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Report On

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

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FCC ID: QGGIPA237C

Document 75912613 Report 01 Issue 1

May 2011



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COMMERCIAL-IN-CONFIDENCE

REPORT ON

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

Document 75912613 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 Jenkins
Authorised Signatory

DATED

13 May 2011

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
237C 3G S8 Access Point



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the ip.access Ltd 237C 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 237C
Serial Number(s)	000295-0000024562
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	Declaration of Build Status 18 April 2011
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	PO26012 28 January 2011
Start of Test	26 April 2011
Finish of Test	26 April 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 237C (Band 4)			
<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		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"/>	[]	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



Product Service

MANUFACTURING DESCRIPTION	237C nano3G S8 Access Point (Band 4)
MANUFACTURER	IP Access Ltd
HARDWARE VERSION	XA
SOFTWARE VERSION	SR1.2.0 - 491.8.0
TRANSMITTER OPERATING RANGE	2110 - 2155 MHz
RECEIVER OPERATING RANGE	1710 – 1755 MHz
COUNTRY OF ORIGIN	UK
INTERMEDIATE FREQUENCIES	NONE
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	ITU CLASS 5M00D1W
MODULATION TYPES: (i.e. GMSK, QPSK)	SPREAD SPECTRUM W-CDMA
HIGHEST INTERNALLY GENERATED FREQUENCY	2155 MHz
FCC ID	QGGIPA237C
INDUSTRY CANADA ID	N/A
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	8 user 3G Access Point operating in Band 4
POE INSERTER	
MANUFACTURING DESCRIPTION	Power over Ethernet single port Midspan
MANUFACTURER	PowerDsine
TYPE	PoE Midspan
PART NUMBER	PD-3501G
VOLTAGE	INPUT: 100-240Vac, 50/60Hz, 0.5A OUTPUT: 48V, 0.35A
COUNTRY OF ORIGIN	China
POE SPLITTER	
MANUFACTURING DESCRIPTION	Power over Ethernet Active Splitter with Isolation
MANUFACTURER	MSTronic
TYPE	PoE Splitter
PART NUMBER	MIT-06I-1209-IP
VOLTAGE	INPUT: 48Vdc, 0.35A OUTPUT: 9V, 1.33A LPS
COUNTRY OF ORIGIN	Taiwan
POWER SUPPLY	
MANUFACTURING DESCRIPTION	Switching Adapter
MANUFACTURER	Phihong
TYPE	PSU
PART NUMBER	PSA15R-090PV
SERIAL NUMBER	INPUT: 100-240Vac, 50/60Hz, 0.5A OUTPUT: 9Vdc, 1.67A LPS
COUNTRY OF ORIGIN	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 237C 3G S8 Access Point . A full technical description can be found in the manufacturers 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 Supply

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.



Product Service

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

The table below details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer	Not Applicable	Not Applicable
1	A few component changes made to resolve a radiated emission failure at between 6 and 7GHz	Adrian Pearce	13 April 2011



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SECTION 2

TEST DETAILS

FCC Testing of the
ip.access Ltd
237C 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

