



TCP Dr. Genz (HK) Co., Ltd.

# Test Report

**FCC RULES 47CFR PART 15 / SUBPART C (Section 15.235)**

**Test report no.: H1M20811-7090-P-15**

**FCC ID: OD9IK1TX**

**Accredited Laboratory by:**



## TEST REPORT

### Summary | FCC RULES 47CFR PART 15 / SUBPART C

Test Report No. ....: H1M20811-7090-P-15

Date of issue .....: 27.11.2008

**Testing Laboratory name** ....: TCP Dr. Genz (HK) Co., Ltd.

Address .....: 26/F., Tamson Plaza, 161 Wai Yip Street,  
Kwun Tong, Kowloon, Hong Kong

**Applicant's name**.....: Techwall Electronics Co., Ltd.

Address .....: 24/F., Tower 1, Tern Center, 237 Queen's Road, Central,  
Hong Kong

**Manufacturer's name** .....: Techwall Electronics Co., Ltd.

Address .....: 24/F., Tower 1, Tern Center, 237 Queen's Road, Central,  
Hong Kong

#### Test specification

Standard(s) applied.....: [FCC Rules 47 CFR Part15 Subpart C \(Section 15.235\)](#)

**Test item description** .....: Baby Monitor

Brand Name .....: Ikea Family

Model and/or type reference ...: IK-1TX

Rating(s).....: 110VAC (9VDC AC/DC adaptor)

#### Summary of Test Results

**Pass**

*The Summary of Test Results based on a technical opinion belongs to the applied standard(s).*

#### Disclaimer

*Further details of testing are provided in particular chapters of this Test Report.*

*This document base on General Terms and Conditions of TCP Dr. Genz (HK) Co., Ltd., which the applicant accepted with order confirmation.*

#### Emphasized conditions or project related conditions:

*Released Test Reports apply only to the specific samples tested under stated test conditions. It is the applicant's responsibility to assure that additional production units of the tested model(s) are manufactured in same construction and with identical electrical and mechanical components to meet the same quality as tested model(s). The applicant/manufacturer/importer is responsible for any modifications made to the production units which result in non-compliance to the applied and/or relevant regulations. TCP Dr. Genz (HK) Co., Ltd. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from any kind of issued reports. Reports are confidential property of the client. As a mutual protection to the applicant, the clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval.*

## TABLE OF CONTENTS

<b>1. General Information</b>	<b>3</b>
1.1 Tester	3
1.2 Testing laboratory	4
1.3 Details of applicant	5
1.4 Application details	5
1.5 Manufacturer	5
1.6 Test item	6
<b>2 Technical test</b>	<b>7</b>
2.1 Summary of test results	7
2.2 Test environment	7
2.3 Test equipment utilized	7
2.4 Test procedure	9
2.5 Test results Overview	10
<b>3 Transmitter parameter</b>	<b>11</b>
3.1 Field Strength of the Fundamental Wave	11
3.2 Radiated Spurious Emissions	12
3.3 Occupied Bandwidth	14
3.4 AC power lines conducted emission	14
<b>4 Disclaimer</b>	<b>15</b>
<b>5 Normative references</b>	<b>16</b>
<b>Annex: A – Pictures</b>	Number of Pages 9
<b>Annex: B – Field Strength of the Fundamental Wave</b>	Number of Pages 2
<b>Annex: C – Radiated Spurious Emissions</b>	Number of Pages 4
<b>Annex: D – AC Power Lines Conducted Emissions</b>	Number of Pages 2

## 1. General Information

### 1.1 Tester

Operator:

27.11.2008

Mr. Scott Li



Date

Test engineer

Signature

Approved by:

27.11.2008

Mr. F. Schulz



Date

Laboratory Manager

Signature

## 1.2 Testing laboratory

Name : TCP Dr. Genz (HK) Co., Ltd.  
Street : 26/F., Tamson Plaza, 161 Wai Yip Street  
Town : Kwun Tong, Kowloon  
Country : Hong Kong  
Telephone : +852 2389 2200  
Fax : +852 2389 3073

**Note:** Test environment and test equipment available in accordance to ISO/IEC/EN 17025 requirements. Accreditation certificates for confirmation can be shown on request.

### **A2LA Accredited Testing Laboratory**

Testing Cert# 2762.01

Name : Hong Kong Productivity Council  
Street : EMC Centre, LG1, HKPC Building, 78 Tat Chee Avenue  
Town : Kowloon  
Country : Hong Kong

**Note:** Test environment and test equipment available in accordance to ISO/IEC/EN 17025 requirements. Accreditation certificates for confirmation can be shown on request.

### **The Hong Kong Laboratory Accreditation Scheme (HOKLAS)**

Reg. No.082

### **FCC registered measurement facility**

Reg. No.90656

### 1.3 Details of applicant

Name : : Techwall Electronics Co., Ltd.  
Street : : 24/F., Tower 1, Tern Center, 237 Queen's Road  
Town : : Central  
Country : : Hong Kong  
Telephone : : +852 2850 6860  
Fax : : +852 2850 6936  
E-mail : : twallhk@netvigator.com

Contact : : Mr. S.M. Wong  
Telephone : : +852 2850 6860

### 1.4 Application details

Date of receipt of application : 03.11.2008  
Date of receipt of test item : 03.11.2008  
Date of test : 05.11. – 25.11.2008

### 1.5 Manufacturer (if different from applicant in point 1.3)

Name :  
Street :  
Town :  
Country :

## 1.6 Test item

### Description of test item

Description of test item	Baby Monitor
Type identification	IK-1TX
Brand Name	Ikea Family
Operation Frequency	49.83 MHz
Number of Channel	2
Channel 1	49.83 MHz with 40 Hz pilot tone
Channel 2	49.83 MHz with 110 Hz pilot tone
Operation mode	simplex
Type of modulation	F3E
Type of antenna	integral
Power supply	110VAC (9VDC AC/DC adaptor) or 4 batteries AA size

## 2 Technical test

### 2.1 Summary of test results

Following conclusion has to be considered as technical opinion belongs to the applied standard(s).

