurement of Radio-Nose Emissions From Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ASNI C63.4-2003) was used in determining radiated and conducted emissions emanating from **ADVAN Int'l Corp.**

21" FLAT PANEL MONITOR (Model No.: 240-030-930)

These measurement tests were conducted at **Gumi College EMC Center**.

The site address is 407, Bugok-Dong, Gumi-si, Gyeongsangbuk-Do, Korea

This test site is one of the highest point of Gumi 1 college at about 200 kilometers away from Seoul city and 40 kilometers away from Daejeon city. It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures. The detailed description of the measurement facility was found to be in compliance with the requirements of §2.948 according to ANSI C63.4 on October 19, 1992



GUMI COLLEGE EMC CENTER
407, Bugok-Dong, Gumi-si,
Gyeongsangbuk-Do 730-711, Korea
Tel: +82-54-440-1195
Fax: +82-54-440-1199

Fig 1. The map above shows the Gumi College in vicinity area.

3. Product Information

3.1 Description of EUT

The Equipment Under Test (EUT) is the **ADVAN Int'l Corp. 21" FLAT PANEL MONITOR (Model No.: 240-030-930)**
FCC ID.: QVXAMM213TDS3

Maximum Resolution(s)	1600×1200 Non-interlaced @ 60Hz(Analog, Digital)
Frequency Range(s)	H-Sync: 30 kHz – 83kHz V-Sync: 56Hz – 75Hz
Used LCD Panel	TX54D31VC0CAB (HITACHI)
Used AC/DC Adapter	MW116KA2400F51 (Ault Inc.) Input: 100-240V 50/60Hz 1.0A Output: 24V 3.75A Serial No.: Prototype
Display	
LCD Monitor Panel	21 inches (533.4mm) (s/w TFT Active matrix LCD)
Synchronization	2.5 - 5.0 Vpp separated sync
Pixel Pitch	0.270mm
Response Time	<25ms
View Angle	+/-85° (L/R) x +/-85° (U/D)
Display Colors	16 million colors
Native Resolution	1600 dots × 1200 dots
Input Signal	Composite video; S-video; Analog RGB; DVI
Maximum Pixel Clock	135 MHz × 1
Electrical	
Power Adapter	AC 100-240V; DC 24V
Power Consumption	90W (max)
Current	Direct
Dimensions	
Dimensions (W × H × D)	499.66 x 428.88 x 104.25mm
Weight	17 lbs.
VESA Mounting Interface	VESA 100mm × 100mm
Operating Conditions	
Operating Temperature	41 to 90°F (5 to 32.2°C)
Relative Humidity	10 to 60%
Electrical Input Rating	24V DC 3.75A
Transport & Storage Conditions	
Storage	(-4 to 140°F) -20 to 60°C
Relative Humidity Range	10 to 85%
Atmospheric Pressure Range	500 to 1060 hPa

3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

Description	Manufacturer	Model No.	S/N & FCC ID
PC	Hewlett Packard	D530	S/N: CNG34800PY FCC ID: DoC
Video card	ATI	ATI RV360(9600)	S/N: SN0402017176 FCC ID: DoC
Printer	Hewlett Packard	970CXI	S/N: MY9B01F1FG FCC ID: DoC
Serial Mouse	LOGITECH	M-S69	S/N: 334684-108 FCC ID: JNZ211443
Key-board	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID: AQ6-23K15
Joystick	Microsoft	X05-92626	S/N: 9262600296169 FCC ID: DoC
DVD Player	Pioneer	DV-525	S/N: UEYD012398LL FCC ID: DoC

See “*Appendix D – Test Setup Photographs*” for actual system test set-up

3.2.2 Used Cable(s)

Cable No.	Condition	Description
Power cable	Connected to the Adapter and Power supply	1.8m unshielded
Adapter cable	Connected to the EUT and Adapter	1.5m shielded main cable with two ferrite cores 23m shielded extension with two ferrite cores
D-sub cable	Connected to the EUT and PC	1.8m shielded with two ferrite cores
DVI-D cable	Connected to the EUT and PC	1.8m shielded with two ferrite cores
S-Video input cable	Connected to the EUT and DVD player	1.8m shielded
C-V cable	Open	1.8m shielded
RS232 cable	Open	1.8m shielded

3.3 Modification Item(s)

All the modification details below described has been applied to ensure the compliance during the preliminary testing. The final measurement has been performed with incorporation of all the modifications made during preliminary testing.

