



Date: 2009-04-21
No.: 60.870.9.007.01F

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: 900MHz Indoor Speaker AW880
Brand name: Nil
Model no.: AW880RX
FCCID: NOY-AW880RX

Date Samples Received: 2009-04-03

Date Tested: 2009-04-06 to 2009-04-17

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:	900MHz Indoor Speaker AW880
Manufacturer:	Atom Industrial Ltd.
Brand Name:	Nil
Model Number:	AW880RX
FCCID:	NOY-AW880RX
Rating:	18.0 Vd.c. (AC/DC Adaptor)
No. of Channel:	3
Accessories and Auxiliary Equipment:	None
EUT Exercising Software:	None

Description of EUT

The Equipment Under Test (EUT) is a wireless speaker 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

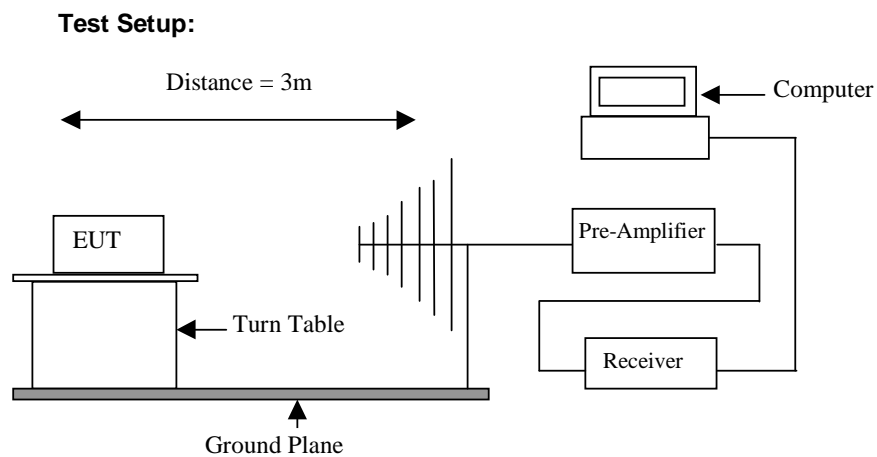
The EUT was placed on a non-metallic table 0.8m above the horizontal metal reference place and 0.4m from a vertical ground plane which is connected to the horizontal metal ground plane. Meanwhile, the AC main of EUT was connected to the distance of 0.8m line impedance stabilization network (LISN) during 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:	2009-04-14
Mode of Operation:	Receiving 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	45.630	V	-0.15	10.55	10.40	40.00	-29.60
1	QP	763.040	V	-1.25	23.05	21.80	46.00	-24.20
1	AV	2052.880	V	31.34	-4.54	26.80	54.00	-27.20
1	AV	3480.760	V	31.06	-0.16	30.90	54.00	-23.10
1	QP	190.620	H	-2.70	14.80	12.10	43.50	-31.40
1	QP	891.050	H	-1.20	25.10	23.90	46.00	-22.10
1	AV	3134.610	H	31.17	-1.07	30.10	54.00	-23.90
1	AV	4793.260	H	29.64	2.36	32.00	54.00	-22.00
3	QP	42.300	V	-0.60	11.00	10.40	40.00	-29.60
3	QP	598.970	V	-1.87	21.07	19.20	46.00	-26.80
3	AV	5211.530	V	30.49	3.11	33.60	54.00	-20.40
3	QP	55.320	H	-3.85	9.35	5.50	40.00	-34.50
3	QP	810.920	H	-1.20	23.70	22.50	46.00	-23.50
3	AV	2932.690	H	31.06	-1.76	29.30	54.00	-24.70
3	AV	5644.230	H	31.60	3.50	35.10	54.00	-18.90

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

Remark:

- Calculated measurement uncertainty: ± 5.0 dB

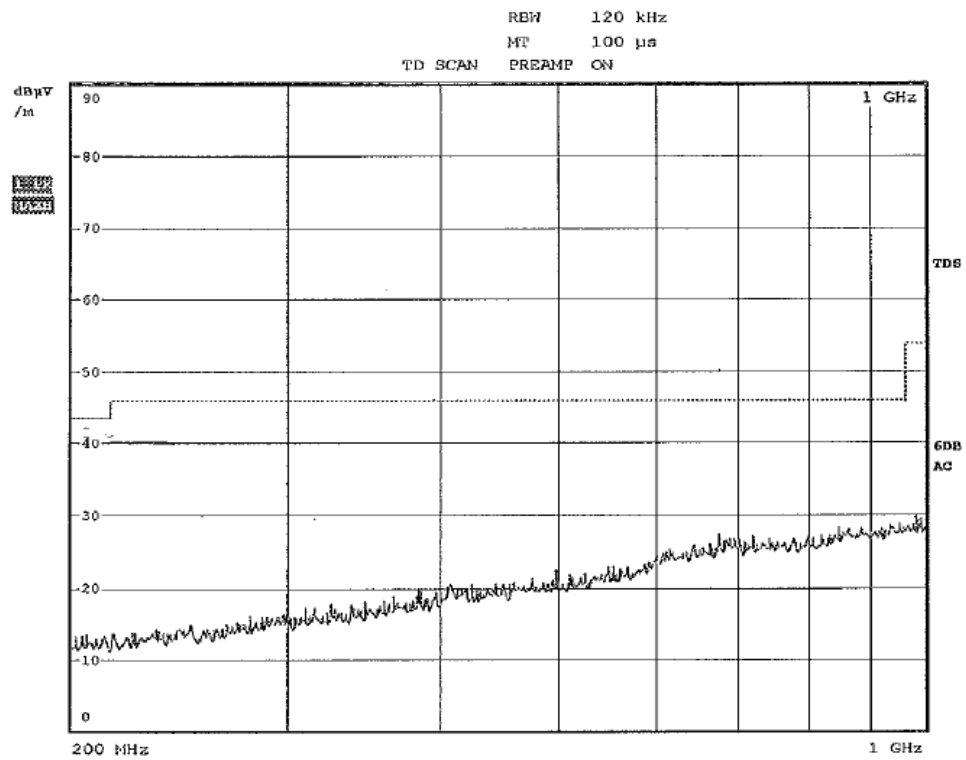
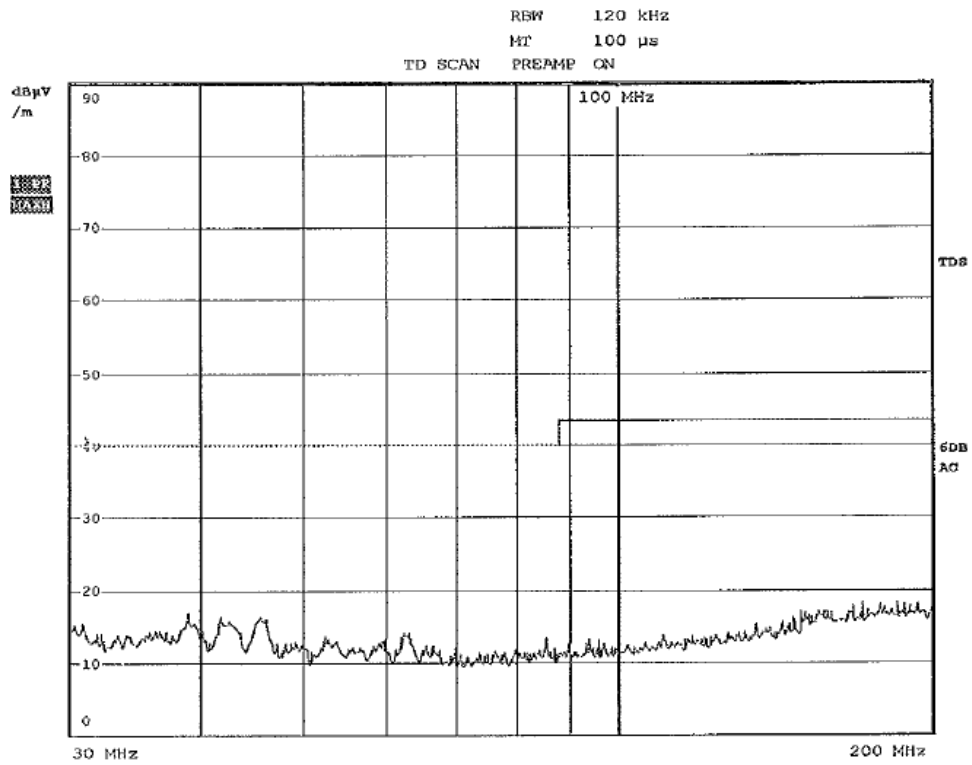
- Result data graph is attached at the next pages for reference.

