MEASUREMENT/TECHNICAL REPORT

HYUNDAI ELECTRONICS INDUSTRIES CO., LTD

MODEL : G910

This report concerns(check one) : Original grant__X__ Class change

Equipment type : ___MONITOR

Deferred grant requested per 47 CFR 0.457(d)(1)( ) ? yes___no__X

If yes, defer until:

____ agrees to notify the Commission by

of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by : BONG JAE, HUR – Deputy General Manager of QA Office

Company : HYUNDAI ELECTRONICS INDUSTRIES CO., LTD.
Address : SAN 136-1, AMI-RI, BUBAL-EUB, ICHON-SI, KYOUNGKI-DO, KOREA
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HYUNDAI ELECTORONICS INDUSTRIES CO., LTD. CORP QA OFFICE /QUALITY MANAGEMENT TEAM
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1. GENERAL INFORMATION

1.1 Product Description

The Hyundai Electronics Industries Co., Ltd. Model G910(refered to as the EUT in this Report) is a 19"COLOR Monitor HOR. Freq. 106.1KHz w/max. Resolution of 1600X1200 Non-Interlaced

Product specification information described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	**PLASTIC(OUT SIDE), METAL(INSIDE)**
LIST OF EACH OSC. OR XTAL. FREQ.(FREQ. 1MHz)	**12 MHz**
CHIPSET BRAND AND PART NO.	**SANKEN: STRF6654** **WELTREND: WT62P1** **PHILIPS: TDA4841PS** **SAMSUNG: KA358** **SAMSUNG: KA3843B** **SAMSUNG: KS24C08** **ROHM: BA7657S** **MYSON: TTV021N-41** **SAMSUNG: KA2506** **NS: LM2402T**
POWER REQUIREMENT	**100 – 240 VAC 50/60Hz(Universal Power) 2.5A , 130W**
NUMBER OF LAYER	**MAIN BOARD 1 LAYER** **CRT SOCKET BOARD 1 LAYER** **BNC BOARD 1 LAYER**
MAX. RESOLUTION	**1600X1200 NON-INTERLACED (@106.1KHz/85Hz)**
H-SYNC FREQUENCY RANGE	**30KHz ~ 110KHz**
V- SYNC FREQUENCY RANGE	**50Hz ~ 150Hz**
CRT SIZE	**19" (SAMSUNG CRT / Type : M46QCE261X113)**
VIDEO CONNECTOR TYPE	**D-SUB 15-PIN**

1.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

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1.3 Tested System Details

The Model names for all equipment, plus descriptions used in the tested system (including inserted cards) are:

DEVICE TYPE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
COLOR MONITOR (EUT)	HYUNDAI	G910	CKLG910	HOST
PC(HOST)	H/P	DTPC-17	DoC	N/A
KEY BOARD	H/P	SK-2501-2D-K	GYUR385K	HOST
PRINTER	H/P	HP895C	DoC	HOST
MODEM	3COM CORPORATION	56K FAX MODEM	DoC	HOST
VIDEO CARD	MATROX	MIL2P/4G	DoC	HOST
MOUSE	H/P	M-S34	DZL211029	HOST

1.4 Test Methodology

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 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1,MAEKOK-RI,HOBUP-MYUN,ICHON-SI,KYOUNGKI-DO, 467-701,KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission on May 22, 1997 and accepted dated July 25,1997(1300F2)

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2.SYSTEM TEST CONFIGURATION

2.1 Justification

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following components and I/O cards inside the E.U.T were used.

DEVICE TYPE	MANUFACTURE	MODEL/PART NUMBER
MAIN BOARD	HYUNDAI	E4208417141
CRT SOCKET BOARD	HYUNDAI	E4208417142
BNC BOARD	HYUNDAI	E4208417143

2.2 EUT exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, contained on a 3-1/2 inch disc, was inserted into drive A and is auto starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is :(1) Display test, (2) RS 232 test (3) Key board test,(4) Printer test,(5) FDD test,(6) HDD test. The complete cycle takes about 20 seconds and is repeated continuously. As the keyboard and mouse are strictly input devices, no data is transmitted to them during test. They are however, continuously scanned for data input activity. The video resolution modes setup and change program was used during the radiated and conducted emission testing.

