

FCC Testing of the Axnes Aviation AS Transceiver. Model: MP50 in conjunction with Model: CHG50 and Model: CHG55 Chargers. In accordance with FCC 47 CFR Part 15B

Prepared for: Axnes Aviation AS
Terje Lovasvei 1
Grimstad
N-4879
NORWAY

FCC ID: 2AOHP MP50A (MP50)

COMMERCIAL-IN-CONFIDENCE

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Product Service

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RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Steven White	11 April 2018	
Authorised Signatory	Andy Lawson	11 April 2018	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

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 47 CFR Part 15B. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Graeme Lawler	11 April 2018	

FCC Accreditation

90987 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15B: 2017.



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Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TÜV SÜD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuv-sud.co.uk

TÜV SÜD Product Service
Octagon House
Concorde Way
Fareham
Hampshire PO15 5RL
United Kingdom



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1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	11 April 2018

Table 1

1.2 Introduction

Applicant	Axnes Aviation AS
Manufacturer	Axnes Aviation AS
Model Number(s)	MP50, (CHG50 / ZVC30NP12-I) and CHG55
Serial Number(s)	000 451, 000 121, Not Serialised (75940027-TSR0004) and 000 149
Hardware Version(s)	R13 (MP50), R3 (CHG50), R3 (CHG55)
Software Version(s)	AXS-SW-0221 (MP50)
Number of Samples Tested	4
Test Specification/Issue/Date	FCC 47 CFR Part 15B: 2017
Order Number	801584
Date	26-July-2017
Date of Receipt of EUT	11-August-2017
Start of Test	11-September-2017
Finish of Test	13-September-2017
Name of Engineer(s)	Graeme Lawler
Related Document(s)	ANSI C63.4: 2014



Product Service

1.3 Brief Summary of Results

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

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: PNG MP50 (Stand Alone) Idle				
2.1	15.109	Radiated Emissions	Pass	ANSI C63.4
Configuration and Mode: PNG MP50 + CHG55 Charger Charging				
2.1	15.109	Radiated Emissions	Pass	ANSI C63.4
Configuration and Mode: PNG MP50 + CHG50 Charger Charging				
2.2	15.107	AC Power Line Conducted Emissions	Pass	ANSI C63.4
2.1	15.109	Radiated Emissions	Pass	ANSI C63.4

Table 2



1.4 Application Form(s)

1.1 DECLARATION OF BUILD STATUS

Manufacturer	Axnes AS
Country of origin	Norway
UK Agent	n/a
Technical Description	PNG MP50 Transceiver, component used in the PNG wireless intercom system
Model No	MP50
Part No	AXS-HH-D0100-N-C0
Serial No	000 451, 000 452
Drawing Number	AX-PNG-MCL-0176
Build Status	R13
Software Issue	AXS-SW-0221
Hardware Issue	R13
Highest Internally Generated Frequency	1880MHz
FCC ID	2AOHP MP50A (MP50)
Industry Canada ID	
Signature	Petter Johnsen
Date	07/09/2017
D of B S Serial No	75940027/001

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 SÜD Product Service as to the accuracy of the information declared in this document by the manufacturer.



Manufacturer	<u>Axnes AS</u>
Country of origin	<u>Norway</u>
UK Agent	<u>n/a</u>
Technical Description	<u>PNG CHG50 Charger, component used in the PNG wireless intercom system</u>
Model No	<u>CHG50</u>
Part No	<u>AXS-CHG-0100-N-C0</u>
Serial No	<u>000 121</u>
Drawing Number	<u>AX-PNG-MCL-0427</u>
Build Status	<u>R3</u>
Software Issue	<u>-</u>
Hardware Issue	<u>R3</u>
Highest Internally Generated Frequency	<u>-</u>
FCC ID	<u>n/a</u>
Industry Canada ID	<u>n/a</u>
Signature	<u>Petter Johnsen</u>
Date	<u>07/09/2017</u>
D of B S Serial No	<u>75940027/002</u>

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Manufacturer	<u>Axnes AS</u>
Country of origin	<u>Norway</u>
UK Agent	<u>n/a</u>
Technical Description	<u>PNG CHG55 Charger, component used in the PNG wireless intercom system</u>
Model No	<u>CHG55</u>
Part No	<u>AXS-CHG-0150-N-C0</u>
Serial No	<u>000 149</u>
Drawing Number	<u>AX-PNG-MCL-0184</u>
Build Status	<u>R4</u>
Software Issue	<u>-</u>
Hardware Issue	<u>R4</u>
Highest Internally Generated Frequency	<u>-</u>
FCC ID	<u>n/a</u>
Industry Canada ID	<u>n/a</u>
Signature	<u>Petter Johnsen</u>
Date	<u>07/09/2017</u>
D of B S Serial No	<u>75940027/003</u>

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1.5 Product Information

1.5.1 Technical Description

PNG MP50 Transceiver, component used in the PNG wireless intercom system.

