

FCC CERTIFICATION  
On Behalf of  
Guangzhou Jincheng Electronic Technology Co., Ltd.

Wireless Rearview System  
Model No.: DIY-w-r-3

FCC ID: UZRDIYWR3

Prepared for : Guangzhou Jincheng Electronic Technology Co., Ltd.  
Address : Building 4, No.3, South Road, Yongshan  
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Guangdong, China  
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Report Number : ATE20070471  
Date of Test : February 6, 2007  
Date of Report : March 6, 2007

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## Test Report Certification

Applicant : Guangzhou Jincheng Electronic Technology Co., Ltd.  
Manufacturer : Guangzhou Jincheng Electronic Technology Co., Ltd.  
EUT Description : Wireless Rearview System  
(A) MODEL NO.: DIY-w-r-3  
(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

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 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 : February 6, 2007

Prepared by :   
(Engineer)

Reviewer :   
(Quality Manager)

Approved & Authorized Signer :   
(Manager)

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

EUT : Wireless Rearview System

Model Number : DIY-w-r-3

Power Supply : DC12V

Operate Frequency : 2468MHz

Channel Number : 1

Applicant : Guangzhou Jincheng Electronic Technology Co., Ltd.  
Address : Building 4, No.3, South Road, Yongshan  
Village(Industrial Area), Shiji, Panyu, Guangzhou,  
Guangdong, China

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 : February 1 2007  
Date of Test : February 6, 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	03.31.2007
EMI Test Receiver	Rohde&Schwarz	ESI26	838786/013	01.24.2008
Bilog Antenna	Schwarzbeck	VULB9163	9163-194	03.31.2007
Bilog Antenna	Chase	CBL6112B	2591	01.24.2008
Horn Antenna	Rohde&Schwarz	HF906	100013	01.24.2008
Spectrum Analyzer	Anritsu	MS2651B	6200238856	03.31.2007
Pre-Amplifier	Agilent	8447D	2944A10619	03.31.2007
L.I.S.N.	Rohde&Schwarz	ESH3-Z5	100305	03.31.2007
L.I.S.N.	Rohde&Schwarz	ESH3-Z5	100310	03.31.2007

### 3. FUNDAMENTAL AND HARMONICS RADIATED EMISSION MEASUREMENT

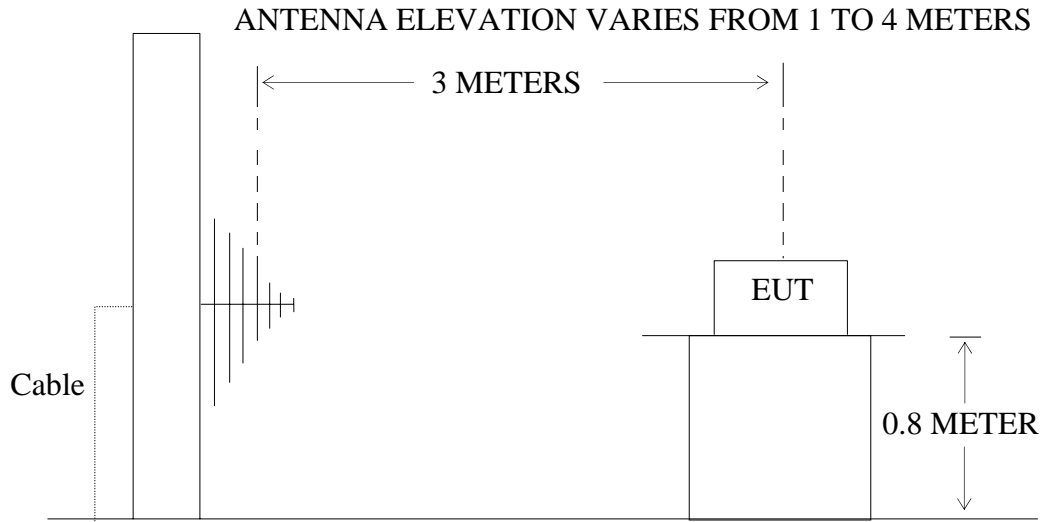
#### 3.1. Block Diagram of Test Setup

##### 3.1.1. Block diagram of connection between the EUT and simulators



(EUT: Wireless Rearview System)

##### 3.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Wireless Rearview System)

#### 3.2. The Emission Limit

3.2.1 For intentional radiators, According to 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

3.2.2 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.

### 3.3. 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 Rearview System (EUT)

Model Number : DIY-w-r-3  
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:	February 6, 2007	Temperature:	23°C
EUT:	Wireless Rearview System	Humidity:	57%
Model No.:	DIY-w-r-3	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	
2468.175	92.5	99.7	-3.4	89.1	96.3	94	114	4.9	17.7	Vertical
2468.347	91.9	98.7	-3.4	88.5	95.3	94	114	5.5	18.7	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	
4935.576	43.3	61.8	2.2	45.5	64.0	54	74	8.5	10.0	Vertical
7403.854	41.3	60.1	7.4	48.7	67.5	54	74	5.3	6.5	Vertical
9872.003	30.8	40.0	9.3	40.1	49.3	54	74	13.9	24.7	Vertical
4935.371	45.2	63.9	2.2	47.4	66.1	54	74	6.6	7.9	Horizontal
7402.565	42.0	62.6	7.4	49.4	70.0	54	74	4.6	4.0	Horizontal
9872.882	32.5	41.2	9.3	41.8	50.5	54	74	12.2	23.5	Horizontal

