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MPE test on Ericsson RBS 6501 B25

(3 appendices)

Test object

Product name: RBS 6501 B25

Product number: KRD 901 125/X, see appendix 1 for details.

See appendix 1 for the tested hardware configuration and general information.

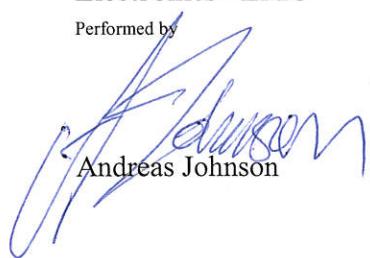
See appendix 3 for photos.

Summary

Standard	Compliant	Appendix	Remarks
FCC 47 CFR 2.1091 Radiofrequency radiation exposure evaluation: mobile devices	Yes	-	-
RSS-102 Radio Frequency Exposure compliance of Radio communication Apparatus, Issue 4	Yes	2	-
OET Bulletin 65/KDB447498 ver 05 rev 1	Yes	2	-

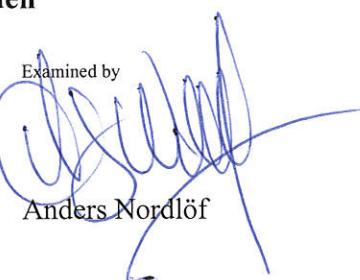
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Performed by



Andreas Johnson

Examined by



Anders Nordlöf

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Appendix 1

Measurement equipment

	Calibration Due	SP number
Test site Tesla	2017-01	503 881
Measurement software: Antennkalibrering V1.20	-	-
Calculation software: EMF 1.0	-	-
Laser probe AR FL7006	2014-06	901 492
Testo 625 Temperature and humidity meter	2014-06	504 188

Uncertainties

Measurement and test instrument uncertainties are described in the quality assurance documentation "SP-QD 10885". The measurement uncertainties can be found in the table below. The uncertainties are calculated with a coverage factor $k=2$ (95% level of confidence).

Standard	Method	Uncertainty
FCC 47 CFR 2.1091	RF exposure evaluation	10 %, Note

Note: Stated uncertainty refers to the calculated distance.

Compliance evaluation is based on a shared risk principle with respect to the measurement uncertainty.

Purpose of test

The tests were performed to verify that the radiofrequency exposure of the RBS 6501 meets the requirements of 47 CFR 2.1091 and RSS-102.

Description of the test object

The test object is a Radio Base Station configured in Single RAT mode for LTE designed to provide mobile users with a connection to a mobile network.

The test scope covers the following models of test object:

Product number: KRD 901 125/1, 100-250 VAC internal antenna

Product number: KRD 901 125/2, -48 VDC internal antenna

Product number: KRD 901 125/3, 100-250 VAC no internal antenna

Product number: KRD 901 125/4, -48 VDC no internal antenna

FCC ID TA8AKRD901125

IC: 287AB-AS901125

IC model numbers:

IC MODEL NO: AS9011251

IC MODEL NO: AS9011252

IC MODEL NO: AS9011253

IC MODEL NO: AS9011254



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Appendix 1

Delivery of test object

The test object was delivered: 2014-04-04.

Test facility

The used test site (503 881) is compliant with the requirements of section 2.948 of the FCC rules and listed, registration number 93866, as a facility accepted for certification under parts 15 and 18. The site complies with RSS-Gen, Issue 3 and is accepted by Industry Canada for the performance of radiated measurements, file no: IC 3482A-1.

Reservation

The test results in this report apply only to the particular test objects as declared in the report.

Test engineers

Kexin Chen, Benyamin Mashouf, Tomas Isbring and Andreas Johnson, SP.

Test participant

None.

