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# Report On

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

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FCC ID: QGGIPA237CA

Document 75912616 Report 01 Issue 1

May 2011



Product Service

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COMMERCIAL-IN-CONFIDENCE

**REPORT ON**

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

Document 75912616 Report 01 Issue 1

May 2011

**PREPARED FOR**

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

**PREPARED BY**

**N Bennett**  
Senior Administrator

**APPROVED BY**

**M J Hardy**  
Authorised Signatory

**DATED**

11 May 2011

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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  
237CA 3G S8 Access Point



## 1.1 INTRODUCTION

The information contained in this report is intended to show verification of the ip.access Ltd 237CA 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 237CA
Serial Number(s)	000295-0000024625
Software Version	SR1.2.0-491.8.0
Hardware Version	XA
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B: 2010
Incoming Release Date	Application Form 18 April 2011
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	PO26015 28 January 2011
Start of Test	24 April 2011
Finish of Test	25 April 2011
Name of Engineer(s)	G Lawler
Related Document(s)	ANSI C63.4 : 2003



## 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 237CA (Band 4)			
<u>Supply Voltage:</u>			
<input checked="" type="checkbox"/> [X] ]	AC mains	State AC voltage	110 V
<input checked="" type="checkbox"/> [X] ]	POE DC (external)	State DC voltage	48 V
<input type="checkbox"/> [ ] ]	DC (internal)	State DC voltage	..... V
		and AC frequency	60 Hz
		and DC current	0.25 A
		and Battery type	.....
<u>Frequency characteristics:</u>			
Frequency range	2110 MHz to 2155 MHz	Channel spacing	200 kHz (if channelized)
Designated test frequencies:			
Bottom:	2112.4 MHz	Middle:	2132.4 MHz
		Top:	2152.6 MHz
<u>Power characteristics:</u>			
Maximum transmitter power	0.02 W	Minimum transmitter power	
	..... W		
		(if variable)	
<input checked="" type="checkbox"/> [X] ]	Continuous transmission		
<input type="checkbox"/> [ ] ]	Intermittent transmission	State duty cycle	.....
	If intermittent, can transmitter be set to continuous transmit test mode? Y/N		
<u>Antenna characteristics:</u>			
<input type="checkbox"/> [ ] ]	Antenna connector	State impedance	..... ohm
<input type="checkbox"/> [ ] ]	Temporary antenna connector	State impedance	..... ohm
<input checked="" type="checkbox"/> [X] ]	Integral antenna	State gain	2 dBi
<u>Modulation characteristics:</u>			
<input checked="" type="checkbox"/> [X] ]	Amplitude	<input type="checkbox"/> [ ] ]	Other
<input type="checkbox"/> [ ] ]	Frequency	Details: .....	
<input checked="" type="checkbox"/> [X] ]	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



