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**Choose certainty.  
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# Report On

FCC Testing of the  
ip.access Ltd  
237BA 3G S8 Access Point

COMMERCIAL-IN-CONFIDENCE

FCC ID: QGGIPA237BA

Document 75912615 Report 01 Issue 2

May 2011



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**REPORT ON**

FCC Testing of the  
ip.access Ltd  
237BA 3G S8 Access Point

Document 75912615 Report 01 Issue 2

May 2011

**PREPARED FOR**

ip.access Ltd  
Building 2020  
Cambourne Business Park  
Cambourne  
CB23 6DW

**PREPARED BY**

**N Bennett**  
Senior Administrator

**APPROVED BY**

**M Jenkins**  
Authorised Signatory

**DATED**

09 May 2011

**This report has been up-issued to Issue 2 to correct typographical errors.**

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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





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## **SECTION 1**

### **REPORT SUMMARY**

FCC Testing of the  
ip.access Ltd  
237BA 3G S8 Access Point



## 1.1 INTRODUCTION

The information contained in this report is intended to show verification of the ip.access Ltd 237BA 3G S8 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 237BA
Serial Number(s)	000295-0000024940
Software Version	SR1.2.0_491.8.0
Hardware Version	B
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B: 2010
Incoming Release Date	Application Form 03 February 2011
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	PO26014 28 January 2011
Start of Test	20 February 2011
Finish of Test	21 March 2011
Name of Engineer(s)	G Lawler
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 - PoE Supply						
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 - 9 V 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

N/A – Not Applicable



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**1.3 APPLICATION FORM**

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 S8 Access Point 237BA (Bands 2 & 5)			
<u>Supply Voltage:</u>			
<input checked="" type="checkbox"/> [ ]	AC mains	State AC voltage	110 V and AC frequency 60 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	869 MHz to 894 MHz	Channel spacing	200 kHz
	1930 MHz to 1990 MHz		(if channelized)
Designated test frequencies:			
Bottom:	871.4 MHz	Middle:	881.6 MHz
Bottom:	1932.4 MHz	Middle:	1960.0 MHz
		Top:	891.6 MHz
		Top:	1987.6 MHz
<u>Power characteristics:</u>			
Maximum transmitter power	0.02 W	Minimum transmitter power (if variable)	..... W
<input checked="" type="checkbox"/> [ ]	Continuous transmission		
[ ] [ ]	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	2 dBi
<u>Modulation characteristics:</u>			
<input checked="" type="checkbox"/> [ ]	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	40 °C	Minimum temperature	0 °C
Maximum supply voltage	..... V	Minimum supply voltage	..... V

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature : Held on file at TÜV SÜD Product Service Ltd  
 Name : Costa Panayi  
 Position held : Mechanical Design and Approvals Engineer  
 Date : 3<sup>rd</sup> February 2011

TÜV SÜD Product Service Ltd formally certifies that the manufacturer's declaration as typed out in this report, is a true and accurate record of the original received from the applicant.



## 1.4 PRODUCT INFORMATION

### 1.4.1 Technical Description

The Equipment Under Test (EUT) was a ip.access Ltd 237BA 3G S8 Access Point. A full technical description can be found in the manufacturer's documentation.

### 1.4.2 Test Configuration

#### Configuration 1: PoE Supply

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.

#### Configuration 2: 9 V DC PSU

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.

### 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 9 V DC PSU or PoE Supply.

FCC Accreditation  
90987 Octagon House, Fareham Test Laboratory

## 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  
237BA 3G S8 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

237BA 3G S8 Access Point, S/N: 000295-0000024940

### 2.1.3 Date of Test and Modification State

28 February to 21 March 2011 - 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

	28 February 2011	21 March 2011
Ambient Temperature	20.7°C	19.9°C
Relative Humidity	28%	34%
Atmospheric Pressure	1027mbar	1031mbar