237C 3G S8 Access Point, S/N: 000295-0000024562

2.1.3 Date of Test and Modification State

26 April 2011 - Modification State 1

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

26 April 2011

Ambient Temperature 19.4°C

Relative Humidity 41.0%

Atmospheric Pressure 1020mbar



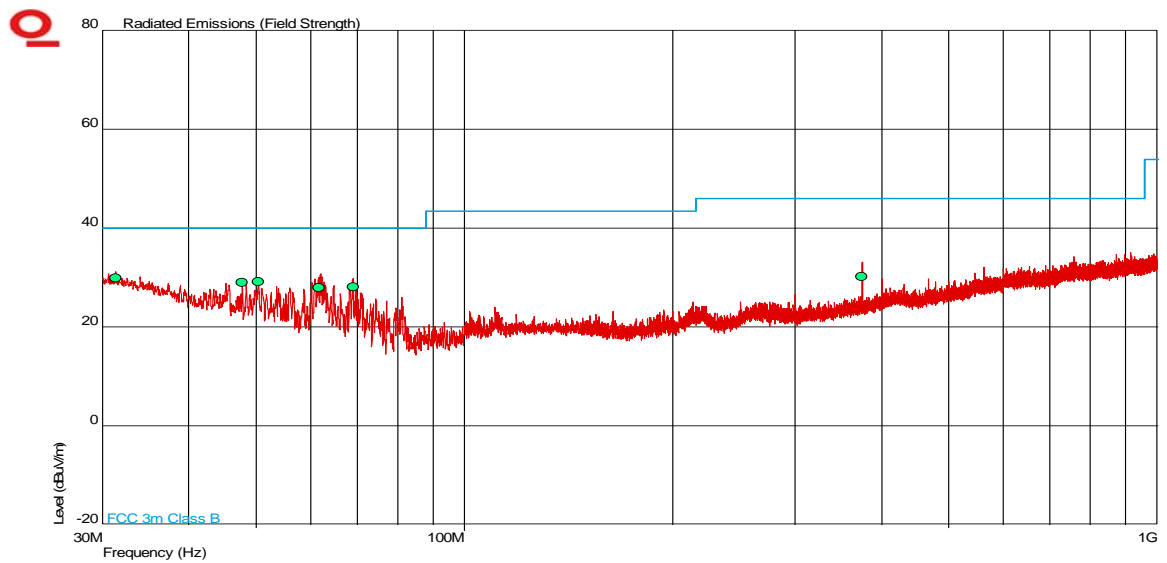
2.1.7 Test Results

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

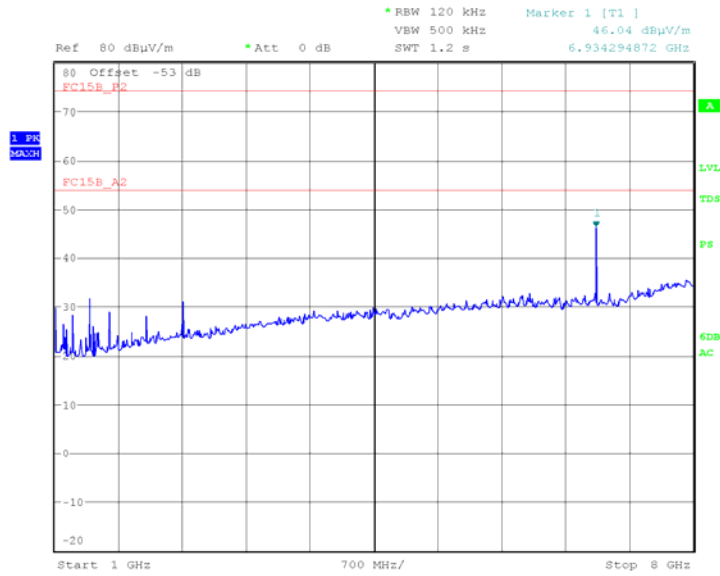


Frequency (MHz)	QP Level (dBμV/m)	QP Level (uV/m)	QP Limit (dBμV/m)	QP limit (uV/m)	QP Margin (dBμV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
31.342	29.9	31.3	40.0	100	-10.1	68.7	360	1.00	Horizontal
47.784	29.1	28.5	40.0	100	-10.9	71.5	49	1.00	Vertical
50.434	29.1	28.5	40.0	100	-10.9	71.5	65	1.00	Vertical
61.611	28.0	25.1	40.0	100	-12.0	74.9	360	1.00	Vertical
69.018	28.1	25.4	40.0	100	-11.9	74.6	93	2.09	Vertical
375.013	30.2	32.4	46.0	200	-15.8	167.6	255	1.00	Vertical



