

## Test Report

<b>Product</b>	DECT handset	
<b>Name and address of the applicant</b>	Ascom Sweden AB Grimbodalen 2P.O.Box 8783 SE-40276 Goteborg,Sweden	
<b>Name and address of the manufacturer</b>	Ascom Sweden AB Grimbodalen 2P.O.Box 8783 SE-40276 Goteborg,Sweden	
<b>Model</b>	DH6 and DH7	
<b>Rating</b>	3.7Vdc	
<b>Trademark</b>	Ascom	
<b>Serial number</b>	DH6: T26105P1I7 DH7: T26105O4IC	
<b>Additional information</b>	DH7 is a Bluetooth version	
<b>Tested according to</b>	CS-03 Part V Issue 9 FCC 47 FR part 68.316/317	
<b>Order number</b>	296394	
<b>Tested in period</b>	2015.12.02 – 2015.12.03 & 2016.09.08	
<b>Issue date</b>	2016.09.08	
<b>Name and address of the testing laboratory</b>	<b>Nemko Group</b> Nemko AS Gaustadalléen 30, P.O.Box 73 Blindern, Tel: +47 22 96 03 30 0314 Oslo, Norway Fax: +47 22 96 05 50	
	 	
	An accredited technical test executed under the Norwegian accreditation scheme	
	 Prepared by [G.Suhanthakumar]	 Approved by [Frode Sveinsen]
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## CONTENTS

<b>1</b>	<b>TEST INFORMATION .....</b>	<b>3</b>
1.1	Tested item.....	3
1.2	Test environment.....	4
1.2.1	Normal test condition .....	4
1.3	Test equipment.....	4
1.4	Other comments.....	4
<b>2</b>	<b>TEST REPORT SUMMARY .....</b>	<b>5</b>
2.1	General.....	5
2.2	Test summary.....	6
2.3	Description of modification for Modification Filing .....	6
2.4	Comments .....	6
<b>3</b>	<b>Test Results .....</b>	<b>7</b>
3.1	CS-03 part V /FCC part 68 Chapter 1: Introduction.....	7
3.2	CS-03 part V /FCC part 68 Chapter 2: General Requirements .....	7
3.3	CS-03 part V / FCC part 68 Chapter 3: Exemptions.....	7
3.4	CS-03 part V /FCC part 68 Chapter 4: TECHNICAL REQUIREMENTS.....	7
3.5	Axial field intensity.....	8
3.6	Radial field intensity .....	12
3.7	Magnetic field Intensity Frequency response, Axial .....	21
3.8	Hearing aid compatibility volume control.....	24
<b>4</b>	<b>MEASUREMENT UNCERTAINTY .....</b>	<b>27</b>
<b>5</b>	<b>TEST EQUIPMENT USED .....</b>	<b>28</b>
<b>6</b>	<b>Photos of EUT.....</b>	<b>29</b>
<b>7</b>	<b>Photo of the test-set-up .....</b>	<b>34</b>

## 1 TEST INFORMATION

### 1.1 Tested item

Name :	DECT handset
Model/version :	DH6-ABAA DH7-ADAA
Serial number :	DH6: T26105P117 DH7: T26105O4IC
Hardware identity and/or version:	/
Software identity and/or version :	0.4.9
Desktop Charger :	NA

#### Description of Tested Device(s)

The ASCOM DH6 and DH7 is a DECT handset. The DH7 is a Bluetooth version

## 1.2 Test environment

### 1.2.1 Normal test condition

Temperature:	20 - 23 °C
Relative humidity:	30 - 50 %
Normal test voltage:	3.7Vdc

The values are the limit registered during the test period.

## 1.3 Test equipment

See list of test equipment in clause 5.

## 1.4 Other comments

The testing was performed according to all relevant requirements of the test standard and the results comply in full with the requirements.

## 2 TEST REPORT SUMMARY

### 2.1 General

The tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with:

- CS-03 Part V Issue 9 , November 2004; Requirements and test methods for magnetic output from Handset Telephones for Hearing Aid Coupling
- FCC 47CFR part 68.316/317 ; Hearing aid compatibility magnetic field intensity requirements: Technical standards.

Nemko Norway at Kjeller is accredited by Norwegian accreditation to CS-03 Part V and recognized by Industry Canada, CAB identifier NO0470, IC#2040D. The tests included in this report are within the scope of the accreditation.

Production Unit

Pre-production Unit



#### **THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.**

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

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## 2.2 Test summary

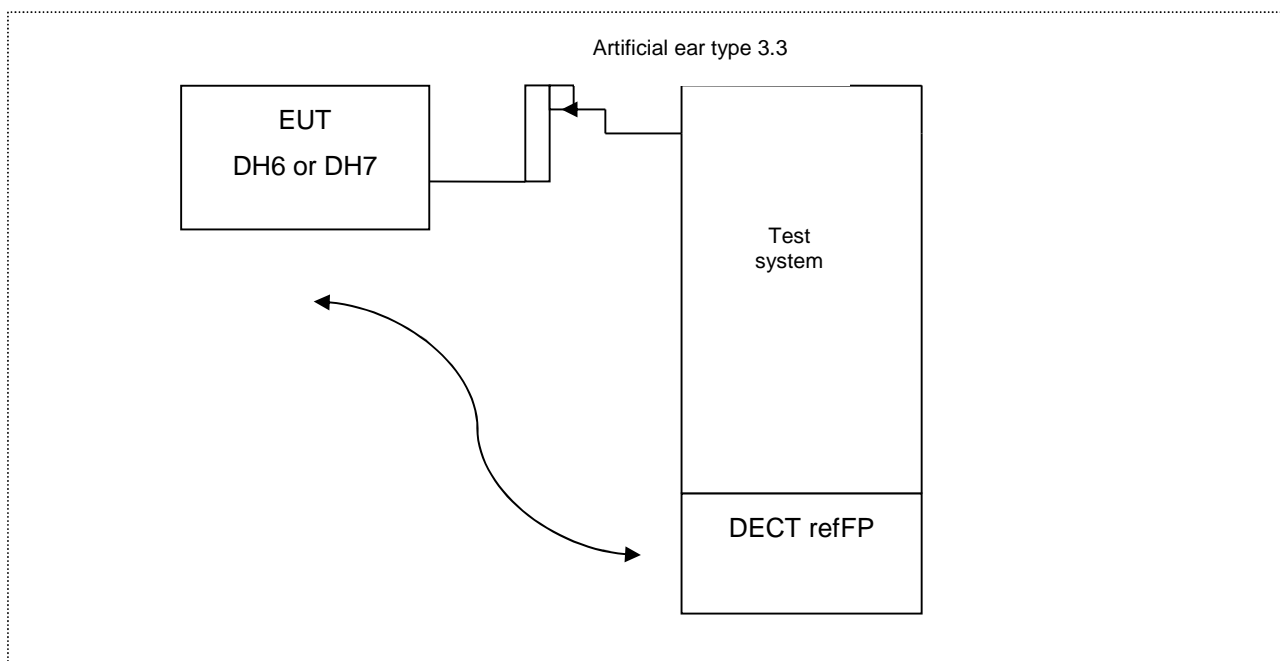
Name of test	FCC part 68	CS-03 part V	Verdict
Axial field intensity	316- 4.2	4.1.2	PASS
Radial field intensity	316- 4.3	4.1.3	PASS
Magnetic field intensity Frequency response	316-	4.1.4	PASS
Hearing aid compatibility volume control	317	5.1	PASS
Automatic dialing and automatic redialing	318	-	NA

## 2.3 Description of modification for Modification Filing

No modifications were made during the test.

## 2.4 Comments

The EUT is connected to RefFP.



### **3 Test Results**

#### **3.1 CS-03 part V /FCC part 68 Chapter 1: Introduction**

Ref. CS-03 part V

#### **3.2 CS-03 part V /FCC part 68 Chapter 2: General Requirements**

Ref. CS-03 part V

#### **3.3 CS-03 part V / FCC part 68 Chapter 3: Exemptions**

Ref. CS-03 part V

#### **3.4 CS-03 part V /FCC part 68 Chapter 4: TECHNICAL REQUIREMENTS**

### 3.5 Axial field intensity

Para. No.: 68.316/CS-03 part V 4.1.2

<b>Test Performed By:</b> G.Suhandhakumar	<b>Date of Test:</b> 2015.12.02
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**Test condition:** Nominal volume setting (Level 4)

**Test Results:** Complies

**Measurement Data:**

Measured Axial field intensity at 1kHz for an input of -10dBm0 at digital interface gives 0 dBPa :

EUT	Position in degree	Calculated Axial field intensity (dB A/m)	Limit (dB A/m)	Verdict
DH6	-	2.6	$\geq -22$	PASS
DH7	-	2.7	$\geq -22$	PASS

See attached graphs below

**Requirement:**

Axial field intensity: shall be greater than -22 dB relative 1 A/m for an input of -10 dBV (or -18dBV (-16dBm0)) at 1kHz.

The magnetic field intensity frequency response graph fig 4.3 or fig 4.4. For field intensity greater than -19 dB relative 1 A/m the frequency response shall be according to fig 4.1 of fig. 4.2.

Radial field intensity: shall be greater than -27 dB relative 1 A/m for an input of -10 dBV at 1kHz.

