

Application for FCC Certification
On behalf of

Zhejiang Yatai Electronics Co., Ltd.

CATV Converter

Model No.: YT-F6688U

FCC ID : QGTYT-F6688U

Prepared For : Zhejiang Yatai Electronics Co., Ltd.
No.185 2A Lane, Xingfu West Rd., Hongqiao,
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Report No. : ACI-F02057
Date of Test : Apr 16-May 16, 2002
Date of Report : May 29, 2002

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TEST REPORT FOR FCC CERTIFICATION

Applicant : Zhejiang Yatai Electronics Co., Ltd.
Manufacturer : Zhejiang Yatai Electronics Co., Ltd.
EUT Description : CATV Converter
(A) Model No.: YT-F6688U
(B) Serial No.: EL011732
(C) Power Supply: 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B APRIL 2002
AND ANSI C63.4-1992*

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B (Class B) limits both radiated and conducted emissions.

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.

This report must not be used by the applicant to claim product endorsement by NVLAP or any agency of the U.S. Government.

Prepared by : *Yolanda Liu 2002.7.1* Test Engineer : *Sammy Chen*
YOLANDA LIU SAMMY CHEN
(Assistant) (Engineer)

Reviewer : *Byron Kwo 08/01/02* Approved Signatory : *Alex Chiu 08/01/02*
BYRON KWO ALEX CHIU
(Supervisor) (Assistant Manager)

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test

Description : CATV Converter

Type of EUT : ☒ Production ☐ Pre-product ☐ Pro-type

Model Number : YT-F6688U

Serial No. : EL011732

FCC ID : QGTYT-F6688U

Applicant : Zhejiang Yatai Electronics Co., Ltd.
No.185 2A Lane, Xingfu West Rd., Hongqiao,
Yueqing, Zhejiang,

Manufacturer : Zhejiang Yatai Electronics Co., Ltd.
No.185 2A Lane, Xingfu West Rd., Hongqiao,
Yueqing, Zhejiang,

Power Cord : Unshielded, Undetachable, 1.8m

AV Line : Shielded, Detachable, 1.2m

1.2 Supported Simulators

1.2.1 TELEVISION

Model Number : T2131D

Serial Number : HQ818M42928

Manufacturer : KONKA

Power Cord : Unshielded, Nondetachable, 2.38m

AV Cable : Unshielded, Detachable, 1.50m

S-Video Cable : Shielded, Detachable, 1.70m

1.2.2 Color TV Pattern Generator

Model Number : PM5518-TX

Serial Number : LO522138

Manufacturer : PHILIPS

1.3 Description of Test Facility

Site Description : Sept. 17, 1998 file on
(Semi-Anechoic Chamber) Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046, USA

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3F 34Bldg 680 Guiping Rd,
Caohejing Hi-Tech Park,
Shanghai, China 200233

NVLAP Lab Code : 200371-0

1.4 Measurement Uncertainty

Conducted Emission Uncertainty : $U = \pm 2.66\text{dB}$
Radiated Emission Uncertainty : $U = \pm 4.26\text{dB}$

