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Report On

FCC and Industry Canada Testing of the
Bridge Systems BV Bridgemate II BM2-1 Hand Held
In accordance with FCC CFR 47 Part 15C and Industry Canada RSS-
210

COMMERCIAL-IN-CONFIDENCE

FCC ID: UVIBM21A
IC ID: 6946A-BM21A

Document 75921258 Report 03 Issue 1

February 2013



Product Service

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PREPARED FOR

Bridge Systems BV
Van Vollenhovenstraat 56 B
3016 BK
Rotterdam
Netherlands

PREPARED BY



Natalie Bennett
Senior Administrator (Technical)

APPROVED BY



Tony Pither
Authorised Signatory

DATED

19 February 2013

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 CFR 47 Part 15C and Industry Canada RSS-210. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);



G Lawler





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SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Bridge Systems BV Bridgemate II BM2-1 Hand Held
In accordance with FCC CFR 47 Part 15C and Industry Canada RSS-210



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC and Industry Canada Testing of the Bridge Systems BV Bridgemate II BM2-1 Hand Held to the requirements of FCC CFR 47 Part 15C and Industry Canada RSS-210.

Objective	To perform FCC and Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Bridge Systems BV
Model Number(s)	BM2-1
Serial Number(s)	Not Serialized (75921258_TS0007)
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15C (2012) Industry Canada RSS-210 (2010)
Incoming Release Date	Application Form 01 February 2013
Disposal Reference Number	Held Pending Disposal
Date	Not Applicable
Order Number	Quote Acceptance Form
Date	9 January 2013
Start of Test	5 February 2013
Finish of Test	5 February 2013
Name of Engineer(s)	G Lawler
Related Document(s)	ANSI C63.10: 2009



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15C and Industry Canada RSS-210 is shown below.

Section	Spec Clause		Test Description	Result	Comments/Base Standard
	FCC	IC			
Handheld Unit					
2.1	15.249 (a)	A2.9	Field Strength of Fundamental	Pass	
2.2	15.249 (a)(d) and 15.209	A2.9	Field Strength of Spurious Emissions	Pass	



1.3 APPLICATION FORM

APPLICANT'S DETAILS			
COMPANY NAME :	Bridge Systems BV		
ADDRESS :	Van Vollenhovenstraat 56 B 3016 BK, Rotterdam, The Netherlands		
NAME FOR CONTACT PURPOSES : Ron Bouwland			
TELEPHONE NO: +31-10-4149171 FAX NO:	E-MAIL: bouwland@bridgemate.nl		
EQUIPMENT INFORMATION			
Model name/number	BM2-1	Identification/Part number	n/a
Hardware Version	1.1	Software Version	2.0.5
Manufacturer	Bridge Systems BV.	Country of Origin	The Netherlands
FCC ID	UVIBM21A	Industry Canada ID	6946A-BM21A
Technical description (a brief description of the intended use and operation) Wireless hand-held for Bridgemate scoring system			
<u>Supply Voltage:</u>			
[] AC mains	State AC voltage V	and AC frequency Hz	
[] DC (external)	State DC voltage V	and DC current A	
[X] DC (internal)	State DC voltage 3 V	and Battery type 2xAA	
<u>Frequency characteristics:</u>			
Transmitter Frequency range	902.3 MHz to 927.7 MHz	Channel spacing 200 kHz (if channelized)	
Receiver Frequency range (if different)	902.3 MHz to 927.7 MHz	Channel spacing 200 kHz (if channelized)	
Designated test frequencies:	Bottom: 902.3 MHz Middle: 914.9 or 915.1 MHz Top: 927.7 MHz		
Intermediate Frequencies :	307.2 kHz		
Highest Internally Generated Frequency :	14.7456 MHz		
<u>Power characteristics:</u>			
Maximum transmitter power	5 mW	Minimum transmitter power	..... W
[] Continuous transmission	State duty cycle <1%		
[X] Intermittent transmission	If intermittent, can transmitter be set to continuous transmit test mode? Yes		
<u>Antenna characteristics:</u>			
[] Antenna connector	State impedance ohm		
[] Temporary antenna connector	State impedance ohm		
[X] Integral antenna Type 2 x 1/4λ wire whip	State gain best case 2 dBi		
[] External Antenna Type	State gain dBi		
<u>Modulation characteristics:</u>			
[] Amplitude	[] Other		
[X] Frequency	Details: 2-FSK @ 19.2 kbps (GMSK, QSPK etc)		
[] Phase	No (except in test mode for certification)		
Can the transmitter operate un-modulated?			
ITU Class of emission: 19K2F1D			



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<u>Battery/Power Supply</u>			
Model name/number	LR6	Identification/Part number
Manufacturer		Country of Origin	China
<u>Ancillaries (if applicable)</u>			
Model name/number	.....	Identification/Part number	.....
Manufacturer	.....	Country of Origin	.....
<u>Extreme conditions:</u>			
Maximum temperature	..... °C	Minimum temperature	..... °C
Maximum supply voltage	3.6 V	Minimum supply voltage	2.4 V

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature :

A handwritten signature in blue ink, appearing to read "RF Bouwland".

