MEASUREMENT/TECHNICAL REPORT

APPLICANT: Q-RUN TECHNOLOGY CORPORATION

MODEL NO.: C905

FCC ID: IQX199895S

This report concerns (check one) : **Original Grant** ✓
Class II Change _____

Equipment type: Monitor

Deferred grant requested per 47CFR 0.457(d)(1)(ii)?
Yes _____ No ✓ If yes, defer until: _____ (date)

We, the undersigned, agree to notify the Commission by (date) _____ / _____ / ___ of the intended date of announce ment of the product so that the grant can be issued on that date.

Transiyion Rules Request per 15.37? Yes ____ No ✓

If no, assumed Part 15, Subpart B for unintentional radiator the new 47 CFR (10-1-90 Edition) provision.

Report Prepared

by Testing House : **Neutron Engineering Inc.**

for Company Name: Q-RUN TECHNOLOGY CORPORATION

Address: No. 3-2, Chung-Shan Rd., Tu-Cheng Industrial District, Tu-Cheng City, Taipei Hsien, Taiwan, R.O.C.

Applicant Signature : Wilson Huang

Wilson Huang / R&D Dept. Supervisor

CERTIFICATION

We hereby certify that:

The test data , data evaluation , test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (1992) / CISPR 22 (1996) and the energy emitted by the sample EUT tested as described in this report is in compliance with CLASS B conducted and radiated emission limits of FCC Rules Part 15 , Subpart B / CISPR 22 (1996)

Prepared by:	Carol Chen	Carol Chen
Reviewed by:	Andy Chiu	Andy Chiu
Approved by:	George Yao	George Yao
Issued Date :	Dec. 01, 1998	
Report No. :	NEI-FCCB-99084	
Company Stamp:		

NEUTRON ENGINEERING INC. 電研股份有限公司

NEUTRON ENGINEERING INC.
20, Alley 50, Lane 119, Dong Hwu Rd.,
P.O. Box 6-158, Nei Hwu,
Taipei, Taiwan
TEL : (02) 2646-5426 FAX: (02) 2646-6815

Table of Contents

1. GENERAL INFORMATION

1-1. Product Description

The Q-RUN TECHNOLOGY CORPORATION Model: C905 (referred to as the EUT in this report) is a 19", VESA compatible, multi-sync., color display monitor with following features:

(1). CRT Display Tube	19" , 100 degree, 0.26 mm dot pitch, Dot-type: black matrix
(2). Compatibility	IBM-VGA, VESA, MACII
(3). Resolution Mode	
Max. Pixel Resolution	1600 X 1200/93.75KHz Hsync., 75Hz refresh , NI
Highest Hor. Sweep Rate	1600X 1200/93.75KHz Hsync., 75Hz refresh , NI
(4). Synchronization	
Horizontal Sweep Freq.	30-95 KHz
Vertical Refresh Freq.	47-160 Hz
(5). Pixel Rate(Video BW)	150 MHz (max.)
(6). User Control	☑ OSD Menu Adjustment ☐ Touch Screen Selecting
(7). PnP Compatibility	☑ Analog RGB VGA Std. with VESA DDC 1/2B compatible
	☑ USB Interface Std. Compatible.
(8). Multimedia Function	☑ N/A
	☐ Integrated a pair of speakers with Audio In/Earphone Jacks
(9). Power Supply	
Power Rating	AC 100V - 240V,2.5A, 115Wmax. , 50/60Hz, 1.8A
Power Cord Type	☑Shielded ☐ Non-shielded
	☑ Detachable ☐ Permanently attached

Connecting I/O Port(s) (check one, if applicable)

☑ VGA Connector

(1). A DB-15P VGA connector provided for EUT connects with VGA port on PC.

(2). A shielded, permanently attached type VGA cable connector, approx. 1.2 m, a ferrite core attached at one side close to DB-15P connector, incorporated with EUT as a special cable accessory.

☑ USB Connectors

(1). One up stream, 4 down streams.

