



## **TEST REPORT**

**Date:** 2012-09-28

**Report No.:** 60.870.12.027.02F

**Applicant:** Acoustic Arc international Limited.  
Unit 311B, 3/F, IC Development Centre, No.6, Science Park  
West Avenue, Hong Kong Science Park, Shatin, N.T., Hong  
Kong

**Description of Samples:** Model name: 900MHz Wireless Speakers (Receiver)  
Brand name: SABRENT  
Model no.: BD-9787-NR  
FCC ID: VHC-AAI-AS121R-00

**Date Samples Received:** 2012-09-24

**Date Tested:** 2012-09-25 to 2011-09-27

**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:-

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Ray Cheung  
Project Engineer  
Wireless & Telecom department

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Jeff Pong  
Operation Manager  
Wireless & Telecom department



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## **1.0**    **General Details**

### **1.1**    **Test Laboratory**

SEM. Test Compliance Service Co. Ltd  
3/F, Jinbao Commerce Building Xin'an Fanshen Road,  
Bao'an District, Shenzhen  
Registration Number: 994117

Tested by:

A handwritten signature in blue ink, appearing to read 'John Zhi', written over a horizontal line.

John Zhi

### **1.2**    **Applicant Details**

#### **Applicant**

**Acoustic Arc international Ltd.**  
Unit 311B, 3/F, IC Development Centre, No.6,  
Science Park West Avenue, Hong Kong Science  
Park, Shatin, N.T., Hong Kong

#### **Manufacturer**

**Acoustic Arc international Ltd.**  
Unit 311B, 3/F, IC Development Centre, No.6,  
Science Park West Avenue, Hong Kong Science  
Park, Shatin, N.T., Hong Kong



### 1.3 Equipment Under Test [EUT]

#### Description of Sample

Model Name:	900MHz Wireless Speakers (Receiver)
Brand Name:	SABRENT
Manufacturer:	Acoustic Arc international ltd.
Model Number:	BD-9787-NR
FCCID:	VHC-AAI-AS121R-00
Rating:	DC 12.0V 1200mA powered by AC/DC adaptor <u>OR</u> 12 VDC (8 x "C" size batteries)
Operated Frequency:	912.5 - 913.5MHz
No. of Channel:	3
Antenna Type:	Integral
Manufacture of Antenna:	Acoustic Arc International Ltd.
Antenna Gain:	0 dBi
Accessories and Auxiliary Equipment:	iPod
EUT Exercising Software:	None

#### **Description of EUT**

The Equipment Under Test (EUT) is a receiver of Wireless Speakers which operated at 912 MHz – 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 and ANSI C63.4: 2003.

### 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.

#### **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**

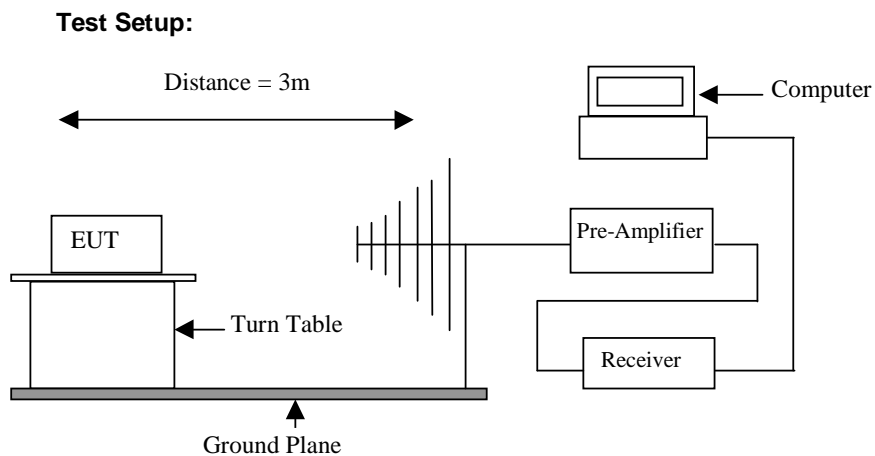
The EUT was placed on a non-metallic table 0.8m above the horizontal metal reference place and 0.4m from a vertical ground plane which is connected to the horizontal metal ground plane. Meanwhile, the AC main of EUT was connected to the distance of 0.8m line impedance stabilization network (LISN) during 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:	2012-09-27
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

