

Application for FCC Certification
On behalf of
Zhenjiang Sansen Electrical Limited
Company of Sole Hong Kong Capital
Remote Control Cable Converter

Model No.: F3388U
FCC ID : PFS-F3388U

Prepared For : Zhenjiang Sansen Electrical Limited Company
of Sole Hong Kong Capital
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TEST REPORT FOR FCC CERTIFICATION

Applicant : Zhenjiang Sansen Electrical Limited Company of Sole Hong Kong Capital

Manufacturer : Zhenjiang Sansen Electrical Limited Company of Sole Hong Kong Capital

EUT Description : Remote Control Cable Converter
(A) Model No. : F3388U
(B) Serial No. : SS-2000-001
(C) Power Supply : AC 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 1998
AND ANSI C63.4:1992*

The device described above is tested by AUDIX Technology (Shanghai) Co., Ltd.

The test results are contained in this test report and AUDIX Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology (Shanghai) Co., Ltd.

Date of Test : Jan 05, 2001

Prepared by : Stella Tang
(STELLA TANG)

Test Engineer : Julie Wang
(HALL WANG)
For and on behalf of
AUDIX TECHNOLOGY (SHANGHAI) CO., LTD.

Reviewer : Jimhsu
(JIM HSU)

Approved Signatory: Jeremy Geng
(JEREMY GENG)

.....
Authorized Signature(s)

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test

Description	:	Remote Control Cable Converter
Type of EUT	:	☒ Production ☐ Pre-product ☐ Pro-type
Model Number	:	F3388U
Serial No.	:	SS-2000-001
FCC ID	:	PFS-F3388U
Applicant	:	Zhenjiang Sansen Electrical Limited Company of Sole Hong Kong Capital No.60 Zongze Road, Zhenjiang, Jiangsu, China
Manufacturer	:	Zhenjiang Sansen Electrical Limited Company of Sole Hong Kong Capital No.60 Zongze Road, Zhenjiang, Jiangsu, China
Power Cord	:	Unshielded, Nondetachable, 2.20m
Data Cable (Audio)	:	Unshielded, Detachable, 1.15m
Data Cable (Video)	:	Unshielded, Detachable, 1.15m

1.2 Supported Simulators

(a) TELEVISION

Model Number	:	T2131D
Serial Number	:	HQ818M42928
Manufacturer	:	KONKA
Power Cord	:	Unshielded, Nondetachable, 2.38m
Audio Cable	:	Unshielded, Detachable, 1.50m
Video Cable	:	Unshielded, Detachable, 1.50m
S-Video Cable	:	Shielded, Detachable, 1.70m

(b) COLOR TV PATTEM GENERATOR

Model Number	:	DM5418TDSI
Serial Number	:	9452 054 18761
Manufacturer	:	PHILIPS
Power Cord	:	Unshielded, Detachable, 2.30m
Data Cable	:	Shielded, Detachable, 1.00m

1.3 Description of Test Facility

Site Description (Semi-Anechoic Chamber)	:	Sept. 17, 1998 file on Federal Communications Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, USA
Name of Firm	:	AUDIX Technology (Shanghai) Co., Ltd.
Site Location	:	3 F., 34 Bldg., 680 Guiping Rd., Caohejing Hi-Tech Park, Shanghai, China
NVLAP Lab Code	:	200371-0

1.4 Measurement Uncertainty

Conducted Emission Uncertainty	:	U=2.66dB
Radiated Emission Uncertainty	:	U=3.90dB

