Report on the Radio Testing

For

Paxton Access Ltd

on

Paxton10 Wireless Connector

Report no. TRA-041571-45-07A

12 March 2019

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Report Number: TRA-041571-45-07A
Issue: A

REPORT ON THE RADIO TESTING OF A
Paxton Access Ltd
Paxton10 Wireless Connector
INTERMODULATION INVESTIGATION
TO SELECTED PARTS OF SPECIFICATION
CFR 15.247 & IC RSS-247
CFR 15.249 & IC RSS-210 ANNEX A2.9.

TEST DATE: 16th October 2018

Written by:	I Broadwell Digitally signed by Ian Broadwell DN: cn=Ian Broadwell, o=Element, ou, email=ian.broadwell@element.com, c=GB Reason: I am the author of this document Date: 2019.03.12 13:59:59 Z	Ian Broadwell/Dave Garvey Radio Engineer
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Date:	12 March 2019	

1 Revision Record

Issue Number	*Issue Date*	*Revision History*
A	12 March 2019	Original

2 Summary

TEST REPORT NUMBER:	TRA-041571-45-07A
WORKS ORDER NUMBER:	TRA-041571-02
PURPOSE OF TEST:	Intermodulation investigation for BTLE and Z-Wave: USA: Testing of radio frequency equipment per the relevant authorization procedure of chapter 47 of CFR (code of federal regulations) Part 2, subpart J. Canada: Testing of radio apparatus for TAC (technical acceptance certificate) per subsections 4(2) of the Radiocommunication Act and 21(1) of the Radiocommunication Regulations.
TEST SPECIFICATION(S):	47CFR15.247 & RSS-247
EQUIPMENT UNDER TEST (EUT):	Paxton10 Wireless Connector
FCC IDENTIFIER:	USE010592
ISED IDENTIFIER	10217A-010592
EUT SERIAL NUMBER:	5909440
MANUFACTURER/AGENT:	Paxton Access Ltd
ADDRESS:	Paxton House Home Farm Road Brighton East Sussex BN1 9HU
CLIENT CONTACT:	Brett Glass ☎ 01273 811016 ✉ brett.glass@paxton-access.co.uk
ORDER NUMBER:	176518
TEST DATE:	16th October 2018
TESTED BY:	Ian Broadwell/Dave Garvey Element

2.1 Test Summary

Test Method and Description	*Requirement Clause*		*Applicable to this equipment*	*Result / Note*
	RSS	*47CFR15*		
Radiated spurious emissions*	Gen, 8.10	15.205	☒	*PASS*
AC power line conducted emissions	Gen, 8.8	15.207	☒	*PASS*

Notes:

*This report only covers the limited testing on Bluetooth Low Energy and Z-Wave radios.

The results contained in this report relate only to the items tested, in the condition at time of test, and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

The apparatus was set up and exercised using the configurations, modes of operation and arrangements defined in this report only. Any modifications made are identified in Section 8 of this report.

Particular operating modes, apparatus monitoring methods and performance criteria required by the standards tested to have been performed except where identified in Section 5.2 of this test report (Deviations from Test Standards).

3 Contents

4 Introduction

This report TRA-041571-45-07A presents the results of the Radio testing on a Paxton Access Ltd, Paxton10 Wireless Connector to specification 47CFR15 Radio Frequency Devices and RSS-247 Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment.

The testing was carried out for Paxton Access Ltd by Element, at the address detailed below.

☒ Element Hull
Unit E
South Orbital Trading Park
Hedon Road
Hull
HU9 1NJ
UK

☐ Element Skelmersdale
Unit 1
Pendle Place
Skemersdale
West Lancashire
WN8 9PN
UK

This report details the configuration of the equipment, the test methods used and any relevant modifications where appropriate.

All test and measurement equipment under the control of the laboratory and requiring calibration is subject to an established programme and procedures to control and maintain measurement standards. The quality management system meets the principles of ISO 9001, and has quality control procedures for monitoring the validity of tests undertaken. Records and sufficient detail are retained to establish an audit trail of calibration records relating to its test results for a defined period. Under control of the established calibration programme, key quantities or values of the test & measurement instrumentation are within specification and comply with the relevant traceable internationally recognised and appropriate standard specifications, which are UKAS calibrated as such where these properties have a significant effect on results. Participation in inter-laboratory comparisons and proficiency testing ensures satisfactory correlation of results conform to Elements own procedures, as well as statistical techniques for analysis of test data providing the appropriate confidence in measurements.

Throughout this report EUT denotes equipment under test.

FCC Site Listing:
Element is accredited for the above sites under the US-EU MRA, Designation number UK0009.

IC Registration Number(s):

Element Hull	3483A
Element North West	3930B

The test site requirements of ANSI C63.4-2014 are met up to 1GHz.

The test site SVSWR requirements of CISPR 16-1-4:2010 are met over the frequency range 1 GHz to 18 GHz.

5 Test Specifications

5.1 Normative References

- FCC 47 CFR Ch. I – Part 15 – Radio Frequency Devices.
- ANSI C63.10-2013 – American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.
- ANSI C63.4-2014 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
- Industry Canada RSS-247, Issue 2, February 2017 – Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
- Industry Canada RSS-Gen, Issue 4, November 2014 – General Requirements for Compliance of Radio Apparatus
- Industry Canada RSS-210

5.2 Deviations from Test Standards

There were no deviations from the test standard.

6 Glossary of Terms

§	denotes a section reference from the standard, not this document
AC	Alternating Current
ANSI	American National Standards Institute
BW	bandwidth
C	Celsius
CFR	Code of Federal Regulations
CW	Continuous Wave
dB	decibel
dBm	dB relative to 1 milliwatt
DC	Direct Current
DSSS	Direct Sequence Spread Spectrum
EIRP	Equivalent Isotropically Radiated Power
ERP	Effective Radiated Power
EUT	Equipment Under Test
FCC	Federal Communications Commission
FHSS	Frequency Hopping Spread Spectrum
Hz	hertz
IC	Industry Canada
ITU	International Telecommunication Union
LBT	Listen Before Talk
m	metre
max	maximum
MIMO	Multiple Input and Multiple Output
min	minimum
MRA	Mutual Recognition Agreement
N/A	Not Applicable
PCB	Printed Circuit Board
PDF	Portable Document Format
Pt-mpt	Point-to-multipoint
Pt-pt	Point-to-point
RF	Radio Frequency
RH	Relative Humidity
RMS	Root Mean Square
Rx	receiver
s	second
SVSWR	Site Voltage Standing Wave Ratio
Tx	transmitter
UKAS	United Kingdom Accreditation Service
V	volt
W	watt
Ω	ohm

7 Equipment Under Test

7.1 EUT Identification

- Name: Paxton10 Wireless Connector
- Serial Number: 5909440
- Model Number: 010-592
- Software Revision: Custom Radio test
- Build Level / Revision Number: Production

7.2 System Equipment

Equipment listed below forms part of the overall test setup and is required for equipment functionality and/or monitoring during testing. The compliance levels achieved in this report relate only to the EUT and not items given in the following list.

