



Product Service

**Choose certainty.
Add value.**

Report On

FCC Testing of the
Motorola Solutions Inc RFD5500
In accordance with FCC CFR 47 Part 15B and ICES-003

COMMERCIAL-IN-CONFIDENCE

FCC ID: UZ7RFD5500
IC ID: 109AN-RFD5500

Document 75921071 Report 01 Issue 1

January 2013



Product Service

TÜV SÜD Product Service, Octagon House, Concorde Way, Segensworth North,
Fareham, Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100. Website: www.tuv-sud.co.uk

COMMERCIAL-IN-CONFIDENCE

REPORT ON

FCC Testing of the
Motorola Solutions Inc RFD5500
In accordance with FCC CFR 47 Part 15B and ICES-003

Document 75921071 Report 01 Issue 1

January 2013

PREPARED FOR

Motorola Solutions Inc
Jays Close
Viabes Industrial Estate
Basingstoke
Hampshire
RG22 4PD

PREPARED BY

Natalie Bennett
Senior Administrator (Technical)

APPROVED BY

Mark Jenkins
Authorised Signatory

DATED

21 January 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 15B and ICES-003. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler





Product Service

CONTENTS

Section	Page No
1	REPORT SUMMARY 3
1.1	Introduction 4
1.2	Brief Summary of Results 5
1.3	Declaration of Build Status 6
1.4	Product Information 7
1.5	Test Conditions 7
1.6	Deviations from the Standard 7
1.7	Modification Record 7
2	TEST DETAILS 8
2.1	AC Line Conducted Emissions 9
2.2	Radiated Emissions 16
3	TEST EQUIPMENT USED 24
3.1	Test Equipment Used 25
3.2	Measurement Uncertainty 26
4	ACCREDITATION, DISCLAIMERS AND COPYRIGHT 27
4.1	Accreditation, Disclaimers and Copyright 28



Product Service

SECTION 1

REPORT SUMMARY

FCC Testing of the
Motorola Solutions Inc RFD5500
In accordance with FCC CFR 47 Part 15B and ICES-003



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Motorola Solutions Inc RFD5500 to the requirements of FCC CFR 47 Part 15B and ICES-003.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Motorola Solutions Inc
Model Number(s)	<ol style="list-style-type: none"> 1) RFD5500-G011US 2) RFD5500-G011US 3) RFD5500-G011US 4) RFD5500-G011US 5) CRD5501-4000CR 6) CRD5500-1000 7) HP-A0502R3D 8) 50-14000-241R 9) 25-1080222-02R 10) 86-14000-249R
Serial Number(s)	<ol style="list-style-type: none"> 1) 1234400505712 2) 1234400505713 3) 1234400505716 4) 1234400505715 5) 12262521122042 6) 12203521400017 7) F33351213013625 8) PWRS-14000-241R 9) Rev.B 02 Nov12 26576A 10) PWRS-14000-249R
Number of Samples Tested	10
Test Specification/Issue/Date	FCC CFR 47 Part 15B (2012) and ICES-003 (2012)
Incoming Release Date	Declaration of Build Status 16 January 2013
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	NP5547700 10 December 2012
Start of Test	13 January 2013
Finish of Test	14 January 2013
Name of Engineer(s)	G Lawler



Product Service

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15B and ICES-003 is shown below.

Section	Spec Clause		Test Description	Result	Comments/Base Standard
	FCC	IC			
RFD5500 + RFID Snap-on in single slot charging cradle - Idle Mode					
2.1	15.107	6.1	AC Line Conducted Emissions	Pass	
2.2	15.109	6.2	Radiated Emissions	Pass	
RFD5500 + RFID Snap-on in 4 slot charging cradle - Idle Mode					
2.1	15.107	6.1	AC Line Conducted Emissions	Pass	
2.2	15.109	6.2	Radiated Emissions	Pass	
RFD5500 + RFID with USB charging cup - Idle Mode					
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	UHF RFID reader		
MANUFACTURER	Motorola Solutions		
Model	RFD5500		
PART NUMBER	RFD5500-GO11US		
SERIAL NUMBER	1234400505712, 1234400505713, 1234400505716, 1234400505715		
HARDWARE VERSION	Revision A		
SOFTWARE VERSION	Control Board Version 2.1.0, RFID Radio Board Version 2.6.0.		
TRANSMITTER OPERATING RANGE	902-928MHz		
RECEIVER OPERATING RANGE	902-928MHz		
COUNTRY OF ORIGIN	Mexico		
INTERMEDIATE FREQUENCIES	None		
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	287KGXD		
MODULATION TYPES: (i.e. GMSK, QPSK)	PRASK		
HIGHEST INTERNALLY GENERATED FREQUENCY	928MHz		
OUTPUT POWER (W or dBm)	29dBm		
FCC ID	UZ7RFD5500		
INDUSTRY CANADA ID	109AN-RFD5500		
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	A UHF RFID reader for use with Motorola MC55 mobile computers		
BATTERY/POWER SUPPLY			
MANUFACTURING DESCRIPTION	For use with MT20XX series		
MANUFACTURER	Motorola		
TYPE	Li-ion		
PART NUMBER	82-108066-01		
VOLTAGE	3.7V		
COUNTRY OF ORIGIN	China		
ANCILLARIES (if applicable)			
MANUFACTURING DESCRIPTION	Single Slot Charger	Four Slot Charger	USB Charging Cup
MANUFACTURER	Motorola	Motorola	Motorola
PART NUMBER	CRD5500-1000	CRD5501-4000CR	25-108022-02R
SERIAL NUMBER	12203521400017	1226521122042	RevB02NOV1226576A
COUNTRY OF ORIGIN	China	China	Taiwan
SUPPORTING AC ADAPTOR PART NUMBER	HP-A0502R3D	50-14000-241R	86-14000-249R

