FCC TEST REPORT

Electromagnetic Emission

F C C M E A S U R E M E N T R E P O R T

CERTIFICATION OF COMPLIANCE

FCC Part 15 Certification Measurement

PRODUCT	:	DIGITAL SATELLITE RECEIVER
MODEL/TYPE NO	:	I PRO 2000
BRAND NAME	:	NEO SAT
FCC ID	:	UT9IPRO2000
APPLICANT	:	UBSTUSA 444 kingsley Dr suite#318 Los Angeles CA 90020 United States Attn.: Park, Jin Ho
MANUFACTURER	:	(HENG DI) Hyundai Digital Technology(Shenzhen) Co., Ltd. 1-5 Floors, No. A, Zhangqihuangsheng Industrial Park Polao Village, Kukeng Guanlan Town, Baoan District, Shenzhen City, Guangdong Province, P.R. China
FCC CLASSIFICATION	:	TV interface device
FCC RULE PART(S)	:	FCC Part 15 Subpart B
FCC PROCEDURE	:	Certification
TEST REPORT No.	:	ETLE061130.545
DATES OF TEST	:	December 04, 2006 to December 07, 2006
REPORT ISSUE DATE	:	December 08, 2006
TEST LABORATORY	:	ETL Inc. (FCC Registration Number : 95422)

This DIGITAL SATELLITE RECEIVER, Model I PRO 2000 has been tested in accordance with the measurement procedures specified in ANSI C63.4-2003 at the ETL/EMC Test Laboratory and has been shown to be complied with the electromagnetic radiated emission limits specified in FCC Rule Part15 Subpart B:

I attest to the accuracy of data. All measurement herein was performed by me or was made under my supervision and is correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Chon Sik, Kim / Chief Engineer

ETL Inc.

#584 Sangwhal-ri, Ganam-myeon, Yoju-gun, Gyeonggi-do, 469-885, Korea

Tel : 82-2-858-0786 Fax : 82-2-858-0788

Table of Contents

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788
EMC Lab : #584 Sangwhal-ri, Ganam-myeon, Yoju-gun, Gyeonggi-do, 469-885, Korea

FCC MEASUREMENT REPORT

Scope – *Measurement and determination of electromagnetic emission(EME) of radio frequency devices including intentional radiators and/or unintentional radiators for compliance with the technical rules and regulations of the U.S Federal Communications Commission(FCC)*

General Information

Applicant Name : UBSTUSA

Address : 444 kingsley Dr suite#318 Los Angeles CA 90020

United States

Attention : Park, Jin Ho

- **EUT Type :** DIGITAL SATELLITE RECEIVER
- **Model Number :** I PRO 2000
- **FCC ID :** UT9IPRO2000
- **S/N :** N/A
- **FCC Rule Part(s) :** FCC Part 15 Subpart B
- **Test Procedure :** ANSI C63.4-2003
- **FCC Classification :** TV interface device
- **Dates of Tests :** December 04, 2006 to December 07, 2006
- **Place of Tests :** ETL Inc.
  EMC Testing Lab. (FCC Registration Number : 95422)
  #584, Sangwhal-ri, Ganam-myeon, Yoju-gun,
  Gyeonggi-do, 469-885, Korea
  Tel : 82-2-858-086 Fax : 82-2-858-0788
- **Test Report No. :** ETLE061130.545

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EMC Lab : #584 Sangwhal-ri, Ganam-myeon, Yoju-gun, Gyeonggi-do, 469-885, Korea

1. INTRODUCTION

The measurement test for radiated and conducted emission test were conducted at the open area test site of E-RAE Testing Laboratory Inc. facility located at #584, Sangwhal-ri, Ganam-myeon, Yoju-gun, Gyeonggi-do, 469-885, Korea. The site is constructed in conformance with the requirements of the ANSI C63.4-2003 and CISPR Publication 16. The ETL has site descriptions on file with the FCC for 3 m and 10 m site configurations. Detailed description of test facility was found to be in compliance with the requirements of Section 2.948 FCC Rules according to the ANSI C63.4-2003 and registered to the Federal Communications Commission (Registration Number : 95422).

The measurement procedure described in American National Standard for Method of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2003) was used in determining radiated and conducted emissions from the UBSTUSA, Model: I PRO 2000.

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2. PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the UBSTUSA, Model: I PRO 2000.

2.2 General Specification

1) SYSTEM CAPACITY
Fully MPEG2, DVB complaint

2) DEMODULATION
QPSK demodulation and FEC decoding
in accordance with DVB prETS 300 421
Symbol rate (Rs) 2 < Rs < 45 Mbaud

3) VIDEO DECODER
MPEG-2 Main Profile @ Main Level With Letter Box filter
Data rate up to 15Mbits/s
Video Formats 4:3, 16:9

4) AUDIO DECODER
MPEG-1 layer I and II, Musicam
Stereo Channel, Dual Mono, Joint Stereo Channel, Mono
Spdif with AC-3

5) PROCESSOR RESSOURCES
Microprocessor STi5100 AUC(STM)
SDRAM Memory 64Mbyte (DDR-RAM, 133MHz)
Flash memory 8Mbyte (4Mbit x16)

6) LNB INPUT
Input Frequency 950 to 2150 Mhz
Digital signal input level -65 to -25 dBm
LNB supply 13.5±0.5V / 18.5±0.7V, max.750mA
Band switch control 22KHz (Microprocessor control)
Connector 2 x F-Type, 3/8-32UNEF-2A (1 Input / 1 Loop through)

7) Component Outputs (YUV)
Connector type : 3 x RCA (Y Pb Pr)
Output impedance 75Ω unbalanced

8) S-VHS Output
Video format Y,C
Output impedance 75W unbalanced

9) AUDIO OUTPUT
Connector type 2 x RCA (Left and Right)
Output impedance 600Ω unbalanced

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10) Digital Audio Output
Connector type 1 x Optic
Output type Spdif encoded signals with ac-3
Sampling frequency rate 32 , 44.1 or 48khz

11) RF MODULATOR
RF Output Signal NTSC M
Video Carrier Frequency 61.25 ± 90 kHz US 3 CH
67.25 ± 90 kHz US 4 CH