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

or

The deviations as specified in 2.4 were ascertained in the course of the tests performed.

### 2.2 Test environment

Temperature : 23 ± 2 °C

Relative humidity content : 50 ± 2 %

Air pressure : 990 ± 5 hPa

No.	Test equipment	Type	Manufacturer
G003	Humidity/Temperature Meter	TES-1364	TES
E016	Air pressure meter	Standard	Raumklima



## 2.3 Test equipment utilized

### Test Equipment list

#### Radiated emission

Test equipment	Type	S/N	Manufacturer	Cal Due Date
Semi-anechoic Chamber	Nil	Nil	Frankonia	28 Mai 09
Test Reciever	ESU 26	100050	Rohde & Schwarz	06 Aug 09
Bi-conical Antenna	HK116	841489/016	Rohde & Schwarz	08 Mar 09
Log.-Periodic Antenna	HL223	841516/020	Rohde & Schwarz	28 Feb 09
Horn Antenna	3115	9002-3351	EMCO	27 Feb 10
Active Loop Antenna	6502	9107-2651	EMCO	20 Dec 09

#### Conducted emission

Test equipment	Type	S/N	Manufacturer	Cal Due Date
Shielded Room	Nil	Nil	Frankonia	28 Mai 09
Pulse limiter	ESH3-Z2	E112	Rohde & Schwarz	06 Aug 09
Two-Line V-Network	ESH3-Z5	E053	Rohde & Schwarz	06 Aug 09
EMI Test receiver	ESHS 10	E002	Rohde & Schwarz	06 Aug 09

## 2.4 Test procedure

**RADIATION INTERFERENCE:** The test procedure used was ANSI STANDARD C63.4-2003 6.4 using a spectrum analyzer. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was the 100 kHz and the video bandwidth was 300 kHz.

**FORMULA OF CONVERSION FACTORS:** The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dB $\mu$ V) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

$$\text{Freq (MHz)} \quad \text{METER READING} + \text{ACF} + \text{CABLE LOSS (to the receiver)} = \text{FS}$$

$$20 \text{ dB}\mu\text{V} + 10.36 \text{ dB} + 6 \text{ dB} = 36.36 \text{ dB}\mu\text{V/m @3m}$$

**ANSI STANDARD C63.4-2003 6.2.1 MEASUREMENT PROCEDURES:** The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table). The UUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrums were scanned from 9 kHz to 30 MHz and 30 MHz to 10<sup>th</sup> harmonic of the fundamental.

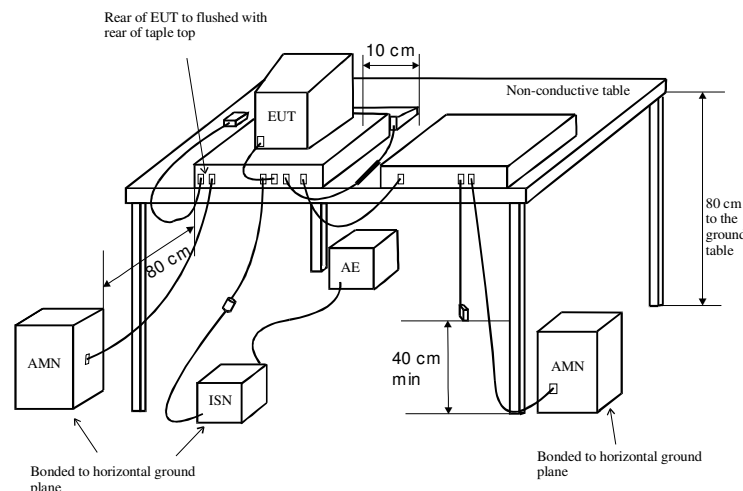
Peak readings were taken in three (3) orthogonal planes and the highest readings. Measurements were made by Hong Kong Productivity Council at the registered test site located at EMC Centre, LG1, HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong. The registration number is 90656.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

AC power lines conducted emission test configuration:

The test configuration is contained inside of a shielded chamber and corresponds to the standard ANSI C63.4 /3/. The equipment under test is connected with the artificial mains network (AMN) in a distance of 0,8 m and of 0,4 m from the earth connection and also 0,8 m from other subassembly and metallic area. The measurement receiver is placed in a special room adjacent to the chamber. (See picture1)

The test is carried out with nominal impedance by 50  $\Omega$  / 50  $\mu$ H of the AMN in a frequency range 150 kHz to 30 MHz. Further information please find in test report.



**Picture 1**

**2.5 Test results Overview**

Report-No. : H1M20811-7090-P-15  
 Test item : Baby Monitor  
 Model No. : IK-1TX  
 Brand Name : Ikea Family

1<sup>st</sup> test       test after modification       production test

Standard	Description	Remarks	Verdict
<b>FCC Rules 47CFR PART 15.235 (Transmitter)</b>			
Section 15.235(a)	Field strength of the Fundamental Wave		P
Section 15.235(b)&15.209	Radiated spurious emission		P
Section 15.235(b)	Occupied bandwidth		P
Section 15.207	Conducted emission to (AC) power lines		P

Important Note: This test device has two channels with one operation frequency, but different pilot tones for each channel. For this reason pre testing measurements was performed on channel 1 and channel 2. All final measurements were done on channel 1 (Worst case).

Test case verdicts

*P - Pass                      Test item does meet the requirement*  
*F - Fail                        Test item does not meet the requirement*  
*N.A. - Not Applicable      Test case does not apply to the test object*

### 3 Transmitter parameter

#### 3.1 Field Strength of the Fundamental Wave

##### Test results Channel 1 (Worst case)

Calculation of test results:

Such factors like antenna factor and cable loss are already included in the provided measurement results. All results measured with peak detector.

