EMC Test Report

According to FCC Part 15 Subpart B

Project No.		**LBE051560**
Equipment under Test		
	Address	416 Maetan3-Dong,Yeongtong-Gu,Suwon-Si,Gyeonggi-Do, Korea,443-742
	Product Name	**Digital Camcorder**
	Model Name	**SC-M2100**
	Manufacturer	Samsung Electronics Co., Ltd
	Brand Name	SAMSUNG
	Variant Model	See Page 3
Date of Test		July 06 ~ 08, 2005
Issued Date		July 14, 2005

	Name/Position	Signature
Tested by	Sung Wook, Choi Test Engineer	S.W.Choi
Reviewed by	No Cheon, Park Manager of EMC Lab.	N. C. Park
Authorized by	Seung Kyu, Cha Chief of EMC Lab.	S. K. Cha

1. This test reports does not constitute an endorsement by NIST/NVLAP or U.S Government.
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.

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.

NVLAP LAB CODE 200623-0

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1. General Information

1.1 Basic Information related Product

Applicant	Samsung Electronics Co., Ltd
Model name	SC-M2100
Applicant Address	Samsung Electronics Co. Ltd; 416 Maetan3- Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
Contact Person	Sung Wook, Choi
Kind of product	Digital Camcorder
Valiant list	SC-M2050, SC-M2200
Manufacturer	Samsung Electronics Co., Ltd
New / Alternative / Permissive change Information	This report is original report #

1.2 Detail Information related Product

Specification

Model Name		SC-M2050S(B)/M2100S(B)/M2200S(B)
The CAM System		
Video Recording System		MPEG4 AVI Format
Photo System		JPEG (DPOF, Exif 2.2)
MP3		Stereo Playing
Voice		WAVE file record/play (8KHz Sampling, 16 bit, Stereo)
Memory		Internal memory/Memory Stick/Memory Stick Pro/SD/MMC
Recording/Playing time		Refer to page 30
CCD Pixel		1/3.6 inch CCD, 2110K
Zoom Ratio		x10(Optical), x100(Digital)
Focal Length		f=4.1~41mm, F1.8~2.4
Minimum Illumination		7 Lux
LCD Monitor		2.0" Trans Reflective, 210K
Connectors		
USB		Mini-B type (USB 2.0 High Speed)
The CAM Connector		Special 22Pin Connector
Common Connector	Ear Phone	Ø3.5 Stereo
	AV Input/Output	Video (1.0Vp_p), Audio (-7.5dBm 47KΩ, Input:mono/Output:stereo)
DC Power In Connector		Special 22Pin Connector
General		
Operating Temperature		0°C~40°C
Operating Humidity		10%~80%
Power Source		3.8V (Li-Polymer Battery pack), 4.8V (AC Adapter)
Power Consumption		3.7W (LCD ON)/3.1W(LCD OFF)
Dimension(WxHxD)		69.0mm x 103.5mm x 37.6mm
Weight		213(Including the Lithium Polymer Battery Pack)
Built-in Microphone		Omni-directional Stereo condenser microphone

AC Adapter	
Power Requirement	AC 100~240V, 50/60Hz
DC Output	DC 4.8V, 1.0A
Operating Temperature	0°C~40°C(32°F~104°F)
Dimensions	70mm x 30mm x 42mm
Weight	104g (Including DC cable)

1.3 Operating Mode and Condition

The system was configured for testing in typical fashion use. Cables were attached to each of the available I/O Ports. Where applicable, peripherals were attached to the I/O cables. The mode of operation utilized for testing was selected to best simulate typical EUT use.

- External
- Internal
- PC Camera
- PLAY
- RECORDING

1.4 Equipment Modifications

No equipment modifications were required.

1.5 Test Configuration

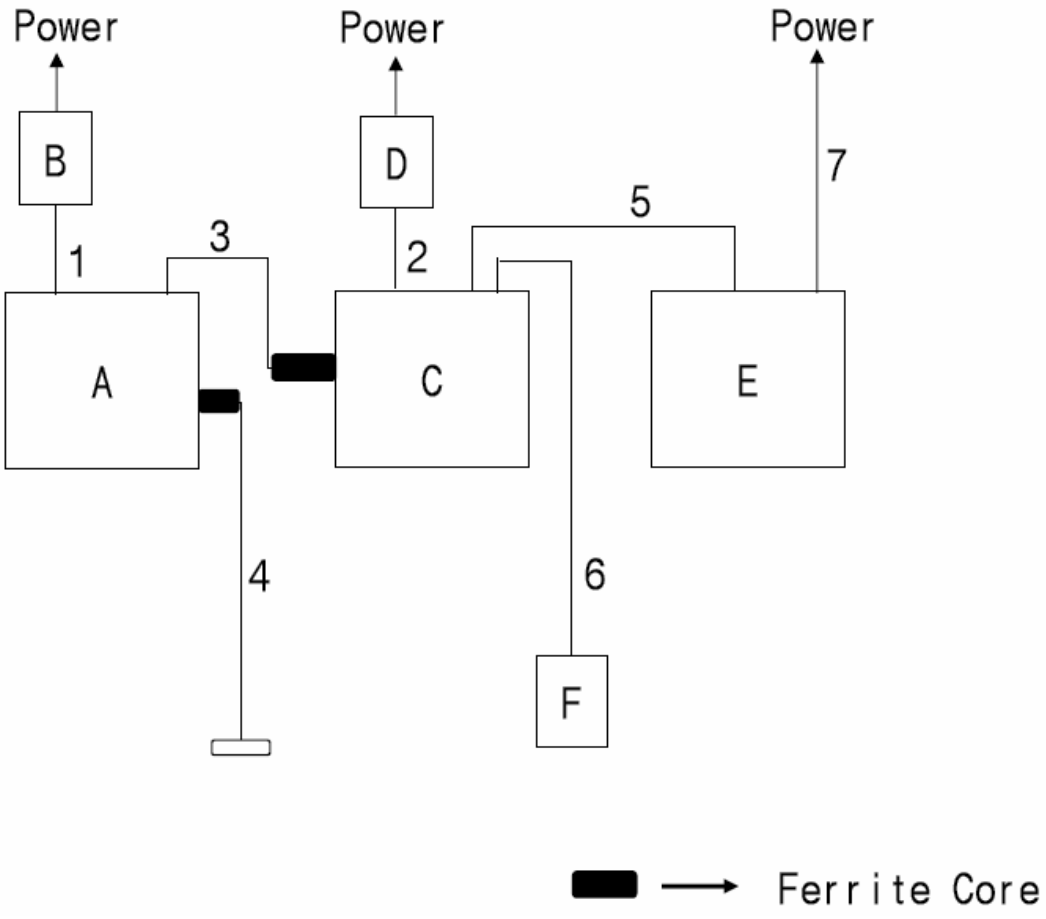
Used EUT and Peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	FCC ID
A	Digital Camcorder	SC-M2100	-	SAMSUNG	A3L05MINIMEGA
B	Adapter	AA-M1WG	6CAY200422	SAMSUNG	DOC
C	Note PC	SP40	BA68-02263A1.1	SAMSUNG	DOC
D	Adapter(Note PC)	API3AD05	BA44-00190A	SAMSUNG	DOC
E	Printer	ML-1520P	BABX822977N	SAMSUNG	DOC
F	Mouse	M-U48a	LZE20853338	SAMSUNG	DOC

