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Report On

FCC and Industry Canada Testing of the
Sorensen Communications Inc ASD041517
In accordance with FCC 47 CFR Part 15B and ICES-003

COMMERCIAL-IN-CONFIDENCE

FCC ID: XHUASD041517
IC: 8439A-ASD041517

Document 75930506 Report 01 Issue 2 July 2015

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REPORT ON

FCC and Industry Canada Testing of the
Sorensen Communications Inc ASD041517
In accordance with FCC 47 CFR Part 15B and ICES-003

Document 75930506 Report 01 Issue 2

July 2015

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DATED 30 July 2015

This report has been up-issued to Issue 2 to correct typographical errors.

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.

Test Engineer(s);

G Lawler

UKAS TESTING 0141

Product Service

CONTENTS

Product Service

SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Sorensen Communications Inc ASD041517
In accordance with FCC 47 CFR Part 15B and ICES-003

1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC and Industry Canada Testing of the Sorensen Communications Inc ASD041517 to the requirements of FCC 47 CFR Part 15B and ICES-003.

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	Sorenson Communications Inc
Model Number(s)	ASD041517
Serial Number(s)	EMC #1
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15B (2014) ICES-003 (2012)
Incoming Release Date	Declaration of Build 23 July 2015
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	Pro-forma Invoice 12 June 2015
Start of Test	1 July 2015
Finish of Test	15 July 2015
Name of Engineer(s)	G Lawler
Related Document(s)	ANSI C63.4 (2009)

Product Service

1.2 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 15	ICES-003			
Idle					
2.1	15.107	6.1	AC Line Conducted Emissions	Pass	
2.2	15.109	6.2	Radiated Emissions	Pass	

1.3 DECLARATION OF BUILD STATUS

MAIN EUT			
MANUFACTURING DESCRIPTION	Set-Top-Box (STB) Videophone		
MANUFACTURER	Sorenson Communications		
TYPE			
PART NUMBER	ASD041517		
SERIAL NUMBER	EMC #1		
HARDWARE VERSION	DVT3		
SOFTWARE VERSION	Build 3.1.0		
TRANSMITTER FREQUENCY OPERATING RANGE (MHz)	2.412 GHz to 2.462 GHz AND 5.15 GHz to 5.250 GHz		
RECEIVER FREQUENCY OPERATING RANGE (MHz)	2.412 GHz to 2.462 GHz AND 5.15 GHz to 5.250 GHz		
COUNTRY OF ORIGIN	USA		
INTERMEDIATE FREQUENCIES	N/A		
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	BT: 1K29F1W WLAN: 17M3D1W		
MODULATION TYPES: (i.e. GMSK, QPSK)	GSFK/DPSK/DSSS/CCK/ODFM/PSK		
HIGHEST INTERNALLY GENERATED FREQUENCY	25 MHz		
OUTPUT POWER (W or dBm)	N/A		
FCC ID	XHUASD041517		
INDUSTRY CANADA ID	8439A- ASD041517		
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	Set-Top-Box (STB) Videophone		
BATTERY/POWER SUPPLY			
MANUFACTURING DESCRIPTION	Switched Mode 'Brick' Power Supply		
MANUFACTURER	Golden Profit Electronics Ltd		
TYPE	Brick PSU		
PART NUMBER	GPE060D-180380D		
VOLTAGE	18v		
COUNTRY OF ORIGIN	China		
MODULES (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
POWER			
FCC ID			
COUNTRY OF ORIGIN			
INDUSTRY CANADA ID			
EMISSION DESIGNATOR			
DHSS/FHSS/COMBINED OR OTHER			
ANCILLARIES (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
PART NUMBER			
SERIAL NUMBER			
COUNTRY OF ORIGIN			

Authorised Person Dave Williams

Date 24 July 2015

Declaration of Build Status Serial Number

Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sorensen Communications Inc ASD041517. 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 110 V AC supply.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

Industry Canada Company Address Code
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 State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: EMC #1			
0	As supplied by manufacturer.	N/A	N/A
1	Board affected is 58-R41832-5551 Modification affects U2_SER and turns off the pre-emphasis. R18_SER pull-up to VIN_3V3 is depopulated and is now DNP R20_SER is now populated with 10K and pulled down to GND Ferrite added to camera cable nearest to camera.	Dave Williams	15/07/2015

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.