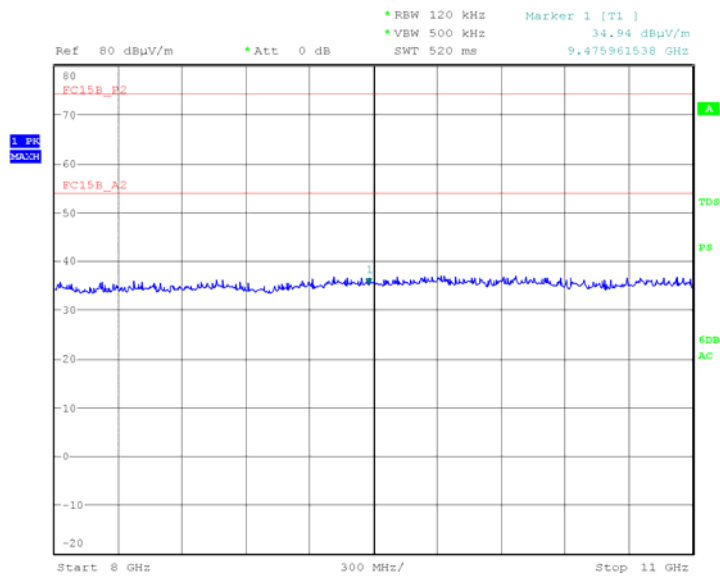
Product Service

1GHz to 8GHz

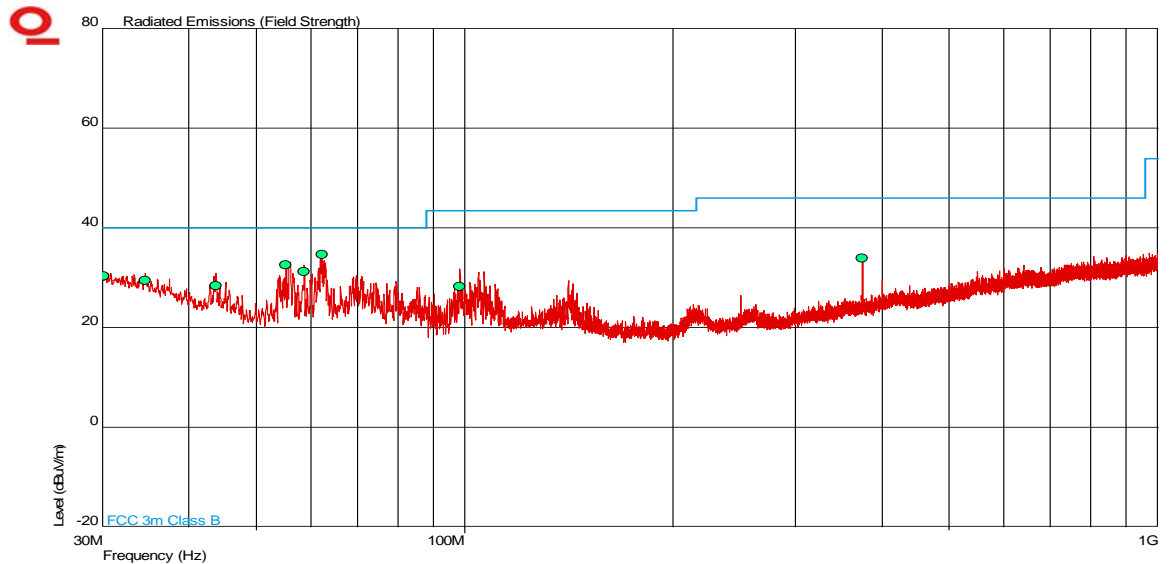


Date: 26.APR.2011 15:40:01

8GHz to 11GHz



Date: 26.APR.2011 16:14:05

Configuration 2 - Mode 130MHz 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
30.178	30.4	33.1	40.0	100	-9.6	66.9	19	1.00	Vertical
34.639	29.4	29.5	40.0	100	-10.6	70.5	54	1.00	Vertical
43.803	28.4	26.3	40.0	100	-11.6	73.7	19	1.00	Vertical
55.281	32.5	42.2	40.0	100	-7.5	57.8	326	1.00	Vertical
58.722	31.2	36.3	40.0	100	-8.8	63.7	346	1.15	Vertical
62.222	34.7	54.3	40.0	100	-5.3	45.7	0	1.00	Vertical
98.440	28.3	26.0	43.5	150	-15.2	124.0	360	1.00	Vertical
374.993	34.0	50.1	46.0	200	-12.0	149.9	0	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

