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# Report On

FCC Testing of the  
Pace Plc PX001ANM  
In accordance with FCC CFR 47 Part 15B

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FCC ID: NQ8PX001ANM

Document 75916394 Report 01 Issue 1

January 2012



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TÜV SÜD Product Service Ltd, Octagon House, Concorde Way, Segensworth North,  
Fareham, Hampshire, United Kingdom, PO15 5RL  
Tel: +44 (0) 1489 558100. Website: [www.tuvps.co.uk](http://www.tuvps.co.uk)

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**PREPARED FOR**

Pace Plc  
Victoria Road  
Saltaire  
Shipley  
West Yorkshire  
BD18 3LF

**PREPARED BY**

**Natalie Bennett**  
Technical Administrator

**APPROVED BY**

**Mark Jenkins**  
Authorised Signatory

**DATED**

11 January 2012

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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 Part 15B. 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  
Pace Plc PX001ANM  
In accordance with FCC CFR 47 Part 15B



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## 1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Pace Plc PX001ANM 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	Pace Plc
Model Number(s)	PX001ANM
Serial Number(s)	PAPV00001023
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B (2010)
Incoming Release Date	Application Form 15 December 2011
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	5141267 19 December 2011
Start of Test	14 December 2011
Finish of Test	15 December 2011
Name of Engineer(s)	G Lawler



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## 1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15B is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
Unintentional Radiator				
2.1	15.107	AC Line Conducted Emissions	Pass	
2.2	15.109	Radiated Emissions	Pass	



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1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	PX001ANM
Part Number	PX001ANM
FCC ID	NQ8PX001ANM
Industry Canada ID (if applicable)	
Technical Description (Please provide a brief description of the intended use of the equipment)	High Definition Cable Set top box with MOC

POWER SOURCE	
<input type="checkbox"/>	AC mains State voltage
AC supply frequency	50-60 (Hz)
VAC	
Max Current	
Hz	
<input checked="" type="checkbox"/>	Single phase
<input type="checkbox"/>	Three phase
And / Or	
<input type="checkbox"/>	External DC supply
Nominal voltage	15dc V Max Current 4.3 A
Extreme upper voltage	240 V
Extreme lower voltage	100 V
Battery	
<input type="checkbox"/>	Nickel Cadmium
<input type="checkbox"/>	Lead acid (Vehicle regulated)
<input type="checkbox"/>	Alkaline
<input type="checkbox"/>	Leclanche
<input type="checkbox"/>	Lithium
<input type="checkbox"/>	Other Details :
Volts nominal.	
End point voltage as quoted by equipment manufacturer	V

FREQUENCY INFORMATION	
Frequency Range	2.405 to 2.485 MHz
Channel Spacing (where applicable)	
Test Frequencies*	Bottom 2.425 MHz Channel Number (if applicable) 15
	Middle 2.45 MHz Channel Number (if applicable) 20
	Top 2.485 MHz Channel Number (if applicable) 25
If alternate test modes are available resulting in different test frequencies please specify which mode is applicable:	
<b>POWER CHARACTERISTICS</b>	
Maximum TX power	0.002 W
Minimum TX power	W (if variable)
Is transmitter intended for :	
Continuous duty	<input type="checkbox"/> Yes <input type="checkbox"/> No
Intermittent duty	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
If intermittent state DUTY CYCLE	
Transmitter ON	0.01 seconds
Transmitter OFF	0.99 seconds



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ANTENNA CHARACTERISTICS			
<input type="checkbox"/>	Antenna connector	State impedance	Ohm
<input type="checkbox"/>	Temporary antenna connector	State impedance	Ohm
<input type="checkbox"/>	Integral antenna	Gain	>1.3 dBi

MODULATION CHARACTERISTICS			
<input type="checkbox"/>	Amplitude	<input type="checkbox"/>	Frequency
<input type="checkbox"/>	Phase	<input type="checkbox"/>	Other (please provide details):
Can the transmitter operate un-modulated?			<input type="checkbox"/> Yes <input type="checkbox"/> No

CLASS OF EMISSION USED	
ITU designation or Class of Emission:	
1	
(if applicable) 2	
(if applicable) 3	
If more than three classes of emission, list separately:	

EXTREME CONDITIONS			
Extreme test voltages (Max)	V	Extreme test voltages (Min)	V
Nominal DC Voltage	V	DC Maximum Current	A
Maximum temperature	°C	Minimum temperature	°C

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

Signature: *J. Ryan* Name: Joseph Ryan

Position held: Global Approvals Manager Date: 15/12/2011





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## **1.4 PRODUCT INFORMATION**

### **1.4.1 Technical Description**

The Equipment Under Test (EUT) was a Pace Plc PX001ANM. A full technical description can be found in the manufacturer's documentation.

## **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.

The EUT was powered from a 110 V AC supply.

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90987 Octagon House, Fareham Test Laboratory

## **1.6 DEVIATIONS FROM THE STANDARD**

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

## **1.7 MODIFICATION RECORD**

Modification 0 - No modifications were made to the test sample during testing.



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## **SECTION 2**

### **TEST DETAILS**

FCC Testing of the  
Pace Plc PX001ANM  
In accordance with FCC CFR 47 Part 15B



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## **2.1 AC LINE CONDUCTED EMISSIONS**

### **2.1.1 Specification Reference**

FCC CFR 47 Part 15B, Clause 15.107

### **2.1.2 Equipment Under Test and Modification State**

PX001ANM S/N: PAPV00001023 - Modification State 0

### **2.1.3 Date of Test**

14 December 2011

### **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 Procedure**

The EUT is set up on a test table 800mm above a horizontal ground plane. A vertical ground plane is also required and is placed 400mm from the EUT. Where a EUT is floor standing it will be stood on but insulated from the ground plane by up to 12mm.

The EUT is powered through a Line Impedance Stabilisation Network (LISN) which is bonded to the ground plane. The EUT is located so that the distance between the EUT and the LISN is no less than 800mm. Where possible the cable between the mains input of the EUT and the LISN is 1m. Where this is not possible the cable is non inductively bundled with the bundle not exceeding 400mm in length.

A preliminary profile of the Conducted Emissions is obtained over the frequency range 150kHz to 30MHz. Any points of interest are noted for formal measurements.

During formal measurements, the measuring receiver is tuned to the emission of interest where Quasi – Peak and Average measurements are performed in a 9kHz Video and Resolution Bandwidth.

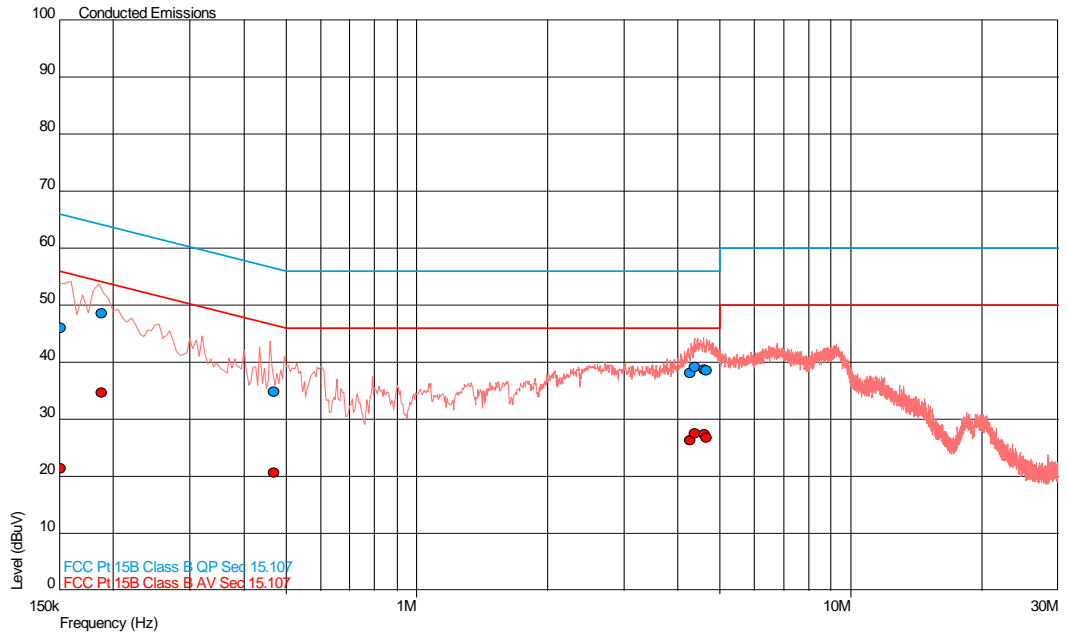
### **2.1.6 Environmental Conditions**

Ambient Temperature	19.8°C
Relative Humidity	30.0%



2.1.7 Test Results

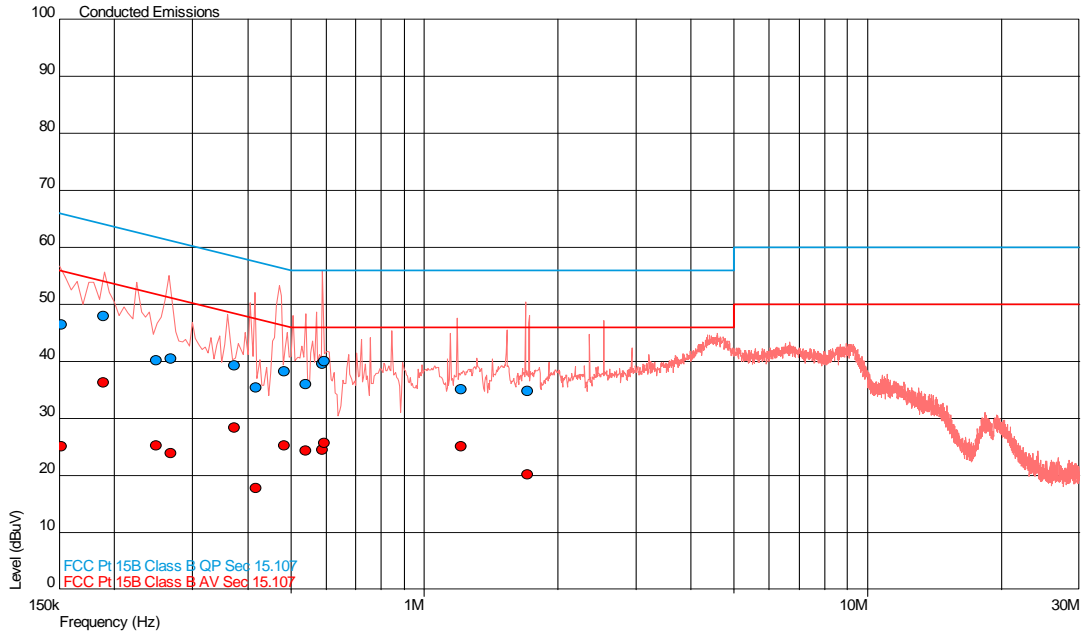
Live Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.151	46.1	65.9	-19.8	21.4	55.9	-34.5
0.188	48.6	64.1	-15.6	34.7	54.1	-19.4
0.469	34.8	56.5	-21.7	20.6	46.5	-25.9
4.273	38.2	56.0	-17.8	26.3	46.0	-19.7
4.382	39.2	56.0	-16.8	27.5	46.0	-18.5
4.604	38.8	56.0	-17.2	27.4	46.0	-18.6
4.645	38.5	56.0	-17.5	26.8	46.0	-19.2



Neutral Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.152	46.4	65.9	-19.5	25.1	55.9	-30.8
0.189	47.9	64.1	-16.2	36.4	54.1	-17.7
0.249	40.3	61.8	-21.5	25.3	51.8	-26.5
0.269	40.5	61.2	-20.7	23.9	51.2	-27.3
0.372	39.4	58.5	-19.1	28.4	48.5	-20.1
0.418	35.4	57.5	-22.1	17.8	47.5	-29.7
0.483	38.3	56.3	-18.0	25.3	46.3	-21.0
0.541	36.0	56.0	-20.0	24.4	46.0	-21.6
0.590	39.6	56.0	-16.4	24.6	46.0	-21.4
0.595	40.0	56.0	-16.0	25.8	46.0	-20.2
1.213	35.1	56.0	-20.9	25.1	46.0	-20.9
1.709	34.9	56.0	-21.1	20.2	46.0	-25.8



## 2.2 RADIATED EMISSIONS

### 2.2.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.109

### 2.2.2 Equipment Under Test and Modification State

PX001ANM S/N: PAPV00001023 - Modification State 0

### 2.2.3 Date of Test

14 December 2011 & 15 December 2011

### 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 Procedure

A preliminary profile of the Spurious Radiated Emissions is obtained up to the 5th harmonic of the EUT's highest internally generated fundamental frequency. For frequencies from 30MHz to 18GHz the EUT is placed on a test table 800mm above the ground plane. For frequencies above 18GHz, the EUT height is increased by 200mm to a height of 1000mm. This is to ensure the beam width of the measuring antenna gives sufficient vertical coverage of the EUT.

During characterisation the turntable azimuth is adjusted from 0 to 360 degrees with the measuring antenna in one polarity. It is then repeated for the other polarity. Any frequencies of interest are noted for formal measuring later. The distance from the measuring antenna to the boundary of the EUT is 3m. Above 18GHz this distance may be reduced to 1m.

During formal measurement the spectrum analyser is tuned to the frequency of the emission. The turntable azimuth is adjusted from 0 to 360 degrees to determine the point at which the maximum emission level occurs. Then the height of the measuring antenna is adjusted from a height of 1m to 4m to determine the height at which the maximum emission level occurs. Once the point of maximum emission has been determined the emission is measured. Emissions in the 30MHz to 1GHz range are measured using a CISPR Quasi – Peak detector function in a 120kHz bandwidth. Emissions in the range 1GHz to 40GHz require Peak and Average measurements. The Peak measurements are made using a peak detector with 1MHz Resolution and Video bandwidths. The average measurements employ a peak detector with a Resolution bandwidth of 1MHz and a Video bandwidth of 10Hz. If measurements are made at a 1m measuring distance, then 10dB is added to the specification limit.

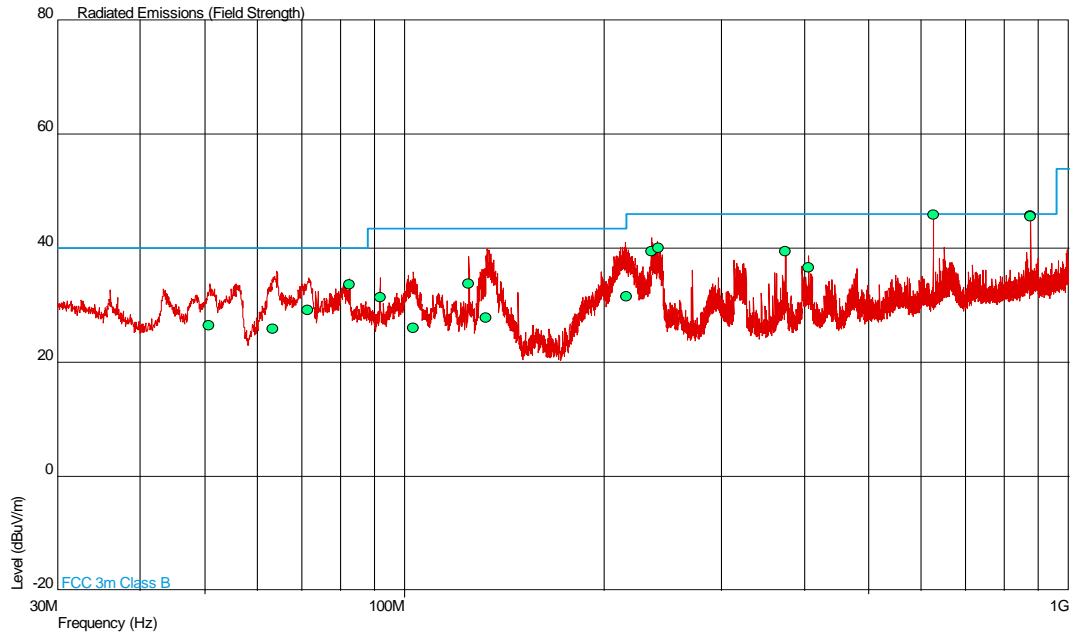
### 2.2.6 Environmental Conditions

Ambient Temperature	15.8 - 19.8°C
Relative Humidity	30.0%



2.2.7 Test Results

30 MHz to 1 GHz



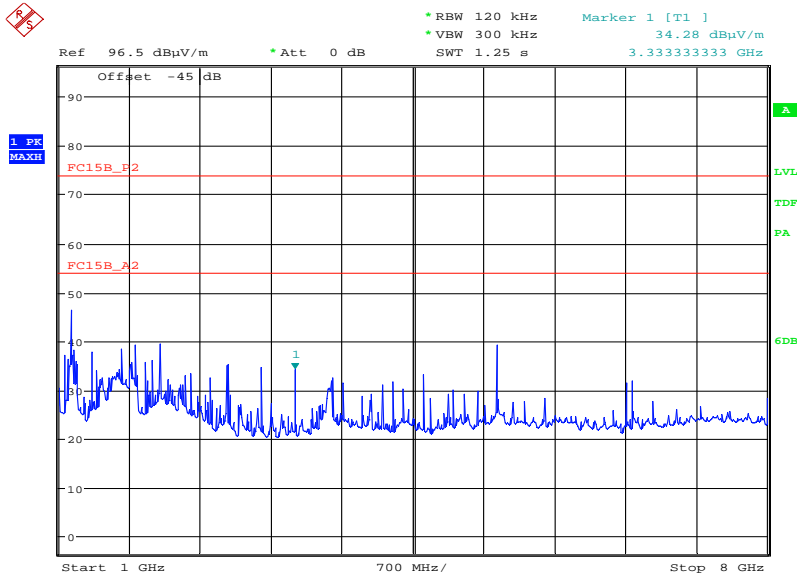
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
50.781	26.5	21.1	40.0	100	-13.5	78.9	313	1.00	Vertical
63.445	25.9	19.7	40.0	100	-14.1	80.3	348	1.03	Vertical
71.375	29.1	28.5	40.0	100	-10.9	71.5	171	1.38	Vertical
82.693	33.7	48.4	40.0	100	-6.3	51.6	90	1.00	Vertical
91.935	31.5	37.6	43.5	150	-12.0	112.4	143	1.00	Vertical
102.977	26.1	20.2	43.5	150	-17.4	129.8	330	1.00	Vertical
125.003	33.8	49.0	43.5	150	-9.7	101.0	251	1.00	Vertical
132.739	27.9	24.8	43.5	150	-15.6	125.2	281	1.00	Vertical
215.564	31.6	38.0	43.5	150	-11.9	112.0	0	1.08	Vertical
235.444	39.4	93.3	46.0	200	-6.6	106.7	360	2.09	Vertical
241.325	40.1	101.2	46.0	200	-5.9	98.8	0	1.00	Vertical
375.011	39.4	93.3	46.0	200	-6.6	106.7	225	1.00	Horizontal
406.418	36.7	68.4	46.0	200	-9.3	131.6	172	1.00	Horizontal
624.995	45.9	197.2	46.0	200	-0.1	2.8	69	1.00	Vertical
874.994	45.7	192.8	46.0	200	-0.3	7.2	175	1.37	Vertical
875.008	45.6	190.5	46.0	200	-0.4	9.5	73	1.03	Horizontal



1 GHz to 13 GHz

Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
1.1250	Vertical	127	091	58.82	50.66
1.1500	Vertical	100	181	48.12	48.12
1.3750	Vertical	100	091	50.91	46.56
1.6250	Vertical	110	096	55.87	49.46
2.0000	Vertical	225	166	53.86	47.35
2.2250	Vertical	107	247	56.75	50.72
3.0000	Vertical	110	091	55.40	52.51
3.3333	Vertical	100	288	57.93	53.68
5.3333	Vertical	130	290	57.31	47.74
6.0000	Vertical	151	084	56.12	52.80

1 GHz to 8 GHz

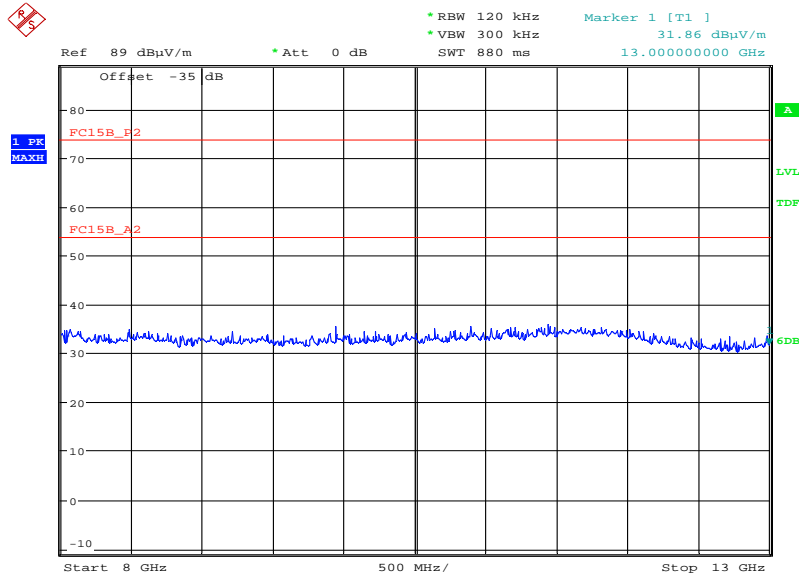


Date: 14.DEC.2011 20:19:18





8 GHz to 13 GHz



Date: 16.DEC.2011 22:07:24



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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 - AC Line Conducted Emissions</b>					
LISN (1 Phase)	Chase	MN 2050	336	12	23-Mar-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Transient Limiter	Hewlett Packard	11947A	2378	12	22-Jun-2012
Test Receiver	Rohde & Schwarz	ESIB40	2941	12	12-May-2012
<b>Section 2.2- Radiated Emissions</b>					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	22-Aug-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3703	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



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### 3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Radiated Emissions	30MHz to 1GHz: $\pm 5.1$ dB 1GHz to 40GHz: $\pm 6.3$ dB
AC Line Conducted Emissions	$\pm 3.2$ dB



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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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