Limits for Radiated Emissions [Section 15.109 Class B]:

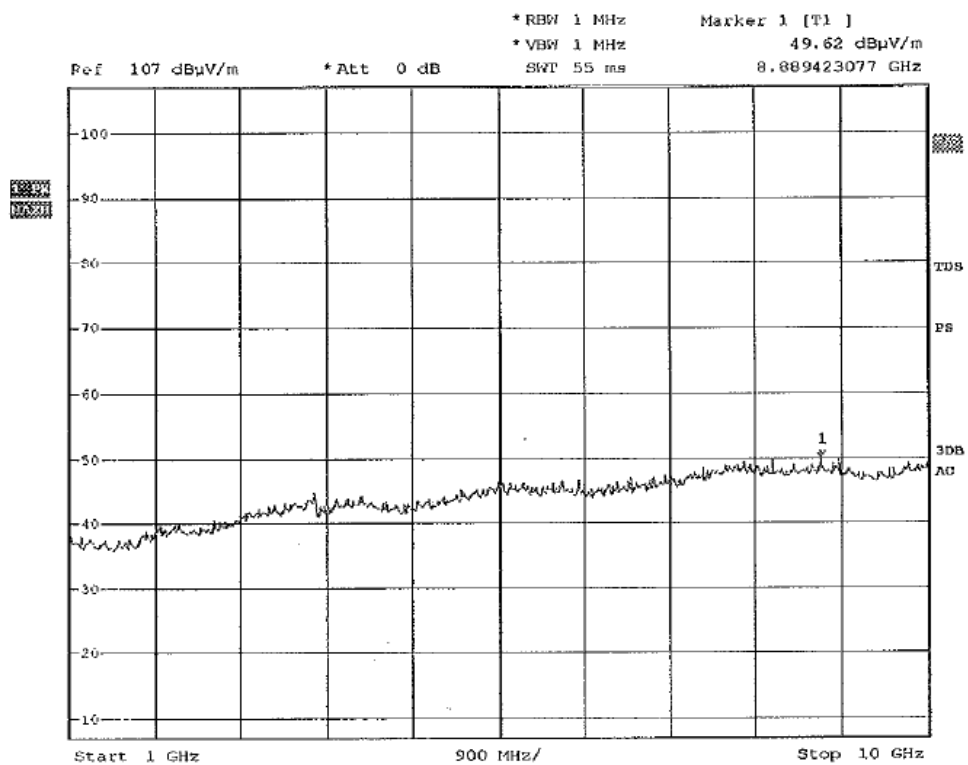
Frequency Range [MHz]	Quasi-Peak Limits [μ V/m]
30-88	100
88-216	150
216-960	200
Above 960	500

