

Electromagnetic Emission

FCC MEASUREMENT REPORT

CERTIFICATION OF COMPLIANCE

FCC Part 15 Certification Measurement

PRODUCT : Digital Satellite Receiver
MODEL/TYPE NO : FTA-Model 725i
FCC ID : UCI-FTA725I
APPLICANT : Leading Digital Co., Ltd.
ADDRESS : Unit 6507-6508, 65/F, The Center, 99 Queen's Road,
Central, Hong Kong
Attn.:H.S. Kim/ DIRECTOR
MANUFACTURER : 1. DPC CO., LTD.
2. Hyundai Digital Technology (Shenzhen)Co., Ltd.
ADDRESS : 1. #23, 17BK, BANWOL IND.COMP 491-1, MOKNAE-DONG,
DANWON-GU, ANSAN-SHI, KYUNGKI-DO, KOREA.
2. HDTCN. Lnd.Park, Potouxia Village. Kukeng. Guanian Town,
Bao'an District, Shenzhen City, China, PRC.
FCC CLASSIFICATION : HID : TV interface device
FCC RULE PART(S) : FCC Part 15 Subpart B
FCC PROCEDURE : Certification
TRADE NAME : Rhinosat
TEST REPORT No. : ETLE060609.252
DATES OF TEST : June 09 - June 10, 2006
REPORT ISSUE DATE : June 10, 2006
TEST LABORATORY : ETL Inc. (FCC Registration Number: 95422)

This Digital Satellite Receiver, FTA-Model 725i 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 comply with the electromagnetic radiated emission limits specified in FCC Rule Part15 Subpart B: TV interface device.

I attest to the accuracy of data. All measurement here in 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

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#584 Sangwhal-ri, Ganam-myeon, Yaju-gun, Gyeonggi-do, 469-885, Korea
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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 : Leading Digital Co., Ltd

Address : Unit 6507-6508, 65/F, The Center, 99 Queen's Road,
Central, Hong Kong

Attention : H.S, Kim / DIRECTOR

- **EUT Type** : Digital Satellite Receiver
- **Model Number** : FTA-Model 725i
- **FCC Identifier** : UCI-FTA725I
- **S/N** : N/A
- **Freq. Range** : 61.25 MHz – 71.75 MHz
- **FCC Rule Part(s)** : Part 15 Subpart B
- **Test Procedure** : ANSI C63.4-2003
- **FCC Classification** : TV Interface Device
- **RF Channels** : Ch. 3 / Ch. 4
- **Dates of Tests** : June 09 - June 10, 2006
ETL Inc.
- **Place of Tests** : 584, Sangwhal-ri, Ganam-myeon, Yoju-gun,
Gyeonggi-do, Korea
Tel : 82-2-858-0786 Fax : 82-2-858-0788
- **Test Report No.** : ETLE060609.252

1. INTRODUCTION

The measurement test for radiated and conducted emission test were conducted at the shielded anechoic chamber room and open area test site of ETL Inc. facility located at 584, Sangwhal-ri, Ganam-myeon, Youju-gun, Gyeonggi-do, 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 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 Leading Digital Co., Ltd / Digital Satellite Receiver / Model : FTA-Model 725i

2. PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test(EUT) is the Leading Digital Co., Ltd / Digital Satellite Receiver /
Model : FTA-Model 725i

2.2 General Specification

- Chassis Type : Metal
- List of Each OSC. Or X-Tal. Freq.(≥ 1 MHz) : 27.00 MHz

1) SYSTEM CAPACITY

Fully MPEG2, DVB compliant

2) DEMODULATION

QPSK demodulation and FEC decoding

Symbol rate (R_s) $2 < R_s < 45$ 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

5) PROCESSOR RESSOURCES

Processor SGS-Thomson Sti5518

SDRAM 8 Mbyte

Flash 2 Mbyte

6) LNB INPUT

Connector 2 x F-Type, 3/8-32UNEF-2A (1 Input / 1 Loop through

Input Frequency 950 to 2150 Mhz

LNB Supply $13.5 \pm 0.5V$ / $18.5 \pm 0.7V$, max.500mA

Band Switch Control 22 KHz

7) Component Outputs (YUV)