2.3 Cable Description

HYUNDAI ELECTORONICS INDUSTRIES CO., LTD. CORP QA OFFICE /QUALITY MANAGEMENT TEAM
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	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
PC(Host)	N	N/A	1.8(P)
COLOR MONITOR(EUT)	N	Y	1.5(P) , 1.5(D)
PARALLEL	N	Y	1.5(P) , 1.5(D)
KEYBOARD	N/A	Y	1.0(D)
SERIAL	N	Y	1.5(P) , 1.5(D)
MOUSE(PS2)	N/A	Y	1.8(D)

The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

2.4 Noise Suppression Parts on Cable.

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
PC(HOST)	N	N/A	N	N/A
COLOR MONITOR(EUT)	Y	PC END	Y	PC END
KEYBOARD	Y	PC END	Y	PC END
PARALLEL	N	N/A	Y	BOTH END
SERIAL	N	N/A	Y	BOTH END
MOUAE(PS/2)	N	N/A	Y	PC END

2.5 Equipment Modifications

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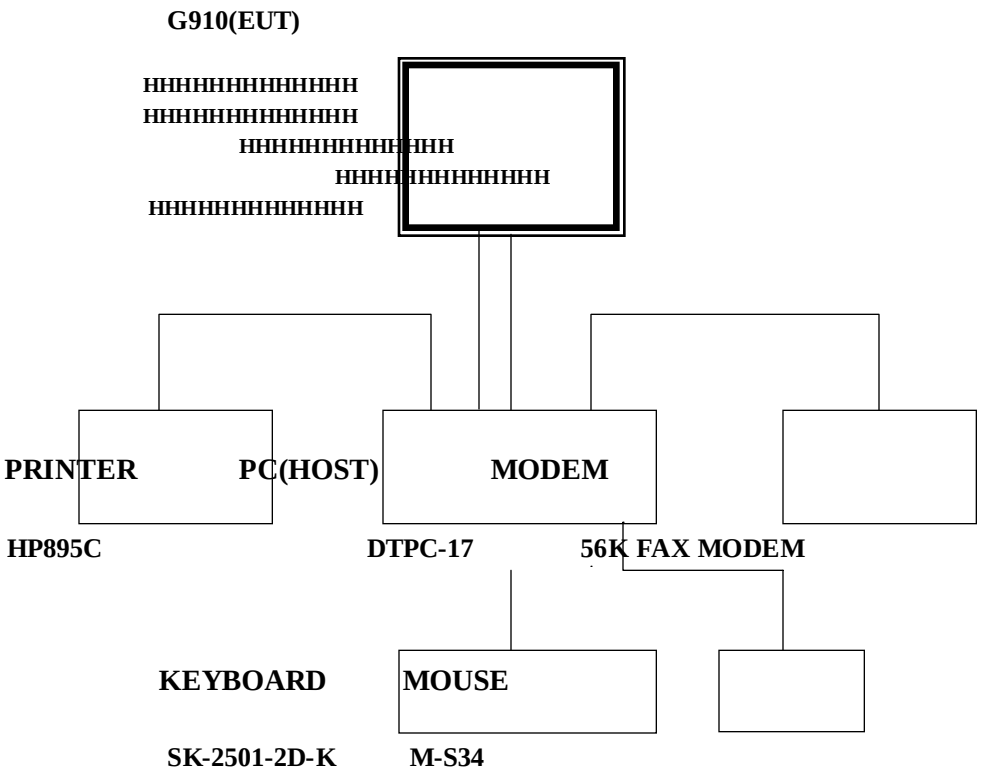
N/A

2.6 Configuration of Test system

Line Conducted Test : EUT was connected to LISN, all other supporting equipment were connected to another LISN.
Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary Radiated Emissions tests were conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating condition. Final Radiated Emission tests were conducted at 10 meter open area test site.

[Configuration of Tested System]



3. PRELIMINARY TESTS

3.1 AC Power line Conducted Emission Tests

During Preliminary Tests, the following operating mode were investigated.

Processor Speed (MHz)	Video Resolution (w/max)	The worst operating condition
Pentium 75 MHz	1600 x 1200 Non-Interlaced (106.1KHz/85Hz)	X
Pentium 75 MHz	1280 x 1024 Non-Interlaced (91KHz/85Hz)	
Pentium 75 MHz	1024 x 768 Non-Interlaced (68.67KHz/85Hz)	
Pentium 75 MHz	800 x 600 Non-Interlaced (63.70KHz/120Hz)	
Pentium 75 MHz	800 x 600 Non-Interlaced (63.92KHz/100Hz)	

3.2 Radiated Emission Tests

During Preliminary Tests, the following operating mode were investigated.

