TECHNICAL REPORT

Timeway

LABORATORIES

Report No: FCC 0509076
File reference No: 2005-11-30

Applicant: Shenzhen Maiwei Broadcast Equipment Co., Ltd

Product: Digital Satellite Receiver

Model No: FS 4000

Trademark: Mvidea

Test Standards: FCC Part 15 Subpart B: 2004

Test result: It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4&FCC Part 15 regulations for the evaluation of electromagnetic compatibility

Approved By

Jack Chung
Manager

Dated: Nov 30, 2005

Results appearing herein relate only to the sample tested
The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

East 5/Block 4, Anhua Industrial Zone, No.8,Tairan Rd. CheGongMiao, FuTian District, Shenzhen, CHINA.

Tel (755) 83448688 Fax (755) 83442996

TEST REPORT

Test Report Conclusion

Content

TEST REPORT

1.0 General Details

1.1 Test Lab Details

Name :	SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD
Address:	East 5/Block 4, Anhua Industrial Zone, No.8,Tairan Rd. CheGongMiao, FuTian District, Shenzhen, CHINA.
Telephone:	(755) 83448688
Fax:	(755) 83442996

1.2 Applicant Details

Applicant:	Shenzhen Maiwei Broadcast Equipment Co., Ltd
Address:	13/F, Fiyta Hi-tech Building, Gaoxinnanyi Avenue, Southern District of Hi-tech Park, Nanshan District, Shenzhen, China
Telephone:	86-755-26733836/86018900
Fax:	86-755-26520637/26634876

1.3 Description of EUT

Product:	Digital Satellite Receiver
Manufacturer:	Shenzhen Maiwei Broadcast Equipment Co., Ltd
Address:	1-3/F, Bldg. #11, Second Industrial Park, Guanlong, Xili, Shenzhen, China
Brand Name:	Mvidea
Model Number:	FS 4000
Additional Model Number:	FS 6000, DSR-3000
Additional Brand Name:	Mvidea, MAIWEI
Rating:	--

1.4 Submitted Sample

1 Sample

1.5 Test Duration

2005-09-19 to 2005-11-26

1.6 Test Uncertainty

Conducted Emissions Uncertainty =±2.4dB

Radiated Emissions Uncertainty =±4.2dB

1.7 Test Engineer

The sample tested by _____

Print Name: Terry Tong

2.0 List of Measurement Equipment

2.1 Conducted Emission Test

Name	Model No.	Serial No.	Manufacturer	Calibration Date	Calibration Cycle
EMI Test Receiver	ESCS30	830245/009	RS	2005.2.23	1Year
Coaxial Switch	MP59B	M70585	ANRITSU	N/A	N/A
LISN	NTFM8132	8132137	SCHWARZBECK	2005.2.24	1Year
LISN	NTFM8134	8134109	SCHWARZBECK	2005.2.24	1Year
LISN	NTFM8136	8136102	SCHWARZBECK	2005.2.24	1Year

2.5 Radiated electromagnetic disturbance test

Name	Model No.	Serial No.	Manufacturer	Calibration Date	Calibration Cycle
EMI Test Receiver	ESCS30	830245/009	RS	2005.2.23	1Year
EMI Test Receiver	ESI26	838786/013	RS	2005.2.24	1Year
Coaxial Switch	MP59B	M70585	ANRITSU	N/A	N/A
Spectrum Analyzer(with Tracking Generator)	MS2661C	MT72089	ANRITSU	2005.2.23	1Year
Amplifier	MH648A	M20494	ANRITSU	2005.2.24	1Year
Bilog Antenna	CBL6101C	2576	CHASE	2005.2.23	1Year
Matching Pad	RAM	836964 / 006	RS	2005.2.23	1Year

3.0 Technical Details

3.1 Investigations Requested

Perform Electromagnetic Interference [EMI] tests for FCC Requirement.

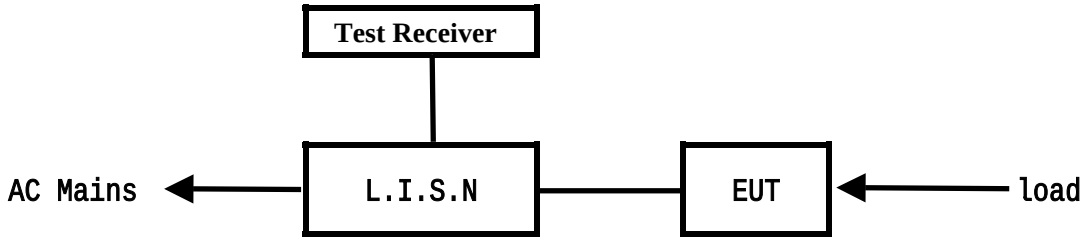
3.2 Test Standards

FCC Part 15 Subpart B : 2004

TEST REPORT

4.0 Conducted Power line Test

4.1 Schematics of the test

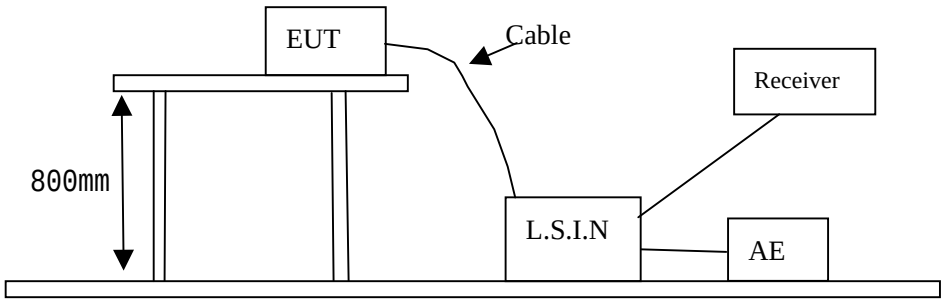


EUT: Equipment Under Test

4.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2001.The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2001.Cables and peripherals were moved to find the maximum emission levels for each frequency.