<b>MANUFACTURING DESCRIPTION</b>	237CA nano3G S8 Access Point (Band 4)
<b>MANUFACTURER</b>	IP Access Ltd
<b>HARDWARE VERSION</b>	XA
<b>SOFTWARE VERSION</b>	SR1.2.0 - 491.8.0
<b>TRANSMITTER OPERATING RANGE</b>	2110 - 2155 MHz
<b>RECEIVER OPERATING RANGE</b>	1710 – 1755 MHz
<b>COUNTRY OF ORIGIN</b>	UK
<b>INTERMEDIATE FREQUENCIES</b>	NONE
<b>EMISSION DESIGNATOR(S): (i.e. G1D, GXW)</b>	ITU CLASS 5M00D1W
<b>MODULATION TYPES: (i.e. GMSK, QPSK)</b>	SPREAD SPECTRUM W-CDMA
<b>HIGHEST INTERNALLY GENERATED FREQUENCY</b>	2155 MHz
<b>FCC ID</b>	QGGIPA237CA
<b>INDUSTRY CANADA ID</b>	N/A
<b>TECHNICAL DESCRIPTION (a brief description of the intended use and operation)</b>	8 user 3G Access Point operating in Band 4
<b>POE INSERTER</b>	
<b>MANUFACTURING DESCRIPTION</b>	Power over Ethernet single port Midspan
<b>MANUFACTURER</b>	PowerDsine
<b>TYPE</b>	PoE Midspan
<b>PART NUMBER</b>	PD-3501G
<b>VOLTAGE</b>	INPUT: 100-240Vac, 50/60Hz, 0.5A    OUTPUT: 48V, 0.35A
<b>COUNTRY OF ORIGIN</b>	China
<b>POE SPLITTER</b>	
<b>MANUFACTURING DESCRIPTION</b>	Power over Ethernet Active Splitter with Isolation
<b>MANUFACTURER</b>	MSTronic
<b>TYPE</b>	PoE Splitter
<b>PART NUMBER</b>	MIT-06I-1209-IP
<b>VOLTAGE</b>	INPUT: 48Vdc, 0.35A    OUTPUT: 9V, 1.33A LPS
<b>COUNTRY OF ORIGIN</b>	Taiwan
<b>POWER SUPPLY</b>	
<b>MANUFACTURING DESCRIPTION</b>	Switching Adapter
<b>MANUFACTURER</b>	Phihong
<b>TYPE</b>	PSU
<b>PART NUMBER</b>	PSA15R-090PV
<b>SERIAL NUMBER</b>	INPUT: 100-240Vac, 50/60Hz, 0.5A    OUTPUT: 9Vdc, 1.67A LPS
<b>COUNTRY OF ORIGIN</b>	China

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 : 18 April 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 237CA 3G S8 Access Point. A full technical description can be found in the manufacturer's documentation.

### 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 9 V DC PSU or PoE Supply.

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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  
237CA 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**