Frequency [MHz]	Antenna Polarization	Results [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin (dB)
49.83	Vertical	77.59	80.00	2.41
49.83	Horizontal	65.48	80.00	14.59

**Note:** The limit is met. For the diagrams see Appendix B.

#### Limit for Section 15.235 (a)

Frequency Range of Fundamental	Limit	
	[ $\mu$ V/m]	[dB $\mu$ V/m]
49.82 – 49.90	10,000	80.00

15.235(a) The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

### 3.2 Radiated Spurious Emissions

#### Test results Channel 1 (Worst case)

##### (a) Measurement up to 30 MHz

Note: No Relevant emissions are expected in the frequency range 9 kHz to 30 MHz. Nevertheless a check using a near field probe was performed. No relevant emissions have been observed. Consequently no final measurement was performed.

##### (b) Measurement above 30 MHz

##### Calculation of test results:

Such factors like antenna factor and cable loss are already included in the provided measurement results. All results measured with peak detector.

Frequency [MHz]	Antenna Polarization	Results [dBμV/m]	Limit [dBμV/m]	Margin (dB)
99.66	Vertical	26.51	43.50	16.99
99.66	Horizontal	25.03	43.50	18.20
149.49	Vertical	30.52	43.50	12.98
149.49	Horizontal	31.10	43.50	12.40
195.73	Vertical	33.10	43.50	10.40
195.73	Horizontal	33.00	43.50	10.50
430.862	Vertical	26.96	46.00	19.04
482.164	Horizontal	25.31	46.00	20.69

Note: The limit is met. The measurement was performed up to the 10<sup>th</sup> harmonic.

No (further) spurious emissions in the range 20 dB below the limit found.

The measurement was performed up to the 10<sup>th</sup> harmonic. For the diagram see appendix C.

#### Limits for Radiated Emission Section 15.209

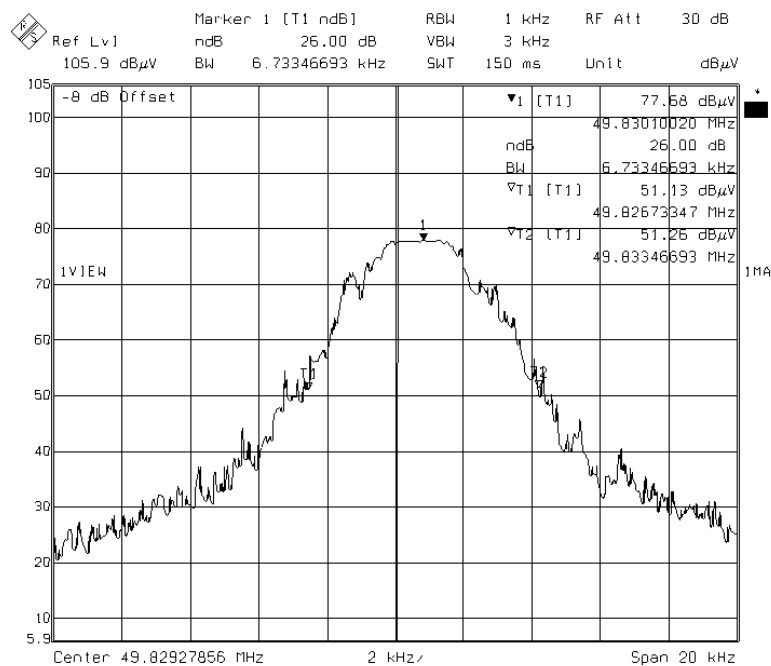
Frequency of Emission [MHz]	Field strength [microvolt/meter]	Field Strength [dB microvolt/meter]
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

### 3.3 Occupied Bandwidth

#### Requirements for Section 15.235 (b)

The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in §15.209, whichever permits the higher Emission levels.

#### Test results Channel 1 (Worst case):



**Note:** The point T1 (49.826 MHz) is 26dB below the carrier and inside the operation band 49.82 – 49.90 MHz. This device does meet the FCC requirement.

### 3.4 AC power lines conducted emission

Test results Channel 1 (Worst case):

Frequency Range	Limit dB $\mu$ V		Passed
	Quasi-peak	Average	
150 kHz – 500 kHz AC	66 to 56*	56 to 46*	☒
500 kHz - 5 MHz AC	56	46	☒
5 MHz – 30 MHz AC	60	50	☒

\* Decreases with logarithm of the frequency

Instrumentation uncertainty:  $U_{lab(rcond)} = 2.50$  dB.

**Note:** The limit is met. For the diagrams see Appendix D.

## 4 Disclaimer

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### Emphasized conditions or project related conditions:

Released Test Reports apply only to the specific samples tested under stated test conditions. It is the applicant's responsibility to assure that additional production units of the tested model(s) are manufactured in same construction and with identical electrical and mechanical components to meet the same quality as tested model(s). The applicant/manufacturer/importer is responsible for any modifications made to the production units which result in non-compliance to the applied and/or relevant regulations.

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The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate. The complexity of the technical specifications means that full and thorough testing is impractical for both technical and economic reasons. Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification. Neither is there any guarantee that such a test sample will interact with other genuinely open systems. The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in clause 1.6 of this report. The test report may only be reproduced or published in full.

