

FCC TEST REPORT

FCC ID : XAJ-DM186

Applicant : Matsunichi Communication Holdings R&D (Shenzhen) Co., Ltd..
Address : 43B/F, International Chamber of Commerce Tower,
FuHua RD3 CBD, FuTian District, Shenzhen, China

Equipment Under Test (EUT) :

Product description : Matsunichi Mobile hard disk encryption

Model No. : DM186

Frequency Range : 125KHz

Standards : FCC Part 15.209 Subpart C

Date of Test : Nov.29,2009

Test Engineer : Olic.huang

Reviewed By : 

Test Result :	PASS *
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* The sample detailed above has been tested to the requirements of Council Directives ANSI C63.4:2003. The test results have been reviewed against the Directives above and found to meet their essential requirements.

1 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (0.009MHz to 1GHz)	FCC PART 15, SUBPART C	ANSI C63.4: 2003	N/A	PASS
Conducted Emission (150KHz to 30MHz)	FCC PART 15, SUBPART C	ANSI C63.4: 2003	N/A	PASS

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2 General Information

2.1 Client Information

Applicant:

Address of Applicant:

Matsunichi Communication Holdings R&D (Shenzhen) Co., Ltd..

43B/F, International Chamber of Commerce Tower,

FuHua RD3 CBD, FuTian District, Shenzhen, China

Manufacturer:

Address of manufacturer:

Goldland Electronics (Shenzhen) Co., Ltd.

Matsunichi Hi-Tech Bld, South of Chuangjing Street, Lanzhu

Road, Longgang Industrial Zone, Shenzhen, China

2.2 General Description of E.U.T.

Product description:

Matsunichi Mobile hard disk encryption

Model No.:

DM186

2.3 Details of E.U.T.

Power Supply:

USB Input

2.4 Description of Support Units

The EUT has been tested as an independent unit.

2.5 Standards Applicable for Testing

The customer requested FCC tests for a Matsunichi Mobile hard disk encryption. The standards used were FCC Part 15 Subpart C. Paragraph 15.209,Paragraph 15.205, Paragraph 15.207, Paragraph 15.31,Paragraph 15.33, Paragraph 15.35

2.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **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.June 24,2008.

- **IC – Registration No.:IC7760A**

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 IC7760A, July 24, 2008.

2.7 Test Location

All Emissions tests were performed at:-

1/F, Fukangtai Building,West Baima Rd.,Songgang Street, Baoan District, Shenzhen
518105,China

3 Equipment Used during Test

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
EMC Analyzer	Agilent/ E7405A	MY451149 43	W2008001	9k-26.5GHz	Aug-09	Aug-10	Wws200 81596	±1dB
Trilog Broadband Antenne 30-3000 MHz	SCHWARZB ECK MESS-ELEKTROM / VULB9163	336	W2008002	30-3000 MHz	Aug-09	Aug-10		±1dB
Broad-band Horn Antenna	SCHWARZB ECK MESS-ELEKTROM / VULB9163	667	W2008003	1-18GHz	Aug-09	Aug-10		f<10 GHz: ±1dB 10GHz<f<18 GHz: ±1.5dB
Broadband Preamplifier	SCHWARZB ECK MESS-ELEKTROM / BBV 9718	9718-148	W2008004	0.5-18GHz	Aug-09	Aug-10		±1.2dB
10m Coaxial Cable with N-male Connectors usable up to 25GHz,	SCHWARZB ECK MESS-ELEKTROM / AK 9515 H	-	-	-	Aug-09	Aug-10		-
10m 50 Ohm Coaxial Cable with N-plug,individ length,usable up to 3(5)GHz, Connector	SCHWARZB ECK MESS-ELEKTROM / AK 9513				Aug-09	Aug-10		
Positioning Controller	C&C LAB/ CC-C-IF				N/A	N/A		
Color Monitor	SUNSPO/ SP-14C				N/A	N/A		
Test Receiver	ROHDE&SC HWARZ/ ESPI	101155	W2005001	9k-3GHz	Aug-09	Aug-10	Wws200 80942	±1dB
EMI Receiver	Beijingkehuan	KH3931		9k-1GHz	Aug-09	Aug-10		
Two-Line V-Network	ROHDE&SC HWARZ/ ENV216	100115	W2005002	50Ω/50μH	Aug-09	Aug-10	Wws200 80941	±10%