237CA 3G S8 Access Point, S/N: 000295-0000024625

**2.1.3 Date of Test and Modification State**

24 April 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**

24 April 2011

Ambient Temperature 20.6°C

Relative Humidity 43%

Atmospheric Pressure 1013mbar



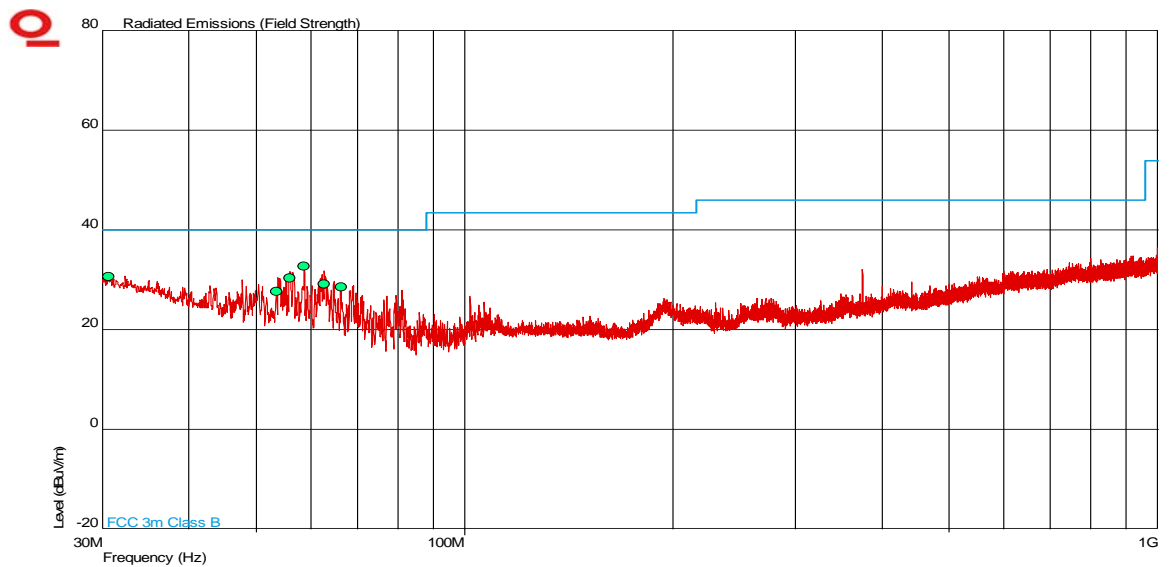
## 2.1.7 Test Results

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

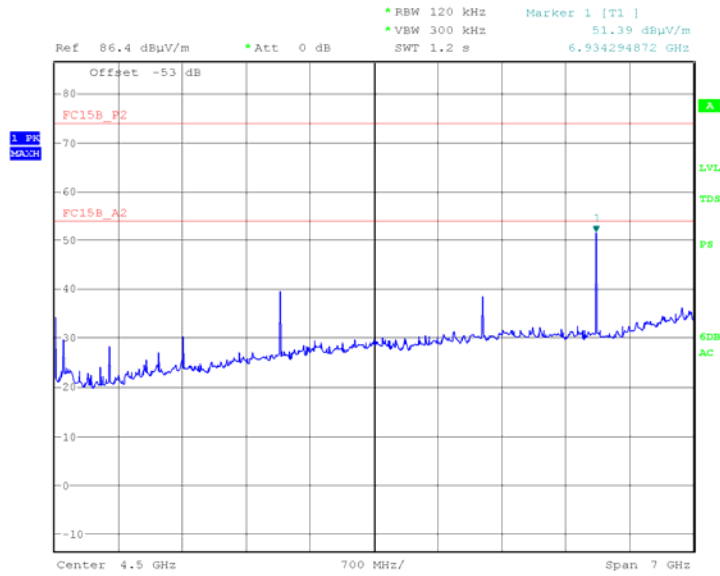


Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dBµV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.624	30.7	34.3	40.0	100	-9.3	65.7	11	1.00	Vertical
53.556	27.7	24.3	40.0	100	-12.3	75.7	360	1.00	Vertical
55.992	30.4	33.1	40.0	100	-9.6	66.9	52	1.40	Vertical
58.726	32.8	43.7	40.0	100	-7.2	56.3	7	1.00	Vertical
62.746	29.2	28.8	40.0	100	-10.8	71.2	248	1.88	Vertical
66.296	28.6	26.9	40.0	100	-11.4	73.1	0	1.88	Vertical



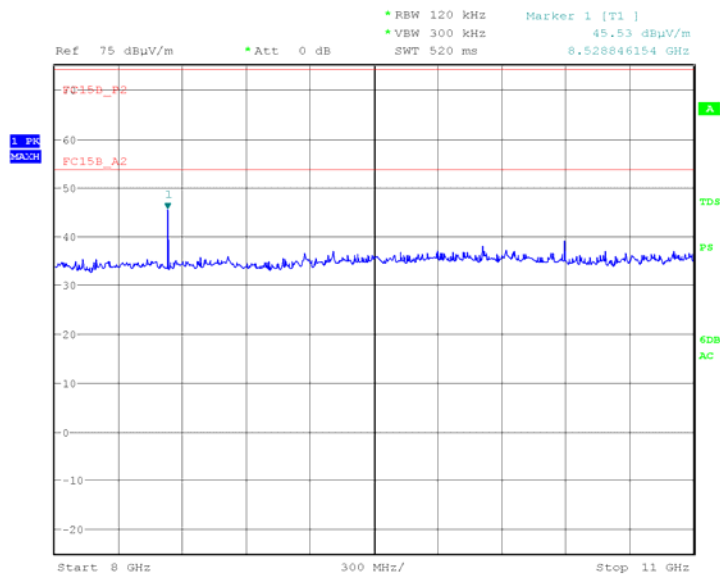
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### 1GHz to 8GHz

