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# Report On

FCC Testing of the  
ip.access Ltd  
217C 3G Enterprise Access Point

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FCC ID: QGGIPA217C

Document 75909058 Report 01 Issue 1

June 2010



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**REPORT ON**

FCC Testing of the  
ip.access Ltd  
217C 3G Enterprise Access Point

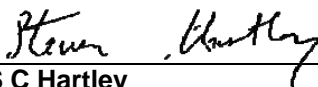
Document 75909058 Report 01 Issue 1

June 2010

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**PREPARED BY**

  
S C Hartley  
EMC Engineer

**APPROVED BY**

  
C Gould  
Authorised Signatory

**DATED**


10 June 2010

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**ENGINEERING STATEMENT**

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47: Parts 15 B. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

  
G Lawler

  
P J Harrison





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## **SECTION 1**

### **REPORT SUMMARY**

FCC Testing of the  
ip.access Ltd  
217C 3G Enterprise Access Point



## 1.1 INTRODUCTION

The information contained in this report is intended to show verification of the ip.access Ltd217C 3G Enterprise Access Point to the requirements of FCC CFR 47 Part 15B.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	ip.access Ltd
Model Number(s)	nano3G 217C
Serial Number(s)	EMC1 Radiated
Software Version	SR1.1.1_461.0
Hardware Version	XB
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B: 2009
Incoming Release Date	Declaration of Build Status 07 May 2010
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	23742 19/02/2010
Start of Test	11 May 2010
Finish of Test	23 May 2010
Name of Engineer(s)	G Lawler P J Harrison
Related Document(s)	ANSI C63.4 : 2003



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## 1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 15B, is shown below.

Configuration 1 - (using AC-DC PSU)						
Section	Spec Clause	Test Description	Mode	Mod State	Result	Base Standard
2.1	15.109	Radiated Emissions (Enclosure Port)	Idle	0	Pass	ANSI C63.4
2.2	15.107	Conducted Emissions (AC Power Port)	Idle	0	Pass	ANSI C63.4

Configuration 2 - (using Power Over Ethernet PSU)						
Section	Spec Clause	Test Description	Mode	Mod State	Result	Base Standard
2.1	15.109	Radiated Emissions (Enclosure Port)	Idle	0	Pass	ANSI C63.4



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**1.3 DECLARATION OF BUILD STATUS**

APPLICANT'S DETAILS			
COMPANY NAME :	ip.access Ltd		
ADDRESS :	2020 Cambourne Business Cambourne Cambridge CB23 6DW		
NAME FOR CONTACT PURPOSES :	Costa Panayi		
TELEPHONE NO: 01954 713721	FAX NO:	01954 713799	
	E-MAIL:	costa.panayi@ipaccess.com	

EQUIPMENT INFORMATION			
<u>Equipment designator:</u>			
Model name/number	nano3G 217C	Identification number	
<u>Supply Voltage:</u>			
<input checked="" type="checkbox"/> [ ]	AC mains	State AC voltage 110 ... V	and AC frequency ..... Hz
<input checked="" type="checkbox"/> [ ]	PoE DC (external)	State DC voltage 48 ... V	and DC current .....0.25 A
[ ] [ ]	DC (internal)	State DC voltage ..... V	and Battery type .....
<u>Frequency characteristics:</u>			
Frequency range	.....2110...MHz to ...2155. MHz	Channel spacing ...5MHz.....	(if channelized)
Designated test frequencies:	Bottom: .....2112.5..... MHz Middle: .....2132.5..... MHz Top: .....2152.5 MHz		
<u>Power characteristics:</u>			
Maximum transmitter power	.....0.25... W	Minimum transmitter power	..... W
<input checked="" type="checkbox"/> [ ]	Continuous transmission	(if variable)	
[ ] [ ]	Intermittent transmission	State duty cycle .....	
	If intermittent, can transmitter be set to continuous transmit test mode? Y/N		
<u>Antenna characteristics:</u>			
[ ] [ ]	Antenna connector	State impedance .....	ohm
[ ] [ ]	Temporary antenna connector	State impedance .....	ohm
<input checked="" type="checkbox"/> [ ]	Integral antenna	State gain .....	0 ..... dBi
<u>Modulation characteristics:</u>			
[ ] [ ]	Amplitude	[ ] [ ]	Other
[ ] [ ]	Frequency	Details: .....	
<input checked="" type="checkbox"/> [ ]	Phase		
Can the transmitter operate un-modulated?	No		
ITU Class of emission: 5M00D1W....			
<u>Extreme conditions:</u>			
Maximum temperature	.....45 °C	Minimum temperature	...0... °C
Maximum supply voltage	..... V	Minimum supply voltage	..... V