Used Cable Description

	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	AC Power cable	1.7	No	
2	AC Power cable(Note PC)	1.7	No	
3	USB	1.5	No	
4	AV	1.5	No	
5	Printer	1.5	No	
6	Mouse	1.5	No	
7	Printer Power cable	1.5	No	

Block Diagram



1.6 Applied Standards

List

Product or Generic Standards	Basic Standards
FCC Part15 Subpart B	ANSI C63.4 : 2003

1.7 Test Facility

General Information

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1, 16-2.

This EMC Testing Lab. 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).

This Lab. is operated as testing laboratory in accordance with the requirements of ISO/IEC 17025:1998.

Accreditation and Listing

Uncertainty

(According to NAMAS Pub.NIS81)

Test Item	Expanded Uncertainty
Conducted Emission	+/-3.3
Radiated Emission	+/-5.09

2. Summary of Test Results

Result : PASS

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

Test Name		Applied Standard	Result
Electromagnetic Emission Test			
3.1	Conducted Emission	FCC Part15 Subpart B	Complied
3.2	Radiated Emission	FCC Part15 Subpart B	Complied

3. Description of Individual Tests

3.1 Conducted Emission

Test Information		
	Test Engineer	Sung Wook, Choi
	Test Date	July 08, 2005
	Climate Condition	Ambient Temperature : 22℃ Relative Humidity :52%
	Test Place	Shield Room #5

Test Equipments

Equipment	Modal Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Test Software	EP5CE	TOYO	None	N/A	N/A
EMC Analyzer	E7405A	AGILENT	US41110272	2006-01-20	12
Field strength meter	ESS	R&S	844661/005	2006-01-11	12
L.I.S.N	ESH3-Z5	R&S	100261	2005-07-23	12

EUT Test Setup

The EUT was set up as per normal use on a wooden table 0.4m from a vertical ground reference plane, at least 0.8m from other conduction surfaces and 0.8m from the LISN.

See photo.

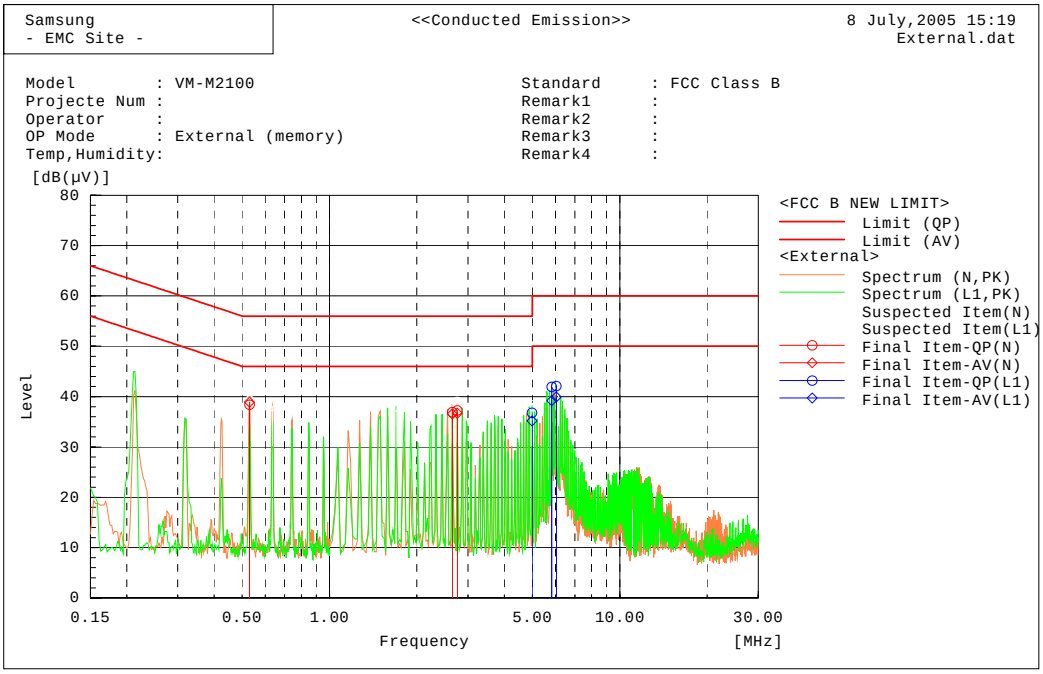
Test Result

Measurement Results	Pass The measured emissions of the EUT have found to be below the specified limits.