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## **5 Normative references**

- /1/ FCC Rules 47 CFR PART 15: 2008  
Radio Frequency Devices
- /2/ CISPR 22:2005  
Limits and Methods of Measurement of Radio Interference Characteristics of Information  
Technology Equipment
- /3/ ANSI C63.4-2003  
Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and  
Electronic Equipment in the Range of 9 kHz to 40 GHz

## **Appendix**

- A Pictures
- B Field Strength of the Fundamental Wave
- C Radiated Spurious Emissions
- D AC power Line Conducted Emissions

## **Appendix B**

### Field Strength of the Fundamental Wave

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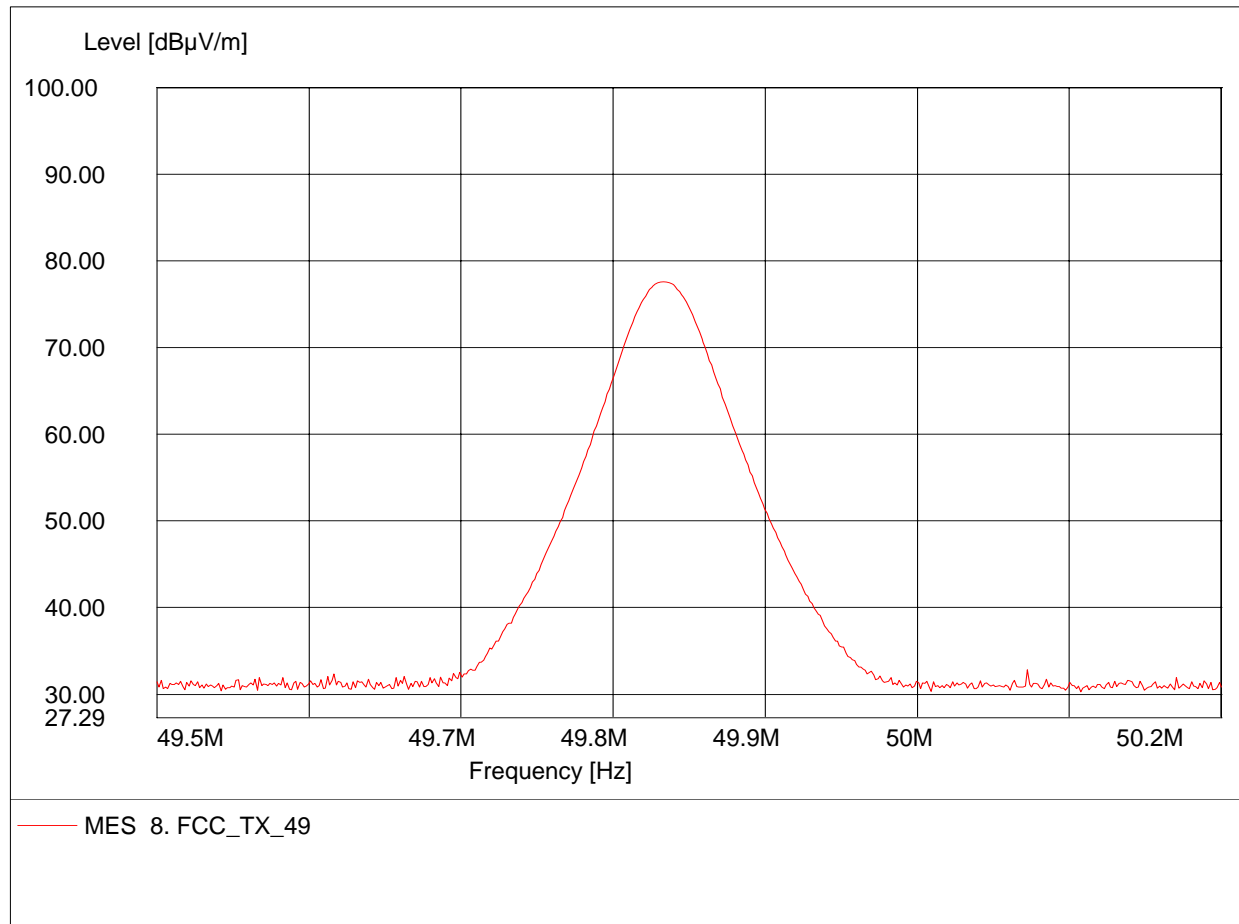
Test Report No.: H1M20811-7090-P-15

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**Carrier power (Field Strength)**

**FCC RULES PART 15, SUBPART C**

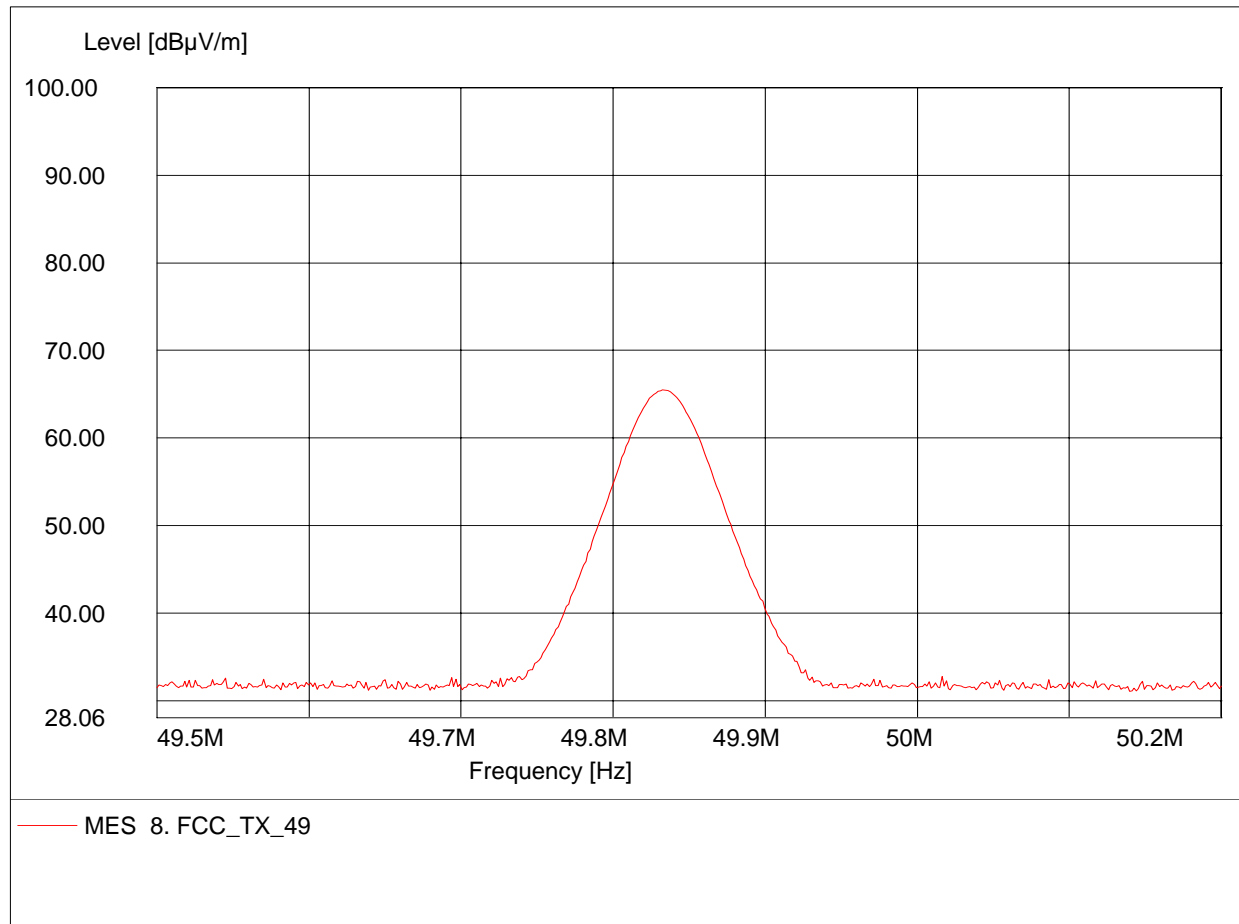
Project No.: H1M20811-7090  
Test Site / Operator: HKPC / Mr. SCOTT  
Temperature/Voltage: Temp.: 23°C/ Unom.: 110VAC (9VDC AC/DC Adaptor)  
Test Specification: according to §15.235  
Comment 1: Dist.: 3m, Ant.: HK116 ,Peak detector  
Freq: 49.832MHz, Emax: 77.59dBµV/m, RBW: 100kHz