1.6 Deviations from the Standard

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

1.7 EUT 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
Serial Number: 000 451			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: 000 121			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: Not Serialised (75940027-TSR0004)			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: 000 149			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3



Product Service

1.8 Test Location

TÜV SÜD Product Service conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: PNG MP50 (Stand Alone) Idle		
Radiated Emissions	Graeme Lawler	UKAS
Configuration and Mode: PNG MP50 + CHG55 Charger Charging		
Radiated Emissions	Graeme Lawler	UKAS
Configuration and Mode: PNG MP50 + CHG50 Charger Charging		
AC Power Line Conducted Emissions	Graeme Lawler	UKAS
Radiated Emissions	Graeme Lawler	UKAS

Table 4

Office Address:

Octagon House
Concorde Way
Segensworth North
Fareham
Hampshire
PO15 5RL
United Kingdom



2 Test Details

2.1 Radiated Emissions

2.1.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.109

2.1.2 Equipment Under Test and Modification State

MP50, S/N: 000 451 - Modification State 0

CHG50, S/N: 000 121 - Modification State 0

ZVC30NP12-I, S/N: Not Serialised (75940027-TSR0004) - Modification State 0

CHG55, S/N: 000 149 - Modification State 0

2.1.3 Date of Test

11-September-2017 to 12-September-2017

2.1.4 Test Method

The test was performed in accordance with ANSI C63.4, clause 8.

2.1.5 Environmental Conditions

Ambient Temperature 19.2 °C

Relative Humidity 51.0 %

2.1.6 Test Results

PNG MP50 (Stand Alone) Idle

Highest frequency generated or used within the EUT: 1880 MHz

Upper frequency test limit: 10 GHz

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
59.995	31.9	39.1	-7.2	103	1.00	Vertical
60.005	30.4	39.1	-8.7	101	1.00	Vertical
132.000	29.5	43.5	-14.0	55	1.00	Vertical
132.004	29.2	43.5	-14.3	32	1.00	Vertical
155.983	30.2	43.5	-13.3	346	1.00	Vertical
155.993	30.8	43.5	-12.7	337	1.00	Vertical
155.994	30.1	43.5	-13.4	8	1.00	Vertical

