

FCC and Industry Canada Testing of the
Wireless Measurement Ltd,
Model: STAMP Radio Module
In accordance with FCC 47 CFR Part 15B and
ICES-003

Prepared for: Wireless Measurement Ltd
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Product Service

Choose certainty.
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FCC ID: 2AKX6-M03 & 2AKX6-M04
IC: 22384-M03 & 22384-M04

COMMERCIAL-IN-CONFIDENCE

Date: February 2017
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RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Steven White	23 February 2017	
Authorised Signatory	Matthew Russell	23 February 2017	

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	Graeme Lawler	23 February 2017	

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: 2015 and ICES-003: 2016.



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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	21 February 2017
2	To correct a typographical error on the introduction section.	23 February 2017

Table 1

1.2 Introduction

Applicant	Wireless Measurement Ltd
Manufacturer	Wireless Measurement Ltd
Model Number(s)	STAMP Radio Module
Part Number(s)	1) WML-MOD-00003 2) WML-MOD-00004
Serial Number(s)	1) 39590 2) 39592
Hardware Version(s)	1
Software Version(s)	Not Applicable
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 15B: 2015 ICES-003: 2016
Order Number	161202
Date	02-December-2016
Date of Receipt of EUT	15-December-2016
Start of Test	24-January-2017
Finish of Test	25-January-2017
Name of Engineer(s)	Graeme Lawler
Related Document(s)	ANSI C63.4 (2014)



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: Idle					
2.1	15.109	6.2	Radiated Emissions	Pass	ANSI C63.4

Table 2



1.4 Declaration of Build Status

Manufacturer	<u>Wireless Measurement Limited</u>
Country of origin	<u>UK</u>
UK Agent	<u>n/a</u>
Technical Description	<u>2.4 GHz Radio Module for use with wireless products</u>
Model No	<u>STAMP Radio Module</u>
Part No	<u>WML-MOD-00003 & WML-MOD-00004</u>
Serial No	<u>39590, 39591, 39592</u>
Drawing Number	<u></u>
Build Status	<u></u>
Software Issue	<u>n/a</u>
Hardware Issue	<u>1</u>
Highest Internally Generated Frequency	<u>2480 MHz</u>
FCC ID	<u>2AKX6-MØ3 & 2AKX6-MØ4</u>
Industry Canada ID	<u>22384-MØ3 & 22384-MØ4</u>
Signature	<u>D.Wooller</u>
Date	<u>16/02/2017</u>
D of B S Serial No	<u></u>

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.

1.5 Product Information

1.5.1 Technical Description

Radio module to build into radio sensor measurement systems.

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: 39590			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: 39592			
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: Idle		
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
ICES-003, Clause 6.2

2.1.2 Equipment Under Test and Modification State

STAMP Radio Module (WML-MOD-00003), S/N: 39590 - Modification State 0
STAMP Radio Module (WML-MOD-00004), S/N: 39592 - Modification State 0

(All tests were performed with the above units, co-located within the test chamber)

2.1.3 Date of Test

24-January-2017 to 25-January-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	19.1 - 19.2 °C
Relative Humidity	28.0 - 31.0 %

2.1.6 Test Results

Idle

Highest frequency generated or used within the EUT: 2480 MHz
Upper frequency test limit: 13 GHz

30 MHz to 1 GHz

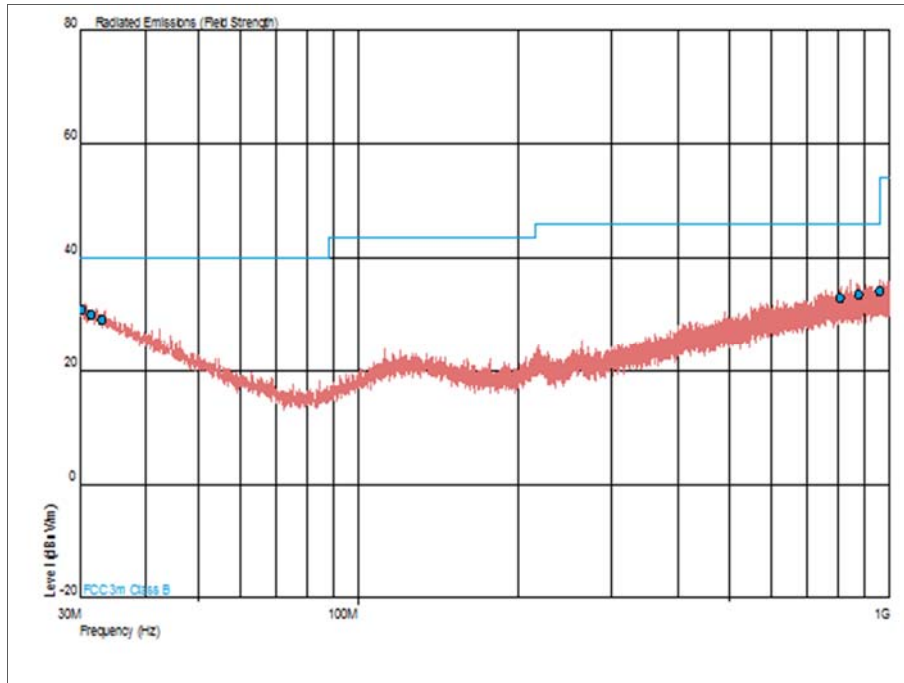


Figure 1 - Horizontal and Vertical Polarity

Frequency (MHz)	QP Level (dBµV/m)	QP Limit (dBµV/m)	QP Margin (dBµV/m)	Angle(Deg)	Height(m)	Polarity
30.245	30.8	39.0	-8.2	0	1.00	Vertical
31.454	29.9	39.0	-9.1	0	1.00	Vertical
32.991	29.1	39.0	-9.9	0	1.00	Vertical
808.512	32.9	46.4	-13.5	0	1.00	Vertical
876.249	33.5	46.4	-12.9	0	1.00	Vertical
960.000	34.2	46.4	-12.2	0	1.00	Vertical

