

# FCC Part 15B Measurement and Test Report

For

**Spheris Digital Ltd.**

**Flat Room A21, BLK a, 4/F, Sheung Shui Plaza, 3ka fu close,  
Sheung Shui Hong Kong**

**FCC ID: YHO-PXT51015**

<b>Test Rule(s):</b>	<u>FCC Part 15 Subpart B</u>
<b>Product Description:</b>	<u>Wireless Digital Display</u>
<b>Tested Model:</b>	<u>PXT510WR04F</u>
<b>Report No.:</b>	<u>STR15058259I-2</u>
<b>Tested Date:</b>	<u>2015-05-27 to 2015-07-14</u>
<b>Issued Date:</b>	<u>2015-07-14</u>
<b>Tested By:</b>	<u>Jason Su / Engineer</u>
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

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## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: Spheris Digital Ltd.  
 Address of applicant: Flat Room A21, BLK a, 4/F, Sheung Shui Plaza, 3ka fu close, Sheung Shui Hong Kong  
 Manufacturer: Spheris Digital Ltd.  
 Address of manufacturer: Flat Room A21, BLK a, 4/F, Sheung Shui Plaza, 3ka fu close, Sheung Shui Hong Kong

General Description of EUT	
Product Name:	Wireless Digital Display
Trade Name:	Pix-Star
Model No.:	PXT510WR04F
Adding Model(s):	PXT510VR02F, PXT510GR02F, PXT510WR02F, PXT510VR04F, PXT510GR04
<p><i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model PXT510WR04F, but the circuit and the electronic construction do not change, declared by the manufacturer.</i></p>	

Technical Characteristics of EUT	
Rated Voltage:	AC120V/60Hz ; Adapter:DC12V
Rated Current:	2A
Rated Power:	/
Power Adapter Model:	GFP241-1220BX-1
Lowest Internal Frequency:	32.768KHz
Highest Internal Frequency:	24MHz
Classification of ITE:	Class B

## 1.2 Test Standards

The following report is prepared on behalf of the Spheris Digital Ltd in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.205, 15.107, and 15.109 rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

## 1.4 Test Facility

### **FCC – Registration No.: 934118**

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 934118.

### **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

### **CNAS Registration No.: L4062**

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2<sup>nd</sup> Road, Bao'an District, Shenzhen, P.R.C (518101).

## 1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark
TM1	USB Playing	/
TM2	SD Playing	/

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
DC Cable	1.7	Unshielded	With Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
USB flash disk	SONY	8G	USB flash disk
SD Card	Kingston	4G	SD Card
Headset	HUAWEI	/	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

## 1.6 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2015-06-17	2016-06-16
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2015-06-17	2016-06-16
Amplifier	Agilent	8447F	3113A06717	2015-06-17	2016-06-16
Amplifier	C&D	PAP-1G18	2002	2015-06-17	2016-06-16
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2015-06-17	2016-06-16
Horn Antenna	ETS	3117	00086197	2015-06-17	2016-06-16
Loop Antenna	Schwarz beck	FMZB 1516	9773	2015-06-17	2016-06-16
Attenuator	ATTEN	ATS100-4-20	/	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-06-17	2016-06-16
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-06-17	2016-06-16
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-06-17	2016-06-16

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## 2. SUMMARY OF TEST RESULTS

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<b>FCC Rules</b>	<b>Description of Test Item</b>	<b>Result</b>
§ 15.107 (a)	Conducted Emissions	Compliant
§ 15.109 (a)	Radiated Emissions	Compliant

N/A: not applicable

### 3. Conducted Emissions

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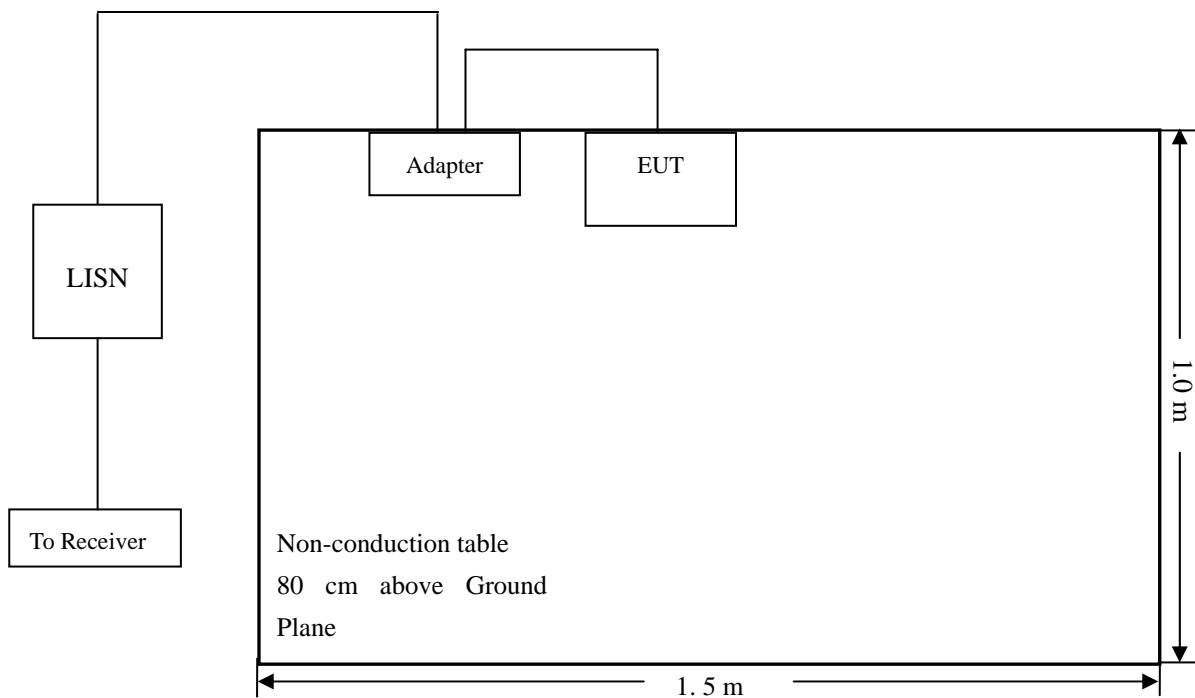
#### 3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is  $\pm 2.88$  dB.