Test Data

■ Operating Mode : External

[Graph and Data]



Final Result

--- N Phase ---

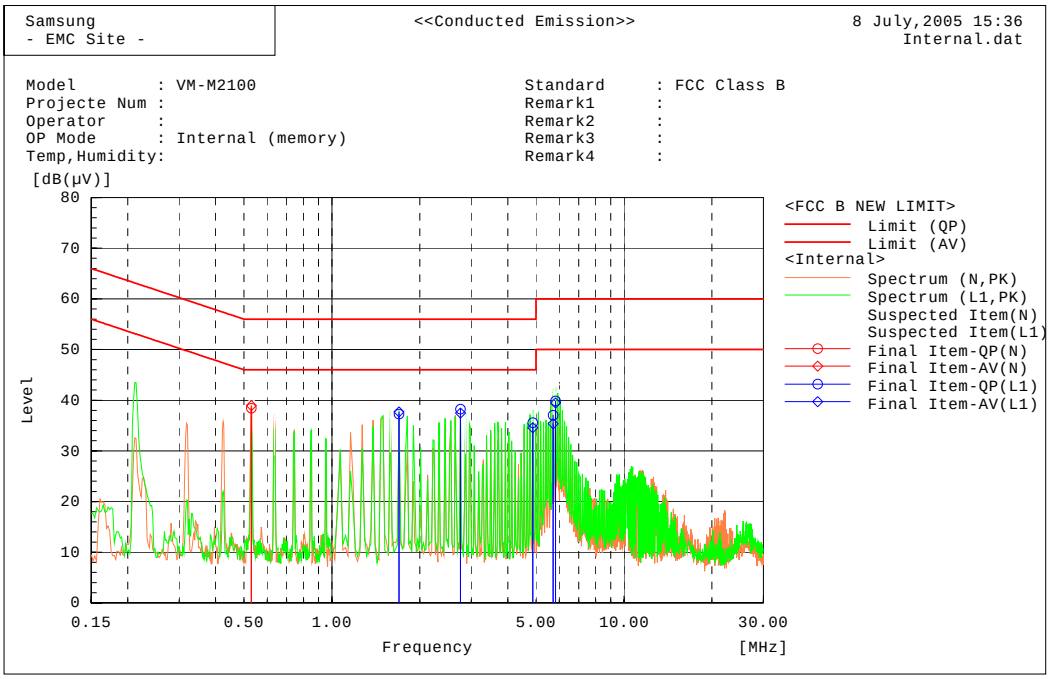
No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	0.52972	38.3	38.8	0.1	38.4	38.9	56.0	46.0	17.6	7.1
2	2.7555	37.2	36.6	0.1	37.3	36.7	56.0	46.0	18.8	9.3
3	2.6495	36.8	36.5	0.1	36.9	36.6	56.0	46.0	19.1	9.4

--- 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	6.0409	42.1	39.9	0.0	42.1	39.9	60.0	50.0	17.9	10.1
2	5.8292	41.9	39.2	0.0	41.9	39.2	60.0	50.0	18.1	10.8
3	4.9814	36.8	35.2	0.0	36.8	35.2	56.0	46.0	19.2	10.8

■ Operating Mode : Internal

[Graph and Data]



Final Result

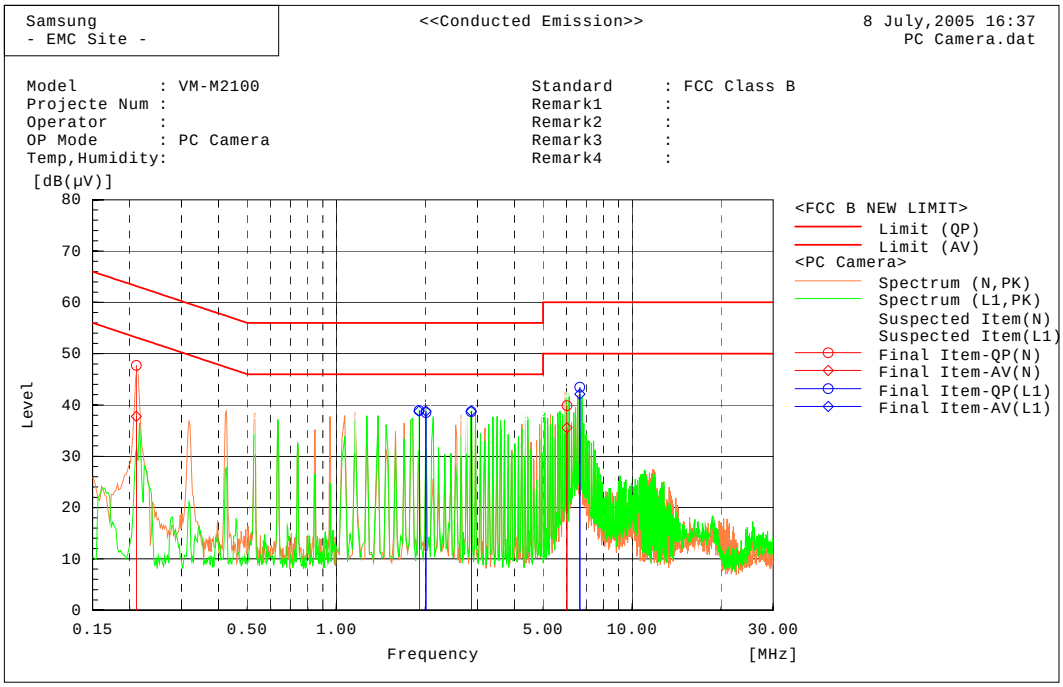
--- N Phase ---

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	0.5298	38.3	38.9	0.1	38.4	39.0	56.0	46.0	17.6	7.1

--- 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	5.8285	39.8	39.5	0.0	39.8	39.5	60.0	50.0	20.2	10.5
2	5.7232	37.1	35.3	0.0	37.1	35.3	60.0	50.0	23.0	14.7
3	4.8752	35.6	34.6	0.0	35.6	34.6	56.0	46.0	20.4	11.4
4	2.7557	38.2	37.4	0.1	38.3	37.5	56.0	46.0	17.7	8.5
5	1.6959	37.1	37.6	0.1	37.2	37.7	56.0	46.0	18.8	8.3

