

EMC TEST REPORT

Samsung Electronics Co., Ltd.

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 of organization : Samsung Electronics Co., Ltd.
- Address : 416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 443-742 Korea

2. Purpose for the report : Approval for EMC

3. Kind of product : Digital Camcorder (Model name: SC-DC565)

4. Date of test : 2006.04.18

5. Applied standard : FCC Part 15, Subpart B

6. Report No. : LBE061160 Issue 1

7. FCC ID : A3L06RAINBOW2

8. Test result : Complied

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

Tested by

Name : Seung Beom, Choi

Reviewed by

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.

2006.04.25

Samsung Electronics Co., Ltd.
Chief of CS Management Center

TEST RESULT

Test Report No. : LBE061160

Applicant / Address : Samsung Electronics Co., Ltd.
416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do
443-742 Korea

Manufacture / Address : Samsung Electronics Co., Ltd.
416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do
443-742 Korea

EUT :

1. Product name : Digital Camcorder
2. Model name : SC-DC565
3. Brand name : Samsung
4. Variant model : SC-DC563, SC-DC564

Test Method : ANSI C 63.4:2003

Test Result : **Complied**
The equipment under test has found to be compliant with the applied standards

Test Lab. : CS Management Center, Samsung Electronics Co., Ltd.



Tested by : Seung Beom, Choi

Reviewed by : No Cheon, Park

Date of Issue : 2006.04.25

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1. General information

1.1 Basic information related product

Applicant	Samsung Electronics Co., Ltd.
Model name	SC-DC565
Applicant address	416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do 443-742 Korea
Contact person	Je Soon, Kang
Kind of product	Digital Camcorder
Valiant model	SC-DC563, SC-DC564
Manufacturer	Samsung Electronics Co., Ltd. 416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 443-742 Korea
Rated power	AC 110 V, 60 Hz
New / Alternative / Permissive change information	New

1.2 Detail Information related product

1.2.1 Specification

System	
Video signal	NTSC
Picture Compression format	MPEG-2
Audio Compression format	DOLBY® DIGITAL STEREO CREATOR
Recording Quality	XP (about 9Mbps), SP (about 6Mbps), LP (about 3Mbps)
Image device	CCD (Charge Coupled Device) (1.1M pixels)
Lens	F1.6 26x (Optical), 1200x(Digital) Electronic zoom lens
Filter diameter	Ø30
LCD Screen/Viewfinder	
Size/dot number	SC-DC563: 2.5inches 113k / SC-DC564/DC565: 2.7inch 230k
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)
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 (Recording)	5.6W(SC-DC563, LCD/Viewfinder), 5.8W(SC-DC564/SC-DC565, LCD/Viewfinder)
Operating temperature	0°~40°C (32°F~104°F)
Storage temperature	-20°C ~ 60°C (-4°F ~ 140°F)
External dimension	Height 2.02 inches (51.5 mm), Length 3.44 inches (87.5 mm), Width 4.78 inches (121.5 mm)
Weight	0.97 lb (440 g, 15.52 oz) (Except for Lithium Ion Battery Pack)
Internal MIC	Omni-directional stereo microphone
Remote control (SC-DC564/DC565 only)	Indoors: greater than 49 ft (15 m) (straight line), Outdoors: about 16.4 ft (5 m) (straight line)

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.

This EUT has the following operating mode(s).

- PC camera mode (USB connected)
- Mass Storage mode (USB connected)

1.4 Equipment modifications

No equipment modification

1.5 Test procedure

1.5.1 Conducted emission

The EUT was placed on a platform nominal size, 1 m by 1.5 m, raised 80 cm above the conducting Ground plane. The rear of tabletop was located 40 cm to the vertical conducting ground plane.

The rear of EUT, including peripherals was aligned and flush with rear of tabletop.

All other surfaces of tabletop was at least 80 cm from any other grounded conducting surface.

I/O cables and AC cables that were connected to the peripherals were bundled in center.

They were folded back and forth forming a bindle 30 cm to 40 cm long and were handed at a 40 cm height to the ground plane.