#### 3.2 Test Procedure

Test is conducting under the description of ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

#### 3.3 Basic Test Setup Block Diagram



### 3.4 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

### 3.5 Summary of Test Results/Plots

According to the data in section 3.6, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

**-11.58 dB** at **4.4220 MHz** in the **Neutral, AVG** detector, 0.15-30MHz

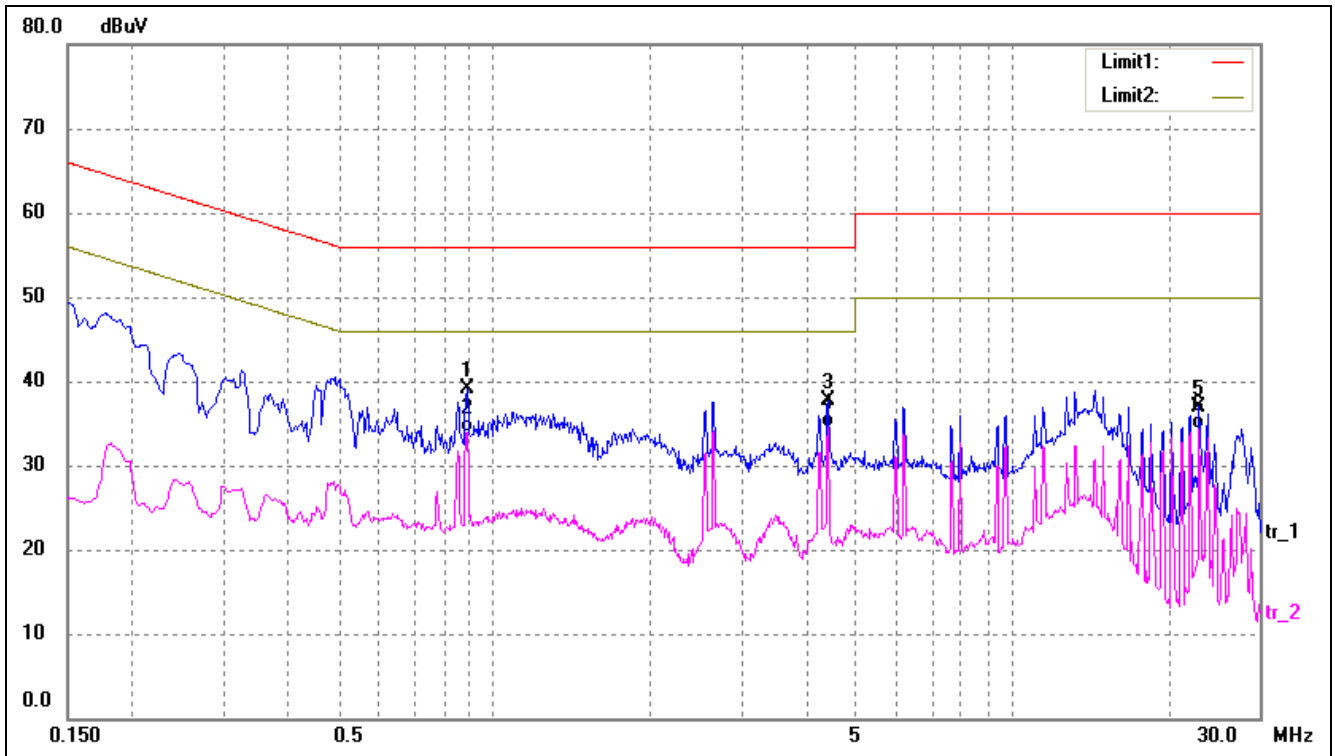
### 3.6 Conducted Emissions Test Data



**Plot of Conducted Emissions Test Data**

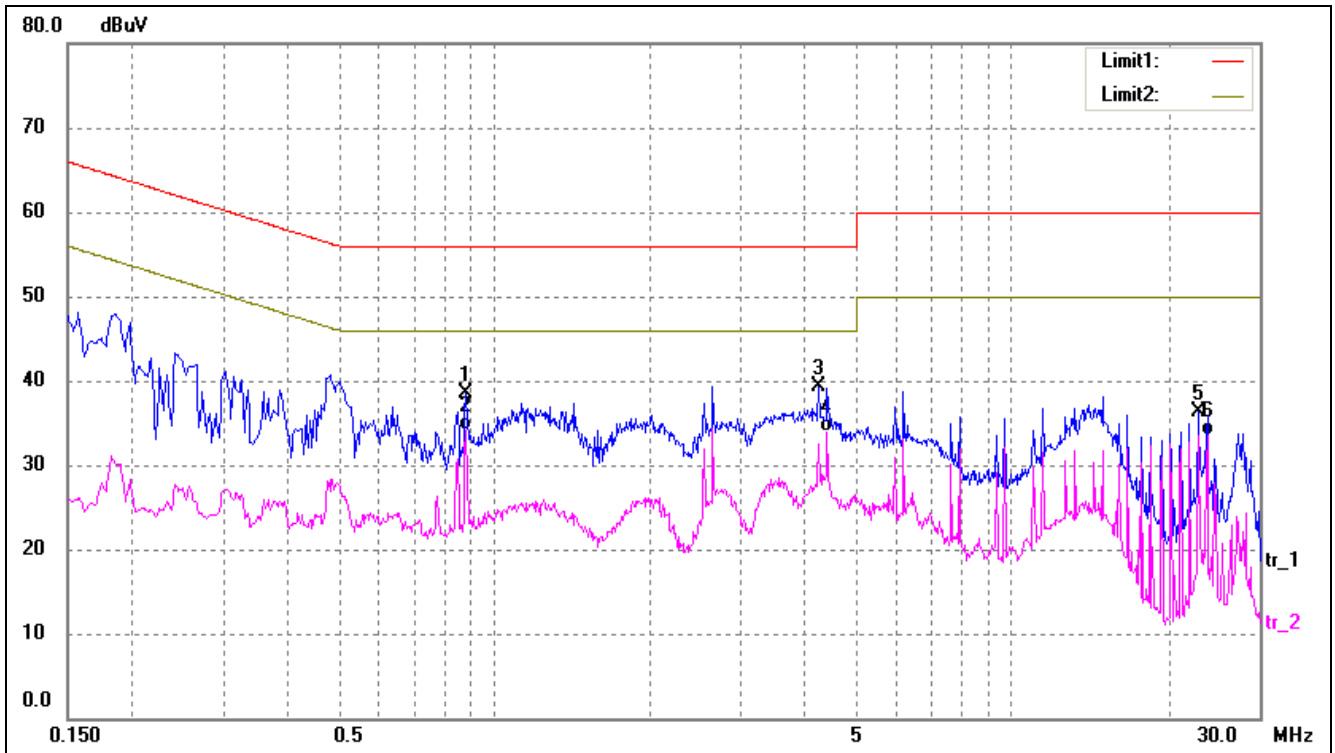
EUT: *Wireless Digital Display*  
 Tested Model: *PXT510WR04F*  
 Operating Condition: *TM1*  
 Comment: *AC 120V/60Hz Adapter:DC12V*

Test Specification: *Neutral*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.8860	26.12	12.89	39.01	56.00	-16.99	peak
2	0.8860	21.07	12.89	33.96	46.00	-12.04	AVG
3*	4.4220	24.76	13.00	37.76	56.00	-18.24	peak
4	4.4220	21.42	13.00	34.42	46.00	-11.58	AVG
5	22.9980	24.67	12.33	37.00	60.00	-23.00	peak
6	22.9980	21.97	12.33	34.30	50.00	-15.70	AVG

