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)	Project No. : LBE052819 Page (1)/(57)	

1. Applicant

◦ Name of organization : Samsung Electronics Co., Ltd.
◦ Address : 416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 443-742 Korea
◦ Date of application : 2005.12.9

2. Purpose for the report : Evaluation by KOLAS

3. Kind of product : DVD player/Video Cassette Recorder (Model name : DVD-V5600)

4. Date of test : 2005.11.30 ~ 2005.12.8

5. Applied standard : FCC Part 15:2003 Subpart B

6. Test result : **PASS**

The equipment under test has found to be compliant with the applied standards.

(Refer to the attached test result for more detail.)

7. FCC ID : A3LDVDV5600

8. Broadcasting system : NTSC-M

Tested by	Reviewed by
Name : Seung Beom, Choi	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.

2005. 12. 9

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

TEST RESULT

Test Report No.	:	LBE052819
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 : DVD player / Video Casette Recorder 2. Model name : DVD-V5600 3. Brand name : Samsung 4. Variant model : None
Test Method	:	**ANSI C 63.4:2003**
Test Result	:	**PASS** 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	:	2005.12.9

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1. General information

1.1 Basic information related product

Applicant	Samsung Electronics Co., Ltd.
Model name	DVD-V5600
Applicant address	416 Maetan 3-Dong, Yeongtong-Gu,Suwon-Si,Gyeonggi-Do 443-742 Korea
Contact person	Seung Beom, Choi
Kind of product	DVD player/Video Casette Recorder
Valiant model	None
Manufacturer	Samsung Electronics Co., Ltd. 416 Maetan 3-Dong, Yeongtong-Gu,Suwon-Si,Gyeonggi-Do 443-742 Korea
Rated power	AC 120 V, 60 Hz
New / Alternative / Permissive change information	New

1.2 Detail Information related product

1.2.1 Specification

Inputs	AUDIO	2 Stereo audio inputs, RCA Connector, -8dbm, 47KΩ, front and rear
	VIDEO	2 Composite video inputs, RCA Connector, 75Ω, 1Vp-p
	RF	Antenna or CATV Input, F-Connector, 75Ω
Outputs	AUDIO	1 Stereo audio outputs, RCA Connector, -8dbm, 1.5KΩ
	AUDIO (DVD only)	1 Digital audio output (1 coaxial) 1 pair Stereo audio outputs
	VIDEO	1 Composite video output, RCA Connector, 75Ω, 1Vp-p
	VIDEO (DVD only)	1 S-Video output, S-Connector, 75Ω, Y=1.0Vp-p, C=0.286Vp-p
		1 Component video output, 75Ω, Y=1.0Vp-p, Pb=0.7Vp-p, Pr=0.7Vp-p

VCR	RF	Channel 3 or 4
	VIDEO SYSTEM	1/2-inch VHS system, 4 rotary head helical scanning; FM azimuth luminance;chrominance: converted sub system phase shift
	AUDIO TRACK	Normal: 1 track; Hi-Fi: 2 track
	PLAY/RECORD TIME	T-180 tape: SP 3 hours, SLP 9 hours
	FF/REW TIME	T-120 tape: <2 minutes
	HEADS	Video: DA 4 rotary Audio: 2 rotary heads (Hi-Fi); 1 stationary head (Linear) Control: 1 stationary head Erase: 1 full track, 1 audio track
	WOW & FLUTTER	Less than 0.005% (Hi-Fi)
	FREQ. RESPONSE	20-20,000 Hz (Hi-Fi)
DVD	DISC COMPATIBILITY	CD, CD-R, CD-RW DVD-Video, CD-Digital Audio (5" and 3.5")
	FREQ. RESPONSE	96/48 kHz Sampling: 4 Hz-22kHz
	S/N RATIO	110 dB
	DYNAMIC RANGE	96 dB
	THD	0.003 %
SYSTEM	POWER REQUIREMENT	120V AC, 60 Hz, 25 watts
	ENVIRONMENT	41-104˚F (5-40˚C); 10%-75% humidity
	WEIGHT	13.8 lbs.

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) at each RF out channel 3 and 4.

- VCR REC (NTSC)
- VCR REC (1V VITS)
- VCR REC (5V VITS)
- VCR PLAY
- DVD PLAY

1.4 Equipment modifications

No equipment modifications were required.

1.5 Test configuration

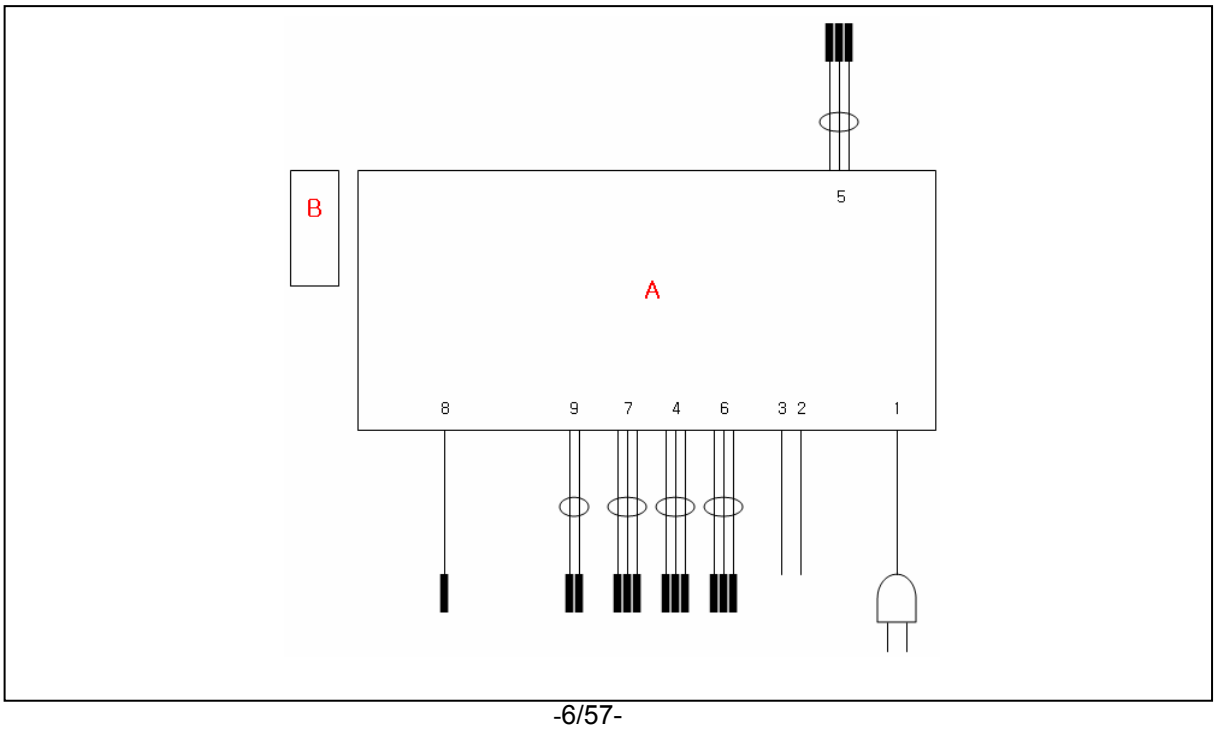
1.5.1 Used EUT and peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	FCC ID/DoC
A	DVD player / Video Casette Recorder	DVD-V5600	-	Samsung	A3LDVDV5600
B	Remote Controller	-	-	Samsung	DoC

1.5.2 Used cable description

No	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	Power	1.5	No	For EUT
2	ANT in	1.5	No	To the SG
3	RF out	1.5	No	Termination
4	Composite1 in	1.5	No	Termination
5	Composite2 in	1.5	No	Termination
6	Composite out	1.5	No	Termination
7	Component out	1.5	No	Termination
8	S-video out	2.0	No	Termination
9	Audio out	1.5	No	Termination

1.5.3 Block diagram



1.6 Applied Standards

Test standard	Test method
FCC Part 15:2003 Subpart B	ANSI C63.4:2003

1.7 Test Facility

1.7.1 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.

1.7.2 Accreditation and listing

1.7.3 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 : PASS

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

Section of the product standard		Applied standard	Test result
3.1	Conducted Emission	FCC Part 15:2003 Subpart B	Complied
3.2	Radiated Emission	FCC Part 15:2003 Subpart B	Complied
3.2	Output Signal Level	FCC Part 15:2003 Subpart B	Complied
3.3	Output Terminal Conducted Spurious Emission	FCC Part 15:2003 Subpart B	Complied
3.4	Antenna Transfer Switch	FCC Part 15:2003 Subpart B	Complied

3. Description of individual tests

3.1 Conducted emission

3.1.1 Test information

Test engineer	Seung Beom, Choi
Test date	December 2, 2005
Climate condition	Ambient temperature : 22.0 ℃, Relative humidity : 37 % Atmospheric pressure 1016 hPa
Test place	Shielded room #2

3.1.2 Test equipment

Equipment	Model name	Manufacturer	Serial no.	Calibration	
				Next date	Interval
Test Software	EMC 32	R&S	None	N/A	N/A
Field strength meter	ESCI	R&S	100136	2006-04-17	12
L.I.S.N	ENV216	R&S	100116	2006-09-08	12
L.I.S.N	ENV216	R&S	100107	2006-08-18	12
TV Signal Generator	PM5418-TDSI	PHILIPS	LO612437	2006-10-10	12

3.1.3 Test result : Pass

The measured emission of the EUT has been found to be below the specified limits.

3.1.4 Test data and graph

The Initial step in collecting conducted data was to perform a peak and average scan over the measurement range using a receiver.

■ Operating Mode: VCR record (1V VITS) – RF out CH03

SAMSUNG ELECTRONICS EMC Report

Test Information

EUT Name:	DVD-V5600
Serial Number:	
Test Description:	
Operating Conditions:	VCR rec (1V VITS)
Operator Name:	SB, Choi
Comment:	
Description	RF out CH03

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

Subrange 1

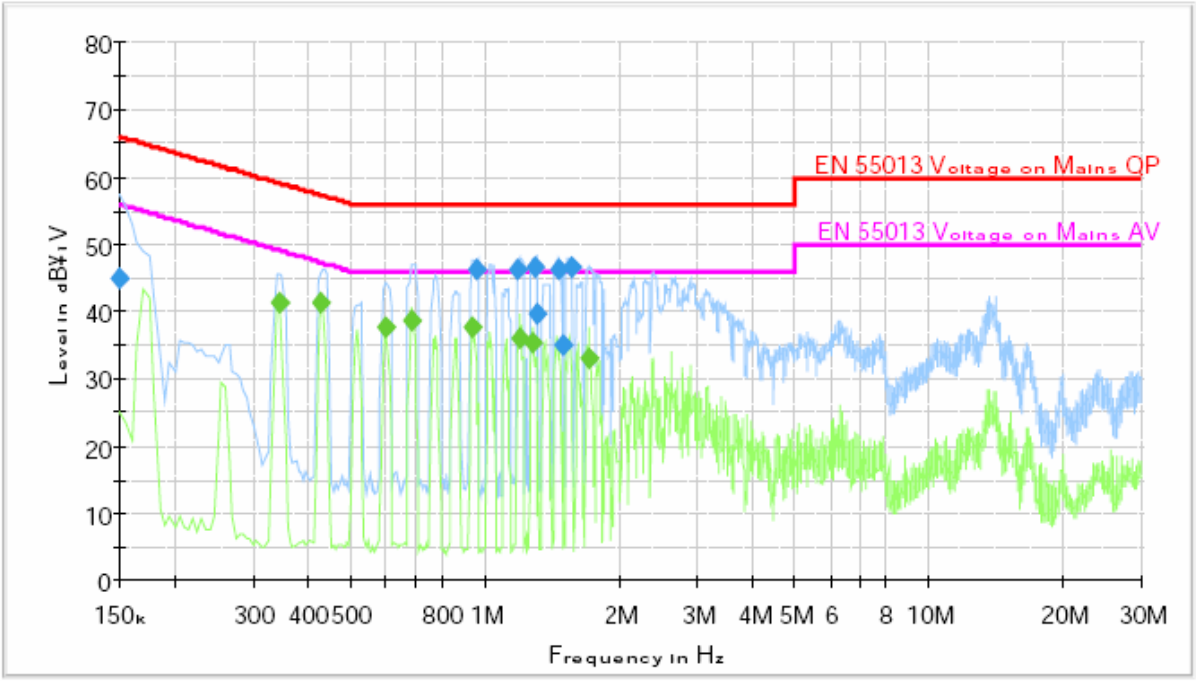
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55013_2-Line-LISN fin [EMI conducted]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	0.1s	ESCI 3

EN55013 with 2-Line-LISN



Final Measurement Detector 2

Frequency (MHz)	Average (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.344500	41.4	100.000	9.000	Off	L1
0.425500	41.2	100.000	9.000	Off	N
0.595500	37.7	100.000	9.000	Off	L1
0.685500	38.5	100.000	9.000	Off	N
0.934500	37.5	100.000	9.000	Off	N
1.195500	36.1	100.000	9.000	Off	L1
1.279500	35.4	100.000	9.000	Off	N
1.714500	33.1	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.344500	9.6	7.7	49.1	
0.425500	9.6	6.1	47.3	
0.595500	9.6	8.3	46.0	
0.685500	9.6	7.5	46.0	
0.934500	9.6	8.5	46.0	
1.195500	9.6	9.9	46.0	
1.279500	9.6	10.6	46.0	
1.714500	9.6	12.9	46.0	

