

# DELTA Test Report

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## Climatic and mechanical testing of Handset PP5 Series

### Performed for KIRK telecom A/S

Project no.: E501508-2

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including 2 annexes

23 February 2006

#### **DELTA**

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**Title** Climatic and mechanical testing of Handset PP5 Series

**Test object** 5 pcs. Handsets PP5 Series (type Z-4040)

**Project no.** E501508-2

**Test period** September 2003

**Client** KIRK telecom A/S  
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Mr. Peder Mortensen


**Manufacturer** KIRK telecom A/S

**Specifications** Confer with *section 2*

**Results** The Handset type Z-4040 fulfilled the IP52 and IP54 requirements in accordance with IEC 60529, and passed the climatic and mechanical testing.

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**Date** 23 February 2006

**Project manager** 

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Susanne Otto  
Product Manager  
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## 1. General

### 1.1 Introduction

This report describes the results obtained during the climatic and mechanical testing of the Handset PP5 Series manufactured by Kirk Telecom A/S in Denmark.

The PP5 Series covers the Handset type Z-4040 .

The test results relate only to the specimen tested.

### 1.2 Test set-up and functional test

Photos of the test set-ups are enclosed in *annex 1*.

The test specimen was placed on a grating inside the climatic chambers and fixed to the vibrator by means of stays and yokes.

Functional tests were performed before and after each test by simply pressing each key and observe the correct indication on the display.

A visual inspection was performed after the testing.

The client will perform a complete functional test after the testing.

Please contact KIRK telecom A/S if further details about the test specimen and the functional test are needed.

## 2. Tests

The tests are described with reference to specification, severity and procedure.

Photos are enclosed in *annex 1* and measurements curves are enclosed in *annex 2*.

Standard environment:

IEC 60068-1 (1988-06): Environmental testing. Part 1: General and guidance, Amendment 1 (1992-04).

Temperature	:	15°C to 35°C
Humidity	:	25 %RH to 75 %RH
Air pressure	:	86 kPa to 106 kPa (860 mbar to 1060 mbar)

### 2.1 Bump

#### Specification

IEC 60068-2-29 (1987), Test Eb: Bump.

#### Severity and procedure

Peak acceleration	:	40 g
Pulse duration	:	6 ms
Bumps per direction	:	1000
Number of directions	:	6 ( $\pm x$ , $\pm y$ , $\pm z$ )

The test specimen is energised and observed during the exposures.

A functional test and a visual inspection are performed after the exposure.

#### Results

No malfunction was observed during the exposures and the function of the test specimen was OK after the exposures.

No damage was observed after the exposures.

### 2.2 Salt fog

#### Specification

MIL-STD-810F, Procedure 509.4

### **Severity and procedure**

Salt solution (spray)	:	5% NaCl
Spraying storage	:	35°C
Spraying duration	:	24 hours
Drying storage	:	40°C and less than 50% RH
Drying period	:	24 hours
Number of cycles	:	2 (a total of 4 days)

The test specimen is de-energised during the exposure.

After recovery in standard environment the test specimen is energised and a functional test and a visual inspection are performed.

### **Results**

The function of the test specimen was OK after recovery.

No corrosion attack was observed after the exposure.

## **2.3 Enclosure protection (dripping)**

### **Specification**

IEC 60529 (2001-02), Ed. 2.1: Degrees of protection provided by enclosures (IP Code)

### **Severity and procedure**

IPx2 (dripping):

Test means	:	Drip box
Vertical positions	:	±15° in two mutually perpendicular planes
Water flow rate	:	3 mm/min
Duration	:	2.5 min per position (10 min totally)

The test specimen is de-energized during the exposure.

A functional test and a visual inspection are performed after the exposure.

### **Results**

The function of the test specimen was OK after the exposure.

No water ingress was observed after the exposure.

## 2.4 Enclosure protection (splashing)

### Specification

IEC 60529 (2001-02), Ed. 2.1: Degrees of protection provided by enclosures (IP Code)

### Severity and procedure

IPx4 (splashing):

Test means	:	Oscillating tube
Spray direction	:	$\pm 180^\circ$
Water flow rate	:	0.07 l/min per hole
Duration	:	10 min

The test specimen is de-energized during the exposure.

A functional test and a visual inspection are performed after the exposure.

### Results

The function of the test specimen was OK after the exposure.