Each EUT current-carrying power lead, except the ground(safety) lead, were individually connected through a LISN to the input power source.

All unused 50 ohm connectors of the LISN were resistively terminated in 50 ohm when not connected to the measuring equipment.

Frequency Band [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
0.15 to 30	EMI Receiver	Quasi-Peak	9 kHz	-
		Average	9 kHz	-

1.5.2 Radiated emission

EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The rear of EUT, including peripherals was aligned and flush with rear of tabletop. The I/O cables that were connected to the peripherals were bundle in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged 40 cm height to the ground plane.

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 and the turn table azimuth was varied to obtain the maximum signal strength

The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found.

The spectrum was scanned from 30 to 1 000 MHz using biconiLog antenna.

The explanation of measuring instrument setup when Respective function is used in any frequency band is as following;

Frequency Band [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
30 to 1 000	EMI Receiver	Quasi-Peak	120 kHz	-

1.6 Test configuration

1.6.1 Used EUT and peripherals

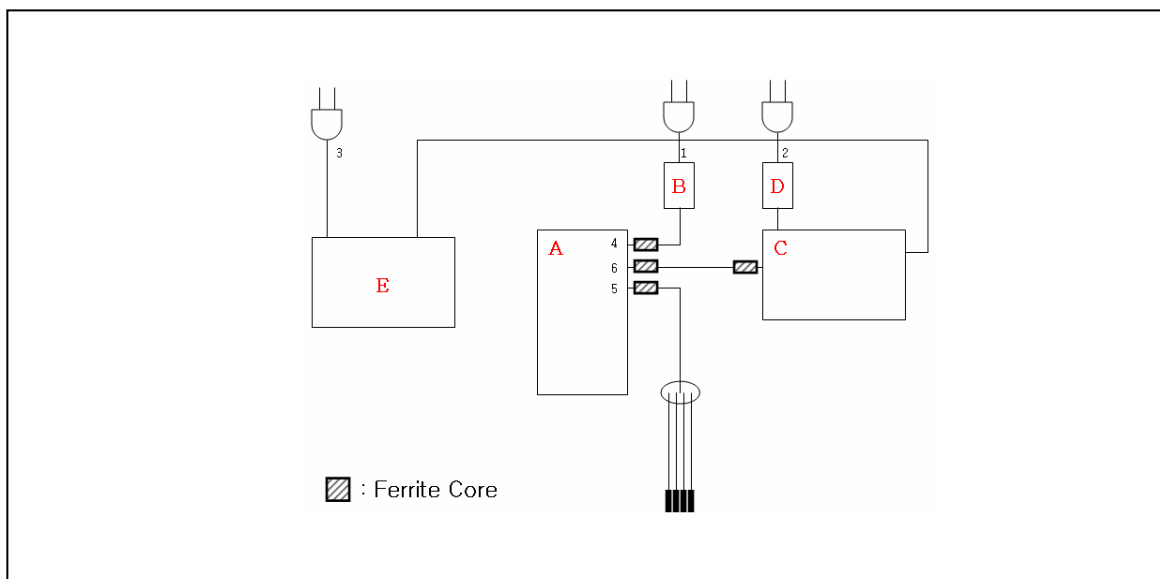
Mark	Item	Model No.	Serial No.	Manufacturer	Note
A	Digital Camcorder	SC-DC565	-	Samsung	EUT
B	Adapter	AA-E8	6CAY2 74799	Samsung	DoC
C	Note PC	REV X03	CN-0G6951-36521-4B6-0020	DELL	DoC
D	Adapter	ADP-50HH	CN-006166-48661-4CK-00VX	DELL	DoC
E	Printer	1100	CN-0J9342-72215-53M-0043	DELL	DoC

1.6.2 Used cable description

Mark	Connected cable	Length [m]	Shielded [Y/N]	Note
1	Power	1.5	No	To adapter (EUT)
2	Power	1.5	No	To adapter (Note PC)
3	Power	1.5	No	To the Printer
4	DC output	1.0	Yes *)	To the EUT
5	AV	1.0	Yes *)	Termination
6	USB	1.0	Yes *)	To the PC

*) Ferrite core was used.