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
Absorbing Clamp	ROHDE&SC HWARZ/ MDS-21	100205	W2005003	impandance50 Ω loss : 17 dB	Aug-09	Aug-10	Wws200 80943	±1dB
10m 50 Ohm Coaxial Cable with N-plug,individual length,useable up to 3(5)GHz, Connectors	SCHWARZB ECK MESS-ELEKTROM / AK 9514				Aug-09	Aug-10		
Digital Power Analyzer	Em Test AG/Switzerland/ DPA 500	V07451 03095	W2008012	Power: 2000VA Vol-range: 0-300V Freq_range: 10-80Hz	Aug-09	Aug-10	Wwd200 81185	Voltage distinguish:0.025% Power_freq distinguish:0.02Hz
Power Source	Em Test AG/Switzerland/ ACS 500	V07451 03096	W2008013	Vol-range: 0-300V Power_freq: 10-80Hz				
Electrostatic Discharge Simulator	Em Test AG/Switzerland/DITO	V07451 03094	W2008005	Contact discharge: 500V-10KV Air diacharge: 500V-16.5KV	Aug-09	Aug-10	Wwc200 82400	7.5A current will be changed in V _m =1.5V
RF Generator	TESEQ GmbH/ NSG4070	25781	W2008008	Fraq-range: 9K-1GHz RF voltage: -60 dBm-+10dBm	Aug-09	Aug-10	Wws200 81890	Power_freq distinguish0.1Hz RFeletricity distinguish 0.1 B
CDN M-Type	TESEQ GmbH/ CDN M016	25112	W2008009	Voltage correct factor 9.5 dB	Aug-09	Aug-10	Wwc200 82396	150K-80MHz: ±1dB 80-230MHz:-2-+3dB
EM-Clamp	TESEQ GmbH/ KEMZ 801	25453	W2008010	Freq_range: 0.15-1000 MHz	Aug-09	Aug-10	Wwc200 82397	0.3-400 MHz: ±4dB Other freq: ±5dB
Attenuator 6dB	TESEQ GmbH/ ATN6050	25365			Aug-09	Aug-10	Wws200 81597	

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
All Modules Generator	SCHAFFNER R/6150	34579	W2008006	voltage:200V-4.4KV Pulse current: 100A-2.2KA	Aug-09	Aug-10	Wwc200 82401	voltage: ±10% Pulse current: ±10%
Capacitive Coupling Clamp	SCHAFFNER R/ CDN 8014	25311			Aug-09	Aug-10	Wwc200 82398	-
Signal and Data Line Coupling Network	SCHAFFNER R/ CDN 117	25627	W2008011	1.2/50μS	Aug-09	Aug-10	Wwc200 82399	-
AC Power Supply	TONGYUN/ DTDGC-4				Aug-09	Aug-10	Wws200 80944	-
Exposure Level Tester ELT-400	Narda Safety TEST Solutions/230 4/03	M-0155	w2008022	Test freq range: 1—400kHz	Aug-09	Aug-10	Wwd200 81191	Test uncertainly : 1—120kHz:±1.83%, 120 kHz-400 kHz: ±4.06%
Magnetic Field Probe 100cm ²	Narda Safety TEST Solutions/230 0/90.10	M-1070	w2008021	Test freq range: 1—400kHz				Test uncertainly : 1Hz-10Hz: ±16.2%, 10Hz - 120kHz:±2.2%, 120 kHz-400 kHz: ±4.7%
Active Loop Antenna Charger 9kHz-30MHz	Beijing Dazhi / ZN30900A	-	-	9kHz-30MHz	Aug-09	Aug-10		±1dB
PC	Lenovo	---	w2008028		Aug-09	Aug-10		

4 Test Results

4.1 Conducted Emission Data

Test Requirement:	FCC Part15 Paragraph 15.207
Test Method:	ANSI C63.4:2003
Test Date:	Nov.29,2009
Frequency Range:	150kHz to 30MHz
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
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

4.1.1 E.U.T. Operation

Operating Environment:	
Temperature:	25.5 °C
Humidity:	51 % RH
Atmospheric Pressure:	1012 mbar
EUT Operation :	

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

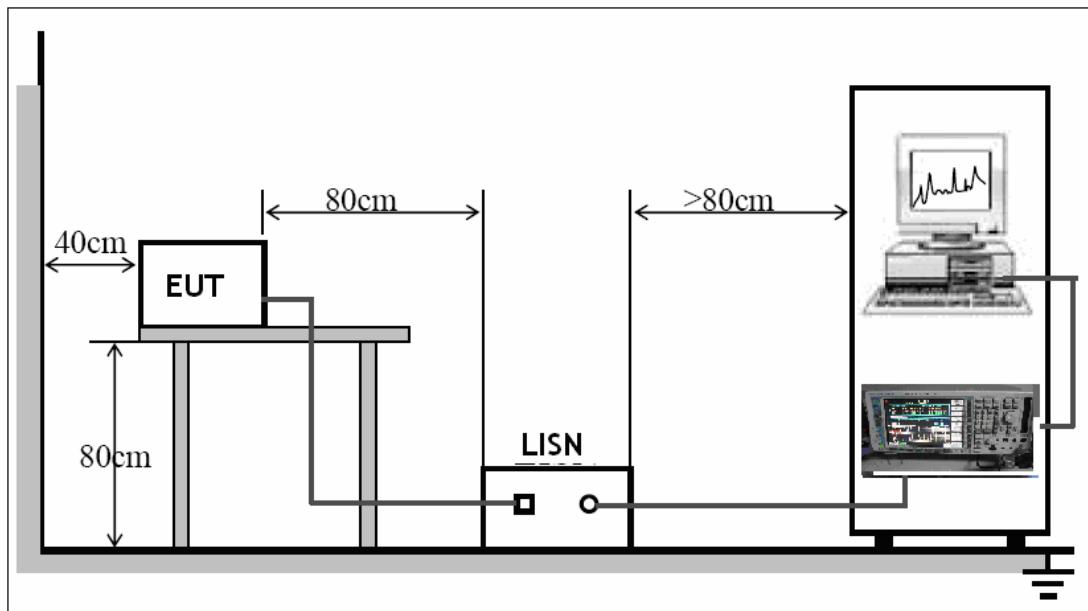
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

4.1.2 Test Procedure

1. The EUT was connected to LISN and placed on a table.
2. The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.
3. 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.