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.150000	45.1	100.000	9.000	Off	L1
0.954500	46.3	100.000	9.000	Off	L1
1.185500	46.3	100.000	9.000	Off	L1
1.300500	46.5	100.000	9.000	Off	L1
1.315500	39.5	100.000	9.000	Off	L1
1.465500	46.4	100.000	9.000	Off	L1
1.490500	35.2	100.000	9.000	Off	L1
1.560500	46.5	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.150000	9.6	20.9	66.0	
0.954500	9.6	9.7	56.0	
1.185500	9.6	9.7	56.0	
1.300500	9.6	9.5	56.0	
1.315500	9.6	16.5	56.0	
1.465500	9.6	9.6	56.0	
1.490500	9.6	20.8	56.0	
1.560500	9.6	9.5	56.0	

■ Operating Mode: VCR record (1V VITS) – RF out CH04

SAMSUNG ELECTRONICS EMC Report

Test Information

EUT Name:	DVD-V5600
Serial Number:	
Test Description:	
Operating Conditions:	VCR rec (1V VITS)
Operator Name:	SB, Choi
Comment:	
Description	RF out CH04

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

Subrange 1

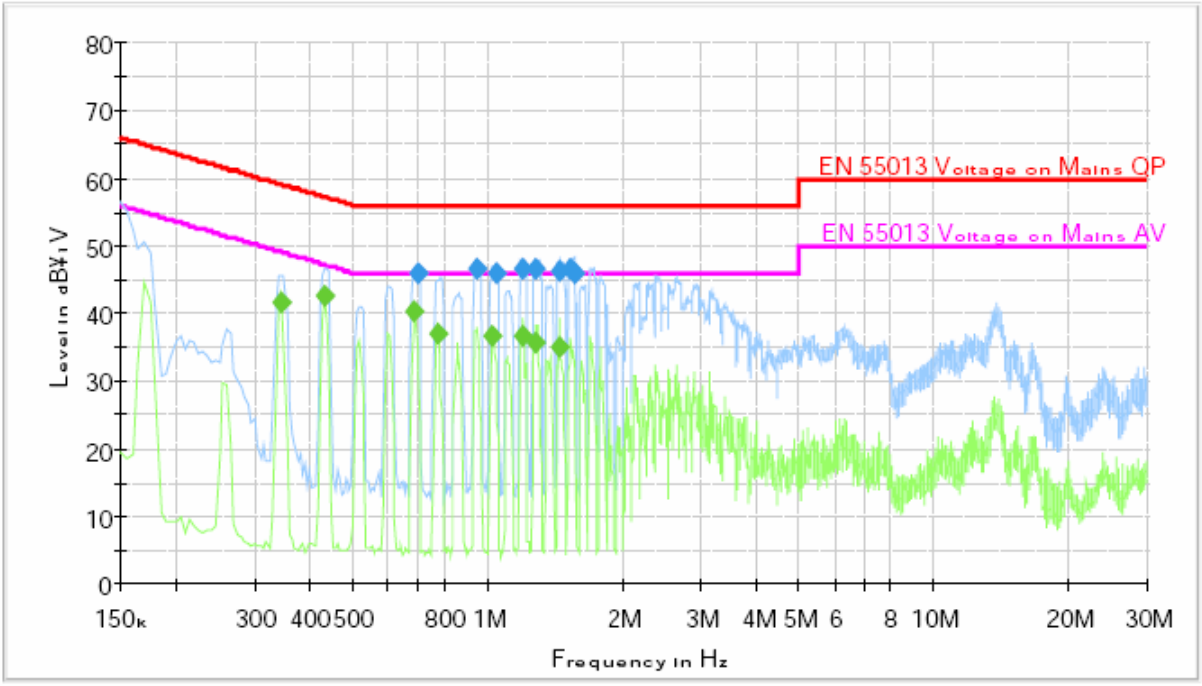
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55013_2-Line-LISN fin [EMI conducted]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	0.1s	ESCI 3

EN55013 with 2-Line-LISN



Final Measurement Detector 2

Frequency (MHz)	Average (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.345500	41.6	100.000	9.000	Off	L1
0.430500	42.5	100.000	9.000	Off	L1
0.685500	40.3	100.000	9.000	Off	L1
0.770500	37.0	100.000	9.000	Off	L1
1.025500	36.8	100.000	9.000	Off	L1
1.195500	36.6	100.000	9.000	Off	L1
1.285500	35.8	100.000	9.000	Off	L1
1.450500	35.1	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.345500	9.6	7.5	49.1	
0.430500	9.6	4.7	47.2	
0.685500	9.6	5.7	46.0	
0.770500	9.6	9.0	46.0	
1.025500	9.6	9.2	46.0	
1.195500	9.6	9.4	46.0	
1.285500	9.6	10.2	46.0	
1.450500	9.6	10.9	46.0	

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.695500	45.8	100.000	9.000	Off	L1
0.950500	46.5	100.000	9.000	Off	L1
1.040500	45.8	100.000	9.000	Off	L1
1.195500	46.7	100.000	9.000	Off	L1
1.284500	46.7	100.000	9.000	Off	L1
1.449500	46.4	100.000	9.000	Off	L1
1.540500	46.7	100.000	9.000	Off	L1
1.570500	45.9	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.695500	9.6	10.2	56.0	
0.950500	9.6	9.5	56.0	
1.040500	9.6	10.2	56.0	
1.195500	9.6	9.3	56.0	
1.284500	9.6	9.3	56.0	
1.449500	9.6	9.6	56.0	
1.540500	9.6	9.3	56.0	
1.570500	9.6	10.1	56.0	

■ Operating Mode: VCR record (5V VITS) – RF out CH03

SAMSUNG ELECTRONICS EMC Report

Test Information

EUT Name:	DVD-V5600
Serial Number:	
Test Description:	
Operating Conditions:	VCR rec (5V VITS)
Operator Name:	SB, Choi
Comment:	
Description	RF out CH03

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

Subrange 1

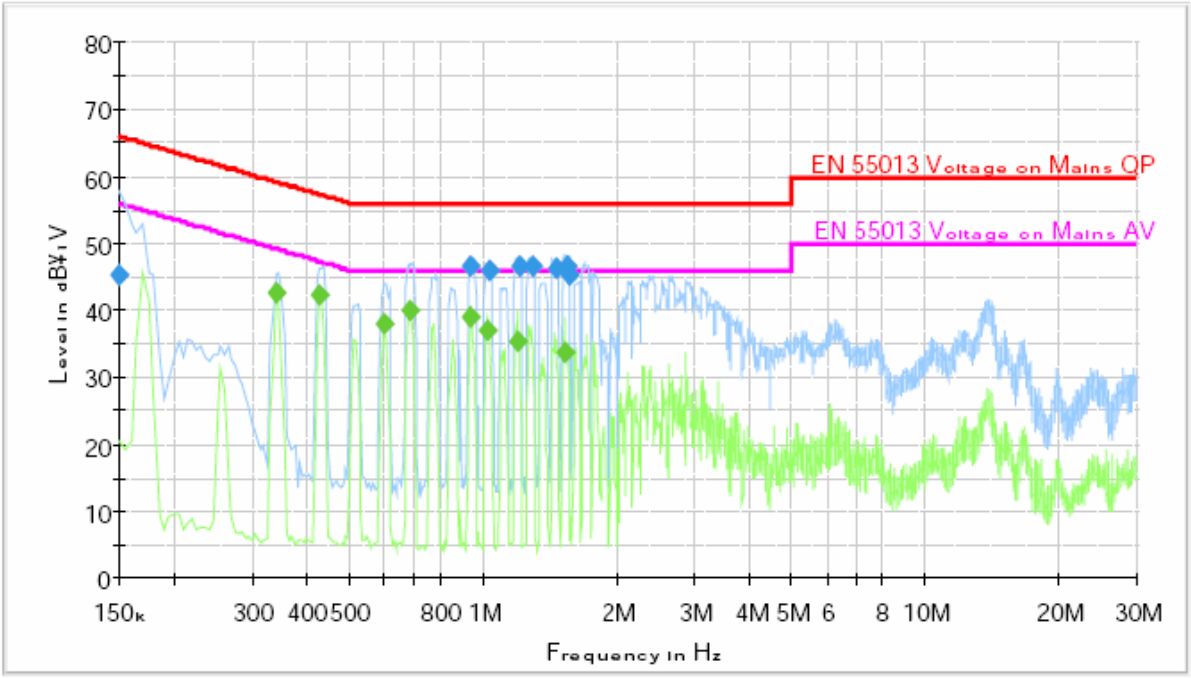
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55013_2-Line-LISN fin [EMI conducted]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	0.1s	ESCI 3

EN55013 with 2-Line-LISN



Final Measurement Detector 2

Frequency (MHz)	Average (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.340500	42.5	100.000	9.000	Off	L1
0.425500	42.2	100.000	9.000	Off	L1
0.599500	37.9	100.000	9.000	Off	L1
0.684500	40.0	100.000	9.000	Off	L1
0.935500	38.9	100.000	9.000	Off	L1
1.020500	37.0	100.000	9.000	Off	N
1.199500	35.3	100.000	9.000	Off	L1
1.530500	33.6	100.000	9.000	Off	N

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.340500	9.6	6.6	49.2	
0.425500	9.6	5.1	47.3	
0.599500	9.6	8.1	46.0	
0.684500	9.6	6.0	46.0	
0.935500	9.6	7.1	46.0	
1.020500	9.6	9.0	46.0	
1.199500	9.6	10.7	46.0	
1.530500	9.6	12.4	46.0	

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.150000	45.2	100.000	9.000	Off	N
0.939500	46.5	100.000	9.000	Off	L1
1.035500	45.8	100.000	9.000	Off	L1
1.209500	46.7	100.000	9.000	Off	L1
1.290500	46.6	100.000	9.000	Off	L1
1.465500	46.3	100.000	9.000	Off	L1
1.544500	46.7	100.000	9.000	Off	L1
1.565500	45.1	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.150000	9.6	20.8	66.0	
0.939500	9.6	9.5	56.0	
1.035500	9.6	10.2	56.0	
1.209500	9.6	9.3	56.0	
1.290500	9.6	9.4	56.0	
1.465500	9.6	9.7	56.0	
1.544500	9.6	9.3	56.0	
1.565500	9.6	10.9	56.0	

■ Operating Mode: VCR record (5V VITS) – RF out CH04

SAMSUNG ELECTRONICS EMC Report

Test Information

EUT Name:	DVD-V5600
Serial Number:	
Test Description:	
Operating Conditions:	VCR rec (5V VITS)
Operator Name:	SB, Choi
Comment:	
Description	RF out CH04

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

Subrange 1

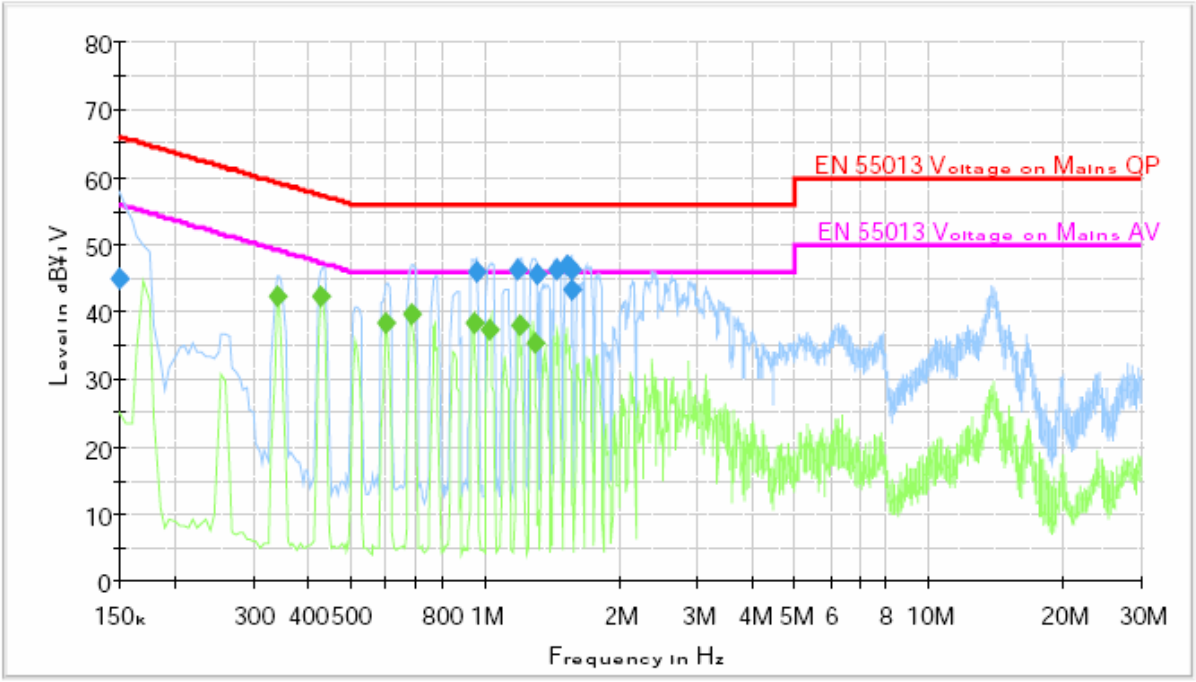
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55013_2-Line-LISN fin [EMI conducted]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	0.1s	ESCI 3

EN55013 with 2-Line-LISN



Final Measurement Detector 2

Frequency (MHz)	Average (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.340500	42.5	100.000	9.000	Off	L1
0.425500	42.3	100.000	9.000	Off	L1
0.595500	38.2	100.000	9.000	Off	L1
0.684500	39.7	100.000	9.000	Off	L1
0.940500	38.3	100.000	9.000	Off	L1
1.025500	37.4	100.000	9.000	Off	L1
1.190500	38.0	100.000	9.000	Off	L1
1.289500	35.4	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.340500	9.6	6.7	49.2	
0.425500	9.6	5.0	47.3	
0.595500	9.6	7.8	46.0	
0.684500	9.6	6.3	46.0	
0.940500	9.6	7.7	46.0	
1.025500	9.6	8.6	46.0	
1.190500	9.6	8.0	46.0	
1.289500	9.6	10.6	46.0	

