

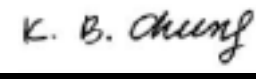



EMC Test Report

Project No.		LBE032580
Equipment under Test		
	Applicant	Samsung Electronics Co.Ltd 416 Maetan-3 Dong, Yeongtong-Ku, Suwon City, Gyeonggi-Do, Korea, 442-742
	FCC ID	A3L2004KHAN2
	Product Name	Video Cassette Recorder
	Model Name	VR8460
	Manufacturer	Samsung Electronics Co. Ltd
	Brand Name	SAMSUNG
	Variant Model	See Page 2
Date of Tests		December 16 ~ 26 , 2003
Issued Date		6-Jan-04
Applied Standards		FCC Part 15
Result		Passed The equipment under test has found to be compliant with the applied standards.
	Name/Position	Signature
Tested by	Kyung Chul, Min Test Engineer	
Reviewed by	No Cheon, Park Manager of EMC Lab.	
Authorized by	Kyu Baek, Chung Chief of EMC Lab.	
SAMSUNG ELECTRONICS Co., Ltd. SUWON EMC Test Lab.		<p>1. This test reports does not constitute an endorsement by NIST/NVLAP or U.S Government.</p> <p>2. This test report is to certify that the tested device properly complies with the requirements of FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators. All tests necessary to show compliance to the requirements were and these results met the specifications requirement.</p> <p>This laboratory is registered by the NIST/NVLAP, U.S.A. The test reported herein have been performed in accordance with its terms of registration.</p> <div style="text-align: right;">  NVLAP LAB CODE 200623-0 </div>
	Address	416 Maetan-3 Dong, Yeongtong-Ku, Suwon City, Kyungki-Do, Korea, 442-742
	Telephone No.	82-31-200-2135
	Fax No.	82-31-200-2189

1. General Information

1.1 Basic Information related Product

Applicant	Samsung Electronics Co. Ltd	
Product name	Video Cassette Recorder	
Model name	VR8460	
Brand Name	SAMSUNG	
Manufacturer	Samsung Electronics Co. Ltd	
Variant Models	None	
Type of RF Output Connector	Type "F" Connector 75 ohm(Unbalanced)	
FCC ID Number	A3L2004KHAN2	
Operating (RF Modulator) Frequency	CH. 3	Visual Carrier : 61.25 MHz
		Aural Carrier : 65.75 MHz
	CH. 4	Visual Carrier : 67.25 MHz
		Aural Carrier : 71.75 MHz

1.2 Power Input Ports

Description	Voltage(V)	Frequency(Hz)	No of phases
Mains Cable	120V	60Hz	1

1.3 EUT & Support Equipment

Used EUT and Peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	Remark
A	Video Cassette Recorder	VR8460	-	SAMSUNG	EUT
B	Remote Controller	-	-	SAMSUNG	EUT

Used Cable Description

No.	Item	Length[m]	Shielded	Remark
1	AC Power Cable	1.5	N	to the mains
2	AV In Cable	1.2	N	Terminated video : 75 ohm Audio In : 1k ohm
3	AV Out Cable	1.2	N	Terminated video : 75 ohm Audio In : 10k ohm
4	RF In Cable	1.5	Y	75 ohm Terminated
5	RF Out Cable	1.2	Y	75 ohm Terminated
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

1.4 Operating Mode and Conditions

The EUT was tested in the following operating modes(at both channel 3 and 4) for the tests mention in this report :

1) Recording (NTSC Signal)

A NTSC signal(Color bar) was supplied at ch.5(77.25MHz) through the ant. Input connector for recording.

2) Recording (1V VITS Signal)

A 1V peak-to-peak VITS signal was supplied through the video input connector for recording.

3) Recording (5V VITS Signal)

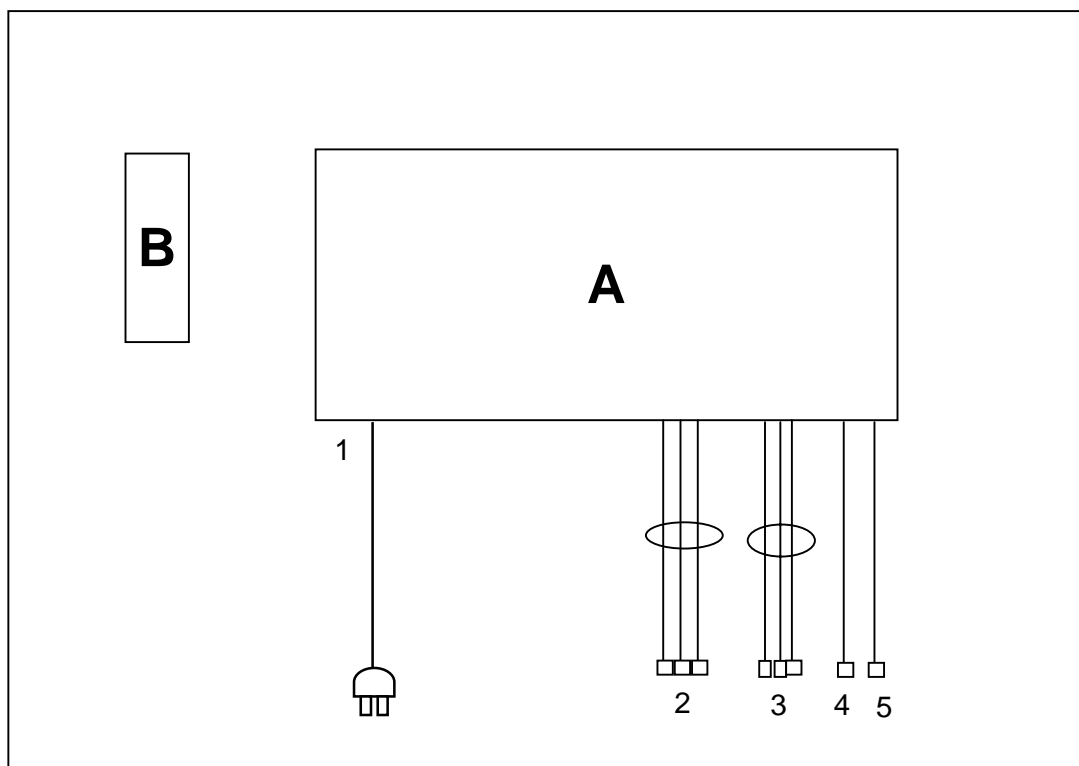
A 5V peak-to-peak VITS signal was supplied through the video input connector for recording.

4) VCR Play

In this test mode, a video tape recorded with VITS signal was played on the EUT.

Note : Recording(NTSC Signal) mode is not applicable to the antenna transfer switch test.

1.5 Block Diagram



1.6 Test Facility

General Information

The EMI/EMS measurement facilities used to collect the tested data are located at 416 Maetan 3 Dong, Yeongtong-Ku, Suwon City, Gyeonggi-Do, Korea.

This sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1 & 16-2. SAMSUNG Electronics Co.,Ltd is accredited by Korea Laboratory Accreditation scheme(KOLAS) which . signed the International Laboratory Accreditation Cooperation(ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(S)

Accreditation and Listing



Reg. No. 124



Reg. No. KR0004



No.195



App. No.001



LAB CODE 200623-0



Reg. No.98856



R-1221,C-1095



H9354285

1.7 Applied Standards

List

FCC Rule Part(s)	Test Procedure(s)
FCC Part 15 Subpart B	ANSI C63.4-2001
	-
	-

2. Summary of Test Results

Result : **Pass**

The equipment under test(EUT) has been found to comply with the applied standards

Section of the Product Standard		Applied Standard	Result
Electromagnetic Emission Test			
3.1	AC Powerline Conducted Emission Measurement	FCC Part 15	Complied
3.2	Radiated Emission Measurement	FCC Part 15	Complied
3.3	Output Signal Level Measurement	FCC Part 15	Complied
3.4	Output Terminal Conducted Spurious Emission Measurement	FCC Part 15	Complied
3.5	Antenna Transfer Switch Measurement	FCC Part 15	Complied

* N/A : Test not applicable

3. Description of Individual Tests

3.1 AC Powerline Conducted Emission Measurement

Test Information	
Test Engineer	Kyung Chul, Min
Test Date	22-Dec-03
Climate Condition	Ambient Temperature : 23.0 , Relative Humidity : 32%
Test Place	Shield Room #5

Test Equipments				
Equipment	Model Name	Manufacturer	Serial No.	Next Cal. Date
TEST RECEIVER	ESI26	R & S	839809/002	04-Nov-04
LISN	ESH3-Z5	R & S	847265/028	16-Jul-04
LISN	ESH3-Z5	R & S	100261	16-Jul-04
Test Software	EP5/CE	TOYO	Version : 2.0.860	N/A

Test Setup

EUT was placed on a platform of nominal size, raised 80cm above the conducting ground plane. The rear of table top was located 40cm to the vertical conducting plane. The rear of EUT was aligned and flushed with rear of tabletop. All other surfaces of tabletop was at least 80cm from any other grounded conducting surface. All unused 50 ohm connectors of the LISN were resistively terminated in 50 ohm when not connected to the measuring equipment
See photo.