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

Note:

1. 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:

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

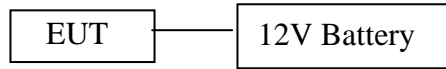
$$\text{Where Corrected Factor} = \text{Antenna Factor} + \text{Cable Loss} + \text{High Pass Filter Loss} - \text{Amplifier Gain}$$



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

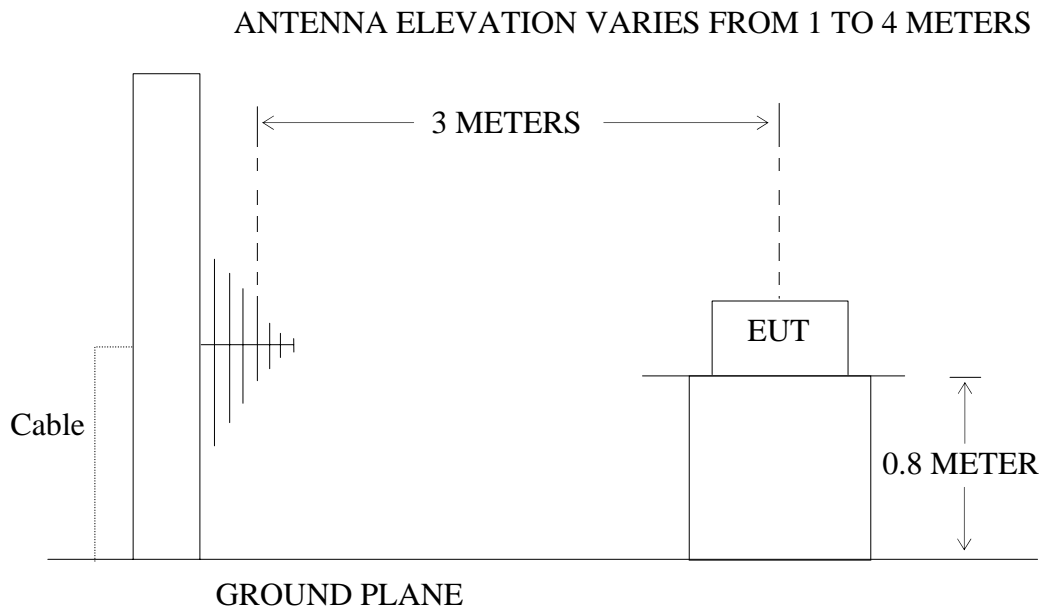
### 4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



(EUT: Wireless Rearview System)

4.1.2. Anechoic Chamber Test Setup Diagram



(EUT: Wireless Rearview System)

### 4.2. The Emission Limit For Section 15.249(d)

4.2.1 Emission radiated outside of the specified frequency bands, except for harmonics, shall be comply with the general radiated emission limits in Section 15.209.

Radiation Emission Measurement Limits According to 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 (dB $\mu$ V/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	

### 4.3. 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 Rearview System (EUT)

Model Number : DIY-w-r-3  
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 +RX 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:	February 6, 2007	Temperature:	23°C
EUT:	Wireless Rearview System	Humidity:	57%
Model No.:	DIY-w-r-3	Power Supply:	DC 12V
Test Mode:	TX + RX	Test Engineer:	Andy

Frequency (MHz)	Reading (dBμV/m)	Factor(dB) Corr.	Result (dBμV/m)	Limit (dBμV/m)	Margin (dBμV/m)	Polarization
	QP		QP	QP	QP	
56.749	62.8	-27.5	35.3	40	4.7	Vertical
75.653	61.7	-25.4	36.3	40	3.7	Vertical
132.413	59.4	-21.1	38.3	43.5	5.2	Vertical
151.333	61.9	-22.1	39.8	43.5	3.7	Vertical
463.436	51.8	-15.9	35.9	46	10.1	Horizontal
501.273	50.8	-15.2	35.6	46	10.4	Horizontal
520.187	51.1	-14.9	36.2	46	9.8	Horizontal

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

#### Note:

1. 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:

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

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

## 5. BAND EDGES

### 5.1. 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 Section 15.209, whichever is the lesser attenuation.

### 5.2. 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.

#### 5.2.1. Wireless Rearview System (EUT)

Model Number : DIY-w-r-3  
Serial Number : N/A  
Manufacturer : Guangzhou Jincheng Electronic Technology Co., Ltd.

### 5.3. Operating Condition of EUT

- 5.3.1. Setup the EUT and simulator as shown as Section 4.1.
- 5.3.2. Turn on the power of all equipment.
- 5.3.3. Let the EUT work in TX modes measure it.

