

FCC MEASUREMENT REPORT

Test report file No.	ETL.00EEL11.001-F	Date of issue :	Nov. 06. 2000
Model / Type No.	DMT1050U		
Kind of product	Digital Satellite Receiver		
Original Applicant	Digital Multimedia Technology Co., Ltd.		
Manufacturer	Digital Multimedia Technology Co., Ltd.		
Address	Doorim Bldg. 4 th Fl., Poi-Dong, Kangnam-Gu, Seoul, 135-260 Korea		

Test result according to the regulation(s)

☒ **Compliance**

☐ **Fail**

Report prepared by

ETL EMC Lab.

584, Sangwhal-Ri, Kanam-Myun, Yaju-Kun, Kyunggi-Do, KOREA
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This test report with appendix consists of **24** pages. The test result only responds to the tested sample (**SN : N/A**). It is not allowed to copy this report even partly without the allowance of the Test Laboratory. This equipment as for has been shown to be capable of continued compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in **ANSI C63.4-1992**.

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1. SUMMARY

GENERAL REMARKS:

The equipment is not modified anything, mechanical or circuits to improve EMI status during a measurement and complied the regulation "FCC Part 15 Subpart B Class B of CFR 47".

FINAL JUDGMENT:

The requirements according to the technical regulations are

☒ - Kept ☐ - Not kept

The equipment under test does

☒ - fulfill the general approval requirements of FCC Part 15 Subpart B Class B of CFR 47 .

☐ - Not fulfill the general approval requirements.

Begin of testing : November 2, 2000

End of testing : November 6, 2000

Reviewed by :

Approved by :



Yo Han. Park / EMC Engineer



Joo Min. Kim / Chip Manager

2. GENERAL DESCRIPTION

2.1 Test Facility

The open field test site and conducted measurement facility used to collect the radiated data are located 584, Sangwhal-Ri, Kanam-Myun, Yaju-Kun, Kyonggi-Do, KOREA.

The site is constructed in conformance with the requirement of ANSI C63.4 and CISPR Publication 22. The detail description of test facility was submitted to the commission and accepted by commission.

2.2 Test Regulation

Both conducted and radiated emission testing were performed according to the procedures in ANSI C63.4/1992. The radiated emission testing was performed at an antenna to EUT distance of 3 meters as described below.

2.3 Description of Test

2.3.1 Conducted Emissions:

Conducted emissions measurements were made in accordance with § 12.2 in ANSI C63.4-1992 "Measurement of TV Interface Devices". The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50 Ω /50uH LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 10KHz or for "quasi-peak" within a bandwidth of 9KHz.

- Procedure of Test

The line-conducted facility is located inside a shielded room 1m X 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 1.5m away from the side wall of the shielded room. Two EMCO 3825/2 LISN are bonded to the shielded room. The EUT is powered from the EMCO LISN and the support equipment is powered from the another EMCO LISN. Power to the LISNs are filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner ϕ 1.2cm. 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 EMCO LISN. Non-inductive bundling to a 1m length shortened all interconnecting cables more than 1m. 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 R3261A Spectrum Analyzer to determine the frequency producing the max. emission from the EUT. The frequency producing the max. level was reexamined using to set Quasi-Peak mode by manual, after scanned by automatic Peak mode from 0.45 to 30MHz. The bandwidth of the Spectrum Analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission.

2.3.2 Radiated Emissions:

Radiated emission measurements were in accordance with § 12.2 in ANSI C63.4-1992 "Measurement of TV Interface Devices". The measurements were performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Quasi-peak" within a bandwidth of 120KHz.

- Procedure of Test

Preliminary measurements were made at 3 meter using broadband antennas, and spectrum analyzer to determined the frequency producing the max. emission in shielded room. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000MHz using SchwarzBeck Log-Bicon antenna. Above 1GHz, linearly polarized double ridge horn antennas were used. Final measurements were made open site at 3-meters. The test equipment was placed on a wooden turn-table. 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 pre-scan measurements was re-examined by manual. The detector function was set to CISPR Quasi-peak mode and the bandwidth of the receiver was set to 120kHz or 1MHz depending on the frequency of type of signal. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the max. emission for the frequency and were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the max. emission. Each emission was maximized by: varying the mode of operation to the EUT and/or support equipment and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in Test Setup photos.

2.3.3 Output Signal Level Measurements

The RF output of the TV interface device was fed to the TV receiver via coaxial cable. 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 signals level measured RMS voltage was the highest RF level present at the output terminals during normal use of the device. Measurement were made of the level of both the visual (61.25MHz) and aural (65.75MHz) carrier of TV channel 3 and the visual (67.25MHz) and aural (71.75MHz) of TV channel 4.

The voltage corresponding to the peak envelope power of the video modulated signal during maximum amplitude peaks across resistance (R ohms) matching the rated output impedance of the device, must not exceed $692.8 R^{1/2}$ uV for cable system terminal device or TV interface device used with a master antenna, and $346.4 R^{1/2}$ uV 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 $155 R^{1/2}$ uV for cable system terminal device or TV interface device used with a mast antenna, and $77.5 R^{1/2}$ uV for all other TV interface device.