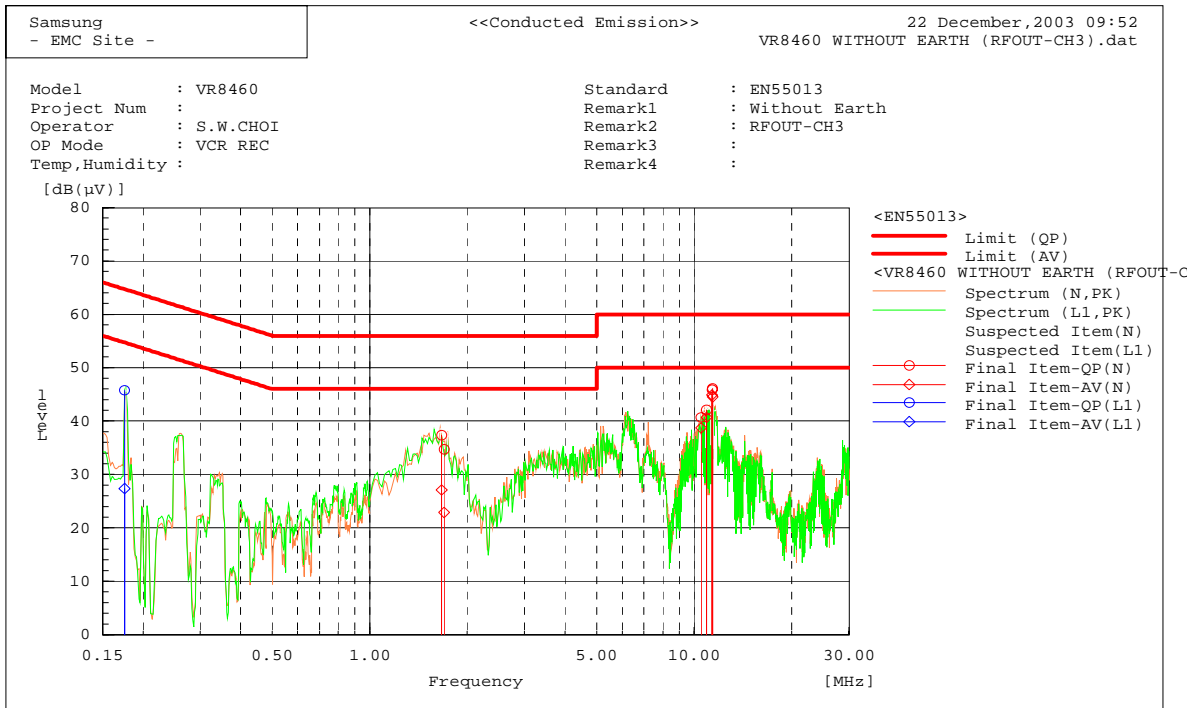
Test Result

Measurement Results	Passed
	The Measured emissions of the EUT have found to be below the specified limits.

Test Graph & Data

* Operating Mode : Recording (NTSC Signal)

RF Out Channel : CH.3



Final Result

--- N Phase ---

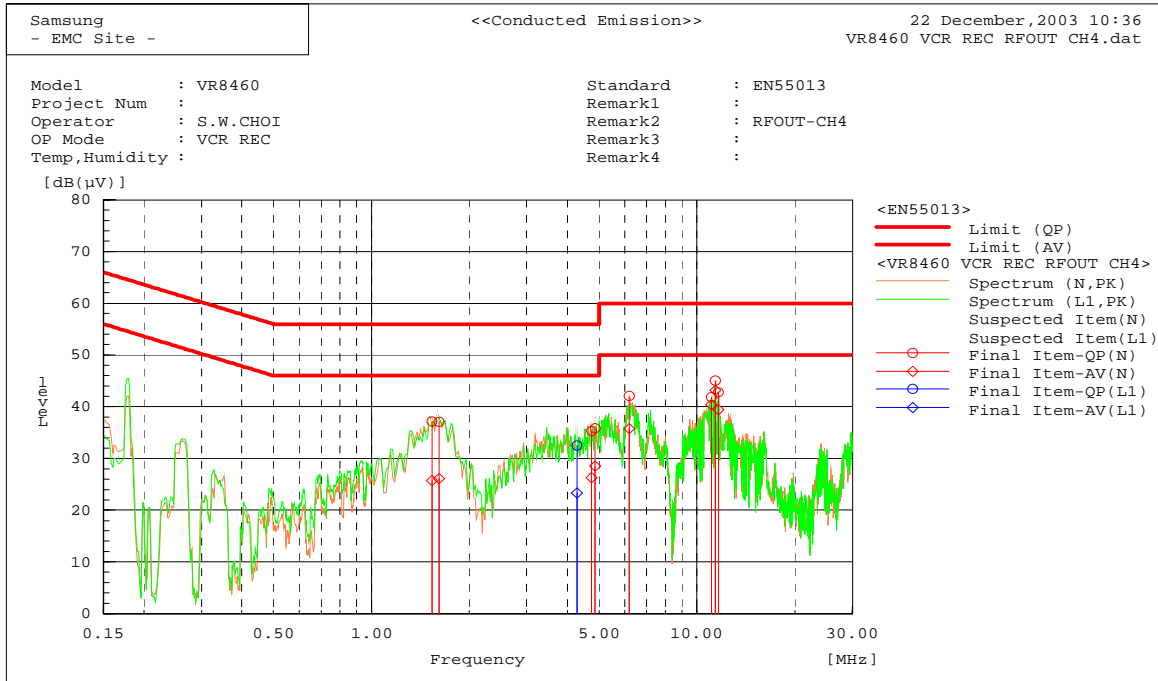
No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	1.66779	37.3	27.0	0.1	37.4	27.1	56.0	46.0	18.6	18.9
2	1.69628	34.6	22.8	0.1	34.7	22.9	56.0	46.0	21.3	23.1
3	10.47875	40.4	38.5	0.2	40.6	38.7	60.0	50.0	19.4	11.3
4	10.90521	41.9	40.4	0.2	42.1	40.6	60.0	50.0	17.9	9.4
5	11.33087	45.7	44.7	0.2	45.9	44.9	60.0	50.0	14.1	5.1
6	11.39099	45.9	44.3	0.2	46.1	44.5	60.0	50.0	13.9	5.5

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	0.17529	45.7	27.3	0.1	45.8	27.4	64.7	54.7	18.9	27.3

* Operating Mode : Recording (NTSC Signal)

RF Out Channel : CH.4



Final Result

--- N Phase ---

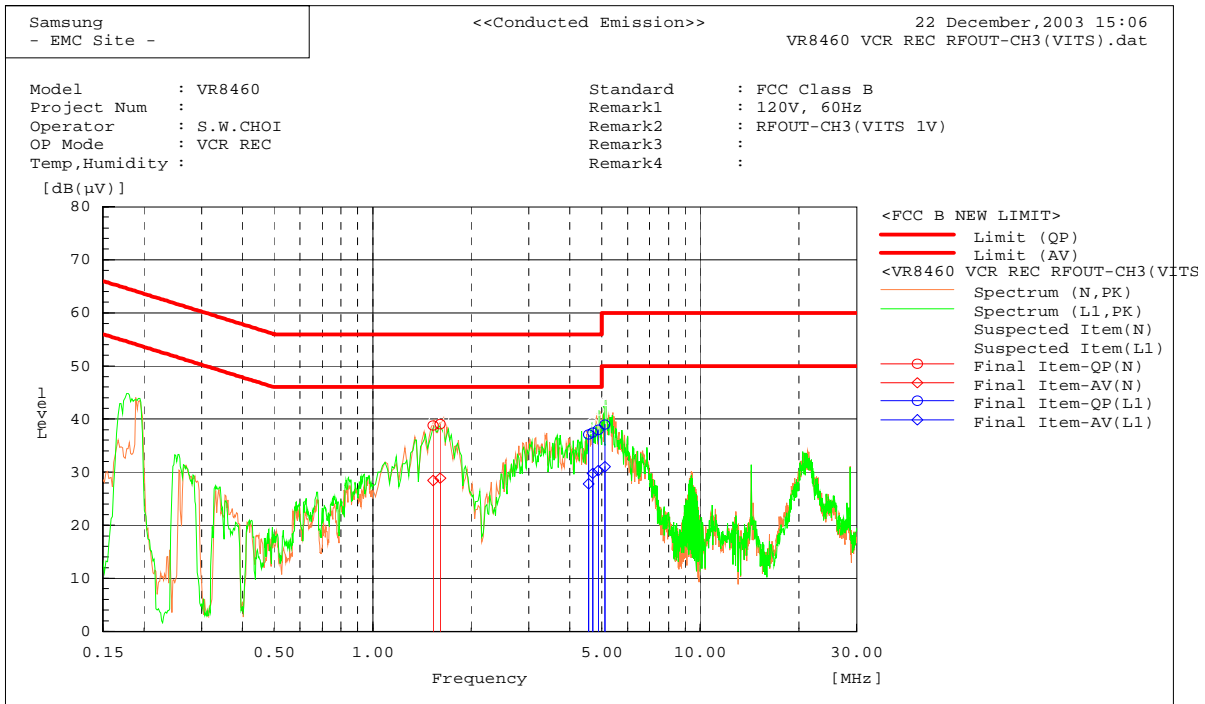
No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	1.53396	37.1	25.6	0.1	37.2	25.7	56.0	46.0	18.8	20.3
2	1.6144	37.0	26.0	0.1	37.1	26.1	56.0	46.0	18.9	19.9
3	4.75105	35.1	26.1	0.2	35.3	26.3	56.0	46.0	20.7	19.7
4	4.85602	35.7	28.3	0.2	35.9	28.5	56.0	46.0	20.1	17.5
5	6.19376	41.9	35.6	0.2	42.1	35.8	60.0	50.0	17.9	14.2
6	11.08316	41.7	40.2	0.2	41.9	40.4	60.0	50.0	18.1	9.6
7	11.38658	44.9	42.9	0.2	45.1	43.1	60.0	50.0	14.9	6.9
8	11.62986	42.7	39.3	0.2	42.9	39.5	60.0	50.0	17.1	10.5

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	4.27779	32.3	23.1	0.2	32.5	23.3	56.0	46.0	23.5	22.7

* Operating Mode : Recording (1V VITS Signal)

