



Date: 2009-11-23
No.: 60.870.9.017.01F

TEST REPORT

Applicant: Atom Industrial Limited.
RM 609, 6/F., Kwong Sang Hong Centre,
No.151-153 Hoi Bun Road, Kwun Tong,
Kowloon, Hong Kong.

Description of Samples: Model name: Wireless Headphone System
Brand name: Nil
Model no.: AWD204 (Receiver)
FCCID: NOY-AWD204RX

Date Samples Received: 2009-11-09

Date Tested: 2009-11-10 to 2009-11-18

Investigation Requested: FCC Part 15 Subpart B

Conclusions: The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks: ----
Checked by:

Approved by:-

Prudence Poon
Project Manager
Telecom department

Victor Kwan
Manager
Telecom department

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1.0 **General Details**

1.1 **Test Laboratory**

Hong Kong Productivity Council
HKPC Building, 78 Tat Chee Avenue, Kowloon Tong,
Hong Kong

Registration Number: 90656

1.2 **Applicant Details** **Applicant**

Atom Industrial Ltd.
RM 609, 6/F., Kwong Sang Hong Centre,
No.151-153 Hoi Bun Road, Kwun Tong,
Kowloon, Hong Kong.

Manufacturer

Atom Industrial Ltd.
RM 609, 6/F., Kwong Sang Hong Centre, No.151-
153 Hoi Bun Road, Kwun Tong, Kowloon, Hong
Kong.

1.3 Equipment Under Test [EUT] Description of Sample

Model Name:	Wireless Headphone System
Manufacturer:	Atom Industrial Ltd.
Brand Name:	Nil
Model Number:	AWD204 (Receiver)
FCCID:	NOY-AWD204RX
Rating:	2.4 VDC (2 x 1.2V "AAA" rechargeable battery)
No. of Channel:	3
Accessories and Auxiliary Equipment:	None
EUT Exercising Software:	None

Description of EUT

The Equipment Under Test (EUT) is a wireless headphone operated at 912 – 914 MHz to receive the audio signal from the associated transmitter.

1.4 Equipment Modification

No modification was conducted on the tested sample by TÜV SÜD Hong Kong Ltd.

1.5 Related Submittal(s) Grants

This is a single application for certification of the receiver.

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2008 and ANSI C63.4: 2003 for FCC Verification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary					
Test Condition	FCC Test Requirement	Class / Severity	Test Result		
			Pass	Failed	N/A
Radiated Emissions, 30 MHz to 10 GHz	Part 15.109	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions on AC, 0.15MHz to 30MHz	Part 15.107	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

3.0 Test Methodology

3.1 Radiated Emission

The sample was placed 0.8m above the ground plane on a standard emission test site *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*On a standard emission test site with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 90656.

3.2 Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$\begin{aligned} \text{FS} &= \text{R} + \text{System Factor} \\ \text{System Factor} &= \text{AF} + \text{CF} + \text{FA} - \text{PA} \end{aligned}$$

Where FS = Net Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer / Test Receiver in dBuV.

AF = Antenna Factor in dB.

CF = Cable Attenuation Factor in dB.

FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

3.3 Conducted Emissions

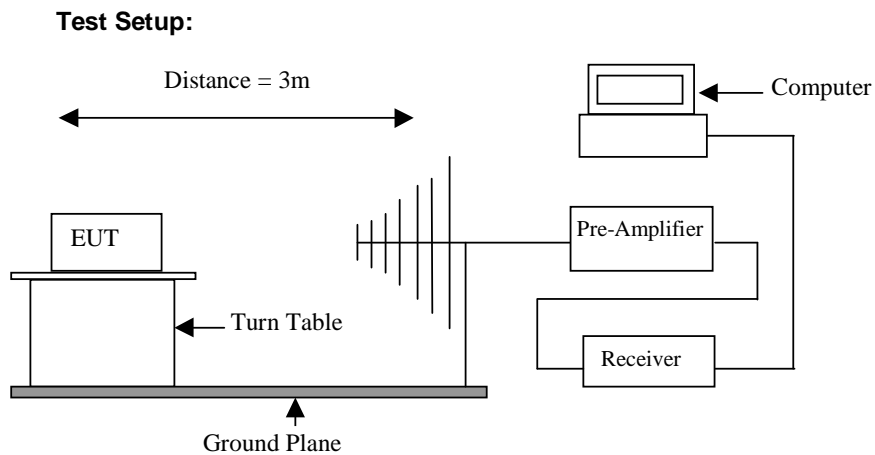
The EUT was placed on a non-metallic table 0.8m above the horizontal metal reference place and 0.4m from a vertical ground plane which is connected to the horizontal metal ground plane. Meanwhile, the AC main of EUT was connected to the distance of 0.8m line impedance stabilization network (LISN) during measurement.