Product Service

SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
Sorensen Communications Inc ASD041517
In accordance with FCC 47 CFR Part 15B and ICES-003

2.1 AC LINE CONDUCTED EMISSIONS

2.1.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.107
ICES-003, Clause 6.1

2.1.2 Equipment Under Test and Modification State

S/N: EMC #1 - Modification State 0

2.1.3 Date of Test

1 July 2015

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 test was performed in accordance with ANSI C63.4, Clause 7 and ICES-003, Clause 6.1.

Remarks

A mains supply cable of 1 m length was used to supply mains power to the EUT from the LISN.

All final measurements were assessed against the Class B emission limits in FCC 47 CFR Part 15, Clause 15.107 and ICES-003, Clause 6.1.

2.1.6 Environmental Conditions

Ambient Temperature	19.8°C
Relative Humidity	57%

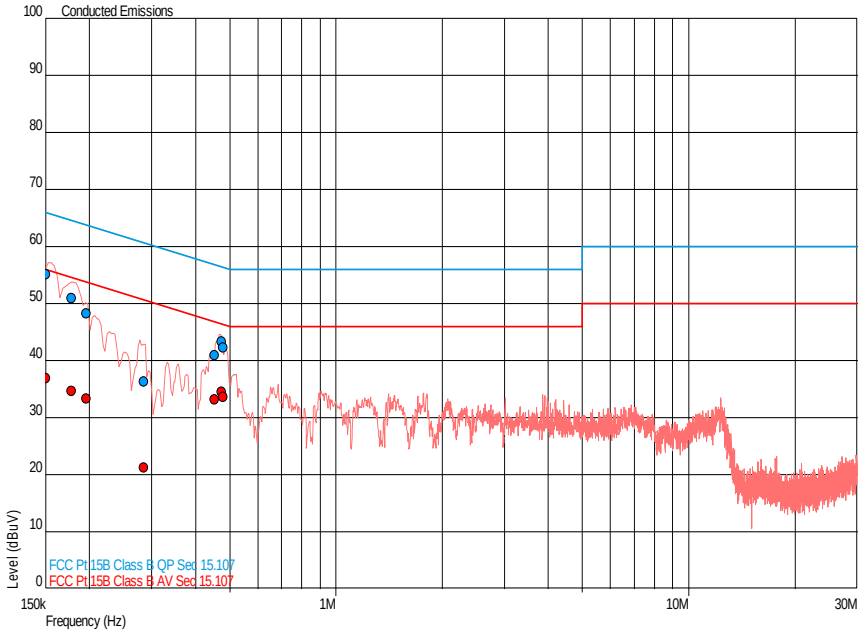
Product Service

2.1.7 Test Results

Idle, Live Line Results

Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.150	55.2	66.0	-10.8	36.9	56.0	-19.1
0.178	50.9	64.6	-13.7	34.7	54.6	-19.9
0.196	48.3	63.8	-15.5	33.4	53.8	-20.4
0.285	36.4	60.7	-24.3	21.2	50.7	-29.5
0.451	41.0	56.9	-15.9	33.2	46.9	-13.6
0.473	43.3	56.5	-13.2	34.5	46.5	-11.9