Table 5 - 30 MHz to 1 GHz

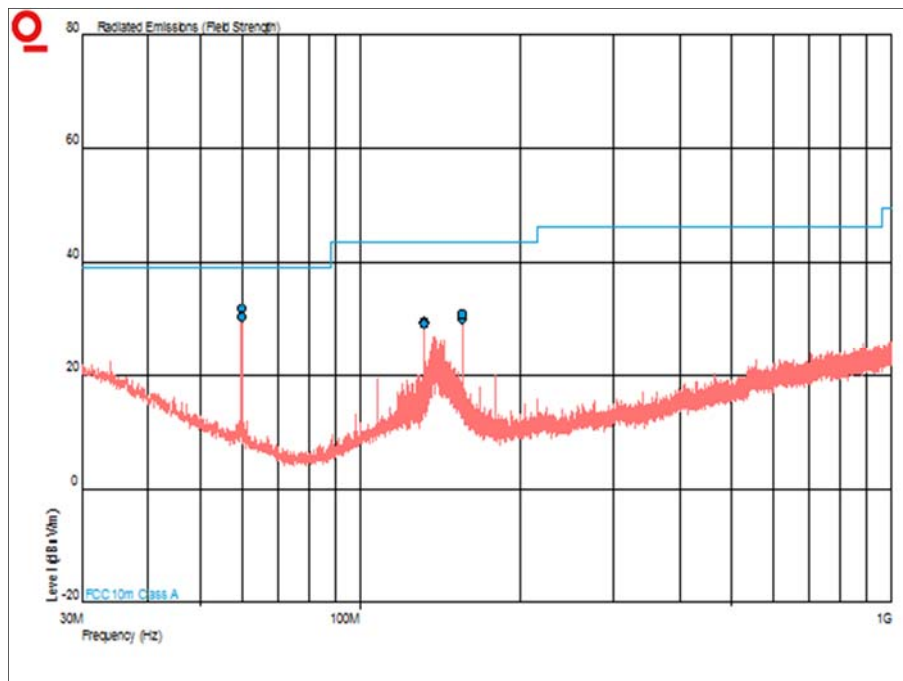


Figure 1 - 30 MHz to 1 GHz - Horizontal and Vertical



Frequency (GHz)	Result (μV/m)		Limit (μV/m)		Margin (μV/m)		Angle (°)	Height (m)	Polarisation
	Peak	Average	Peak	Average	Peak	Average			
*									

Table 6 - 1 GHz to 10 GHz

*No emissions were detected within 10 dB of the limit.

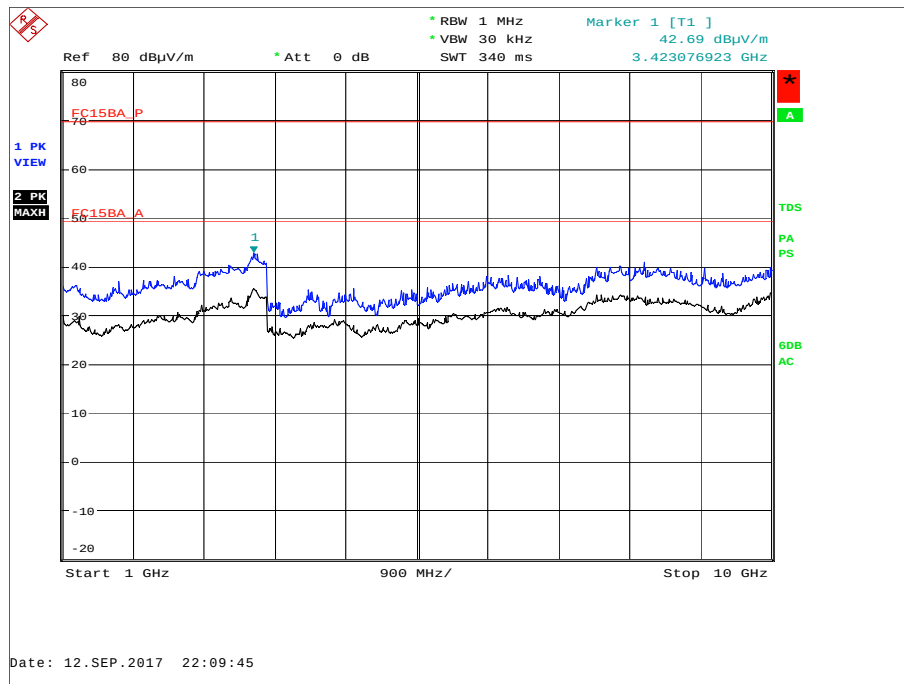


Figure 2 - 1 GHz to 10 GHz - Horizontal and Vertical

PNG MP50 + CHG55 Charger Charging

Highest frequency generated or used within the EUT: 1880 MHz

Upper frequency test limit: 10 GHz

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
89.401	22.3	43.5	-21.2	248	1.00	Vertical
90.883	29.9	43.5	-13.6	50	1.17	Vertical
92.343	30.7	43.5	-12.8	161	1.00	Vertical
93.816	24.7	43.5	-18.8	262	1.00	Vertical
162.689	29.6	43.5	-13.9	277	1.00	Vertical
165.611	29.0	43.5	-14.5	352	1.00	Vertical

