

CERTIFICATION
On Behalf of
Superex Canada Ltd.

Wireless Reverse Video System
Model No.: 99-521

FCC ID: VEU99521U
IC ID: 7157A-99521

Prepared for : Superex Canada Ltd.
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M2H 3B8
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Report Number : ATE20071770
Date of Test : July 20, 2007
Date of Report : July 26, 2007

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Test Report Certification

Applicant : Superex Canada Ltd.
Manufacturer : Guangzhou Jincheng Electronic Technology Co., Ltd.
EUT Description : Wireless Reverse Video System
(A) MODEL NO.: 99-521
(B) SERIAL NO.: N/A
(C) POWER SUPPLY: DC 12V

Measurement Procedure Used:

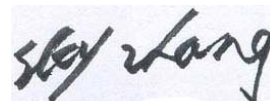
FCC Rules and Regulations Part 15 Subpart C Section 15.249: 2006 & ANSI C63.4: 2003
RSS-210 A2.9: Issue 6 September 2005 & RSS-Gen: Issue 1 September 2005

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.249, RSS-210 Issue 6 September 2005 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : July 20, 2007

Prepared by :



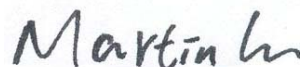
(Engineer)

Reviewer :



(Quality Manager)

Approved & Authorized Signer :



(Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : Wireless Reverse Video System
 Model Number : 99-521
 Power Supply : DC12V
 Operate Frequency : 2468MHz
 Channel Number : 1
 Applicant : Superex Canada Ltd.
 Address : 601 Gordon Baker Road, Toronto, Ontario, Canada
 M2H 3B8
 Manufacturer : Guangzhou Jincheng Electronic Technology Co., Ltd.
 Address : Building 4, No.3, South Road, Yongshan
 Village(Industrial Area), Shiji, Panyu, Guangzhou,
 Guangdong, China
 Date of sample received : July 12, 2007
 Date of Test : July 20, 2007

1.2. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen, May 10, 2004
 Accredited by FCC, May 10, 2004
 The Certificate Registration Number is 253065
 Accredited by Industry Canada, May 18, 2004
 The Certificate Registration Number is IC 5077
 Name of Firm : ACCURATE TECHNOLOGY CO. LTD
 Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.
 Science & Industry Park, Nanshan, Shenzhen, Guangdong
 P.R. China

1.3. Measurement Uncertainty

Conducted emission expanded uncertainty = 2.23dB, k=2
 Radiated emission expanded uncertainty = 4.12dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

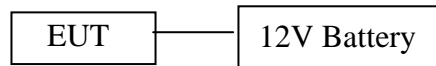
Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	03.31.2008
EMI Test Receiver	Rohde&Schwarz	ESI26	838786/013	01.24.2008
Bilog Antenna	Schwarzbeck	VULB9163	9163-194	03.31.2008
Bilog Antenna	Chase	CBL6112B	2591	01.24.2008
Horn Antenna	Rohde&Schwarz	HF906	100013	01.24.2008
Spectrum Analyzer	Anritsu	MS2651B	6200238856	03.31.2008
Pre-Amplifier	Agilent	8447D	2944A10619	03.31.2008
L.I.S.N.	Rohde&Schwarz	ESH3-Z5	100305	03.31.2008
L.I.S.N.	Rohde&Schwarz	ESH3-Z5	100310	03.31.2008

3. FUNDAMENTAL AND HARMONICS RADIATED EMISSION MEASUREMENT

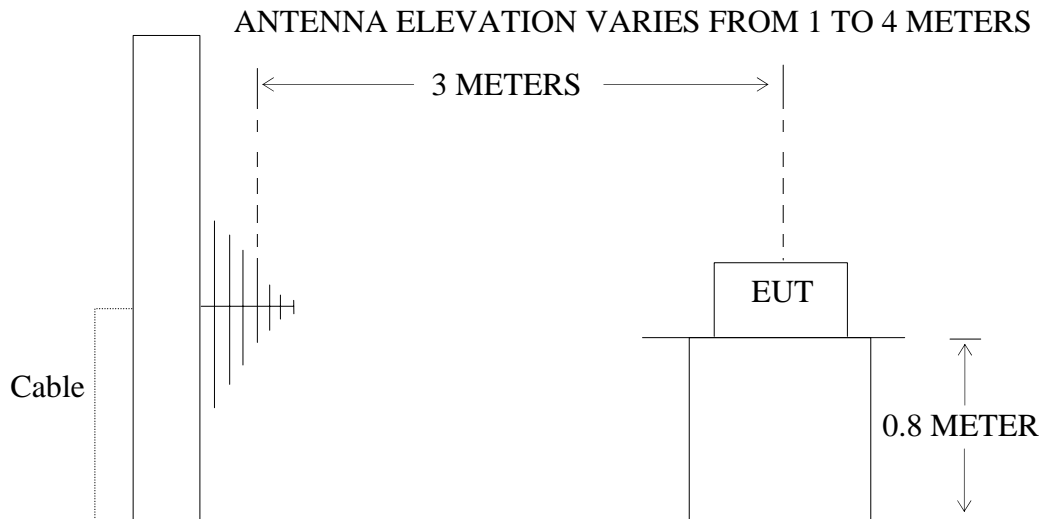
3.1. Block Diagram of Test Setup

3.1.1. Block diagram of connection between the EUT and simulators



(EUT: Wireless Reverse Video System)

3.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Wireless Reverse Video System)

3.2. The Emission Limit

- 3.2.1 FCC Part 15 Subpart C Section 15.249(a): Operation within the frequency band of 2.4 to 2.4835GHz, The fundamental field strength shall not exceed 94 dBμV/m and the harmonics shall not exceed 54 dBμV/m.

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of harmonics (microvolts/meter)
902-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

According to section 15.249(e), as shown in section 15.35(b), The peak field strength

of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

- 3.2.2 RSS-210 A2.9(1): The field strengths measured at 3 metres shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength (millivolts/meter)	
	Fundamental	harmonics
902-928	50	0.5
2400-2483.5	50	0.5
5725-5875	50	0.5

- 3.2.3 Restricted Band Radiation Emission Measurement Limits According to FCC part 15 Section 15.205 and Section 15.209; RSS-210 table 1.