Signature:

Name: Alan Parrish
 Position Held: Director-Regulatory Compliance
 Date: 16 January 2013



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Motorola Solutions Inc RFD5500. 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 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 or test plan were made during testing.

1.7 MODIFICATION RECORD

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



Product Service

SECTION 2

TEST DETAILS

FCC Testing of the
Motorola Solutions Inc RFD5500
In accordance with FCC CFR 47 Part 15B and ICES-003



2.1 AC LINE CONDUCTED EMISSIONS

2.1.1 Specification Reference

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

2.1.2 Equipment Under Test and Modification State

RFD5500-G011US, S/N: 1234400505712 – Modification State 0
 RFD5500-G011US, S/N: 1234400505713 – Modification State 0
 RFD5500-G011US, S/N: 1234400505716 – Modification State 0
 RFD5500-G011US, S/N: 1234400505715 – Modification State 0
 CRD5501-4000CR, S/N: 12203521400017 – Modification State 0
 CRD5500-1000, S/N: 12262521122042 – Modification State 0
 HP-A0502R3D, S/N: F33351213013625 – Modification State 0
 50-14000-241R, S/N: PWRS-14000-241R – Modification State 0
 25-1080222-02R, S/N: Rev.B 02 Nov12 26576A – Modification State 0
 86-14000-249R, S/N: PWRS-14000-249R – Modification State 0

2.1.3 Date of Test

13 January 2013 & 14 January 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 set up on a test table 800mm above a horizontal ground plane. A vertical ground plane is also required and is placed 400mm from the EUT. Where a EUT is floor standing it will be stood on but insulated from the ground plane by up to 12mm.

The EUT is powered through a Line Impedance Stabilisation Network (LISN) which is bonded to the ground plane. The EUT is located so that the distance between the EUT and the LISN is no less than 800mm. Where possible the cable between the mains input of the EUT and the LISN is 1m. Where this is not possible the cable is non inductively bundled with the bundle not exceeding 400mm in length.

A preliminary profile of the Conducted Emissions is obtained over the frequency range 150kHz to 30MHz. Any points of interest are noted for formal measurements.

During formal measurements, the measuring receiver is tuned to the emission of interest where Quasi – Peak and Average measurements are performed in a 9kHz Video and Resolution Bandwidth.

2.1.6 Environmental Conditions

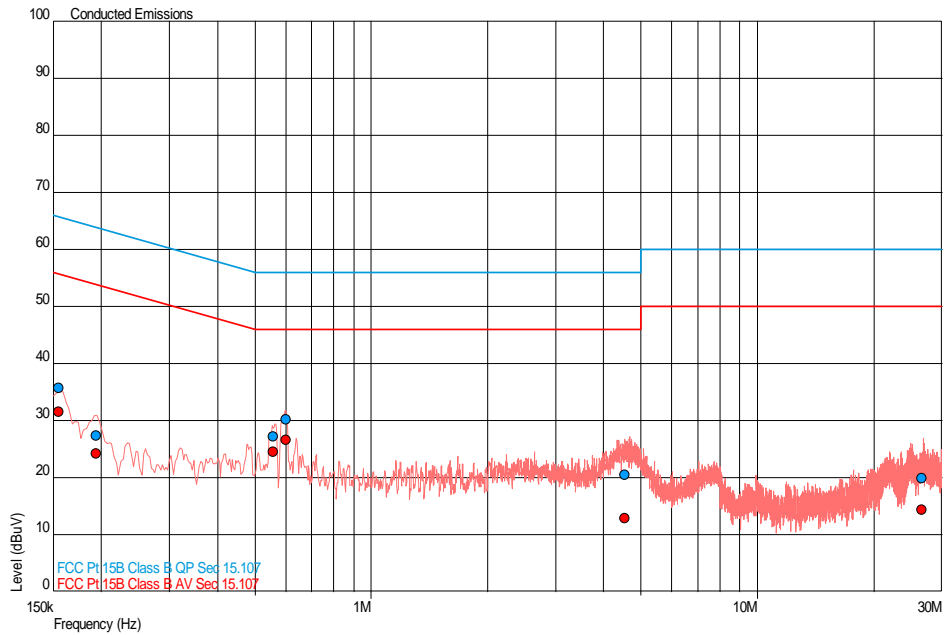
Ambient Temperature	15.9 - 16.5°C
Relative Humidity	36.0%