12) RS232 SERIAL DATA PORT
Connector 9 pin DB9(M)
Data protocol RS232C interface

13) USB
USB 2.0 interface
Connector type **A type**

14) ETHERNET
Connector type RJ45
IEEE 802.3 / 802.3u standards
10 BASE-T and 100 BASE - TX support

15) POWER SUPPLY
Type Switching mode
Main input voltage 90 - 250V AC @ 50Hz/60Hz±5%
Nominal power consumption 40W

16) CONNECTORS
1 LNB Input / 1 Loop through output (2F-type)
2 x Audio L/R (RCA)
1 x Video SIGNAL (RCA)
3 x YUV (RCA)
1 x RS-232 (9-pin D-sub male)
1 x RF Modulator (2F-type : IEC169-24)
1 x S-VHS (4-pin Mini-Din)
1 x Digital Audio Output (optic)
1x USB A-type
1x R J45 Type Ethernet
1 x AC Power Switch

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EMC Lab : #584 Sangwhal-ri, Ganam-myeon, Yoju-gun, Gyeonggi-do, 469-885, Korea

3. DESCRIPTION OF TESTS

3.1 AC Power line Conducted Emissions Test

Conducted emissions measurements were made in accordance with section 11, "Measurement of Information Technology Equipment" of ANSI C63.4-2003. The measurements were performed over the frequency range of 0.15 MHz to 30 MHz using a 50 Ω/50 uH LISN as the input transducer to a Spectrum Analyzer or a Test Receiver. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 9 kHz or for "quasi-peak" within a bandwidth of 9 kHz.

The line-conducted emission test is conducted inside a shielded anechoic chamber room with 1 m x 1.5 m x 0.8 m wooden table which is placed 40 cm away from the vertical wall and 1.5 m away from the side wall of the chamber room. Two LISN are bonded to the shielded room. The EUT is powered from the LISN and the support equipment is powered from the another LISN. Power to the LISNs is filtered by a noise cut power line filters. All electrical Satellite Receivers are shielded by braided tinned steel tubing with inner ϕ 1.2 cm. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and these supply lines will be connected to the LISN. All interconnecting Satellite Receivers more than 1 m were shortened by non-inductive bundling(serpentine fashion) to a 1 m length. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the Spectrum Analyzer and Test Receiver to determine the frequency producing the max. Emission from the EUT The frequency producing the max level was reexamined using the detector function set to the CISPR Quasi-Peak mode by manual, after scanned by automatic Peak mode from 0.15 MHz to 30 MHz. The bandwidth of the Test Receiver was set to 9 kHz. The EUT, support equipment, and interconnecting Satellite Receivers were arranged and manipulated to maximize each emission. Each emission was maximized by switching power lines, varying the mode of operation or resolution, clock or data exchange speed, if apply Satellite Receiver, whichever determined the worst-case emission. Each emission reported was calibrated using self-calibrating mode.

Photographs of the worst-case emission can be seen in photographs of conducted emission test setup in Appendix B.

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3.2 Radiated Emissions Test

Preliminary measurements were made at indoors 3 m semi EMC Compact Chamber using broadband antennas, broadband amplifier and spectrum analyzer to determine the emission frequencies producing the maximum EME.
Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 MHz to 1 000 MHz using LogBicon antenna and above 1 000 MHz, linearly polarized double ridge horn antennas were used. Above 1 GHz, linearly polarized double ridge horn antennas were used. The measurements were performed with three frequencies which were selected as bottom, middle and top frequency in the operating band. Emission level from the EUT with various configurations were examined on the spectrum analyzer connected with the RF amplifier and plotted graphically.

Final measurements were made outdoors open site at 3 m test range using LogBicon antenna. The output from the antenna was connected, via a pre-selector or a preamplifier, to the input of the EMI Measuring Receiver or Spectrum analyzer(for above 1 GHz). The detector function was set to the quasi-peak or peak mode as appropriate. The measurement bandwidth on the Field strength receiver was set to at least 120 kHz (1 MHz for measurement above 1 GHz), with all post-detector filtering no less than 10 times the measurement bandwidth. Sufficient time for the EUT, support equipment and test equipment was allowed in order for them to warm up to their normal operating condition.

Each frequency found during preliminary measurement was examined and investigated as the same set up and configuration which produced the maximum emission The EUT, support equipment and interconnecting Satellite Receivers were configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8 m high non-metallic 1m x 1.5 m table. The turntable containing the system was rotated and the antenna height was varied 1 m to 4 m and stopped at the azimuth or height producing the maximum emission.

Each emission was maximized by varying the mode of operating frequencies of the EUT. The worst case emissions are recorded in the data tables. If necessary, the radiated emission measurement could be performed at a closer distance to ensure higher accuracy and the results were extrapolated to the specified distance using an inverse linear distance extrapolation factor(20 dB/decade) as per section 15.31(f).

Photographs of the worst-case emission test setup can be seen in Appendix B.

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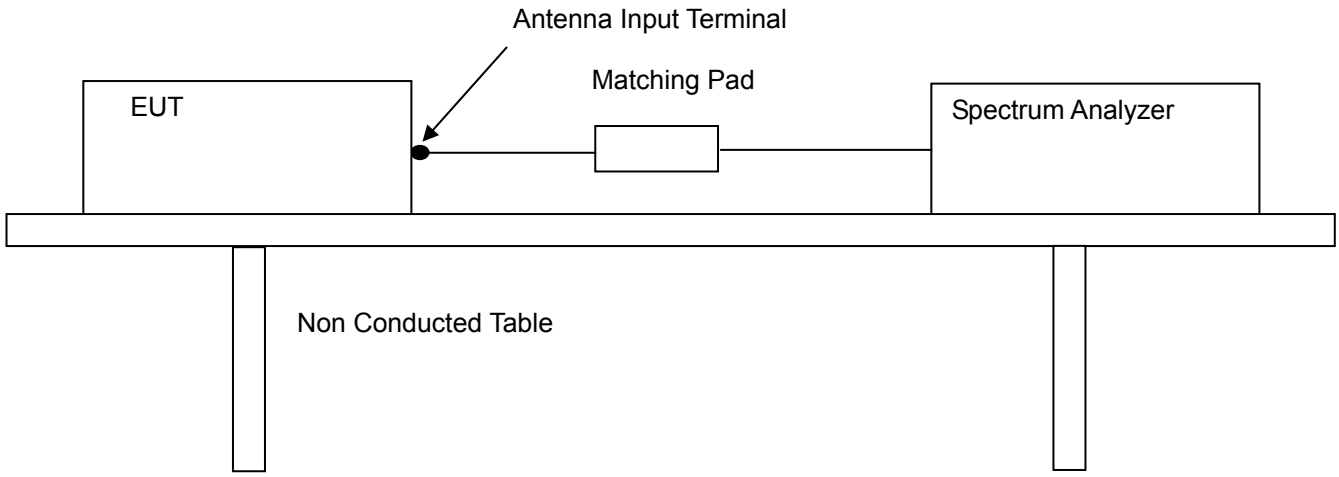
3.3 Antenna-Conducted Power Measurements