3.3. Configuration of EUT on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.3.1. Wireless Reverse Video System (EUT)

Model Number : 99-521
Serial Number : N/A
Manufacturer : Guangzhou Jincheng Electronic Technology Co., Ltd.

3.4. Operating Condition of EUT

3.4.1. Setup the EUT and simulator as shown as Section 3.1.

3.4.2. Turn on the power of all equipment.

3.4.3. Let the EUT work in TX modes measure it.

3.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 1MHz.

3.6. The Field Strength of Radiation Emission Measurement Results

PASS.

Date of Test:	July 20, 2007	Temperature:	23°C
EUT:	Wireless Reverse Video System	Humidity:	57%
Model No.:	99-521	Power Supply:	DC 12V
Test Mode:	TX	Test Engineer:	Andy

Fundamental Radiated Emissions

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2468.048	86.4	94.5	-3.4	83.0	91.1	94	114	11.0	22.9	Vertical
2468.328	90.0	97.7	-3.4	86.6	94.3	94	114	7.4	19.7	Horizontal

Harmonics Radiated Emissions

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
*4936.693	47.4	60.4	2.2	49.6	62.6	54	74	4.4	11.4	Vertical
*4936.659	47.7	60.4	2.2	49.9	62.6	54	74	4.1	11.4	Horizontal
*7404.509	24.2	35.7	7.4	31.6	43.1	54	74	22.4	30.9	Horizontal

The spectral diagrams in appendix I display the measurement of peak values.

Note:

1. The emission emitted by the EUT is too low to be measured except the emission listed above.
2. *: Denotes restricted band of operation.
3. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

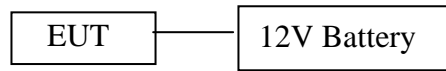
$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

$$\text{Where Corrected Factor} = \text{Antenna Factor} + \text{Cable Loss} + \text{High Pass Filter Loss} - \text{Amplifier Gain}$$

4. RADIATED EMISSION FOR FCC PART 15 SECTION 15.249(D)

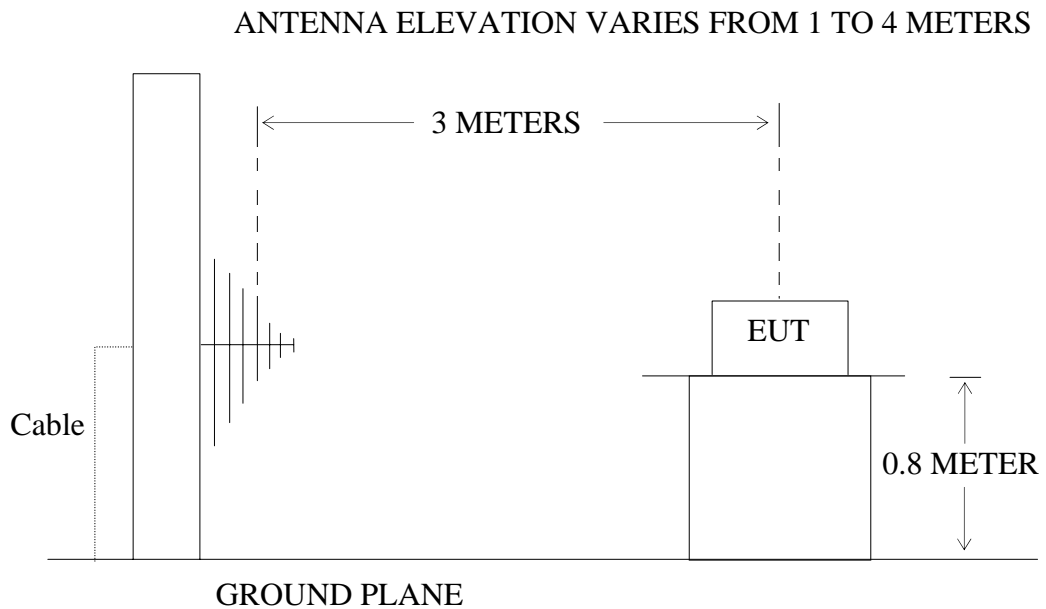
4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



(EUT: Wireless Reverse Video System)

4.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Wireless Reverse Video System)

4.2. The Emission Limit

4.2.1 FCC Part 15 Subpart C Section 15.249(d): Emission radiated outside of the specified frequency bands, except for harmonics, shall be comply with the general radiated emission limits in Section 15.209.

Frequency (MHz)	Limit,		The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector.
	Field Strength of Quasi-peak Value (microvolts/m)	Field Strength of Quasi-peak Value (dBμV/m)	
30 - 88	100	40	

88 - 216	150	43.5	Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
216 - 960	200	46	
Above 960	500	54	

4.2.2 RSS-210 A2.9(2): Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to Table 2 limits, whichever is the less stringent.

Frequency (MHz)	Field Strength Microvolts/m at 3 metres	
	Transmitters	Receivers
30 - 88	100	100
88 - 216	150	150
216 - 960	200	200
Above 960	500	500

4.3.EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.3.1. Wireless Reverse Video System (EUT)

Model Number : 99-521
Serial Number : N/A
Manufacturer : Guangzhou Jincheng Electronic Technology Co., Ltd.

4.4.Operating Condition of EUT

4.4.1. Setup the EUT and simulator as shown as Section 4.1.

4.4.2. Turn on the power of all equipment.

4.4.3. Let the EUT work in TX modes measure it.

4.5.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120KHz in 30-1000MHz. and set at 1MHz in above 1000MHz.

The frequency range from 30MHz to 25000MHz is checked.

The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

4.6. The Emission Measurement Result

PASS.

Date of Test:	July 20, 2007	Temperature:	23°C
EUT:	Wireless Reverse Video System	Humidity:	57%
Model No.:	99-521	Power Supply:	DC 12V
Test Mode:	TX	Test Engineer:	Andy

Frequency (MHz)	Reading (dBμV/m)	Factor(dB) Corr.	Result (dBμV/m)	Limit (dBμV/m)	Margin (dBμV/m)	Polarization
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

The spectral diagrams in appendix I display the measurement of peak values.