One drop of water was observed under the keyboard membrane after disassembling of the test specimen. However, it was concluded that this drop of water had passed the edge of the membrane during the disassembling. The exposure itself did not cause any water ingress.

## 2.5 Enclosure protection (dust-protected)

### Specification

IEC 60529 (2001-02), Ed. 2.1: Degrees of protection provided by enclosures (IP Code)

### Severity and procedure

IP5x (dust-protected):

Test means	:	Dust chamber
Category	:	2 (no pressure difference)
Dust material	:	Talcum powder
Amount	:	2 kg/m <sup>3</sup>
Duration	:	8 hours

The test specimen is de-energized during the exposure.

A functional test and a visual inspection are performed after the exposure.

## **Results**

The function of the test specimen was OK after the exposure.

No dust deposit was observed inside the test specimen after the exposure.



## **Annex 1**

### **Photos**



PHOTO 1. Handset PP5 Series Z-4040.

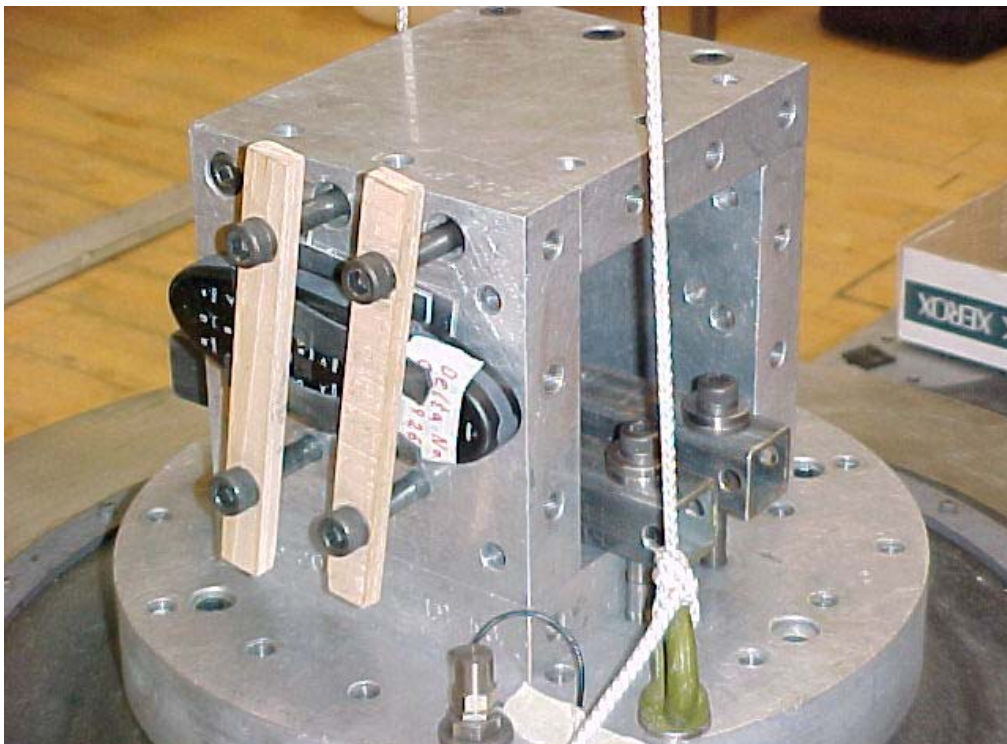


PHOTO 2. Test set-up for bump testing.

