

FCC and Industry Canada Testing of the  
 BCF Technology Ltd  
 Bovine Ultrasound Scanner, Model: Easi Scan: Go  
 Battery Charging Dock, Model: ESG-CHARGER  
 Power Supply, Model: VEP24US12  
 In accordance with FCC 47 CFR Part 15B and  
 Industry Canada RSS-GEN



Product Service

Choose certainty.  
 Add value.

Prepared for: BCF Technology Ltd  
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 UNITED KINGDOM

FCC ID: 2AL6R-ESGL01  
 IC: 22758-ESGL01

COMMERCIAL-IN-CONFIDENCE

Date: January 2018  
 Document Number: 75940063-06 | Issue: 01

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Natalie Bennett	18 January 2018	
Authorised Signatory	Kim Archer	18 January 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 and Industry Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Graeme Lawler	18 January 2018	

FCC Accreditation  
 90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation  
 IC2932B-1 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be in compliance with FCC 47 CFR Part 15B: 2016 and Industry Canada RSS-GEN: Issue 4, November 2014 for the tests detailed in section 1.3.

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## Contents

<b>1</b>	<b>Report Summary .....</b>	<b>2</b>
1.1	Report Modification Record.....	2
1.2	Introduction.....	2
1.3	Brief Summary of Results .....	3
1.4	Application Form .....	4
1.5	Product Information .....	5
1.6	Deviations from the Standard.....	5
1.7	EUT Modification Record .....	5
1.8	Test Location.....	6
<b>2</b>	<b>Test Details .....</b>	<b>7</b>
2.1	AC Power Line Conducted Emissions .....	7
2.2	Radiated Emissions.....	11
<b>3</b>	<b>Measurement Uncertainty .....</b>	<b>16</b>



# 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	18 January 2018

**Table 1**

## 1.2 Introduction

Applicant	BCF Technology Ltd
Manufacturer	BCF Technology Ltd
Model Number(s)	1) ESG-CHARGER 2) VEP24US12 3) Easi Scan: Go
Serial Number(s)	1) Not Serialised (75940063-TSR003) 2) 1601-00908 3) Not Serialised (75940063-TSR0010)
Hardware Version(s)	PBA-WP500_REV_G
Software Version(s)	boot_image_wpp version 117 (FCC/CE testing)
Number of Samples Tested	3
Test Specification/Issue/Date	FCC 47 CFR Part 15B: 2016 Industry Canada RSS-GEN: Issue 4, November 2014
Order Number	33985
Date	16-August-2017
Date of Receipt of EUT	21-August-2017 and 27-November-2017
Start of Test	07-January-2018
Finish of Test	08-January-2018
Name of Engineer(s)	Graeme Lawler
Related Document(s)	ANSI C63.4 (2014)



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### 1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15B and Industry Canada RSS-GEN is shown below.

Section	Specification Clause		Test Description	Result	Comments/Base Standard
	Part 15B	RSS-GEN			
Configuration and Mode: Idle					
2.1	15.107	8.8	AC Power Line Conducted Emissions	Pass	ANSI C63.4
2.2	15.109	7.1	Radiated Emissions	Pass	ANSI C63.4