Note:

1. -: Denotes the output Field Strength of all the spurious frequency is at least 15dB down to the limit.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

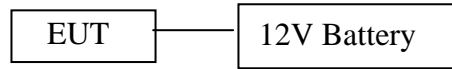
Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

5. 99% OCCUPIED BANDWIDTH

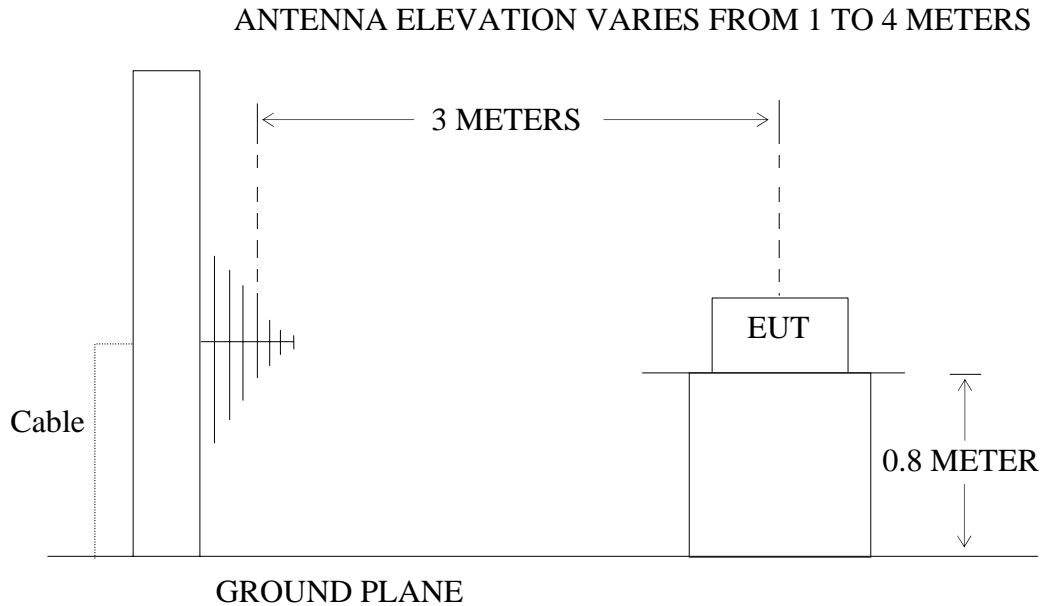
5.1. Block Diagram of Test Setup

5.1.1. Block diagram of connection between the EUT and simulators



(EUT: Wireless Reverse Video System)

5.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Wireless Reverse Video System)

5.2. The Occupied Bandwidth According To RSS-Gen 4.4.1

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

5.3.EUT Configuration on Measurement

The following equipment are installed on the bandwidth of emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.3.1.Wireless Reverse Video System (EUT)

Model Number	:	99-521
Serial Number	:	N/A
Manufacturer	:	Guangzhou Jincheng Electronic Technology Co., Ltd.

5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 4.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in measuring mode (TX) measure it.

5.5.Test Procedure

5.5.1. Set SPA Center Frequency = Fundamental frequency, RBW = 300kHz, VBW = 1MHz, Span = 30MHz.

5.5.2.Set SPA Max hold. Mark peak.

5.5.3.Set SPA “Meas” function, Select “Occupied Bandwidth” function, Select “99% Power Bandwidth”. The frequency of the upper and lower markers indicating the edges of the transmitters “99% Power” emission bandwidth shall be recorded to automate by SPA.

5.6. Measurement Result

99% Power bandwidth = 6.72MHz

The spectral diagrams in appendix I.

6. BAND EDGES

6.1. The Requirement

- 5.1.1. Band Edge from 2400MHz to 2483.5MHz. Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in FCC part 15 Section 15.209 or RSS-210 table 2 limit, whichever is the lesser attenuation.

6.2. EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.2.1. Wireless Reverse Video System (EUT)

Model Number	:	99-521
Serial Number	:	N/A
Manufacturer	:	Guangzhou Jincheng Electronic Technology Co., Ltd.

6.3. Operating Condition of EUT

6.3.1. Setup the EUT and simulator as shown as Section 5.1.

6.3.2. Turn on the power of all equipment.

6.3.3. Let the EUT work in TX modes measure it.

6.4. Test Procedure

4.4.1. Measure the fundamental amplitude appearing on spectral display and set it as a reference level. measure the lower band edge amplitude. Get the delta amplitude and edge frequency.

4.4.2. Repeat above procedures , Measure the fundamental amplitude appearing on spectral display and set it as a reference level. measure the upper band edge amplitude. Get the delta amplitude and edge frequency.

6.5. The Measurement Result

Pass

5.5.1 Lower band edge: Emission radiated outside of the lower band edge are 46.3 dB below the level of the fundamental.

The emission of carrier power strength (dB μ V/m)	The maximum field strength in restrict band (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
94.3	48.0	74	26	Peak
86.6	40.3	54	13.7	Average

5.5.2 Upper band edge: Emission radiated outside of the upper band edge are 44.7 dB below the level of the fundamental.

The emission of carrier power strength (dB μ V/m)	The maximum field strength in restrict band (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
94.3	49.6	74	24.4	Peak
86.6	41.9	54	12.1	Average