Spurious Radiated Emission								
Channel	Value	Emissions	E-Field	Reading	System	Field	Limit	Delta to
		Frequency	Polarity		Factor	Strength at 3m		Limit
		MHz		dBμV/m	dB	dBμV/m	dBμV/m	dBμV/m
1	QP	32.41	V	25.41	8.44	33.85	40.00	-6.15
1	QP	37.02	V	28.35	9.21	37.56	40.00	-2.44
1	QP	100.93	V	28.84	6.75	35.59	43.50	-7.91
1	QP	127.22	V	28.84	6.75	35.59	43.50	-7.91
1	QP	174.42	V	22.74	3.72	26.46	43.50	-17.04
1	QP	452.72	V	21.31	11.58	32.89	46.00	-13.11
1	QP	32.41	H	29.96	8.44	38.40	40.00	-1.60
1	QP	39.71	H	16.15	9.64	25.79	40.00	-14.21
1	QP	99.53	H	17.56	6.72	24.28	43.50	-19.22
1	QP	122.83	H	22.58	4.66	27.24	43.50	-16.26
1	QP	171.99	H	25.20	3.71	28.91	43.50	-14.59
3	QP	33.10	V	26.98	8.56	35.54	40.00	-4.46
3	QP	38.35	V	25.47	9.42	34.89	40.00	-5.11
3	QP	101.64	V	26.58	6.67	33.25	43.50	-10.25
3	QP	126.33	V	27.04	4.39	31.43	43.50	-12.07
3	QP	31.73	H	26.15	8.33	34.48	40.00	-5.52
3	QP	37.81	H	16.32	9.33	25.65	40.00	-14.35
3	QP	103.08	H	15.30	6.54	21.84	43.50	-21.66
3	QP	169.60	H	19.39	3.70	23.09	43.50	-20.41
3	QP	734.49	H	17.15	17.68	34.83	46.00	-11.17

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

Remark:

- No significant emissions were detected of the remote control part.
- Calculated measurement uncertainty:  $\pm 5.0\text{dB}$ .
- Result data graph is attached at the next pages for reference.

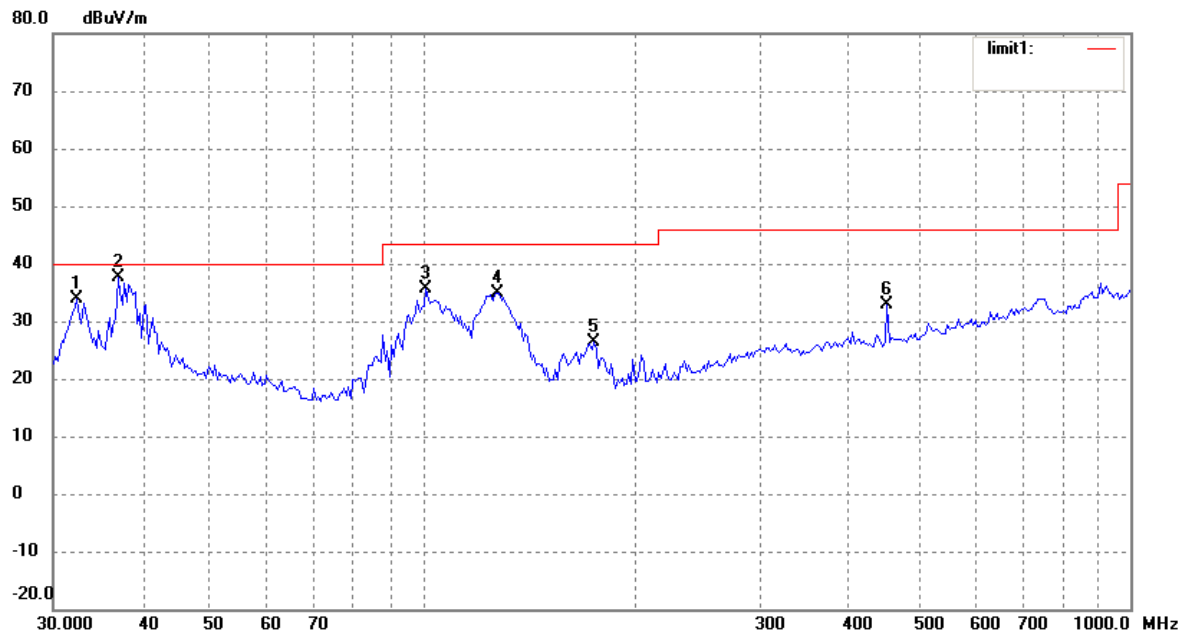
#### Limits for Radiated Emissions [ Section 15.109 Class B ]:

Frequency Range [MHz]	Quasi-Peak Limits [ $\mu\text{V/m}$ ]
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.

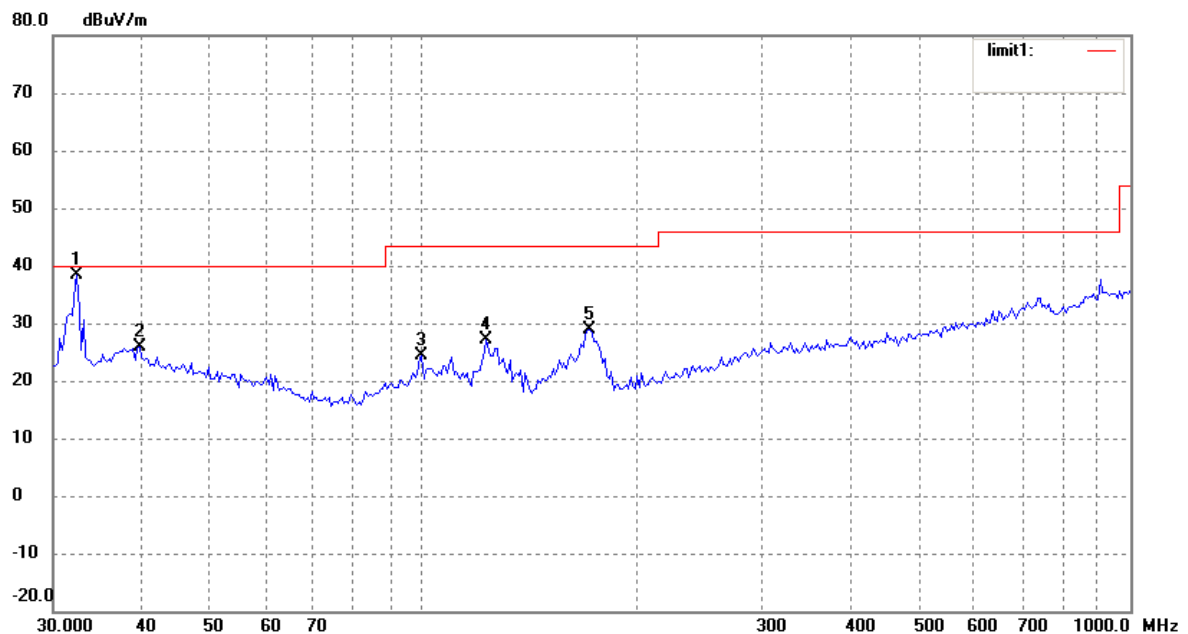


### Vertical (Channel 1)



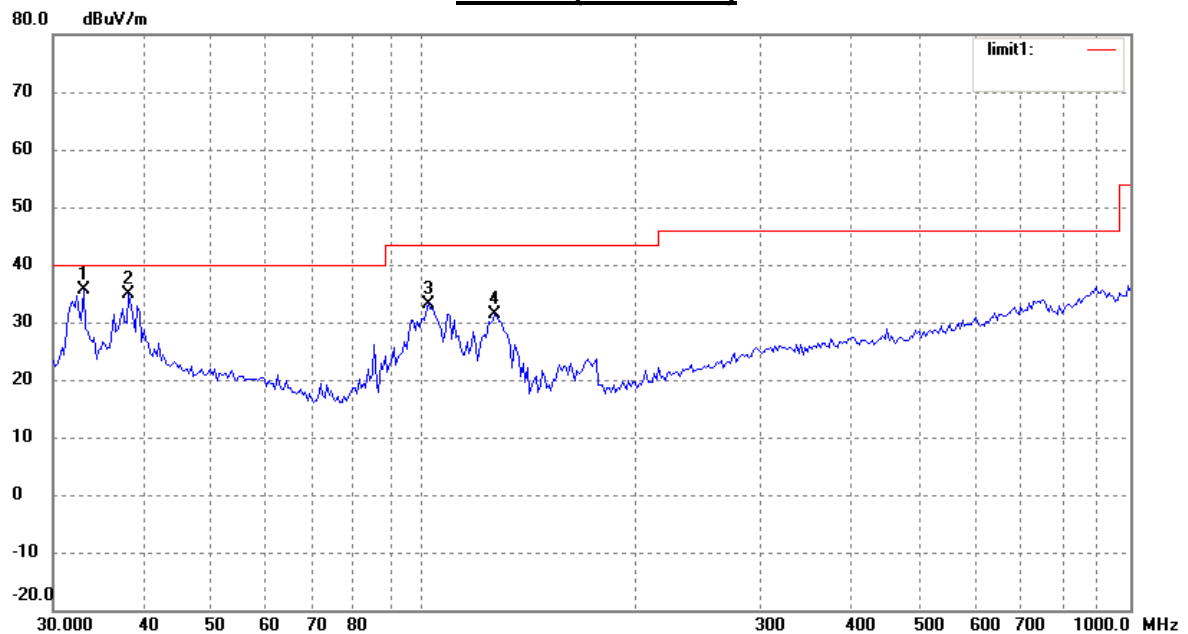