**Signature**

Held on File at TUV Product Service

**Date**

07/05/2010

Note: This document has been prepared to enable manufacturers with no mechanism for producing their own Declaration of Build Status, to declare the build state of the equipment submitted for test.

No responsibility will be accepted by TÜV Product Service as to the accuracy of the information declared in this document by the manufacturer.



## 1.4 PRODUCT INFORMATION

### 1.4.1 Technical Description

The Equipment Under Test (EUT) was a ip.access Ltd 217C 3G Enterprise Access Point as shown in the photograph below. A full technical description can be found in the manufacturers documentation.



Equipment Under Test





#### 1.4.2 Test Configuration

##### Configuration 1:

The EUT was configured in accordance with FCC CFR 47 Part 15B.

The EUT was configured to operate in Idle Mode, from an AC – DC Power Supply Adaptor, and an external Laptop PC, running PUTTY software.

##### Configuration 2:

The EUT was configured in accordance with FCC CFR 47 Part 15B.

The EUT was configured to operate in Idle Mode, via a Power Over Ethernet Power Supply Unit, and an external Laptop PC, running PUTTY software.

#### 1.4.3 EUT Cable / Port Identification

Port	Max Cable Length specified	Usage	Type	Screened
AC Power (for POE Inserter)	2m	Mains Lead	3 core	No
Signal	<100m (total length from source)	Signal/Power Lead	Cat 5	No
DC Power POE	<100m (total length from source)	Signal/Power Lead	Cat 5	No
DC Power	<3m	Power Cable	2 core	No

#### 1.4.4 Modes of Operation

Modes of operation of each EUT during testing were as follows:

Mode 1 - Idle

Information on the specific test modes utilised are detailed in the test procedure for each individual test.



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## **1.5 TEST CONDITIONS**

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure, test laboratories or an open test area as appropriate.

The EUT was powered from a 120V, 60Hz AC Power supply or via a PoE Inserter.

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## **1.6 DEVIATIONS FROM THE STANDARD**

No deviations from the applicable test standards or test plan were made during testing.

## **1.7 MODIFICATION RECORD**

No modifications were made to the EUT during testing.



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## **SECTION 2**

### **TEST DETAILS**

FCC Testing of the  
ip.access Ltd  
217C 3G Enterprise Access Point



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## **2.1 RADIATED EMISSIONS (ENCLOSURE PORT)**

### **2.1.1 Specification Reference**

FCC CFR 47 Part 15B: Clause 15.109

### **2.1.2 Equipment Under Test**

217C 3G Enterprise Access Point, S/N: EMC1 Radiated

### **2.1.3 Date of Test and Modification State**

11 May 2010 - Modification State 0

### **2.1.4 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

### **2.1.5 Test Method and Operating Modes**

The test was applied in accordance with the test method requirements of ANSI C63.4.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