Name : RF Bouwland

Position held : Managing Director

Date : February 1st, 2013



1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Bridge Systems BV Bridgemate II BM2-1 Hand Held. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 3 V DC supply.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

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

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.



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SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
Bridge Systems BV Bridgemate II BM2-1 Hand Held
In accordance with FCC CFR 47 Part 15C and Industry Canada RSS-210



2.1 FIELD STRENGTH OF FUNDAMENTAL

2.1.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.249 (a)
Industry Canada RSS-210, Clause A2.9

2.1.2 Equipment Under Test and Modification State

BM2-1 S/N: Not Serialised (75921258_TS0007) - Modification State 0

2.1.3 Date of Test

5 February 2013

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

The EUT is placed on a test table 800mm above the ground plane.

During formal measurement the spectrum analyser is tuned to the frequency of the fundamental. The turntable azimuth is adjusted from 0 to 360 degrees to determine the point at which the maximum level occurs. Then the height of the measuring antenna is adjusted from a height of 1m to 4m to determine the height at which the maximum level occurs. Once the point of maximum emission has been determined the emission is measured.

2.1.6 Environmental Conditions

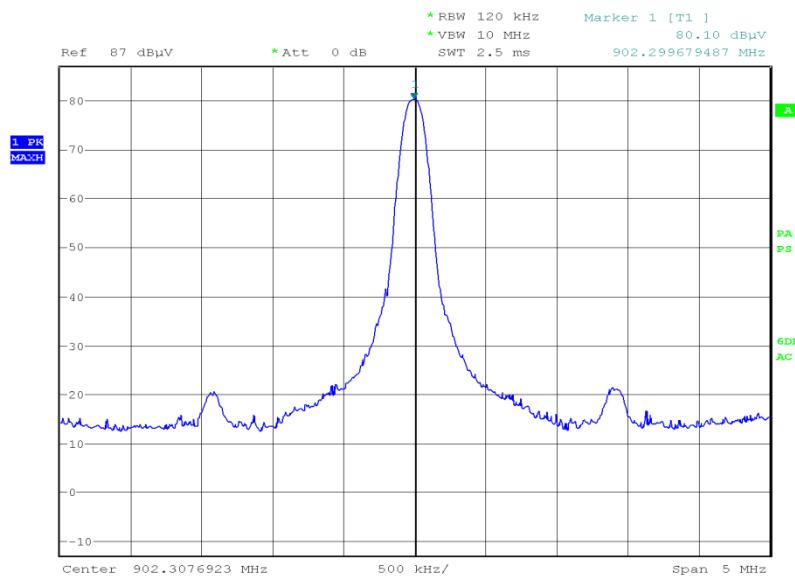
Ambient Temperature	20.0°C
Relative Humidity	26.0%