■ Operating Mode : PC Camera



Final Result

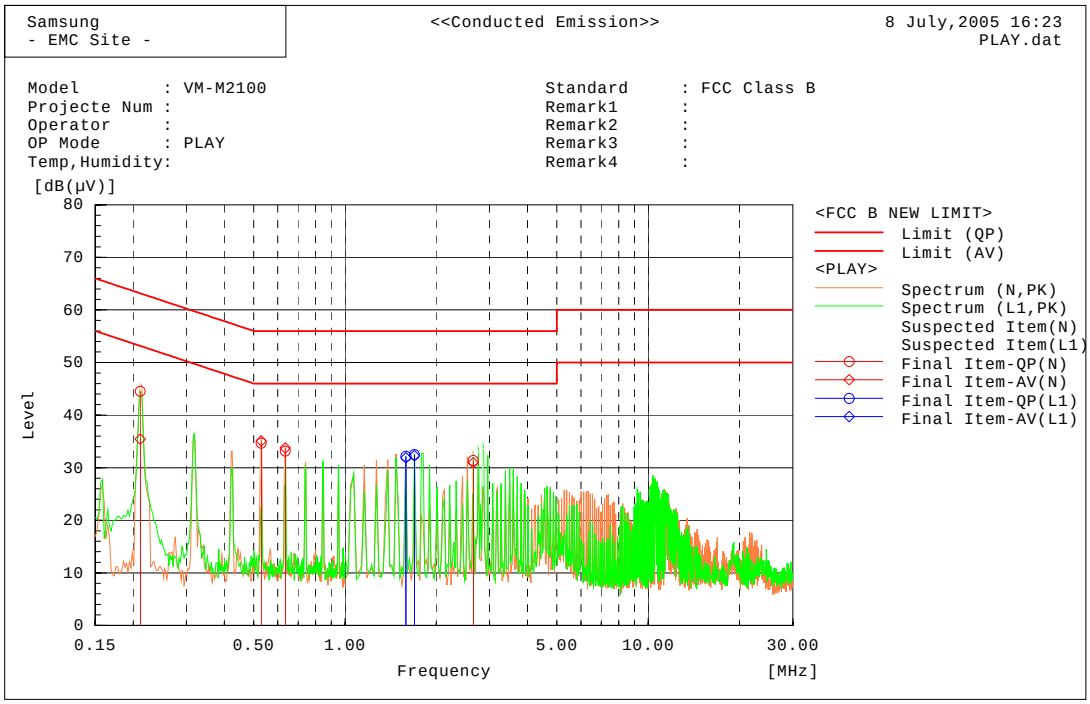
--- N Phase ---

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	0.21078	47.6	37.7	0.1	47.7	37.8	63.2	53.2	15.5	15.4
2	6.0261	39.8	35.5	0.1	39.9	35.6	60.0	50.0	20.1	14.4

--- 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	2.0094	38.4	38.7	0.1	38.5	38.8	56.0	46.0	17.5	7.2
2	2.8551	38.6	38.7	0.1	38.7	38.8	56.0	46.0	17.3	7.3
3	6.6615	43.5	42.1	0.0	43.5	42.1	60.0	50.0	16.5	7.9
4	1.9032	38.8	38.7	0.1	38.9	38.8	56.0	46.0	17.1	7.2

■ Operating Mode : Play



Final Result

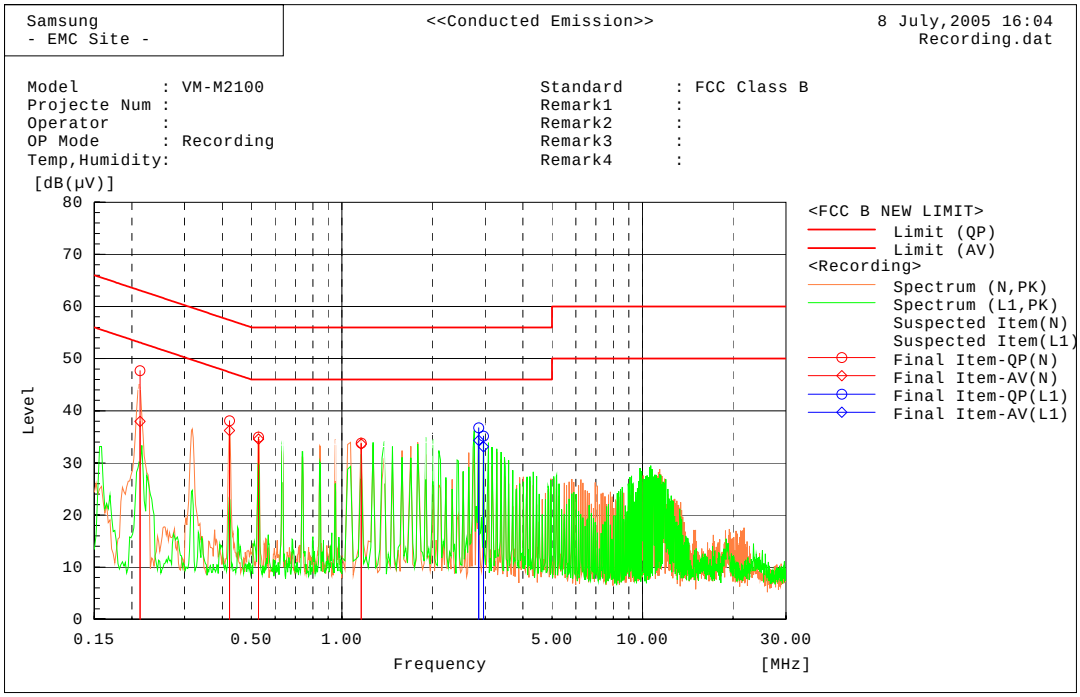
--- N Phase ---

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	0.21118	44.4	35.3	0.1	44.5	35.4	63.2	53.2	18.7	17.8
2	0.52919	34.6	35.0	0.1	34.7	35.1	56.0	46.0	21.3	10.9
3	0.63497	33.0	33.7	0.1	33.1	33.8	56.0	46.0	22.9	12.3
4	2.6461	31.3	30.9	0.1	31.4	31.0	56.0	46.0	24.7	15.1

--- 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	1.5877	32.0	31.8	0.1	32.1	31.9	56.0	46.0	23.9	14.1
2	1.6935	32.4	32.2	0.1	32.5	32.3	56.0	46.0	23.5	13.7