**Carrier power (Field Strength)**

**FCC RULES PART 15, SUBPART C**

Project No.: H1M20811-7090  
Test Site / Operator: HKPC / Mr. SCOTT  
Temperature/Voltage: Temp.: 23°C/ Unom.: 110VAC (9VDC AC/DC Adaptor)  
Test Specification: according to §15.235  
Comment 1: Dist.: 3m, Ant.: HK116 , Peak detector  
Freq: 49.832MHz, Emax: 65.48dBµV/m, RBW: 100kHz



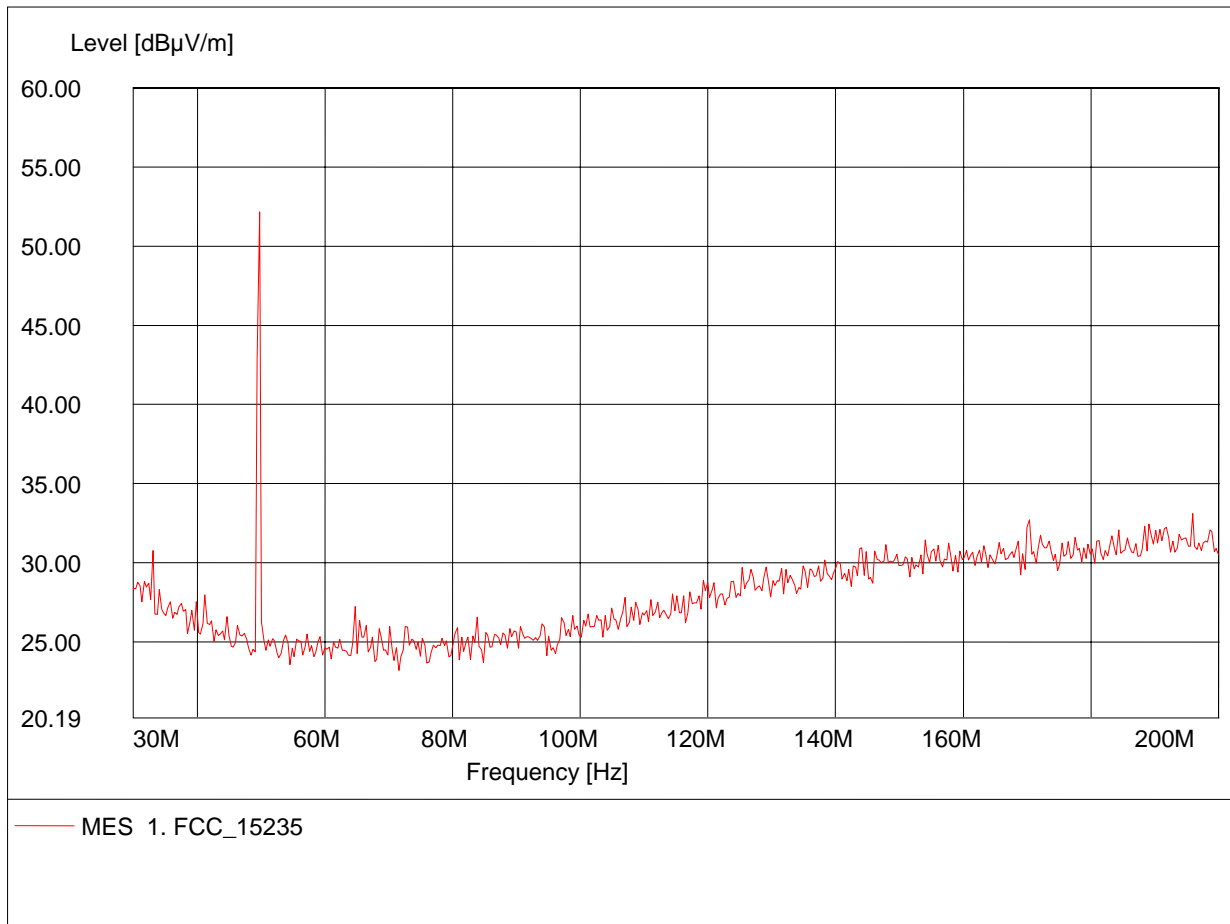
## **Appendix C**

### Radiated Spurious Emissions

**Spurious emissions Field Strength**

**FCC RULES PART 15, SUBPART C**

Project No.: H1M20811-7090  
Test Site / Operator: HKPC / Mr. SCOTT  
Temperature/Voltage: Temp.: 23°C/ Unom.: 110VAC (9VDC AC/DC Adaptor)  
Test Specification: according to §15.235  
Comment 1: Dist.: 3m, Ant.: HK 116 ,Peak detector  
Emax: 52.16dBµV/m, RBW: 100kHz