Appendix 1

Tested configuration

Antenna port A: 1x 37.0 dBm (1x 5 W)
Antenna port B: 1x 37.0 dBm (1x 5 W)
Communication: IP via electrical interface
Power configuration: 120 VAC/ 60 Hz for KRD 901 125/3

Operational test mode

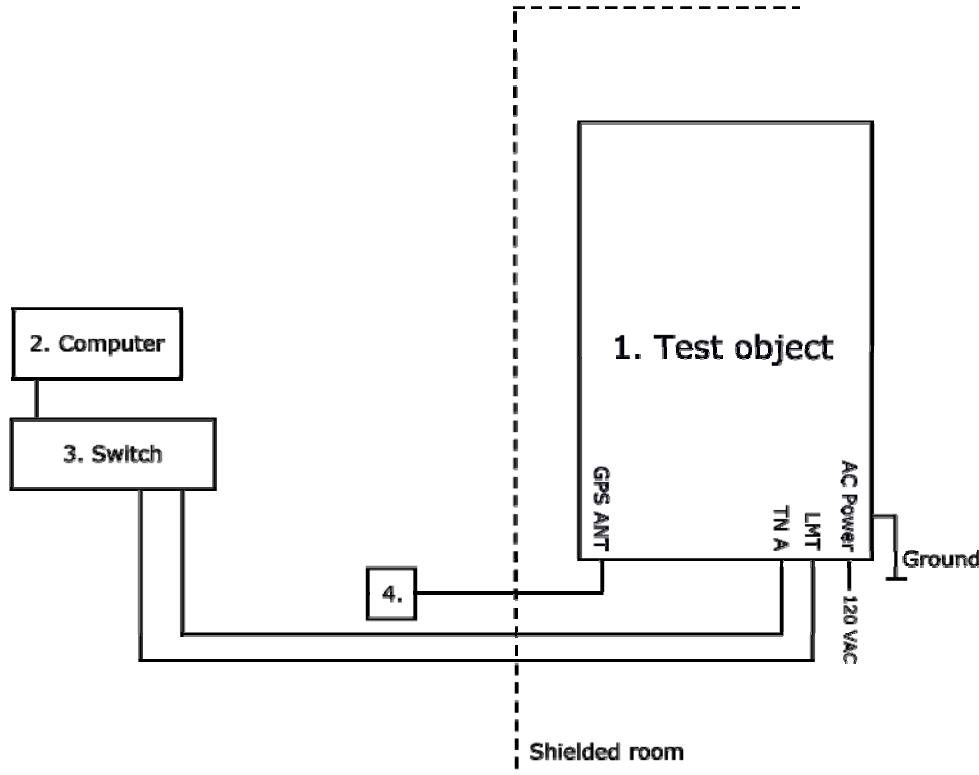
The RBS 6501 unit was activated for maximum transmit power transmitting test model E-TM1.1 as defined in ETSI TS 136 141/ 3GPP TS 36.141.

The test object was configured in MIMO mode with both RF paths allocated to the following EARFCN:

EARFCN Downlink	Frequency [MHz]	Comment
8140	1940	Single carrier TX bottom frequency in 20 MHz BW configuration
8340	1960	Single carrier TX mid frequency in all BW configurations (1.4 MHz - 20 MHz)
5890	1985	Single carrier TX top frequency in 20 MHz BW configuration

Appendix 1

Test setup:



1.	RBS 6501 B25 AC, KRD 901 125/3, rev. R1A, s/n: CB4S878468 Software: CXP 102 051/19, rev. R37AL
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Functional test equipment:

2.	Computer HP EliteBook 8540w BAMS – 1001052042
3.	Switch Netgear GS108E
4.	GPS Active Antenna, KRE 101 2082/1

Integrated antenna

Directional antenna, KRE 101 2141/1, rev. R1C, s/n: T89U102776
 Representing version: KRD 901 125/1

Semi-integrated omni antenna

VPol Omni, KRE 101 2233/1, s/n: DEG2731542
 VPol Omni, KRE 101 2233/1, s/n: DEG2731546
 Representing version: KRD 901 125/3



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Appendix 1

Interface:	Type of port:
Power: -48 VDC	DC Power
Power: 120 VAC	AC Power
-48 VDC output power	DC Power
TNA, RJ45 interface	Telecom
TNB, Optical interface	Telecom
EC bus and Ext Alarm	Signal
GPS	Signal
Ground wire	Ground

Appendix 2

RF exposure evaluation: 2.1091 Mobile devices / RSS-102 4.2

Date	Temperature	Humidity
2014-04-23	24 °C ± 3 °C	26 % ± 5 %
2014-04-24	23 °C ± 3 °C	29 % ± 5 %
2014-04-25	22 °C ± 3 °C	20 % ± 5 %

Procedure

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

Test setup and procedure

1. The test object is measured in twelve directions (in 30° steps) with the field probe continuously scanning from 0.1 – 2 m in height.
2. Measuring distance was 20 cm from the centre of the test object, step 1 is repeated with a distance increment of 20 cm until the measured field strength is compliant.

