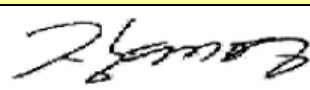
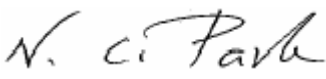


EMC Test Report

According to FCC Part 15 Subpart B

Project No.	LBE050706
Equipment under Test	
Address	416 Maetan3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
Product Name	DirecTV Satellite Receiver
Model Name	D11
Manufacturer	SAMSUNG
Brand Name	SAMSUNG
Broadcasting System	Satellite(DirecTV)
Variant Model	See Page 3
Date of Test	April 13 ~ 15 , 2005
Issued Date	April 22, 2005

	Name/Position	Signature
Tested by	Tae Young, Jang Test Engineer	
Reviewed by	No Cheon, Park Manager of EMC Lab.	
Authorized by	Seung Kyu, Cha Chief of EMC Lab.	

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

Table of Contents

1. General Information

- 1.1 Basic Information related Product
- 1.2 Detail Information related Product
- 1.3 Test Configuration
- 1.4 EUT Operating Conditions
- 1.5 Applied Standard
- 1.6 Test Facility

2. Summary of Test Results

3. Description of individual tests

- 3. 1 Conducted Emission
- 3. 2 Radiated Emission
- 3. 3 Output Signal Level
- 3. 4 Output Terminal Conducted Spurious Emission
- 3. 5 Ant. Transfer Switch

4. Appendix A

- 4.1 Test Photography
- 4.2 EUT Photography

1. General Information

1.1 Basic Information related Product

Applicant	SAMSUNG
Model name	D11
Applicant Address	Samsung Electronics Co. Ltd. 416 Maetan3- Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
Contact Person	Jong Uk, Kim
Kind of product	DirectTV Satellite Receiver
Valiant list	None
Manufacturer	SAMSUNG
New / Alternative / Permissive change Information	This report is original report #

1.2 Detail Information related Product

Specification

Item	Specification
Front End	TUNER
Code Rate	1/2, 2/3, 3/4, 5/6, 6/7, 7/8
Modulation(Outer coder)	QPSK
Input frequency	950~2150MHz
NF	Typ:6dB, Worst : 12dB
ANT. Input	F TYPE(Female)
Input Level	-25dBm ~ -69dBm at 75

Parameters		Unit	Min	Typ	Max	Remark
Frequency Range		MHz	57	-	863	
RF Input BAND	VHF-L	MHz	57		171	
	VHF-H		172		466	
	UHF		467		863	
IF Frequency	Digital	MHz		44.00		Center
Noise Figure		dB		6	12	
Power Gain		dB		40		
V.S.W.R					5	
Image Rejection (57-863MHz)		dB	46	55		
Loop Through Gain Deviation		dB	-5	0	5	
Phase Noise	1kHz	dBc	-65	-75		
	10kHz	/Hz	-75	-85		
LO Voltage at the Antenna	57-863MHz	dBuV			46	
	863-1700MHz				52	

1.3 Operating Mode and Condition

This system have following operating mode(s).

- Satellite Signal Receiving

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.

1.4 Equipment Modifications

No equipment modifications were required.