**Table 2**



1.4 Application Form

MAIN EUT	
MANUFACTURING DESCRIPTION	Bovine Ultrasound Scanner
MANUFACTURER	BCF Technology Ltd
MODEL NAME/NUMBER	Easi-Scan:Go - ESGL01
PART NUMBER	ESG-SCANNER-L
SERIAL NUMBER	ESGL0100002, ESGL0100005
HARDWARE VERSION	PBA-WP500 REV_G
SOFTWARE VERSION	boot_image_wpp version 117 (FCC/CE testing)
TRANSMITTER FREQUENCY OPERATING RANGE (MHz)	2412MHz-2462MHz, 5150MHz-5250MHz
RECEIVER FREQUENCY OPERATING RANGE (MHz)	2412MHz-2462MHz, 5150MHz-5250MHz
COUNTRY OF ORIGIN	United Kingdom
INTERMEDIATE FREQUENCIES	N/A
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	G1D
MODULATION TYPES: (i.e. GMSK, QPSK)	BPSK
HIGHEST INTERNALLY GENERATED FREQUENCY	180MHz
OUTPUT POWER (W or dBm)	18dBm
FCC ID	FCC ID:2AL6R-ESGL01
INDUSTRY CANADA ID	IC: 22758-ESGL01
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The product is a Bovine Ultrasound Scanner used in the veterinary industry for scanning cattle. The product contains a Texas Instruments pre-approved 2.4 GHz and 5 GHz WLAN module which is FCC and Industry Canada certified and this is used to communicate to a commercial smart phone or tablet. The scanner is a compact body worn unit with a built in ultrasound probe and uses certified Li-ion batteries.
BATTERY/POWER SUPPLY	
MANUFACTURING DESCRIPTION	Lithium ion rechargeable battery pack - 3.7V/1800mAh
MANUFACTURER	Creasefield Limited
TYPE	Lithium Ion
PART NUMBER	ESG-BATT
VOLTAGE	3.7V (Nominal)
COUNTRY OF ORIGIN	United Kingdom
MODULES (if applicable)	
MANUFACTURING DESCRIPTION	WiLink™ 8 industrial dual band, 2x2 MIMO Wi-Fi®, Bluetooth® & BLE module
MANUFACTURER	TI
TYPE	WL1837MOD
POWER	18dBm
FCC ID	FCC ID: Z64-WL18DBMOD
COUNTRY OF ORIGIN	USA
INDUSTRY CANADA ID	IC: 4511-WL18DBMOD
EMISSION DESIGNATOR	G1D
DHSS/FHSS/COMBINED OR OTHER	OFDM: MCS0
ANCILLARIES (if applicable)	
MANUFACTURING DESCRIPTION	
MANUFACTURER	
TYPE	
PART NUMBER	
SERIAL NUMBER	
COUNTRY OF ORIGIN	

I hereby declare that the information supplied is correct and complete.

Name: Fabrizio Gaudenzi  
 Date: 18/01/2018

Position held: Lead Design Engineer



## 1.5 Product Information

### 1.5.1 Technical Description

The product is a Bovine Ultrasound Scanner used in the veterinary industry for scanning cattle. The product contains a Texas Instruments pre-approved 2.4 GHz and 5 GHz WLAN module which is FCC and Industry Canada certified and this is used to communicate to a commercial smart phone or tablet.

The scanner is a compact body worn unit with a built in ultrasound probe and uses certified Li-ion batteries.

The Li-Ion batteries are charged externally to the scanner by the battery charging dock and power supply.

### 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: Not Serialised (75940063-TSR003)			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: 1601-00908			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: Not Serialised (75940063-TSR0010)			
0	As supplied by the customer	Not Applicable	Not Applicable

**Table 3**



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### 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: Idle/Rx		
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 AC Power Line Conducted Emissions

#### 2.1.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.107, Class B.  
Industry Canada RSS-GEN, Clause 8.8

#### 2.1.2 Equipment Under Test and Modification State

ESG-CHARGER, S/N: Not Serialised (75940063-TSR003) - Modification State 0  
VEP24US12, S/N: 1601-00908 - Modification State 0