### 5.4. 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.

## 5.5. The Measurement Result

### Pass

5.5.1 Lower band edge: Emission radiated outside of the lower band edge are 55.7 dB below the level of the fundamental.

The emission of carrier power strength (dB $\mu$ V/m)	The maximum field strength in restrict band (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
96.3	40.6	74	-33.4	Peak
89.1	33.4	54	-20.6	Average

5.5.2 Upper band edge: Emission radiated outside of the upper band edge are 51.3 dB below the level of the fundamental.

The emission of carrier power strength (dB $\mu$ V/m)	The maximum field strength in restrict band (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
96.3	45.0	74	-29	Peak
89.1	37.8	54	-16.2	Average

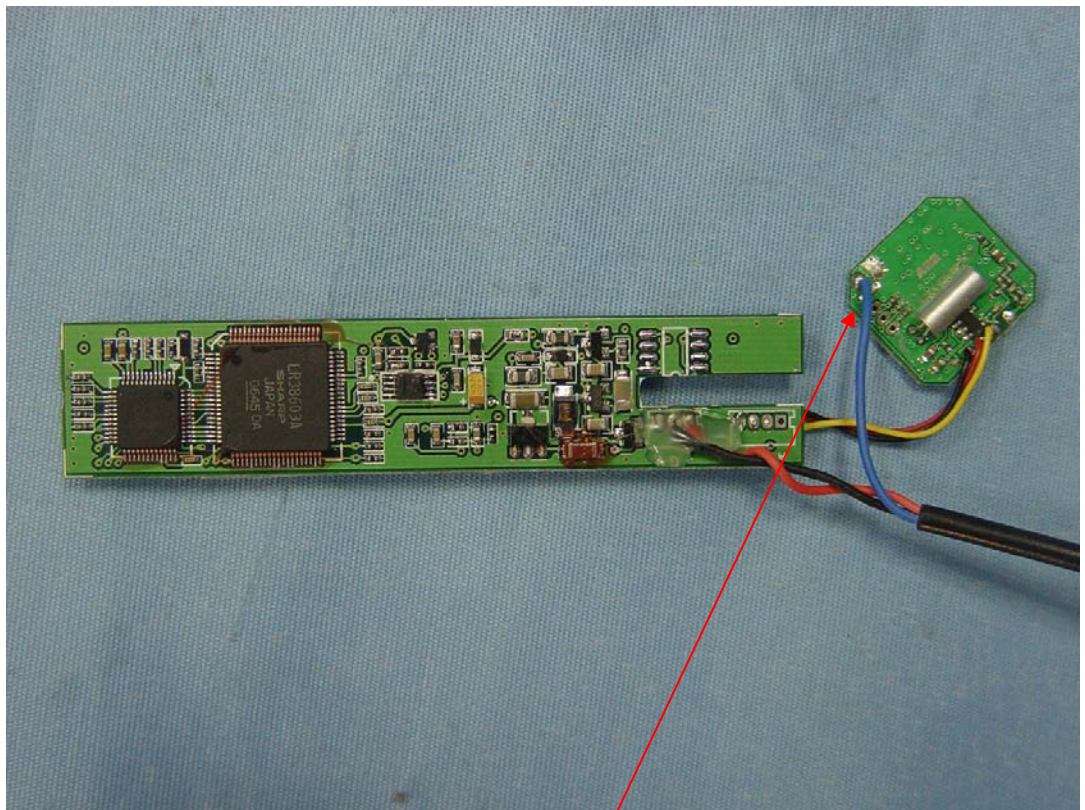
## 6. ANTENNA REQUIREMENT

### 6.1. 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.

### 6.2. 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

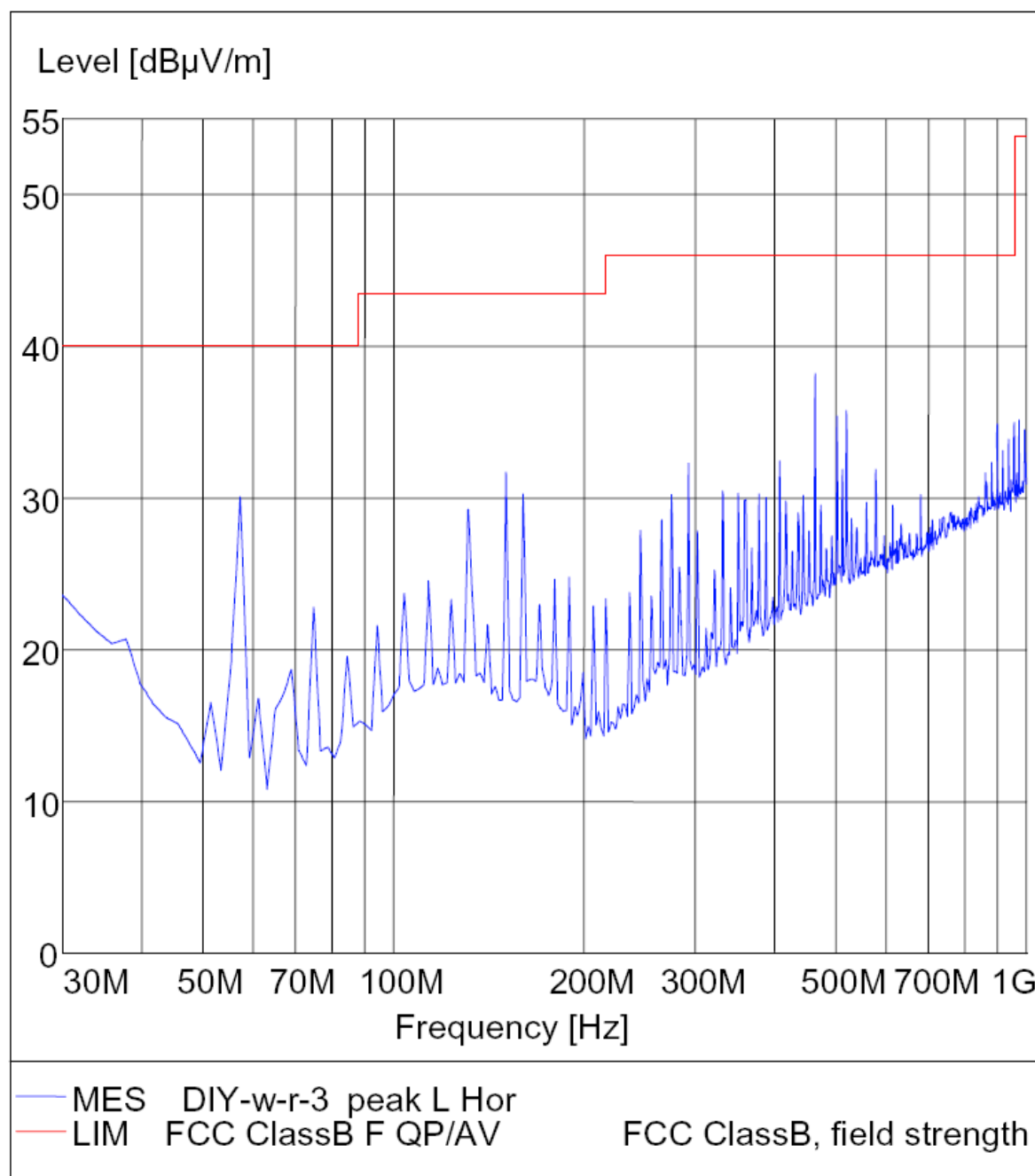
# APPENDIX I (Test Curves)