1.6.3 Block diagram



1.7 Applied Standards

Test standard	Test method
FCC Part 15, Subpart B, Class B	ANSI C 63.4:2003

Performance Criteria

- A. normal performance within the specification limits
- B. temporary degradation or less of function or performance which is self-recoverable
- C. temporary degradation or less of function or performance which require operator intervention or system reset

1.8 Test Facility

1.8.1 General information

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 22, 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.

1.8.2 Accreditation and listing



1.8.3 Measurement uncertainty

(According to CISPR 16-4 and Lab. 34)

Test item	Measurement uncertainty
Conducted emission	± 3.3 dB
Radiated emission Horizontal	± 4.0 dB
Vertical	± 4.4 dB

2. Summary of test results

Result : Complied

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

Section of the product standard	Applied standard	Test result	
Electromagnetic Emission Test			
3.1	Conducted Emission	FCC Part 15, Subpart B	Complied
3.2	Radiated Emission	FCC Part 15, Subpart B	Complied

3. Description of individual tests

3.1 Conducted emission

3.1.1 Test information

Test engineer	Seung Beom, Choi
Test date	April 18, 2006
Climate condition	Ambient temperature : 21.5 , Relative humidity : 34 % Atmospheric pressure 101.3 kPa
Test place	Shielded room # 1

3.1.2 Test equipment

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Field strength meter	ESCI	R&S	10086	2007-03-28	12
L.I.S.N	ENV216	R&S	100116	2006-09-08	12
L.I.S.N	ENV216	R&S	100117	2006-08-18	12

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.

See photo.

Test Result

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

Operating Mode : PC camera mode

[Graph and Data]

Test Information

EUT Name: SC-DC565
 Serial Number:
 Test Description: 110V, 60Hz
 Operating Conditions: PC camera mode (USB connected)
 Operator Name: SB, Choi
 Comment:

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

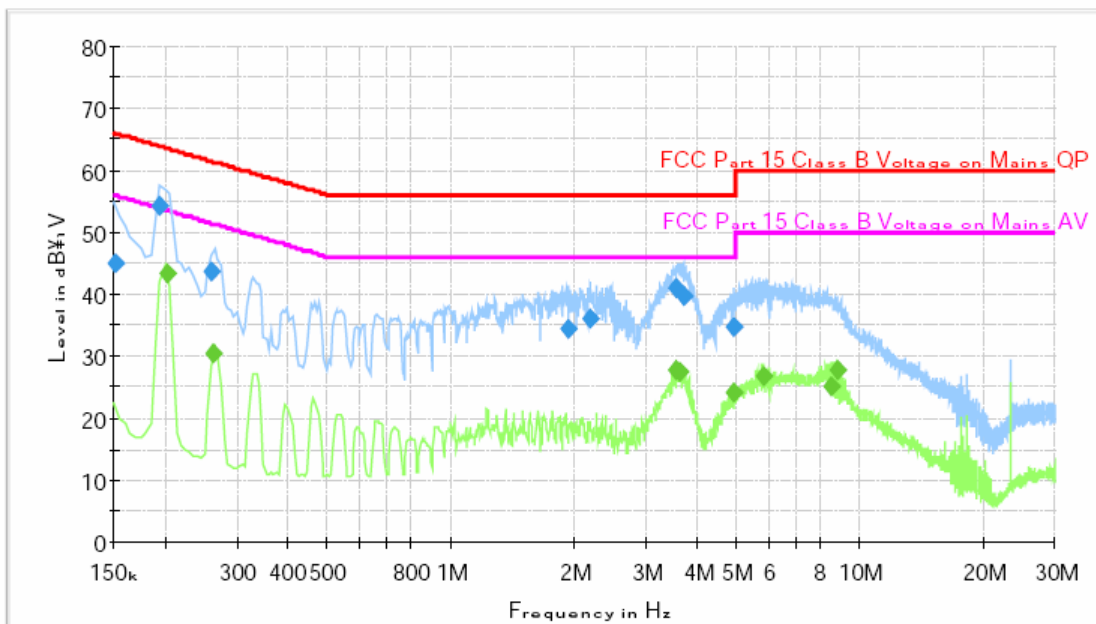
Subrange 1
 Frequency Range: 150kHz - 30MHz
 Receiver: ESCI 3
 Transducer: ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: FCC Part 15 Class B_2-Line-LISN fin [EMI conducted]