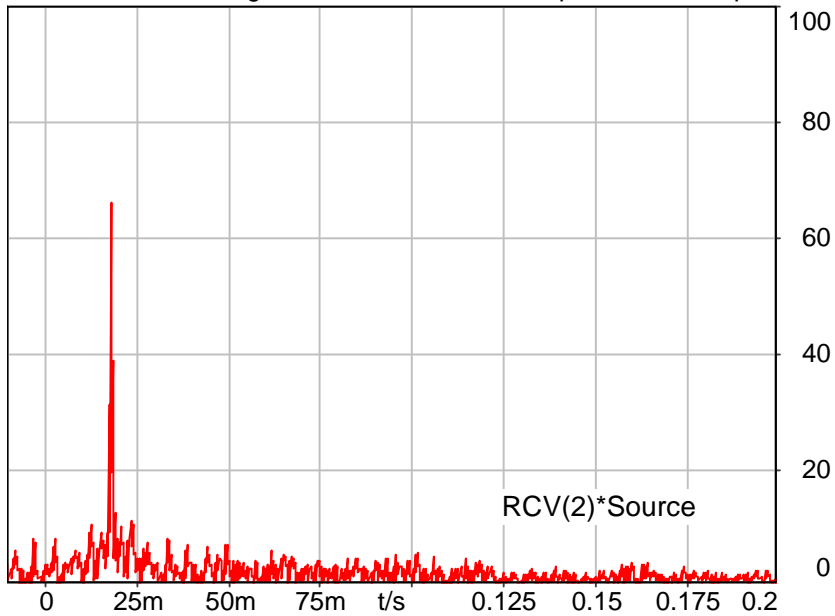


## Preparation: Overall Delay and input level to Probe Coil

Input level calibration - -10dBm0 gives 0 dBPa at the receiver

47 CFR § 68.316: Hearing Aid Compatibility

Cross correlation avg. FFT Size:65536 Overlap:0,0% Envelope %

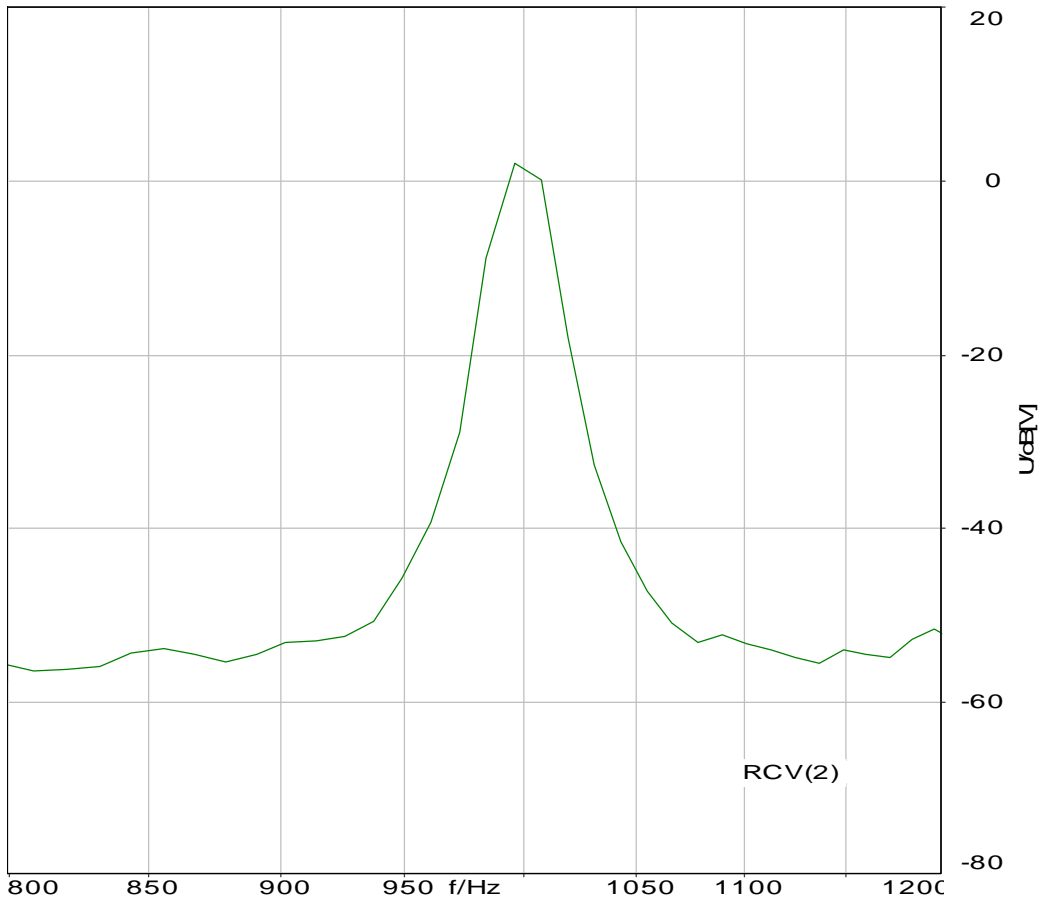


Delay (Cross): 18,4 ms

02.12.2015 11:11 ACQUA 3.3.200

### 4.1.2 /4.2 Axial Field Intensity Dig

#### DH6



value RCV(2): 2.6 dBV/ A/m Ok

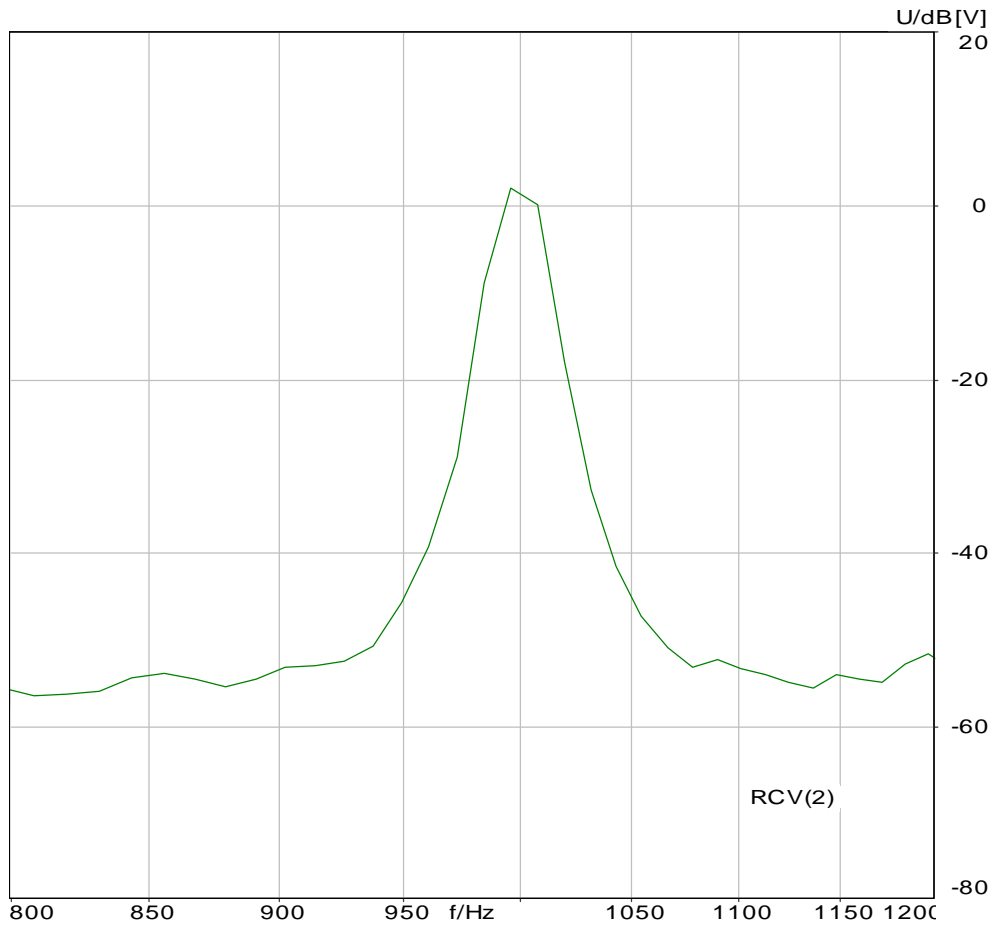
Ok

03.12.2015 09:49 ACQUA 3.3.200

**Limits**

	lower
Run 1	-22.00 dBV/ A/m

**DH7**



value RCV(2): 2.7 dBV/ A/m Ok

**Ok**

03.12.2015 09:49 ACQUA 3.3.200

**Limits**

	lower
Run 1	-22.00 dBV/ A/m

### 3.6 Radial field intensity

Para. No.: 68.316/CS-03 part V 4.1.3

<b>Test Performed By:</b> G.Suhandhakumar	<b>Date of Test:</b> 2015.12.02
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**Test condition:** Nominal volume setting (Level 4)

**Test Results:** **Complies**

**Measurement Data:**

Measured Axial field intensity at 1kHz for an input of -9dBm0 at digital interface gives 0 dBPa :

EUT	Position in degrees	Calculated radial field intensity (dB A/m)	Limit (dB A/m)	Verdict
DH6/DH7	0 or 360	-11.6/-10.7	$\geq -27$	PASS
DH6/DH7	90	-9.1/-9.9	$\geq -27$	PASS
DH6/DH7	180	-8.2/-9.9	$\geq -27$	PASS
DH6/DH7	270	-9.4/-11.1	$\geq -27$	PASS

See attached graphs below.