Configuration 2 - Mode 1

### **2.1.6 Environmental Conditions**

11 May 2010

Ambient Temperature 18°C

Relative Humidity 33%

Atmospheric Pressure 1009mbar



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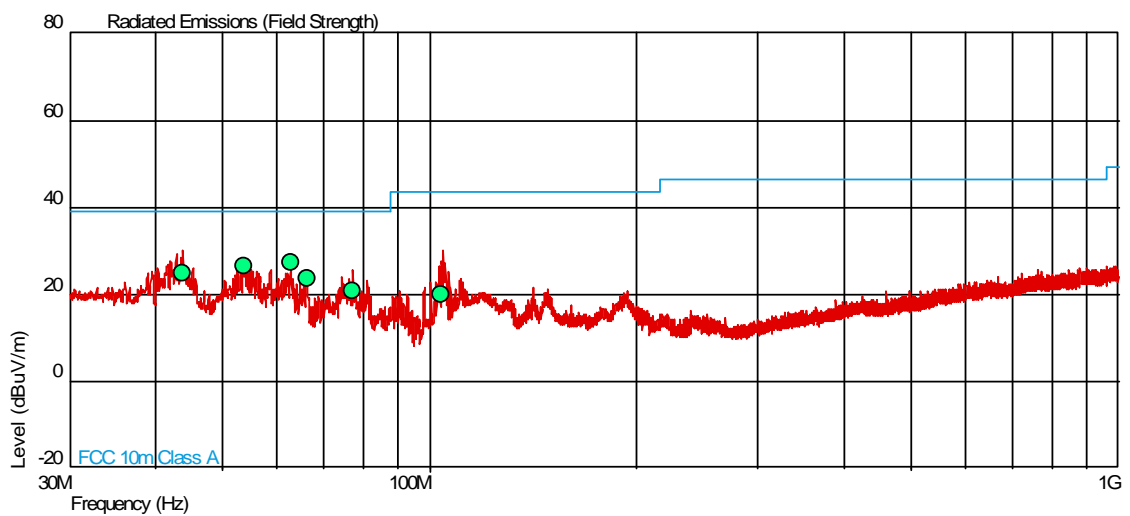
**2.1.7 Test Results**

For the period of test the EUT met the requirements of FCC CFR 47 Part 15B, Class A for Radiated Emissions (Enclosure Port).

The test results are shown below.

Configuration 1 - Mode 1

30MHz to 1GHz

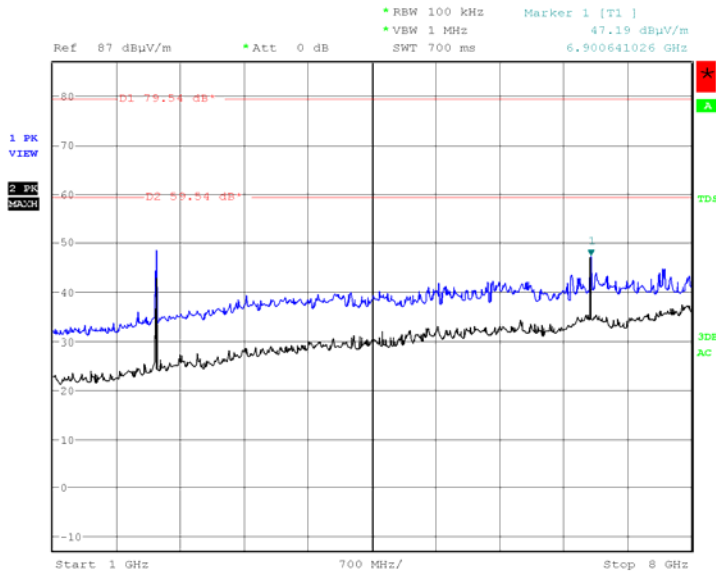


Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
43.800	25.0	17.8	39.1	90.0	-14.1	-72.2	57	1.00	Vertical
53.603	26.7	21.6	39.1	90.0	-12.4	-68.4	319	1.00	Vertical
62.777	27.4	23.4	39.1	90.0	-11.7	-66.6	16	1.52	Vertical
66.276	23.9	15.7	39.1	90.0	-15.2	-74.3	7	1.16	Vertical
77.207	20.9	11.1	39.1	90.0	-18.2	-78.9	184	1.00	Vertical
103.865	20.0	10.0	43.5	150.0	-23.5	-140.0	99	1.00	Vertical

Class A measured at 3m and extrapolated to 10m.

