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Report On

FCC and IC Testing of the
Motorola Inc
CR0078 Cradle

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FCC ID: UZ7CR0078
IC ID: 109AN-CR0078

Document 75909238 Report 04 Issue 2

September 2010



Product Service

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COMMERCIAL-IN-CONFIDENCE

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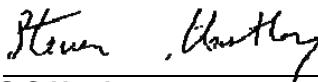
Document 75909238 Report 04 Issue 2

September 2010

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APPROVED BY



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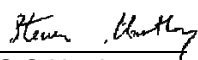
DATED

02 September 2010

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 15 and RSS-Gen. The sample tested was found to comply with the requirements defined in the applied rules.


Test Engineer(s);



S C Hartley



G Lawler



A R Hubbard

This report has been up-issued to Issue 2 to remove the photographs.





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	8
1.5	Test Conditions	10
1.6	Deviations From the Standard	10
1.7	Modification Record	10
2	TEST DETAILS	11
2.1	Radiated Emissions (Enclosure Port)	12
2.2	Conducted Emissions (AC Power Port)	18
3	TEST EQUIPMENT USED	23
3.1	Test Equipment Used	24
3.2	Measurement Uncertainty	25
4	ACCREDITATION, DISCLAIMERS AND COPYRIGHT	26
4.1	Accreditation, Disclaimers and Copyright	27



SECTION 1

REPORT SUMMARY

FCC and IC Testing of the
Motorola Inc
CR0078 Cradle



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Motorola Inc, CR0078 Cradle to the requirements of FCC CFR 47 Part 15B and Industry Canada RSS-Gen.

Objective	To perform FCC and IC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Motorola
EUT Model Number(s)	Cradle: CR0078 Cradle PSU (HIPRO): HP-0204D3
EUT Serial Number(s)	Cradle: 9YZTX Cradle PSU: F3-09100155550D
Support Equipment Model Number(s)	Symbol Scanner: DS6878 Motorola RS232 AC Adaptor: DCH-050MV-0301
Support Equipment Serial Number(s)	Symbol Scanner: MXA4VY34 Motorola RS232 AC Adaptor: 50-14000-253R
Software Version	Rev A
Hardware Version	Rev A
Number of Samples Tested	1 (Cradle)
Test Specification/Issue/Date	FCC CFR 47 Part 15B: 2009 RSS-Gen, Issue 2: 2007
Incoming Release Date	Declaration of Build Status 15 July 2010
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	NP5084073 09 March 2010
Start of Test	24 June 2010
Finish of Test	01 July 2010
Name of Engineer(s)	S C Hartley G Lawler A R Hubbard
Related Document(s)	ANSI C63.4 : 2003



Product Service

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 15B and RSS-Gen is shown below.

Configuration 1 - Stand Alone							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	FCC	IC					
2.1	15.109	7.2.3, Table 1	Radiated Emissions (Enclosure Port)	Charge (Charging Scanner)	0	Pass	ANSI C63.4
2.2	15.107	7.2.2, Table 2	Conducted Emissions (AC Power Port)	Charge (Charging Scanner)	0	Pass	ANSI C63.4

Configuration 2 - BT & RS232							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	FCC	IC					
2.1	15.109	7.2.3, Table 1	Radiated Emissions (Enclosure Port)	Charge (Charging Scanner)	0	Pass	ANSI C63.4
2.2	15.107	7.2.2, Table 2	Conducted Emissions (AC Power Port)	Charge (Charging Scanner)	0	Pass	ANSI C63.4

Configuration 3 – USB							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	FCC	IC					
2.1	15.109	7.2.3, Table 1	Radiated Emissions (Enclosure Port)	Charge (Charging Scanner)	0	Pass	ANSI C63.4
	15.107	7.2.2, Table 2	Conducted Emissions (AC Power Port)	Charge (Charging Scanner)		N/A	ANSI C63.4

N/A – Not Applicable



Product Service

1.3 DECLARATION OF BUILD STATUS

Manufacturer	<u>Motorola Inc</u>
Country of origin	<u>Mexico</u>
UK Agent	<u></u>
Technical Description	<u>Bluetooth 2.0 EDR cradle for DS6878</u>
Model No	<u>CR0078</u>
Part No	<u>See the following page for details</u>
Serial No	<u>9YZTX</u>
Drawing Number	<u>17-123572-01</u>
Build Status	<u>Rev A</u>
Software Issue	<u>Rev A</u>
Hardware Issue	<u>Rev A</u>

Signature

Zhang Xianjian

Date

15 July 2010

D of B S Serial No

75909238/01

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 Product Service as to the accuracy of the information declared in this document by the manufacturer.