Radiated Emission

FCC Part 15

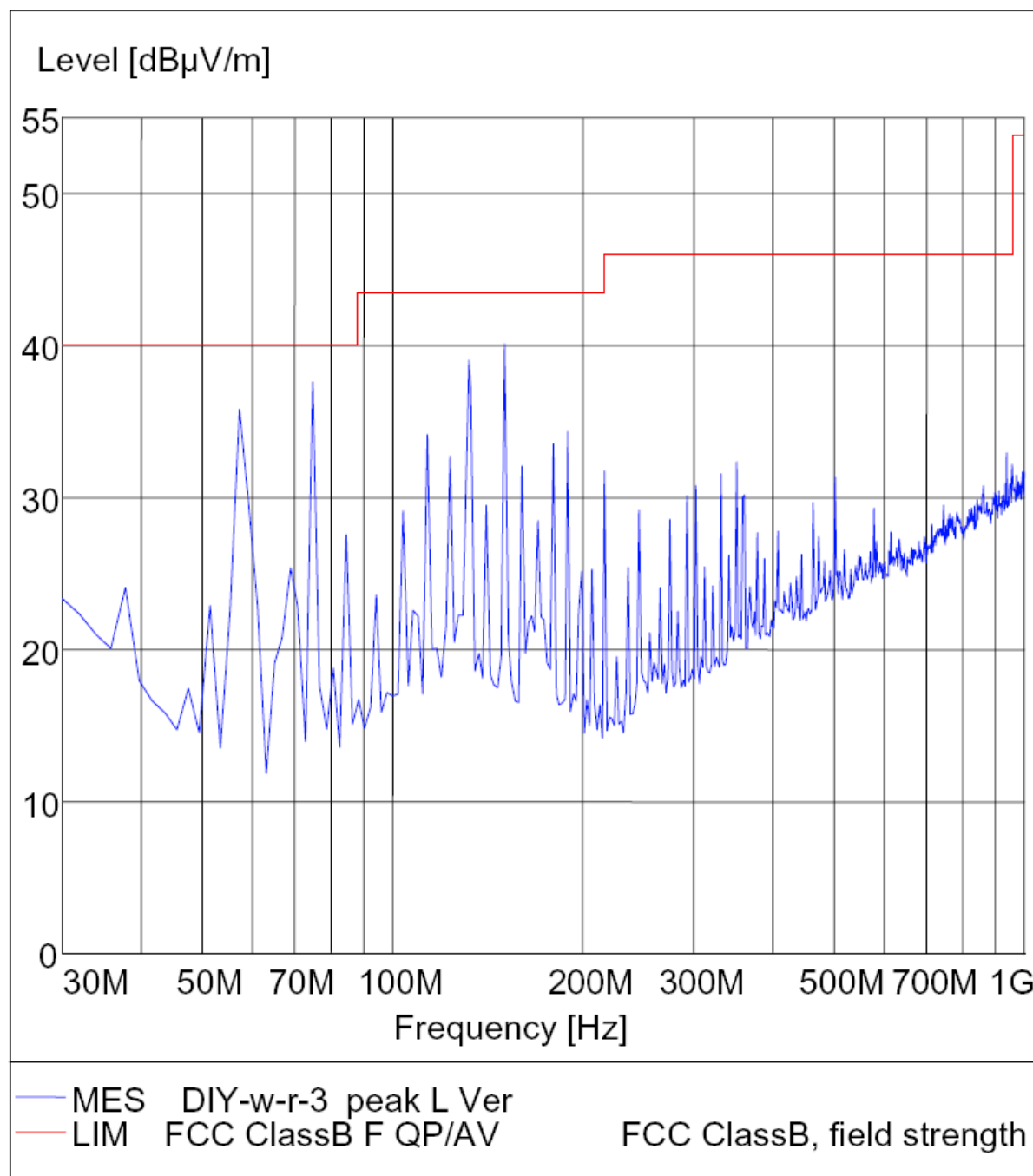
EUT: Wireless Rearview System M/N: DIY-w-r-3  
 Manufacturer: Jincheng Electronic  
 Operating Condition: TX+RX  
 Test Site: ATC EMC Lab.SAC  
 Operator: Andy  
 Test Specification: Horizontal  
 Comment : DC 12V