Power on the receive antenna terminals was to be determined by measurement of the voltage present at these terminals. Antenna-conducted power measurements is performed with the EUT antenna terminals connected directly to a spectrum analyzer, if the antenna impedance matches the impedance of the measuring instrument. Otherwise, use an impedance-matching network to connect the measuring instrument to the antenna terminals of the EUT. Losses in decibels in any impedance-matching network used were added to the measured value in dBμV.

With the EUT tuned to one of the frequency over which device operates , measure both the frequency and voltage present at the antenna input terminals over the frequency range specified in the individual equipment requirements. Repeat this measurement with the receiver tuned to another frequency until the number of frequencies specified has been successively measured. Power on the receive antenna terminals is the ratio of V^2/R, where V is the loss-corrected voltage measured at the antenna terminals, and R is the impedance of the measuring instrument.



Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788
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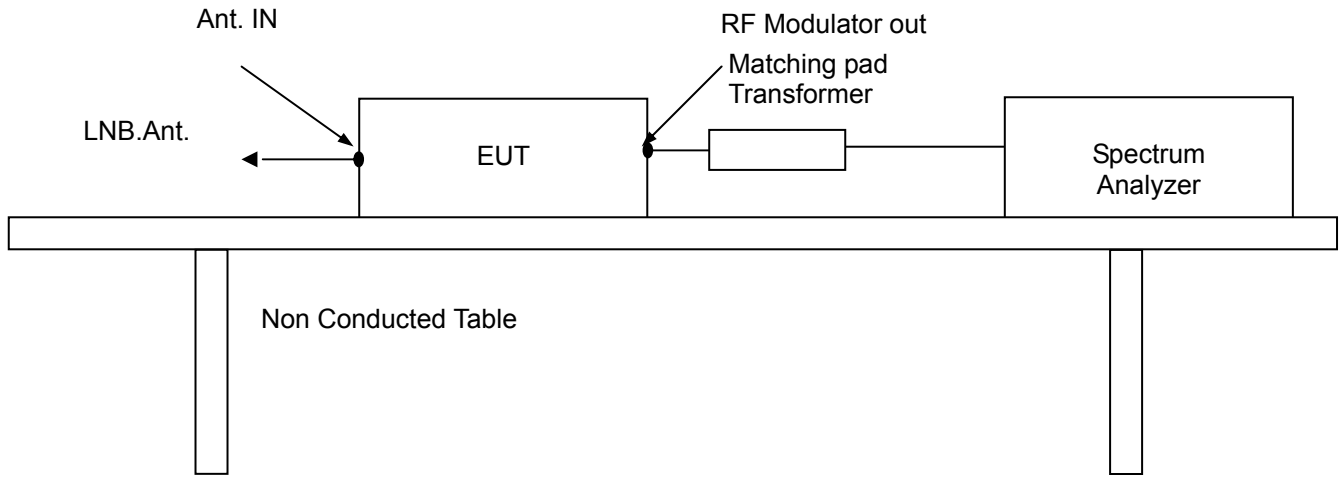
3.4 Output Signal Conducted Level Measurement

The output signal level is the maximum voltage level present at the output terminals of the EUT on a particular frequency during normal use of the device.

The signal level was measured by direct connection to the spectrum analyzer with 50 ohm/75 ohm matching transformer between the spectrum analyzer and the TV interface device. The RF output signal level measured was the highest RF level present at the output terminals during normal use of the device. Measurements were made of the levels of both the visual (61.25 MHz) and audio (65.75 MHz) carrier for each TV channel(3 and 4) on which the device operates. The Satellite Receiver was supported between the EUT and the measuring instrument in a straight horizontal line so it had at least 75 cm clearance from any conducting surface.

The EUT is provided with a typical signal consistent with normal operation. For each channel on which the EUT operates and in each mode in which the device operates, the video and audio carrier level is measured and recorded.

The voltage corresponding to the peak envelope power of the video modulated signal during maximum amplitude peaks across a resistance (R ohms) matching the rated output impedance of the device, must not exceed 692.8 $R^{1/2}$ μV for all other TV interface device. The voltage corresponding to peak envelope power of the audio modulated signal, if provided by the TV interface device, must not exceed 155$R^{1/2}$ μV for Satellite Receiver system terminal device of TV interface device used with a master antenna, and 77.5 $R^{1/2}$ μV for all other TV interface device. Losses in decibels in any impedance-matching network used were added to the measured value in dBμV. The EUT was configured in accordance with ANSI C63.4-2003 Section 12.2 as below configuration block diagram.



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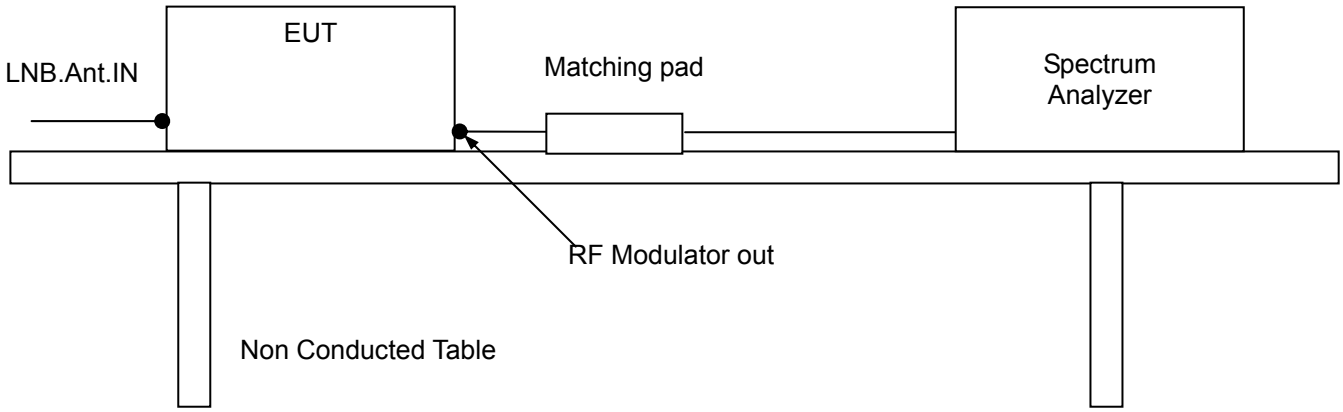
3.5 Output Terminal Conducted Spurious Emission Measurement