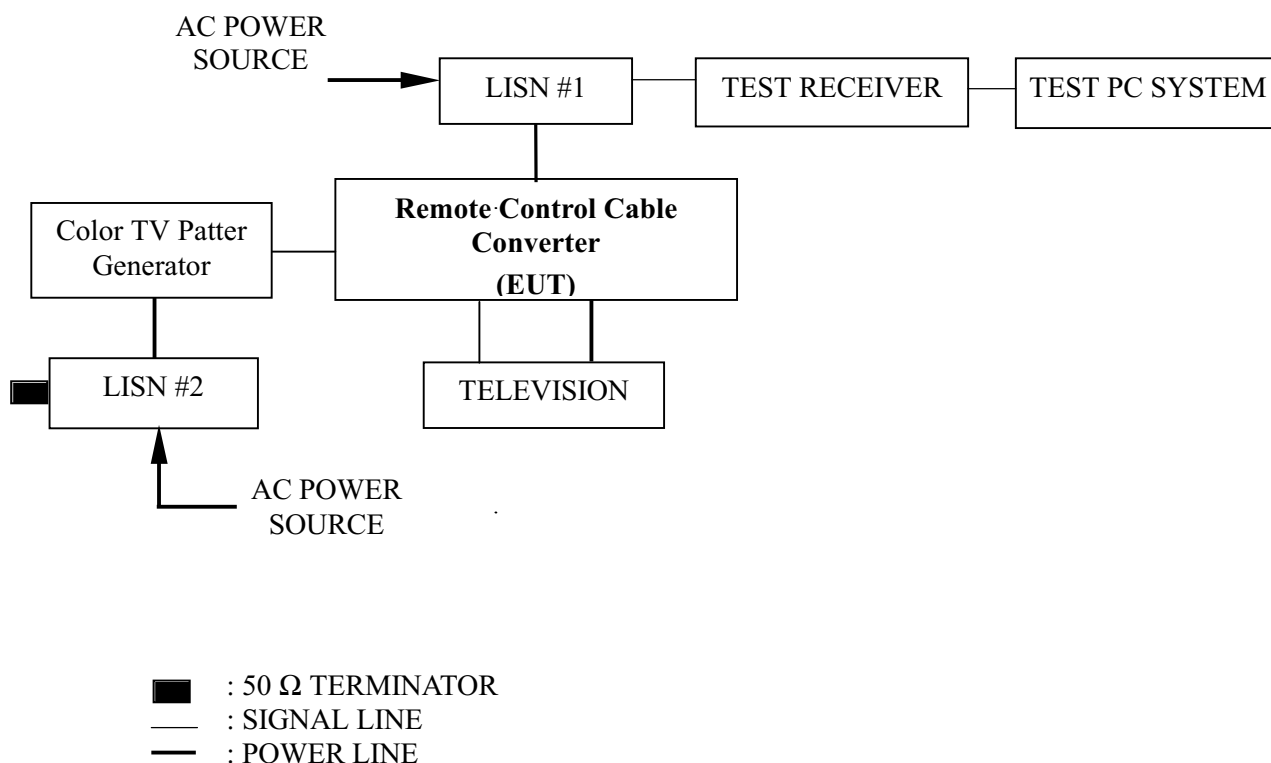
2 CONDUCTED EMISSION TEST

2.1 Test Equipment

The following test equipment are used during the conducted emission test in a shielded room:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS10	844077/020	May 20, 2000	1 Year
2.	Line Impedance Stabilization Network (LISN) #1	Kyoritsu	KNW-407	8-1280-4	Jun 02, 2000	1 Year
3.	LISN #2	Kyoritsu	KNW-407	8-1280-5	Apr 15, 2000	1 Year

2.2 Block Diagram of Test Setup



2.3 Conducted Emission Limit

Frequency (MHz)	Maximum RF Line Voltage	
	(μ V)	dB(μ V)
0.45 ~ 30	250	48
NOTE 1 – RF Line Voltage dB(μ V) = 20 log RF Line Voltage (μ V)		

2.4 Test Configuration

The EUT (listed in Sec. 1.1) and the supported simulator (listed in Sec 1.2) were installed to meet FCC requirement and operating in a manner which tends to maximize its emission level in a normal application.

2.5 Operating Condition of EUT

- (a) Setup the EUT and the simulator as shown in section 2.2.
- (b) Turn on the power of all equipment.
- (c) The EUT was in TV mode;
- (d) The EUT will be operated normally.

2.6 Test Procedure

The EUT was connected to the power mains through a Line Impedance Stabilization Network (LISN). The other supported simulated device power cords was connected to the power mains through EUT or LISN #2. This provided a 50 Ω coupling impedance for the measuring equipment.

Both sides of AC line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ANSI C63.4-1992 during conducted emission test.

The bandwidth of Test Receiver ESHS10 was set at 10 kHz.

The frequency range from 450 kHz to 30 MHz was checked. The test mode (TV mode) was done on conducted emission test and all the test results are listed in Sec. 2.7.

2.7 Test Results

< PASS >

The frequency and amplitude of the highest conducted emission relative to the limit is reported. All emissions not reported below are too low against the prescribed limits.