2.1.7 Test Results

RFD5500 + RFID Snap-on in 4 slot charging cradle - Idle Mode

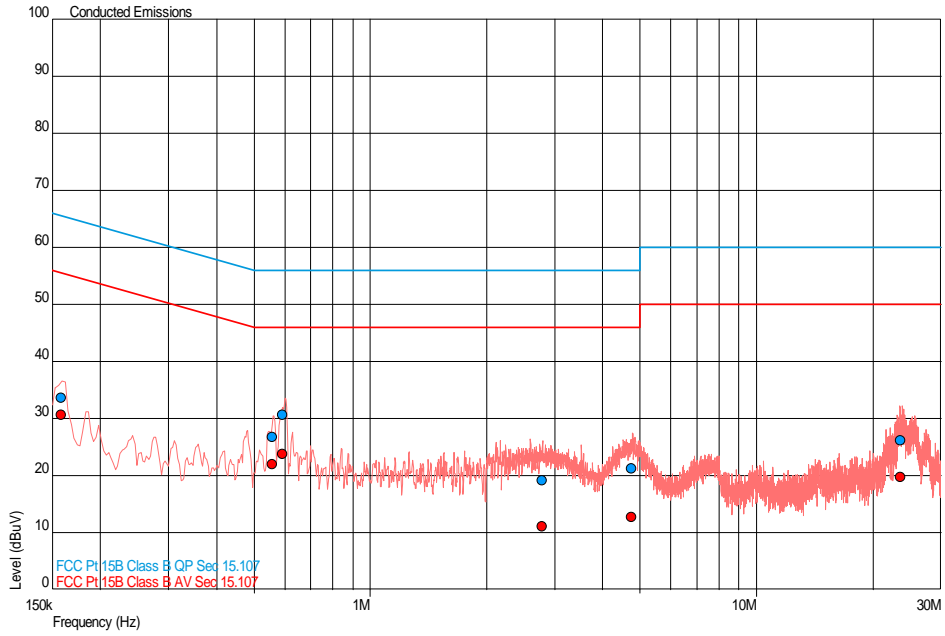
Live Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.155	35.7	65.7	-30.0	31.5	55.7	-24.2
0.194	27.3	63.9	-36.5	24.2	53.9	-29.6
0.557	27.2	56.0	-28.8	24.5	46.0	-21.5
0.600	30.3	56.0	-25.7	26.7	46.0	-19.3
4.526	20.6	56.0	-35.4	12.9	46.0	-33.1
26.636	20.0	60.0	-40.0	14.5	50.0	-35.5