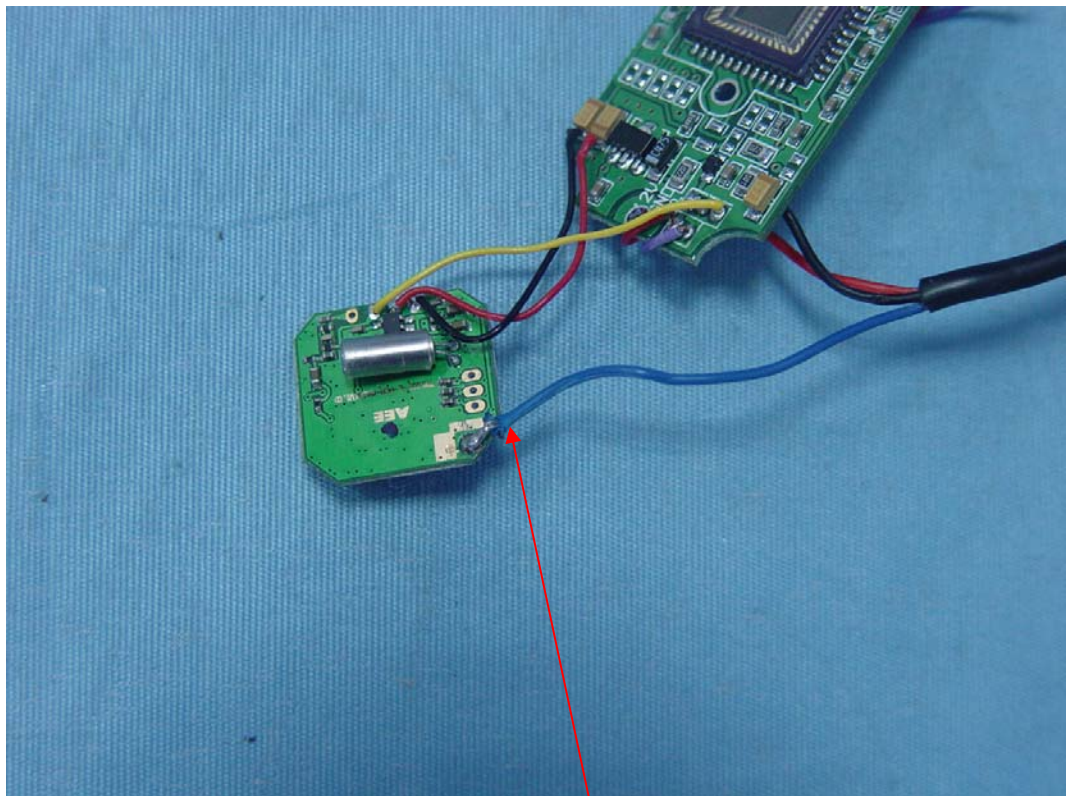
7. ANTENNA REQUIREMENT

7.1. The Requirement

- 7.1.1. According to Section 15.203, An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

7.2. Antenna Construction

The transmitter utilizes dipole antenna. The antenna (blue wire) was solder to PCB. The antenna is 1 meter in length along with DC power wire (red & black wire) both be wrapped into black insulation tube. The antenna is not connected to DC +, - polarity. It is not considered to be user replaceable.



Antenna

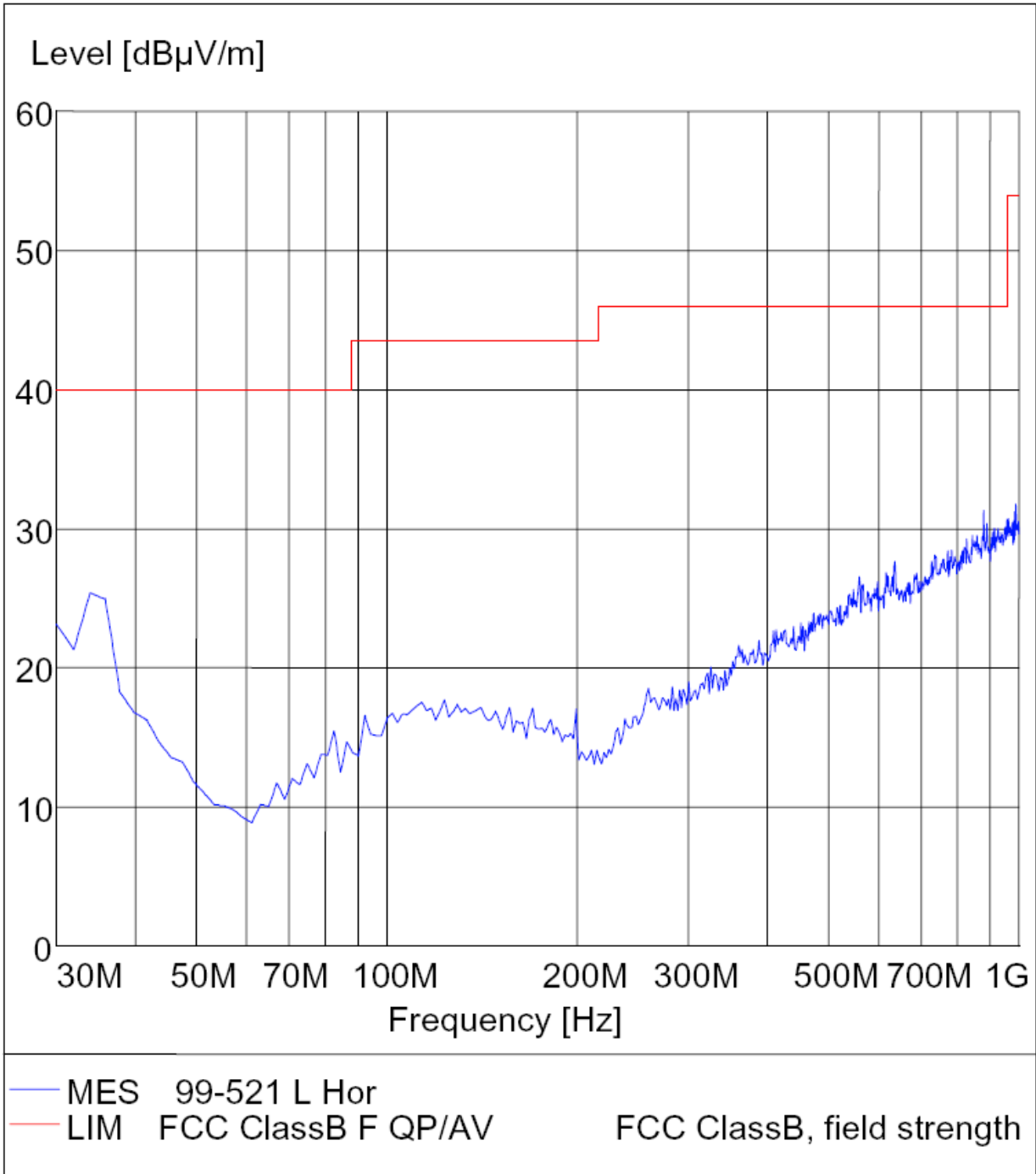
APPENDIX I (Test Curves)

Radiated Disturbance

FCC Part 15 & RSS-210

EUT: Wireless Reverse Video System
Manufacturer: Superex Canada Ltd.
Operating Condition: TX
Test Site: ATC EMC Lab.SAC
Operator: Andy
Test Specification: Horizontal
Comment: DC 12V

