EMC TEST REPORT

Samsung Electronics CS Management Center

416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si,Gyeonggi-Do,

443-742 Korea

(Tel: 031 277 7752, Fax: 031 277 7753)

NVLAP Code : 200623-0

1. Applicant
   - ◦ Name : Samsung Electronics Co., Ltd. DVS Division
   - ◦ Address : 416 Maetan 3-Dong, Yeongtong-Gu,Suwon-Si,Gyeonggi-Do, 443-742 Korea
2. Purpose for the report : Approval for EMC
3. EUT
   1) Product name : Digital Camcorder
   2) Model name : SC-D965
   3) Brand name : Samsung
   4) Variant model : SC-D963
4. Date of test : 2006. 03. 17 ~ 2006. 03. 23
5. Applied standards : FCC Part 15:2003 Subpart B

6. Report No. : LBE060910 Issue 1
7. FCC ID : A3L06OASIS

8. Test result : The equipment under test has found to be compliant with the applied standards.
   (Refer to the attached test result for more detail.)

Prepared by	Authorised by
Name : Tae Young, Jang	Name : No Cheon, Park

This report is the test result about the sphere accredited by KOLAS which signed the Mutual Recognition Arrangement of International Laboratory Accreditation Cooperation.

2006. 03. 27

Samsung Electronics Co., Ltd.
CS Management Center

Table of contents

1. General information

1.1 Operating mode and condition

The system was configured for testing in typical fashion use.

All connectors not used are terminated with resistors matching the nominal terminal impedance.

The mode of operation utilized for testing was selected to best simulate typical EUT use

1.2 EUT modifications

No EUT modifications were required.

1.3 Details of sampling

Client selected, single unit

1.4 Test configuration

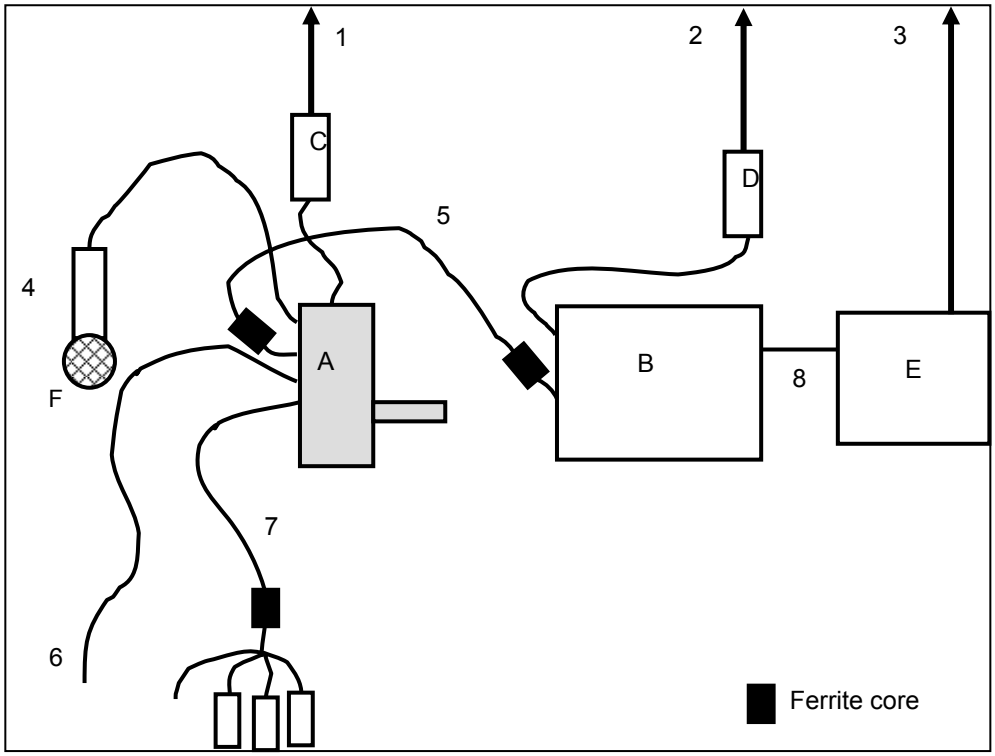
1.4.1 Used EUT and peripherals

Seq	Item	Model No.	Serial No.	Manufacturer	Note
A	Digital camcorder	SC-D965	-	SAMSUNG	EUT
B	Note PC	REV X03	CN-0G6951-36521-4B6-0020	DELL	DoC
C	Adapter	AA-E8	6CAY2 00385	SAMSUNG	For EUT
D	Adapter	ADP-50HH	CN-006166-48661-4CK-00VX	DELL	For PC
E	Printer	1100	CN-0J9342-72215-53M-0043	DELL	DoC
F	MIC	YMC-2521	-	SAMSUNG	DoC