A more detailed and/or technical descriptions of EUT is attached in **attachment-A**

1-2. Related Submittal(s) / Grant (s)

1-2-1. Models Covered

Model covered in this test report for FCC ID filing is: C905

1-2-2. Model Difference

N/A

1-3. Tested System Details

The FCC IDs for all equipments, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

Model No.	FCC ID	Equipment	Cable
C905 (1)	IQX199895S	Monitor	Shielded Video Cable. (2) Shielded Power Cord
444	N/A (3)	PC	Shielded Power Cord.
DPU-414	N/A (3)	Printer	Shielded Parallel I/F Cable. Unshielded Power Cord.
DM-1414V	N/A (3)	Modem	Shielded Serial I/F Cable. Unshielded Power Cord.
FDA-104GA	F4ZFDA-104GA	Keyboard	Shielded Data Cable
M-534	DZL210472	Mouse	Shielded Data Cable
SP-365B	N/A (3)	VGA Card	Add-On Card Cableless
MOSXT	N/A (3)	USB Mouse	Shielded Data Cable
MOSUU	EMJ0000002	USB Mouse	Shielded Data Cable
MOSUU	EMJ0000002	USB Mouse	Shielded Data Cable
MOSUU	EMJ0000002	USB Mouse	Shielded Data Cable

Notes:

(1) EUT submitted for grant.
(2) Monitor‘s attached video cable with ferrite core.
(3) The support equipment was authorized by Declaration of Conformity.

1-4. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992)/CISPR 22 (1996). Radiated testing was performed at an antenna to EUT distance 10 meters.

1-5. Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of No. 132-1, Lane 329, Sec. 2, Palain Road, Shijr 221, Taipei, Taiwan, R.O.C. of NEUTRON ENGINEERING INC. This site has been fully described in report dated Jun. 25, 1999 Submitted to your office, and accepted in a letter dated Sep. 02, 1999 (Reg. No. 95335).

3. System Test Configuration

3-1. Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). The EUT was connected to support equipment-personal computer. Peripherals of PC, such as printer, modem, mouse and keyboard as well as the VGA add-on card were contained in this system in order to comply with the ANSI C63.4 standard requirement. The system was tested in the highest pixel resolution mode also, the highest horizontal sweep rate mode of 1600x1200 Hsync. 94KHz this mode was investigated and were used to collect the included data. In addition, the band with(Pixel rate) designation for the EUT more than 100MHz, an additional measurement for frequency over 1GHz also attached.

The four down stream USB Ports were tested at the same time by connecting with an USB device respectly. The simultaneous testing of this identical port did not take the system out of compliance.

3-2. 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 disk, was inserted into driver A and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

1. Read(write) from(to)the disk desk driver.
2. Send " H " pattern to the parallel port device (Printer).
3. Send " H " pattern to the video port device (Monitor).
4. Send " H " pattern to the serial port device (Modem).
5. Repeated from 1 to 4 continuously.

As the Keyboard and mouse are strictly input devices, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.

3-3. Special Accessories

N/A

3-4. Equipment Modifications

In order to achieve in compliance with Class B levels, the following change(s) were made by NEUTRON test house during the compliance testing:

Please refer to the next page as the modification described and cross reference of photos of tested EUT.

The above modifications will be implemented in all product models of this equipment.

Applicant Signature :	Wilson Huang	**Date :**	June 16, 1999
Type/Printed Name :	Wilson Huang	**Position :**	R&D Dept. Supervisor

Q-RUN TECHNOLOGY CORPORATION

No.3, Chung-Shan Road, Tu-Cheng Industrial District, Tu-Cheng City, Taipei Hsien, Taiwan.

TEL: 886 2 2268 0970 FAX: 886 2 2268 7176 R&D FAX: 886 2 2267 1190

Modification Report

Company: Q-RUN TECHNOLOGY Corp.

Model No.: C905

FCC ID: IQX199895S

Date: June 16, 1999

A. **Add a trorid core the video cable.**

B. **Add a trorid core the G2 cable.**

C. **Add a trorid core the G1&G4 cable.**

D. **Add a trorid core the safety ground line.**

All the above modification will be implemented and relay out in the mass production to mere the FCC Class B requirements.