Part Number Format: CR00XX-XXXXXXXXXX

Radio	CR00?X-XXXXXXXXXX		
	0	=	No radio
	7	=	Bluetooth
Interface	CR00X?-XXXXXXXXXX		
	8	=	Multi-Interface
Form Factor	CR00XX-?XXXXXXXXXX		
	S	=	Standard
	P	=	Hands-free Presentation
Charging	CR00XX-X?XXXXXXXXXX		
	C	=	Charging
	Z	=	Non-charging
Number of Slots	CR00XX-XX?XXXXXXXXXX		
	0-9		Number of slots
Encryption	CR00XX-XXX?XXXXXX		
	0	=	Standard
	F	=	FIPS
Standard/Custom	CR00XX-XXXX?XXXXXX		
	0	=	Standard
	1-9, A-Z	=	Custom
Material	CR00XX-XXXXX?XXX		
	0	=	Standard
	9	=	Disinfectant Ready
Colour	CR00XX-XXXXXX?XX		
	1	=	Cash Register White
	7	=	Twilight Black
	B	=	Healthcare White
Country	CR00XX-XXXXXX??		
	WR	=	Worldwide RoHS



1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Motorola Inc, CR0078 Cradle as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.



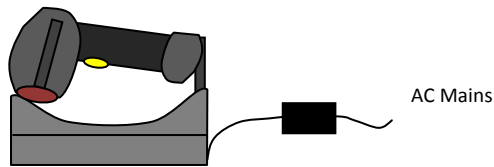
EUT (Cradle shown here with its (HIPRO) PSU, Scanner and RS232 Cable & PSU)



1.4.2 Test Configuration

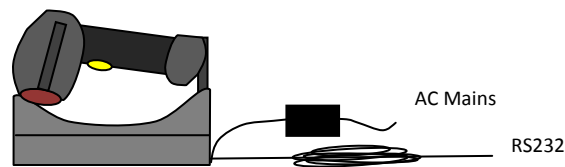
Configuration 1: Stand Alone

The EUT was configured in accordance with FCC CFR 47 Part 15B and RSS-Gen.



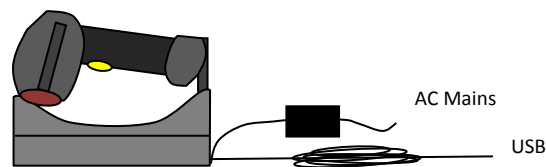
Configuration 2: BT & RS232

The EUT was configured in accordance with FCC CFR 47 Part 15B and RSS-Gen.



Configuration 3: USB

The EUT was configured in accordance with FCC CFR 47 Part 15B and RSS-Gen.



Please Note: for Configurations 2 & 3, a Dell Laptop (powered down) was connected to the Load end of the RS232 and USB cables respectively, to replicate a typical termination.

1.4.3 EUT Cable / Port Identification

Port	Max Cable Length specified	Usage	Type	Screened	Configuration and Mode
AC Power Cable to Cradle PSU	<3m	Mains Lead	3 core	No	Configuration 1 Mode 1 Configuration 2 Mode 1 Configuration 3 Mode 1
RS232 Cable, AC PSU Brick Adaptor	<3m	DC Lead	2 core	No	Configuration 2 Mode 1
RS232 Cable	<3m	RS232	Multi-core	No	Configuration 2 Mode 1
USB Cable	<3m	USB	Multi-core	No	Configuration 3 Mode 1



Product Service

1.4.4 Modes of Operation

Modes of operation of each EUT during testing were as follows:

Mode 1 - Charge (Charging Scanner)

Information on the specific test modes utilised are detailed in the test procedure for each individual test.

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 120V, 60Hz AC Mains 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 standards or test plan were made during testing.

1.7 MODIFICATION RECORD

No modifications were made to the EUT during testing.



Product Service

SECTION 2

TEST DETAILS

FCC and IC Testing of the
Motorola Inc
CR0078 Cradle



Product Service

2.1 RADIATED EMISSIONS (ENCLOSURE PORT)

2.1.1 Specification Reference

FCC CFR 47 Part 15B: Clause 15.109
RSS-Gen: Clause 7.2.3.2, Table 1

2.1.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTX

2.1.3 Date of Test and Modification State

01 July 2010 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, the list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

Through this process of profiling the EUT, it was determined that the worst case was Configuration 2 (BT & RS232) and Configuration 3 (USB), therefore a full sweep of plots for the Middle Channel has been presented. For Configurations 1(Stand Alone) a plot showing 30MHz to 1GHz for the Middle Channel has also been presented in this document to support this judgement.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1
Configuration 2 - Mode 1
Configuration 3 - Mode 1