Name: Paxton10 Wireless Connector
Model Number: 010-687
Serial Number: None given
Exercising / Monitoring: Acting as dummy load for the EUT's RS485 output port
Brief Description: Wireless connector unit configured to act as dummy load.

Name: Dell Support Laptop
Model Number: Vostro 15
Serial Number: JK17362
Exercising / Monitoring: Using Chrome on the desktop of the support laptop to enable the different functions of the EUT, Bluetooth, Z-Wave and the RS485 dummy load.
Brief Description: Support laptop.

Name: Intel Next Unit of Computing (NUC)
Model Number: DC3217IYE
Serial Number: 3401555
Exercising / Monitoring: Acting as a server for the laptop support unit.
Brief Description: Mini PC acting as a server.

Name: TP-Link Router
Model Number: TL-WR840N
Serial Number: 214A106007889
Exercising / Monitoring: Used for Ethernet for the PoE switch.
Brief Description: 300 Mbps Wireless N Router.

Name: TP-Link PoE Switch
Model Number: TL-SF1008P
Serial Number: 2151819001955
Exercising / Monitoring: PoE switch providing power to EUT and Ethernet traffic between the NUC and laptop.
Brief Description: PoE switch.

7.3 EUT Mode of Operation

7.3.1 Transmission

The mode of operation for Tx tests was as follows. The EUT was powered from the Wireless Controller support unit (itself receiving power from the PoE switch). Once the unit was powered, the support laptop was used to initialise the BTLE radio.

7.4 EUT Radio Parameters

7.4.1 General

Radio Type:	Z-Wave	Bluetooth Low Energy
Frequencies of operation:	908.40 MHz – 916.0 MHz	2402 MHz – 2480 MHz
Declared output power:	4 dBm	10 dBm
Antenna type:	Integral	Integral
Antenna gain:	1.4 dBi	1 dBi

7.5 EUT Description

The EUT is a building automation hub.

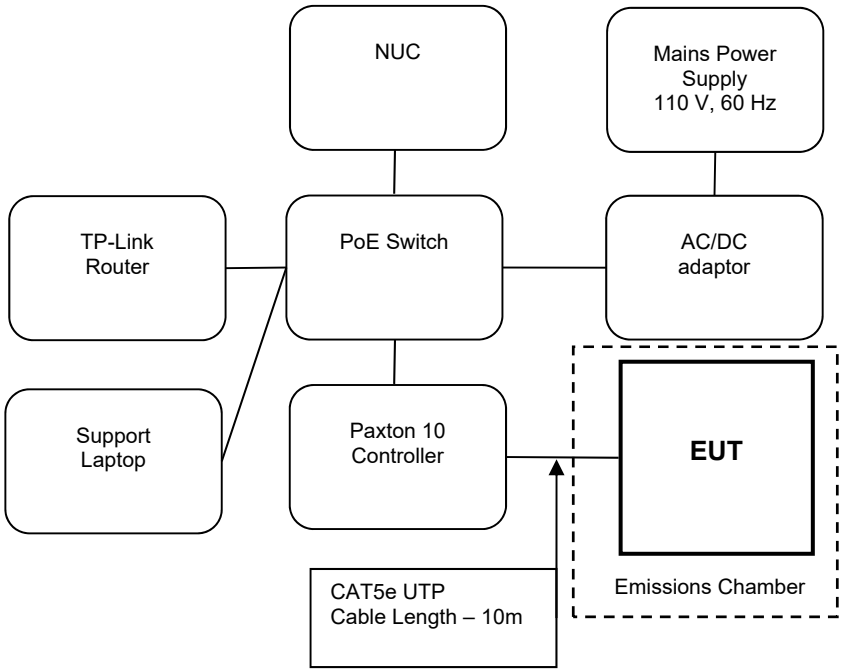
8 Modifications

No modifications were performed during this assessment.

9 EUT Test Setup

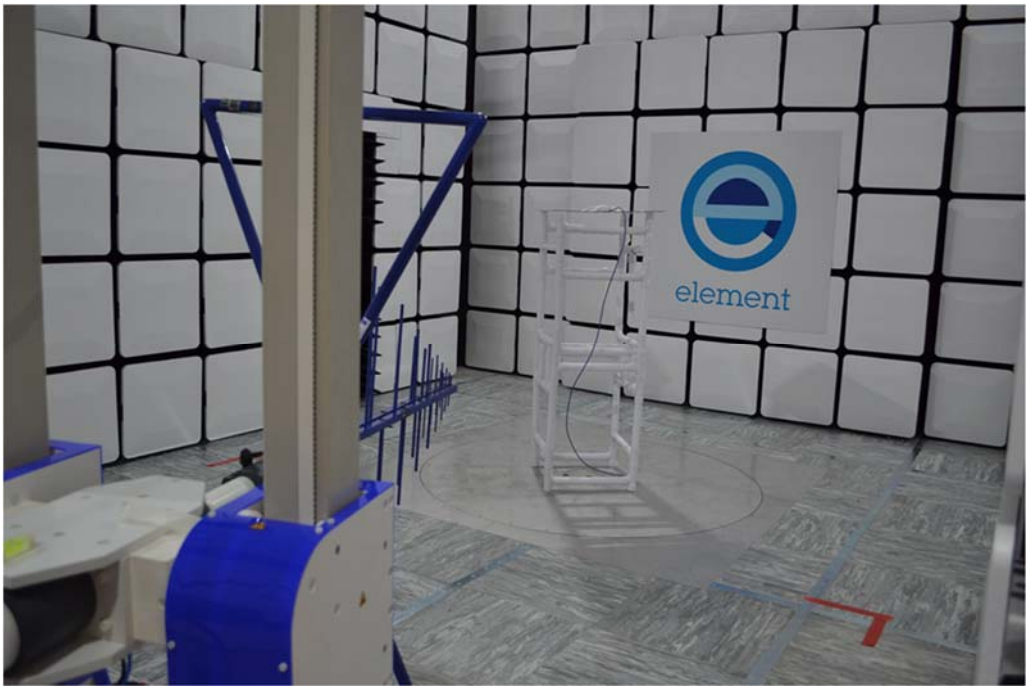
9.1 Block Diagram

The following diagram shows basic EUT interconnections with cable type and cable lengths identified:



9.2 General Set-up Photograph

The following photograph shows basic EUT set-up:



Sample on table close up

10 General Technical Parameters

10.1 Normal Conditions

The E U T was tested under the normal environmental conditions of the test laboratory, except where otherwise stated. The normal power source applied was PoE from the Paxton 10 Controller.