**Requirement:**

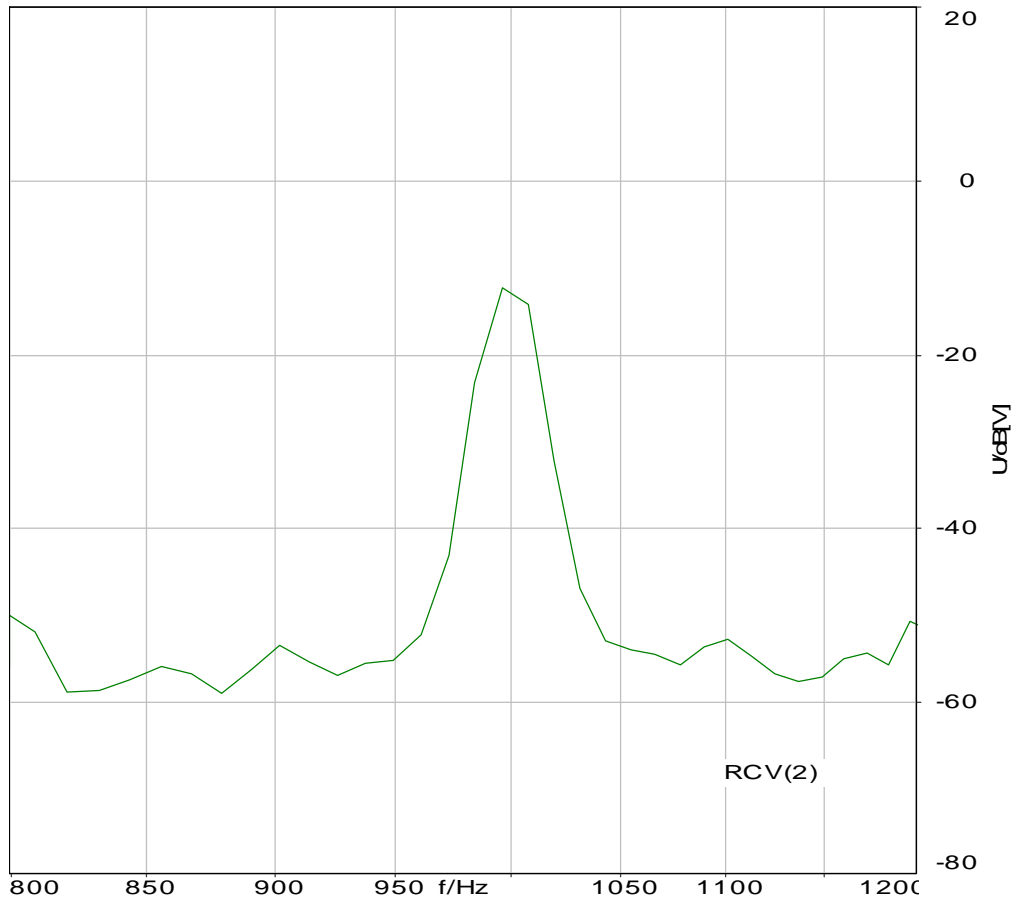
Axial field intensity: shall be greater than -22 dB relative 1 A/m for an input of -10 dBV (or -18dBV (-16dBm0)) at 1kHz.

The magnetic field intensity frequency response graph fig 4.3 or fig 4.4. For field intensity greater than -19 dB relative 1 A/m the frequency response shall be according to fig 4.1 of fig. 4.2.

Radial field intensity: shall be greater than -27 dB relative 1 A/m for an input of -10 dBV at 1kHz.