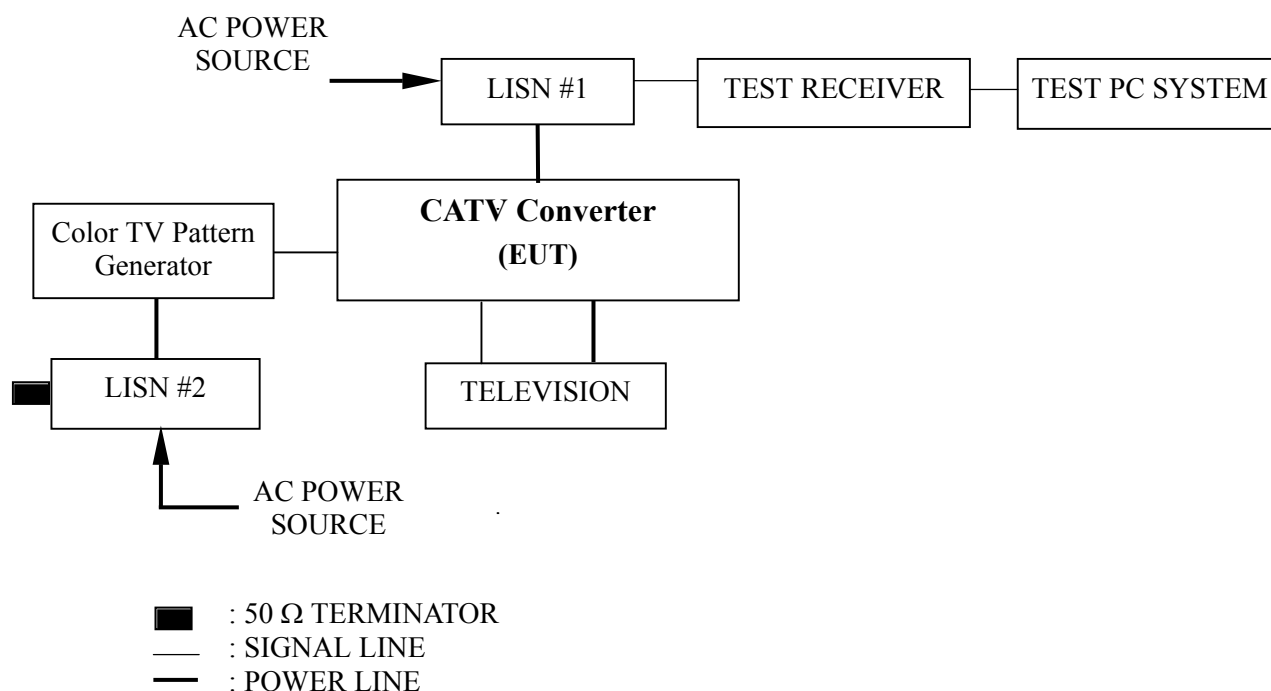
2 CONDUCTED EMISSION TEST

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	Apr 25, 2002	1 Year
2.	Line Impedance Stabilization Network (LISN #1)	Kyoritsu	KNW-407	8-1280-4	Apr 28, 2002	1 Year
3.	LISN #2	Kyoritsu	KNW-407	8-1280-5	May 09, 2002	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 and supported simulator were installed as shown on Sec. 2.2 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

2.5.1 Setup the EUT and the simulator as shown in Sec. 2.2.

2.5.2 Turn on the power of all equipment.

2.5.3 The EUT was in TV mode.

2.5.4 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 IF 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 : CATV Converter Temperature : 21°C

Model No. : YT-F6688U Humidity : 46%

Test Mode : TV mode Date of Test : Apr 18, 2002
(Test Channel #3)

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	2.648	0.27	13.45	13.72	48.00	34.28
	4.292	0.27	26.91	27.18	48.00	20.82
	7.194	0.27	32.16	32.43	48.00	15.57
	11.959	0.27	14.62	14.89	48.00	33.11
	19.141	0.30	17.76	18.06	48.00	29.94
	25.899	0.42	16.01	16.43	48.00	31.57
VB	2.626	0.25	14.87	15.12	48.00	32.88
	4.185	0.26	27.67	27.93	48.00	20.07
	6.928	0.28	30.67	30.95	48.00	17.05
	11.959	0.28	14.78	15.06	48.00	32.94
	19.141	0.31	17.12	17.43	48.00	30.57
	25.899	0.42	17.27	17.69	48.00	30.31
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 7.194 MHz with corrected signal level of 32.43dB(μV) (limit is 48.00 dB(μV)), when the VA of the EUT is connected to LISN.						