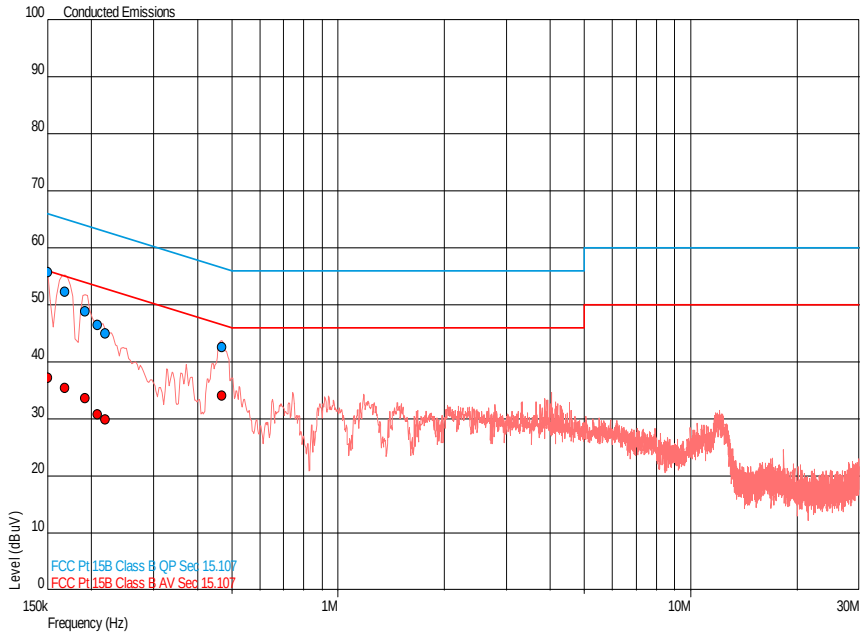
Idle, Live Line Plot



Idle, Neutral Line Results

Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.150	55.7	66.0	-10.3	37.3	56.0	-18.7
0.168	52.4	65.0	-12.7	35.4	55.0	-19.6
0.192	48.9	64.0	-15.0	33.6	54.0	-20.3
0.208	46.5	63.3	-16.8	30.9	53.3	-22.4
0.219	45.1	62.8	-17.8	30.0	52.8	-22.9
0.469	42.7	56.5	-13.8	34.2	46.5	-12.4

Idle, Neutral Line Plot



FCC 47 CFR Part 15, Limit Clause 15.107 and ICES-003, Limit Clause 6.1

Class B

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	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

*Decreases with the logarithm of the frequency.

2.2 RADIATED EMISSIONS

2.2.1 Specification Reference

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

2.2.2 Equipment Under Test and Modification State

S/N: EMC #1 - Modification State 1

2.2.3 Date of Test

15 July 2015

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

The test was performed in accordance with ANSI C63.4, Clause 8 and ICES-003, Clause 6.2.

Remarks

When frequencies greater than 18 GHz were measured the EUT was positioned 1 m above the horizontal reference ground plane.

All final measurements were assessed against the Class B emission limits in FCC 47 CFR Part 15, Clause 15.109 and ICES-003, Clause 6.2.1 and 6.2.2.

