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**PROPRIETARY**

**AQTL-2014-121**

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**Document Title:** **9641GS Gen1\_Build1\_H323 6.5\_  
HAC\_ROLR Evaluation**

**Standards:** **FCC Part 68  
Industry Canada CS-03, Part V**

**Tested By:** **Avaya  
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## Template Revision History

### Template:

**Identification: AQTL-10**

**Date: 12 June 2014**

**Issue: 1.5**

**Issuing Authority: Ian Hawes, AQTL Quality Manager**

Issue	Description of change	Author	Date
1.0	Original Issue	P. Ruttan	9 <sup>th</sup> March 2012
1.1	Added test software version section and test sample and configuration photograph section	P. Ruttan	16 <sup>th</sup> April 2012
1.2	Added NVLAP formating	P. Ruttan	23 <sup>rd</sup> April 2012
1.3	Cover page added signatories & total number of pages 1: NVLAP disclaimer edit to reflect AQTL Lab 2.1: Renamed to Scope of Accreditation	R. Jones	24 <sup>th</sup> April 2012
1.4	2.6 Measurement uncertainty table updated	P. Ruttan	23 <sup>rd</sup> Jan 2014
1.5	Added Industry Canada (IC) ROLR limits	P. Ruttan	12 <sup>th</sup> June 2014

## Report Revision History

Issue	Description of change	Author	Date
1.0	Original Issue	P. Ruttan	2 <sup>nd</sup> Dec 2014

## 1 Executive Summary

This report is a summary of the tests performed on an Avaya 9641GS IP Phone. The audio conformance and Hearing Aid Compatibility (HAC) conformance were evaluated as per FCC Part 68 and Industry Canada CS-03 standard. (see also subsection 2.1)

Equipment Assessed: 9641GS Gen 1, Build 1, sn 14N543612180

Equipment FW Release: H323 S9621\_41HALBR6\_5\_0\_0Y\_V474.tar

Specifications: FCC Part 68, section 68.316 and 68.317  
Industry Canada CS-03, Part V

Compliance Status: Complies

Exclusions: None

Non-compliances: None

Date Tested : HAC - November 27, 2014  
Audio – November 27, 2014

Testing was performed at the Avaya, Belleville Audio Quality Test Lab (Avaya BVW AQT Lab) during the period of November 2014.

NVLAP requires that this report **MUST NOT BE REPRODUCED, EXCEPT IN FULL**, without the approval of Avaya Belleville AQT Laboratory.



This Report relates to the items tested. NVLAP accreditation of Avaya Belleville Audio Quality Test Lab, test procedures and personnel, in no way constitutes or implies product certification, approval or endorsement by NIST

### 1.1 Statement of Compliance

The equipment described in this test report was found to comply with the hearing aid compatibility and audio conformance requirements set forth above.

### 1.2 Results Checked By:

Lab Manager	Signature
Miguel De Araujo	

## 2 Introduction

The following is a summary of the hearing aid compatibility and audio performance of a sample Avaya 9641GS IP Phone. This report looks at the audio performance on a call through the IP network from a half channel perspective. For the audio test, the handset path was tested while connected to a digital trunk, speech path: G.711. For the HAC test, the handset path was tested while connected to an analog trunk.

NOTE: The results contained in this report relate only to the item tested. The BVW AQTL facility has been accredited by NVLAP for performance of product testing. The scope of accreditation for HAC and audio conformance is given below.

### 2.1 Scope of Accreditation

The Belleville AQTL facility has been accredited by NVLAP for performance of product testing. The scope of accreditation for Audio Testing is given below:

1. FCC Part 68, section 68.316 and 68.317
2. Industry Canada CS-03, Part V

### 2.2 Unit under test

Avaya 9641GS IP Phone s/n 14N543612180 was tested.

### 2.3 Telephone Set Firmware

The set was tested with firmware version H323 S9621\_41HALBR6\_5\_0\_0Y\_V474.tar.

### 2.4 Test Requirements

The requirements were based on the limits stated in Section 2.1.

### 2.5 Volume Control

The 9641GS IP Phone had an 8-step volume control. The handset volume level was adjusted as required.