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.

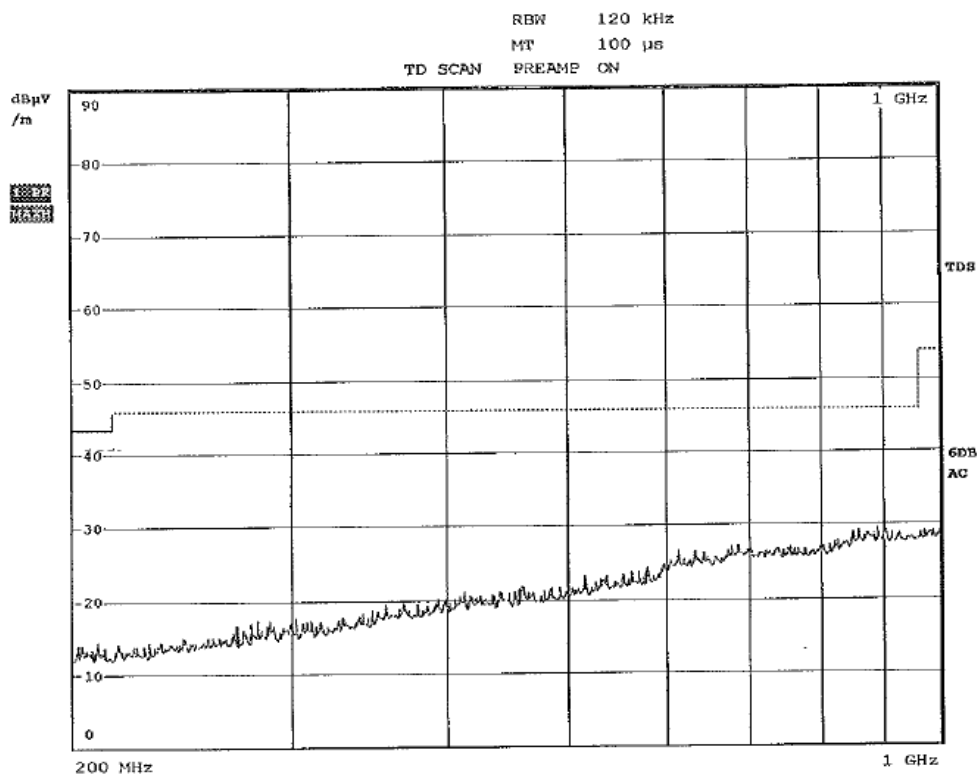
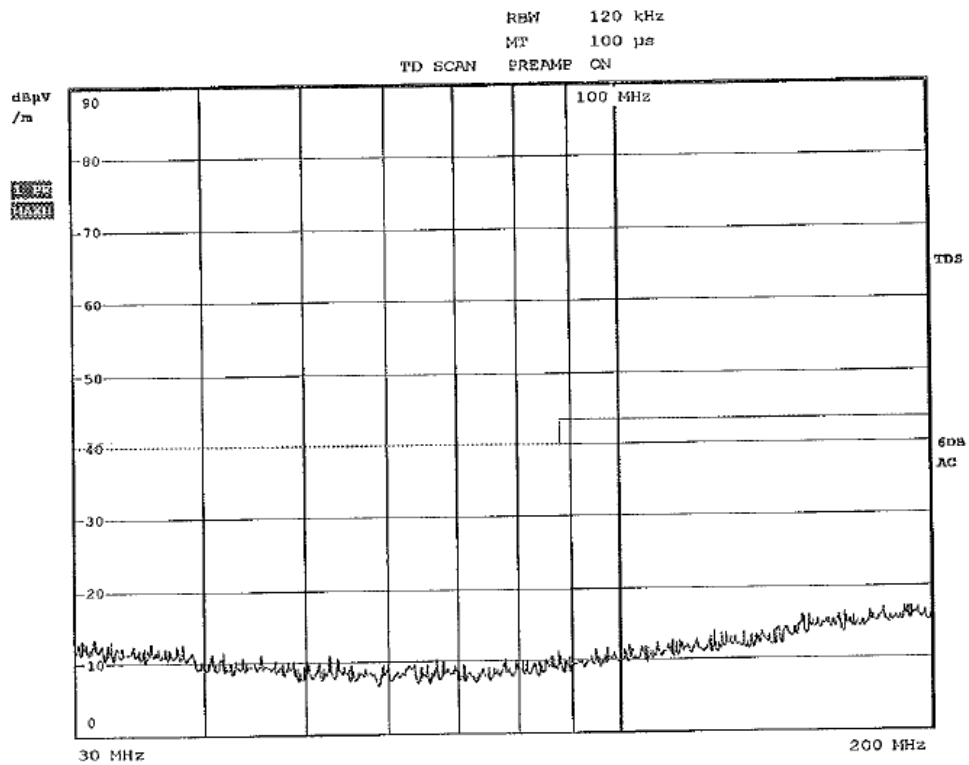
Vertical Channel 1



