

FCC TEST REPORT

FCC ID : SJ8-M710HR
Applicant : RDI Technology (Shenzhen) Co., Ltd.
Address : Building C1 Xintang Industrial Park, East Baishixia, Fuyong, Baoan, Shenzhen, China
Manufacturer : RDI Technology (Shenzhen) Co., Ltd.
Address : Building C1 Xintang Industrial Park, East Baishixia, Fuyong, Baoan, Shenzhen, China
Equipment Under Test (EUT) :
Product Name : Digital Wireless Monitor
Model No. : M710HR
Rules : FCC CFR47 Part 15 Section 15.107:2010
FCC CFR47 Part 15 Section 15.109:2010
Date of Test : Oct. 11 ~ 12, 2012
Date of Issue : Nov. 19, 2012

Test Result : PASS *

Remark:

* The sample described above has been tested to be in compliance with the requirements of ANSI C63.4:2003. The test results have been reviewed and comply with the rules listed above and found to meet their essential requirements.

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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2 Test Summary

Test Items	Test Requirement	Result
Conducted Emission	FCC Part 15.107:2010	PASS
Radiated Emission	FCC Part 15.109:2010	PASS

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4 General Information

4.1 General Description of E.U.T.

Product Name	: Digital Wireless Monitor
Model No.	: M710HR
Operation Frequency	: 2402MHz ~ 2480MHz
Type of Modulation	: GFSK
Antenna installation	: Integrated Antenna
Antenna Gain	: 2 dBi

4.2 Details of E.U.T.

Technical Data	: DC 5V 2A powered by adapter (input: 100 ~ 240VAC, 50/60Hz, 500mA)
Adapter manufacturer	: Csec
M/N	: CS12B050200FUF

4.3 Description of Support Units

The EUT has been tested as an independent unit.

4.4 Standards Applicable for Testing

The customer requested FCC tests for a Digital Wireless Surveillance System. The rules used were FCC Part 15 Section 15.107:2009 and Section 15.109:2009.

4.5 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A, July 10, 2012.

- **FCC – Registration No.: 880581**

Waltek Services(Shenzhen) 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. Registration 880581, May 26, 2011.

4.6 Test Location

All the tests were performed at:
Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District, Shenzhen, China

Waltek Services (Shenzhen) Co., Ltd.

<http://www.waltek.com.cn>

5 Equipment Used during Test

Conducted Emissions						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101178	Aug. 13,2012	Aug. 13,2013
2.	LISN	R&S	ENV216	101215	Aug. 13,2012	Aug. 13,2013
3.	Cable	HUBER+SUHNER	CBL2-NN-3M	2230300	Aug. 13,2012	Aug. 13,2013
3m Semi-anechoic Chamber for Radiation Emissions						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer	Agilent	E7405A	MY45114943	Aug. 13,2012	Aug. 13,2013
2.	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Aug. 13,2012	Aug. 13,2013
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Aug. 13,2012	Aug. 13,2013
4.	Broad-band Horn Antenna	SCHWARZBECK	VULB9163	667	Aug. 13,2012	Aug. 13,2013
5.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	399	Aug. 13,2012	Aug. 13,2013
6.	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Feb .23,2012	Feb .23,2013
7.	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Aug. 13,2012	Aug. 13,2013
8.	10m Coaxial Cable with N- plug	SCHWARZBECK	AK 9515 H	-	Aug. 13,2012	Aug. 13,2013
9.	10m 50 Ohm Coaxial Cable with N-plug	SCHWARZBECK	AK 9513	-	Aug. 13,2012	Aug. 13,2013
10.	Positioning Controller	C&C LAB	CC-C-IF	-	Aug. 13,2012	Aug. 13,2013
11.	Color Monitor	SUNSP0	SP-14C	-	Aug. 13,2012	Aug. 13,2013
Associated Equipment						
1	Computer	lenovo	T4900V	0100640332	-	-
2	LCD	lenovo	9227-AC6	4M029218230 0473	-	-
3	Keyboard	shuangfeiyan	KB-8620D	-	-	-
4	Mouse	shuangfeiyan	OP-220	23-033863069	-	-

6 Conducted Emission Data

Test Requirement:	FCC Part 15 Section 15.107
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class:	Class B
Limit:	66-56 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V between 5MHz & 30MHz The tighter limit applies at the band edges.
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