Items	Description
#1	Added a cover made by conductive tape on the control PCB of LCD Panel
#2	Added a slim type ferrite core (SCE Co., Ltd. Type No.: PC29A) on the link cable
#3	Bonded the link cable to the rear part of LCD panel with conductive tape.
#4	Attached 2 conductive gaskets on the rear side of LCD panel.
#5	Made supplemental GND point around DVI and D-sub port.
#6	Added a gasket on the shield case of main PCB.
#7	Added a clamp type ferrite core (TDK, Type No: 1730-0730) on the control cable with 1 turn.
#8	Bonded the control cable on the main frame of LCD Panel with conductive tape.
#9	Made the control cable between two piggy boards be shielded with conductive tape.

Refer to the “Appendix H Photographs of Modification Items”.

4. Description of tests

4.1 Test Condition

The EUT was installed, arranged and operated in a manner that is most representative of equipment as typically used. The measurements were carried out while varying operating modes and cable positions within typically arrangement to determine maximum emission level.

The representative and worst test mode(s) were noted in the test report.

- Test Voltage / Frequency : 120Vac / 60Hz
- Test Mode(s)
 - Radiated emission : 1600*1200/60Hz (Analog), 1600*1200/60Hz (Digital)
 - Conducted emission : 1600*1200/60Hz (Analog), 1600*1200/60Hz (Digital)
1024*768/75Hz (Analog), 640*480/60Hz (Analog)
- Operating test pattern
 - “H” character scrolling mode (Font size : 10)
 - Black background white character
 - Brightness and contrast was adjusted as maximum level

4.2 Conducted Emission

The Line conducted emission test facility is inside a $4 \times 8 \times 2.5$ meter shielded enclosure.

The EUT was placed on a non-conducting 1.0 by 1.5 meter table, which is 0.8 meters in height and 0.4 meters away from the vertical wall of the shielded enclosure.

The EUT is powered from the Rohde & Schwarz LISN (ESH2-Z5) and the support equipment is powered from the Rohde & Schwarz LISN (ESH3-Z5). Powers to the LISN are filtered by high-current high insertion loss power line filter.

Sufficient time for EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.

The RF output of the LISN was connected to the EMI test receiver (Rohde & Schwarz, ESCS30).

The EMI test receiver was scanned from 150kHz to 30MHz with 20msec sweep time to determine the frequency producing the maximum EME from the EUT. The frequency producing the maximum level was re-examined using Quasi-Peak mode of the EMI test receiver.

The bandwidth of Quasi-peak mode was set to 9kHz. Each emission was maximized consistent with typical applications by varying the configuration of the test sample. Interface cables were connected to the available interface ports of the test unit. The effect of varying the position of cables was investigated to find the configuration that produces maximum diagram emission. Excess cable lengths were bundled at center with 30 – 40 centi-meters.

Each EME reported was calibrated using the R/S signal generator

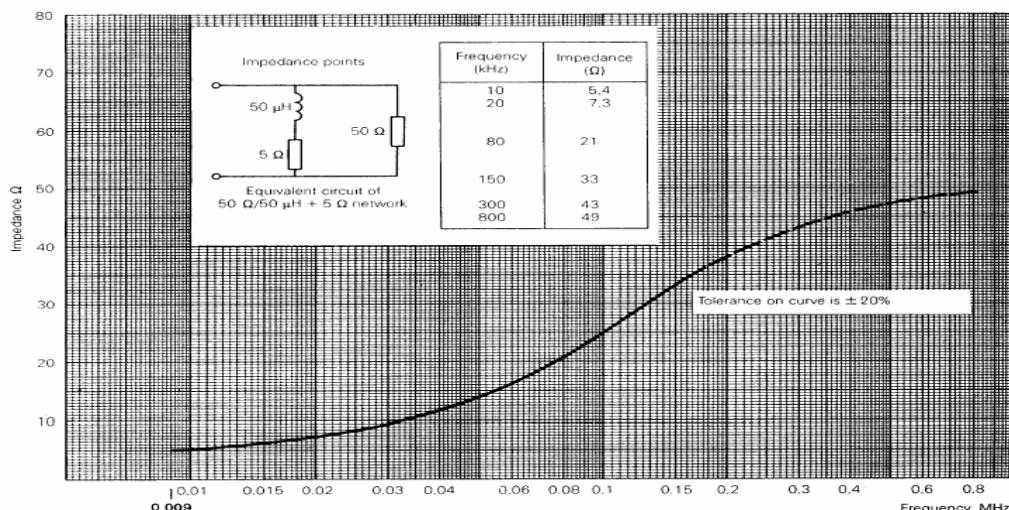


Fig 2. Impedance of LISN

4.3 Radiated Emission

Preliminary measurements were conducted 3m semi anechoic chamber using broadband antennas 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 technology configuration, mode of operation and turntable azimuth with respect to antenna was note for each frequency found.

