Report on the FCC and IC Testing of the

BCF Technology Ltd
WiFi BUG (BCF Universal Goggles)
BUG-OLED: Go, Model: BGO01

In accordance with FCC 47 CFR Part 15B and ICES-003

Product Service

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Prepared for: BCF Technology Ltd
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Phoenix Crescent
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UNITED KINGDOM

FCC ID: 2AL6R-BGO01 IC: 22758-BGO01

COMMERCIAL-IN-CONFIDENCE

Date: June 2018
Document Number: 75941154-02 | Issue: 01

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Natalie Bennett	22 June 2018	
Authorised Signatory	Kim Archer	22 June 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 ICES-003. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Mohammed Malik	22 June 2018	
Testing	Graeme Lawler	22 June 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 compliant with FCC 47 CFR Part 15B: 2017 and ICES-003: 2016 for the tests detailed in section 1.3.

TÜV SÜD Product Service
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Product Service

Contents

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	22 June 2018

1.2 Introduction

Applicant	BCF Technology Ltd
Manufacturer	BCF Technology Ltd
Model Number(s)	BGO01
Declared Variant	Model Name: BUG-VGA: Go, Model: BGV01
Serial Number(s)	BGO01-000002
Hardware Version(s)	PBA-HMD500_REV_B
Software Version(s)	boot_image_wfb_fcc
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15B: 2017 ICES-003: 2016
Order Number Date	35256 08-December-2017
Date of Receipt of EUT	03-May-2018
Start of Test	25-April-2018
Finish of Test	23-May-2018
Name of Engineer(s)	Graeme Lawler Mohammed Malik
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 and ICES-003 is shown below.

Section	Specification Clause		Test Description	Result	Comments/Base Standard
	Part 15B	ICES-003			
Configuration and Mode: Idle					
2.1	15.109	6.2	Radiated Disturbance	Pass	ANSI C63.4: 2014

Product Service

1.4 Declaration of Build Status

MAIN EUT			
MANUFACTURING DESCRIPTION	Head Mounted Viewing Device		
MANUFACTURER	BCF Technology Ltd		
MODEL NAME/NUMBER	Name: BUG-OLED:Go, Model: BGO01		
PART NUMBER	BUG-GO-OLED		
SERIAL NUMBER	BGO01-000002		
HARDWARE VERSION	PBA-HMD500_REV_B		
SOFTWARE VERSION	boot_image_wfb_fcc		
PSU VOLTAGE/FREQUENCY/CURRENT	3.7V nominal DC		
HIGHEST INTERNALLY GENERATED / USED FREQUENCY	5250 MHz		
FCC ID (if applicable)	FCC ID: 2AL6R-BGO01		
INDUSTRY CANADA ID (if applicable)	IC: 22758-BGO01		
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The product is a Head Mounted Display used in the veterinary industry for viewing Ultrasound images from BCF Technology's Duo Scan: Go and Easi Scan: Go scanner devices. The product contains a Texas Instruments pre-approved 2.4 GHz and 5 GHz WLAN module which is CE, FCC and Industry Canada certified and this is used to communicate to the scanner. The product is powered from a Lithium Ion Battery.		
COUNTRY OF ORIGIN	United Kingdom		
RF CHARACTERISTICS (if applicable)			
TRANSMITTER FREQUENCY OPERATING RANGE (MHz)	2412MHz-2462MHz, 5150MHz-5250MHz		
RECEIVER FREQUENCY OPERATING RANGE (MHz)	2412MHz-2462MHz, 5150MHz-5250MHz		
INTERMEDIATE FREQUENCIES	N/A		
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	G1D		
MODULATION TYPES: (i.e. GMSK, QPSK)	BPSK		
OUTPUT POWER (W or dBm)	18dBm		
SEPARATE BATTERY/POWER SUPPLY (if applicable)			
MANUFACTURING DESCRIPTION	Lithium Ion rechargable battery - 3.7V/6700mAh		
MANUFACTURER	Creasefield Limited		
TYPE	Lithium Ion		
PART NUMBER	ESG-BATT		
PSU VOLTAGE/FREQUENCY/CURRENT	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		
INDUSTRY CANADA ID	IC: 451I-WL18DBMOD		
EMISSION DESIGNATOR	G1D		
DHSS/FHSS/COMBINED OR OTHER	OFDM: MCS0		
COUNTRY OF ORIGIN			
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: Andrew Brownlie Position held: Hardware Design Engineer
Date: 26/3/18

1.5 Product Information

1.5.1 Technical Description

The product is a Head Mounted Display used in the veterinary industry for viewing Ultrasound images from BCF Technology's Duo Scan: Go and Easi Scan: Go scanner devices. The product contains a Texas Instruments pre-approved 2.4 GHz and 5 GHz WLAN module which is CE, FCC and Industry Canada certified and this is used to communicate to the scanner. The product is powered from a Lithium Ion Battery.

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: BGO01-000002			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 1

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		
Radiated Disturbance	Graeme Lawler Mohammed Malik	UKAS

Table 2

Office Address:

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

2 Test Details

2.1 Radiated Disturbance

2.1.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.109
ICES-003, Clause 6.2

2.1.2 Equipment Under Test and Modification State

BGO01, S/N: BGO01-000002 – Modification State 0

2.1.3 Date of Test

25-April-2018 to 23-May-2018

2.1.4 Test Method

The EUT was set up in a semi-anechoic chamber on a remotely controlled turntable and placed on a non-conductive in accordance with ANSI C63.4, clause 8.