2.3.4 Output Terminal Conducted Spurious Emission

The RF output signal was fed to the TV receiver via coaxial cable. Measurements were made by direct connection to the spectrum analyzer and TV interface with 50/75 ohm matching transformer. The frequency range 30 to 1000 MHz was investigated for significant emission.

The maximum RMS voltage of any emission appearing on frequency removed by more than 4.6 MHz below or 7.4 MHz above the video carrier frequency on which the TV interface device is operated must not exceed $692.8 R^{1/2}$ uV for cable system terminal device or TV interface device used with a master antenna and $10.95 R^{1/2}$ uV for all other TV interface device when terminated with a resistance (R ohms) matching the rated output impedance of the TV interface device.

2.3.5. Transfer Switch Isolation Measurement

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 switch, must not exceed $0.346 R^{1/2}$ μ V. The maximum voltage corresponds to the peak envelope power of the video modulated signal during maximum amplitude. Each EME reported was calibrated using IFR 2025 signal generator and is listed on table of Output Terminal Signal Measurements test data.

2.4 Test Conditions

The measurement the conducted emissions (interference voltage) and Output Signal Level, Output Terminal Conducted Spurious Emission, Transfer Switch Isolation Measurement were performed in a shielded room.

2.5 Product (Equipment Under Test) Information

The Equipment Under Test(EUT) is the Digital Multimedia Technology Co., Ltd.
Digital Satellite Receiver, Model DMT1050U

- Chassis Type : Metal
- List of Each OSC. Or X-Tal. Freq.(≥ 1 MHz) : 27MHz
- RF MODULATOR : LG ELECTRONICS,TAMC-H001F (Ch 3/ Ch 4)
- Tuner(LNB) : NIM MODULE (Tuner) : LG ELECTRONICS, TDQA-S211F
WAVE Form : QPSK, Symbol rate : 2 ~ 45 Msps
Input Frequency : 950 ~ 2150 MHz
- Number of Layers : Main Board , Power , Front B/D : 2 Layers
- RF Output Signal : Ch 29 ~ 69
Channel 3 or Channel 4 (Switch selectable), NTSC
- Video & Audio Decoder : MPEG2
- Power Consumption : 30W 120VAC 60Hz
- Port/Connector : RF Out(F) – RF In (F) Video Out (RCA, S-VHS),
Audio Out(RCA), 0/12V, RS-232C (For Upgrade)
- Power Cord : Unshielded
- Remote Control : O-Sung, DMT1050UR

3. SYSTEM TEST CONFIGURATION

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following conditions and configurations were used.

3.1 EUT exercise equipment

The EUT exercise equipment used during the radiated and conducted testing was designated to exercise the various system components in a manner similar to a typical use.

3.2 Configuration of test system

3.2.1 Line Conducted Test

EUT was connected to LISN, all other supporting equipment were connected to another LISN. Preliminary power line conducted emission tests were performed by using the procedure in ANSI C63.4/1992 Clause 7.2.3 to determine the worst operating conditions.

3.2.2 Radiated Emission Test

Preliminary radiated emission tests were conducted using the procedure in ANSI C63.4/1992 Clause 8.3.1.1 to determine the worst operating condition. Final radiated emission tests were conducted at 3 meter open field test site.

3.2.3 Output Signal Level Test

The output voltage of video carrier frequency at the RF-output terminal of the EUT was measured at 3 and 4 channel connecting directly to a spectrum analyzer with 50 ohm input impedance via 75-to-50 ohm matching pad. Indicated voltage on screen of measuring instrument was converted to the voltage of 75 ohm system. Data conversion method is as follows,

$$V_{75} [\mu V] = 10^{(V_r + CF)/20} [\mu V]$$

Here, V_{75} : Voltage at the RF-output terminal of 75 ohm in μV ,

V_r : Voltage read at analyzer with 50 ohm input-impedance in dBuV,

CF : Conversion Factor of the matching pad in dB.

3.2.4 Output Terminal Conducted Spurious Emission Test

Any other spectrum at RF-output terminal appearing on frequencies removed by more than 4.6 MHz below or 7.4 MHz above the video carrier frequency of the EUT was searched at 3 and 4 channel. Data conversion method is as follows,

$$V_{75} [\mu V] = 10^{(V_r + CF + AT)/20} [\mu V]$$

Here, V_{75} : Voltage at the RF-output terminal of 75 ohm in μV ,

V_r : Voltage read at analyzer with 50 ohm input-impedance in dBuV,

CF : Conversion Factor of the matching pad in dB.

AT : Attenuation of attenuator in dB.

3.2.5 Transfer Switch Isolation Test

As a Transfer switch was equipped with EUT as an antenna-in, measurement of isolation were made at RF-input terminal with rated impedance.

The Maximum voltage of video carrier frequency of the EUT at the antenna input(RF-in) terminal of the switch was measured for both channels.

Data conversion method is as follows,

$$V_{75} [\mu V] = 10^{(V_r + CF - PG + AT)/20} [\mu V]$$

Here, V_{75} : Voltage at the RF-output terminal of 75 ohm in μV ,

V_r : Voltage read at analyzer with 50 ohm input-impedance in dBuV,

CF : Conversion Factor of the matching pad in dB.

PG : Gain of pre-amplifier in dB

AT : Attenuation of attenuator in dB.