The RF output signal was fed to the TV receiver via coaxial Satellite Receiver. Measurements were made by direct connection to the spectrum analyzer and TV interface device with 50/75 ohm matching transformer. The frequency range 30 MHz to 1 000 MHz was investigated for significant emission.

The maximum RMS voltage of any emission appearing on frequencies removed by more than 4.6 MHz below and 7.4 MHz above the video carrier frequency on which the TV interface device is operated must not exceed 692.8 $R^{1/2}$ μV for Satellite Receiver system terminal device or TV interface device used with a master antenna and 10.95 $R^{1/2}$ μV for all other TV interface device when terminated with a resistance (R ohms) matching the rated output impedance of the TV interface device. The EUT was configured in accordance with ANSI C63.4-2003 Section 12.2 as below configuration block diagram.



Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788
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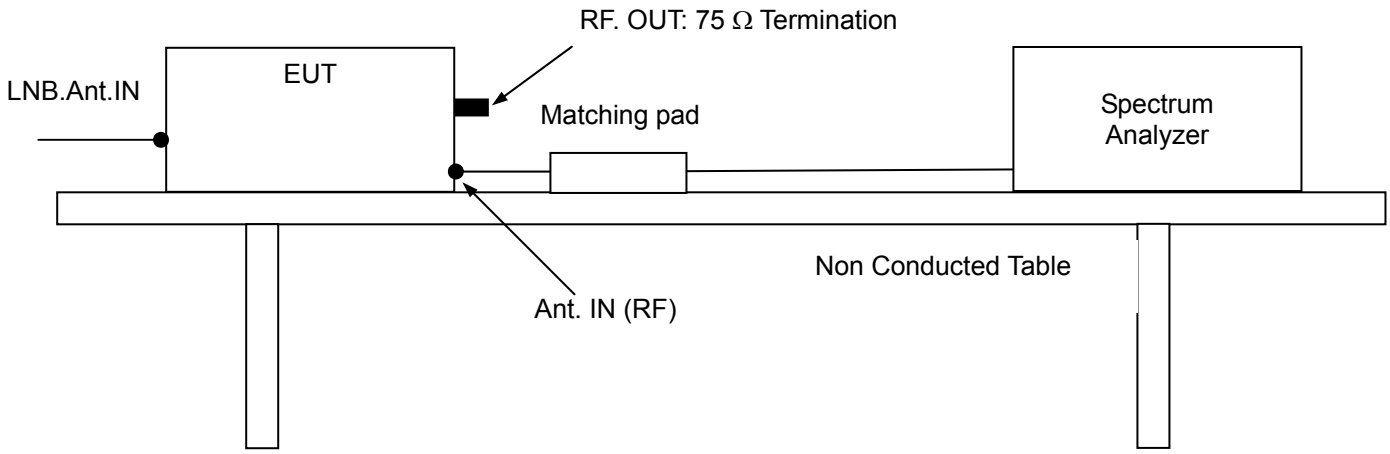
3.6 Antenna Transfer Switch Measurement

Isolation was measured for all positions of an antenna transfer switch on all output channels of the EUT. TV interface device transfer switch isolation is the difference the levels of a signal going into one antenna input port of the switch and that of the same signal coming out of another antenna terminal of transfer switch. The isolation of an antenna transfer switch equipped with coaxial connector performed by measuring the maximum voltage of the visual carrier. Measurements were made of the maximum RMS voltage at the antenna input terminals of the switch for all positions of the transfer switch. The maximum voltage corresponds to the peak envelope power of the video signal during maximum amplitude peaks. In either position of the receiver transfer switch, the maximum voltage at the receiving antenna input terminals of the switch when terminated with a resistance (R ohms) matching the rated impedance of the antenna input of the switch, must not exceed 0.346 $R^{1/2}$ μV.

The maximum voltage corresponds to the peak envelope power of the video modulated signal during maximum amplitude.

The EUT was configured in accordance with ANSI C63.4-2003 Section 12.2 as below configuration block diagram. and the EUT configuration can also be seen in Appendix B. Photographs of the test setup.

The unused RF input/output terminals are terminated in proper impedance. The antenna input terminal is connected to the input of preamplifier through the matching transformer coaxial Satellite Receiver. And the output of preamplifier is connected to the spectrum analyzer. Then, the signal level on the antenna input terminal is measured under the EUT condition produced the maximum signal level.



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4. TEST CONDITION

4.1 Test Configuration

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the EUT and the supported equipments were installed to meet FCC requirement and operated in a manner and which tends to maximize its emission level in a typical application.

4.2 EUT operation

The EUT was set to the normal receiving mode in a TV mode during all the testing in a manner similar to a typical use. For the EUT operation, the satellite live signal was fed to the EUT through the LNB input. During the preliminary testing, the worst case condition of the operating mode was ch.3

4.3 Support Equipment Used

Description	Model Name	Serial No.	Manufacturer	FCC ID
LCD TV	NONE	NONE	DM TECH	NONE
Adapter	NONE	NONE	NONE	NONE
Notebook	LGM6	502KISD 213318	LG Electronics	NONE
Adapter	PA-1900-D8	L9050B02002179	Dongguang Lite Power 2nd Plant	NONE
EUT	**I PRO 2000**	**NONE**	(HENG DI) Hyundai Digital Technology(Shenzhen) Co., Ltd.	UT9IPRO2000
DVD Player	NONE	NONE	Ellion Digital	NONE