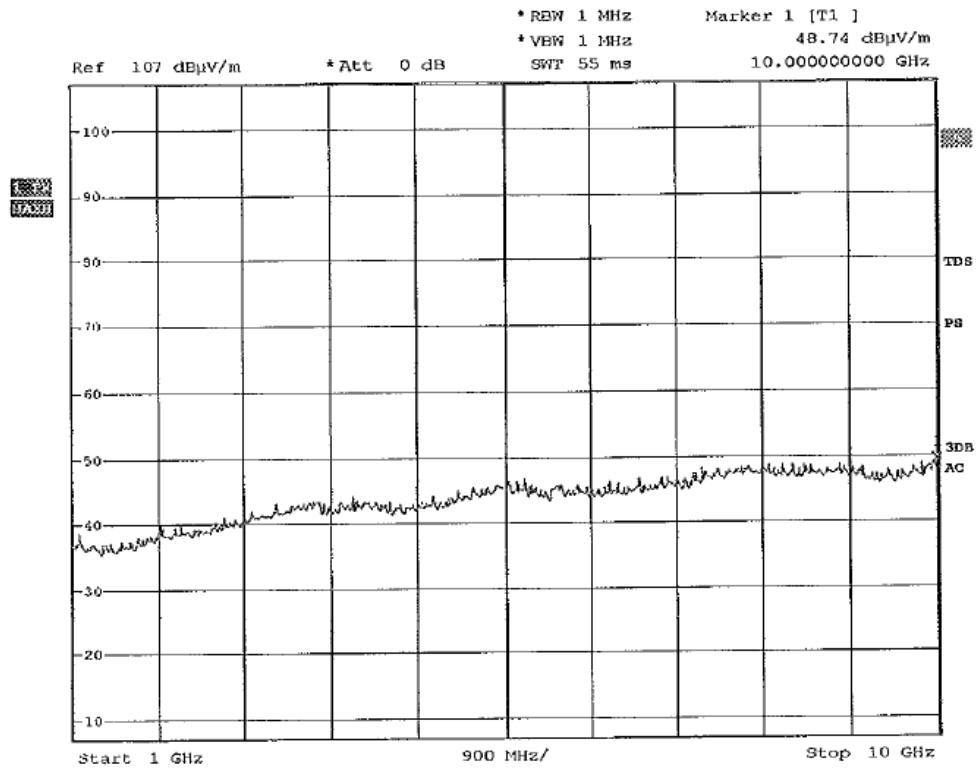
Vertical Channel 1



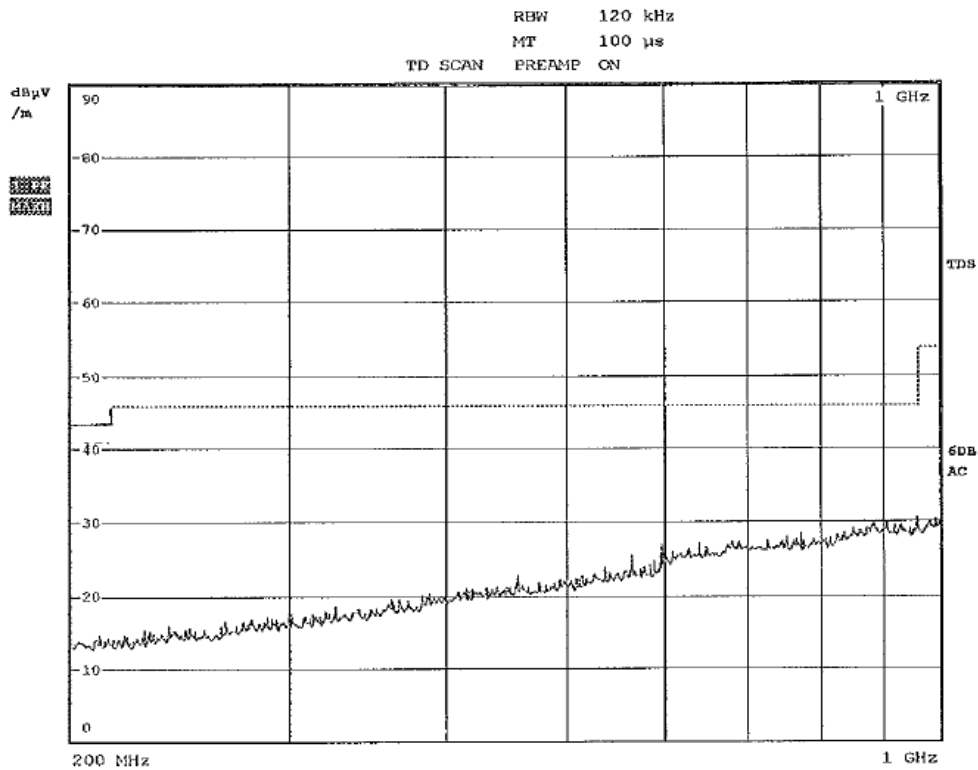
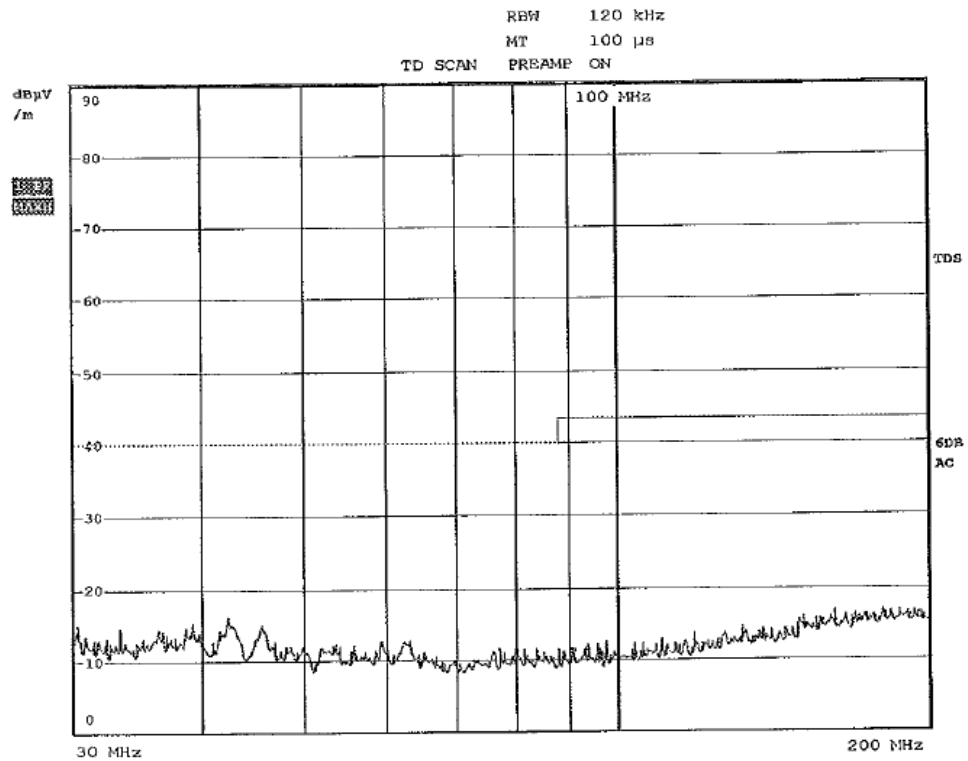
Horizontal Channel 1