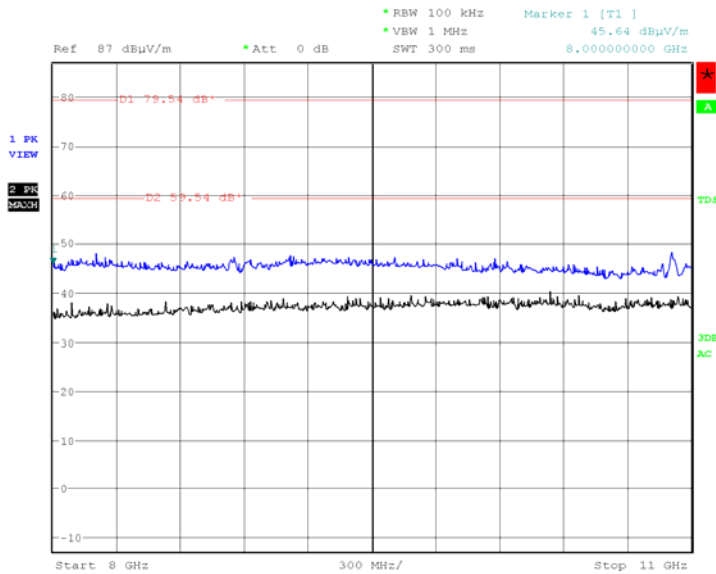


1GHz to 8GHz



Date: 23.MAY.2010 12:10:50

8GHz to 11GHz



Date: 23.MAY.2010 13:20:19

Frequency (MHz)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)	Average Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)	Angle (Deg)	Height (m)	Polarity
2132.361	56.0	79.5	-23.5	43.4	59.5	-16.1	65	1.00	Horizontal
6889.721	55.5	79.5	-24.0	51.3	59.5	-8.2	87	1.00	Vertical

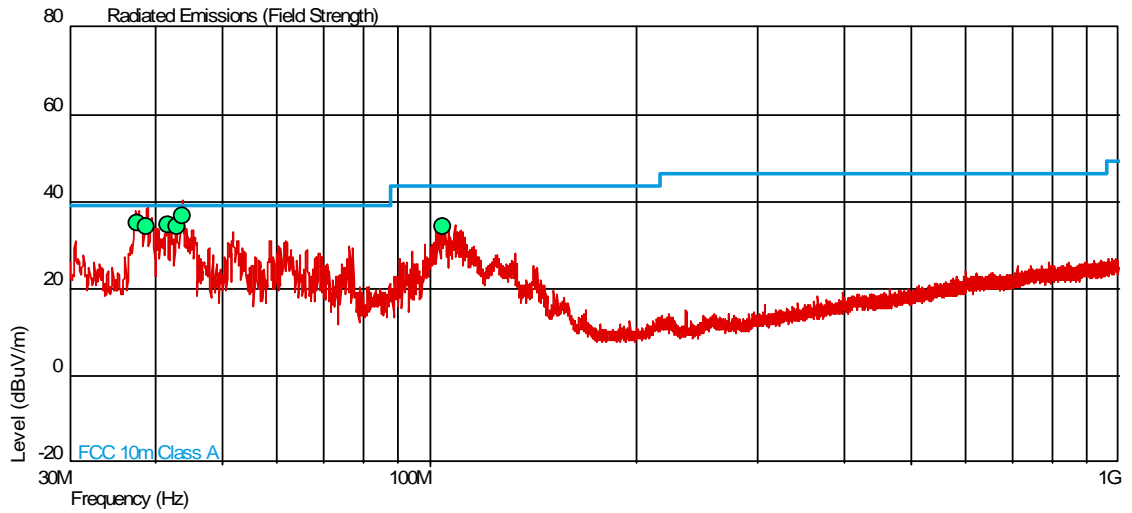
Class A limit extrapolated to 3m



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Configuration 2 - Mode 1

30MHz to 1GHz



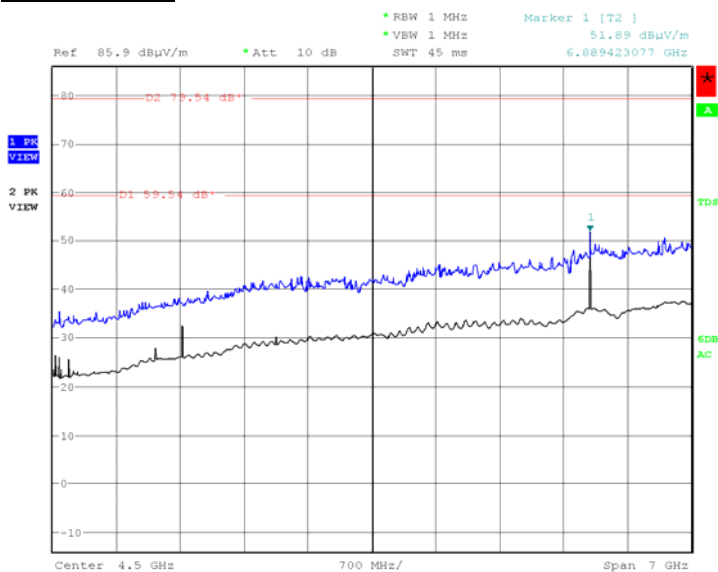
Class A measured at 3m and extrapolated to 10m.

Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
37.538	35.1	56.9	39.1	90.0	-4.0	-33.1	304	1.00	Vertical
38.857	34.4	52.5	39.1	90.0	-4.7	-37.5	36	1.00	Vertical
41.619	34.7	54.3	39.1	90.0	-4.4	-35.7	355	1.00	Vertical
42.933	34.2	51.3	39.1	90.0	-4.9	-38.7	86	1.00	Vertical
43.797	36.6	67.6	39.1	90.0	-2.5	-22.4	268	1.00	Vertical
104.740	34.1	50.7	43.5	150.0	-9.4	-99.3	88	1.00	Vertical



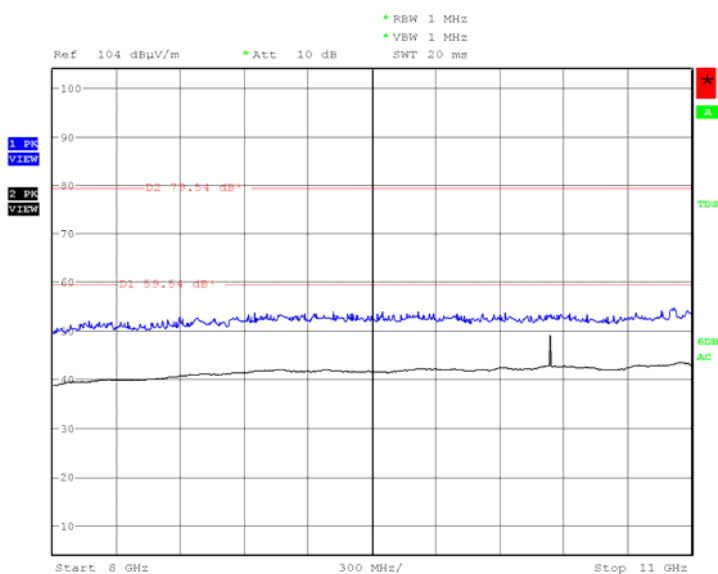
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1GHz to 8GHz



Date: 11.MAY.2010 14:35:26

8GHz to 11GHz



Date: 11.MAY.2010 15:28:43

Frequency (MHz)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dBuV/m)	Average Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dBuV/m)	Angle (Deg)	Height (m)	Polarity
10334.4	57.7	79.5	-21.8	50.9	59.5	-8.6	123	1.25	Vertical
6889.7	57.7	79.5	-21.8	54.3	59.5	-5.2	152	1.00	Vertical

Class A limit extrapolated to 3m





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## 2.2 CONDUCTED EMISSIONS (AC POWER PORT)

### 2.2.1 Specification Reference

FCC CFR 47 Part 15B: Clause 15.107

### 2.2.2 Equipment Under Test

217C 3G Enterprise Access Point, S/N: EMC1 Radiated

### 2.2.3 Date of Test and Modification State

12 and 17 May 2010 – Modification State 0

### 2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.2.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1  
Configuration 2 - Mode 1