### 4.1.3/4.3 Radial Field Intensity Dig, 0 deg

#### DH6



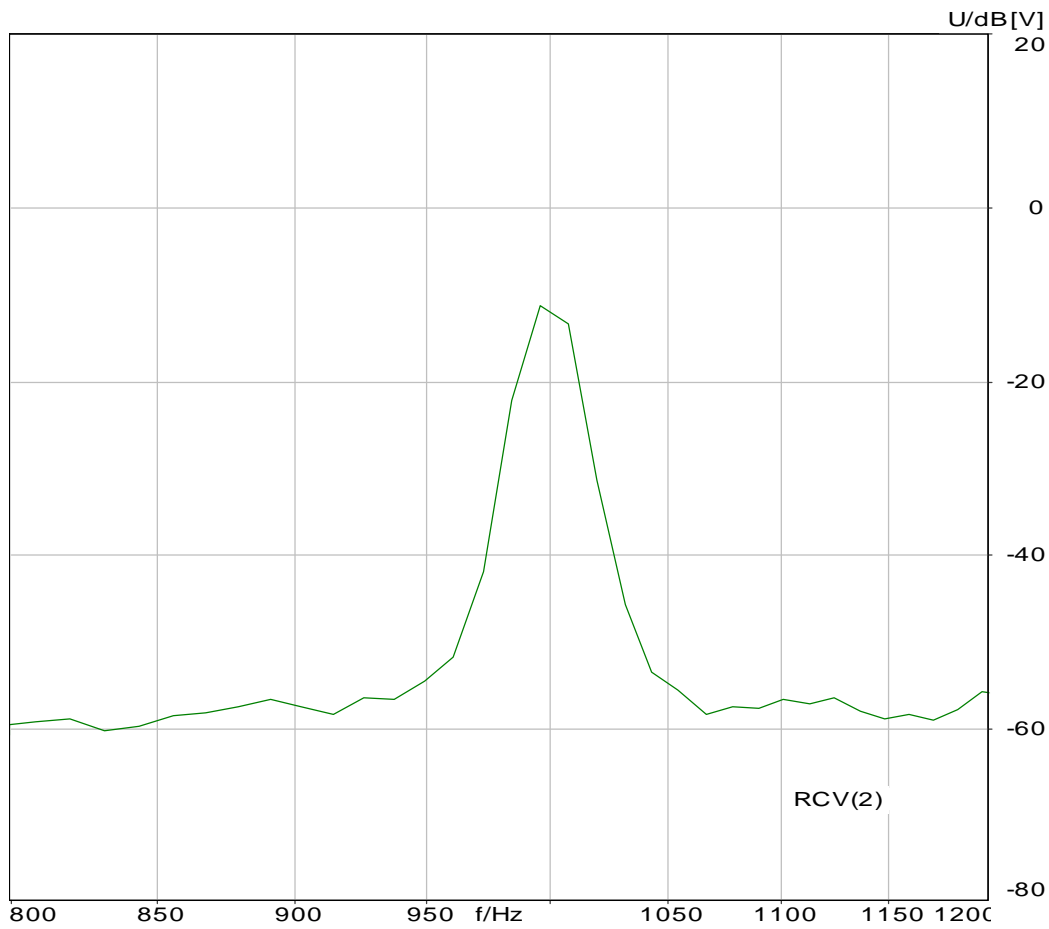
value RCV(2): -11.6 dBV/ A/m Ok

02.12.2015 11:14 ACQUA 3.3.200

**Limits**

	lower
Run 1	-27.00 dBV/ A/m

**DH7**



value RCV(2): -10.7 dBV/ A/m Ok

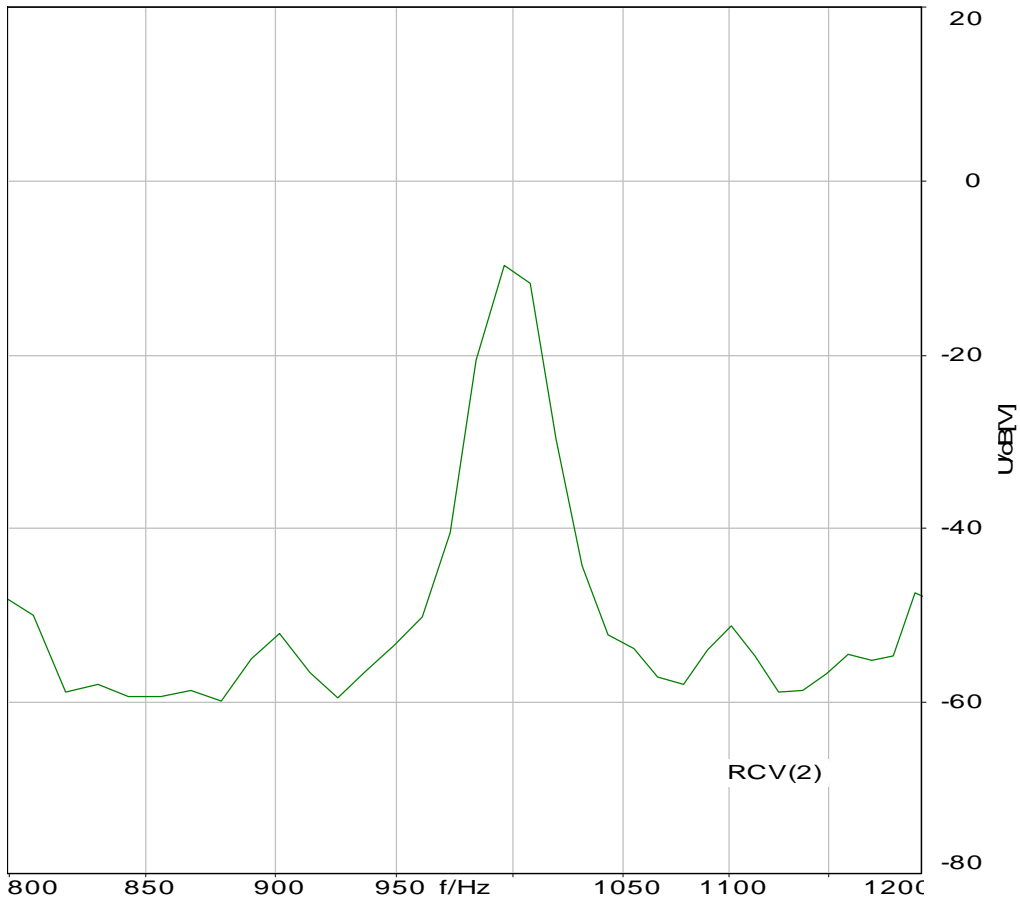
02.12.2015 11:14 ACQUA 3.3.200

**Limits**

	lower
Run 1	-27.00 dBV/ A/m

### 4.1.3/4.3 Radial Field Intensity Dig, 90 deg

#### DH6



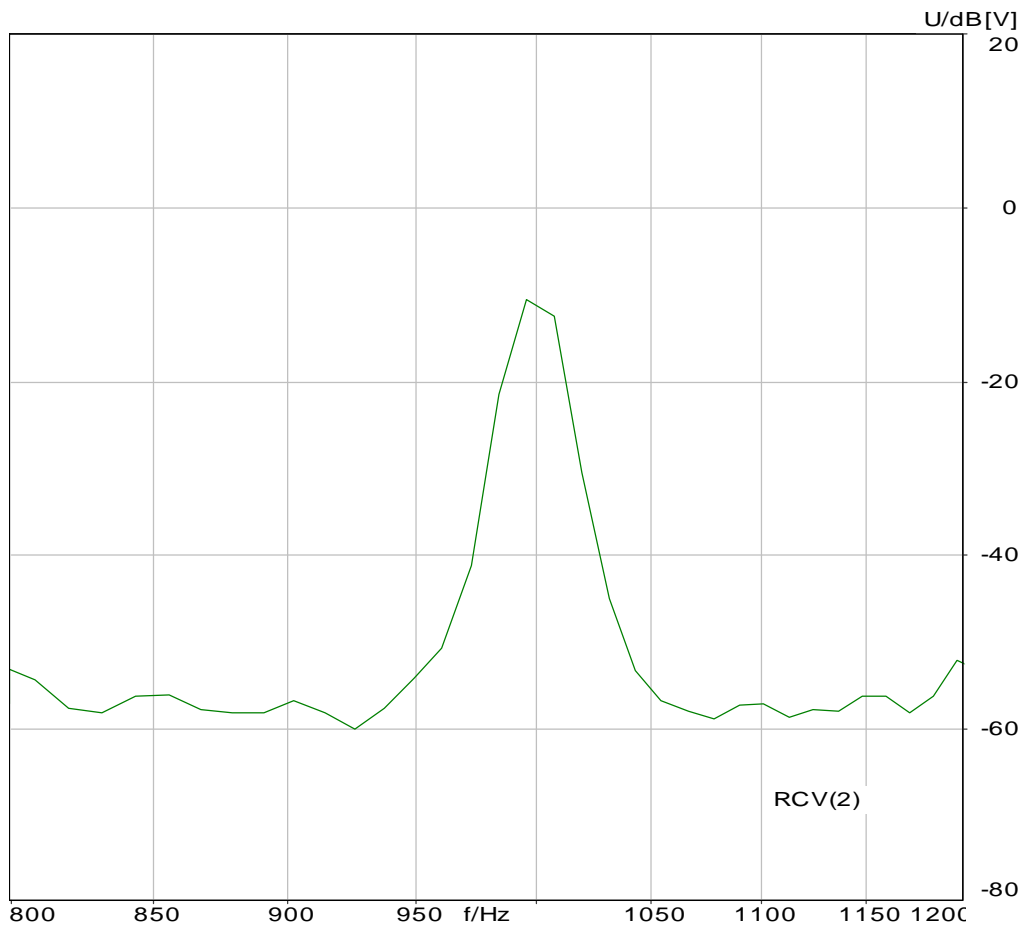
value RCV(2): -9.1 dBV/ A/m Ok

02.12.2015 11:14 ACQUA 3.3.200

**Limits**

	lower
Run 1	-27.00 dBV/ A/m

**DH7**



value RCV(2): -9.9 dBV/ A/m Ok

02.12.2015 11:14 ACQUA 3.3.200

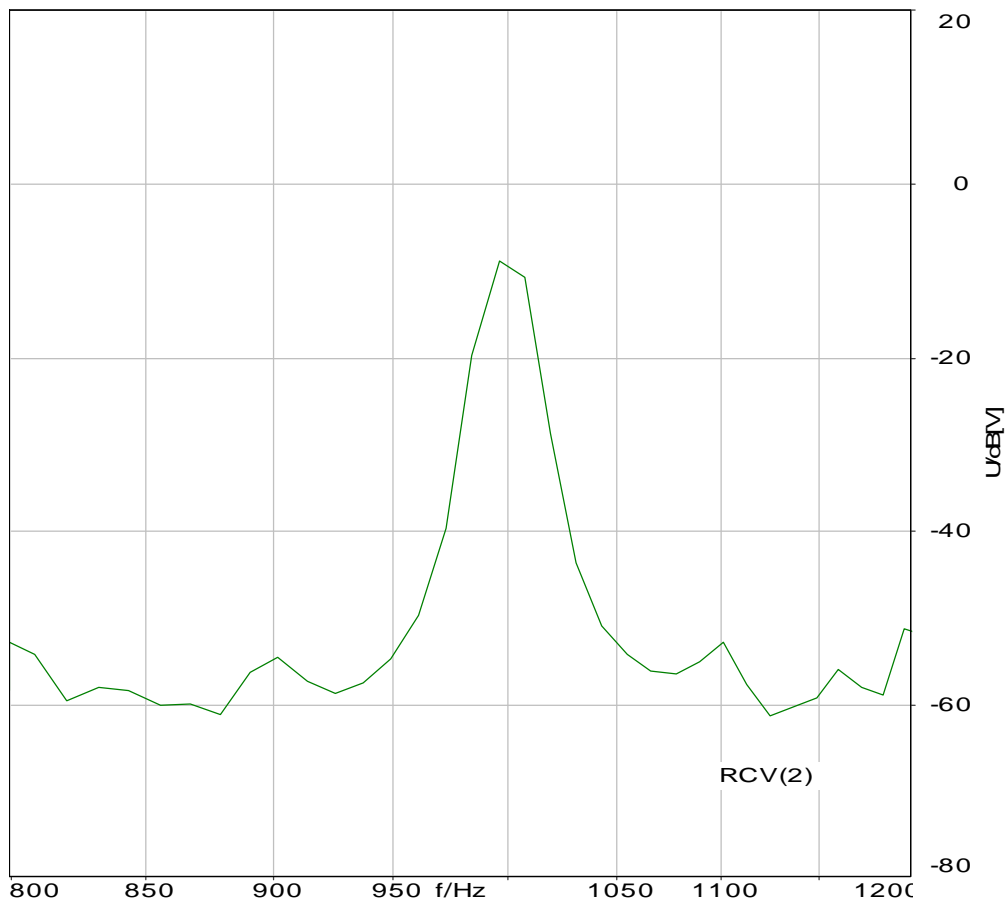
**Limits**

	lower
Run 1	-27.00 dBV/ A/m



### 4.1.3 Radial Field Intensity Dig, 180 deg

#### DH6



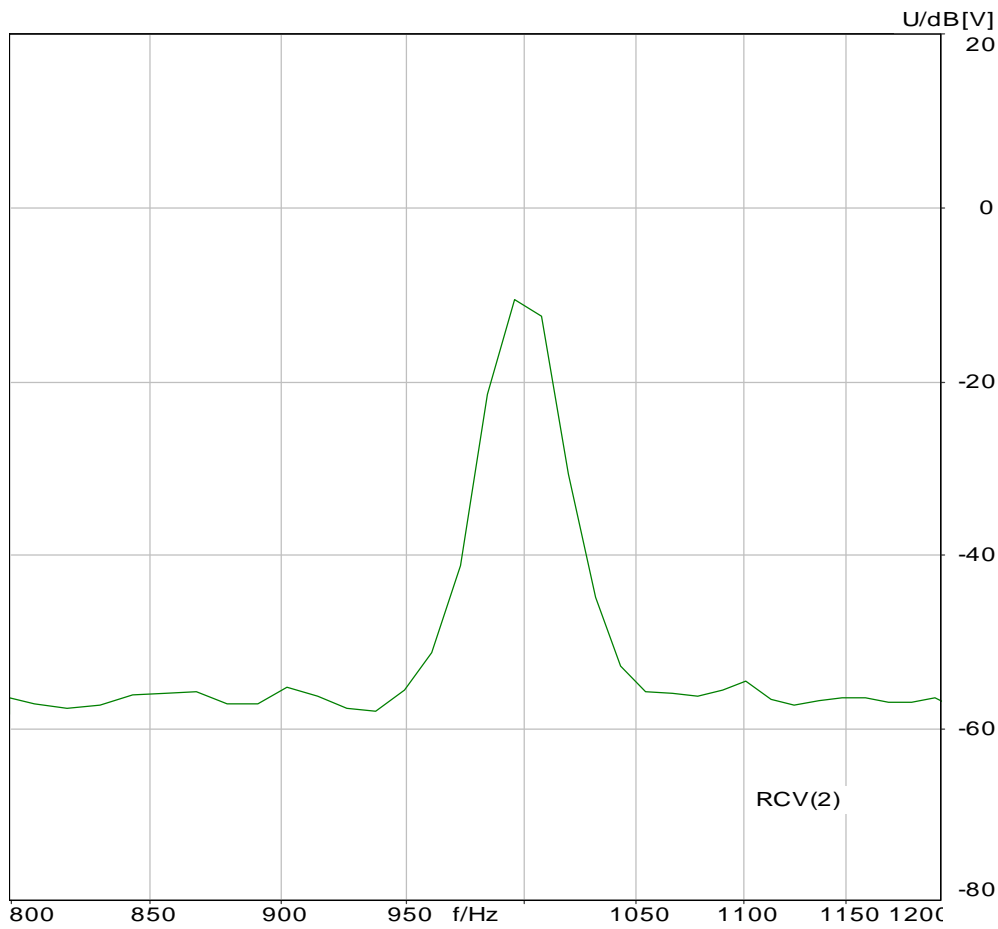
value RCV(2): -8.2 dBV/ A/m Ok

02.12.2015 11:14 ACQUA 3.3.200

**Limits**

	lower
Run 1	-27.00 dBV/ A/m

**DH7**



value RCV(2): -9.9 dBV/ A/m Ok

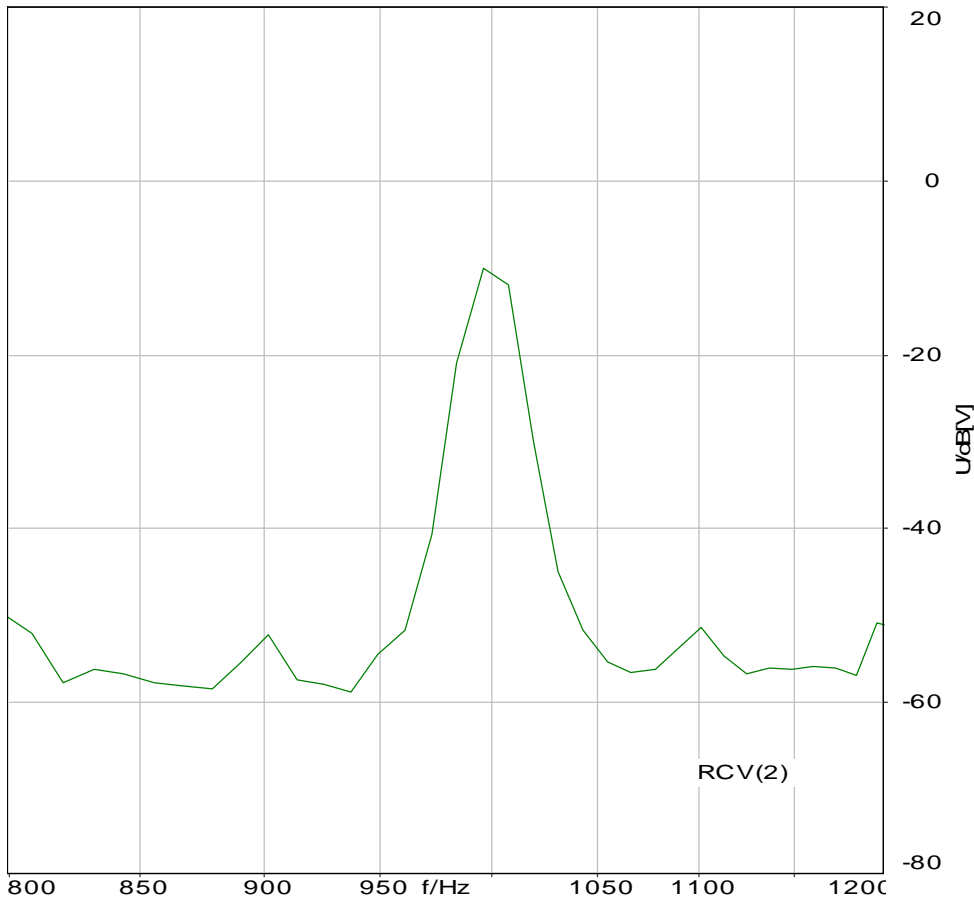