4.1.3 EUT Setup

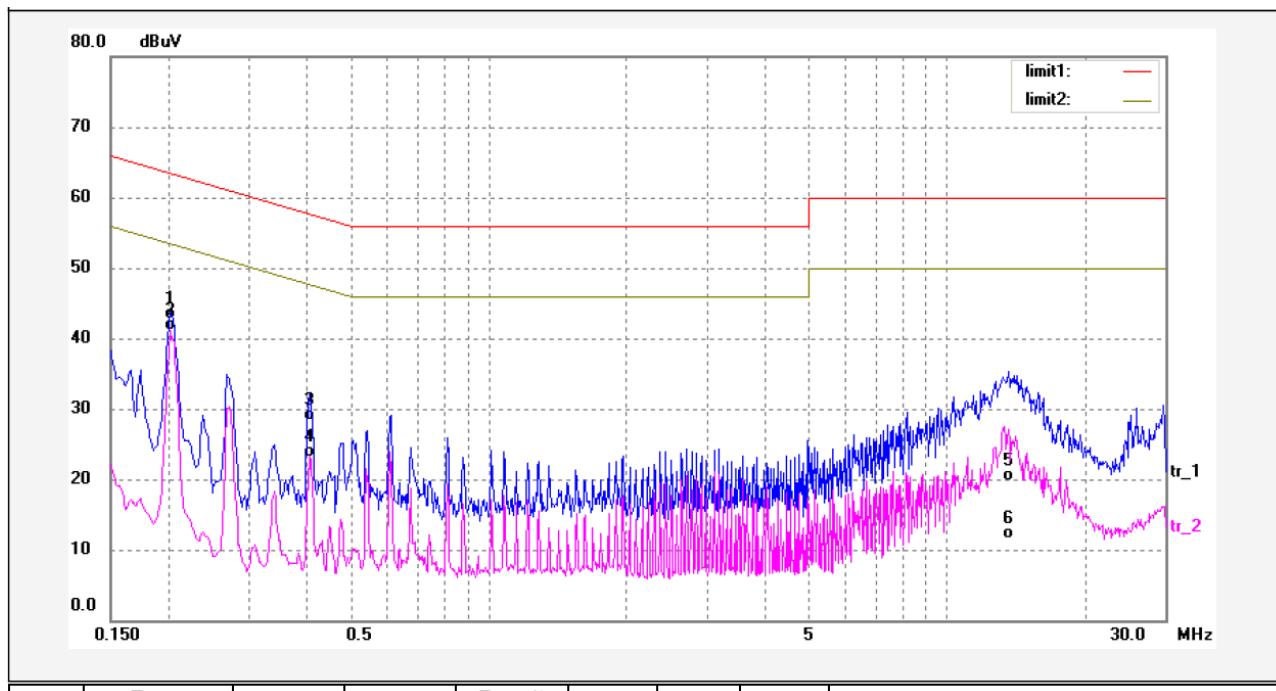
The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC Part15 B 15.107 limits.