Radiated Emission

FCC Part 15

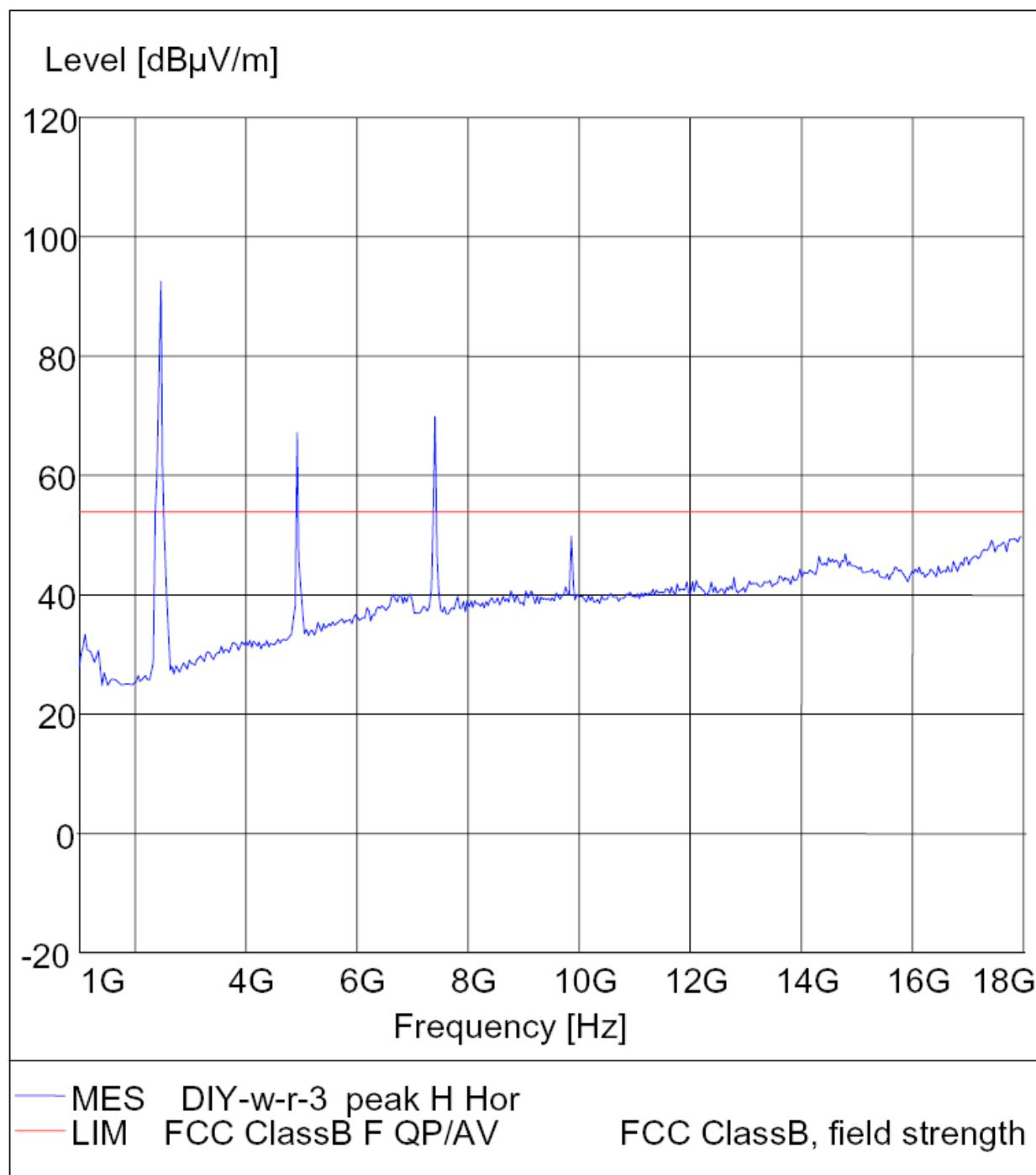
EUT: Wireless Rearview System M/N: DIY-w-r-3  
 Manufacturer: Jincheng Electronic  
 Operating Condition: TX+RX  
 Test Site: ATC EMC Lab.SAC  
 Operator: Andy  
 Test Specification: Vertical  
 Comment : DC 12V