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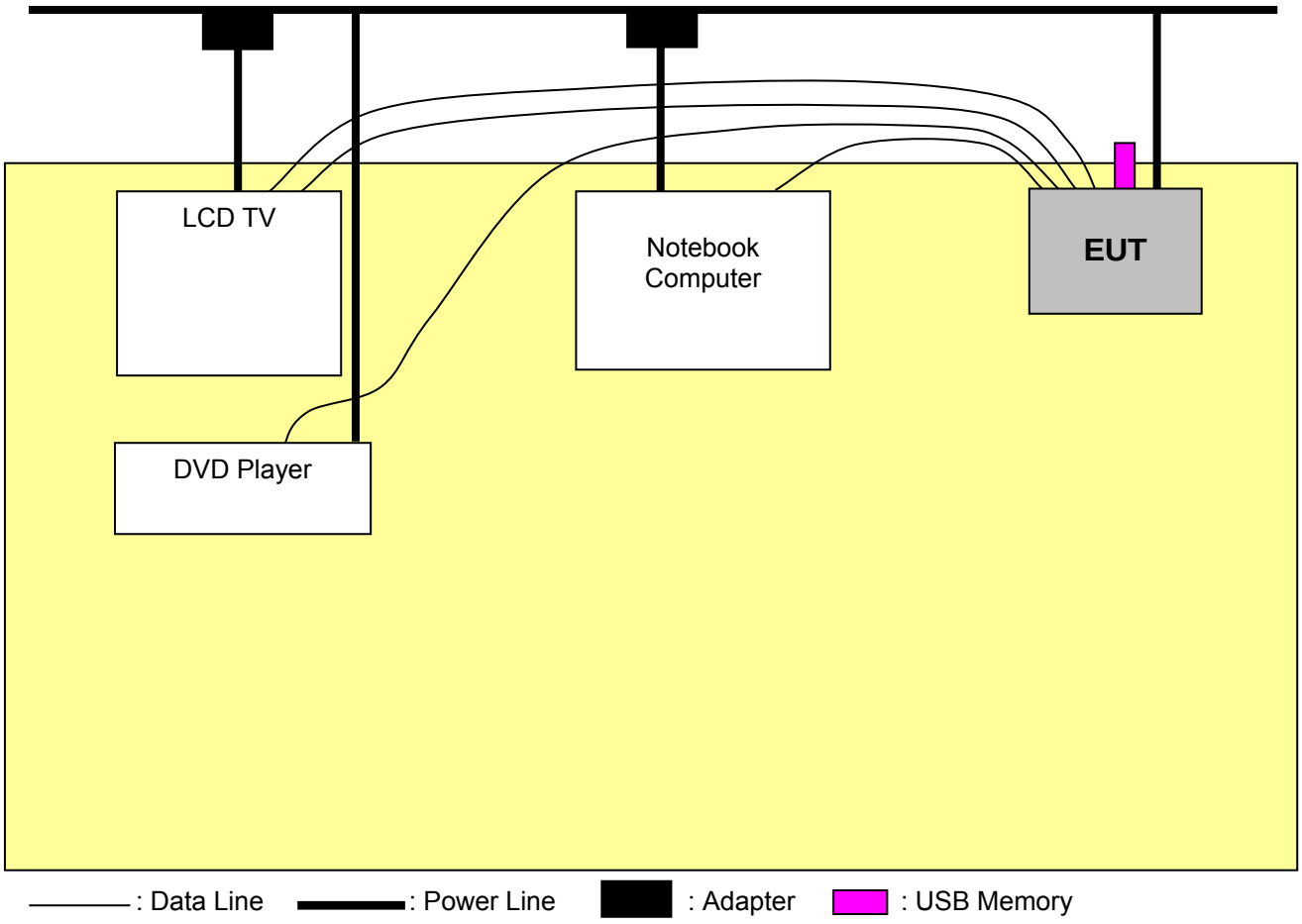
EMC Lab : #584 Sangwhal-ri, Ganam-myeon, Yoju-gun, Gyeonggi-do, 469-885, Korea

4.4 The setup drawing(s)



4.5 Type of Cables Used

Device from	Device to	Type of Cable	Length(m)	Type of shield
EUT	LCD TV	S-VHS	1,2	Shielded
EUT	LCD TV	AUDIO-VIDEO	1,5	Shielded
EUT	USB Memory	USB	-	-
EUT	DVD Player	Component Video Out	1,5	Shielded
EUT	Notebook Computer	Ethernet	1,5	Unshielded
EUT	Power Socket	INLET	1,2	Shielded

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EMC Lab : #584 Sangwhal-ri, Ganam-myeon, Yoju-gun, Gyeonggi-do, 469-885, Korea

5. TEST RESULTS

5.1 Summary of Test Results

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum emission of the EUT are reported.

FCC Rule	Measurement Required	Result
15.107	Conducted Emission Measurement	Passed by 2,4 dB
15.109	Radiated Emission Measurement	Passed by 3,1 dB
15.111	Antenna Power Conduction Measurement	Passed by 5,2 dB
15.115(b)(1)(ii)	Output Signal Level Measurement	Passed by 4,9 dB
15.115(b)(2)(ii)	Output Terminal Conducted Spurious Emission Measurement	Passed by 6,1 dB
15.115(c)(1)(ii)	Transfer Switch Measurement	Passed

The data collected shows that the **UBSTUSA / DIGITAL SATELLITE RECEIVER / I PRO 2000** complied with technical requirements of above rules part 15.107 and 15.109 Class B Limits.

The equipment is not modified anything, mechanical or circuits to improve EMI status during a measurement. No EMI suppression device(s) was added and/or modified during testing.

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5.2 Conducted Emissions Measurement

EUT	DIGITAL SATELLITE RECEIVER / I PRO 2000 (SN :N/A)
Limit apply to	FCC Part 15. 107 Class B
Test Date	December 06, 2006
Operating Condition	TV Mode (Channel 3)
Result	Passed by 2,4 dB

Conducted Emission Test Data

The following table shows the highest levels of conducted emissions on both polarizations of hot and neutral line.
Detector mode: CISPR Quasi-Peak mode (6 dB Bandwidth : 9 kHz)

Frequency [MHz]	Result [dBμV]		Phase (*H/**N)	Limit [dBμV]		Margin [dB]	
	Quasi-peak	Average		Quasi-peak	Average	Quasi-peak	Average
3,388	45,2	41,6	H	56,0	46,0	10,8	4,4
3,398	45,8	42,1	N	56,0	46,0	10,2	3,9
3,456	45,2	39,3	H	56,0	46,0	10,8	6,7
3,988	46,8	41,9	H	56,0	46,0	9,2	4,1
3,999	46,7	41,7	N	56,0	46,0	9,3	4,3
4,056	47,5	43,0	H	56,0	46,0	8,5	3,0
4,065	47,7	43,6	N	56,0	46,0	8,3	2,4
4,786	45,8	42,1	H	56,0	46,0	10,2	3,9

NOTES: **1. * H: HOT Line , **N: Neutral Line**
2. Margin value = Limit – Result
3. Measurement were performed at the AC Power Inlet in the frequency band of 150 kHz ~ 30 MHz according to the FCC Part 15 Class B.