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.150000	45.0	100.000	9.000	Off	L1
0.955500	46.1	100.000	9.000	Off	L1
1.185500	46.3	100.000	9.000	Off	L1
1.304500	45.8	100.000	9.000	Off	L1
1.450500	46.4	100.000	9.000	Off	L1
1.530500	46.8	100.000	9.000	Off	L1
1.560500	46.1	100.000	9.000	Off	L1
1.570500	43.4	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.150000	9.6	21.0	66.0	
0.955500	9.6	9.9	56.0	
1.185500	9.6	9.7	56.0	
1.304500	9.6	10.2	56.0	
1.450500	9.6	9.6	56.0	
1.530500	9.6	9.2	56.0	
1.560500	9.6	9.9	56.0	
1.570500	9.6	12.6	56.0	

■ Operating Mode: VCR record (NTSC) – RF out CH03

SAMSUNG ELECTRONICS EMC Report

Test Information

EUT Name:	DVD-V5600
Serial Number:	
Test Description:	
Operating Conditions:	VCR rec (NTSC receiving)
Operator Name:	SB, Choi
Comment:	
Description	RF out CH03

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

Subrange 1

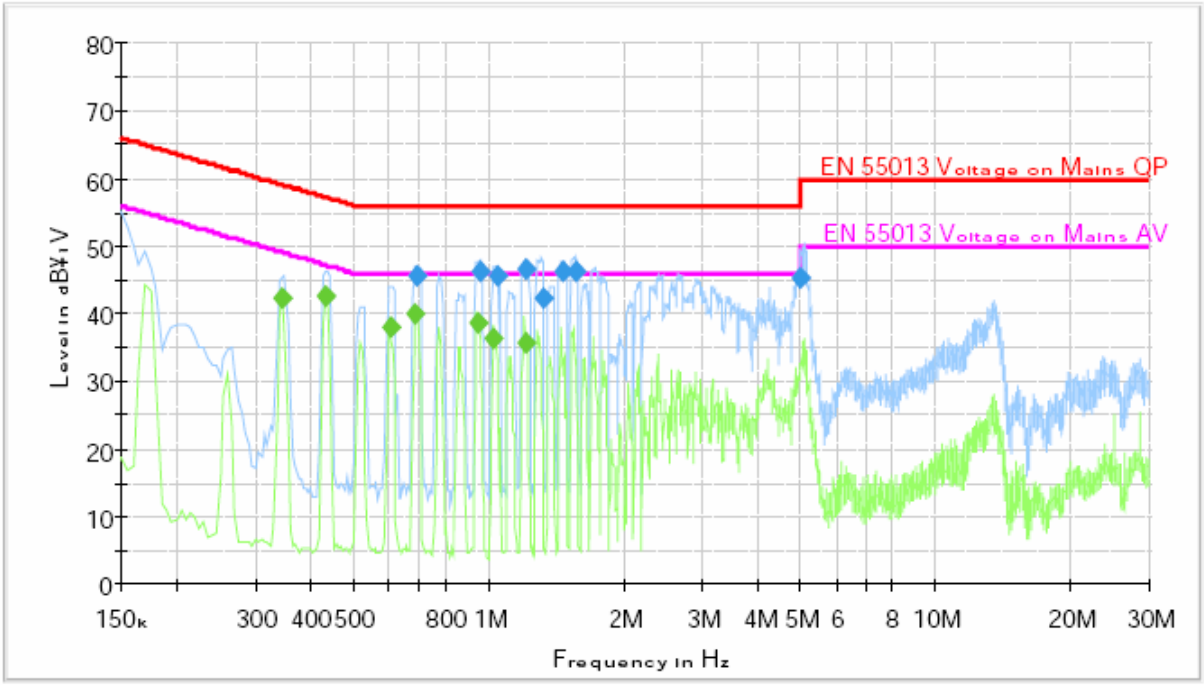
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55013_2-Line-LISN fin [EMI conducted]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	0.1s	ESCI 3

EN55013 with 2-Line-LISN



Final Measurement Detector 2

Frequency (MHz)	Average (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.345500	42.3	100.000	9.000	Off	L1
0.430500	42.6	100.000	9.000	Off	L1
0.600500	38.0	100.000	9.000	Off	L1
0.685500	40.1	100.000	9.000	Off	L1
0.940500	38.6	100.000	9.000	Off	L1
1.025500	36.2	100.000	9.000	Off	N
1.204500	35.8	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.345500	9.6	6.7	49.1	
0.430500	9.6	4.7	47.2	
0.600500	9.6	8.0	46.0	
0.685500	9.6	5.9	46.0	
0.940500	9.6	7.4	46.0	
1.025500	9.6	9.8	46.0	
1.204500	9.6	10.2	46.0	

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.689500	45.8	100.000	9.000	Off	L1
0.959500	46.2	100.000	9.000	Off	L1
1.044500	45.8	100.000	9.000	Off	L1
1.215500	46.6	100.000	9.000	Off	L1
1.319500	42.4	100.000	9.000	Off	L1
1.470500	46.4	100.000	9.000	Off	L1
1.574500	46.2	100.000	9.000	Off	L1
4.999500	45.1	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.689500	9.6	10.2	56.0	
0.959500	9.6	9.8	56.0	
1.044500	9.6	10.2	56.0	
1.215500	9.6	9.4	56.0	
1.319500	9.6	13.6	56.0	
1.470500	9.6	9.6	56.0	
1.574500	9.6	9.8	56.0	
4.999500	9.6	10.9	56.0	

■ Operating Mode: VCR record (NTSC) – RF out CH04

SAMSUNG ELECTRONICS EMC Report

Test Information

EUT Name:	DVD-V5600
Serial Number:	
Test Description:	
Operating Conditions:	VCR rec (NTSC receiving)
Operator Name:	SB, Choi
Comment:	
Description	RF out CH04

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

Subrange 1

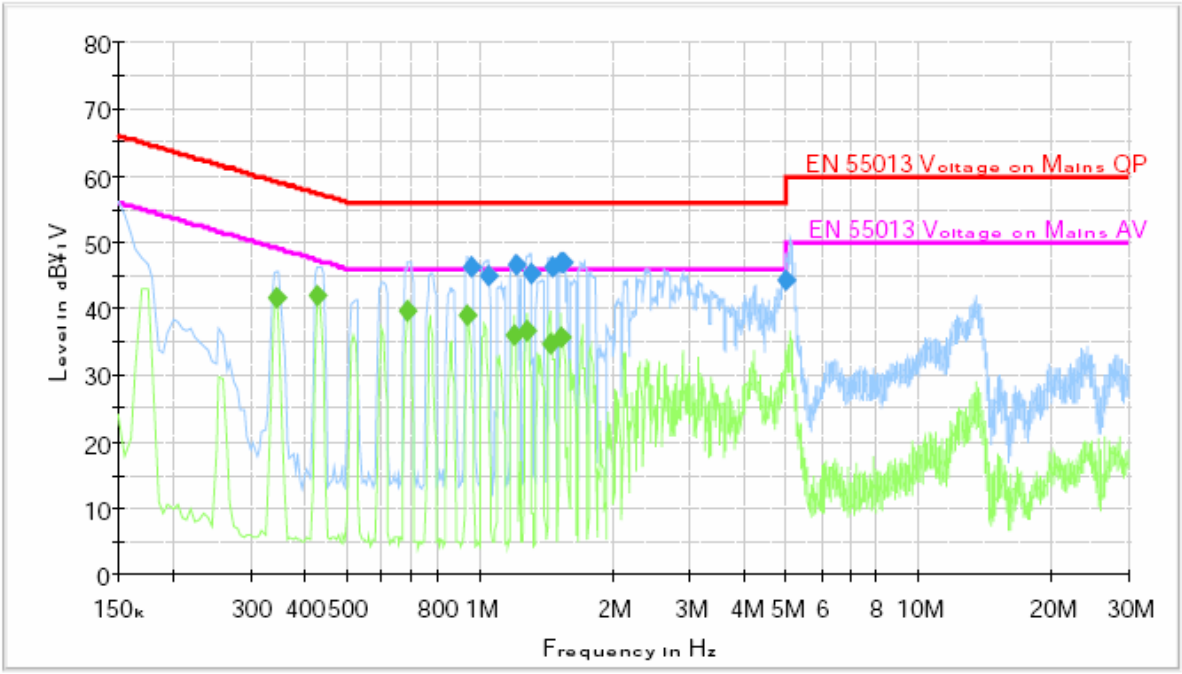
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55013_2-Line-LISN fin [EMI conducted]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	0.1s	ESCI 3

EN55013 with 2-Line-LISN



Final Measurement Detector 2

Frequency (MHz)	Average (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.345500	41.5	100.000	9.000	Off	L1
0.425500	41.9	100.000	9.000	Off	L1
0.685500	39.8	100.000	9.000	Off	L1
0.939500	39.0	100.000	9.000	Off	L1
1.195500	36.0	100.000	9.000	Off	N
1.279500	36.8	100.000	9.000	Off	N
1.449500	34.9	100.000	9.000	Off	L1
1.534500	35.6	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.345500	9.6	7.5	49.1	
0.425500	9.6	5.4	47.3	
0.685500	9.6	6.2	46.0	
0.939500	9.6	7.0	46.0	
1.195500	9.6	10.0	46.0	
1.279500	9.6	9.2	46.0	
1.449500	9.6	11.1	46.0	
1.534500	9.6	10.4	46.0	

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.955500	46.2	100.000	9.000	Off	L1
1.049500	44.8	100.000	9.000	Off	L1
1.214500	46.6	100.000	9.000	Off	L1
1.309500	45.3	100.000	9.000	Off	L1
1.464500	46.4	100.000	9.000	Off	L1
1.535500	47.1	100.000	9.000	Off	L1
1.555500	46.9	100.000	9.000	Off	L1
4.990500	44.2	100.000	9.000	Off	N

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.955500	9.6	9.8	56.0	
1.049500	9.6	11.2	56.0	
1.214500	9.6	9.4	56.0	
1.309500	9.6	10.7	56.0	
1.464500	9.6	9.6	56.0	
1.535500	9.6	8.9	56.0	
1.555500	9.6	9.1	56.0	
4.990500	9.6	11.8	56.0	

■ Operating Mode: VCR play – RF out CH03

SAMSUNG ELECTRONICS EMC Report

Test Information

EUT Name:	DVD-V5600
Serial Number:	
Test Description:	
Operating Conditions:	VCR play
Operator Name:	SB, Choi
Comment:	
Description	RF out CH03

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

Subrange 1

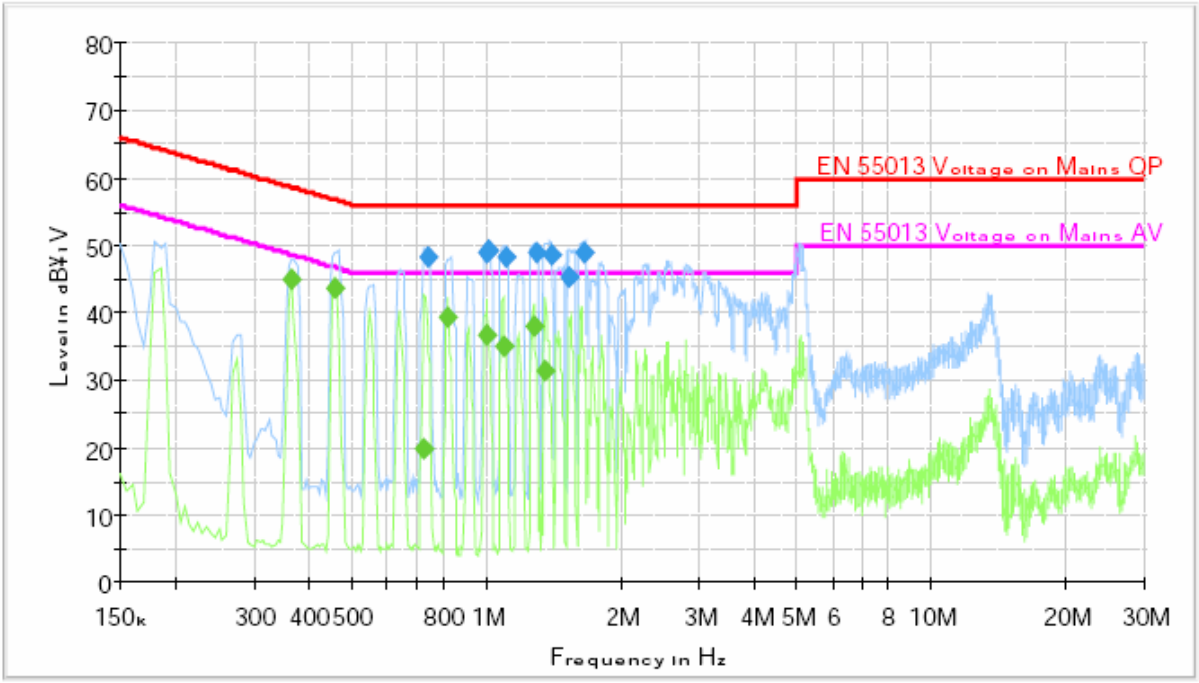
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55013_2-Line-LISN fin [EMI conducted]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	0.1s	ESCI 3

EN55013 with 2-Line-LISN



Final Measurement Detector 2

Frequency (MHz)	Average (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.365500	45.1	100.000	9.000	Off	L1
0.455500	43.5	100.000	9.000	Off	L1
0.720500	20.0	100.000	9.000	Off	L1
0.820500	39.3	100.000	9.000	Off	N
1.000000	36.6	100.000	9.000	Off	L1
1.090500	35.2	100.000	9.000	Off	L1
1.275500	38.0	100.000	9.000	Off	L1
1.360500	31.3	100.000	9.000	Off	N