1.5 Test Configuration

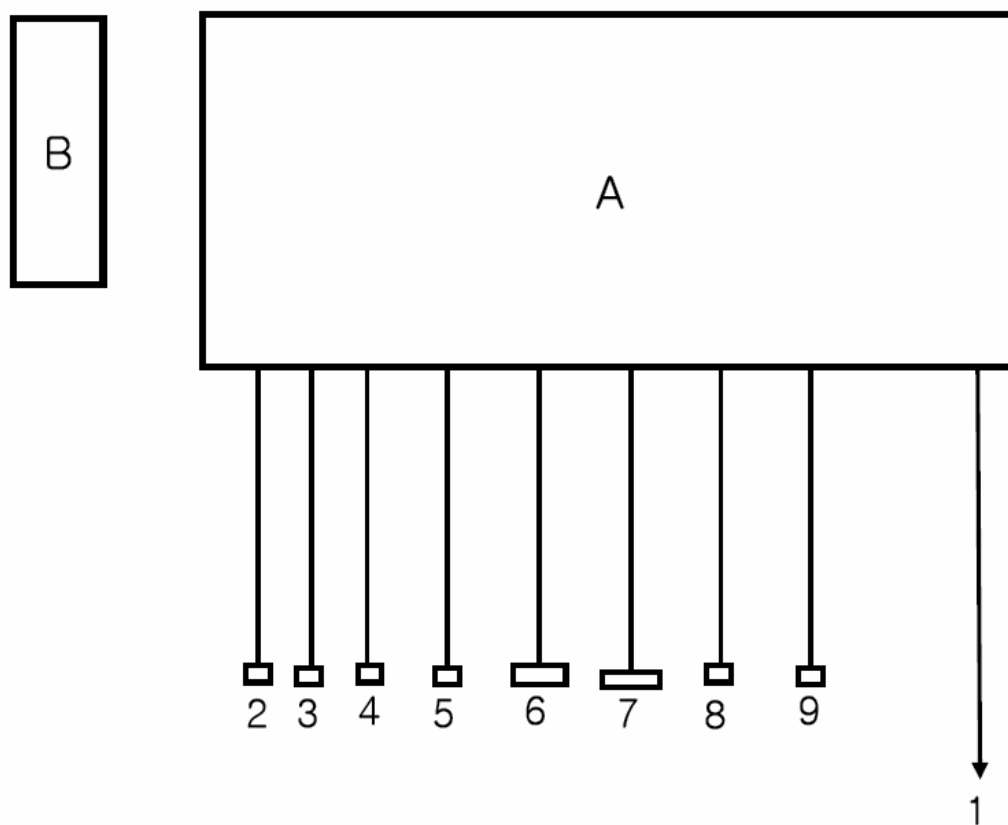
Used EUT and Peripherals

Seq	Device	Model Name	Serial #	Maker	Note
A	DirecTV Satellite Receiver	D11	-	SAMSUNG	EUT
B	Remote Controller	-	-	SAMSUNG	EUT

Used Cable Description

	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	Power	1.5	No	To the Mains
2	Satellite In	1.5	Yes	To the SG
3	Out To TV	1.5	No	75 ohm Termination
4	Off Air In	1.5	No	75 ohm Termination
5	S-Video	1.5	No	75 ohm Termination
6	AV Out 1	1.5	No	Audio Out : 10 kohm Terminated Video Out : 75 ohm Termination
7	AV Out 2	1.5	No	Audio Out : 10 kohm Terminated Video Out : 75 ohm Termination
8	USB	1.5	No	-
9	Phone Jack	1.5	No	-

Block Diagram



1.6 Applied Standards

List

Applied Standards	Test Procedure
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 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.

Accreditation and Listing



Uncertainty

(According to NAMAS Pub.NIS81)

Test Item	Expanded Uncertainty
Conducted Emission	± 1.64
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
3.3	Output Signal Level	FCC Part15 Subpart B	Complied
3.4	Output Terminal Conducted Spurious Emission	FCC Part15 Subpart B	Complied
3.5	Ant. Transfer Switch	FCC Part15 Subpart B	Complied

3. Description of Individual Tests

3.1 Conducted Emission

Test Information		
	Test Engineer	Tae Young, Jang
	Test Date	April 14, 2005
	Climate Condition	Ambient Temperature : 22.6 °C Relative Humidity : 32%
	Test Place	Shield Room #5

Test Equipments

Equipment	Modal Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
EMC ANALYZER	E7405A	US41110272	AGILENT	2006-01-20	12
RF Generator	RF-100	Doctor Design	-	N/A	12
L.I.S.N	ESH3-Z5	847265/028	R&S	2005-09-12	12
EMI TEST RECEIVER	ESS-30	844861/005	R&S	2006-01-11	12
RF Relais Matrix	PSU	R&S	861206/024	N/A	12
Test Software	EP5CE	TOYO	None	N/A	N/A

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..