3.3 Tested System Details

Following peripheral devices and interface cables were connected during the measurement:

EUT - Digital Satellite Receiver

FCC ID : DMT1050U
Model Name : DMT1050U
Serial No. : N/A
Manufacturer : Digital Multimedia Technology Co., Ltd.
Power Supply : Switching
Type :
Power Cord : Non-Shielded, Un-Detachable, 1.5m
Data Cable : 1.5 m Shielded RF coaxial cable
1.5m Unshielded A/V RCA cable
1m Shielded RF coaxial cable to antenna
1.5m Unshielded S-VHS cable

Support Unit 1 - TV

FCC ID : N/A
Model Name : CNR2595
Serial No. : 50902509
Manufacturer : LG Electronics Co., Ltd.
Power Supply : Linear
Type :
Power Cord : Non-Shielded, Detachable, 1.2m
Data Cable : refer to EUT connection

Support Unit 2 – 1.5m Antenna for Satellite Receive

FCC ID : N/A
Model Name : WRC12
Serial No. : N/A
Manufacturer : WinerSat
Power Supply : N/A (DC 18V supply from EUT)
Type :
Data Cable : 40m Shielded RF coaxial cable

4. Preliminary Tests

4.1 AC Power line Conducted Emission Tests

During Preliminary Tests, the following operating mode was investigated.

Operating Mode	The Worst operating condition
CH. 3	X
CH. 4	

4.2 Radiated Emission Tests

During Preliminary Tests, the following operating mode was investigated.

Operating Mode	The Worst operating condition
CH. 3	X
CH. 4	

5. FINAL TESTS SUMMARY

5.1 TEST RESULT SUMMARY

Conducted emissions 150 kHz ~ 30MHz

■ - Pass

The requirements are.	■ - Kept	□ - Not kept
Min. limit margin.	-6.63 dB	at 2.466 MHz

Remarks: See the test-data & graphs to be attached.

Radiated emissions (electric field) 30 MHz ~ 1000 MHz

■ - Pass

The requirements are.	■ - Kept	□ - Not kept
Min. limit margin.	-3.21dB	At 200.0 MHz

Remarks: See the test data to be attached.

Output Terminal Signal Measurements (Visual and Aural)

■ - Pass

The requirements are.	■ - Kept	□ - Not kept
Min. limit margin.	-4.29 dB	At 67.31 (Ch. 4 Visual)

Remarks: See the test data to be attached.

Output Terminal Conducted Spurious Emission (30 ~ 1000 MHz)

■ - Pass

The requirements are.	■ - Kept	□ - Not kept
Min. limit margin.	No significant emission was observed from 30 – 1000MHz	

Remarks: See the test data to be attached.

Transfer Switch Isolation Measurements

■ - Pass

The requirements are.

■ - Kept

□ - Not kept

Min. limit margin.

-3.21dB

At 200.0 MHz

Remarks: See the test data to be attached.

5.2 Conducted Emission Test Data

EUT Type	Digital Satellite Receiver, DMT1050U (SN:N/A)
Limit apply to	FCC Part 15 subpart B
Type of Tests	CLASS B
Manufacturer	Digital Multimedia Technology Co., Ltd.
Operation Condition	Channel 3 and 4
	Humidity Level : 45%, Temperature : 21 °C
Date	Nov 2, 2000

Line Conducted Emission Tabulated Data

The following table shows the highest levels of conducted emissions on both polarization of live and neutral line.

Detector mode : CISPR Quasi-Peak mode (6dB Bandwidth : 9 KHz)

Frequency [MHz]	Reading [dBμV]		Phase (*L/**N)	Limit [dBμV]		Margin [dB]	
	Quasi-peak	Average		Quasi-peak	Average	Q.Peak	Average
2.941	31.2	-	L	48.0		-16.8	-
16.821	41.8	-	L	48.0		-6.2	-
17.443	41.6	-	L	48.0		-6.4	-
18.943	38.2	-	L	48.0		-9.8	-
2.941	35.8	-	N	48.0		-12.2	-
16.821	42.3		N	48.0		-5.7	
17.443	42.6		N	48.0		-5.4	
18.943	40.5		N	48.0		-7.5	
All frequencies had been -5.4 dB margin at least.							