Test Specification: Line

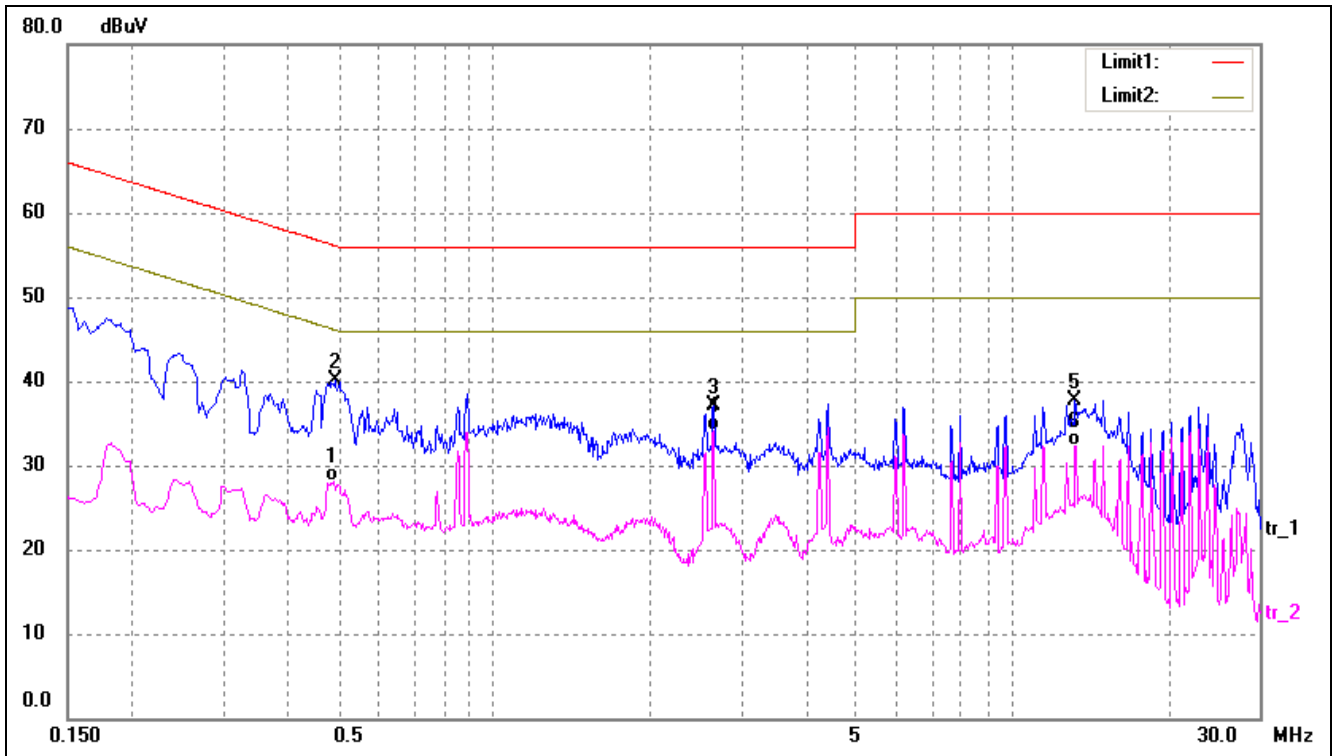


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.8820	25.70	12.88	38.58	56.00	-17.42	peak
2	0.8820	21.18	12.88	34.06	46.00	-11.94	AVG
3	4.2380	26.22	13.00	39.22	56.00	-16.78	peak
4	4.4060	20.86	13.00	33.86	46.00	-12.14	AVG
5	22.8900	23.91	12.30	36.21	60.00	-23.79	peak
6	23.7900	20.90	12.60	33.50	50.00	-16.50	AVG

**Plot of Conducted Emissions Test Data**

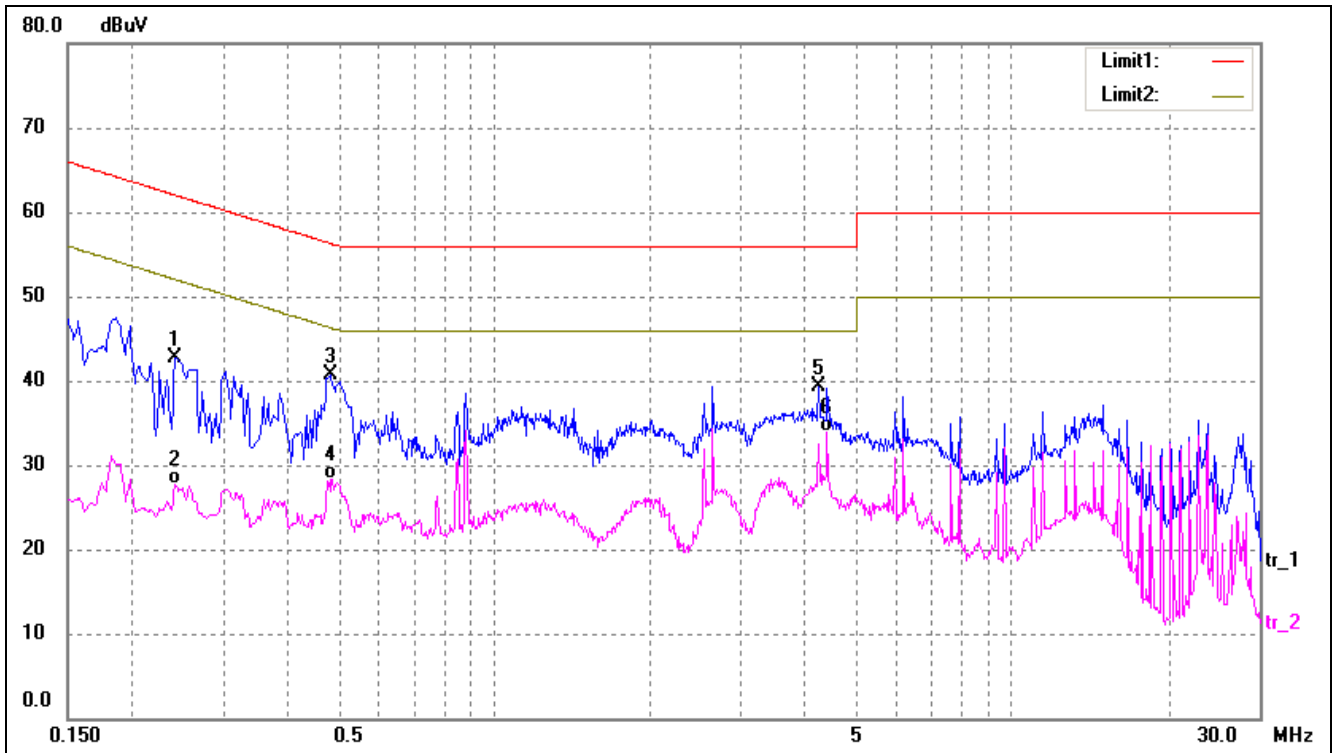
EUT: *Wireless Digital Display*  
 Tested Model: *PXT510WR04F*  
 Operating Condition: *TM2*  
 Comment: *AC 120V/60Hz Adapter:DC12V*

Test Specification: *Neutral*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4900	15.55	12.50	28.05	46.17	-18.12	AVG
2	0.4940	27.56	12.50	40.06	56.10	-16.04	peak
3	2.6500	24.09	13.00	37.09	56.00	-18.91	peak
4	2.6500	21.06	13.00	34.06	46.00	-11.94	AVG
5	13.2339	26.71	11.00	37.71	60.00	-22.29	peak
6	13.2739	21.35	11.00	32.35	50.00	-17.65	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2420	30.30	12.50	42.80	62.02	-19.22	peak
2	0.2420	15.24	12.50	27.74	52.02	-24.28	AVG
3	0.4820	28.30	12.50	40.80	56.30	-15.50	peak
4	0.4860	15.88	12.50	28.38	46.24	-17.86	AVG
5	4.2379	26.22	13.00	39.22	56.00	-16.78	peak
6*	4.4059	20.86	13.00	33.86	46.00	-12.14	AVG