6.1 E.U.T. Operation

Operating Environment:

Temperature:	25.5 °C
Humidity:	51 % RH
Atmospheric Pressure:	1012 mbar

EUT Operation:

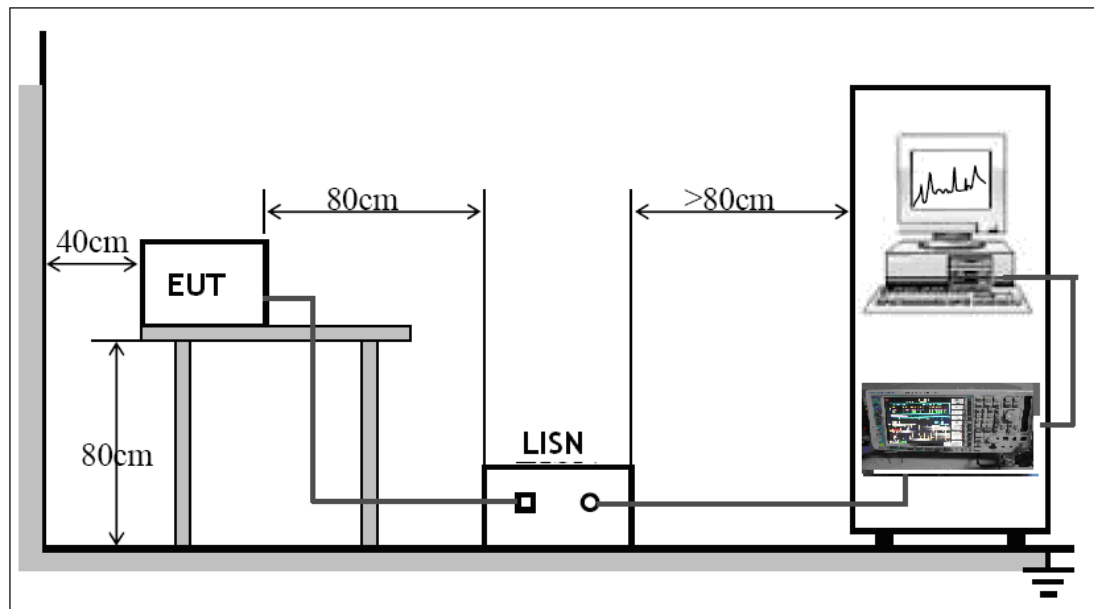
The pre-test was performance on PC connecting mode.

The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.2 EUT Setup

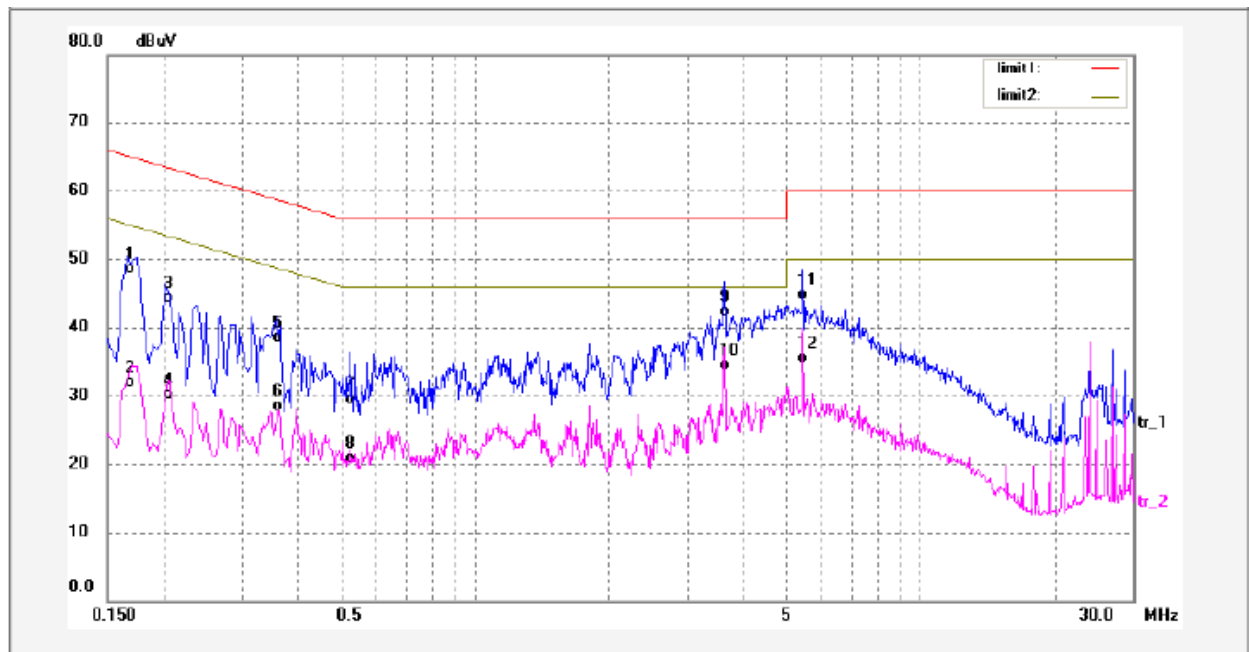
The EUT was placed on the test table in shielding room.