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.365500	9.6	3.5	48.6	
0.455500	9.6	3.2	46.8	
0.720500	9.6	26.0	46.0	
0.820500	9.6	6.7	46.0	
1.000000	9.6	9.4	46.0	
1.090500	9.6	10.8	46.0	
1.275500	9.6	8.0	46.0	
1.360500	9.6	14.7	46.0	

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.734500	48.3	100.000	9.000	Off	L1
1.000000	49.0	100.000	9.000	Off	L1
1.010500	49.2	100.000	9.000	Off	L1
1.110500	48.2	100.000	9.000	Off	L1
1.295500	49.0	100.000	9.000	Off	L1
1.395500	48.8	100.000	9.000	Off	N
1.535500	45.4	100.000	9.000	Off	L1
1.665500	48.8	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.734500	9.6	7.7	56.0	
1.000000	9.6	7.0	56.0	
1.010500	9.6	6.8	56.0	
1.110500	9.6	7.8	56.0	
1.295500	9.6	7.0	56.0	
1.395500	9.6	7.2	56.0	
1.535500	9.6	10.6	56.0	
1.665500	9.6	7.2	56.0	

■ Operating Mode: VCR play – RF out CH04

SAMSUNG ELECTRONICS EMC Report

Test Information

EUT Name:	DVD-V5600
Serial Number:	
Test Description:	
Operating Conditions:	VCR play
Operator Name:	SB, Choi
Comment:	
Description	RF out CH04

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

Subrange 1

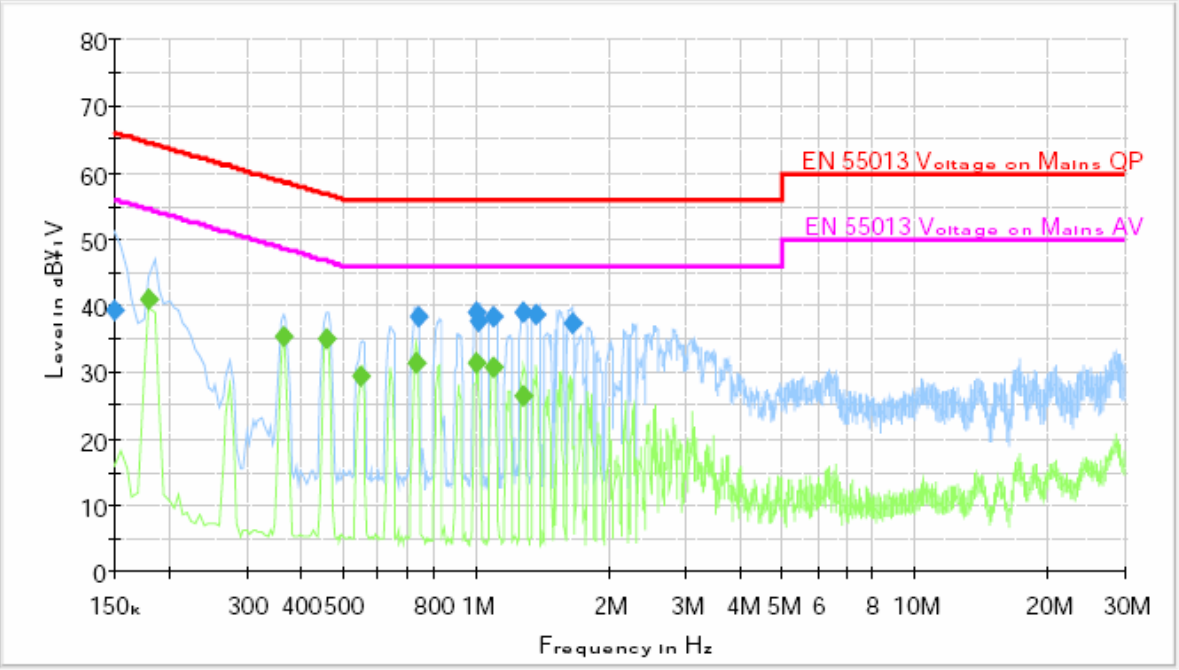
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55013_2-Line-LISN fin [EMI conducted]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	0.1s	ESCI 3

EN55013 with 2-Line-LISN



Final Measurement Detector 2

Frequency (MHz)	Average (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.180500	41.1	100.000	9.000	Off	N
0.365500	35.4	100.000	9.000	Off	L1
0.455500	35.1	100.000	9.000	Off	L1
0.545500	29.6	100.000	9.000	Off	L1
0.730500	31.3	100.000	9.000	Off	L1
1.000500	31.4	100.000	9.000	Off	L1
1.090500	30.6	100.000	9.000	Off	L1
1.280500	26.4	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.180500	9.6	13.4	54.5	
0.365500	9.6	13.2	48.6	
0.455500	9.6	11.7	46.8	
0.545500	9.6	16.4	46.0	
0.730500	9.6	14.7	46.0	
1.000500	9.6	14.6	46.0	
1.090500	9.6	15.4	46.0	
1.280500	9.6	19.6	46.0	

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.150000	39.4	100.000	9.000	Off	L1
0.734500	38.3	100.000	9.000	Off	L1
1.005500	38.9	100.000	9.000	Off	L1
1.015500	37.7	100.000	9.000	Off	L1
1.095500	38.2	100.000	9.000	Off	L1
1.275500	38.9	100.000	9.000	Off	L1
1.365500	38.6	100.000	9.000	Off	L1
1.654500	37.3	100.000	9.000	Off	N

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.150000	9.6	26.6	66.0	
0.734500	9.6	17.7	56.0	
1.005500	9.6	17.1	56.0	
1.015500	9.6	18.3	56.0	
1.095500	9.6	17.8	56.0	
1.275500	9.6	17.1	56.0	
1.365500	9.6	17.4	56.0	
1.654500	9.6	18.7	56.0	

■ Operating Mode: DVD play – RF out CH03

SAMSUNG ELECTRONICS EMC Report

Test Information

EUT Name:	DVD-V5600
Serial Number:	
Test Description:	
Operating Conditions:	DVD play
Operator Name:	SB, Choi
Comment:	
Description	RF out CH03

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

Subrange 1

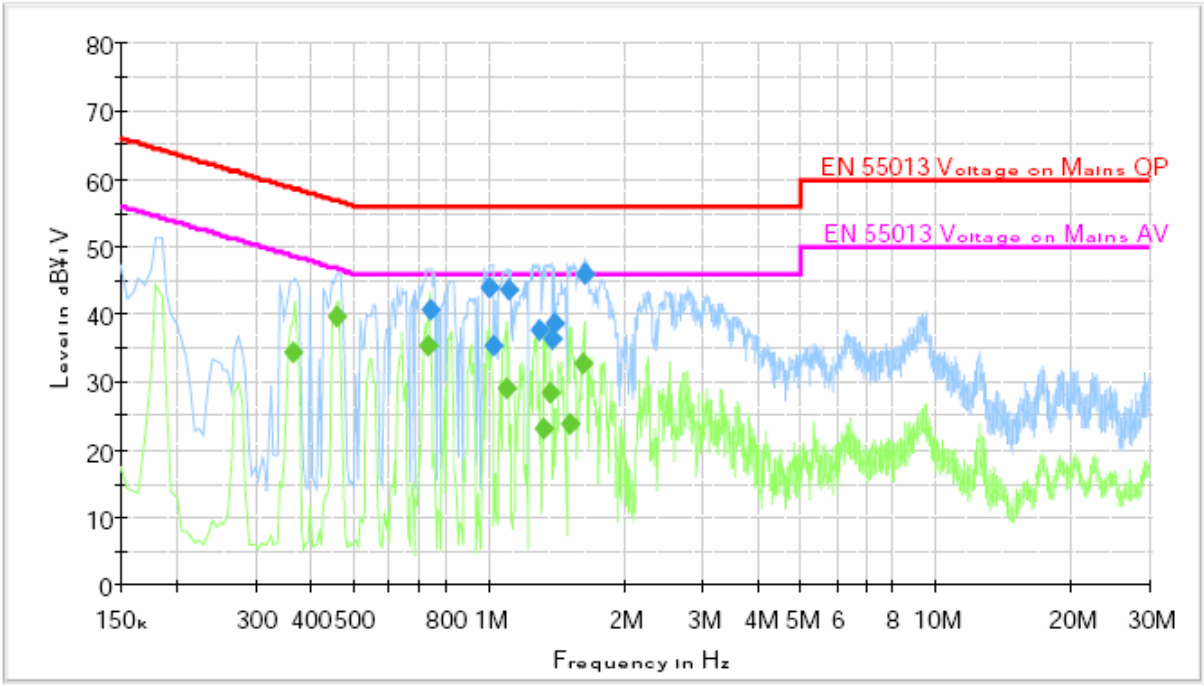
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55013_2-Line-LISN fin [EMI conducted]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	0.1s	ESCI 3

EN55013 with 2-Line-LISN



Final Measurement Detector 2

Frequency (MHz)	Average (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.365500	34.4	100.000	9.000	Off	L1
0.455500	39.6	100.000	9.000	Off	L1
0.730500	35.3	100.000	9.000	Off	L1
1.095500	29.0	100.000	9.000	Off	L1
1.330500	23.3	100.000	9.000	Off	N
1.365500	28.5	100.000	9.000	Off	L1
1.514500	23.9	100.000	9.000	Off	N
1.625500	32.7	100.000	9.000	Off	L1

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.365500	9.6	14.2	48.6	
0.455500	9.6	7.2	46.8	
0.730500	9.6	10.7	46.0	
1.095500	9.6	17.0	46.0	
1.330500	9.6	22.7	46.0	
1.365500	9.6	17.5	46.0	
1.514500	9.6	22.1	46.0	
1.625500	9.6	13.3	46.0	

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.739500	40.7	100.000	9.000	Off	L1
1.005500	44.0	100.000	9.000	Off	L1
1.024500	35.5	100.000	9.000	Off	L1
1.100500	43.5	100.000	9.000	Off	L1
1.300500	37.7	100.000	9.000	Off	L1
1.389500	36.2	100.000	9.000	Off	L1
1.399500	38.8	100.000	9.000	Off	L1
1.634500	46.1	100.000	9.000	Off	N

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.739500	9.6	15.3	56.0	
1.005500	9.6	12.0	56.0	
1.024500	9.6	20.5	56.0	
1.100500	9.6	12.5	56.0	
1.300500	9.6	18.3	56.0	
1.389500	9.6	19.8	56.0	
1.399500	9.6	17.2	56.0	
1.634500	9.6	9.9	56.0	

■ Operating Mode: DVD play – RF out CH04

SAMSUNG ELECTRONICS EMC Report

Test Information

EUT Name:	DVD-V5600
Serial Number:	
Test Description:	
Operating Conditions:	DVD play
Operator Name:	SB, Choi
Comment:	
Description	RF out CH04

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

Subrange 1

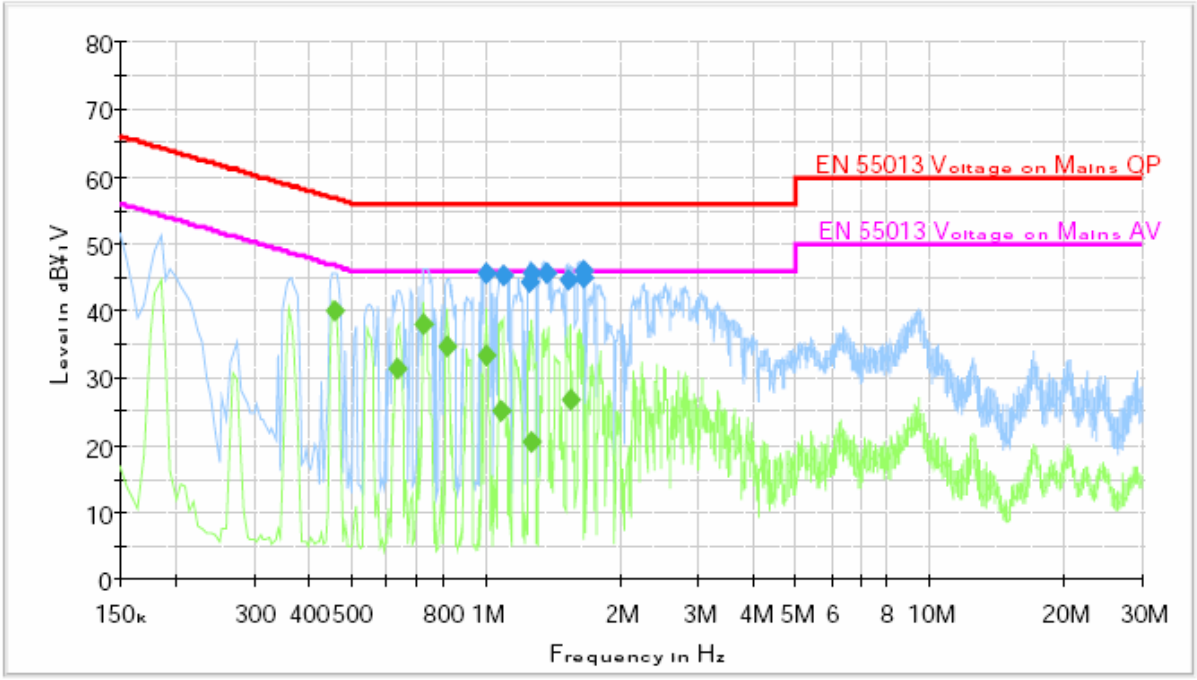
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: EN55013_2-Line-LISN fin [EMI conducted]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	0.1s	ESCI 3