A pre-scan of the EUT emissions profile was made while varying the antenna-to-EUT azimuth and antenna-to-EUT polarisation using a peak detector; measurements were taken at a 3m distance. Using the pre-scan list of the highest emissions detected, their bearing and associated antenna polarisation, the EUT was then formally measured using a Quasi-Peak, Peak, Average detector as appropriate. The readings were maximised by adjusting the antenna height, polarisation and turntable azimuth, in accordance with the specification.

2.1.5 Environmental Conditions

Ambient Temperature	19.9 - 22.2 °C
Relative Humidity	36.0 - 41.6 %

2.1.6 Test Results

Results for Configuration and Mode : Idle.

Performance assessment of the EUT made during this test: Pass

Detailed results are shown below.

Highest frequency generated or used within the EUT: 5250 MHz
Which necessitates an upper frequency test limit of: 30 GHz

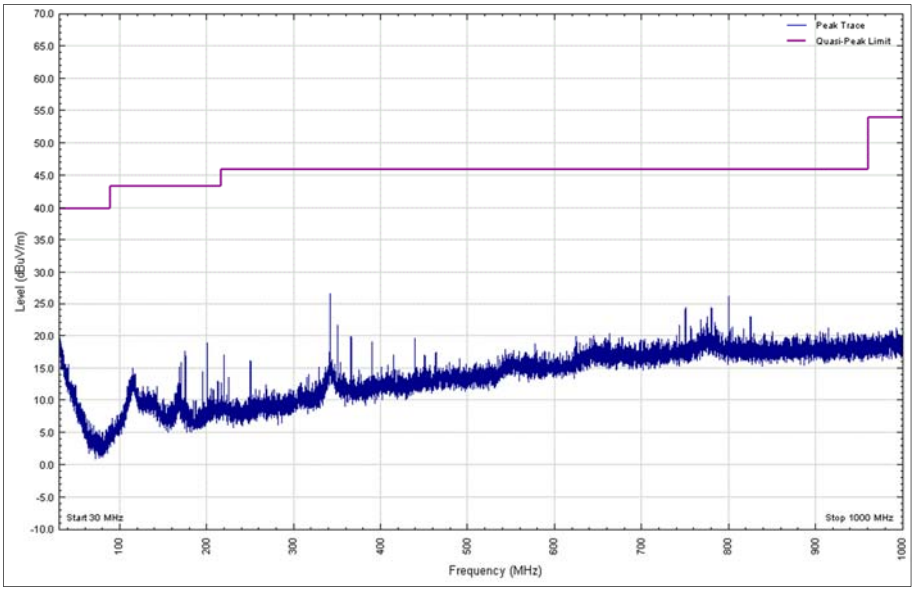

Figure 1 - 30 MHz to 1 GHz – Polarity: Horizontal, EUT Orientation: X

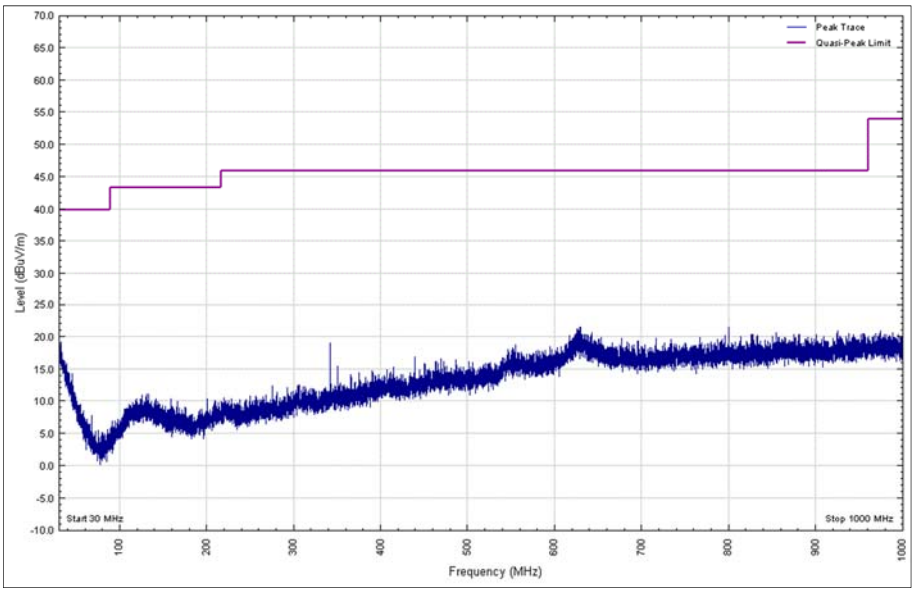

Figure 2 - 30 MHz to 1 GHz - Polarity: Vertical, EUT Orientation: X

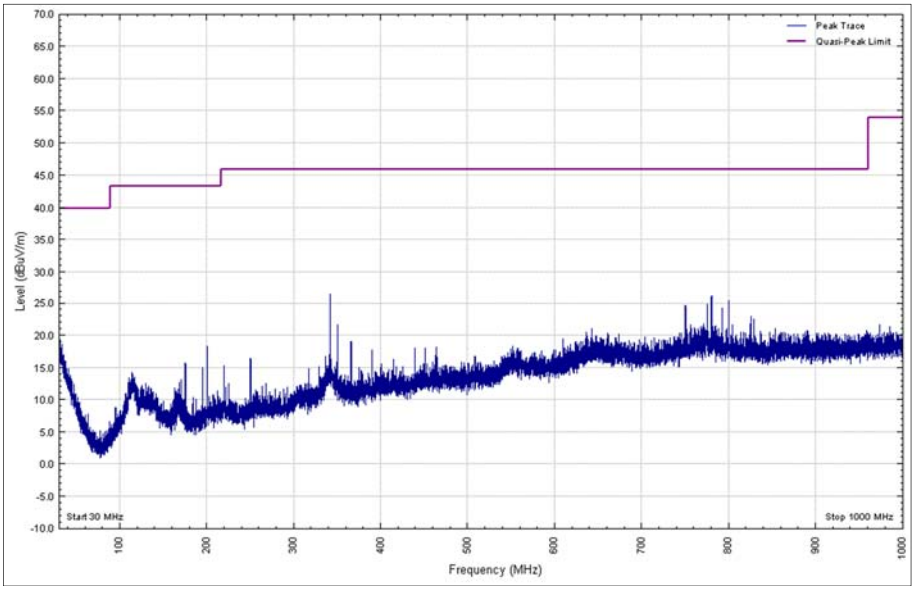

Figure 3 - 30 MHz to 1 GHz - Polarity: Horizontal, EUT Orientation: Y

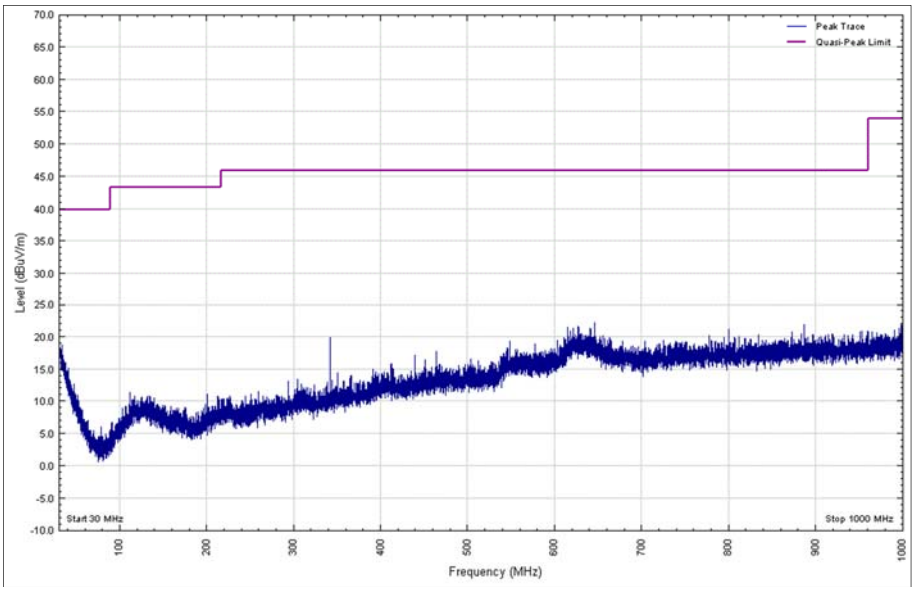

Figure 4 - 30 MHz to 1 GHz - Polarity: Vertical, EUT Orientation: Y

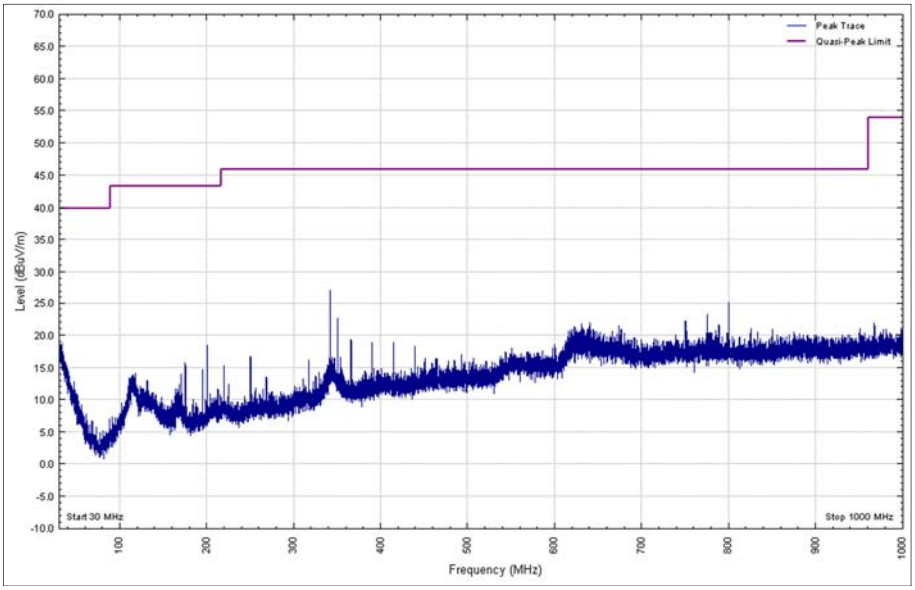

Figure 5 - 30 MHz to 1 GHz- Polarity: Horizontal, EUT Orientation: Z

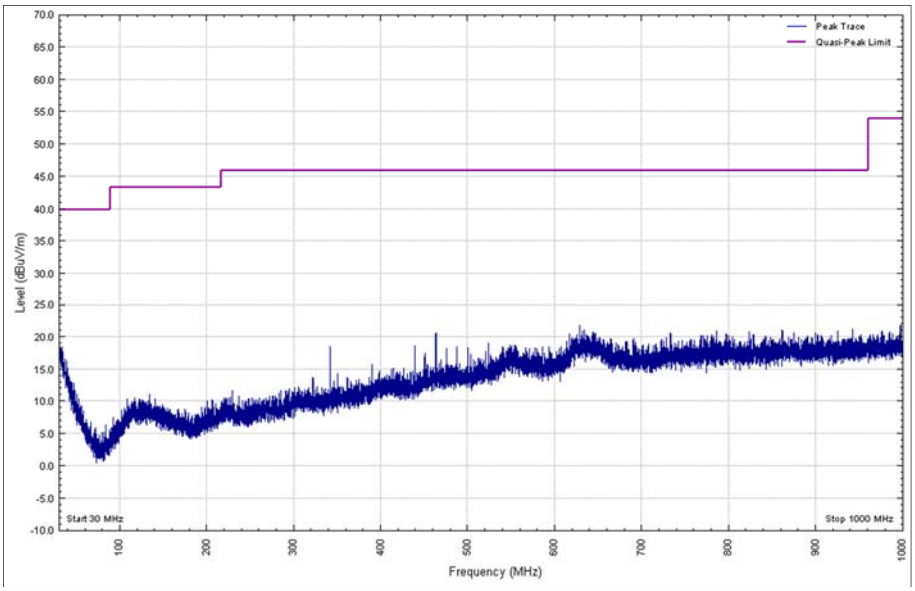

