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# EMI Test Report

On Model Name: DTV Converter Box

Model Number: N9901T

Brand Name : COSHIP

FCC ID Number: VXF2008061801

Prepared for COSHIP ELECTRONICS CO., LTD

According to FCC Part 15 Class B

Test Report #: SHE-0806-7007-FCC

Prepared by: Eddy Chen

Reviewed by: Ivan Wen

QC Manager: Paul Chen

Test Report Released by: Paul J. Chen

Paul Chen

2008, June 24

Date

### ***Test Location***

*Tests performed at ECMG Worldwide Certification Solutions(Shanghai) in a Certified ANSI Semi-Anechoic Chamber and Shielded Room.*

*Test Site Location:* ***Building 2, No. 1298, Lianxi Road, Pu Dong New Area, Shanghai P.R.C 201204, China***

*Tel:* ***86-021-51909320/51909321***

*Fax:* ***86-021-51909333***

*FCC Registration Number:* ***172634***

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### **Opinions and Interpretations**

*This test report relates to the above mentioned equipment under test (EUT). Without the permission of ECMG Worldwide Certification Solution Inc. Test Lab this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark on this or similar products. The manufacturer has sole responsibility of continued compliance of the device.*

### **Statement of Measurement Uncertainty**

*The data and results referenced in the document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error. Furthermore, component and process variability of devices similar to that tested may result in additional deviation.*

## ***Administrative Data***

*Test Sample* : *DTV Converter Box*  
*Model Number* : *N9901T*  
*Model Tested* : *N9901T*  
*Date Tested* : *2008, June 20*  
*Applicant* : *COSHIP ELECTRONICS CO., LTD*  
*7F, Block A, W2 Bldg, Hi-Tech Industrial Park , Shenzhen , China*  
*Telephone* : *86-755-26990000-8699*  
*Fax* : *86-755-26733777*  
*Manufacturer* : *COSHIP ELECTRONICS CO., LTD*  
*7F, Block A, W2 Bldg, Hi-Tech Industrial Park , Shenzhen . China*

### ***EUT Description***

*COSHIP ELECTRONICS CO., LTD model tested N9901T (referred to as the EUT in this report) is a DTV Converter Box.*

## Test Summary

The Electromagnetic Compatibility requirements on model N9901T for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment Under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.

<b>Emission Tests</b>				
<b>Specifications</b>	<b>Description</b>	<b>Test Results</b>	<b>Test Point</b>	<b>Remark</b>
Part 15.107 ANSI C63.4 2003	Conducted Emission	Passed	AC Input Port	Attachment 1
Part 15.109 ANSI C63.4 2003	Radiated Emission	Passed	Enclosure	Attachment 2
Part 15.111(a) ANSI C63.4 2003	Antenna Power Conduction	Passed	RF input	Attachment 3
Part 15.115(b) ANSI C63.4 2003	Output and spurious conducted level	Passed	RF Output	Attachment 4
Part 15.115(d) ANSI C63.4 2003	Incorporate circuitry to automatically prevent emanations	Passed	RF Input	Attachment 5

### ***Test Mode Justification***

*This device complies with Part 15 of the FCC rules. Operations 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.*

### ***Equipment Modification***

*Any modifications installed previous to testing by COSHIP ELECTRONICS CO., LTD will be incorporated in each production model sold or leased in United States.*

*There were no modifications installed by ECMG Worldwide Certification Solution Inc. (China) test personnel.*