Initial measurements were performed in quasi-peak and average detection modes by the test receiver, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

4.0 Test Results

4.1 Radiated Emissions (30 MHz to 10 GHz)

Test Requirement:	FCC part 15 section 15.109 Class B
Test Method:	ANSI C63.4:2003
Test Date:	2009-11-18
Mode of Operation:	Receiving 1KHz signal from the transmitter.
Detector Function:	Quasi-peak (Below 1000 MHz) Average (Above 1000 MHz)
Measurement BW:	120 kHz (Below 1000 MHz) 1 MHz (Above 1000 MHz)



Results: PASS

Radiated Emissions								
Channel	Value	Emissions Frequency MHz	E-Field Polarity	Reading dB μ V/m	System Factor dB	Field Strength at 3m dB μ V/m	Limit dB μ V/m	Delta to Limit dB μ V/m
1	QP	71.88	V	1.18	8.42	9.60	40.00	-30.40
1	QP	686.60	V	-0.64	22.14	21.50	46.00	-24.50
1	AV	8125.00	V	32.29	4.62	36.90	54.00	-17.10
1	QP	128.52	H	-3.41	11.71	8.30	43.50	-35.20
1	QP	633.20	H	-0.82	21.12	20.30	46.00	-25.70
1	AV	7951.92	H	33.41	3.89	37.30	54.00	-16.70
3	QP	178.48	V	-2.89	13.79	10.90	43.50	-32.60
3	QP	912.00	V	-1.07	23.97	22.90	46.00	-23.10
3	AV	8024.03	V	33.19	4.61	37.80	54.00	-16.20
3	QP	156.72	H	-2.69	13.09	10.40	43.50	-33.10
3	QP	844.72	H	-0.99	23.39	22.40	46.00	-23.60
3	AV	8615.38	H	32.24	4.96	37.20	54.00	-16.80

Note: No further spurious emissions found between 30 MHz and lowest internal used/generated frequency.

Remark:

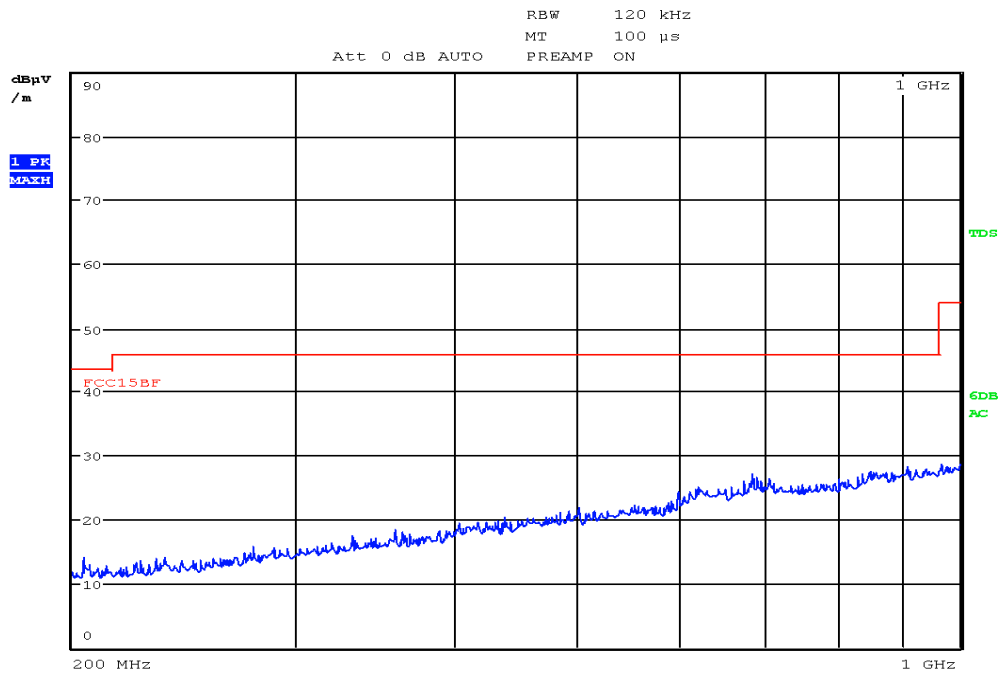
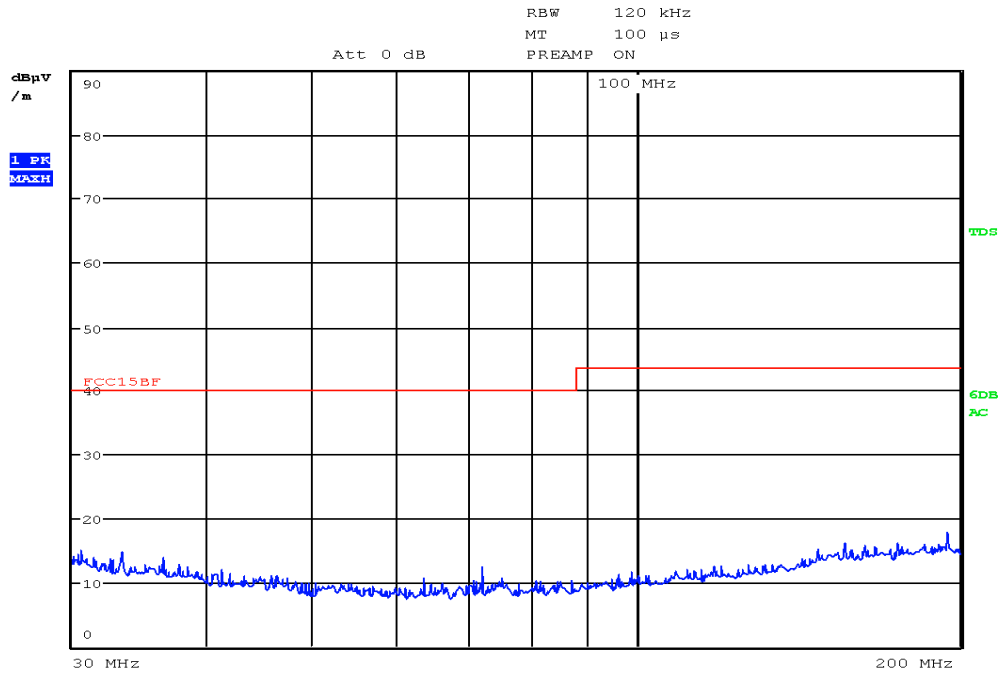
- Calculated measurement uncertainty: ± 5.0 dB.
- Result data graph is attached at the next pages for reference.