RF Out Channel : CH.3



Final Result

--- N Phase ---

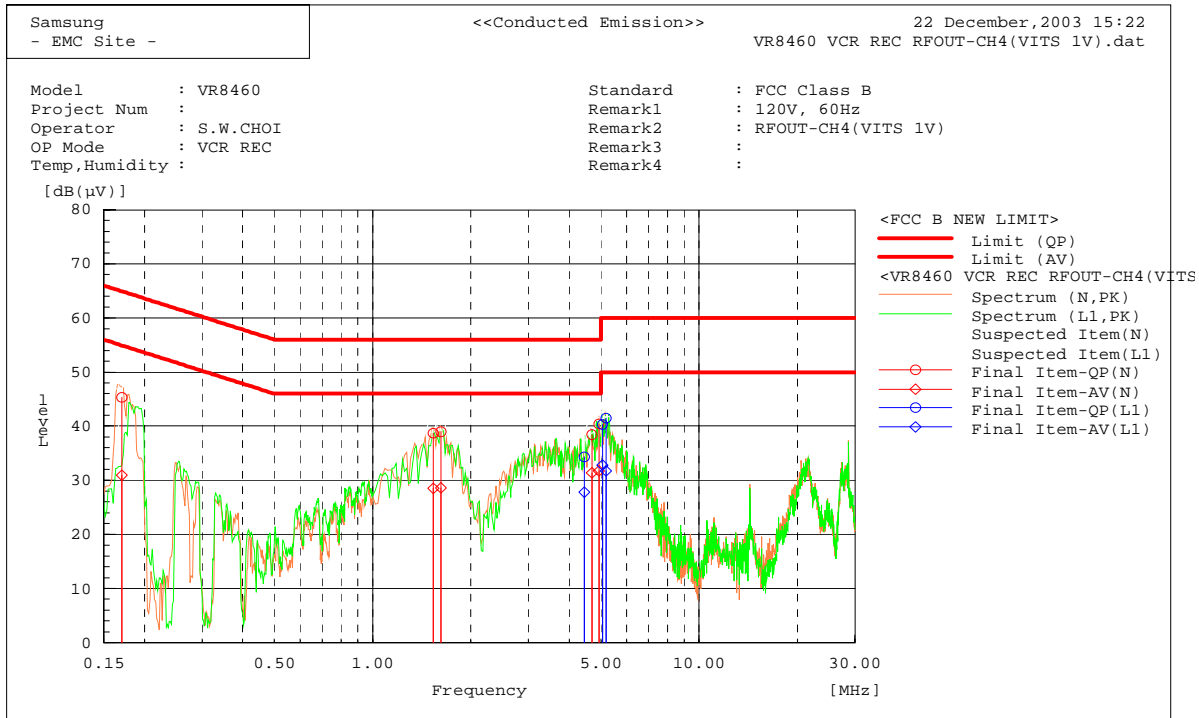
No.	Frequency [MHz]	Reading		c.f [dB]	Result		Limit		Margin	
		QP [dB(µV)]	AV [dB(µV)]		QP [dB(µV)]	AV [dB(µV)]	QP [dB(µV)]	AV [dB(µV)]	QP [dB]	AV [dB]
1	1.53143	38.7	28.3	0.1	38.8	28.4	56.0	46.0	17.2	17.6
2	1.60502	39.0	28.7	0.1	39.1	28.8	56.0	46.0	16.9	17.2

--- L1 Phase ---

No.	Frequency [MHz]	Reading		c.f [dB]	Result		Limit		Margin	
		QP [dB(µV)]	AV [dB(µV)]		QP [dB(µV)]	AV [dB(µV)]	QP [dB(µV)]	AV [dB(µV)]	QP [dB]	AV [dB]
1	4.56708	36.9	27.6	0.2	37.1	27.8	56.0	46.0	18.9	18.2
2	4.68937	37.2	29.5	0.2	37.4	29.7	56.0	46.0	18.6	16.3
3	4.87208	37.7	30.1	0.2	37.9	30.3	56.0	46.0	18.1	15.7
4	5.11556	38.8	30.8	0.2	39.0	31.0	60.0	50.0	21.0	19.0

* Operating Mode : Recording (1V VITS Signal)

RF Out Channel : CH.4



Final Result

--- N Phase ---

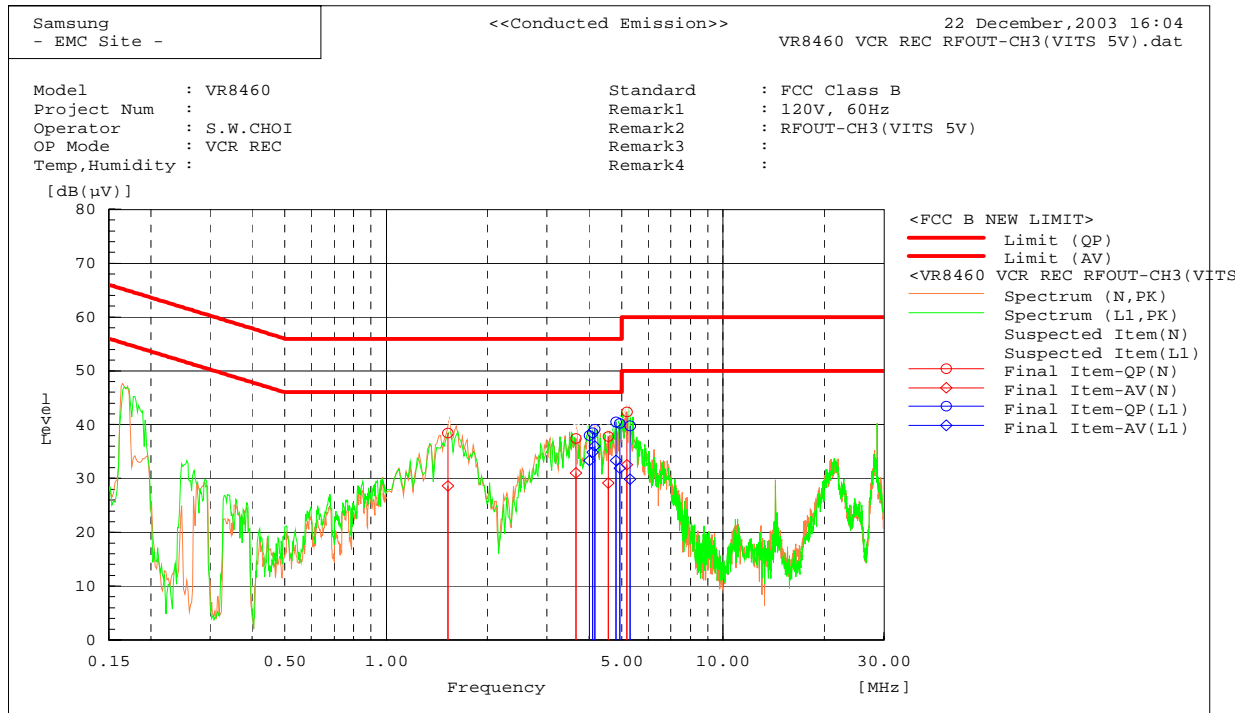
No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.17045	45.2	30.8	0.1	45.3	30.9	64.9	54.9	19.6	24.0
2	1.53197	38.6	28.4	0.1	38.7	28.5	56.0	46.0	17.3	17.5
3	1.61746	38.9	28.5	0.1	39.0	28.6	56.0	46.0	17.0	17.4
4	4.68883	38.3	31.2	0.2	38.5	31.4	56.0	46.0	17.5	14.6
5	4.93177	40.2	31.5	0.2	40.4	31.7	56.0	46.0	15.6	14.3

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	4.44516	34.2	27.6	0.2	34.4	27.8	56.0	46.0	21.6	18.2
2	5.0537	40.1	32.6	0.2	40.3	32.8	60.0	50.0	19.7	17.2
3	5.17634	41.3	31.5	0.2	41.5	31.7	60.0	50.0	18.5	18.3

* Operating Mode : Recording (5V VITS Signal)