#### 2.1.3 Date of Test

08-January-2018

#### 2.1.4 Test Method

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

#### 2.1.5 Environmental Conditions

Ambient Temperature	18.3 °C
Relative Humidity	33.0 %





**2.1.6 Test Results**

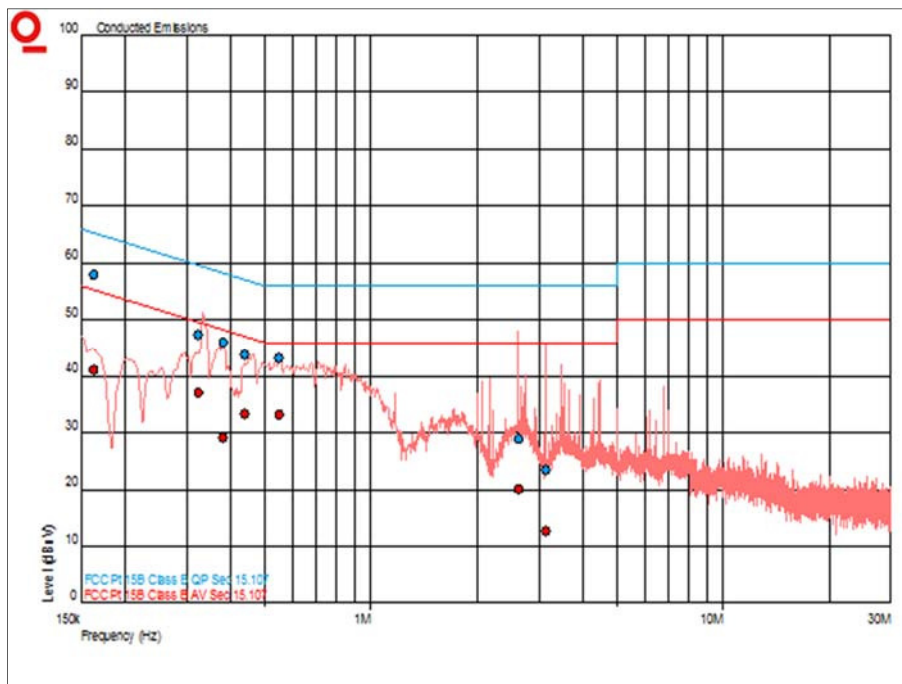
Idle/Rx

Applied supply voltage: 120 Vac

Applied supply frequency: 60 Hz

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.163	57.9	65.3	-7.4	41.2	55.3	-14.1
0.323	47.4	59.6	-12.2	37.1	49.6	-12.5
0.381	46.1	58.2	-12.1	29.2	48.2	-19.1
0.439	43.9	57.1	-13.2	33.4	47.1	-13.7
0.549	43.3	56.0	-12.7	33.2	46.0	-12.8
2.625	28.8	56.0	-27.2	20.0	46.0	-26.0
3.144	23.5	56.0	-32.5	12.8	46.0	-33.2

**Table 5 - Live Line Emissions Results**

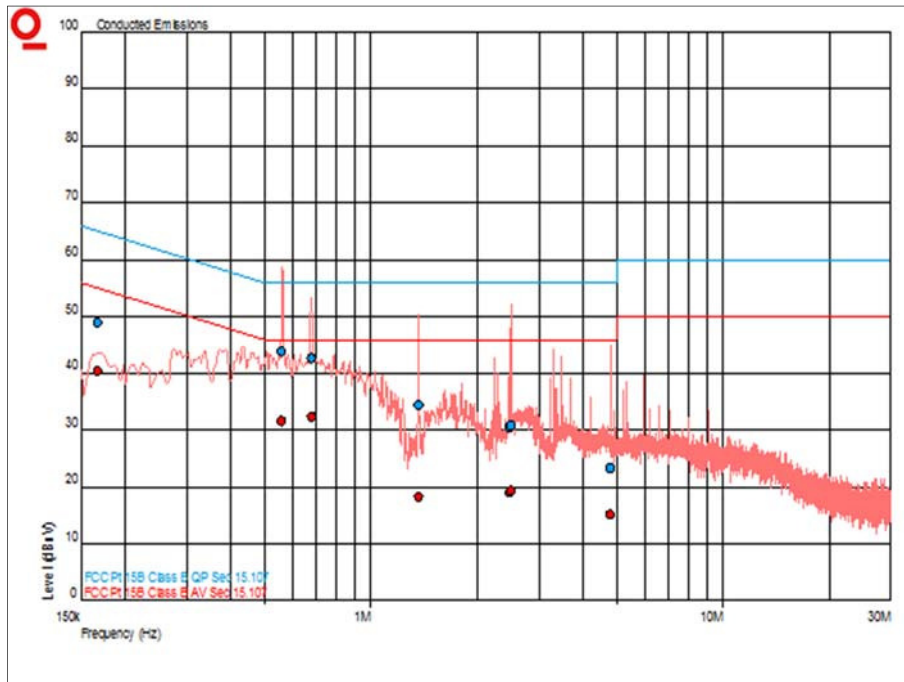


**Figure 1 - Live Line - 150 kHz to 30 MHz**



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.167	49.1	65.1	-16.0	40.4	55.1	-14.7
0.557	43.8	56.0	-12.2	31.6	46.0	-14.4
0.677	42.6	56.0	-13.4	32.3	46.0	-13.7
1.365	34.4	56.0	-21.6	18.2	46.0	-27.8
2.472	30.5	56.0	-25.5	19.0	46.0	-27.0
2.499	30.8	56.0	-25.2	19.3	46.0	-26.7
4.785	23.4	56.0	-32.6	15.2	46.0	-30.8

**Table 6 - Neutral Line Emissions Results**



**Figure 2 - Neutral Line - 150 kHz to 30 MHz**

FCC 47 CFR Part 15, Limit Clause 15.107 and RSS-GEN, Limit Clause 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	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

**Table 7**

\*Decreases with the logarithm of the frequency.