02.12.2015 11:14 ACQUA 3.3.200

**Limits**

	lower
Run 1	-27.00 dBV/ A/m

### 4.1.3 Radial Field Intensity Dig, 270 deg

#### DH6



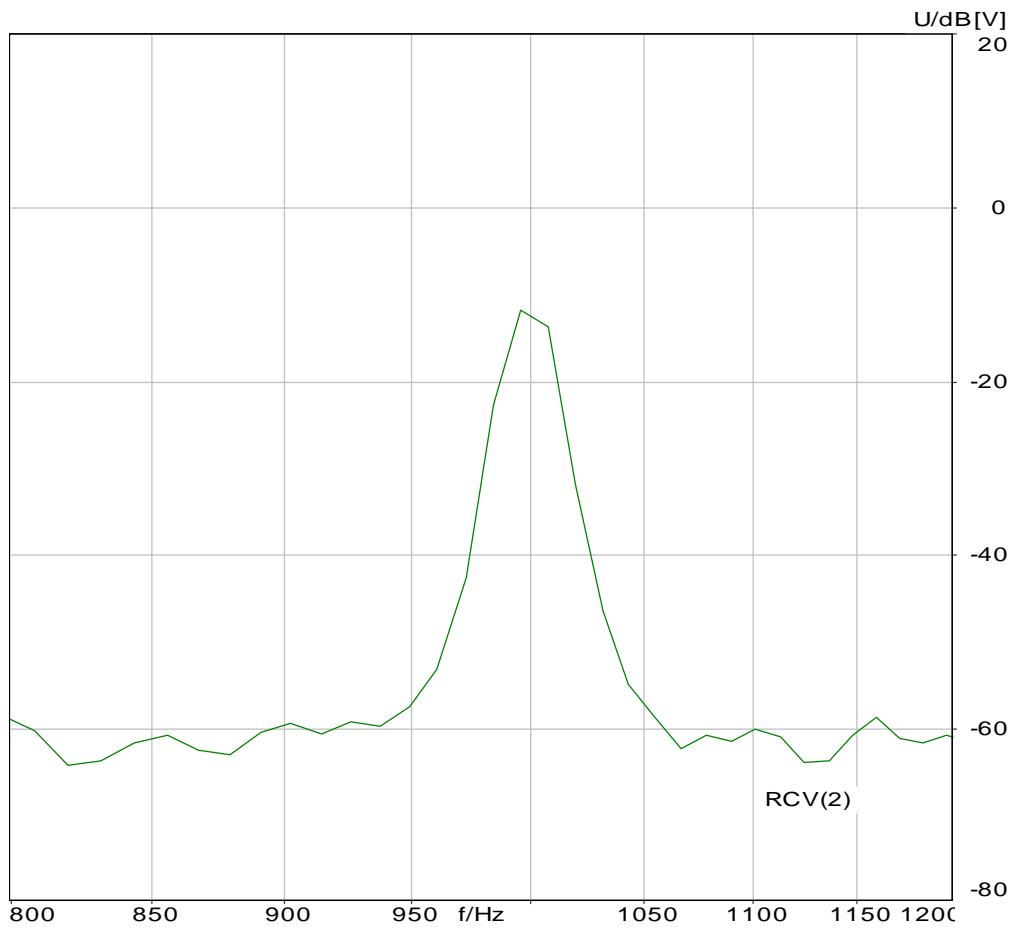
value RCV(2): -9.4 dBV/ A/m Ok

02.12.2015 11:14 ACQUA 3.3.200

#### Limits

	lower
Run 1	-27.00 dBV/ A/m

**DH7**



value RCV(2): -11.1 dBV/ A/m Ok

02.12.2015 11:14 ACQUA 3.3.200

**Limits**

	lower
Run 1	-27.00 dBV/ A/m

### 3.7 Magnetic field Intensity Frequency response, Axial

Para. No.: 68.316/CS-03 part V 4.1.4

Test Performed By: G.Suhandhakumar	Date of Test: 2015.12.02
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**Test condition:** Nominal volume setting (Level 4)

**Test Results:** **Complies**

#### Measurement Data:

See attached for graphs

The measured axial field intensity is greater than -19 dB relative to 1 A/m, therefore fig 4.2 limit mask is used.

#### Requirement:

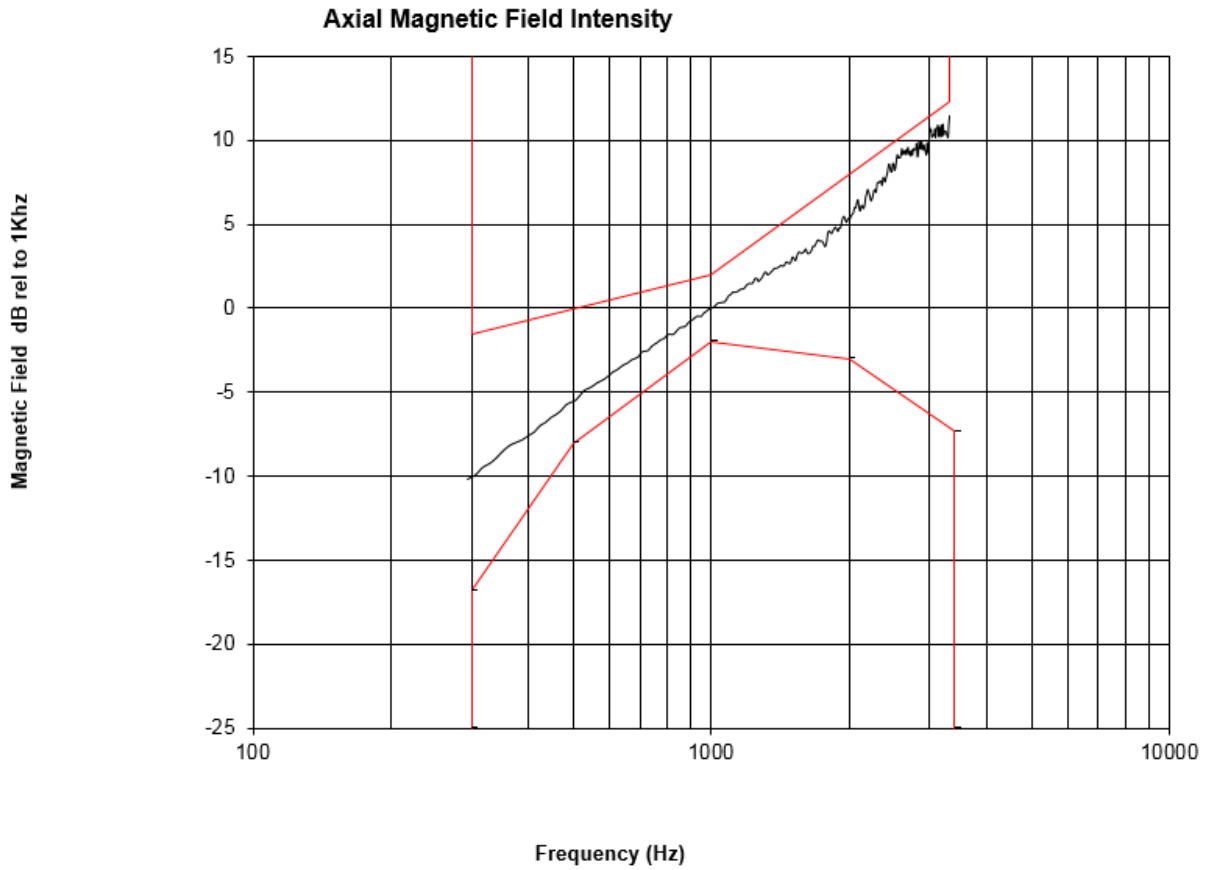
Axial field intensity: shall be greater than -22 dB relative 1 A/m for an input of -10 dBV or -18dBV (-16dBm0)) at 1kHz.