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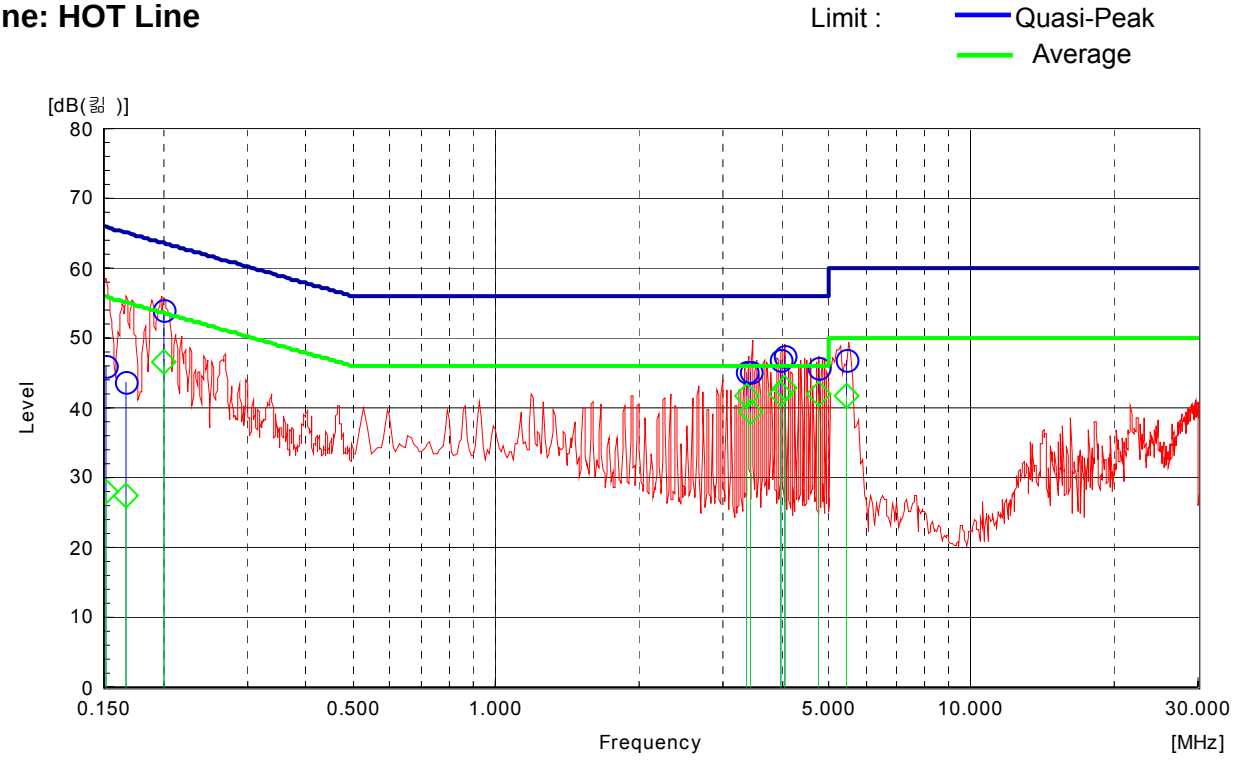
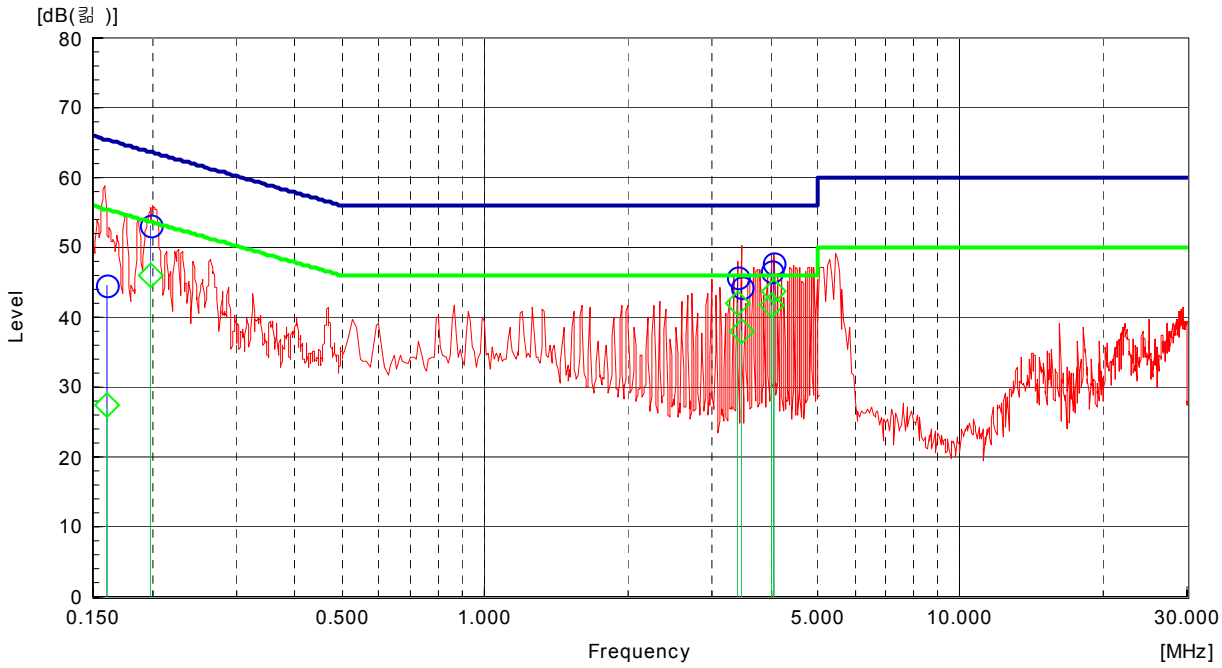
Line: HOT Line