2.1.7 Test Results

902.300 MHz

Fundamental

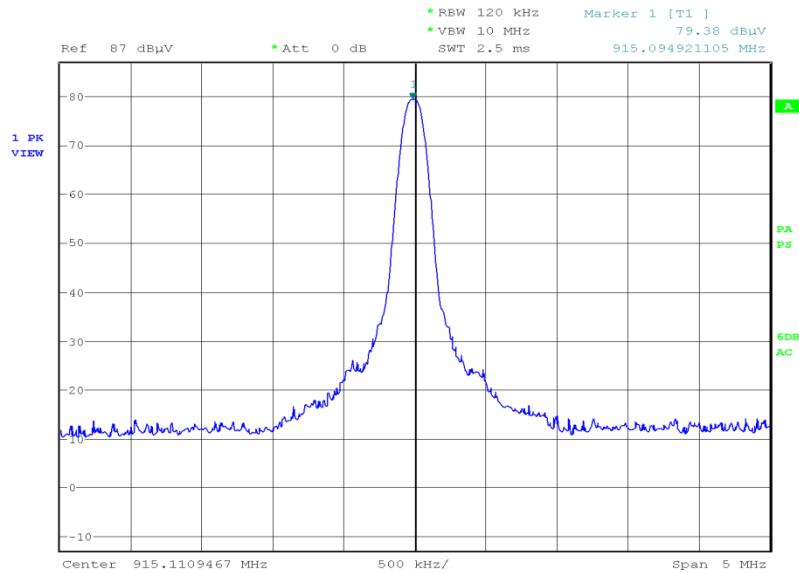


Date: 5.FEB.2013 17:48:33

Frequency (MHz)	Result (dB μ V/m)	Limit (dB μ V/m)
902.300	81.59	94.00



Product Service

915.100 MHzFundamental

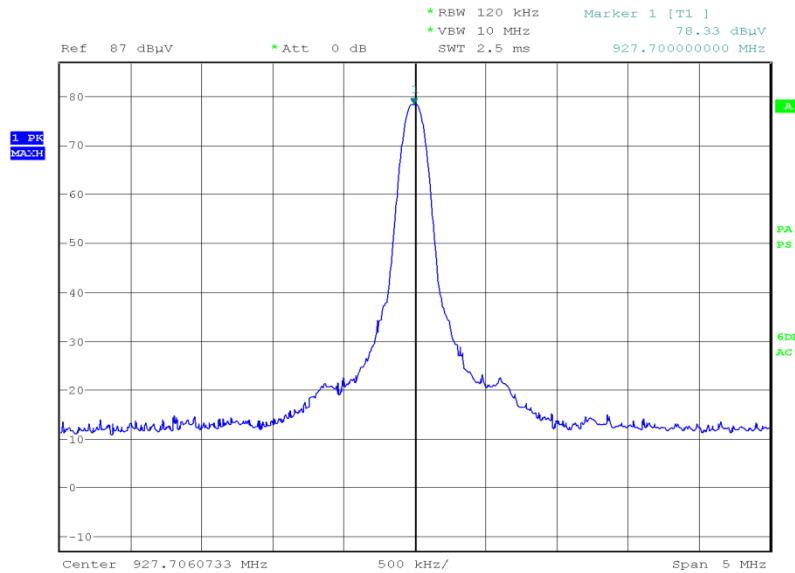
Date: 5.FEB.2013 18:56:12

Frequency (MHz)	Result (dB μ V/m)	Limit (dB μ V/m)
915.100	79.73	94.00



927.700 MHz

Fundamental



Date: 5.FEB.2013 19:48:39

Frequency (MHz)	Result (dB μ V/m)	Limit (dB μ V/m)
927.700	79.51	94.00

The customer has declared the following statement: The transmitter is pulse modulated. The duty cycle of the transmitter is well below 1%, transmissions typically last for only a few milliseconds, and there will be less than 5 transmissions per second. During a 100ms interval, you will never have more than 1 transmission, and in a really worst-case situation, that transmission will last 8ms. Therefore the following calculation has been used to determine a duty cycle correction factor:

$$20 \log 8\text{ms}/8\text{ms} + 100\text{ms} = -22.61 \text{ dB}$$

-22.61 dB was applied to the peak measurement of the fundamental to obtain the final result.

Limit Clause 15.249 (a) and A2.9

Fundamental Frequency (MHz)	Field Strength of Fundamental (millivolts/meter)
902 to 928	50
2400 to 2483.5	50
5725 to 5875	50
24000 to 24250	250



2.2 FIELD STRENGTH OF SPURIOUS EMISSIONS

2.2.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.249 (a)(d) and 15.209
Industry Canada RSS-210, Clause A2.9

2.2.2 Equipment Under Test and Modification State

BM2-1 S/N: Not Serialised (75921258_TS0007)- Modification State 0

2.2.3 Date of Test

5 February 2013

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Procedure

A preliminary profile of the Spurious Radiated Emissions is obtained up to the 10th harmonic of the EUT's fundamental frequency. For frequencies from 30MHz to 18GHz the EUT is placed on a test table 800mm above the ground plane. For frequencies above 18GHz, the EUT height is increased by 200mm to a height of 1000mm. This is to ensure the beam width of the measuring antenna gives sufficient vertical coverage of the EUT.

During characterisation the turntable azimuth is adjusted from 0 to 360 degrees with the measuring antenna in one polarity. It is then repeated for the other polarity. Any frequencies of interest are noted for formal measuring later. The distance from the measuring antenna to the boundary of the EUT is 3m. Above 18GHz this distance may be reduced to 1m.

During formal measurement the spectrum analyser is tuned to the frequency of the emission. The turntable azimuth is adjusted from 0 to 360 degrees to determine the point at which the maximum emission level occurs. Then the height of the measuring antenna is adjusted from a height of 1m to 4m to determine the height at which the maximum emission level occurs. Once the point of maximum emission has been determined the emission is measured. Emissions in the 30MHz to 1GHz range are measured using a CISPR Quasi – Peak detector function in a 120kHz bandwidth. Emissions in the range 1GHz to 40GHz require Peak and Average measurements. The Peak measurements are made using a peak detector with 1MHz Resolution and Video bandwidths. The average measurements employ a peak detector with a Resolution bandwidth of 1MHz and a Video bandwidth of 10Hz. If measurements are made at a 1m measuring distance, then 10dB is added to the specification limit.

2.2.6 Environmental Conditions

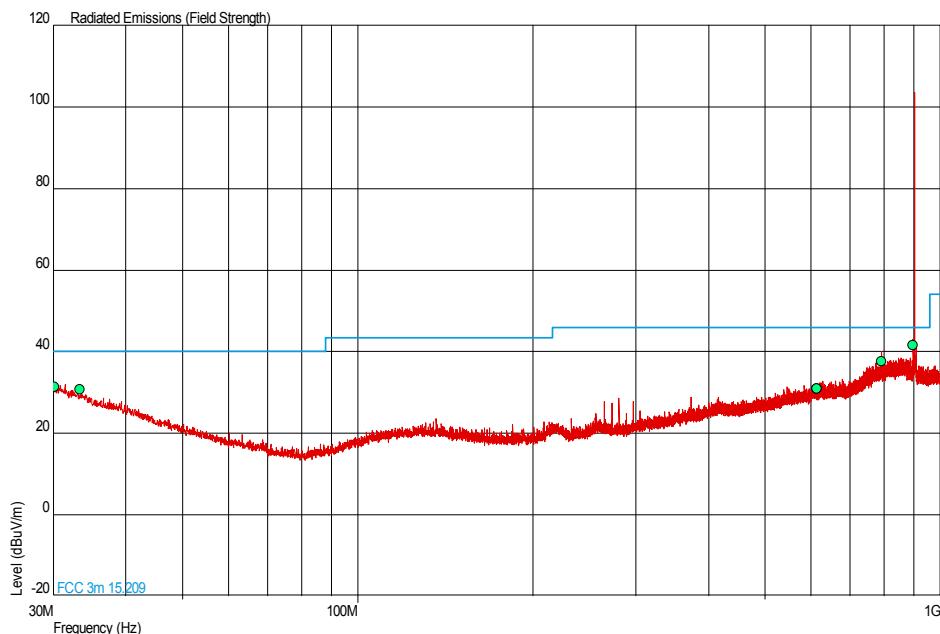
Ambient Temperature	20.0°C
Relative Humidity	26.0%