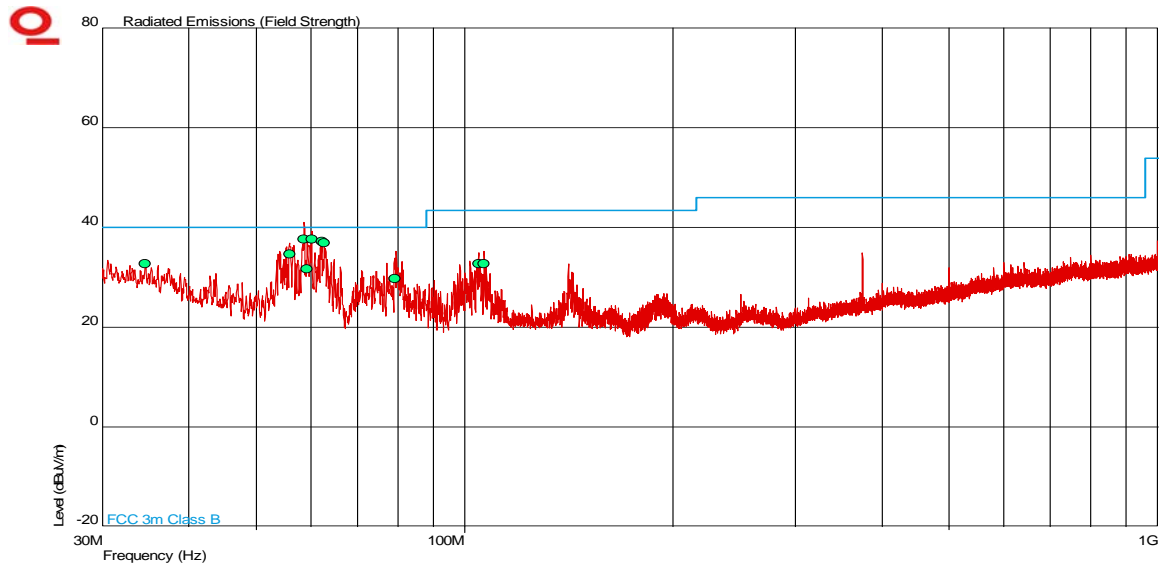


Date: 24.APR.2011 09:17:18

### 8GHz to 11GHz



Date: 24.APR.2011 09:22:03

Configuration 2 - Mode 130MHz to 1GHz

Frequency (MHz)	QP Level (dB $\mu$ V/m)	QP Level ( $\mu$ V/m)	QP Limit (dB $\mu$ V/m)	QP Limit ( $\mu$ V/m)	QP Margin (dB $\mu$ V/m)	QP Margin ( $\mu$ V/m)	Angle (Deg)	Height (m)	Polarity
34.651	32.7	43.2	40.0	100	-7.3	56.8	337	1.03	Vertical
56.019	34.7	54.3	40.0	100	-5.3	45.7	62	1.00	Vertical
58.712	37.6	75.9	40.0	100	-2.4	24.1	32	1.00	Vertical
59.289	31.8	38.9	40.0	100	-8.2	61.1	44	1.00	Vertical
60.213	37.7	76.7	40.0	100	-2.3	23.3	65	1.00	Vertical
62.246	37.3	73.3	40.0	100	-2.7	26.7	19	1.15	Vertical
62.773	37.0	70.8	40.0	100	-3.0	29.2	19	1.25	Vertical
79.219	29.7	30.5	40.0	100	-10.3	69.5	299	2.47	Vertical
104.742	32.7	43.2	43.5	150	-10.8	106.8	135	1.00	Vertical
106.733	32.7	43.2	43.5	150	-10.8	106.8	113	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**