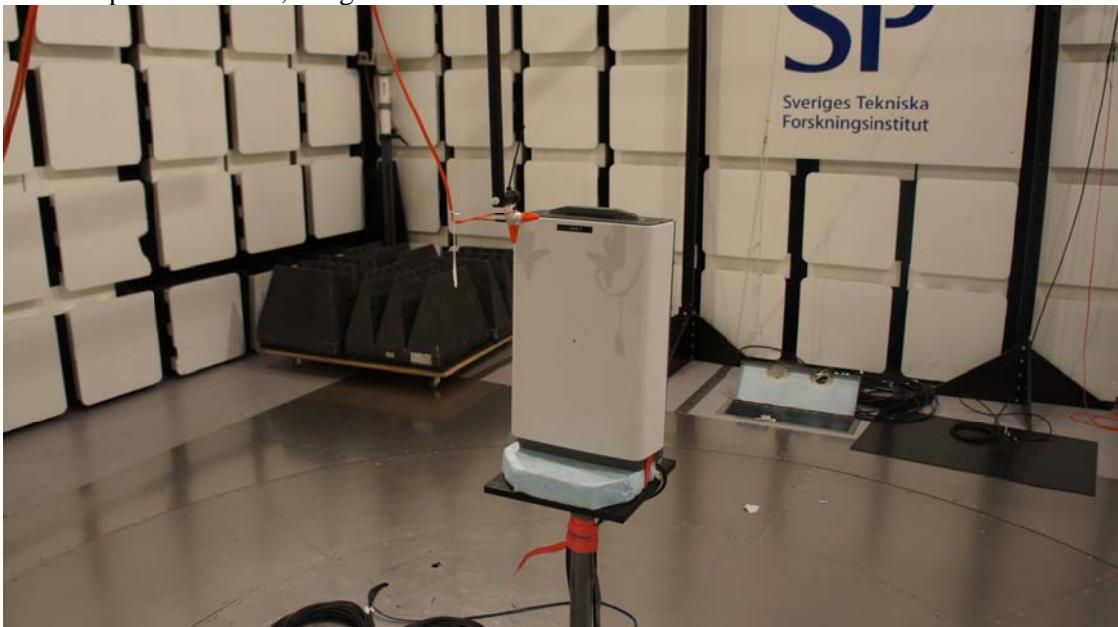
The distance for compliance for Adult is derived from spatial average over the full scan height. The distance for compliance for Child is derived from spatial average over ± 45 cm from the height where the highest level was detected.

The nominal power stated by the manufacturer is 2x 5 W (2x 37 dBm), with a tolerance of ± 1 dB. The measured output power was 4.8 W (36.8 dBm). Therefore the calculation was adjusted by 1.2 dBm to cover the highest possible output power.