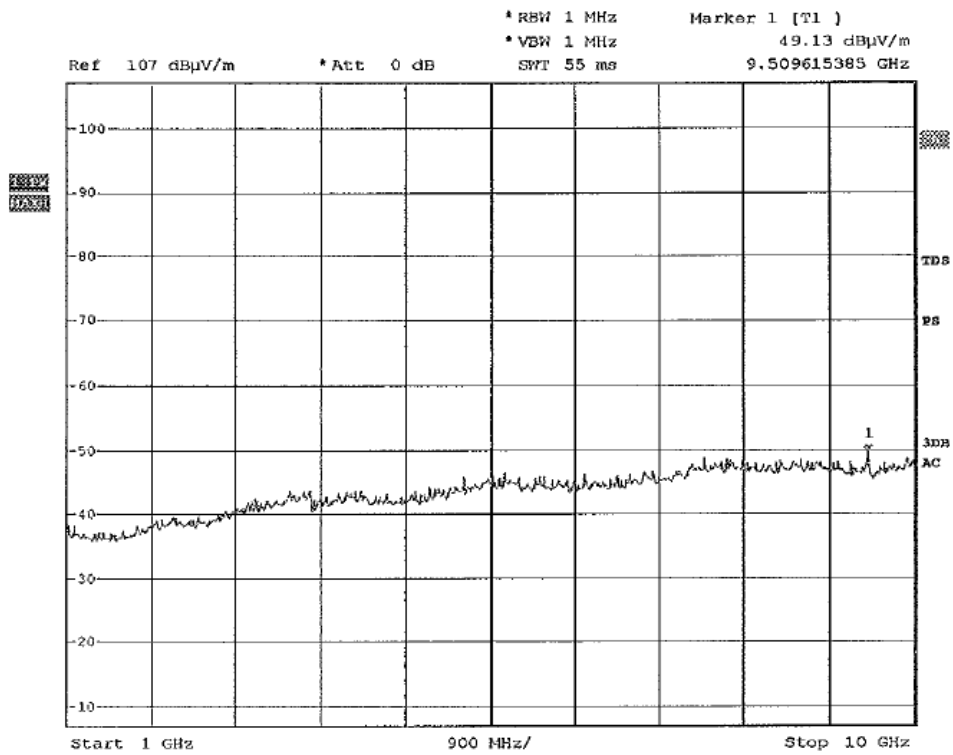
Horizontal Channel 1



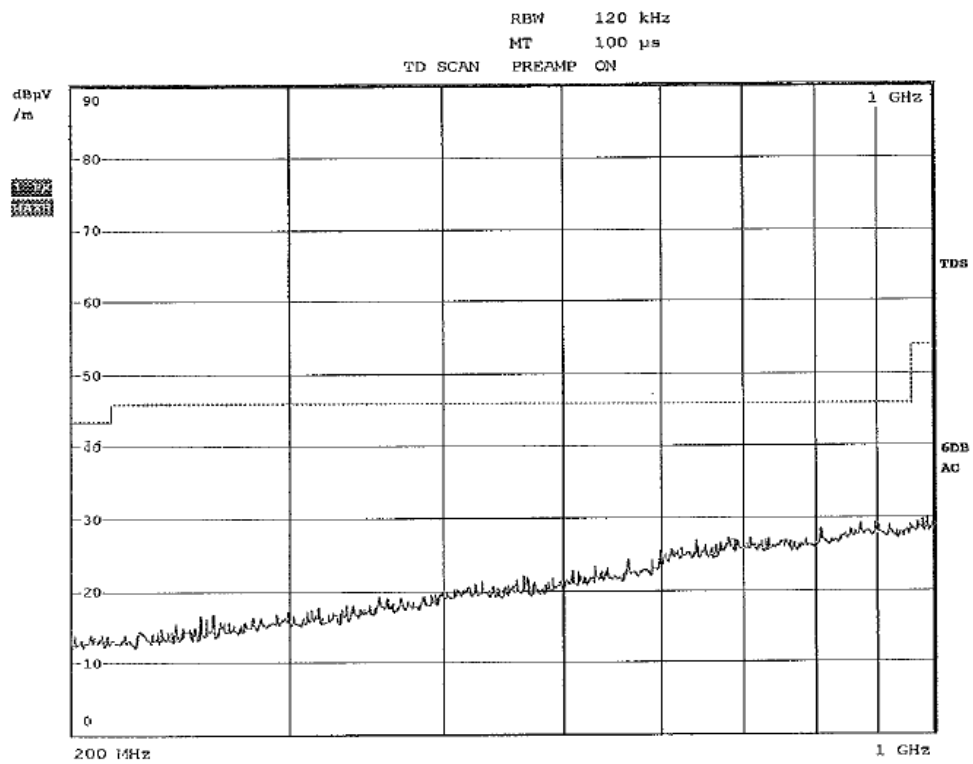
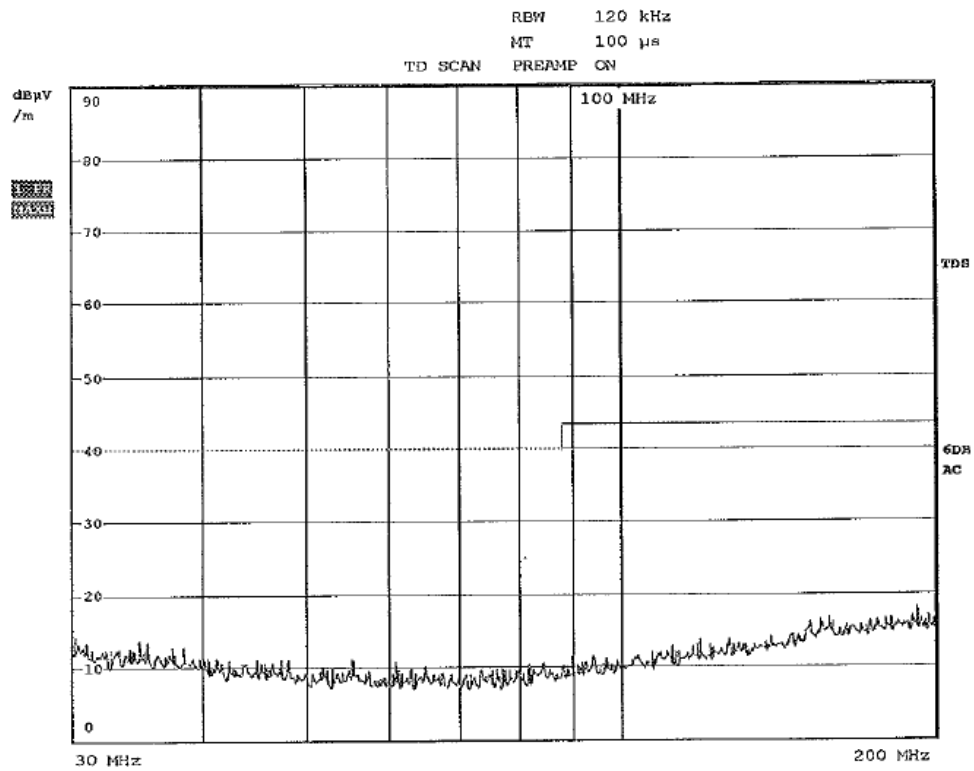
Vertical Channel 3