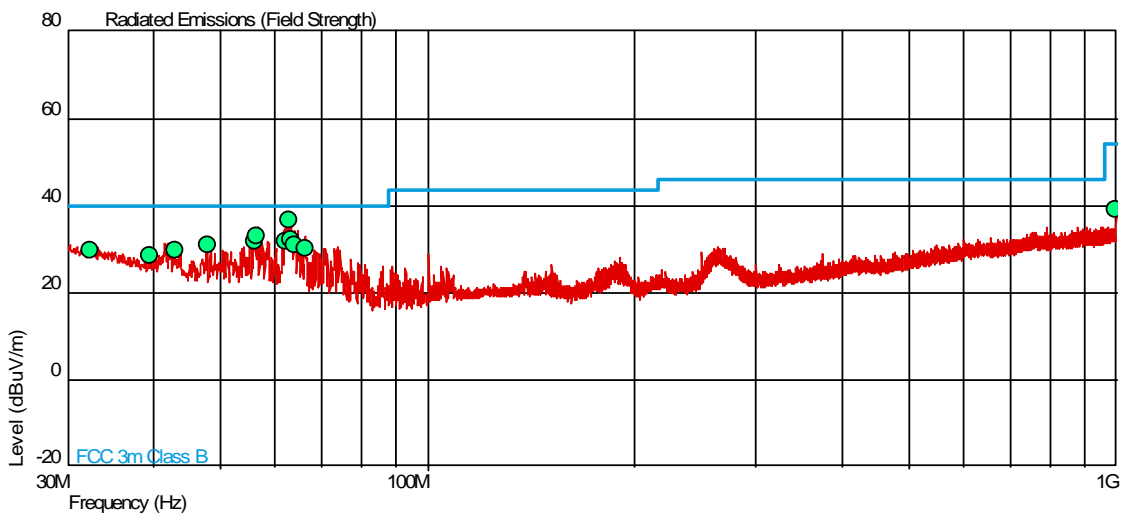
**2.1.7 Test Results**

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

The test results are shown below.

Configuration 1 - Mode 1

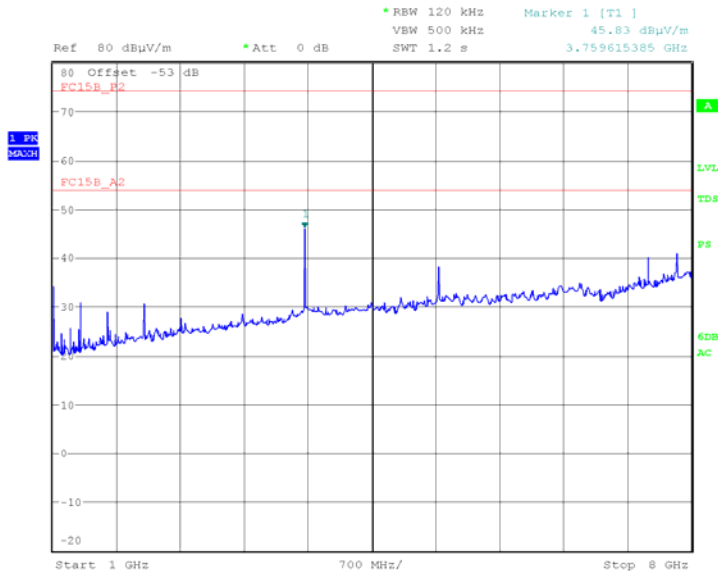
30MHz to 1GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP limit (uV/m)	QP Margin (dBµV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
32.329	29.7	30.5	40.0	100	-10.3	69.5	360	2.43	Horizontal
39.506	28.8	27.5	40.0	100	-11.2	72.5	122	3.00	Vertical
42.943	29.8	30.9	40.0	100	-10.2	69.1	36	1.16	Vertical
47.798	30.9	35.1	40.0	100	-9.1	64.9	354	1.00	Vertical
55.983	31.9	39.4	40.0	100	-8.1	60.6	338	1.00	Vertical
56.535	33.2	45.7	40.0	100	-6.8	54.3	345	1.00	Vertical
62.017	31.8	38.9	40.0	100	-8.2	61.1	88	1.00	Vertical
62.770	36.5	66.8	40.0	100	-3.5	33.2	96	1.00	Vertical
63.408	32.1	40.3	40.0	100	-7.9	59.7	88	1.00	Vertical
64.184	30.8	34.7	40.0	100	-9.2	65.3	198	1.00	Vertical
66.303	30.4	33.1	40.0	100	-9.6	66.9	173	1.00	Vertical
1000.000	39.2	91.2	54.0	500	-14.8	408.8	90	1.00	Vertical