Neutral Line

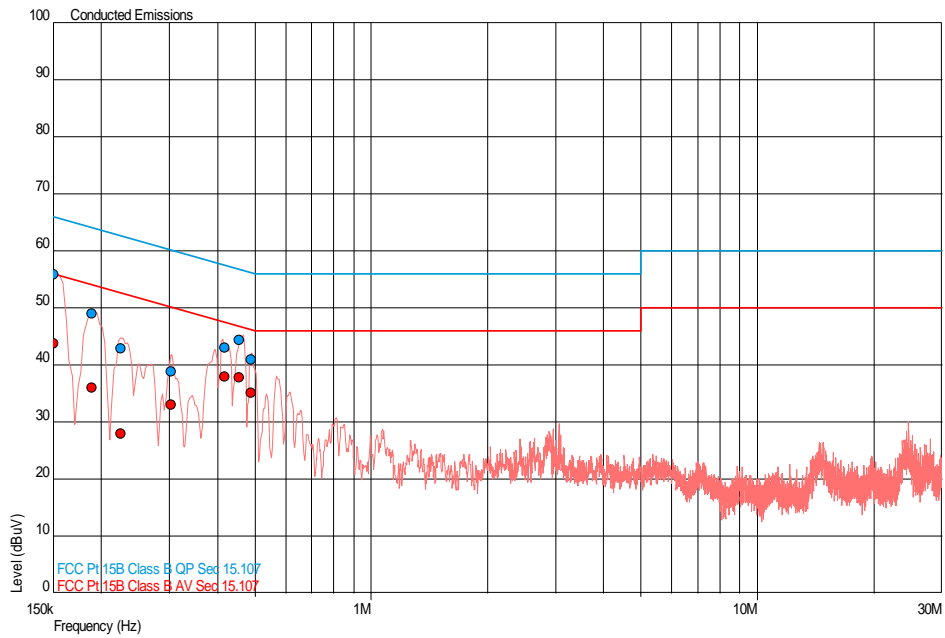


Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.158	33.7	65.6	-31.9	30.7	55.6	-24.8
0.558	26.7	56.0	-29.3	22.0	46.0	-24.0
0.591	30.6	56.0	-25.4	23.8	46.0	-22.2
2.787	19.2	56.0	-36.8	11.1	46.0	-34.9
4.742	21.2	56.0	-34.8	12.7	46.0	-33.3
23.525	26.2	60.0	-33.8	19.8	50.0	-30.2



RFD5500 + RFID Snap-on in single slot charging cradle - Idle Mode

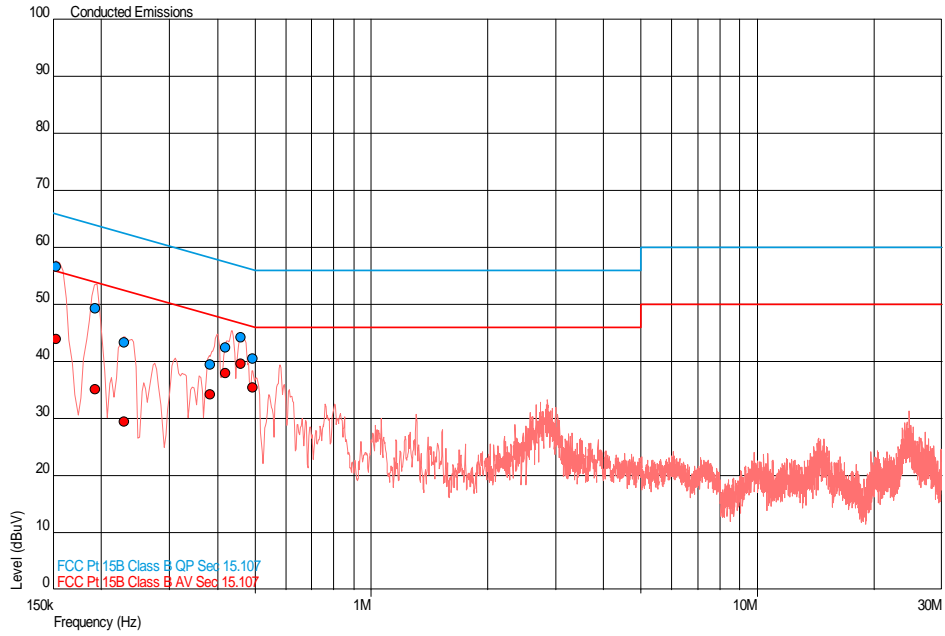
Live Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.151	55.9	66.0	-10.1	43.9	56.0	-12.1
0.189	49.1	64.1	-15.0	36.1	54.1	-18.0
0.225	42.9	62.6	-19.7	27.9	52.6	-24.7
0.303	38.9	60.2	-21.3	33.1	50.2	-17.0
0.416	43.1	57.5	-14.4	38.1	47.5	-9.5
0.455	44.4	56.8	-12.4	37.8	46.8	-9.0
0.487	41.0	56.2	-15.3	35.1	46.2	-11.1



Neutral Line



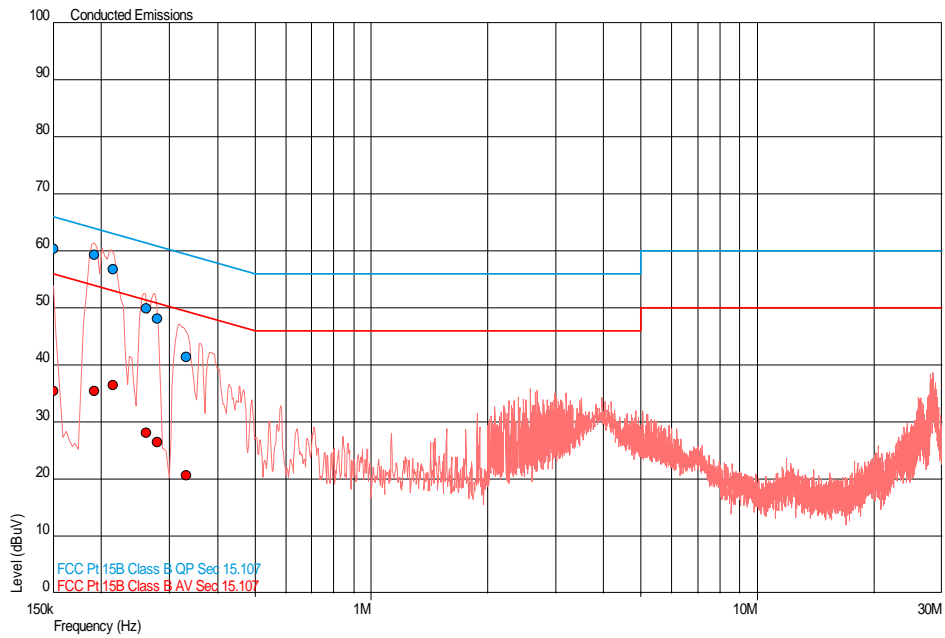
Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.152	56.6	65.9	-9.2	44.0	55.9	-11.9
0.192	49.4	63.9	-14.5	35.1	53.9	-18.8
0.230	43.4	62.5	-19.0	29.5	52.5	-22.9
0.383	39.5	58.2	-18.7	34.3	48.2	-13.9
0.418	42.4	57.5	-15.0	37.9	47.5	-9.5
0.459	44.3	56.7	-12.4	39.6	46.7	-7.1
0.493	40.6	56.1	-15.6	35.4	46.1	-10.7