Block diagram of Test setup



4.3 Power line conducted Emission Limit

Frequency (MHz)	Class A Limits (dB μ V)		Class B Limits (dB μ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ～ 0.50	79.0	66.0	66.0～56.0*	56.0～46.0*
0.50 ～ 5.00	73.0	60.0	56.0	46.0
5.00 ～ 30.00	73.0	60.0	60.0	50.0

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The tighter limit shall apply at the transition frequencies

4.4 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

TEST REPORT

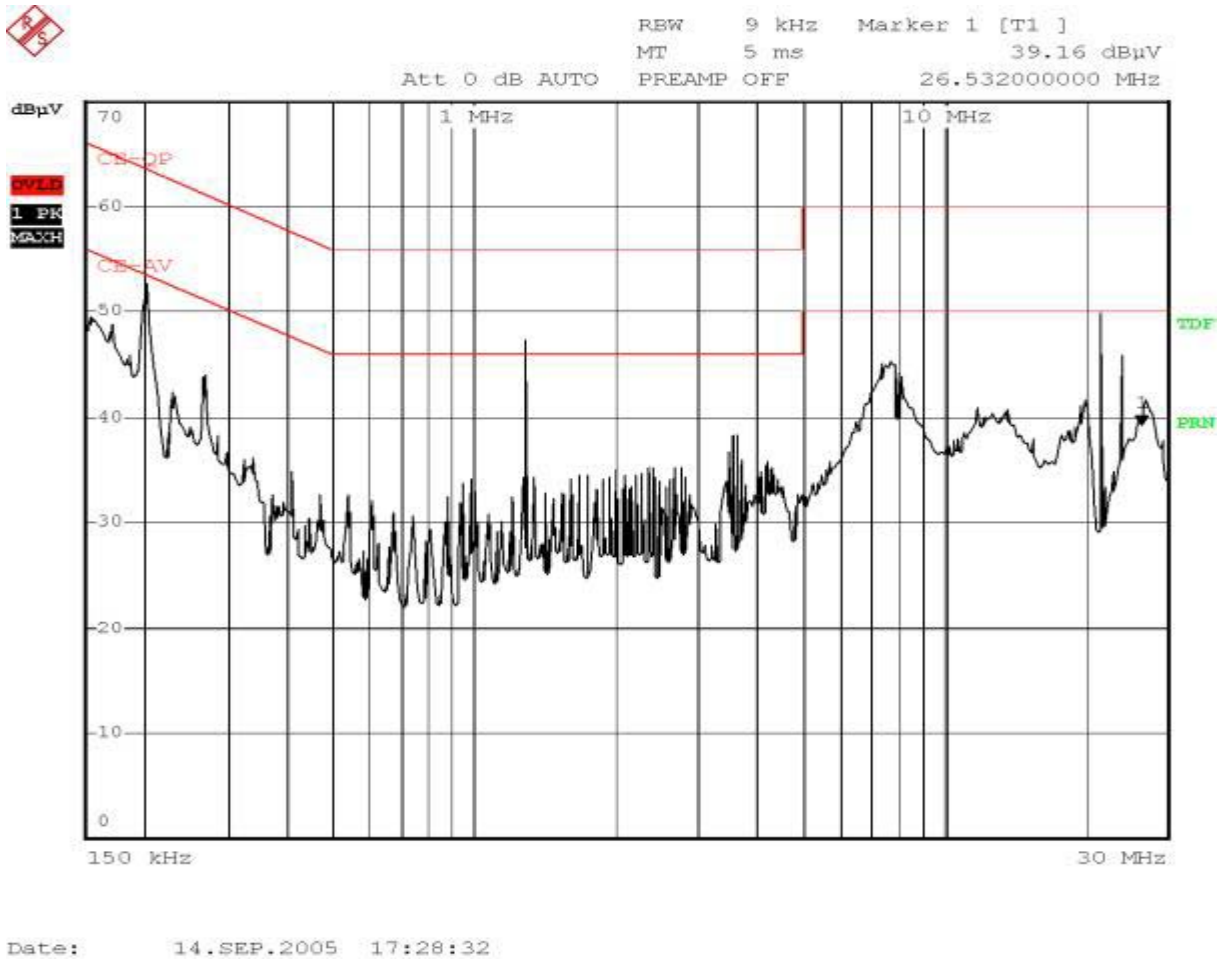
A: Conducted Emission on Live Terminal of the power line (150kHz to 30MHz)

EUT set Condition: Normal Operation Mode

Level **Class B**

Results: **PASS**

Please refer to following diagram for individual



Frequency (MHz)	Reading(dB µ V)				Limit	
	Live		Neutral		(dB µ V)	
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.202	50.03	37.63	--	--	63.50	53.50
1.288	43.89	41.51	--	--	56.00	46.00
7.648	38.77	34.78	--	--	60.00	50.00
24.000	44.33	43.55	--	--	60.00	50.00
26.364	24.58	17.52	--	--	60.00	50.00

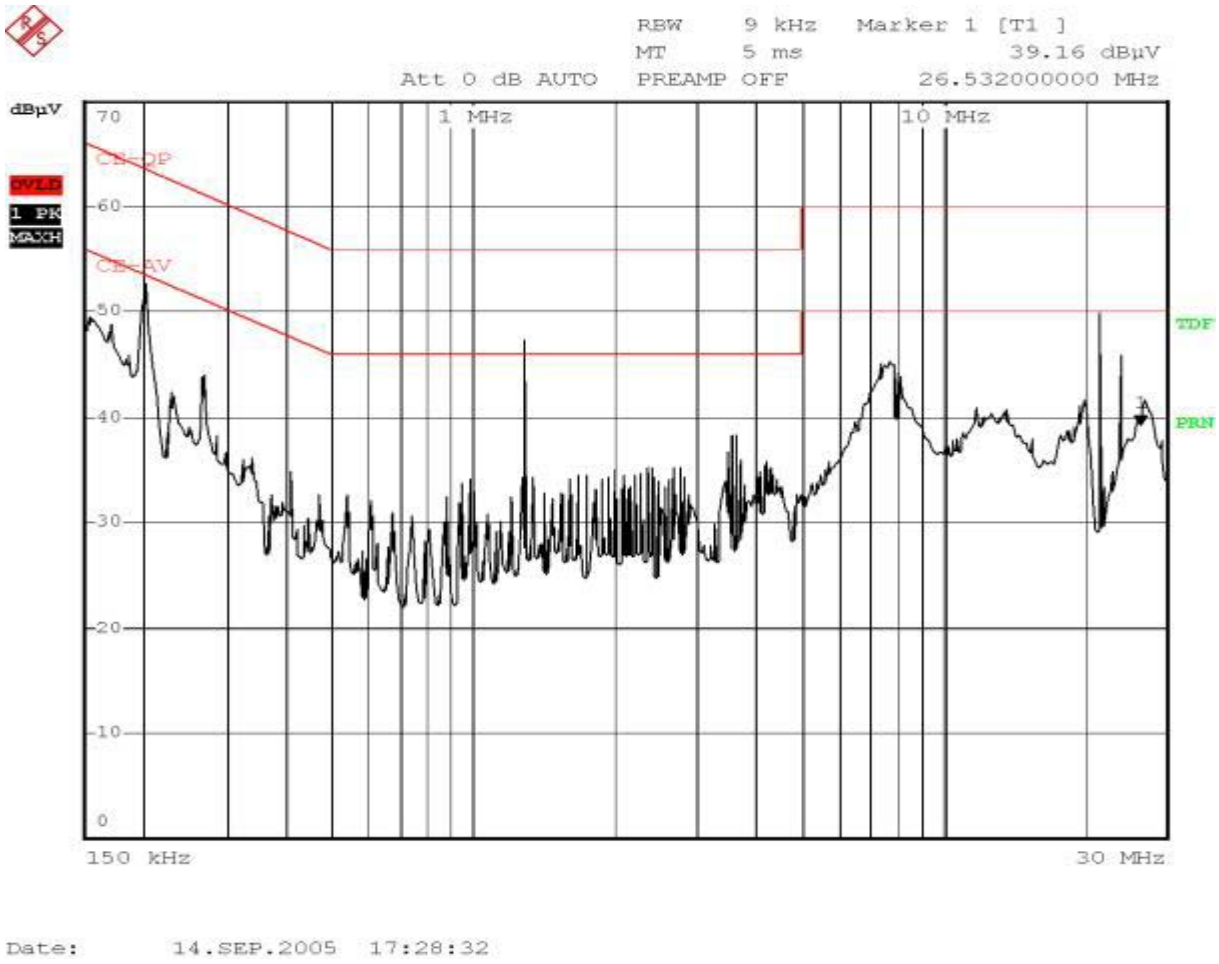
B: Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)