Limits for Radiated Emissions [Section 15.109 Class B]:

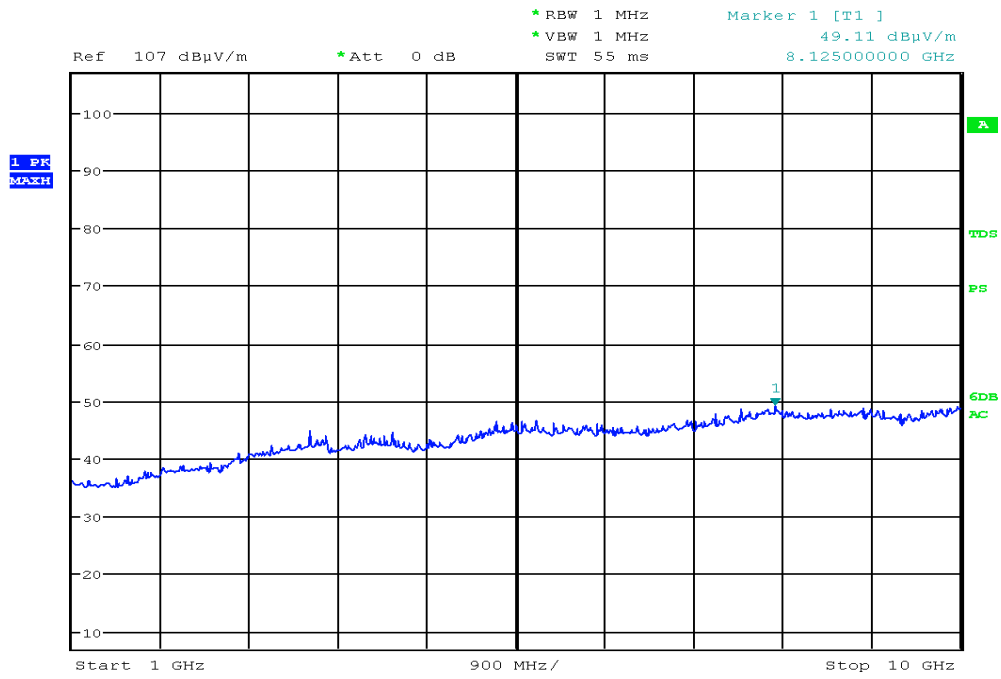
Frequency Range [MHz]	Quasi-Peak Limits [μ V/m]
30-88	100
88-216	150
216-960	200