The spectrum was scanned from 30 to 1000MHz using bicornical log antenna (Schwarzbeck, VULB9160). Above 1GHz, horn antenna (Schwarzbeck, BBHA9120D) was used.

Final measurements were made outdoors at 3m/10m-test range.

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 EMI test receiver. The detector function was set to CISPR quasi-peak mode average mode and the bandwidth of the receiver was set to 120kHz or 1MHz depending on the frequency or type of signal.

The EUT, support equipment and interconnecting cables were reconfigured to the setup producing the maximum emission for the frequency and were placed on top of a 0.8m high non-metallic 1.0×1.5 meter table.

The turntable containing the test sample was rotated; the antenna height was varied 1 to 4 meter and stopped at the azimuth or height producing the maximum emission.

Each EME reported was calibrated using the R/S signal generator

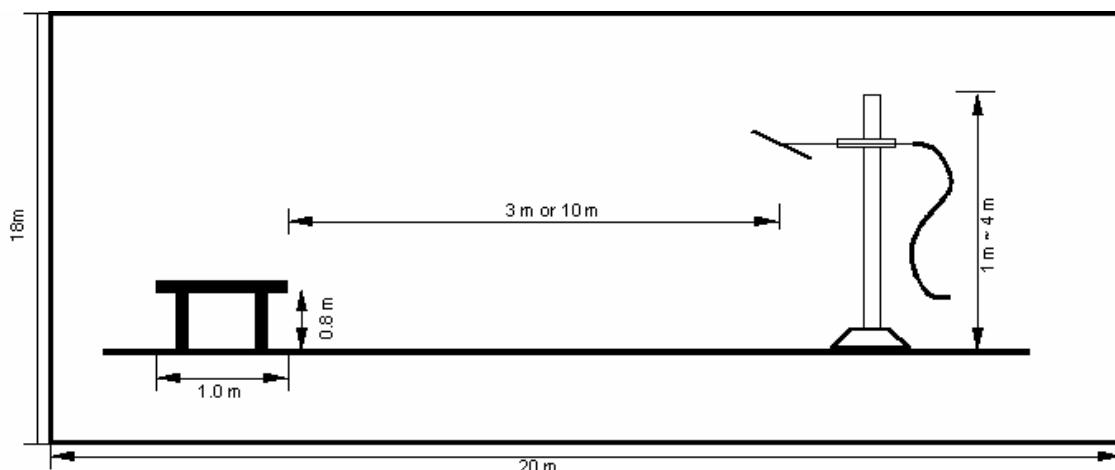


Fig 3. Dimensions of Open Site Test Area

5. Conducted Emission

5.1 Operating environment

Temperature : 21 °C
 Relative humidity : 44 %

5.2 Test set-up

The conducted emission measurements were performed in the shielded room.

The EUT was placed on wooden table, 0.8m heights above the floor, 0.4m from the reference ground plane (GRP) wall and 0.8m from AMN.

AMN is bonded on horizontal reference ground plane.

The ground plane, which was electrically bonded to the shield room, ground system and all power lines entering the shield room, were filtered.

5.3 Measurement uncertainty

The measurement uncertainty was calculated in accordance with ISO “Guide to the expression of uncertainty in measurement”.

The measurement uncertainty was given with a confidence of 95%.

Contribution	Probability Distribution	Uncertainty (±dB)	
		Power Port	Communication port
Receiver specification	Rectangular	0.50	0.50
LISN coupling specification	Rectangular	1.50	
ISN coupling specification	Rectangular		1.50
Mismatch			
LISN VRC : $\Gamma_l =$ 0.20	U-shaped	0.05	0.05
ISN VRC : $\Gamma_l =$ 0.20		-0.05	-0.05
ATT VRC(IN) : $\Gamma_g =$ 0.03			
Uncertainty limits $20\log(1 \pm \Gamma_l \Gamma_g)$			
Mismatch			
Receiver VRC : $\Gamma_l =$ 0.09	U-shaped	0.09	0.09
ATT VRC : $\Gamma_g =$ 0.11		-0.09	-0.09
Uncertainty limits $20\log(1 \pm \Gamma_l \Gamma_g)$			
System repeatability	Std Deviation	0.11	0.11
Cable and input attenuator calibration	Normal (k=2)	0.04	0.04
Repeatability of EUT			
Combined standard uncertainty $U_c(y)$	Normal	0.92 -0.92	0.92 -0.92
Extended uncertainty U	Normal (k=2)	1.85 -1.85	1.85 -1.85

5.4 Limit

RFI Conducted		FCC Limit(dB) Class B	
Freq. Range		Quasi-Peak	Average
150kHz – 0.5MHz		66 – 56*	56 – 46*
0.5MHz – 5MHz		56	46
5MHz – 30MHz		60	50

*Limits decreases linearly with the logarithm of frequency.