## 4. Radiated Emissions

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### 4.1 Measurement Uncertainty

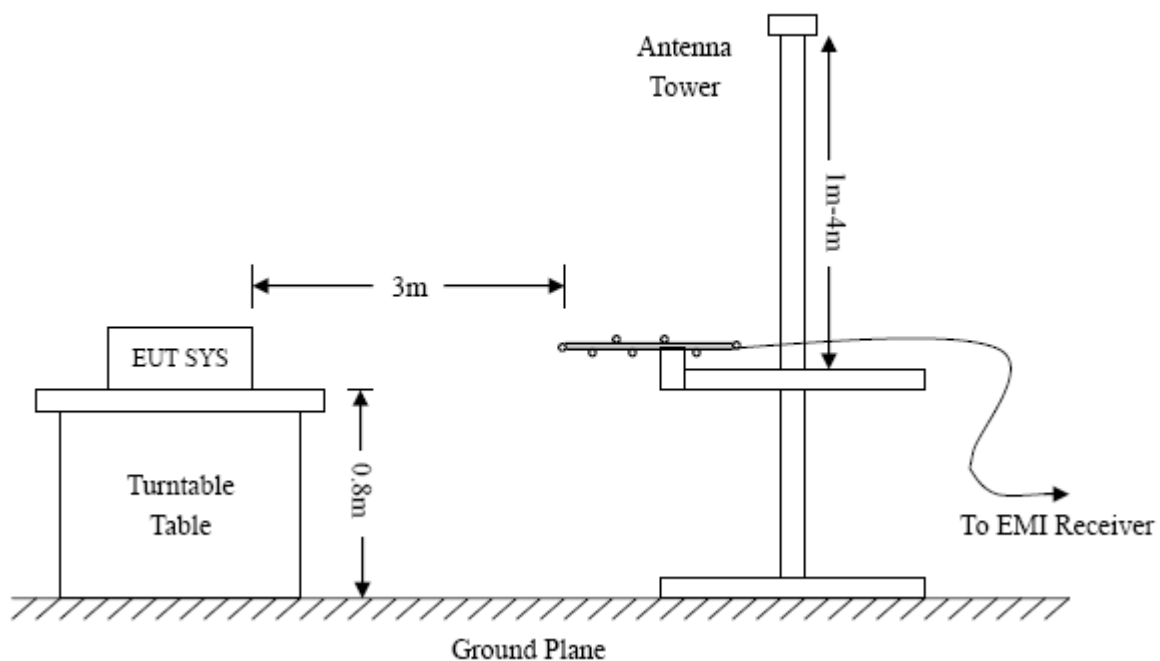
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is  $\pm 5.10$  dB.

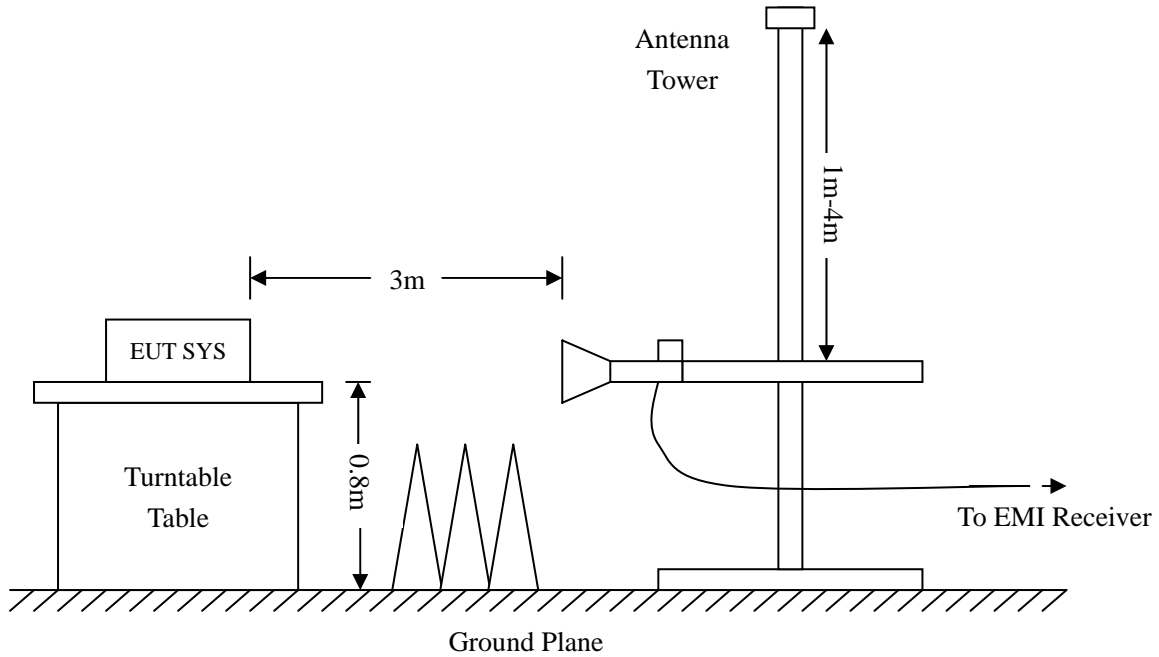
### 4.2 Test Procedure

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.109 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.