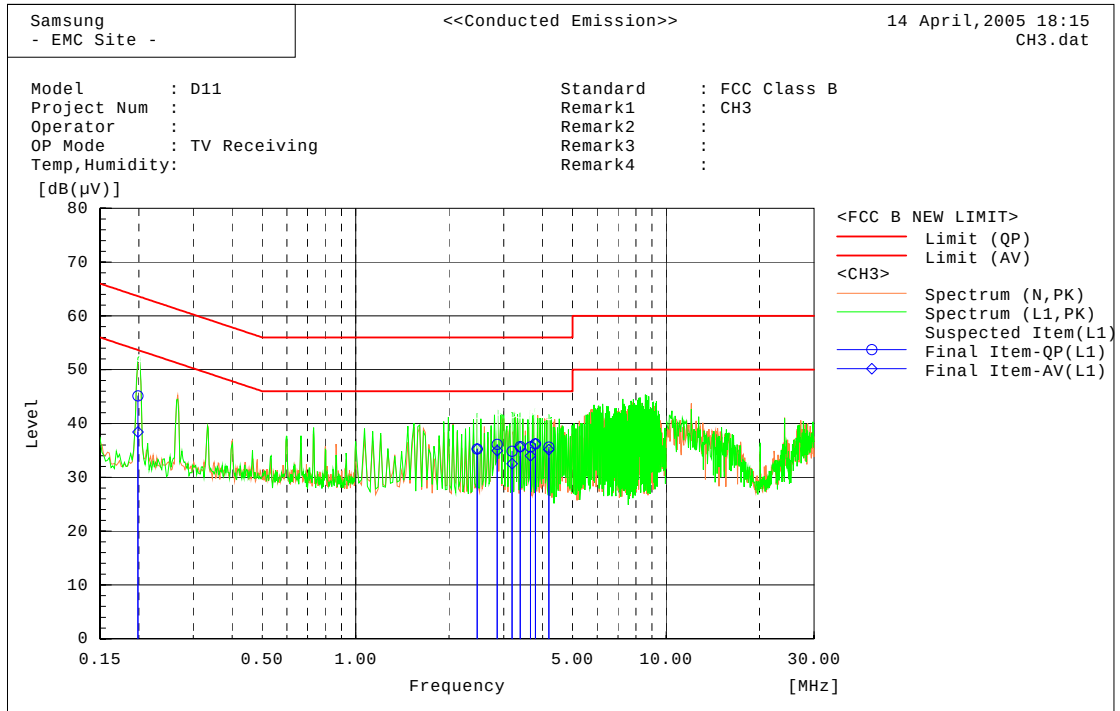
Test Result

Measurement Results	Pass No Operation errors were detected during or after the applied test.
----------------------------	---

Test Data

■ Operating Mode : Satellite Signal Receiving-RF Out CH 03

[Graph and Data]



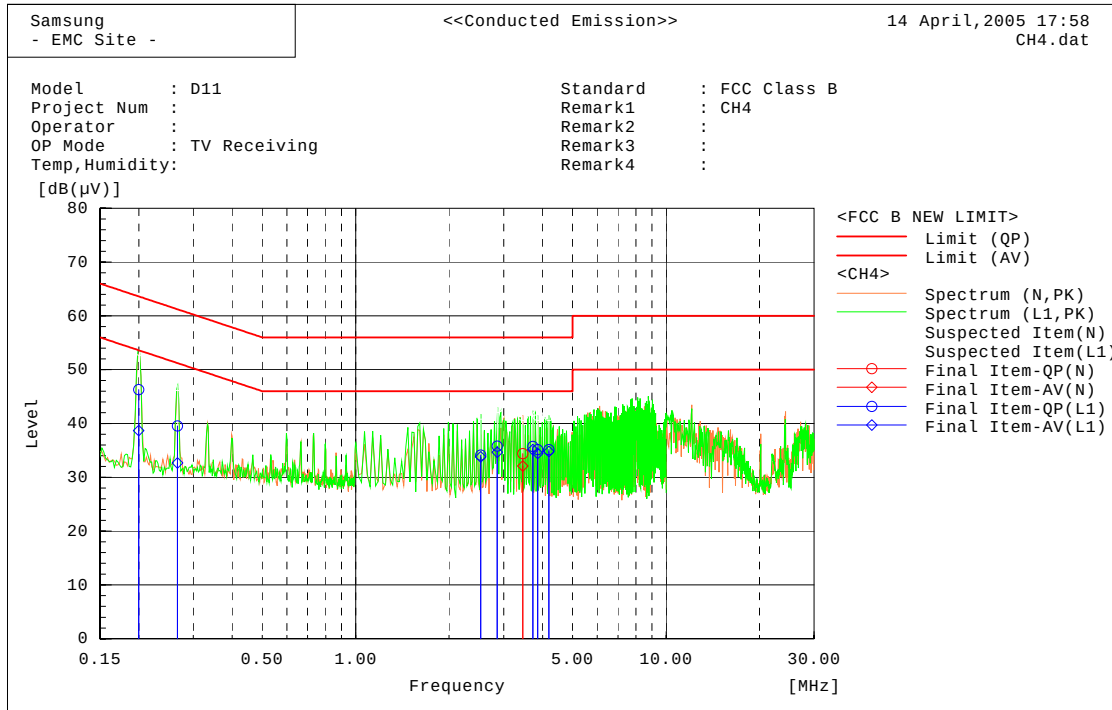
Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.1986	45.0	38.3	0.1	45.1	38.4	63.7	53.7	18.6	15.3
2	2.4612	35.2	35.2	0.1	35.3	35.3	56.0	46.0	20.7	10.7
3	2.859	36.0	34.9	0.1	36.1	35.0	56.0	46.0	19.9	11.0
4	3.1929	34.8	32.5	0.1	34.9	32.6	56.0	46.0	21.2	13.5
5	3.392	35.6	35.5	0.1	35.7	35.6	56.0	46.0	20.3	10.4
6	3.6584	35.6	33.9	0.1	35.7	34.0	56.0	46.0	20.4	12.0
7	3.7914	36.1	36.1	0.1	36.2	36.2	56.0	46.0	19.8	9.8
8	4.1896	35.5	35.0	0.1	35.6	35.1	56.0	46.0	20.4	10.9