2.1.6 Environmental Conditions

	01 July 2010
Ambient Temperature	22 - 24.6°C
Relative Humidity	35 - 42%
Atmospheric Pressure	1009 - 1010mbar

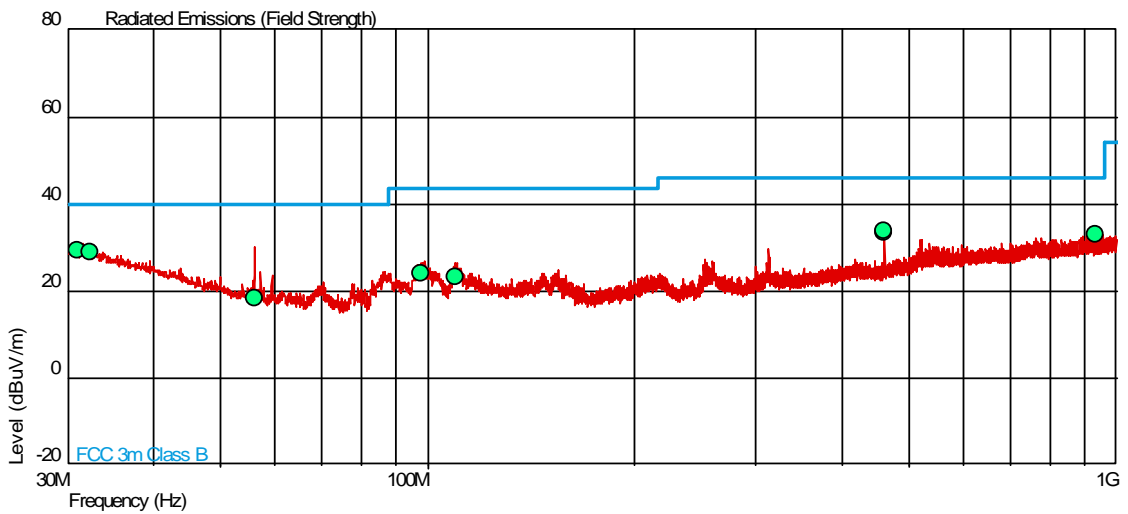


2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15B and RSS-Gen for Radiated Emissions (Enclosure Port).

The test results are shown below.

Configuration 1 - Mode 1



Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
31.055	29.5	29.9	40.0	100	-10.5	-70.1	206	1.00	Vertical
32.269	29.0	28.2	40.0	100	-11.0	-71.8	107	1.00	Horizontal
55.989	18.5	8.4	40.0	100	-21.5	-91.6	341	1.00	Horizontal
97.781	24.1	16.0	43.5	150	-19.4	-134.0	138	1.00	Vertical
109.640	23.1	14.3	43.5	150	-20.4	-135.7	92	1.00	Vertical
460.631	33.5	47.3	46.0	200	-12.5	-152.7	333	1.22	Horizontal
460.634	33.7	48.4	46.0	200	-12.3	-151.6	155	1.00	Vertical
932.195	33.2	45.7	46.0	200	-12.8	-154.3	268	1.00	Horizontal

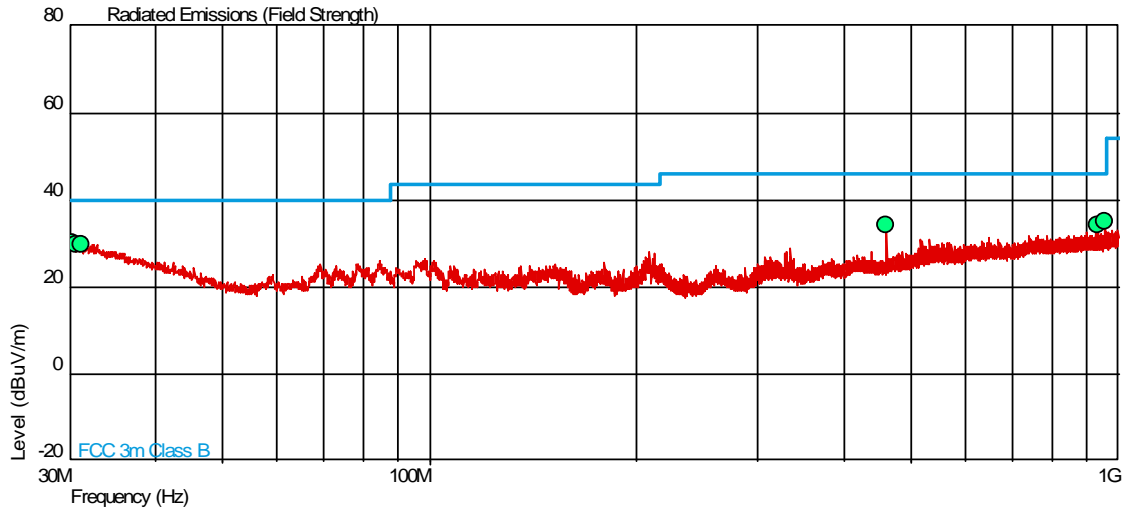
Note:

The emissions between 1GHz to 13GHz were only performed with the EUT in Configurations 2 and 3.