RF Out Channel : CH.3



Final Result

--- N Phase ---

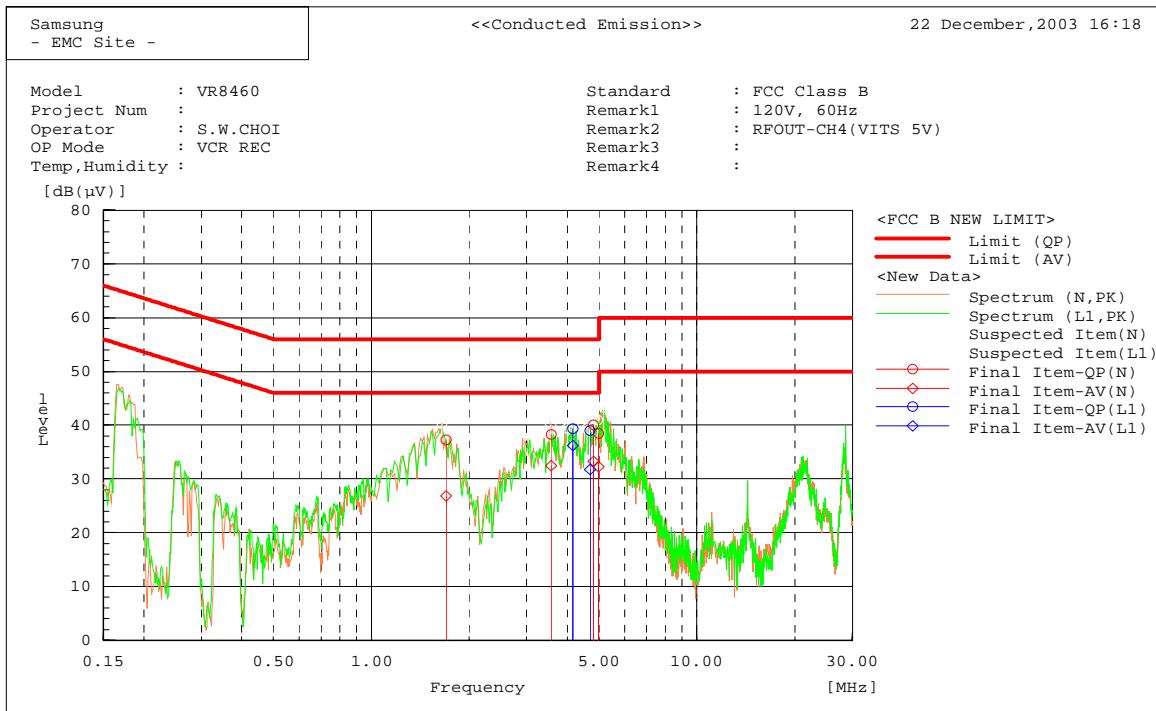
No.	Frequency [MHz]	Reading		c.f [dB]	Result		Limit		Margin	
		QP [dB(µV)]	AV [dB(µV)]		QP [dB(µV)]	AV [dB(µV)]	QP [dB(µV)]	AV [dB(µV)]	QP [dB]	AV [dB]
1	1.52314	38.4	28.5	0.1	38.5	28.6	56.0	46.0	17.5	17.4
2	3.65139	37.3	31.0	0.1	37.4	31.1	56.0	46.0	18.6	14.9
3	4.56636	37.6	28.9	0.2	37.8	29.1	56.0	46.0	18.2	16.9
4	5.1767	42.2	32.3	0.2	42.4	32.5	60.0	50.0	17.6	17.5

--- L1 Phase ---

No.	Frequency [MHz]	Reading		c.f [dB]	Result		Limit		Margin	
		QP [dB(µV)]	AV [dB(µV)]		QP [dB(µV)]	AV [dB(µV)]	QP [dB(µV)]	AV [dB(µV)]	QP [dB]	AV [dB]
1	4.01302	37.9	33.2	0.1	38.0	33.3	56.0	46.0	18.0	12.7
2	4.09183	38.4	34.8	0.1	38.5	34.9	56.0	46.0	17.5	11.1
3	4.1546	39.1	36.0	0.1	39.2	36.1	56.0	46.0	16.8	9.9
4	4.81057	40.3	33.1	0.2	40.5	33.3	56.0	46.0	15.5	12.7
5	4.93267	40.0	31.7	0.2	40.2	31.9	56.0	46.0	15.8	14.1
6	5.29809	39.5	29.7	0.2	39.7	29.9	60.0	50.0	20.3	20.1

* Operating Mode : Recording (5V VITS Signal)

RF Out Channel : CH.4



Final Result

--- N Phase ---

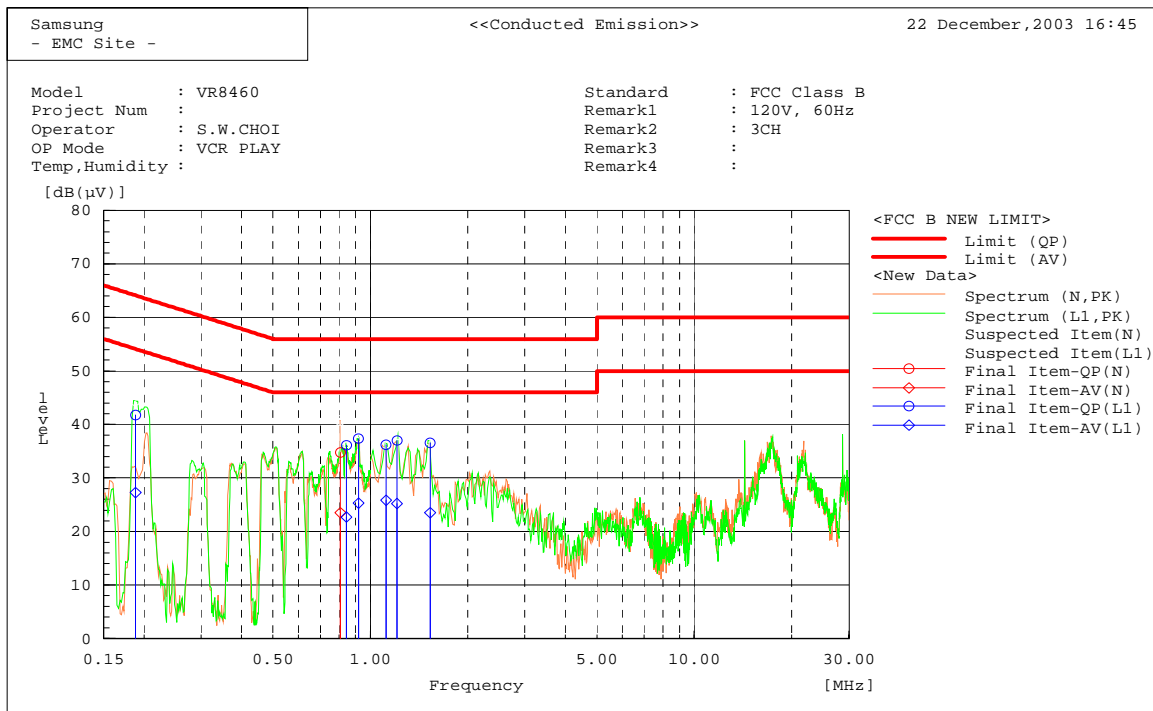
No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	4.81057	39.9	33.0	0.2	40.1	33.2	56.0	46.0	15.9	12.8
2	4.99346	38.2	32.1	0.2	38.4	32.3	56.0	46.0	17.6	13.7
3	1.6934	37.2	26.7	0.1	37.3	26.8	56.0	46.0	18.7	19.2
4	3.57221	38.2	32.3	0.1	38.3	32.4	56.0	46.0	17.7	13.6

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	4.68937	38.8	31.5	0.2	39.0	31.7	56.0	46.0	17.0	14.3
2	4.15442	39.2	36.1	0.1	39.3	36.2	56.0	46.0	16.7	9.8

* Operating Mode : VCR PLAY

RF Out Channel : CH.3



Final Result

--- N Phase ---

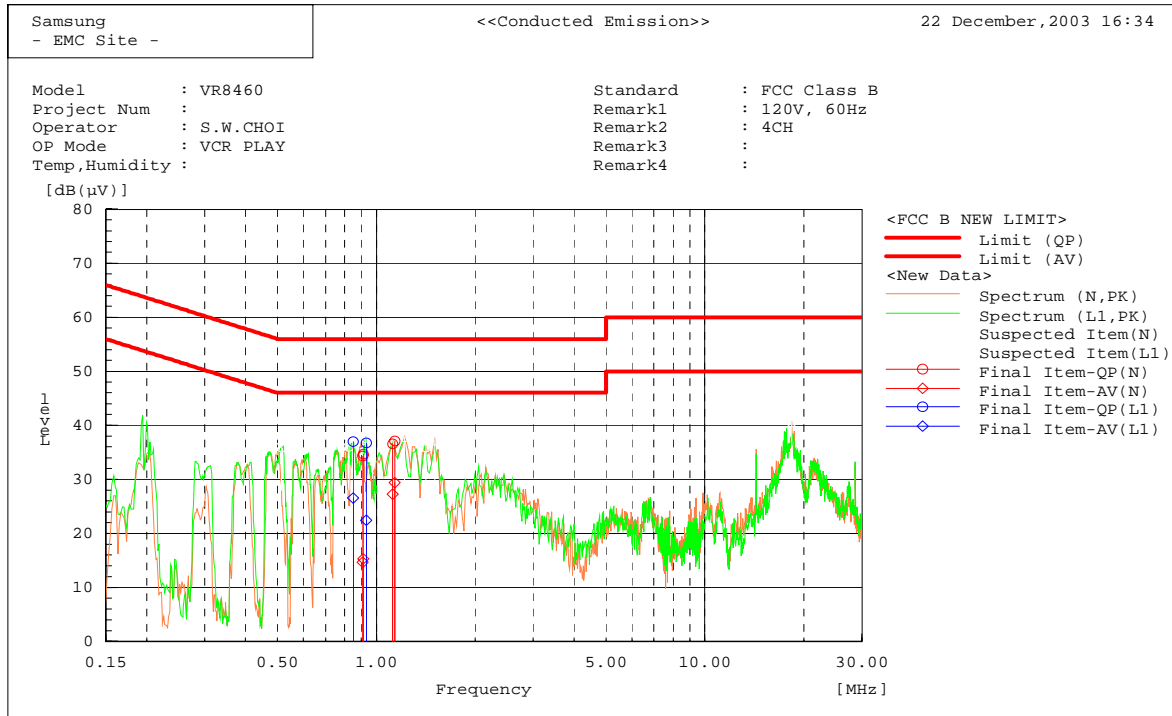
No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	0.80885	34.6	23.4	0.1	34.7	23.5	56.0	46.0	21.3	22.5

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	0.18823	41.7	27.2	0.1	41.8	27.3	64.1	54.1	22.3	26.8
2	0.84203	36.0	22.6	0.1	36.1	22.7	56.0	46.0	19.9	23.3
3	0.91736	37.2	25.2	0.1	37.3	25.3	56.0	46.0	18.7	20.7
4	1.11859	36.1	25.7	0.1	36.2	25.8	56.0	46.0	19.8	20.2
5	1.21057	36.9	25.1	0.1	37.0	25.2	56.0	46.0	19.0	20.8
6	1.52873	36.5	23.4	0.1	36.6	23.5	56.0	46.0	19.4	22.5