Connector type : 3 x RCA (Y Pb Pr)

Output impedance 75 Ω unbalanced

8) S-VHS Output

Video format Y,C

Output impedance 75W unbalanced

9) VIDEO OUTPUT/ AUDIO OUTPUT

Connector one RCA/ Connector two RCA (L/R)

10) Digital Audio Output

Connector type 1 x Optic

Sampling frequency rate 32 , 44.1 or 48khz

11) RF MODULATOR

Connector two IEC(M/F)

RF Output Signal NTSC M

Video Carrier Frequency 61.25 \pm 90 kHz US 3 CH
 67.25 \pm 90 kHz US 4 CH

12) RS232 SERIAL DATA PORT

Connector 9 pin DB9(M)

Data protocol RS232C interface

13) POWER SUPPLY

Type Switching mode

Input Voltage 90 - 250V AC @ 50Hz/60Hz \pm 5%

Norminal Power Consumption 27W

14) Built-in HDD

Formatted Gbyte : 80Gbytes

Interface: Ultra ATA/66

14) CONNECTORS

1 LNB Input / 1 Loop through output (2F-type : IEC169-24)

1 x 0/12 Volt (RCA)

2 x Audio L/R (RCA)

1 x CVBS (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)

3. DESCRIPTION OF TESTS

3.1 AC Powerline Conducted Emissions Test

Conducted emissions measurements were made in accordance with section 11, "Measurement of Information Technology Equipment" of ANSI C63.4-2003. The measurement were performed over the frequency range of 0.15 MHz to 30 MHz using a 50 Ω /50uH 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 an 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 1.0 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 1m 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 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 applicable 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.

3. DESCRIPTION OF TESTS

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 biconilog 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 biconilog antenna. The output from the antenna was connected, via a preselector 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 1 m x 1.5 m table. The turntable containing the system was rotated and the antenna height was varied 1m 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).

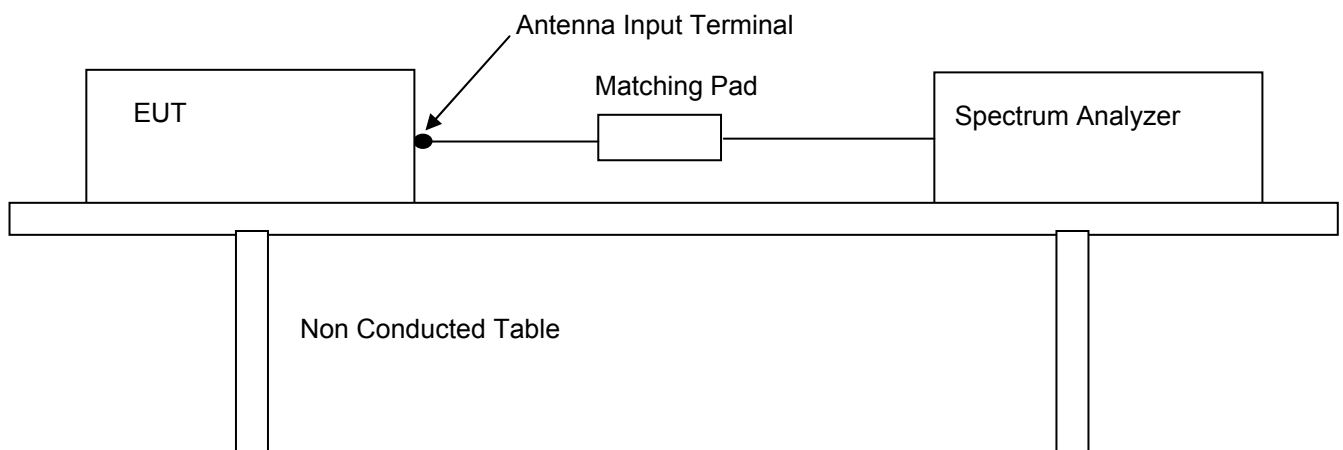
Photographs of the worst-case emission test setup can be seen in Appendix B.

3. DESCRIPTION OF TESTS

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 is added to the measured value in dB μ V.