Above 960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

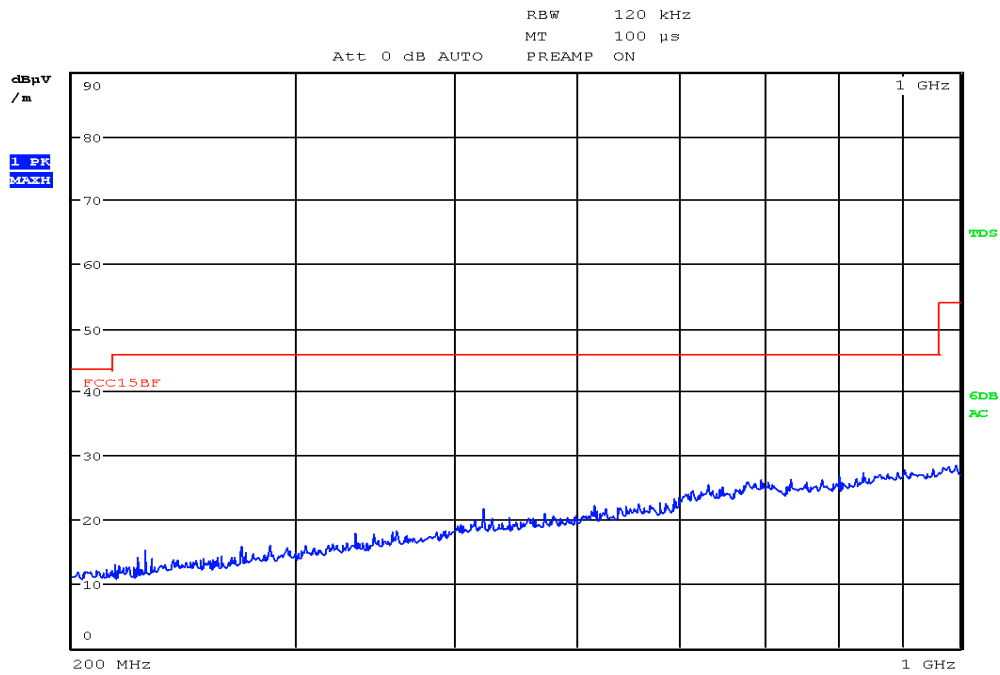
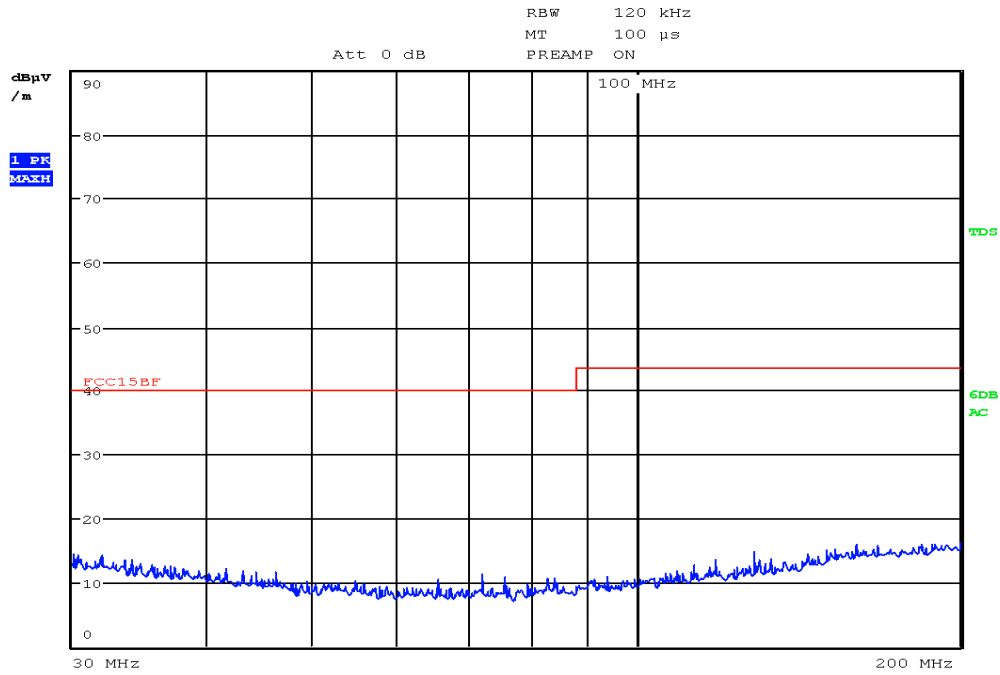
Vertical Channel 1