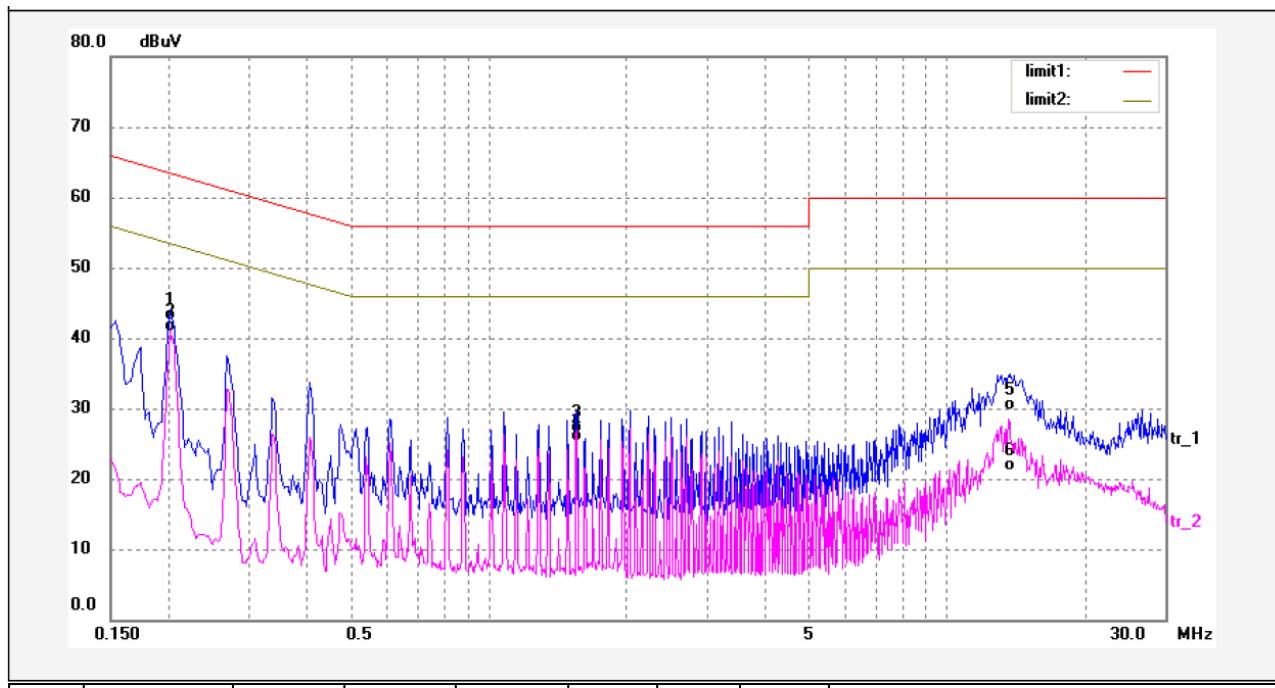
4.1.4 Conducted Emission Test Result

The test data as following:

Live Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2020	32.33	10.35	42.68	63.52	-20.84	QP	
2	0.2020	30.84	10.35	41.19	53.52	-12.33	AVG	
3	0.4100	17.92	10.35	28.27	57.65	-29.38	QP	
4	0.4100	12.82	10.35	23.17	47.65	-24.48	AVG	
5	13.6460	9.22	10.45	19.67	60.00	-40.33	QP	
6	13.6460	1.15	10.45	11.60	50.00	-38.40	AVG	

Neutral Line

No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2020	32.18	10.35	42.53	63.52	-20.99	QP	
2	0.2020	30.52	10.35	40.87	53.52	-12.65	AVG	
3	1.5620	16.12	10.37	26.49	56.00	-29.51	QP	
4	1.5620	14.99	10.37	25.36	46.00	-20.64	AVG	
5	13.8340	19.27	10.45	29.72	60.00	-30.28	QP	
6	13.8340	10.64	10.45	21.09	50.00	-28.91	AVG	

4.1.5 Conducted Emission Test Setup View



4.2 Radiation Emission Data

Test Requirement:	FCC Part15 Paragraph 15.209
Test Method:	Based on ANSI 63.4:2003
Test Date:	Nov.29,2009
Frequency Range:	0.009MHz to 1GHz
Limit:	2400/F(KHz)/m between 0.009&0.490 MHz at 300m 24000/ F(KHz)/m between 0.490&1.705MHz at 30m 30 μ V/m between 1.705&30MHz at 30m 40.0 dB μ V/m between 30MHz & 88MHz at 3m 43.5 dB μ V/m between 88MHz & 216MHz at 3m 46.0 dB μ V/m between 216MHz & 960MHz at 3m 54.0 dB μ V/m zbove 960MHz at 3m
Detector:	Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak if maximised peak within 6dB of limit

4.2.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on ANSI C63.4:2003, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Waltek EMC lab is ± 5.03 dB.

4.2.2 EUT Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC Part15.209 limits.

4.2.3 Spectrum Analyzer Setup

According to FCC Part15.209 Rules, the system was tested 0.009 to 1000MHz.

Start Frequency.....	0.009MHz
Stop Frequency.....	1000 MHz
Sweep Speed Auto	
IF Bandwidth	120 kHz
Video Bandwidth.....	100KHz
Quasi-Peak Adapter Bandwidth	120 kHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	100KHz

4.2.4 Test Procedure

1. The computer uses in the equipment under test for radiated emissions test.
2. The radiation emission should be tested under 3-axes(X,Y,Z) position(X denotes lying on the table,Y denotes side stand and Z denotes vertical stand),After pre-test,It was found that the worse radiation emission was get at the X position.
So the data shown was the X position only.
3. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.
4. All data was recorded in the peak and average detection mode.
5. The EUT was under working mode during the final qualification test and the configuration was used to represent the worst case results.

4.2.5 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. The equation for margin calculation is as follows:

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

4.2.6 Distance Correction for Measurements Below 30 MHz – Part 15.31

Radiated measurements were performed at a distance closer than 300 meters and 30m as required, according to Part 15.209. Therefore a correction factor was applied to account for propagation loss at the specified distance. The propagation loss was determined by using the square of an inverse linear distance extrapolation factor (40dB/decade) according to 15.31. A sample calculation of the distance correction factor is shown below for limits expressed at a 300m measurement distance and a 30m measurement distance.

$$\begin{aligned}\text{Distance correction factor (300m Specified Test Distance)} &= 40 * \text{Log}(\text{Test Distance}/300) \\ &= 40 * \text{Log}(3/300) \\ &= -80 \text{ dB}\end{aligned}$$

$$\begin{aligned}\text{Distance correction factor (30m Specified Test Distance)} &= 40 * \text{Log}(\text{Test Distance}/30) \\ &= 40 * \text{Log}(3/30) \\ &= -40 \text{ dB}\end{aligned}$$

Sample Calculation:

Example Calculation – Average/Quasi-Peak Limit < 30MHz

Measurement Distance 300m @ 125kHz

Limit (dBuV/m) = $20 * \text{Log}(2400/F(\text{kHz}))$ - Distance Correction Factor