2.2.6 Environmental Conditions

Ambient Temperature	20.7°C
Relative Humidity	65.0%

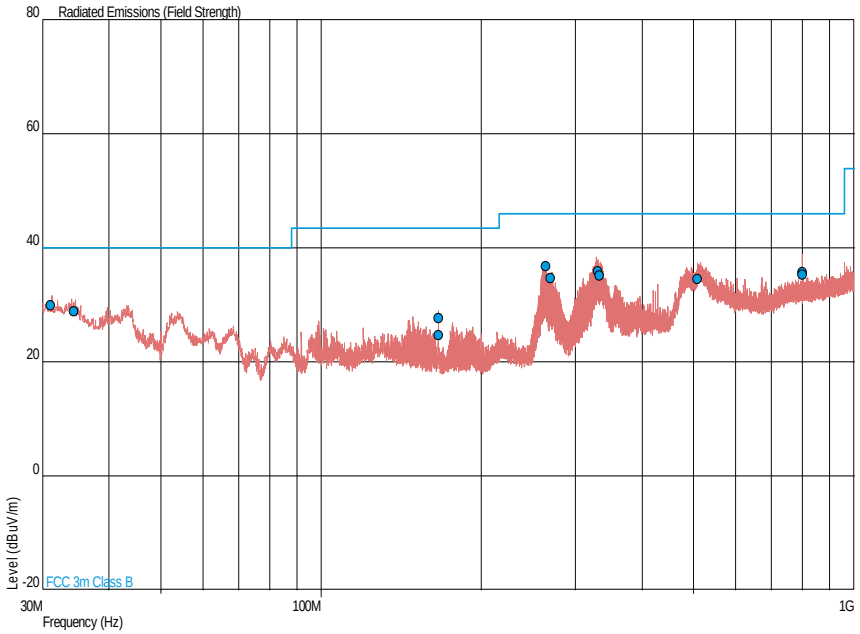
Product Service

2.2.7 Test Results

Idle, 30 MHz to 1 GHz Results

Frequency (MHz)	Quasi-Peak Level (dBµV/m)	Quasi-Peak Level (µV/m)	Quasi-Peak Margin (dµV/m)	Quasi-Peak Margin (µV/m)	Angle (°)	Height (m)	Polarisation
31.118	29.9	31.3	-10.1	-68.7	58	1.00	Horizontal
34.348	28.9	27.9	-11.1	-72.1	360	1.00	Vertical
166.089	27.8	24.5	-15.7	-125.5	341	1.03	Vertical
166.203	24.7	17.2	-18.8	-132.8	36	3.99	Horizontal
264.126	36.8	69.2	-9.2	-130.8	358	2.55	Horizontal
269.606	34.8	55.0	-11.2	-145.0	341	2.26	Horizontal
330.190	36.0	63.1	-10.0	-136.9	117	1.00	Horizontal
333.325	35.2	57.5	-10.8	-142.5	121	1.20	Horizontal
508.710	34.6	53.7	-11.4	-146.3	296	1.09	Horizontal
799.990	35.7	61.0	-10.3	-139.0	185	1.00	Vertical
800.003	35.4	58.9	-10.6	-141.1	200	1.00	Horizontal

Idle, 30 MHz to 1 GHz Plot

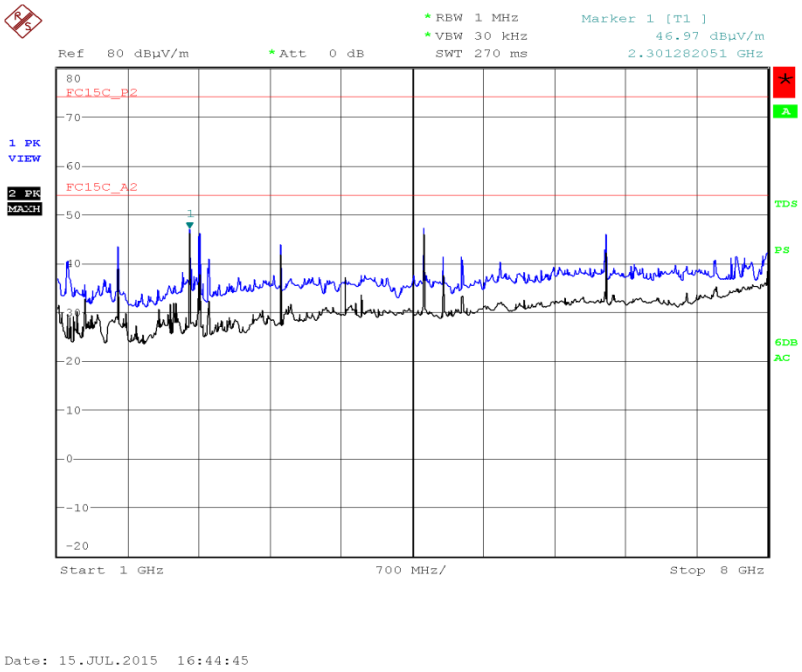


Idle, 1 GHz to 29 GHz Results

Frequency (MHz)	Average Level (dBµV/m)	Peak Level (dBµV/m)	Average Level (µV/m)	Peak Level (µV/m)	Angle (deg)	Height (m)	Polarisation
2304.002	51.75	52.38	386.81	415.91	195	168	Horizontal
3199.008	44.60	49.48	169.82	297.85	092	135	Vertical
4607.994	49.80	52.94	309.03	443.61	201	105	Vertical

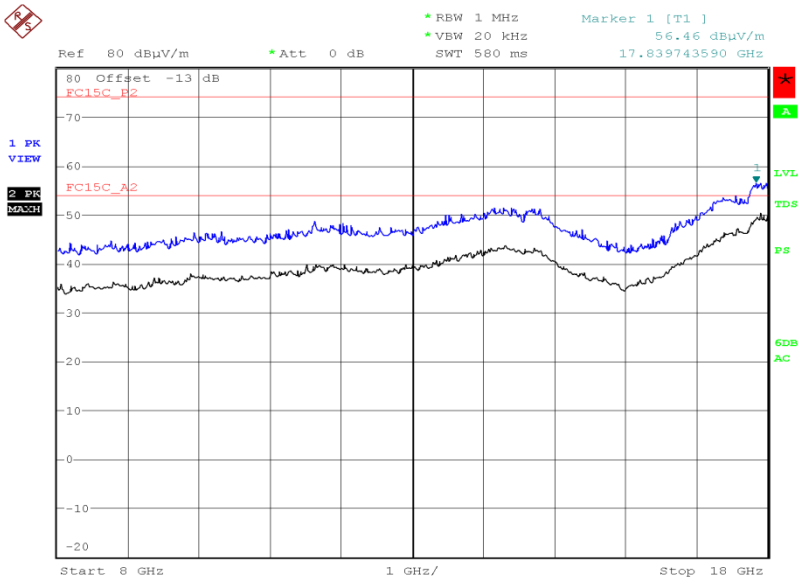
No other emissions were detected within 10 dB of the limit.