## Radiated Disturbance

## FCC Part 15

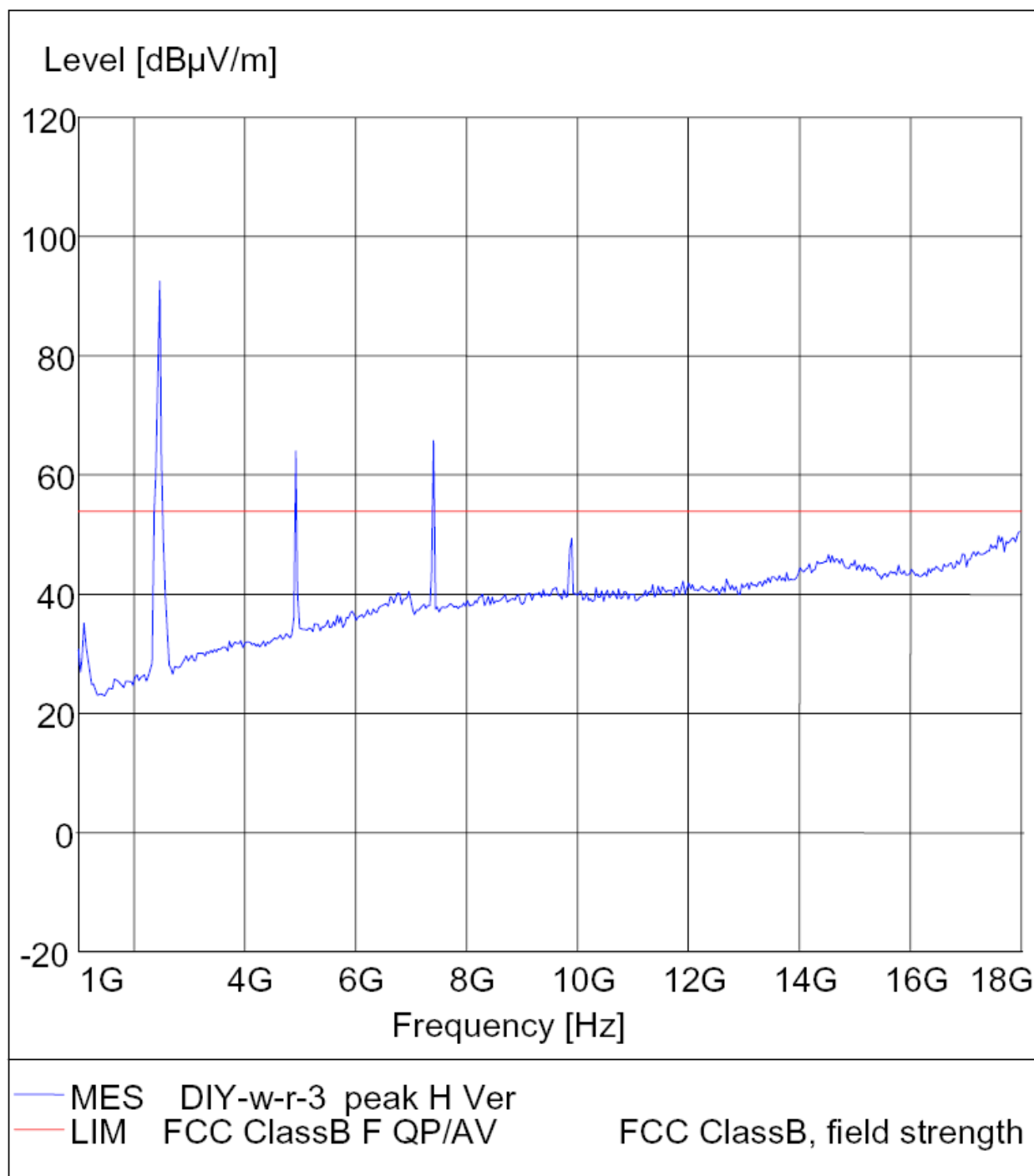
EUT: Wireless Rearview System M/N: DIY-w-r-3  
 Manufacturer: Jincheng Electronic  
 Operating Condition: TX+RX  
 Test Site: ATC EMC Lab.SAC  
 Operator: Andy  
 Test Specification: Horizontal  
 Comment : DC 12V