TEST ENGINEER: Sammy Chen
(SAMMY CHEN)

EUT : CATV Converter Temperature : 21°C

Model No. : YT-F6688U Humidity : 46%

Test Mode : TV mode Date of Test : Apr 18, 2002
(Test Channel #4)

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	2.637	0.27	16.11	16.38	48.00	31.62
	4.185	0.27	26.51	26.78	48.00	21.22
	7.015	0.27	32.01	32.28	48.00	15.72
	11.959	0.27	15.98	16.25	48.00	31.75
	19.302	0.30	17.95	18.25	48.00	29.75
	25.575	0.41	15.06	15.47	48.00	32.53
VB	2.626	0.25	15.06	15.31	48.00	32.69
	4.185	0.26	28.04	28.30	48.00	19.70
	6.898	0.28	33.62	33.90	48.00	14.10
	14.940	0.28	15.17	15.45	48.00	32.55
	18.822	0.31	17.14	17.45	48.00	30.55
	25.899	0.42	17.65	18.07	48.00	29.93
<p>Note 1. Emission Level = Meter Reading + Factor</p> <p>Note 2. Factor = Insertion Loss + Cable Loss</p> <p>Note 3. All reading are Quasi-Peak Values.</p> <p>Note 4. The worst emission is detected at 6.898 MHz with corrected signal level of 33.90dB(μV) (limit is 48.00 dB(μV)), when the VB of the EUT is connected to LISN.</p>						

TEST ENGINEER: Sammy Chen
(SAMMY CHEN)

3 RADIATED EMISSION TEST

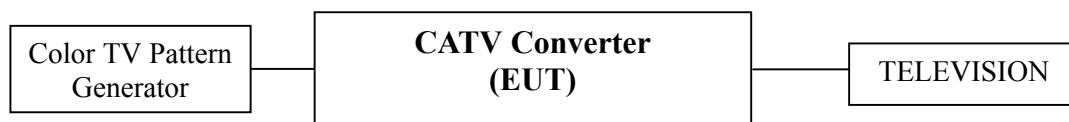
3.1 Test Equipment

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

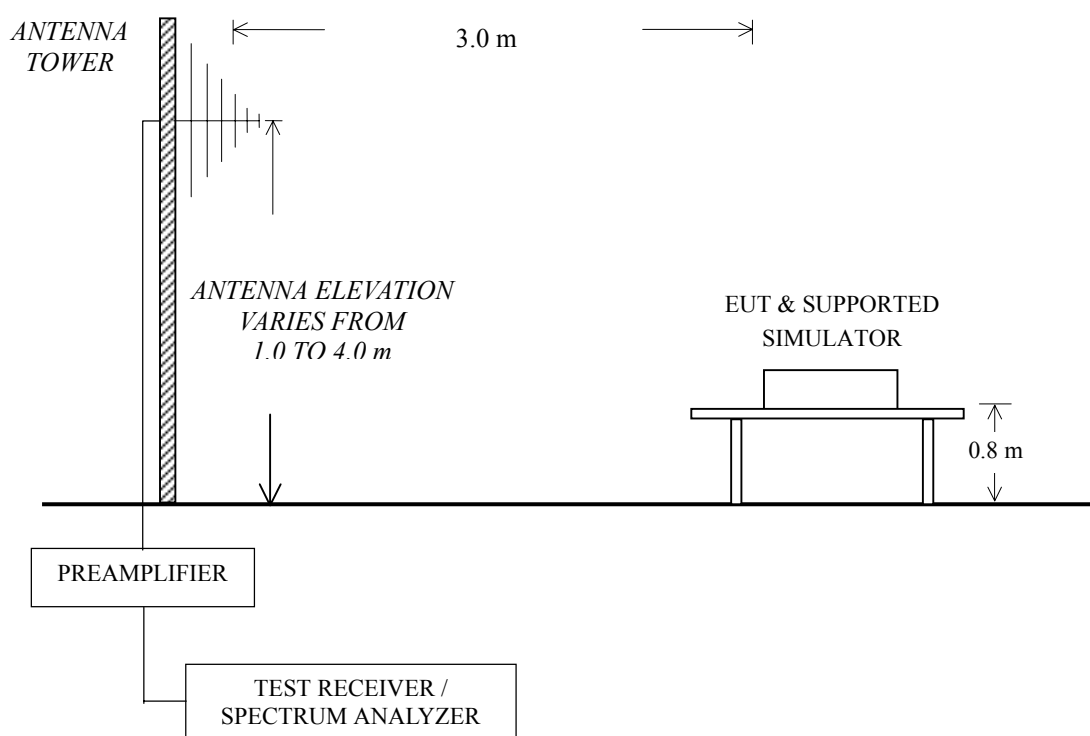
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	85422E	3617A00167	Sept 28, 2001	1 Year
2.	Preamplifier	HP	8447D	2944A06849	Apr 29, 2002	1/2 Year
3.	Bilog Antenna	Chase	CBL6111	1146	Apr 29, 2002	1/2 Year
4.	Test Receiver	Rohde & Schwarz	ESVS10	844594/001	Apr 23, 2002	1 Year