EUT set Condition: Normal Operation Mode

Level **Class B**

Results: **PASS**

Please refer to following diagram for individual



Frequency (MHz)	Reading(dB µ V)				Limit	
	Live		Neutral		(dB µ V)	
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.202	--	--	50.15	38.64	63.50	53.50
1.288	--	--	45.68	43.05	56.00	46.00
7.436	--	--	43.00	35.91	60.00	50.00
21.660	--	--	42.54	43.05	60.00	50.00
24.000	--	--	44.68	43.94	60.00	50.00

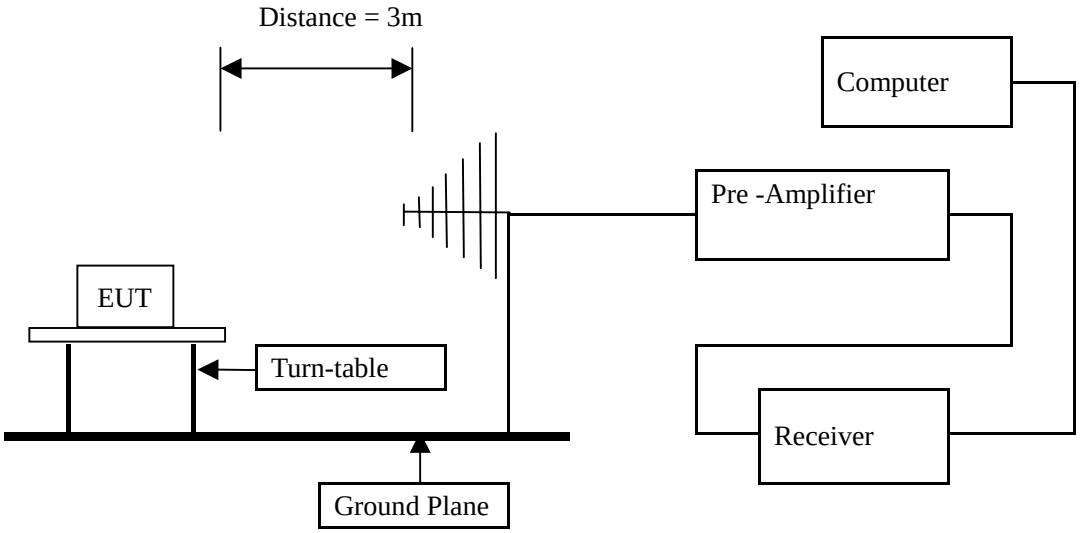
5.0 Radiated Disturbance Test

5.1 Schematics of the test

5.2 Test Method and test Procedure:

The EUT was tested according to ANSI C63.4 –2001, The frequency spectrum from 30MHz to 1GHz was investigated. All reading from 30MHz to 1GHz are quasi-peak 0values with a resolution bandwidth of 120kHz. All readings are above 1GHz, peak values with a resolution bandwidth of 1MHz. Measurements were made at 3 meters.

Block diagram of Test setup



5.3 Radiated Emission Limit

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: The lower limit shall apply at the transition frequencies

5.4 Test result

The frequency spectrum from 30MHz to 1GHz was investigated. All reading from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All readings are above 1GHz, peak values with a resolution bandwidth of 1MHz. Measurements were made at 3 meters.

TEST REPORT

A: Radiated Disturbance In Horizontal (30MHz---1000MHz)