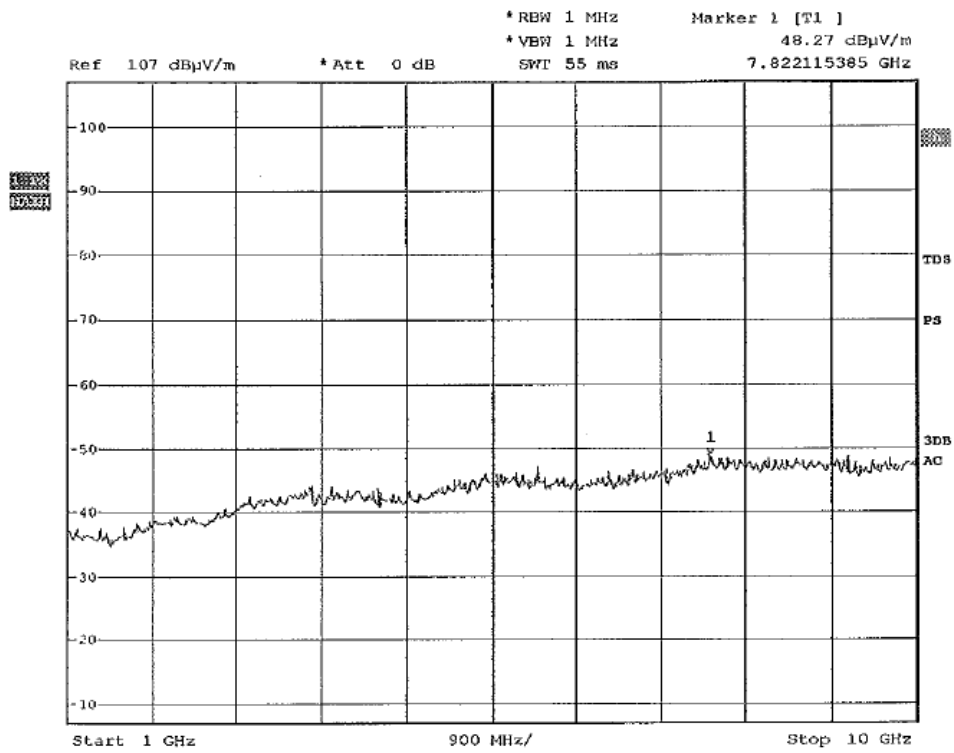
Vertical Channel 3



Horizontal Channel 3



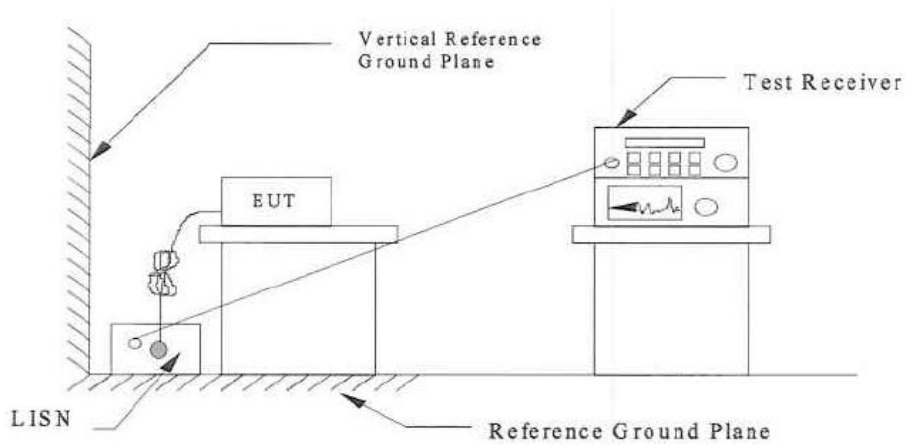
Horizontal Channel 3



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:	2009-04-14
Mode of Operation:	Receiving signal from the transmitter.
Detector Function:	Quasi-peak, average
Measurement BW:	9 kHz

Test Setup:



Results: PASS

Conducted Emissions					
Frequency (MHz)	Detector (QP/AV)	Phase	Result (dB μ V)	Limit dB μ V)	Margin
0.150	QP	L	14.0	66.0	-52.0
	AV	L	0.1	56.0	-55.9
0.172	QP	L	45.5	64.9	-19.4
	AV	L	27.9	54.9	-27.0
0.227	QP	L	39.5	62.5	-23.0
	AV	L	27.5	52.5	-25.0
0.282	QP	L	35.4	60.7	-25.3
	AV	L	21.8	50.7	-28.9
0.466	QP	L	35.8	56.6	-20.8
	AV	L	25.9	46.6	-20.7
12.882	QP	L	29.0	60.0	-31.0
	AV	L	21.8	50.0	-28.2
0.150	QP	N	13.6	66.0	-52.4
	AV	N	0.1	56.0	-55.9
0.171	QP	N	45.0	66.0	-21.0
	AV	N	29.7	56.0	-26.3
0.224	QP	N	39.1	62.6	-23.5
	AV	N	26.6	52.6	-49.5
0.462	QP	N	36.4	56.6	-20.2
	AV	N	29.8	46.6	-16.8
0.756	QP	N	26.8	56.0	-29.2
	AV	N	16.7	46.0	-29.3
12.798	QP	N	31.4	60.0	-28.6
	AV	N	23.3	50.0	-26.7

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

Remark: - The EUT connected the AC/DC Adaptor when testing.