NOTE : * L: Live Line , ** N: Neutral Line

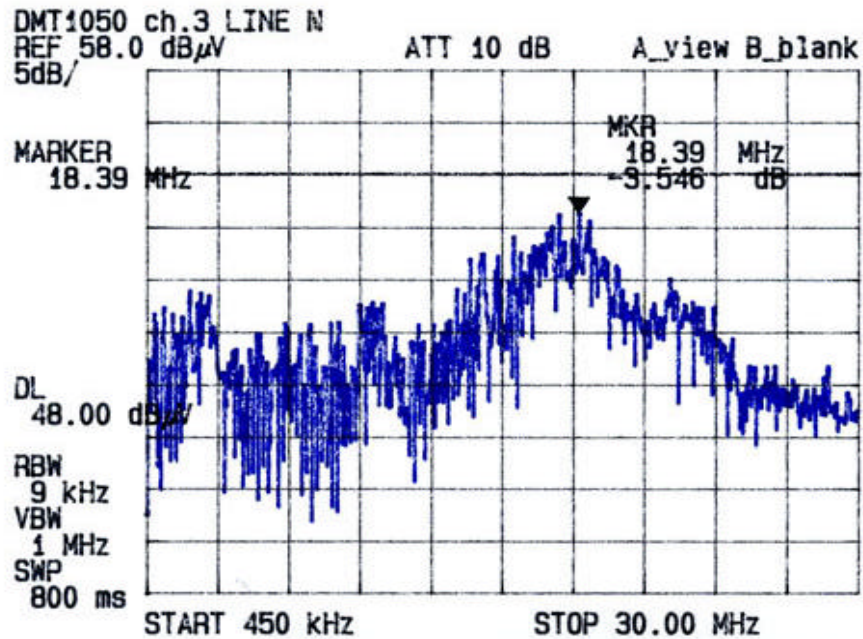
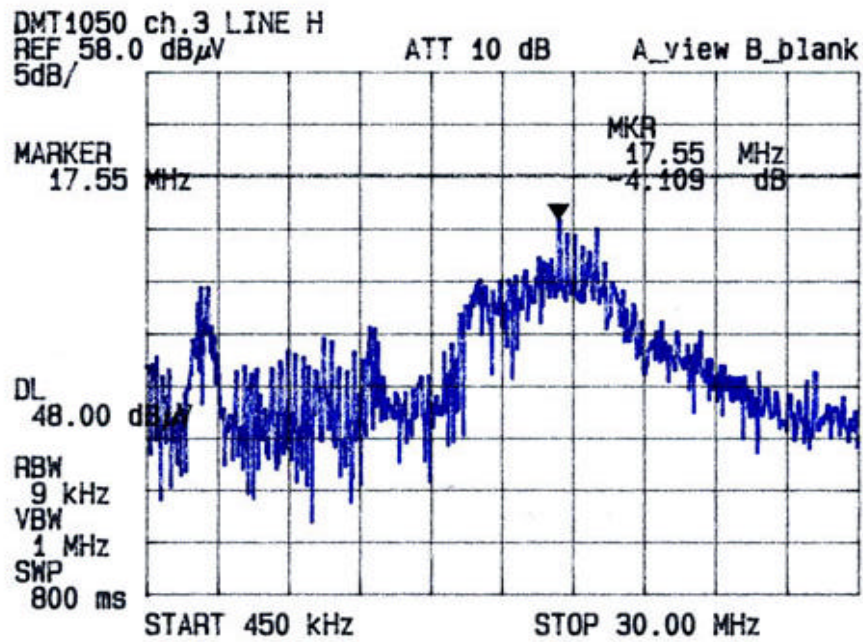
* All video display were investigated and the worst-case emissions are reported.

* The RF modulator was switch to Ch. 3 or 4 and the worst case reported.

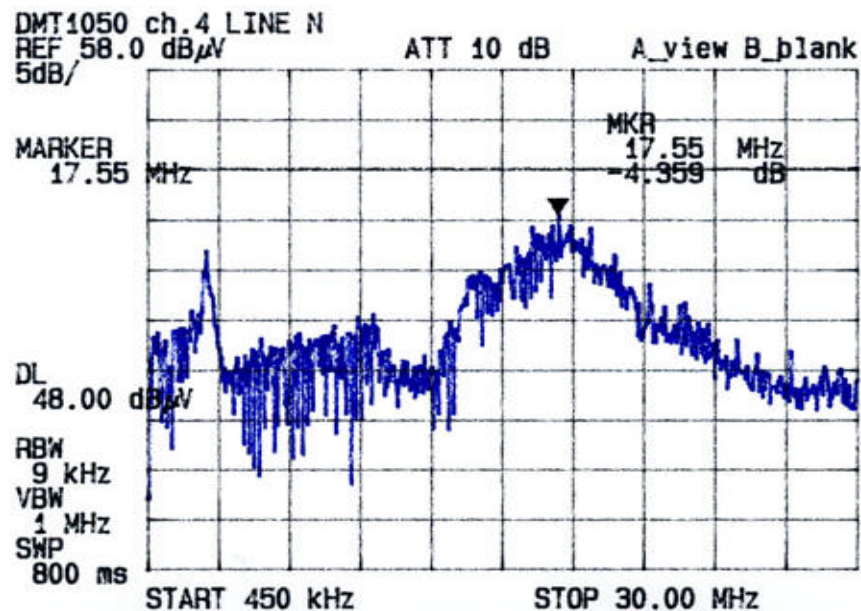
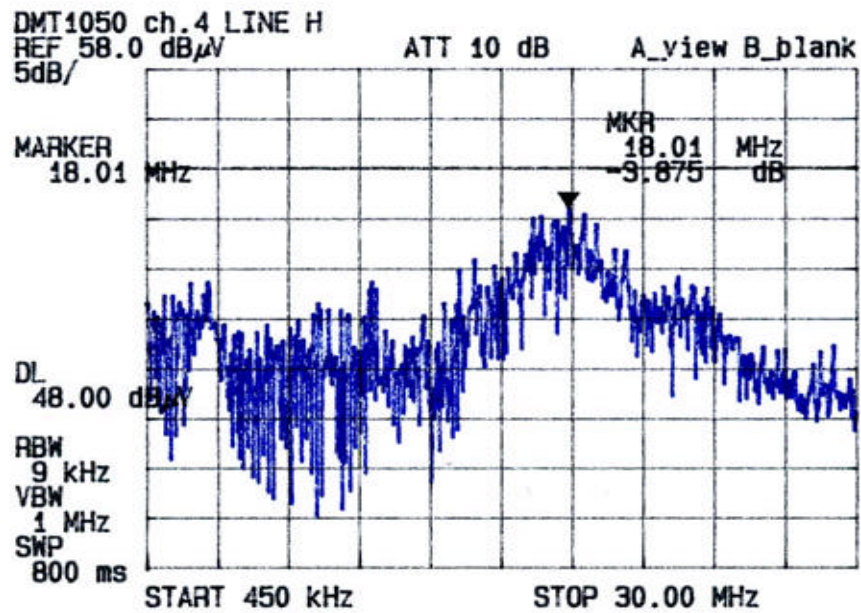


