Report on the FCC Testing of the

Quake Global Inc
Iridium Satellite Modem,
Model: QLocate (1158-5010)

In accordance with FCC 47 CFR Part 15B

Prepared for: Quake Global Inc
4933 Paramount Drive
San Diego
California
CA92123
UNITED STATES

FCC ID: PB5NQLOCATE

COMMERCIAL-IN-CONFIDENCE

Document Number: 75941975-01 | Issue: 02

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Natalie Bennett	29 August 2018	
Authorised Signatory	Matthew Russell	29 August 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	Jack Tuckwell	29 August 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.

TÜV SÜD Product Service
is a trading name of TUV SUD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TUV SUD 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

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	03 July 2018
2	To amend the FCC ID	29 August 2018

Table 1

1.2 Introduction

Applicant	Quake Global Inc
Manufacturer	Quake Global Inc
Model Number(s)	QLocate (1158-5010)
Declared Variant(s)	QLocate (1158-5002) QLocate (1158-5003)
Serial Number(s)	IMEI: 300234030631340, S/N: MX1749024710101
Hardware Version(s)	Rev X1
Software Version(s)	TA16005
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15B: 2017
Order Number Date	PO9851 15-February-2018
Date of Receipt of EUT	23-March-2018 and 29-March-2018
Start of Test	10-April-2018
Finish of Test	10-April-2018
Name of Engineer(s)	Jack Tuckwell and 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: Idle				
2.1	15.109	Radiated Disturbance	Pass	ANSI C63.4: 2014

Table 2

Product Service

1.4 Application Form

EQUIPMENT DESCRIPTION	
Model Name/Number	QLocate
Part Number	1158-5002/5003
Hardware Version	Rev X1
Software Version	TA16005
FCC ID (if applicable)	PB5NQLOCATE
Industry Canada ID (if applicable)	4650A-QLOCATE
Technical Description (Please provide a brief description of the intended use of the equipment)	Qlocate is an Iridium Short Burst Data Transceiver available on two configurations, as a simple SBD transceiver and also one with integrated GPS/GLONASS receiver.

INTENTIONAL RADIATORS									
Technology	Frequency Band (MHz)	Conducted Declared Output Power (dBm)	Antenna Gain (dBi)	Supported Bandwidth (s) (MHz)	Modulation Scheme(s)	ITU Emission Designator	Test Channels (MHz)		
							Bottom	Middle	Top
Iridium	1616 to 1626.5	32	3	31.5 kHz per channel	DEQPSK		1616.020833	1620.979087	1625.979007

UN-INTENTIONAL RADIATOR	
Highest frequency generated or used in the device or on which the device operates or tunes	1626.5 MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	1608.0 MHz
Class A Digital Device (Use in commercial, industrial or business environment) ☒ Class B Digital Device (Use in residential environment only) ☐	

Power Source			
AC	Single Phase	Three Phase	Nominal Voltage
	N/A	N/A	N/A
External DC	Nominal Voltage	Maximum Current	
	5 V	1.5 A	
Battery	Nominal Voltage	Battery Operating End Point Voltage	
	N/A	N/A	
Can EUT transmit whilst being charged?		Yes ☐ No ☐	

EXTREME CONDITIONS					
Maximum temperature	85	°C	Minimum temperature	-40	°C

Ancillaries
Please list all ancillaries which will be used with the device.
Dual Band Antenna for SAT and GPS Power Supply for +5 V RS-232 Comm port

ANTENNA CHARACTERISTICS						
☒	Antenna connector			State impedance	50	Ohm
☐	Temporary antenna connector			State impedance		Ohm
☐	Integral antenna	Type				
☒	External antenna	Type	Passive			

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

Name: David Mitchell

Position held: VP, Customer Support Date: 23 March 2018

1.5 Product Information

1.5.1 Technical Description

Qlocate is an Iridium Short Burst Data transceiver available on two configurations, as a simple SBD transceiver and also one with integrated GPS/GLONASS receiver.