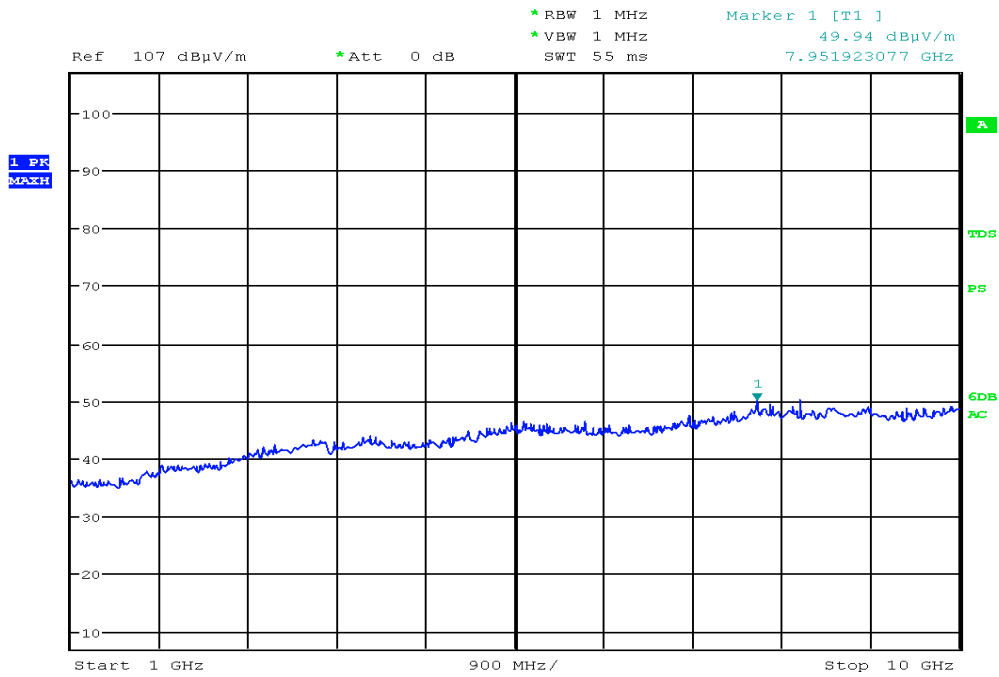
Vertical Channel 1



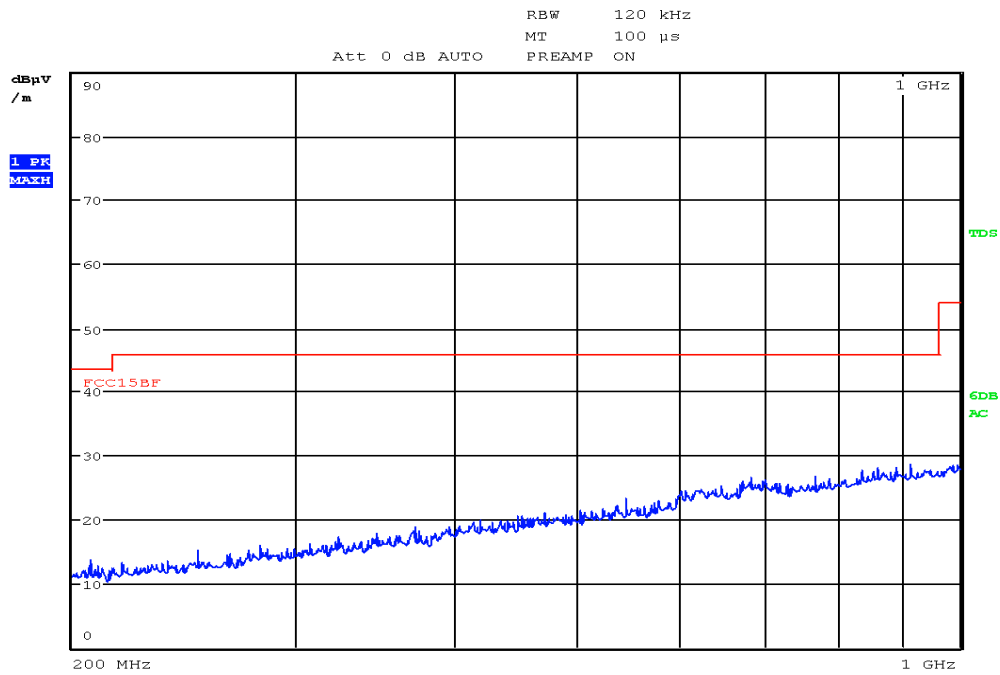
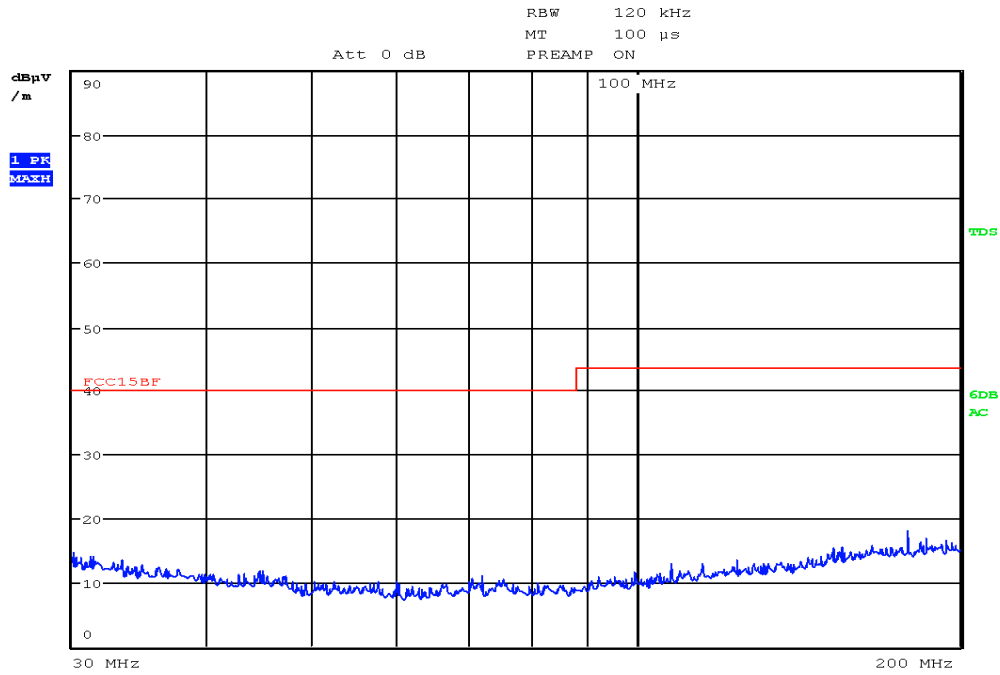
Horizontal Channel 1