Q-RUN TECHNOLOGY Corp.

Wilson Huang

Wilson Huang
R&D Dept.
Supervisor

3.5 Configuration of Tested System

The configuration of tested system is described as the block diagram shown in next page Figure 3.1 and details information of I/O cable an power cord connection are tabulated as Table A and B. The monitor is powered from a floor mounted receptacle (referred to as the wall outlet in the previous described) was tested.

TABLE A - Test Equipment

Item	Equipment	Mfr.	Model/Type No.	I/O Port	FCC ID	Remark
E-1	Monitor	Q-RUN	C905	VGA Port	N/A (3)	EUT
E-2	PC	IBM	444		N/A (3)	
E-3	Printer	SII	DPU-414	Printer Port	N/A (3)	
E-4	Modem	ACCEEX	DM-1414V	COM Port	N/A (3)	
E-5	Keyboard	Forward	FDA-104GA	KB Port	F4ZFDA-104GA	
E-6	Mouse	HP	M-534	PS/2 Port	DZL210472	
E-7	VGA Card	Sparkle	SP-365B	Add-on Slot	N/A (3)	
E-8	USB Mouse	Primax	MOSXT	USB Port	N/A (3)	
E-9	USB Mouse	Primax	MOSUU	USB Port	EMJ0000002	
E-10	USB Mouse	Primax	MOSUU	USB Port	EMJ0000002	
E-11	USB Mouse	Primax	MOSUU	USB Port	EMJ0000002	

Remark:

(1) Unless otherwise denoted as EUT in (Remark) column, device(s) used in tested system
is a support equipment.

(2) Unless otherwise marked as * in (Remark) column, Neutron consigns the supporting equipment(s) to the tested system.

(3) The support equipment was authorized by Declaration of Conformity.

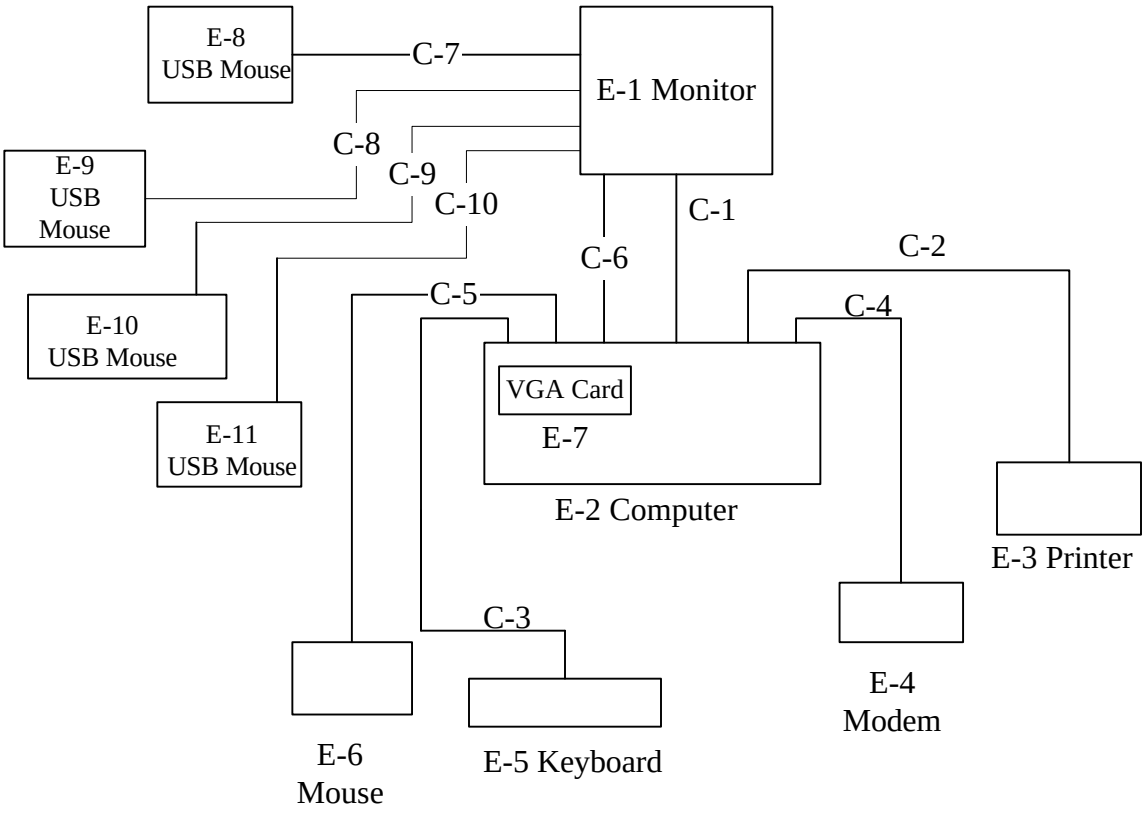
Table B. - Informations Cable Information