3.2 Block Diagram of Test Setup

3.2.1 EUT and supported simulator



3.2.2 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 IF bandwidth setting on Test Receiver ESVS10 was 120 kHz.

The frequency range from 30 MHz to 1000 MHz was checked.

The test modes (TV mode) were 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 : CATV Converter Temperature : 25°C

Model No. : YT-F6688U Humidity : 45%

Test Mode : TV mode Date of Test : Apr 16, 2002
(Test Channel #3)

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	33.880	17.47	0.72	25.52	25.15	17.82	40.00	22.18
	71.710	7.35	1.04	25.23	37.92	21.08	40.00	18.92
	109.540	11.07	1.29	25.10	36.85	24.11	43.50	19.39
	202.660	10.36	2.03	25.10	38.54	25.83	43.50	17.67
	286.080	13.73	2.43	25.10	37.88	28.94	46.00	17.06
	799.210	23.12	4.41	26.55	25.37	26.35	46.00	19.65
Vertical	41.640	14.08	0.81	25.44	38.05	27.50	40.00	12.50
	72.680	7.37	1.05	25.22	40.75	23.95	40.00	16.05
	109.540	11.07	1.29	25.10	41.91	29.17	43.50	14.33
	211.390	10.88	2.07	25.10	41.49	29.34	43.50	14.16
	286.080	13.73	2.43	25.10	41.38	32.44	46.00	13.56
	865.170	23.63	4.57	26.46	25.46	27.20	46.00	18.80

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 286.080 MHz with corrected signal level of 28.94 dB(μV/m) (limit is 46.00 dB(μV/m)), when the antenna was 1.20m height and the turn table was at 23°.

Note 4 - The worst emission at vertical polarization was detected at 41.640 MHz with corrected signal level of 27.50 dB(μV/m) (limit is 40.00 dB(μV/m)), when the antenna was 1.00m height and the turn table was at 327°.

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

TEST ENGINEER: Sammy Chen
(SAMMY CHEN)

EUT : CATV Converter Temperature : 25°C

Model No. : YT-F6688U Humidity : 45%

Test Mode : TV mode Date of Test : Apr 16, 2002
(Test Channel #4)

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	31.940	18.16	0.70	25.54	25.02	18.34	40.00	21.66
	62.980	5.89	0.98	25.28	38.01	19.60	40.00	20.40
	90.140	8.43	1.14	25.14	38.80	23.23	43.50	20.27
	137.670	13.24	1.56	25.10	35.21	24.91	43.50	18.59
	232.730	12.06	2.19	25.10	39.05	28.20	46.00	17.80
	434.490	18.11	3.22	26.26	32.12	27.19	46.00	18.81
Vertical	39.700	15.11	0.79	25.46	35.43	25.87	40.00	14.13
	62.980	5.89	0.98	25.28	41.13	22.72	40.00	17.28
	109.540	11.07	1.29	25.10	41.91	29.17	43.50	14.33
	177.440	10.14	1.87	25.10	36.89	23.80	43.50	19.70
	339.430	15.61	2.73	25.50	33.62	26.46	46.00	19.54
	595.510	20.57	3.83	26.70	29.39	27.09	46.00	18.91

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 232.730 MHz with corrected signal level of 28.20 dB(μV/m) (limit is 46.00 dB(μV/m)), when the antenna was 1.20m height and the turn table was at 23°.

Note 4 - The worst emission at vertical polarization was detected at 39.700 MHz with corrected signal level of 25.87 dB(μV/m) (limit is 40.00 dB(μV/m)), when the antenna was 1.00m height and the turn table was at 327°.