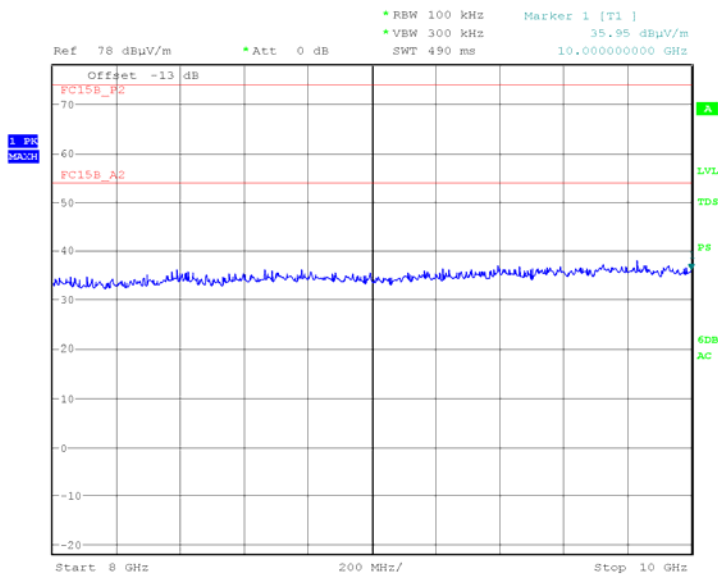


1GHz to 8GHz



Date: 28.FEB.2011 18:38:15

8GHz to 10GHz



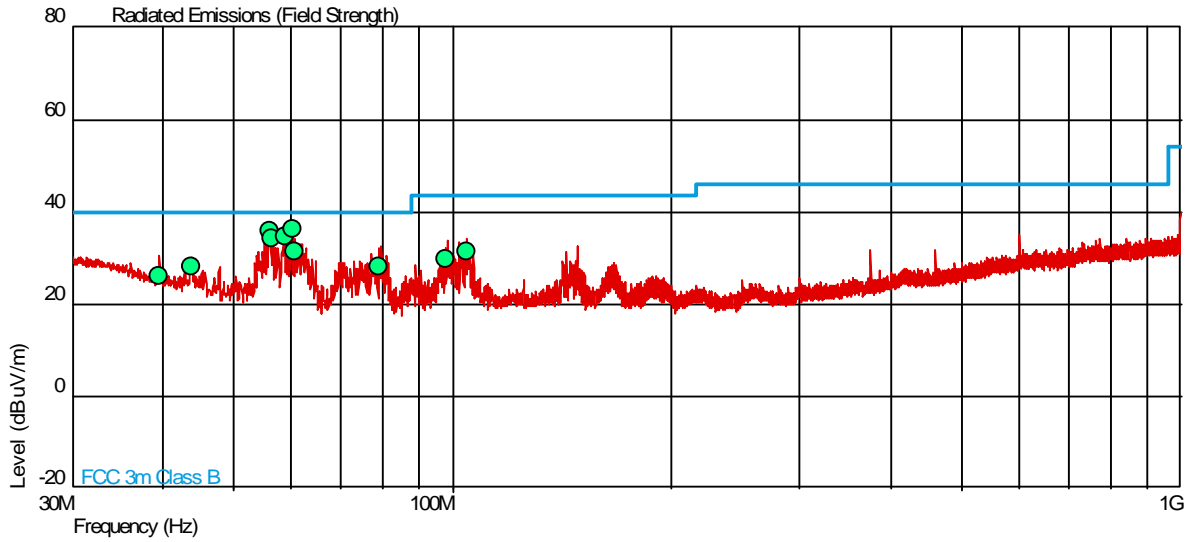
Date: 28.FEB.2011 19:01:07



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Configuration 2 - Mode 1

30MHz to 1GHz



Frequency (MHz)	QP Level (dB $\mu$ V/m)	QP Level (uV/m)	QP Limit (dB $\mu$ V/m)	QP limit (uV/m)	QP Margin (dB $\mu$ V/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
39.552	26.1	20.2	40.0	100	-13.9	79.8	198	1.00	Vertical
43.783	28.2	25.7	40.0	100	-11.8	74.3	56	1.16	Vertical
56.001	36.0	63.1	40.0	100	-4.0	36.9	22	1.00	Vertical
56.531	34.3	51.9	40.0	100	-5.7	48.1	53	1.02	Vertical
58.707	34.5	53.1	40.0	100	-5.5	46.9	59	1.13	Vertical
60.233	36.3	65.3	40.0	100	-3.7	34.7	44	1.00	Vertical