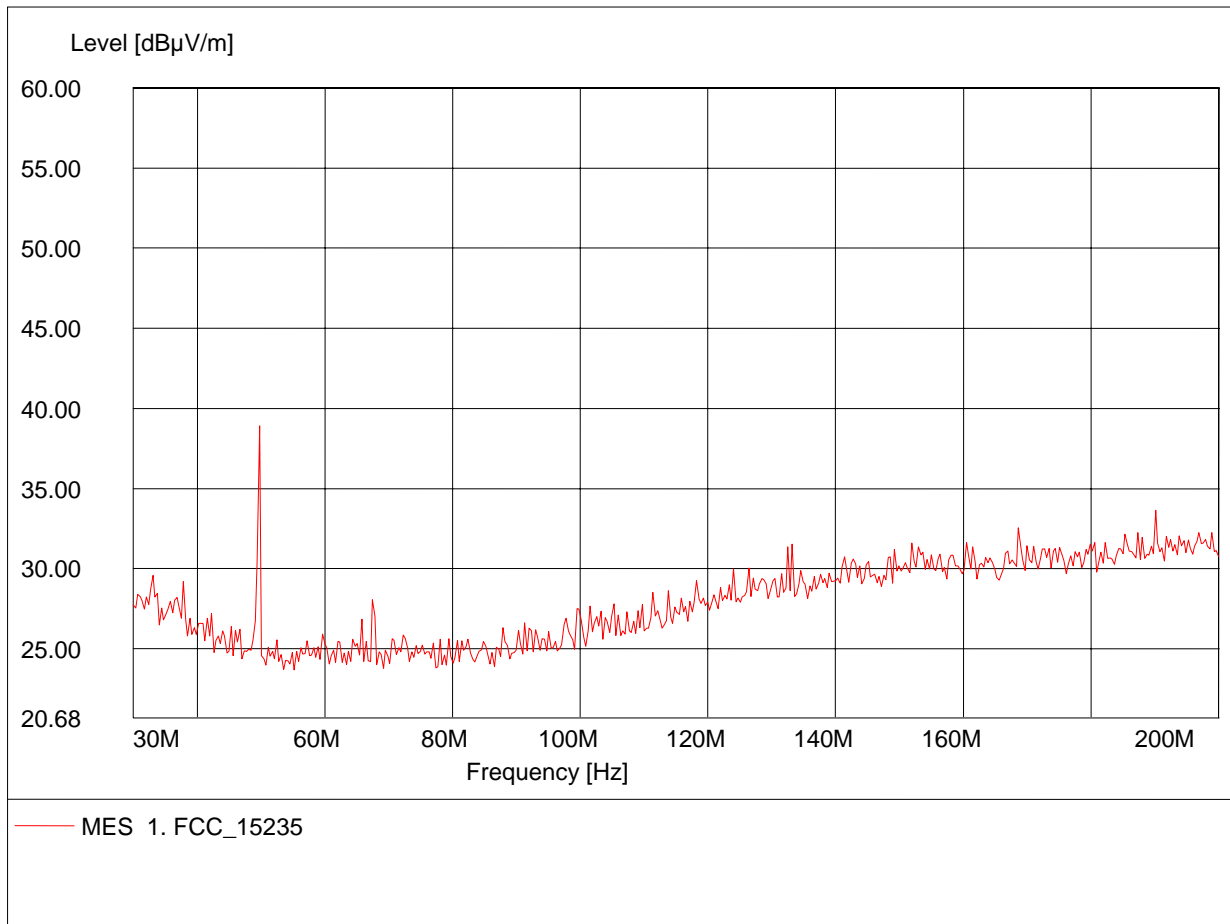
**MEASUREMENT RESULT: "1. FCC\_15235"**

Frequency MHz	Level dBµV/m
99.66	26.51
149.49	30.52
195.73	33.10

**Spurious emissions Field Strength**

**FCC RULES PART 15, SUBPART C**

Project No.: H1M20811-7090  
Test Site / Operator: HKPC / Mr. SCOTT  
Temperature/Voltage: Temp.: 23°C/ Unom.: 110VAC (9VDC AC/DC Adaptor)  
Test Specification: according to §15.235  
Comment 1: Dist.: 3m, Ant.: HK 116 ,Peak detector  
Freq: 49.760MHz, Emax: 38.91dBµV/m, RBW: 100kHz