■ Operating Mode : Recording



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	0.21299	47.6	37.9	0.1	47.7	38.0	63.1	53.1	15.4	15.2
2	0.52791	34.9	34.5	0.1	35.0	34.6	56.0	46.0	21.0	11.4
3	0.42234	38.0	36.1	0.1	38.1	36.2	57.4	47.4	19.3	11.2
4	1.1611	33.7	33.5	0.1	33.8	33.6	56.0	46.0	22.2	12.4

--- 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	2.8506	36.6	34.2	0.1	36.7	34.3	56.0	46.0	19.3	11.7
2	2.9557	35.0	33.0	0.1	35.1	33.1	56.0	46.0	20.9	12.9

3.2 Radiated Emission

Test Information		
	Test Engineer	Sung Wook, Choi
	Test Date	July 06, 2005
	Climate Condition	Ambient Temperature : 23℃ Relative Humidity : 48%
	Test Place	10m Semi Anechoic chamber

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
RF Selector	NS4900	TOYO	0303-015	N/A	N/A
Bi-log Antenna	6112B	SCHAFFNER	2766	2005-07-06	12
Mast Controller	HD2000	HD	HD20000902027	N/A	N/A
Test Software	EP5RET	TOYO	None	N/A	N/A
Test Software	EP5RE	TOYO	None	N/A	N/A
Spectrum Analyzer	E7405A	Agilent	MY42000052	2005-08-26	12
EMI Test Receiver	ESCS30	R&S	839809/002	2006-05-24	12
RF Amplifier	8447D	Agilent	2944A10430	2005-07-20	12
Mast Controller	HD 100	HD	100/374	N/A	N/A

EUT Test Setup

EUT is positioned at 10m from antenna at the center of the table in the semi-anechoic chamber.

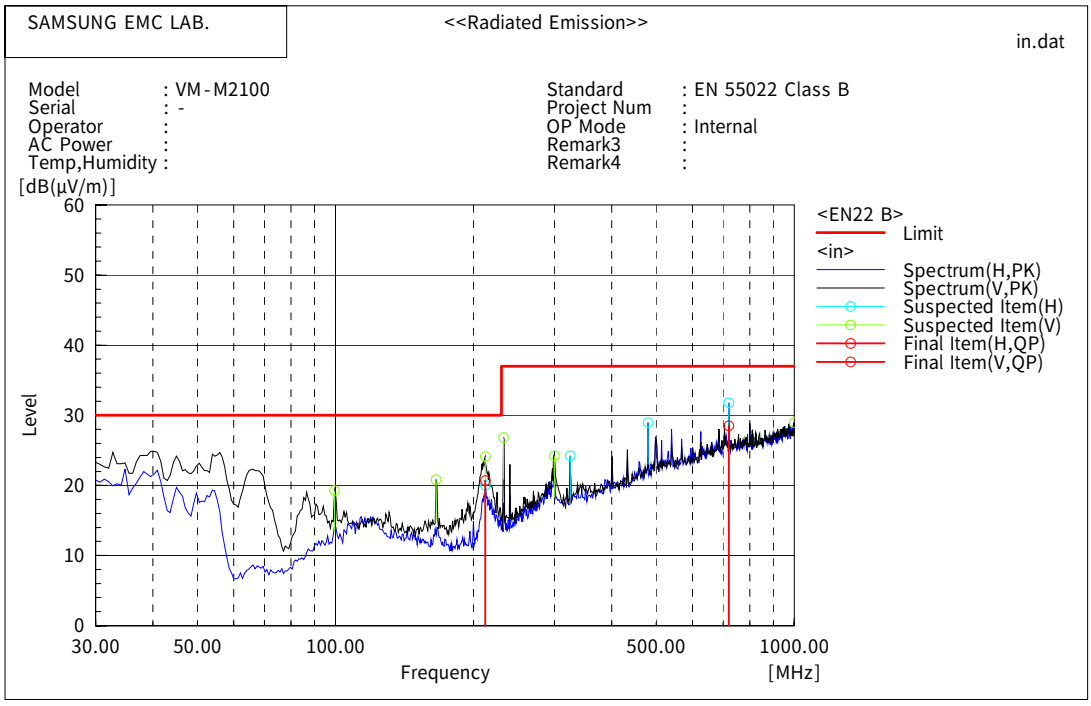
All unused ports were terminated into characteristic loads.

Test Result

Measurement Results	Pass The measured emissions of the EUT have found to be below the specified limits.

Test Data (Other Frequency)

■ Operating Mode : PLAY



Final Result

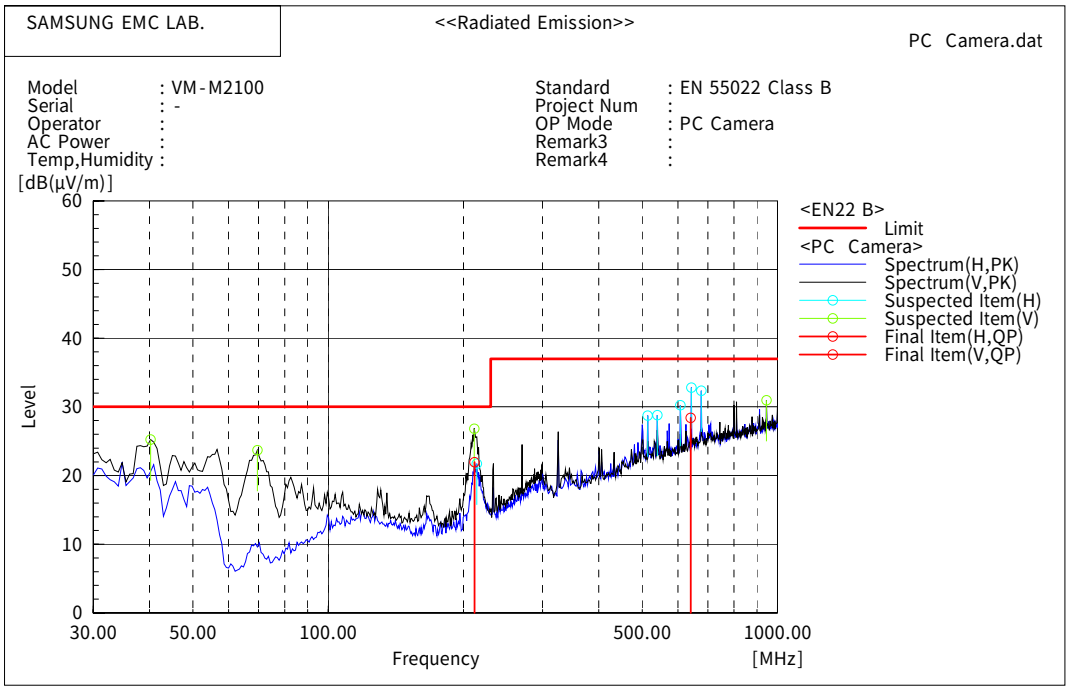
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(µV)]	c.f [dB(1/m)]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Remark
1	719.965	30.9	-2.4	28.5	37.0	8.5	