### 2.6 Measurement Uncertainty

The following are the worst-case measurement uncertainty estimates related to this report for the Avaya Belleville Audio Quality Test Laboratory:

Components of Uncertainty	Expanded Uncertainty	
Receive Acoustical	0.13 dB	0.03 Hz
Transmit Acoustical	0.14 dB	0.89 Hz
Sound Card Left Input	0.01 dB	0.00 Hz
Sound Card Right Output	0.29 dB	0.89 Hz
HAC	0.31dB	0.00 Hz

### 3 Test Conditions

#### 3.1 Specifications

The Device Under Test was assessed against the following specifications:

FCC Part 68, section 68.316 and 68.317  
Industry Canada CS-03, Part V

#### 3.2 Test Method Deviations

None.

#### 3.3 Test Environment

All tests were performed under the following environmental conditions:

Test Environment Parameters	Specified Range	Pre-Test Readings
Temperature	15°C to 25°C	23.5°C
Humidity	30% to 75%	13.1%
Pressure	86kPa to 106kPa	101.9kPa

#### 3.4 Test Application Force

Test Head: N/A

HATS: 8.5 Newtons

## 4 Test Equipment

The following lists of equipment were used for the Hearing Aid Compatibility (HAC) test and for the audio evaluation. All audio measurements were performed using the Sound Check application and associated sound card.

### 4.1 Equipment Used For HAC Test

Equipment
Axial Hearing Aid Compatibility Coil Model # A-100
Radial Hearing Aid Compatibility Coil Model # R-100
Signal Analyzer Model: HP 35670A
DC Feed Model: NTDCF 021

### 4.2 Test Software Used For HAC Test

Directory: HAC Part 68.316 Ver 1.5

Sequence: HAC Part 68.316\_V1.5.sqc

### 4.3 Equipment Used For Audio Evaluation

Equipment
PC 1207 with Card Deluxe Sound Card
CS1000 Call Server
H.P. 3488A Switch Controller
H.P. E6349A E1 Test Advisor
B&K 5935 Microphone Amplifier
GRAAS Microphone Power Module Type 12AA
B&K 4134 Pressure Microphone
B&K Telephone Test Head Type 4602
B&K 4228 Sound Level Calibrator Pistonphone
Xantrex DC Power Supply (x4)

### 4.4 Test Software Used For Audio Evaluation

Directory: S004-2008 Aust Ver 1.0

Sequence: MD0801 HN ROLR Type 1 Sine Recv.sqc for Test Head (TH)

Sequence: MD0801 HN HL ROLR Sine Recv.sqc for Head and Torso Simulator (HATS)