Item	I/O Cable	Device Connected	Shielded Type	Ferrite Core	Detachable/ Permanently	Length	Note
C-1	Video Cable	VGA Card-Monitor	Yes	Yes	Permanently attached	120cm	*
C-2	Centronics Cable	PC-Printer	Yes	No	Detachable type	200cm	
C-3	Keyboard Cable	PC-Keyboard	Yes	No	Permanently attached	280cm	
C-4	RS-232 Cable	PC-Modem	Yes	No	Detachable type	175cm	
C-5	Mouse Cable	PC-Mouse	Yes	No	Permanently attached	200cm	
C-6	USB Cable	EUT-PC	Yes	No	Detachable type	120cm	*
C-7	USB Mouse Cable	EUT-USB Mouse	Yes	No	Permanently attached	150cm	
C-8	USB Mouse Cable	EUT-USB Mouse	Yes	No	Permanently attached	150cm	
C-9	USB Mouse Cable	EUT-USB Mouse	Yes	No	Permanently attached	150cm	
C-10	USB Mouse Cable	EUT-USB Mouse	Yes	No	Permanently attached	150cm	

Note:

(1) Unless otherwise marked as * in (Remark)column, Neutron consigns the supporting equipment(s) to the tested system.

Flgure 3.1 Configuration of Tested System

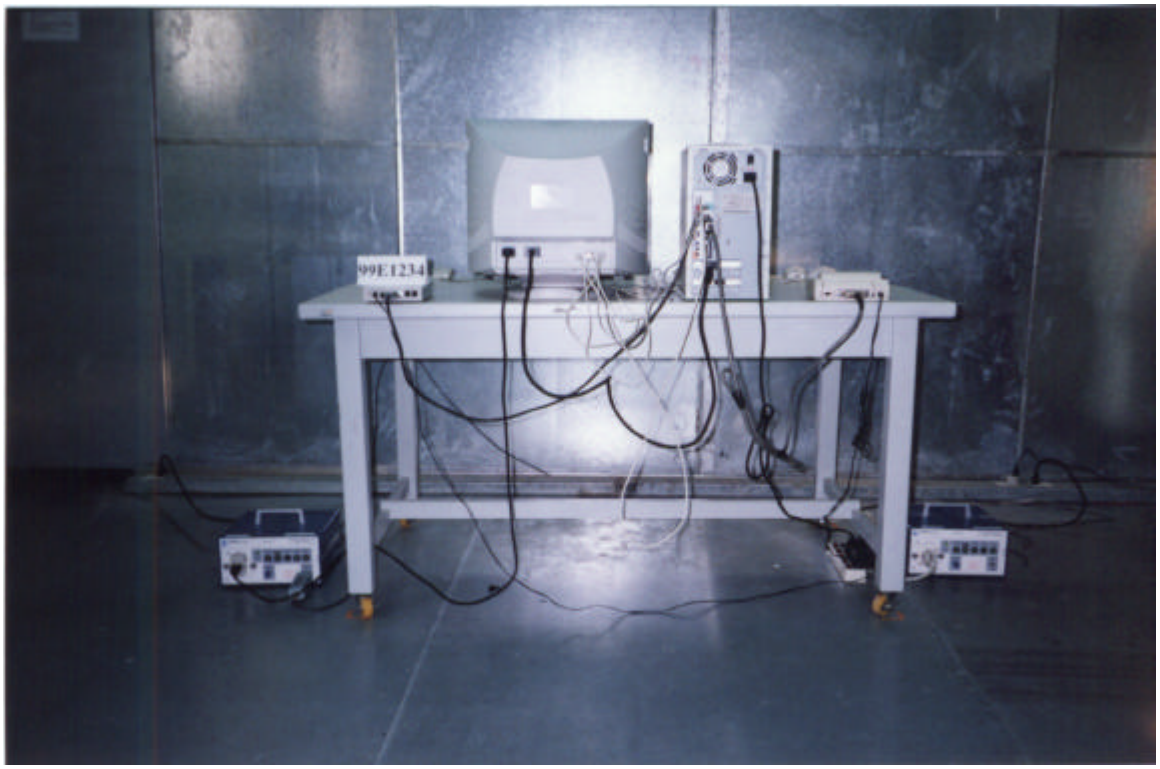


4. Block Diagram(s)

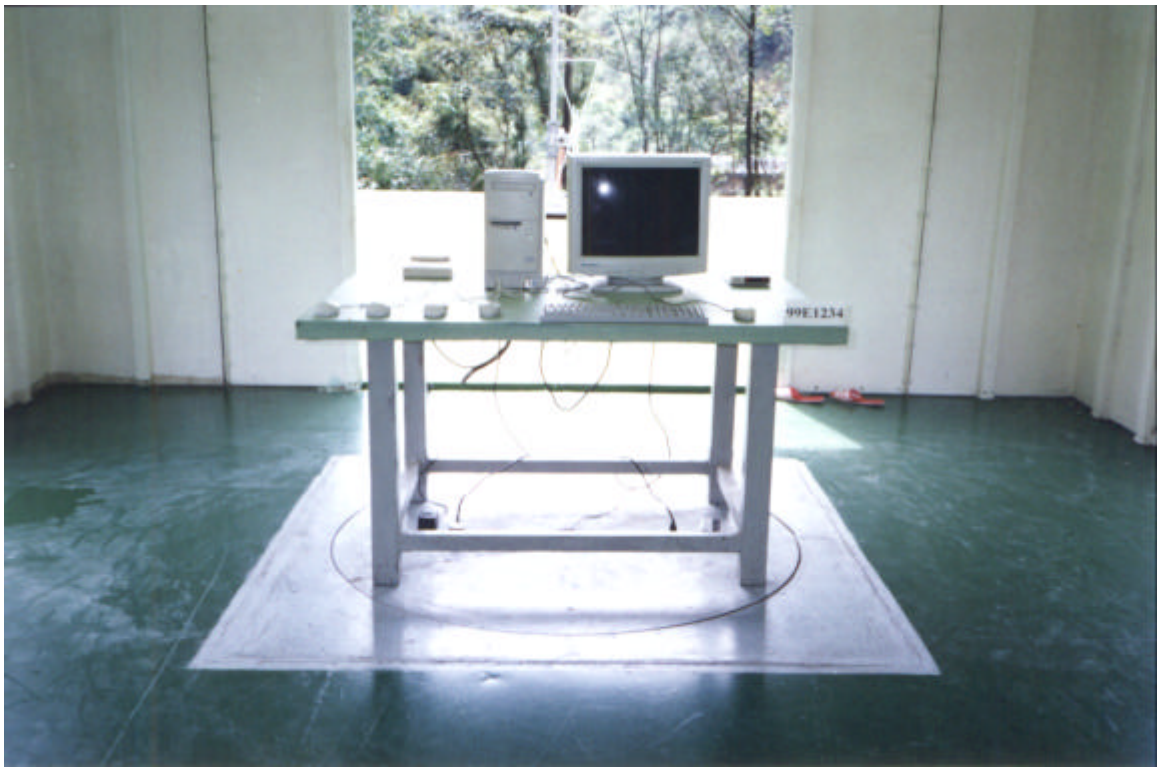
Figure 4.1 Block diagram of system

5. Conducted and Radiated Measurement Photos

5-1. Conducted Measurement Photos



5-2. Radiated Measurement Photos



6. Conducted Emission Datas