Remark: Only background noise was measured from 1GHz-10GHz except about operating frequency.

### Horizontal (Channel 1)



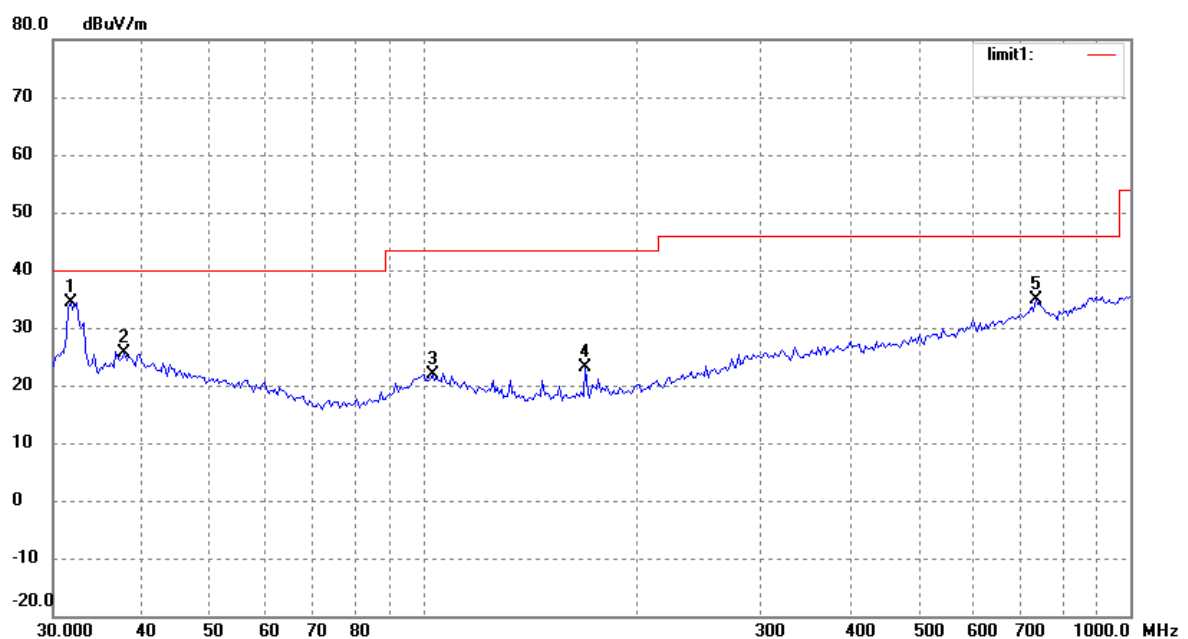
Remark: Only background noise was measured from 1GHz-10GHz except about operating frequency.