Product Service

RFD5500 + RFID with USB charging cup - Idle Mode

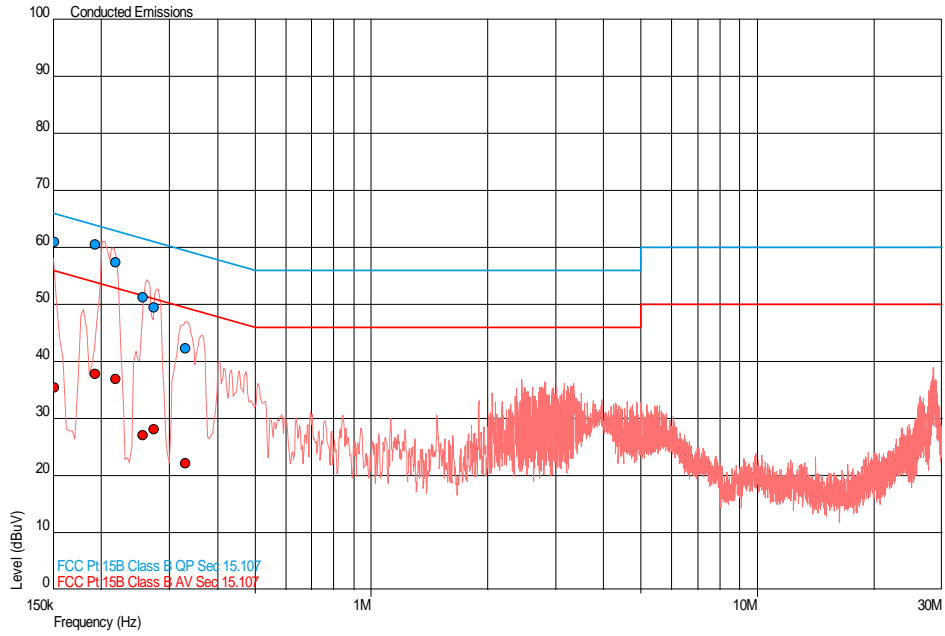
Live Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.151	60.4	66.0	-5.6	35.4	56.0	-20.6
0.191	59.3	64.0	-4.7	35.4	54.0	-18.6
0.214	56.8	63.0	-6.2	36.5	53.0	-16.5
0.261	49.9	61.4	-11.5	28.1	51.4	-23.3
0.280	48.2	60.8	-12.7	26.5	50.8	-24.3
0.332	41.5	59.4	-17.9	20.6	49.4	-28.8



Neutral Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.151	61.0	66.0	-4.9	35.5	56.0	-20.5
0.193	60.5	63.9	-3.4	37.8	53.9	-16.1
0.217	57.3	62.9	-5.6	36.9	52.9	-16.0
0.256	51.2	61.6	-10.3	27.1	51.6	-24.4
0.274	49.5	61.0	-11.5	28.1	51.0	-22.9
0.330	42.3	59.4	-17.1	22.1	49.4	-27.3



2.2 RADIATED EMISSIONS

2.2.1 Specification Reference

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

2.2.2 Equipment Under Test and Modification State

RFD5500-G011US, S/N: 1234400505712 – Modification State 0
RFD5500-G011US, S/N: 1234400505713 – Modification State 0
RFD5500-G011US, S/N: 1234400505716 – Modification State 0
RFD5500-G011US, S/N: 1234400505715 – Modification State 0
CRD5501-4000CR, S/N: 12203521400017 – Modification State 0
CRD5500-1000, S/N: 12262521122042 – Modification State 0
HP-A0502R3D, S/N: F33351213013625 – Modification State 0
50-14000-241R, S/N: PWRS-14000-241R – Modification State 0
25-1080222-02R, S/N: Rev.B 02 Nov12 26576A – Modification State 0
86-14000-249R, S/N: PWRS-14000-249R – Modification State 0

2.2.3 Date of Test

13 January 2013 & 14 January 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 5th harmonic of the EUT's highest internally generated 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.