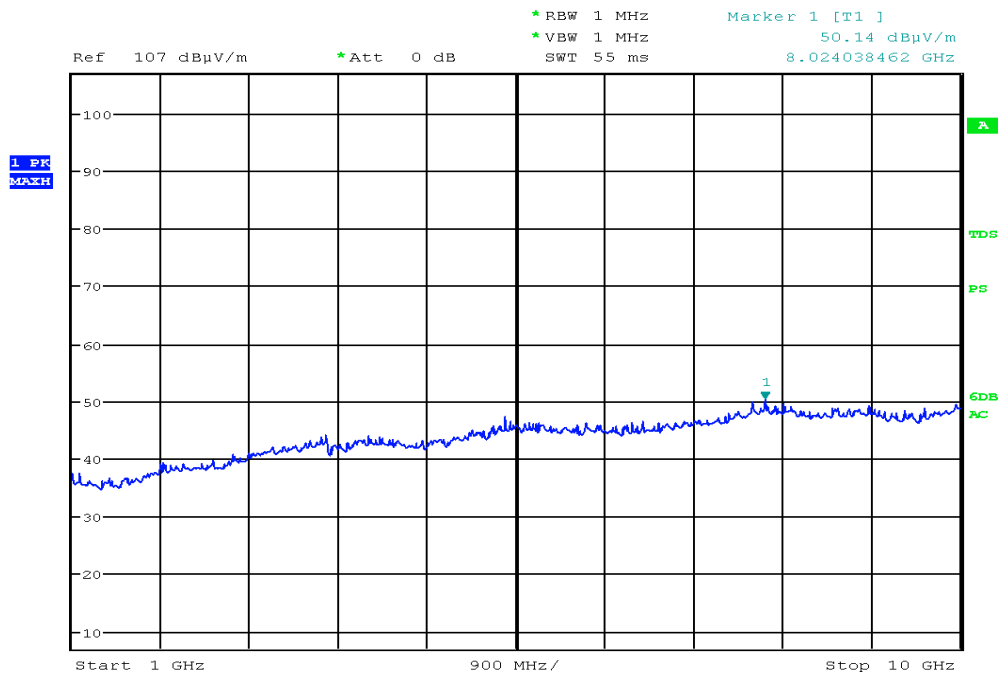
Horizontal Channel 1



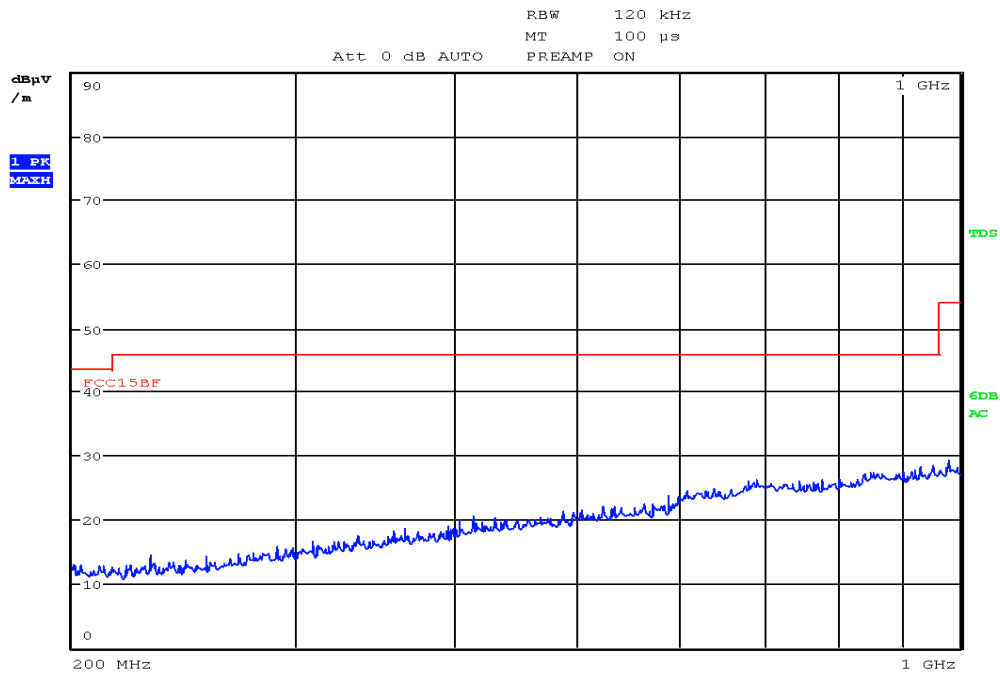
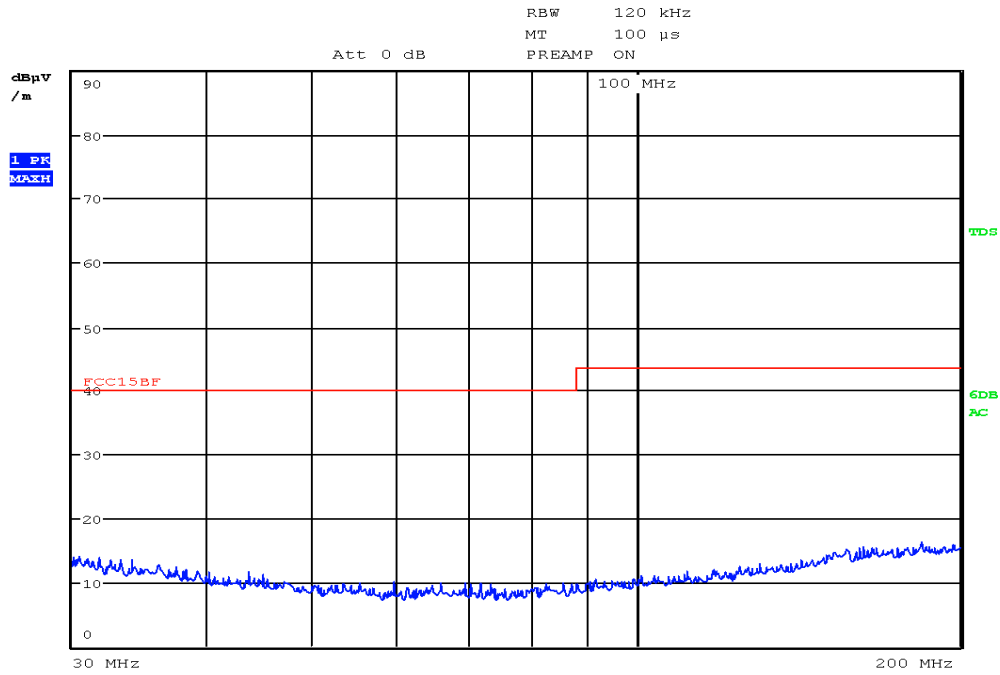
Vertical Channel 3