6.3 Conducted Emission Test Result

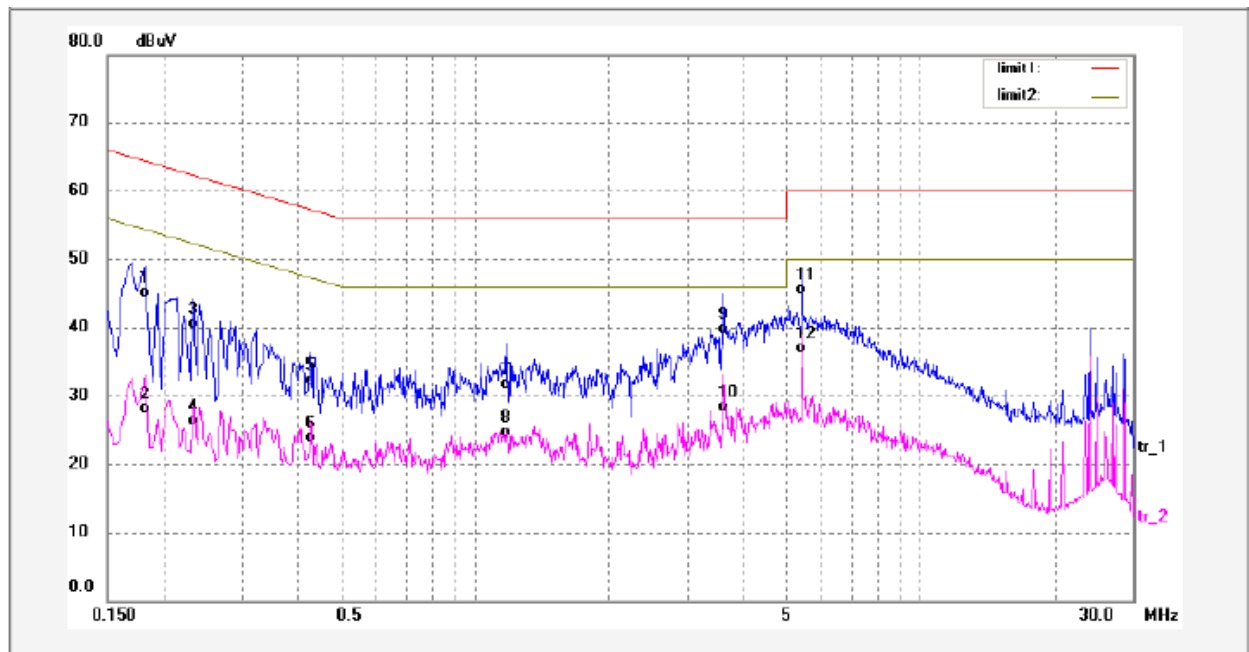
An initial pre-scan was performed on the live and neutral lines.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	0.1660	36.57	11.21	47.78	65.15	-17.37	QP	
2	0.1660	19.99	11.21	31.20	55.15	-23.95	AVG	
3	0.2020	32.19	11.30	43.49	63.52	-20.03	QP	
4	0.2020	18.05	11.30	29.35	53.52	-24.17	AVG	
5	0.3580	26.31	11.31	37.62	58.77	-21.15	QP	
6	0.3580	16.35	11.31	27.66	48.77	-21.11	AVG	
7	0.5260	17.40	11.31	28.71	56.00	-27.29	QP	
8	0.5260	8.76	11.31	20.07	46.00	-25.93	AVG	
9	3.6420	30.28	11.22	41.50	56.00	-14.50	QP	
10	3.6420	22.45	11.22	33.67	46.00	-12.33	AVG	
11	5.4500	32.66	11.24	43.90	60.00	-16.10	QP	
12	5.4500	23.49	11.24	34.73	50.00	-15.27	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	0.1819	33.01	11.25	44.26	64.39	-20.13	QP	
2	0.1819	16.02	11.25	27.27	54.39	-27.12	AVG	
3	0.2340	28.45	11.30	39.75	62.30	-22.55	QP	
4	0.2340	14.28	11.30	25.58	52.30	-26.72	AVG	
5	0.4260	20.16	11.31	31.47	57.33	-25.86	QP	
6	0.4260	11.76	11.31	23.07	47.33	-24.26	AVG	
7	1.1740	19.66	11.18	30.84	56.00	-25.16	QP	
8	1.1740	12.74	11.18	23.92	46.00	-22.08	AVG	
9	3.6380	27.76	11.22	38.98	56.00	-17.02	QP	
10	3.6380	16.37	11.22	27.59	46.00	-18.41	AVG	
11	5.4420	33.46	11.24	44.70	60.00	-15.30	QP	
12	5.4420	24.92	11.24	36.16	50.00	-13.84	AVG	