### 2.2.6 Environmental Conditions

	12 May 2010	17 May 2010
Ambient Temperature	18°C	21°C
Relative Humidity	33%	35%
Atmospheric Pressure	1009mbar	1023mbar



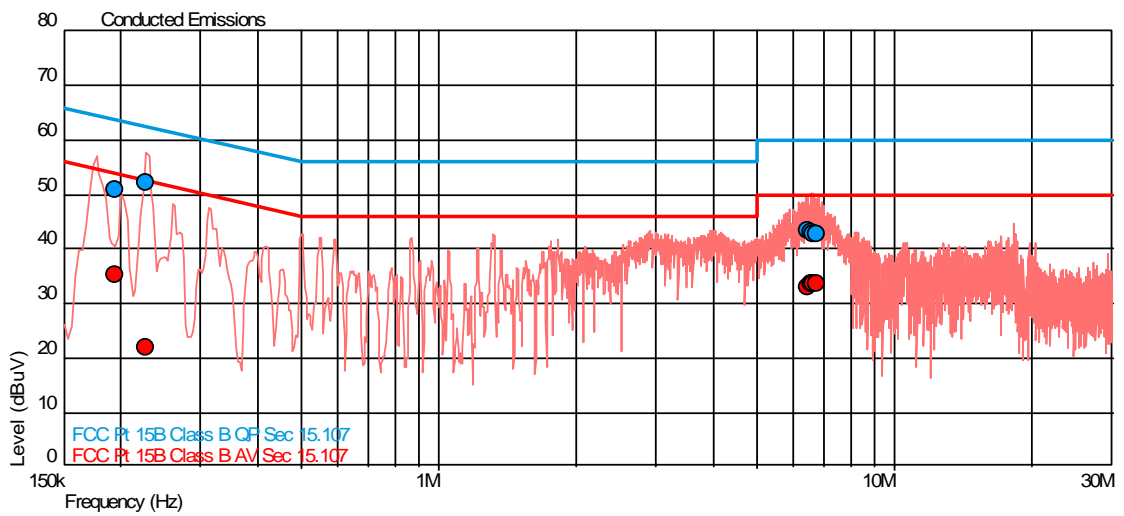
**2.2.7 Test Results**

For the period of test the EUT met the requirements of FCC CFR 47 Part 15B, Class B for Conducted Emissions (AC Power Port).

The test results are shown below.

Configuration 1 - Mode 1

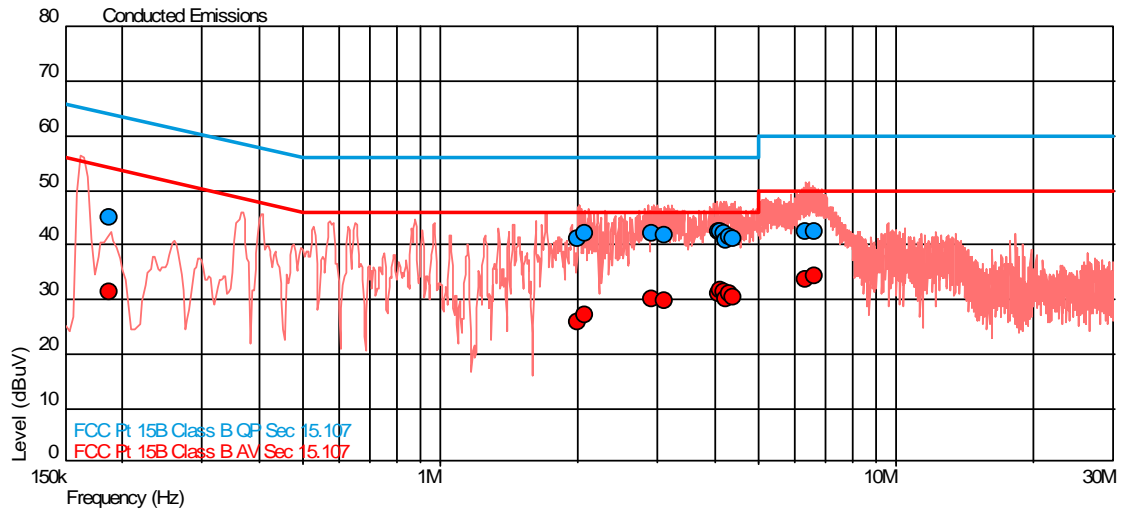
Live Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.194	51.0	63.9	-12.9	35.2	53.9	-18.6
0.227	52.2	62.6	-10.3	21.9	52.6	-30.7
6.432	43.4	60.0	-16.6	33.1	50.0	-16.9
6.553	43.1	60.0	-16.9	33.8	50.0	-16.2
6.597	42.8	60.0	-17.2	33.6	50.0	-16.4
6.756	42.8	60.0	-17.2	33.5	50.0	-16.5