### 4.3 Test Receiver Setup

Frequency :9kHz-30MHz  
 RBW=10KHz,  
 VBW =30KHz  
 Sweep time= Auto  
 Trace = max hold  
 Detector function = peak

Frequency :30MHz-1GHz  
 RBW=120KHz,  
 VBW=300KHz  
 Sweep time= Auto  
 Trace = max hold  
 Detector function = peak, QP

Frequency :Above 1GHz  
 RBW=1MHz,  
 VBW=3MHz(Peak), 10Hz(AV)  
 Sweep time= Auto  
 Trace = max hold  
 Detector function = peak, AV

### 4.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for a Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.109(a) Limit}$$

### 4.5 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

### 4.6 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

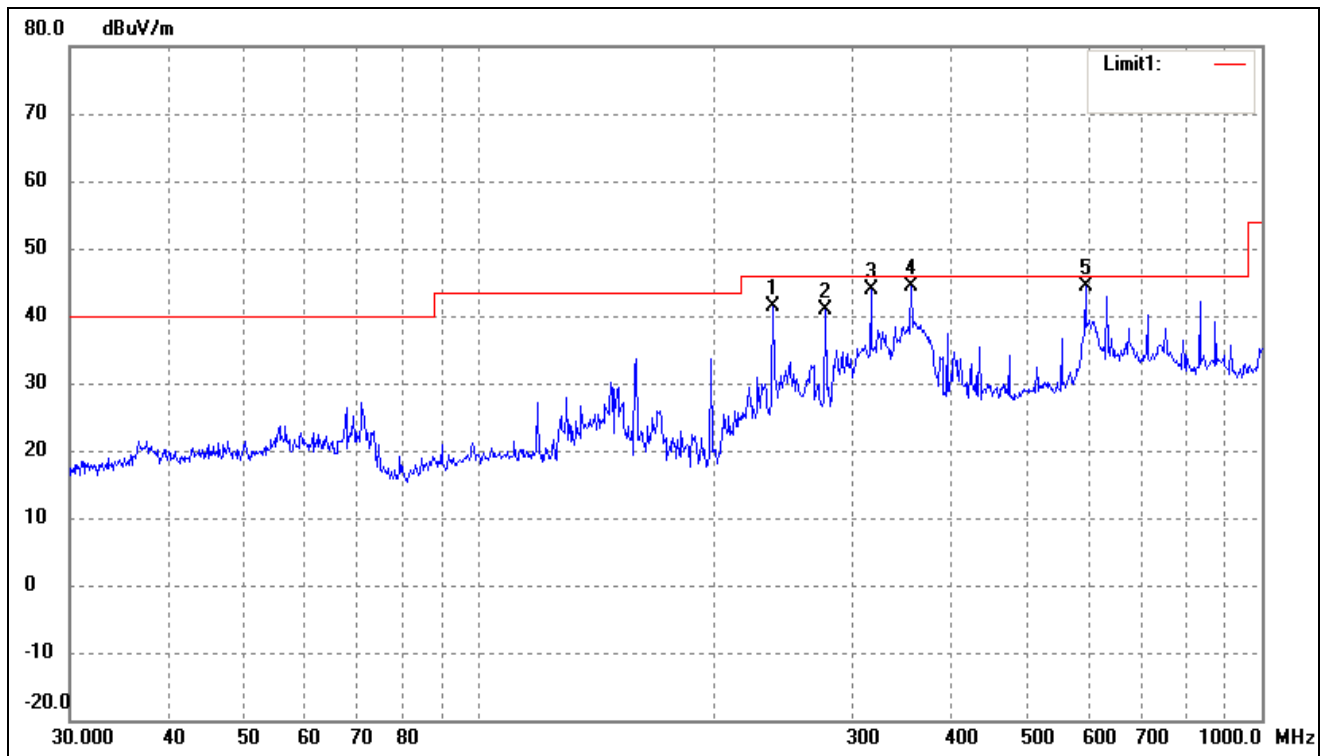
*Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