* Operating Mode : VCR PLAY

RF Out Channel : CH.4



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.9085	34.2	14.5	0.1	34.3	14.6	56.0	46.0	21.7	31.4
2	1.13626	37.0	29.3	0.1	37.1	29.4	56.0	46.0	18.9	16.6
3	0.91107	34.6	15.2	0.1	34.7	15.3	56.0	46.0	21.3	30.7
4	1.12328	36.5	27.2	0.1	36.6	27.3	56.0	46.0	19.4	18.7

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.8499	36.9	26.4	0.1	37.0	26.5	56.0	46.0	19.0	19.5
2	0.93102	36.6	22.4	0.1	36.7	22.5	56.0	46.0	19.3	23.5

3.2 Radiated Emission Measurement

Test Information	
Test Engineer	Kyung Chul, Min
Test Date	17-Dec-03
Climate Condition	Ambient Temperature : 23.5 , Relative Humidity : 33%
Test Place	Semi-Anechoic Chamber

Test Equipments				
Equipment	Model Name	Manufacturer	Serial No.	Calibration Date
Test Receiver	ESCS30	R & S	100104	1/17/2004
Secetrum Analyzer	E7405A	AGILENT	US41110272	6/14/2004
RF Selector	NS4900	TOYO	0303-015	N/A
Mast Controller	HD2000	HD	HD20000902027	N/A
Bi-Log Antenna	CBL6112B	SCHAFFNER	2766	6/20/2004
Preamp	8447D	Agilent	2944A10430	7/25/2004
Test Software	EP5/RE	TOYO	Version : 2.0.860	N/A
Antenna Mast	MA240	HD	240/620	N/A
Turn Table	DS412	HD	-	N/A

Test Setup

EUT was placed on a platform of nominal size and raised 80cm above the conducting ground plane. The rear of EUT was aligned and flushed with rear of tabletop. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. See photo.

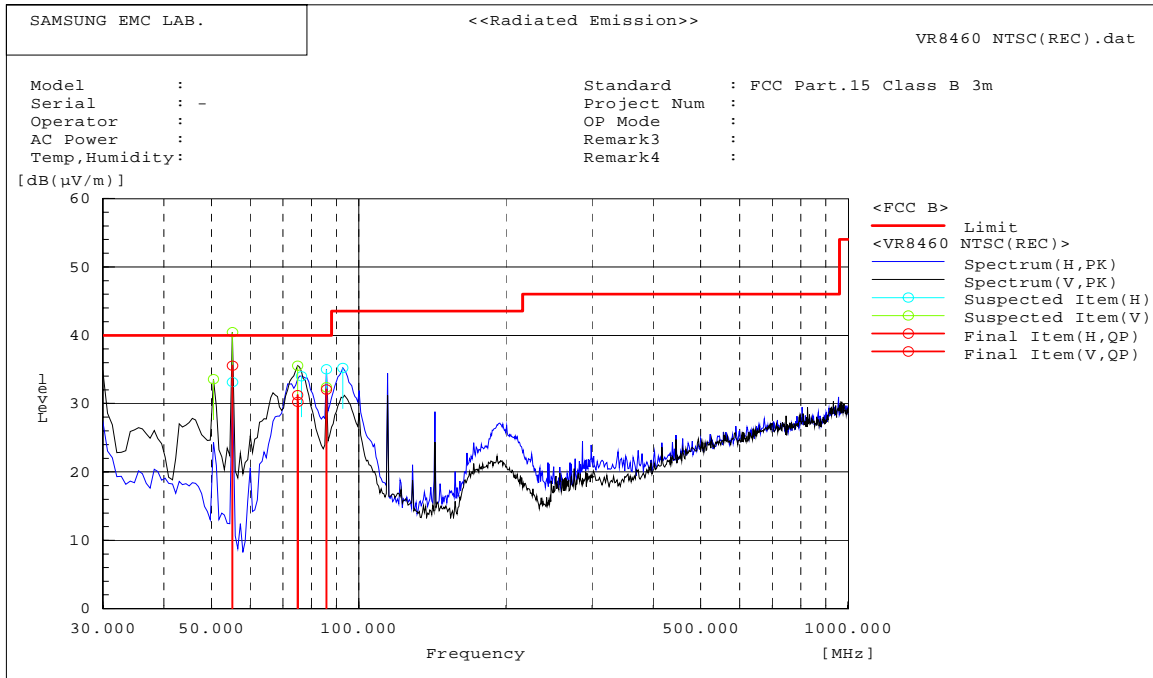
Test Result

Measurement Results	Passed
	The Measured emissions of the EUT have found to be below the specified limits.

Test Graph & Data

* Operating Mode: Recording (NTSC Signal)

RF Out Channel : CH.3



Final Result

--- Horizontal Polarization (QP)---

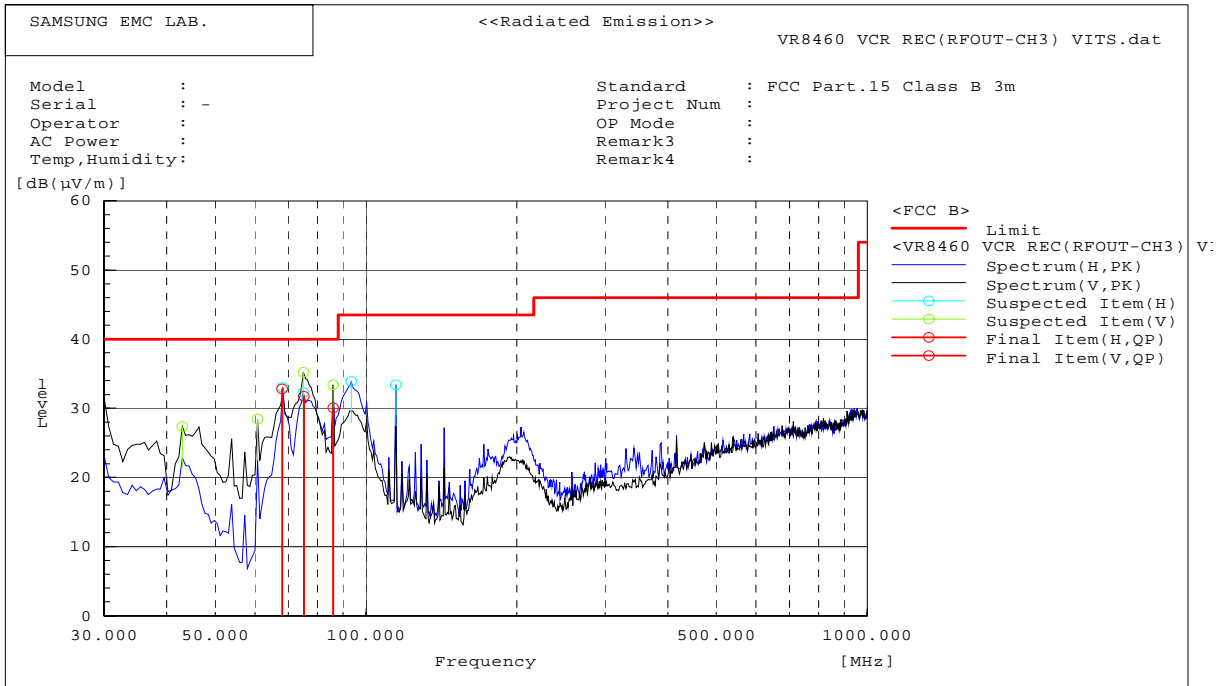
No.	Frequency [MHz]	Reading [dB(µV)]	c.f [dB(1/m)]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Remark
1	85.910	49.6	-17.5	32.1	40.0	7.9	
2	75.110	50.1	-19.8	30.3	40.0	9.7	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(µV)]	c.f [dB(1/m)]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Remark
1	55.238	55.4	-19.9	35.5	40.0	4.5	
2	75.016	51.0	-19.8	31.2	40.0	8.8	

*** Operating Mode: Recording (1V VITS Signal)**

RF Out Channel : CH.3



Final Result

--- Horizontal Polarization (QP)---

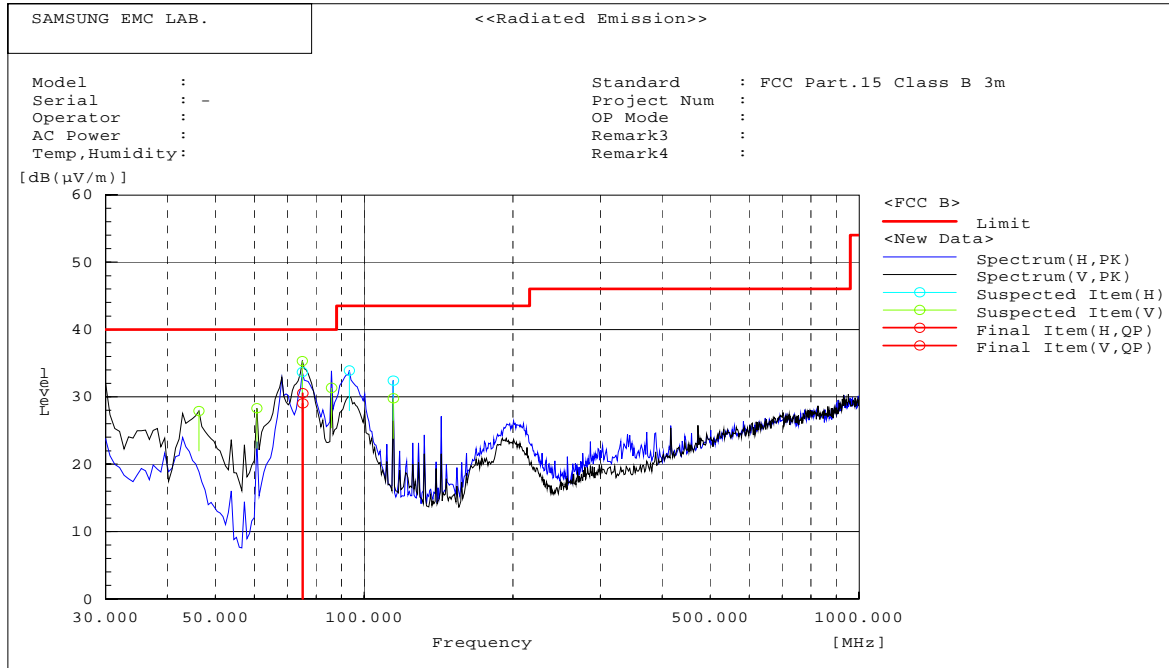
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	68.016	53.6	-20.8	32.8	40.0	7.2	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	75.171	51.5	-19.8	31.7	40.0	8.3	
2	85.910	47.6	-17.5	30.1	40.0	9.9	