Hardware Setup: Voltage with 2-Line-LISN
 Level Unit: dBµV

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

FCC Part 15 Class _B with 2-Line-LISN



Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.202500	43.4	5000.000	9.000	On	L1
0.263500	30.3	5000.000	9.000	On	L1
3.565500	27.7	5000.000	9.000	On	L1
3.635500	27.4	5000.000	9.000	On	L1
4.938500	24.2	5000.000	9.000	On	L1
5.830500	26.9	5000.000	9.000	On	N
8.502500	25.2	5000.000	9.000	On	N
8.777500	27.8	5000.000	9.000	On	N

(continuation of the "Final Measurement Detector 2" table from column 6 ...)

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.202500	9.6	10.1	53.5	
0.263500	9.6	21.0	51.3	
3.565500	9.6	18.3	46.0	
3.635500	9.6	18.6	46.0	
4.938500	9.6	21.8	46.0	
5.830500	9.6	23.1	50.0	
8.502500	9.7	24.8	50.0	
8.777500	9.7	22.2	50.0	

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.151000	45.1	5000.000	9.000	On	L1
0.194500	54.2	5000.000	9.000	On	L1
0.260500	43.6	5000.000	9.000	On	L1
1.937500	34.4	5000.000	9.000	On	L1
2.196500	36.0	5000.000	9.000	On	L1
3.563500	41.1	5000.000	9.000	On	L1
3.700500	39.8	5000.000	9.000	On	N
4.929500	34.6	5000.000	9.000	On	N

(continuation of the "Final Measurement Detector 1" table from column 6 ...)

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.151000	9.6	20.9	65.9	
0.194500	9.6	9.7	63.8	
0.260500	9.6	17.8	61.4	
1.937500	9.6	21.6	56.0	
2.196500	9.6	20.0	56.0	
3.563500	9.6	14.9	56.0	
3.700500	9.6	16.2	56.0	
4.929500	9.6	21.4	56.0	

Operating Mode : Mass storage mode

[Graph and Data]

Test Information

EUT Name: SC-DC565
 Serial Number:
 Test Description: 110V, 60Hz
 Operating Conditions: mass storage mode (USB connected)
 Operator Name: SB, Choi
 Comment:

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

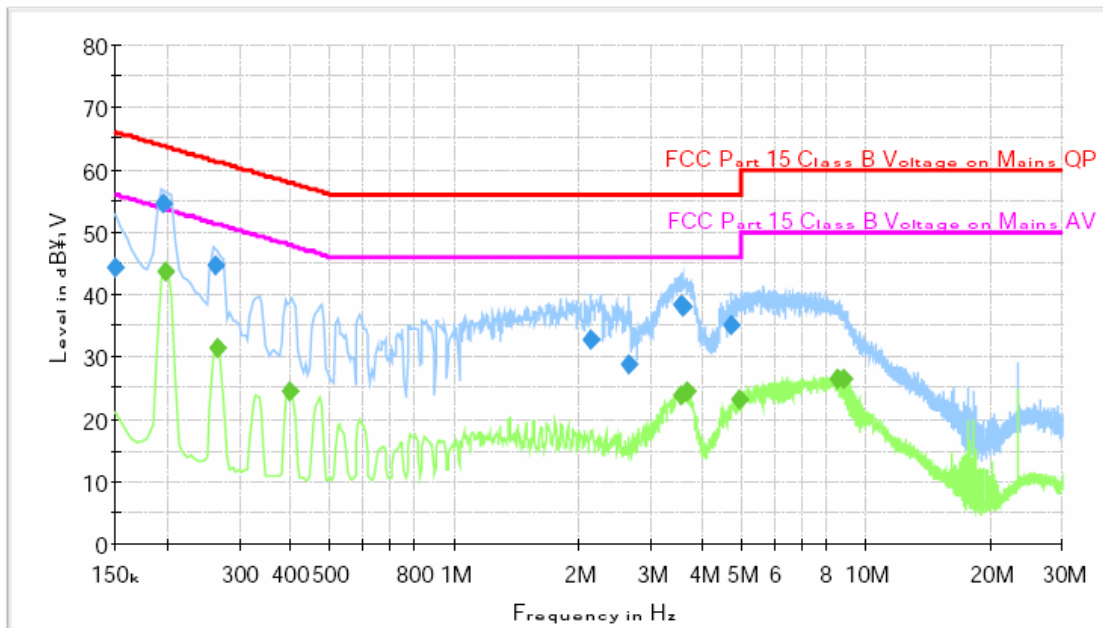
Subrange 1
 Frequency Range: 150kHz - 30MHz
 Receiver: ESCI 3
 Transducer: ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: FCC Part 15 Class B_2-Line-LISN fin [EMI conducted]