### Vertical (Channel 3)



Remark: Only background noise was measured from 1GHz-10GHz except about operating frequency.

### Horizontal (Channel 3)

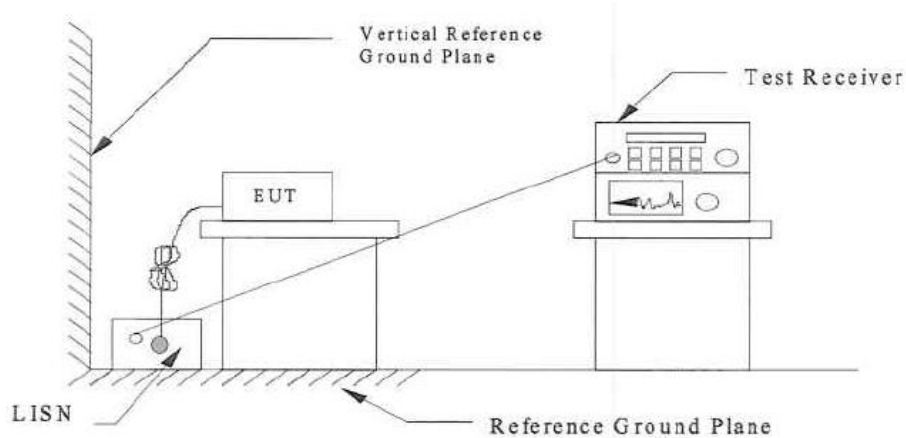


Remark: Only background noise was measured from 1GHz-10GHz except about operating frequency.

#### 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:	2012-09-27
Mode of Operation:	Receiving 1kHz signal from the transmitter.
Detector Function:	Quasi-peak, average
Measurement BW:	9kHz

#### Test Setup





Results: PASS

Conducted Emission					
Frequency (MHz)	Detector (QP/AV)	Phase	Result (dBμV)	Limit (dBμV)	Margin
0.206	QP	L	56.29	63.36	-7.07
0.494	QP	L	40.49	56.09	-15.60
0.542	AV	L	25.29	46.00	-20.71
0.882	AV	L	21.28	46.00	-24.72
1.278	QP	L	32.32	56.00	-23.68
2.194	AV	L	16.77	46.00	-29.23
0.202	QP	N	60.22	63.52	-3.30
0.350	AV	N	34.64	48.95	-14.31
0.426	AV	N	31.13	47.32	-16.19
0.558	QP	N	46.34	56.00	-9.66
0.942	QP	N	41.23	56.00	-14.77
1.030	AV	N	27.05	46.00	-18.95
2.194	AV	N	22.57	46.00	-23.43
2.250	QP	N	39.48	56.00	-16.52
5.318	QP	N	37.06	60.00	-22.94
6.098	AV	N	20.06	50.00	-29.94

Note : - The worst case 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:  $\pm 2.8\text{dB}$