6.1 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Test Mode : 1600X1200 94KHz 75Hz

Judgement: Passed by **-1.27** **dB** in mode of **Neutral** terminal **0.19 MHz**

Freq.	Terminal	Measured(dBuV)		Limits(dBuV)		Safe Margins	
(MHz)	L/N	QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dBuV)	Note
0.19	Line	53.92	52.22	64.04	54.04	-1.82	(AV)
0.29	Line	44.28	*	60.67	50.67	-16.39	(QP)
0.47	Line	43.06	*	56.44	46.44	-13.38	(QP)
0.76	Line	38.96	*	56.00	46.00	-17.04	(QP)
2.07	Line	36.91	*	56.00	46.00	-19.09	(QP)
0.19	Neutral	54.27	52.77	64.04	54.04	-1.27	(AV)
0.29	Neutral	47.46	*	60.67	50.67	-13.21	(QP)
0.38	Neutral	43.52	*	58.30	48.30	-14.78	(QP)
0.48	Neutral	43.69	*	56.41	46.41	-12.72	(QP)
0.76	Neutral	39.03	*	56.00	46.00	-16.97	(QP)

Remark :

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz; SPA setting in RBW=100KHz,VBW =100KHz, Swp. Time = 0.3 sec./MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz.

(2) All readings are QP Mode value unless otherwise stated AVG in column of(Note). If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemd to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn‘ t perform. In this case, a “ * ” marked in AVG Mode column of Interference Voltage Measured.