11 Radiated emissions

11.1 Definitions

Spurious emissions
Emissions on a frequency or frequencies, which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

Restricted bands
A frequency band in which intentional radiators are permitted to radiate only spurious emissions but not fundamental signals.

11.2 Test Parameters

Test Location:	Element Hull
Test Chamber:	Wireless Lab 3
Test Standard and Clause:	ANSI C63.10-2013, Clause 6.5 and 6.6
Frequency Measured:	2440 MHz
EUT Channel Bandwidths:	1 MHz
Deviations From Standard:	None
Measurement BW:	30 MHz to 1 GHz: 120 kHz Above 1 GHz: 1 MHz
Measurement Detector:	Up to 1 GHz: quasi-peak Above 1 GHz: RMS average and Peak

Environmental Conditions (Normal Environment)

Temperature: 20 °C	+15 ºC to +35 ºC (as declared)
Humidity: 50 % RH	20 % RH to 75 % RH (as declared)
Supply: PoE	

11.3 Test Limit

Unwanted emissions that fall within the restricted frequency bands shall comply with the limits specified:

General Field Strength Limits for License-Exempt Transmitters at Frequencies above 30 MHz

Frequency (MHz)	*Field Strength (µV/m at 3 m)*
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

11.4 Test Method

With the EUT setup as per section 9 of this report and connected as per Figure i, the emissions from the EUT were measured on a spectrum analyzer / EMI receiver.

Radiated electromagnetic emissions from the EUT are checked first by preview scans. Preview scans for all spectrum and modulation characteristics are checked, using a peak detector and where applicable worst-case determined for function, operation, orientation, etc. for both vertical and horizontal polarisations. Pre-scan plots are shown with a peak detector and 100 kHz RBW.

If the EUT connects to auxiliary equipment and is table or floor standing, the configurations prescribed in ANSI C63.10 are followed. Alternatively, a layout closest to normal use (as declared by the provider) is employed, (see EUT setup photographs for more detail).

Emissions between 30 MHz and 1 GHz are measured using calibrated broadband antennas. Emissions above 1 GHz are characterized using standard gain horn antennas. Pre-amplifiers and filters are used where required. Care is taken to ensure that test receiver resolution bandwidth, video bandwidth and detector type(s) meet the regulatory requirements.

For both horizontal and vertical polarizations, the EUT is then rotated through 360 degrees in azimuth until the highest emission is detected. At the previously determined azimuth the test antenna is raised and lowered from 1 to 4 m in height until a maximum emission level is detected, this maximum value is recorded.

Power values measured on the test receiver / analyzer are converted to field strength, FS, in dBµV/m at the regulatory distance, using:

$$FS = PR + CL + AF – PA + DC – CF$$

Where,

PR is the power recorded on the receiver / spectrum analyzer in dBµV;
CL is the cable loss in dB;
AF is the test antenna factor in dB/m;
PA is the pre-amplifier gain in dB (where used);
DC is the duty correction factor in dB (where used, e.g. harmonics of pulsed fundamental);
CF is the distance factor in dB (where measurement distance different to limit distance);

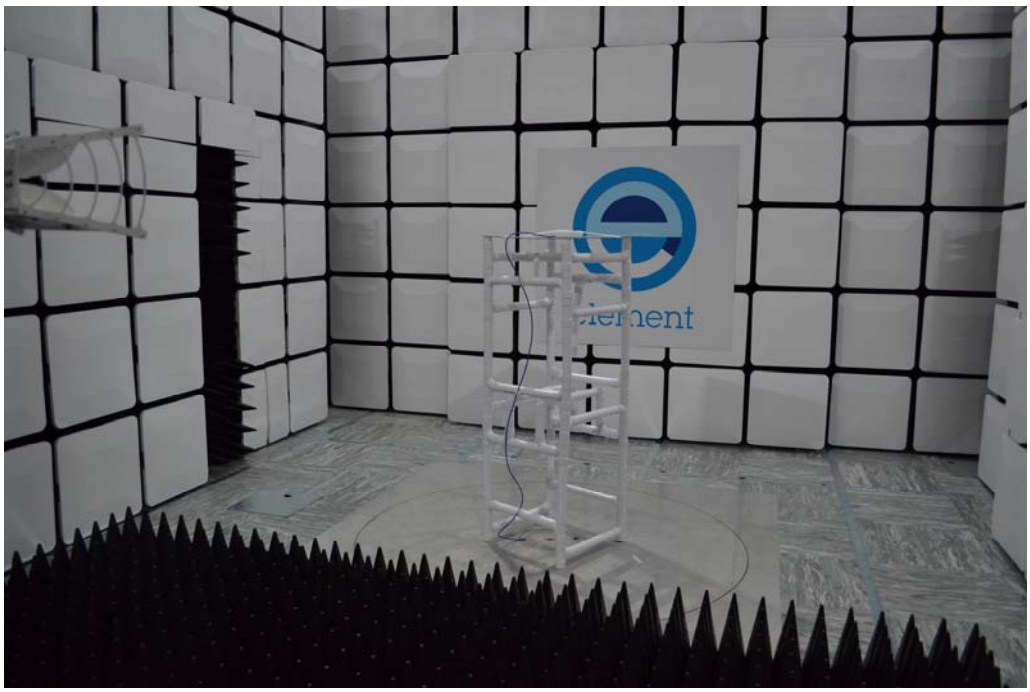
This field strength value is then compared with the regulatory limit.