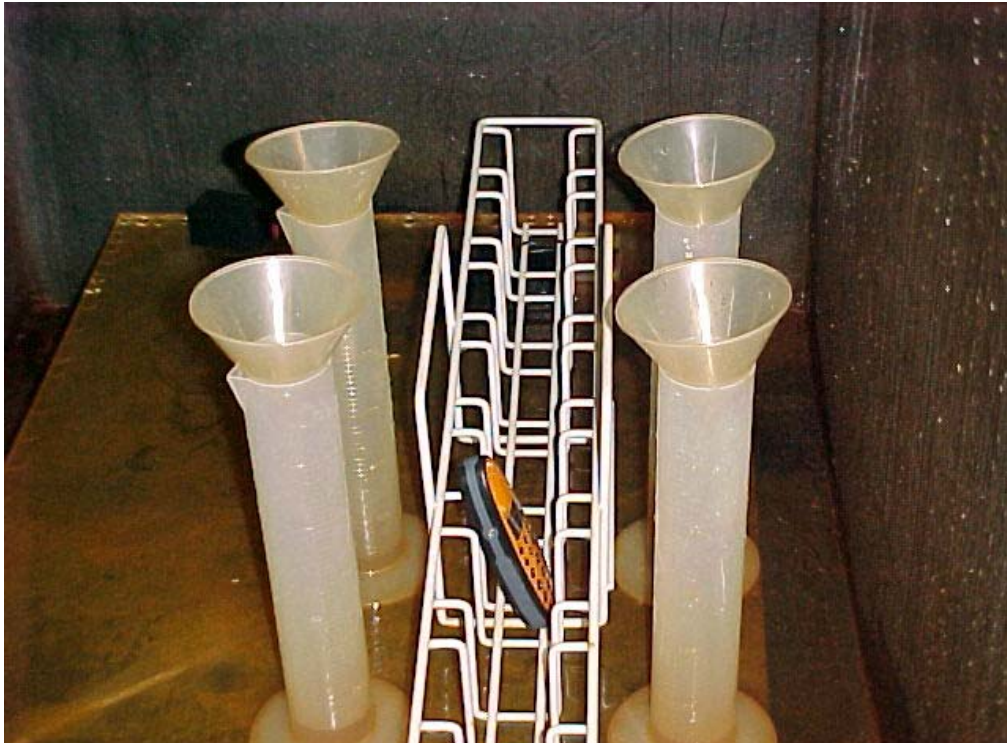


PHOTO 3. Test set-up for salt mist testing.



PHOTO 4. Visual inspection after salt mist testing (no salt deposits inside).

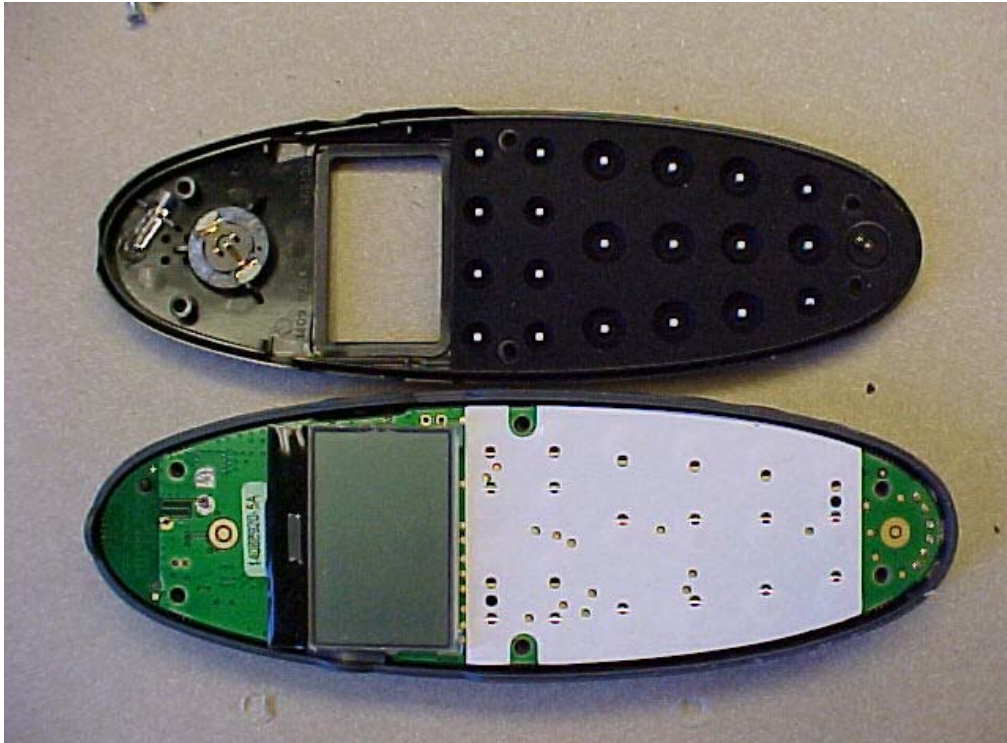


PHOTO 5. Visual inspection after salt mist testing (no salt deposits inside).



PHOTO 6. Small amount of salt deposits on keyboard membrane (external side).



PHOTO 7. Test set-up enclosure protection testing (dripping).