Limit (dBuV/m) = $20 * \text{Log}(2400/125) + 80$

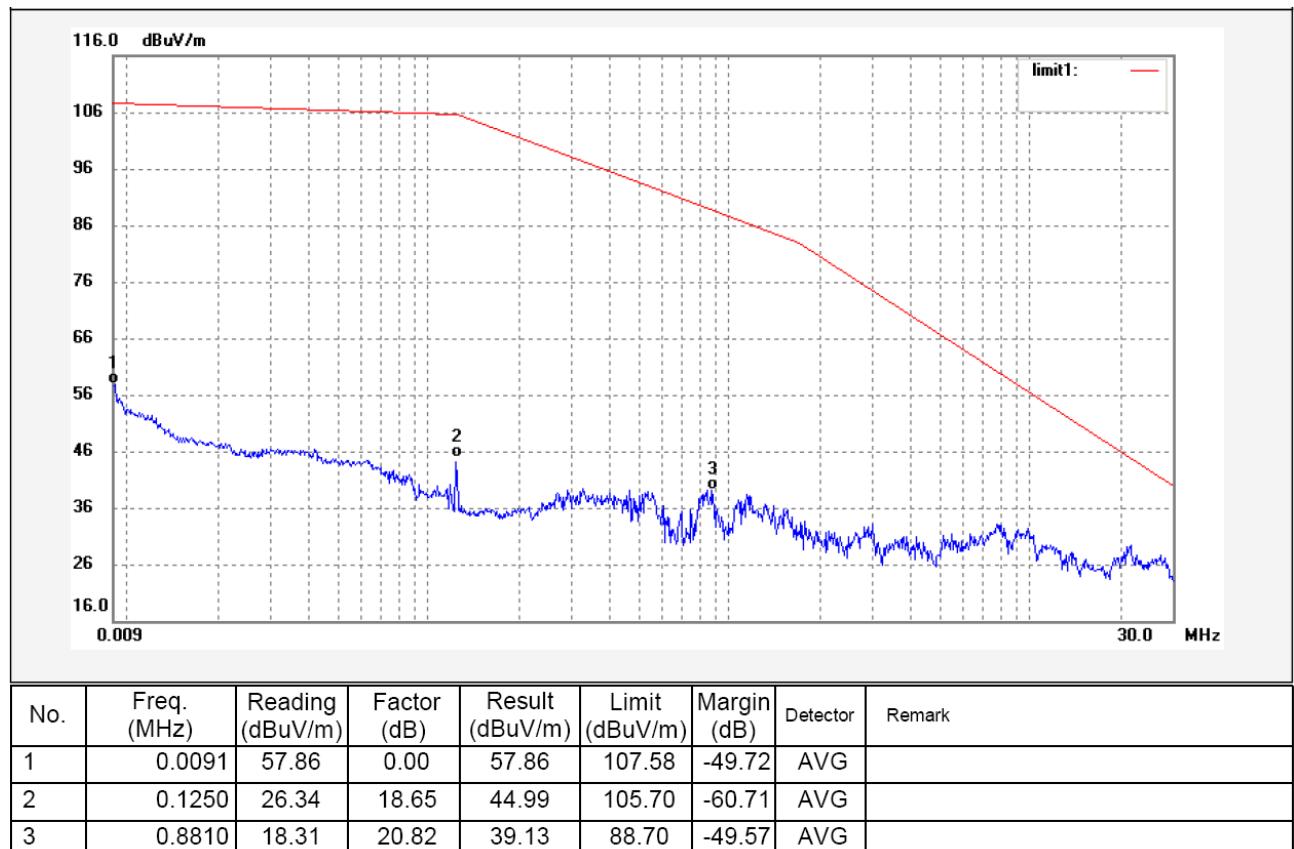
Limit (dBuV/m) = 105.7

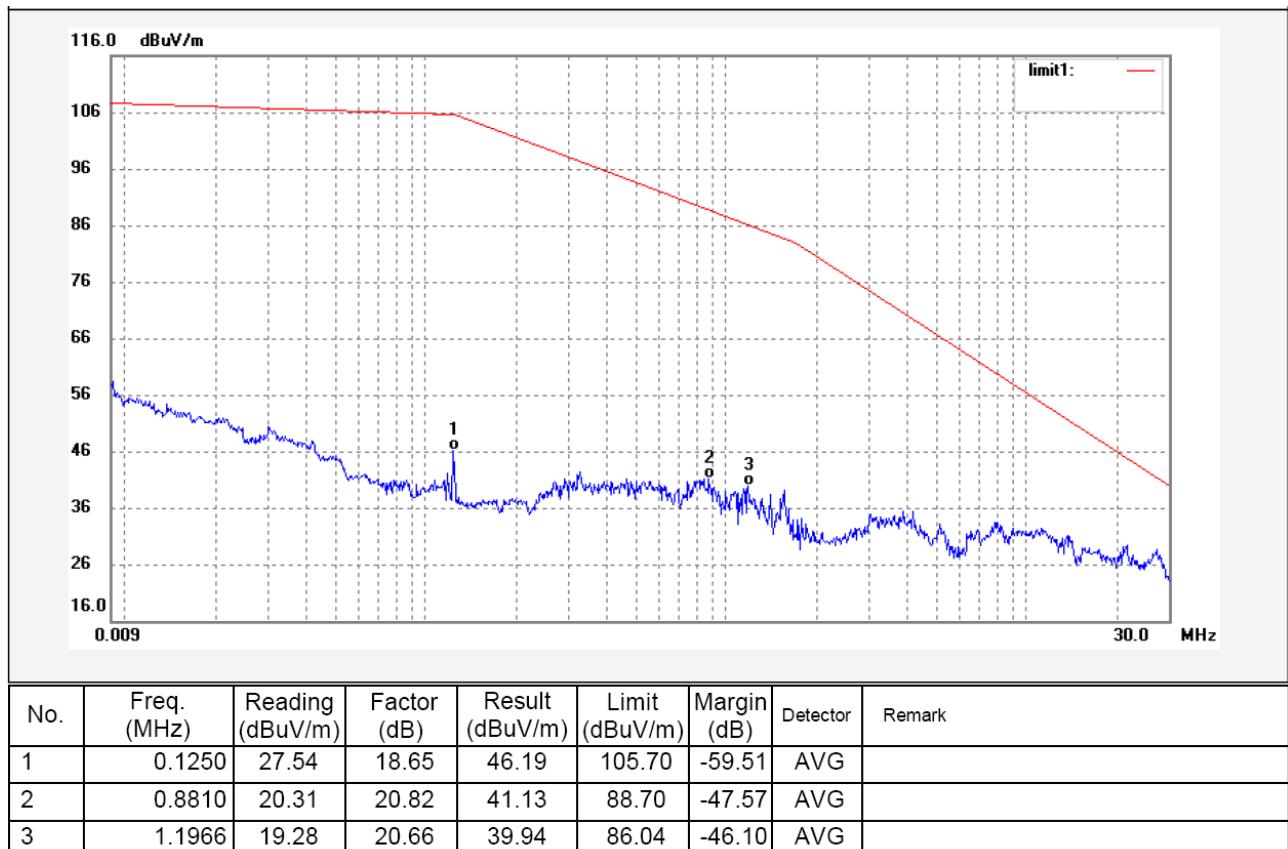
4.2.7 Summary of Test Results

According to the data in this section, the EUT complied with the FCC Part15.209 standards.