## Radiated Disturbance

## FCC Part 15

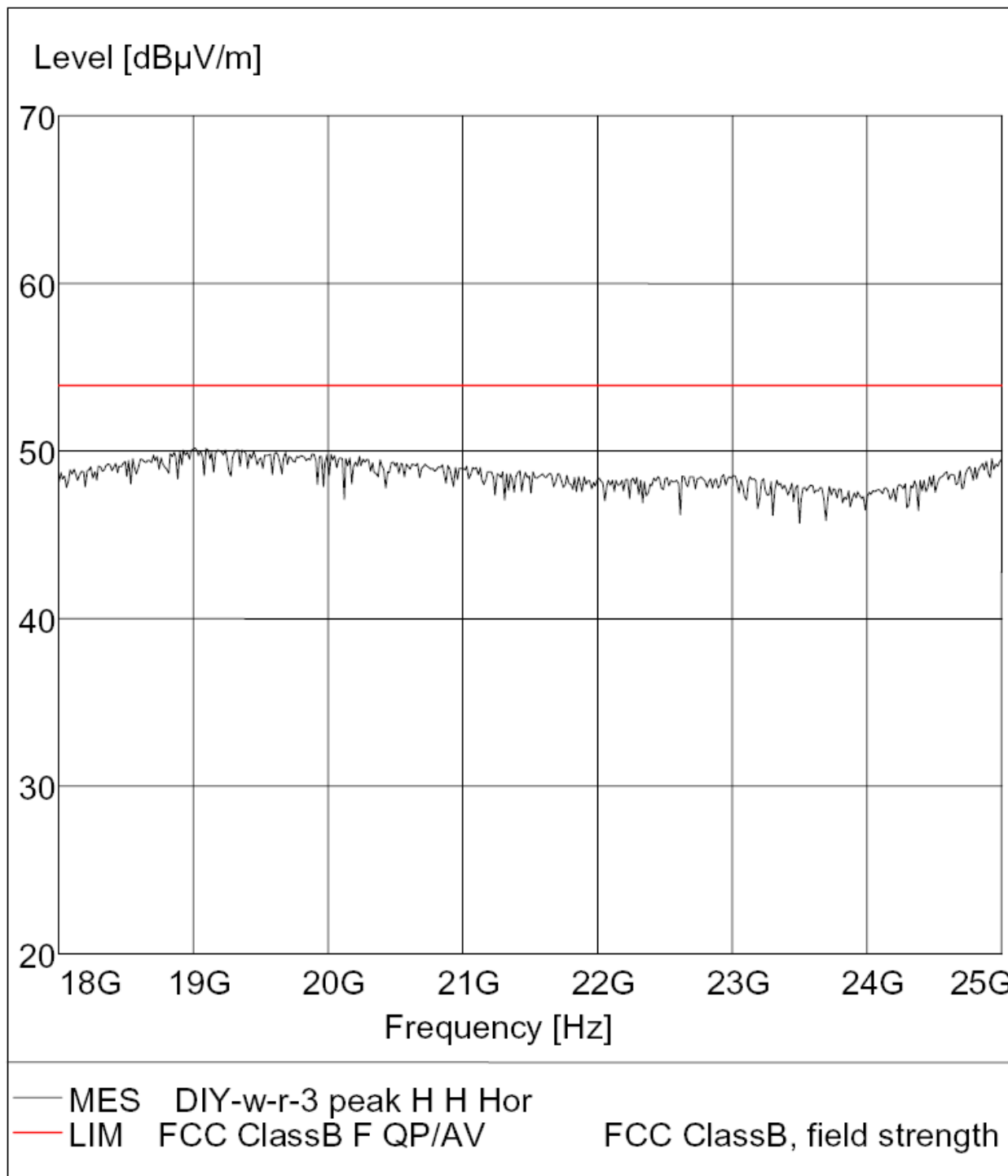
EUT: Wireless Rearview System M/N: DIY-w-r-3  
 Manufacturer: Jincheng Electronic  
 Operating Condition: TX+RX  
 Test Site: ATC EMC Lab.SAC  
 Operator: Andy  
 Test Specification: Vertical  
 Comment : DC 12V



Radiated Disturbance

FCC Part 15

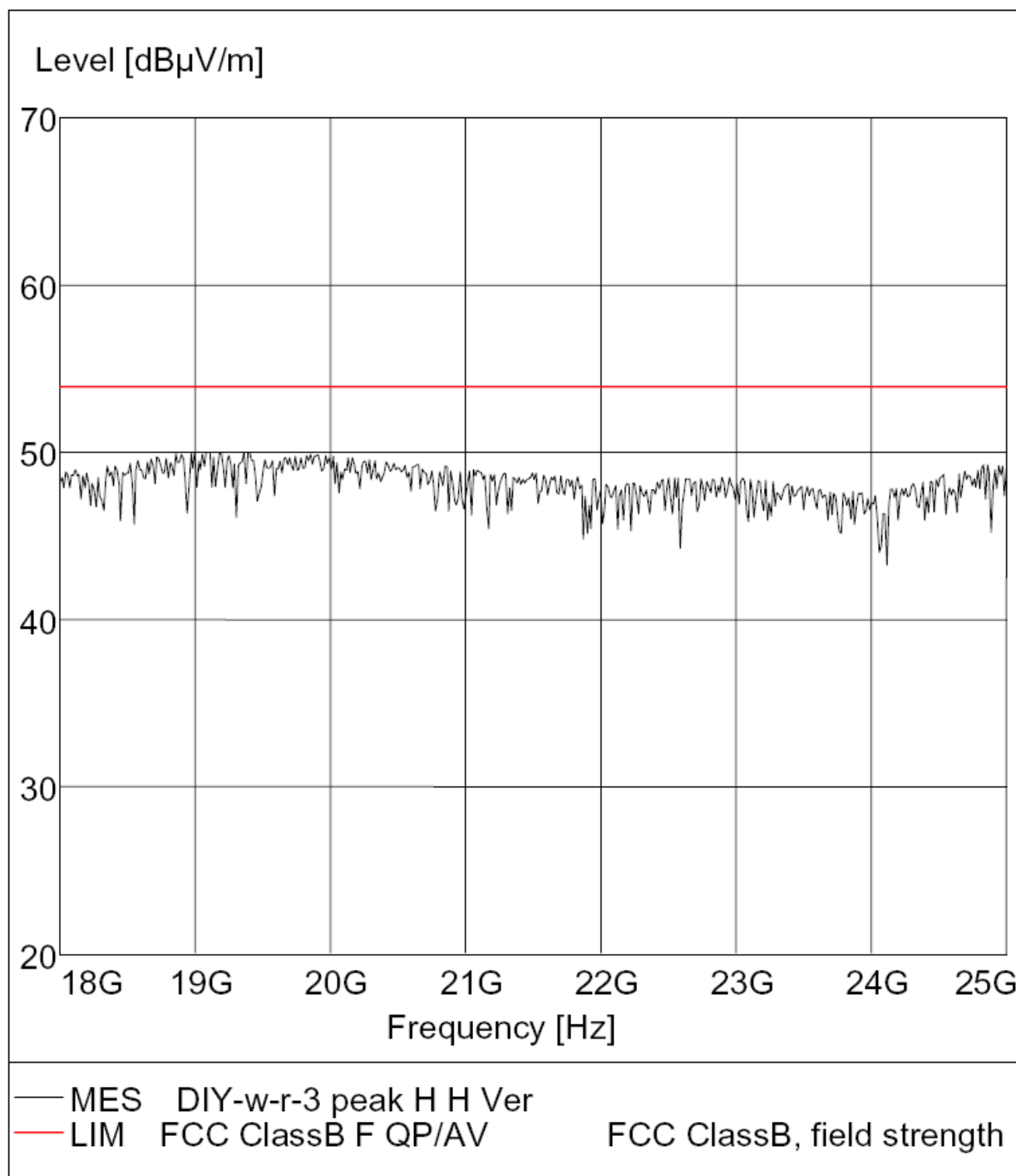
EUT: Wireless Rearview System M/N: DIY-w-r-3  
 Manufacturer: Jincheng Electronic  
 Operating Condition: TX+RX  
 Test Site: ATC EMC Lab.SAC  
 Operator: Andy  
 Test Specification: Horizontal  
 Comment : DC 12V



