MEASUREMENT/TECHNICAL REPORT

CES EMC LAB.

MODEL : MS-71FS

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.

Transition Rules Request per 15.37? yes__ no_X

If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR [10-1-91 Edition] provision.

Report prepared by : JOO MIN, KIM - Manager

Company : KOREA COMPLIANCE ENGINEERING SERVICES CO., LTD.
Address : 584, SANGWHAL-RI, KANAM-MYUN, YOJU-KUN, KYOUNGKI-DO, KOREA
Phone No : 82-337-885-0072
Fax No : 82-337-885-0074

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1. GENERAL INFORMATION

1.1 Product Description

The MODIS Co., Ltd. Model MS-71FS(refered to as the EUT in this report) is a 17" COLOR Monitor HOR. Freq. 93.5kHz w/max. Resolution of 1600 ×1200 Non-Interlaced.
Product specification information described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	**PLASTIC**
LIST OF EACH OSC. OR XTAL. FREQ.(FREQ. 1MHz)	**10 MHz**
CHIPSET BRAND AND PART NO.	**SAMSUNG : KA358** **SAMSUNG : 2S09655** **MITSUBISHI : M52743ASP** **DYNACOLOR : D16F78BE** **SGS TOMSON : TDA4856** **SGS TOMSON : TDA8172** **NATIONAL : LM2405T**
POWER REQUIREMENT	**100 – 240 VAC 1.6A~0.8A 50/60 Hz**
NUMBER OF LAYERS	**MAIN BOARD 1 LAYER** **CRT SOCKET BOARD 2 LAYER**
MAX. RESOLUTION	**1600 X 1200 NON-INTERLACED (@ 93.5 kHz/75Hz)**
H-SYNC FREQUENCY RANGE	**30 KHz 95kHz**
V-SYNC FREQUENCY RANGE	**50 Hz 160 Hz**
CRT SIZE	**17" (SAMSUNG / Type : M41QCJ761X171)**
VIDEO CONNECTOR TYPE	**D-SUB 15-PIN**

1.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

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)	MODIS	MS-71FS		HOST
PC(HOST)	H/P	VECTRA MCx5/133 500	B94VECTRAVEMT	N/A
KEYBOARD	H/P	SK-2501-2D-K	GYUR38SK	HOST
MOUSE	H/P	M-S34	DZL211029	HOST
VIDEO CARD	MATROX	MIL2P/4N	DoC	HOST
PRINTER	H/P	C4562B	B94C2164X	HOST
SERIAL MOUSE	PETRA	MUS5S	JKGMUS5S01	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 3 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data are located at the 584,SANGWHAL-RI,KANAM-MYUN,YOJU-KUN,KYOUNGKI-DO, 469-880,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 and accepted by Commission.

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	MODIS	MS-71FS
CRT SOCKET BOARD	MODIS	MS-71FS

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

	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
PC(HOST)	N	N/A	1.5(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 MOUSE	N	Y	1.5(P), 1.5(D)
MOUSE(PS/2)	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	N/A	Y	PC END
PARALLEL	N	N/A	Y	BOTH END
SERIAL	N	N/A	Y	N/A
MOUSE(PS/2)	N	N/A	Y	PC END