237C 3G S8 Access Point, S/N: 000295-0000024562

2.2.3 Date of Test and Modification State

26 April 2011 – Modification State 1

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

26 April 2011

Ambient Temperature 19.4°C

Relative Humidity 41.0%

Atmospheric Pressure 1020mbar



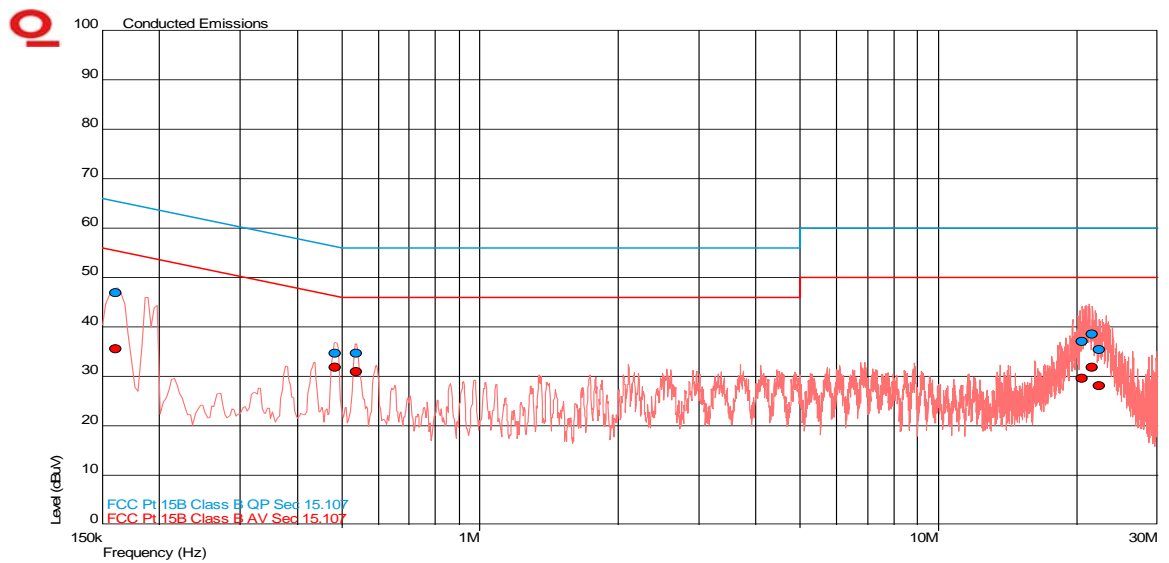
2.2.7 Test Results

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

The test results are shown below.