--- 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	212.189	36.6	-15.9	20.7	30.0	9.3	

■ Operating Mode : RECORDING



Final Result

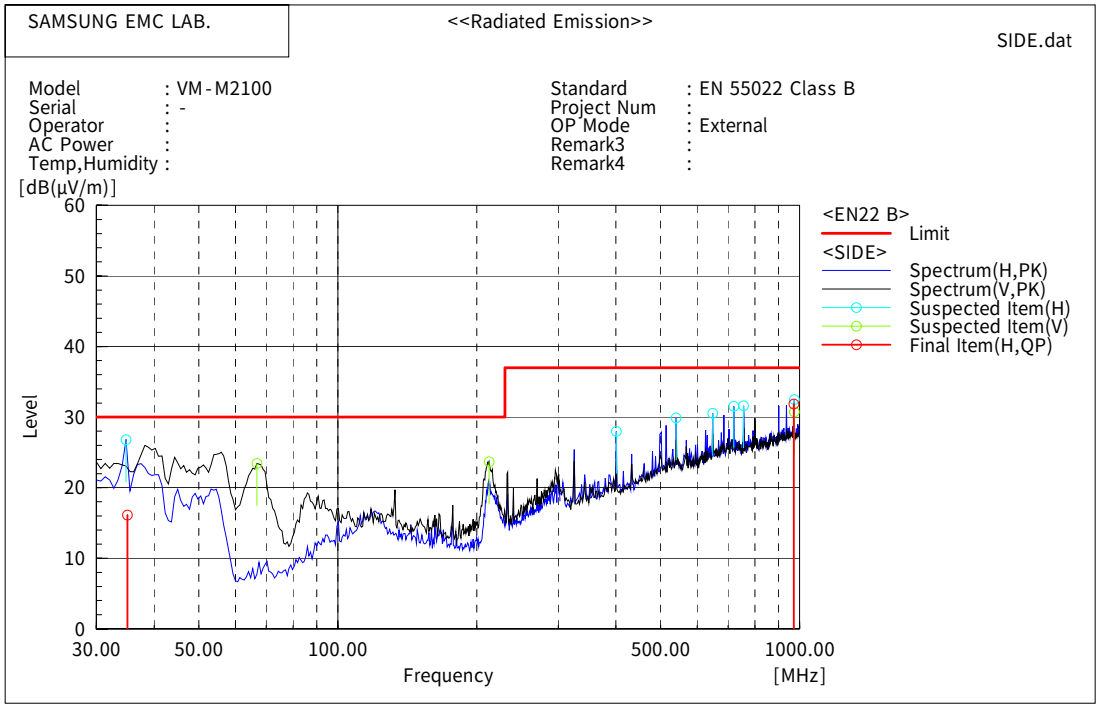
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(µV)]	c.f [dB(1/m)]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Remark
1	641.250	32.2	-3.8	28.4	37.0	8.6	

--- 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	211.683	37.9	-15.9	22.0	30.0	8.1	

■ Operating Mode :

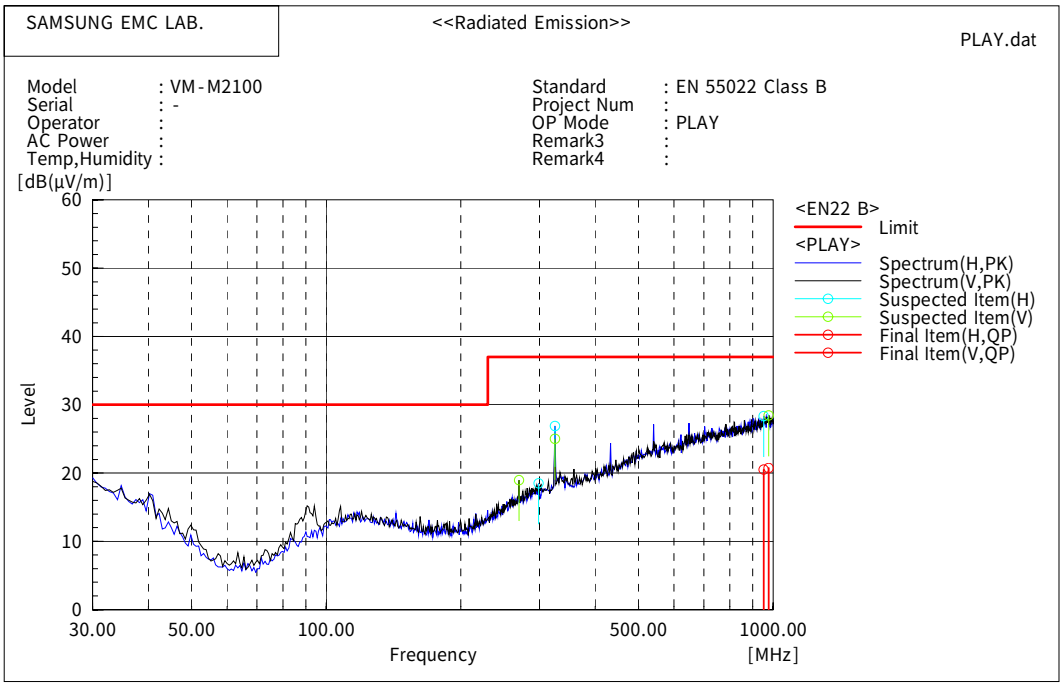


Final Result

--- 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	35.029	27.7	-11.6	16.1	30.0	13.9	
2	972.000	30.6	1.3	31.9	37.0	5.1	