Hardware Setup: Voltage with 2-Line-LISN
 Level Unit: dBµV

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

FCC Part 15 Class _B with 2-Line-LISN



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.150000	44.4	5000.000	9.000	On	N
0.195500	54.5	5000.000	9.000	On	N
0.261500	44.7	5000.000	9.000	On	L1
2.139500	32.8	5000.000	9.000	On	N
2.651500	28.7	5000.000	9.000	On	N
3.547500	38.2	5000.000	9.000	On	L1
3.607500	37.9	5000.000	9.000	On	N
4.720500	35.2	5000.000	9.000	On	L1

(continuation of the "Final Measurement Detector 1" table from column 6 ...)

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	9.6	21.6	66.0	
0.195500	9.6	9.3	63.8	
0.261500	9.6	16.7	61.4	
2.139500	9.6	23.2	56.0	
2.651500	9.6	27.3	56.0	
3.547500	9.6	17.8	56.0	
3.607500	9.6	18.1	56.0	
4.720500	9.6	20.8	56.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.198500	43.8	5000.000	9.000	On	N
0.265500	31.5	5000.000	9.000	On	N
0.399500	24.5	5000.000	9.000	On	L1
3.540500	23.8	5000.000	9.000	On	N
3.682500	24.6	5000.000	9.000	On	L1
4.909500	23.1	5000.000	9.000	On	L1
8.525500	26.5	5000.000	9.000	On	N
8.785500	26.6	5000.000	9.000	On	L1

(continuation of the "Final Measurement Detector 2" table from column 6 ...)

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.198500	9.6	9.9	53.7	
0.265500	9.6	19.8	51.3	
0.399500	9.6	23.4	47.9	
3.540500	9.6	22.2	46.0	
3.682500	9.6	21.4	46.0	
4.909500	9.6	22.9	46.0	
8.525500	9.7	23.5	50.0	
8.785500	9.7	23.4	50.0	

3.2 Radiated emission

3.2.1 Test information

Test engineer	Seung Beom, Choi
Test date	April 18, 2006
Climate condition	Ambient temperature : 24.0 , Relative humidity : 40 % Atmospheric pressure 102.0 kPa
Test place	10 m Semi-Anechoic Chamber # 2

3.2.2 Test equipment

Equipment	Model name	Manufacturer	Serial no.	Calibration	
				Next date	Interval
EMI Test Receiver	ESI-26	R&S	100289	2007-03-13	12
Ant. Mast	MA4000	inn-co	-	N/A	N/A
Ant. Mast	MA4000	inn-co	-	N/A	N/A
Mast Controller	CO2000	inn-co	-	N/A	N/A
Amplifier	310N	SONOMA	251675	2007-03-05	12
RF selector	NS4900	TOYO	-	N/A	N/A
Bi-log Antenna	CBL6141A	SCHAFFNER	4265	2006-05-24	12
Bi-log Antenna	CBL6141A	SCHAFFNER	4267	2006-05-24	12

EUT Test Setup

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

All ports terminated into characteristic loads.