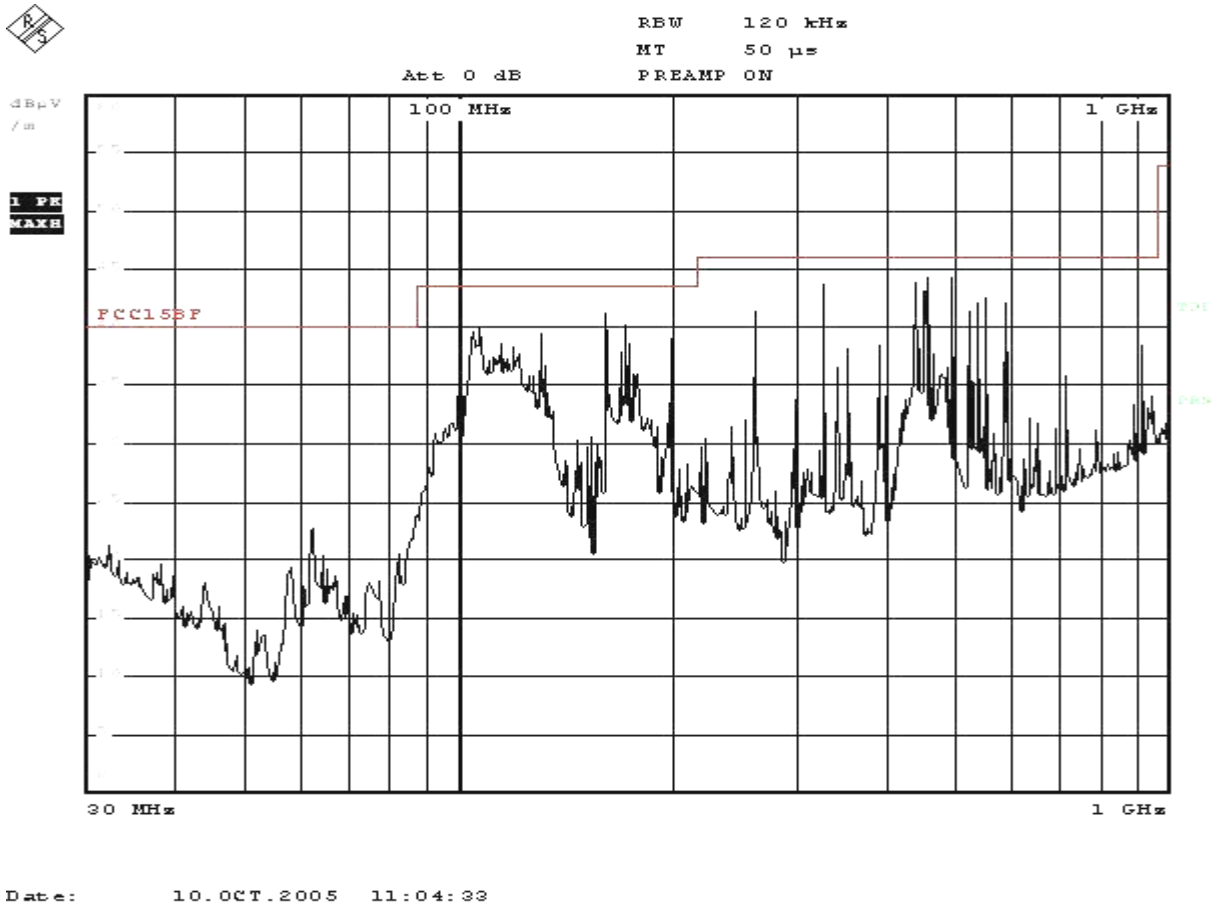
EUT set Condition:

Level: **Class B**

Results: **PASS**

Please refer to following diagram for individual

Picture of the test



Frequency (MHz)	Level@3m (dB µ V/m)	Antenna Polarity	Limit@3m (dB µ V/m)
106.88	36.91	H	43.50
162.00	41.20	H	43.50
198.84	38.98	H	43.50
262.12	41.40	H	46.00
328.52	43.58	H	46.00
459.08	43.79	H	46.00
497.08	44.57	H	46.00

B: Radiated Disturbance In Vertical (30MHz---1000MHz)

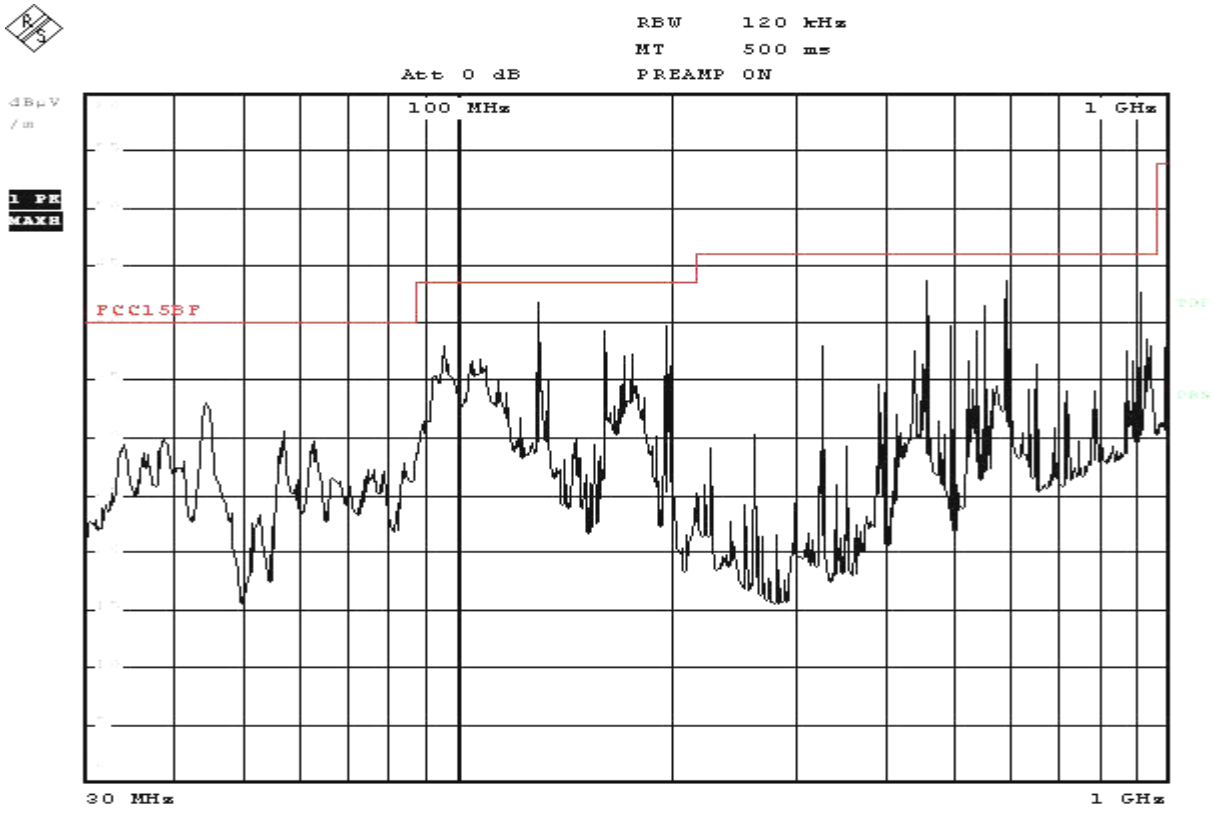
EUT set Condition:

Level: **Class B**

Results: **PASS**

Please refer to following diagram for individual

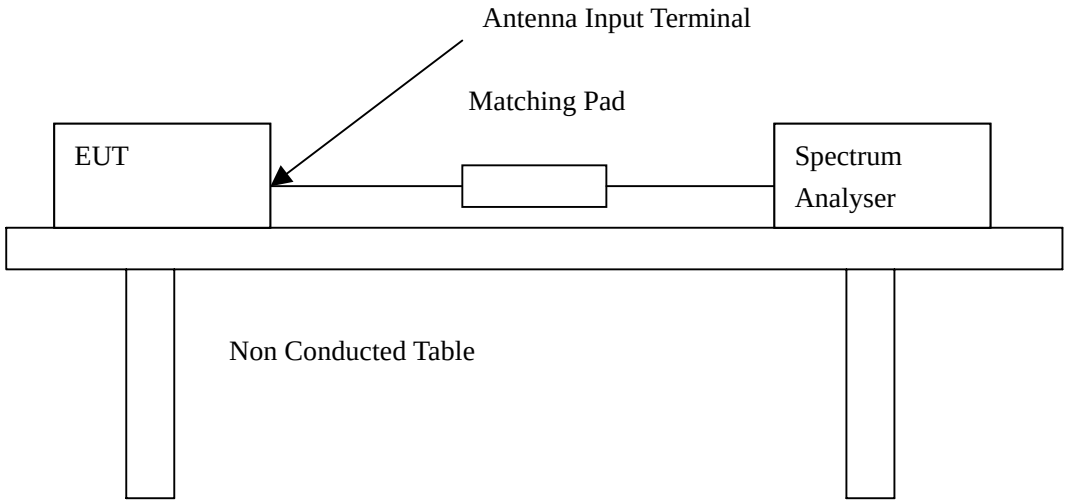
Picture of the test



Frequency (MHz)	Level@3m (dB µ V/m)	Antenna Polarity	Limit@3m (dB µ V/m)
129.68	41.43	V	43.50
162.00	38.60	V	43.50
196.80	39.75	V	43.50
457.88	44.51	V	46.00
596.52	43.08	V	46.00
917.20	42.70	V	46.00

6.0 Antenna Power Conducted Measurements

Power on the receive antenna terminals was to be determined by measurement of the voltage present at These terminals. Antenna power conducted measurements is performed with the EUT antenna terminals connected directly to a spectrum analyser, 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 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 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.



Operation Condition: LNB Tuner

Test Data

Tune Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
90.16	41.19	50.0	8.81	Pass
1206.32	34.68	50.0	15.32	Pass

Note:

1. Measurements using the CISPR Quasi -peak mode in the the frequency range 30 to 1000MHz and measurements using the CISPR peak mode in the the frequency range 1000 to 12000MHz

2. The limits is 2.0 nanowatts in the frequency range 30 to 12000MHz

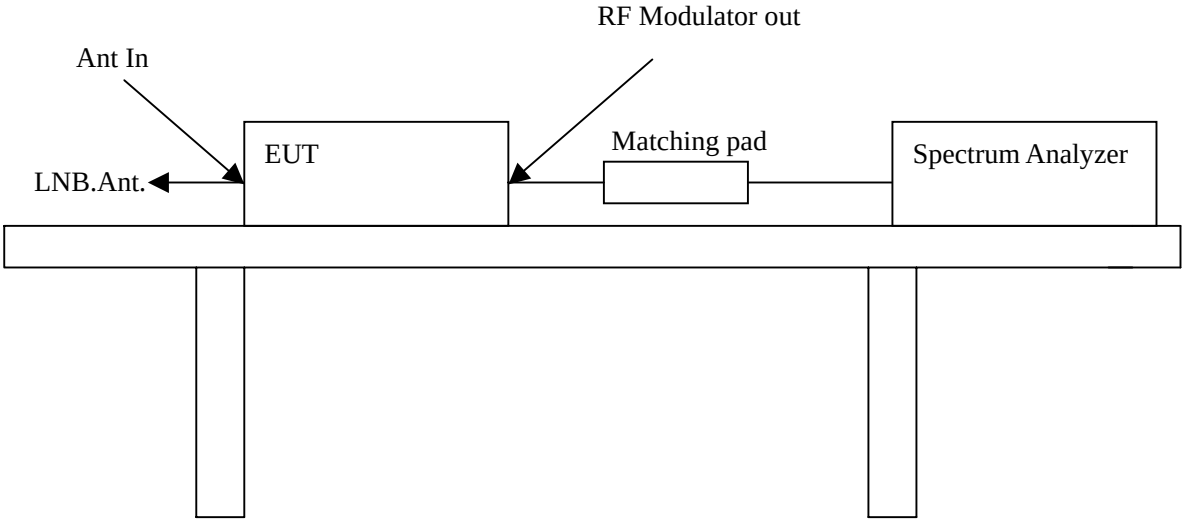
7.0 Output Signal Conducted Level Measurement

The output signal level is the maximum voltage level present ata 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 analyser 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 cable 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 $R^{1/2}$ 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 cable system terminal device of TV interface device used with a master antenna, and 77.5 R1/2 μV for all other TV interface device. Losses in decibels in any impedance-matching network used is added to the measured value in dBμV. The EUT was configured in accordance with ANSI C63.4-2001 Section 12.2 as below configuration block diagram.



Test Condition: TV mode (Channel 3. 4)

Test Data

Test Channel	Emission Frequency (MHz)	Signal Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
3	61.25	63.89	69.5	5.61	Pass
	65.75	50.14	56.5	6.36	Pass
4	67.25	63.35	69.5	6.15	Pass
	71.75	49.16	56.5	7.34	Pass

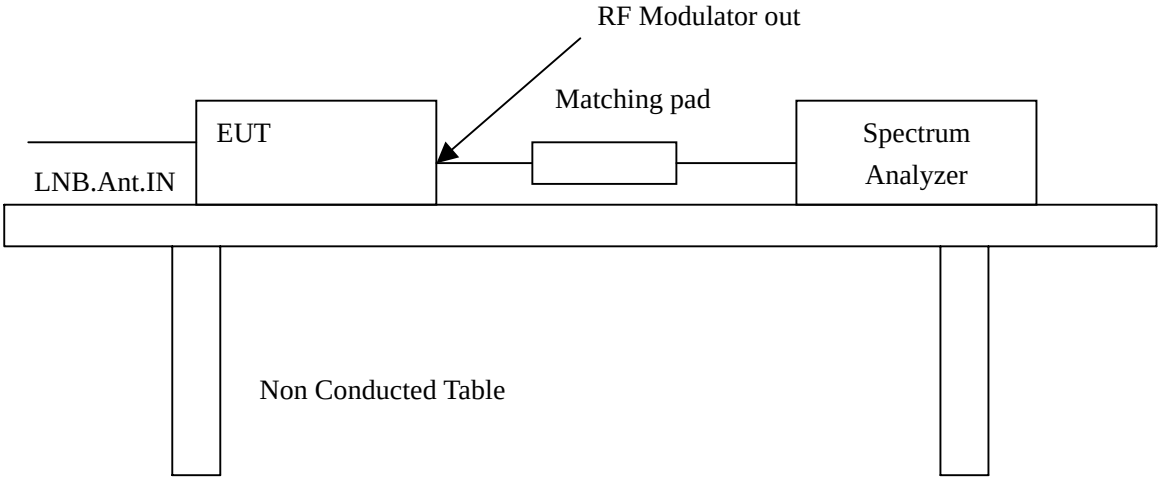
Note:

Margin= Limit- Level

8.0 Output Terminal Conducted Spurious Emission Measurement

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 device 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 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 cable 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 C63.4-2001 Section 12.2 as below configuration block diagram.