*** Operating Mode: Recording (1V VITS Signal)**

RF Out Channel : CH.4



Final Result

--- Horizontal Polarization (QP)---

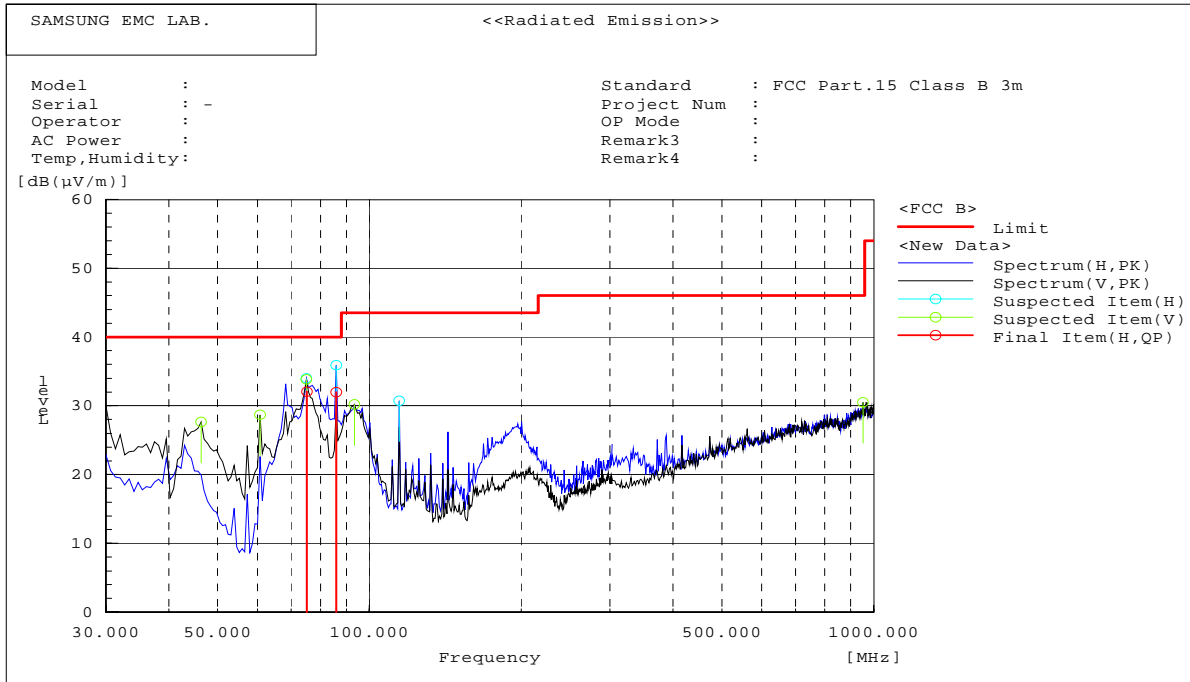
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	75.171	48.8	-19.8	29.0	40.0	11.0	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	75.171	50.3	-19.8	30.5	40.0	9.5	

*** Operating Mode: Recording (5V VITS Signal)**

RF Out Channel : CH.3



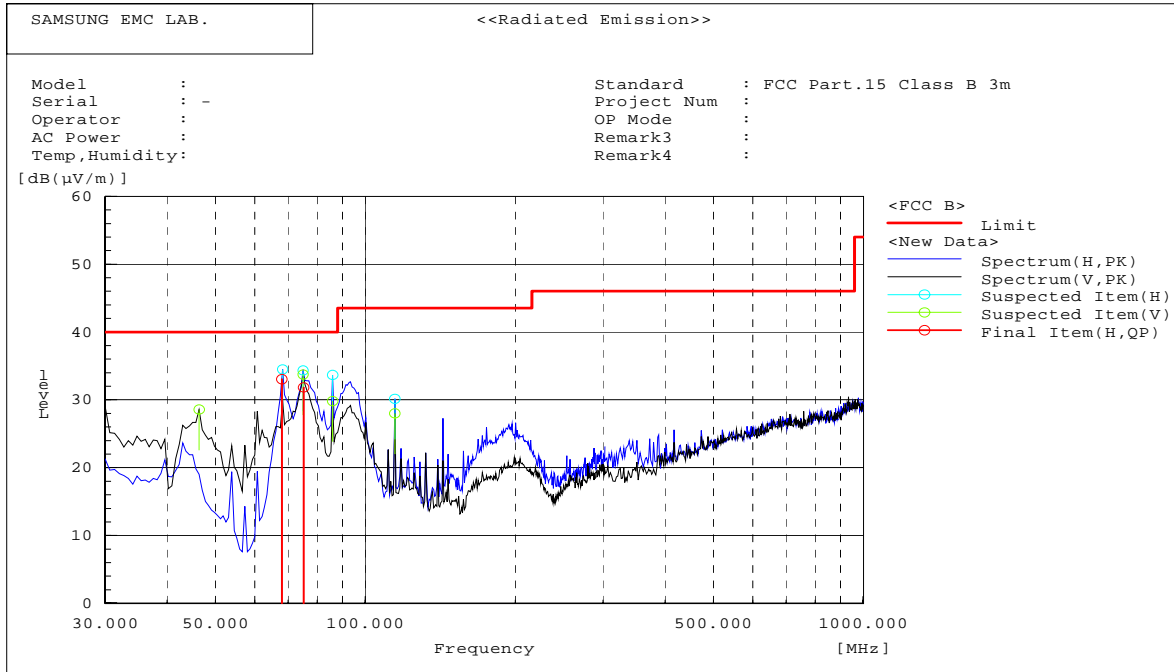
Final Result

--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(µV)]	c.f [dB(l/m)]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Remark
1	85.904	49.5	-17.5	32.0	40.0	8.0	
2	75.178	51.9	-19.8	32.1	40.0	7.9	

*** Operating Mode: Recording (5V VITS Signal)**

RF Out Channel : CH.4



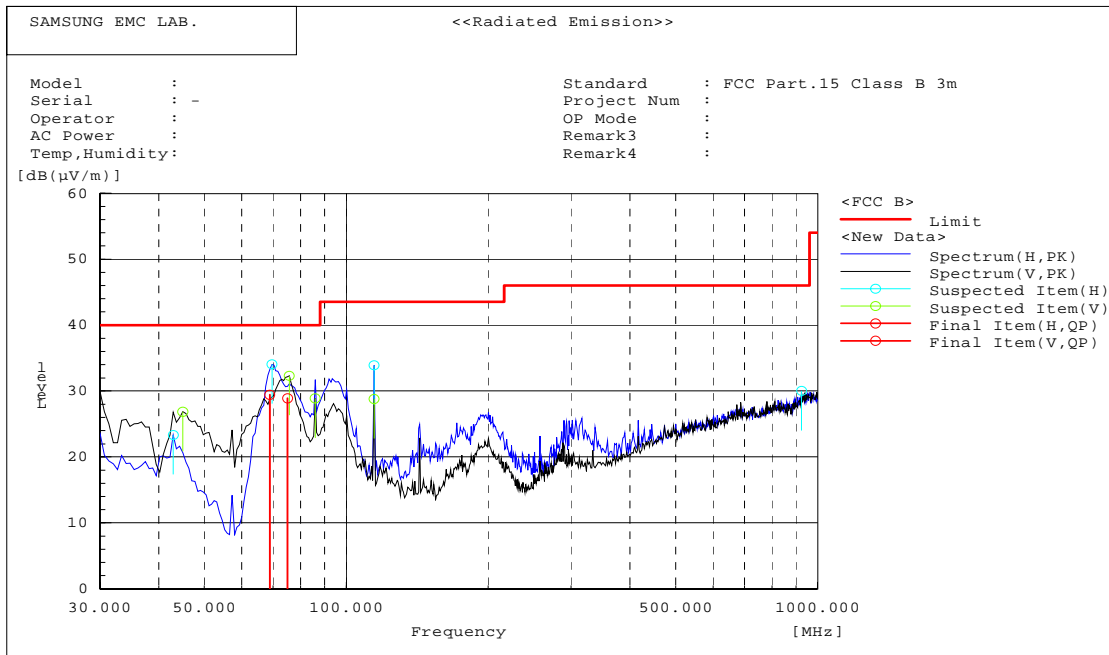
Final Result

--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(l/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	68.016	53.9	-20.8	33.1	40.0	6.9	
2	75.171	51.6	-19.8	31.8	40.0	8.2	