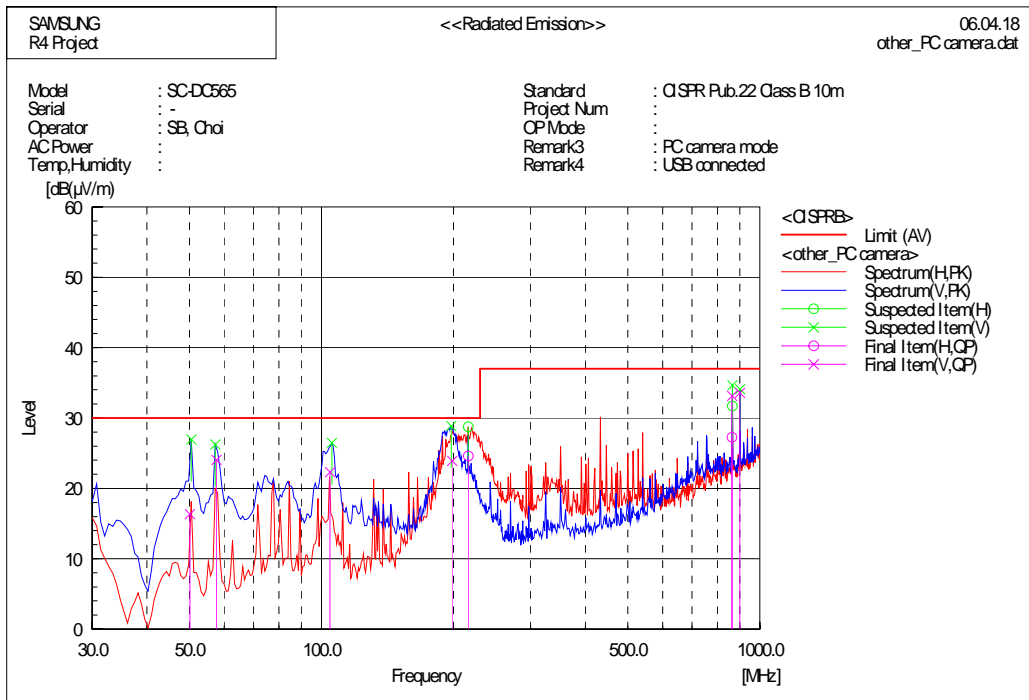
Test Result

Measurement Results	Complied The measured emissions of the EUT have found to be below the specified limits.
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Test Data (Other Frequency)

Operating Mode : PC camera mode

[Graph and Data]



Final Result

--- Horizontal Polarization (QP)---

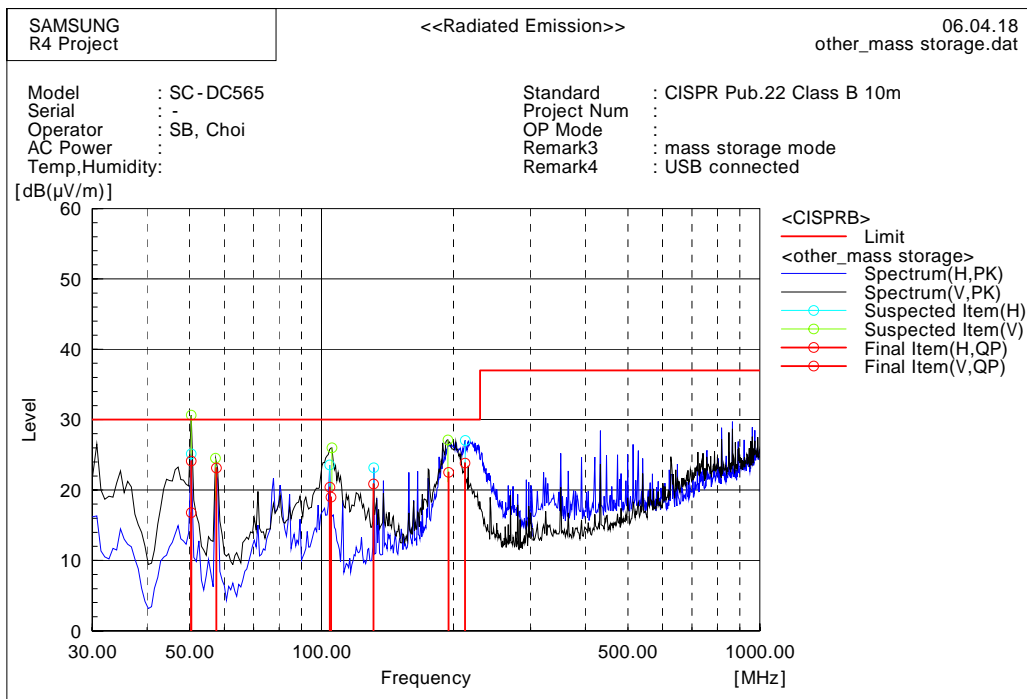
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Remark
1	216.293	45.6	-21.0	24.6	30.0	5.4	
2	864.030	34.6	-7.3	27.3	37.0	9.7	