Line: Neutral Line



Quasi-peak ○ Average ◇

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5.3. Radiated Emissions Measurement

EUT	DIGITAL SATELLITE RECEIVER / I PRO 2000 (SN :N/A)
Limit apply to	FCC Part 15. 109 Class B
Test Date	December 04, 2006
Operating Condition	TV Mode (Channel 3)
Result	Passed by 3,1 dB

Radiated Emission Test Data

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.
Detector mode: CISPR Quasi-Peak mode (6 dB Bandwidth: 120 kHz)

Frequency [MHz]	Reading [dBμV]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dBμV]	Emission Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]
30,68	23,81	V	11,38	1,41	36,60	40,0	3,40
40,13	17,87	V	11,63	1,81	31,30	40,0	8,70
50,93	22,67	V	12,13	2,10	36,90	40,0	3,10
74,55	21,07	V	8,69	2,25	32,00	40,0	8,00
81,30	19,83	V	7,88	2,39	30,10	40,0	9,90
250,05	23,80	H	10,85	4,85	39,50	46,0	6,50
375,25	21,50	H	14,05	6,35	41,90	46,0	4,10
501,25	17,80	V	16,58	7,62	42,00	46,0	4,00

NOTES : **1. * H : Horizontal polarization , ** V : Vertical polarization**
2. Result = Reading + Antenna factor + Cable loss
3. Margin value = Limit - Result
4. The measurement was performed for the frequency range 30 MHz ~ 1 000 MHz according to the FCC PART 15.109 Class B.

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5.4 Antenna Power Conduction Measurement

EUT	DIGITAL SATELLITE RECEIVER / I PRO 2000 (SN :N/A)
Limit apply to	FCC Part 15 Subpart B Section 15.111
Test Date	December 06, 2006
Operating Condition	LNB Tuner
Result	Passed by 5,20 dB

Antenna Power Conduction Test Data

Tuned Frequency [MHz]	Meter Reading [dBμV]	Correction Factor [dB]	Result [dBμV]	Limit [dBμV]	Margin [dB]
61,050	27,1	7,5	34,6	50,0	15,5
726,626	34,2	10,6	44,8	50,0	5,2

NOTES :

1. *Result = Meter Reading + Correction Factor(Matching Loss + Cable loss)*
   Margin value = Limit – Result
2. *Measurements using the CISPR Quasi-peak mode in the frequency range 30 MHz to 1 000 MHz and measurements using the CISPR peak mode in the frequency range 1 000 to 12 000 MHz .*
3. *The limits is 2.0 nW in the frequency range 30 to 12 000 MHz.*

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5.5 Output Signal Level Measurement

EUT	DIGITAL SATELLITE RECEIVER / I PRO 2000 (SN :N/A)
Limit apply to	FCC Part15 Subpart B Section 15.115(b)(1)
Test Date	December 06, 2006
Operating Condition	TV Mode (Channel3, 4)
Result	Passed by 4,9 dB

Output Signal Test Data

Test Channel	Emission Frequency [MHz]	Meter Reading [dBμV]	Correction Factor [dB]	Signal Level [dBμV]	Limit [dBμV]	Margin [dB]
3	61,27	57,1	7,5	64,6	69,5	4,9
	65,74	42,5	7,5	50,0	56,5	6,5
4	67,27	57,2	7,5	64,7	69,5	4,9
	71,75	42,9	7,5	50,4	56,5	6,1

NOTES :

1. *The correction factor consist of the insertion loss of the impedance matching transformer and the coaxial Satellite Receiver used for the test.*
2. *The spectrum was checked in each test mode and operation mode, and the maximum measured data were reported.*
3. *Signal Level = Meter Reading + Correction Factor(Matching Loss + Cable loss)*
   Margin value = Limit - Signal Level

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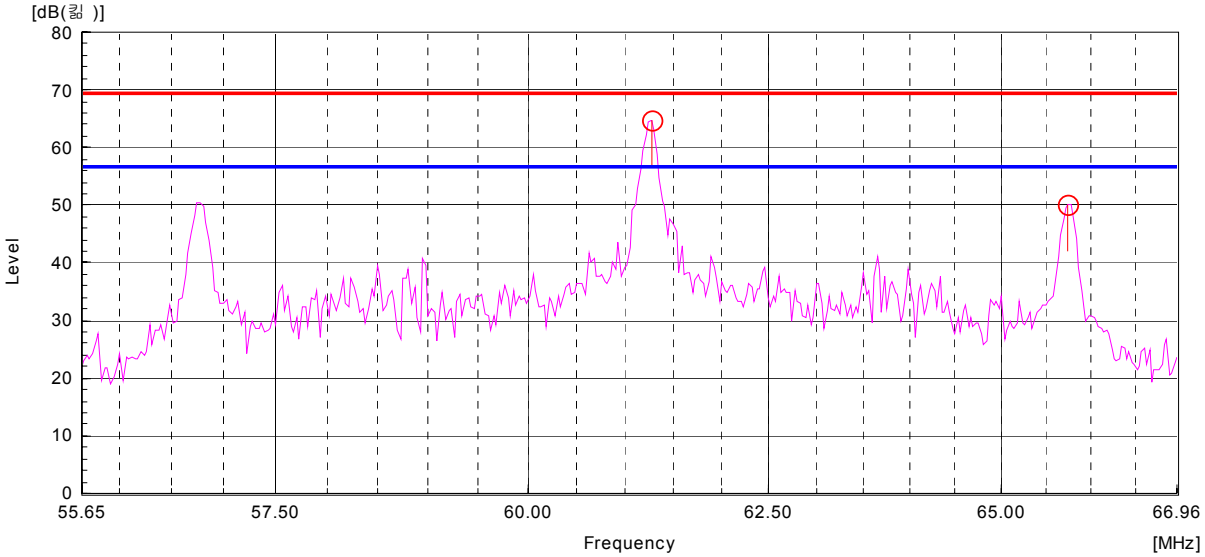
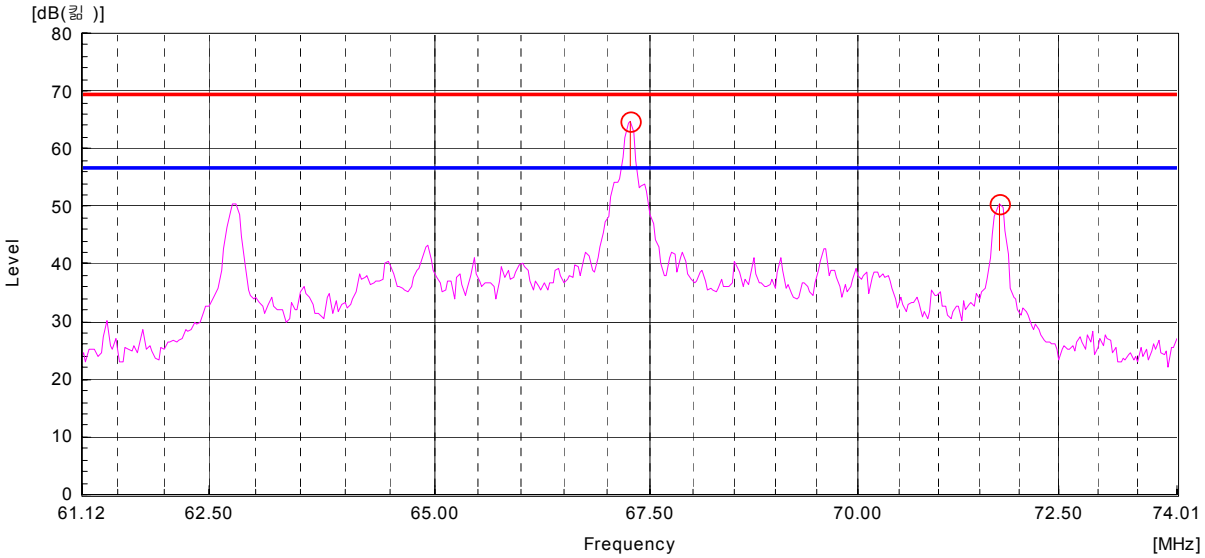
Channel 3