The magnetic field intensity frequency response graph fig 4.3 or fig 4.4. For field intensity greater than -19 dB relative 1 A/m the frequency response shall be according to fig 4.1 of fig. 4.2.

Radial field intensity: shall be greater than -27 dB relative 1 A/m for an input of -10 dBV at 1kHz.

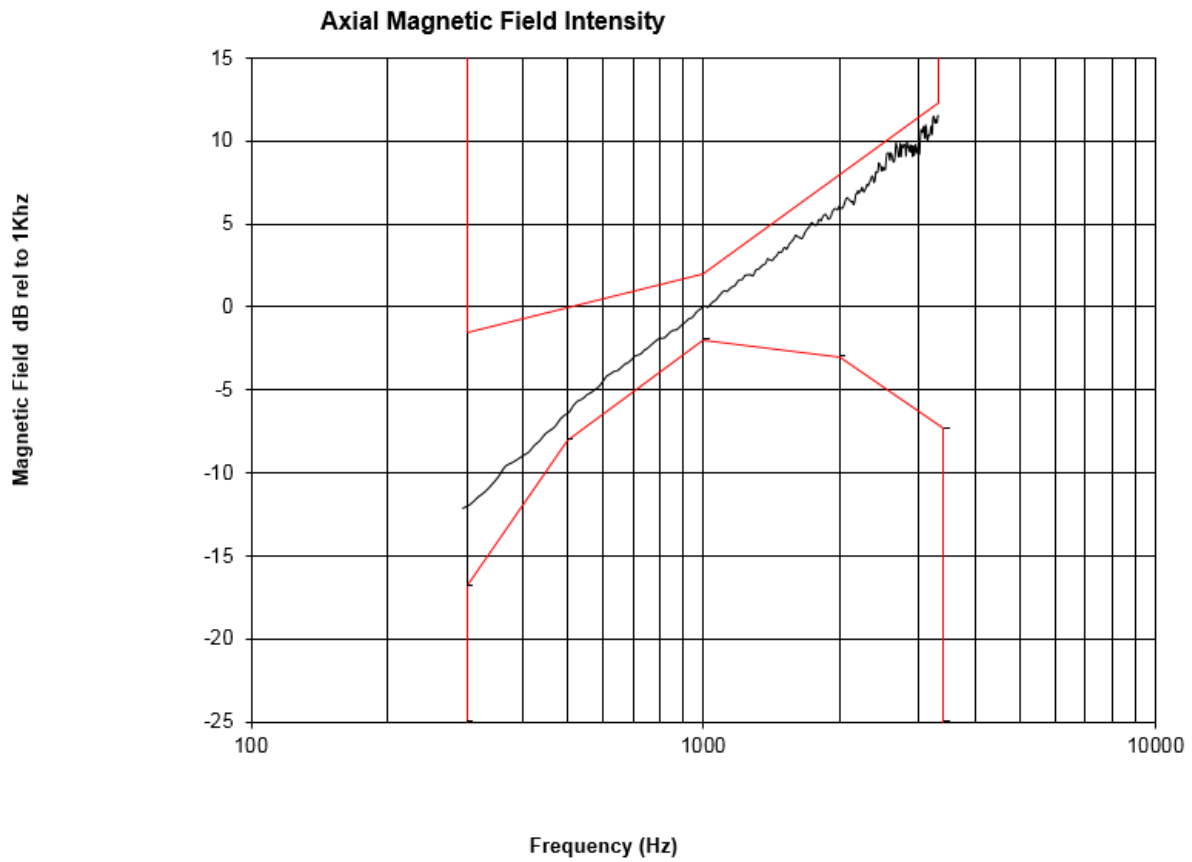
### 4.1.4 Frequency Response, Axial Component, Dig

#### DH6



08.09.2016 08:04 ACQUA 3.3.200

**DH7**



08.09.2016 08:14 ACQUA 3.3.200

### 3.8 Hearing aid compatibility volume control

Para. No.: 68.317/CS-03 part V 6.0

Test Performed By: G.Suhandhakumar	Date of Test: 2015.12.02
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Test Results: **Complies**

Measurement Data:

DH6:

Volume setting/Line length (0km)	ROLR (dB)	Limit (dB)
High	34.57	-
Nominal	47.59	(+46 – +51 dB)
Gain	12.53	< 18 dB
Compliance	PASS	

DH7:

Volume setting/Line length (0km)	ROLR (dB)	Limit (dB)
High	35.67	-
Nominal	48.44	(+46 – +51 dB)
Gain	12.70	< 18 dB
Compliance	PASS	

Nominal volume setting is : level 4

(The receive volume can be regulated manually by user , Level 1 to level 8)

Requirement:

For digital telephone sets the nominal ROLR is +48.5 dB, within a permissible range of +46- +51 dB.

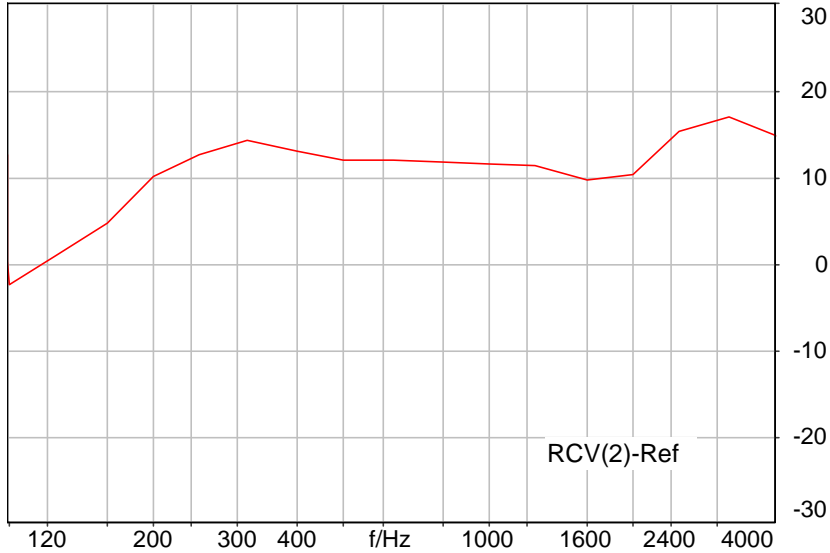
The minimum gain 12 dB and maximum gain 18 dB. If maximum gain exceeds 18 dB .



## 68.317 ROLR of digital Telephone, nom. vol. level-DH6

47 CFR § 68.317: Hearing Aid Compatibility Volume Control \ Digital Phones

DRP/ERP 3rd Octave FFT Size:4096 Overlap:75,0% Hanning L/dB[Pa/V]

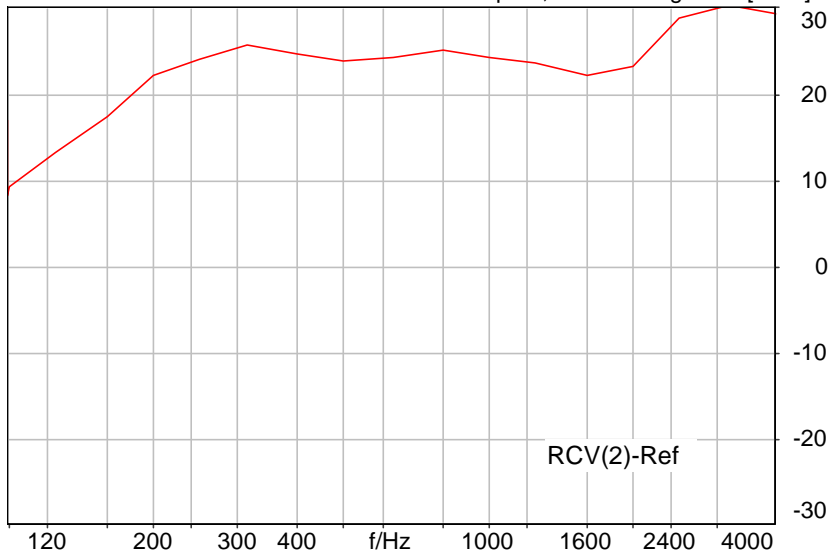


ROLR: 47,59 dB Ok

## 68.317 ROLR of digital Telephone, max. vol. level-DH6

47 CFR § 68.317: Hearing Aid Compatibility Volume Control \ Digital Phones

DRP/ERP 3rd Octave FFT Size:4096 Overlap:75,0% Hanning L/dB[Pa/V]