--- 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	198.696	45.3	-21.4	23.9	30.0	6.1	
2	864.030	39.6	-6.4	33.2	37.0	3.8	
3	900.020	39.1	-5.5	33.6	37.0	3.4	
4	50.095	39.7	-23.3	16.4	30.0	13.7	
5	104.601	42.0	-19.7	22.3	30.0	7.7	
6	57.581	52.1	-28.0	24.1	30.0	6.0	

Operating Mode : Mass storage mode

[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	212.426	44.9	-21.1	23.8	30.0	6.2	
2	50.419	39.7	-22.9	16.8	30.0	13.2	
3	104.419	41.4	-21.0	20.4	30.0	9.6	
4	131.419	41.6	-20.7	20.9	30.0	9.1	

--- 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	50.419	47.7	-23.6	24.1	30.0	5.9	
2	195.071	43.8	-21.3	22.5	30.0	7.5	
3	105.060	38.7	-19.7	19.0	30.0	11.0	
4	57.581	51.2	-28.0	23.2	30.0	6.9	



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- * Receiving antenna mode : Horizontal, Vertical
- * Test distance : 10m (RF Semi Anechoic Chamber)
- * Result = Reading + c.f (Antenna factor + Cable loss- Amp Gain)
- * Margin = Limit – Result

4. Appendix

4.1 Test photography



Picture 1. Conducted emission



Picture 2. Radiated emission (Front)



Picture 3. Radiated emission (Rear)

4.2 EUT photography



Picture 4. EUT (Front)



Picture 5. EUT (Rear)



Picture 6. EUT (Left)



Picture 7. EUT (Right)



ELECTRONICS



Report No. : LBE061160

SAMSUNG

CLASS 1 LASER PRODUCT

FCC ID : A3L06RAINBOW2

DVD CAMERA RECORDER

MODEL : SC-DC563

DC IN : 7.4V \equiv 0.76A

MADE IN KOREA "D"

COMPLIES WITH 21 CFR CHAPTER 1, SUBCHAPTER J

SAMSUNG ELECTRONICS CO.,LTD. SUWON-CITY, KOREA

UL AUDIO/VIDEO APPARATUS **US LISTED**
2AA9 E221083

SAMSUNG

CLASS 1 LASER PRODUCT

FCC ID : A3L06RAINBOW2

DVD CAMERA RECORDER

MODEL : SC-DC564

DC IN : 7.4V \equiv 0.78A

MADE IN KOREA "D"

COMPLIES WITH 21 CFR CHAPTER 1, SUBCHAPTER J

SAMSUNG ELECTRONICS CO.,LTD. SUWON-CITY, KOREA

UL AUDIO/VIDEO APPARATUS **US LISTED**
2AA9 E221083

SAMSUNG

CLASS 1 LASER PRODUCT

FCC ID : A3L06RAINBOW2

DVD CAMERA RECORDER

MODEL : SC-DC565

DC IN : 7.4V \equiv 0.78A

MADE IN KOREA "D"

COMPLIES WITH 21 CFR CHAPTER 1, SUBCHAPTER J

SAMSUNG ELECTRONICS CO.,LTD. SUWON-CITY, KOREA

UL AUDIO/VIDEO APPARATUS **US LISTED**
2AA9 E221083

Picture 8. EUT (Label)