60.821	31.2	36.3	40.0	100	-8.8	63.7	360	1.00	Vertical
79.292	28.0	25.1	40.0	100	-12.0	74.9	0	1.00	Vertical
97.816	29.6	30.2	43.5	150	-13.9	119.8	90	1.00	Vertical
104.706	31.5	37.6	43.5	150	-12.0	112.4	60	1.00	Vertical



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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

237BA 3G S8 Access Point, S/N: 000295-0000024940

### 2.2.3 Date of Test and Modification State

20 February to 22 March 2011 – 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

	20 February 2011	22 March 2011
Ambient Temperature	20.5°C	21.8°C
Relative Humidity	31%	32%
Atmospheric Pressure	1012mbar	1034mbar



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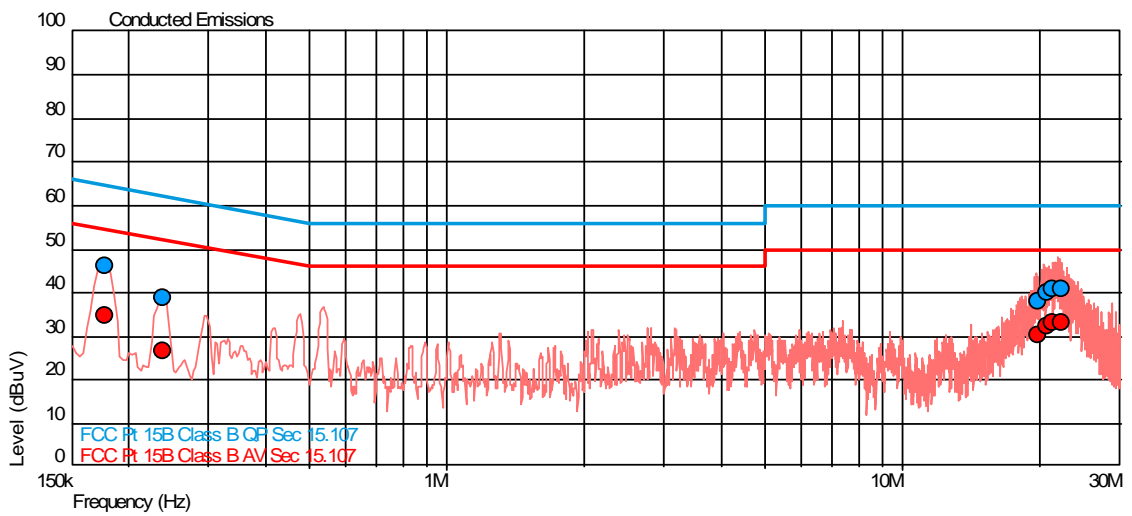
**2.2.7 Test Results**