Idle, 1 GHz to 8 GHz Plot



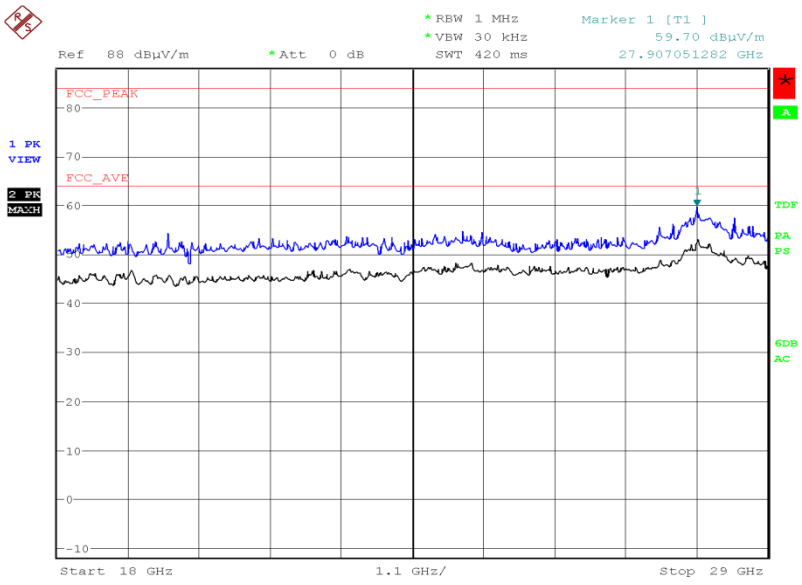
Product Service

Idle, 8 GHz to 18 GHz Plot



Date: 15.JUL.2015 18:27:37

Idle, 18 GHz to 29 GHz Plot



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FCC 47 CFR Part 15, Limit Clause 15.109

Class B

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

Class B

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

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

Product Service

SECTION 3

TEST EQUIPMENT USED

Product Service

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 – AC Line Conducted Emissions					
LISN (1 Phase)	Chase	MN 2050	336	12	1-Apr-2016
Screened Room (5)	Rainford	Rainford	1545	0	20-Dec-2017
Transient Limiter	Hewlett Packard	11947A	2377	12	11-Feb-2016
Multimeter	Iso-tech	IDM101	2418	12	26-Sep-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
Section 2.2- Radiated Emissions					
Antenna (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	26-Nov-2015
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Antenna (Bilog)	Schaffner	CBL6143	287	24	3-Feb-2016
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	1002	12	19-Sep-2015
Pre-Amplifier	Phase One	PSO4-0087	1534	12	23-Dec-2015
Screened Room (5)	Rainford	Rainford	1545	0	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Multimeter	Iso-tech	IDM101	2417	12	26-Sep-2015
Amplifier (8 - 18GHz)	Phase One	PS06-0061	3176	12	11-Aug-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
1 Metre K Type Cable	Rhophase	KPS-1501A-1000-KPS	4105	12	7-Nov-2015
Cable 1503 2M 2.92(P)m 2.92(P)m	Rhophase	KPS-1503A-2000-KPS	4293	12	9-Jun-2016
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	1-Oct-2015
2m K-Type Cable (Rx)	Scott Cables	KPS-1501-2000-KPS	4527	6	29-Jul-2015
0.5m SMA Cable (Rx)	Scott Cables	SLSLL18-SMSM-00.50M	4528	6	29-Jul-2015

TU – Traceability Unscheduled

3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
AC Line Conducted Emissions	± 3.2 dB
Radiated Emissions	30 MHz to 1 GHz: ± 5.1 dB 1 GHz to 40 GHz: ± 6.3 dB

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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.

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