7 Radiation Emission Data

Test Requirement:	FCC Part 15 Section 15.109
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	30MHz to 1GHz, 1GHz to 6GHz
Measurement Distance:	3m
Class:	Class B
Limit:	40.0 dB μ V/m between 30MHz & 88MHz for Quasi-Peak 43.5 dB μ V/m between 88MHz & 216MHz for Quasi-Peak 46.0 dB μ V/m between 216MHz & 960MHz for Quasi-Peak 54.0 dB μ V/m above 960MHz & 1GHz for Quasi-Peak 54.0 dBuV/m above 1GHz for AV 74.0 dBuV/m above 1GHz for Peak The tighter limit applies at the band edges.
Detector:	Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak if maximised peak within 6dB of limit

7.1 E.U.T. Operation

Operating Environment:

Temperature:	25.5 °C
Humidity:	51 % RH
Atmospheric Pressure:	1012 mbar

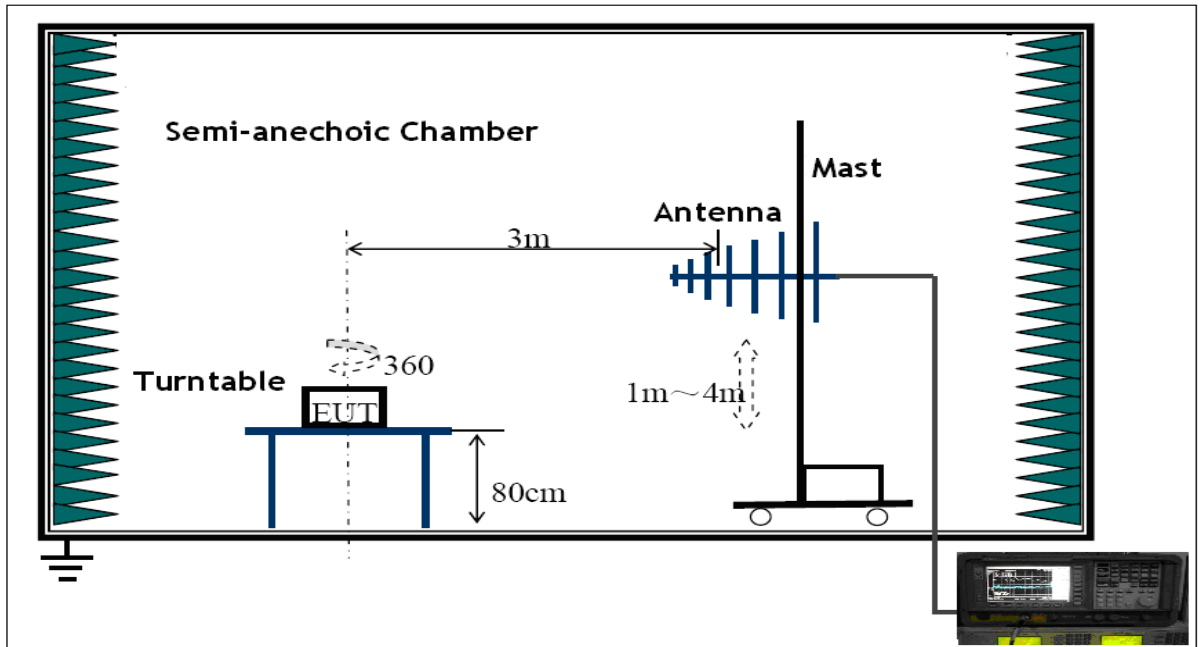
EUT Operation:

The pre-test was performance on PC connecting mode.

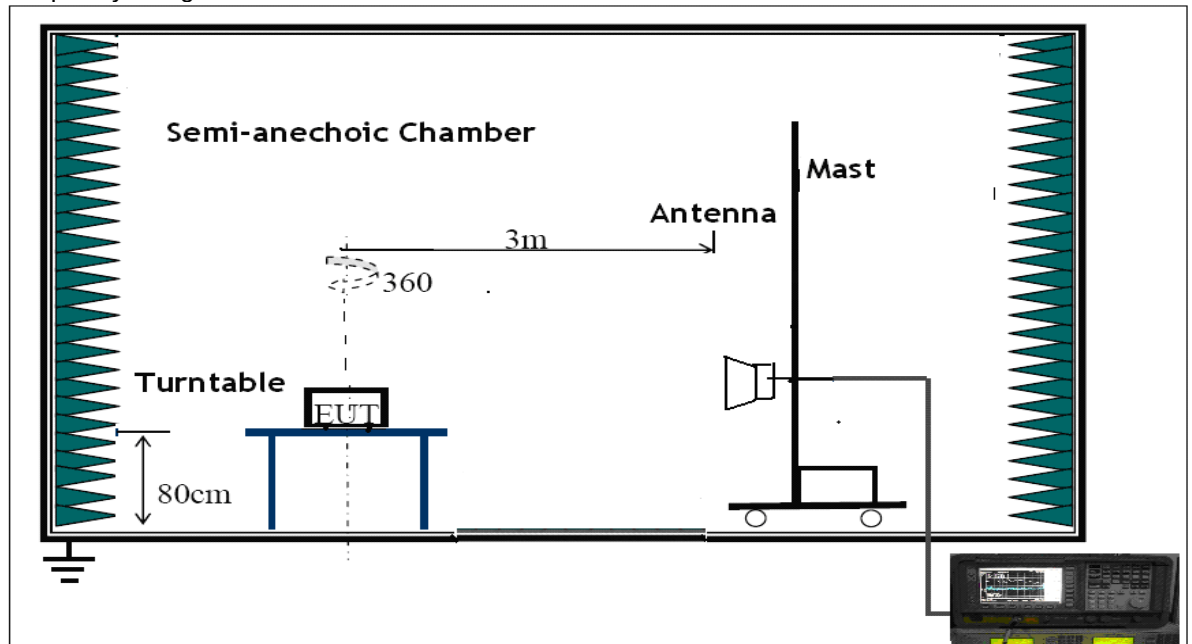
7.2 EUT Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site.

Frequency Range: 30MHz to 1GHz



Frequency Range: 1GHz to 6GHz



7.3 Spectrum Analyzer Setup

According to FCC Part15 B Rules, the system was tested 30 to 6000MHz.

30MHz to 1GHz

Sweep Speed Auto
IF Bandwidth 120 KHz
Video Bandwidth..... 100KHz
Quasi-Peak Adapter Bandwidth..... 120 KHz
Quasi-Peak Adapter Mode..... Normal
Resolution Bandwidth..... 100KHz

1GHz to 6GHz

Sweep Speed Auto
IF Bandwidth 120 KHz
Video Bandwidth..... 3MHz
Quasi-Peak Adapter Bandwidth..... 120 KHz
Quasi-Peak Adapter Mode..... Normal
Resolution Bandwidth..... 1MHz

7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X(normal uses) axis positioning.