Configuration 2 - Mode 1

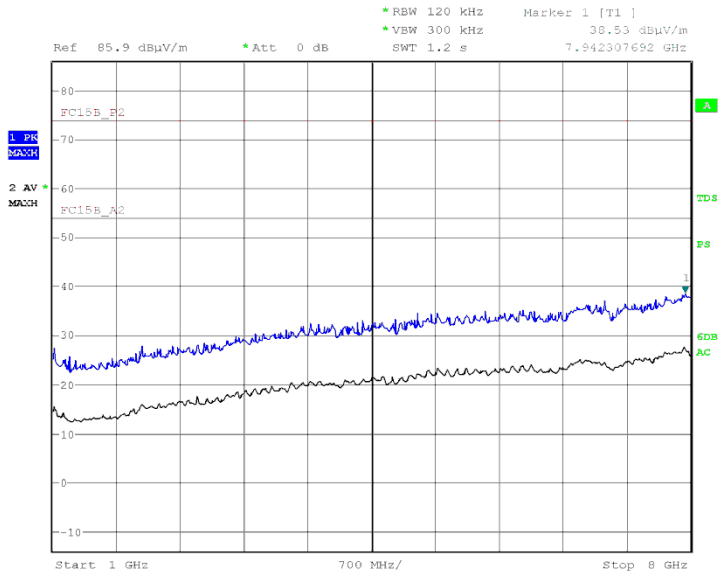
30MHz to 1GHz



Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
30.183	30.3	32.7	40.0	100	-9.7	-67.3	143	1.00	Vertical
30.595	29.8	30.9	40.0	100	-10.2	-69.1	236	1.00	Horizontal
31.178	29.8	30.9	40.0	100	-10.2	-69.1	253	1.00	Vertical
460.621	34.1	50.7	46.0	200	-11.9	-149.3	2	1.00	Vertical
932.190	34.3	51.9	46.0	200	-11.7	-148.1	50	1.00	Vertical
957.666	35.3	58.2	46.0	200	-10.7	-141.8	199	1.00	Vertical