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 have 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.



3. DESCRIPTION OF TESTS

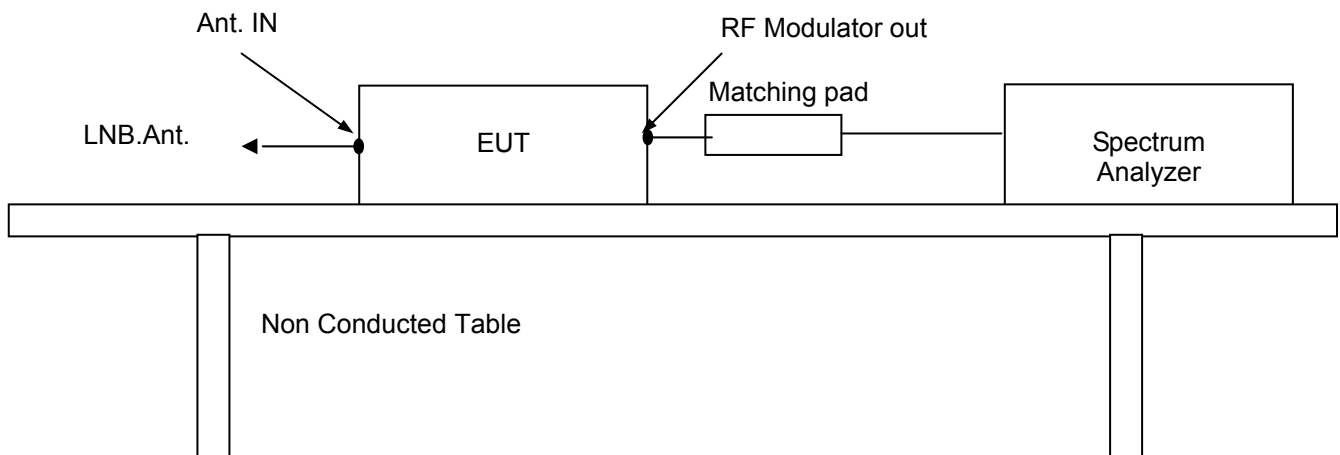
3.4 Output Signal Conducted Level Measurement

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 50/75 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 75cm 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 $692.8 R^{1/2} \mu V$ 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 $155 R^{1/2} \mu V$ for Satellite Receiver system terminal device of TV interface device used with a master antenna, and $77.5 R^{1/2} \mu V$ for all other TV interface device. Losses in decibels in any impedance-matching network used is added to the measured value in dB μV . The EUT was configured in accordance with ANSI C63.4-2003 Section 12.2 as below configuration block diagram.

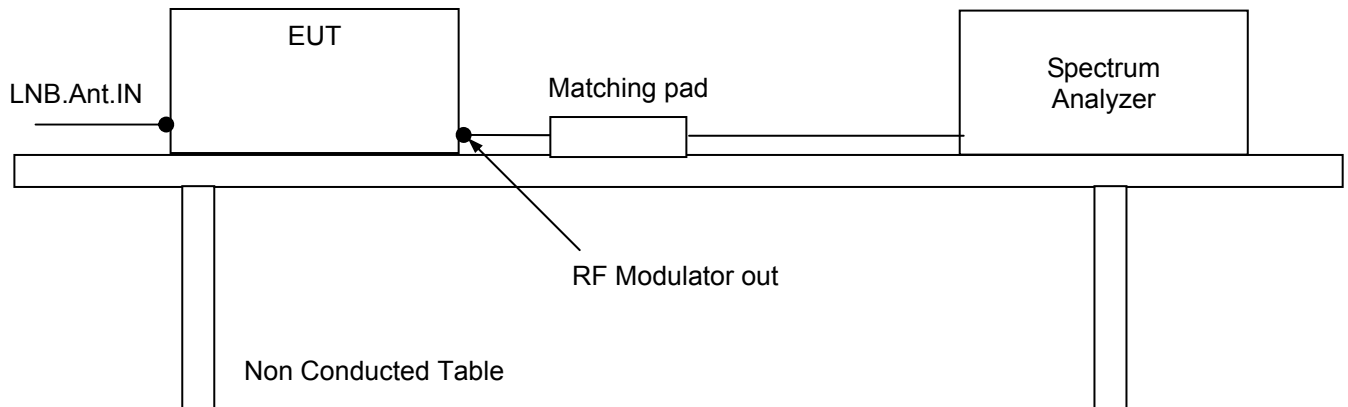


3. DESCRIPTION OF TESTS

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 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 $692.8 R^{1/2} \mu V$ for Satellite Receiver system terminal device or TV interface device used with a master antenna and $10.95 R^{1/2} \mu V$ 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.