Table 7 - 30 MHz to 1 GHz

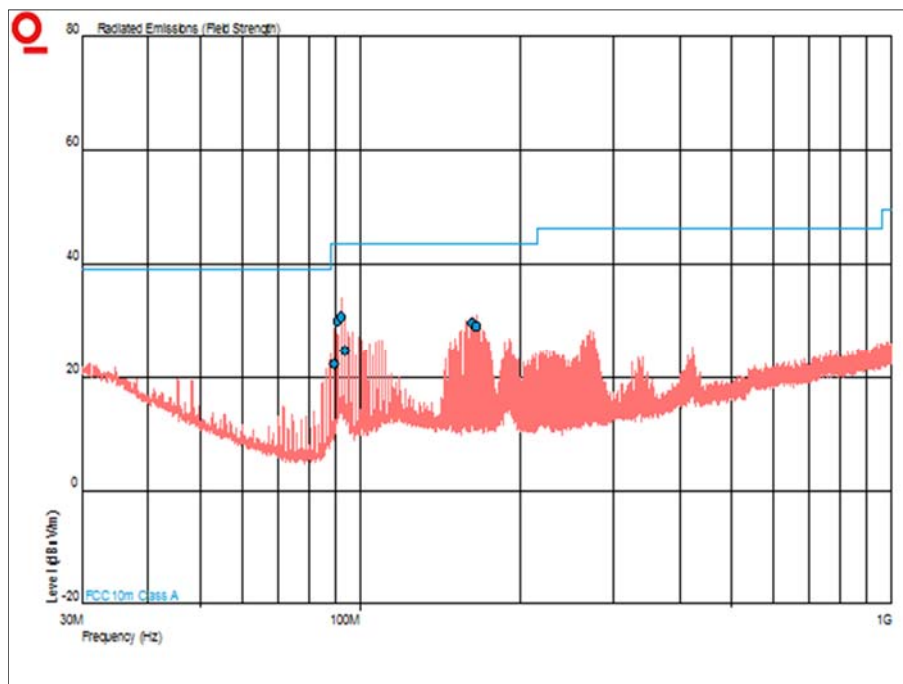


Figure 3 - 30 MHz to 1 GHz - Horizontal and Vertical

Frequency (GHz)	Result (μV/m)		Limit (μV/m)		Margin (μV/m)		Angle (°)	Height (m)	Polarisation
	Peak	Average	Peak	Average	Peak	Average			
*									

Table 8 - 1 GHz to 10 GHz

*No emissions were detected within 10 dB of the limit.

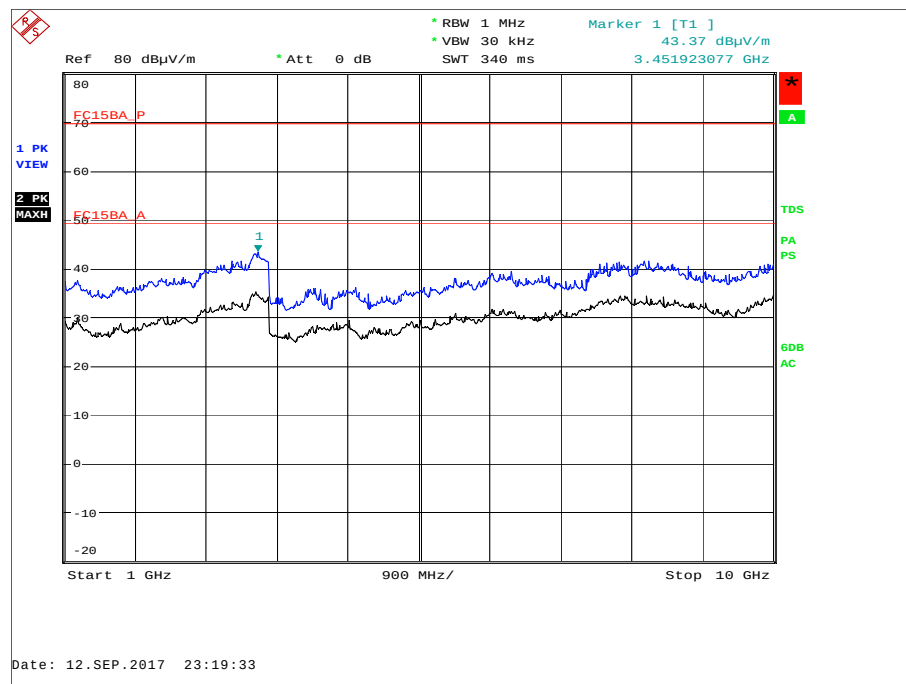


Figure 4 - 1 GHz to 10 GHz - Horizontal and Vertical

PNG MP50 + CHG50 Charger Charging

Highest frequency generated or used within the EUT: 1880 MHz

Upper frequency test limit: 10 GHz

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
202.217	37.3	43.5	-6.2	92	1.00	Vertical
205.094	38.9	43.5	-4.6	110	1.00	Vertical
206.605	38.7	43.5	-4.8	67	1.09	Vertical
208.057	39.6	43.5	-3.9	82	1.00	Vertical
209.542	39.5	43.5	-4.0	61	1.00	Vertical
212.470	37.1	43.5	-6.4	86	1.00	Vertical