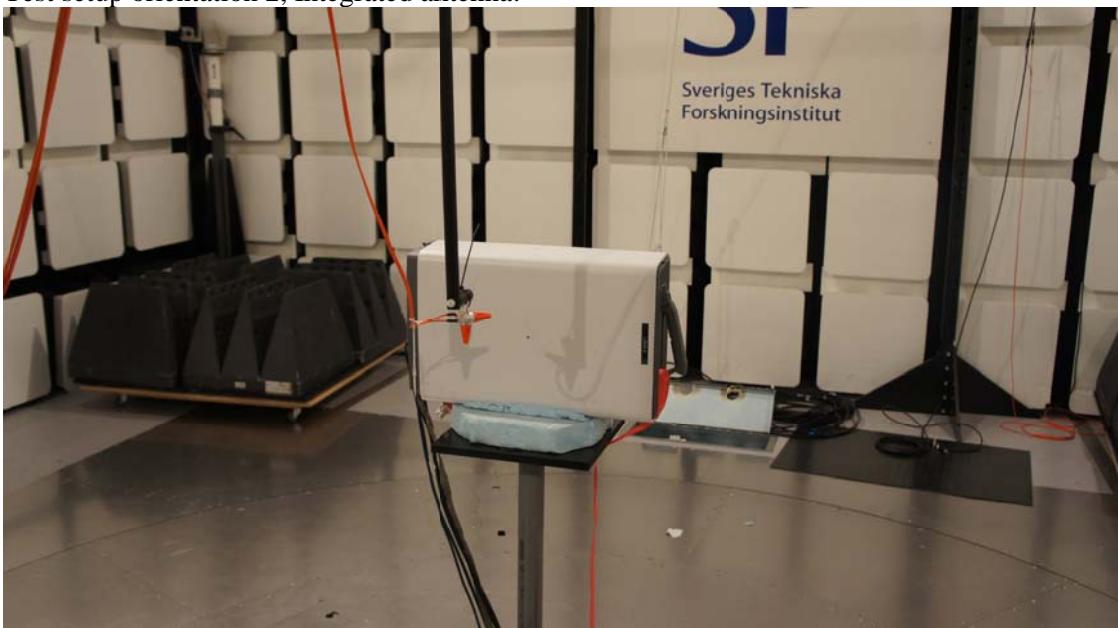
The measurements were made with an Integrated antenna and a Semi-integrated omni antenna.

Appendix 2

Test setup orientation 1, Integrated antenna:

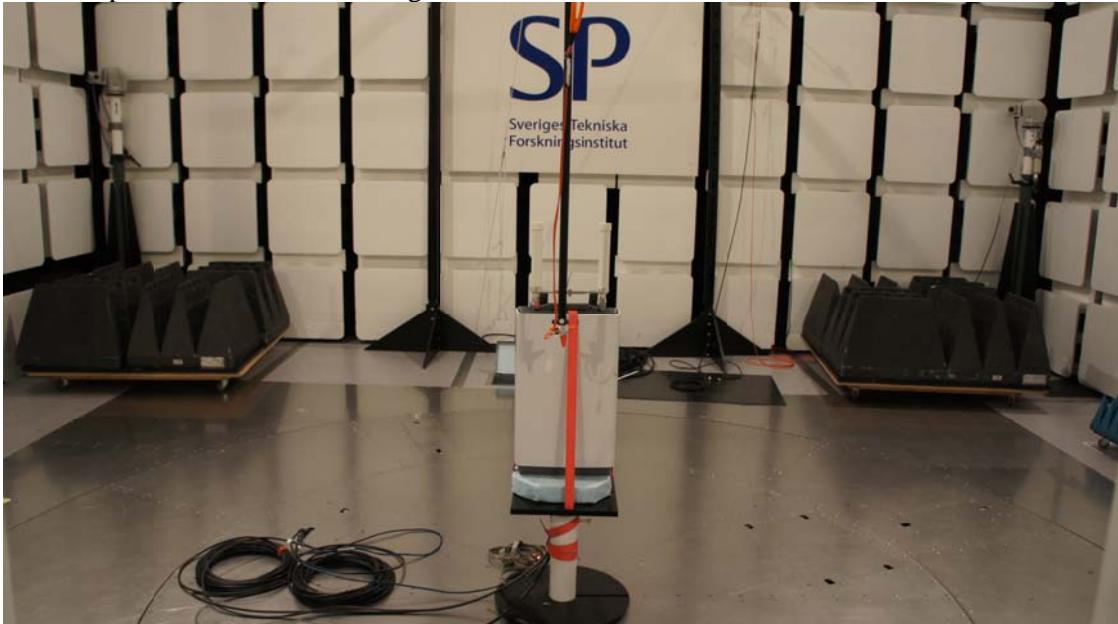


Test setup orientation 2, Integrated antenna:

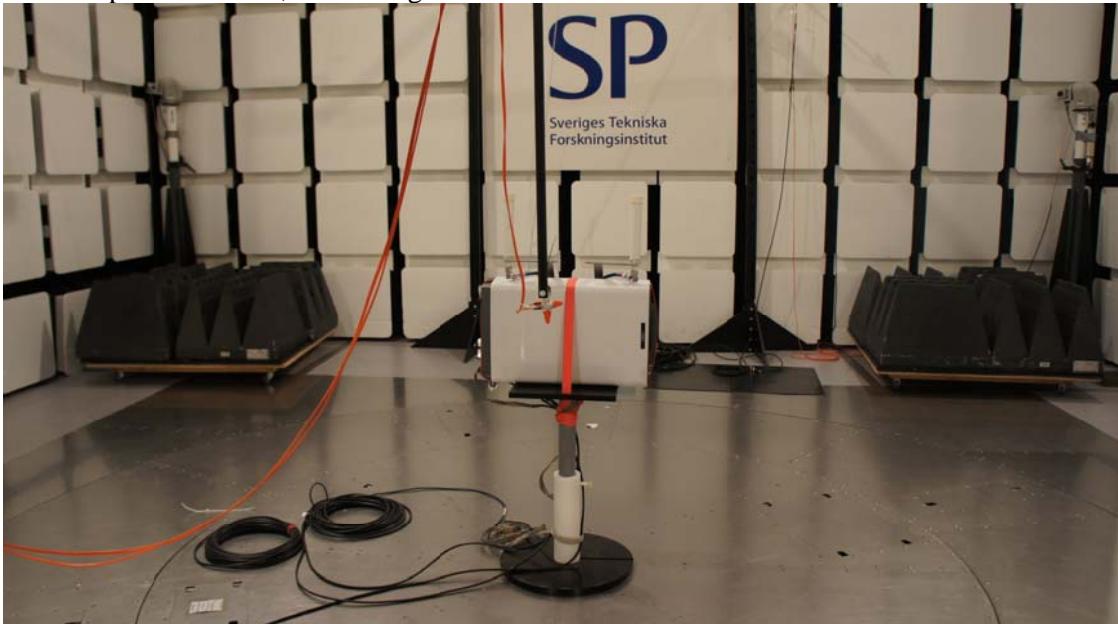


Appendix 2

Test setup orientation 1, Semi-integrated omni antenna:



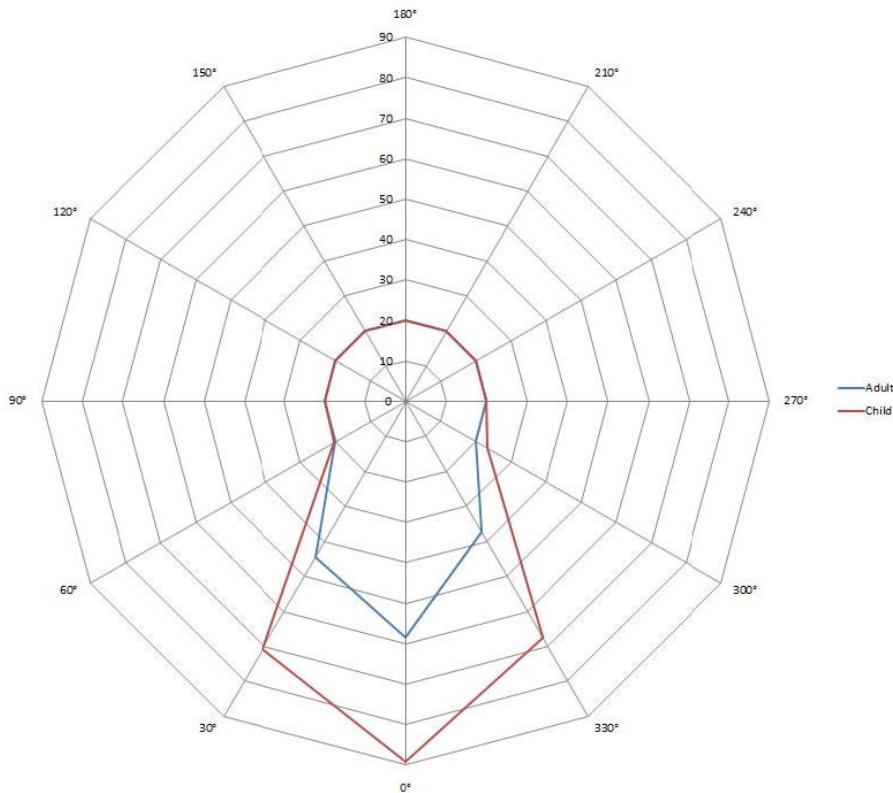
Test setup orientation 2, Semi-integrated omni antenna:



Appendix 2

Results

Orientation 1, Integrated antenna, worst case: 20 MHz TX Top frequency



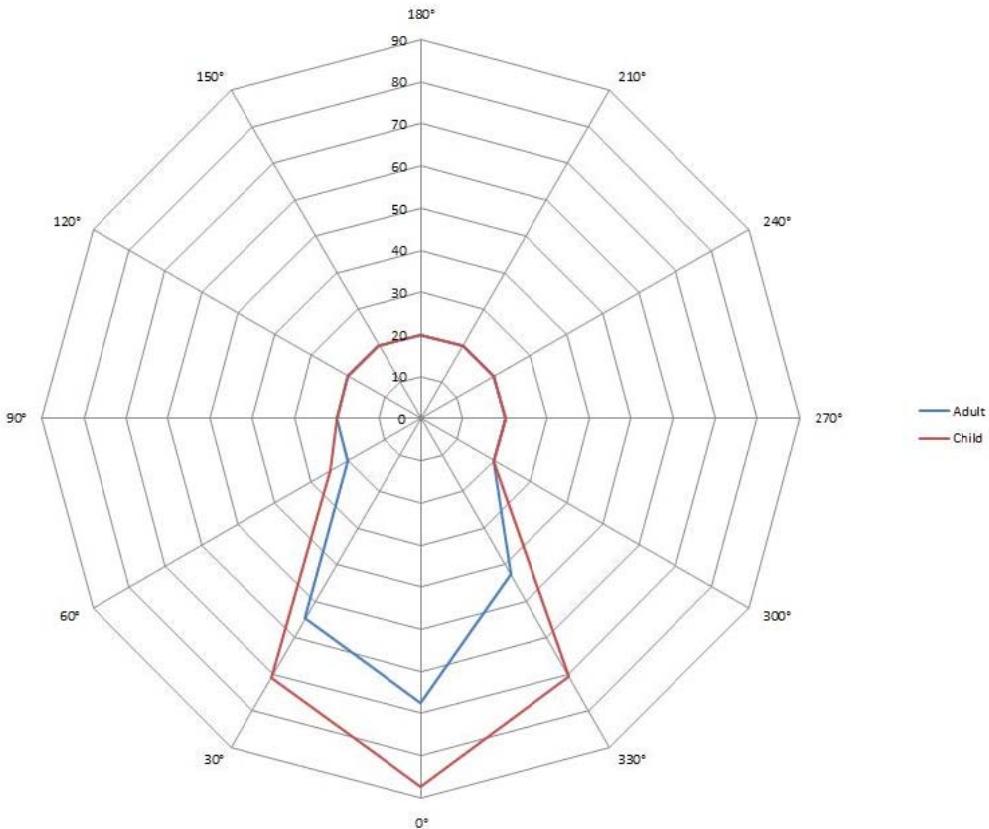
Note: The test object was placed with the front side facing 0° and the back side facing 180° as shown in the test setup photo.

Direction	Distance for compliance (cm).	
	Adult	Child
0°	58.6	89.2
30°	44.4	70.8
60°	20.0	20.4
90°	20.0	20.0
120°	20.0	20.0
150°	20.0	20.0
180°	20.0	20.0
210°	20.0	20.0
240°	20.0	20.0
270°	20.0	20.0
300°	20.0	23.3
330°	37.5	67.5

Note: The distance for compliance of every direction in the table above is calculated from the chassis of the test object.