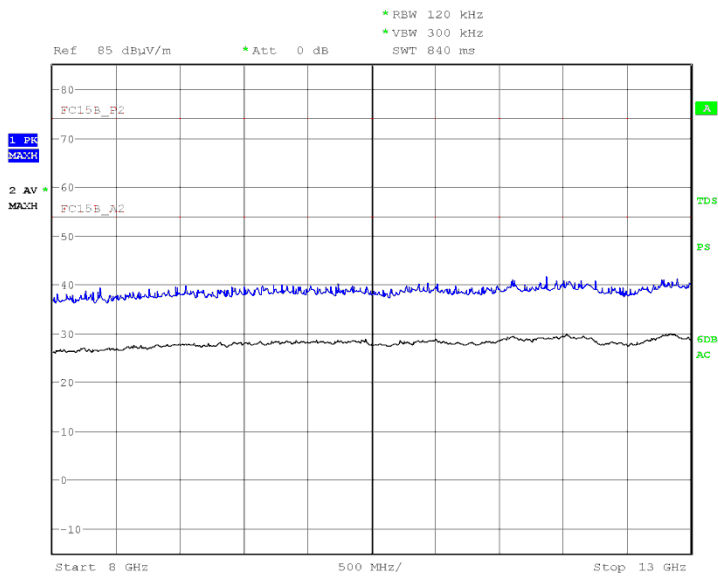


1GHz to 8GHz



Date: 1.JUL.2010 20:18:46

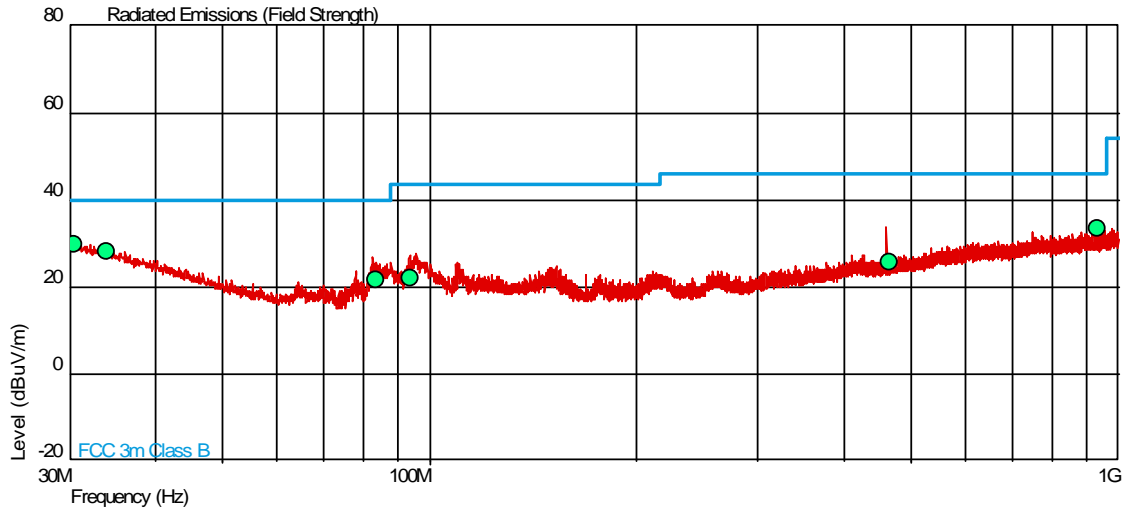
8GHz to 13GHz



Date: 1.JUL.2010 20:36:07



Configuration 3 - Mode 1

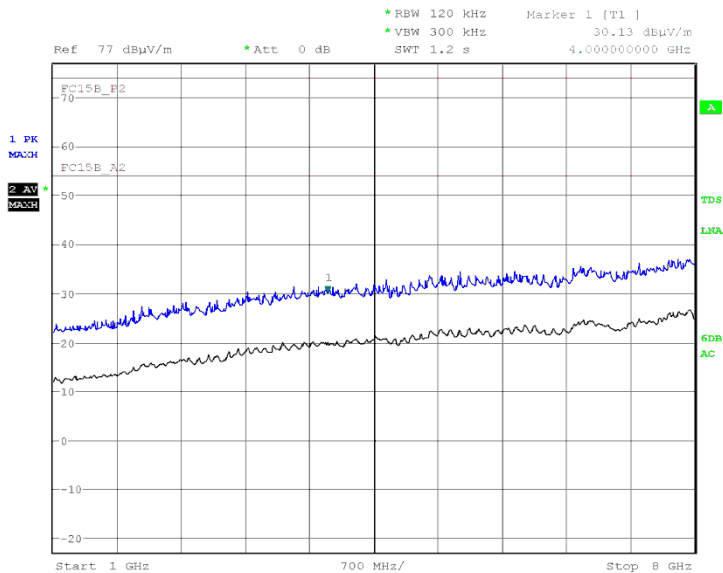


Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
30.400	29.9	31.2	40.0	100	-10.1	-68.7	43	1.00	Vertical
33.961	28.0	25.1	40.0	100	-12.0	-74.9	129	1.00	Vertical
83.726	21.8	12.3	40.0	100	-18.2	-87.7	54	1.00	Vertical
93.717	22.1	12.7	43.5	150	-21.4	-137.3	21	1.00	Vertical
466.000	25.5	18.8	46.0	200	-20.5	-181.2	247	1.00	Vertical
932.208	33.4	46.8	46.0	200	-12.6	-153.2	247	1.00	Horizontal