Configuration 1 - Mode 1

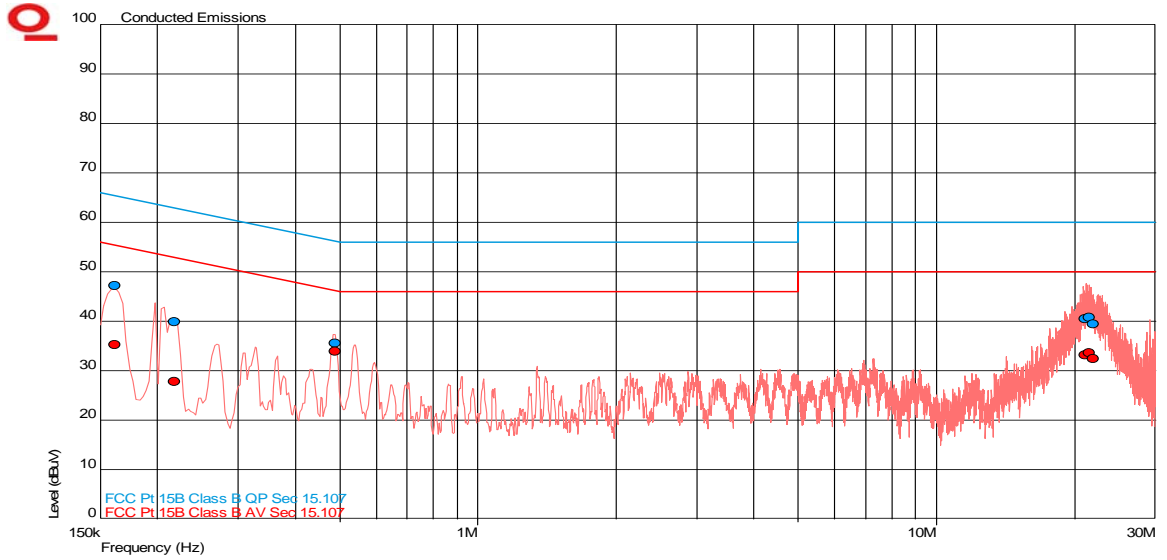
Live Line



Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.161	47.0	65.4	-18.4	35.7	55.4	-19.8
0.484	34.7	56.3	-21.6	31.8	46.3	-14.4
0.537	34.7	56.0	-21.3	31.0	46.0	-15.0
20.532	37.0	60.0	-23.0	29.6	50.0	-20.4
21.666	38.6	60.0	-21.4	31.8	50.0	-18.2
22.447	35.4	60.0	-24.6	28.1	50.0	-21.9



Neutral Line

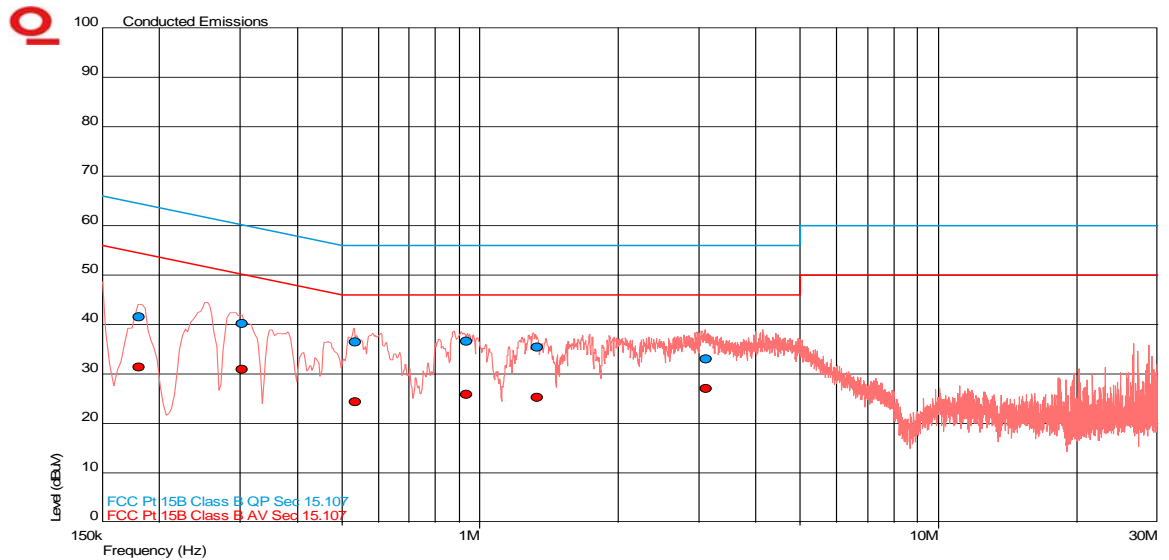


Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.161	47.3	65.4	-18.1	35.3	55.4	-20.1
0.217	39.9	62.9	-23.0	27.9	52.9	-25.0
0.488	35.6	56.2	-20.6	34.0	46.2	-12.2
21.064	40.5	60.0	-19.5	33.3	50.0	-16.7
21.477	40.9	60.0	-19.1	33.7	50.0	-16.3
21.996	39.4	60.0	-20.6	32.4	50.0	-17.6