Figure i Test Setup

11.5 Test Set-up Photograph

Below 1GHz

Above 1GHz



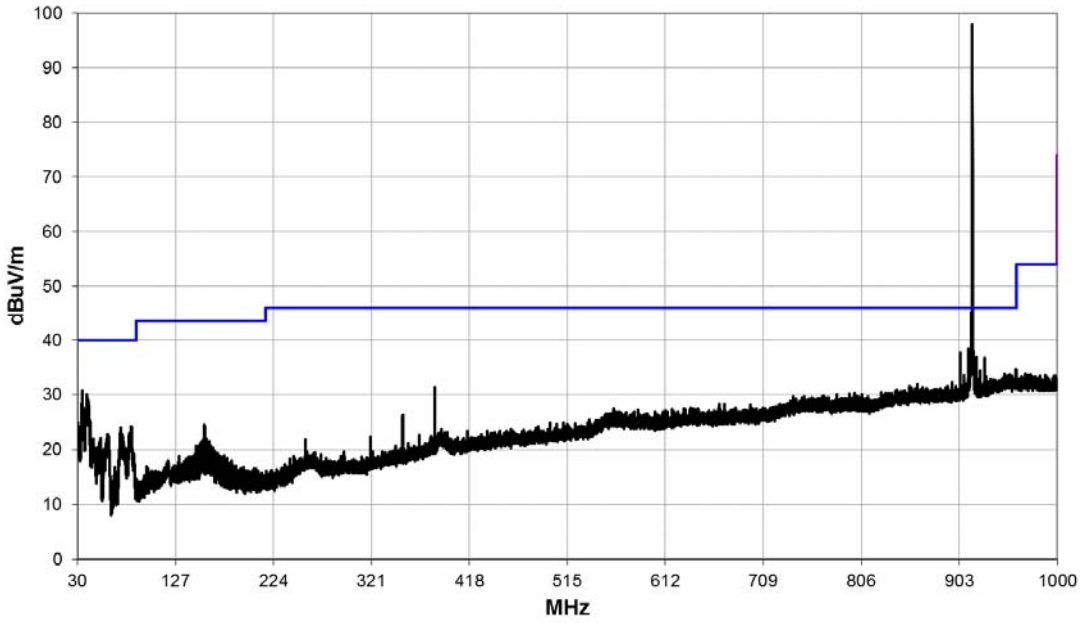
11.6 Test Equipment

Equipment Type	Manufacturer	Equipment Description	Element No	Due For Calibration
Ferrite Lined Chamber	Rainford	Chamber	REF2259	2020-08-03
Receiver	R&S	ESU40	RFG701	2018-11-20
Pre-Amp (9kHz – 1GHz)	Sonoma	310	REF927	2019-05-22
Pre-Amp (1 – 26.5GHz)	Agilent	8449B	REF913	2019-02-07
Bilog Antenna	Chase	CBL6111B	REF2218	2019-11-06
Horn Antenna	A Info Inc	LB-10180-NF	REF2241	2020-07-13

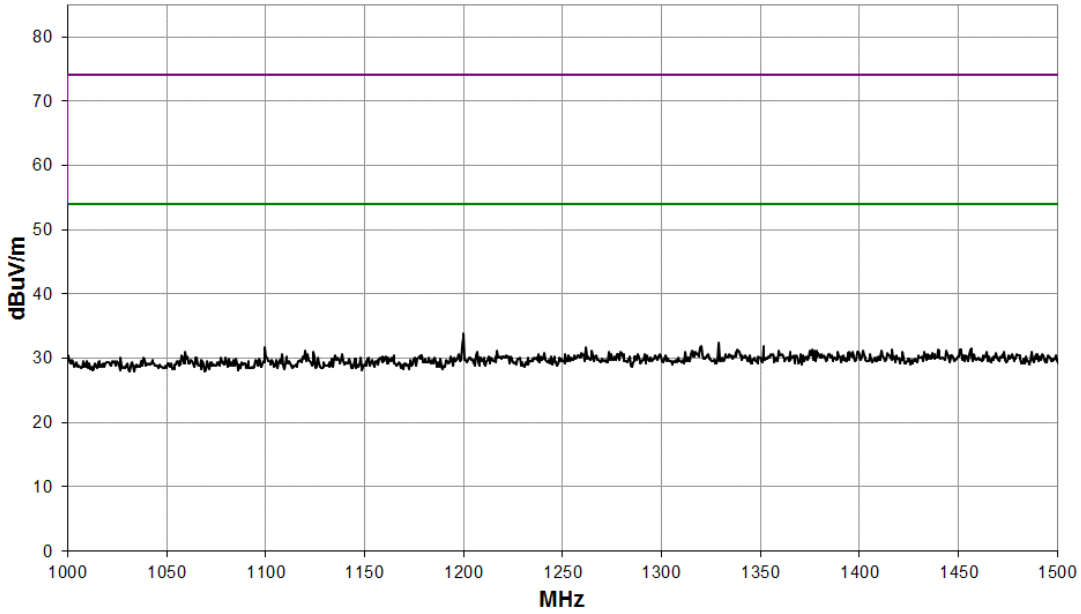
11.7 Test Results

Power: 16; Frequency: 916 MHz; Data Rate: 100 kbps and BTLE with Frequency 2440 MHz										
Detector	***Freq. (MHz)***	***Meas'd Emission (dBµV)***	***Cable Loss (dB)***	***Antenna Factor (dB/m)***	***Pre-amp Gain (dB)***	***Duty Cycle Corr'n (dB)***	***Distance Extrap'n Factor (dB)***	***Field Strength (dBµV/m)***	***Field Strength (µV/m)***	***Limit (µV/m)***
No intermodulation emissions recorded within 10 dB of limit.										

