

Prüfbericht - Nr.: 17021164 001			Seite 1 von 26 Page 1 of 26		
Test Report No.:					
Auftraggeber: Client:		Uni-Art Precise Products Ltd. 11-12/F. Yue Xiu Industrial Building, 87 Hung To Road, Kwun Tong, Kowloon, Hong Kong			
Gegenstand der Prüfung: Test item:		Transmitter of Wireless Headphone			
Bezeichnung: Identification:		HP1391 (ARKON)	HP1491	Serien-Nr.: Serial No.:	n.a.
		WHP141 (Tx) (RCA)	WHP151 (Tx)		
Wareneingangs-Nr.: Receipt No.:		163078118	Eingangsdatum: 2011-05-17 Date of receipt:		
Prüfört: Testing location:		TÜV Rheinland (Guangdong) Ltd. EMC Laboratory Guangzhou Auto Market, Yuan Gang Section of Guangshan Road, Guangzhou, P.R. China FCC Registration No.: 833845 Test site Industry Canada No.: 2932C-1			
Prüfgrundlage: Test specification:		FCC CFR47 Part 15: Subpart C Section 15.249 FCC CFR47 Part 15: Subpart C Section 15.207 FCC CFR47 Part 15: Subpart C Section 15.209 RSS-210 Issue 8 June 2010 RSS-Gen Issue 3 December 2010 RSS-102 Issue 4 March, 2010			
Prüfergebnis: Test Result:		Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). The test item passed the test specification(s).			
Prüflaboratorium: Testing Laboratory:		TÜV Rheinland (Shenzhen) Co., Ltd.			
geprüft/ tested by:		kontrolliert/ reviewed by:			
 2011-08-07 Winnie Hou/ Project Manager		 2011-08-18 Shawn Peng/ Technical Certifier			
Datum Date	Name/Stellung Name/Position	Unterschrift Signature	Datum Date	Name/Stellung Name/Position	Unterschrift Signature
Sonstiges/ Other Aspects:					
Abkürzungen: P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar NIT = nicht getestet			Abbreviations: P(ass) = passed F(ail) = failed N/A = not applicable NIT = not tested		
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.					

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: Passed

5.1.2 FIELD STRENGTH OF FUNDAMENTAL AND HARMONICS

RESULT: Passed

5.1.3 20dB BANDWIDTH

RESULT: Passed

5.1.4 99% BANDWIDTH

RESULT: Passed

5.1.5 OUT OF BAND EMISSION

RESULT: Passed

5.1.6 RADIATED EMISSION

RESULT: Passed

5.1.7 CONDUCTED EMISSION

RESULT: Passed

6.1.1 ELECTROMAGNETIC FIELDS

RESULT: Passed

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1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix 1: Test Result

2. Test Sites

2.1 Test Facilities

TÜV Rheinland (Guangdong) Ltd.
EMC Laboratory

Guangzhou Auto Market,
Yuan Gang Section of Guangshan Road,
Guangzhou, P.R. China

FCC Registration No.: 833845

Test site Industry Canada No.: 2932C-1

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
Spurious emission and Radiated emission				
EMI Test Receiver	Rohde & Schwarz	ESCI-3	100216	2012-03-16
Spectrum Analyzer	Rohde & Schwarz	FSP30	100286	2012-03-16
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100111	2012-03-16
Trilog-Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	209	2011-08-21
Double-Ridged Waveguide Horn Antenna	Rohde & Schwarz	HF906	100385	2011-08-24
Pre-amplifier	MITEQ	AFS42-00101800-25-S-42	1101599	2011-07-31
Standard Gain Horn Antenna	EMCO	3160-09	21642	2014-06-26
Pre-amplifier	MITEQ	AFS33-18002650-30-8P-44	1108282	2012-03-16
3m Anechoic Chamber	Albatross Project GmbH	N/A	N/A	2012-04-16
Conducted Emission				
EMI Test Receiver	Rohde & Schwarz	ESCS30	100316	2012-03-16
Pulse Limiter	Rohde & Schwarz	11947A	100701	2012-03-16
Artificial Mains Network	Rohde & Schwarz	ESH2-Z5	100114	2012-03-16
Radio Test Suite				
Receiver	Rohde & Schwarz	ESCI	100178	2011-09-27

2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO/IEC 17025 are:

Table 2: Measurement Uncertainty

Items		Extended Uncertainty
CE	Disturbance Voltage (dBuV)	$U=\pm 2.56\text{dB}$, $k=2$, $\sigma=95\%$
RE (9kHz – 30MHz)	Field Strength (dBuA)	$U=\pm 4.46\text{dB}$, $k=2$, $\sigma=95\%$
RE (30-1000MHz)	Field strength (dBuV/m)	$U=\pm 4.94\text{dB}$, $k=2$, $\sigma=95\%$

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached in this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Guangdong) Ltd. test facility located at Guangzhou Auto Market, Yuan Gang Section of Guangshan Road, Guangzhou, P.R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3. General Product Information

3.1 Product Function and Intended Use

The EUT is 900MHz transmitters for a wireless headphone system with 3 channels available. Stereo audio signal input to the audio-in port of the sample and modulated as a FM signal for transition. 19 kHz pilot signal is also included in the RF signal as complete FM transmission. The antenna type is integrated.

HP1391 is identical to HP1491 except that:

1. Audio signal is input to HP1391 through the 3.5mm audio signal plug of it. While in HP1491, RCA audio signal jack is provided for the audio signal input.
2. Contact lead is provided in HP1491 for the charge of headphone. While in HP1391, additional cable with power plug is used to charge the headphone.

HP1391 is transmitter part of system HP1390.

System HP1390 has an alternative system type designation: WHP141 with brand name "RCA".

HP1491 is transmitter part of system HP1490.

System HP1490 has an alternative system type designation: WHP151 with brand name "RCA".

For details refer to the User Manual, technical description and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Rating of EUT

Kind of Equipment:	Transmitter of Wireless Headphone
Type Designation:	HP1391 (ARKON) Transmitter of WHP141 (RCA) HP1491 (ARKON) Transmitter of WHP151 (RCA)
FCC ID:	MVAWHP141-001T
IC ID:	2579A-HP1390A

Table 4: Technical Specification of EUT

Technical Specification	Value
Operating Frequency	912-913 MHz
Channel separation	500kHz
Extreme Temperature Range	-10°C to 55°C
Operation Voltage	DC 12V via AC/DC adapter
Modulation	FM
Antenna Type	Internal Antenna, Non-User Replaceable
External Ports	None
Antenna Gain	0dBi
RF Output Power	0.00014W (-8.4dBm)
Number of channels	3
Channel frequency (MHz)	912MHz, 912.5MHz, 913MHz

3.3 Independent Operation Modes

The basic operation modes are:

- A. Transmitting
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. Standby
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Bill of Material
- PCB Layout
- Photo Document
- Technical Description
- Circuit Diagram
- Instruction Manual
- Rating Label

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.4: 2003.

Due to models' differences indicated in clause 3.1, full test was applied on model HP1391 only.

4.3 Special Accessories and Auxiliary Equipment

The EUT was tested with following accessories

Description	Manufacturer	Type
Receiver of wireless headphone	Uni-Art Precise Products Ltd.	HP1392A
AC/DC Adapter	Uni-Art Precise Products Ltd.	UD-1201B