5.5 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Calibrated Date
■ - ESCS30	Rohde & Schwarz	EMI test receiver	839809/003	12. 14. 2005
■ - ESH3-Z5	Rohde & Schwarz	Artificial mains network	838979/020	12. 16. 2005
■ - ESH2-Z5	Rohde & Schwarz	Artificial mains network	829991/009	12. 16. 2005

5.6 Test data for power line conducted emission

- Test Date : May 19, 2006
- Resolution bandwidth : 9kHz
- Frequency range : 0.15MHz ~ 30MHz

◆ Test resolution: 1600*1200/60Hz(Analog)

Frequency (MHz)	Insertion Loss	Cable Loss	Pol.	Quasi-Peak[dBuV]			Average[dBuV]			Margin[dBuV]	
				Limit	Reading	Result	Limit	Reading	Result	Quasi	Average
0.205	0.12	-0.23	H	63.41	48.8	48.69	53.41	47.3	47.19	14.71	6.21
0.415	0.13	-0.13	H	57.55	42.6	42.61	47.55	40.8	40.81	14.94	6.74
0.725	0.15	-0.23	H	56.00	43.2	43.12	46.00	42.1	42.02	12.88	3.98
1.345	0.16	-0.26	H	56.00	43.5	43.40	46.00	42.0	41.90	12.60	4.10
3.100	0.22	-0.14	H	56.00	43.2	43.28	46.00	41.0	41.08	12.72	4.92
5.580	0.30	-0.17	H	60.00	40.3	40.43	50.00	35.9	36.03	19.57	13.97
11.270	0.45	0.00	H	60.00	31.4	31.85	50.00	22.6	23.05	28.15	26.95

*Comment : Pol : H (Live), N(Neut)

Insertion Loss : Insertion Loss of LISN

Cable Loss : Cable Loss + Pulse Limiter Insertion loss value

◆ Test resolution: 1600*1200/60Hz(Digital)

Frequency (MHz)	Insertion Loss	Cable Loss	Pol.	Quasi-Peak[dBuV]			Average[dBuV]			Margin[dBuV]	
				Limit	Reading	Result	Limit	Reading	Result	Quasi	Average
0.205	0.12	-0.23	H	63.41	48.6	48.49	53.41	47.1	46.99	14.91	6.41
0.410	0.13	-0.13	H	57.65	42.3	42.31	47.65	40.4	40.41	15.34	7.24
0.825	0.13	-0.23	N	56.00	39.5	39.40	46.00	36.3	36.20	16.60	9.80
1.340	0.16	-0.26	H	56.00	43.1	43.00	46.00	41.7	41.60	13.00	4.40
5.550	0.30	-0.17	H	60.00	39.4	39.53	50.00	34.3	34.43	20.47	15.57
6.905	0.34	-0.10	N	60.00	33.3	33.54	50.00	28.0	28.24	26.46	21.76
14.325	0.58	0.10	N	60.00	25.3	25.98	50.00	19.0	19.68	34.02	30.32

*Comment : Pol : H (Live), N(Neut)

Insertion Loss : Insertion Loss of LISN

Cable Loss : Cable Loss + Pulse Limiter Insertion loss value

◆ Test resolution: 1024*768/75Hz(Analog)

Frequency (MHz)	Insertion Loss	Cable Loss	Pol.	Quasi-Peak[dBuV]			Average[dBuV]			Margin[dBuV]	
				Limit	Reading	Result	Limit	Reading	Result	Quasi	Average
0.150	0.07	-0.14	H	66.00	42.2	42.13	56.00	37.5	37.43	23.87	18.57
0.415	0.13	-0.13	H	57.55	42.5	42.51	47.55	40.8	40.81	15.04	6.74
1.035	0.15	-0.23	H	56.00	43.5	43.42	46.00	42.7	42.62	12.58	3.38
2.795	0.21	-0.18	N	56.00	41.8	41.83	46.00	39.4	39.43	14.17	6.57
3.725	0.24	-0.14	N	56.00	42.2	42.30	46.00	39.6	39.70	13.70	6.30
5.580	0.30	-0.17	N	60.00	38.6	38.73	50.00	34.5	34.63	21.27	15.37
6.825	0.33	-0.11	H	60.00	35.2	35.43	50.00	29.9	30.13	24.57	19.87
11.680	0.46	0.00	H	60.00	30.2	30.66	50.00	23.6	24.06	29.34	25.94