237CA 3G S8 Access Point, S/N: 000295-0000024625

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

25 April 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**

25 April 2011

Ambient Temperature 20.1°C

Relative Humidity 45%

Atmospheric Pressure 1020mbar





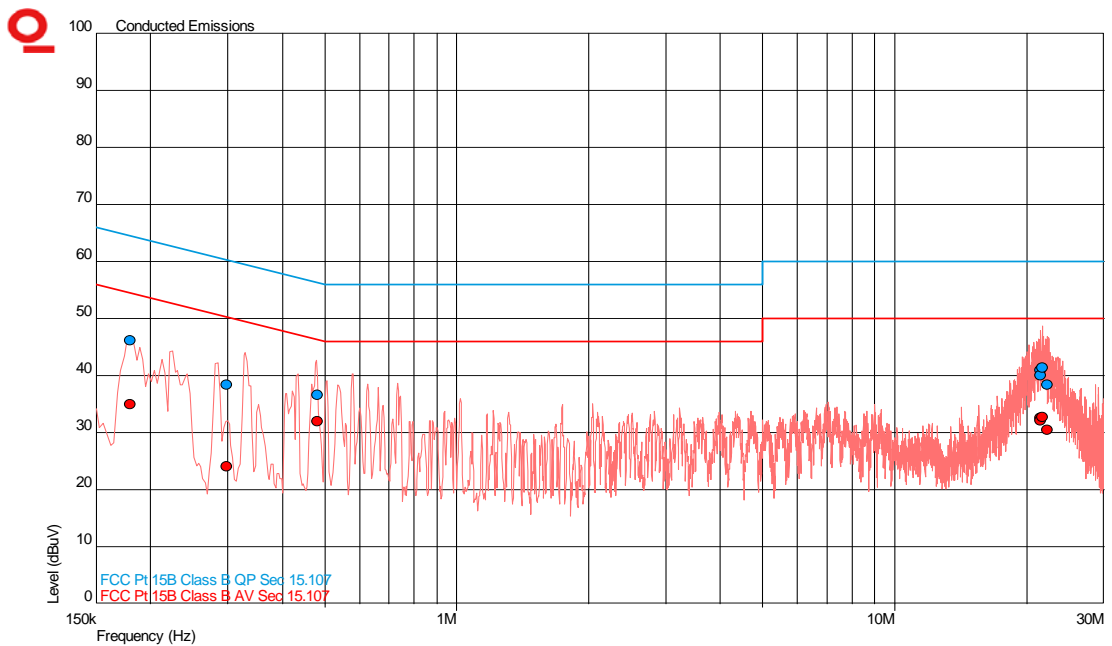
## 2.2.7 Test Results

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

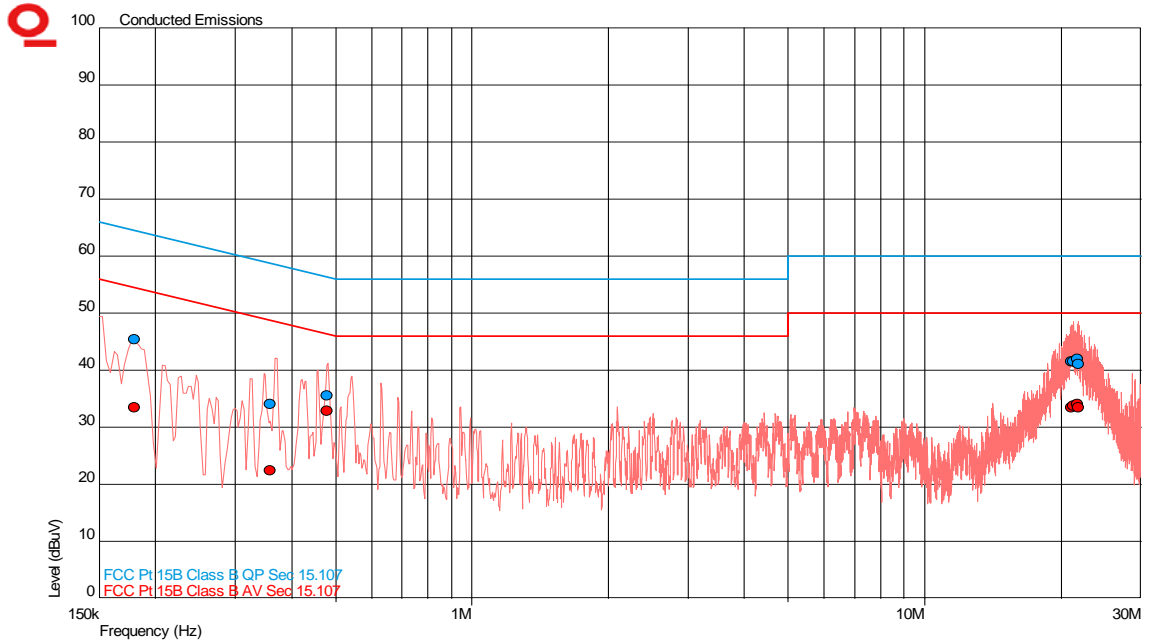
#### Live Line



Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.179	46.1	64.5	-18.4	35.0	54.5	-19.6
0.298	38.5	60.3	-21.8	24.2	50.3	-26.1
0.480	36.6	56.3	-19.8	32.1	46.3	-14.3