EN55013 with 2-Line-LISN



Final Measurement Detector 2

Frequency (MHz)	Average (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.454500	40.0	100.000	9.000	Off	L1
0.630500	31.4	100.000	9.000	Off	L1
0.720500	38.0	100.000	9.000	Off	L1
0.819500	34.5	100.000	9.000	Off	L1
1.000000	33.4	100.000	9.000	Off	L1
1.085500	25.2	100.000	9.000	Off	N
1.265500	20.6	100.000	9.000	Off	N
1.545500	26.8	100.000	9.000	Off	N

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.454500	9.6	6.8	46.8	
0.630500	9.6	14.6	46.0	
0.720500	9.6	8.0	46.0	
0.819500	9.6	11.5	46.0	
1.000000	9.6	12.6	46.0	
1.085500	9.6	20.8	46.0	
1.265500	9.6	25.4	46.0	
1.545500	9.6	19.2	46.0	

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
1.004500	45.5	100.000	9.000	Off	L1
1.095500	45.2	100.000	9.000	Off	L1
1.245500	44.2	100.000	9.000	Off	L1
1.260500	45.7	100.000	9.000	Off	L1
1.364500	45.7	100.000	9.000	Off	L1
1.525500	44.6	100.000	9.000	Off	L1
1.654500	45.8	100.000	9.000	Off	N
1.665500	45.1	100.000	9.000	Off	N

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

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
1.004500	9.6	10.5	56.0	
1.095500	9.6	10.8	56.0	
1.245500	9.6	11.8	56.0	
1.260500	9.6	10.3	56.0	
1.364500	9.6	10.3	56.0	
1.525500	9.6	11.4	56.0	
1.654500	9.6	10.2	56.0	
1.665500	9.6	10.9	56.0	

3.2 Radiated emission

3.2.1 Test information

Test engineer	Seung Beom, Choi
Test date	November 30 ~ December 8, 2005
Climate condition	Ambient temperature : 21.5 ℃, Relative humidity : 38 % Atmospheric pressure 1020 hPa
Test place	3m Semi-anechoic Chamber

3.2.2 Test equipment

Equipment	Model name	Manufacturer	Serial no.	Calibration	
				Next date	Interval
Bi-con Antenna	CBL6141A	SCHAFFNER	4258	2006-03-08	12
EMI Receiver	ESI26	R&S	100291	2006-06-09	12
AMPLIFIER	310N	SONOMA	251674	2006-03-08	12
Ant Mast	MA4000	Inn-co	-	N/A	
Mast Controller	CO2000	Inn-co	-	N/A	
RF Selector	NS4900	TOYO	-	N/A	
TV Signal Generator	PM5418-TDSI	PHILIPS	LO612437	2006-10-10	12

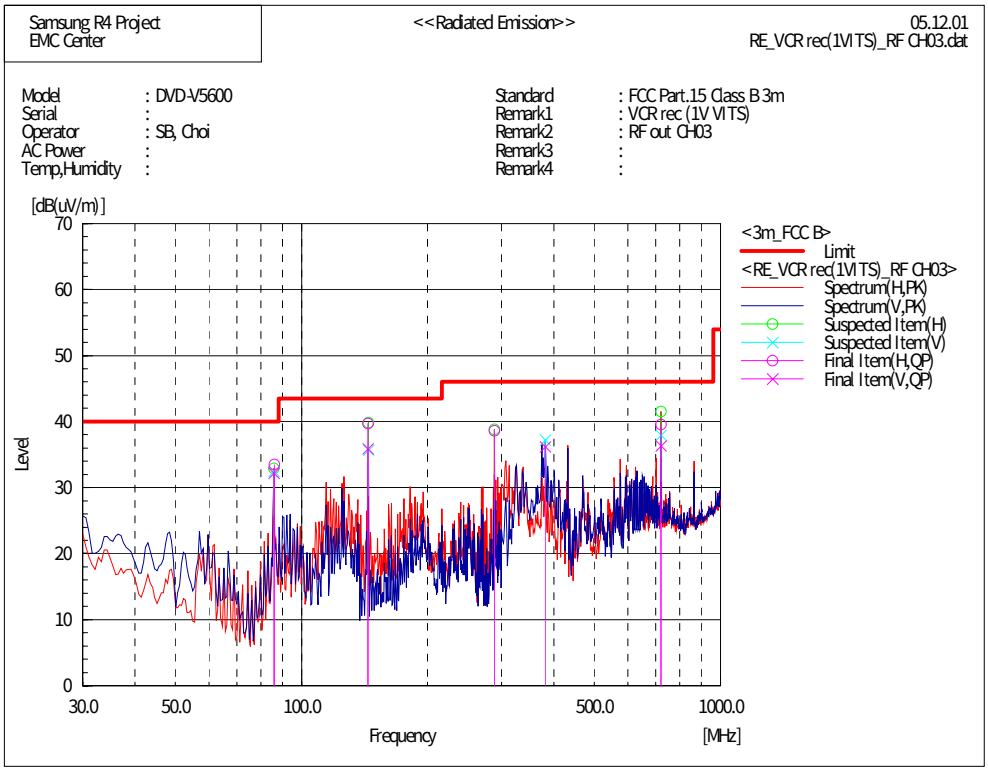
3.2.3 Test result : Pass

The measured emission of the EUT has been found to be below the specified limits.

3.2.3 Test data and graph

The initial step in collecting radiated data was to perform a peak scan over the measurement range using a receiver. All modes of operation were investigated and the worst-case emissions were reported. All other emissions are non-significant.

■ Operating Mode: VCR record (1V VITS) – RF out CH03



Final Result

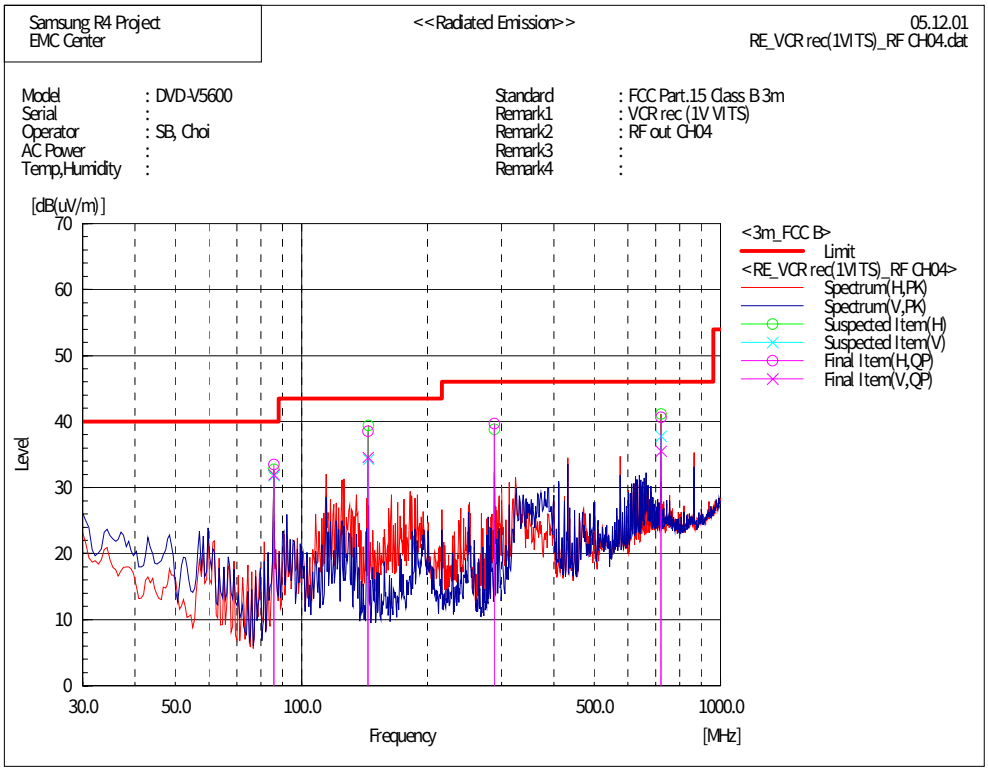
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.929	54.4	-20.9	33.5	40.0	6.5	
2	144.009	56.9	-17.2	39.7	43.5	3.8	
3	288.018	54.7	-16.1	38.6	46.0	7.4	
4	720.035	45.4	-5.8	39.6	46.0	6.4	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.913	53.1	-20.9	32.2	40.0	7.8	
2	144.014	53.1	-17.2	35.9	43.5	7.6	
3	381.229	49.3	-13.1	36.2	46.0	9.8	
4	720.049	42.1	-5.8	36.3	46.0	9.7	

■ Operating Mode: VCR record (1V VITS) – RF out CH04



Final Result

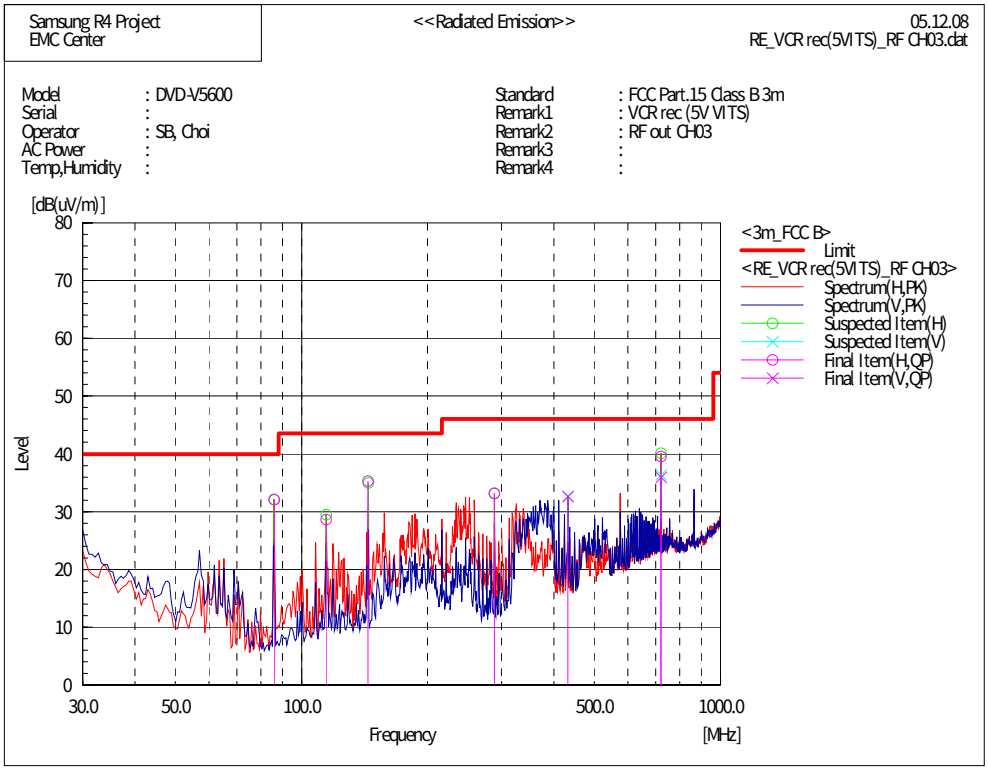
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.918	54.4	-20.9	33.5	40.0	6.5	
2	144.020	55.7	-17.2	38.5	43.5	5.0	
3	288.018	55.8	-16.1	39.7	46.0	6.3	
4	720.049	46.4	-5.8	40.6	46.0	5.4	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.913	52.9	-20.9	32.0	40.0	8.0	
2	144.020	51.8	-17.2	34.6	43.5	8.9	
3	720.077	41.4	-5.8	35.6	46.0	10.4	

■ Operating Mode: VCR record (5V VITS) – RF out CH03



Final Result

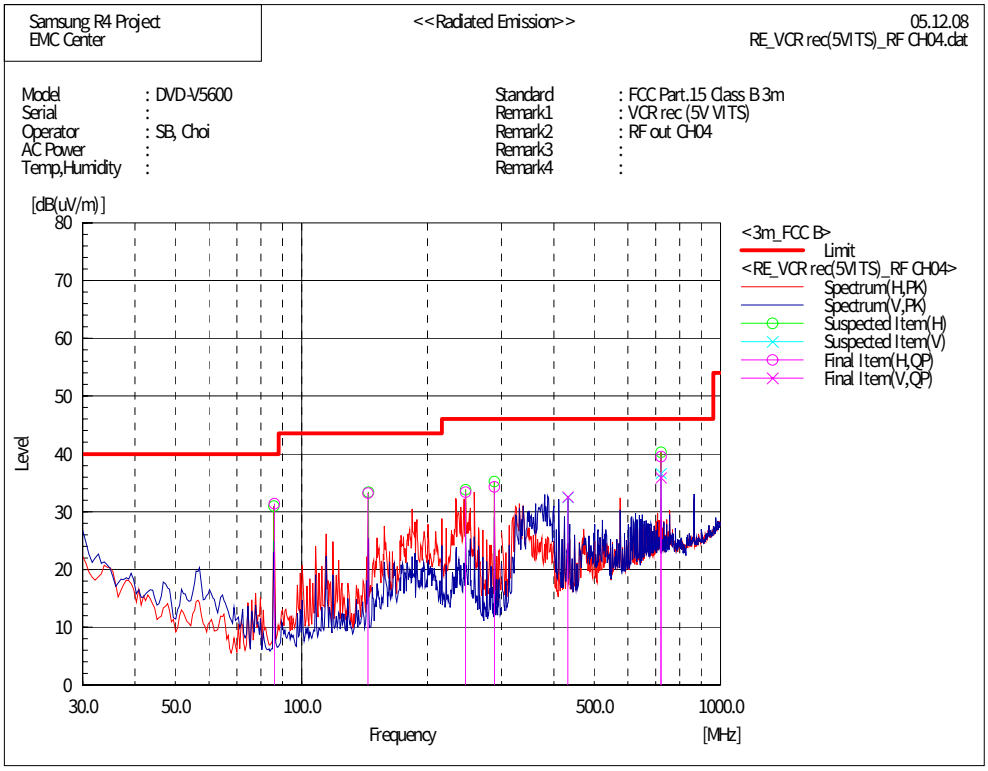
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.934	52.9	-20.9	32.0	40.0	8.0	
2	144.020	52.5	-17.2	35.3	43.5	8.2	
3	720.035	45.4	-5.8	39.6	46.0	6.4	
4	288.034	49.3	-16.1	33.2	46.0	12.8	
5	114.574	47.0	-18.3	28.7	43.5	14.8	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	720.049	41.8	-5.8	36.0	46.0	10.0	
2	432.039	44.6	-11.9	32.7	46.0	13.3	