*Comment : Pol : H (Live), N(Neut)

Insertion Loss : Insertion Loss of LISN

Cable Loss : Cable Loss + Pulse Limiter Insertion loss value

◆ Test resolution: 640*480/60Hz(Analog)

Frequency (MHz)	Insertion Loss	Cable Loss	Pol.	Quasi-Peak[dBuV]			Average[dBuV]			Margin[dBuV]	
				Limit	Reading	Result	Limit	Reading	Result	Quasi	Average
0.205	0.12	-0.23	H	63.41	48.5	48.39	53.41	47.2	47.09	15.01	6.31
0.415	0.13	-0.13	H	57.55	42.6	42.61	47.55	40.8	40.81	14.94	6.74
0.725	0.15	-0.23	H	56.00	43.3	43.22	46.00	42.3	42.22	12.78	3.78
1.345	0.16	-0.26	H	56.00	43.5	43.40	46.00	42.3	42.20	12.60	3.80
3.105	0.22	-0.14	H	56.00	43.1	43.18	46.00	40.9	40.98	12.82	5.02
3.725	0.24	-0.14	H	56.00	42.9	43.00	46.00	40.3	40.40	13.00	5.60
11.180	0.44	0.00	H	60.00	31.3	31.74	50.00	23.9	24.34	28.26	25.66

*Comment : Pol : H (Live), N(Neut)

Insertion Loss : Insertion Loss of LISN

Cable Loss : Cable Loss + Pulse Limiter Insertion loss value

6. Radiated Emission

6.1 Operating environment

Temperature : 24 °C
 Relative humidity : 40 %

6.2 Test set-up

A preliminary scan with peak mode was performed in the semi anechoic chamber and found frequency for open area test site.

The formal radiated emission was measured at 3m/10m-distance open area test site.

The EUT was placed on a non-conductive turntable approximately 0.8 meters above the ground plane.

The turntable with EUT was rotated 360°, and the antenna was varied in height between 1.0 and 4.0 meters in order to determine the maximum emission levels.

This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

6.3 Measurement uncertainty

The measurement uncertainty was calculated in accordance with ISO “Guide to the expression of uncertainty in measurement”.

The measurement uncertainty was given with a confidence of 95%.

Contribution	Probability Distribution	Uncertainty (dB)			
		Biconical Ant.		Log-periodic Ant.	
		3m	10m	3m	10m
Ambient signal					
Antenna factor calibration	Normal (k=2)	0.50	0.50	0.50	0.50
Receiver specification	Rectangular	0.50	0.50	0.50	0.50
Antenna directivity	Rectangular	0.25	0.00	1.50	0.25
Antenna phase center variation	Rectangular	0.00	0.00	1.00	0.20
Antenna factor frequency interpolation	Rectangular	0.25	0.25	0.25	0.25
Measure distance variation	Rectangular	0.60	0.40	0.60	0.40
Site imperfections	Rectangular	1.46	-2.32	2.26	2.94
Mismatch					
Receiver VRC : $\Gamma_l = 0.09$	U-shaped	0.33	0.33	0.33	0.33
Antenna VRC : $\Gamma_g = 0.43$ (Bi) 0.23 (Lp)		-0.35	-0.35	-0.18	-0.18
Uncertainty limits $20\log(1 \pm \Gamma_l \Gamma_g)$					
System repeatability	Std Deviation	0.18	0.18	0.17	0.17
Cable loss calibration	Normal (k=2)	0.05	0.05	0.05	0.05
Combined standard uncertainty $U_{c(y)}$	Normal	1.05 -1.05	1.45 -1.45	1.78 -1.77	1.80 -1.78
Extended uncertainty U	Normal (k=2)	2.11 -2.11	2.90 -2.90	3.55 -3.53	3.59 -3.57

6.4 Limit

Frequency (MHz)	FCC Limit @ 3m. dB μ V/m	CISPR Limit @ 10m. dB μ V/m
30 – 88	40.0	30.0
88 – 216	43.5	30.0
216 – 230	46.0	30.0
230 – 960	46.0	37.0
960 – 1000	54.0	37.0
> 1000	54.0	No Specified limit