**-1.12 dB at 356.6757 MHz in the Horizontal polarization, 9 kHz to 1 GHz, 3Meters**

#### Plot of Radiated Emissions Test Data

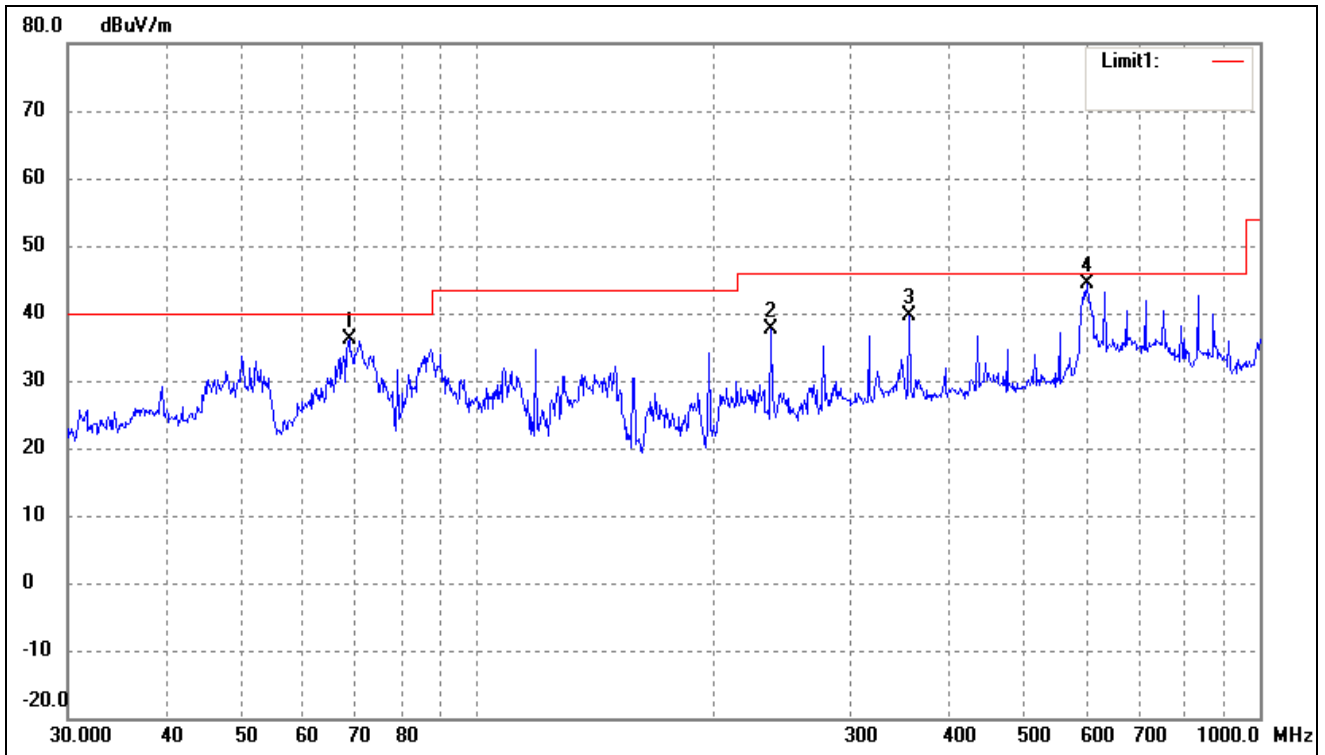
EUT: *Wireless Digital Display*  
 Tested Model: *PXT510WR04F*  
 Operating Condition: *TM1*  
 Comment: *AC 120V/60Hz Adapter:DC12V*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	237.4759	32.32	9.18	41.50	46.00	-4.50	85	100	peak
2	277.0935	29.57	11.20	40.77	46.00	-5.23	156	100	peak
3	316.5889	31.56	12.28	43.84	46.00	-2.16	301	100	peak
4	356.6757	32.23	12.15	44.38	46.00	-1.62	126	100	peak
5	595.1328	26.03	18.41	44.44	46.00	-1.56	65	100	peak

Test Specification: Vertical



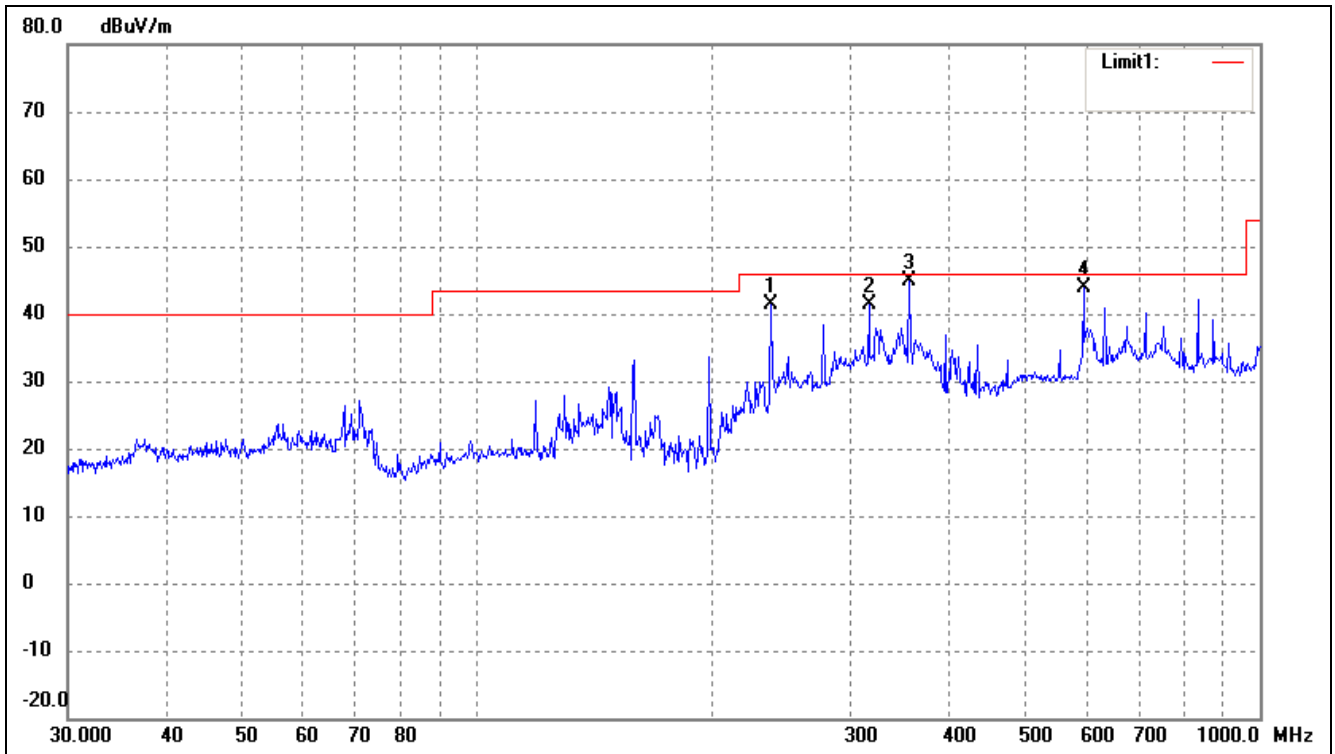
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	68.6310	32.53	3.49	36.02	40.00	-3.98	98	100	peak
2	237.4760	28.41	9.18	37.59	46.00	-8.41	128	100	peak
3	356.6758	27.46	12.15	39.61	46.00	-6.39	136	100	peak
4	601.4265	25.21	19.22	44.43	46.00	-1.57	201	100	peak