2.5 Equipment Modifications

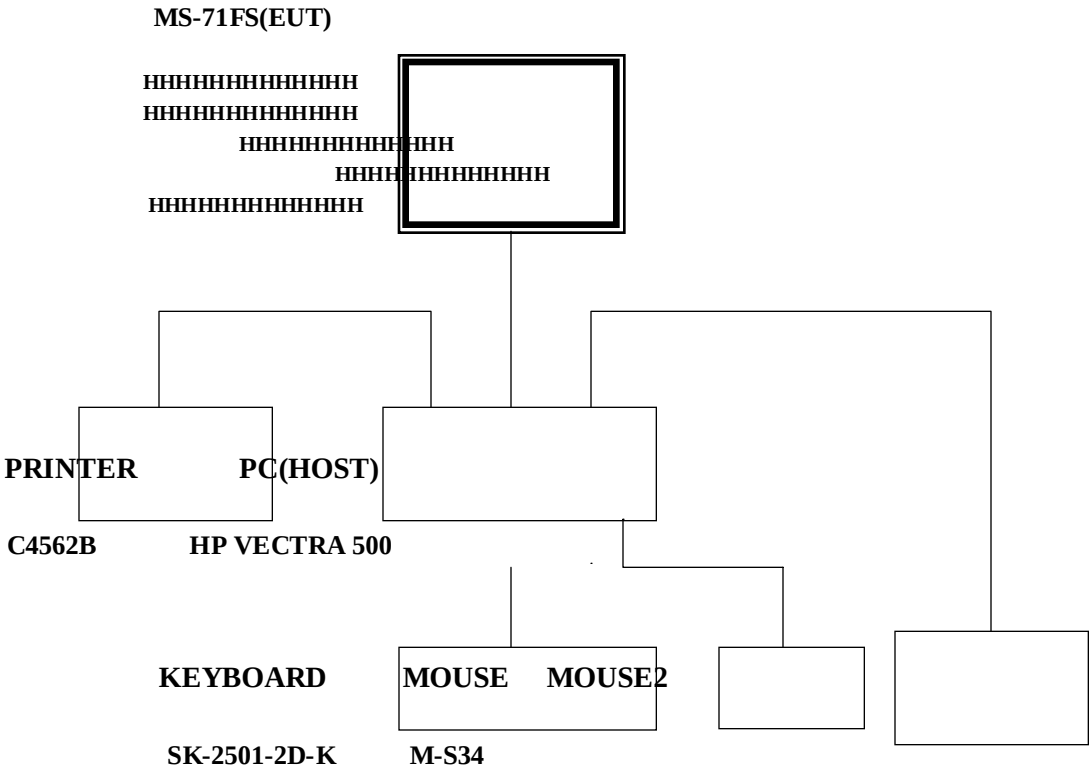
N/A

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 3 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 (93.5 kHz/75Hz)	X
Pentium 75 MHz	1280 x 1024 Non-Interlaced (64 kHz/60Hz)	
Pentium 75 MHz	1024 x 768 Non-Interlaced (68.7 kHz/85Hz)	
Pentium 75 MHz	800 x 600 Non-Interlaced (53.6 KHz/85Hz)	
Pentium 75 MHz	640 x 480 Non-Interlaced (43.2 KHz/85Hz)	

4.2 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 (93.5 kHz/75Hz)	X
Pentium 75 MHz	1280 x 1024 Non-Interlaced (64 kHz/60Hz)	
Pentium 75 MHz	1024 x 768 Non-Interlaced (68.7 kHz/85Hz)	
Pentium 75 MHz	800 x 600 Non-Interlaced (53.6 KHz/85Hz)	
Pentium 75 MHz	640 x 480 Non-Interlaced (43.2 KHz/85Hz)	

Tested by Yo Han, Park **Date :** April 20. 2000

4. FINAL CONDUCETD AND RADIATED EMISSION TESTS SUMMARY

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 : 32% Temperature : 22
Limit apply to : FCC CFR 47, PART 15, SUBPART B
Type of Tests : CLASS B
Date : APRIL 20, 2000
Result : PASSED BY 9.1 dB

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EUT : 17" COLOR MONITOR
Operating Condition : 1600 X 1200 Non-Interlaced (Hf : 93.5KHz, Vf : 75Hz)
Detector : CISPR Quasi-Peak (6 dB Bandwidth : 9 KHz)