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

TEST ENGINEER: Sammy Chen
(SAMMY CHEN)

4 OUTPUT SIGNAL LEVEL MEASUREMENT

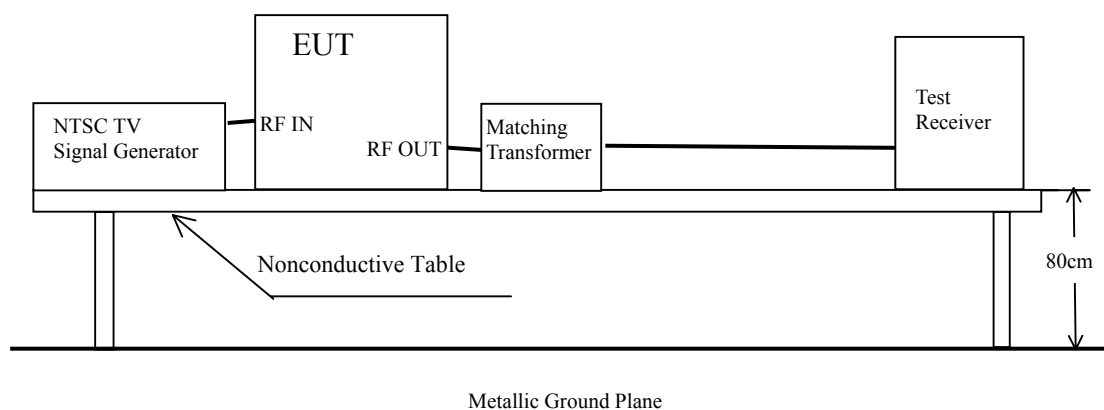
4.1 Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESVS10	844594/001	Apr 23, 2002	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

- 4.4.1 Configure the EUT System in accordance with ANSI C63.4-1992 Sec.12.2. See also the block diagram and the photographs of EUT System configuration in this report.
- 4.4.2 Unused RF input/output terminals are terminated in the proper impedance.
- 4.4.3 Activate the EUT system.
- 4.4.4 Set the test receiver as follows.
 - Frequency Span : 1 MHz
 - Resolution bandwidth : 100 kHz
 - Video bandwidth : 3 MHz
 - Detector function : Peak mode
- 4.4.5 The RF output terminal is connected to the test receiver through the matching transformer.
- 4.4.6 Then, the RF output signal level is measured under the EUT condition produced the maximum signal level.

4.5 Test Results

EUT : CATV Converter Temperature : 21°C

Model No. : YT-F6688U Humidity : 46%

Test Mode : TV mode Date of Test : May 16, 2002

Emission Frequency (MHz)	Correction Factor (dB)	Meter Reading (dBμV) 50Ω	Signal Level (dBμV) 75Ω	Limits (dBμV) 75Ω	Margin (dB)
Test Channel #3					
61.250	0.41	62.99	63.40	69.5	6.10
65.714	0.41	50.01	50.42	56.5	6.08
Test Channel #4					
67.250	0.41	63.75	64.16	69.5	5.34
71.750	0.42	49.59	50.01	56.5	6.49
<p>Note1 - The correction factor consist of the voltage loss of the impedance matching transformer and the coaxial cable used for the test.</p> <p>Note2 - The spectrum was checked in each test mode and operation mode, and the maximum measured data was reported.</p> <p>Note3 - Sample Calculation Frequency : 61.250 MHz (Test Channel#3) Meter Reading : 62.99 dBμV/50Ω Correction Factor : 0.41 dB Then, the output signal level is calculated as follows. Signal Level = 62.99 + 0.41 = 63.40 dBμV/75Ω</p> <p>Note4 - Summary of Test Results Minimum margin was 5.34 dB at 67.250 MHz, test channel #4.</p>					

TEST ENGINEER: Sammy Chen
(SAMMY CHEN)