1.4.2 Used cable description

No	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	Power	2.0	No	EUT
2	Power	1.8	Yes	Note PC
3	Power	1.8	Yes	Printer
4	MIC	4.0	No	-
5	1394	1.8	Yes	-
6	USB	1.8	Yes	-
7	AV	1.8	Yes	-

1.4.3 Block diagram



1.5 Applied standards

Test standard	Test method
FCC Part15:2003 Subpart B	ANSI C63.4: 2003

1.6 Power input ports

The following data details the supply levels at which the EUT was operated during tests.

Designation	**Frequency (Hz)**	**Voltage (V)**
Mains lead	50	120

1.7 Specification

System	
Video signal	NTSC
Video recording system	2 rotary heads, Helical scanning system
Audio recording system	Rotary heads, 12/16b PCM system
Usable cassette	Digital video tape (6.35mm width): Mini DV cassette
Tape speed	SP: approx. 18.81mm/s LP: approx. 12.56mm/s
Tape recording time	SP: 60 minutes (when using DVM 60), LP: 90 minutes (when using DVM 60)
FF/REW time	Approx. 150 sec. (using DVM60 tape)
Image device	CCD (Charge Coupled Device) (1MEGA pixels)
Lens	F1.6 26x, 1200x (Digital) Electronic zoom lens
Filter diameter	Ø27
LCD Screen/Viewfinder	
Size/dot number	2.5inch 112K (SC-D963 only) / 2.7inch (wide) 230K (SC-D965 only)
LCD Screen Method	TFT LCD
Viewfinder	Color LCD
Connectors	
Video output	1Vp-p (75Ω terminated)
S-video output	Y: 1Vp-p, 75Ω, C: 0. 286Vp-p, 75Ω
Audio output	-7.5dBs (600Ω terminated)
DV input/output	4pin special in/out connector
USB output	Mini-B type connector
External mic	Ø3.5 stereo

General	
Power source	DC 8.4V, Lithium Ion Battery Pack 7.4V
Power source type	Lithium Ion Battery Pack, Power supply (100V~240V) 50/60Hz
Power consumption	3.9W(LCD), 3.7W(Viewfinder) (SC-D963 only)
(Recording)	4.1W(LCD), 3.9W(Viewfinder) (SC-D965 only)
Operating temperature	0°~40°C (32°F~104°F)
Storage temperature	-20°C ~ 60°C (-4°F ~ 140°F)
External dimension	Height 3.62inches(93mm), Length 4.63inches(105mm), Width 2.52inches(53mm)
Weight	0.904lb (350g, 14.46oz) (Except for Lithium Ion Battery Pack and tape)
Internal MIC	Omni-directional stereo microphone
Remote control	Indoors: greater than 49ft(15m) (straight line),
(SC-D965 only)	Outdoors: about 16.4ft(5m) (straight line)

2. Summary of test results

Result : Complied

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

Test Item		Applied Standard	Results
Electromagnetic Emission Test			
3.1	Conducted Emission	FCC Part15:2003 Subpart B	Complied
3.2	Radiated Emission	FCC Part15:2003 Subpart B	Complied

