SIMULA
Waterproof Product Solution
Introduction
  - Waterproof Product Application
  - Definition of Waterproof Rating

Design Concept of WP Product
  - WP Audio Jack
  - WP MicroUSB

Assembly and test process
  - Assembly process
  - Gluing Process
  - Test Method
To prevent water from penetrating through the audio jack or uUSB into the portable equipment.
WP Product Application

Waterproof mobile phone, media player, camera, tablet or laptop are applied in outdoor environment.
Application

**IPX6**
(Protect From Rain Fall)

**IPX7**
(Allowed Shortly Drop Into Water)

**IPX8**
(Continually Using Under Water)
## Definition of WP Rating (IPXX)

<table>
<thead>
<tr>
<th>Level</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No Protection. 無任何防護措施.</td>
</tr>
<tr>
<td>1</td>
<td>Protected against vertically falling drops of water. 防止垂直落下水滴之傷害</td>
</tr>
<tr>
<td>2</td>
<td>Protected against direct sprays of water up to 15 degrees from vertical. 防止由15度角以內直接灑下水之傷害.</td>
</tr>
<tr>
<td>3</td>
<td>Protected against direct sprays of water up to 60 degree from vertical. 防止由60度角以內直接灑下的水之傷害.</td>
</tr>
<tr>
<td>4</td>
<td>Protection against splashing water from all direction. 防止所有方向灑水之傷害</td>
</tr>
<tr>
<td>5</td>
<td>Protected against low pressure jets of water. 防止所有方向之低壓噴射水柱之傷害</td>
</tr>
<tr>
<td>6</td>
<td>Protected against powerful water jets. 防止所有方向之強壓噴射水柱之傷害.</td>
</tr>
<tr>
<td>7</td>
<td>Ingress of water in quantities causing harmful effects shall not be possible when enclosure is temporarily immersed 1 meter in water under standardized condition of pressure and time. 防止在短時間內浸水1公尺深所造成之傷害.</td>
</tr>
<tr>
<td>8</td>
<td>Ingress of water in quantities causing harmful effects shall not be possible when enclosure is continuously immersed in water under conditions which shall be agreed between manufacturer and user, but are more severe than for level 7. 防止在長時間內浸水所造成之傷害, 條件須經製造商及客戶雙方同意.</td>
</tr>
</tbody>
</table>

**PS. IPXX, 1ˢᵗ X mean dust-proof level, and 2ⁿᵈ X means waterproof level.**
Design Concept of WP Product
Design Concept of WP Product

Component Level

- Insert Molding
- Mylar (Support up to IPX3)
- Adhesive/Glue (Required from IPX4)

Device Level

- Device Case Mechanical Support (Kapton Film / O-Ring)
Audio Jack (WP3E8A)

**General Specification**
- 3.5mm / 4 Pole Audio Jack
- SMT Type
- Waterproof Conn IPX7

**Technical Specification**
- Insertion Force: 2.0 Kg Max.
- Extraction Force: 0.3 Kg Min.
- Durability: 5,000 Cycles
- Package: Tape & Reel

**Mechanical Dimension**
- Length: 14.60 mm
- Width: 7.20 mm
- Height: 4.10 mm

**Remark**
- Mass Production Status
- Total height is 4.1mm
- Application: Mobile Devices
Audio Jack (WP3E7C)

General Specification
- 3.5mm / 4 Pole Audio Jack
- Mid-Mount / DIP Type
- Center Height is 0.62mm above Board
- Waterproof Conn IPX7

Mechanical Dimension
- Length: 14.60 mm
- Width: 8.00 mm
- Height: 5.47 mm

Technical Specification
- Insertion Force : 2.0 Kg Max.
- Extraction Force : 0.3 Kg Min.
- Durability : 5,000 Cycles
- Package : Tape & Reel

Remark
- Mass Production Status
- Application: Mobile Devices

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Tel.: 0536 811616 - Fax: 0536 811500 - Web: www.bce.it - Email: bce@bce.it
Audio Jack (WP3E7D)

General Specification
- 3.5mm / 4 Pole Audio Jack
- Mid-Mount / DIP Type
- Center Height is 0.62mm above Board
- Waterproof Conn IPX7