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

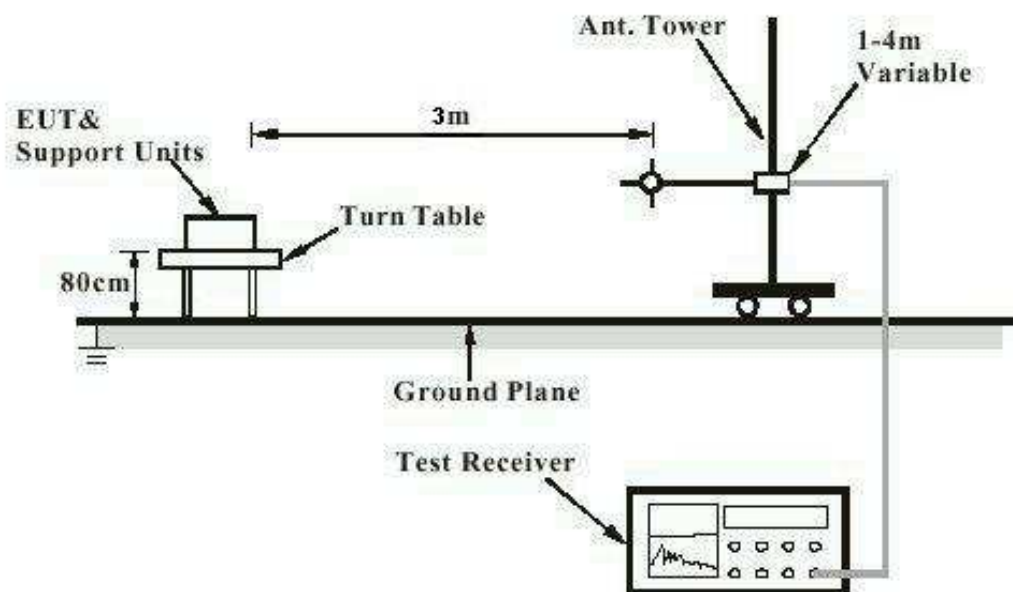


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement

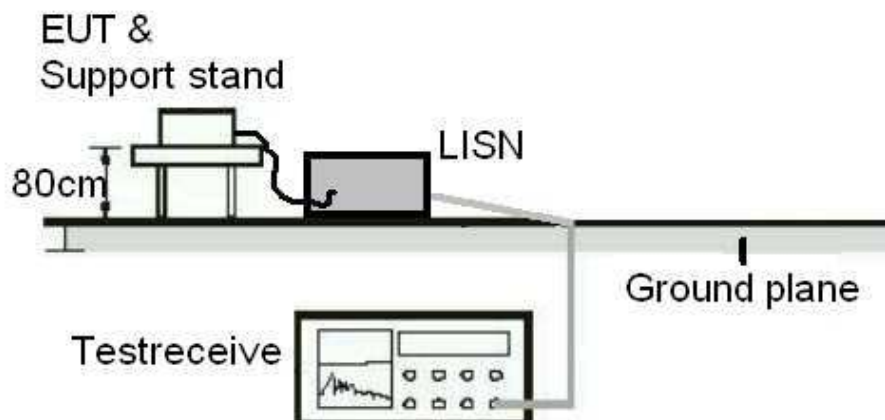
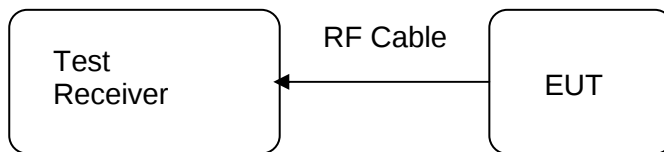


Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:**Passed**

Test date	:	2011-06-24
Test standard	:	FCC Part 15.203 RSS-Gen 7.1.2
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is 0dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply the provision.

Refer to EUT photo for details.

5.1.2 Field strength of fundamental and harmonics

RESULT:
Passed

Test date : 2011-07-01
 Test standard : FCC Part 15.249(a)
 Clause A2.9(a) of RSS-210
 Basic standard : ANSI C63.4: 2003
 Limit : FCC Part 15.249(a)
 Clause A2.9(a) of RSS-210
 Kind of test site : 3m Semi-Anechoic Chamber

Test setup

Operation Mode : A
 Ambient temperature : 23°C
 Relative humidity : 50%
 Atmospheric pressure : 101 kPa

Table 5: Test result of Field strength of fundamental and harmonics

Channel Frequency (MHz)	Test result			
	Reading (dBuV/m)	Antenna orientation	Detector	Limit (dBuV/m)
912	82.97	Horizontal	QP	94
912	89.27	Vertical	QP	94
912.5	83.20	Horizontal	QP	94
912.5	89.55	Vertical	QP	94
913	83.19	Horizontal	QP	94
913	89.66	Vertical	QP	94
1824	38.9	Horizontal	Peak	74
1824	33.8		Average	54
1824	45.6	Vertical	Peak	74
1824	43.7		Average	54
1825	35.8	Horizontal	Peak	74
1825	30.1		Average	54
1825	44.8	Vertical	Peak	74
1825	39.7		Average	54
1826	35.9	Horizontal	Peak	74
1826	28.8		Average	54
1826	42.3	Vertical	Peak	74
1826	36.4		Average	54

Note: refer to page 3 to page 18 of Appendix 1 for test plot.