EUT : Remote Control Cable Converter Temperature : 22°C

Model No. : F3388U Humidity : 53%

Test Mode : TV mode Date of Test : Jan 05, 2001

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.614	0.30	22.35	22.65	48.00	25.35
	7.858	0.27	29.29	29.56	48.00	18.44
	9.572	0.27	29.75	30.02	48.00	17.98
	14.586	0.26	31.92	32.18	48.00	15.82
	18.586	0.30	33.67	33.97	48.00	14.03
	28.646	0.52	34.10	34.62	48.00	13.38
VB	0.450	0.33	19.34	19.67	48.00	28.33
	8.229	0.28	30.74	31.02	48.00	16.98
	9.735	0.28	29.32	29.60	48.00	18.40
	15.451	0.28	33.61	33.89	48.00	14.11
	17.525	0.30	33.70	34.00	48.00	14.00
	18.822	0.31	33.95	34.26	48.00	13.74
Note 1. Emission Level = Meter Reading + Factor Note 2. Factor = Insertion Loss + Cable Loss Note 3. All reading are Quasi-Peak Values. Note 4. The worst emission is detected at 28.646 MHz with corrected signal level of 34.62dB(μV) (limit is 48.00 dB(μV)), when the VA of the EUT is connected to LISN.						

TEST ENGINEER:


(HALL WANG)

3 RADIATED EMISSION TEST

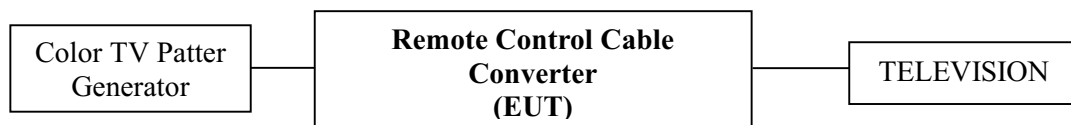
3.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

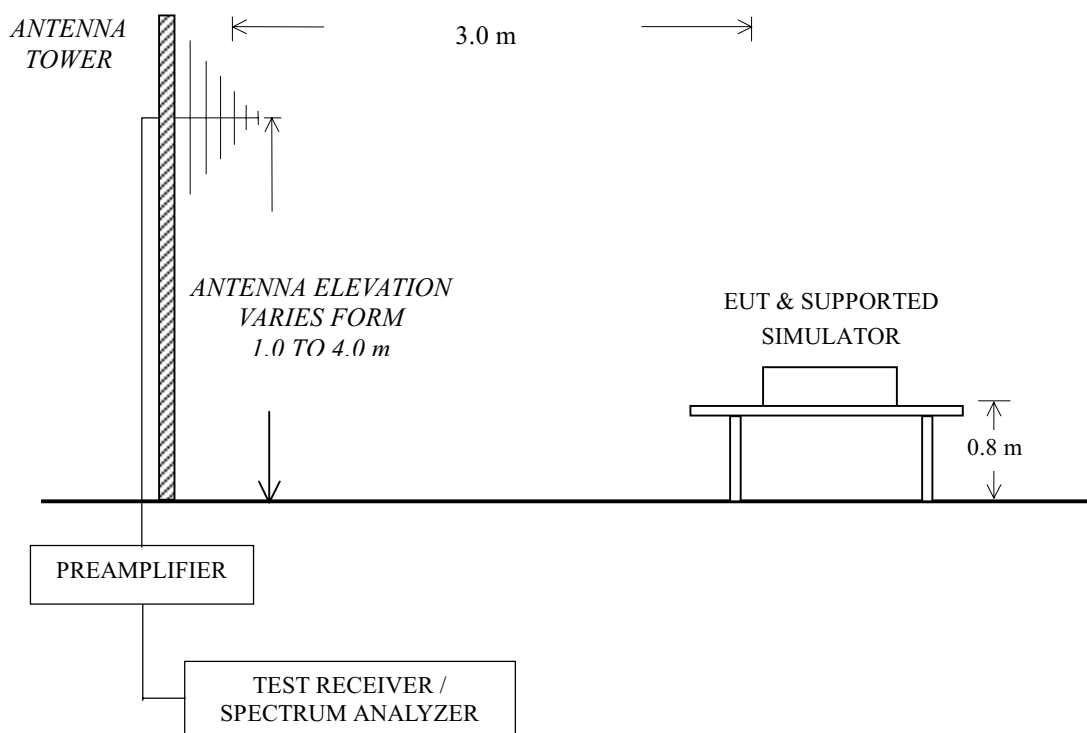
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	85422E	3617A00167	Set 15,2000	1 Year
2.	Preamplifier	HP	8447D	2944A06849	June 03, 2000	1/2 Year
3.	Bilog Antenna	Chase	CBL6111	1146	Dec 10, 2001	1/2 Year
4.	Test Receiver	Rohde & Schwarz	ESVS10	844594/001	May 20,2000	1 Year