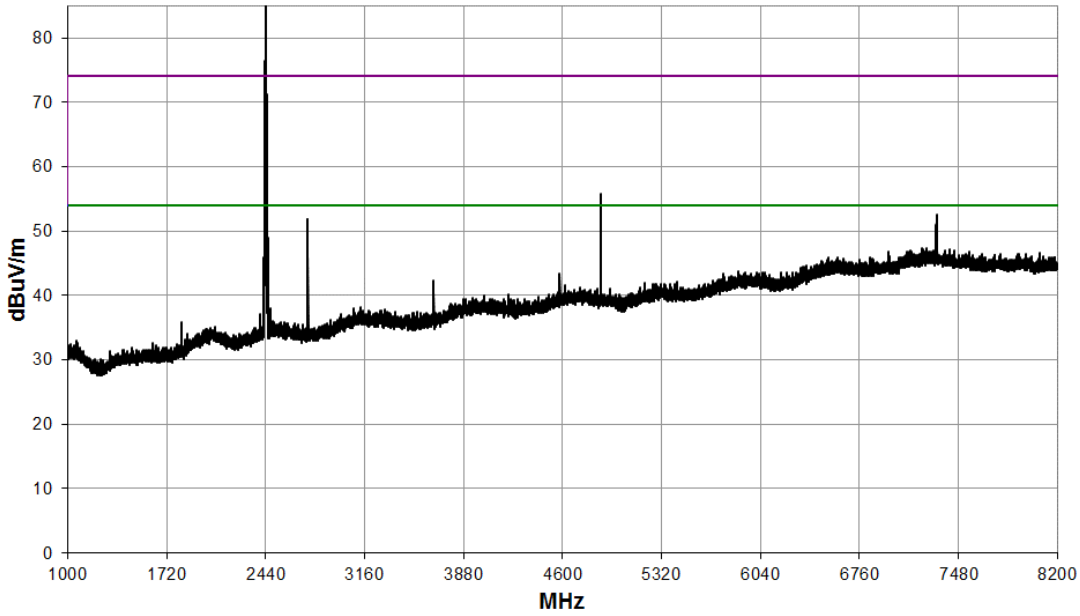
Plot of 30 MHz to 1 GHz taken without filter.



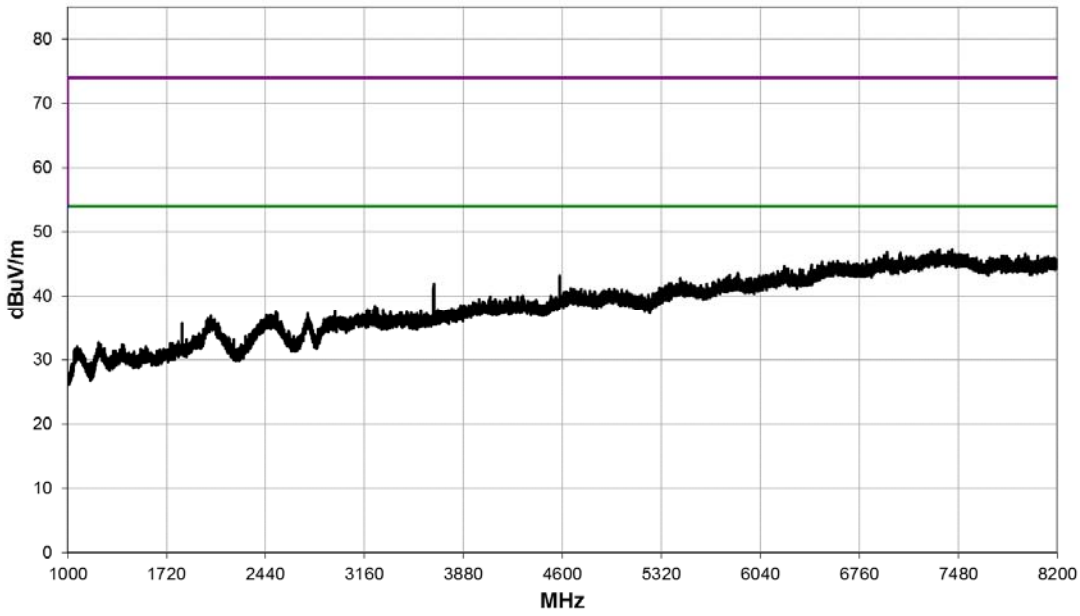
Plot or 1-1.5 GHz taken without filter.



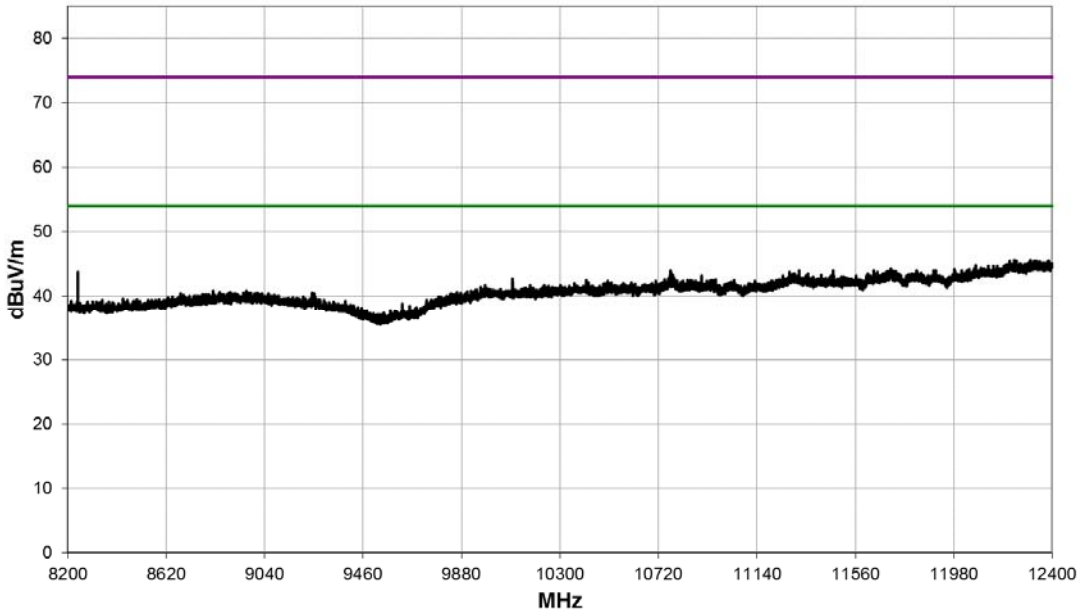
Plot of 1-8.2 GHz taken with 1.3 GHz high pass filter showing emission at 2748 MHz corresponding to the 3rd harmonic of the ZWave and higher BTLE harmonics.