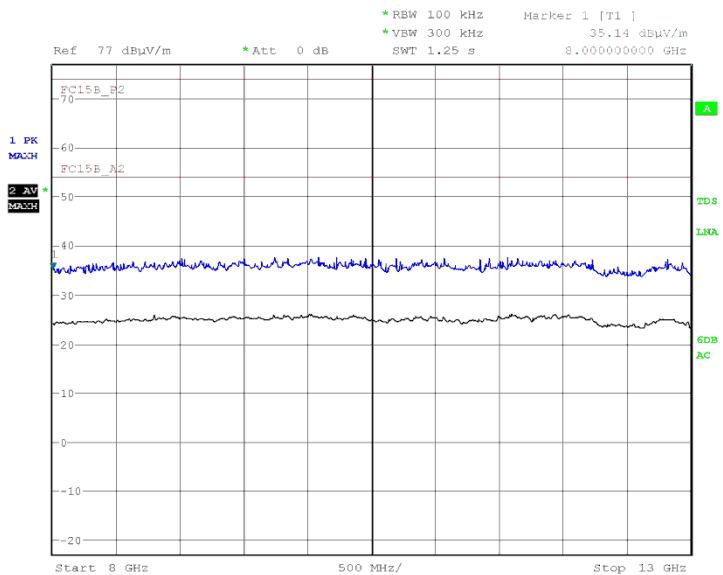
Product Service

1GHz to 8GHz



Date: 1.JUL.2010 21:34:48

8GHz to 13GHz



Date: 1.JUL.2010 21:23:33



Product Service

2.2 CONDUCTED EMISSIONS (AC POWER PORT)

2.2.1 Specification Reference

FCC CFR 47 Part 15B: Clause 15.107
RSS-Gen: Clause 7.2.2, Table 2

2.2.2 Equipment Under Test

CR0078 Cradle, S/N: 9YZTX

2.2.3 Date of Test and Modification State

24 June 2010 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1
Configuration 2 - Mode 1

2.2.6 Environmental Conditions

	24 June 2010
Ambient Temperature	21.3°C
Relative Humidity	36%
Atmospheric Pressure	1015mbar



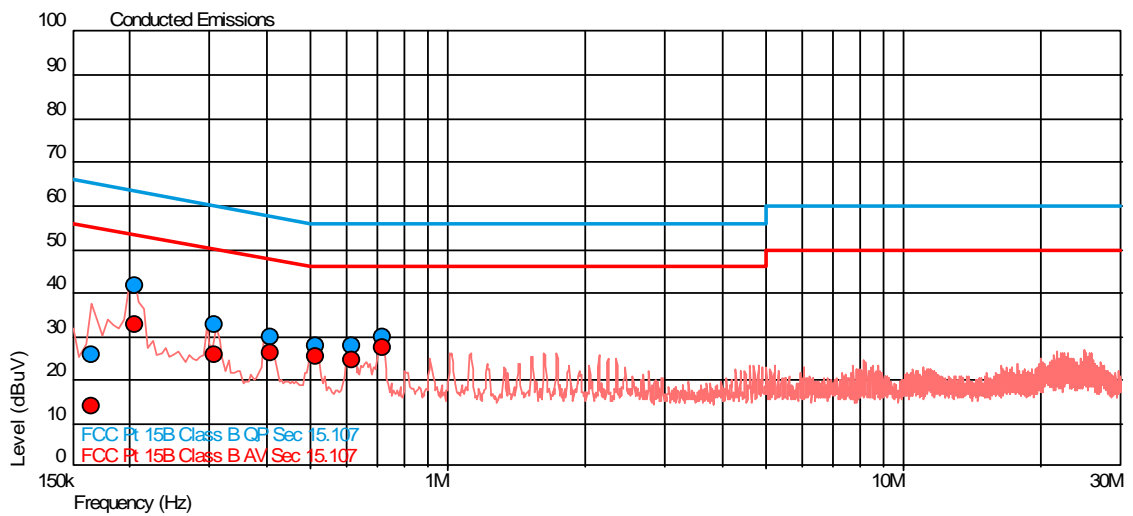
2.2.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15B and RSS-Gen for Conducted Emissions (AC Power Port).

The test results are shown below.

Configuration 1 - Mode 1

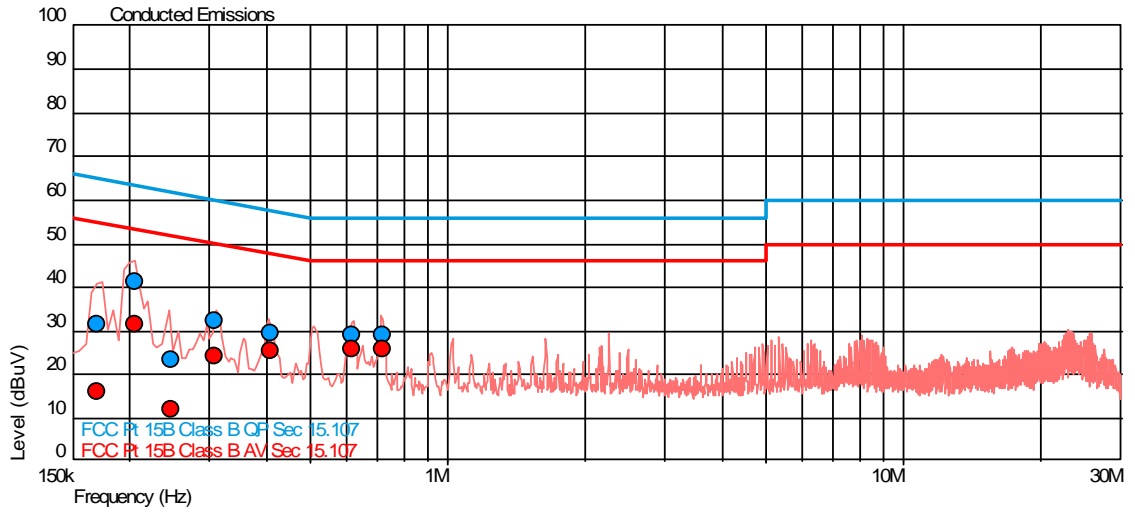
Live Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.165	25.6	65.2	-39.6	13.8	55.2	-41.4
0.205	41.6	63.4	-21.8	32.9	53.4	-20.5
0.307	32.7	60.0	-27.3	26.0	50.0	-24.1
0.409	30.0	57.7	-27.7	26.4	47.7	-21.3
0.512	28.0	56.0	-28.0	25.5	46.0	-20.5
0.616	27.7	56.0	-28.3	24.5	46.0	-21.5
0.718	29.9	56.0	-26.1	27.4	46.0	-18.6