3. Description of individual tests

3.1 Conducted emission

3.1.1 Test information

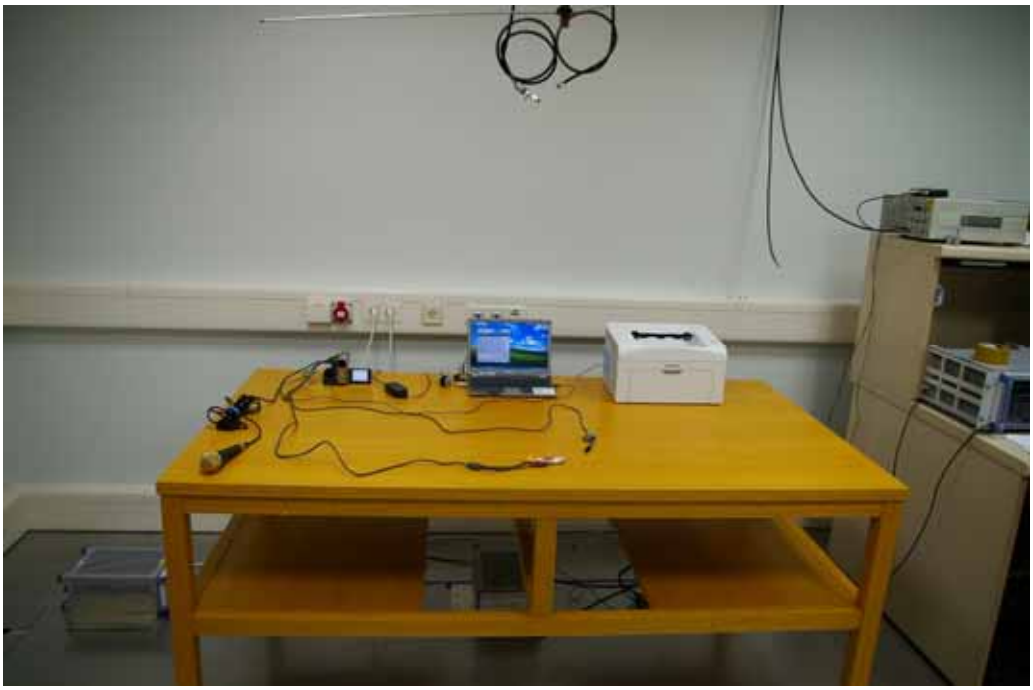
Test engineer	Tae Young, Jang
Test date	March 23, 2006
Climate condition	Ambient temperature : 23.1 ℃, Relative humidity : 28 % Atmospheric pressure : 100.7 ㎪
Test place	Shielded room # 1

3.1.2 Test equipment

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Date	Interval(Month)
Field strength meter	ESCI	R&S	100136	2005-04-17	12
LISN	ENV216	R&S	100116	2005-09-08	12
Test Software	EMC 32	R&S	Ver 4.40.0	N/A	N/A

EUT Test Setup

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



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

Uncertainty

3.30 dBμV (95 % C.L, k=2)

Test Data

■ Operating Mode : Mass storage (USB)

Test Information

EUT Name:	SC-D965
Serial Number:	
Test Description:	
Operating Conditions:	Mass storage
Operator Name:	
Comment:	USB

Hardware Setup: Voltage with 2-Line-LISN - [EMI conducted]

Subrange 1

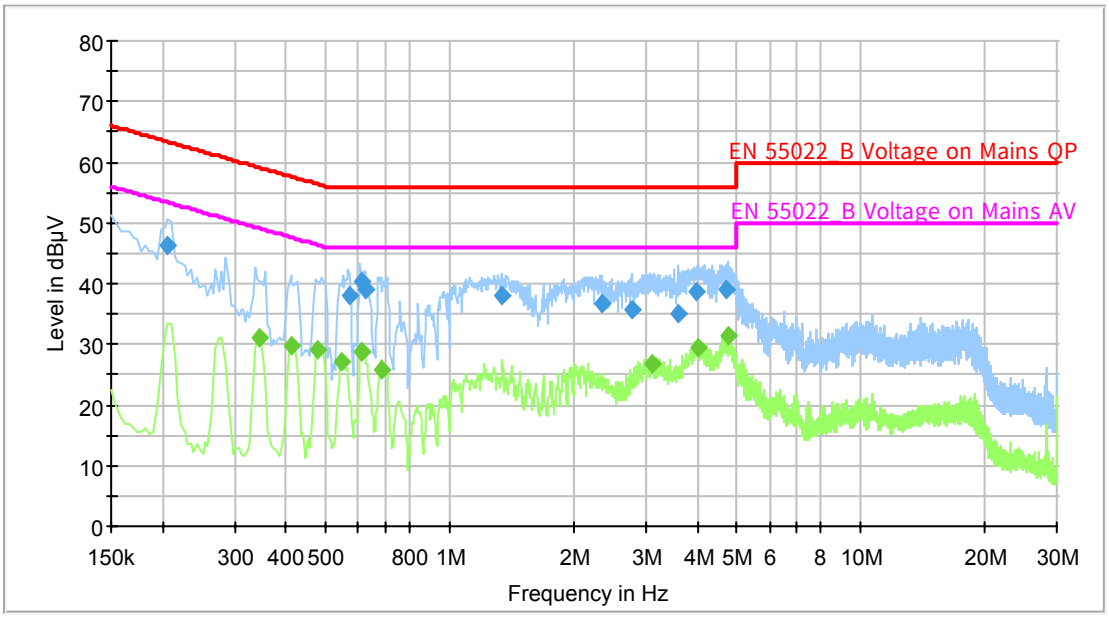
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55022_B_2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with 2-Line-LISN
Level Unit:	dB µ V