■ Operating Mode :



Final Result

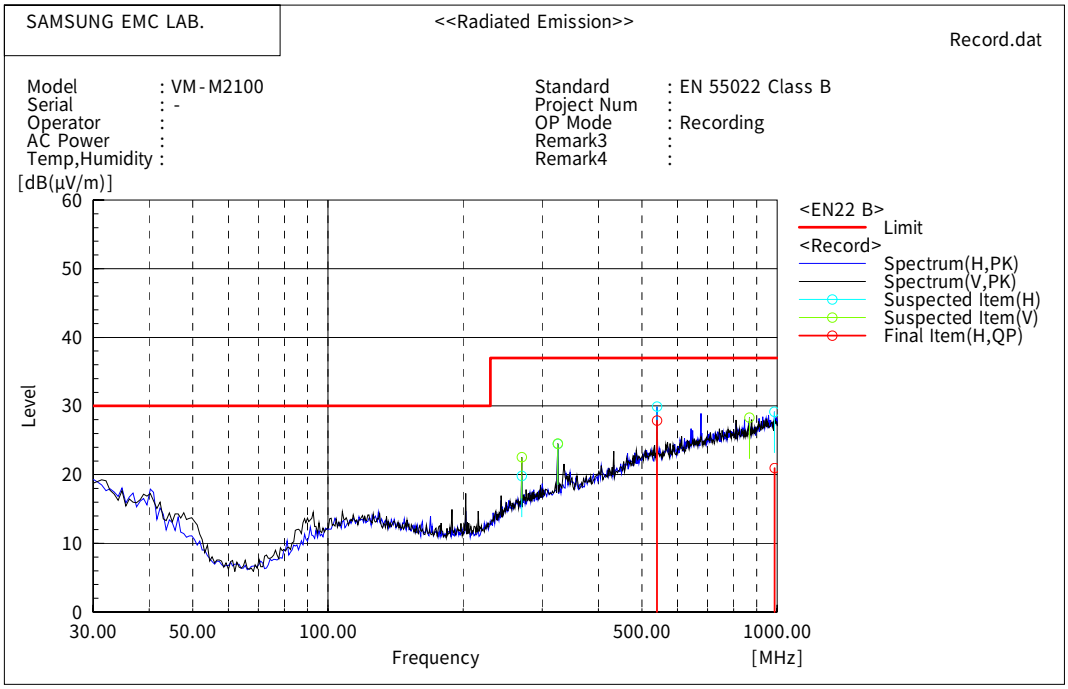
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(µV)]	c.f [dB(1/m)]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Remark
1	952.838	19.7	0.8	20.5	37.0	16.5	

--- 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	976.743	19.4	1.4	20.8	37.0	16.3	

■ Operating Mode :



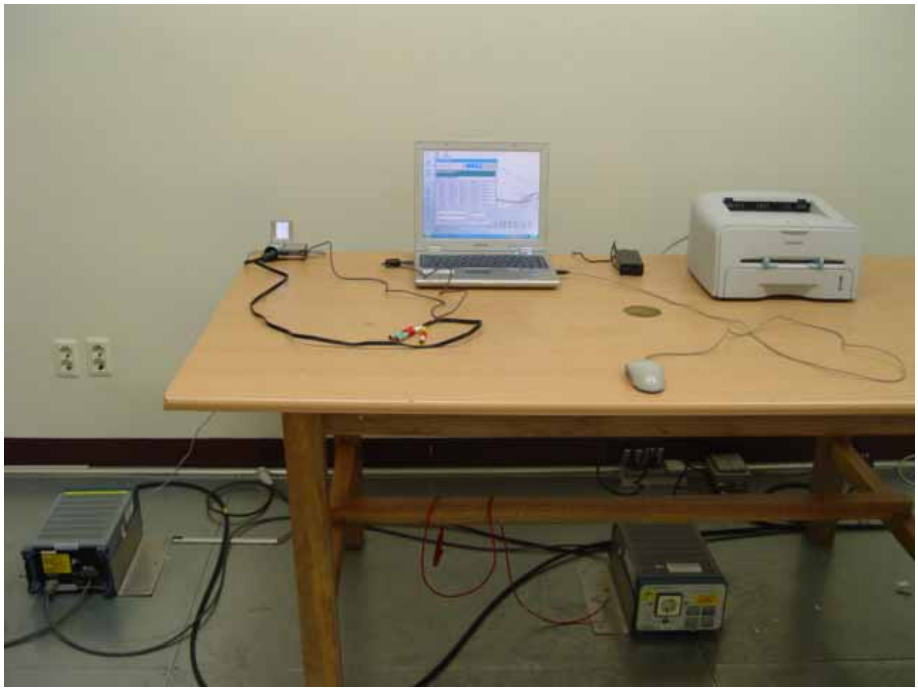
Final Result

--- Horizontal Polarization (QP)---

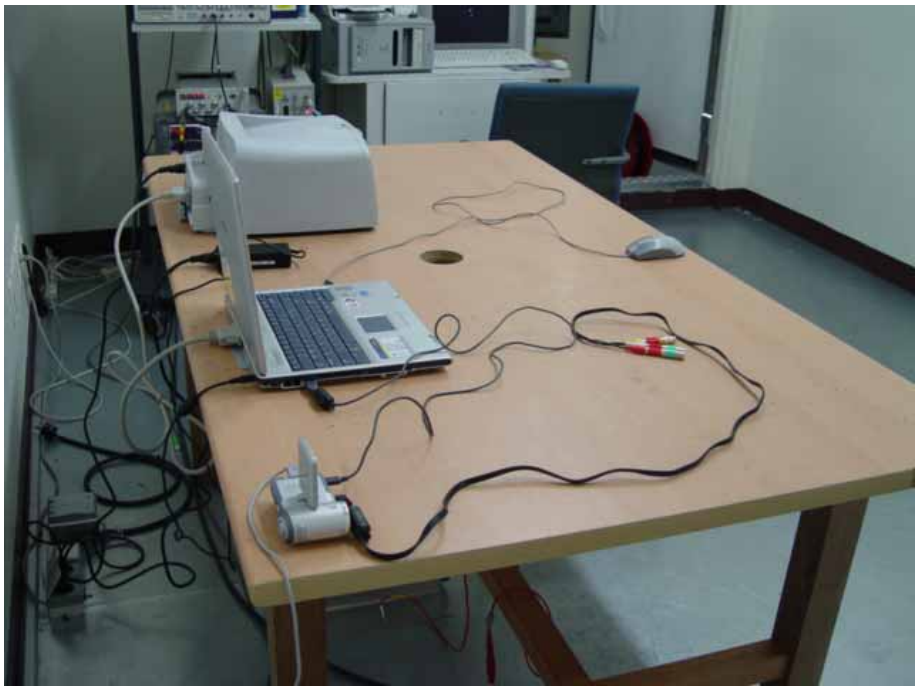
No.	Frequency [MHz]	Reading [dB(µV)]	c.f [dB(1/m)]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Remark
1	539.995	32.8	-4.9	27.9	37.0	9.1	
2	986.998	19.3	1.7	21.0	37.0	16.0	