Figure 6 - 30 MHz to 1 GHz - Polarity: Vertical, EUT Orientation: Z

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
*						

Table 3 - 30 MHz to 1 GHz

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

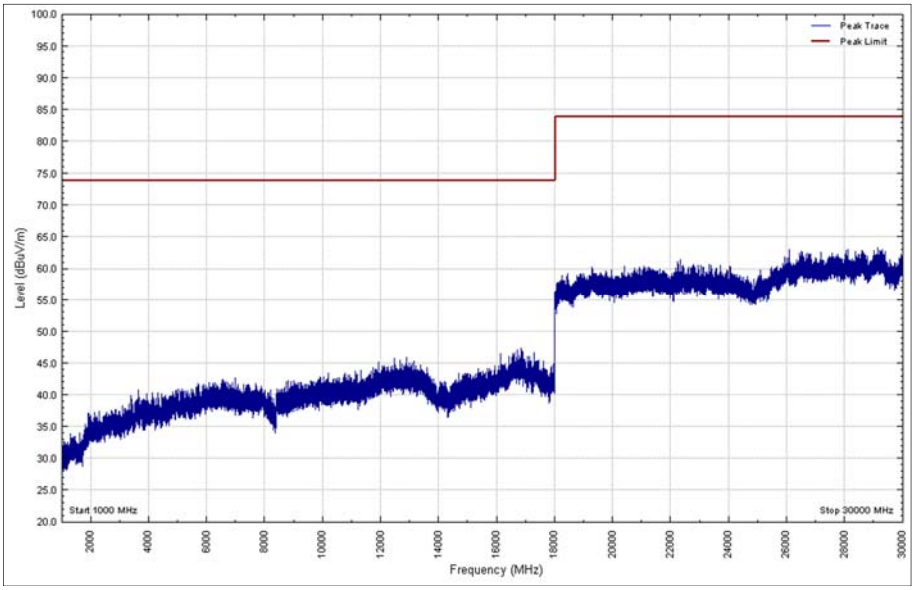

Figure 7 - 1 GHz to 30 GHz – Polarity: Horizontal, EUT Orientation: X - Peak

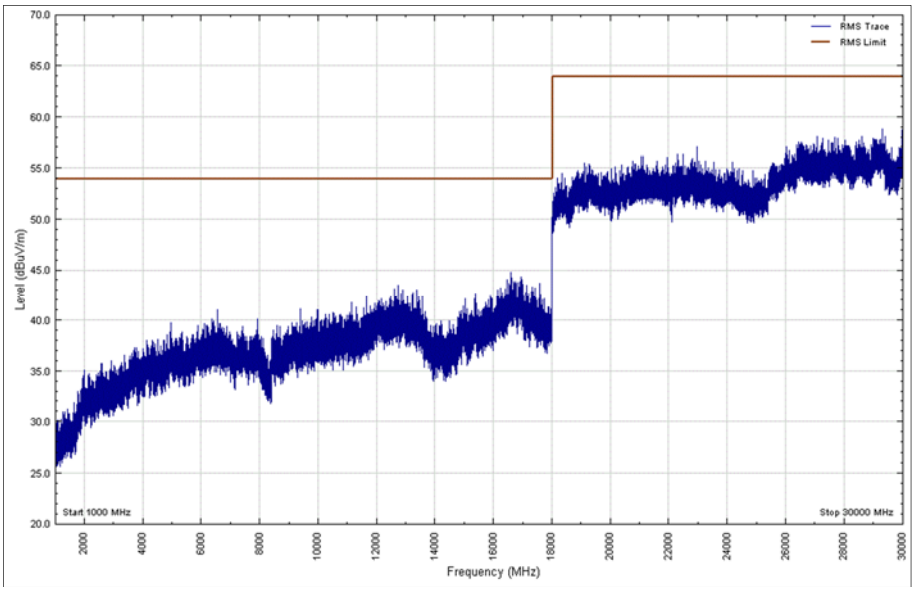

Figure 8 - 1 GHz to 30 GHz – Polarity: Horizontal, EUT Orientation: X - Average

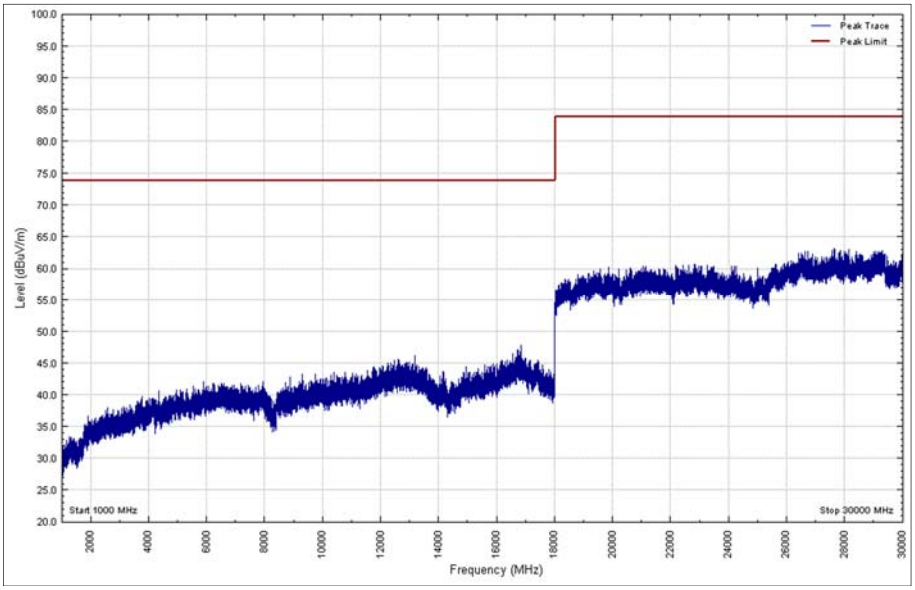

Figure 9 - 1 GHz to 30 GHz – Polarity: Vertical, EUT Orientation: X - Peak

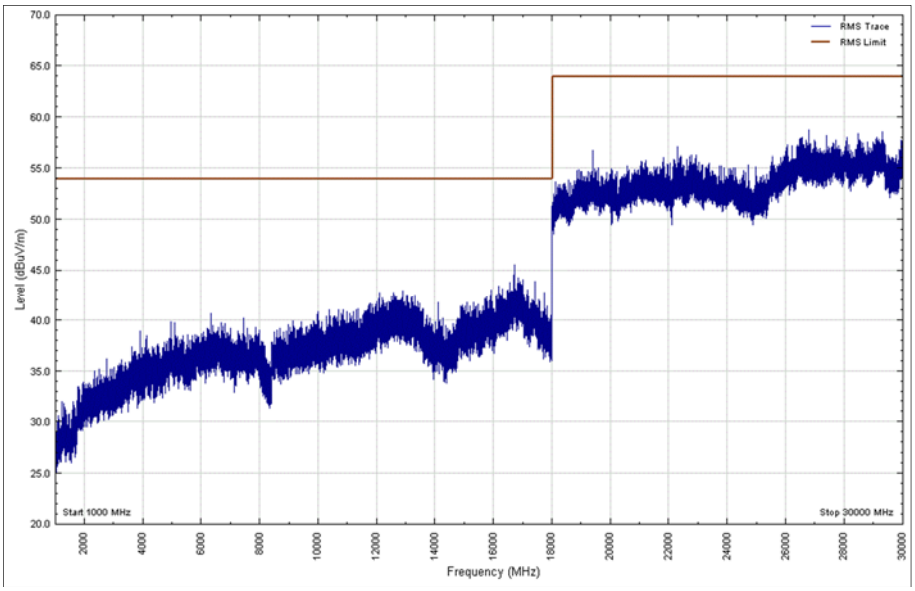

Figure 10 - 1 GHz to 30 GHz – Polarity: Vertical, EUT Orientation: X - Average

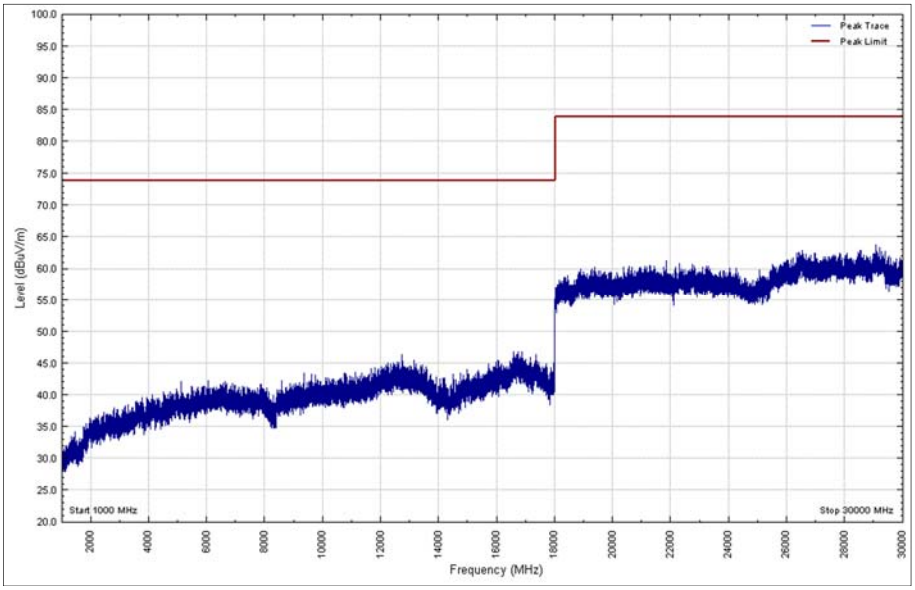