Neutral Line

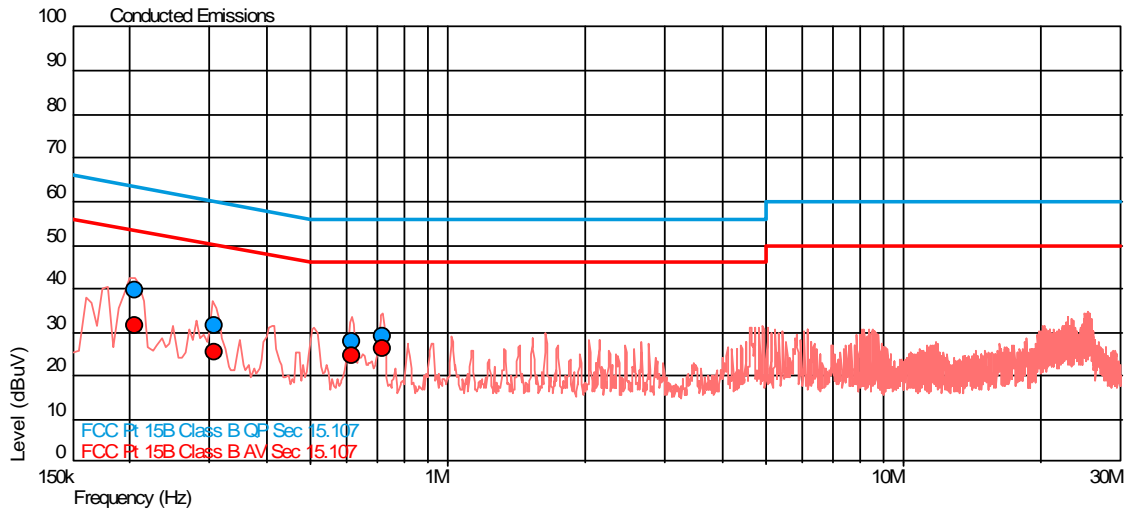


Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.170	31.7	64.9	-33.2	15.9	54.9	-39.0
0.205	41.3	63.4	-22.1	31.7	53.4	-21.8
0.247	23.5	61.9	-38.4	12.2	51.9	-39.7
0.308	32.2	60.0	-27.8	24.2	50.0	-25.9
0.409	29.6	57.7	-28.0	25.6	47.7	-22.1
0.616	29.0	56.0	-27.0	25.8	46.0	-20.2
0.718	28.9	56.0	-27.1	25.8	46.0	-20.2