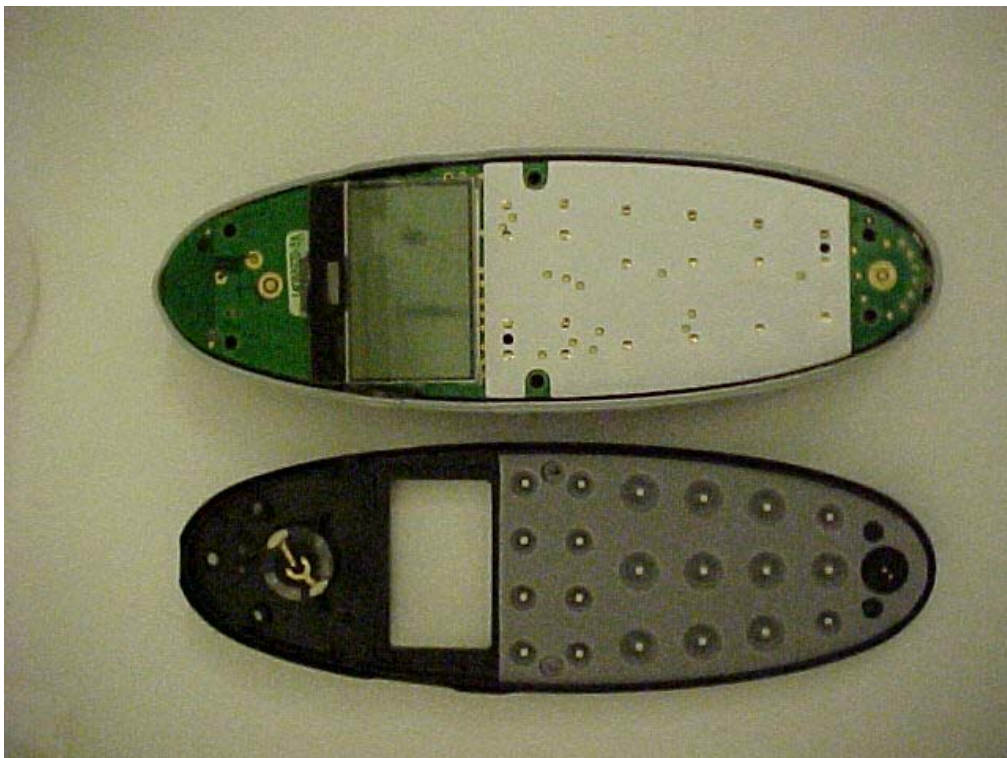


PHOTO 8. Visual inspection after dripping (no water ingress observed).