7.5 Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

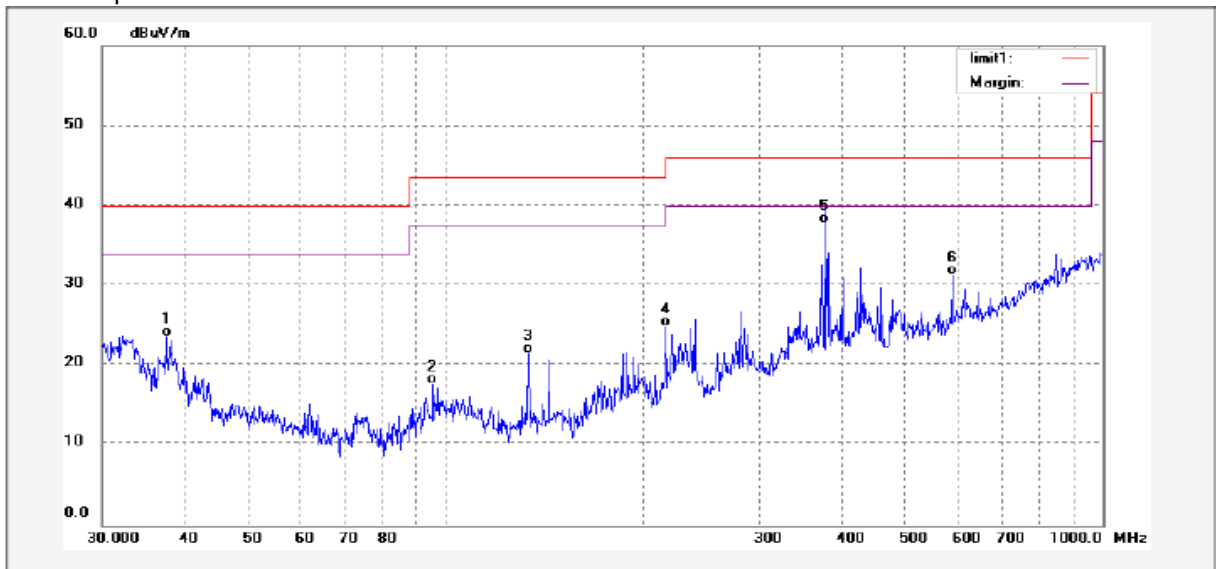
The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB μ V means the emission is 7dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