5.1.3 20dB Bandwidth

RESULT:**Passed**

Date of testing : 2011-06-24
Test standard : RSS-Gen 4.6.3
Basic standard : ANSI C63.4: 2003
Kind of test site : Shielded room

Test setup

Test Channel : Low/ Middle/ High
Operation Mode : A
Ambient temperature : 20°C
Relative humidity : 45%
Atmospheric pressure : 101 kPa

Table 6: Test result of 20dB Bandwidth

Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)
Low Channel	912	74
Mid Channel	912.5	74
High Channel	913	74

Test Plot of 20dB Bandwidth

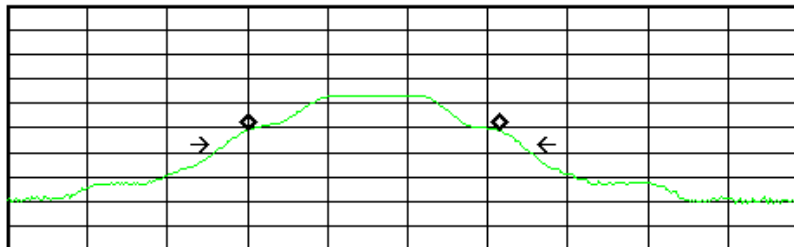
Low Channel

 Agilent

Ch Freq 912 MHz Trig Free
 Occupied Bandwidth

Ref 0 dBm

Atten 10 dB

 #Peak
 Log
 10
 dB/


Center 912 MHz

#Res BW 10 kHz

#VBW 10 kHz

Span 200 kHz

Sweep 8.5 ms (401 pts)

Occupied Bandwidth
63.0238 kHz

 Occ BW % Pwr 99.00 %
 x dB -20.00 dB

 Transmit Freq Error -8.578 kHz
 x dB Bandwidth 73.854 kHz

Freq/Channel
Center Freq
 912.000000 MHz

Start Freq
 911.900000 MHz

Stop Freq
 912.100000 MHz

CF Step
 20.000000 kHz
 Auto Man

Freq Offset
 0.00000000 Hz

Signal Track
 On Off

Scale Type
 Log Lin

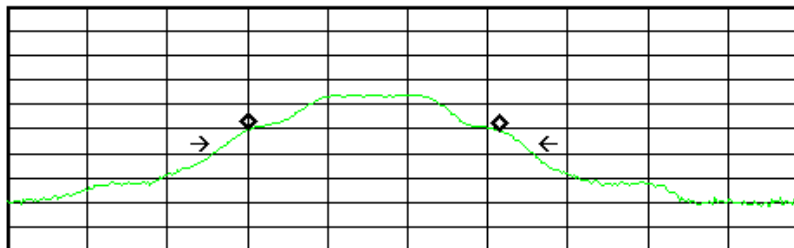
Middle Channel

 Agilent

Ch Freq 912.5 MHz Trig Free
 Occupied Bandwidth

Ref 0 dBm

Atten 10 dB

 #Peak
 Log
 10
 dB/


Center 912.5 MHz

#Res BW 10 kHz

#VBW 10 kHz

Span 200 kHz

Sweep 8.5 ms (401 pts)

Occupied Bandwidth
63.0804 kHz

 Occ BW % Pwr 99.00 %
 x dB -20.00 dB

 Transmit Freq Error -8.447 kHz
 x dB Bandwidth 74.169 kHz

Freq/Channel
Center Freq
 912.500000 MHz

Start Freq
 912.400000 MHz

Stop Freq
 912.600000 MHz

CF Step
 20.000000 kHz
 Auto Man

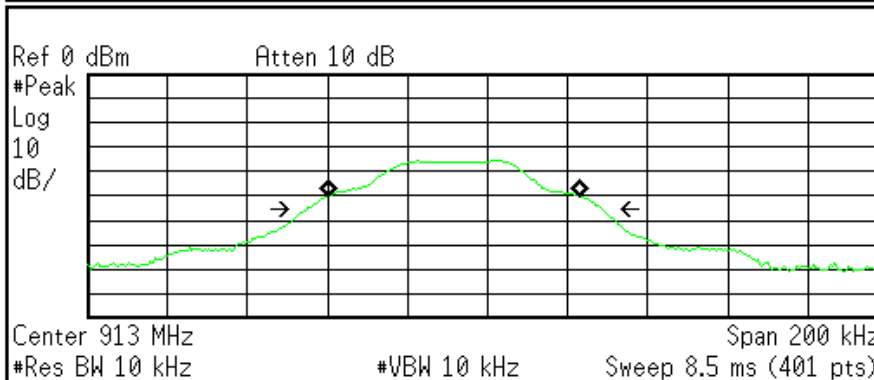
Freq Offset
 0.00000000 Hz

Signal Track
 On Off

Scale Type
 Log Lin

High Channel
 Agilent

Ch Freq 913 MHz Trig Free
 Occupied Bandwidth



Occupied Bandwidth 62.9695 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error -8.370 kHz
x dB Bandwidth 74.287 kHz