Tested by : Yo Han, Park / Test Engineer

Test Graph of Ch. 3



Test Graph of Ch. 4



5.3 Radiated Emission Test Data

EUT Type	Digital Satellite Receiver, DMT1050U (SN:N/A)
Limit apply to	FCC Part 15 Subpart B
Type of Tests	CLASS B
Manufacturer	Digital Multimedia Technology Co., Ltd.
Operation Condition	Select channel 3 and 4
	Humidity Level : 45%, Temperature : 21 °C
Date	Nov 3, 2000

Radiated Emission Tabulated Data

The following table shows the highest levels of radiated emissions on both polarization of horizontal and vertical.

Detector mode : CISPR Quasi-Peak mode (6dB Bandwidth : 120 kHz)

Frequency [MHz]	Reading [dBμV]	Polarization (*H/**V)	Ant. Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBuV]	Margin [dB]
108.0	22.73	H	10.00	2.32	35.05	43.5	-8.45
162.0	23.94	H	12.80	2.99	39.73	43.5	-3.77
173.8	21.76	H	11.99	3.22	36.97	43.5	-6.53
184.5	19.36	H	10.88	3.48	33.72	43.5	-9.78
192.0	25.48	H	9.93	3.89	39.30	43.5	-4.20
243.0	22.85	H	10.69	5.08	38.62	46.0	-7.38
288.2	21.00	H	12.21	5.99	39.20	46.0	-6.80
360.1	21.28	H	13.94	6.20	41.42	46.0	-4.58
399.3	19.40	H	14.32	6.46	40.18	46.0	-5.82
698.5	11.68	H	19.99	7.56	39.23	46.0	-6.77

Remarks : * H : Horizontal polarization , ** V : Vertical polarization
Result value = Reading + Antenna factor + Cable loss
Margin value = Result value - Limit



Tested by : Yo Han, Park / Test Engineer

5.3.1 Radiated Emission(Harmonics) Test Data

This is the additional radiatd emission test due to the local oscillator of the satellite receiver part in the EUT.
The fundamental and 2nd harmonic frequencies of the local oscillator of the satellite receiver part was tested on a near top, middle and bottom tuning frequencies of the EUT according to section 15.31(m) and 15.33(b)(3).

Radiated Emissions			Ant Pol (H/V)	Ant (dBuV)	Cable (dBuV)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Freq. Tuned(MHz)	OSC. Freq (MHz)	Reading (dBuV)						
950	1429.5	-	H	-	-	-	54.0	-
955	1434.5	-	H	-	-	-	54.0	-
960	1439.4	-	H	-	-	-	54.0	-

* Harmonics RF Radiation

Radiated Emissions				Ant Pol (H/V)	Ant (dBuV)	Cable (dBuV)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Freq. Tuned(MHz)	Har	Freq. (MHz)	Reading (dBuV)						
950	2	1429.5	-	H	-	-	-	54.0	-
955	2	1434.5	-	H	-	-	-	54.0	-
960	2	1439.4	-	H	-	-	-	54.0	-

Remark : There was no found any emission during the above test
IF = 479.5 MHz



Tested by : Yo Han, Park / Test Engineer

5.4 Output terminal signal Level Test Data

EUT Type	Digital Satellite Receiver, DMT1050U (SN:N/A)
Limit apply to	FCC Part 15 Subpart B
Type of Tests	CLASS B
Manufacturer	Digital Multimedia Technology Co., Ltd.
Operation Condition	Humidity Level : 45%, Temperature : 21 °C
Date	Nov 6, 2000