7.6 Summary of Test Results

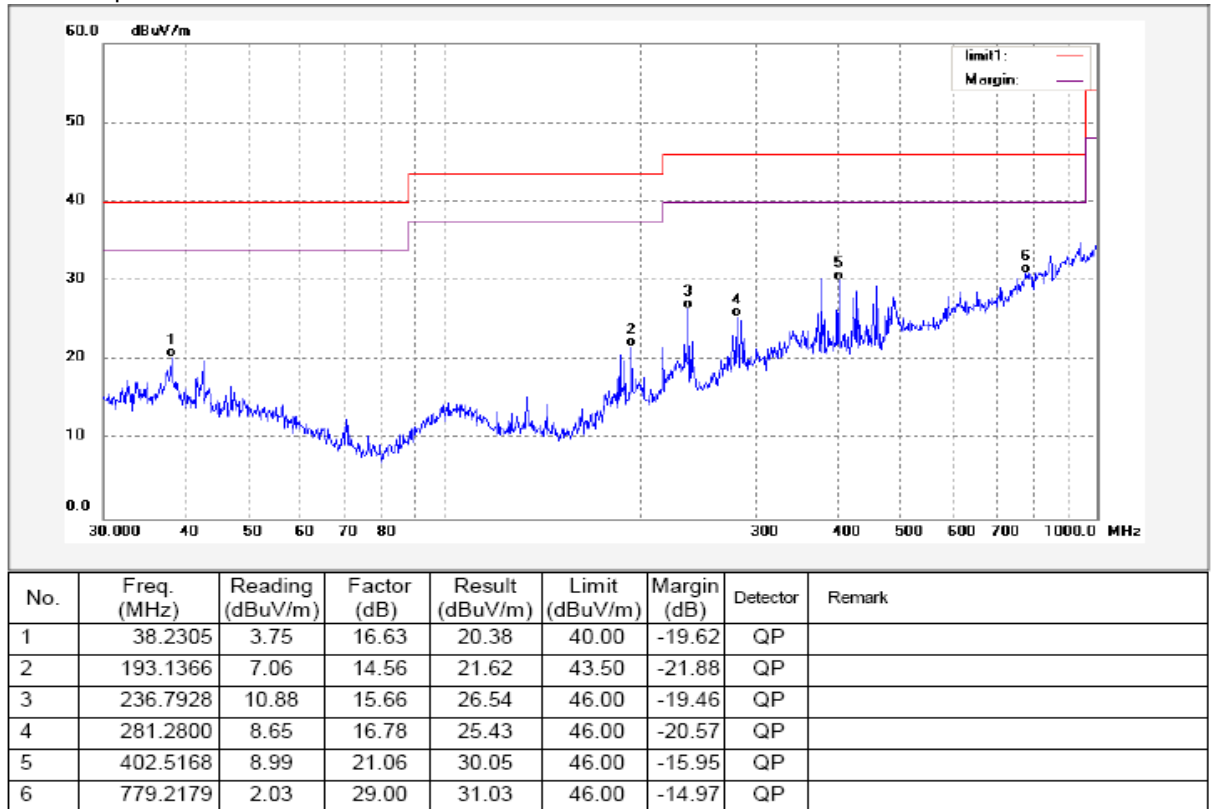
Investigate Frequency: 30MHz to 1000MHz

Antenna polarization: Vertical



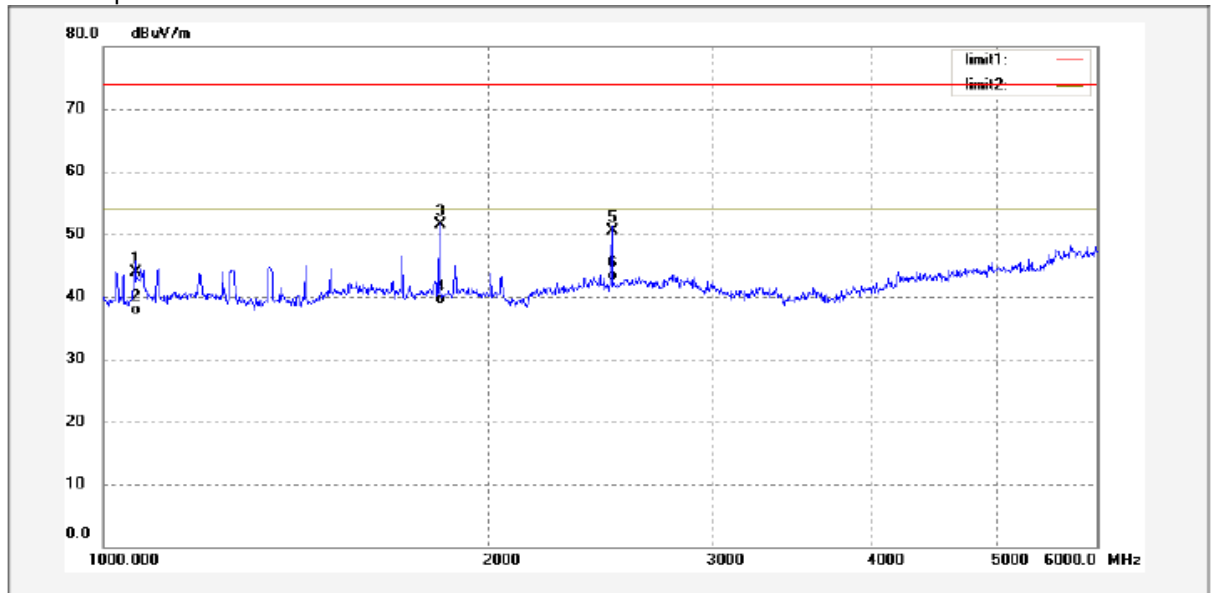
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	37.5648	7.00	16.61	23.61	40.00	-16.39	QP	
2	95.6485	4.34	13.26	17.60	43.50	-25.90	QP	
3	133.5493	9.48	12.08	21.56	43.50	-21.94	QP	
4	216.1197	9.51	15.33	24.84	46.00	-21.16	QP	
5	377.8481	17.58	20.12	37.70	46.00	-8.30	QP	
6	590.3511	6.32	24.96	31.28	46.00	-14.72	QP	