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	5s	ESCI 3

[Graph and Data]



[Quasi Peak]

Frequency (MHz)	QuasiPeak (dB µV)	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.207	46.183	L1	9.570	17.162	63.345
0.568	37.881	N	9.570	18.119	56.000
0.612	40.247	N	9.570	15.753	56.000
0.625	38.905	N	9.570	17.095	56.000
1.340	37.999	N	9.574	18.001	56.000
2.338	36.579	N	9.587	19.421	56.000
2.766	35.720	N	9.594	20.280	56.000
3.594	34.973	N	9.606	21.027	56.000
3.999	38.564	N	9.610	17.436	56.000
4.732	38.944	N	9.618	17.056	56.000

[Average]

Frequency (MHz)	Average (dB µV)	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.343	30.956	N	9.570	18.186	49.142
0.411	29.787	N	9.570	17.851	47.638
0.479	29.250	N	9.570	17.115	46.365
0.546	27.011	N	9.570	18.989	46.000
0.611	28.797	N	9.570	17.203	46.000
0.612	28.826	N	9.570	17.174	46.000
0.681	25.850	N	9.570	20.150	46.000
3.111	26.800	N	9.599	19.200	46.000
4.030	29.478	N	9.611	16.522	46.000
4.737	31.327	N	9.618	14.673	46.000

* QP : Quasi-peak, AV: Average
* Result = Level(QP or AV) + Trans. (LISN Insertion loss + Cable loss)
* Margin = Limit - Level

■ Operating Mode : PC camera (1394)

Test Information

EUT Name:	SC-D965
Serial Number:	
Test Description:	
Operating Conditions:	PC CAM
Operator Name:	
Comment:	Only 1394 operation

Hardware Setup: Voltage with 2-Line-LISN - [EMI conducted]

Subrange 1

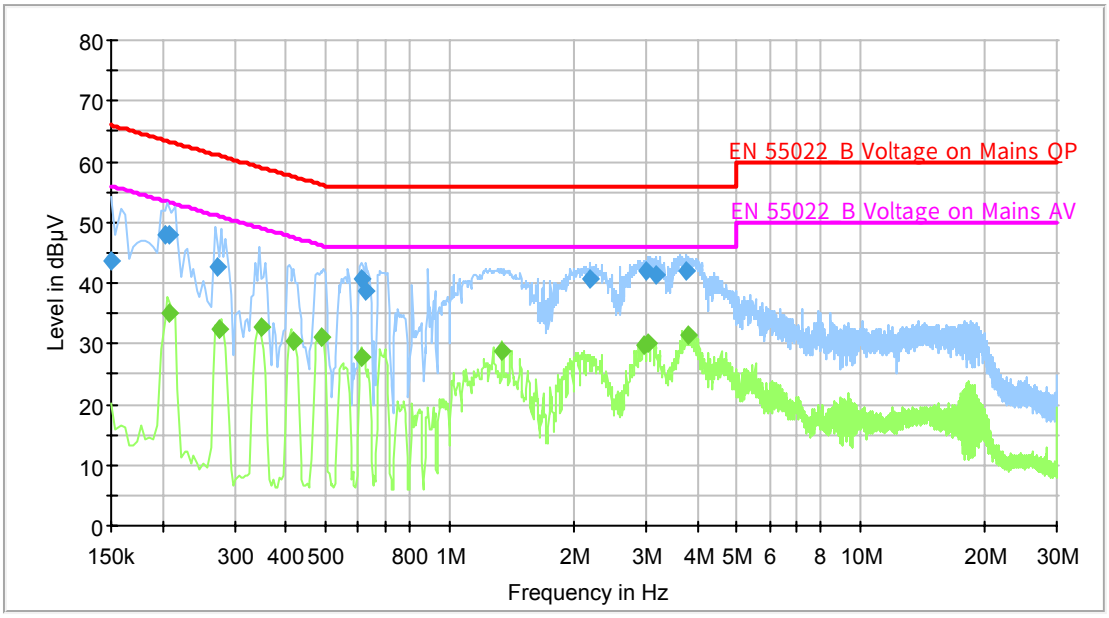
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55022_B_2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with 2-Line-LISN
Level Unit:	dB µ V