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### 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
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-Jan-2018
Multimeter	Iso-tech	IDM101	2424	12	13-Dec-2018
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Nov-2018
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	04-May-2018

**Table 8**



## **2.2 Radiated Emissions**

### **2.2.1 Specification Reference**

FCC 47 CFR Part 15B, Clause 15.109, Class B.  
Industry Canada RSS-GEN, Clause 7

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

Easi Scan: Go, S/N: Not Serialised (75940063-TSR0010) - Modification State 0

### **2.2.3 Date of Test**

07-January-2018

### **2.2.4 Test Method**

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

### **2.2.5 Environmental Conditions**

Ambient Temperature	14.4 °C
Relative Humidity	35.0 %



**2.2.6 Test Results**

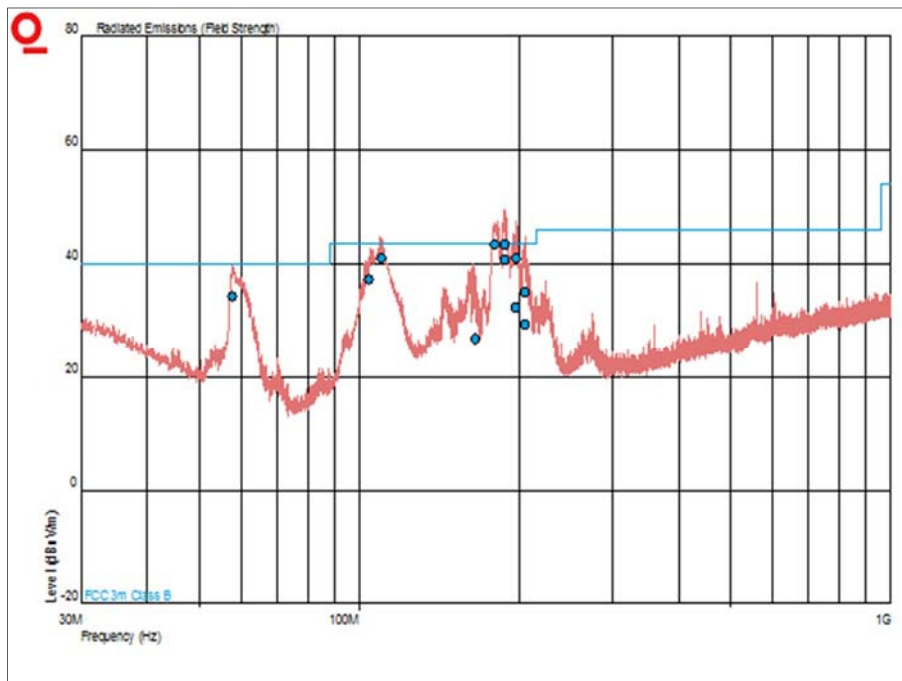
Idle/Rx

Highest frequency generated or used within the EUT: 5875 MHz

Upper frequency test limit: 30 GHz

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
57.820	34.2	40.0	-5.8	120	1.00	Vertical
104.553	37.3	43.5	-6.2	125	1.00	Vertical
110.133	41.0	43.5	-2.5	360	1.00	Vertical
165.380	26.8	43.5	-16.7	85	1.00	Vertical
179.943	43.4	43.5	-0.1	32	1.00	Vertical
187.785	40.6	43.5	-2.9	76	1.61	Horizontal
188.226	43.3	43.5	-0.2	60	1.00	Vertical
197.435	32.4	43.5	-11.1	265	2.39	Horizontal
197.819	41.0	43.5	-2.5	43	1.00	Vertical
204.970	29.3	43.5	-14.2	241	1.50	Horizontal
204.974	35.0	43.5	-8.5	250	1.18	Vertical