3. DESCRIPTION OF TESTS

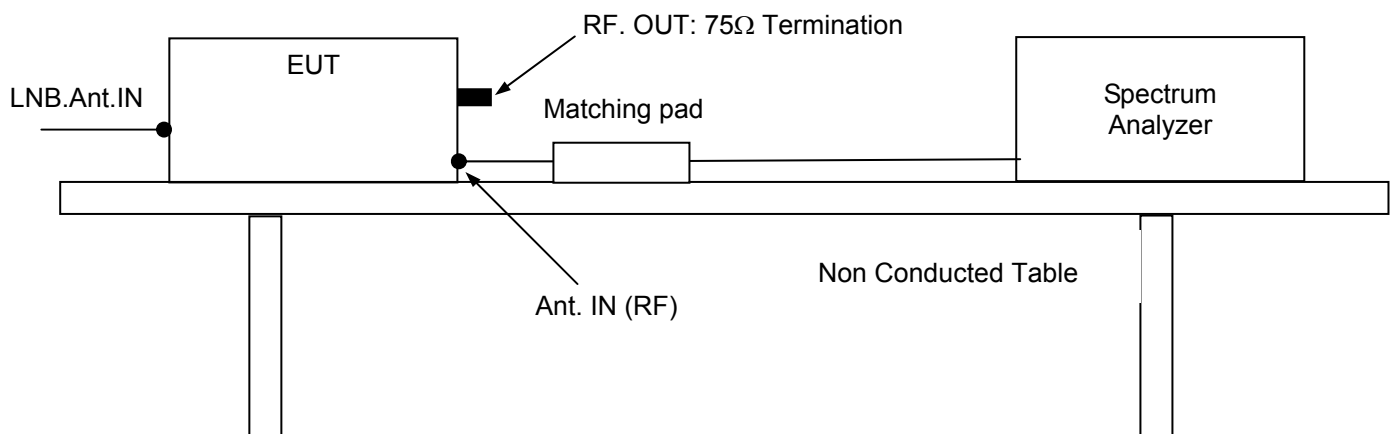
3.6 Antenna Transfer Switch Measurement

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 connectors is 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 $0.346 R^{1/2} \mu V$.

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 a proper impedance. The antenna input terminal is connected to the 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.



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 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

Following peripheral devices and interface Satellite Receivers were connected during the measurement:

EUT- Digital Satellite Receiver

FCC ID : UCI-FTA725I
Model Name : FTA-Model 725i
Serial No. : N/A
Manufacturer : 1. DPC CO., LTD.
2. Hyundai Digital Technology (Shenzhen)Co., Ltd.
Power Supply Type : Switching type
Data Cable : 1.5 m Shielded RF Cable , 1.5 m Shielded RCA Cable(2EA)
1.5 m Shielded S-video Cable

Support Unit - TV

FCC ID : N/A
Model Name : DM TECH TV
Serial No. : N/A
Manufacturer : DM TECH
Power Supply Type : Switching
Data Satellite Receiver : refer to EUT connection

Support Unit - DVD Receiver

FCC ID : N/A
Model Name : DVDP-M100
Serial No. : N/A
Manufacturer : Alphacast
Power Supply Type : External Adapter
Data Satellite Receiver : refer to EUT connection

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 Parts | Measurement Required | Result |
|------------------|---|--------------------|
| 15.107 | Conducted Emission | Passed by 5.00 dB |
| 15.109 | Radiated Emission | Passed by 5.90 dB |
| 15.111 | Antenna Power Conduction Measurement | Passed by 8.80 dB |
| 15.115(b)(1)(ii) | Output Signal Level Measurement | Passed by 2.09 dB |
| 15.115(b)(2)(ii) | Output Terminal Conducted Spurious Emission Measurement | Passed by 17.10 dB |
| 15.115(c)(1)(ii) | Transfer Switch Measurement | Passed |

The data collected shows that the **Leading Digital Co., Ltd / Digital Satellite Receiver / FTA-Model 725i** complies with Part 15 Subpart B Unintentional radiators and the TV Interface Device section(15.115) of the FCC Rules.