**MEASUREMENT RESULT: "1. FCC\_15235"**

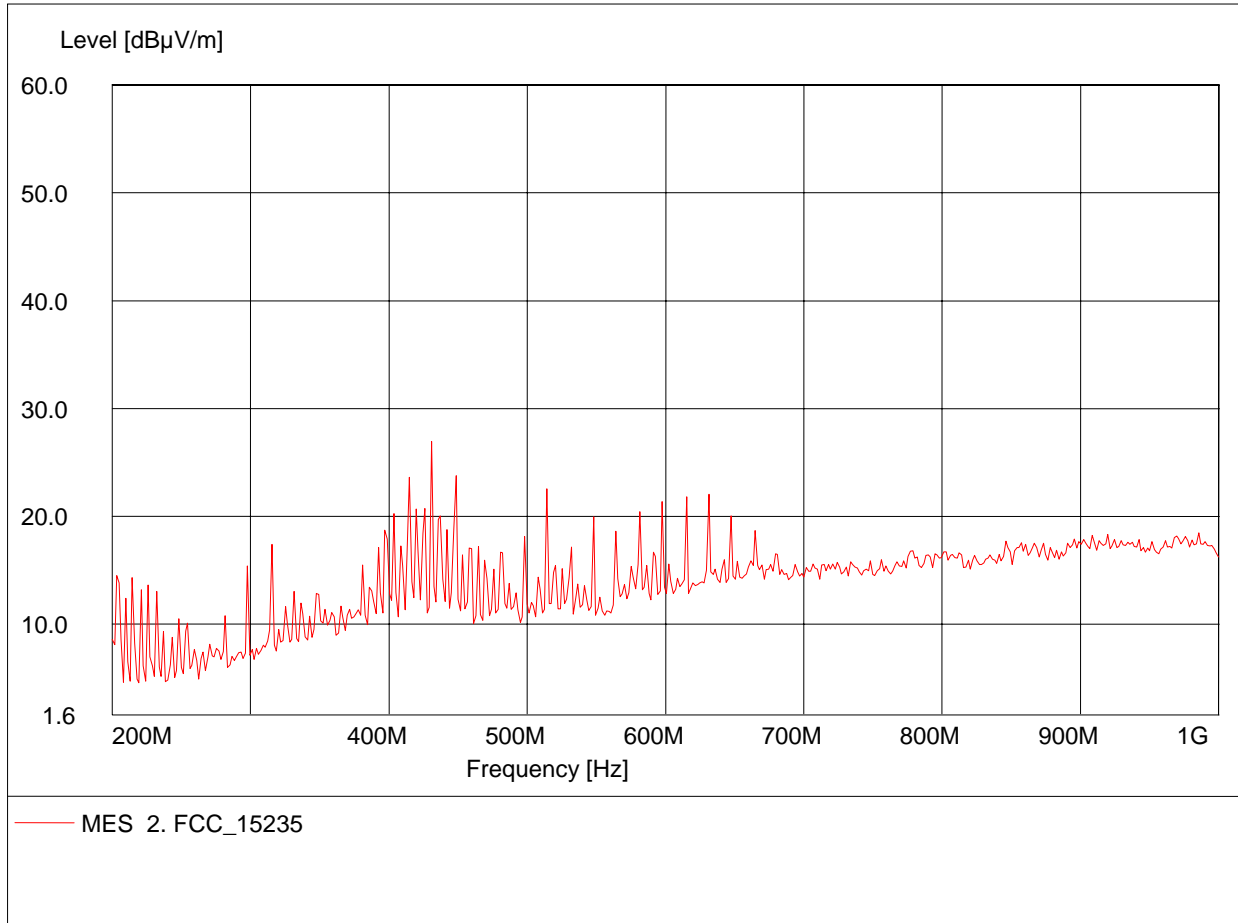
Frequency MHz	Level dBµV/m
99.66	25.03
149.49	31.10
195.73	33.00



**Spurious emissions Field Strength**

**FCC RULES PART 15, SUBPART C**

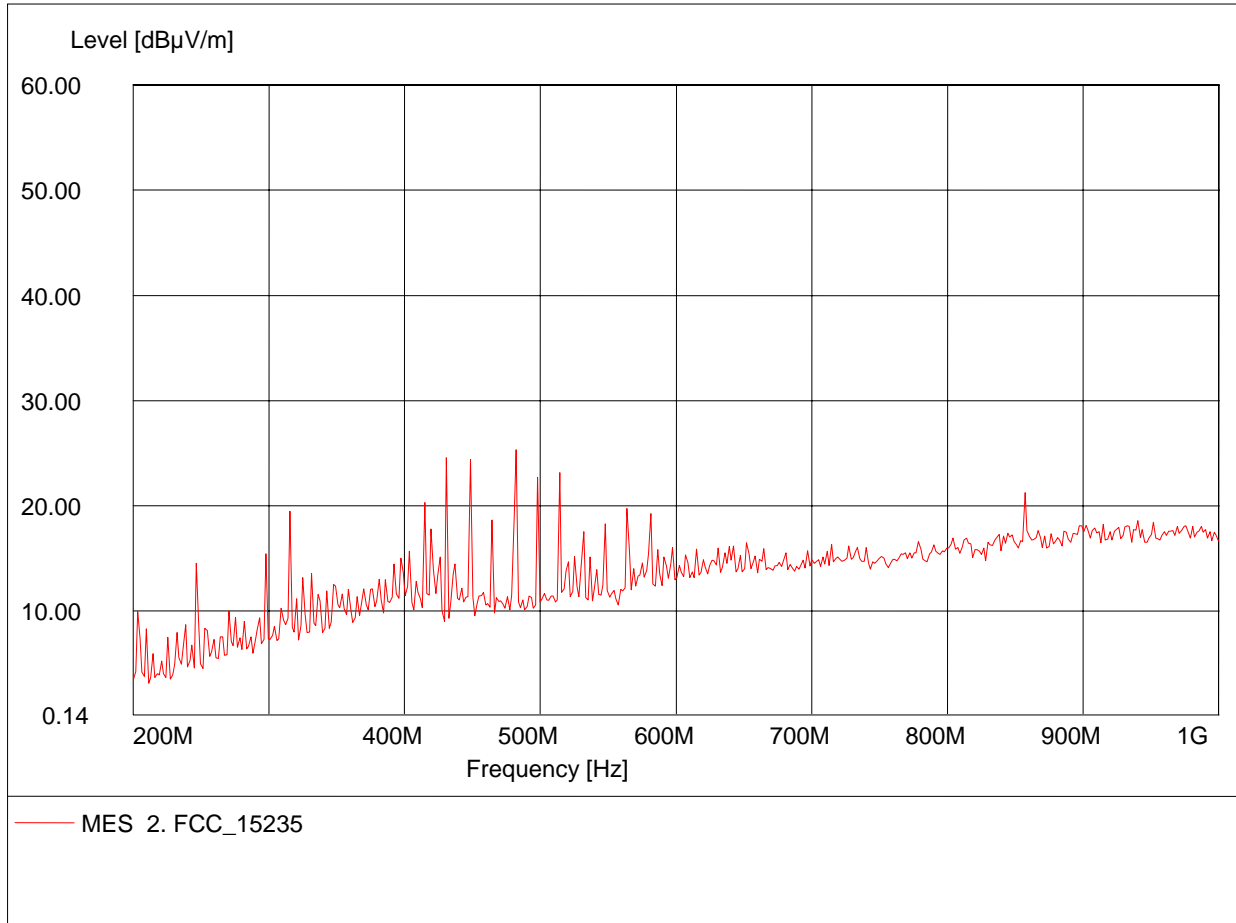
Project No.: H1M20811-7090  
Test Site / Operator: HKPC / Mr. SCOTT  
Temperature/Voltage: Temp.: 23°C/ Unom.: 110VAC (9VDC AC/DC Adaptor)  
Test Specification: according to §15.235  
Comment 1: Dist.: 3m, Ant.: HL 223, amplif. ,Peak detector  
Freq: 430.862MHz, Emax: 26.96dBµV/m, RBW: 100kHz