6.5 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Calibrated Date
■ - ESI	Rohde & Schwarz	EMI test receiver	830482/010	12. 2. 2005
■ - ESCS30	Rohde & Schwarz	EMI test receiver	839809/003	12. 14. 2005
■ - ESI	Rohde & Schwarz	EMI test receiver	830482/010	12. 2. 2005
■ - HL223	Rohde & Schwarz	Log-periodic antenna	829228/011	12. 2. 2005
■ - BBHA9120D	Schwarzbeck	Horn antenna	207	11. 26. 2005
■ - 87405A	Agilent	Preamplifier	MY39500777	NCR
■ - HD100	HD GmbH	Position Controller	100/692/01	NCR
■ - DS415S	HD GmbH	Turntable	415/657/01	NCR
■ - MA240	HD GmbH	Antenna Mast	240/565/01	NCR

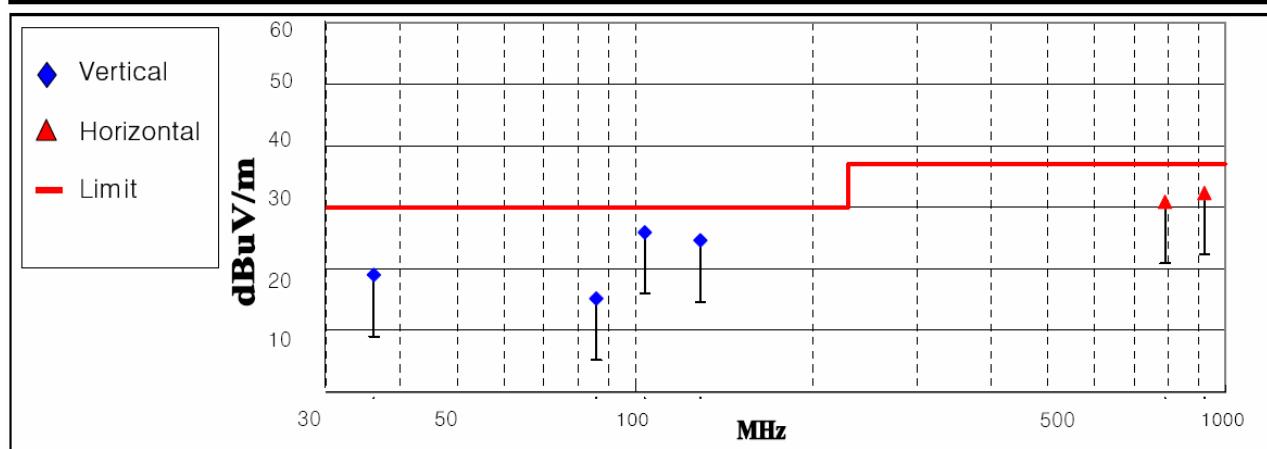
6.6 Test data for radiated emission

- Test Date : May 23, 2006
- Resolution bandwidth : 120kHz / 1MHz
- Frequency range : 30MHz ~ 2000MHz
- Measurement distance : 30MHz ~ 1000MHz: 10m
1000MHz ~ 2000MHz: 3m

♦ Operating Condition: 1600*1200/60Hz(Analog)

Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dBuV/m)	Margin (dBuV/m)	Positioning System		
	Reading Value(dBuV)	Antenna Factor(dB)	Cable Loss(dB)	Test Result (dBuV/m)			Pol. (H/V)	Height (cm)	Angle (deg)
36.10	5.3	11.90	1.80	19.0	30.0	11.0	V	185	22
85.93	4.2	8.44	2.52	15.2	30.0	14.8	V	201	124
103.81	13.2	9.99	2.74	25.9	30.0	4.1	V	145	135
128.88	10.3	11.27	3.06	24.6	30.0	5.4	V	190	16
789.74	1.3	21.15	8.44	30.9	37.0	6.1	H	325	90
921.35	0.8	22.29	9.25	32.3	37.0	4.7	H	246	100