21.466	41.0	60.0	-19.0	32.6	50.0	-17.4
21.545	40.1	60.0	-19.9	32.2	50.0	-17.8
21.783	41.4	60.0	-18.6	32.8	50.0	-17.2
22.322	38.5	60.0	-21.5	30.5	50.0	-19.5



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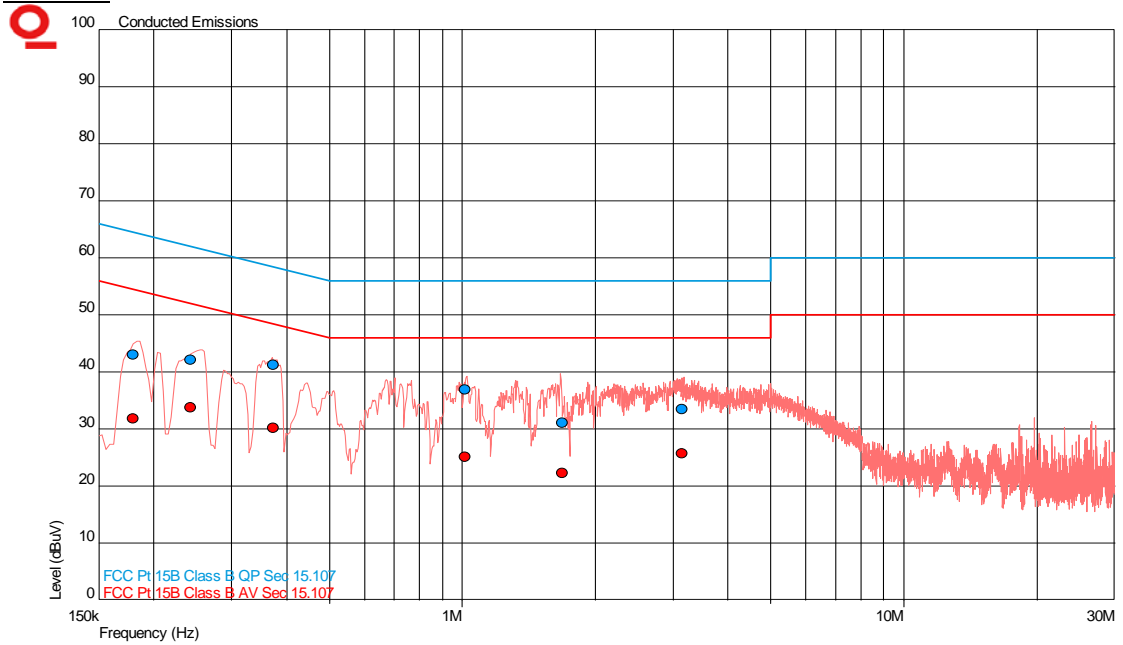
Neutral Line

Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.180	45.4	64.5	-19.1	33.5	54.5	-21.0
0.358	34.1	58.8	-24.7	22.4	48.8	-26.3
0.478	35.5	56.4	-20.8	32.9	46.4	-13.5
21.032	41.5	60.0	-18.5	33.4	50.0	-16.6
21.303	41.6	60.0	-18.4	33.9	50.0	-16.1
21.732	42.1	60.0	-17.9	34.1	50.0	-15.9
21.898	41.1	60.0	-18.9	33.6	50.0	-16.4