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
Satellite Modem: Serial Number: IMEI: 300234030631340, S/N: MX1749024710101			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

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	Jack Tuckwell	UKAS

Table 4

Office Address:

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

Product Service

2 Test Details

2.1 Radiated Disturbance

2.1.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.109

2.1.2 Equipment Under Test and Modification State

Satellite Modem, QLocate (1158-5010), S/N: IMEI: 300234030631340, S/N: MX1749024710101 - Modification State 0

2.1.3 Date of Test

10-April-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 table 0.8m above a reference ground plane.

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	20.0 °C
Relative Humidity	40.0 %

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: 1626.5 MHz
Which necessitates an upper frequency test limit of: 9 GHz

Frequency Range of Test: 30 MHz to 1 GHz

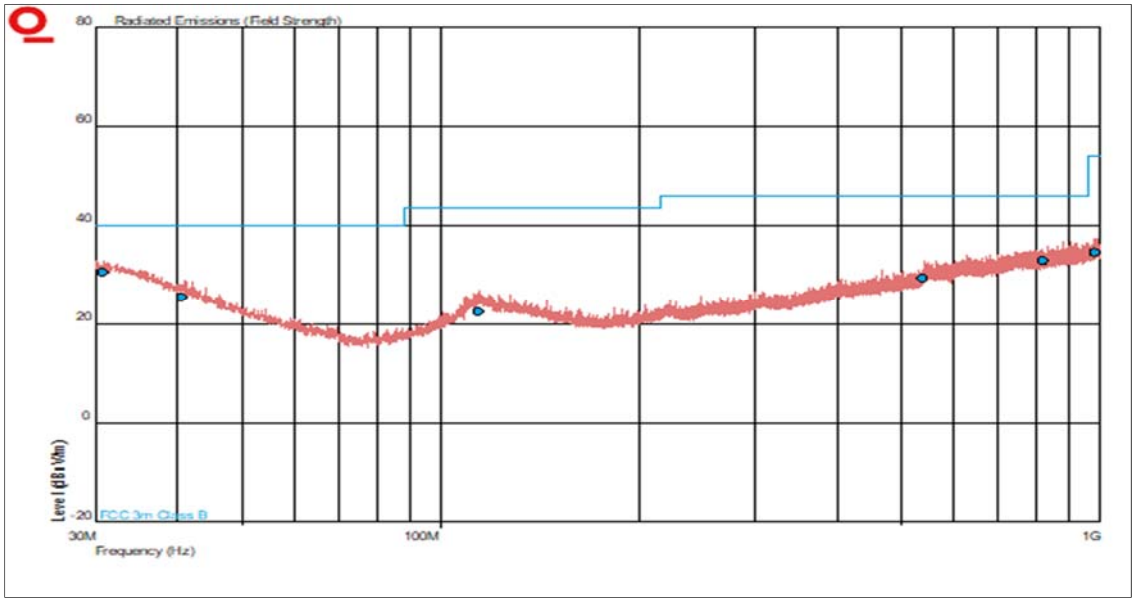

Figure 1 - Graphical Results
Horizontal and Vertical Polarity

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
30.796	30.5	40.0	-9.5	354	1.00	Vertical
40.464	25.4	40.0	-14.6	42	1.66	Horizontal
113.866	22.4	43.5	-21.1	14	1.00	Horizontal
538.181	29.3	46.0	-16.7	50	1.00	Vertical
818.740	32.9	46.0	-13.1	44	1.00	Vertical
982.377	34.6	54.0	-19.4	274	1.00	Horizontal