■ Operating Mode : Satellite Signal Receiving-RF Out CH 04

[Graph and Data]



Final Result

--- N Phase ---										
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	3.4572	34.3	32.0	0.1	34.4	32.1	56.0	46.0	21.6	13.9
--- L1 Phase ---										
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.19981	46.2	38.6	0.1	46.3	38.7	63.6	53.6	17.3	14.9
2	0.26641	39.5	32.6	0.1	39.6	32.7	61.2	51.2	21.6	18.5
3	2.5257	34.0	33.7	0.1	34.1	33.8	56.0	46.0	21.9	12.2
4	2.8596	35.7	34.6	0.1	35.8	34.7	56.0	46.0	20.2	11.3
5	3.7232	35.7	35.1	0.1	35.8	35.2	56.0	46.0	20.3	10.9
6	3.8562	35.0	34.3	0.1	35.1	34.4	56.0	46.0	20.9	11.6
7	4.1889	35.1	34.7	0.1	35.2	34.8	56.0	46.0	20.9	11.2

3.2 Radiated Emission

Test Information		
	Test Engineer	Tae Young, Jang
	Test Date	April 13, 2005
	Climate Condition	Ambient Temperature : 22.6 °C Relative Humidity : 32%
	Test Place	Semi Anechoic Chamber

Test Equipments

Equipment	Modal Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Mast Controller	HD2000	HD	HD20000902027	N/A	N/A
Test Software	EP5RET	TOYO	None	N/A	N/A
EMI TEST RECEIVER	ESCS30	839809/002	R&S	2005-04-28	12
Test Software	EP5RE	TOYO	None	N/A	N/A
RF Generator	RF-100	Doctor Design	-	N/A	12
Biconilog Antenna	6112B	SCHAFFNER	2766	2005-06-03	12
EMC ANALYZER	E7405A	MY42000052	AGILENT	2005-08-26	12
RF Selector	NS4900	TOYO	0303-015	N/A	N/A

EUT Test Setup

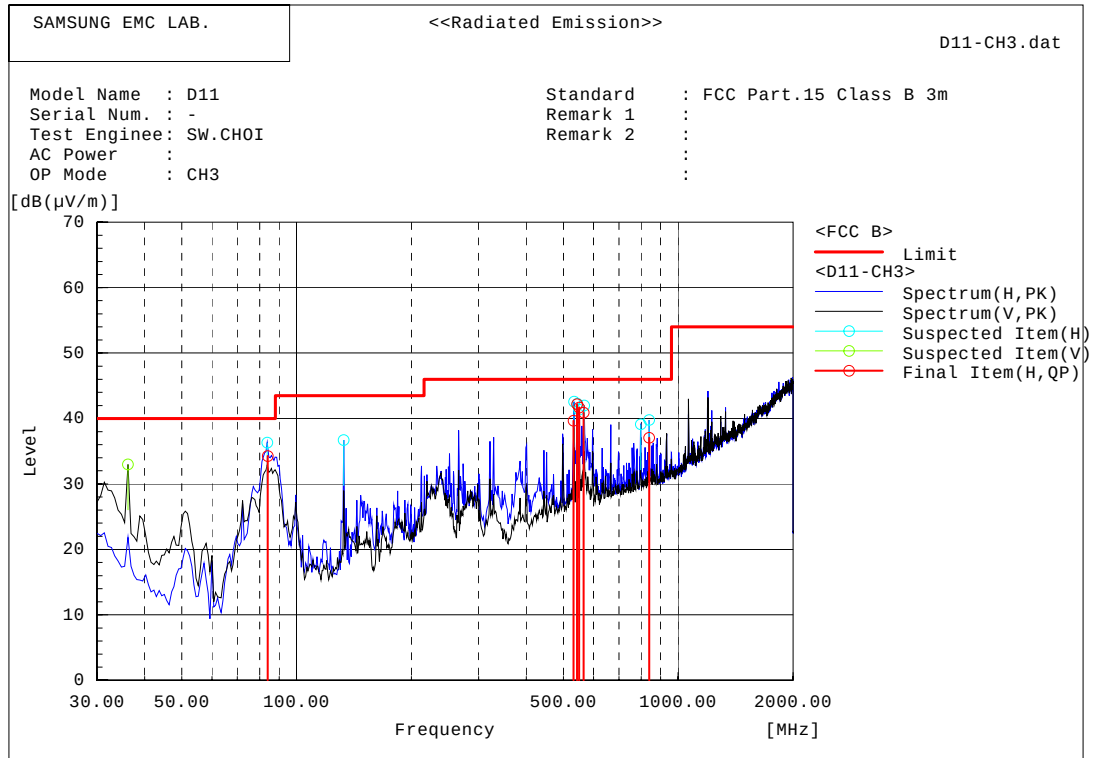
EUT set up in semi-anechoic chamber. EUT positioned at 3m from antenna in center of table.
All ports terminated into characteristic loads.