Table 9 - 30 MHz to 1 GHz

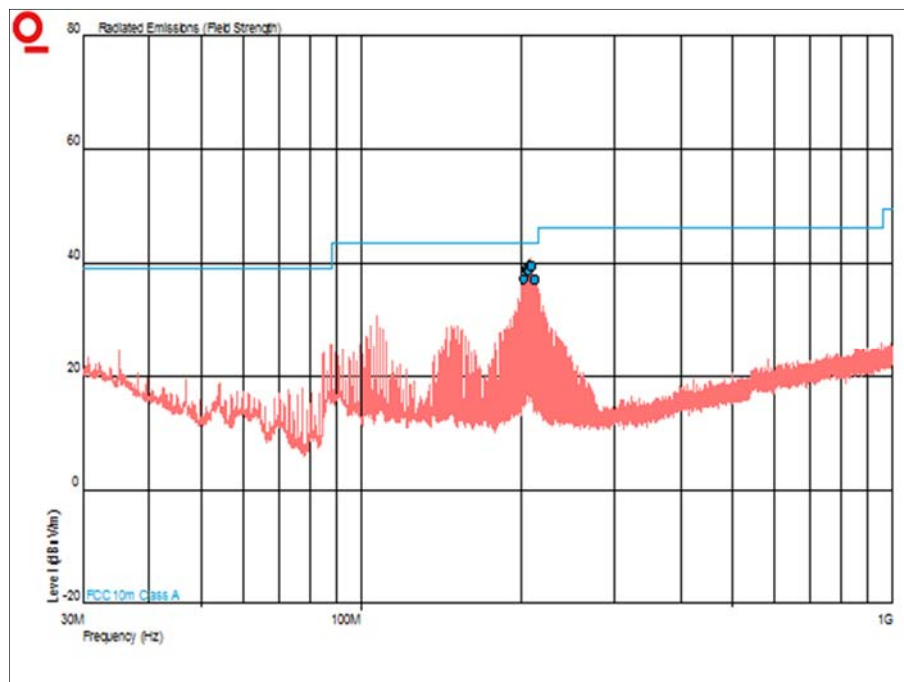


Figure 5 - 30 MHz to 1 GHz - Horizontal and Vertical

Frequency (GHz)	Result (μV/m)		Limit (μV/m)		Margin (μV/m)		Angle (°)	Height (m)	Polarisation
	Peak	Average	Peak	Average	Peak	Average			
*									

Table 10 - 1 GHz to 10 GHz

*No emissions were detected within 10 dB of the limit.