Test Condition: TV mode (Channel 3. 4)

Test Data

Test Channel	Emission Frequency (MHz)	Signal Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
3	50.36	17.95	39.5	21.55	Pass
	162.0	19.36	39.5	20.14	Pass
	176.29	24.50	39.5	15.00	Pass
	216.0	29.09	39.5	10.41	Pass
4	57.33	18.74	39.5	20.76	Pass
	183.9	19.92	39.5	19.58	Pass
	198.62	20.65	39.5	18.85	Pass
	216.0	28.58	39.5	10.92	Pass

Note: Margin= Limit- Level

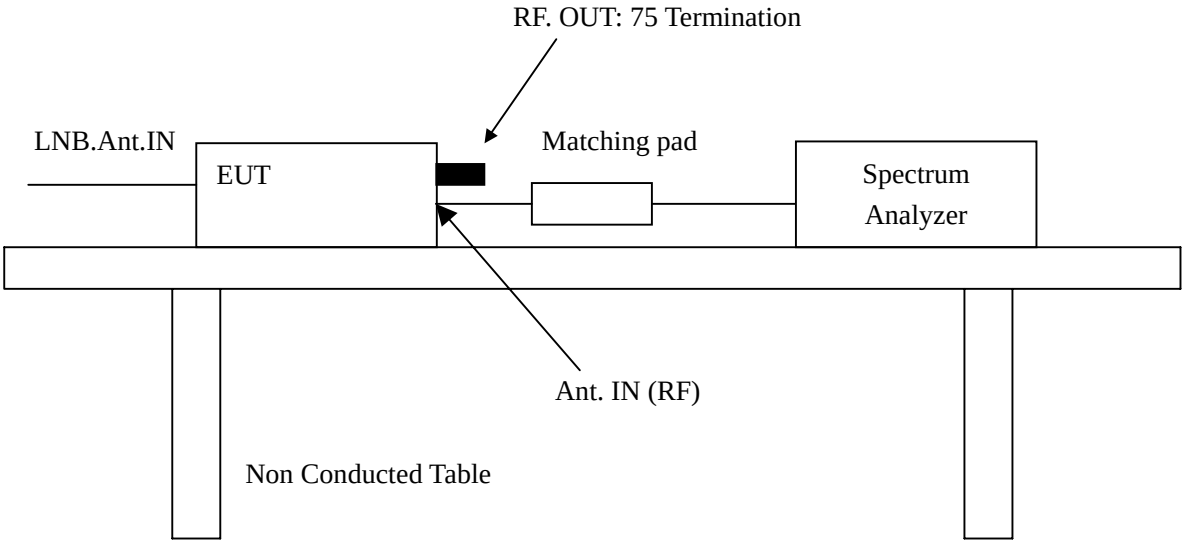
9.0 Antenna Transfer Switch Measurement

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 connectorsis 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 C63.4-2001 Section 12.2 as below configuration block diagram.

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 cable. 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.



TEST REPORT

Test Condition: TV mode (Channel 3. 4)

Test Data

Test Channel	Emission Frequency (MHz)	Signal Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
3	61.25	During this test, no signal detected			Pass
4	67.25				Pass

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. intput 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 cable used for the test and the gain of pre-amplifier.

3. Spectrum analyzer setting : Frequency Span 1MHz, Resolution bandwidth 100 kHz, Video bandwidth 300 k Hz, Detector function Peak mode.

4. Margin value = Limit - Level

10.0 FCC Label

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location: On the product body