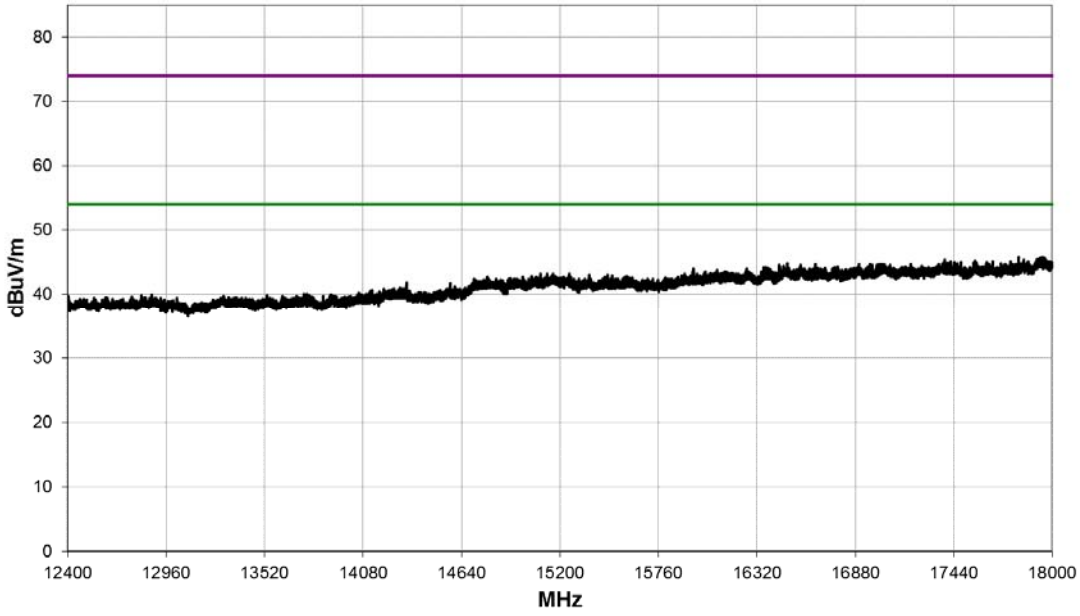
Plot of 1 GHz to 8.2 GHz with 1.3 GHz high pass and 2.4GHz band stop filters showing suppression of BTLE harmonics.



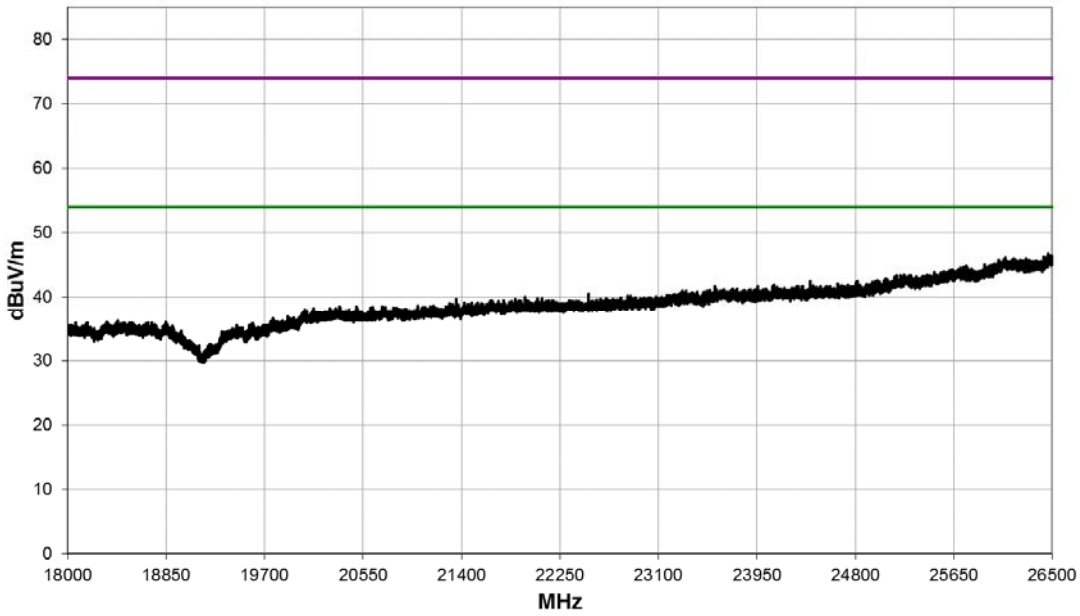
Plot of 8.2 GHz to 12.4 GHz with 7 GHz high pass filter



Plot of 12.4 GHz to 18 GHz with 7 GHz high pass filter



Plot of 18 GHz to 26.5 GHz taken without filter.



12 AC power-line conducted emissions

12.1 Definition

Line-to-ground radio-noise voltage that is conducted from all of the EUT current-carrying power input terminals that are directly (or indirectly via separate transformers or power supplies) connected to a public power network.

12.2 Test Parameters

Test Location:	Element Hull
Test Chamber:	Hull Lab 7
Test Standard and Clause:	ANSI C63.4 & ANSI C63.10-2013, Clause 6.2
EUT Channels / Frequencies Measured:	Mid
EUT Channel Bandwidths:	1MHz
EUT Modulation:	GFSK; 2FSK
Deviations From Standard:	None
Measurement BW:	9 kHz (150 kHz - 30 MHz)
Measurement Detectors:	Quasi-Peak and Average, RMS

Environmental Conditions (Normal Environment)

Temperature: 20 °C	+15 ºC to +35 ºC (as declared)
Humidity: 42 % RH	20 % RH to 75 % RH (as declared)
Supply: 110 V ac	110 V ac ±10 % (as declared)

12.3 Test Limit

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz, shall not exceed the limits in Table 3.

Table 3 – AC Power Line Conducted Emission Limits

Frequency (MHz)	***Conducted limit (dBµV)***	
	Quasi-Peak	***Average****
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

*The level decreases linearly with the logarithm of the frequency.
**A linear average detector is required.

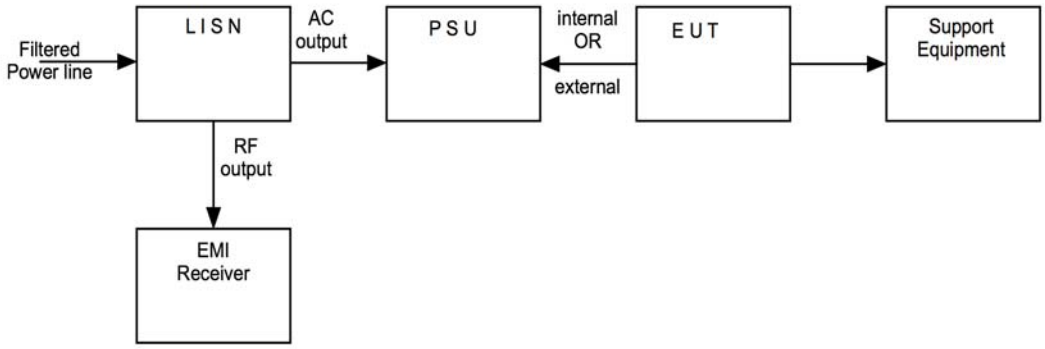
12.4 Test Method

With the EUT setup in a screened room, as per section 9 of this report and connected as per Figure ii, the power line emissions were measured on a spectrum analyzer / EMI receiver.