2.2.7 Test Results

902.300 MHz

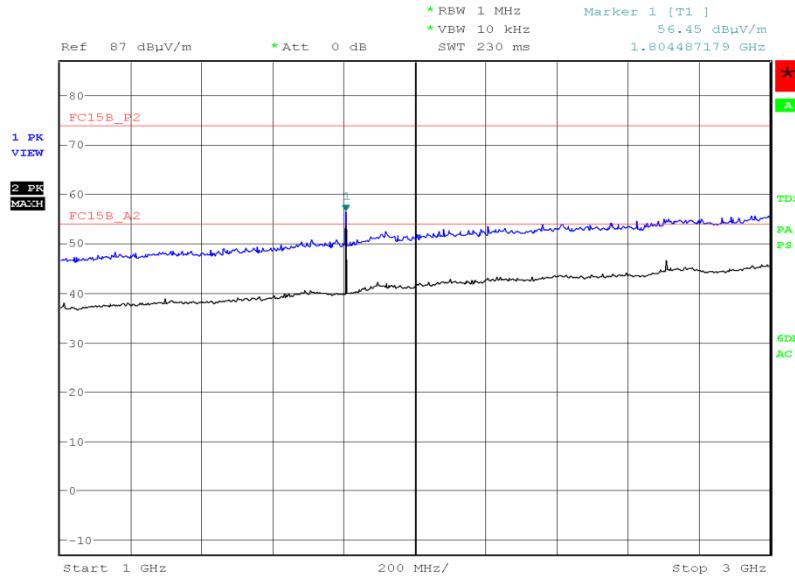
30 MHz to 1 GHz



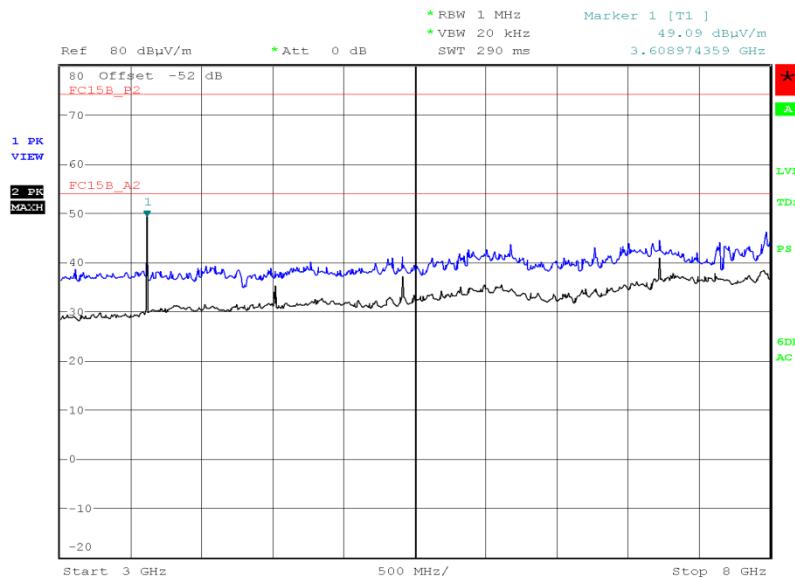
Frequency (MHz)	QP Level (dB μ V/m)	QP Limit (dB μ V/m)	QP Margin (dB μ V/m)	Angle(Deg)	Height(m)	Polarity
30.117	31.3	40.0	-8.7	135	1.00	Vertical
33.358	30.7	40.0	-9.3	336	1.00	Horizontal
614.000	30.8	46.0	-15.2	112	1.00	Horizontal
614.000	30.8	46.0	-15.2	161	1.00	Vertical
791.725	37.5	46.0	-8.5	268	1.00	Horizontal
896.350	41.5	46.0	-4.5	213	1.00	Horizontal