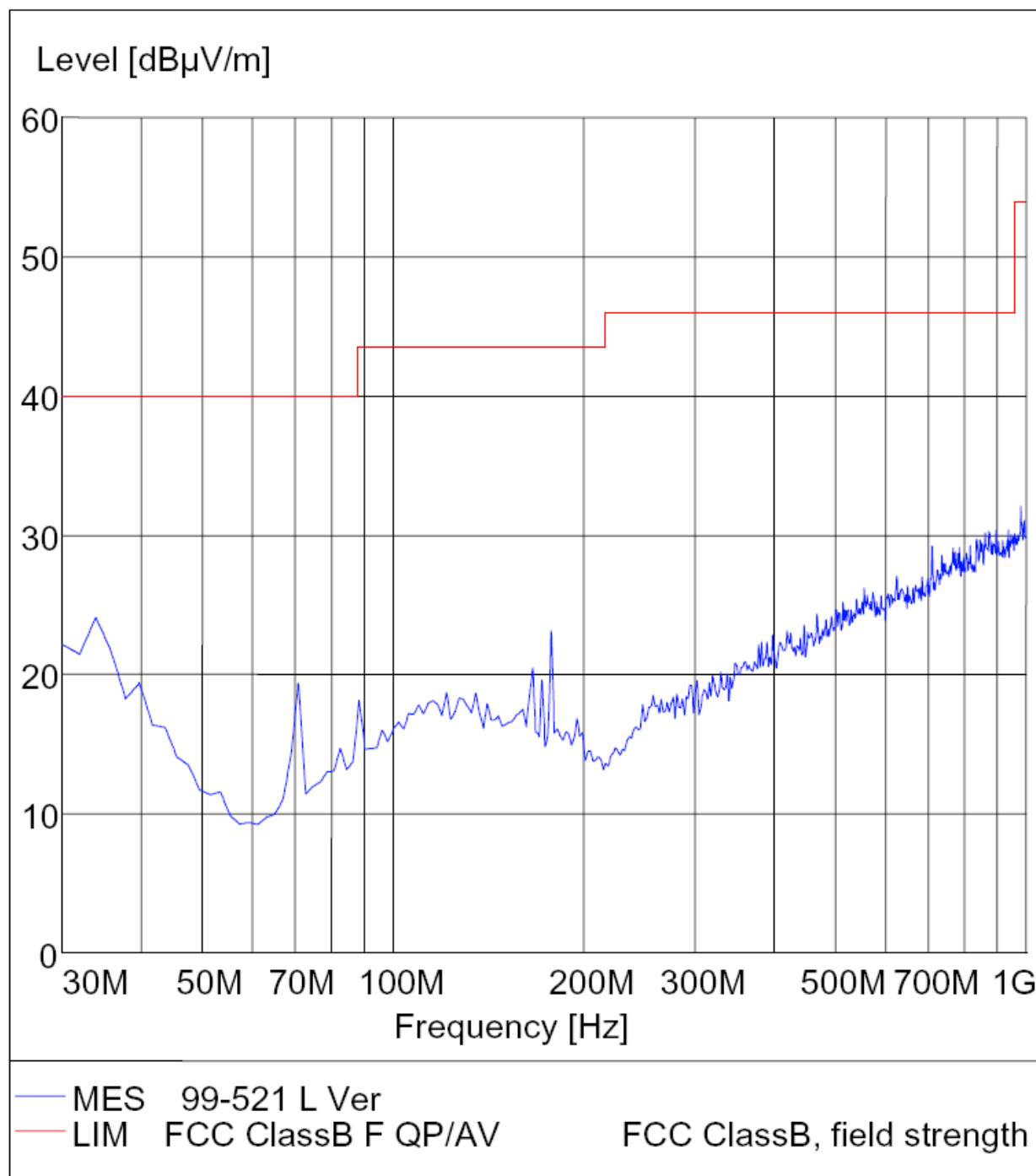
M/N: 99-521



Radiated Disturbance**FCC Part 15 & RSS-210**

EUT: Wireless Reverse Video System
 Manufacturer: Suprex Canada Ltd.
 Operating Condition: TX
 Test Site: ATC EMC Lab.SAC
 Operator: Andy
 Test Specification: Vertical
 Comment : DC 12V