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	5s	ESCI 3

[Graph and Data]



[Quasi Peak]

Frequency (MHz)	QuasiPeak (dB µV)	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.150	43.543	L1	9.566	22.457	66.000
0.203	48.047	L1	9.570	15.460	63.507
0.209	48.001	L1	9.570	15.263	63.265
0.271	42.565	L1	9.570	18.538	61.103
0.612	40.579	N	9.570	15.421	56.000
0.627	38.660	N	9.570	17.340	56.000
2.201	40.663	N	9.584	15.337	56.000
3.017	41.863	N	9.598	14.137	56.000
3.195	41.441	N	9.600	14.559	56.000
3.764	41.952	N	9.608	14.048	56.000

[Average]

Frequency (MHz)	Average (dB µV)	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.208	35.020	N	9.570	18.285	53.305
0.276	32.468	N	9.570	18.483	50.950
0.347	32.766	N	9.570	16.280	49.046
0.415	30.500	N	9.570	17.058	47.558
0.489	31.000	N	9.570	15.193	46.193
0.610	27.764	N	9.570	18.236	46.000
1.346	28.755	N	9.574	17.245	46.000
2.982	29.870	N	9.597	16.130	46.000
3.041	29.997	N	9.598	16.003	46.000
3.824	31.296	N	9.608	14.704	46.000

* QP : Quasi-peak, AV: Average
* Result = Level(QP or AV) + Trans. (LISN Insertion loss + Cable loss)
* Margin = Limit - Level

*** PC camera is operated by only 1394 mode. (The operation at USB mode is blocked by software.)**

3.2 Radiated emission

3.2.1 Test information

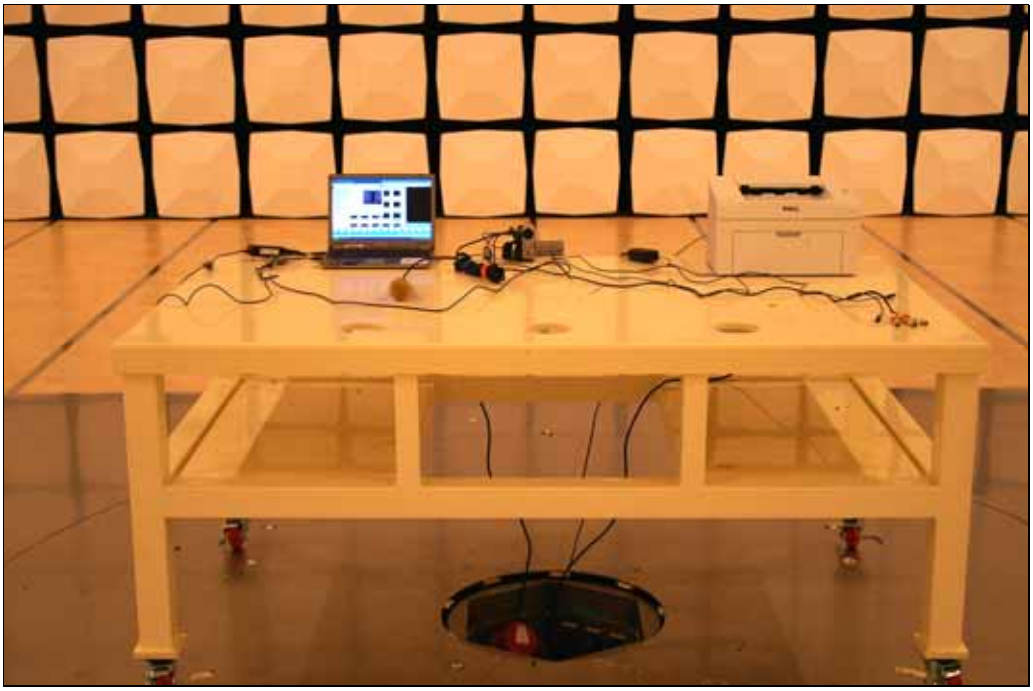
Test engineer	Tae Young, Jang
Test date	March 17, 2006
Climate condition	Ambient temperature : 22.3 ℃, Relative humidity : 32 % Atmospheric pressure : 101.2 ㎪
Test place	10 m Semi-Anechoic Chamber #1