Product Service

1 GHz to 3 GHz

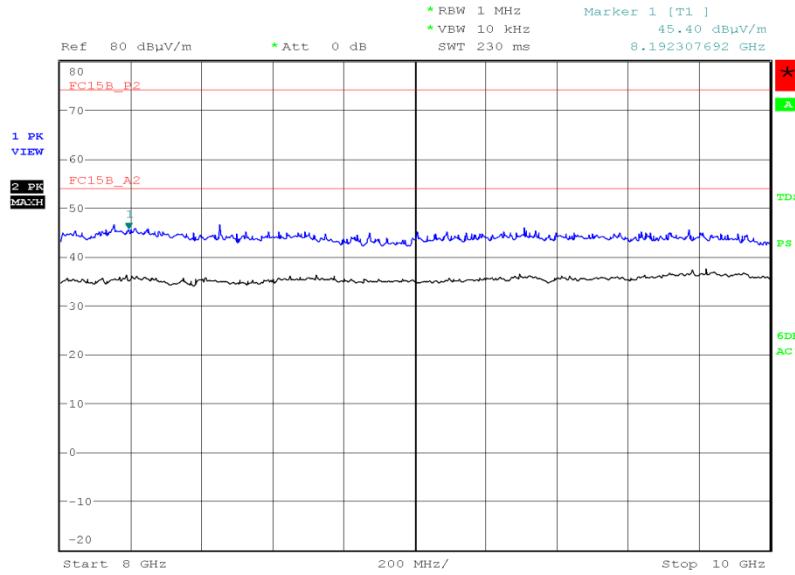
Date: 5.FEB.2013 21:12:09

3 GHz to 8 GHz

Date: 5.FEB.2013 21:50:07

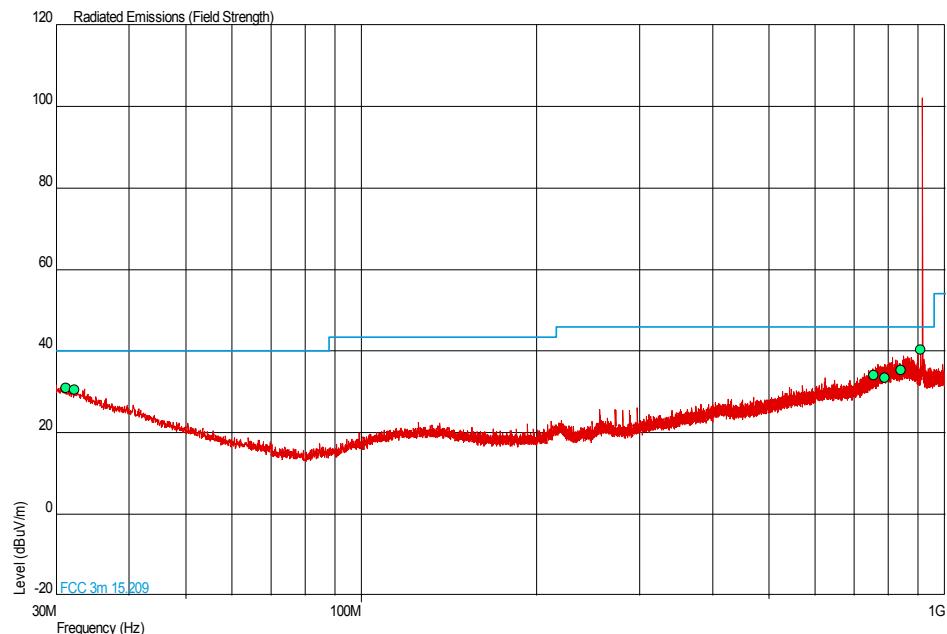


Product Service

8 GHz to 10 GHz



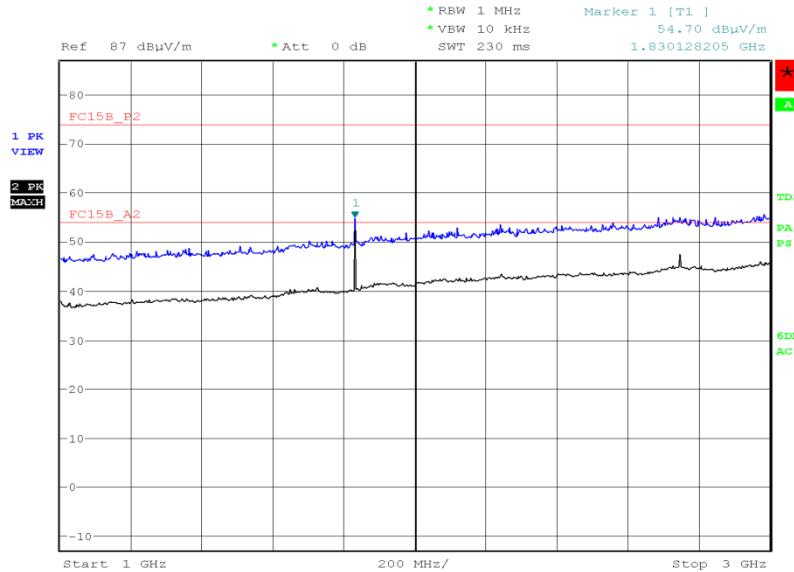
Product Service

915.100 MHz30 MHz to 1 GHz

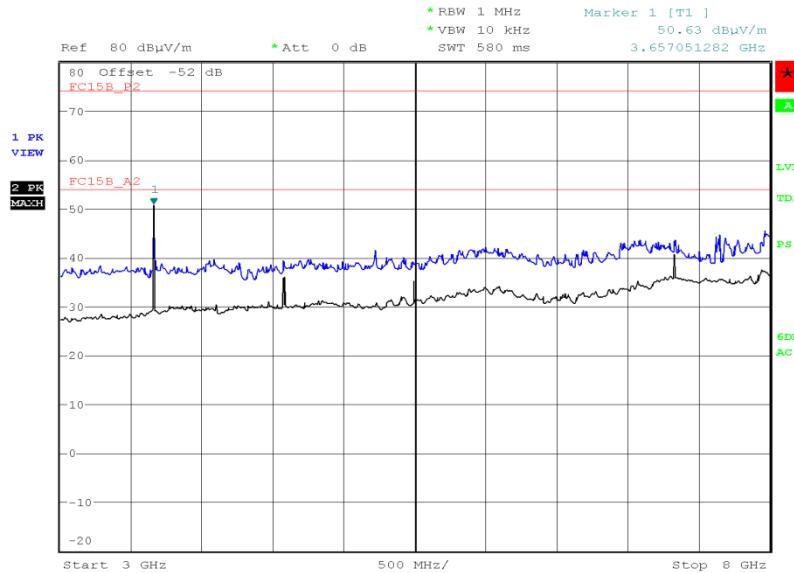
Frequency (MHz)	QP Level (dB μ V/m)	QP Limit (dB μ V/m)	QP Margin (dB μ V/m)	Angle(Deg)	Height(m)	Polarity
31.135	30.9	40.0	-9.1	248	1.00	Horizontal
32.250	30.4	40.0	-9.6	12	3.00	Vertical
755.521	33.9	46.0	-12.1	266	1.00	Horizontal
789.522	33.3	46.0	-12.7	195	1.00	Horizontal
841.131	35.2	46.0	-10.8	222	1.00	Horizontal
908.196	40.3	46.0	-5.7	69	1.00	Horizontal