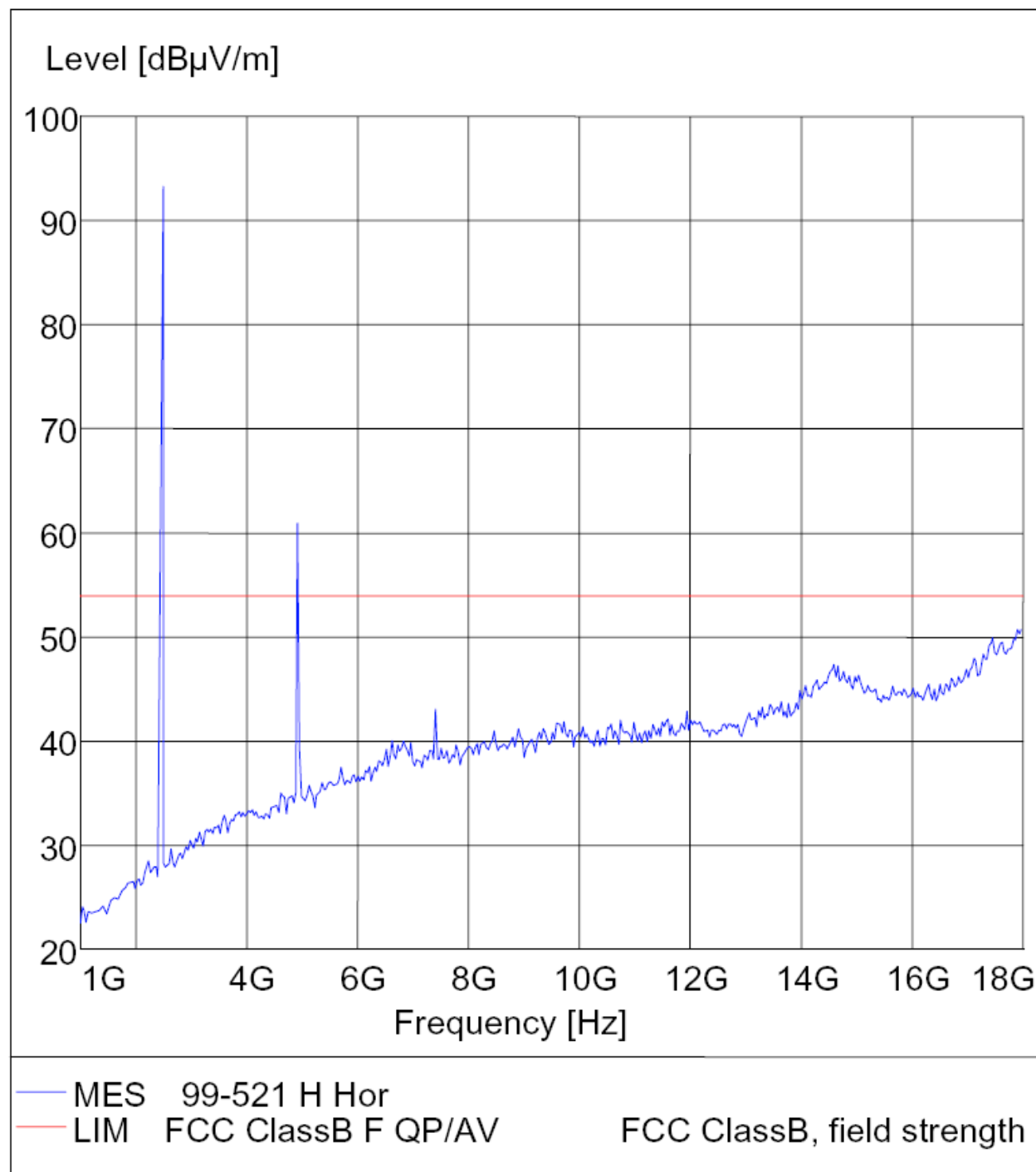
M/N: 99-521



Radiated Disturbance**FCC Part 15 & RSS-210**

EUT: Wireless Reverse Video System
 Manufacturer: Superex Canada Ltd.
 Operating Condition: TX
 Test Site: ATC EMC Lab.SAC
 Operator: Andy
 Test Specification: Horizontal
 Comment: DC 12V

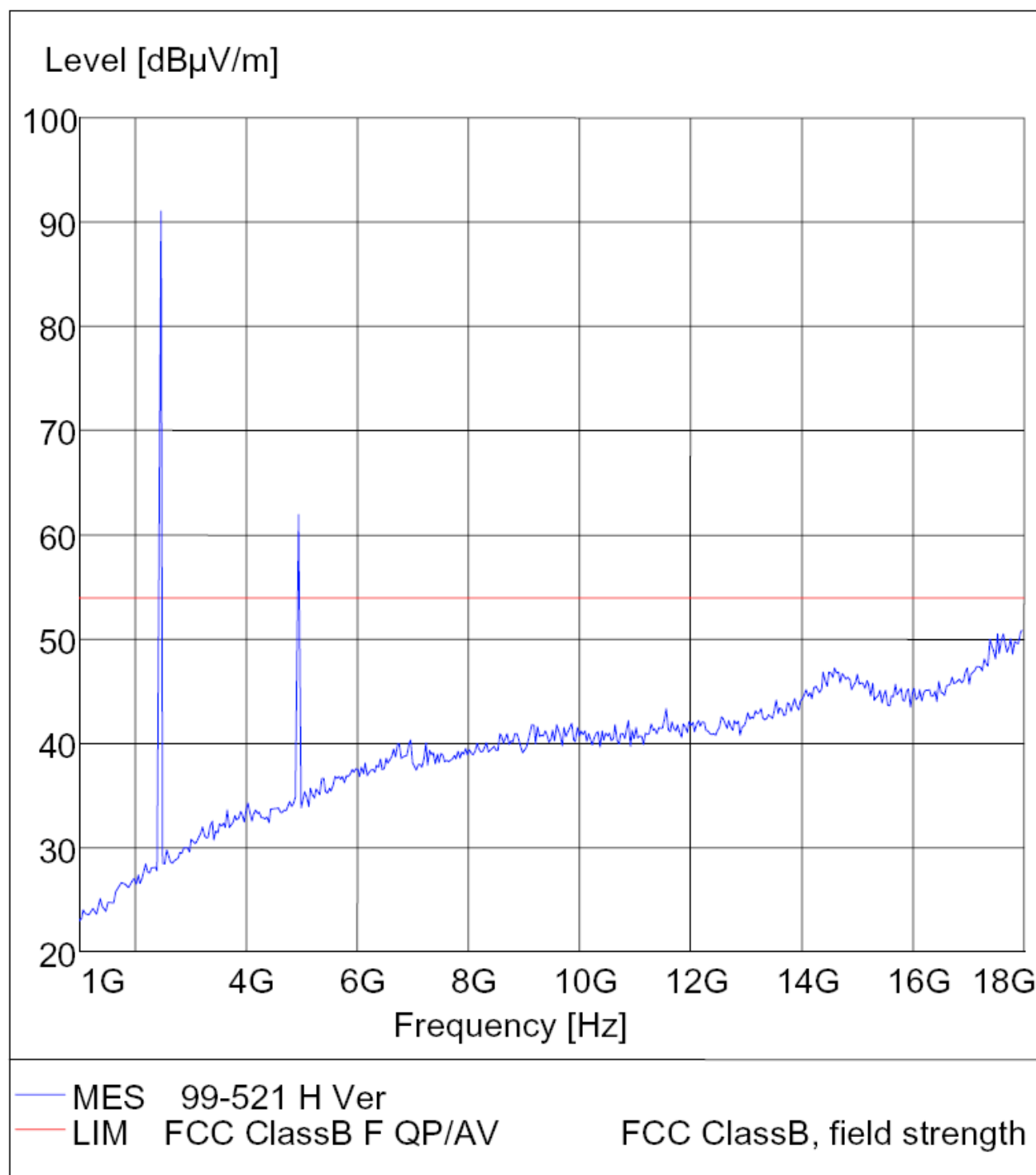
M/N: 99-521



Radiated Disturbance**FCC Part 15 & RSS-210**

EUT: Wireless Reverse Video System
 Manufacturer: Suprex Canada Ltd.
 Operating Condition: TX
 Test Site: ATC EMC Lab.SAC
 Operator: Andy
 Test Specification: Vertical
 Comment: DC 12V