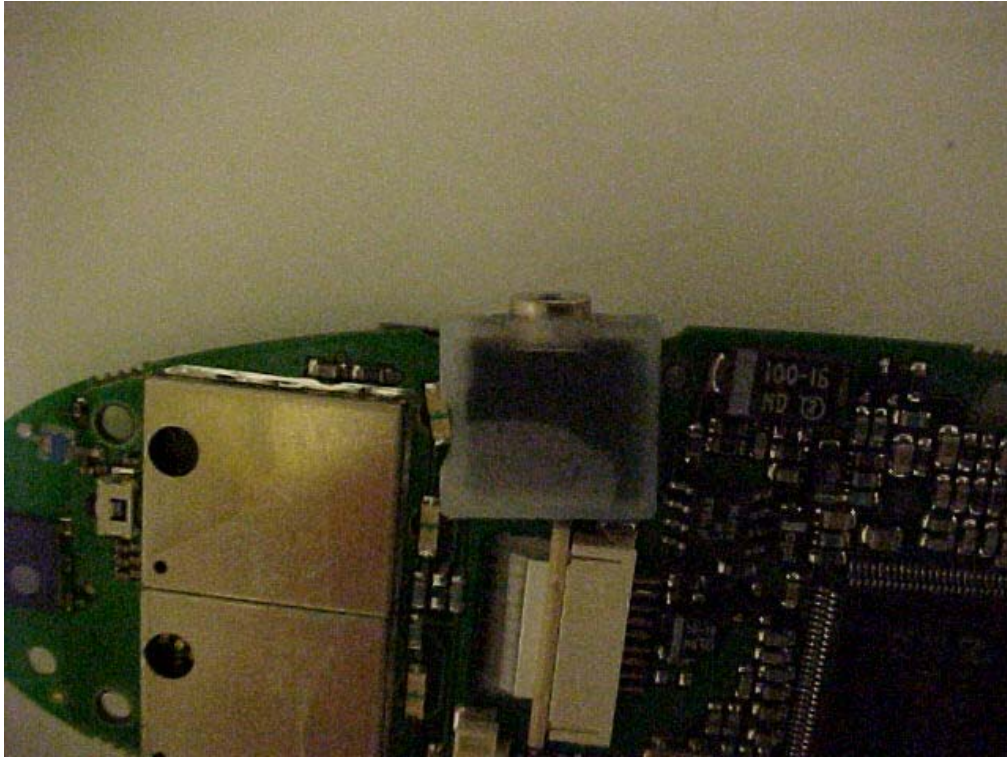


PHOTO 9. Water in sealed plug did not leak to the electronics.



PHOTO 10. Test set-up enclosure protection testing (splashing).



PHOTO 11. Visual inspection after splashing (one drop observed under keyboard membrane).

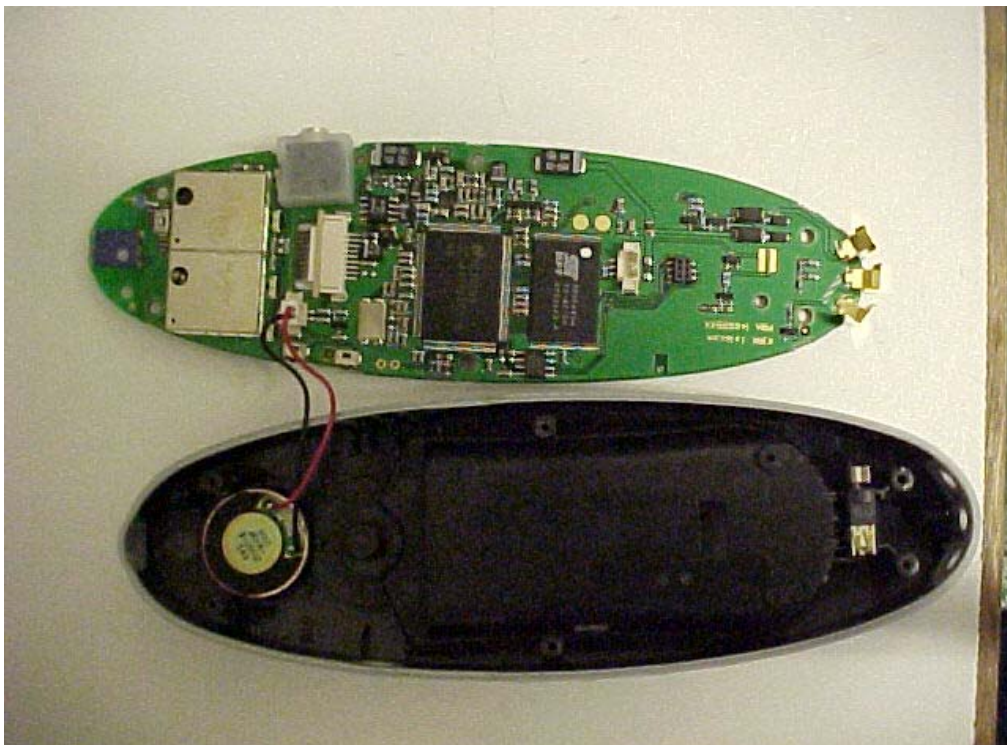


PHOTO 12. No water on the electronics and outside the sealed plug.