AC power line conducted emissions from the EUT are checked first by preview scans with peak and average detectors covering both live and neutral lines. A spectrum analyzer is used to determine if any periodic emissions are present.

Formal measurements using the correct detector(s) and bandwidth are made on frequencies identified from the preview scans. Final measurements were performed with EUT set at its maximum duty in transmit and receive modes.

Figure ii Test Setup



12.4.1 Emissions Operating Mode

The manufacturer has selected the following mode of operation to provide a worst case emission profile during the test programme.

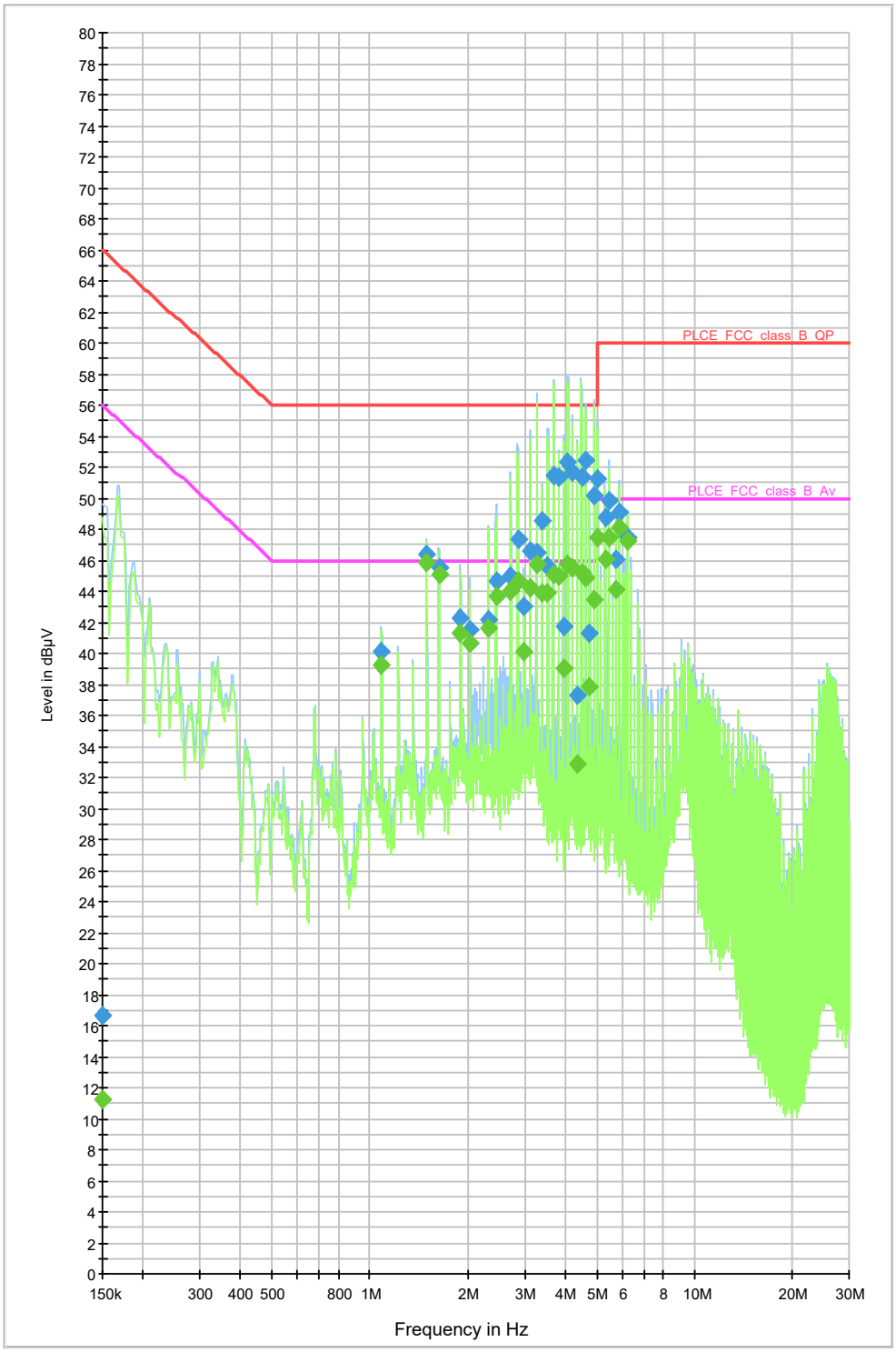
The EUT was powered from the Wireless Controller support unit (itself receiving power from the PoE switch). Once the unit was powered, the support laptop was used to initialise all functions of the EUT. The Bluetooth radio was enabled and placed onto the middle channel, the Z-Wave radio was enabled and made to toggle the output of the Z-Wave mains adaptor on/off once per second and the dummy load port was activated which illuminated a red LED on the dummy load support unit.

12.5 Test Set-up Photograph

12.6 Test Equipment

EquipmentType	Manufacturer	Equipment Description	Serial Number	Element No
Receiver/Analyser	Rohde & Schwarz	ESCI7	100850	H715
LISN	Rohde & Schwarz	ESH3-Z5	100141	H732
Pulse Limiter	Rohde & Schwarz	101157	101157	H674