5 OUTPUT TERMINAL CONDUCTED SPURIOUS EMISSION MEASUREMENT

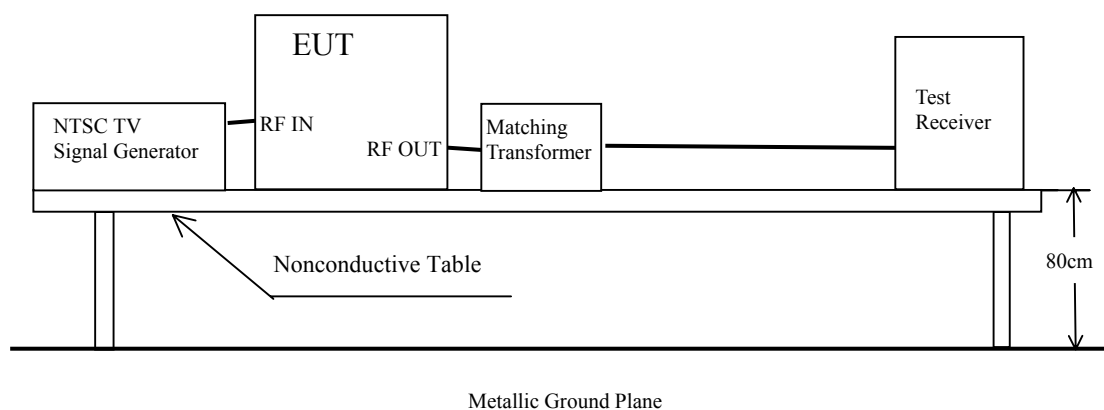
5.1 Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
2.	Test Receiver	Rohde & Schwarz	ESVS10	844594/001	Apr 23, 2002	1 Year

5.2 Block Diagram of Test Setup

TV mode (0dBmV NTSC TV Signal Input)

Shielded Room



5.3 Output Signal Limits

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

5.4 Test Procedure

- 5.4.1 Configure the EUT System in accordance with ANSI C63.4-1992 Sec. 12.2. See also the block diagram and the photographs of EUT System configuration in this report.
- 5.4.2 Unused RF input/output terminals in the proper impedance.
- 5.4.3 Activate the EUT system.
- 5.4.4 Set the test receiver as follows.
 - Frequency Span : 1 MHz
 - Resolution bandwidth : 100 kHz
 - Video bandwidth : 3 MHz
 - Detector function : Peak mode
- 5.4.5 The RF output terminal is connected to the test receiver through the matching transformer.
- 5.4.6 The test receiver was scanned from 30 MHz to more than 4.6 MHz below the video carrier frequency, and from more than 7.4 MHz above the video 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.
- 5.4.7 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 : CATV Converter Temperature : 21°C

Model No. : YT-F6688U Humidity : 46%

Test Mode : TV mode Date of Test : May 16, 2002

Emission Frequency [MHz]	Correction Factor dB	Meter Reading (dBμV) 50Ω	Signal Level (dBμV) 75Ω	Limits (dBμV) 75Ω	Margin (dB)
Test Channel #3					
38.715	0.39	12.22	12.61	39.5	26.89
47.679	0.40	17.25	17.65	39.5	21.85
56.500	0.40	12.70	13.10	39.5	26.40
122.419	0.44	34.95	35.39	39.5	4.11
183.635	0.47	30.04	30.51	39.5	8.99
279.245	0.54	23.35	23.89	39.5	15.61
Test Channel #4					
32.000	0.39	11.17	11.56	39.5	27.94
43.967	0.40	10.72	11.12	39.5	28.38
53.687	0.40	17.34	17.74	39.5	21.76
165.102	0.46	24.41	24.87	39.5	14.63
280.158	0.54	16.27	16.81	39.5	22.69
731.300	0.96	15.35	16.31	39.5	23.19

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 : 38.715 MHz (Test Channel #3)

Meter Reading : 12.22 dBμV/50Ω

Correction Factor : 0.39 dB

Then, the output signal level is calculated as follows.

Signal Level= 12.22 + 0.39 = 12.61 dBμV/75Ω

Note4 - Summary of Test Results

Minimum margin was 4.11 dB at 122.419 MHz, test channel #3.

TEST ENGINEER: Sammy Chen
(SAMMY CHEN)