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.

5. TEST RESULTS

5.2 Conducted Emission Test

| | |
|-----------------------|--|
| EUT | Digital Satellite Receiver / FTA-Model 725i (SN:N/A) |
| Limit apply to | FCC Part 15 Subpart B Section 15.107 |
| Test Date | June 09, 2006 |
| Operating Condition | TV Mode (Channel 3) |
| Environment Condition | Humidity : 40 %R.H., Temperature : 21 °C |
| Result | Passed by 5.00 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 (6dB Bandwidth : 9 kHz)

| Frequency [MHz] | Result [dB μ V] | | Phase (*L/**N) | Limit [dB μ V] | | Margin [dB] | |
|--------------------|------------------------|---------|-------------------|-----------------------|---------|----------------|---------|
| | Quasi-peak | Average | | Quasi-peak | Average | Q.Peak | Average |
| 1.262 | 41.1 | 37.3 | N | 56.0 | 46.0 | 14.90 | 8.70 |
| 1.790 | 47.0 | 34.8 | H | | | 9.00 | 11.20 |
| 2.024 | 46.5 | 32.6 | N | | | 9.50 | 13.40 |
| 2.119 | 51.0 | 36.9 | H | | | 5.00 | 9.10 |
| 2.143 | 48.8 | 28.6 | H | | | 7.20 | 17.40 |
| 2.177 | 49.3 | 33.9 | H | | | 6.70 | 12.10 |
| 3.580 | 49.1 | 39.5 | N | | | 6.90 | 6.50 |

NOTES :

- * H : Live Line , **N :Neutral Line
- Margin value = Result - Limit.
- Channel 3 was the worst case operation mode



Kug Kyoung Yoon
Test Engineer

5. TEST RESULTS

5.3 Radiated Emission Test

| | |
|-----------------------|--|
| EUT | Digital Satellite Receiver / FTA-Model 725i (SN:N/A) |
| Limit apply to | FCC Part 15 Subpart B Section 15.109 |
| Test Date | June 09, 2006 |
| Operating Condition | TV Mode (Channel 4) |
| Environment Condition | Humidity : 48 %R.H., Temperature : 15 °C |
| Result | Passed by 5.90 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 (6dB Bandwidth : 120 kHz)

Measurement Distance : 3 m

| Frequency [MHz] | Reading [dB μ V] | Polarization (*H/**V) | Ant. Factor [dB/m] | Cable Loss [dB] | Result [dB μ V/m] | Limit [dB μ V/m] | Margin [dB] |
|-----------------|----------------------|-----------------------|--------------------|-----------------|-----------------------|----------------------|-------------|
| 297.32 | 18.76 | H | 12.67 | 5.47 | 36.90 | 46.0 | 9.10 |
| 364.79 | 18.77 | V | 13.89 | 6.24 | 38.90 | 46.0 | 7.10 |
| 365.17 | 19.96 | H | 13.89 | 6.25 | 40.10 | 46.0 | 5.90 |
| 539.77 | 12.82 | V | 17.84 | 8.24 | 38.90 | 46.0 | 7.10 |
| 704.31 | 9.80 | V | 20.44 | 9.66 | 39.90 | 46.0 | 6.10 |

NOTES :

- * H : Horizontal polarization , ** V : Vertical polarization
- Result = Reading + Antenna factor + Cable loss
- Margin value = Limit - Result
- Channel 4 was the worst case operation mode.