Product Service

2.2.6 Environmental Conditions

Ambient Temperature	15.9 - 16.5°C
Relative Humidity	36.0%



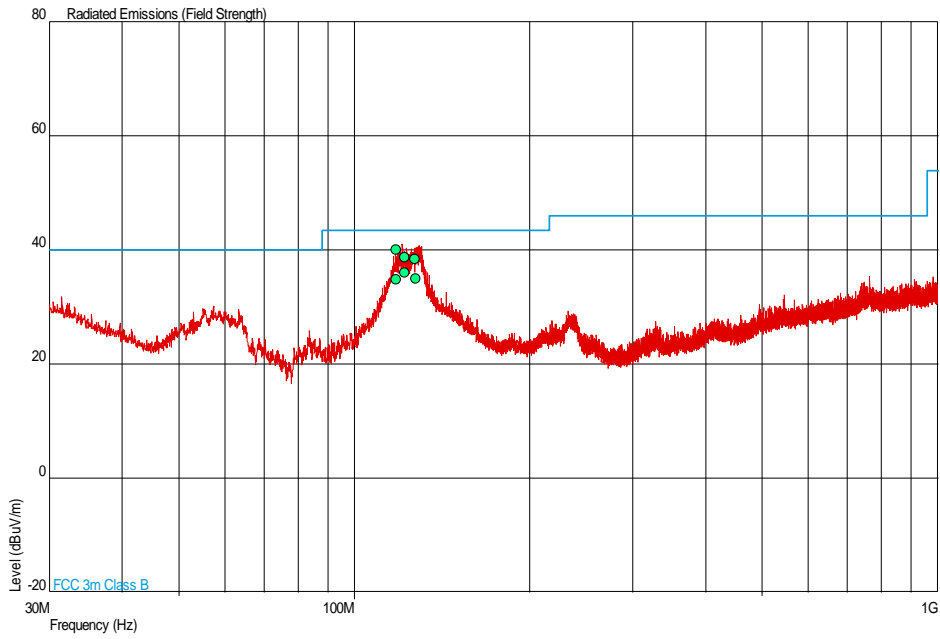
Product Service

2.2.7 Test Results

RFD5500 + RFID Snap-on in 4 slot charging cradle - Idle Mode

Channel 1

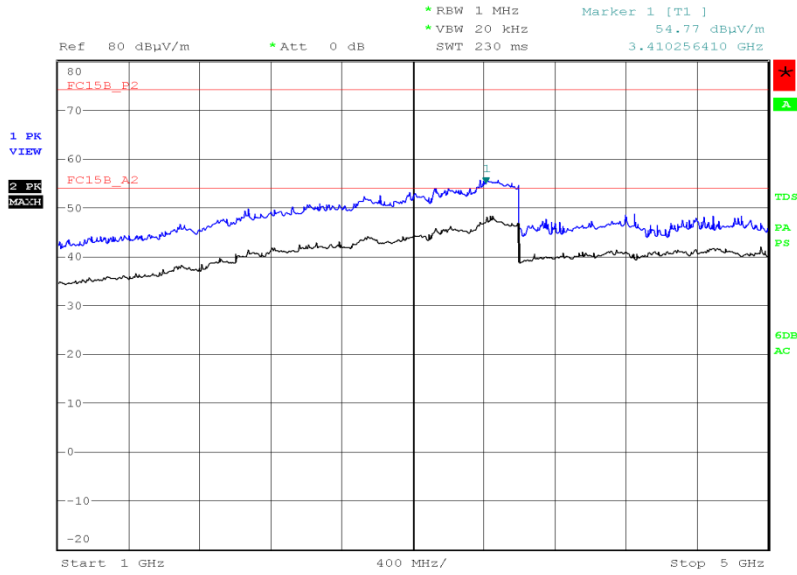
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
117.736	34.9	55.6	43.5	150	-8.6	94.4	237	1.08	Vertical
117.753	40.1	101.2	43.5	150	-3.4	48.8	360	2.99	Horizontal
121.843	38.7	86.1	43.5	150	-4.8	63.9	3	2.74	Horizontal
121.968	36.0	63.1	43.5	150	-7.5	86.9	261	1.00	Vertical
127.109	38.5	84.1	43.5	150	-5.0	65.9	133	2.98	Horizontal
127.186	35.0	56.2	43.5	150	-8.5	93.8	309	1.00	Vertical