4. Appendix A

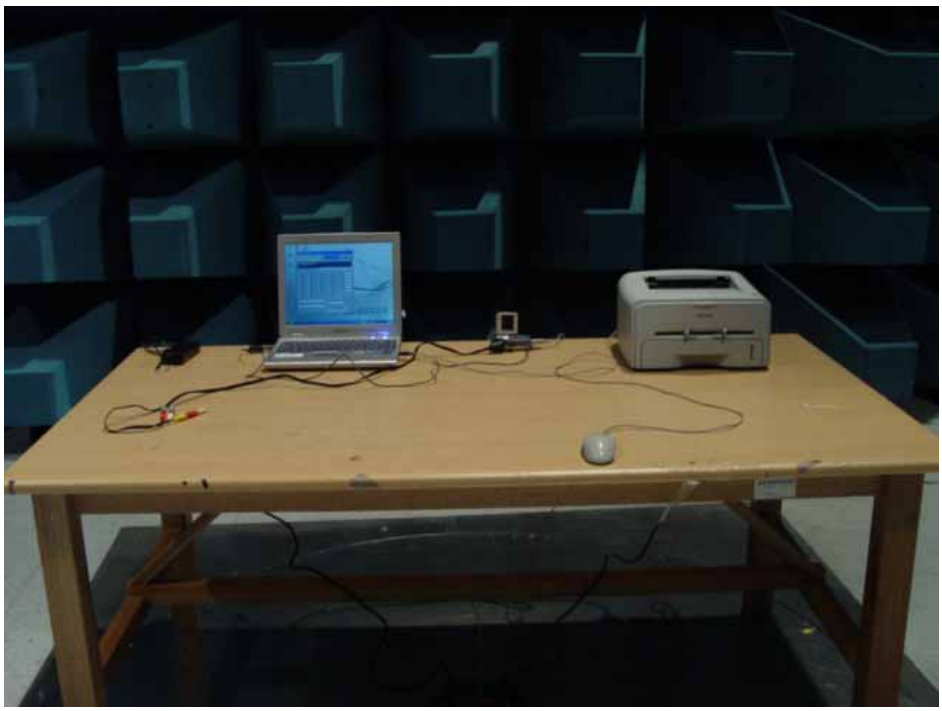
4.1 Test Photography



Picture 1. Conducted Emission (Front)



Picture 2. Conducted Emission (Side)



Picture 3. Radiated Emission (Front)

Picture 4. Radiated Emission (Rear)

4.2 EUT Photography

Picture 5. EUT (Front)

Picture 6. EUT (Rear)

[Picture 7]

[Picture 8]

[Picture 9]

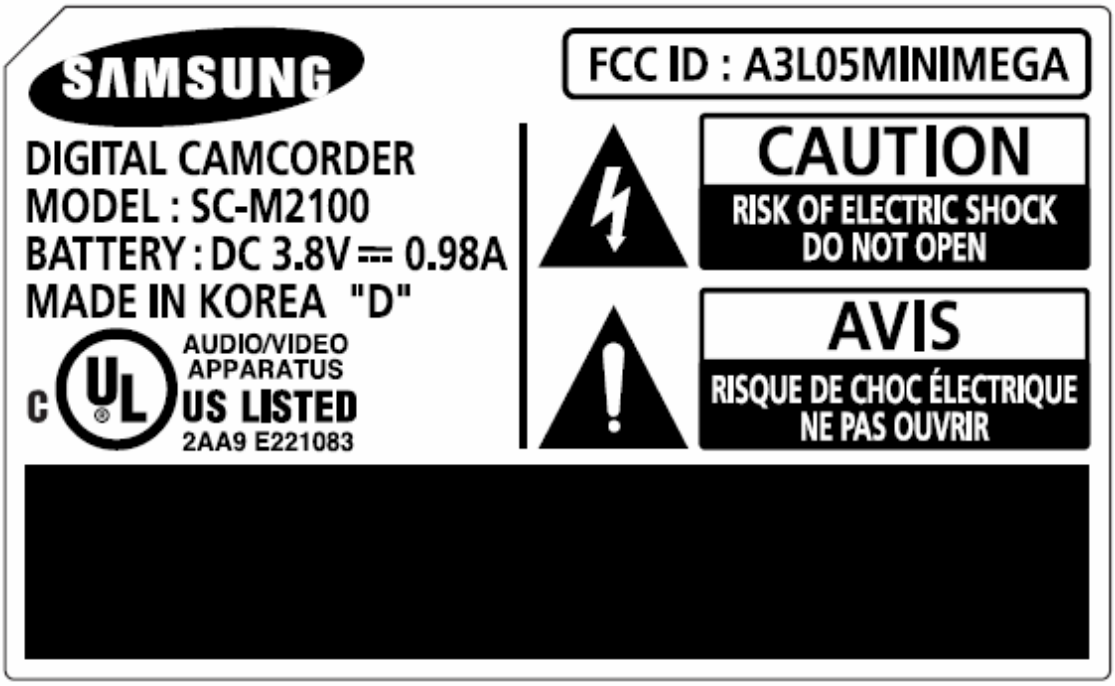
[Picture 10]

[Picture 11]

[Picture 12]

[Picture 13]

[Picture 14]



[Label]