Kug Kyoung Yoon
Test Engineer

5. TEST RESULTS

5.4 Antenna Power Conduction Measurement

| | |
|-----------------------|--|
| EUT | Digital Satellite Receiver / FTA-Model 725i (SN:N/A) |
| Limit apply to | FCC Part 15 Subpart B Section 15.111 |
| Test Date | June 10, 2006 |
| Operating Condition | LNB Tuner |
| Environment Condition | Humidity : 55 %R.H., Temperature : 24.1 °C |
| Result | Passed by 8.80 dB |

Antenna Power Conduction Test Data

| Tuned Frequency [MHz] | Meter Reading [dB μ V] | Correction Factor [dB] | Result [dB μ V] | Limit [dB μ V] | Margin [dB] |
|-----------------------|----------------------------|------------------------|---------------------|--------------------|-------------|
| 3070.00 | 32.30 | 8.9 | 41.20 | 50.0 | 8.80 |
| 3270.00 | 31.50 | 8.9 | 40.40 | | 9.60 |

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 the frequency range 30 MHz to 1 000 MHz and measurements using the CISPR peak mode in the the frequency range 1 000 MHz to 5 000 MHz .
3. The limits is 2.0 nanowatts in the frequency range 30 MHz to 5 000 MHz.



Kug Kyoung Yoon
Test Engineer

5. TEST RESULTS

5.5 Output Signal Level Measurement

| | |
|-----------------------|--|
| EUT | Digital Satellite Receiver / FTA-Model 725i (SN:N/A) |
| Limit apply to | FCC Part15 Subpart B Section 15.115(b)(1) |
| Test Date | June 10, 2006 |
| Operating Condition | TV Mode (Channel3, 4) |
| Environment Condition | Humidity : 55 %R.H., Temperature : 24.1 °C |
| Result | Passed by 2.09 dB |

Output Signal Test Data

| Test Channel | Emission Frequency [MHz] | Meter Reading [dB μ V] | Correction Factor [dB] | Signal Level [dB μ V] | Limit [dB μ V] | Margin [dB] |
|--------------|--------------------------|----------------------------|------------------------|---------------------------|--------------------|-------------|
| 3 | 61.25 | 59.91 | 7.5 | 67.41 | 69.5 | 2.09 |
| | 65.75 | 43.56 | 7.5 | 51.06 | 56.5 | 5.44 |
| 4 | 67.25 | 59.75 | 7.5 | 67.25 | 69.5 | 2.25 |
| | 71.75 | 43.34 | 7.5 | 50.84 | 56.5 | 5.66 |

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



Kug Kyoung Yoon
Test Engineer

5. TEST RESULTS

5.6 Output Terminal Conducted Spurious Emission Measurement

| | |
|-----------------------|--|
| EUT | Digital Satellite Receiver / FTA-Model 725i (SN:N/A) |
| Limit apply to | FCC Part15 Subpart B Section 15.115(b)(1) |
| Test Date | June 10, 2006 |
| Operating Condition | TV Mode (Channel3, 4) |
| Environment Condition | Humidity : 55 %R.H., Temperature : 24.1 °C |
| Result | Passed by 17.10 dB |

Output Terminal Conducted Spurious Test Data

| Test Channel | Emission Frequency [MHz] | Meter Reading [dB μ V] | Correction Factor [dB] | Result [dB μ V] | Limit [dB μ V] | Margin [dB] |
|--------------|--------------------------|----------------------------|------------------------|---------------------|--------------------|-------------|
| 3 | 38.10 | 11.70 | 7.5 | 19.20 | 39.5 | 20.30 |
| | 81.30 | 14.90 | 7.5 | 22.40 | 39.5 | 17.10 |
| | 122.48 | 13.40 | 7.6 | 21.00 | 39.5 | 18.50 |
| 4 | 38.10 | 12.80 | 7.5 | 20.30 | 39.5 | 19.20 |
| | 122.48 | 12.40 | 7.6 | 20.00 | 39.5 | 19.60 |
| | 147.45 | 9.10 | 7.6 | 16.70 | 39.5 | 22.80 |

NOTES :

1. The correction factor consist of the insertion loss of the impedance matching transformer, 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. Result = Meter Reading + Correction (Matching Loss+ Cable loss)
Margin value = Limit - Signal Level