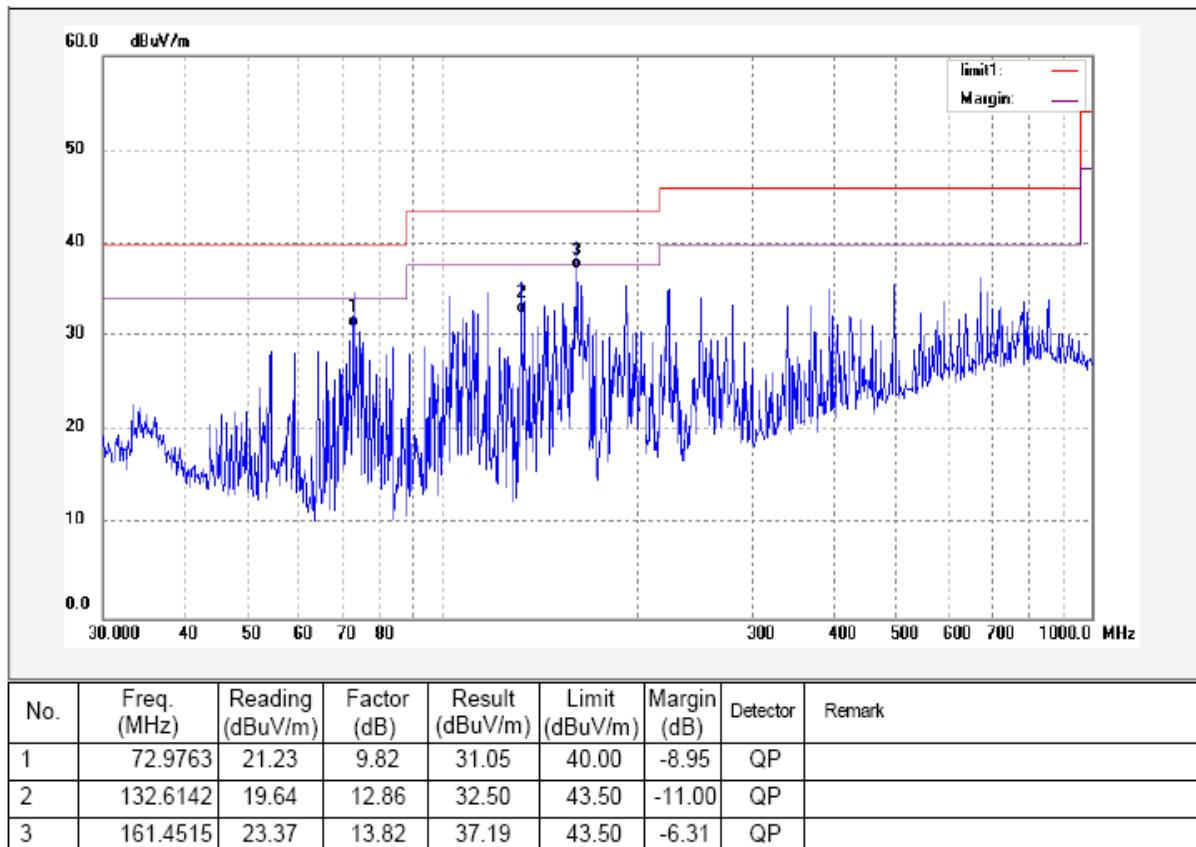
Below 30MHz

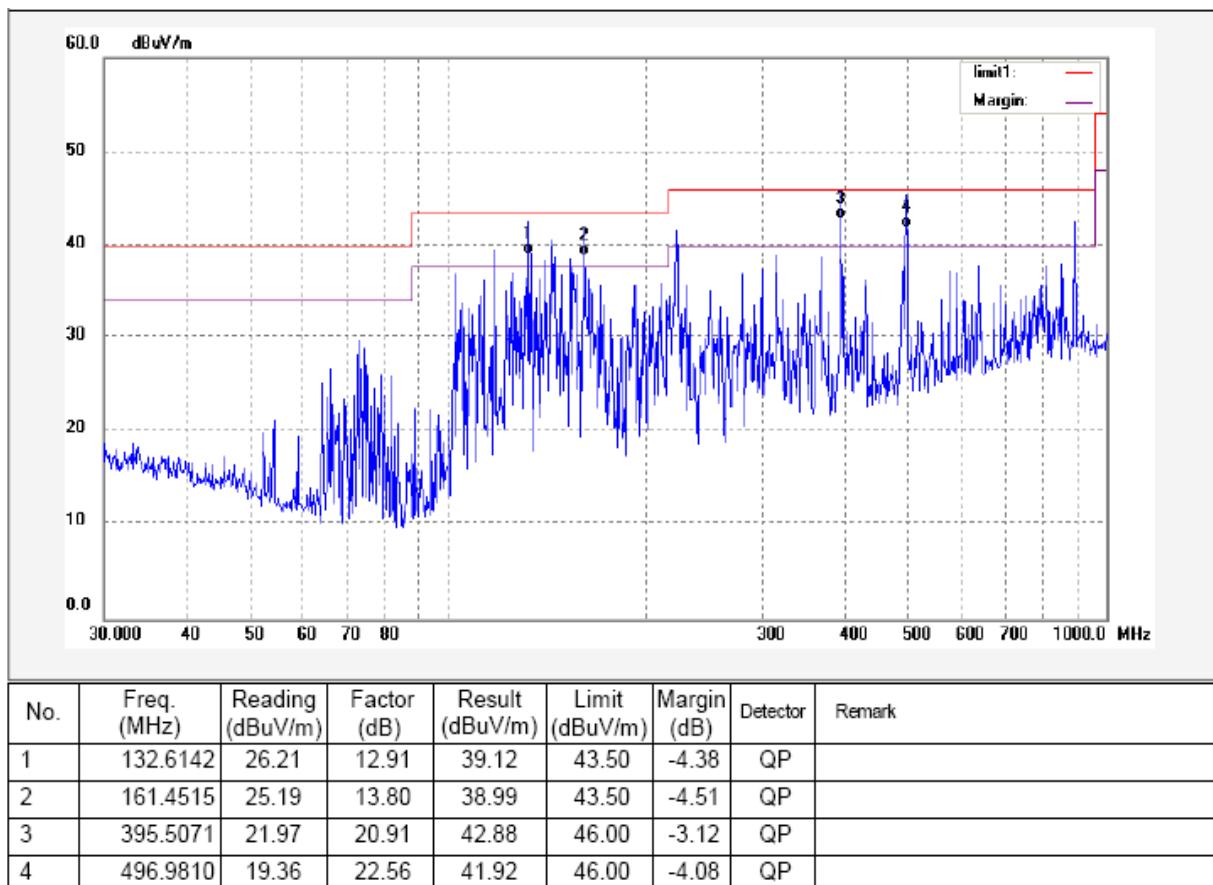
Test Antenna Polarization: **Horizontal**