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

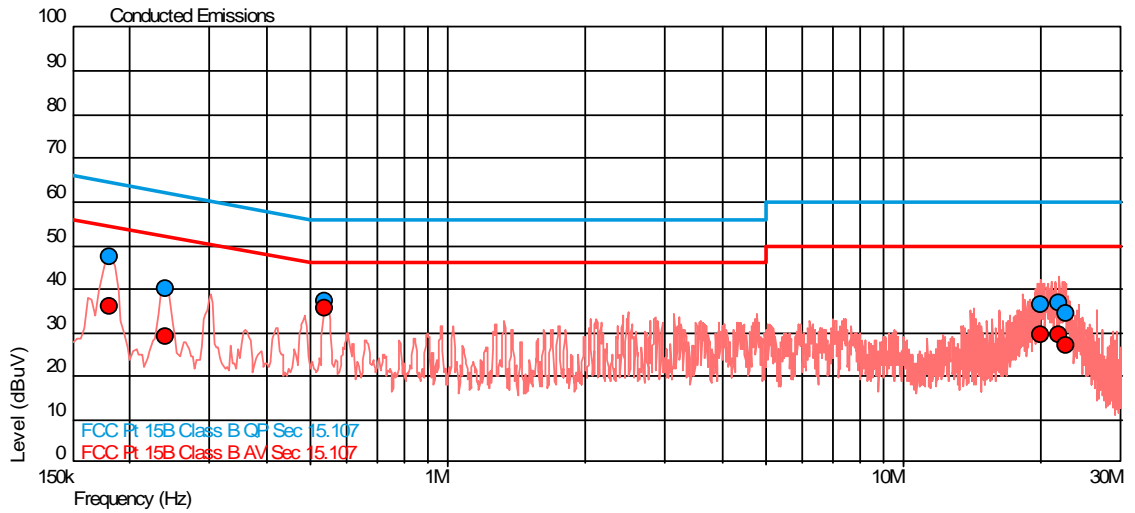


Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.178	46.3	64.6	-18.2	34.6	54.6	-19.9
0.237	39.0	62.2	-23.2	26.5	52.2	-25.7
19.715	38.1	60.0	-21.9	30.4	50.0	-19.6
20.816	40.2	60.0	-19.8	32.3	50.0	-17.7
21.283	40.8	60.0	-19.2	33.2	50.0	-16.8
22.272	40.7	60.0	-19.3	33.0	50.0	-17.0





Neutral Line

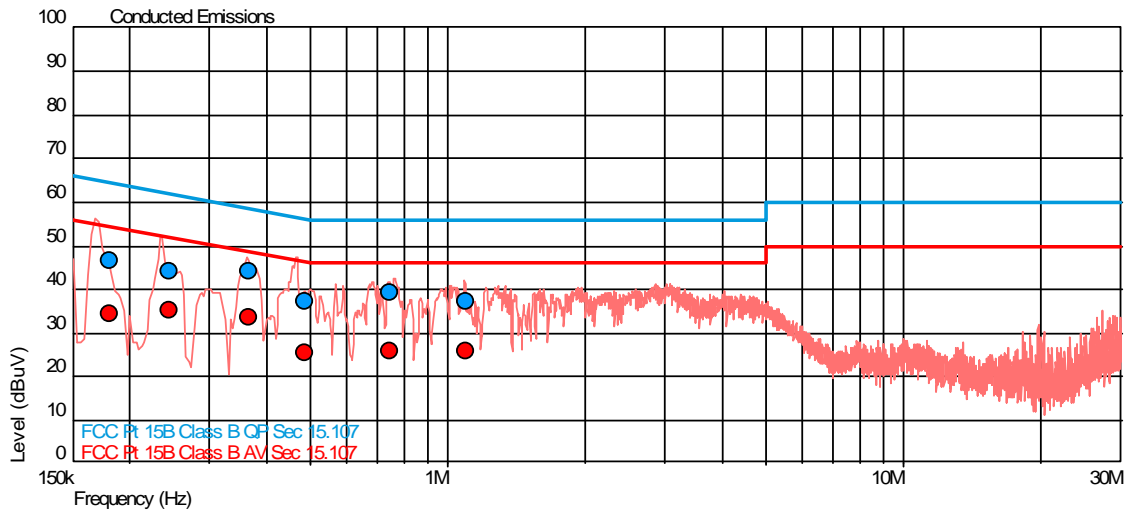


Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.181	47.4	64.5	-17.1	35.9	54.5	-18.6
0.240	40.0	62.1	-22.1	29.0	52.1	-23.1
0.536	37.3	56.0	-18.7	35.4	46.0	-10.6
20.011	36.3	60.0	-23.7	29.6	50.0	-20.4
21.950	36.9	60.0	-23.1	29.3	50.0	-20.7
22.647	34.4	60.0	-25.6	27.0	50.0	-23.0