3.2 Block Diagram of Test Setup

(a) EUT and supported simulator



(b) Radiated emission test setup



3.3 Radiated Emission Limit

Frequency (MHz)	Distance (m)	Field strength limits	
		($\mu\text{V/m}$)	dB ($\mu\text{V/m}$)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Note 1. Emission Level $\text{dB}(\mu\text{V/m}) = 20 \log \text{Emission Level } (\mu\text{V/m})$ Note 2. The tighter limit applies at the band edges. Note 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.			

3.4 Test Configuration

The configuration of the EUT and simulators are same as those used in conducted test.

Please refer to Sec. 2.4.

3.5 Operating Condition of EUT

Same as conducted test which is listed in Sec. 2.5, except the test set up replaced by Sec. 3.2.

3.6 Test Procedure

The EUT and simulator were placed on a turn table which is 0.8 meter above ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or dipole antenna were used as receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C 63.4-1992 requirements during radiated emission test.

The bandwidth setting on Test Receiver ESVS10 was 120 kHz.

The frequency range from 30 MHz to 1000 MHz was checked. The test mode (TV mode) was done on radiated emission test and all the test results are listed in Sec. 3.7.

3.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

EUT : Remote Control Cable Converter Temperature : 20.8°C

Model No. : F3388U Humidity : 53%

Test Mode : TV mode Date of Test : Jan 05, 2001

Polarization	Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV/m)	Limits dB(μV/m)	Margin (dB)
Horizontal	36.790	15.62	0.76	25.50	32.12	23.00	40.00	17.00
	56.190	6.78	0.94	25.33	41.04	23.43	40.00	16.57
	153.190	10.81	1.69	25.10	36.28	23.68	43.50	19.82
	187.140	9.47	1.93	25.10	39.63	25.93	43.50	17.57
	201.690	9.49	2.02	25.10	39.11	25.52	43.50	17.98
	652.740	21.01	4.01	26.70	31.40	29.72	46.00	16.28
Vertical	30.000	18.15	0.67	25.57	34.91	28.16	40.00	11.84
	42.610	12.66	0.82	25.44	42.35	30.39	40.00	9.61
	72.680	7.19	1.04	25.23	44.05	27.05	40.00	12.95
	441.280	18.02	3.25	26.31	34.15	29.11	46.00	16.89
	596.480	20.60	3.84	26.70	34.46	32.20	46.00	13.80
	652.740	21.01	4.01	26.70	34.32	32.64	46.00	13.36

Note 1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Preamp Factor

Note 2. All reading are Quasi-Peak values.

Note 3. The worst emission at horizontal polarization was detected at 652.740 MHz with corrected signal level of 29.72 dB(μV/m) (limit is 46.00 dB(μV/m)), when the antenna was 1.80m height and the turn table was at 175°.

Note 4. The worst emission at vertical polarization was detected at 42.610 MHz with corrected signal level of 30.39 dB(μV/m) (limit is 40.00 dB(μV/m)), when the antenna was 1.00m height and the turn table was at 190°.

Note 5. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

TEST ENGINEER:


(HALL WANG)