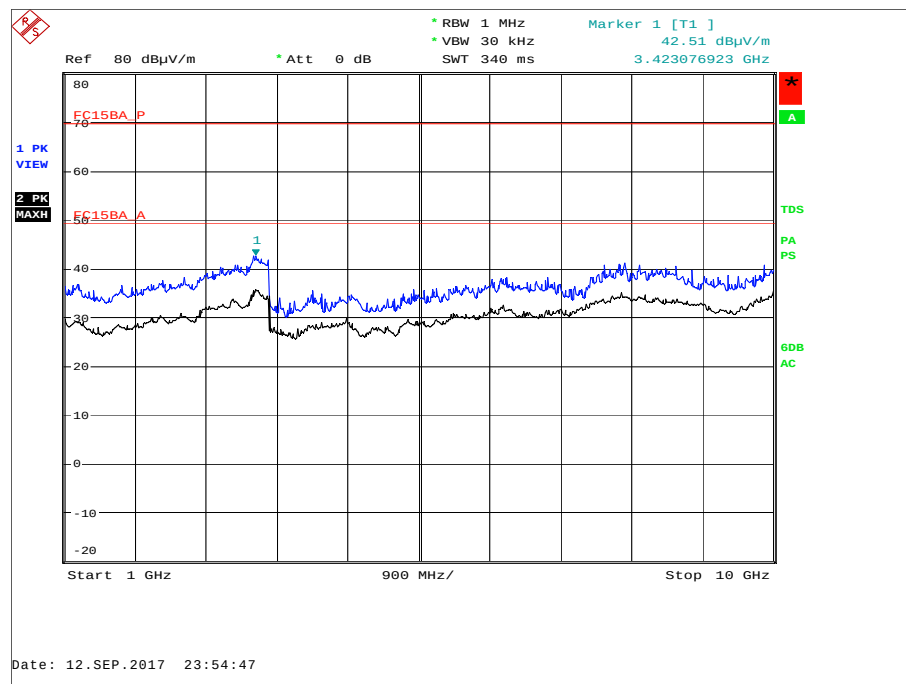


Figure 6 - 1 GHz to 10 GHz - Horizontal and Vertical

FCC 47 CFR Part 15, Limit Clause 15.109 (Class A)

Frequency of Emission (MHz)	Field Strength (μV/m)
30 to 88	90.0
88 to 216	150.0
216 to 960	210.0
Above 960	300.0

Table 11



2.1.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna (Bilog)	Schaffner	CBL6143	287	24	18-Apr-2018
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Comb Generator	Schaffner	RSG1000	3034	-	TU
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	02-May-2018
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	12-Nov-2017
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
Cable (Yellow, Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4527	6	04-Nov-2017
Hygrometer	Rotronic	HP21	4741	12	22-Aug-2018
Double Ridge Broadband Horn Antenna	Schwarzbeck	BBHA 9120 B	4848	12	17-Feb-2018
Compliance 5 Emissions	Teseq	C5e Software	3275	-	N/A - Software

Table 12

TU - Traceability Unscheduled



2.2 AC Power Line Conducted Emissions

2.2.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.107

2.2.2 Equipment Under Test and Modification State

MP50, S/N: 000 451 - Modification State 0

CHG50, S/N: 000 121 - Modification State 0

ZVC30NP12-I, S/N: Not Serialised (75940027-TSR0004) - Modification State 0

2.2.3 Date of Test

13-September-2017

2.2.4 Test Method

The test was performed in accordance with ANSI C63.4, clause 7.

2.2.5 Environmental Conditions

Ambient Temperature 19.6 °C

Relative Humidity 49.0 %

2.2.6 Test Results

PNG MP50 + CHG50 Charger Charging

Applied supply Voltage: 60 Hz

Applied supply frequency: 120 Vac

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.150	34.2	79.0	-44.8	19.8	66.0	-46.2
0.192	51.7	79.0	-27.3	37.0	66.0	-29.0
0.253	41.7	79.0	-37.3	29.0	66.0	-37.0
19.835	31.0	73.0	-42.0	23.8	60.0	-36.2
24.904	35.0	73.0	-38.0	31.7	60.0	-28.3
29.304	36.8	73.0	-36.2	36.1	60.0	-23.9