M/N: 99-521

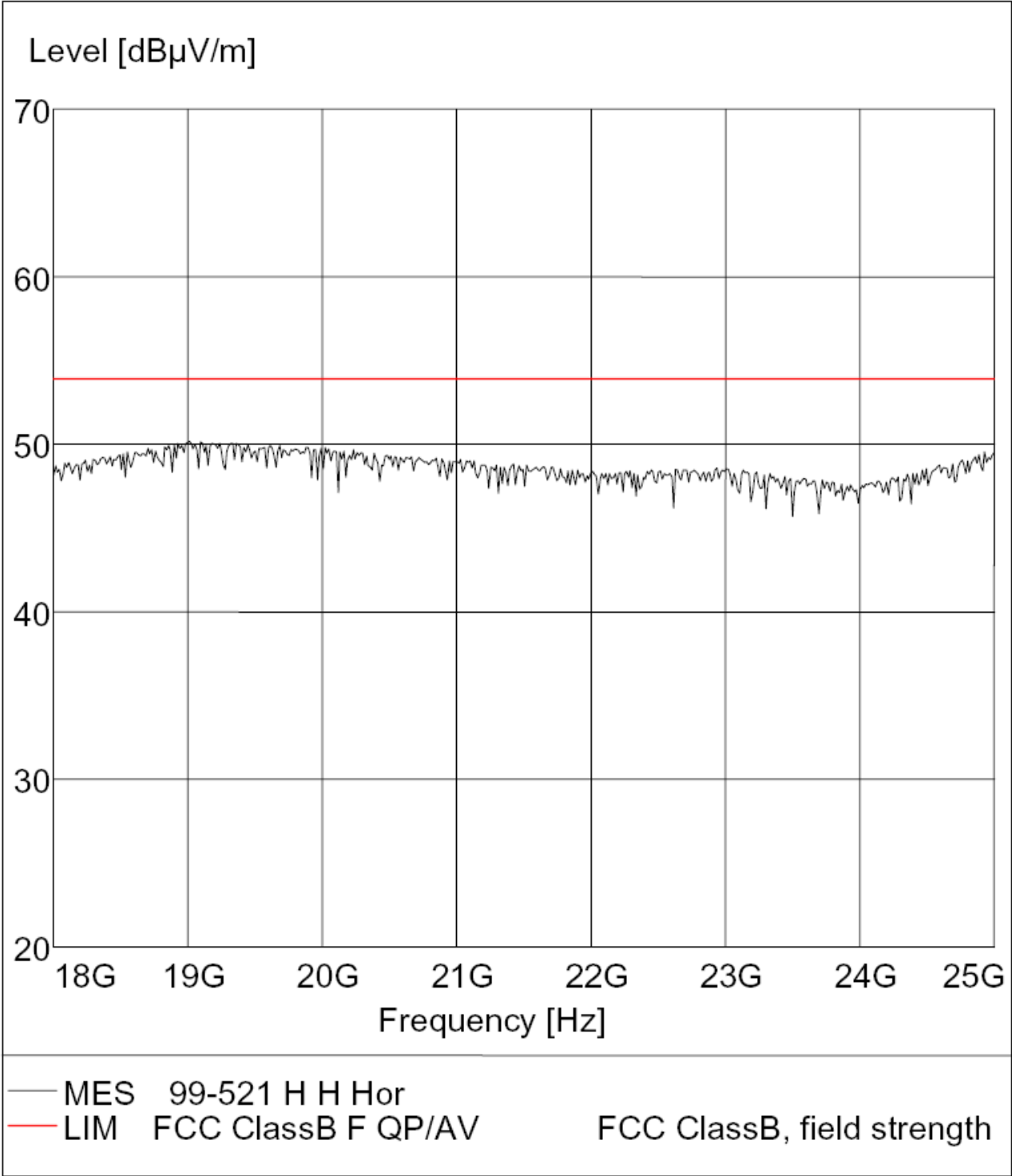


Radiated Disturbance

FCC Part 15 & RSS-210

EUT: Wireless Reverse Video System
Manufacturer: Superex Canada Ltd.
Operating Condition: TX
Test Site: ATC EMC Lab.SAC
Operator: Andy
Test Specification: Horizontal
Comment: DC 12V