12.7 Test Results



Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)
0.150000	16.6	15000.0	0.200	GND	N	10.1	66.0	49.4
1.087550	40.2	15000.0	9.000	GND	L1	10.3	56.0	15.8
1.497375	46.4	15000.0	9.000	GND	N	10.3	56.0	9.6
1.633175	45.6	15000.0	9.000	GND	L1	10.3	56.0	10.4
1.903200	42.3	15000.0	9.000	GND	L1	10.4	56.0	13.7
2.040575	41.5	15000.0	9.000	GND	L1	10.4	56.0	14.5
2.314600	42.2	15000.0	9.000	GND	L1	10.4	56.0	13.8
2.450400	44.7	15000.0	9.000	GND	L1	10.4	56.0	11.3
2.722000	45.0	15000.0	9.000	GND	L1	10.4	56.0	11.0
2.857800	47.3	15000.0	9.000	GND	L1	10.4	56.0	8.7
2.995175	43.1	15000.0	9.000	GND	N	10.4	56.0	12.9
3.129400	46.6	15000.0	9.000	GND	L1	10.5	56.0	9.4
3.267625	46.5	15000.0	9.000	GND	L1	10.5	56.0	9.5
3.401000	48.5	15000.0	9.000	GND	L1	10.5	56.0	7.5
3.536800	45.6	15000.0	9.000	GND	L1	10.5	56.0	10.4
3.675025	51.5	15000.0	9.000	GND	L1	10.5	56.0	4.5
3.809250	51.4	15000.0	9.000	GND	N	10.5	56.0	4.6
3.948200	41.7	15000.0	9.000	GND	L1	10.5	56.0	14.3
4.082425	52.3	15000.0	9.000	GND	L1	10.5	56.0	3.7
4.218225	51.7	15000.0	9.000	GND	L1	10.5	56.0	4.3
4.354025	37.3	15000.0	9.000	GND	L1	10.5	56.0	18.7
4.492250	51.4	15000.0	9.000	GND	L1	10.6	56.0	4.6
4.625625	52.4	15000.0	9.000	GND	L1	10.6	56.0	3.6
4.763850	41.3	15000.0	9.000	GND	L1	10.6	56.0	14.7
4.899650	50.2	15000.0	9.000	GND	L1	10.6	56.0	5.8
5.034000	51.2	15000.0	9.000	GND	L1	10.6	60.0	8.8
5.306500	48.7	15000.0	9.000	GND	L1	10.6	60.0	11.3
5.441500	49.8	15000.0	9.000	GND	L1	10.6	60.0	10.2
5.714000	46.1	15000.0	9.000	GND	L1	10.7	60.0	13.9
5.851500	49.1	15000.0	9.000	GND	N	10.7	60.0	10.9
6.259000	47.4	15000.0	9.000	GND	N	10.7	60.0	12.6

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)
0.150000	11.2	15000.0	0.200	GND	N	10.1	56.0	44.8
1.087550	39.2	15000.0	9.000	GND	L1	10.3	46.0	6.8
1.497375	45.9	15000.0	9.000	GND	N	10.3	46.0	0.1
1.633175	45.1	15000.0	9.000	GND	L1	10.3	46.0	0.9
1.903200	41.3	15000.0	9.000	GND	L1	10.4	46.0	4.7
2.040575	40.7	15000.0	9.000	GND	L1	10.4	46.0	5.3
2.314600	41.6	15000.0	9.000	GND	L1	10.4	46.0	4.4
2.450400	43.7	15000.0	9.000	GND	L1	10.4	46.0	2.3
2.722000	44.0	15000.0	9.000	GND	L1	10.4	46.0	2.0
2.857800	44.6	15000.0	9.000	GND	L1	10.4	46.0	1.4
2.995175	40.2	15000.0	9.000	GND	N	10.4	46.0	5.8
3.129400	44.2	15000.0	9.000	GND	L1	10.5	46.0	1.8
3.267625	45.7	15000.0	9.000	GND	L1	10.5	46.0	0.3
3.401000	43.9	15000.0	9.000	GND	L1	10.5	46.0	2.1
3.536800	43.9	15000.0	9.000	GND	L1	10.5	46.0	2.1
3.675025	45.1	15000.0	9.000	GND	L1	10.5	46.0	0.9
3.809250	45.0	15000.0	9.000	GND	N	10.5	46.0	1.0
3.948200	39.1	15000.0	9.000	GND	L1	10.5	46.0	6.9
4.082425	45.7	15000.0	9.000	GND	L1	10.5	46.0	0.3
4.218225	45.5	15000.0	9.000	GND	L1	10.5	46.0	0.5
4.354025	32.8	15000.0	9.000	GND	L1	10.5	46.0	13.2
4.492250	45.2	15000.0	9.000	GND	L1	10.6	46.0	0.8
4.625625	44.9	15000.0	9.000	GND	L1	10.6	46.0	1.1
4.763850	37.9	15000.0	9.000	GND	L1	10.6	46.0	8.1
4.899650	43.5	15000.0	9.000	GND	L1	10.6	46.0	2.5
5.034000	47.5	15000.0	9.000	GND	L1	10.6	50.0	2.5
5.306500	46.1	15000.0	9.000	GND	L1	10.6	50.0	3.9
5.441500	47.5	15000.0	9.000	GND	L1	10.6	50.0	2.5
5.714000	44.1	15000.0	9.000	GND	L1	10.7	50.0	5.9
5.851500	48.1	15000.0	9.000	GND	N	10.7	50.0	1.9
6.259000	47.3	15000.0	9.000	GND	N	10.7	50.0	2.7

NOTES:

1. The above plot is generated from a combined live and neutral Peak and Average hold preview scan. With the blue trace representing the Peak hold and the green trace representing the Average hold. The Blue markers above are a maximised Quasi-peak detector, the Green markers above are the maximised Average detector with both required for the formal assessment. The above emissions are listed in table format above.

2. The above plot shows a number of formal measurements, at 150 kHz and between 2 MHz and 6 MHz that are significantly below the preview peak hold, these emissions were manually investigated for a minimum time period of 60 seconds. During this time period the emissions were found to occur at a time interval of less than once in a 15 second period and therefore considered transient in nature as per the guidelines in CISPR16-2-3 and therefore deemed a pass result.

13 Measurement Uncertainty

Calculated Measurement Uncertainties

All statements of uncertainty are expanded standard uncertainty using a coverage factor of 1.96 to give a 95 % confidence:

[1] Radiated spurious emissions

Uncertainty in test result (30 MHz to 1 GHz) = **4.75 dB**
Uncertainty in test result (1 GHz to 18 GHz) = **4.46 dB**

[2] AC power line conducted emissions

Uncertainty in test result = **3.2 dB**

[3] Occupied bandwidth

Uncertainty in test result = **15.58 %**

[4] Conducted carrier power

Uncertainty in test result (Power Meter) = **0.93 dB**

[5] Conducted RF power out-of-band

Uncertainty in test result – up to 8.1 GHz = **3.31 dB**
Uncertainty in test result – 8.1 GHz to 15.3 GHz = **4.43 dB**

[6] Radiated RF power out-of-band

Uncertainty in test result (30 MHz to 1 GHz) = **4.75 dB**
Uncertainty in test result (1 GHz to 18 GHz) = **4.46 dB**

[7] Power spectral density

Uncertainty in test result (Spectrum Analyser) = **3.11 dB**

[8] ERP / EIRP

Uncertainty in test result (Laboratory) = **4.71 dB**
Uncertainty in test result (Pershore OATS) = **4.26 dB**