(3) Measuring frequency range from 150KHz to 30MHz.

Review : Andy Chen Test Personnel. : Ares Date: June 16, 1999

7. Radiated Emission Datas

7.1 The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Test Mode : 1600X1200 94KHz 75Hz

Judgement: Passed by **-5.06** **dB** in polarity of **Vertical 47.3 MHz**

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
46.85	V	43.09	- 15.13	27.96	30.00	- 2.04	QP
48.00	H	43.32	- 15.09	28.23	30.00	- 1.77	QP
111.99	V	42.57	- 15.45	27.12	30.00	- 2.88	
119.99	V	40.00	- 14.54	25.46	30.00	- 4.54	QP
144.00	H	37.80	- 13.30	24.50	30.00	- 5.50	QP
156.03	H	40.17	- 13.33	26.84	30.00	- 3.16	
202.40	H	43.23	- 15.37	27.86	30.00	- 2.14	
240.80	V	43.60	- 13.79	29.81	37.00	- 7.19	
240.80	H	46.20	- 13.79	32.41	37.00	- 4.59	
300.80	H	45.40	- 11.33	34.07	37.00	- 2.93	
420.48	V	37.10	- 7.38	29.72	37.00	- 7.28	
484.00	V	35.80	- 5.49	30.31	37.00	- 6.69	

Remark :

(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz¡ SPA setting in RBW=1MHz, VBW =1MHz, Swp. Time = 0.3 sec./MHz.

(2) All readings are Peak unless otherwise stated QP in column of(Note). Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn‘ t perform.