3.3.2 Test equipment

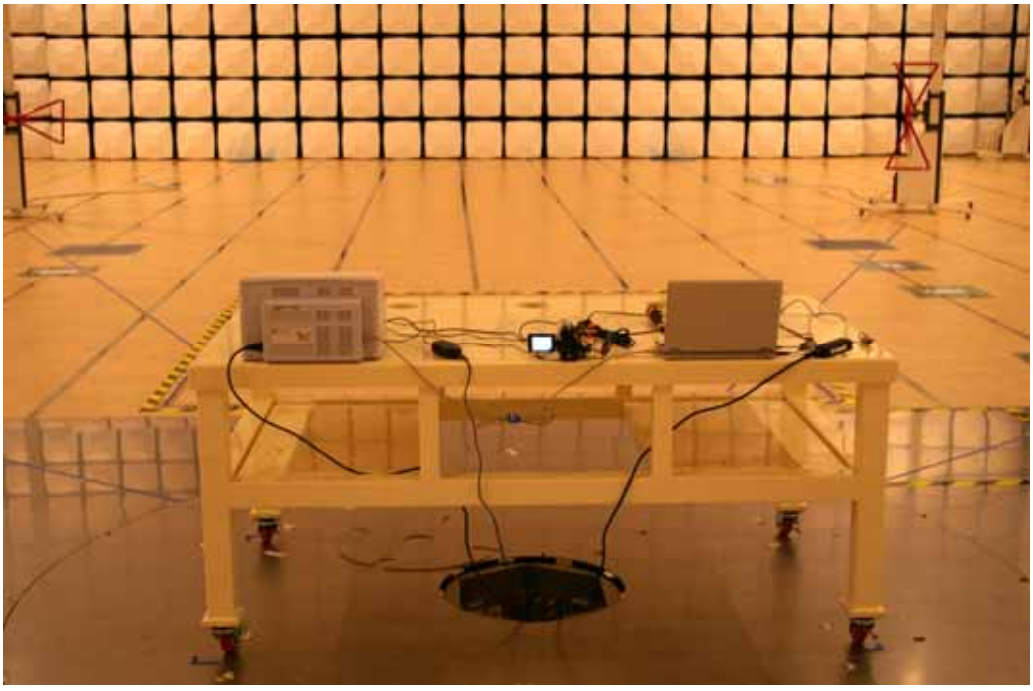
Equipment	Model name	Manufacturer	Serial no.	Calibration	
				Date	Interval(Month)
Bi-con Antenna	CBL6141A	SCHAFFNER	4268	2005-05-24	12
Bi-con Antenna	CBL6141A	SCHAFFNER	4266	2005-05-24	12
EMI Receiver	ESI26	R&S	100289	2005-04-11	12
EMI Receiver	ESI26	R&S	100291	2005-04-12	12
AMPLIFIER	310N	SONOMA	251674	2006-03-08	12
AMPLIFIER	310N	SONOMA	251677	2006-03-08	12
Ant Mast	MA4000	Inn-co	-	N/A	
Ant Mast	MA4000	Inn-co	-	N/A	
Mast Controller	CO2000	Inn-co	-	N/A	
RF Selector	NS4900	TOYO	-	N/A	

EUT Test Setup

The EUT was set up on a plastic table at least 0.8m from all metallic objects with the cables, to be tested, extended to pass through the absorbing clamp and along the length of the track.
The cables was terminated into the characteristic impedance of the port.