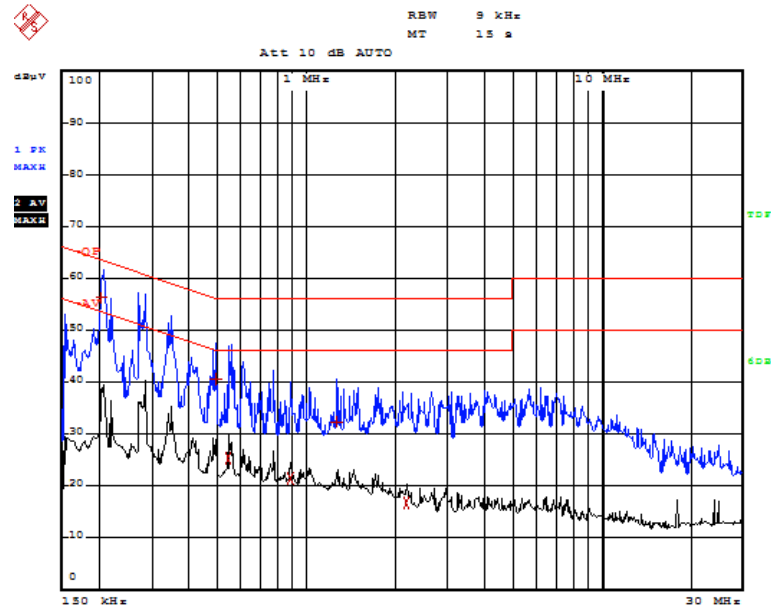
**Limits for Conducted Emission [ Section 15.107]:**

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

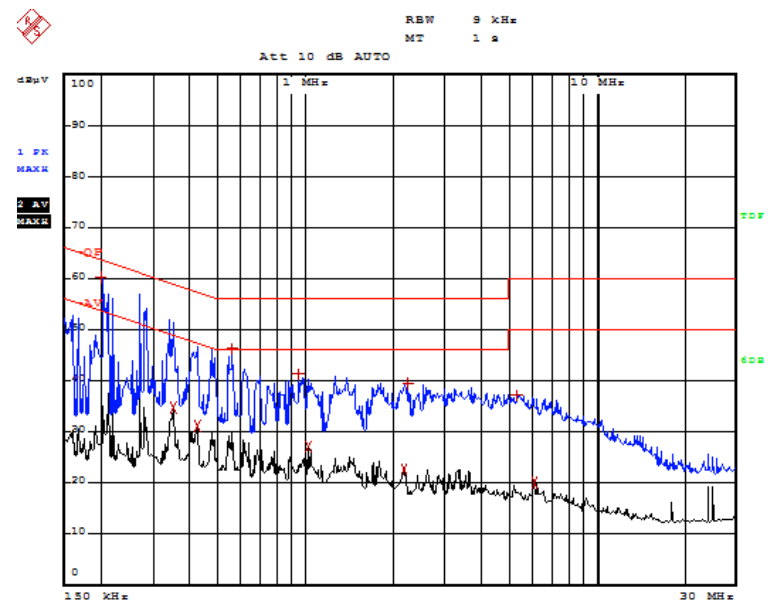
\* Decreases with the logarithm of the frequency.



## Conducted Emission Result



Phase -L



Phase - N



## 5.0 List of Measurement Equipment

### Radiated Emission

Description	Manufacturer	Model no.	Serial no.	CAL due
Spectrum Analyzer	Agilent	E4402B	US41192821	27 Mar 2013
Test Receiver	R & S	ESI26	838786/013	27 Mar 2013
DC Power Supply	LW	APR-3003	N/A	15 Jul 2013
Spectrum Analyzer	R & S	FSP30	836079/035	27 Mar 2013
Positioning Controller	C&C	CC-C-1F	N/A	19 Dec 2012
RF Switch	EM	EMSW 18	SW060023	19 Dec 2012
Pre-amplifier	Agilent	8447F	3113A06717	27 Mar 2013
Pre-amplifier	Compliance Direction	PAP-1G18	24002	27 Mar 2013
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	24 Feb 2013
Horn Antenna	ETS	3117	00086197	24 Feb 2013
Anechoic chamber	Albatross Projects	MCDC	SW060023	19 Mar 2013

### Conducted Emission

Description	Manufacturer	Model no.	Serial no.	CAL due
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	27 Mar 2013
L.I.S.N	Schwarzbeck	NSLK8126	8126-224	27 Mar 2013
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	27 Mar 2013
AMN	EMCO	3825/2	11967C	27 Mar 2013

#### Remarks:

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