Configuration 2 - Mode 1

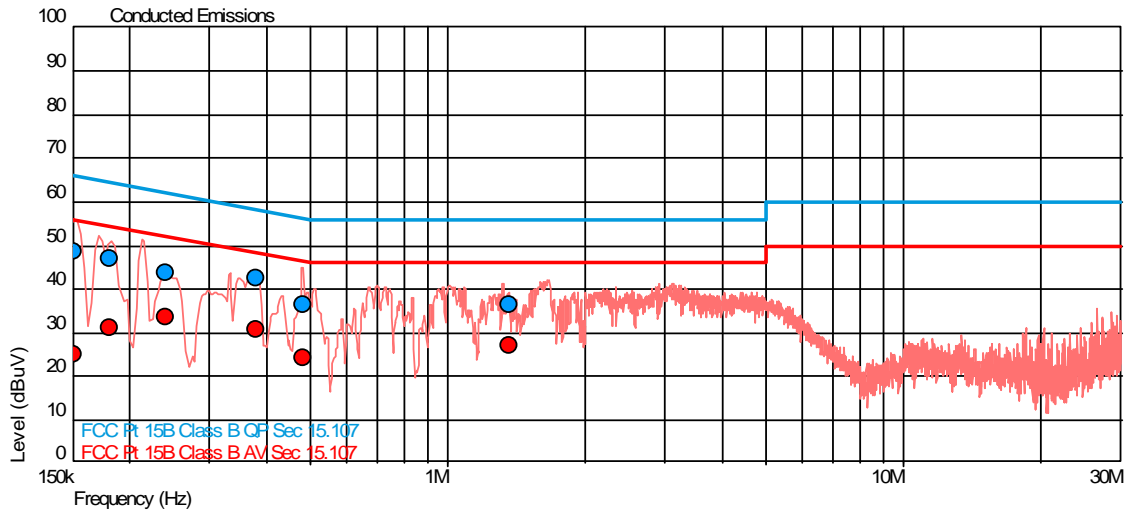
Live Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.180	46.6	64.5	-17.8	34.4	54.5	-20.1
0.245	43.9	61.9	-18.0	35.2	51.9	-16.7
0.366	44.0	58.6	-14.6	33.4	48.6	-15.2
0.484	37.1	56.3	-19.2	25.6	46.3	-20.7
0.743	39.3	56.0	-16.7	25.8	46.0	-20.2
1.090	37.2	56.0	-18.8	25.7	46.0	-20.3



Neutral Line



Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.150	48.5	66.0	-17.5	25.0	56.0	-31.0
0.181	46.9	64.4	-17.5	31.2	54.4	-23.2
0.240	43.8	62.1	-18.3	33.7	52.1	-18.4
0.379	42.5	58.3	-15.8	30.7	48.3	-17.6
0.481	36.6	56.3	-19.8	24.3	46.3	-22.1
1.360	36.4	56.0	-19.6	27.0	46.0	-19.0



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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 2.1 - Radiated Emissions</b>					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	12-Nov-2011
Antenna (Bilog)	Schaffner	CBL6143	287	24	19-Jan-2012
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	2-Aug-2012
Pre-Amplifier	Phase One	PS04-0086	1533	12	15-Sep-2011
Pre-Amplifier	Phase One	PSO4-0087	1534	12	22-Sep-2011
Screened Room (5)	Rainford	Rainford	1545	24	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Turntable/Mast Controller	EMCO	2090	1607	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	4-Dec-2011
Comb Generator	Schaffner	RSG1000	3034	-	TU
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	26-Apr-2011
Amplifier (1 - 8GHz)	Phase One	PS06-0060	3175	12	2-Jul-2011
Amplifier (8 - 18GHz)	Phase One	PS06-0061	3176	12	2-Jul-2011
1m RF Cable sma(m)-sma(m)	Reynolds	262-0248-1000	3453	-	TU
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2011
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	9-Sep-2011
3 GHz High Pass Filter	K&L uwave	11SH10-3000/X18000-O/O	3552	12	14-Apr-2011
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3703	12	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	10-Aug-2011
<b>Section 2.2 - Conducted Emissions</b>					
LISN (1 Phase)	Chase	MN 2050	336	12	25-Mar-2011
Screened Room (5)	Rainford	Rainford	1545	24	3-Feb-2014
Transient Limiter	Hewlett Packard	11947A	2378	12	22-Jun-2011
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	9-Sep-2011

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  
(Not UKAS Accredited).

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