Front



Rear

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

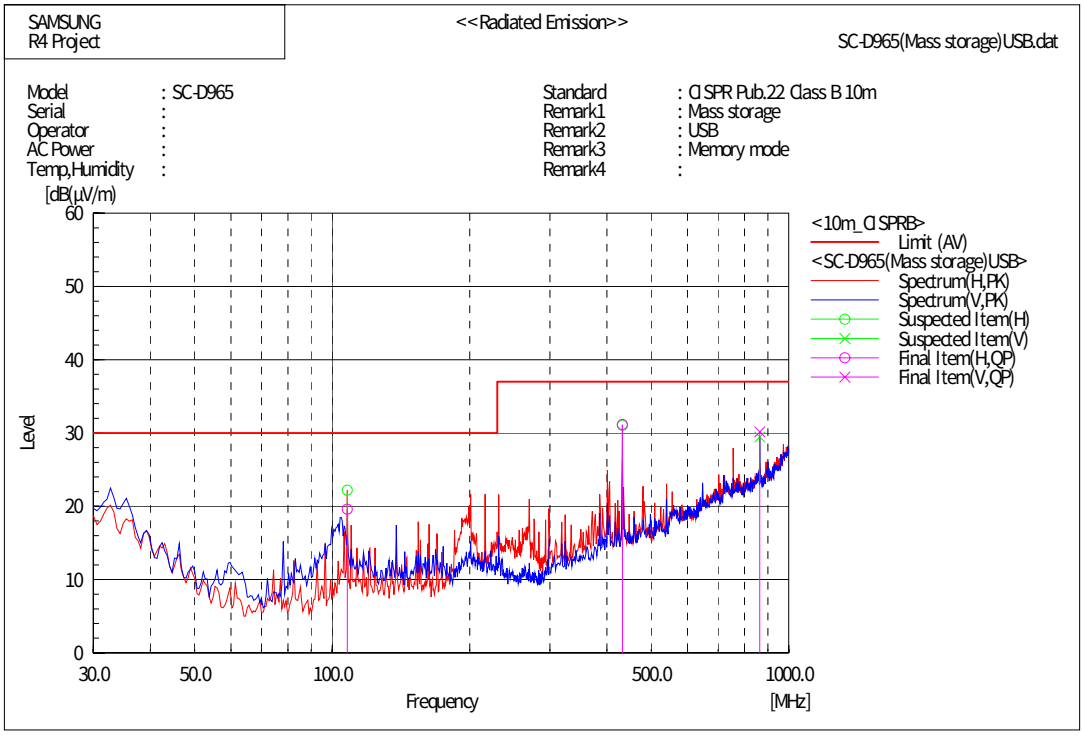
Uncetainty

(Hor) 4.00 dBμV/m, (Ver) 4.40 dBμV/m (95 % C.L, k=2)

Test Data (Local Oscillator)

■ Operating Mode : Mass storage (USB)

[Graph and Data]