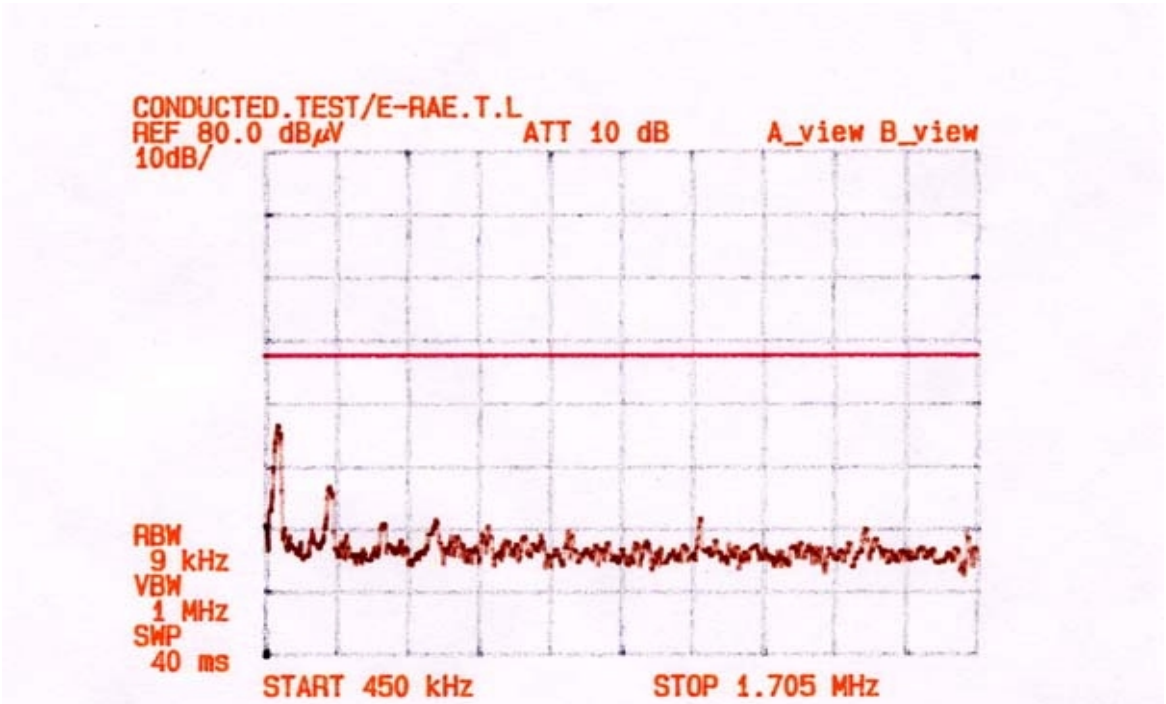
Power Line Conducted Emissions			FCC Class B	
Frequency (MHz)	Amplitude (dBuV)	Conductor	Limit (dBuv)	Margin (dB)
0.4673	38.9	HOT	48	-9.1
0.5584	29.4	HOT	48	-18.6
0.8405	22.3	HOT	48	-25.7
2.5100	32.3	HOT	48	-15.7
20.084	33.3	HOT	48	-14.7
20.272	34.7	HOT	48	-13.3
20.367	34.2	HOT	48	-13.8