Test Antenna Polarization: **Vertical**

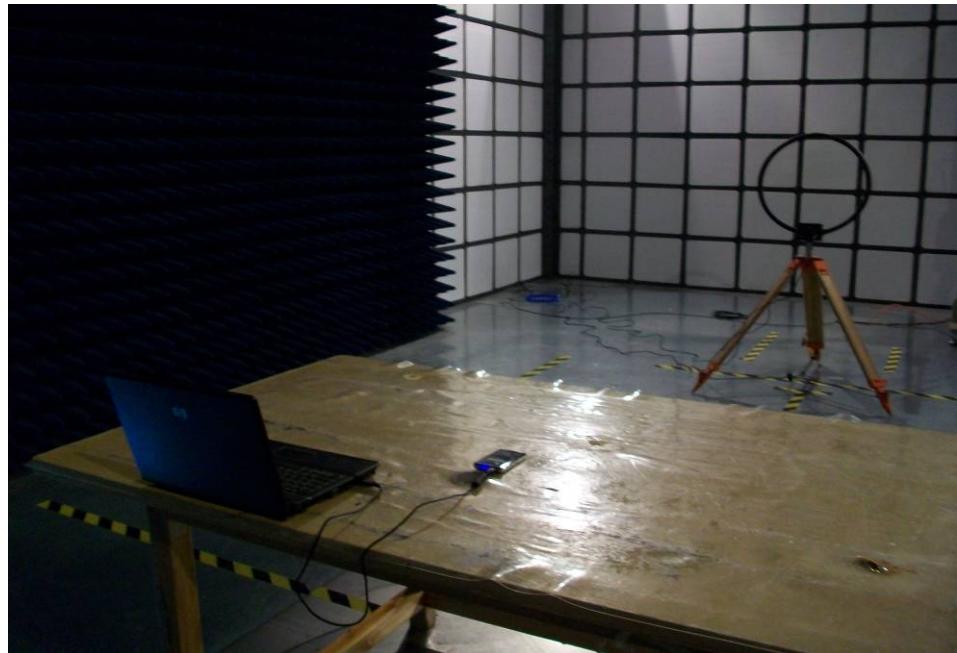
Above 30MHz

Test Antenna Polarization: **Horizontal**

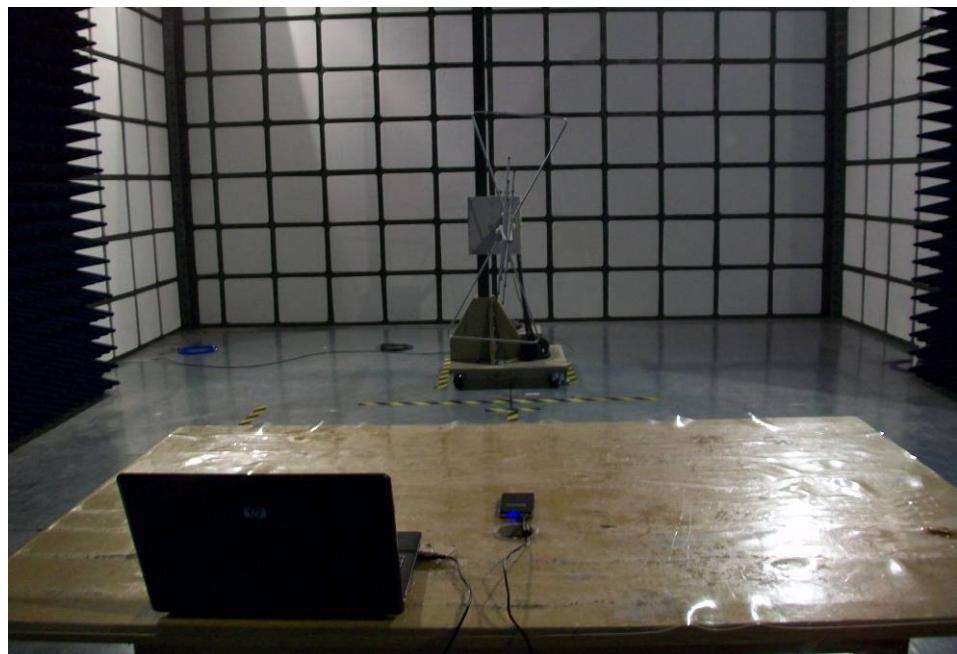
Test Antenna Polarization: **Vertical**

4.2.8 Photographs – Radiation Emission Test Setup

Below 30MHz



Above 30MHz



5 Photographs - Constructional Details

5.1 EUT - Component View



5.2 EUT - Front View



5.3 EUT - Back View



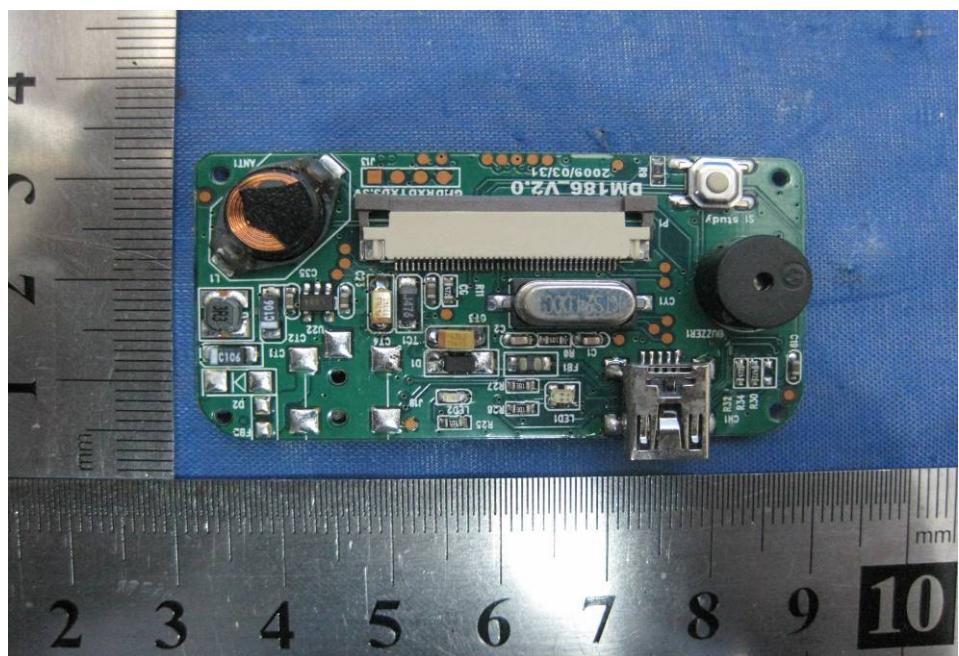
5.4 EUT - Open View



5.5 PCB - Front View



5.6 PCB - Back View



FCC ID Label

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:(1)this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Proposed Label Location on EUT

EUT Top View/ proposed FCC Label Location