Table 5 - Emissions Results: 30 MHz to 1 GHz

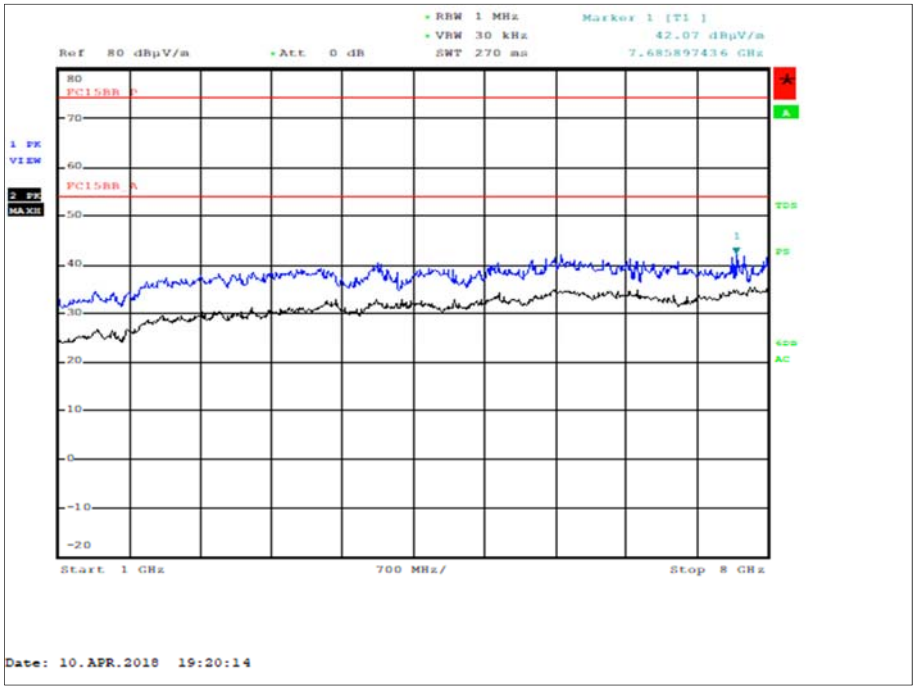

Figure 2 - Graphical Results - 1 GHz to 8 GHz
Combined Polarity

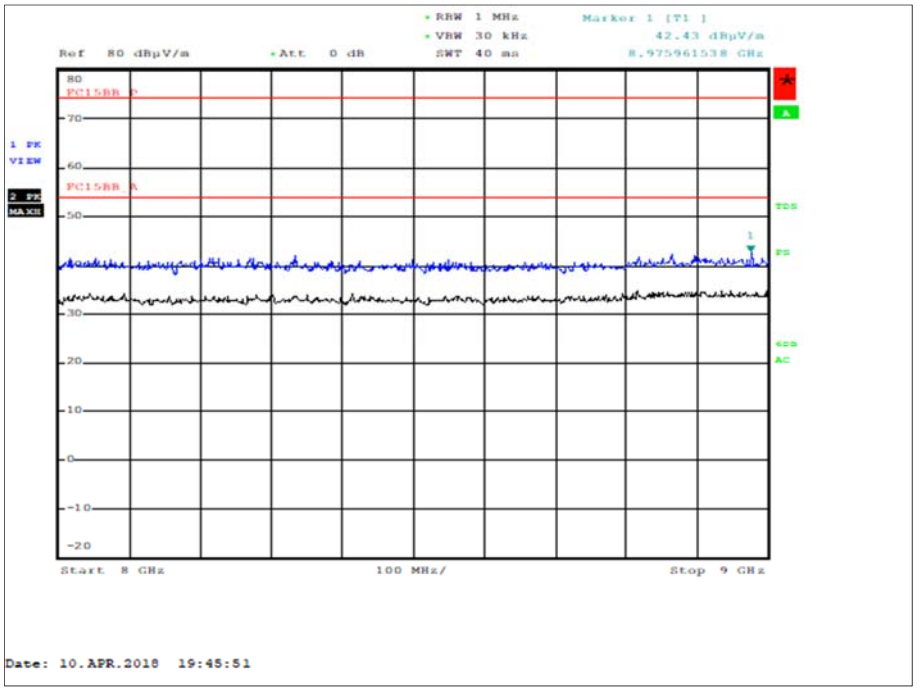

Figure 3 - Graphical Results - 8 GHz to 9 GHz
Combined Polarity

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 9 GHz

No emissions were detected within 6 dB of the limit.

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
Pre-Amplifier	Phase One	PS04-0086	1533	12	12-Jan-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
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	2-May-2018
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
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	18-Oct-2018
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526	6	22-May-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

Table 7

TU – Traceability Unscheduled

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 8