Configuration 2 - Mode 1

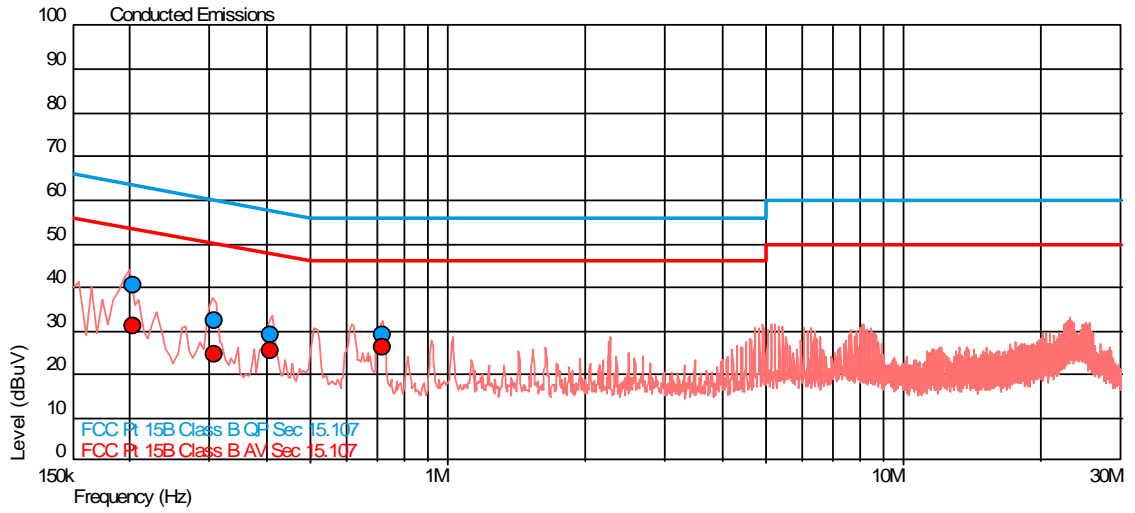
Live Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.205	39.5	63.4	-23.9	31.6	53.4	-21.8
0.306	31.7	60.1	-28.4	25.3	50.1	-24.7
0.616	28.0	56.0	-28.0	24.7	46.0	-21.3
0.719	29.0	56.0	-27.0	26.2	46.0	-19.8



Neutral Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.204	40.6	63.4	-22.9	31.1	53.4	-22.3
0.308	32.2	60.0	-27.8	24.4	50.0	-25.6
0.409	28.9	57.7	-28.8	25.4	47.7	-22.2
0.717	29.2	56.0	-26.8	26.3	46.0	-19.7



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
Sections 2.1 EMC - Radiated Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	12-Oct-2010
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Pre-Amplifier	Phase One	PS04-0085	1532	12	16-Sep-2010
Pre-Amplifier	Phase One	PS04-0086	1533	12	17-Sep-2010
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
TurntableController	Inn-Co GmbH	CO 1000	1606	-	TU
Mast Controller	EMCO	2090	1607	-	TU
4GHz HPF	Sematron	F-100-4000-5-R	2245	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	4-Dec-2011
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	4-Aug-2010
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	1-Sep-2010
Sections 2.2 EMC - Conducted Emissions					
3 Phase LISN	Rohde & Schwarz	ESH2-Z5	323	12	7-Jan-2011
LISN (1 Phase)	Chase	MN 2050	336	12	25-Mar-2011
Load (50ohm, 15W)	Diamond Antenna	DL-30N	344	12	22-Jun-2011
Screened Room (1)	Rainford	Rainford	1541	-	TU
Transient Limiter	Hewlett Packard	11947A	2377	12	16-Dec-2010
Test Receiver	Rohde & Schwarz	ESIB40	2941	12	28-Apr-2011

TU – Traceability Unscheduled



3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.2dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*
Conducted Emissions, ISN	150kHz to 30MHz Amplitude	2.1dB
Substitution Antenna, Radiated Field	30MHz to 12.5GHz Amplitude	2.6dB
Discontinuous Interference	150kHz to 30MHz Amplitude	3.0dB*
Interference Power	30MHz to 300MHz Amplitude	3.0dB*
Radiated E-Field Susceptibility	10MHz to 6GHz Test Amplitude	2.0dB†
Conducted Susceptibility RF	50kHz to 1000MHz Amplitude	3.1dB•
	EM Clamp Method of Test	1.2dB•
	CDN Method of Test	1.1dB•
	BCI Clamp Method of Test	1.2dB•
Conducted Susceptibility LF	DC to 150kHz	1.0%†
Power Frequency Magnetic Field	50Hz/60Hz Amplitude	0.45%
Magnetic Emissions	9kHz to 30MHz Amplitude	3.4dB*
Magnetic Field/Flux law EN 50366	10Hz to 400kHz	2.64%
Harmonics and Flicker	The test was applied using proprietary equipment that meets the requirements of EN 61000-3-2 and EN 61000-3-3	—
Mains Voltage Variations and Interrupts	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-11	—
Fast Transient Burst	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-4	—
Electrostatic Discharge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2	—
Surge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-5	—
Vehicle Transients	The test was applied using proprietary equipment that meets the requirements of ISO 7637-1 and 2	—
Compass Safe Distance	Azimuth Accuracy	0.10°

Worst case error for both Time and Frequency measurement 12 parts in 106.

* In accordance with CISPR 16-4-2

† In accordance with UKAS Lab 34

• In accordance with EN61000-4-6: 2009



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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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
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