11.0 Photo of testing

11.1 Conducted test View-- N/A

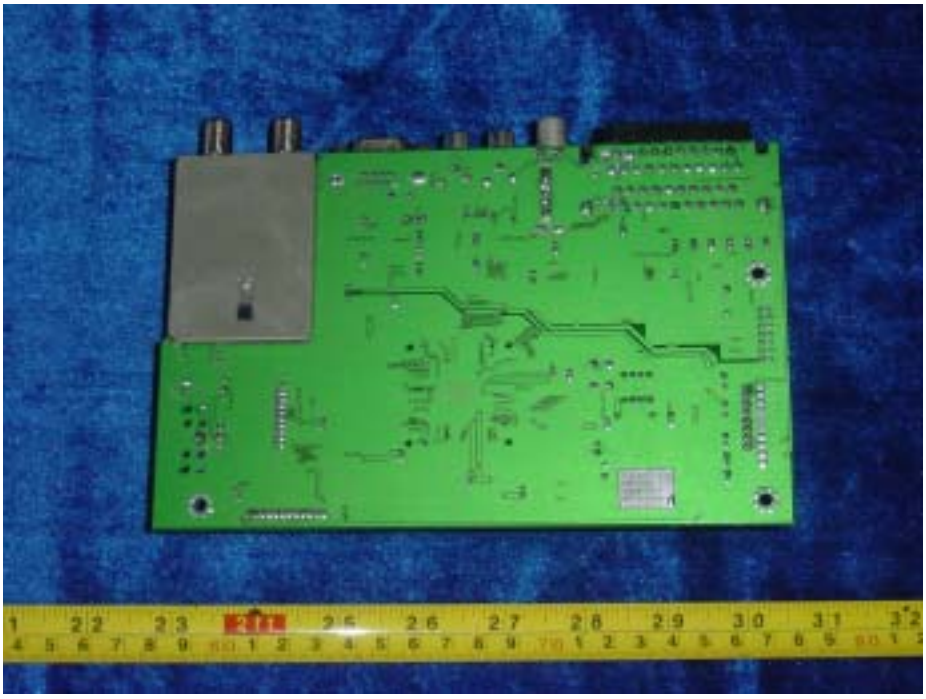
11.2 Radiated emission test view

11.3 Photo for the EUT

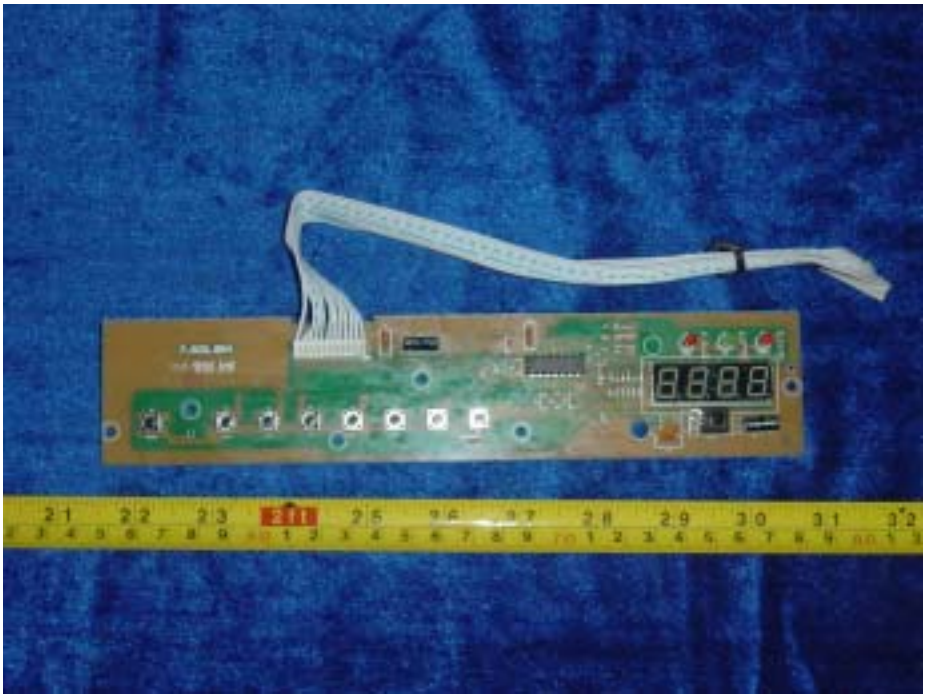
Top View

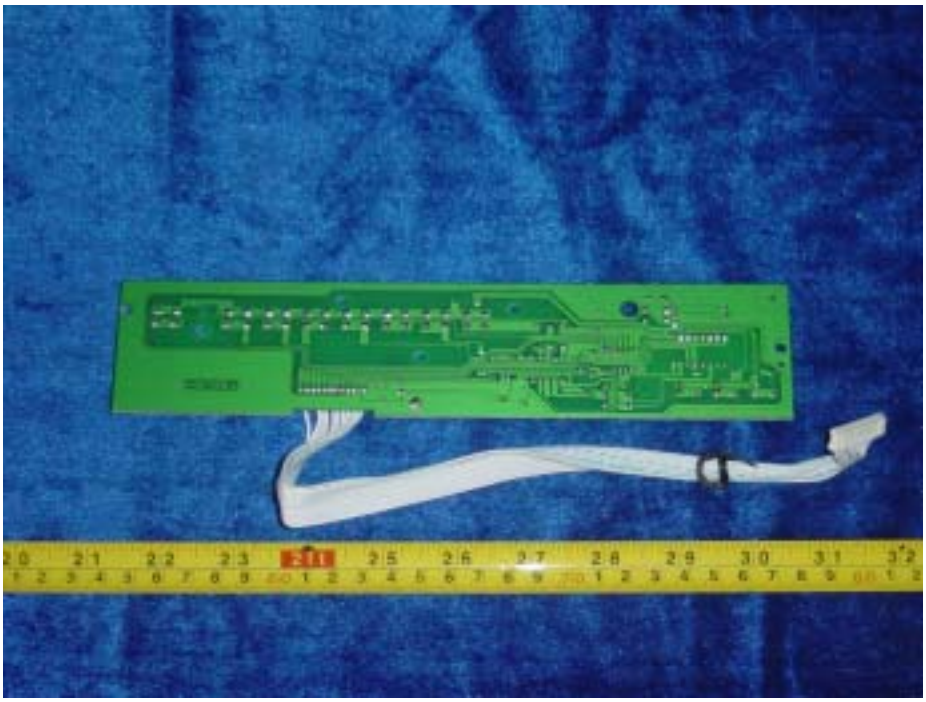
Interior View