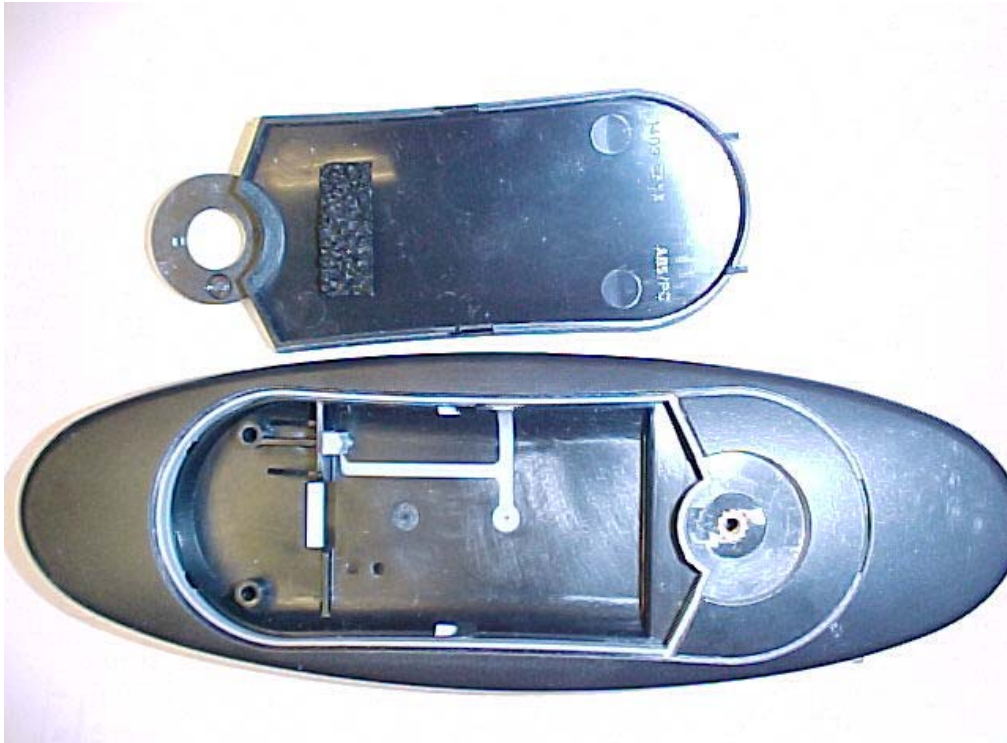


PHOTO 13. Visual inspection after enclosure testing (dust-protected).

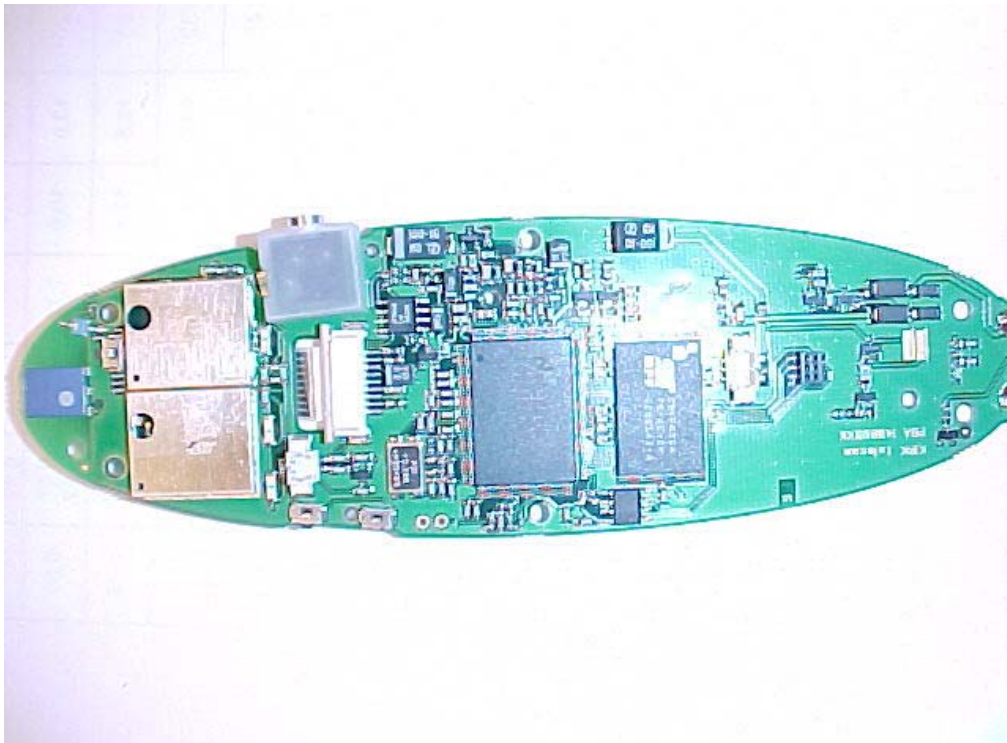


PHOTO 14. No dust deposits on electronics (rear side).