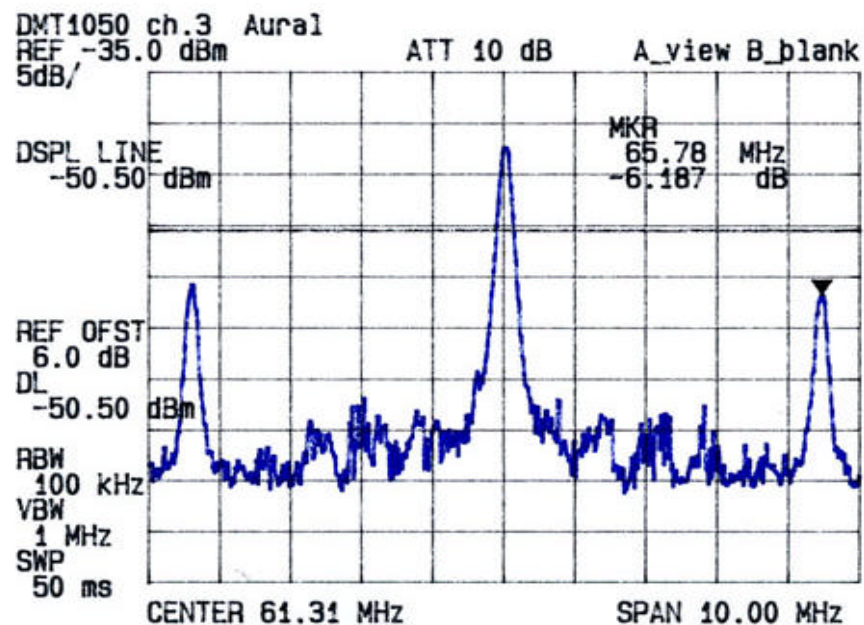
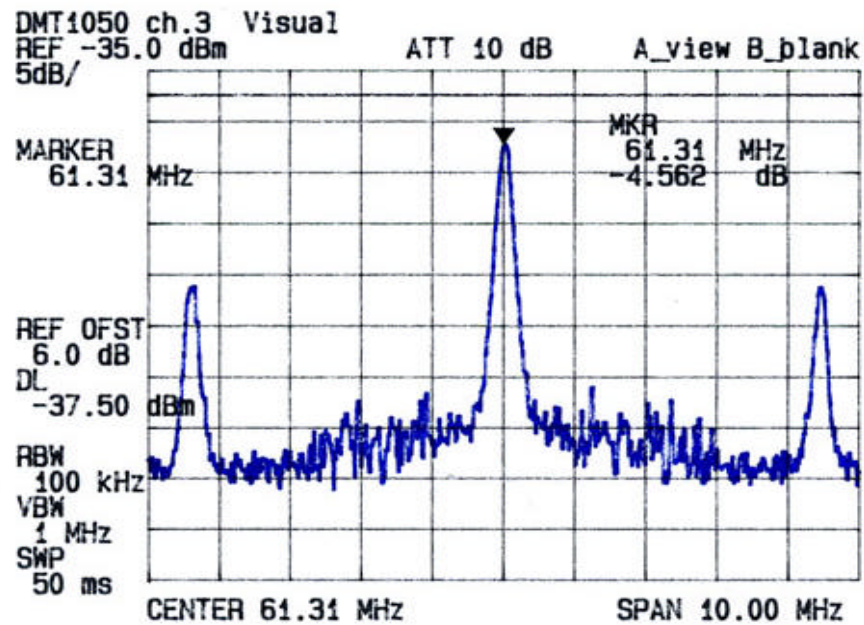
Output Terminal Signal Tabulated Data

TV Channel	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
3 (Visual)	61.31	-42.06	-37.46	-4.6
3 (Aural)	65.78	-56.69	-50.46	-6.23
4 (Visual)	67.31	-41.75	-37.46	-4.29
4 (Aural)	71.78	-56.50	-50.46	-6.04

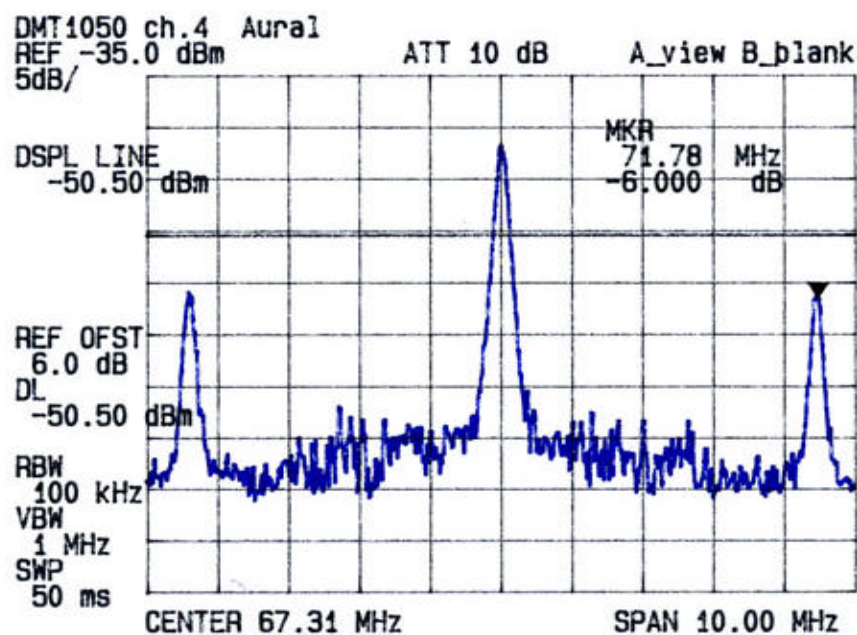
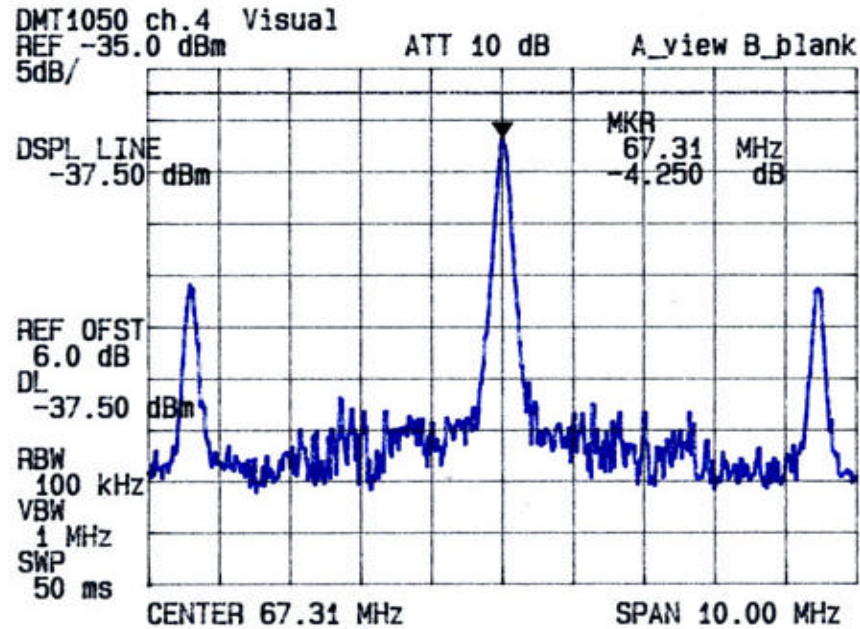