■ Operating Mode: VCR record (5V VITS) – RF out CH04



Final Result

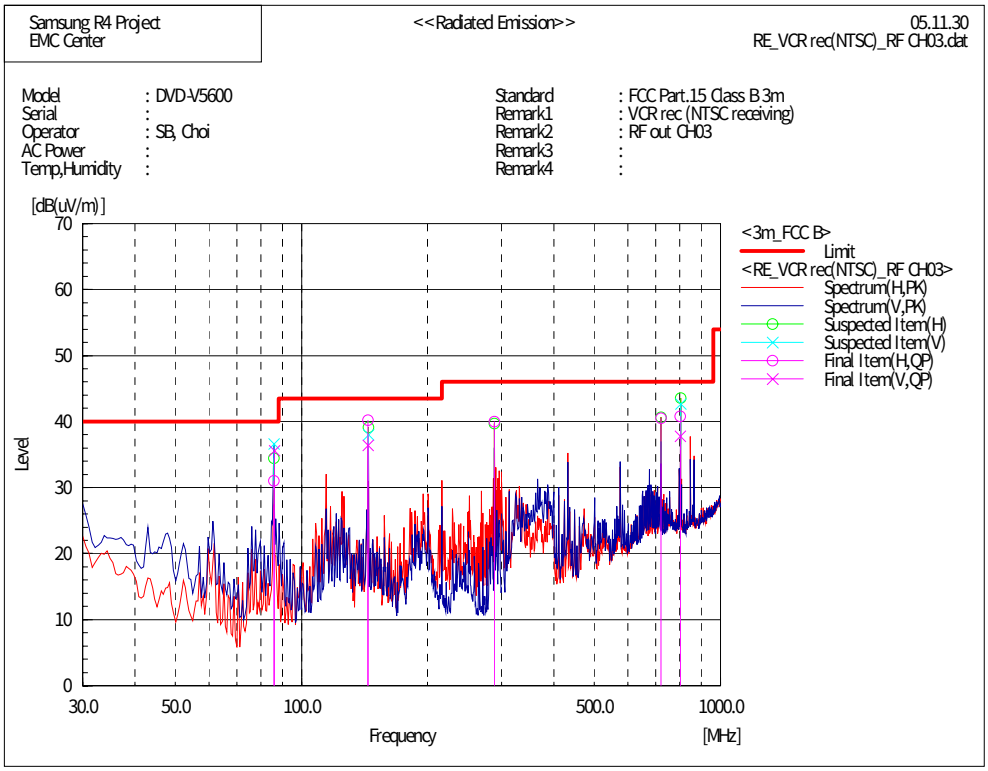
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.929	52.3	-20.9	31.4	40.0	8.6	
2	720.035	45.3	-5.8	39.5	46.0	6.5	
3	144.020	50.4	-17.2	33.2	43.5	10.3	
4	288.029	50.4	-16.1	34.3	46.0	11.7	
5	245.813	50.3	-16.9	33.4	46.0	12.6	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	720.063	41.7	-5.8	35.9	46.0	10.1	
2	432.039	44.4	-11.9	32.5	46.0	13.5	

■ Operating Mode: VCR record (NTSC) – RF out CH03



Final Result

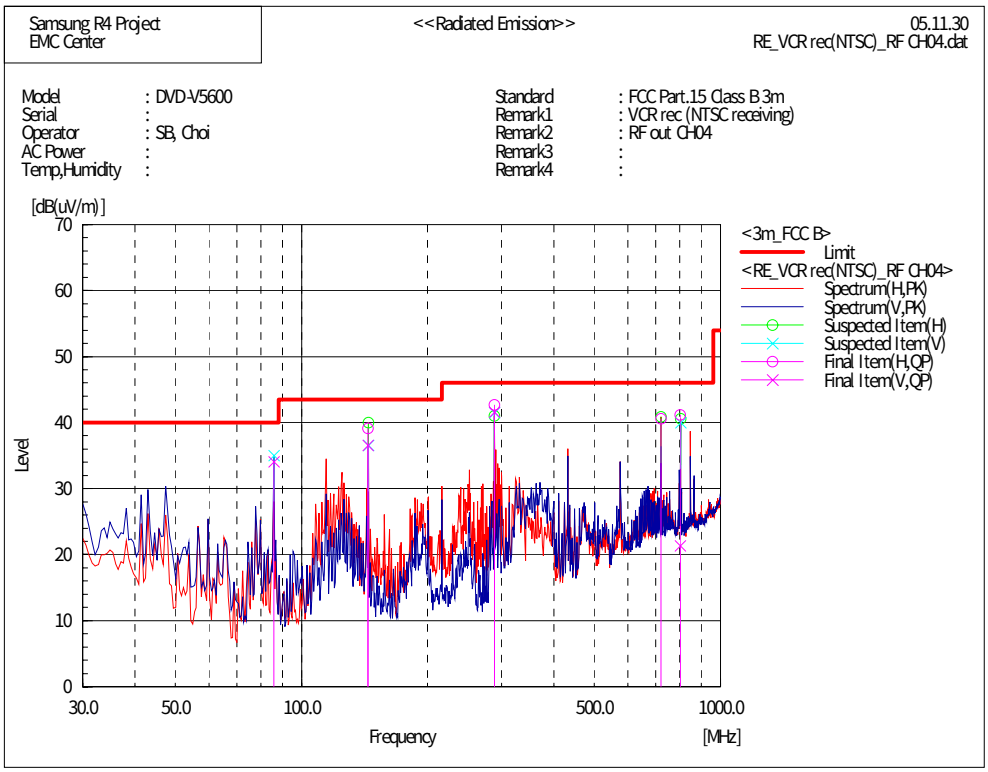
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.913	52.0	-20.9	31.1	40.0	8.9	
2	144.020	57.4	-17.2	40.2	43.5	3.3	
3	288.018	56.1	-16.1	40.0	46.0	6.0	
4	720.049	46.3	-5.8	40.5	46.0	5.5	
5	801.258	46.2	-5.4	40.8	46.0	5.2	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.924	56.5	-20.9	35.6	40.0	4.4	
2	144.036	53.7	-17.2	36.5	43.5	7.0	
3	801.286	43.2	-5.4	37.8	46.0	8.2	

■ Operating Mode: VCR record (NTSC) – RF out CH04



Final Result

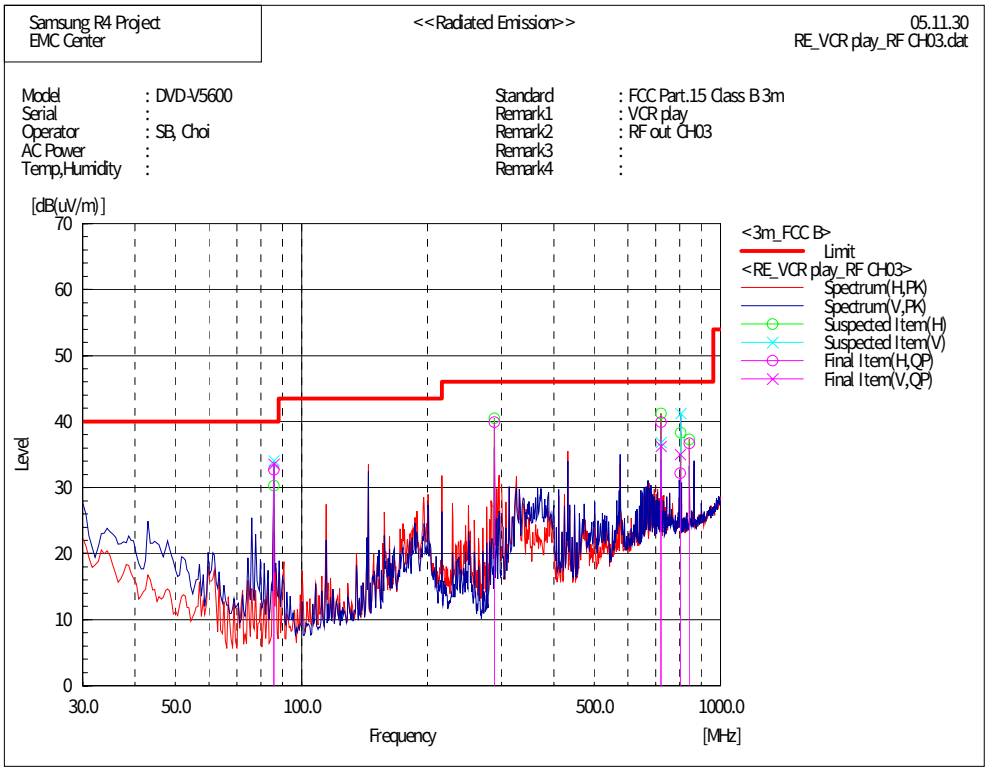
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	144.009	56.3	-17.2	39.1	43.5	4.4	
2	288.012	58.8	-16.1	42.7	46.0	3.3	
3	720.049	46.4	-5.8	40.6	46.0	5.4	
4	801.272	46.5	-5.4	41.1	46.0	4.9	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.913	55.0	-20.9	34.1	40.0	5.9	
2	144.020	53.8	-17.2	36.6	43.5	6.9	
3	288.029	57.7	-16.1	41.6	46.0	4.4	
4	801.300	26.7	-5.4	21.3	46.0	24.7	

■ Operating Mode: VCR play – RF out CH03



Final Result

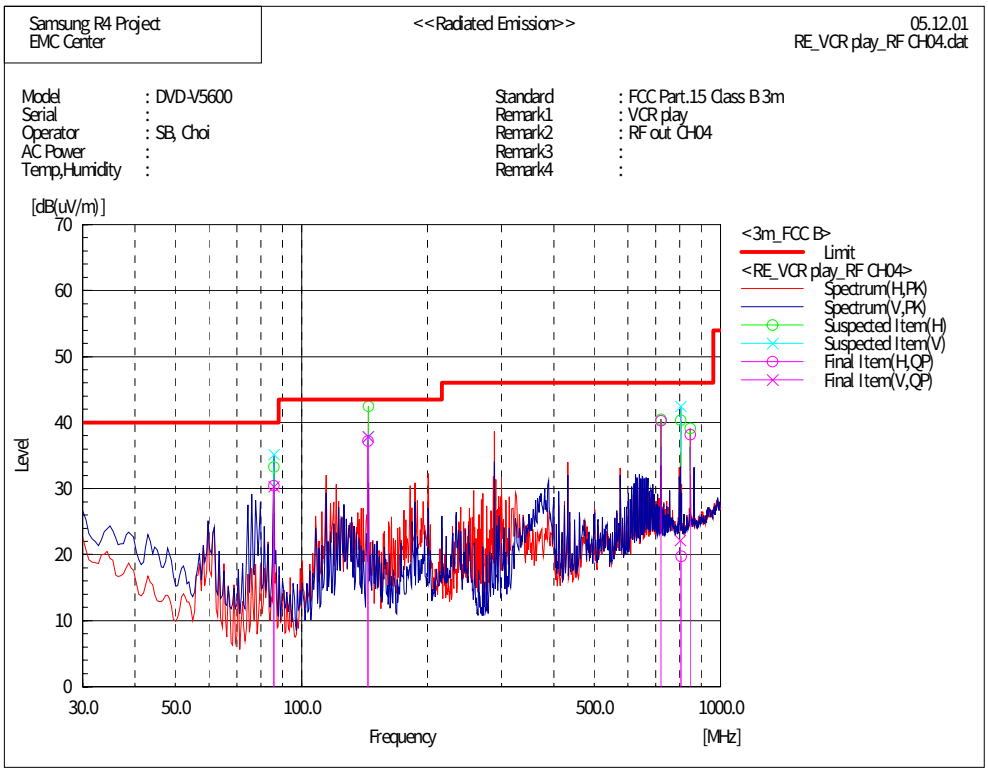
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.907	53.6	-20.9	32.7	40.0	7.3	
2	288.012	56.0	-16.1	39.9	46.0	6.1	
3	720.063	45.7	-5.8	39.9	46.0	6.1	
4	801.342	37.6	-5.4	32.2	46.0	13.8	
5	842.149	40.8	-4.1	36.7	46.0	9.3	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.907	54.5	-20.9	33.6	40.0	6.4	
2	720.049	42.1	-5.8	36.3	46.0	9.7	
3	801.286	40.4	-5.4	35.0	46.0	11.0	