Technical Specification
- Insertion Force: 2.0 Kg Max.
- Extraction Force: 0.3 Kg Min.
- Durability: 5,000 Cycles
- Package: Tape & Reel

Mechanical Dimension
- Length: 14.70 mm
- Width: 8.00 mm
- Height: 5.48 mm

Remark
- Mass Production Status
- Application: Mobile Devices

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Micro USB Design Concept

Assemble O-ring

Finished Product in ID

Water Approach Area

Water Proof Area

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uUSB2.0 (WP812B)

General Specification
- uUSB B type Receptacle
- Mid-mount (center height: -0.575 mm)
  - 5 Pins
- SMT (tail) & DIP (shell) Type
- Waterproof Conn IPX7

Technical Specification
- Insertion Force : 3.5kg Max.
- Extraction Force : 0.8 ~ 2kg
- Durability : 5000 cycles
- Package : Tape & Reel

Remark
- Mass Production Status
- Half Duplex Transferring
- Speed 480Mbps per channel

Mechanical Dimension
- Length: 6.80 mm (7.50 mm include tail)
- Width: 9.00 mm (11.40 mm include solder leg)
- Height: 3.95 mm
uUSB2.0 (WP812C/D)

**General Specification**
- uUSB B type Receptacle
- Mid-mount (center height: -0.57mm)
  - 5 Pins
- SMT (tail) & DIP (shell) Type
- Waterproof Conn IPX3

**Technical Specification**
- **Insertion Force**: 3.5kg Max.
- **Extraction Force**: 0.8 ~2kg
- **Durability**: 5000 cycles
- **Package**: Tape & Reel

**Remark**
- Mass Production Status
- Half Duplex Transferring
- Speed 480Mbps per channel

**Mechanical Dimension**
- **Length**: 6.80 mm (7.50 mm include tail)
- **Width**: 9.00 mm (11.40 mm include solder leg)
- **Height**: 3.95 mm

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Assembly and Test Process
Assembly process

Terminal M4F → M5 → M6 → M1 → M4A → M4B → Cover → Gluing → Assistant pin → Pressure test → E-test → Hi-pot → Co planarity inspection → Appearance inspection → Package
Gluing Process

(1) Put the product at the gluing fixture

(2) Auto Gluing

SMT tail → Underside → Finish
WP812B – Automation Gluing Process

(1) Automation Type (By Axis)

Two Axis

One Axis

(2) Glue / Needle

(3) Gluing Spec

Height = 0.40mm (Max)
Test Method -- Real test

- IPX7 Level.
- Water depth of 100cm.
- Assembly the audio jack into the testing fixture and put into the water.
- Test duration: 30 minutes.

45X45X120 cm Acrylic tank

Fixture
TEST REPORT

Report No.: HN30001/2013
Page: 1 of 4
Date: March 6, 2013

SIMULA TECHNOLOGY INC.
14F, 1351, ZHONG-ZHENG RD.,
TAOYUAN CITY, TAIWAN

The following merchandise was submitted and identified by the vendor as:
Product Description: Water Proof Audio Jack
Style/Item No.: WP3E8A/ No.1
Quantity: Total 1 piece
Testing Period: Mar. 5, 2013

We have tested the submitted sample(s) as requested and the following results were obtained:
Test Required:
Test for Degrees of Protection Provided by Enclosures (IEC 60529 Edition 2.1. 2001)

Test Result:
Degree of protection against ingress of water (IPX6)

<table>
<thead>
<tr>
<th>Check Item</th>
<th>Style/Item No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Does any water penetrate into the specimen?</td>
</tr>
<tr>
<td>2</td>
<td>(followed check item 1) If any water has entered, does the water accumulate near the cable end or live parts?</td>
</tr>
<tr>
<td>2.1</td>
<td>(followed check item 2) Does the water be sufficient to interfere with the correct operation of the equipment or impair safety?</td>
</tr>
<tr>
<td>2.2</td>
<td>(followed check item 2.1) Does the water deposit on insulation parts where it could lead to tracking along the creep age distances?</td>
</tr>
<tr>
<td>2.3</td>
<td>(followed check item 2.2) Does the water reach live parts or windings not designed to operate when wet?</td>
</tr>
</tbody>
</table>

Note 1: N/A means “Not Applicable”
Thank You