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Report On

FCC Testing of the
IP Access Ltd
219C nano3G Picocellular Base Station

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FCC ID: QGGIPA219C

Document 75907109 Report 01 Issue 1

August 2009



Product Service

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COMMERCIAL-IN-CONFIDENCE

REPORT ON

FCC Testing of the
IP Access Ltd
219C nano3G Picocellular Base Station

Document 75907109 Report 01 Issue 1

August 2009

PREPARED FOR

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Building 2020, Cambourne Business Park
Cambourne
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CB23 6DW

PREPARED BY

G Lawler
EMC Engineer

APPROVED BY

C Gould
Authorised Signatory

DATED

24 August 2009

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);

A R Hubbard

G Lawler





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SECTION 1

REPORT SUMMARY

FCC Testing of the
IP-Access Ltd
219C nano3G Picocellular Base Station



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the IP Access Ltd 219C nano3G Picocellular Base Station 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)	219C
Serial Number(s)	000295-0000009479
Software Version	Main FS Version 400.0 FS Variant 220G
Hardware Version	XB
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B: 2007
Incoming Release Date	Declaration of Build Status 20 August 2009
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	22514 13 July 2009
Start of Test	13 August 2009
Finish of Test	16 August 2009
Name of Engineer(s)	A R Hubbard G Lawler
Related Document(s)	ANSI 63.4 : 2001



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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 - Test Configuration 1 (see setup instructions)						
Section	Spec Clause	Test Description	Mode	Mod State	Result	Base Standard
2.1	15.109	Radiated Emissions (Enclosure Port)	Idle	0	Pass	ANSI 63.4
2.2	15.107	Conducted Emissions (AC Power Port)	Idle	0	Pass	ANSI 63.4

Configuration 2 - Test Configuration 2 (see setup instructions)						
Section	Spec Clause	Test Description	Mode	Mod State	Result	Base Standard
2.1	15.109	Radiated Emissions (Enclosure Port)	Idle	0	Pass	ANSI 63.4



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1.3 DECLARATION OF BUILD STATUS

Manufacturer	IP Access Ltd
Country of origin	UK
UK Agent	N/A
Technical Description	3G Picocellular Base Station (Band 4, +13dBm)
Model No	nano3G-4
Part No	219C
Serial No	000295-0000009479
Drawing Number (Mechanical)	219#005_PRT Individual Box Assembly 219#010_PRT nano3G-4 Assembly 219#015_PRT PCB Assembly
Build Status	219C015_XB
Software Issue	Main FS Version 400.0 FS Variant 220G
Hardware Issue	XB
FCC ID	QGGIPA219C
Industry Canada ID	N/A

Signature

A handwritten signature in blue ink, appearing to be 'J. G.', written over a horizontal line.

Date

20/08/2009

D of B S Serial No

75907109-41000

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 an IP-Access Ltd, 219C nano3G Picocellular Base Station as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.



Equipment Under Test



1.4.2 Test Configuration

Configuration 1: Test Configuration 1

The EUT was powered via an AC adapter. The EUT was connected to remote Laptop PC by unshielded Cat 5 Ethernet cable. The Laptop PC was configured to ping the EUT.

Configuration 2: Test Configuration 2

The EUT was DC powered by a Power over Ethernet (PoE) splitter.

1.4.3 EUT Cable / Port Identification

Port	Max Cable Length specified	Usage	Type	Screened	Configuration and Mode
AC Power	<3m	Mains Lead	3 core	No	Configuration 1 Mode 1
Signal	>3m	Ethernet	Multicore	No	Configuration 1 Mode 1 Configuration 2 Mode 1

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 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
219C nano3G Picocellular Base Station



Product Service

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

219C nano3G Picocellular Base Station, S/N: 0947

2.1.3 Date of Test and Modification State

13 to 16 August 2009 - 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 63.4.