Test Result

Measurement Results	Pass No Operation errors were detected during or after the applied test.
----------------------------	--

Test Data (Other Frequency)

■ Operating Mode : Satellite Signal Receiving-RF Out CH 03

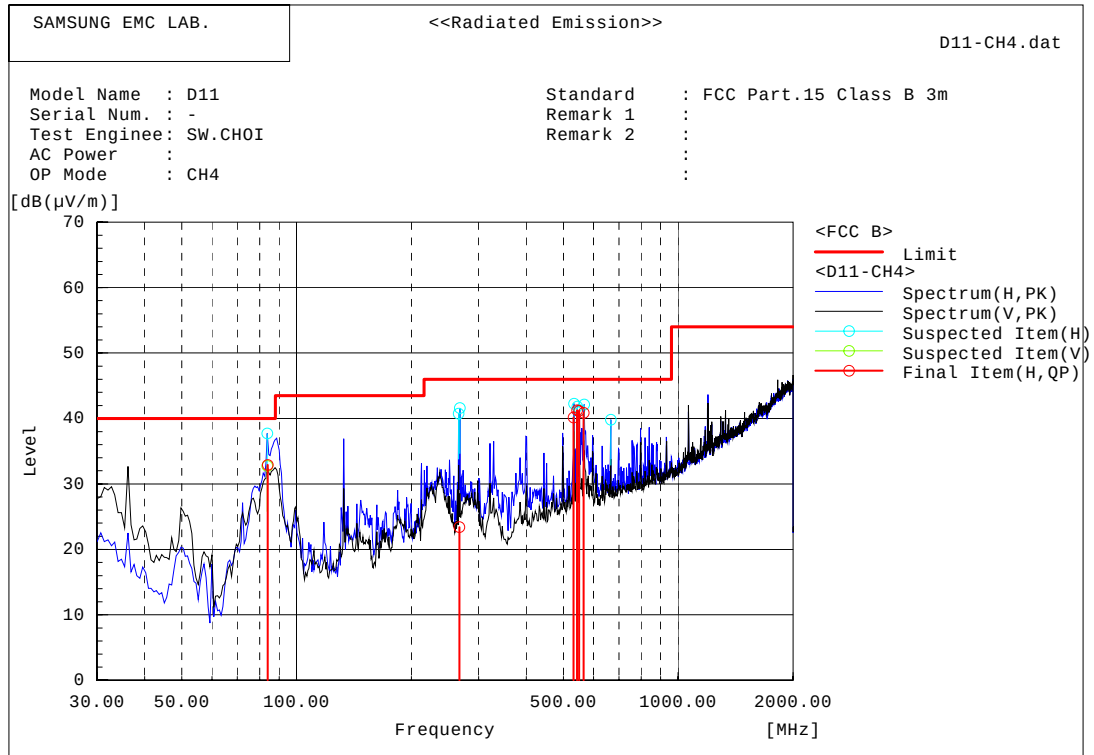


Final Result

--- 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	531.998	42.2	-2.5	39.7	46.0	6.3	
2	84.020	51.8	-17.5	34.3	40.0	5.7	
3	543.635	44.5	-2.3	42.2	46.0	3.8	
4	565.248	42.9	-2.0	40.9	46.0	5.1	
5	550.040	43.9	-2.2	41.7	46.0	4.3	
6	838.930	35.4	1.7	37.1	46.0	8.9	

■ Operating Mode : Satellite Signal Receiving-RF Out CH 04



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	84.020	50.4	-17.5	32.9	40.0	7.1	
2	531.998	42.7	-2.5	40.2	46.0	5.8	
3	565.248	42.9	-2.0	40.9	46.0	5.1	
4	543.530	43.6	-2.3	41.3	46.0	4.7	
5	267.263	32.8	-9.4	23.4	46.0	22.6	
6	550.040	43.4	-2.2	41.2	46.0	4.8	

Test Data (Oscillator)

■Operating Mode : Satellite Receiving

IF Frequency : 0 MHz

Tuned Frequency [MHz]	Local Oscillator Frequency [MHz]		Meter Reading [dBuV]		Total Loss [dB]	Results [dBuV]	Limit [dBuV]
			H	V			
988	Fundamental	988	-	-	-	-	54
	Harmonics	1976	-	-	-	-	54

Remark : There was no found any emission during the above test.