Kug Kyoung Yoon
Test Engineer

5. TEST RESULTS

5.7 Antenna Transfer Switch Measurement

| | |
|-----------------------|--|
| EUT | Digital Satellite Receiver / FTA-Model 725i (SN:N/A) |
| Limit apply to | FCC Part15 Subpart B Section 15.115(b)(1) |
| Test Date | June 10, 2006 |
| Operating Condition | TV Mode (Channel3, 4) |
| Environment Condition | Humidity : 55 %R.H., Temperature : 24.1 °C |
| Result | Passed |

Antenna Transfer Switch Test Data

| Test Channel | Emission Frequency [MHz] | Meter Reading [dB μ V] | Correction Factor [dB] | Result [dB μ V] | Limit [dB μ V] | Margin [dB] |
|--------------|--------------------------|-------------------------------------|------------------------|---------------------|--------------------|-------------|
| 3 | 61.25 | During this test, no signal detect. | | | 9.5 | - |
| 4 | 67.25 | | | | 9.5 | - |

NOTES :

- 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.
- 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.
- Result = Meter Reading + Correction Factor(Matching Loss + Cable loss)
Margin value = Limit - Result
- Spectrum analyzer setting : Frequency Span 1MHz, Resolution bandwidth 100 kHz, Video bandwidth 300 kHz, Detector function Peak mode.



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Test Engineer

6. SAMPLE CALCULATION

Sample Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Satellite Receiver 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 Loss

$$dB(\mu V/m) = 20 \log_{10} (\mu V / m) : \text{Equation 1}$$

$$dB\mu V = dBm + 107 : \text{Equation 2}$$

Example : @365.17 MHz

| | | |
|-----------------------------|---|----------------------|
| Class B Limit | = | 46.00 dBuV/m |
| Reading | = | 19.96 dBuV |
| Antenna Factor + Cable Loss | = | 20.14 dB/m |
| Total | = | 40.10 dBuV/m |
| Margin | = | 46.00 – 40.10 = 5.90 |
| | = | 5.90 dB below Limit |

7. List of Test Equipments

| | Test Equipment | Model | Mfg. | Serial No. | Cal. Due Date |
|-------------------------------------|-------------------|-----------------|-----------------|--------------|---------------|
| <input checked="" type="checkbox"/> | Spectrum Analyzer | 7401A | H.P | US38440057 | 07.04.07 |
| <input checked="" type="checkbox"/> | Spectrum Analyzer | 7405A | H.P | US41160290 | 06.10.18 |
| <input checked="" type="checkbox"/> | TEST Receiver | ESPI | Rohde & Schwarz | 100478 | 06.10.18 |
| <input checked="" type="checkbox"/> | LISN | 3825/2 | EMCO | 9006-1669 | 07.04.06 |
| <input checked="" type="checkbox"/> | LISN | 3825/2 | EMCO | 9208-1995 | 07.04.07 |
| <input type="checkbox"/> | LogBicon Antenna | VULB9160 | Schwarz Beck | 3082 | 06.07.19 |
| <input checked="" type="checkbox"/> | LogBicon Antenna | VULB9165 | Schwarz Beck | 2023 | 06.07.05 |
| <input type="checkbox"/> | Dipole Antenna | VHAP | Schwarz Beck | 964 | 07.06.24 |
| <input type="checkbox"/> | Dipole Antenna | VHAP | Schwarz Beck | 965 | 07.07.05 |
| <input type="checkbox"/> | Dipole Antenna | UHAP | Schwarz Beck | 949 | 07.06.24 |
| <input type="checkbox"/> | Dipole Antenna | UHAP | Schwarz Beck | 950 | 07.07.05 |
| <input checked="" type="checkbox"/> | Turn-Table | DETT-03 | Daeil EMC | - | N/A |
| <input checked="" type="checkbox"/> | Antenna Master | DEAM-03 | Daeil EMC | - | N/A |
| <input checked="" type="checkbox"/> | Chamber | DTEC01 | DAETONG | - | N/A |
| <input checked="" type="checkbox"/> | RAM | Rohde & Schwarz | Matching Pad | 836964 / 009 | 06.10.18 |

End of test Report