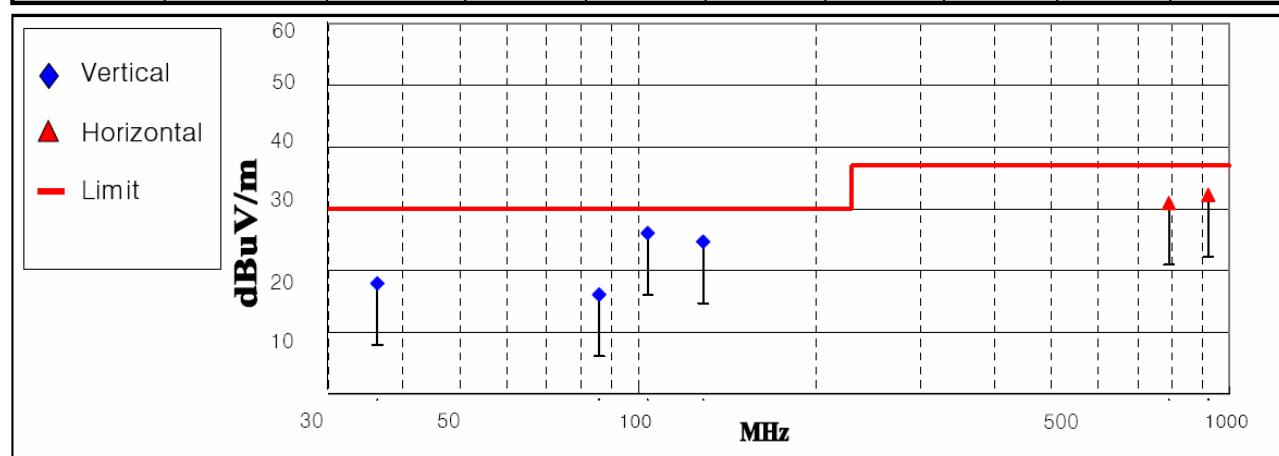


< Fig 4. Radiated emission result (30MHz ~ 1000MHz)>

◆ Operating Condition: 1600*1200/60Hz(Digital)

Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dBuV/m)	Margin (dBuV/m)	Positioning System		
	Reading Value(dBuV)	Antenna Factor(dB)	Cable Loss(dB)	Test Result (dBuV/m)			Pol. (H/V)	Height (cm)	Angle (deg)
36.20	4.2	11.88	1.80	17.9	30.0	12.1	V	185	32
85.92	5.1	8.44	2.52	16.1	30.0	13.9	V	100	85
103.80	13.3	9.99	2.74	26.0	30.0	4.0	V	136	100
128.85	10.3	11.27	3.05	24.6	30.0	5.4	V	195	190
789.72	1.3	21.15	8.44	30.9	37.0	6.1	H	225	248
921.33	0.7	22.29	9.25	32.2	37.0	4.8	H	301	265

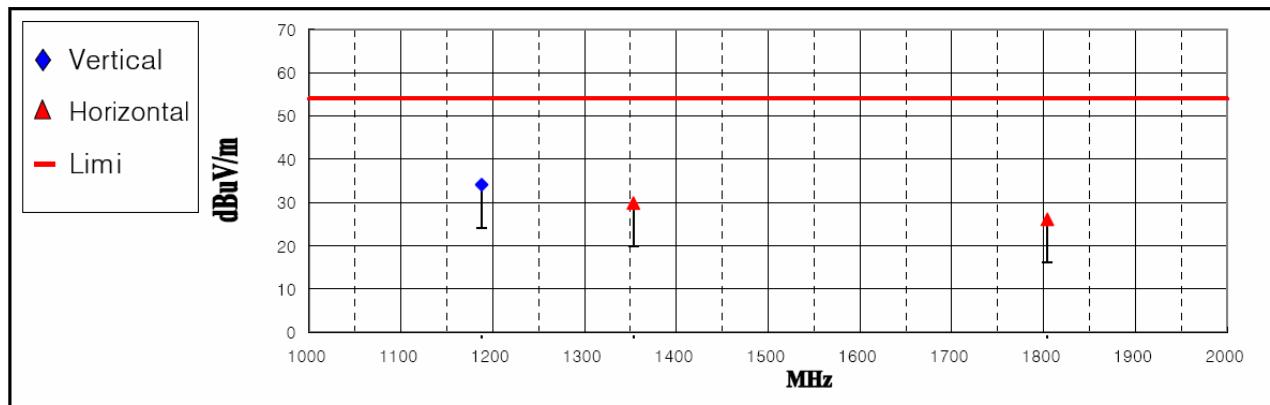


< Fig 5. Radiated emission result (30MHz ~ 1000MHz)>

◆ Operating Condition: 1600*1200/60Hz (Analog)

Detector mode: Peak detector mode / Average detector mode

Frequency (MHz)	Measurement Level					AV Limit (dBuV/m)	Margin (dBuV/m)	Positioning System				
	Reading Value(dBuV)		AF	AMP / CL	Test Result (dBuV/m)				Pol. (H/V)	Height (cm)	Angle (deg)	
	Peak	Average	(dB)	(dB)	Peak	Average						
1187.95	47.8	32.5	23.3	-21.7	49.4	34.1	54.0	19.9	V	125	12	
1353.16	44.1	27.4	23.9	-21.5	46.6	29.9	54.0	24.1	H	250	185	
1804.12	39.6	21.4	25.5	-20.8	44.3	26.1	54.0	27.9	H	224	213	



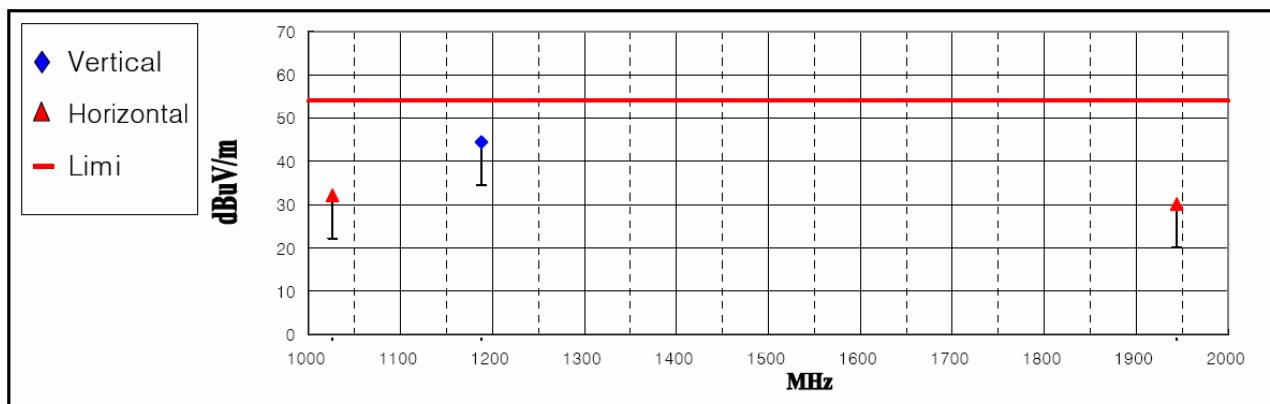
*Command :AMP/CL : Cable loss + AMP gain

< Fig 6. Radiated emission result (1000MHz ~ 2000MHz)>

◆ Operating Condition: 1600*1200/60Hz (Digital)

Detector mode: Peak detector mode / Average detector mode

Frequency (MHz)	Measurement Level					AV Limit (dBuV/m)	Margin (dBuV/m)	Positioning System			
	Reading Value(dBuV)		AF	AMP / CL	Test Result (dBuV/m)			Pol. (H/V)	Height (cm)	Angle (deg)	
	Peak	Average	(dB)	(dB)	Peak	Average					
1025.98	40.6	31.5	22.8	-22.1	41.3	32.2	54.0	21.8	H	200	350
1187.98	50.5	42.8	23.3	-21.7	52.1	44.4	54.0	9.6	V	248	142
1943.98	31.9	24.7	26.0	-20.6	37.2	30.1	54.0	23.9	H	326	185



*Command :AMP/CL : Cable loss + AMP gain

< Fig 7. Radiated emission result (1000MHz ~ 2000MHz)>

EUT Type: 21" FLAT PANEL MONITOR

FCC ID: QVXAMM213TDS3

Page 19 of 21

7. Sample Calculations

$$dB\mu V = 20 \log_{10}(\mu V/m)$$

$$dB\mu V = dBm + 107$$

$$\mu V = 10^{(dB\mu V/20)}$$

7.1 Example 1 :

■ 20.3 MHz

$$\begin{aligned} \text{Class B Limit} &= 250 \mu V &= 48 dB\mu V \\ \text{Reading} &= -67.8 dBm \text{(Calibrated level)} \\ \text{Convert to } dB\mu V &= -67.8 dBm + 107 = 39.2 dB\mu V \\ 10^{(39.2 dB\mu V/20)} &= 91.2 \mu V \\ \text{Margin} &= 39.2 - 48 = -8.8 \\ &= 8.8 \text{ dB below Limit} \end{aligned}$$

7.2 Example 2 :

■ 66.7 MHz

$$\begin{aligned} \text{Class B Limit} &= 100 \mu V/m &= 40.0 dB\mu V/m \\ \text{Reading} &= -76.0 dBm \text{(Calibrated level)} \\ \text{Convert to } dB\mu V/m &= -76.0 dBm + 107 = 31.0 dB\mu V/m \\ \text{Antenna Factor + Cable Loss} &= 5.8 \text{ dB} \\ \text{Total} &= 36.8 dB\mu V/m \\ \text{Margin} &= 36.8 - 40.0 = -3.2 \\ &= 3.2 \text{ dB below Limit} \end{aligned}$$

8. Recommendation & conclusion

The data collected shows that the **ADVAN Int'l Corp. 21" FLAT PANEL MONITOR (Model No.: 240-030-930)** was complies with §15.107 and 15.109 of the FCC Rules.