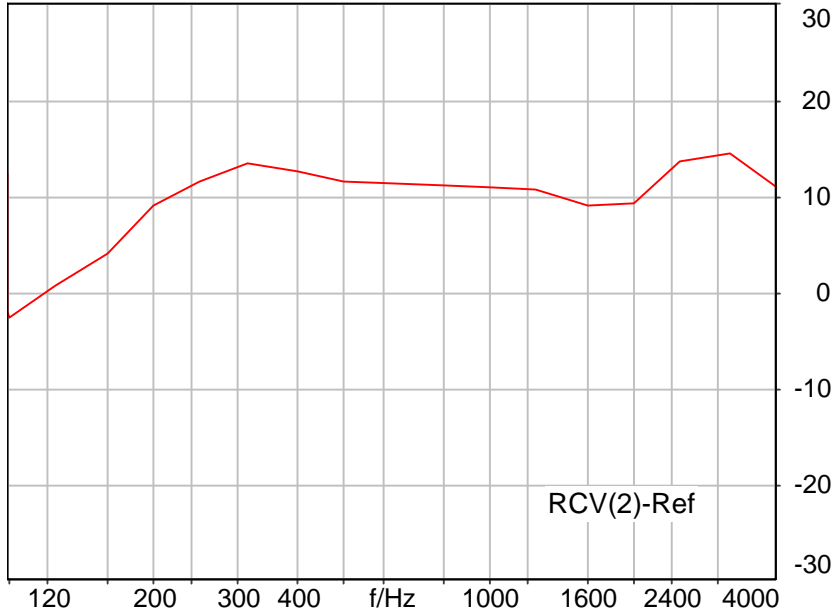


ROLR: 35,06 dB

02.12.2015 11:07 ACQUA 3.3.200

**68.317 ROLR of digital Telephone, nom. vol. level-DH7**

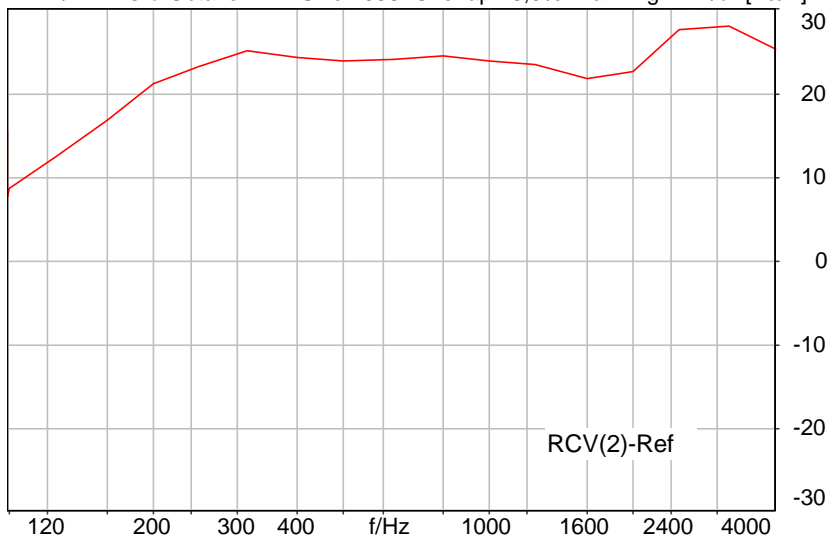
47 CFR § 68.317: Hearing Aid Compatibility Volume Control \ Digital Phones  
 DRP/ERP 3rd Octave FFT Size:4096 Overlap:75,0% Ha L/dB[Pa/V]



ROLR: 48,44 dB Ok

**68.317 ROLR of digital Telephone, max. vol. level – DH7**

47 CFR § 68.317: Hearing Aid Compatibility Volume Control \ Digital Phones  
 DRP/ERP 3rd Octave FFT Size:4096 Overlap:75,0% Hanning f L/dB[Pa/V]



ROLR: 35,67 dB

02.12.2015 11:07 ACQUA 3.3.200

## 4 MEASUREMENT UNCERTAINTY

CS-03 part V	Description	Parameter	Estimated uncertainty
4.2/4.3	Axial and radial sensitivity at 1kHz	dB A/m	± 0.15 dB
4.4	Receiving Frequency response 100 – 10000 Hz	dBPa/V	± 0.2 dB
6.0	Receiving Overall loudness rating	ROLR (dB)	± 0.13 dB

## 5 TEST EQUIPMENT USED

Number	Model name	Manufacturer	Serial number	Cal. date	Cal. due
LT 5474	MFE VIII LAN interface	HEAD Acoustic	-	N/A	N/A
-	ACQUA software v3.3.200	HEAD Acoustic	-	N/A	N/A
LR 1572	MFE VI (Frontend analogue with ear canal coupler and artificial mouth)	HEAD Acoustic	64626147	2013/06	2017/06
LR 1571	Artificial ear type 3.3	HEAD Acoustic	12306232	2013/06	2017/06
LT 5522	HAC probe- Radial	CCL	0325	2015/03	2018/03
LT 5521	HAC probe-Axial	CCL	0325	2015/03	2018/03
LT 5292	Calibrator	B&K	1723569	2015/07	2017/07