**EUT Sample Photos - N9901T**



**Front View**



**Back View**



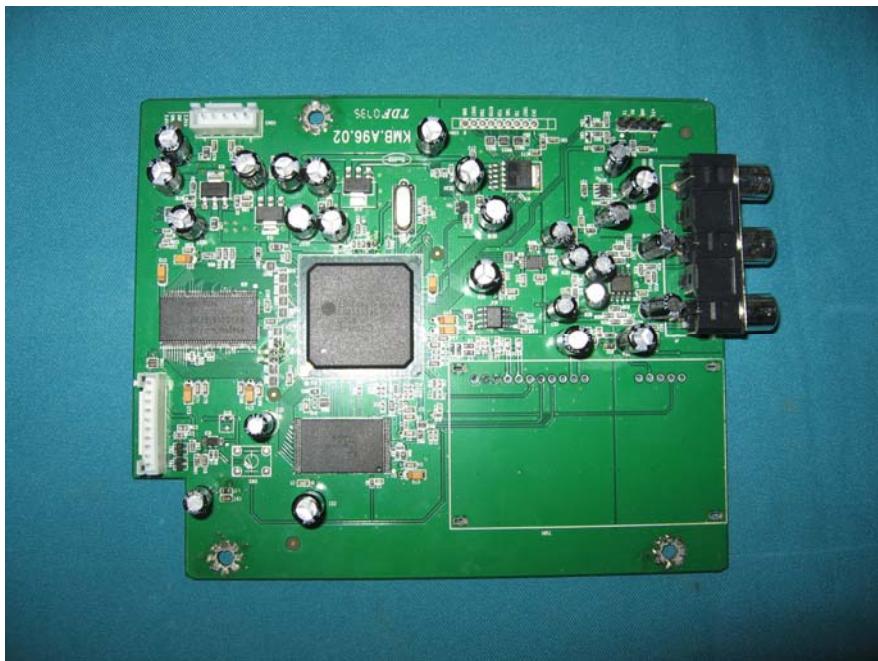
**Top View**



**Bottom View**



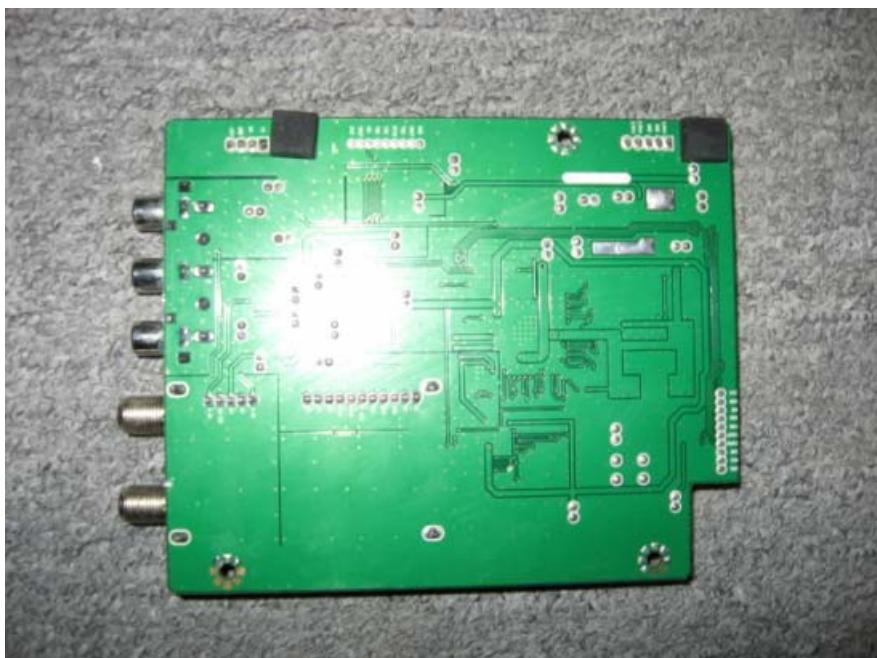
***Inside View #1***



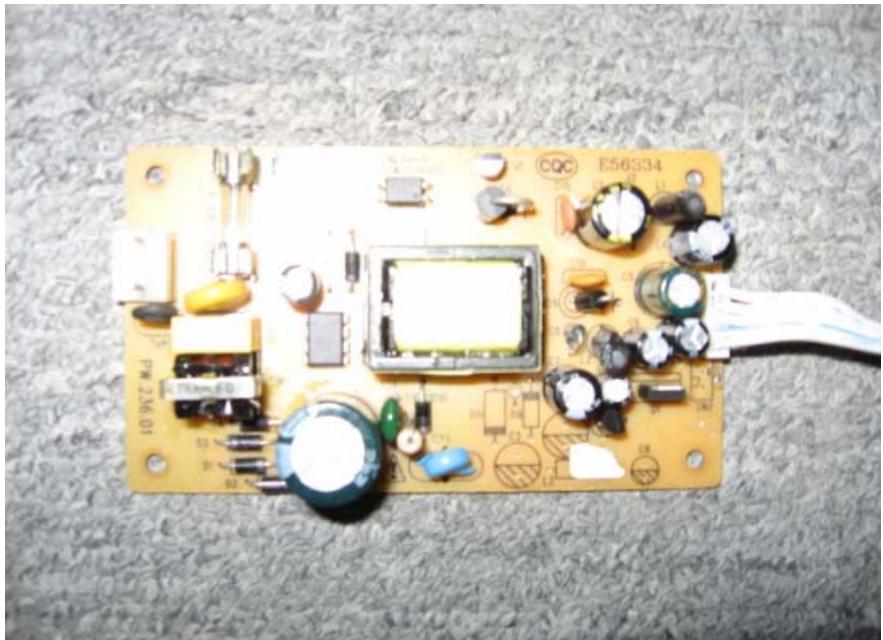
***Inside View #2***



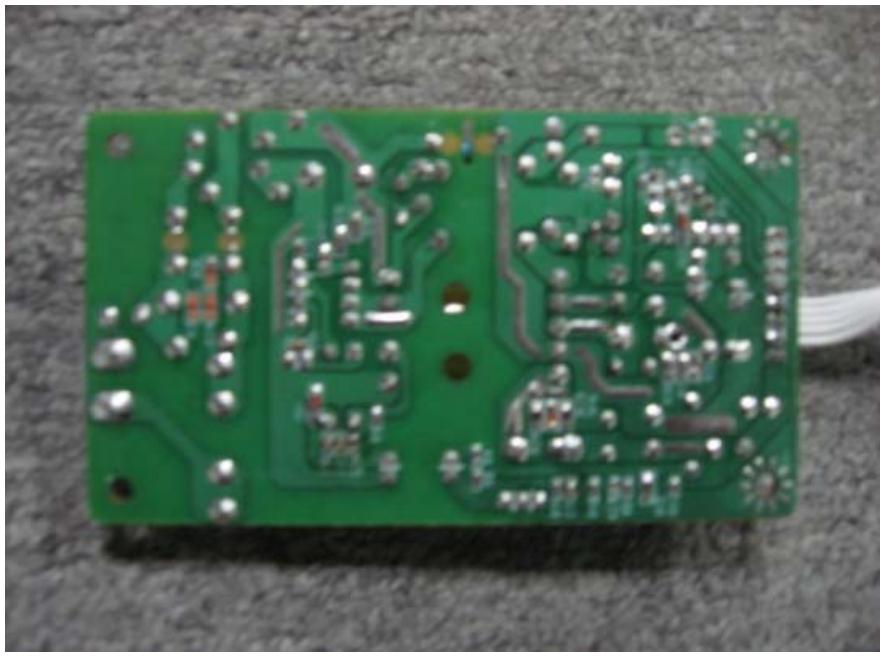
**Main board View #1**



**Main board View #2**



**Power board View #1**

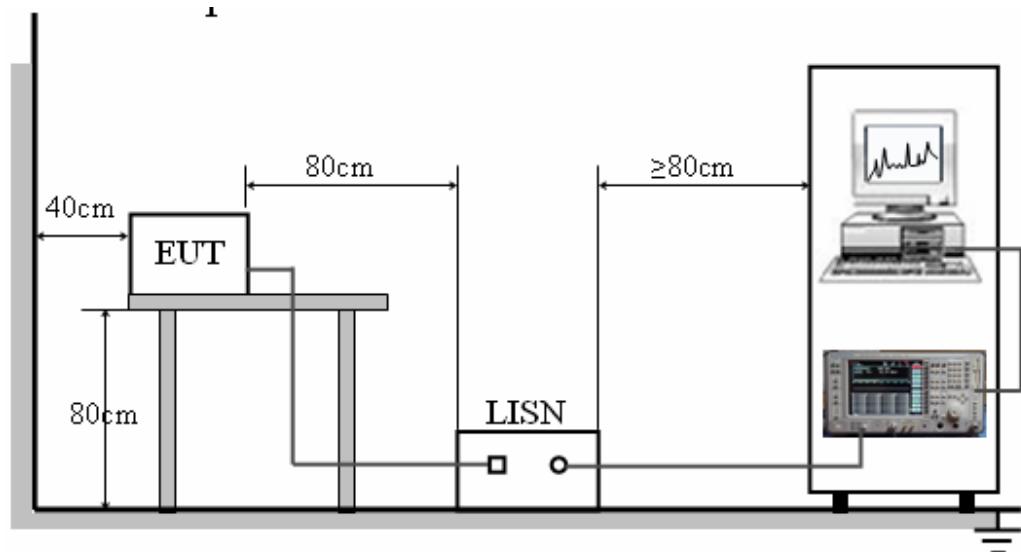


**Power board View #2**

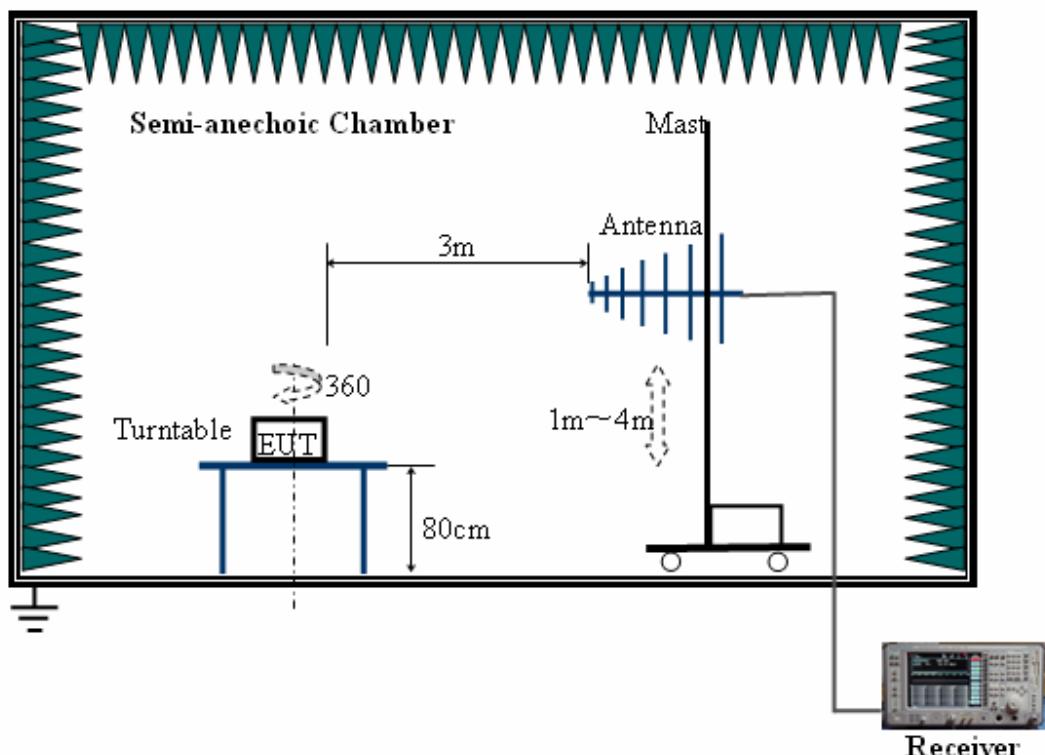
## Test System Details

<b>EUT</b>					
<b>Model Number:</b>	N9901T				
<b>Model Tested:</b>	N9901T				
<b>Description:</b>	DTV Converter Box				
<b>Manufacture:</b>	COSHIP ELECTRONICS CO., LTD				
<b>Support Equipment</b>					
<b>Description</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Manufacturer</b>		
Monitor	KV-HZ29M81	N/A	SONY		
<b>Cable Description</b>					
<b>Description</b>	<b>From</b>	<b>To</b>	<b>Length (Meters)</b>	<b>Shielded (Y/N)</b>	<b>Ferrite (Y/N)</b>
AC Power Cord	EUT	Plug	1.5	N	N
AV Cable	EUT	Monitor	1.1	N	N