Channel 4



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5.6 Output Terminal Conducted Spurious Emission Measurement

EUT	DIGITAL SATELLITE RECEIVER / I PRO 2000 (SN :N/A)
Limit apply to	FCC Part15 Subpart B Section 15.115(b)(2)
Test Date	December 06, 2006
Operating Condition	TV Mode (Channel 3, 4)
Result	Passed by 6,10 dB

Output Terminal Conducted Spurious Test Data

Test Channel	Emission Frequency [MHz]	Meter Reading [dBμV]	Correction Factor [dB]	Result [dBμV]	Limit [dBμV]	Margin [dB]
3	675,05	24,2	7,8	32,0	39,5	7,5
	980,60	25,4	8,0	33,4	39,5	6,1
4	740,52	25,5	7,8	33,3	39,5	6,2
	873,90	23,9	7,9	31,8	39,5	7,7

NOTES :

1. *The correction factor consist of the insertion loss of the impedance matching transformer.*
2. *The spectrum was checked in each test mode and operation mode, and the maximum measured data were reported.*
3. *Result = Meter Reading + Correction (Matching Loss+ Cable loss)*
   Margin value = Limit - Signal Level

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5.7 Antenna Transfer Switch Measurement

EUT	DIGITAL SATELLITE RECEIVER / I PRO 2000 (SN :N/A)
Limit apply to	FCC Part15 Subpart B Section 15.115(c)(1)
Test Date	December 06, 2006
Operating Condition	TV Mode (Channel 3, 4)
Result	Passed

Antenna Transfer Switch Test Data

Test Channel	Emission Frequency [MHz]	Meter Reading [dBμV]	Correction Factor [dB]	Result [dBμV]	Limit [dBμV]	Margin [dB]
3	61.25	During this test, no signal detected			9.5	-
4	67.25				9.5	-

NOTES :

1. *No emission was observed during the test. The spectrum was checked in each test mode and operation mode Transfer switch isolation measurements were made on the Channel 3 or 4 video output frequency of 61.25 or 67.25MHz and both positions of the transfer switch were checked for compliance.*
2. *To clarify the emissions emanated from ANT. input terminal on the EUT, RF pre-amplifier was used. The gain of pre-amplifier at each frequency measured from the EUT was obtained after sufficient warm-up for stabilization of gain. The correction factor consist of the insertion loss of the impedance matching transformer, the coaxial Satellite Receiver used for the test and the gain of pre-amplifier.*
3. *Result = Meter Reading + Correction Factor(Matching Loss + Cable loss)*
   Margin value = Limit - Result
4. *Spectrum analyzer setting : Frequency Span 1MHz, Resolution bandwidth 100 kHz, Video bandwidth 300 kHz, Detector function Peak mode.*

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6. SAMPLE CALCULATION

Sample Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.
The basic equation with a sample calculation is as follows:

FS = RA + AF + CF

Where FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Attenuation Factor

$dB(\mu V) = 20 \log_{10} (\mu V)$
$dB\mu V$ = dBm + 107

Example : @ 50,93 MHz

Class B Limit = 40 dB μN/m

Reading = 22,67 dB μN

Antenna Factor + Cable Loss = 12,13 + 2,10 = 14,23 dB μN/m

Total = 36,90 dB μN/m

Margin = 40 – 36,90 = 3,10 dB

= 3,10 dB below Limit

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7. List of test equipments used for measurements

Test Equipment		Model	Mfg.	Serial No.	Cal. Due Date
☒	EMI TEST Receiver	ESVS 10	R & S	835165/001	07-04-25
☒	EMI TEST Receiver	ESPI3	R & S	100478	07-10-17
☒	LISN	3816-2	EMCO	1002	07-10-17
☒	LISN	3825/2	EMCO	9208-1995	07-04-06
☒	LogBicon Antenna	VULB9160	Schwarz Beck	3082	07-08-11
☒	Spectrum Analyzer	E7405A	Agilent	US41160290	07-10-17
☒	Matching Pad	RAM	R&S	836964/009	07-10-17
☒	Turn-Table	DETT-03	Daeil EMC	-	N/A
☒	Antenna Master	DEAM-03	Daeil EMC	-	N/A

End of Test Report

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