1 GHz to 5 GHz



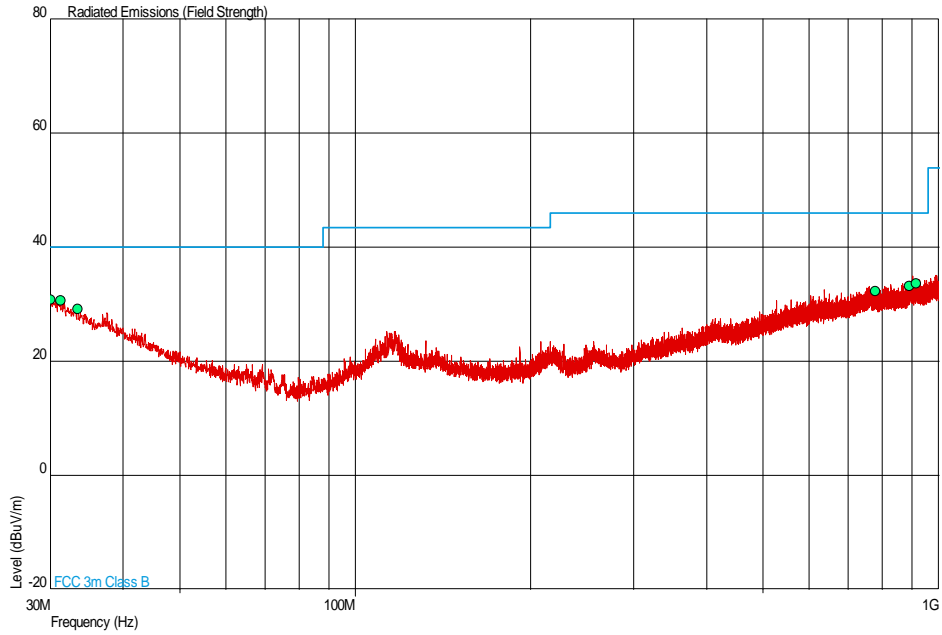
Date: 13.JAN.2013 14:59:42



RFD5500 + RFID Snap-on in single slot charging cradle - Idle Mode

Channel 1

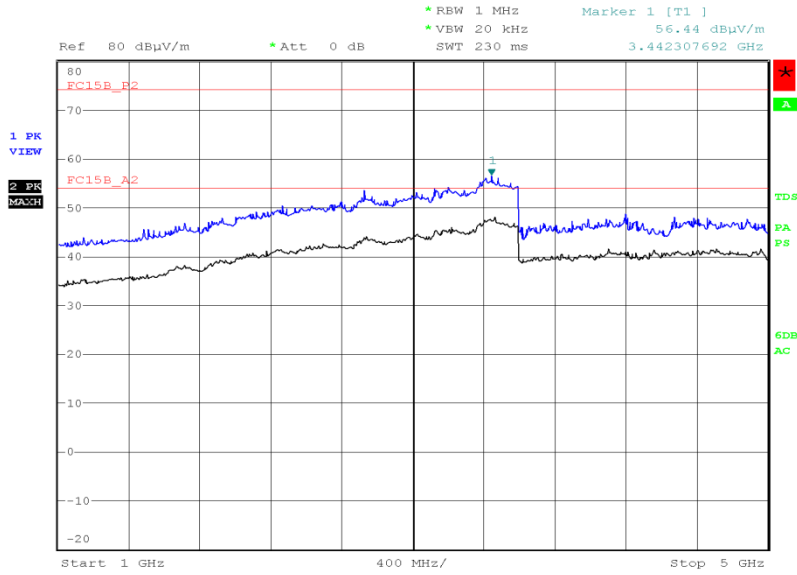
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBμV/m)	QP Level (μV/m)	QP Limit (dBμV/m)	QP Limit (μV/m)	QP Margin (dBμV/m)	QP Margin (μV/m)	Angle (Deg)	Height (m)	Polarity
30.012	30.8	34.7	40.0	100	-9.2	65.3	19	1.00	Horizontal
31.324	30.6	33.9	40.0	100	-9.4	66.1	118	1.43	Horizontal
33.473	29.2	28.8	40.0	100	-10.8	71.2	286	1.00	Horizontal
779.077	32.3	41.2	46.0	200	-13.7	158.8	311	1.00	Horizontal
889.608	33.3	46.2	46.0	200	-12.7	153.8	205	1.00	Horizontal
913.964	33.7	48.4	46.0	200	-12.3	151.6	317	1.00	Horizontal