Tested by : Yo Han, Park / Test Engineer

Graph of Output Signal Level (Ch. 3)



Graph of Output Signal Level (Ch. 4)



5.5 Output Terminal Conducted Spurious Test Data

EUT Type : Digital Satellite Receiver, DMT1050U (SN:N/A)
Limit apply to : FCC Part 15 Subpart B
Type of Tests : CLASS B
Manufacturer : Digital Multimedia Technology Co., Ltd.
Operation Condition : Humidity Level : 45%, Temperature : 21 °C
Date : Nov 6, 2000

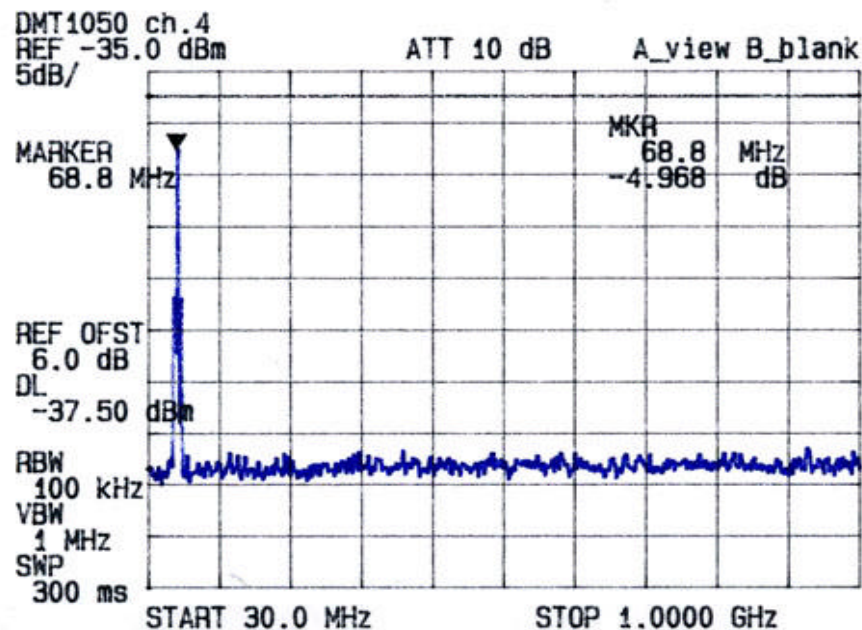
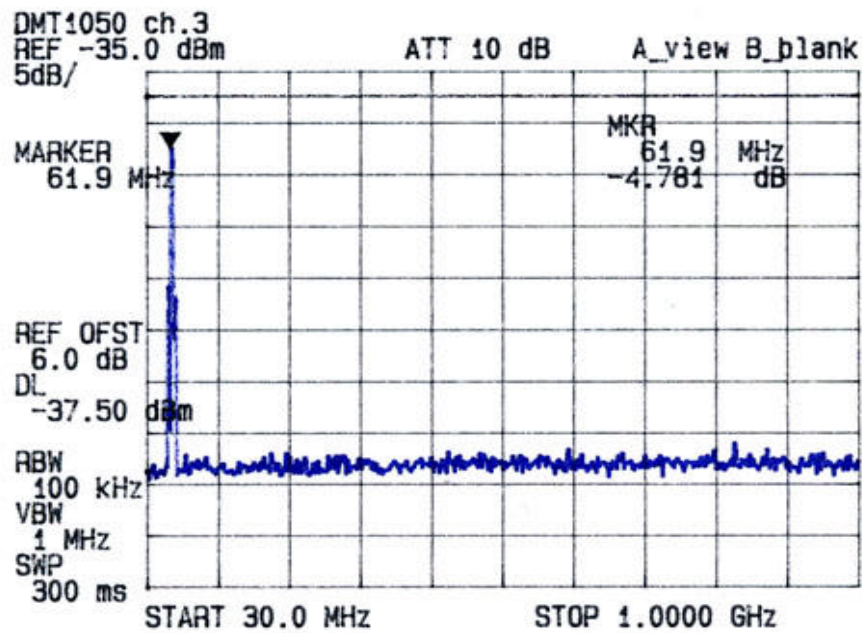
Output Terminal Conducted Spurious Tabulated Data

CH	Freq (MHz)	Reading (dBuV)	M/P Loss (dB)	Total Level (dBuV)	Limit (uV)	Margin (dB)
3	-	-	6	-	95	-
	-	-	6	-	95	-
4	-	-	6	-	95	-
	-	-	6	-	95	-

Remark : There was no found any emission during the above test
Refer to graph (Plot Data)


Tested by : Yo Han, Park / Test Engineer

Graph of Output Terminal Conducted Spurious



5.6 Antenna Power Conduction Test Data

This is the power conduction test at the antenna terminal due to the local oscillator of the satellite receiver part

in the EUT.