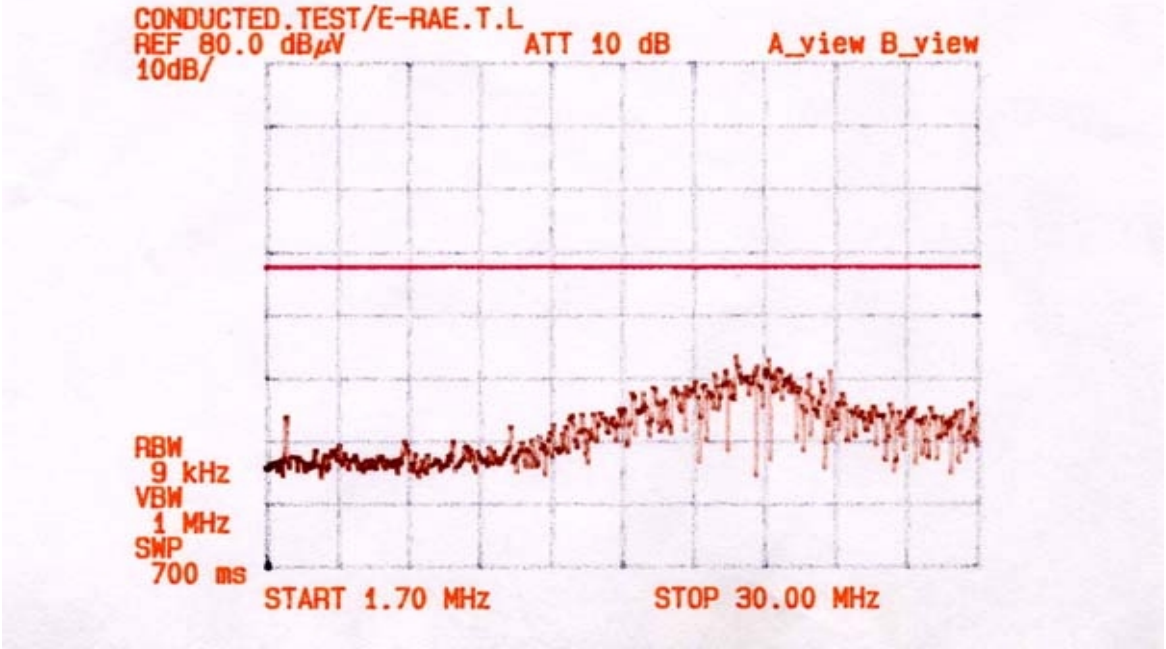
Line Conducted Emissions Tabulated Data

NOET:
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.
2. The limit for Class B device is 250 uV from 450 kHz to 30 MHz.