Figure 11 - 1 GHz to 30 GHz – Polarity: Horizontal, EUT Orientation: Y - Peak

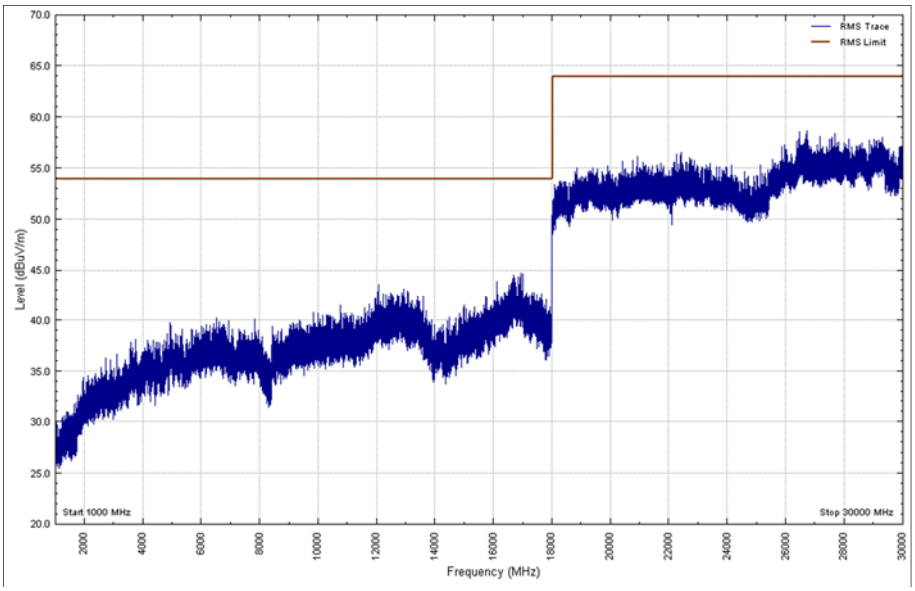

Figure 12 - 1 GHz to 30 GHz – Polarity: Horizontal, EUT Orientation: Y - Average

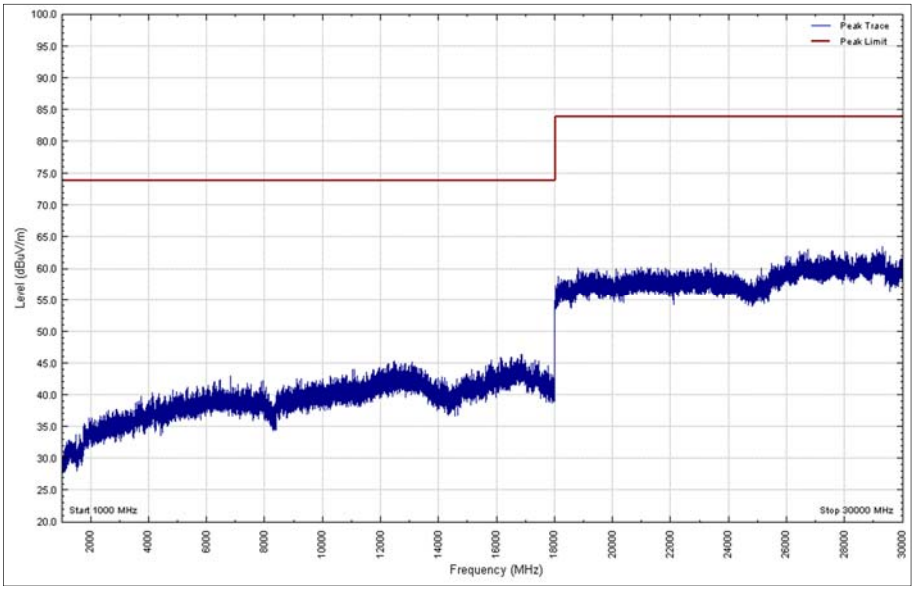

Figure 13 - 1 GHz to 30 GHz – Polarity: Vertical, EUT Orientation: Y - Peak

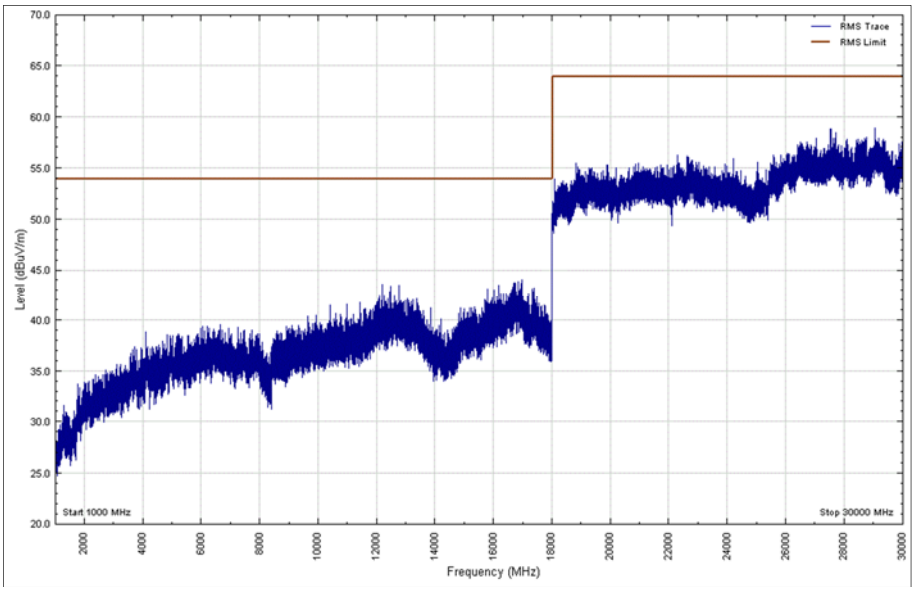

Figure 14 - 1 GHz to 30 GHz – Polarity: Vertical, EUT Orientation: Y - Average

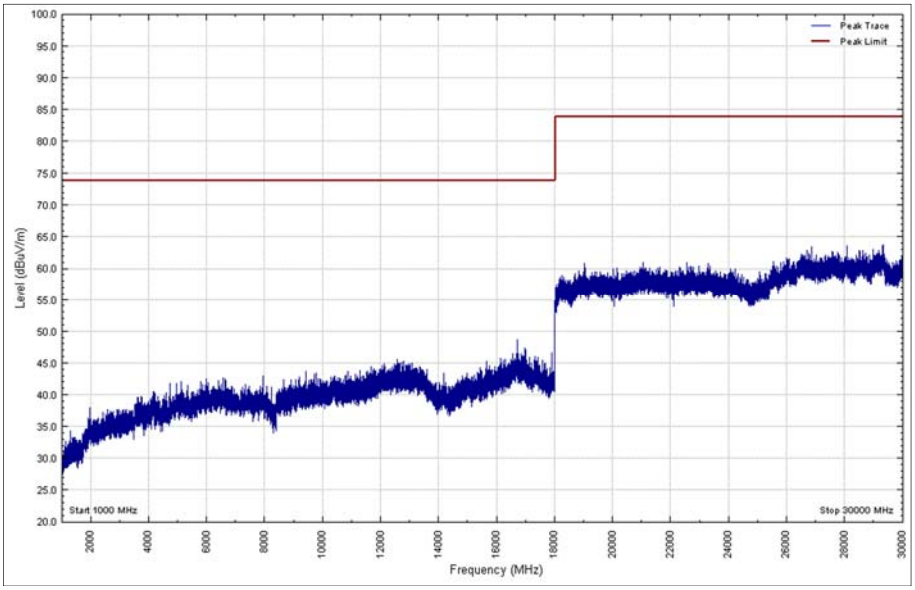

Figure 15 - 1 GHz to 30 GHz – Polarity: Horizontal, EUT Orientation: Z - Peak

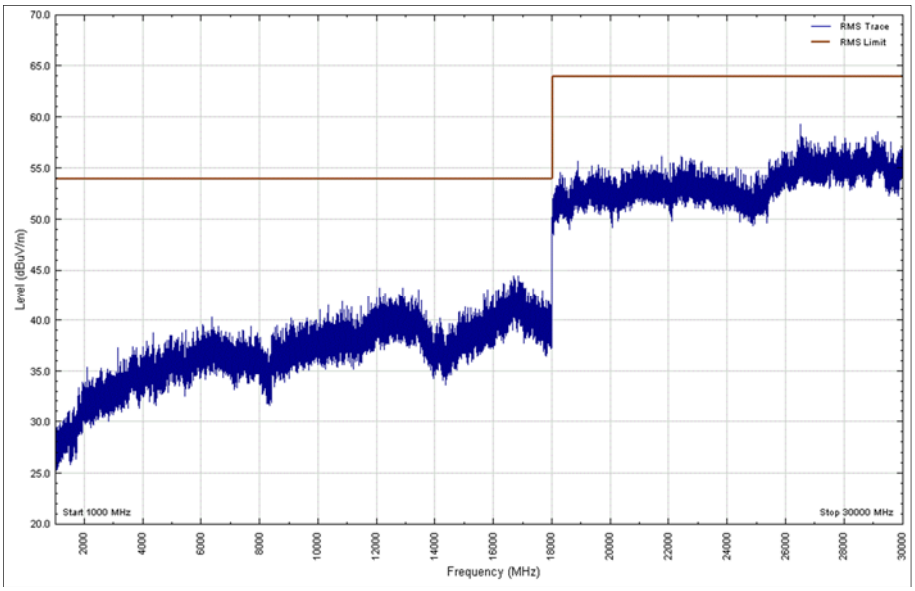

Figure 16 - 1 GHz to 30 GHz – Polarity: Horizontal, EUT Orientation: Z - Average

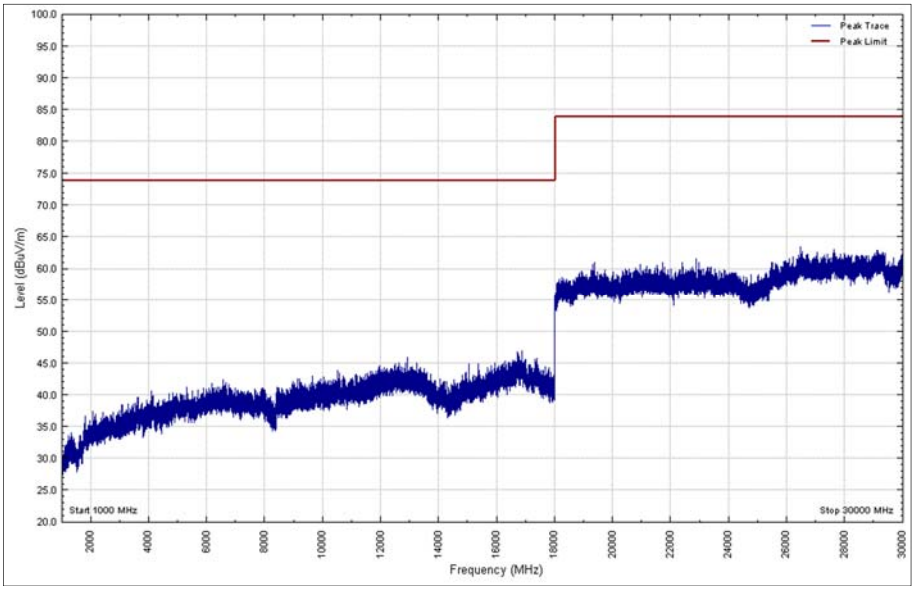