Interior View

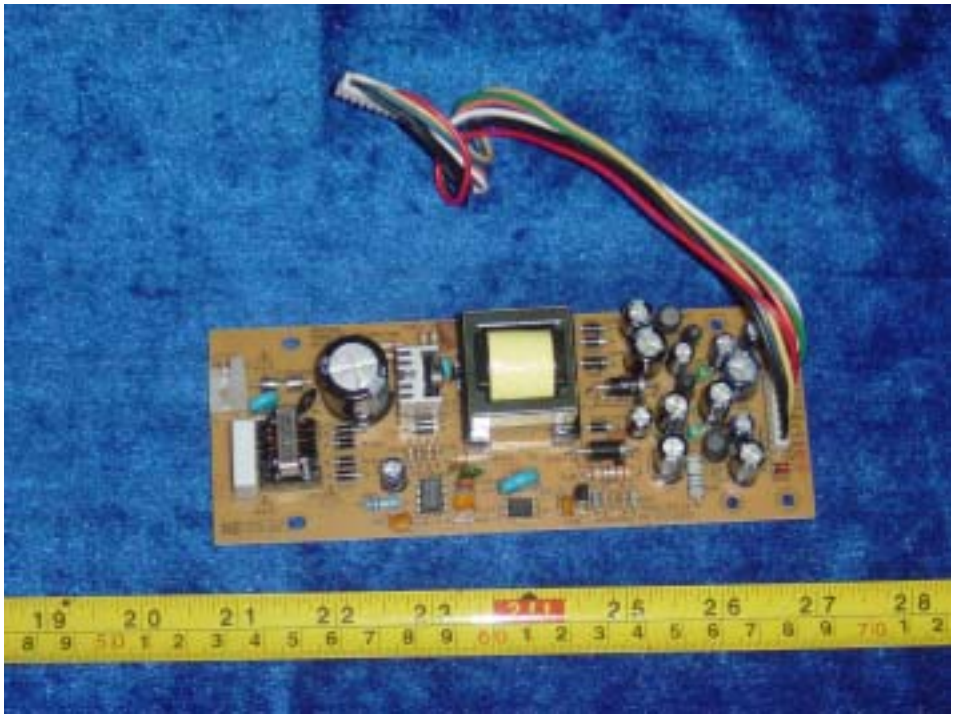


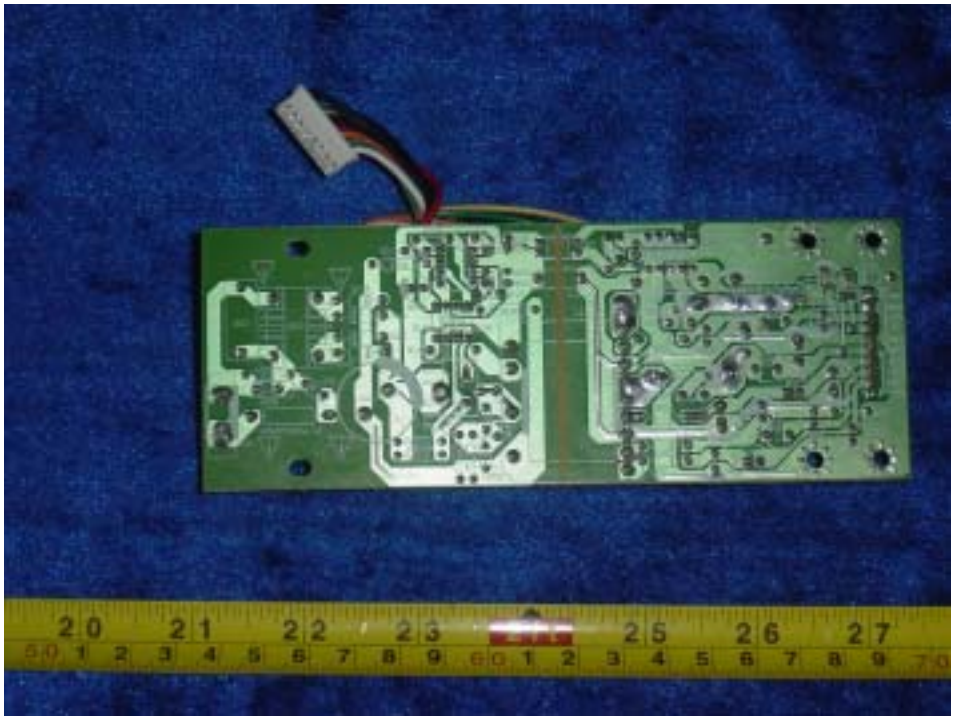
Interior View





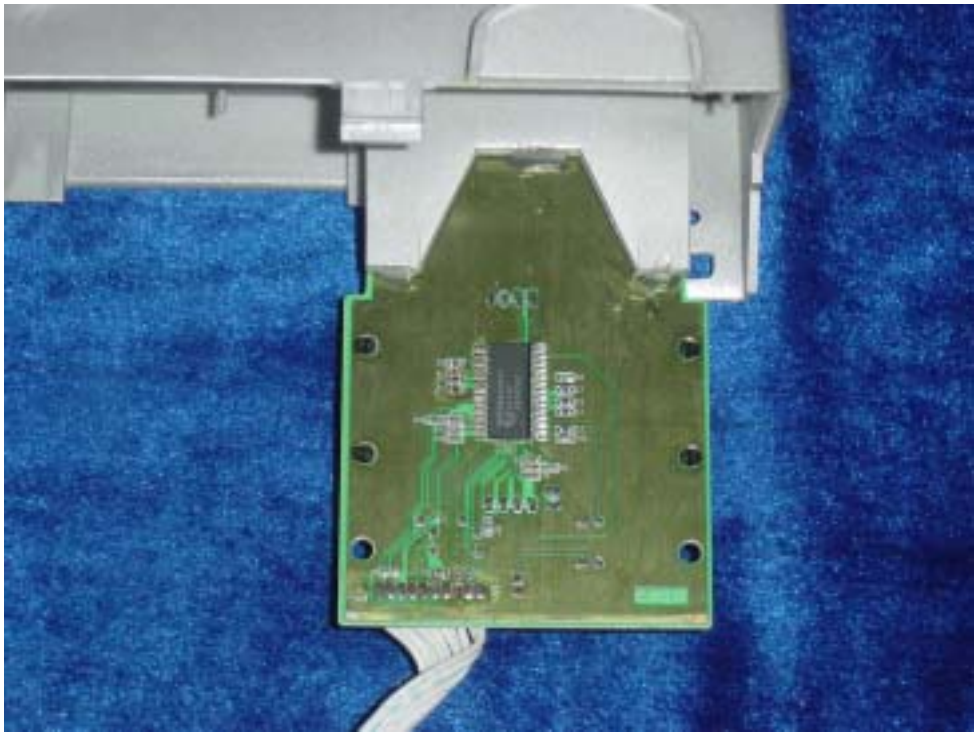
Interior View

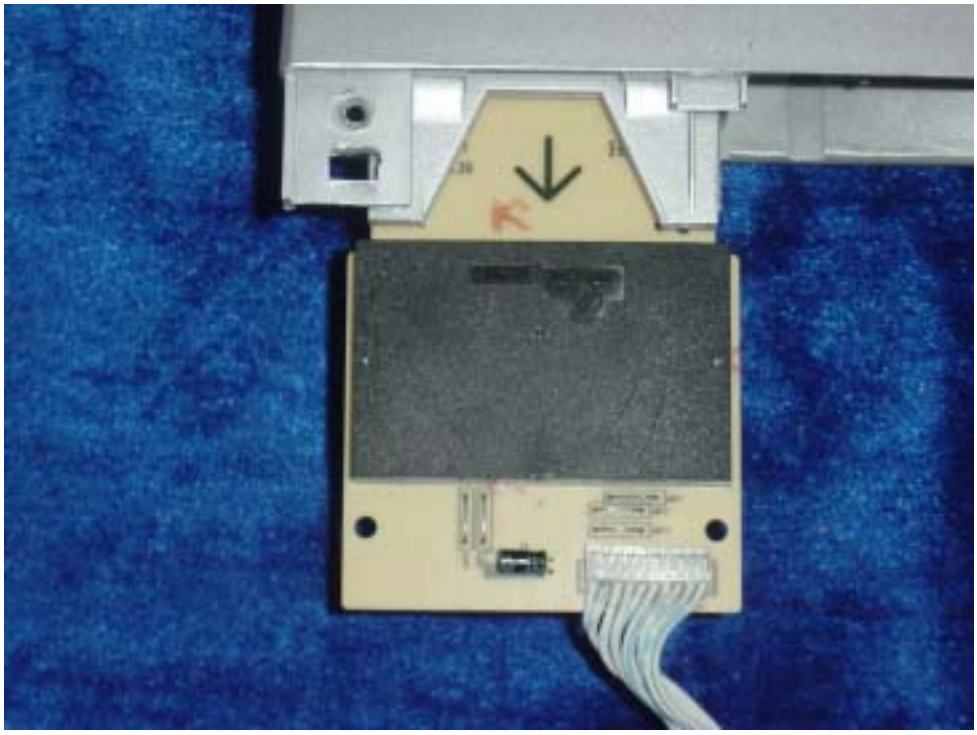




TEST REPORT

Interior View





-End of the report-