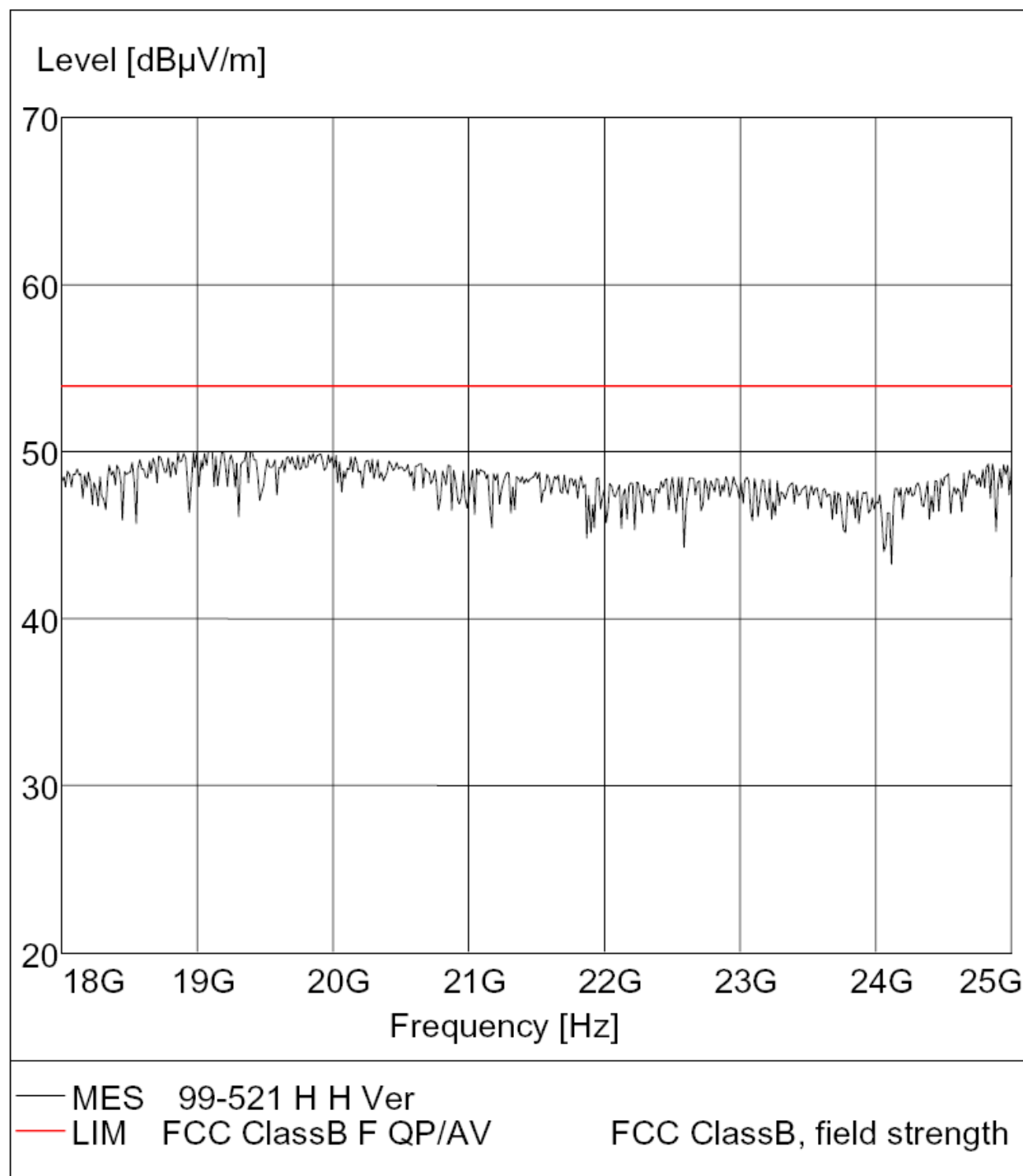
M/N: 99-521

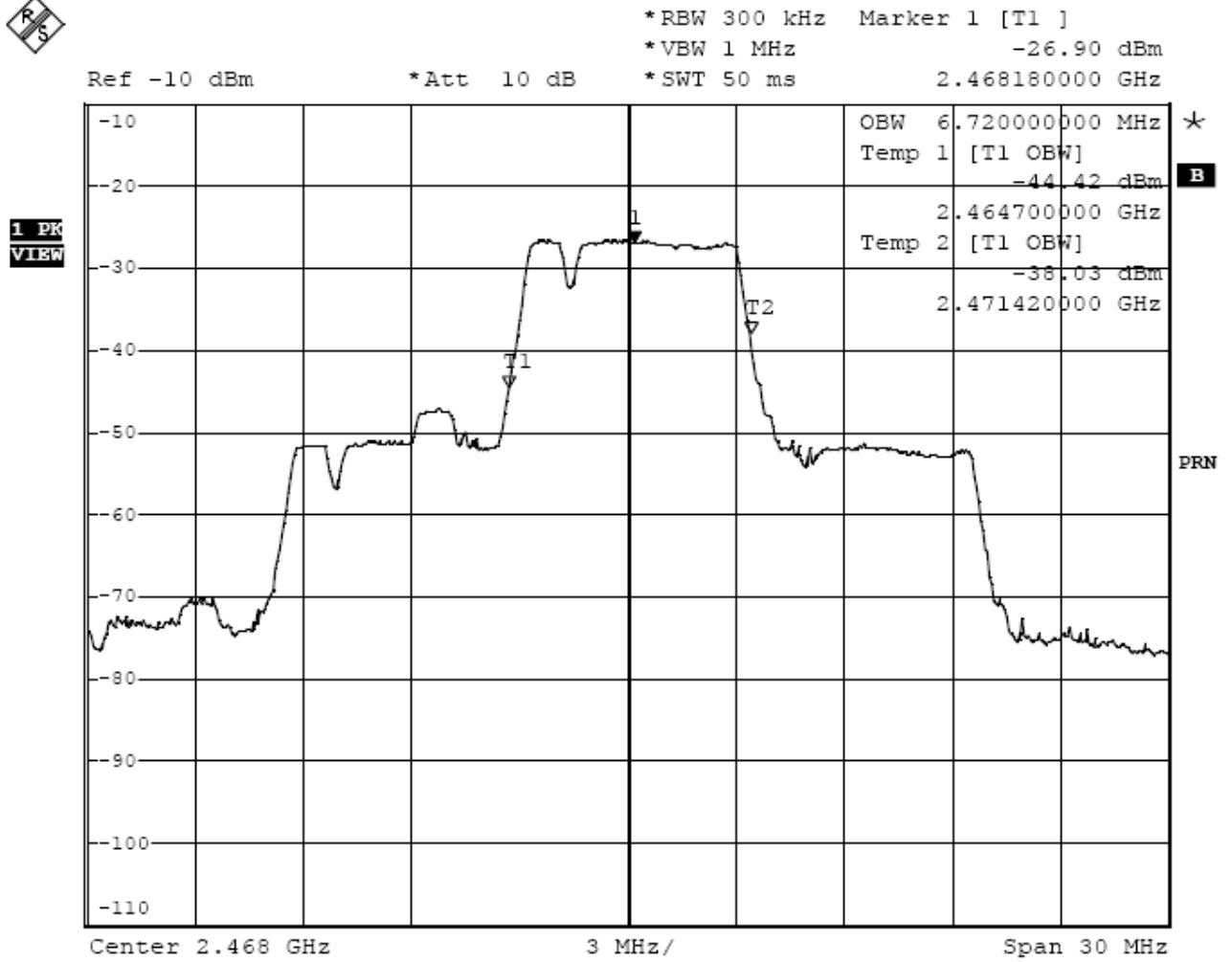


Radiated Disturbance**FCC Part 15 & RSS-210**

EUT: Wireless Reverse Video System
 Manufacturer: Superex Canada Ltd.
 Operating Condition: TX
 Test Site: ATC EMC Lab.SAC
 Operator: Andy
 Test Specification: Vertical
 Comment: DC 12V

M/N: 99-521







1 PK
VIEW