■ Operating Mode: VCR play – RF out CH04



Final Result

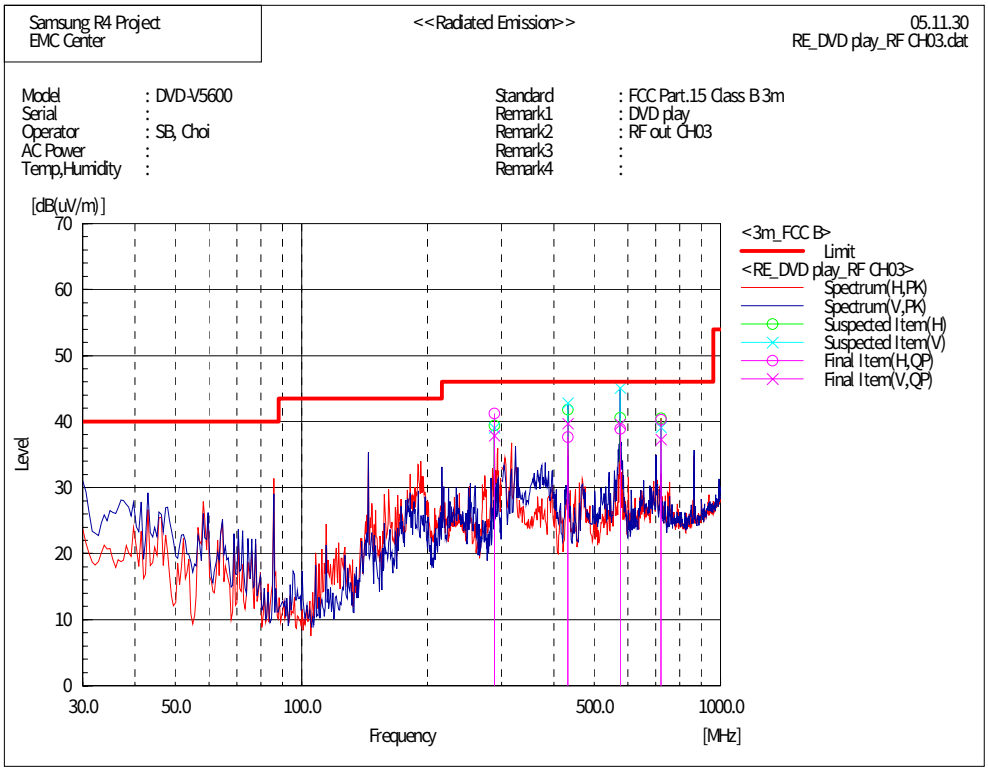
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.918	51.4	-20.9	30.5	40.0	9.5	
2	144.001	54.4	-17.2	37.2	43.5	6.3	
3	720.049	46.1	-5.8	40.3	46.0	5.7	
4	804.428	25.1	-5.3	19.8	46.0	26.2	
5	846.989	42.2	-4.0	38.2	46.0	7.8	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	85.918	51.2	-20.9	30.3	40.0	9.7	
2	144.030	55.0	-17.2	37.8	43.5	5.7	
3	801.272	27.6	-5.4	22.2	46.0	23.8	

■ Operating Mode: DVD play – RF out CH03



Final Result

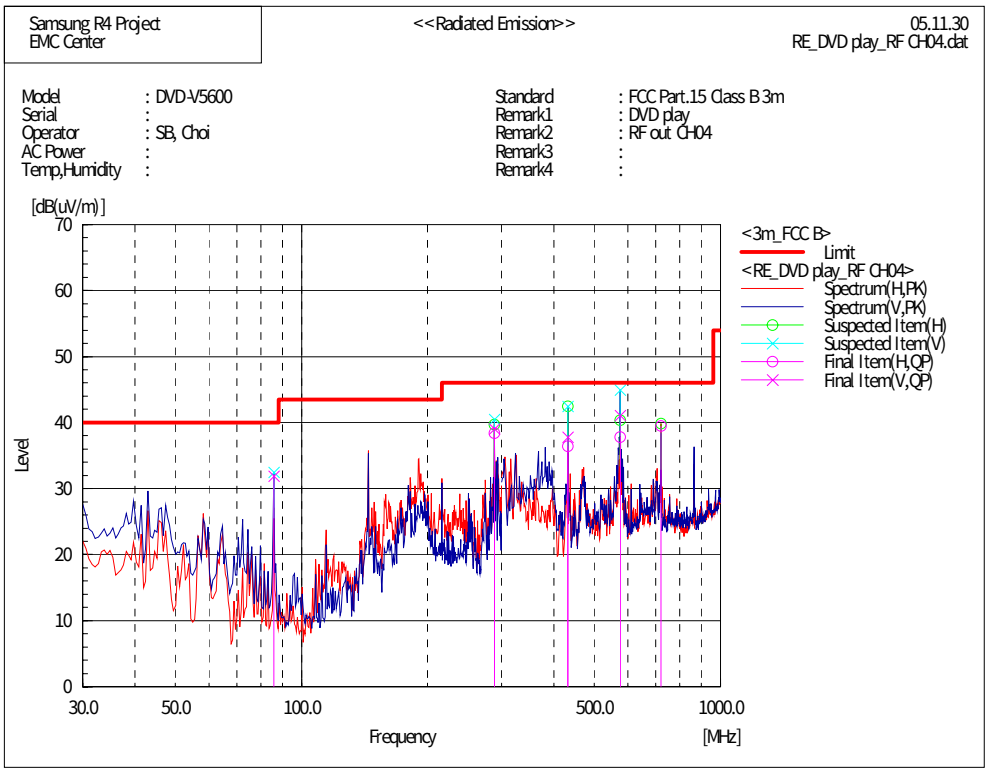
--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	432.025	49.5	-11.9	37.6	46.0	8.4	
2	576.065	47.4	-8.5	38.9	46.0	7.1	
3	720.049	46.1	-5.8	40.3	46.0	5.7	
4	288.029	57.3	-16.1	41.2	46.0	4.8	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	576.051	48.1	-8.5	39.6	46.0	6.4	
2	432.039	51.6	-11.9	39.7	46.0	6.3	
3	720.049	43.1	-5.8	37.3	46.0	8.7	
4	288.045	53.9	-16.1	37.8	46.0	8.2	

■ Operating Mode: DVD play – RF out CH04



Final Result

--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	432.039	48.3	-11.9	36.4	46.0	9.6	
2	575.995	46.3	-8.5	37.8	46.0	8.2	
3	720.035	45.3	-5.8	39.5	46.0	6.5	
4	288.023	54.5	-16.1	38.4	46.0	7.6	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Remark
1	576.002	49.6	-8.5	41.1	46.0	4.9	
2	432.053	49.7	-11.9	37.8	46.0	8.2	
3	288.012	55.1	-16.1	39.0	46.0	7.0	
4	85.913	52.8	-20.9	31.9	40.0	8.1	

3.3 Output Signal Level

3.3.1 Test information

Test engineer	Seung Beom, Choi
Test date	December 5, 2005
Climate condition	Ambient temperature : 21.7 ℃, Relative humidity : 39 % Atmospheric pressure 1017 hPa
Test place	Shield room #2

3.3.2 Test equipment

Equipment	Model name	Manufacturer	Serial no.	Calibration	
				Next date	Interval
Field strength meter	ESCI	R&S	100136	2006-04-17	12
Amplifier	8447D	Agilent	2994A10430	2006-09-10	12
Matching pad	RAM	R&S	860175/025	2006-01-08	12
TV Signal Generator	PM5418-TDSI	PHILIPS	LO612437	2006-10-10	12

3.3.3 Test result : Pass

The measured emission of the EUT has been found to be below the specified limits.

3.3.4 Test data

The RF output terminal was connected to the test receiver through the matching pad (75-50 ohm) with a cable.

Then, the RF output signal level was measured under the operating modes.

■ Operating Mode: VCR REC(NTSC) - RF out CH03

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
56.763	71.0	-20.2	50.8	56.5	5.7
61.256	85.7	-20.2	65.5	69.5	4.0
65.745	69.8	-20.2	49.6	56.5	6.9

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

■ Operating Mode: VCR REC(NTSC) - RF out CH04

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
62.750	70.3	-20.2	50.1	56.5	6.4
67.238	85.0	-20.2	64.8	69.5	4.7
71.739	69.1	-20.2	48.9	56.5	7.6

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

■ Operating Mode: VCR REC(1V VITS) - RF out CH03

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
56.757	71.1	-20.2	50.9	56.5	5.6
61.256	85.2	-20.2	69.5	69.5	4.5
65.757	69.8	-20.2	49.6	56.5	6.9

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

■ Operating Mode: VCR REC(1V VITS) - RF out CH04

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
62.740	70.3	-20.2	50.1	56.5	6.4
67.244	84.6	-20.2	64.4	69.5	5.1
71.743	69.2	-20.2	49.0	56.5	7.5

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

■ Operating Mode: VCR REC(5V VITS) - RF out CH03

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
56.755	71.1	-20.2	50.9	56.5	5.6
61.256	85.2	-20.2	65.0	69.5	4.5
65.757	69.8	-20.2	49.6	56.5	6.9

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

■ Operating Mode: VCR REC(5V VITS) - RF out CH04

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
62.750	70.3	-20.2	50.1	56.5	6.4
67.242	84.6	-20.2	64.4	69.5	5.1
71.741	69.2	-20.2	49.0	56.5	7.5

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

■ Operating Mode: VCR PLAY - RF out CH03

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
56.765	71.0	-20.2	50.8	56.5	5.7
61.256	84.7	-20.2	64.5	69.5	5.0
65.753	69.8	-20.2	49.6	56.5	6.9

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

■ Operating Mode: VCR PLAY - RF out CH04

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
62.744	70.3	-20.2	50.1	56.5	6.4
67.242	84.0	-20.2	63.8	69.5	5.7
71.741	69.1	-20.2	48.9	56.5	7.6

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

■ Operating Mode: DVD PLAY - RF out CH03

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
56.757	71.1	-20.2	50.9	56.5	5.6
61.258	85.4	-20.2	65.2	69.5	4.3
65.755	69.9	-20.2	49.7	56.5	6.8

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

■ Operating Mode: DVD PLAY - RF out CH04

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
62.736	70.4	-20.2	50.2	56.5	6.3
67.238	84.6	-20.2	64.4	69.5	5.1
71.735	69.1	-20.2	48.9	56.5	7.6

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

3.4 Output Terminal Conducted Spurious Emission

3.4.1 Test information

Test engineer	Seung Beom, Choi
Test date	December 5, 2005
Climate condition	Ambient temperature : 21.7 ℃, Relative humidity : 39 % Atmospheric pressure 1017 hPa
Test place	Shield room #2

3.4.2 Test equipment

Equipment	Model name	Manufacturer	Serial no.	Calibration	
				Next date	Interval
Field strength meter	ESCI	R&S	100136	2006-04-17	12
Amplifier	8447D	Agilent	2994A10430	2006-09-10	12
Matching pad	RAM	R&S	860175/025	2006-01-08	12
TV Signal Generator	PM5418-TDSI	PHILIPS	LO612437	2006-10-10	12

3.4.3 Test result : Pass

The measured emission of the EUT has been found to be below the specified limits.

3.4.4 Test data

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

Tested frequency range was from 30MHz to more than 4.6MHz below the visual carrier frequency and from more than 7.4MHz above the visual carrier frequency to 1000MHz.

■ Operating Mode: VCR REC(NTSC) - RF out CH03 [Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
32.616	32.4	-20.3	12.6	39.5	26.9
46.934	33.0	-20.3	12.7	39.5	26.8
47.727	34.4	-20.3	14.1	39.5	25.4

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

■ Operating Mode: VCR REC(NTSC) - RF out CH03 [Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
796.775	41.5	-19.3	22.2	39.5	17.3
801.265	51.8	-19.3	32.5	39.5	7.0
847.007	53.4	-19.1	34.3	39.5	5.2

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

■ Operating Mode: VCR REC(NTSC) - RF out CH04 [Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
38.609	34.4	-20.3	14.1	39.5	25.4
52.923	32.5	-20.3	12.2	39.5	27.3
53.710	34.0	-20.2	13.8	39.5	25.7

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

■ Operating Mode: VCR REC(NTSC) - RF out CH04 [Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
796.755	41.6	-19.3	22.3	39.5	17.2
801.265	51.7	-19.3	32.4	39.5	7.1
847.007	53.3	-19.1	34.2	39.5	5.3

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

■ Operating Mode: VCR REC(1V VITS) - RF out CH03 [Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
53.072	33.2	-20.3	12.9	39.5	26.6
54.161	32.7	-20.2	12.5	39.5	27.0
55.259	32.1	-20.2	11.9	39.5	27.6

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

■ Operating Mode: VCR REC(1V VITS) - RF out CH03 [Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
796.755	41.6	-19.3	22.3	39.5	17.2
801.265	51.7	-19.3	32.4	39.5	7.1
847.067	53.2	-19.1	34.1	39.5	5.4

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

■ Operating Mode: VCR REC(1V VITS) - RF out CH04 [Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
38.067	34.5	-20.3	14.2	39.5	25.3
59.046	32.4	-20.2	12.2	39.5	27.3
60.145	32.1	-20.2	11.9	39.5	27.6

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

■ Operating Mode: VCR REC(1V VITS) - RF out CH04 [Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
796.765	41.5	-19.3	22.2	39.5	17.3
801.265	51.7	-19.3	32.4	39.5	7.1
847.047	53.2	-19.1	34.1	39.5	5.4

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

■ Operating Mode: VCR REC(5V VITS) - RF out CH03 [Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
46.938	32.5	-20.3	12.2	39.5	27.3
47.756	34.8	-20.3	14.5	39.5	25.1
56.516	38.6	-20.2	18.4	39.5	21.1

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

■ Operating Mode: VCR REC(5V VITS) - RF out CH03 [Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
796.755	41.6	-19.3	22.3	39.5	17.2
801.265	51.7	-19.3	32.4	39.5	7.1
847.037	53.2	-19.1	34.1	39.5	5.4

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

■ Operating Mode: VCR REC(5V VITS) - RF out CH04 [Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
52.925	32.1	-20.3	11.8	39.5	27.7
53.742	34.3	-20.2	14.1	39.5	25.4
62.539	38.3	-20.2	18.1	39.5	21.4