Appendix 2

Orientation 2, Integrated antenna worst case: 20 MHz TX top frequency



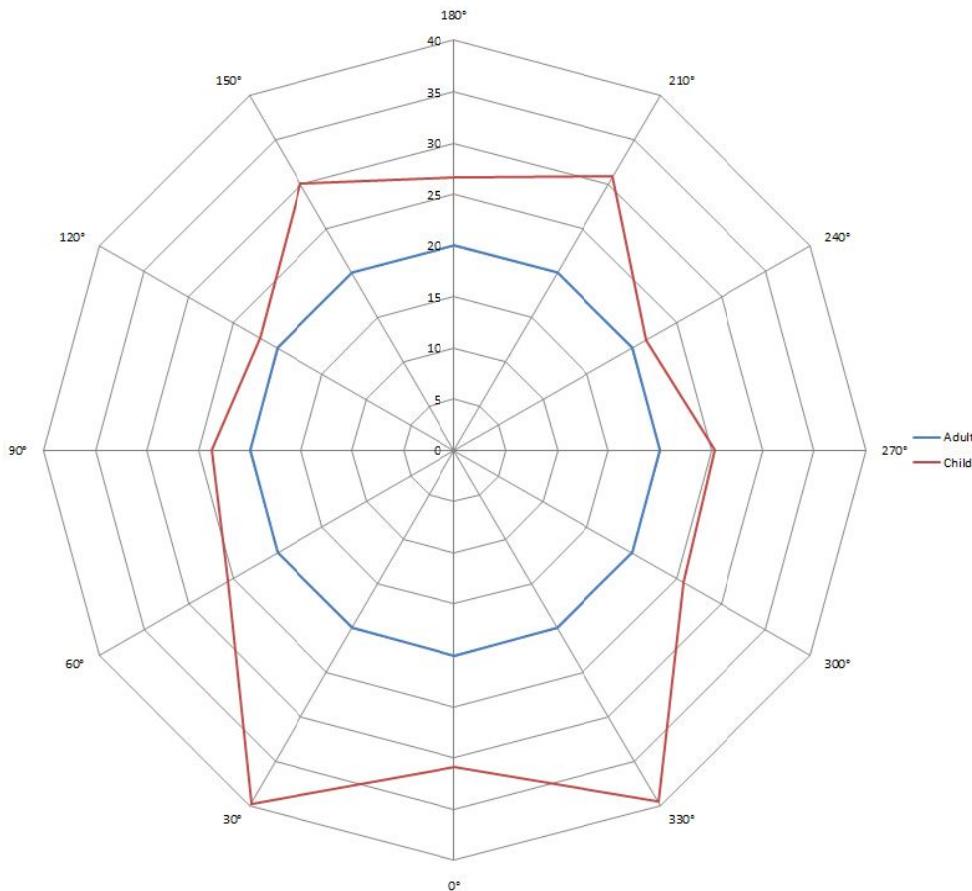
Note: The test object was placed with the front side facing 0° and the handle facing 270° as shown in the test setup photo.

Direction	Distance for compliance (cm).	
	Adult	Child
0°	67.6	87.4
30°	54.7	70.9
60°	20.0	24.8
90°	20.0	20.0
120°	20.0	20.0
150°	20.0	20.0
180°	20.0	20.0
210°	20.0	20.0
240°	20.0	20.0
270°	20.0	20.0
300°	20.0	20.0
330°	42.6	70.6

Note: The distance for compliance of every direction in the table above is calculated from the chassis of the test object.