Final Result

--- Horizontal Polarization (QP)---

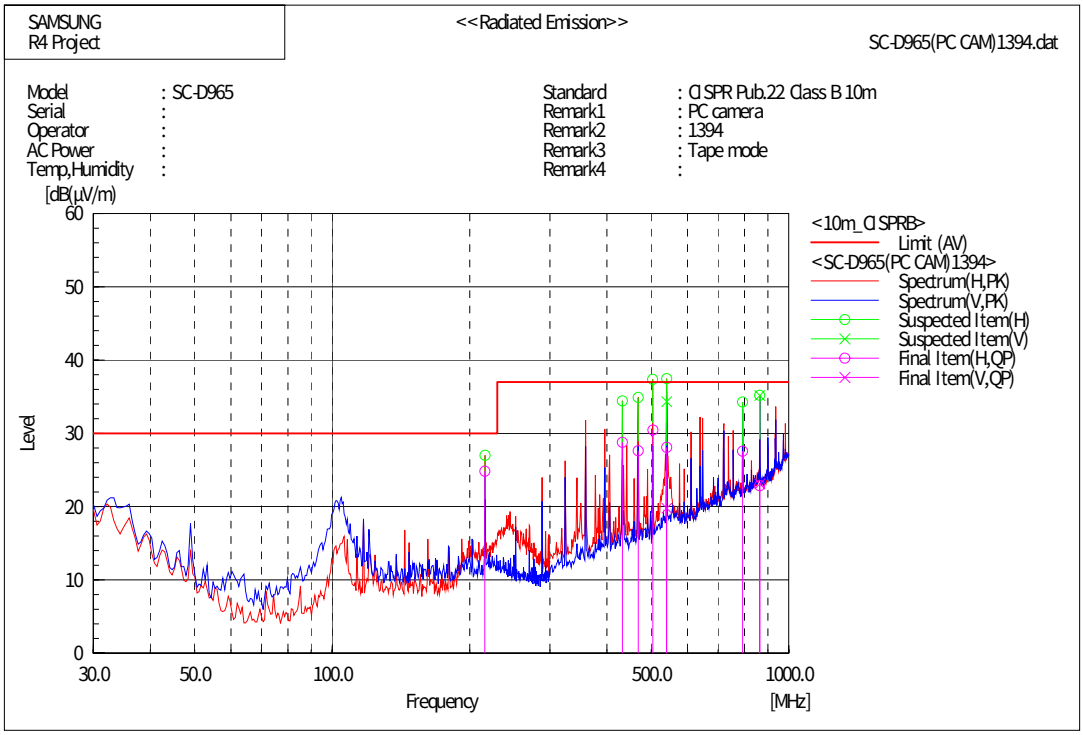
No.	Frequency [MHz]	Reading [dB(µV)]	c.f [dB(1/m)]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Remark
1	107.994	38.7	-19.1	19.6	30.0	10.4	
2	432.011	43.2	-12.0	31.2	37.0	5.8	

--- 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	863.991	33.6	-3.4	30.2	37.0	6.8	

■ Operating Mode : PC camera (1394)

[Graph and Data]



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	431.997	40.8	-12.0	28.8	37.0	8.2	
2	467.993	38.9	-11.3	27.6	37.0	9.4	
3	504.003	41.2	-10.7	30.5	37.0	6.5	
4	539.985	38.2	-10.1	28.1	37.0	8.9	
5	791.999	32.6	-5.0	27.6	37.0	9.4	
6	863.928	26.3	-3.4	22.9	37.0	14.1	
7	216.005	42.2	-17.4	24.8	30.0	5.2	

--- 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	539.999	29.9	-10.1	19.8	37.0	17.2	
2	863.928	26.5	-3.4	23.1	37.0	13.9	

*** PC camera is operated by only 1394 mode. (The operation at USB mode is blocked by software.)**

4. Appendix

4.1 EUT photography

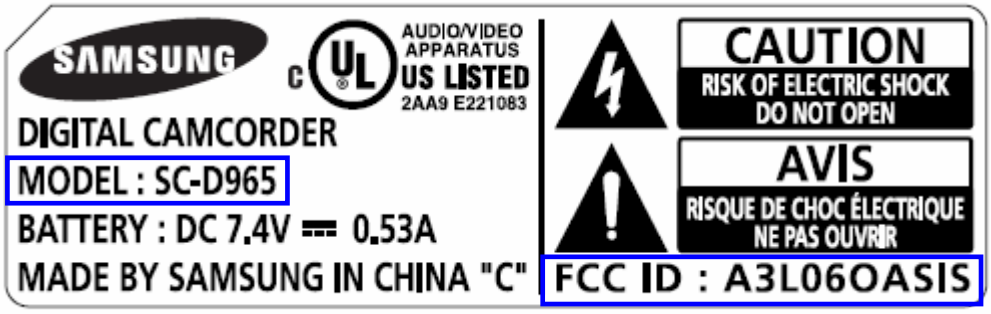
Picture 1. EUT (Front)

Picture 2. EUT (Rear)

Picture 3. EUT (Leftside)

Picture 4. EUT (Leftside2)

Picture 5. EUT (Rightside)



Picture 6. EUT (Label)