## 6 Photos of EUT



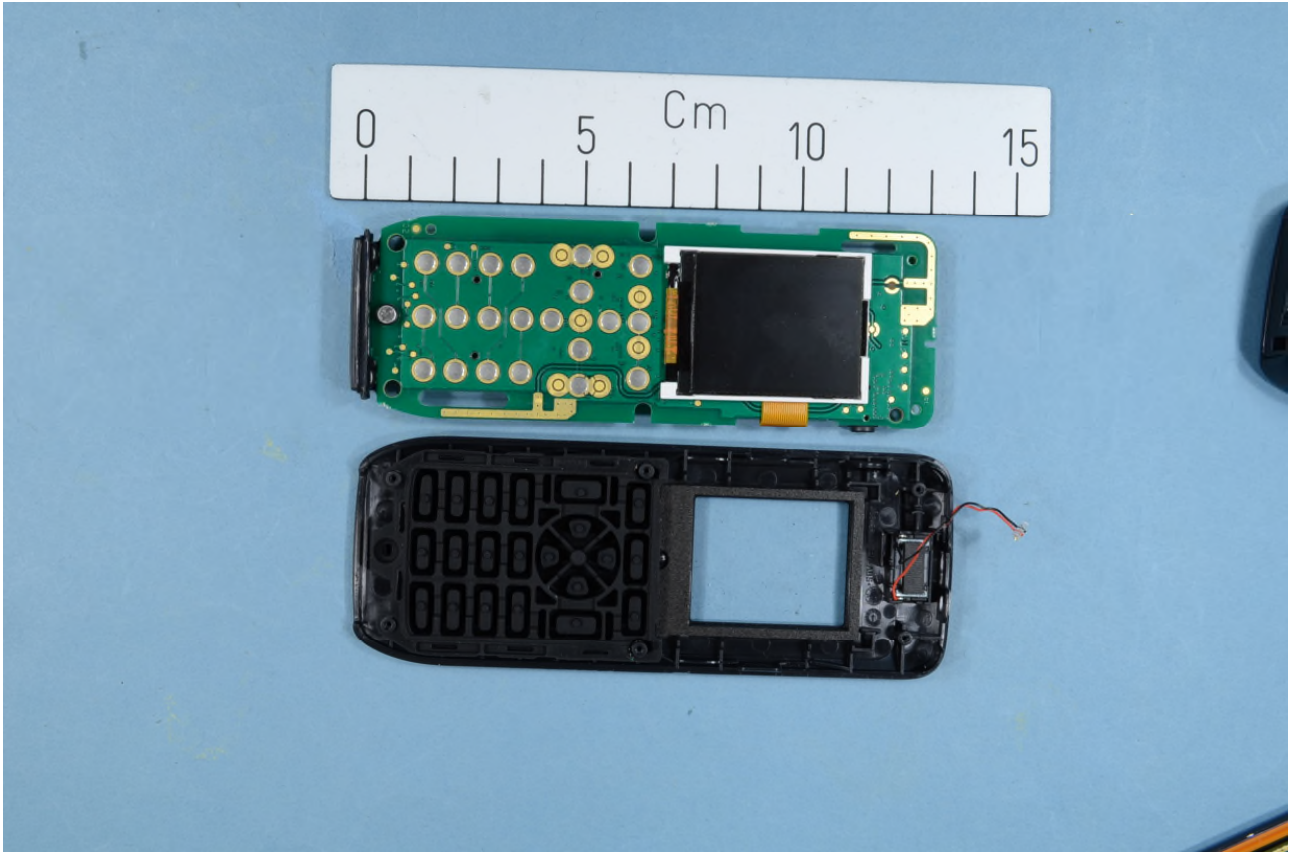
DH6- Front side



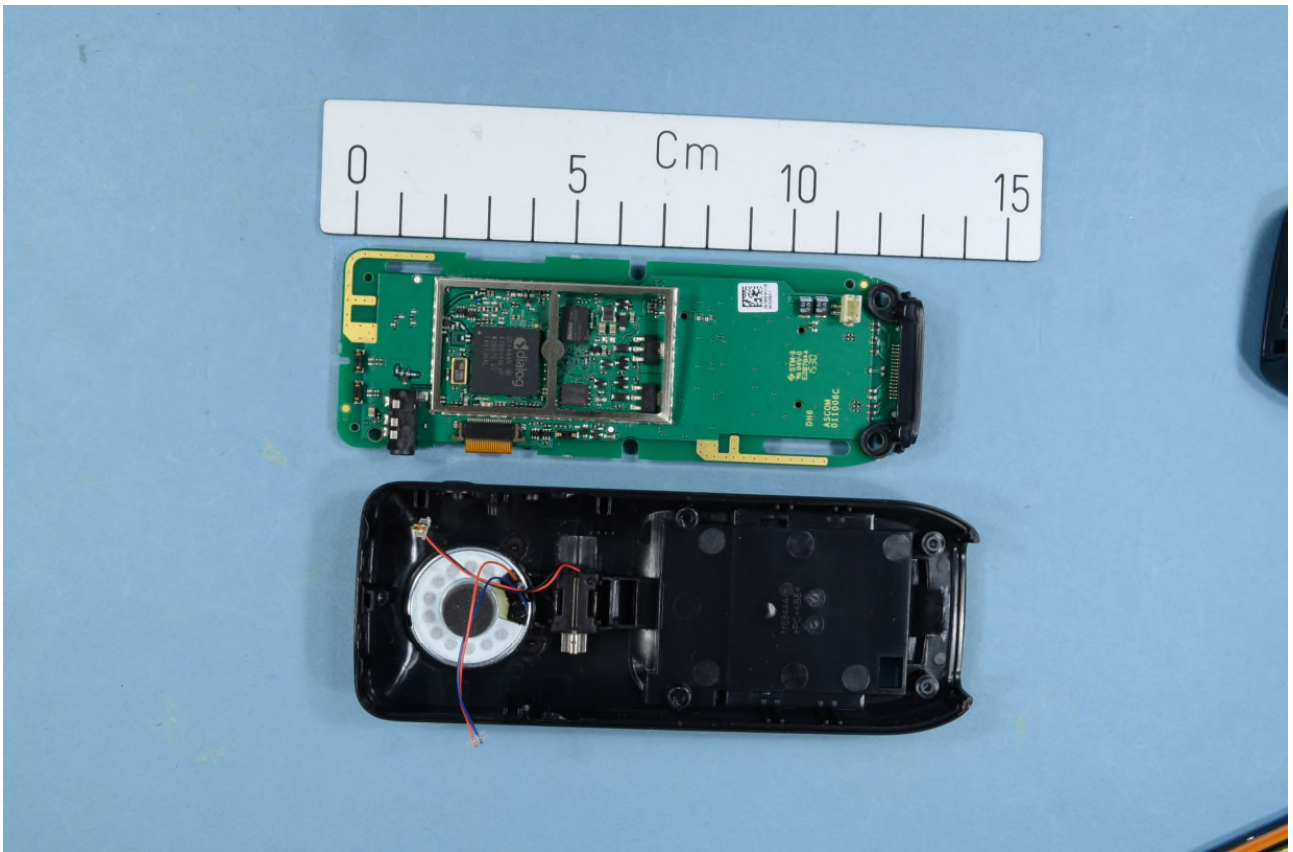
DH6- rear side



DH6- rear side with battery



DH6 – Front PCB



DH6- rear PCB

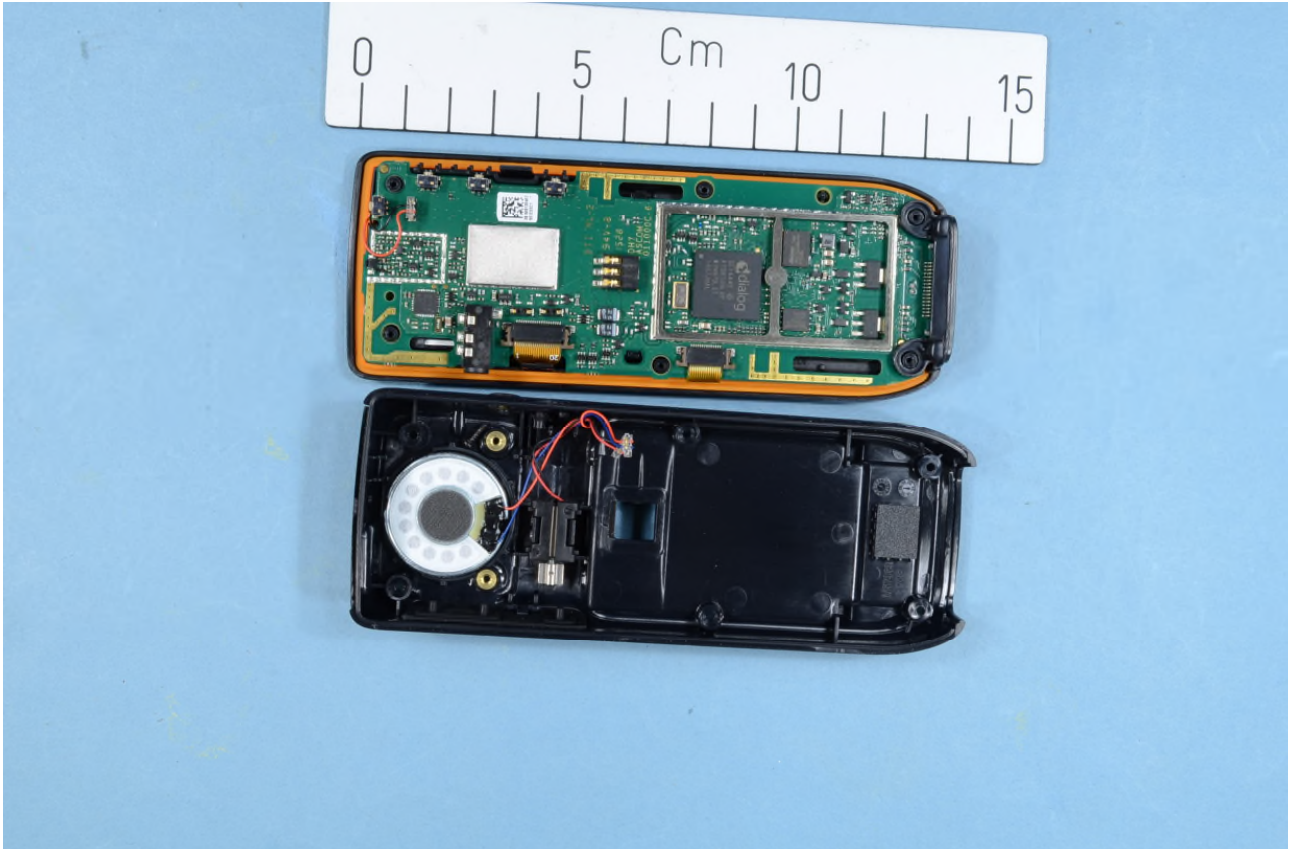


DH7- Front side

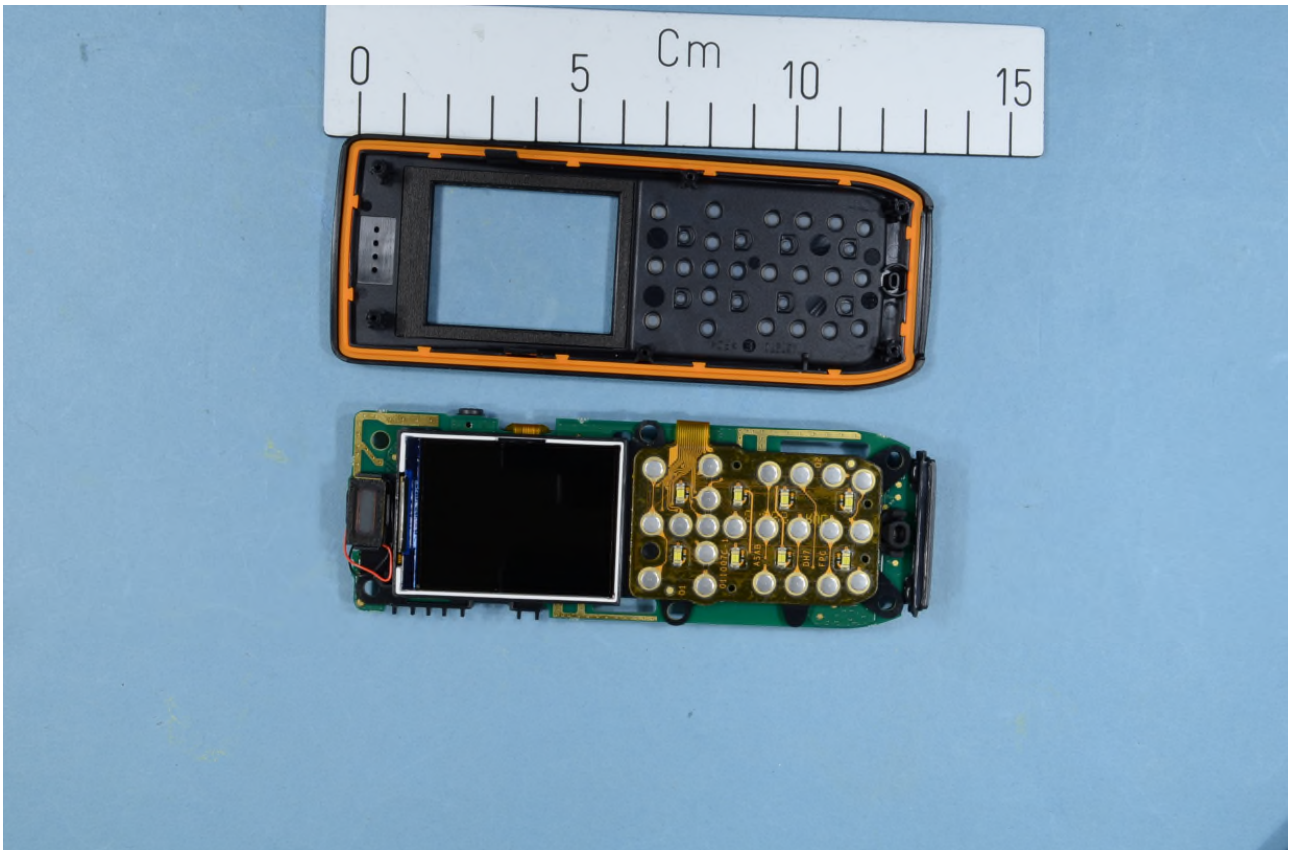


DH7- Rear side





DH7 – Front PCB



DH7 – rear PCB

## 7 Photo of the test-set-up



RORL measurements