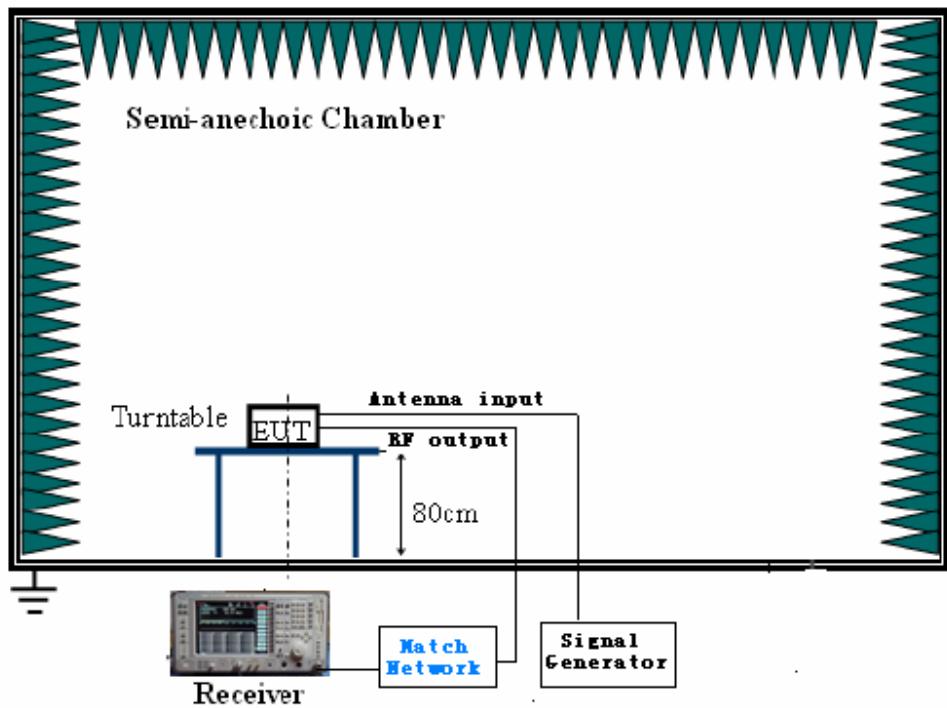
## Configuration of Tested System



## Conducted Emission Measurement



## Radiated Emission Measurement



### ***RF Output and Spurious Level Measurement***

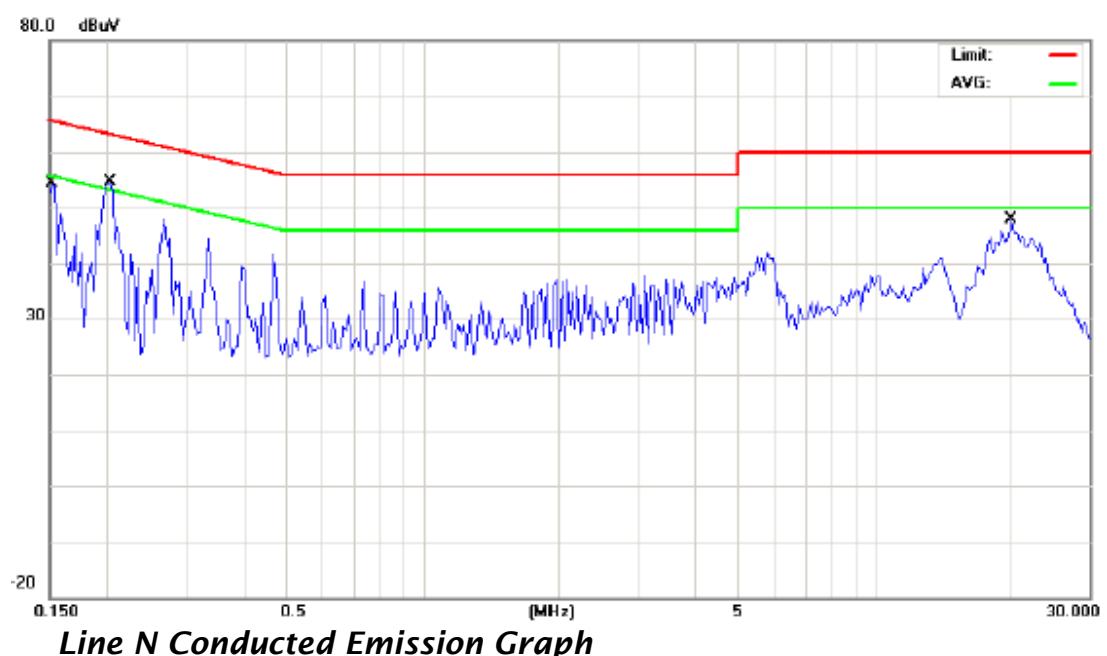
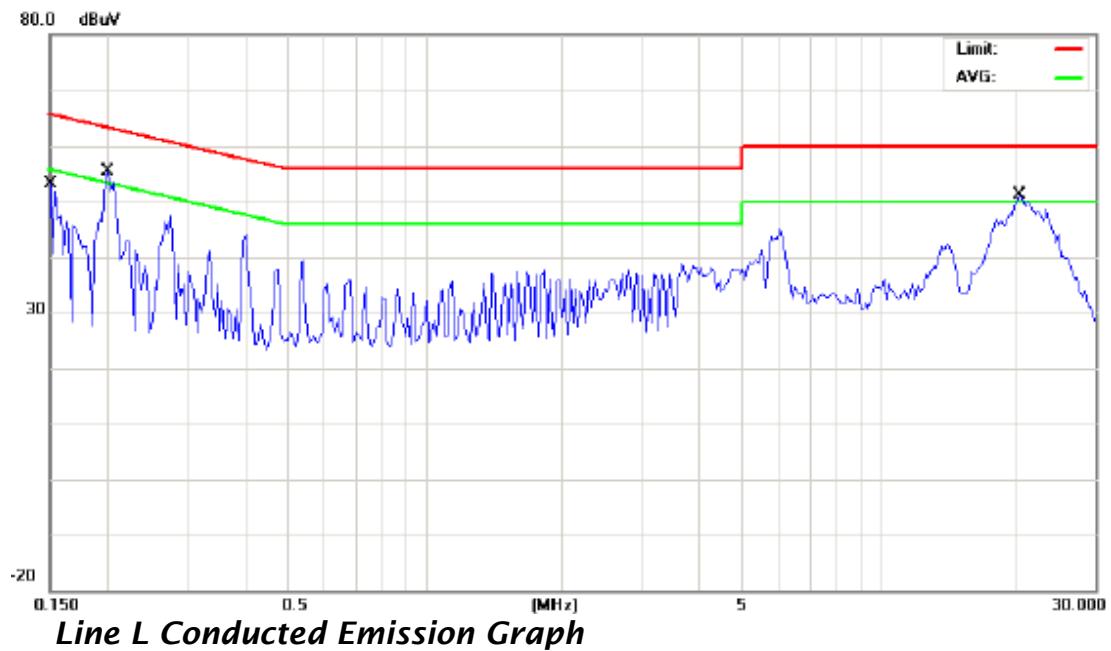
## Attachment 1 – Conducted Emission Measurement