Neutral Line

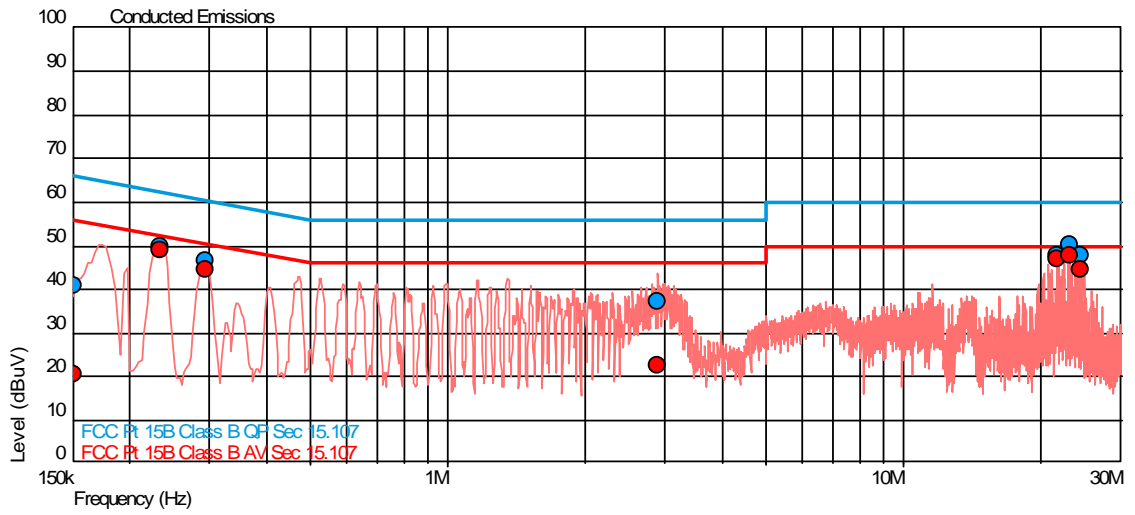


Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.187	45.2	64.2	-19.0	31.4	54.2	-22.7
1.995	41.2	56.0	-14.8	25.9	46.0	-20.1
2.082	42.1	56.0	-13.9	27.3	46.0	-18.7
2.897	42.2	56.0	-13.8	30.0	46.0	-16.0
3.101	41.8	56.0	-14.2	29.8	46.0	-16.2
4.061	42.4	56.0	-13.6	31.2	46.0	-14.8
4.121	42.4	56.0	-13.6	31.7	46.0	-14.3
4.186	42.1	56.0	-13.9	31.5	46.0	-14.5
4.212	40.9	56.0	-15.1	30.1	46.0	-15.9
4.320	41.6	56.0	-14.4	31.2	46.0	-14.8
4.371	41.0	56.0	-15.0	30.5	46.0	-15.5
6.329	42.5	60.0	-17.5	33.6	50.0	-16.4
6.614	42.4	60.0	-17.6	34.3	50.0	-15.7



Configuration 2 - Mode 1

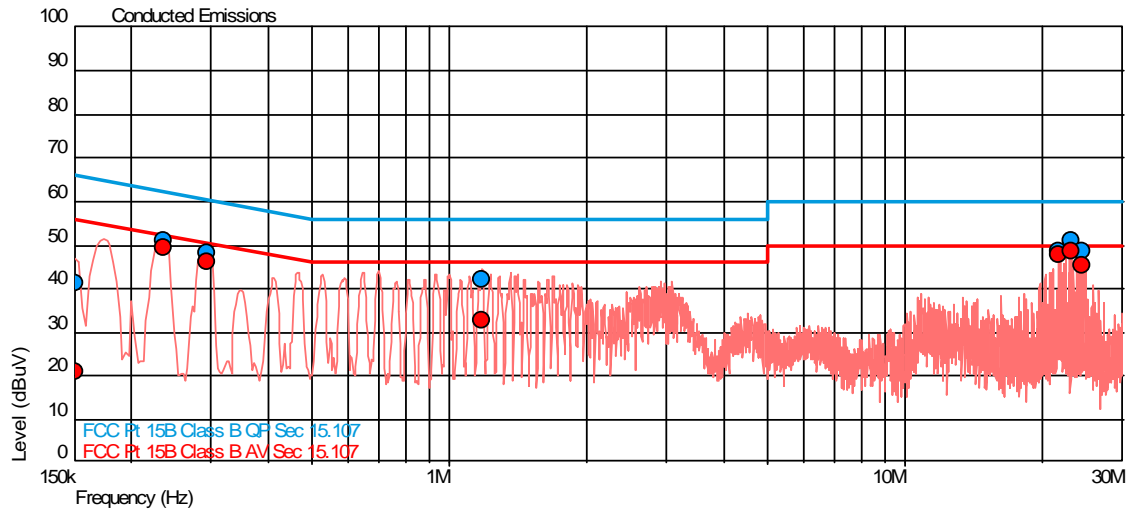
Live Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.150	40.7	66.0	-25.3	20.6	56.0	-35.4
0.234	49.8	62.3	-12.5	49.0	52.3	-3.3
0.294	46.5	60.4	-13.9	44.4	50.4	-6.0
2.884	37.2	56.0	-18.8	22.4	46.0	-23.6
21.663	47.8	60.0	-12.2	47.1	50.0	-2.9
23.128	50.3	60.0	-9.7	47.9	50.0	-2.1
24.350	47.8	60.0	-12.2	44.6	50.0	-5.4