(3) Measuring frequency range from 30MHz to 1000MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

Review : Andy Chiu Test Personnel. : Ares Date: June 16, 1999

7. Radiated Emission Datas

7.1 The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Test Mode : 1600X1200 94KHz 75Hz

Judgement: Passed by **-9.91** **dB** in polarity of **Vertical 1310.00** **MHz**

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
1002.00	V	32.57	7.63	40.20	54.00	-13.80	
1014.00	V	35.37	7.86	43.23	54.00	-10.77	
1030.00	H	33.90	7.92	41.82	54.00	-12.18	
1032.00	V	34.00	7.92	41.92	54.00	-12.08	
1062.00	H	33.98	8.39	42.37	54.00	-11.63	
1137.00	H	32.38	9.13	41.51	54.00	-12.49	
1137.00	V	34.96	9.13	44.09	54.00	- 9.91	
1188.00	H	33.35	9.23	42.58	54.00	-11.42	
1329.00	V	30.31	10.12	40.43	54.00	-13.57	
1360.00	H	30.07	10.16	40.23	54.00	-13.77	

Remark :

(1) Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW=1 MHz ,VBW =1MHz, Swp. Time = 0.3 sec./MHz.

(2) Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz.

(3) Measuring frequency range from 1000MHz to 2000MHz.

(4) All readings are Peak unless otherwise stated AV in column of (Note). * marked denotes that the Peak reading compliance with the Average Limits in FCC 15.109 and then the AV Mode measurement didn‘ t perform.

(5) If the peak scan value lower limit more than 20dB, then this signal data does not show in table

Review : Andy Chiu Test Personnel. : Ares Date: June 16, 1999

7-2. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor (1)

CL = Cable Attenuation Factor (1)

AG = Amplifier Gain (1) (2)

Remark :

(1) The Correction Factor = AF + CL - AG, as shown in the data tables' Correction Factor column.

(2) AG is not available for Neutron's Open Site Facility

Example of Calculation:

Assume a Receiver Reading of 23.7 dBuV is obtained with an Antenna Factor of 7.2 dB and a Cable Factor of 1.1 dB. Then:

1. The Correction Factor will be caculated by

Correction Factor = AF + CL - AG = 7.2 + 1.1 - 0 = 8.3 (dB)

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

FS = RA + Correction Factor = 23.7 + 8.3 = 32 (dBuV/m).

FS is the value shown in the data tables' Corrected Reading column and RA is the value shown in the data tables' Receiver Reading column. The 32 dBuV/m value was mathematically converted to its corresponding level in uV/m as:

Log^{-1}[(32.0dBuV/m)/20] = 39.8 (uV/m)

7-3. Correction Factor VS Frequency

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30.00	11.10	0.90
35.00	10.80	0.50
40.00	11.20	1.00
45.00	11.50	0.80
50.00	11.30	1.00
55.00	10.50	1.30
60.00	9.90	1.00
65.00	8.70	1.50
70.00	7.60	1.20
75.00	6.40	1.40
80.00	6.10	1.30
85.00	7.00	1.40
90.00	8.00	1.70
95.00	10.00	1.50
100.00	11.20	1.90
110.00	12.60	2.00
120.00	13.00	1.80
130.00	12.50	1.80
140.00	12.00	2.00
150.00	12.00	2.20
160.00	13.20	2.40
170.00	14.80	2.50
180.00	16.30	2.50
190.00	17.00	2.50
200.00	17.30	2.40
225.00	10.50	2.70
250.00	11.70	3.10
275.00	12.80	3.70
300.00	14.50	4.00
325.00	14.00	4.50
350.00	14.20	4.50
375.00	14.60	4.60
400.00	15.10	4.80
450.00	16.20	5.40
500.00	17.60	6.50
550.00	17.80	7.00
600.00	18.40	7.10
650.00	19.50	7.10
700.00	20.80	7.20
750.00	20.50	7.50
800.00	21.10	8.00
850.00	22.40	8.60
900.00	23.50	8.90
950.00	24.00	9.70
1000.00	24.80	10.30

8. Photos of Tested EUT:

The following photos are attached:

Photo # 1. Front View Rear View

Photo # 2. Unit Partially Disassembled

Photo # 3. Unit Partially Disassembled

Photo # 4. Unit Partially Disassembled

Photo # 5. Unit Partially Disassembled

Photo # 6. Unit Partially Disassembled

Photo # 7. Unit Partially Disassembled

Attachment

User's Manual