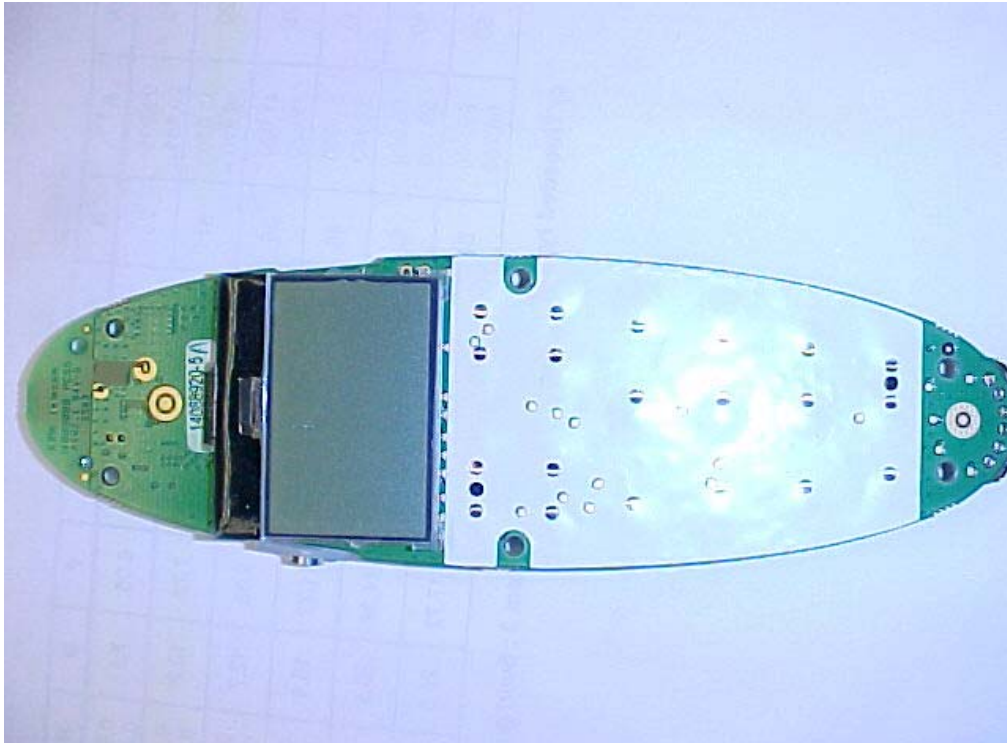


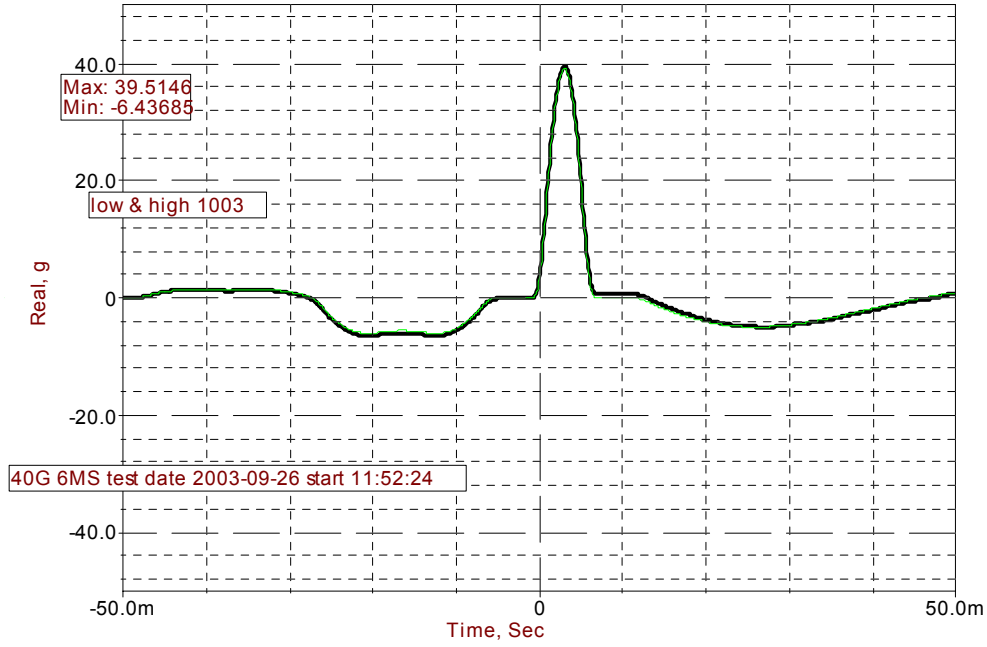
PHOTO 15. No dust deposits on electronics (front side).



## **Annex 2**

### **Measurement curves**

control ch5



CURVE 3. Bump pulse measured.