Meas Setup
Avg Number

10
 On Off

Avg Mode

Exp Repeat

Max Hold

On Off

Occ BW % Pwr

99.00 %

OBW Span

200.000000 kHz

x dB

-20.00 dB

Optimize

Ref Level

5.1.4 99% Bandwidth**RESULT:****Passed**

Date of testing : 2011-06-24
Test standard : RSS-Gen clause 4.6.1
Basic standard : ANSI C63.4: 2003
Kind of test site : Shielded room

Test setup

Test Channel : Low/ Middle/ High
Operation Mode : A
Ambient temperature : 20°C
Relative humidity : 45%
Atmospheric pressure : 101 kPa

Table 7: Test result of 99% Bandwidth

Channel	Channel Frequency (MHz)	99% Bandwidth (kHz)
Low Channel	912	63
Mid Channel	912.5	63
High Channel	913	63

Test Plot of 99% Bandwidth

Low Channel

 Agilent

Ch Freq 912 MHz Trig Free
 Occupied Bandwidth

Ref 0 dBm

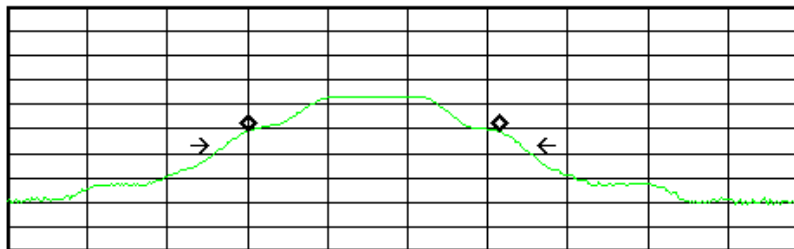
Atten 10 dB

#Peak

Log

10

dB/



Center 912 MHz

#Res BW 10 kHz

#VBW 10 kHz

 Span 200 kHz
 Sweep 8.5 ms (401 pts)

Occupied Bandwidth
63.0238 kHz

Occ BW % Pwr 99.00 %

x dB -20.00 dB

Transmit Freq Error -8.578 kHz

x dB Bandwidth 73.854 kHz

Freq/Channel
Center Freq

912.000000 MHz

Start Freq

911.900000 MHz

Stop Freq

912.100000 MHz

CF Step

20.000000 kHz

Auto Man

Freq Offset

0.00000000 Hz

Signal Track

On Off

Scale Type

Log Lin

Middle Channel

 Agilent

Ch Freq 912.5 MHz Trig Free
 Occupied Bandwidth

Ref 0 dBm

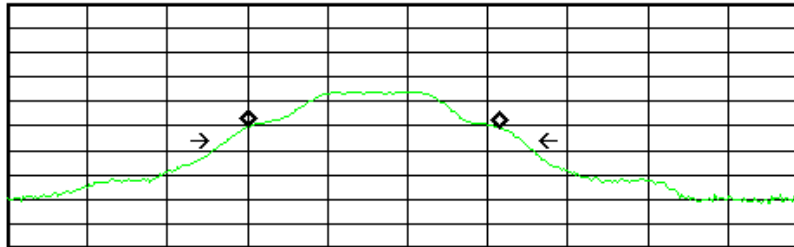
Atten 10 dB

#Peak

Log

10

dB/



Center 912.5 MHz

#Res BW 10 kHz

#VBW 10 kHz

 Span 200 kHz
 Sweep 8.5 ms (401 pts)