Figure 17 - 1 GHz to 30 GHz – Polarity: Vertical, EUT Orientation: Z - Peak

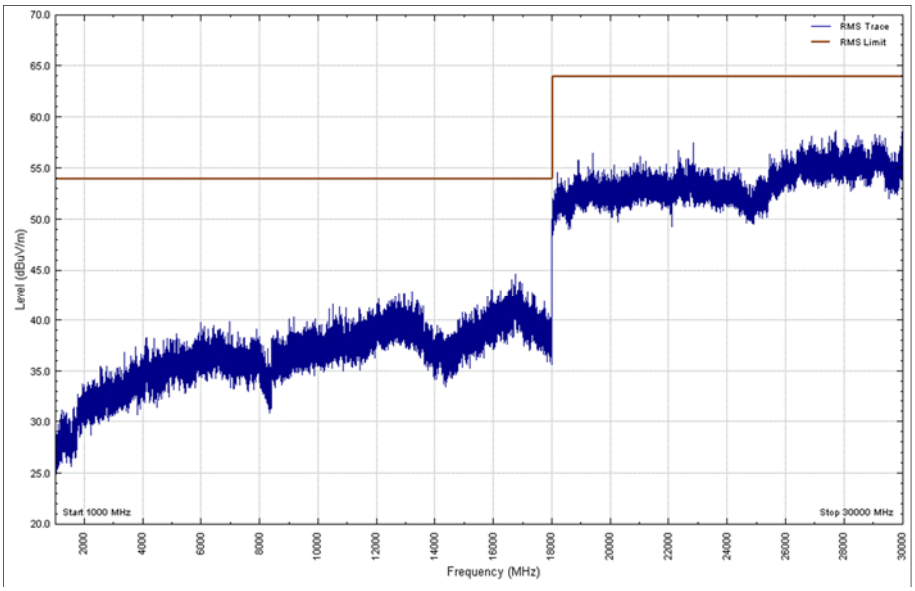

Figure 18 - 1 GHz to 30 GHz – Polarity: Vertical, EUT Orientation: Z - Average

Frequency (GHz)	Result (dBµV/m)		Limit (dBµV/m)		Margin (dBµV/m)	
	Peak	Average	Peak	Average	Peak	Average
*						

Table 4 - 1 GHz to 30 GHz

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

FCC 47 CFR Part 15, Limit Clause 15.109

Frequency of Emission (MHz)	Field Strength (µV/m)
30 to 88	100.0
88 to 216	150.0
216 to 960	200.0
Above 960	500.0

Table 5

ICES-003, Limit Clause 6.2

Frequency of Emission (MHz)	Quasi-Peak (dBµV/m)
30 to 88	40.0
88 to 216	43.5
216 to 960	46.0
960 to 1000	54.0

Table 6

Frequency of Emission (MHz)	Field Strength (dBµV/m)	