<b>CLIENT:</b>	COSHIP ELECTRONICS CO., LTD	<b>TEST STANDERD:</b>	FCC Part 15, Class B
<b>MODEL NUMBERS:</b>	N9901T	<b>PRODUCT:</b>	DTV Converter Box
<b>EUT MODEL:</b>	N9901T	<b>EUT DESIGNATION:</b>	TV Interface Device
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	47%RH
<b>ATM PRESSURE:</b>	101.0kPa	<b>GROUNDING:</b>	Through AC Power Cord
<b>TESTED BY:</b>	Eddy Chen	<b>DATE OF TEST:</b>	2008, June 20
<b>TEST REFERENCE:</b>	ANSI C63.4: 2003, CISPR 16-1:2002		
<b>TEST PROCEDURE:</b>	The EUT was set up according to the guideline of ANSI C63.4: 2003 for conducted emissions. The measurement was using a AMN on each line and an EMI receiver peak scan was made at the frequency measurement range. The six highest significant peaks were then marked, and these signals were then quasi-peaked and averaged. The frequency range investigated was from 150KHz to 30MHz.		
<b>TESTED RANGE:</b>	150kHz to 30MHz		
<b>TEST VOLTAGE:</b>	120VAC / 60Hz		
<b>RESULTS:</b>	The EUT meets the requirements of test reference for Conducted Emissions. The test results relate only to the equipment under test provided by client.		
<b>Changes or Modifications:</b>	There were no modifications installed by ECMG Worldwide Certification Solution Inc. (China) test personnel.		
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7} \times$ Center Freq., Amp $\pm 2.6$ dB		

### **15.107 Conducted limit:**

*Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.*

<b>Frequency of Emission (MHz)</b>	<b>Conducted Limit(dBuV)</b>	
	<b>Quasi-Peak</b>	<b>Average</b>
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50



**Test Data:**

Line	Frequency (MHz)	Corrected QP Level (dBuV)	Limits QP (dBuV)	Margin QP (dB)	Corrected AV Level (dBuV)	Limits AV (dBuV)	Margin QP (dB)
L	0.153	50.63	65.83	-15.20	40.56	55.83	-15.27
L	0.201	53.90	63.56	-9.66	43.19	53.56	-10.37
L	20.430	50.44	60.00	-9.56	39.77	50.00	-10.23
N	0.154	54.01	65.78	-11.77	42.55	55.78	-13.23
N	0.204	54.19	63.44	-9.25	44.24	53.44	-9.20
N	20.162	47.15	60.00	-12.85	36.59	50.00	-13.41

*Note: All readings are using a bandwidth of 9 kHz, with a 30 ms sweep time. A video filter was not used.*

**Test Equipment List :**

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
Test Receiver	HP	85462A	3704A00349	11/29/07	11/28/08
Bilog Antenna	Sunol	JB5	A110503	11/29/07	11/28/08
Signal Generator	Sencore	VP403	6789734	11/29/07	11/28/08

*Note: All testing were performed using internationally recognized standards. All test instruments were calibrated and traceable to the National Institute of Standards and Technology (NIST).*

SIGNED BY: Z. Zoloty  
ENGINEER

REVIEWED BY: J. Van Wren  
SENIOR ENGINEER



***Conducted Emission Test Set-up***

## Attachment 2 – Radiated Emission Measurement

<b>CLIENT:</b>	COSHIP ELECTRONICS CO., LTD	<b>TEST STANDERD:</b>	FCC Part 15, Class B
<b>MODEL NUMBERS:</b>	N9901T	<b>PRODUCT:</b>	DTV Converter Box
<b>EUT MODEL:</b>	N9901T	<b>EUT DESIGNATION:</b>	TV Interface Device
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	47%RH
<b>ATM PRESSURE:</b>	101.0kPa	<b>GROUNDING:</b>	Through AC Power Cord
<b>TESTED BY:</b>	Eddy Chen	<b>DATE OF TEST:</b>	2008, June 20
<b>TEST REFERENCE:</b>	ANSI C63.4: 2003, CISPR 16-1: 2002		
<b>TEST PROCEDURE:</b>	<p>The EUT was set up according to the guidelines of ANSI C63.4: 2003 for radiated emissions.</p> <p>An EMI receiver peak scan was made at the frequency measurement range (pre-scan) in an Anechoic chamber. Signal discrimination was then performed and the significant peaks marked. These peaks were then quasi-peaked in the frequency range of 30 MHz to 1GHz and Average in the frequency range of 1GHz to 5GHz at an Anechoic chamber.</p> <p>The following data lists the significant emission frequencies, measured levels, correction factors (including cable and antenna correction factors), and the corrected readings against the limits. Explanation of the Correction Factor are given as follows:</p> <p>FS= RA + AF + CF - AG</p> <p>Where: FS = Field Strength</p> <p>RA = Receiver Amplitude</p> <p>AF = Antenna Factor</p> <p>CF = Cable Attenuation Factor</p> <p>AG = Amplifier Gain</p>		
<b>TESTED RANGE:</b>	30MHz to 5000MHz		
<b>TEST VOLTAGE:</b>	120VAC / 60Hz		
<b>RESULTS:</b>	<p>The EUT meets the requirements of test reference for Radiated Emissions.</p> <p>The test results relate only to the equipment under test provided by client.</p>		
<b>CHANGES OR MODIFICATIONS:</b>	There were no modifications installed by ECMG Worldwide Certification Solution Inc. (China) test personnel.		
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7} \times$ Center Freq., Amp $\pm 2.6$ dB		

### **15.209 Limits of Radiated Emission :**

*The field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:*

Frequency of Emission (MHz)	Field Strength ( $\mu$ V/m)	Field Strength ( $dB\mu$ V/m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

#### *Low Channel(198.31MHz):*

Frequency [MHz]	Antenna Polarization [V/H]	Corrected Reading [ $dB\mu$ V/m]	Margin [dB]	3 Meters Limits [ $dB\mu$ V/m]
100.032	V	32.2	-11.3	43.5
175.014	V	37.8	-5.7	43.5
525.005	V	42.9	-3.1	46.0
100.002	H	35.4	-8.1	43.5
175.004	H	32.5	-11.0	43.5
524.987	H	34.2	-11.8	46.0

*1. All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.*

*2. Quasi-peaked in the frequency range of 30 MHz to 1GHz and Average in the frequency range of 1GHz to 5GHz*

*3. All other frequency are more than 20dB below the limit.*

*Mid Channel(560.31):*

Frequency [MHz]	Antenna Polarization [V/H]	Corrected Reading [dB $\mu$ V/m]	Margin [dB]	3 Meters Limits [dB $\mu$ V/m]
100.028	V	31.8	-11.7	43.5
175.00	V	37.6	-5.9	43.5
525.002	V	43.0	-3.0	46.0
100.001	H	35.6	-7.9	43.5
175.002	H	32.6	-10.9	43.5
525.988	H	34.5	-11.5	46.0
1. All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used. 2. Quasi-peaked in the frequency range of 30 MHz to 1GHz and Average in the frequency range of 1GHz to 5GHz 3. All other frequency are more than 20dB below the limit.				