3.3 Output Signal Level

Test Information		
	Test Engineer	Tae Young, Jang
	Test Date	April 15, 2005
	Climate Condition	Ambient Temperature : 22.5 °C Relative Humidity : 32%
	Test Place	Shield Room #5

Test Equipments

Equipment	Modal Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
RF Generator	RF-100	Doctor Design	-	N/A	12
Pre-Amplifier	310N	SONOMA	185861	2005-10-08	12
EMI TEST RECEIVER	ESS-30	844861/005	R&S	2006-01-11	12
Matching Pad	RAM	R&S	834188/009	2006-01-08	12
EMC ANALYZER	E7405A	US41110272	AGILENT	2006-01-20	12
RF Matrix	PSU	R&S	861206/024	N/A	12

EUT Test Setup

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 EUT Operating mode(s).

Test Result

Measurement Results	Pass No Operation errors were detected during or after the applied test.
----------------------------	---

Test Data

■ Operating Mode : Satellite Signal Receiving

RF Output CH No. :3CH

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
56.748	60.1	-24.7	35.4	56.5	21.1
61.25	76.7	-24.7	52	69.5	17.5
65.74	61	-24.7	36.3	56.5	20.2

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

■ Operating Mode : Satellite Signal Receiving

RF Output CH No. :4CH

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
62.745	61.2	-24.7	36.5	56.5	20
67.248	76.2	-24.7	51.5	69.5	18
71.745	58.9	-24.7	34.2	56.5	22.3

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

3.4 Output Terminal Conducted Spurious

Test Information		
	Test Engineer	Tae Young, Jang
	Test Date	April 15, 2005
	Climate Condition	Ambient Temperature : 22.6 °C Relative Humidity : 32%
	Test Place	Shield Room #5

Test Equipments

Equipment	Modal Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
RF Generator	RF-100	Doctor Design	-	N/A	12
Pre-Amplifier	310N	SONOMA	185861	2005-10-08	12
EMI TEST RECEIVER	ESS-30	844861/005	R&S	2006-01-11	12
Matching Pad	RAM	R&S	834188/009	2006-01-08	12
EMC ANALYZER	E7405A	US41110272	AGILENT	2006-01-20	12
RF Matrix	PSU	R&S	861206/024	N/A	12

EUT Test Setup

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 EUT Operating mode(s).

Tested frequency range were 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

Test Result

Measurement Results	Pass No Operation errors were detected during or after the applied test.
----------------------------	--

Test Data

■ Operating Mode : Satellite Signal Receiving RF Output CH No. :3CH[Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
40.9605	34	-24.8	9.2	39.5	30.3
49.15	37.1	-24.8	12.3	39.5	27.2
54.0037	34.1	-24.7	9.4	39.5	30.1

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

■ Operating Mode : Satellite Signal Receiving RF Output CH No. :3CH[Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
73.729	44.5	-24.7	19.8	39.5	19.8
81.85	46.1	-24.6	21.5	39.5	18
133	48	-24.4	23.6	39.5	15.9

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

■ Operating Mode : Satellite Signal Receiving RF Output CH No. :4CH[Spurious Low]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
49.1541	37.2	-24.8	12.4	39.5	27.1
49.6145	36.6	-24.8	11.8	39.5	27.7
53.9994	34.1	-24.7	9.4	39.5	30.1

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

■ Operating Mode : Satellite Signal Receiving RF Output CH No. :4CH[Spurious High]

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
81.85	46	-24.6	21.4	39.5	18.1
103.57	29.9	-24.5	5.4	39.5	34.1
133.01	48.1	-24.4	23.7	39.5	15.8

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

3.5 Antenna Transfer Switch Measurement

Test Information		
	Test Engineer	Tae Young, Jang
	Test Date	April 15, 2005
	Climate Condition	Ambient Temperature : 22.6°C Relative Humidity : 32%
	Test Place	Shield Room #5

Test Equipments

Equipment	Modal Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
RF Generator	RF-100	Doctor Design	-	N/A	12
Pre-Amplifier	310N	SONOMA	185861	2005-10-08	12
EMI TEST RECEIVER	ESS-30	844861/005	R&S	2006-01-11	12
Matching Pad	RAM	R&S	834188/009	2006-01-08	12
EMC ANALYZER	E7405A	US41110272	AGILENT	2006-01-20	12
RF Matrix	PSU	R&S	861206/024	N/A	12

EUT Test Setup

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

Test Result

Measurement Results	Pass No Operation errors were detected during or after the applied test.
---------------------	---

Test Data

■ Operating Mode : Satellite

RF Output CH No. :3CH

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
"There was no found any emission during the above test"					