4 OUTPUT SIGNAL LEVEL MEASUREMENT

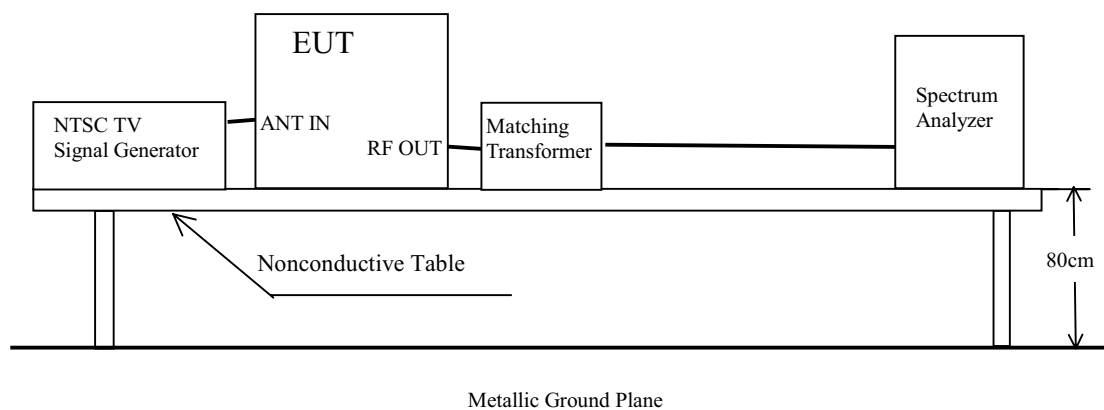
4.1 Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	85422E	3617A00167	Set 15,2000	1 Year

4.2 Block Diagram of Test Setup

TV mode (0dBmV NTSC TV Signal Input)

Shielded Room



4.3 Output Signal Limit

FCC Rule Part 15, §15.115 (b) (1) (ii)

4.4 Test Procedure

- (a) Configure the EUT System in accordance with ANSI C63.4-1992 section 12.2.
see also the block diagram and the photographs of EUT System configuration in this report.
- (b) Unused RF input/output terminals are terminated in the proper impedance.
- (c) Activate the EUT system.
- (d) Set the spectrum analyzer as follows.

Frequency Span	: 1 MHz
Resolution bandwidth	: 100 kHz
Video bandwidth	: 3 MHz
Detector function	: Peak mode
- (e) The RF output terminal is connected to the spectrum analyzer through the matching transformer.
- (f) Then, the RF output signal level is measured under the EUT condition produced the maximum signal level.

4.5 Test Results

EUT : Remote Control Cable Converter Temperature : 20°C

Model No. : F3388U Humidity : 53%

Test Mode : TV mode Date of Test : Jan 05, 2001

Emission Frequency (MHz)	Correction Factor (dB)	Meter Reading (dBμV) 50Ω	Signal Level (dBμV) 75Ω	Limits (dBμV) 75Ω	Margin (dB)
<u>Test Channel #3</u>					
61.25	2.0	63.77	65.77	69.5	3.73
65.75	2.0	49.48	51.48	56.5	5.02
<u>Test Channel #4</u>					
67.25	2.1	63.43	65.53	69.5	3.97
71.75	2.1	49.13	51.23	56.5	5.27

Note1. The correction factor consist of the voltage loss of the impedance matching transformer and the coaxial cable used for the test.

Note2. The spectrum was checked in each test mode and operation mode, and the maximum measured data was reported.

Note3. Sample Calculation

Frequency : 61.25MHz (Test Channel#3)

Meter Reading : 63.77 dBμV/50Ω

Correction Factor : 2.0 dB

Then, the output signal level is calculated as follows.

Signal Level= 63.77 + 2.0 =65.77 dBμV/75Ω

Note4. Summary of Test Results

Minimum margin was 3.73 dB at 61.25 MHz, test channel #3.

TEST ENGINEER:

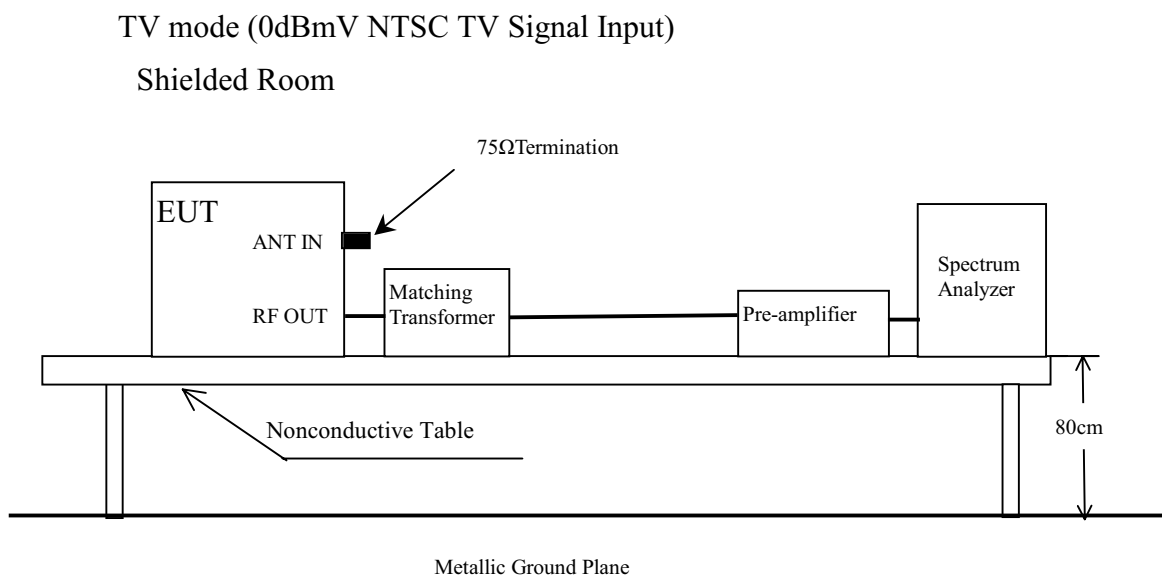

(HALL WANG)

5 OUTPUT TERMINAL CONDUCTED SPURIOUS EMISSION MEASUREMENT

5.1 Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	85422E	3617A00167	Set 15,2000	1 Year
2.	Preamplifier	HP	8447D	2944A06664	Dec 10,2000	1/2 Year

5.2 Block Diagram of Test Setup



5.3 Output Signal Limits

FCC Rule Part 15, §15.115 (b) (2) (ii)

5.4 Test Procedure

- (a) Configure the EUT System in accordance with ANSI C63.4-1992 section 12.2.

See also the block diagram and the photographs of EUT System configuration in this report.

- (b) Unused RF input/output terminals in the proper impedance.

- (c) Activate the EUT system.

- (d) Set the spectrum analyzer as follows.

Frequency Span	: 1 MHz
Resolution bandwidth	: 100 kHz
Video bandwidth	: 3 MHz
Detector function	: Peak mode

- (e) The RF output terminal is connected to the spectrum analyzer through the matching transformer.

- (f) The spectrum was scanned from 30 MHz to more than 4.6 MHz below the visual carrier frequency, and from more than 7.4 MHz above the visual carrier frequency to 1000 MHz, and the three highest emissions are selected under the EUT condition produced the maximum signal level at each frequency range.

- (g) Then, the RF output terminal conducted spurious emission level is measured under the EUT condition produced the maximum signal level.

5.5 Test Results

EUT : Remote Control Cable Converter Temperature : 20°C

Model No. : F3388U Humidity : 53%

Test Mode : TV mode Date of Test : Jan 05, 2001

Emission Frequency [MHz]	Correction Factor dB	Meter Reading (dBμV) 50Ω	Signal Level (dBμV) 75Ω	Limits (dBμV) 75Ω	Margin (dB)
Test Channel #3					
38.775	-23.3	39.25	15.95	39.5	23.55
47.784	-23.3	46.93	23.63	39.5	15.87
53.039	-23.3	45.15	21.85	39.5	17.65
69.441	-23.3	45.16	21.86	39.5	17.64
74.731	-23.2	46.89	23.69	39.5	15.81
83.726	-23.2	39.27	16.07	39.5	23.43
Test Channel #4					
44.736	-23.3	39.34	16.04	39.5	23.46
53.746	-23.3	46.94	23.64	39.5	15.86
59.024	-23.2	45.17	21.97	39.5	17.53
75.416	-23.2	44.46	21.26	39.5	18.24
80.699	-23.2	46.53	23.33	39.5	16.17
89.664	-23.2	39.12	15.92	39.5	23.58

Note1. The correction factor consist of the voltage loss of the impedance matching transformer and the coaxial cable used for the test, and consist of the gain of pre-amplifier.

Note2. The spectrum was checked in each test mode and operation mode, and the maximum measured data was reported.

Note3. Sample Calculation

Frequency : 38.775 MHz (Test Channel #3)

Meter Reading : 39.25 dBμV/50Ω

Correction Factor : -23.3 dB

Then, the output signal level is calculated as follows.

Signal Level= 39.25 – 23.3 = 15.95 dBμV/75Ω

Note4. Summary of Test Results

Minimum margin was 15.81 dB at 74.731 MHz, test channel #3.