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

■ Operating Mode: VCR REC(5V VITS) - RF out CH04 [Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
796.745	41.5	-19.3	22.2	39.5	17.3
801.265	51.7	-19.3	32.4	39.5	7.1
847.067	53.2	-19.1	34.1	39.5	5.4

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

■ Operating Mode: VCR PLAY - RF out CH03 [Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
32.618	32.2	-20.3	11.9	39.5	27.6
47.754	34.8	-20.3	14.5	39.5	25.0
55.650	26.9	-20.2	6.7	39.5	32.8

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

■ Operating Mode: VCR PLAY - RF out CH03 [Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
796.745	41.6	-19.3	22.3	39.5	17.2
801.265	51.7	-19.3	32.4	39.5	7.1
846.997	53.2	-19.1	34.1	39.5	5.4

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

■ Operating Mode: VCR PLAY - RF out CH04 [Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
38.062	33.6	-20.3	13.3	39.5	26.2
40.499	27.8	-20.3	7.4	39.5	32.1
53.739	34.4	-20.2	14.2	39.5	25.3

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

■ Operating Mode: VCR PLAY - RF out CH04 [Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
796.755	41.6	-19.3	22.3	39.5	17.2
801.265	51.7	-19.3	32.4	39.5	7.1
846.997	53.2	-19.1	34.1	39.5	5.4

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

■ Operating Mode: DVD PLAY - RF out CH03 [Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
44.998	25.6	-20.3	5.3	39.5	34.2
47.758	34.7	-20.3	14.4	39.5	25.1
56.395	44.0	-20.2	23.8	39.5	15.7

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

■ Operating Mode: DVD PLAY - RF out CH03 [Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
796.775	41.5	-19.3	22.2	39.5	17.3
801.265	51.7	-19.3	32.4	39.5	7.1
846.997	53.3	-19.1	34.2	39.5	5.3

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

■ Operating Mode: DVD PLAY - RF out CH04 [Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
40.504	27.6	-20.3	7.3	39.5	32.2
53.741	34.3	-20.2	14.1	39.5	25.4
62.388	27.0	-20.2	6.8	39.5	32.7

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

■ Operating Mode: DVD PLAY - RF out CH04 [Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
796.785	41.4	-19.3	39.5	39.5	17.4
801.265	51.7	-19.3	32.4	39.5	7.1
846.997	53.3	-19.1	34.2	39.5	5.3

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

3.5 Antenna Transfer Switch

3.5.1 Test information

Test engineer	Seung Beom, Choi
Test date	December 6, 2005
Climate condition	Ambient temperature : 21.5 ℃, Relative humidity : 40 % Atmospheric pressure 1018 hPa
Test place	Shield room #2

3.5.2 Test equipment

Equipment	Model name	Manufacturer	Serial no.	Calibration	
				Next date	Interval
Field strength meter	ESCI	R&S	100136	2006-04-17	12
Amplifier	8447D	Agilent	2994A10430	2006-09-10	12
Matching pad	RAM	R&S	860175/025	2006-01-08	12
TV Signal Generator	PM5418-TDSI	PHILIPS	LO612437	2006-10-10	12

3.5.3 Test result : Pass

The measured emission of the EUT has been found to be below the specified limits.

3.5.4 Test data

The Antenna input terminal was connected to the test receiver through the matching pad (75 – 50 ohm) with a calibrated cable. Then, the RF output leakage level was measured under the operating modes.

■ Operating Mode: VCR REC (1V VITS) - RF out CH03

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
61.256	25.0	-20.2	4.8	9.5	4.7

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

■ Operating Mode: VCR REC (1V VITS) - RF out CH04

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
67.243	27.2	-20.2	7.0	9.5	2.5

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

■ Operating Mode: VCR REC (5V VITS) - RF out CH03

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
61.256	25.0	-20.2	4.8	9.5	4.7

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

■ Operating Mode: VCR REC (5V VITS) - RF out CH04

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
67.243	27.1	-20.2	6.9	9.5	2.6

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

■ Operating Mode: VCR PLAY - RF out CH03

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
61.252	24.2	-20.2	4.0	9.5	5.5

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

■ Operating Mode: VCR PLAY - RF out CH04

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
67.239	27.6	-20.2	7.4	9.5	2.1

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

■ Operating Mode: DVD PLAY - RF out CH03

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
61.256	25.5	-20.2	5.3	9.5	4.2

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

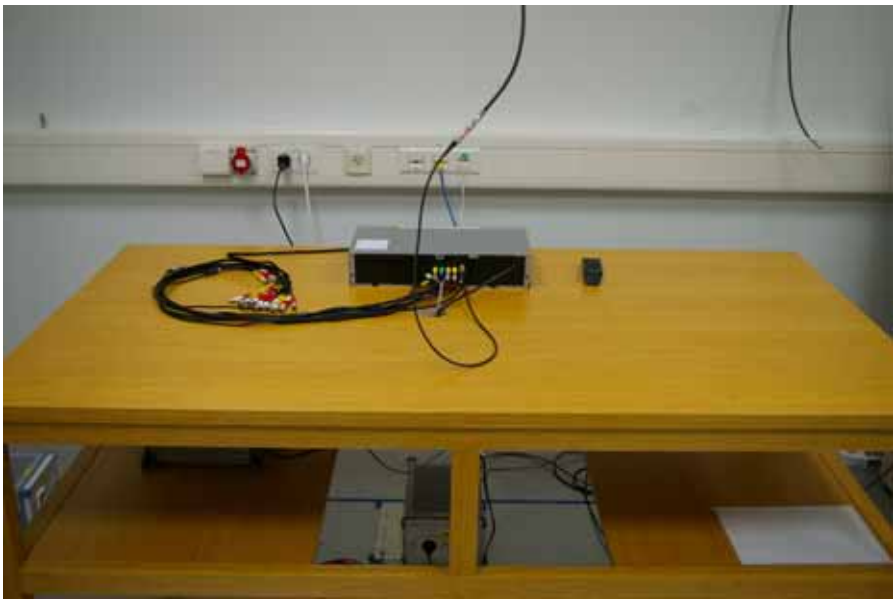
■ Operating Mode: DVD PLAY - RF out CH04

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
67.243	27.6	-20.2	7.4	9.5	2.1

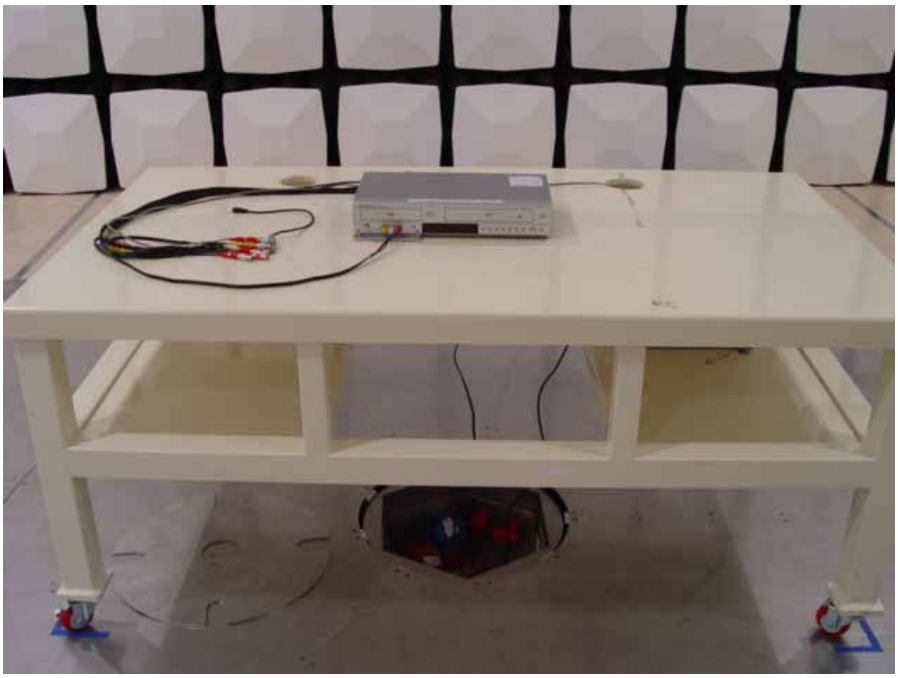
* Factor = Preamp Gain + Matching Pad Loss + Cable Loss

4. Appendix

4.1 Test photography

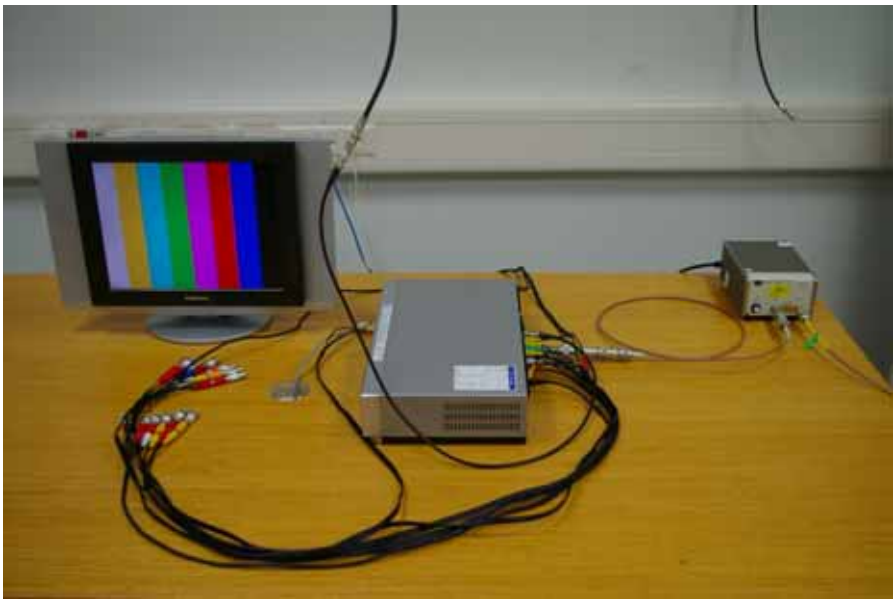


Picture 1. Conducted emission

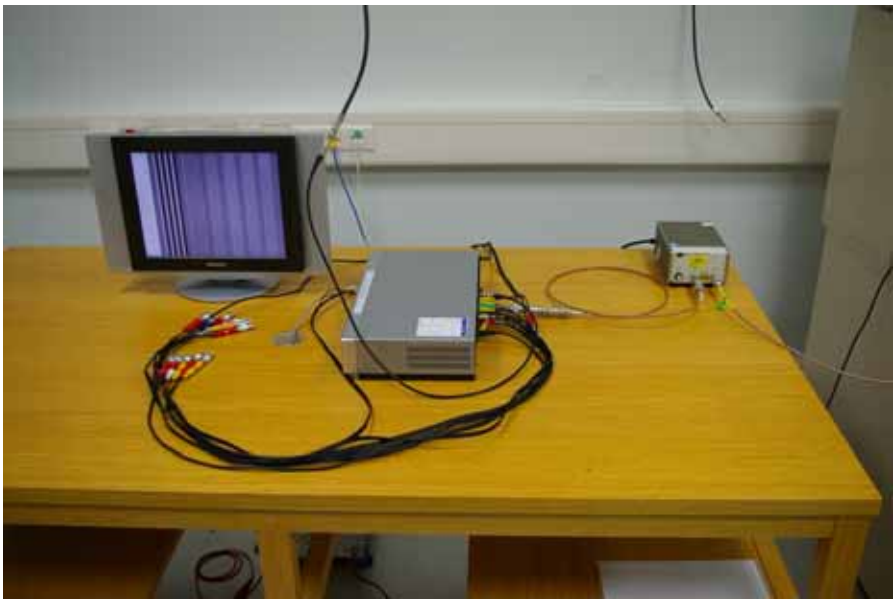


Picture 2. Radiated emission (Front)

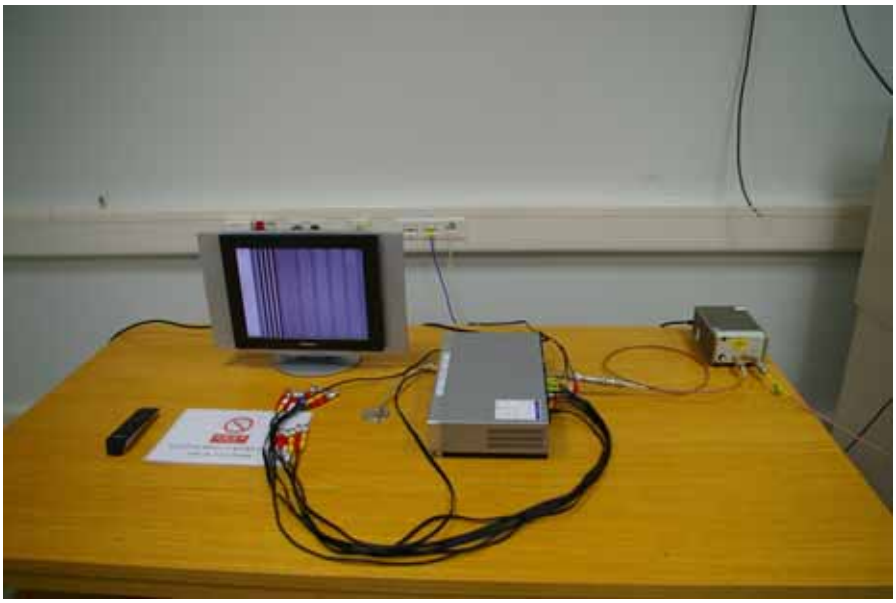
Picture 3. Radiated emission (Rear)



Picture 4. Output Signal Level



Picture 5. Output Terminal Conducted Spurious Emission



Picture 6. Antenna Transfer Swithch

4.2 EUT photography

Picture 7. EUT (Front)

Picture 8. EUT (Rear)