The fundamental and 2nd harmonic frequencies of the local oscillator of the satellite receiver part was tested on a near top, middle and bottom tuning frequencies of the EUT according to section 15.31(m) and 15.33(b)(3). The EUT antenna terminal connected to resistive termination equal to the impedance specified or employed for the antenna, the power at the antenna terminal at any frequency within the range of measurements specified in section 15.33 shall not exceed 2.0 nanowatts (2.0 nW = 50.1dBuV)

EUT Type : Digital Satellite Receiver, DMT1050U (SN:N/A)
Limit apply to : FCC Part 15 Subpart B
Type of Tests : CLASS B
Manufacturer : Digital Multimedia Technology Co., Ltd.
Operation Condition : Span 10MHz, SWP : 2sec, RBW : 100 KHz, VBW : 1MHz
Date : Nov 6, 2000

Antenna Power Conduction Tabulated Data

Freq. Tuned(MHz)	OSC. Freq. (MHz)	Reading (dB)	Cable (dB))	Result (dB)	Limit (dB)	Margin (dB)
950	1429.5	-	-	-	50.10	-
955	1434.5	-	-	-	50.10	-
960	1439.4	-	-	-	50.10	-

* Harmonics RF Radiation

Freq. Tuned(MHz)	Herr .	OSC. Freq. (MHz)	Reading (dB)	Cable (dBuV)	Result (dBuV)	Limit (dBuV)	Margin (dB)
950	2	1429.5	-	-	-	50.10	-
955	2	1434.5	-	-	-	50.10	-
960	2	1439.4	-	-	-	50.10	-

Remark : There was no found any emission during the above test
IF = 479.5 MHz



Tested by : Yo Han, Park / Test Engineer

5.7 Transfer Switch Isolation Test Data

The following tables shows that the maximum voltage of video carrier frequency of the
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EUT at the antenna input(RF-in) terminal of the switch was measured for both channels

EUT Type : Digital Satellite Receiver, DMT1050U (SN:N/A)
Limit apply to : FCC Part 15 Subpart B
Type of Tests : CLASS B
Manufacturer : Digital Multimedia Technology Co., Ltd.
Operation Condition : Span 1MHz, SWP : 30 msec, RBW : 10 KHz, VBW : 30 KHz
Date : Nov 6, 2000

Transfer Switch Isolation Tabulated Data

TV Cannel	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
3 (Visual)	61.25	-	-97.47	-
4 (Visual)	67.25	-	-97.47	-

* There was no found ant emission during the above test



Tested by : Yo Han, Park / Test Engineer

6. Field Strength Calculation

$$\text{dBuV} = 20 \log (\mu\text{V/m})$$

$$\text{dBuV} = \text{dBm} + 107$$

Example 1 :**@ 16.821 MHz**Class B Limit = 250 μV = 47.96 dBuV

Reading = 42.3 dBuV

Convert to μV = 130.31 μV

$$10^{(42.3/20)}$$

Margin = 42.3 – 47.96 = -5.66

= 5.66 dB below Limit

Example 2 :**@ 162.0 MHz**Class B Limit = 150 μV = 43.5 dBuV/m

Reading = 23.94 dBuV

Antenna Factor + Cable Loss = 15.79 dB

Total = 39.73 dBuV/m

Margin = 39.73 - 43.5 = -3.77

= 3.77 dB below Limit

7. List of Test Equipments

No.	Equipments	Manufacturer	Model	Serial No.	Cal Due Date	Remarks
1	Spectrum Analyzer	Advantest	R3261A	21720033	'01.10.18	
2	Receiver	R&S	ESVS 10	835165/001	'01.04.06	
3	Log-Bicon Antenna	Schwarzbeck	VULB9160	3082	'01.05.08	
4	Log-Bicon Antenna	Schwarzbeck	VULB9165	2023	'01.05.08	
5	Conical Log-spiral Antenna	Eaton	93491-2	340	'01.02.15	
6	Dipole Antenna	Schwarzbeck	VHAP	964,965	'01.05.03	
7	Dipole Antenna	Schwarzbeck	UHAP	949,950	'01.05.03	
8	LISN	EMCO	3825/2	9208-1995	'01.09.03	
9	LISN	EMCO	3825/2	90061669	'01.09.03	
10	RF Amplifier	H.P	8447		'01.09.03	
11	Plotter	H.P	7440A	2725A 75722	N/A	
12	Turn-Table	Daeil EMC	DETT-03	--	N/A	
13	Antenna Master	Daeil EMC	DEAM-03	--	N/A	
14	Shielded room	Daetong	DTSR01	-	N/A	