TEST ENGINEER:


(HALL WANG)

6 TRANSFER SWITCH MEASUREMENT

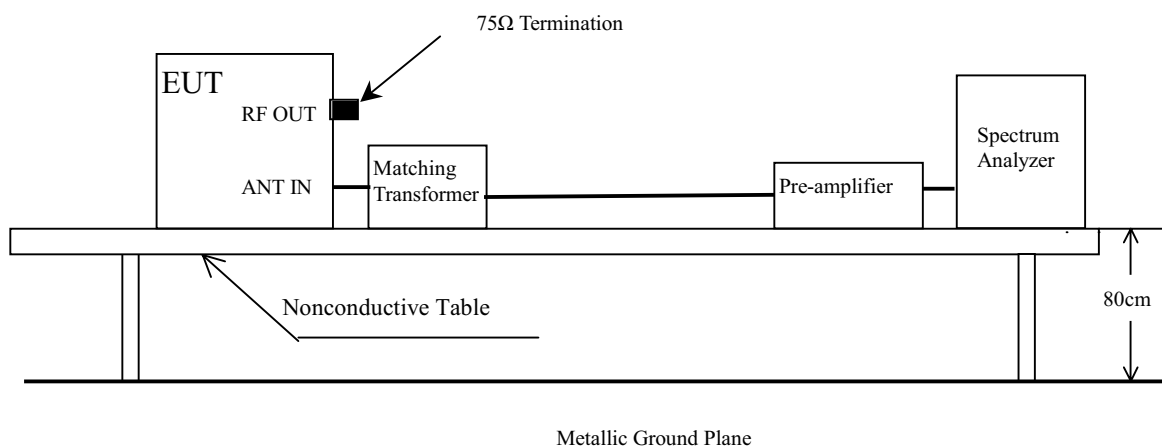
6.1 Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	85422E	3617A00167	Set 15,2000	1 Year
2.	Preamplifier	HP	8447D	2944A06664	Dec 10,2000	1/2 Year

6.2 Block Diagram of Test Setup

TV mode (0dBmV NTSC TV Signal Input)

Shielded Room



6.3 Limit of the signal appearing at the receiving antenna input terminals

FCC Rule Part 15, §15.115 (c) (1) (ii).

6.4 Test Procedure

- (a) Configure the EUT System in accordance with ANSI C63.4-1992 section 12.2.

see also the block diagram and the photographs of EUT System configuration in this report.

- (b) Unused RF input/output terminals are terminated in the proper impedance.
- (c) Activate the EUT system.
- (d) Set the spectrum analyzer as follows.

Frequency Span	: 1 MHz
Resolution bandwidth	: 100 kHz
Video bandwidth	: 3 MHz
Detector function	: Peak mode
- (e) The antenna input terminal is connected to the input of pre-amplifier through the matching transformer coaxial cable. And the output of pre-amplifier is connected to the spectrum analyzer.
- (f) Then, the signal level on the antenna input terminal is measured under the EUT condition produced the maximum signal level.

6.5 Test Results

EUT : Remote Control Cable Converter Temperature : 20°C

Model No. : F3388U Humidity : 53%

Test Mode : TV mode Date of Test : Jan 05, 2001

Emission Frequency [MHz]	Correction Factor (dB)	Meter Reading (dBμV) 50Ω	Signal Level (dBμV) 75Ω	Limits (dBμV) 75Ω	Margin (dB)
<u>Test Channel #3</u> 61.25	-23.3	27.82	4.52	9.5	4.48
<u>Test Channel #4</u> 67.25	-23.2	27.90	4.7	9.5	4.8

Note1. The correction factor consist of the voltage loss of the impedance matching transformer and the coaxial cable used for the test, and consist of the gain of pre-amplifier.

Note2. The spectrum was checked in each test mode and operation mode, and the maximum measured data was reported.

Note3. Sample Calculation

Frequency : 61.25 MHz (Test Channel #3)

Meter Reading : 27.82 dBμV/50Ω

Correction Factor : -23.3 dB

Then, the output signal level is calculated as follows.

Signal Level= 27.82 – 23.3 = 4.52 dBμV/75Ω

Note4. Summary of Test Results

Minimum margin was 4.48 dB at 61.25 MHz, test channel #3.

TEST ENGINEER:


(HALL WANG)