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

■ Operating Mode : Satellite

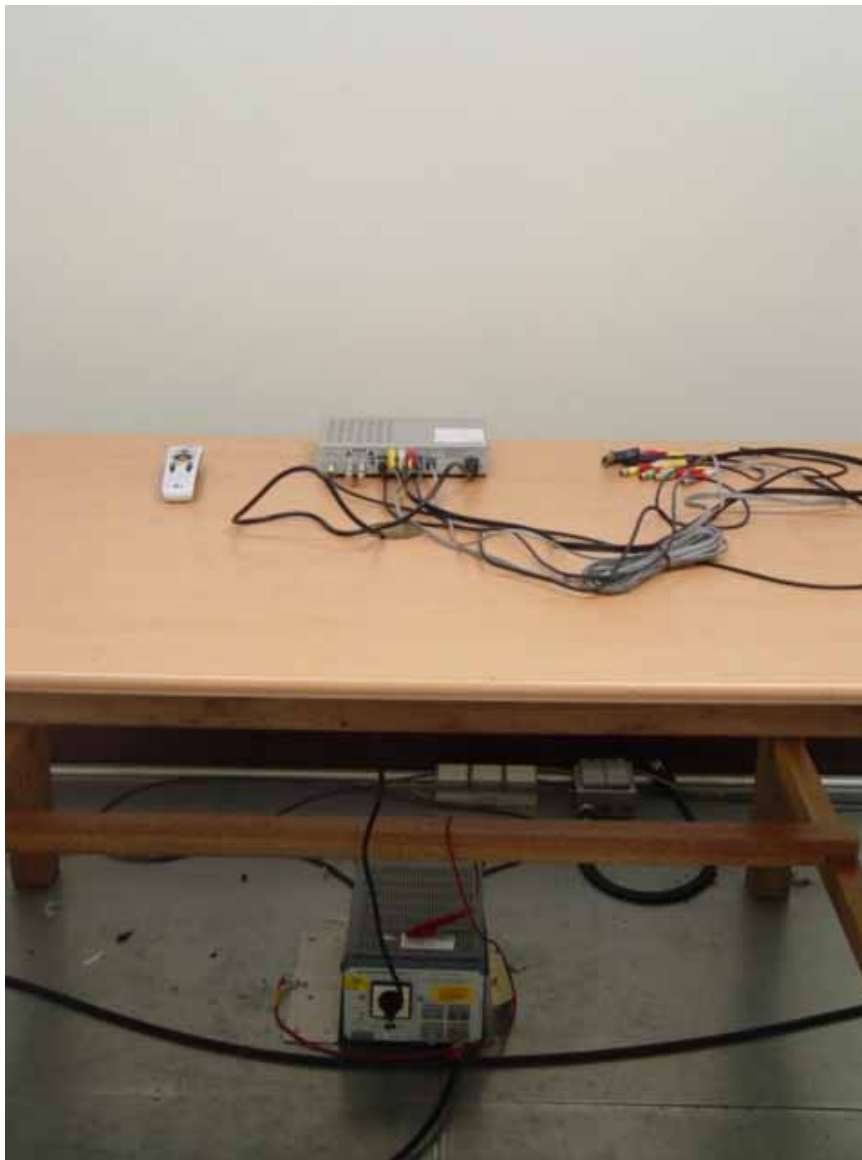
RF Output CH No. :4CH

Frequency	Reading	Factor	Level	Limit	Margin
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
"There was no found any emission during the above test"					