Product Service

1 GHz to 3 GHz

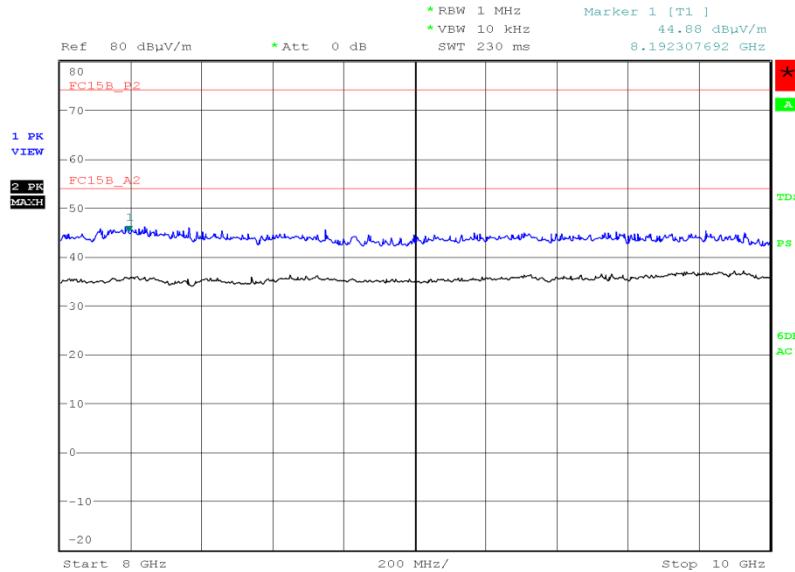
Date: 5.FEB.2013 20:53:15

3 GHz to 8 GHz

Date: 5.FEB.2013 22:01:14



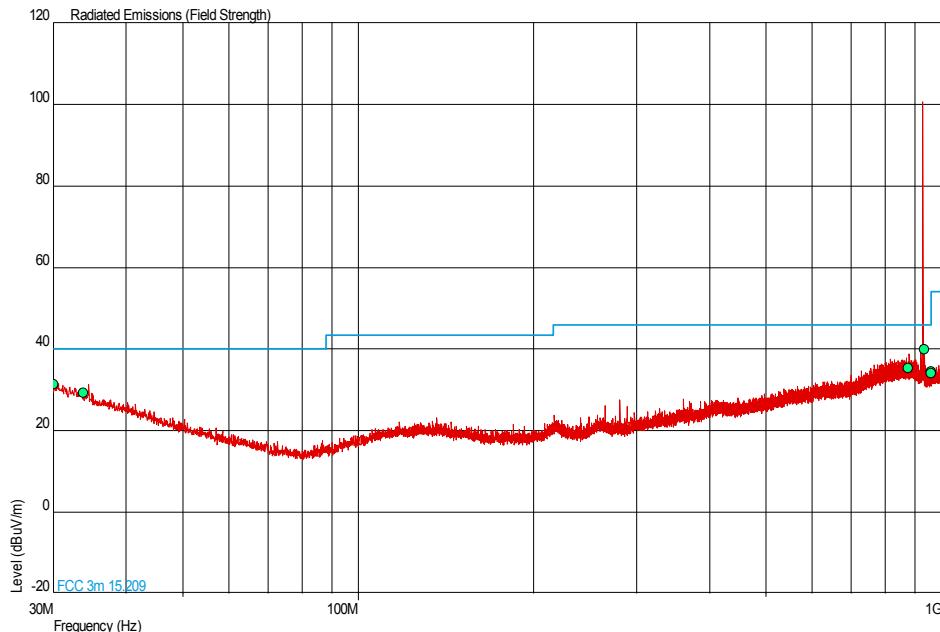
Product Service

8 GHz to 10 GHz

Date: 5.FEB.2013 22:30:25



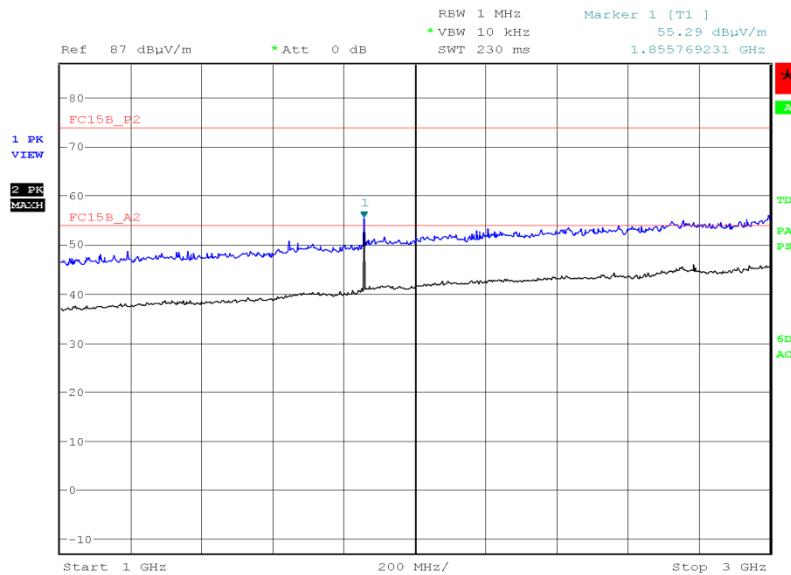
Product Service

927.700 MHz30 MHz to 1 GHz

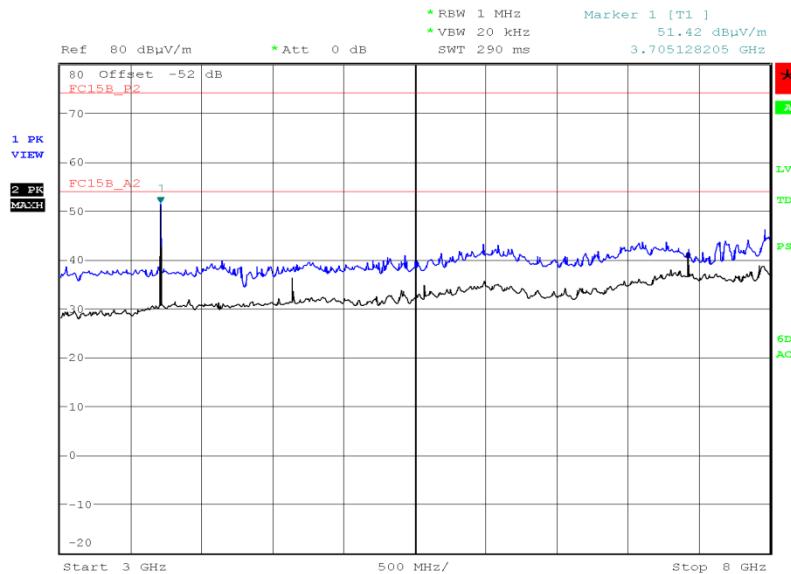
Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
30.085	31.3	40.0	-8.7	245	1.00	Horizontal
33.829	29.2	40.0	-10.8	47	1.00	Horizontal
875.072	35.3	46.0	-10.7	56	1.00	Horizontal