*High Channel (848.31MHz):*

Frequency [MHz]	Antenna Polarization [V/H]	Corrected Reading [dB $\mu$ V/m]	Margin [dB]	3 Meters Limits [dB $\mu$ V/m]
100.033	V	32.1	-11.4	43.5
175.000	V	37.9	-5.6	43.5
525.008	V	42.8	-3.2	46.0
100.006	H	35.3	-8.2	43.5
175.000	H	32.5	-11.0	43.5
524.990	H	34.4	-11.6	46.0
1. All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used. 2. Quasi-peaked in the frequency range of 30 MHz to 1GHz and Average in the frequency range of 1GHz to 5GHz 3. All other frequency are more than 20dB below the limit.				

### **Test Equipment List :**

<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Last Cal.</b>	<b>Cal. Due Date</b>
Test Receiver	HP	85462A	3704A00349	11/29/07	11/28/08
Bilog Antenna	Sunol	JB5	A110503	11/29/07	11/28/08
Horn Antenna	Xibao	Xibao	040507	11/29/07	11/28/08
Signal Generator	Sencore	VP403	6789734	11/29/07	11/28/08
3m SEMI-ANECHOIC CHAMBER	ETS	9X6X6	---	01/18/08	01/18/11

*Note: All testing were performed using internationally recognized standards. All test instruments were calibrated and traceable to the National Institute of Standards and Technology (NIST).*

**SIGNED BY:** Z. Daly  
**ENGINEER**

**REVIEWED BY:** J. Van Wren  
**SENIOR ENGINEER**



***Radiated Emission Test Set-up(Below 1GHz)***



***Radiated Emission Test Set-up(Above 1GHz)***

### Attachment 3 – Antenna-Conducted Power Measurement

<b>CLIENT:</b>	COSHIP ELECTRONICS CO., LTD	<b>TEST STANDERD:</b>	FCC Part 15, Class B
<b>MODEL NUMBERS:</b>	N9901T	<b>PRODUCT:</b>	DTV Converter Box
<b>EUT MODEL:</b>	N9901T	<b>EUT DESIGNATION:</b>	TV Interface Device
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	47%RH
<b>ATM PRESSURE:</b>	101.0kPa	<b>GROUNDING:</b>	Through AC Power Cord
<b>TESTED BY:</b>	Eddy Chen	<b>DATE OF TEST:</b>	2008, June 20
<b>TEST REFERENCE:</b>	ANSI C63.4: 2003, CISPR 16-1: 2002		
<b>TEST PROCEDURE:</b>	<p>The EUT was set up according to the guidelines of ANSI C63.4: 2003 for antenna-conducted power.</p> <ol style="list-style-type: none"> <li>The EUT antenna terminals connected to the EMI receiver , If the antenna impedance matches the impedance of the measuring instrument , Otherwise , use a balun or impedance-matching network to connect the measuring instrument to the antenna terminals of the EUT.</li> <li>Activate the EUT and the measuring instrument and Tune the EUT to one of the numbers of frequencies specified in 12.1.1 of ANSI C63.4</li> <li>Measure both the frequency and voltage present at the antenna input terminals over the frequency range specified in the individual equipment requirement.</li> <li>Repeat this measurement with the EUT tuned to another frequency until the number of frequency has been successively measured,</li> <li>Power available from the antenna terminals is the ratio of <math>V^2/R</math>..Where V is the loss-corrected voltage measured at the antenna terminals, and R is the impedance of the measuring instrument.</li> </ol>		
<b>TESTED RANGE:</b>	30MHz to 1000MHz		
<b>TEST VOLTAGE:</b>	120VAC / 60Hz		
<b>RESULTS:</b>	<p>The EUT meets the requirements of test reference for antenna power conduction.</p> <p>The test results relate only to the equipment under test provided by client.</p>		
<b>CHANGES OR MODIFICATIONS:</b>	There were no modifications installed by ECMG Worldwide Certification Solution Inc. (China) test personnel.		
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7} \times$ Center Freq., Amp $\pm 2.6$ dB		

**Antenna Power Conduction Limit:**

**15.109 (f)**

*For a receiver which employs terminals for the connection of an external receiving antenna, the receiver shall be tested to demonstrate compliance with the provisions of this Section with an antenna connected to the antenna terminals unless the antenna conducted power is measured as specified in Section 15.111(a). If a permanently attached receiving antenna is used, the receiver shall be tested to demonstrate compliance with the provisions of this Section.*

**Section 15.111 (a)**

*In addition to the radiated emission limits, receivers that operate (tune) in the frequency range 30 to 960 MHz and CB receivers that provide terminals for the connection of an external receiving antenna may be tested to demonstrate compliance with the provisions of Section 15.109 with the antenna terminals shielded and terminated with a resistive termination equal to the impedance specified for the antenna, provided these receivers also comply with the following: with the receiver antenna terminal connected to a 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.*