* Operating Mode: VCR PLAY

RF Out Channel : CH.3

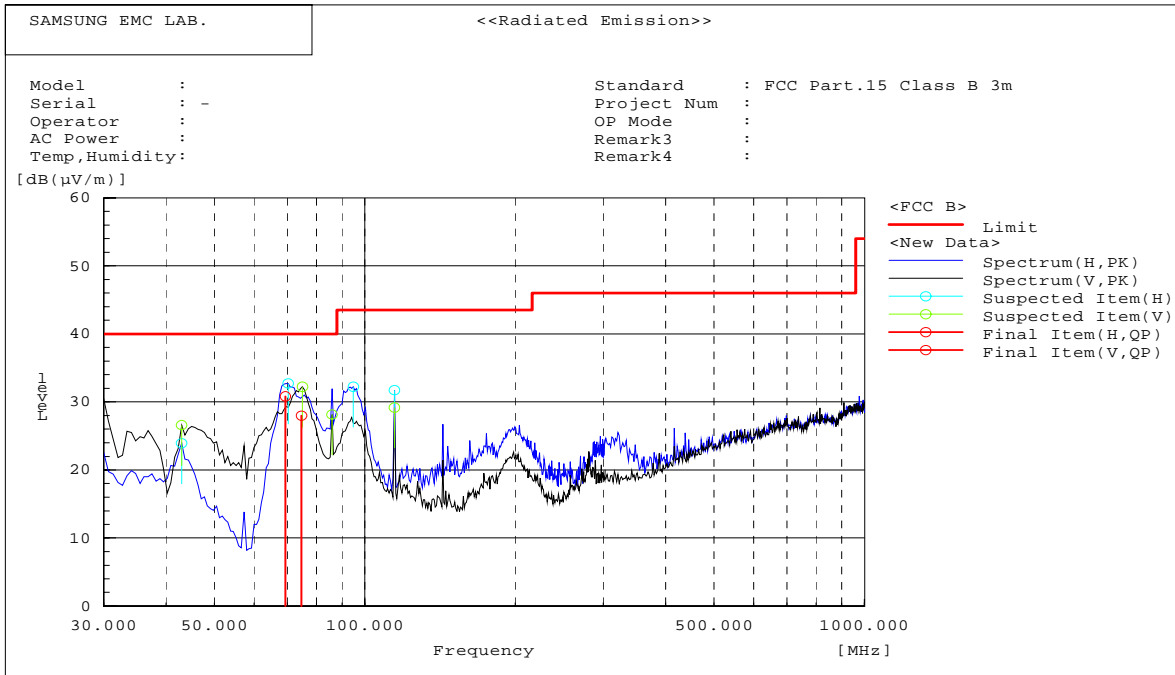


Final Result

--- Horizontal Polarization (QP)---							
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	68.826	50.1	-20.7	29.4	40.0	10.6	
--- Vertical Polarization (QP)---							
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	75.063	48.7	-19.8	28.9	40.0	11.1	

* Operating Mode: VCR PLAY

RF Out Channel : CH.4



Final Result

--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	69.319	51.5	-20.7	30.8	40.0	9.2	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	74.618	47.9	-19.9	28.0	40.0	12.0	

3.3 Output Signal Level Measurement

Test Information	
Test Engineer	Kyung Chul, Min
Test Date	19-Dec-03
Climate Condition	Ambient Temperature : 23.1 , Relative Humidity : 32%
Test Place	Shield Room #5

Test Equipments				
Equipment	Model Name	Manufacturer	Serial No.	Next Cal. Date
TEST RECEIVER	ESI26	R & S	839809/002	11/4/2004
Preamp	310	SONOMA INSTRUMENT	185861	9/20/2004
Matching Pad	RAM	R & S	882204/064	-

Test Setup

The RF output terminal is connected to the test receiver through the matching pad(75 - 50 ohm) with a calibrated cable. Then, the RF output signal level is measured under the EUT operating mode(s).

See photo.

Test Result

Measurement Results	Passed
	The Measured emissions of the EUT have found to be below the specified limits.

Test Data

*** Operating Mode : Recording(NTSC Signal) RF Out Ch. : CH 3**

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]	Remark
56.76403	76.2	-25.1	51.1	56.5	5.4	Audio Signal
61.25902	89.1	-25.1	64	69.5	5.5	Video Signal
65.75602	75.8	-25.1	50.7	56.5	5.8	Audio Signal

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

*** Operating Mode : Recording(1V VITS Signal) RF Out Ch. : CH 3**

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]	Remark
56.75802	76.3	-25.1	51.2	56.5	5.3	Audio Signal
61.26102	89.1	-25.1	64	69.5	5.5	Video Signal
65.75802	75.4	-25.1	50.3	56.5	6.2	Audio Signal

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

*** Operating Mode : Recording(5V VITS Signal) RF Out Ch. : CH 3**

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]	Remark
56.75802	76	-25.1	50.9	56.5	5.6	Audio Signal
61.25902	88.9	-25.1	63.8	69.5	5.7	Video Signal
65.75802	75.2	-25.1	50.1	56.5	6.4	Audio Signal

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

*** Operating Mode : VCR Play RF Out Ch. : CH 3**

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]	Remark
56.77805	77.1	-25.1	52	56.5	4.5	Audio Signal
61.25902	88.7	-25.1	63.6	69.5	5.9	Video Signal
65.74399	76.3	-25.1	51.2	56.5	5.3	Audio Signal

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

*** Operating Mode : Recording(NTSC Signal)**

RF Out Ch. : CH 4

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]	Remark
62.73396	76.4	-25.1	51.3	56.5	5.2	Audio Signal
67.23898	89.2	-25.1	64.1	69.5	5.4	Video Signal
71.71794	75.5	-25.1	50.4	56.5	6.1	Audio Signal

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

*** Operating Mode : Recording(1V VITS Signal)**

RF Out Ch. : CH 4

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]	Remark
62.72395	76.2	-25.1	51.1	56.5	5.4	Audio Signal
67.21895	89.1	-25.1	64	69.5	5.5	Video Signal
71.72195	75.5	-25.1	50.4	56.5	6.1	Audio Signal

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

*** Operating Mode : Recording(5V VITS Signal)**

RF Out Ch. : CH 4

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]	Remark
62.72194	76.4	-25.1	51.3	56.5	5.2	Audio Signal
67.22295	89.2	-25.1	64.1	69.5	5.4	Video Signal
71.72195	75.5	-25.1	50.4	56.5	6.1	Audio Signal

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

*** Operating Mode : VCR Play**

RF Out Ch. : CH 4

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]	Remark
62.75	76.9	-25.1	51.8	56.5	4.7	Audio Signal
67.22896	89	-25.1	63.9	69.5	5.6	Video Signal
71.70191	76.2	-25.1	51.1	56.5	5.4	Audio Signal

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

3.4 Output Terminal Conducted Spurious Measurement

Test Information	
Test Engineer	Kyung Chul, Min
Test Date	19-Dec-03
Climate Condition	Ambient Temperature : 23.1 , Relative Humidity : 32%
Test Place	Shield Room #5

Test Equipments				
Equipment	Model Name	Manufacturer	Serial No.	Next Cal. Date
TEST RECEIVER	ESI26	R & S	839809/002	11/4/2004
Preamp	310	SONOMA INSTRUMENT	185861	9/20/2004
Matching Pad	RAM	R & S	882204/064	-

Test Setup

The RF output terminal is connected to the test receiver through the matching pad(75 - 50 ohm) with a calibrated cable. Then, the RF output signal level is measured under the EUT operating mode(s).

See photo.

Test Result

Measurement Results	Passed
	The Measured emissions of the EUT have found to be below the specified limits.

Test Data

* Operating Mode : Recording(NTSC Signal) RF Out Ch. : CH 3

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
47.71904	39.5	-25.1	14.4	39.5	25.1
50.73012	39.4	-25.1	14.3	39.5	25.2
55.24887	40	-25.1	14.9	39.5	24.6
74.71972	38.1	-25.1	13	39.5	26.5
122.51151	53.6	-25.1	28.5	39.5	11
662.93081	39.4	-24.4	15	39.5	24.5

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

* Operating Mode : Recording(1V VITS Signal) RF Out Ch. : CH 3

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
36.19599	47.8	-25.1	22.7	39.5	16.8
43.35517	53	-25.1	27.9	39.5	11.6
50.5149	59	-25.1	33.9	39.5	5.6
79.15071	51.1	-25.1	26	39.5	13.5
86.31048	46	-25.1	20.9	39.5	18.6
122.51151	53.2	-25.1	28.1	39.5	11.4

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

* Operating Mode : Recording(5V VITS Signal) RF Out Ch. : CH 3

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
36.19546	47.9	-25.1	22.8	39.5	16.7
43.3557	53	-25.1	27.9	39.5	11.6
50.51543	58.9	-25.1	33.8	39.5	5.7
79.15071	51.1	-25.1	26	39.5	13.5
86.31048	46	-25.1	20.9	39.5	18.6
122.5029	53.8	-25.1	28.7	39.5	10.8

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

* Operating Mode : VCR Play RF Out Ch. : CH 3

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
47.70997	39.8	-25.1	14.7	39.5	24.8
54.89959	34	-25.1	8.9	39.5	30.6
56.20699	38.7	-25.1	13.6	39.5	25.9
74.77963	38.3	-25.1	13.2	39.5	26.3
122.51151	53.2	-25.1	28.1	39.5	11.4
951.92881	35.4	-23.1	12.3	39.5	27.2

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

* Operating Mode : Recording(NTSC Signal) RF Out Ch. : CH 4

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
50.73014	39	-25.1	13.9	39.5	25.6
53.77463	38.9	-25.1	13.8	39.5	25.7
55.24486	39.4	-25.1	14.3	39.5	25.2
80.70927	37.5	-25.1	12.4	39.5	27.1
134.48098	50.8	-25.1	25.7	39.5	13.8
662.94094	38.8	-24.4	14.4	39.5	25.1