Neutral Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.150	41.2	66.0	-24.8	20.9	56.0	-35.1
0.236	51.1	62.2	-11.2	49.5	52.2	-2.8
0.293	48.0	60.4	-12.4	46.2	50.4	-4.2
1.175	42.0	56.0	-14.0	32.5	46.0	-13.5
21.663	48.5	60.0	-11.5	47.9	50.0	-2.1
23.128	50.9	60.0	-9.1	48.5	50.0	-1.5
24.349	48.5	60.0	-11.5	45.3	50.0	-4.7



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### **SECTION 3**

#### **TEST EQUIPMENT USED**



### 3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
<b>Section 2.2 EMC - Conducted Emissions</b>					
LISN (1 Phase)	Chase	MN 2050	336	12	25-Mar-2011
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
Transient Limiter	Hewlett Packard	11947A	2378	12	22-Jun-2010
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	1-Sep-2010
<b>Section 2.1 EMC - Radiated Emissions</b>					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	12-Oct-2010
Pre-Amplifier	Phase One	PS04-0085	1532	12	16-Sep-2010
Pre-Amplifier	Phase One	PS04-0086	1533	12	17-Sep-2010
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
Cable (2m, SMA Type )	Reynolds	262-0248-2000	2401	-	TU
Signal Generator	Rohde & Schwarz	SMR40	3171	12	4-Aug-2010
Cable (1m, SMA Type)	Reynolds	262-0248-1000	3221	-	TU
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	1-Sep-2010

TU – Traceability Unscheduled



### 3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*
Conducted Emissions, ISN	150kHz to 30MHz Amplitude	2.1dB
Substitution Antenna, Radiated Field	30MHz to 18GHz Amplitude	2.6dB
Discontinuous Interference	150kHz to 30MHz Amplitude	3.0dB*
Interference Power	30MHz to 300MHz Amplitude	3.0dB*
Radiated E-Field Susceptibility	26MHz to 2.5GHz Test Amplitude	1.4dB†
Conducted Susceptibility	100kHz to 250MHz Amplitude	1.8dB†
DC Input Ripple Immunity	Current Voltage	0.45% 0.91%
Power Frequency Magnetic Field	50Hz/60Hz Amplitude	0.45%
Magnetic Emissions	9kHz to 30MHz Amplitude	3.4dB*
Magnetic Field/Flux iaw EN 50366	10Hz to 400kHz	2.64%
Harmonics and Flicker	The test was applied using proprietary equipment that meets the requirements of EN 61000-3-2 and EN 61000-3-3	—
Mains Voltage Variations and Interrupts	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-11	—
Fast Transient Burst	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-4	—
Electrostatic Discharge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2	—
Surge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-5	—
Vehicle Transients	The test was applied using proprietary equipment that meets the requirements of ISO 7637-1 and 2	—
Compass Safe Distance	Azimuth Accuracy	0.10°

Worst case error for both Time and Frequency measurement 12 parts in 10<sup>6</sup>.

\* In accordance with CISPR 16-4

† In accordance with UKAS Lab 34





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## **SECTION 4**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**



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#### 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA  
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