Frequency(MHz)	QP-Limit (nW)	QP-Limit (dBuV)
30 to 1000	2	51.7

*Remark : The impedance used in test instrument is 50  $\Omega$*

**Test Data:**

<i>Source</i>		<i>limits</i> (dBuV)	<i>Emission Level</i> (dBuV)	<i>Margin</i> (dB)
<i>channel</i>	<i>Frequency(MHz)</i>			
11	<i>Fundamental</i>	198.31	51.7	32.8
	<i>Harmonics</i>	396.62	51.7	31.2
	<i>Harmonics</i>	594.93	51.7	29.4
	<i>Harmonics</i>	793.24	51.7	28.6
	<i>Harmonics</i>	991.55	51.7	28.8
15	<i>Fundamental</i>	476.31	51.7	33.2
	<i>Harmonics</i>	952.62	51.7	30.5
29	<i>Fundamental</i>	560.31	51.7	32.3
77	<i>Fundamental</i>	848.31	51.7	32.9

### **Test Equipment List:**

<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Last Cal.</b>	<b>Cal. Due Date</b>
Test Receiver	HP	85462A	3704A00349	11/29/07	11/28/08
Signal Generator	Sencore	VP403	6789734	11/29/07	11/28/08
Match Network	12N50-75B	Anritsu	A0304264	11/29/07	11/28/08

*Note: All testing were performed using internationally recognized standards. All test instruments were calibrated and traceable to the National Institute of Standards and Technology (NIST).*

**SIGNED BY:** Z. Daly  
**ENGINEER**

**REVIEWED BY:** J. Van Wren  
**SENIOR ENGINEER**



***Antenna Power Conduction Test Set Up***

#### Attachment 4 – Output and Spurious level Measurement

<b>CLIENT:</b>	COSHIP ELECTRONICS CO., LTD	<b>TEST STANDERD:</b>	FCC Part 15, Class B
<b>MODEL NUMBERS:</b>	N9901T	<b>PRODUCT:</b>	DTV Converter Box
<b>EUT MODEL:</b>	N9901T	<b>EUT DESIGNATION:</b>	TV Interface Device
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	47%RH
<b>ATM PRESSURE:</b>	101.0kPa	<b>GROUNDING:</b>	Through AC Power Cord
<b>TESTED BY:</b>	Eddy Chen	<b>DATE OF TEST:</b>	2008, June 20
<b>TEST REFERENCE:</b>	ANSI C63.4: 2003, CISPR 16-1: 2002		
<b>TEST PROCEDURE:</b>	<p>The EUT was set up according to the guidelines of ANSI C63.4: 2003 for out put and spurious level measurement .</p> <p><b>a)</b> Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external signal generator.</p> <p><b>b)</b> A spectrum analyzer or other instrument providing a spectral display is recommended for exploratory measurements. Video filtering is not used during these tests. For measurements in the range 30 to 1000 MHz, set the bandwidth of the measuring instrument to 100 kHz and the detector function to the peak mode. The frequency range may be scanned in segments or in its entirety, adjusting the sweep speed control so that the display is calibrated.</p> <p><b>c)</b> Configure the EUT as specified in 6.2 and 12.2.2. Remove the termination connected to the end of the EUT output cable, and connect the output cable to the measuring instrument, using an impedance-matching device or balun, as appropriate.</p> <p><b>d)</b> Energize the EUT, and set it to one of its output channels.</p> <p><b>e)</b> If the EUT</p> <ol style="list-style-type: none"> <li>1) Operates only from internal video signals, it shall be tested with these in normal operation. A VCR shall be tested in the record and play modes using a standard TV signal as the modulating signal. Measure the signal level at the visual and aural carrier frequencies. Also measure any emissions in the range from 30 MHz to 4.6 MHz below the visual carrier frequency, and any emissions in the range from 7.4 MHz above the visual carrier frequency to 1 GHz.</li> <li>2) Also operates from externally generated video signal(s), it shall be tested with modulation as follows:           <ol style="list-style-type: none"> <li>i) With the internal signals described in step e), item I)</li> <li>ii) External VITS signal at 1 V peak to peak</li> <li>iii) External VITS signal at 5 V peak to peak</li> </ol>           Measure the signal level at the visual and aural carrier frequencies. Also measure any emissions in the range from 30 MHz to 4.6 MHz below the visual carrier frequency, and any emissions in the range from 7.4 MHz above the visual carrier frequency to 1 GHz.         </li> </ol> <p><b>f)</b> Repeat step e1), step e2), or step e3), as appropriate, for any other available output channel(s) on the EUT.</p>		

<b>TESTED RANGE:</b>	30MHz to 1000MHz
<b>TEST VOLTAGE:</b>	120VAC / 60Hz
<b>RESULTS:</b>	<p>The EUT meets the requirements of test reference for RF output and spurious level .</p> <p>The test results relate only to the equipment under test provided by client.</p>
<b>CHANGES OR MODIFICATIONS:</b>	There were no modifications installed by ECMG Worldwide Certification Solution Inc. (China) test personnel.
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7} \times$ Center Freq., Amp $\pm 2.6$ dB

**Section 15.115(b) Output signal Limit :**

(1) At any RF output terminal, the maximum measured RMS voltage, in microvolts, corresponding to the peak envelope power of the modulated signal during maximum amplitude peaks across a resistance (R in ohms) matching the rated output impedance of the TV interface device, shall not exceed the following:

(i) For a cable system terminal device or a TV interface device used with a master antenna, 692.8 times the square root of (R) for the video signal and 155 times the square root of (R) for the audio signal.

[At 75 ohms, this is 6000/1342 uV; at 300 ohms, this is 12,000/2685 uV. There is a 13 dB difference<sup>38</sup> between video and audio levels.]

(ii) For all other TV interface devices, 346.4 times the square root of (R) for the video signal and 77.5 times the square root of (R) for the audio signal.

[At 75 ohms, this is 3000/671 uV; at 300 ohms, this is 6000/1342 uV.]

(2) At any RF output terminal, the maximum measured RMS voltage, in microvolts, corresponding to the peak envelope power of the modulated signal during maximum amplitude peaks across a resistance (R in ohms) matching the rated output impedance of the TV interface device, of any emission appearing on frequencies 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 shall not exceed the following:

(i) For a cable system terminal device or a TV interface device used with a master antenna, 692.8 times the square root of (R).