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

* Operating Mode : Recording(1V VITS Signal) RF Out Ch. : CH 4

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
42.18094	48.8	-25.1	23.7	39.5	15.8
49.34235	53.2	-25.1	28.1	39.5	11.4
56.50179	59	-25.1	33.9	39.5	5.6
85.14177	50.2	-25.1	25.1	39.5	14.4
92.29618	44.9	-25.1	19.8	39.5	19.7
134.48098	50.4	-25.1	25.3	39.5	14.2

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

* Operating Mode : Recording(5V VITS Signal) RF Out Ch. : CH 4

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
42.18224	48.7	-25.1	23.6	39.5	15.9
49.3417	53.3	-25.1	28.2	39.5	11.3
56.50179	59	-25.1	33.9	39.5	5.6
85.14177	50.2	-25.1	25.1	39.5	14.4
92.3046	44.2	-25.1	19.1	39.5	20.4
134.48098	50.4	-25.1	25.3	39.5	14.2

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

* Operating Mode : VCR Play RF Out Ch. : CH 4

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
53.78771	39.7	-25.1	14.6	39.5	24.9
60.86145	33.5	-25.1	8.4	39.5	31.1
62.21194	38.4	-25.1	13.3	39.5	26.2
80.7598	37.6	-25.1	12.5	39.5	27
134.48098	50.4	-25.1	25.3	39.5	14.2
951.92881	35.3	-23.1	12.2	39.5	27.3

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

3.5 Antenna Transfer Switch Measurement

Test Information	
Test Engineer	Kyung Chul, Min
Test Date	19-Dec-03
Climate Condition	Ambient Temperature : 23.1 , Relative Humidity : 32%
Test Place	Shield Room #5

Test Equipments				
Equipment	Model Name	Manufacturer	Serial No.	Next Cal. Date
TEST RECEIVER	ESI26	R & S	839809/002	11/4/2004
Preamp	310	SONOMA INSTRUMENT	185861	9/20/2004
Matching Pad	RAM	R & S	882204/064	-

Test Setup

The ANT input terminal is connected to the test receiver through the matching pad(75 - 50 ohm) with a calibrated cable. Then, the RF output leakage level is measured under the EUT operating mode(s).

See photo.

Test Result

Measurement Results	Passed
	The Measured emissions of the EUT have found to be below the specified limits.

Test Data

*** Operating Mode : Recording(1V VITS Signal) RF Out Ch. : CH 3**

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
61.25226	26.6	-25.1	1.5	9.5	8

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

*** Operating Mode : Recording(5V VITS Signal) RF Out Ch. : CH 3**

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
61.25274	26.6	-25.1	1.5	9.5	8

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

*** Operating Mode : VCR Play RF Out Ch. : CH 3**

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
61.25279	27	-25.1	1.9	9.5	7.6

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

*** Operating Mode : Recording(1V VITS Signal) RF Out Ch. : CH 4**

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
67.23998	25.8	-25.1	0.7	9.5	8.8

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

*** Operating Mode : Recording(5V VITS Signal) RF Out Ch. : CH 4**

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
67.23597	25.9	-25.1	0.8	9.5	8.7

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

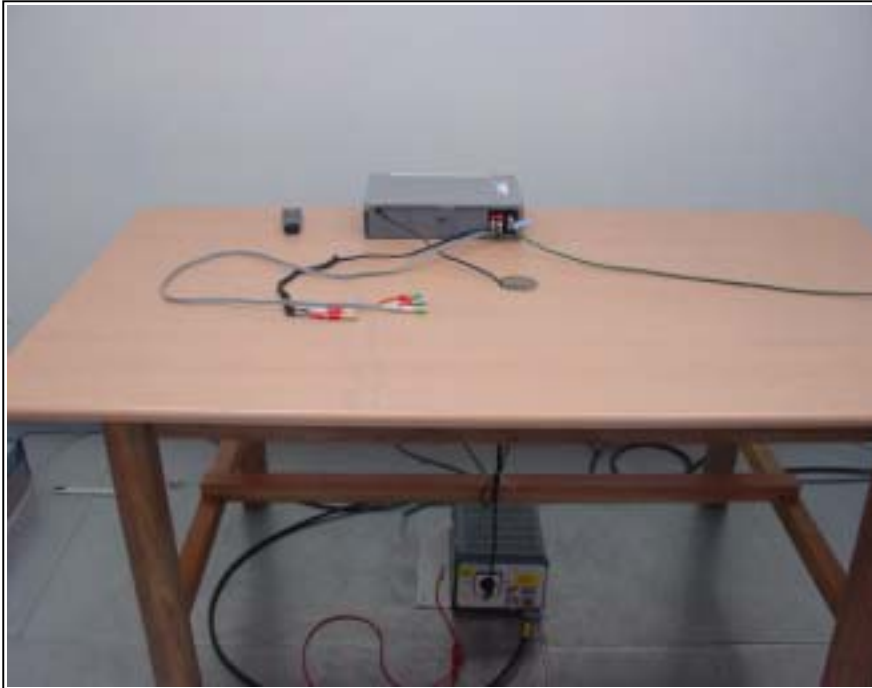
*** Operating Mode : VCR Play RF Out Ch. : CH 4**

Frequency [MHz]	Reading [dB(μV)]	Factor [dB]	Level [dB(μV)]	Limit [dB(μV)]	Margin [dB]
67.23998	26.1	-25.1	1	9.5	8.5

*CF Factor = Preamp Gain + Matching Pad Loss + Cable Loss

4. Appendix

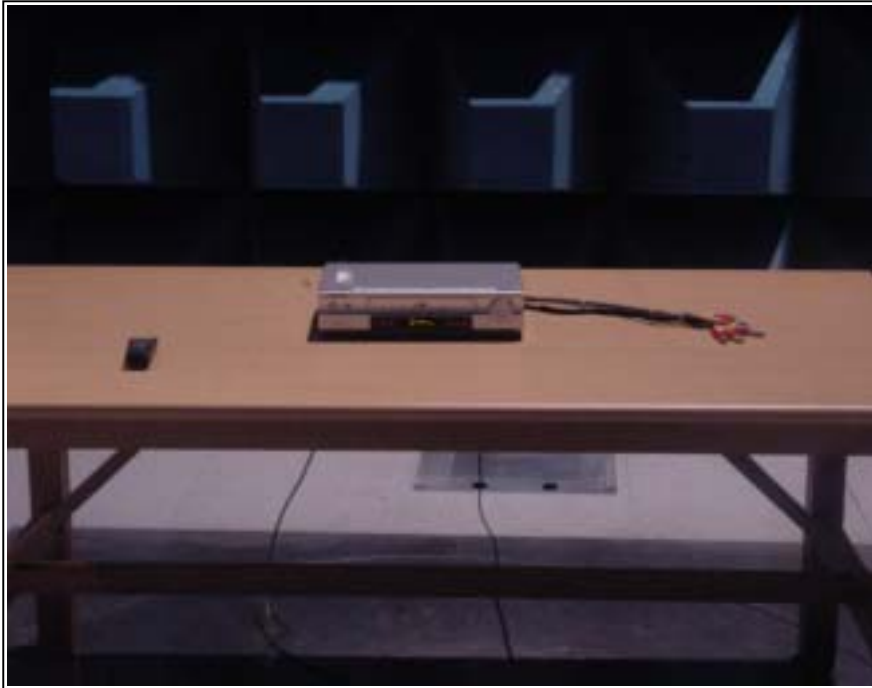
4.1 Test Photography



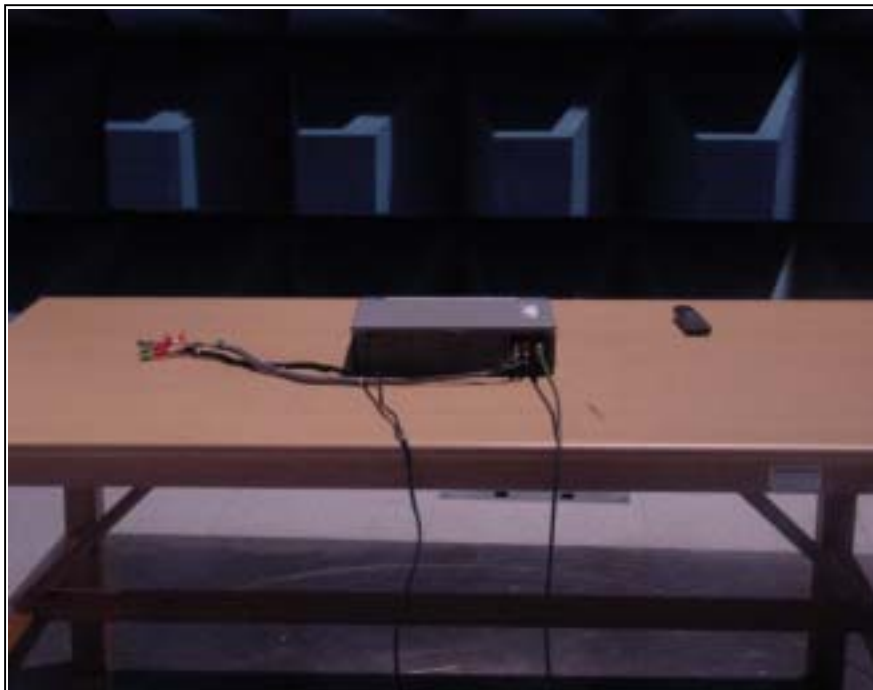
Pic. 1 AC Powerline Conducted Emission [Front]



Pic. 2 AC Powerline Conducted Emission [Rear]



Pic. 3 Radiated Emission [Front]



Pic. 4 Radiated Emission [Rear]



Pic. 5 RF Output Signal Level & Output Terminal Conducted Spurious Emission



Pic. 6 Antenna Transfer Switch

4.2 EUT Photography



Pic. 7 EUT [Front]



Pic. 8 EUT [Rear]