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

	13 August 2009	16 August 2009
Ambient Temperature	20.1°C	19.6°C
Relative Humidity	55%	51%
Atmospheric Pressure	1015mbar	1013mbar



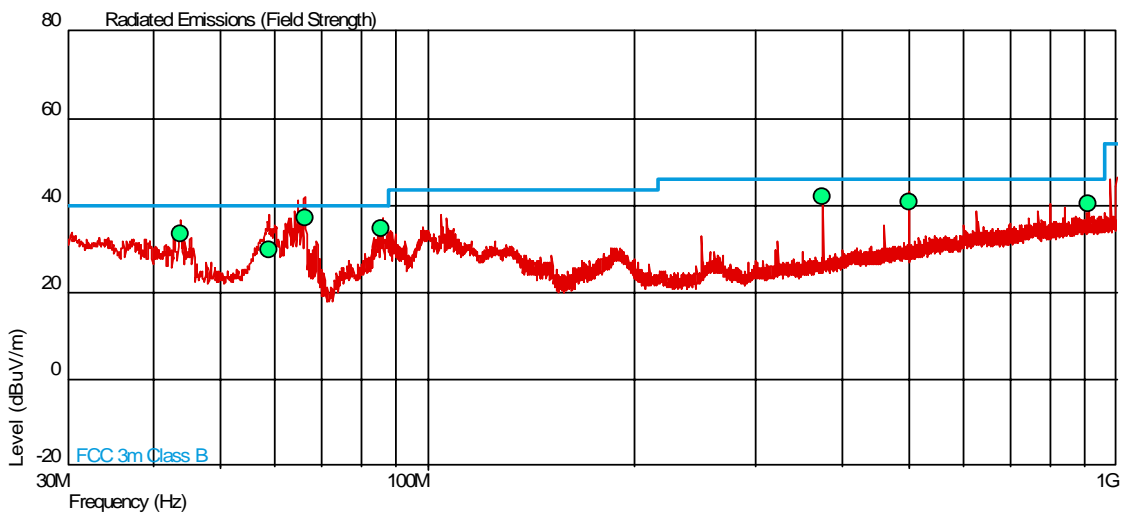
2.1.7 Test Results

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 (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
43.806	33.6	47.9	40.0	100	-6.4	-52.1	325	1.00	Vertical
58.719	29.9	31.3	40.0	100	-10.1	-68.7	54	1.00	Vertical
66.272	37.2	72.4	40.0	100	-2.8	-27.6	75	1.00	Vertical
85.524	34.6	53.7	40.0	100	-5.4	-46.3	206	1.00	Vertical
374.993	42.1	127.4	46.0	200	-3.9	-72.6	119	1.00	Vertical
500.014	40.9	110.9	46.0	200	-5.1	-89.1	203	1.00	Horizontal
909.974	40.3	103.5	46.0	200	-5.7	-96.5	208	1.13	Vertical

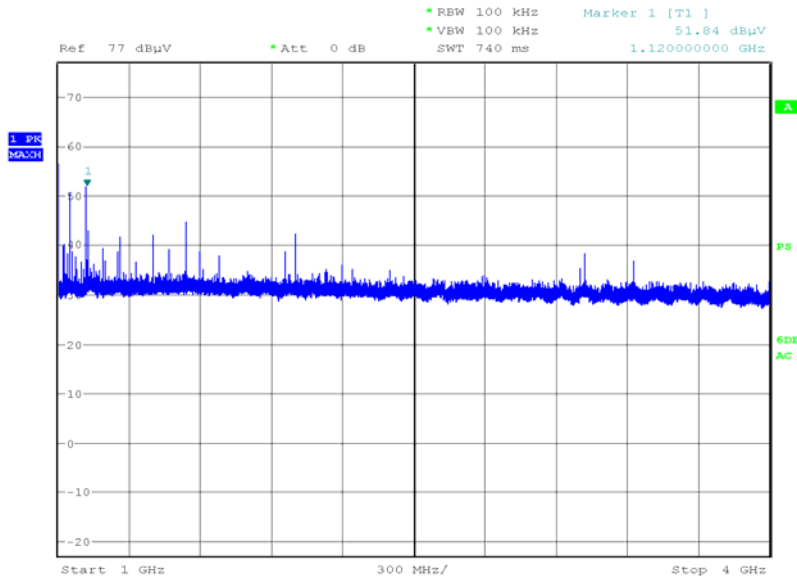
Results 1GHz to 11GHz

Freq. GHz	Ant Pol V/H	Ant Hgt cm	EUT Arc Deg	Final Peak dBµV/m	Final Peak µV/m	Final Average dBµV/m	Final Average µV/m	Peak Limit dBµV/m	Peak Limit µV/m	Average Limit dBµV/m	Average Limit µV/m
1.200	V	100	360	41.3	116.1	41.1	113.5	74.0	5012	54.0	500
1.001	H	202	151	51.8	389.0	46.1	201.8	74.0	5012	54.0	500
6.849	H	100	236	46.0	199.5	39.4	93.3	74.0	5012	54.0	500
8.530	H	100	360	52.6	426.6	44.3	164.1	74.0	5012	54.0	500



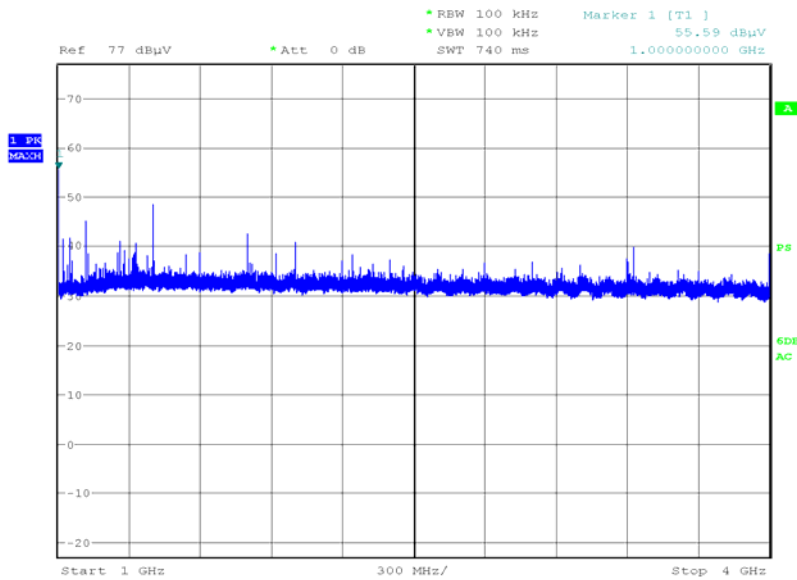
1GHz to 4GHz

Vertical



Date: 16.AUG.2009 15:19:08

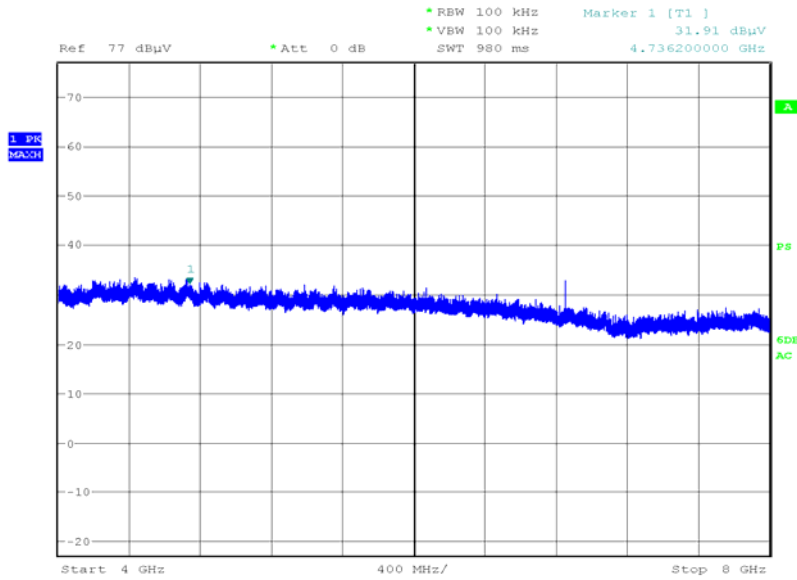
Horizontal



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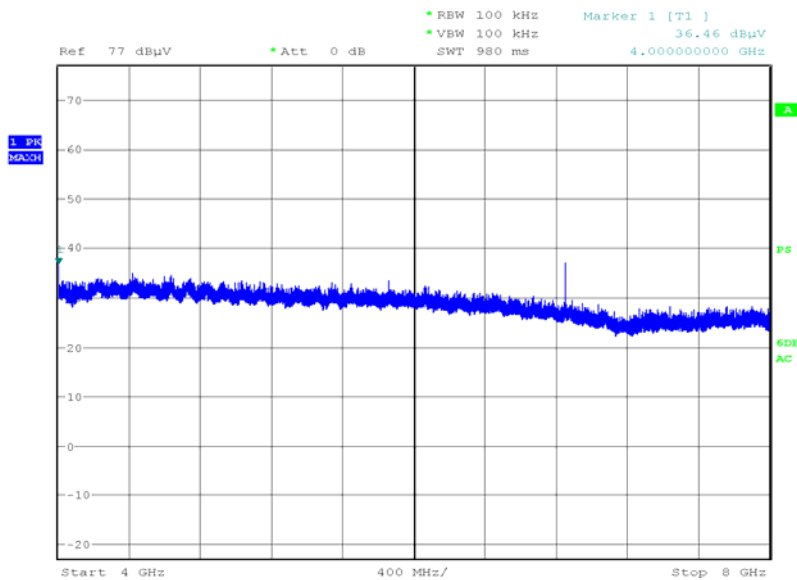


4 GHz to 8GHz



Date: 16.AUG.2009 15:21:20

Horizontal

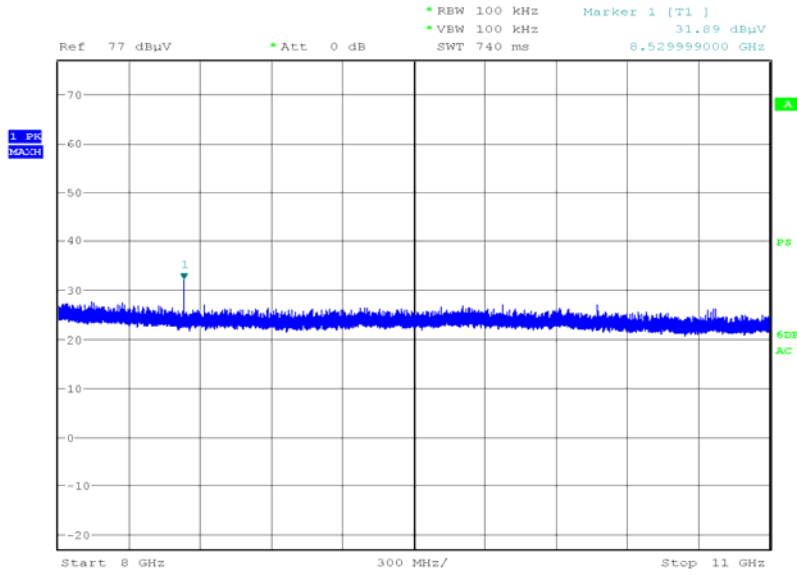


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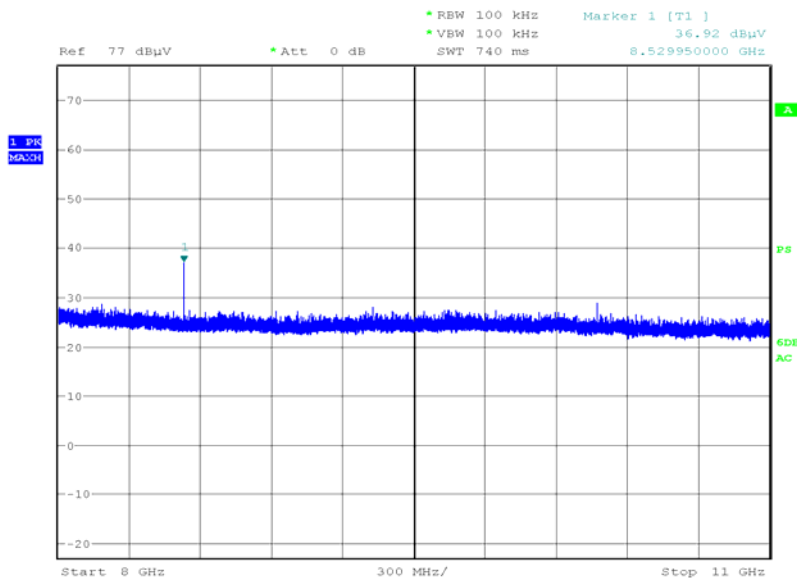
8 GHz to 11GHz

Vertical



Date: 16.AUG.2009 16:36:07

Horizontal

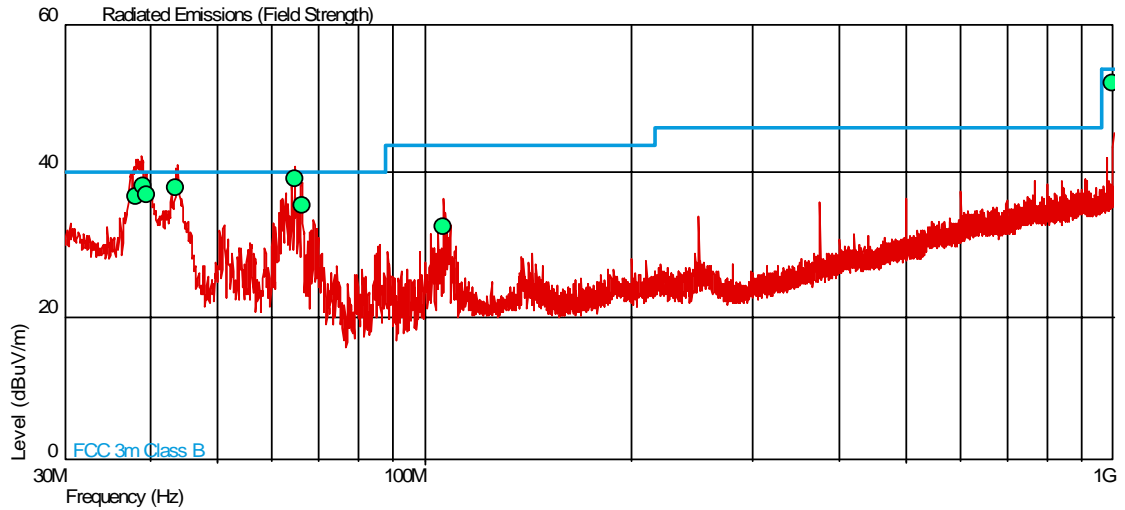


Date: 16.AUG.2009 16:11:11



Configuration 2 - 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
38.074	36.6	67.6	40.0	100	-3.4	-32.4	330	1.00	Vertical
38.932	38.0	79.4	40.0	100	-2.0	-20.6	72	1.00	Vertical
39.550	36.8	69.2	40.0	100	-3.2	-30.8	52	1.00	Vertical
43.499	37.6	75.9	40.0	100	-2.4	-24.1	351	1.00	Vertical
64.774	38.9	88.1	40.0	100	-1.1	-11.9	273	1.00	Vertical
66.295	35.2	57.5	40.0	100	-4.8	-42.5	289	1.00	Vertical
106.698	32.4	41.7	43.5	150	-11.1	-108.9	44	1.00	Vertical
1000.000	52.0	398.1	54.0	500	-2.0	-101.9	149	1.20	Horizontal

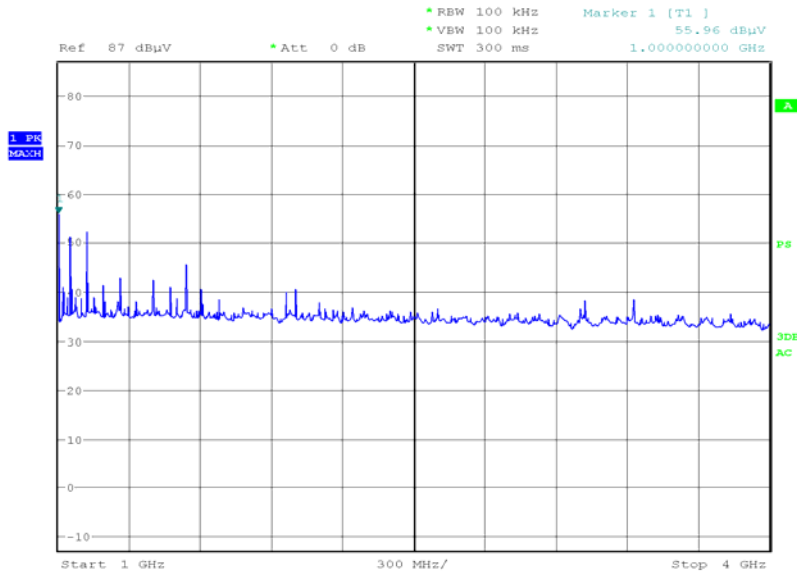
Results 1GHz to 11GHz

Freq. GHz	Ant Pol V/H	Ant Hgt cm	EUT Arc Deg	Final Peak dBµV/m	Final Peak µV/m	Final Average dBµV/m	Final Average µV/m	Peak Limit dBµV/m	Peak Limit µV/m	Average Limit dBµV/m	Average Limit µV/m
1.001	H	140	163	51.7	384.6	49.0	281.8	74.0	5012	54.0	500



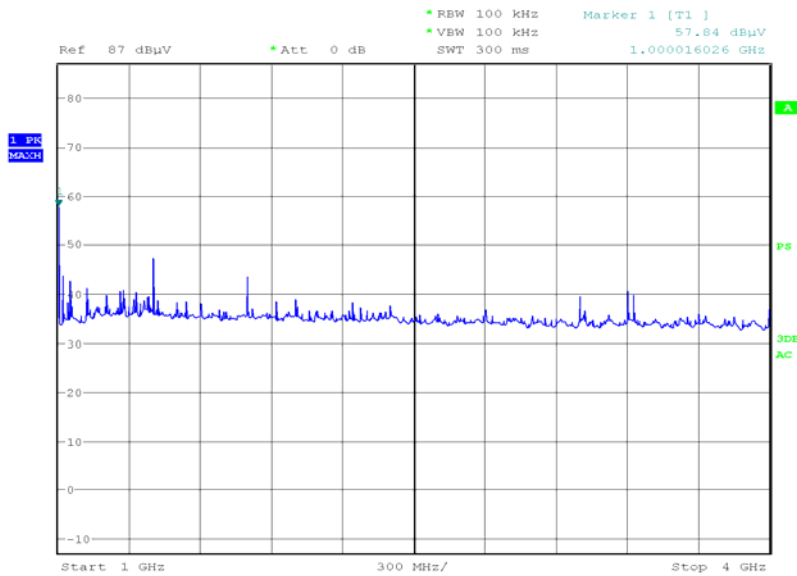
1 GHz to 4GHz

Vertical



Date: 16.AUG.2009 18:48:35

Horizontal

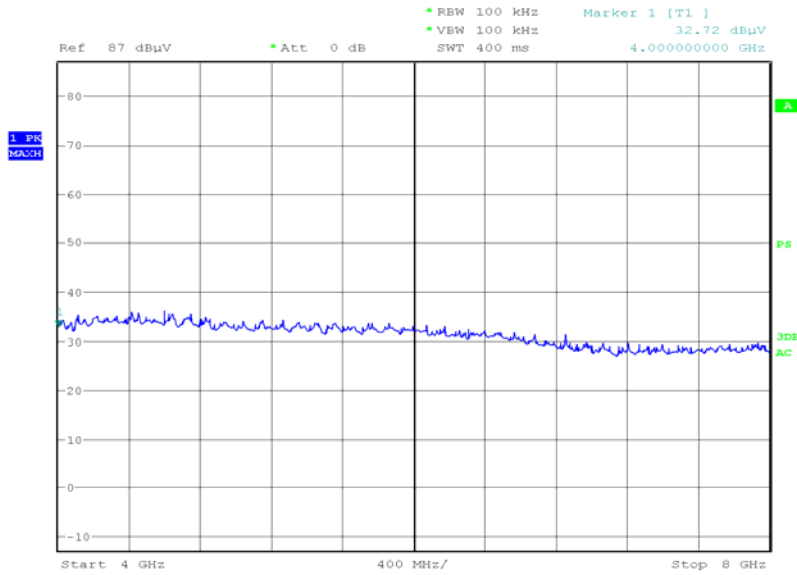


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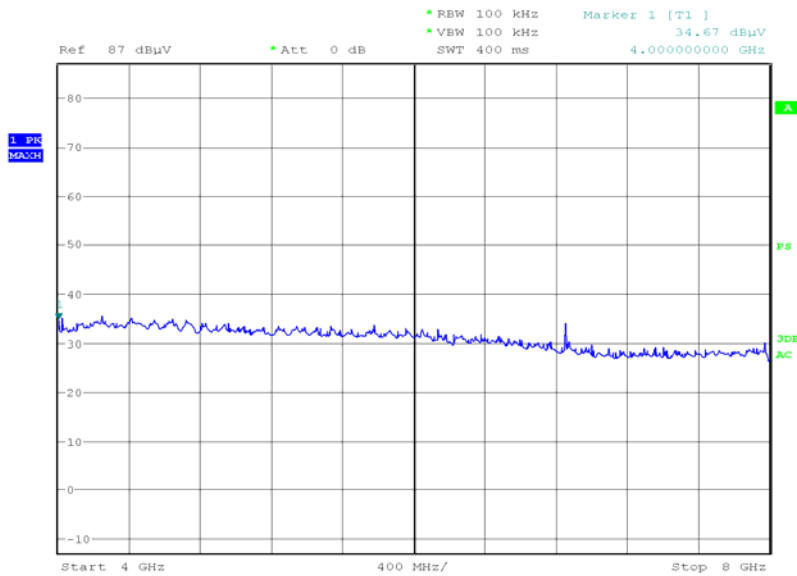
4GHz to 8GHz

Vertical



Date: 16.AUG.2009 18:51:40

Horizontal

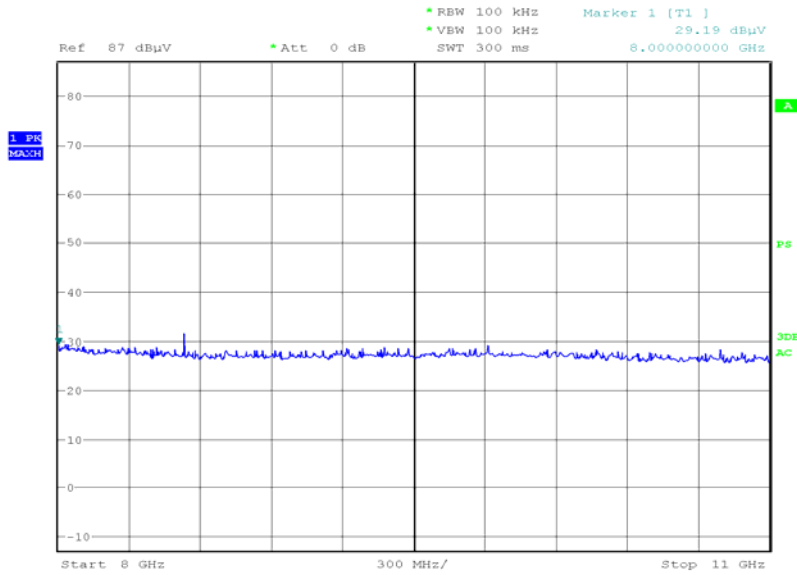


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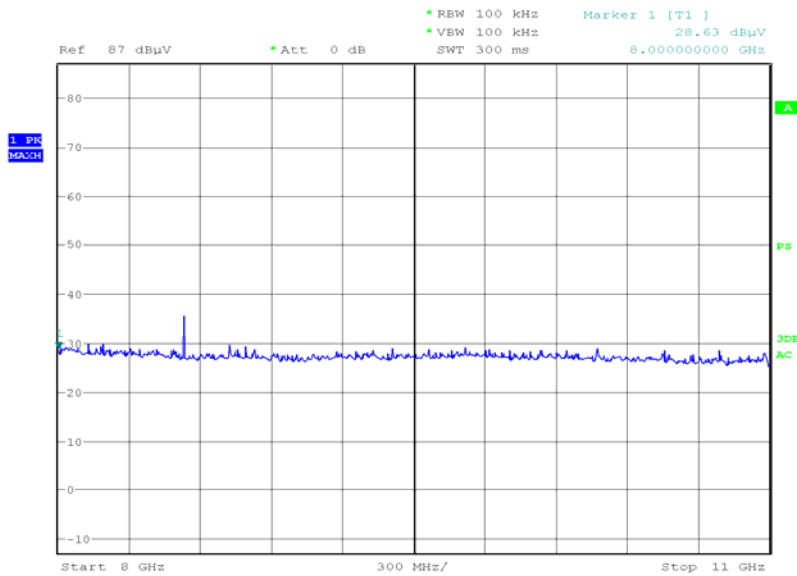
8GHz to 11GHz

Vertical



Date: 16.AUG.2009 18:20:15

Horizontal



Date: 16.AUG.2009 18:24:04



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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

219C nano3G Picocellular Base Station, S/N: 0947

2.2.3 Date of Test and Modification State

16 August 2009 - 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 63.4.

The test was performed with the EUT in the following configuration and mode of operation:

Configuration 1 - Mode 1

2.2.6 Environmental Conditions

	16 August 2009
Ambient Temperature	19.6°C
Relative Humidity	51%
Atmospheric Pressure	1013mbar



Product Service

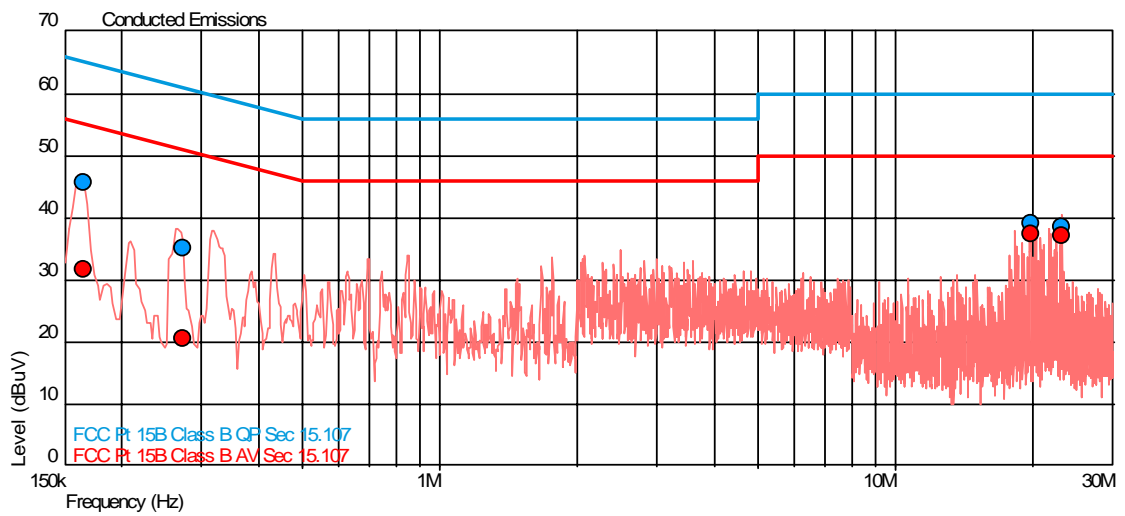
2.2.7 Test Results

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

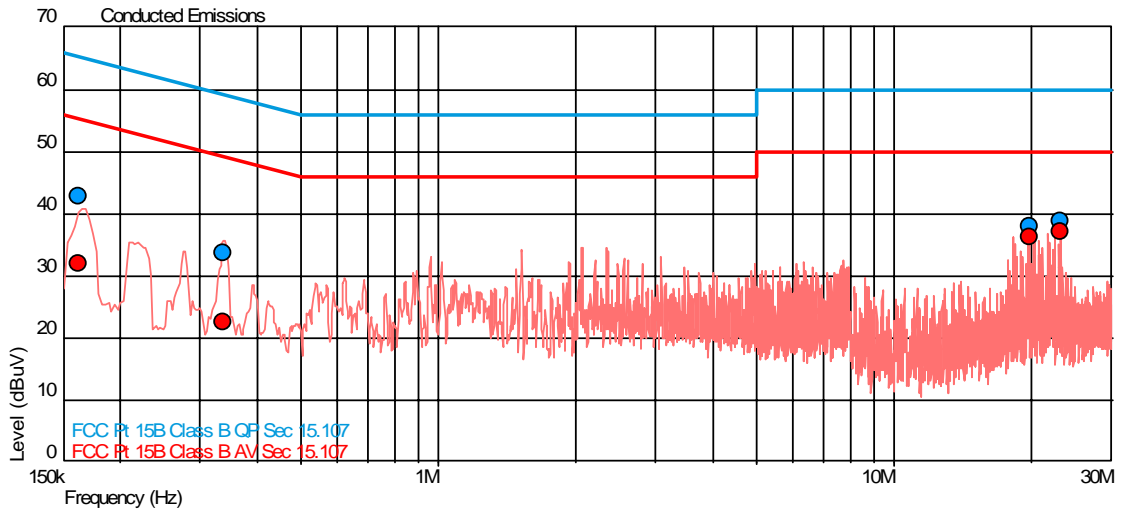
Live Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.165	45.7	65.2	-19.5	31.8	55.2	-23.4
0.273	35.3	61.0	-25.8	20.8	51.0	-30.3
19.710	39.1	60.0	-20.9	37.5	50.0	-12.5
23.130	38.7	60.0	-21.3	37.0	50.0	-13.0



Neutral Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.163	42.7	65.3	-22.6	32.1	55.3	-23.2
0.337	33.7	59.3	-25.6	22.6	49.3	-26.7
19.709	37.9	60.0	-22.1	36.3	50.0	-13.7
23.129	39.0	60.0	-21.0	37.1	50.0	-12.9



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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
Section 2.1 EMC - Radiated Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	6-Sep-2009
Pre-Amplifier	Phase One	PS04-0085	1532	12	15-Sep-2009
Pre-Amplifier	Phase One	PS04-0086	1533	12	15-Sep-2009
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Turntable/Mast Controller	EMCO	2090	1610	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	28-Nov-2009
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	4-Aug-2010
Compliance 3 Emissions	Schaffner	C3e Software V.4.00.00	3274	-	N/A - Software
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	20-Aug-2009
Section 2.2 EMC - Conducted Emissions					
3 Phase Artificial Mains Network (LISN)	Rohde & Schwarz	ESH2-Z5	16	12	11-Mar-2010
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	20-Aug-2009

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

PHOTOGRAPHS



4.1 TEST SET UP PHOTOGRAPHS



Radiated Emissions (Configuration 1)



Radiated Emissions (Configuration 2)



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Conducted Emissions (AC Power Port)



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SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

5.1 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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