Configuration 2 - Mode 1

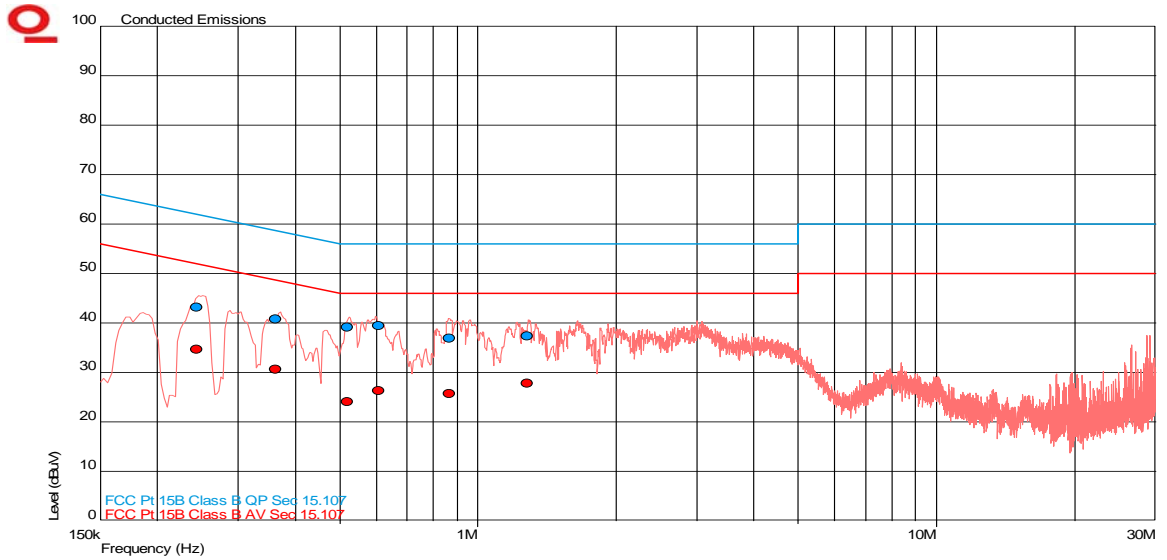
Live Line



Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.180	41.6	64.5	-22.8	31.4	54.5	-23.1
0.303	40.2	60.2	-20.0	30.9	50.2	-19.3
0.535	36.6	56.0	-19.4	24.4	46.0	-21.6
0.934	36.7	56.0	-19.3	25.9	46.0	-20.1
1.337	35.5	56.0	-20.5	25.2	46.0	-20.8



Neutral Line



Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.243	43.2	62.0	-18.8	34.6	52.0	-17.3
0.362	40.9	58.7	-17.8	30.7	48.7	-18.0
0.519	39.2	56.0	-16.8	24.0	46.0	-22.0
0.608	39.5	56.0	-16.5	26.4	46.0	-19.6
0.867	37.0	56.0	-19.0	25.8	46.0	-20.2
1.283	37.4	56.0	-18.6	27.9	46.0	-18.1



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SECTION 3

TEST EQUIPMENT USED



Product Service

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
Section 2.1 - Radiated Emissions					
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	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
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
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2011
Power magnetic field Coil (Horizontal 2.1m*2.2m)	TUV	N/A	3522	-	TU
3 GHz High Pass Filter	K&L uwave	11SH10-3000/X18000-O/O	3552	12	14-Apr-2012
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	10-Aug-2011
Mast Controller	maturo GmbH	NCD	3917	-	TU
Section 2.2- Conducted Emissions					
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 10⁶.

* 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.

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