**Table 9 - 30 MHz to 1 GHz**



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



Frequency (GHz)	Result ( $\mu\text{V/m}$ )		Limit ( $\mu\text{V/m}$ )		Margin ( $\mu\text{V/m}$ )		Angle ( $^\circ$ )	Height (m)	Polarisation
	Peak	Average	Peak	Average	Peak	Average			
*									

Table 10 - 1 GHz to 30 GHz

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

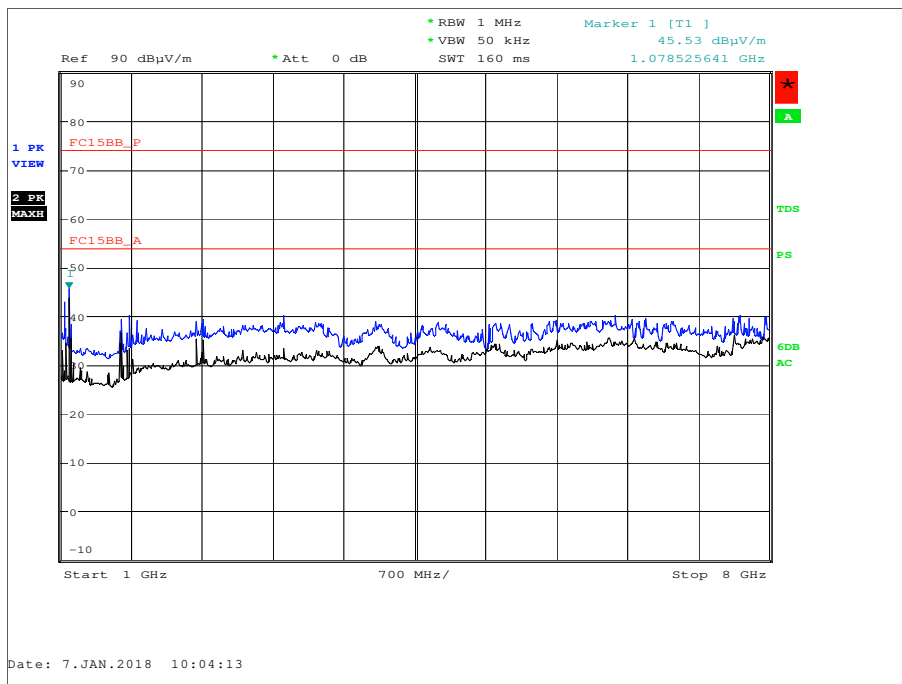


Figure 4 - 1 GHz to 8 GHz - Horizontal and Vertical

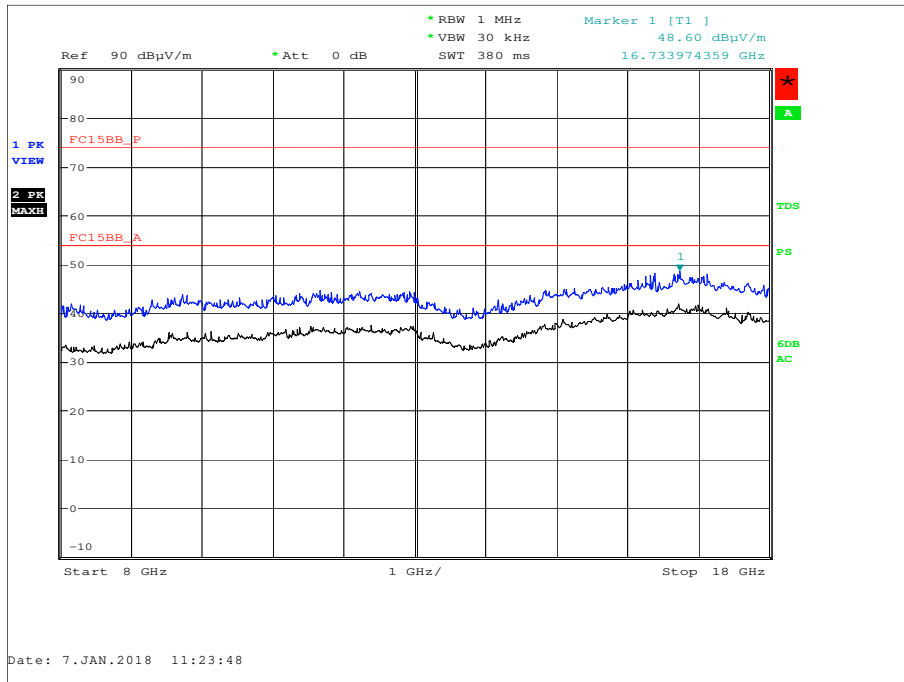


Figure 5 - 8 GHz to 18 GHz - Horizontal and Vertical

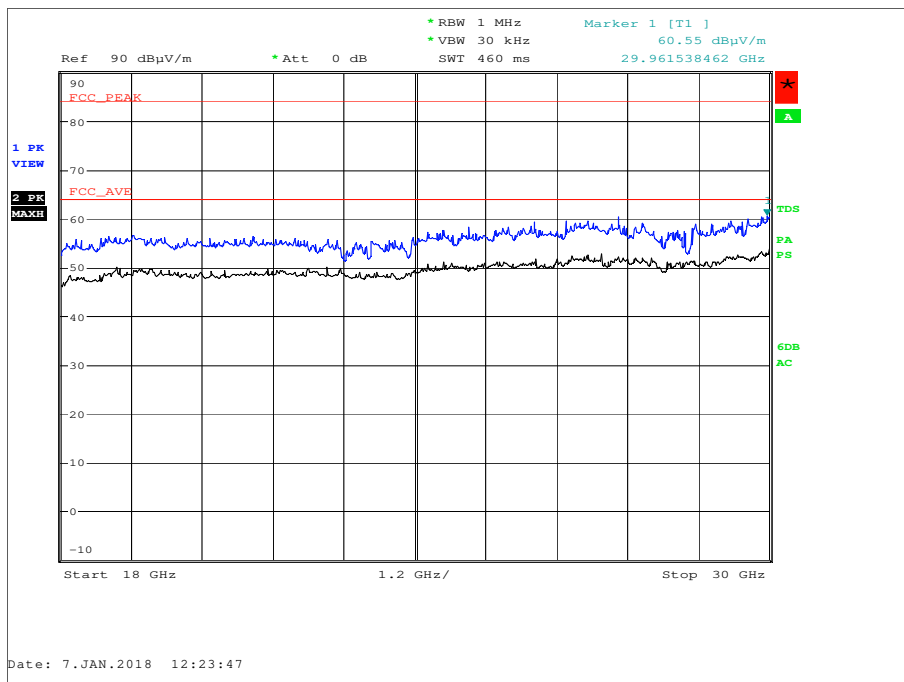


Figure 6 - 18 GHz to 30 GHz - Horizontal and Vertical



FCC 47 CFR Part 15, Limit Clause 15.109 (Class B) and RSS-GEN, Limit Clause 7.1.2

Frequency of Emission (MHz)	Field Strength ( $\mu\text{V}/\text{m}$ )	Field Strength ( $\text{dB}\mu\text{V}/\text{m}$ )
30 to 88	100.0	40
88 to 216	150.0	43.5
216 to 960	200.0	46
Above 960	500.0	54

**Table 11**

**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
Antenna (Bilog)	Schaffner	CBL6143	287	24	18-Apr-2018
Antenna 18-40GHz (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	07-Dec-2018
Pre-Amplifier	Phase One	PS04-0086	1533	12	31-Jul-2018
18GHz - 40GHz Pre-Amplifier	Phase One	PSO4-0087	1534	12	23-Jan-2018
Screened Room (5)	Rainford	Rainford	1545	36	20-Jan-2018
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	02-May-2018
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Nov-2018
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
Cable 1503 2M 2.92(P)m 2.92(P)m	Rhophase	KPS-1503A-2000-KPS	4293	12	23-Jan-2018
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	18-Oct-2018
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	04-May-2018
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526	6	22-May-2018
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	17-Feb-2018

**Table 12**

TU - Traceability Unscheduled





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### 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, $\pm 3.7$ dB
Radiated Emissions	30 MHz to 1 GHz: $\pm 5.2$ dB
	1 GHz to 40 GHz: $\pm 6.3$ dB

**Table 13**