**Spurious emissions Field Strength**

**FCC RULES PART 15, SUBPART C**

Project No.: H1M20811-7090  
Test Site / Operator: HKPC / Mr. SCOTT  
Temperature/Voltage: Temp.: 23°C/ Unom.: 110VAC (9VDC AC/DC Adaptor)  
Test Specification: according to §15.235  
Comment 1: Dist.: 3m, Ant.: HL 223, amplif. Peak detector  
Freq: 482.164MHz, Emax: 25.31dBµV/m, RBW: 100kHz



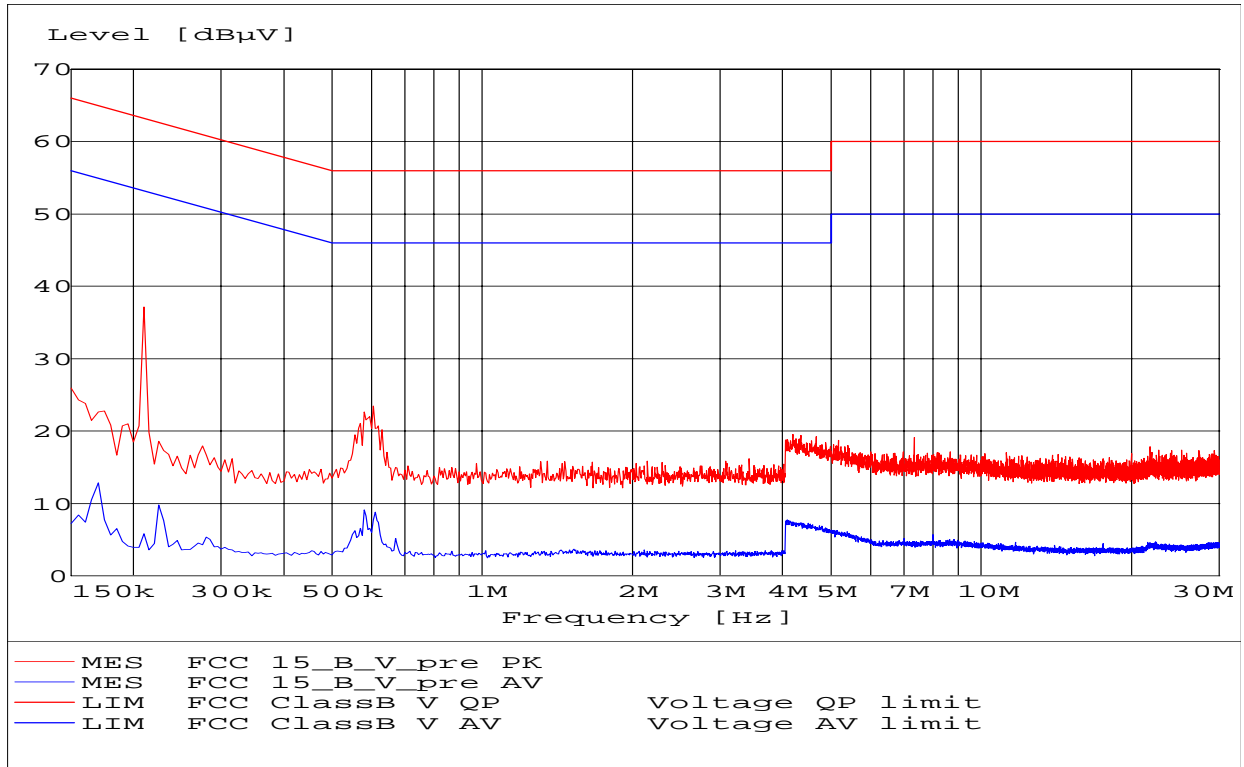
## **Appendix D**

### AC power Lines Conducted Emissions

Voltage mains

according to FCC Part 15C

Project number: H1M20811-7090  
Operating Condition: 22°C /110VAC(9VDC AC/DC Adaptor)  
Operator: Mr. SCOTT  
Test Specification: FCC Part 15C  
Comment: ESHS 10 / ESH3-Z5 (N)  
Mode: normal operating



Voltage mains

according to FCC Part 15C

Project number: H1M20811-7090  
Operating Condition: 22°C /110VAC(9VDC AC/DC Adaptor)  
Operator: Mr. SCOTT  
Test Specification: FCC Part 15C  
Comment: ESHS 10 / ESH3-Z5 (L)  
Mode: normal operating