## Configuration 2 - Mode 1

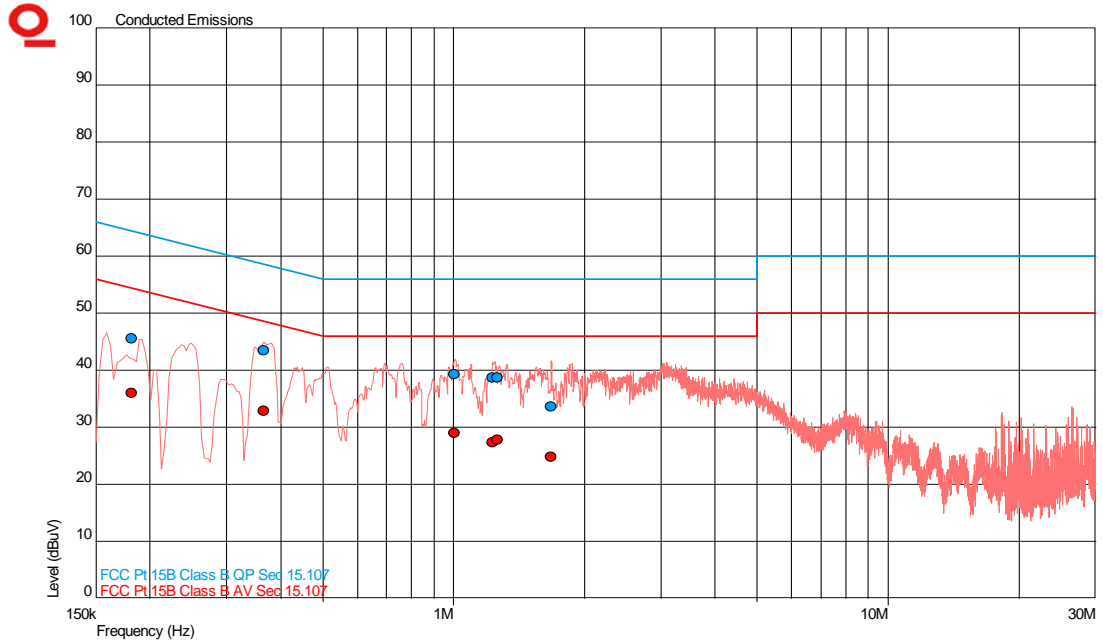
### Live Line



Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.180	43.0	64.5	-21.5	31.9	54.5	-22.6
0.242	42.2	62.0	-19.9	33.8	52.0	-18.2
0.373	41.3	58.4	-17.1	30.2	48.4	-18.3
1.016	36.9	56.0	-19.1	25.1	46.0	-20.9
1.682	31.1	56.0	-24.9	22.2	46.0	-23.8
3.147	33.5	56.0	-22.5	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)
0.181	45.5	64.4	-18.9	36.0	54.4	-18.4
0.366	43.5	58.6	-15.1	32.9	48.6	-15.7
1.001	39.3	56.0	-16.7	29.0	46.0	-17.0
1.232	38.7	56.0	-17.3	27.4	46.0	-18.6
1.259	38.7	56.0	-17.3	27.8	46.0	-18.2
1.680	33.6	56.0	-22.4	24.9	46.0	-21.1



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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
LISN (1 Phase)	Chase	MN 2050	336	12	23-Mar-2012
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	22-Sep-2011
Signal Generator	Rohde & Schwarz	SMR40	1002	12	22-Jul-2011
Attenuator	Hewlett Packard	11708A	1507	12	17-Dec-2011
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	PS04-0087	1534	12	22-Sep-2011
Screened Room (5)	Rainford	Rainford	1545	24	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Transient Limiter	Hewlett Packard	11947A	2378	12	22-Jun-2011
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	12-Aug-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-2012
Microwave Downconverter	Hewlett Packard	11793A	3709	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	10-Aug-2011
Mast Controller	maturo GmbH	NCD	3917	-	TU
<b>Section 2.2 - Conducted Emissions</b>					
LISN (1 Phase)	Chase	MN 2050	336	12	23-Mar-2012
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**





Product Service

#### 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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