Antenna polarization: Horizontal



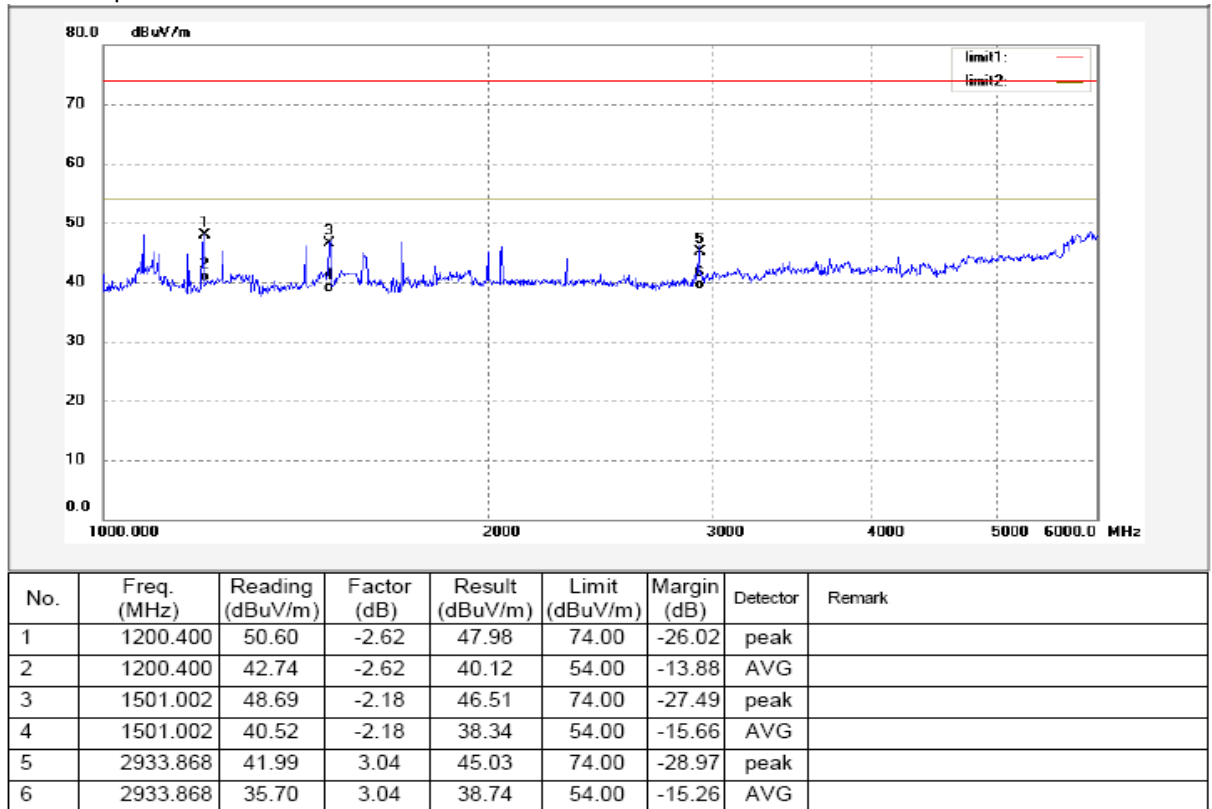
Investigate Frequency: 1GHz to 6GHz

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1060.120	47.38	-3.45	43.93	74.00	-30.07	peak	
2	1060.120	40.50	-3.45	37.05	54.00	-16.95	AVG	
3	1836.673	52.90	-1.35	51.55	74.00	-22.45	peak	
4	1836.673	40.02	-1.35	38.67	54.00	-15.33	AVG	
5	2503.006	48.68	1.85	50.53	74.00	-23.47	peak	
6	2503.006	40.68	1.85	42.53	54.00	-11.47	AVG	

Antenna polarization: Horizontal



8 Photographs – Test Setup

8.1 Photograph – Radiation Emission Test Setup

30MHz to 1GHz



1GHz to 6GHz



8.2 Photograph – Conducted Emission Test Setup



9 Photographs –Constructional Details

Refer to test report No.: WT12106630-F-S-F

==END==