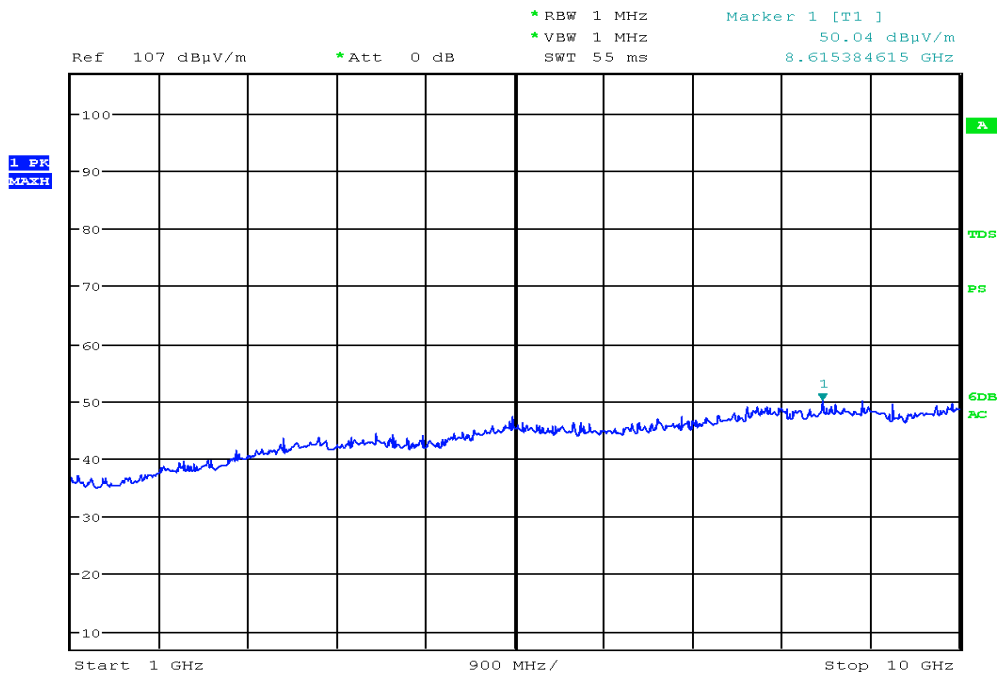
Vertical Channel 3



Horizontal Channel 3



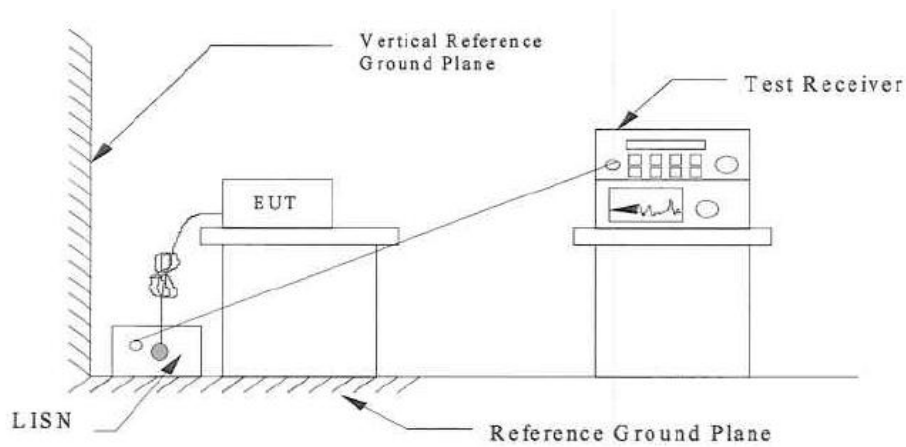
Horizontal Channel 3



4.2 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC part 15 Section 15.107 Class B
Test Method:	ANSI C63.4:2003
Test Date:	2009-11-16
Mode of Operation:	Receiving signal from transmitter with Charging.
Detector Function:	Quasi-peak, average
Measurement BW:	9 kHz

Test Setup:



Results: PASS

Conducted Emissions					
Frequency (MHz)	Detector (QP/AV)	Phase	Result (dBμV)	Limit (dBμV)	Margin
0.150	QP	L	41.40	66.00	-24.60
	AV	L	13.30	56.00	-42.70
0.486	QP	L	34.40	56.20	-21.80
	AV	L	5.20	46.20	-41.00
0.564	QP	L	34.80	56.00	-21.20
	AV	L	5.40	46.00	-40.60
1.182	QP	L	24.50	56.00	-31.50
	AV	L	2.20	46.00	-43.80
10.308	QP	L	17.80	60.00	-42.20
	AV	L	11.60	50.00	-38.40
18.000	QP	L	23.60	60.00	-36.40
	AV	L	22.60	50.00	-27.40
0.150	QP	N	42.90	66.00	-23.10
	AV	N	14.10	56.00	-41.90
0.348	QP	N	36.30	59.00	-22.70
	AV	N	5.40	49.00	-43.60
0.528	QP	N	38.20	56.00	-17.80
	AV	N	7.60	46.00	-38.40
0.996	QP	N	26.10	56.00	-29.90
	AV	N	2.20	46.00	-43.80
10.392	QP	N	17.30	60.00	-42.70
	AV	N	10.40	50.00	-39.60
18.000	QP	N	23.50	60.00	-36.50
	AV	N	22.50	50.00	-27.50

Note : - Result data graph is attached at the next pages for reference.

Remark: - The EUT is connected to AC/DC Adaptor during testing.