Table 13 - Live Line Emissions Results

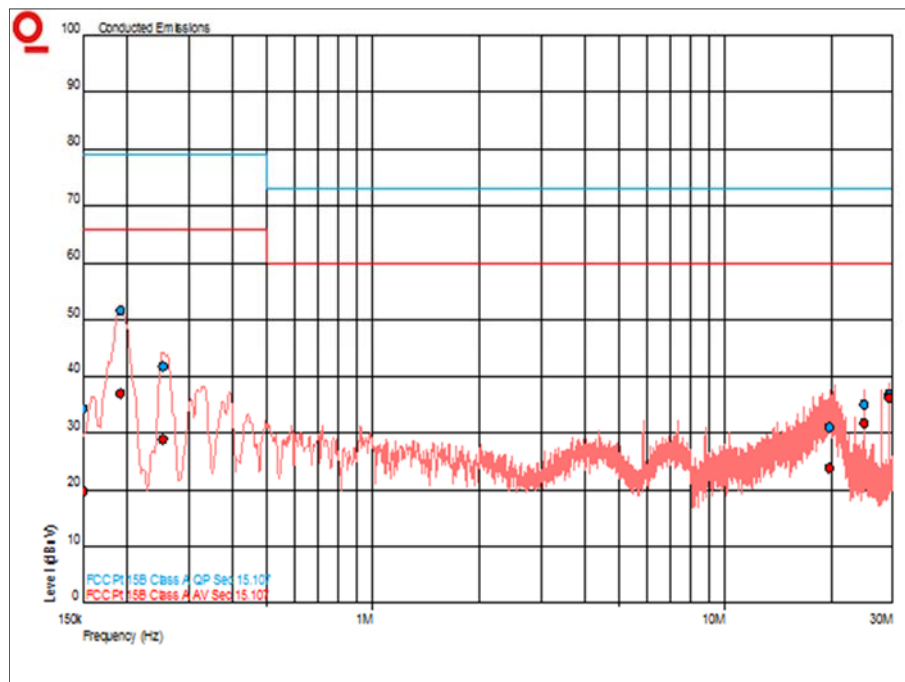


Figure 7 - Live Line - 150 kHz to 30 MHz



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.150	37.4	79.0	-41.6	21.2	66.0	-44.8
0.190	53.6	79.0	-25.4	39.4	66.0	-26.6
0.255	43.9	79.0	-35.1	29.8	66.0	-36.2
0.315	36.1	79.0	-42.9	22.2	66.0	-43.8
20.471	31.3	73.0	-41.7	25.6	60.0	-34.4
24.902	35.2	73.0	-37.8	33.1	60.0	-26.9

Table 14 - Neutral Line Emissions Results

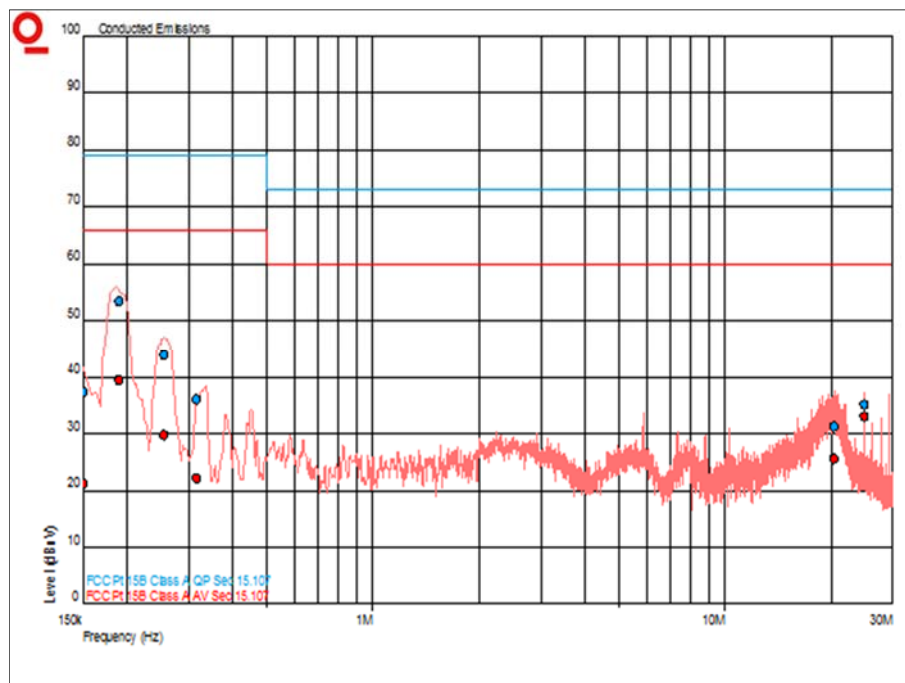


Figure 8 - Neutral Line - 150 kHz to 30 MHz

FCC 47 CFR Part 15, Limit Clause 15.107

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-Peak	Average
0.15 to 0.5	79	73
0.5 to 30	66	60

Table 15



2.2.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Compliance 5 Emissions	Teseq	C5e Software	3275	-	N/A - Software
Transient Limiter	Hewlett Packard	11947A	15	12	30-May-2018
LISN (1 Phase)	Chase	MN 2050	336	12	07-Apr-2018
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Multimeter	Iso-tech	IDM101	2417	12	30-Sep-2017
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	12-Nov-2017
Digital thermo Hygrometer	Radio Spares	1260	4300	12	30-Aug-2018

Table 16



3 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
AC Power Line Conducted Emissions	150 kHz to 30 MHz, LISN, ± 3.7 dB
Radiated Emissions	30 MHz to 1 GHz: ± 5.2 dB
	1 GHz to 40 GHz: ± 6.3 dB

Table 17