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

4. Appendix A

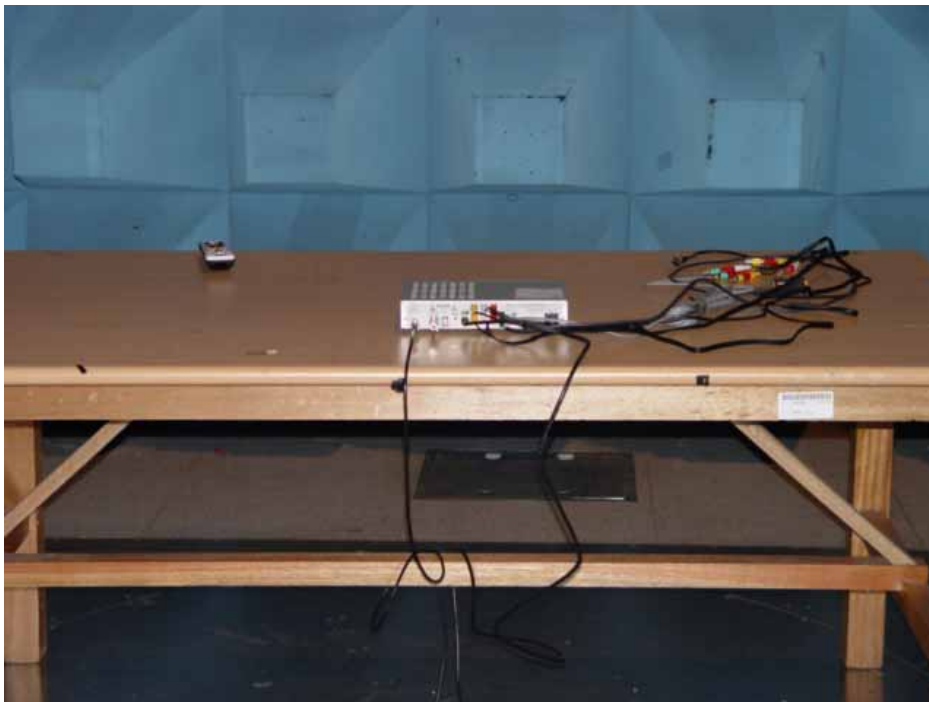
4.1 Test Photography



Picture 1. Conducted Emission (Rear)



Picture 2. Radiated Emission (Front)



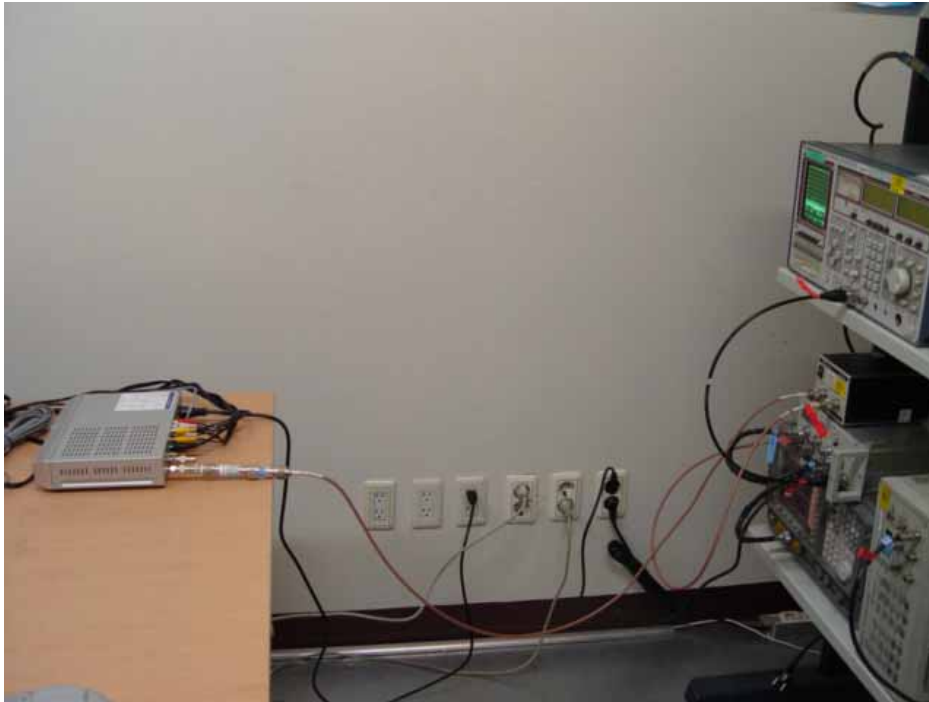
Picture 3. Radiated Emission (Rear)



Picture 4. Output Signal Level



Picture 5. Output Terminal Conducted Spurious Emission



Picture 6. Ant. Transfer Switch

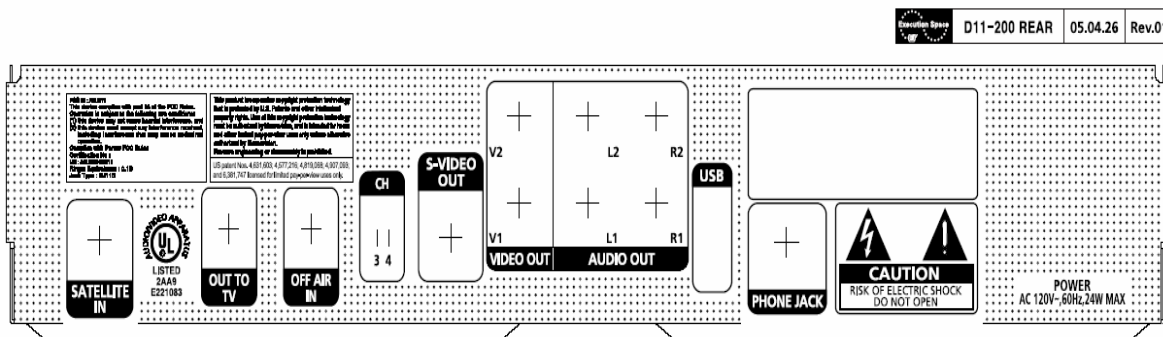
4.2 EUT Photography



Picture 7. EUT (Front)



Picture 8. EUT (Rear)



Picture 9. Lable