1 GHz to 5 GHz



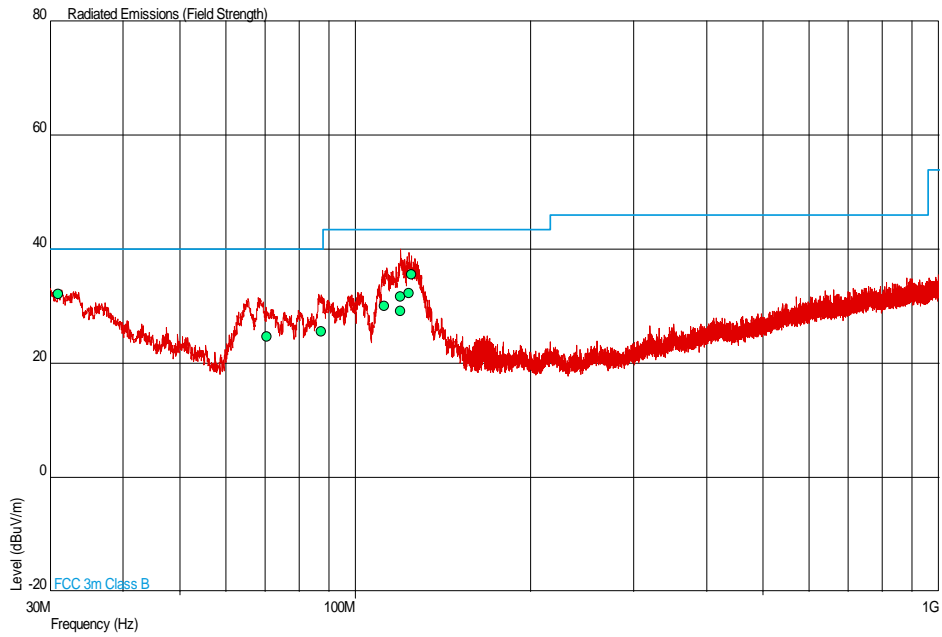
Date: 13.JAN.2013 15:30:19



RFD5500 + RFID with USB charging cup - Idle Mode

Channel 1

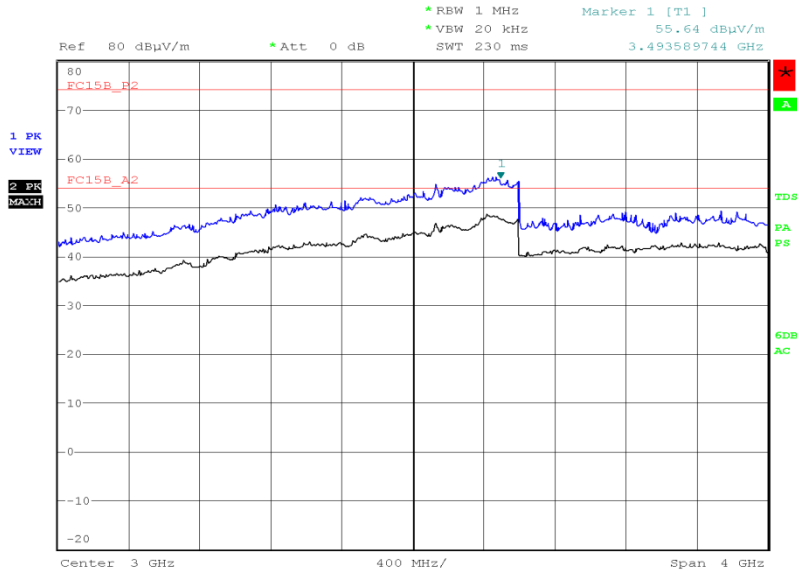
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.933	32.1	40.3	40.0	100	-7.9	59.7	122	1.03	Vertical
70.458	24.7	17.2	40.0	100	-15.3	82.8	55	1.00	Vertical
87.542	25.5	18.8	40.0	100	-14.5	81.2	360	1.00	Vertical
111.938	30.1	32.0	43.5	150	-13.4	118.0	53	1.00	Vertical
119.337	29.2	28.8	43.5	150	-14.3	121.2	110	2.92	Horizontal
119.515	31.8	38.9	43.5	150	-11.7	111.1	57	1.00	Vertical
123.675	32.2	40.7	43.5	150	-11.3	109.3	80	1.25	Horizontal
124.798	35.5	59.6	43.5	150	-8.0	90.4	104	1.00	Vertical



1 GHz to 5 GHz



Date: 14.JAN.2013 21:51:57



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– AC Line Conducted Emissions					
LISN (1 Phase)	Chase	MN 2050	336	12	23-Mar-2013
Transient Limiter	Hewlett Packard	11947A	1032	12	28-Jun-2013
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	11-Oct-2013
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
Section 2.2 - Radiated Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	9-Nov-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
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	11-Oct-2013
9m RF Cable (N Type)	Rhophase	NPS-2303-9000- NPS	3791	12	TU
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU

TU – Traceability Unscheduled



Product Service

3.2 MEASUREMENT UNCERTAINTY

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

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

This report must not be reproduced, except in its entirety, without the written permission of
TÜV SÜD Product Service

© 2013 TÜV SÜD Product Service