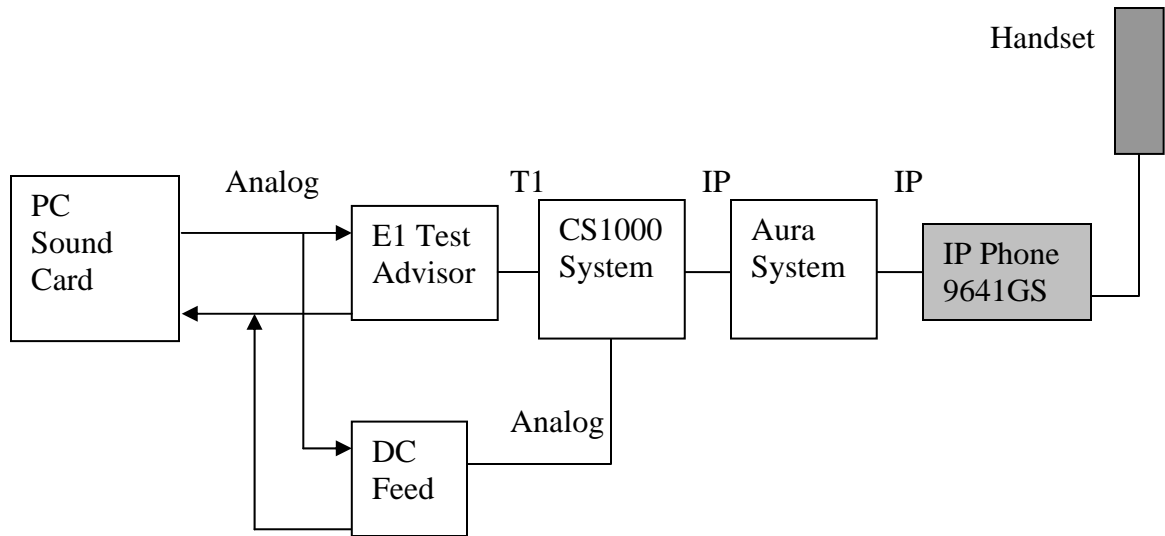
### 4.5 System Calibration

Calibration Path	Operator	Date of Calibration
Receive	P. Ruttan	Nov 6, 2014
Transmit	P. Ruttan	Nov 6, 2014

#### 4.6 Test Operator

Test	Test Operator	Date Performed	
		From	To
HAC	P. Ruttan	Nov 17, 2014	Nov 17, 2014
ROLR	P. Ruttan	Nov 17, 2014	Nov 17, 2014

#### 4.7 Half Channel Test Setup





## 5 Test Results Summary

Clause	Test Description	Status	Results	Comments
68.316	Hearing Aid Compatibility (HAC)	Required	Pass	
68.317	Volume Control Testing	Required	Pass	
68.317	Handset ROLR	Required	Pass	
68.317	Clipping/Distortion	Required	Pass	

N/A – Not Applicable

## 6 Hearing Aid Compatibility (HAC) Test Results

### 1- Axial and Radial Measurements:

Axial Coil Sensitivity as obtained from calibration report: -60.1

Radial Coil Sensitivity as obtained from calibration report: -59.9

HAC	Measured Result	Specification (FCC Part 68)		P/F
		Requirement	Comment	
<b>Hearing Aid Compatibility (HAC)</b>		FCC - Part 68.316 IC - CS-03 Part V	note 1	
Axial Field Intensity	-16.31	-22 dB relative to 1 A/m		PASS
Frequency Response Margin	2.00			PASS
Radial Field Intensity				
Point 1 @ 0 degrees	-25.04	-27 dB relative to 1 A/m		PASS
Point 2 @ 90 degrees	-25.79	-27 dB relative to 1 A/m		PASS
Point 3 @ 180 degrees	-25.55	-27 dB relative to 1 A/m		PASS
Point 4 @ 270 degrees	-24.67	-27 dB relative to 1 A/m		PASS

Note 1:

FCC – Federal Communications Commission

IC – Industry Canada

### 2- Frequency Response Measurements:

The results (see Appendix A) fit within the limits of the frequency response template as defined in standards FCC Part 68 and Industry Canada CS-03, Part V.

## 7 Receive Objective Loudness Rating (ROLR) Test Results

ROLR	Measured Result	Specification (FCC Part 68)		P/F
		Requirement	Comment	
<b>Receive Objective Loudness Rating (ROLR)</b>		FCC - Part 68.317 IC - CS-03 Part V	note 1	
FCC - ROLR nominal (Digital)	50.1	51.0 ± 5.0 dB	Vol = nom	PASS
IC - ROLR nominal (Digital)	50.1	48.5 ± 5.0 dB	Vol = nom	PASS
Loudness ROLR maximum (Digital)	38	36.0 ± 8.0 dB	Vol = max	PASS
Nominal to Maximum Delta	12	15.0 ± 3.0 dB		PASS
<b>Clipping / Distortion</b>				
Receive Distortion @ 315 Hz	0.6	10% Max.		PASS
Receive Distortion @ 500 Hz	1.46	10% Max.		PASS
Receive Distortion @ 1000 Hz	2.26	10% Max.		PASS

Note 1:

FCC – Federal Communications Commission

IC – Industry Canada

## **8 Final Comments**

### **8.1 Conclusion**

Based on the test results in this report, the Avaya 9641GS IP Phone met the requirements of the FCC Part 68, section 68.316 and 68.317 and Industry Canada CS-03, Part V standards.

### **8.2 Test Failures**

None.

## 9 Appendix A

### 9.1 Photographs of Test Sample and Test Configuration

Test Sample



ROLR Test Configuration



HAC Test Configuration



## **10 Appendix B**

### **10.1 Plots Attached**

*End of document*