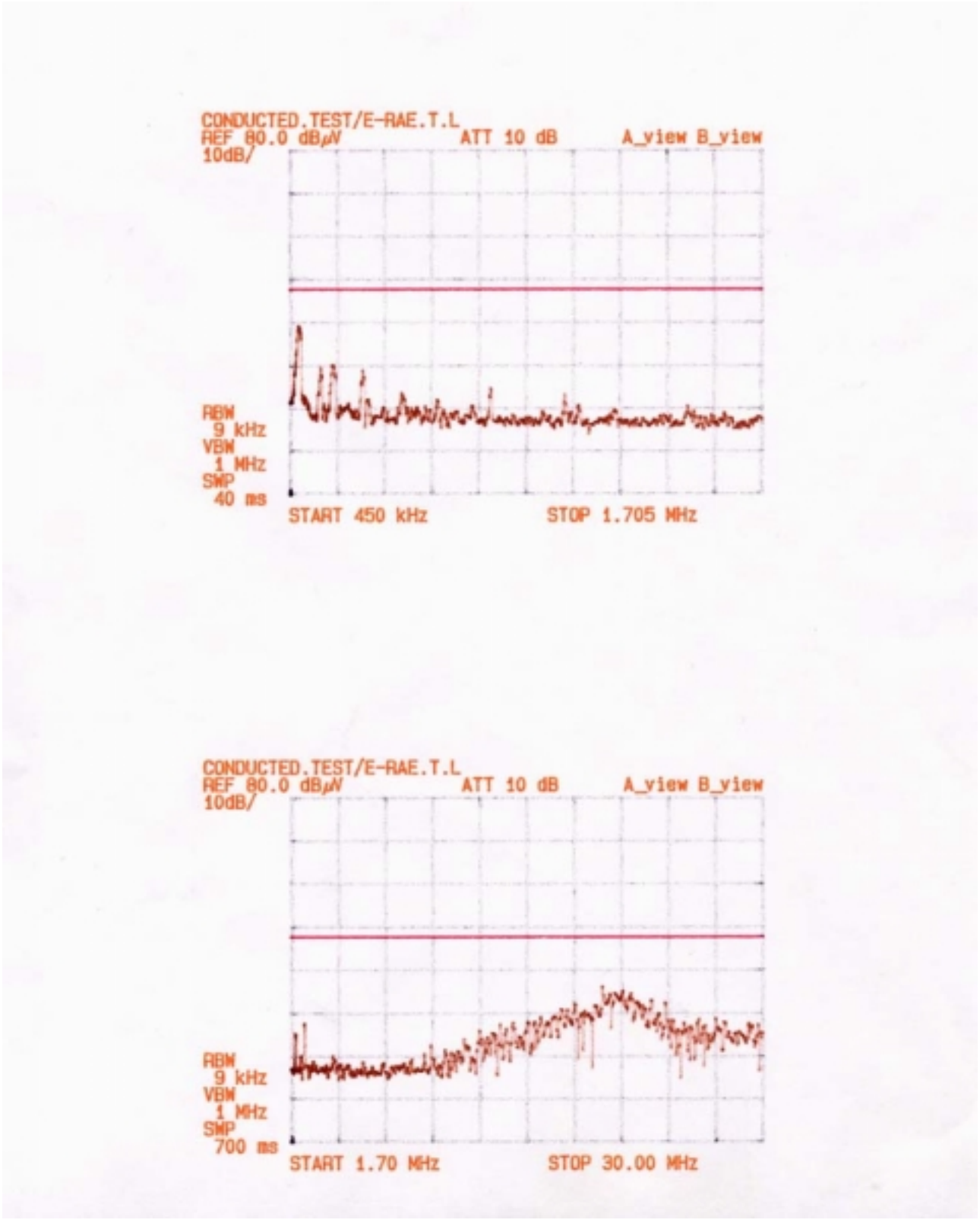
Measured by : Yo Han, Park / Engineer

LINE POLARIZATION : HOT





LINE POLARIZATION : NEUTRAL



4.2 Radiated Emissions Tests

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

Humidity Level : 30 % Temperature : 19
Limit apply to : FCC CFR 47, PART 15, SUBPART B
Type of Tests : CLASS B
Date : APRIL 21, 2000
Result : PASSED BY 6.0 dB

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EUT : 17" COLOR MONITOR
Operating Condition : 1600 X 1200 Non-Interlaced (Hf : 93.5 KHz, Vf : 75 Hz)
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)
55.27	16.35	V	11.48	27.83	40.0	-12.17
73.69	20.95	V	9.14	30.09	40.0	-9.91
110.55	18.37	V	15.70	34.07	43.5	-9.43
128.98	15.87	H	15.98	31.85	43.5	-11.66
147.41	14.56	H	15.75	30.31	43.5	-13.19
165.81	12.82	H	17.37	30.19	43.5	-13.31
184.26	13.10	H	18.62	31.72	43.5	-11.78
202.73	23.25	H	14.38	37.63	43.5	-5.87
221.14	23.12	H	14.18	37.30	46.0	-8.70
239.50	25.32	H	14.58	39.90	46.0	-6.10
257.99	22.30	H	15.38	37.68	46.0	-8.32
276.42	17.15	H	16.44	33.59	46.0	-12.41
386.99	12.22	V	19.02	31.24	46.0	-14.76
405.39	16.07	H	19.15	35.22	46.0	-10.78
442.25	12.00	V	20.35	32.35	46.0	-13.65

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.

Measured by : Yo Han, Park / Engineer

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 23.25 dBuV is obtained. The Antenna Factor of 11.7 and a Cable Factor of 2.68 is added. The 37.63 dBuV/m value was mathematically converted to its corresponding level in uV/m.

FS = 23.25 + 11.70 + 2.68 = 37.63 dBuV/m

Level in uV/m = Common Antilogarithm [(37.63 dBuV/m)/20] = 76.12 uV/m