Appendix 2

Orientation 1, Semi-integrated omni antenna worst case: 20 MHz TX Top frequency



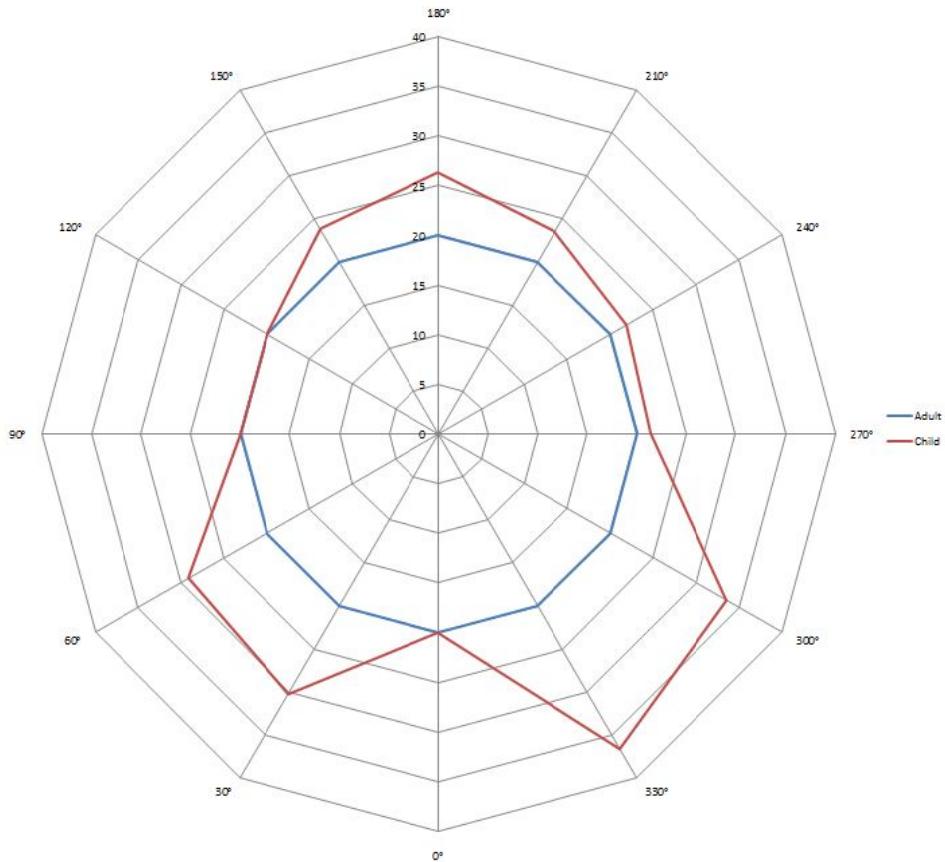
Note The test object was placed with the front facing 0° and the back side facing 180° as shown in the test setup photo.

Direction	Distance for compliance (cm).	
	Adult	Child
0°	20.0	30.9
30°	20.0	39.8
60°	20.0	25.5
90°	20.0	23.7
120°	20.0	21.9
150°	20.0	30.1
180°	20.0	26.6
210°	20.0	30.9
240°	20.0	21.6
270°	20.0	25.3
300°	20.0	25.7
330°	20.0	39.6

Note: The distance for compliance of every direction in the table above is calculated from the chassis of the test object.

Appendix 2

Orientation 2, Semi-integrated omni worst case: 20 MHz TX Top frequency



Note: The test object was placed with the front side facing 0° and the handle facing 270° as shown in the test setup photo.

Direction	Distance for compliance (cm).	
	Adult	Child
0°	20.0	20.0
30°	20.0	30.3
60°	20.0	29.1
90°	20.0	20.0
120°	20.0	20.0
150°	20.0	23.8
180°	20.0	26.3
210°	20.0	23.5
240°	20.0	21.9
270°	20.0	21.4
300°	20.0	33.6
330°	20.0	36.7

Note: The distance for compliance of every direction in the table above is calculated from the chassis of the test object.

Appendix 2

Limits

According to 47 CFR 1.1310.

(B) Limits for General Population/Uncontrolled Exposure

Frequency range (MHz)	Electric field strength [E] (V/m)	Magnetic field strength [H] (A/m)	Power density [S] (mW/cm ²)	Averaging time E ² . H ² or S (minutes)
1500-100.000	-	-	1.0	(Note 1)

According to RSS-102 4.2

RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency range (MHz)	Electric field strength [E] (V/m)	Magnetic field strength [H] (A/m)	Power density [S] (W/m ²)	Averaging time E ² . H ² or S (minutes)
1500-15000	-	-	10	(Note 1)

Note 1: The test was executed with the test object configured for maximum output power to represent worst case. Therefore no averaging time measurement was made.

Complies?	Yes
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Appendix 3

Representative photos of test object

Front side with cover:



Front side without cover:



Front side without Integrated antenna:



Back side :



Appendix 3

Right side without Integrated antenna:



Left side without Integrated antenna:



Appendix 3

Front side with
Semi-integrated omni antenna,
upright mounted



Front side with
Semi-integrated omni antenna,
side mounted



Appendix 3

Labels:

RBS 6501 B25 AC:



Integrated antenna:



Semi-integrated omni antennas

Antenna 1



Antenna 2