934.453	39.8	46.0	-6.2	245	1.00	Horizontal
960.000	34.4	46.0	-11.6	193	1.00	Horizontal
960.000	34.0	46.0	-12.0	8	2.10	Vertical



Product Service

1 GHz to 3 GHz

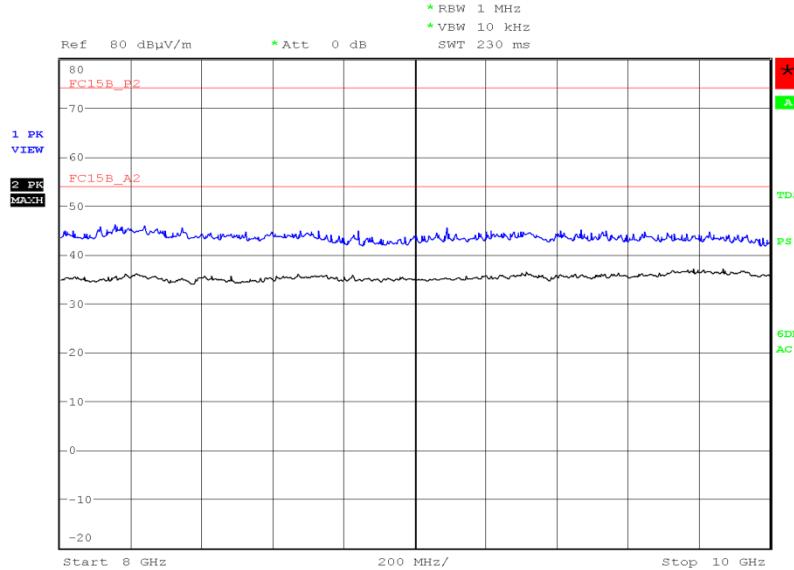
Date: 5.FEB.2013 20:44:16

3 GHz to 8 GHz

Date: 5.FEB.2013 22:13:22



Product Service

8 GHz to 10 GHz

Date: 5.FEB.2013 22:22:59

Limit Clause15.249 (a) and A2.9

Fundamental Frequency (MHz)	Field Strength of Harmonics (microvolts/meter)
902 to 928	500
2400 to 2483.5	500
5725 to 5875	500
24000 to 24250	2500