Occupied Bandwidth
63.0804 kHz

Occ BW % Pwr 99.00 %

x dB -20.00 dB

Transmit Freq Error -8.447 kHz

x dB Bandwidth 74.169 kHz

Freq/Channel
Center Freq

912.500000 MHz

Start Freq

912.400000 MHz

Stop Freq

912.600000 MHz

CF Step

20.000000 kHz

Auto Man

Freq Offset

0.00000000 Hz

Signal Track

On Off

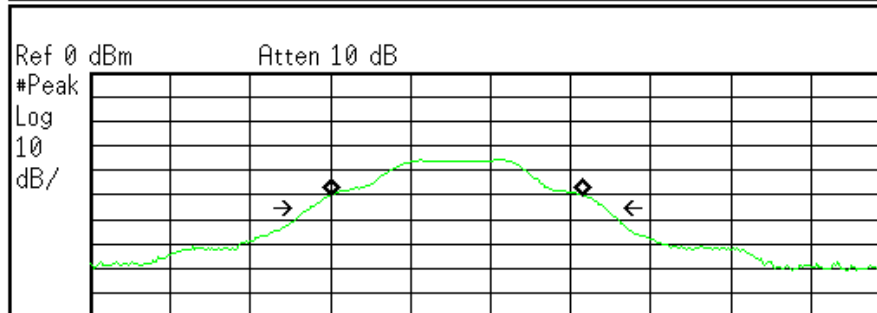
Scale Type

Log Lin

High Channel
 Agilent

Ch Freq 913 MHz **Trig** Free
 Occupied Bandwidth

[Redacted]



Center 913 MHz Span 200 kHz
 #Res BW 10 kHz #VBW 10 kHz Sweep 8.5 ms (401 pts)

Occupied Bandwidth
62.9695 kHz
Occ BW % Pwr 99.00 %

x dB -20.00 dB

Transmit Freq Error -8.370 kHz

x dB Bandwidth 74.287 kHz

Meas Setup
Avg Number

 10
 On Off

Avg Mode

Exp Repeat

Max Hold

On Off

Occ BW % Pwr

99.00 %

OBW Span

200.000000 kHz

x dB

-20.00 dB

Optimize
Ref Level

5.1.5 Out of band emission

RESULT:**Passed**

Date of testing	:	2011-07-04
Test standard	:	FCC part 15.249(d) RSS-210 A2.9(b)
Basic standard	:	ANSI C63.4: 2003
Limit	:	FCC part 15.249(d) RSS-210 A2.9(b)
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/ High
Operation mode	:	A
Ambient temperature	:	23°C
Relative humidity	:	50%
Atmospheric pressure	:	101 kPa

All emissions outside of the specified frequency bands are attenuated more than 50 dB below the level of the fundamental.

Refer to Appendix 1 for detailed test plot.

5.1.6 Radiated emission

RESULT:**Passed**

Date of testing	:	2011-06-23
Test standard	:	FCC part 15.209(a) & 15.205 Clause 2.2 & 2.5 of RSS-210
Basic standard	:	ANSI C63.4: 2003
Limits	:	Refer to FCC part 15.209(a) Refer to RSS-Gen Table 5
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Operation mode	:	A
Ambient temperature	:	23°C
Relative humidity	:	50%
Atmospheric pressure	:	101 kPa

For details refer to Appendix 1.

Remark: Testing was carried out within frequency range 9kHz to the tenth harmonics.

5.1.7 Conducted Emission

RESULT:**Passed**

Date of testing	:	2011-06-24
Test specification	:	FCC Part 15.207(a) Clause 5.3 of ICES-003
Frequency range	:	0.15 – 30MHz
Classification	:	Class B
Test procedure	:	ANSI C63.4: 2003 CAN/CSA-CEI/IEC CISPR 22-02
Kind of test site	:	Shielded room

Test setup

Input Voltage (to AC input of Adapter)	:	AC 120V, 60Hz
Operation mode	:	A
Artificial hand	:	Not applied
Earthing	:	Not connected

Test data refer to Appendix 1.

6. Safety Human exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT:**Passed**

Since maximum peak output power of the transmitter is $<60/f(\text{GHz})\text{mW}$, i.e. $0.14\text{mW} < 25(=60/2.4)\text{mW}$, hence the EUT is excluded from SAR evaluation according to FCC KDB publication 447498 D01: Mobile Portable RF Exposure.

The measured peak output power of the transmitter is only 0.14mW (-8.4dBm). According to RSS-102 Issue 4 March 2010 clause 2.5, from 3 kHz up to 1 GHz inclusively and if the output power (i.e. the higher of the conducted or effective isotropic radiated power (e.i.r.p.) source-based time-averaged output power) is less than, or equal to 200 mW for General Public Use and 1000 mW for Controlled Use, then the transmitters are exempt from routine SAR and RF exposure evaluations, therefore the EUT is deemed to fulfill the requirement without additional test.

7. Photographs of the Test Set-Up

Photograph 1: Set-up for Radiated Emissions (9kHz - 30MHz), transmitter



Photograph 2: Set-up for Radiated Emissions (30MHz-1GHz), transmitter



Photograph 3: Set-up for Radiated Emissions (1GHz-10GHz), transmitter



Photograph 4: Set-up for Conducted Emissions



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