	Linear Average Detector	Peak Detector
Above 1000	54.0	74.0

Table 7

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 18-40GHz (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	7-Dec-2018
Pre-Amplifier	Phase One	PS04-0086	1533	12	12-Jan-2019
18GHz - 40GHz Pre-Amplifier	Phase One	PSO4-0087	1534	12	2-Feb-2019
Screened Room (5)	Rainford	Rainford	1545	36	9-Jun-2018
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygromer	Rotronic	A1	2138	12	21-Feb-2019
Antenna (Bilog)	Chase	CBL6143	2904	24	8-Aug-2019
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	-	O/P Mon
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Nov-2018
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
1501A 4.0M Km Km Cable	Rhophase	KPS-1501A-4000-KPS	4301	12	19-Feb-2019
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	18-Oct-2018
Cable (Rx, Nm-Nm, 7m)	Scott Cables	SLU18-NMNM-07.00M	4498	6	19-Jun-2018
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526	6	2-Jul-2018
Cable (Rx, SMAm-SMAm 0.5m)	Scott Cables	SLSLL18-SMSM-00.50M	4528	6	15-Aug-2018
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	1-Mar-2019
1 metre K type Cable	IW Microwave	KPS-1501LC-394-KPS-R	4830	-	O/P Mon
4dB Attenuator	Pasternack	PE7047-4	4935	12	28-Nov-2018

Table 8

TU – Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment

3 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Radiated Disturbance	30 MHz to 1 GHz, Bilog Antenna, ±5.2 dB 1 GHz to 40 GHz, Horn Antenna, ±6.3 dB

Table 9