Table 5

1 GHz to 13 GHz

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 6

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

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

Table 7

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

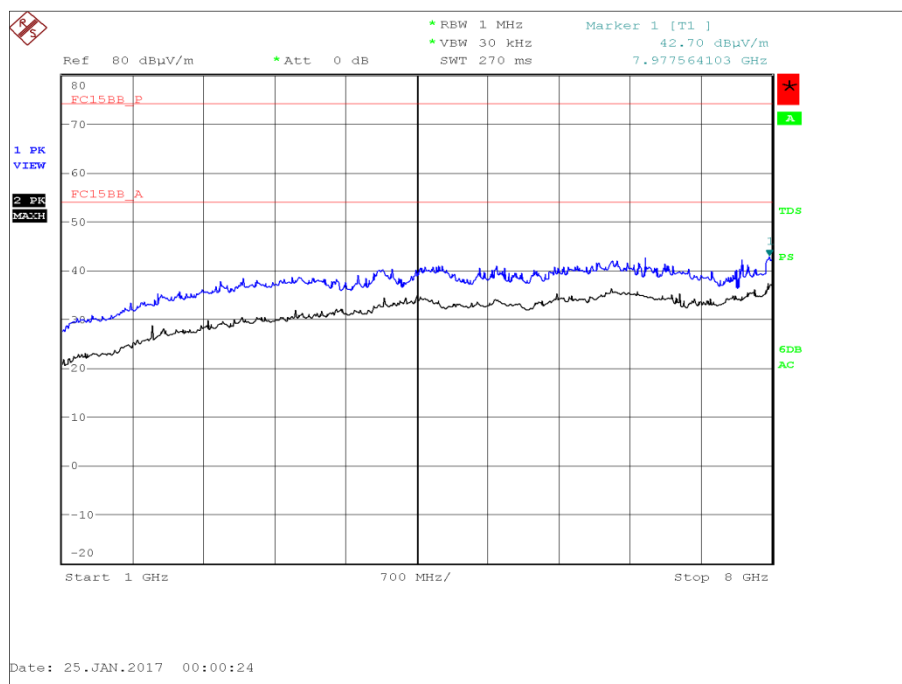


Figure 2 - Horizontal and Vertical Polarity - 1 GHz to 8 GHz

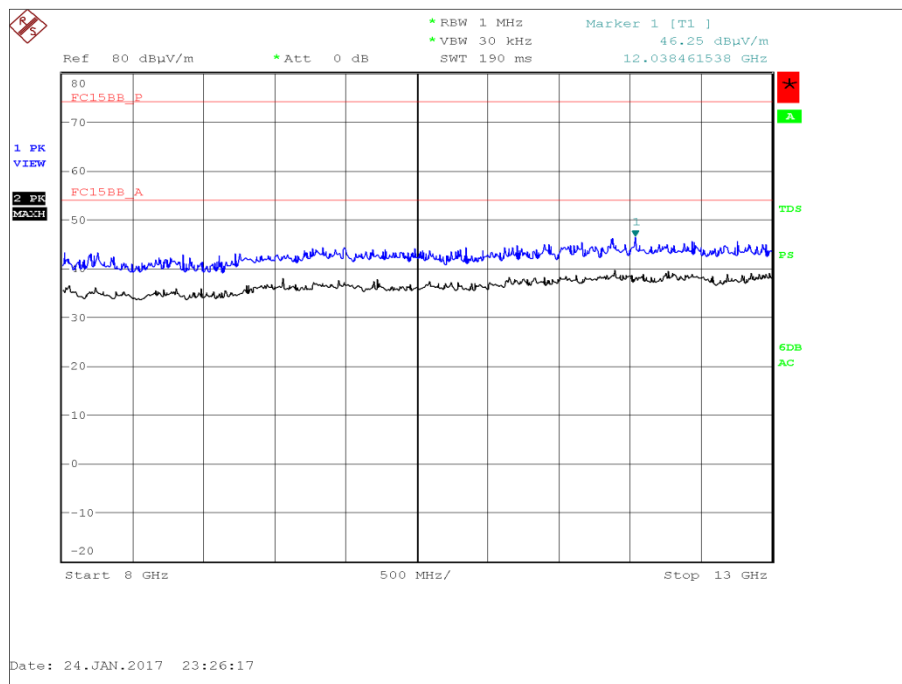


Figure 3 - Horizontal and Vertical Polarity - 8 GHz to 13 GHz

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

ICES-003, Limit Clause 6.2

Frequency of Emission (MHz)	Quasi-Peak (dBμV/m)
30 to 88	39.0
88 to 216	43.5
216 to 960	46.4
960 to 1000	49.5

Frequency of Emission (MHz)	Field Strength (dBμV/m)	
	Linear Average Detector	Peak Detector
Above 1000	49.5	69.5



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
Pre-Amplifier	Phase One	PS04-0086	1533	12	29-Jul-2017
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygrometer	Rotronic	HYGROPALM 1	2338	12	21-Sep-2017
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	-	O/P Mon
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	12-Nov-2017
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	17-Oct-2017
Cable (Yellow, Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4527	-	O/P Mon
Cable (Rx, SMAm-SMAm 0.5m)	Scott Cables	SLSLL18-SMSM-00.50M	4528	6	03-Feb-2017
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	27-Feb-2017

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 Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB

Table 9