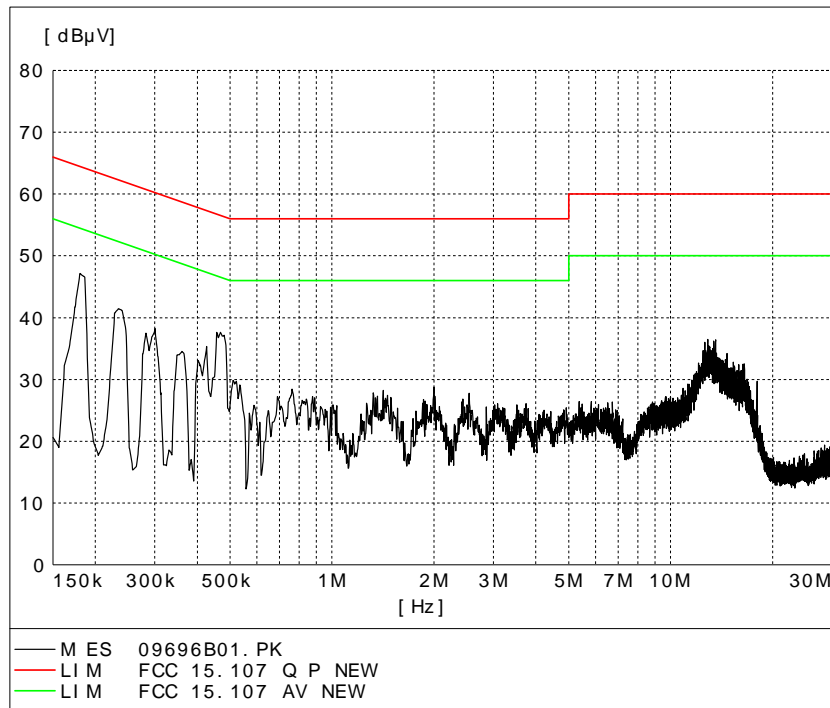
- Calculated measurement uncertainty: ± 2.8 dB

Limits for Conducted Emission [Section 15.207]:

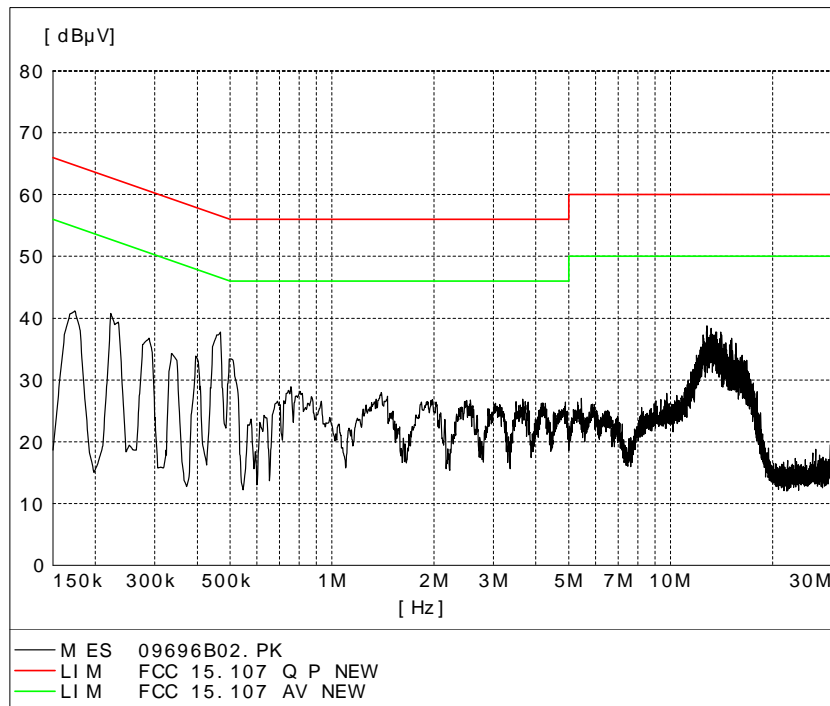
Frequency Range [MHz]	Quasi-Peak Limit [dB μ V]	Average Limit [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Conducted Emissions Result



Phase – L



Phase – N

5.0 List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	CAL DUE
EMC209	Semi-anechoic Chamber	Frankonia	N/A	N/A	28-May-08	28-May-09
EMC567	Test Receiver	R & S	ESU26	100050	06-Aug-08	06-Aug-09
EMC038	Bi-conical Antenna	R & S	HK116	841489/015	08-Mar-08	08-Mar-10
EMC039	Log Periodic Antenna	R & S	HL223	841516/017	03-Feb-08	03-Feb-10
EMC185	Horn Antenna	EMCO	3115	9002-3351	27-Feb-08	27-Feb-10
EMC138	Loop Antenna	Chase	LLA6142	1019	07-May-08	07-May-09
EMC406	Coaxial Cable 50ohm	Rosenberger	RTK081-05S-10m	LA2-001-10M/002	15-May-08	15-May-09
EMC174	RF Communications Test Set	HP	8920B	US36492628	13-Aug-07	13-Aug-09

Conducted Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	CAL DUE
EMC384	Test Receiver	R & S	ESHS30	847115/005	14-May-08	14-May-09
EMC407	LISN	R & S	ESH3-Z5	849876/027	14-May-08	14-May-09
EMC160	RF Voltage Probe	Schwarzbeck	TK9416	N/A	15-Feb-09	15-Feb-10
EMC426	Double Shield	Radiall	RG142	N/A	05-Jun -08	05-Jun -09
EMC174	RF Communications Test Set	HP	8920B	US36492628	13-Aug-07	13-Aug-09

Remarks:

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