Processor Speed (MHz)	Video Resolution (w/max)	The worst operating condition
Pentium 75 MHz	1600 x 1200 Non-Interlaced (106.1KHz/85Hz)	X
Pentium 75 MHz	1280 x 1024 Non-Interlaced (91KHz/85Hz)	
Pentium 75 MHz	1024 x 768 Non-Interlaced (68.67KHz/85Hz)	
Pentium 75 MHz	800 x 600 Non-Interlaced (63.70KHz/120Hz)	
Pentium 75 MHz	800 x 600 Non-Interlaced (63.92KHz/100Hz)	

NOTE:
The monitor(EUT) has two(2) video interface port(VGA 15 pin D-sub, 5BNC) to support various kinds of graphics adapters. So the test were performed with each video interface port. The final measurement was performed with VGA 15 pin D-sub video interface port that produce the worst case emission.

Tested by KEUN HO, PARK **Date : FEB. 28, 2000**

4. FINAL CONDUCETD AND RADIATED EMISSION TESTS SUMMARY

HYUNDAI ELECTORONICS INDUSTRIES CO., LTD. CORP QA OFFICE /QUALITY MANAGEMENT TEAM
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4.1 Conducted Emissions Tests

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Humidity Level : 22% Temperature : 21
Limit apply to : CISPR 22
Type of Tests : CLASS B
Date : FEB. 29, 2000
Result : PASSED BY –6.3 dB(Average)

==========

EUT : 17" COLOR MONITOR
Operating Condition : 1600 X 1200 Non-Interlaced (Hf : 106.1KHz, Vf : 85Hz)
Detector : CISPR Quasi-Peak (6 dB Bandwidth : 9 KHz)

Frequency (MHz)	Quasi Peak(dBuV)			Average(dBuV)			Power Line (H/N)
	LEVEL	LIMIT	Magin	LEVEL	LIMIT	Magin	
0.2130	49.9	63.2	-13.3	46.8	53.2	-6.4	N
0.3180	42.2	59.8	-17.6	42.3	49.8	-7.5	N
0.2130	48.7	63.4	-14.7	46.9	53.4	-6.3	H
0.3180	42.4	59.8	-17.4	43.1	49.8	-6.7	H

Line Conducted Emissions Tabulated Data

NOTE:
1. All video modes and resolutions were investigated and the worst-case emissions are reported
Other video modes & resolution were tested and found to be in compliance.

Measured by : KEUN HO, PARK / Engineer

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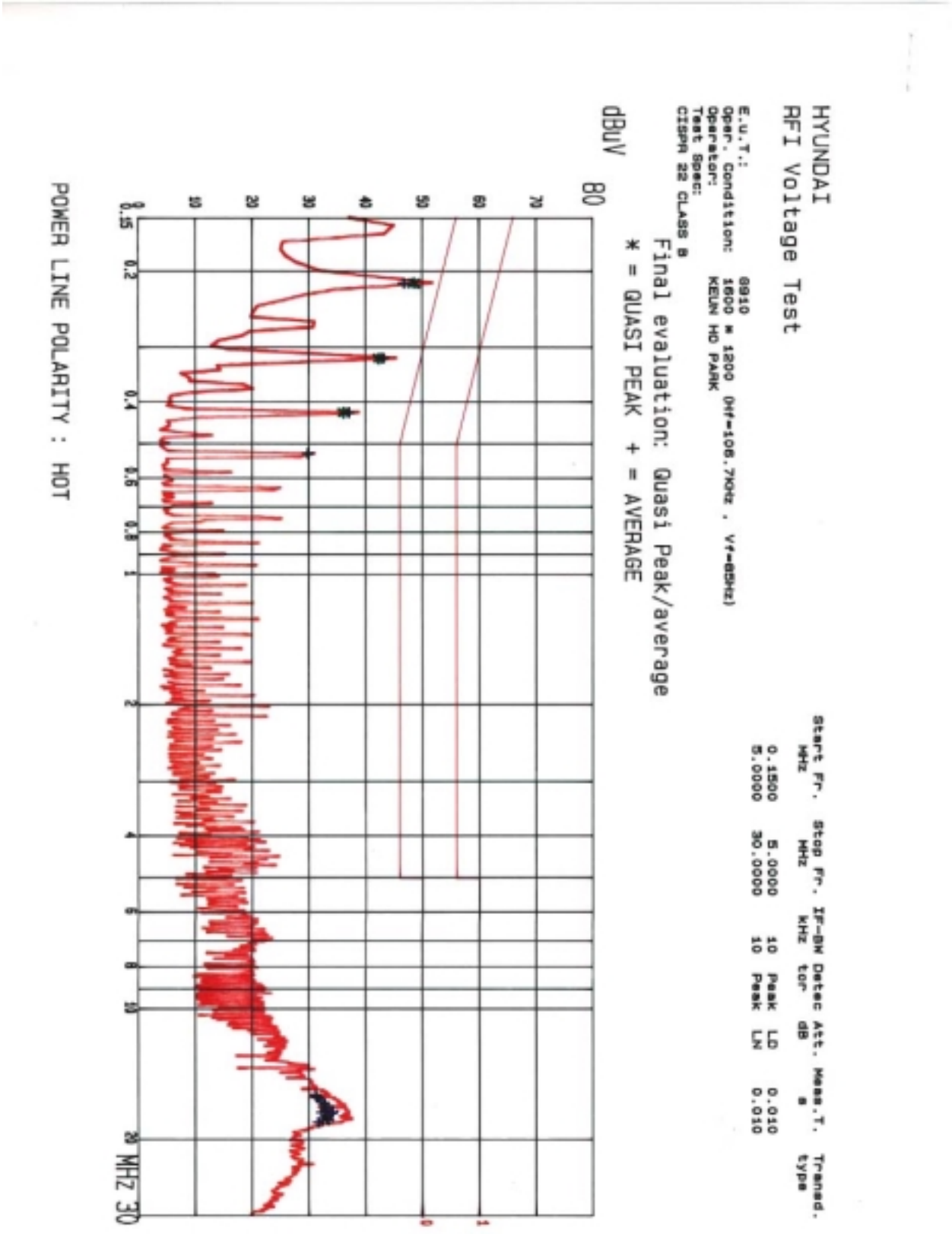

HYUNDAI
RFI Voltage Test
E.u.T.: 8910
Oper. Condition: 1600 x 1200 (Hf=108.7KHz , Vf=85Hz)
Operator: KEUN HO PARK
Test Spec:
CISPR 22 CLASS B
Final evaluation: Quasi Peak/average
* = QUASI PEAK + = AVERAGE
Start Fr. MHz
Stop Fr. MHz
IF-BW kHz
Detec tor
Att. dB
Meas.T. s
Transd. type
0.1500 5.0000 10 Peak LO 0.010
5.0000 30.0000 10 Peak LN 0.010
dBuV
80
70
60
50
40
30
20
10
0
0.15
0.2
0.4
0.6
0.8
1
2
4
6
8
10
20
MHz 30
POWER LINE POLARITY : HOT

HYUNDAI
RFI Voltage Test

E.U.T.: 9910
Oper. Condition: 1600 * 1200 Dif=106.7KHz , Vf=85KHz)
Operator: KEUN HO PARK
Test Spec:
CISPR 22 CLASS B

Quasi Peak values

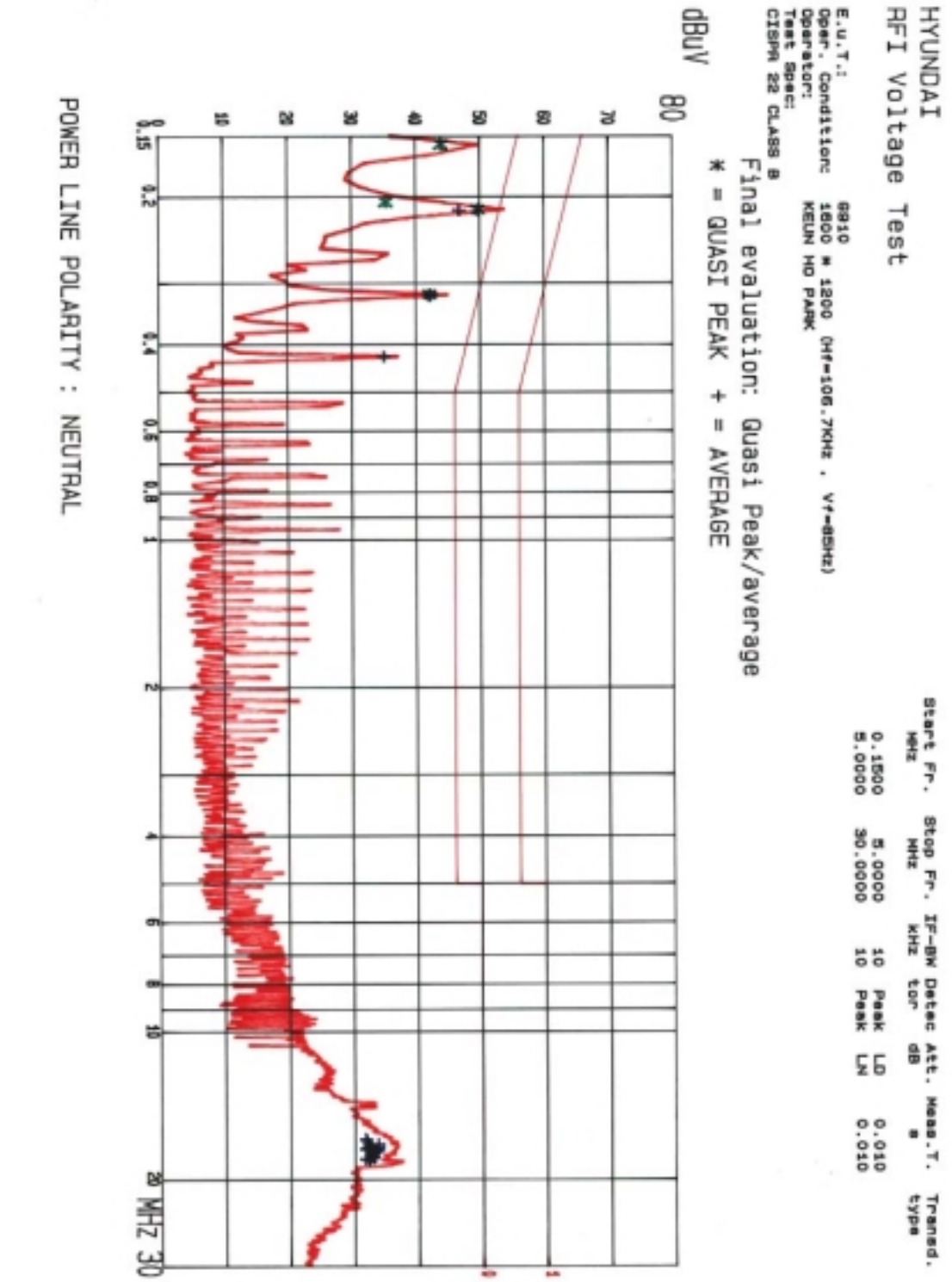
Frequency MHz	Peak dBuV	Q-Peak dBuV	QP-Margin dB
0.2130	51.8	48.7	-14.5
0.3180	45.4	42.4	-17.4
0.4230	38.8	36.2	-21.2

Average values

Frequency MHz	Peak dBuV	Average dBuV	Average-Margin dB
0.2130	51.8	46.9	-6.3
0.3180	45.4	43.1	-6.7
0.4230	38.8	37.1	-10.3
0.5280	31.0	29.8	-16.2
15.8710	31.4	31.3	-18.7
16.0880	32.9	31.4	-18.6
16.3050	34.5	32.0	-18.0
16.5219	34.9	32.6	-17.4
16.7390	36.2	32.8	-17.2
16.9560	36.4	33.1	-16.9
17.1729	36.5	32.9	-17.1
17.2850	32.5	34.2	-15.8
17.3900	37.0	32.3	-17.7
17.5020	30.1	34.0	-16.0
17.7190	36.4	33.5	-16.5
17.8310	31.1	32.9	-17.1
17.9360	37.5	33.3	-16.7
18.1180	36.5	33.4	-16.6
18.1530	35.2	32.5	-17.5
18.3700	33.2	31.6	-18.4

* Limit exceeded

POWER LINE POLARITY : HOT


HYUNDAI
RFI Voltage Test
E.U.T.: 6910
Oper. Condition: 1800 * 1200 (Hf=106.7KHz , Vf=65Hz)
Operator: KEUN HO PARK
Test Spec: CISPR 22 CLASS B
Final evaluation: Quasi Peak/average
* = QUASI PEAK + = AVERAGE
Start Fr. MHz
Stop Fr. MHz
IF-BW KHz
Detec
Att. dB
Meas.T. s
Transd. type
0.1500 5.0000 10 Peak LD 0.010
5.0000 30.0000 10 Peak LN 0.010
dBuV
80
70
60
50
40
30
20
10
0
0.15
0.2
0.4
0.6
0.8
1
2
4
6
8
10
20
30 MHZ
POWER LINE POLARITY : NEUTRAL

HYUNDAI

RFI Voltage Test

E.u.T.: 6910
Oper. Condition: 1600 * 1200 (Hf=106.7KHz , Vf=65Hz)
Operator: KELIN HO PARK
Test Spec:
CISPR 22 CLASS B

POWER LINE POLARITY : NEUTRAL

Quasi Peak values Frequency MHz	Peak dBuV	Q-Peak dBuV	QP-Margin dB
0.1570	49.8	44.0	-21.8
0.2060	44.2	35.4	-28.2
0.2130	53.8	49.9	-13.3
0.3180	45.1	42.2	-17.8

Average values Frequency MHz	Peak dBuV	Average dBuV	Average-Margin dB
0.2130	53.8	45.8	-8.4
0.3180	45.1	42.3	-7.5
0.4230	37.2	35.1	-12.3
16.5570	34.7	31.6	-18.4
16.6620	34.6	31.9	-18.1
16.9490	31.1	33.6	-16.4
16.9840	35.7	32.0	-18.0
17.0890	36.7	32.5	-17.5
17.1660	34.3	33.6	-16.4
17.1940	36.3	32.5	-17.5
17.2990	36.0	32.0	-18.0
17.3830	35.0	33.7	-16.3
17.4040	36.0	31.6	-18.4
17.6000	35.3	33.4	-16.6
17.8170	34.4	32.8	-17.2
18.0340	34.2	32.4	-17.6
18.1180	35.1	33.0	-17.0
18.1460	32.2	32.8	-17.2
18.2510	35.4	31.7	-18.3
18.3630	32.2	32.2	-17.8

* Limit exceeded

4.2 Radiated Emissions Tests

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

Humidity Level : 20 % Temperature : 10
Limit apply to : CISPR 22
Type of Tests : CLASS B
Date : FEB. 29, 2000
Result : PASSED BY –4.8 dB

==========

EUT : 19" COLOR MONITOR
Operating Condition : 1600 X1200 Non-Interlaced (Hf : 106.1KHz, Vf : 85Hz)
Detector : CISPR Quasi-Peak (6 dB Bandwidth : 120 KHz)

Radiated Emissions		Ant.	Correction Factors	Total	FCC Class B	
Freq. (MHz)	Ampl. (dBuV)	Pol.	Antenna & Cable Loss (dB/m)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
31.9	4.7	V	18.0	22.7	30.0	-7.3
111.6	11.8	V	13.2	25.0	30.0	-5.0
114.6	6.7	V	13.7	20.4	30.0	-9.6
133.7	8.5	V	15.7	24.2	30.0	-5.8
133.7	9.3	H	15.7	25.0	30.0	-5.0
187.3	3.8	V	19.3	23.1	30.0	-6.9
187.3	4.4	H	19.3	23.7	30.0	-6.3
229.3	3.9	V	21.1	25.0	30.0	-5.0
229.3	4.1	H	21.1	25.2	30.0	-4.8
233.4	6.2	V	21.1	27.3	37.0	-9.7
309.5	9.6	V	18.8	28.4	37.0	-8.6
366.8	7.4	V	20.4	27.8	37.0	-9.2
389.7	8.5	V	20.9	29.4	37.0	-7.6
412.6	8.1	V	21.1	29.2	37.0	-7.8
458.5	6.6	V	22.2	28.8	37.0	-8.2

NOTE:
1.All video modes and resolutions were investigated and the worst-case emissions are reported.
2.Other video modes & resolution were tested and found to be in compliance.
3.The EUT was test up to 2GHz and no significant emission was found.

Measured by : KEUN HO, PARK / Engineer

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5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.
The basic equation with a sample calculation is as follows:

FS = RA + AF + CF

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dBuV is obtained. The Antenna Factor of 7.4 and a Cable Factor of 1.1 is added. The 30 dBuV/m value was mathematically converted to its corresponding level in uV/m.

FS = 21.5 + 7.4 + 1.1 = 30 dBuV/m

Level in uV/m = Common Antilogarithm [(30 dBuV/m)/20] = 31.6 uV/m

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