(ii) For all other TV interface devices, 10.95 times the square root of (R).

[At 75 ohms, this is 95 uV; at 300 ohms, this is 190 uV; this represents a 30 dB attenuation.]

***Level of the Carrier:***

<i>Source</i>			<i>limits (dBuV)</i>	<i>Emission Level (dBuV)</i>	<i>Margin (dB)</i>
<i>channel</i>	<i>Carrier Frequency(MHz)</i>				
11	<i>Video</i>	198.31	69.54	62.32	-7.22
	<i>Audio</i>	198.31	56.53	50.24	-6.29
29	<i>Video</i>	560.31	69.54	62.18	-7.36
	<i>Audio</i>	560.31	56.53	49.58	-6.95
77	<i>Video</i>	848.31	69.54	61.98	-7.56
	<i>Audio</i>	848.31	56.53	51.25	-5.28

*Note :The impedance of RF Output terminal is 75 ohm. ( dBuV=20lgV)*

***Level of the spurious :***

<b><i>Source</i></b>		<b><i>limits</i></b> (dBuV)	<b><i>Emission Level</i></b> (dBuV)	<b><i>Margin</i></b> (dB)	
<b><i>channel</i></b>	<b><i>Frequency(MHz)</i></b>				
11	<i>Spurious</i>	46.231	39.55	12.3	-27.25
	<i>Spurious</i>	86.254	39.55	13.0	-26.55
	<i>Spurious</i>	136.432	39.55	14.8	-24.75
	<i>Spurious</i>	248.568	39.55	11.4	-28.15
	<i>Spurious</i>	259.484	39.55	18.2	-21.35
	<i>Spurious</i>	375.126	39.55	12.1	-27.45
29	<i>Spurious</i>	247.788	39.55	14.1	-25.45
	<i>Spurious</i>	362.438	39.55	13.6	-25.95
	<i>Spurious</i>	432.445	39.55	11.2	-28.35
	<i>Spurious</i>	652.556	39.55	16.8	-22.75
	<i>Spurious</i>	754.486	39.55	11.1	-28.45
	<i>Spurious</i>	878.025	39.55	12.7	-26.85
77	<i>Spurious</i>	160.056	39.55	13.4	-26.15
	<i>Spurious</i>	248.116	39.55	11.4	-28.15
	<i>Spurious</i>	335.442	39.55	14.9	-24.65
	<i>Spurious</i>	896.268	39.55	12.4	-27.15
	<i>Spurious</i>	930.333	39.55	17.3	-22.25
	<i>Spurious</i>	976.158	39.55	11.3	-28.25
<i>Note :The impedance of RF Output terminal is 75 ohm. ( dBuV=20lg<u>uV</u>)</i>					

**Test equipment list:**

<b>Test Equipment</b>	<b>Model No.</b>	<b>Manufacturer</b>	<b>Serial No.</b>	<b>Last Cal.</b>	<b>Cal. Interval</b>
EMI test receiver	ESCS30	R&S	830245/009	01/22/2007	01/21/2008
Match Network	12N50-75B	Anritsu	A0304264	01/22/2007	01/21/2008
Signal Generator	SMY01	R&S	SB4033	01/22/2007	01/21/2008
3m SEMI-ANECHOIC CHAMBER	ETS	9X6X6	---	01/18/08	01/18/11

*Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.*

SIGNED BY: Z. Daly  
ENGINEER

REVIEWED BY: J. Van Wren  
SENIOR ENGINEER



***Output and Spurious level test set up photo***

**Attachment 5 – Incorporate circuitry to automatically prevent emanations**

<b>CLIENT:</b>	COSHIP ELECTRONICS CO., LTD	<b>TEST STANDERD:</b>	FCC Part 15, Class B
<b>MODEL NUMBERS:</b>	N9901T	<b>PRODUCT:</b>	DTV Converter Box
<b>EUT MODEL:</b>	N9901T	<b>EUT DESIGNATION:</b>	TV Interface Device
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	47%RH
<b>ATM PRESSURE:</b>	101.0kPa	<b>GROUNDING:</b>	Through AC Power Cord
<b>TESTED BY:</b>	Eddy Chen	<b>DATE OF TEST:</b>	2008 , June. 20
<b>TEST REFERENCE:</b>	Part 15.115(d)		
<b>TEST PROCEDURE:</b>	<p>The EUT was set up according to 15.115(d)</p> <p>A TV interface device, including a cable system terminal device, shall incorporate circuitry to automatically prevent emanations from the device from exceeding the technical specifications in this Part.</p> <p>These circuits shall be adequate to accomplish their functions when the TV interface device is presented, if applicable, with video input signal levels in the range of one to five volts;</p>		
<b>TESTED RANGE:</b>	With video input signal levels in the range of one to five Volts.		
<b>TEST VOLTAGE:</b>	120VAC / 60Hz		
<b>RESULTS:</b>	<p>The EUT meets the requirements of 15.115(d),These circuits could accomplish their function when input a video input signal levels from one to five volts.</p> <p>The test results relate only to the equipment under test provided by client.</p>		
<b>CHANGES OR MODIFICATIONS:</b>	There were no modifications installed by ECMG Worldwide Certification Solution Inc. (China) test personnel.		
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7} \times$ Center Freq., Amp $\pm 2.6$ dB		

**Test equipment list:**

<b>Test Equipment</b>	<b>Model No.</b>	<b>Manufacturer</b>	<b>Serial No.</b>	<b>Last Cal.</b>	<b>Cal. Interval</b>
Match Network	12N50-75B	Anritsu	A0304264	01/22/2007	01/21/2008
Signal Generator	SMY01	R&S	SB4033	01/22/2007	01/21/2008

*Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.*

**SIGNED BY:** Z. Daly  
ENGINEER

**REVIEWED BY:** J. Van Wren  
SENIOR ENGINEER



**test set up photo**