**Plot of Radiated Emissions Test Data**

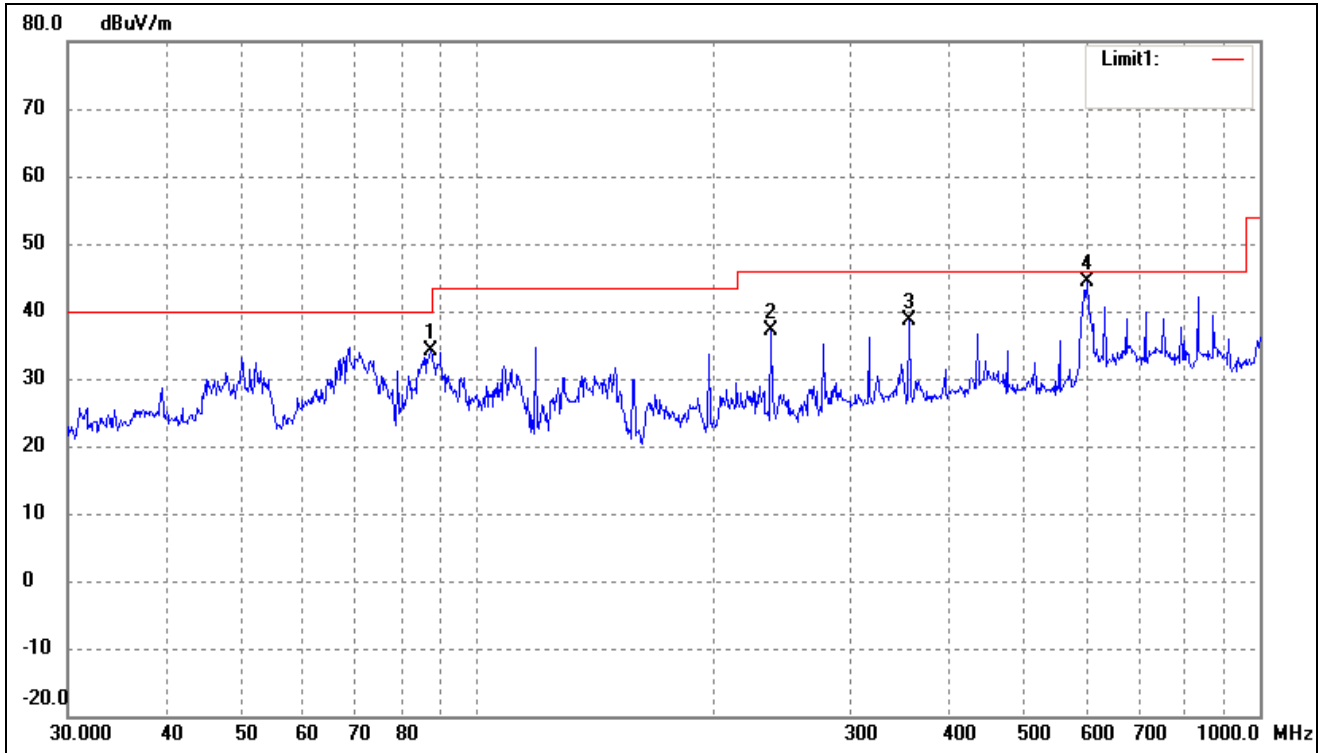
EUT: *Wireless Digital Display*  
 Tested Model: *PXT510WR04F*  
 Operating Condition: *TM2*  
 Comment: *AC 120V/60Hz Adapter:DC12V*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	237.4759	32.32	9.18	41.50	46.00	-4.50	165	100	peak
2	316.5889	29.06	12.28	41.34	46.00	-4.66	230	100	peak
3	356.6757	32.73	12.15	44.88	46.00	-1.12	151	100	peak
4	595.1328	25.53	18.41	43.94	46.00	-2.06	236	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	87.4176	30.88	3.20	34.08	40.00	-5.92	21	100	peak
2	237.4759	27.91	9.18	37.09	46.00	-8.91	112	100	peak
3	356.6757	26.46	12.15	38.61	46.00	-7.39	301	100	peak
4	601.4265	25.21	19.22	44.43	46.00	-1.57	95	100	peak

The measurements greater than 20dB below the limit from 9kHz to 30MHz and test data are not provided.

\*\*\*\*\* END OF REPORT \*\*\*\*\*