Radiated Disturbance

FCC Part 15

EUT: Wireless Rearview System M/N: DIY-w-r-3  
 Manufacturer: Jincheng Electronic  
 Operating Condition: TX+RX  
 Test Site: ATC EMC Lab.SAC  
 Operator: Andy  
 Test Specification: Vertical  
 Comment : DC 12V



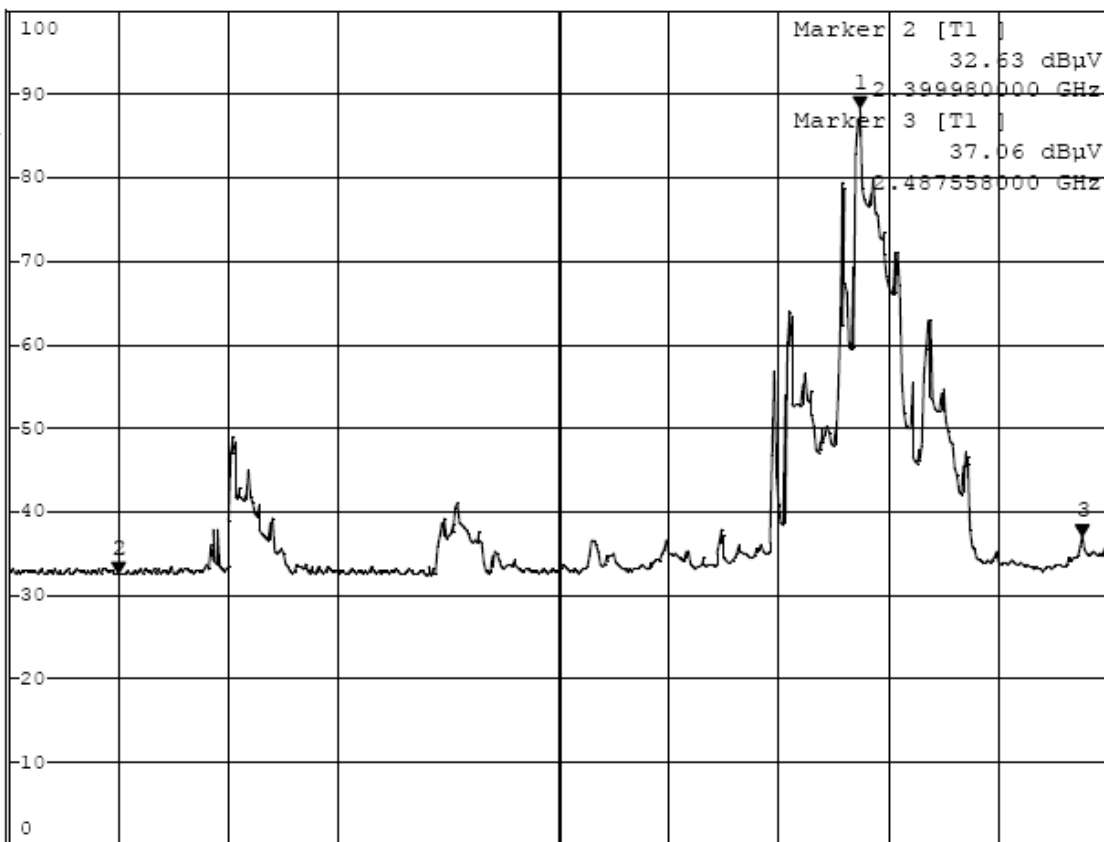


\*RBW 100 kHz    Marker 1 [T1 ]  
 \*VBW 100 kHz                    88.35 dBuV  
 \*SWT 200 ms                    2.467356000 GHz

Ref 100 dBuV

Att 30 dB

1 AV  
 VIEW



Start 2.39 GHz

10 MHz/

Stop 2.49 GHz

PRN