15.249 (d), 15.209

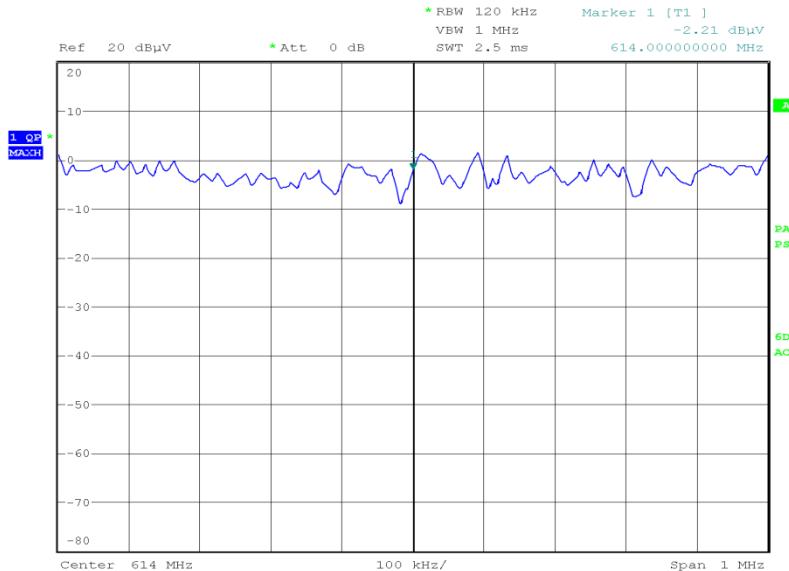
Frequency (MHz)	Field Strength (microvolts/meter)
0.009 to 0.490	2400/F (kHz)
0.490 to 1.705	24000/F (kHz)
1.705 to 30.0	30
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500



Product Service

Band Edge Emissions902.300 MHz

Polarisation	Final Peak (dB μ V/m)	Final Average (dB μ V/m)
Vertical	30.8	N/A



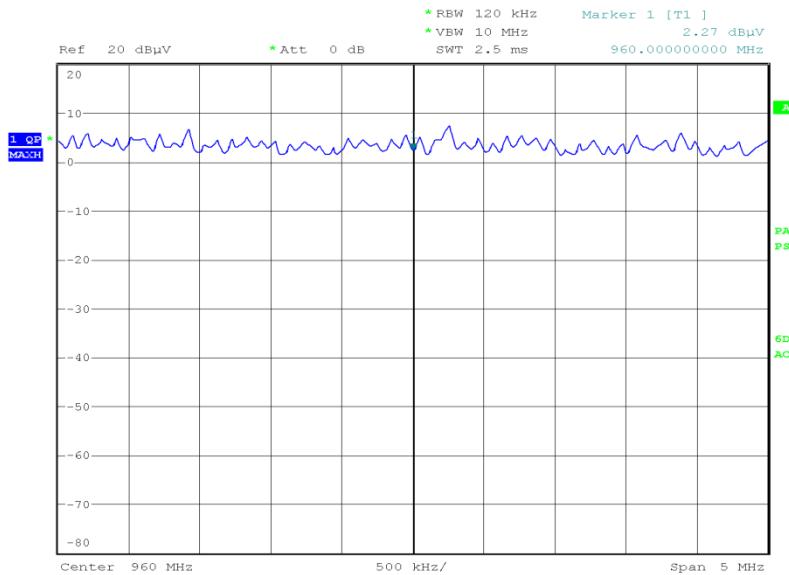
Date: 5.FEB.2013 18:45:19



Product Service

927.700 MHz

Polarisation	Final Peak (dB μ V/m)	Final Average (dB μ V/m)
Vertical	34.4	N/A



Date: 5.FEB.2013 19:53:41

Limit

Peak (dB μ V/m)	Average (dB μ V/m)
74.0	54.0



Product Service

SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 and 2.2- Field Strength of Fundamental and Field Strength of Spurious Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	9-Nov-2013
Pre-Amplifier	Phase One	PS04-0086	1533	12	27-Sep-2013
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	30-Aug-2013
Amplifier (1 - 8GHz)	Phase One	PS06-0060	3175	12	10-Jul-2013
High Pass Filter (3GHz)	RLC Electronics	F-100-3000-5-R	3349	12	29-May-2013
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	11-Oct-2013
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
LISN, 5µH +10µF	ACME LISN Foundry	Def Stan 59-41/411	3904		14-Jun-2013
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Field Strength of Fundamental	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
Field Strength of Spurious Emissions	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA
(Not UKAS Accredited).

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