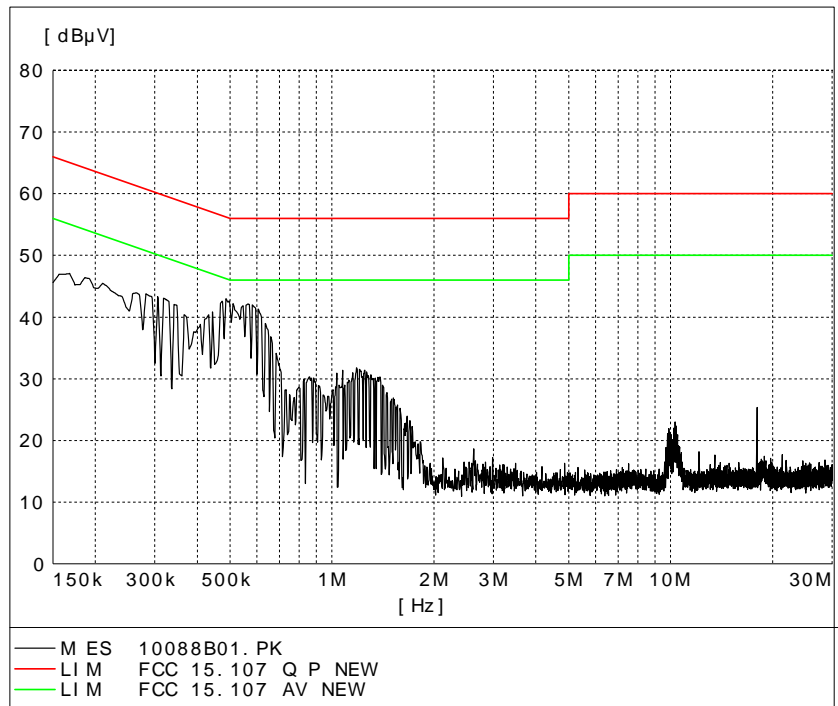
- Calculated measurement uncertainty: $\pm 2.8\text{dB}$

Limits for Conducted Emission [Section 15.107]:

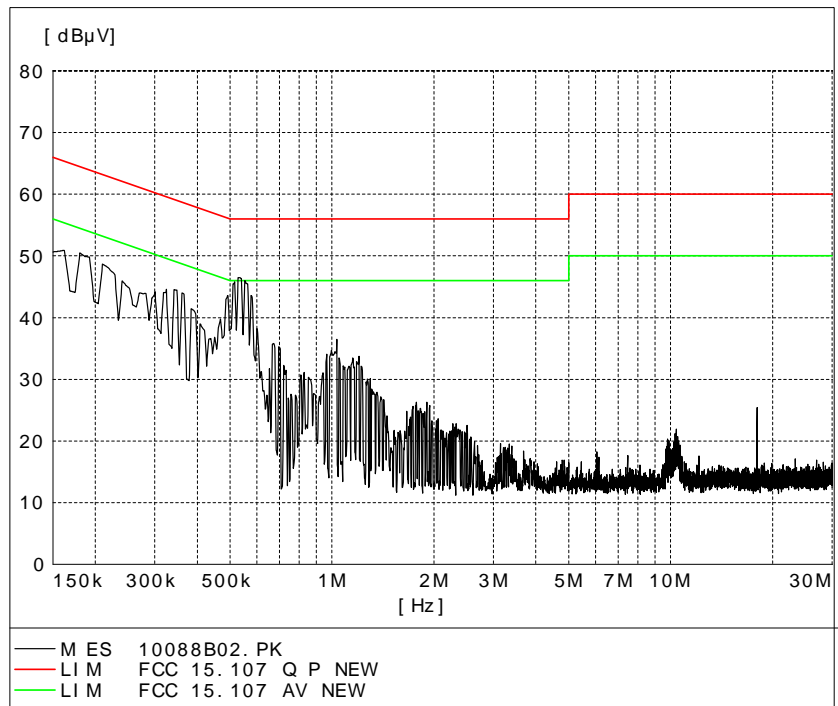
Frequency Range [MHz]	Quasi-Peak Limit [dBμV]	Average Limit [dBμV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Conducted Emissions Result



Phase – L



Phase – N

5.0 List of Measurement Equipment

Radiated Emission

Description	Manufacturer	Model no.	Serial no.	Last cal	CAL due
Semi-anechoic Chamber	Frankonia	N/A	N/A	27 Feb 09	27 Feb 10
Test Receiver	R & S	ESU26	100050	06 Aug 09	06 Aug 10
Bi-conical Antenna	R & S	HK116	841489/015	22 May 08	22 May 10
Log Periodic Antenna	R & S	HL223	841516/017	21 May 08	21 May 10
Horn Antenna	EMCO	3115	9002-3351	27 Feb 08	27 Feb 10
Active Loop Antenna	EMCO	6025	9107-2651	21 May 08	21 May 10
Coaxial Cable 50ohm	Rosenberger	RTK081-05S-10m	LA2-001-10M/002	15-May-09	15 May 10
RF Communications Test Set	HP	8920B	US36492628	12-Aug-09	12 Aug 11

Conducted Emission

Description	Manufacturer	Model no.	Serial no.	Last cal	CAL due
Test Receiver	R & S	ESHS30	847115/005	24 Aug 09	24 Aug 10
LISN	R & S	ESH3-Z5	849876/027	24 Aug 09	24 Aug 10
RF Voltage Probe	Schwarzbeck	TK9416	N/A	13 Feb 09	13 Feb 10
Double Shield	Radiall	RG142	N/A	05 Jun -09	05 Jun 10
RF Communications Test Set	HP	8920B	US36492628	12 Aug 09	12 Aug 11

Remarks:

CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined