

## Specification of AgNW Capacitive Touch Panel

<b>Product Name</b>	<b>Nuovo 23.8" CTP</b>
<b>Product Model</b>	<b>NF-M-C238-FF-02A</b>
<b>Issue Date</b>	<b>2018.05.02</b>

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## **1. Introduction**

### **1.1 Purpose**

The purpose of this specification is to define the quality standard, test criteria, and engineering drawing of capacitive touch panel.

### **1.2 Scope**

This specification applies to the 23.8" Touch Panel model NF-M-C238-FF-02A provided by Nuovo Film.

### **1.3 Precaution**

#### **1.3.1 Storage**

The touch panel should be stored under the environment condition as suggested, and avoid storing in direct sunlight.

#### **1.3.2 Handling**

- i. Hold the touch panel body instead of the FPC all the time.
- ii. Ensure that static precautions are observed at all times during handling of the TP modules

#### **1.3.3 Cleaning**

- i. Prevent using any kind of the chemical solvent, acidic or alkali solution when cleaning.
- ii. Neutral detergent or isopropyl alcohol is suggested if the panel need cleaning.

#### **1.3.4 Assembly**

- i. Do not apply rough force such as bending or twisting to the touch panel during assembly.
- ii. Excessive force or strain to the panel or FPC is prohibited.

#### **1.3.5 Operation**

- i. The panel must be operated in a steady environment, the abrupt change of the environment conditions may cause malfunction.
- ii. Do not pull the interface connector in or out while the touch panel is operating.
- iii. Any sharp edged or hard objects are inhibited to contact the touch panel when under operation.

### **1.4 Warranty**

Nuovo Film provides one year product guarantee under normal storage condition and operational guideline as defined in this document.

## 2. General Description

### 2.1 General Information

Item	Description
Panel Size	23.8"
Aspect Ratio	16:9
Interface	USB(2.0 Full Speed)
Power	5V(USB:4.7V~6.0V, Typical: 5V)
Touch Controller IC	ILI2312
Active Points	Multi-touch 10 points
Channel number	RX78*TX44
OS	Window/ Android/ Linux

### 2.2 Dimension Overview

Item	Spec
Cover Lens OD	572.50mm(L)* 342.00mm(W)
View Area	528.00mm(L)* 297.50mm(W)
Sensor OD	552.00mm (L)* 330.87mm (W)

### 2.3 Stack-up

Layer	Thickness	Materials
Cover Lens	3	Physical strengthened glass
OCA	0.125mm	Adhesive
Sense side SNW	0.125mm	AgNW Film
OCA	0.05mm	Adhesive
Drive side SNW	0.125mm	AgNW Film
Total Thickness	3.45±0.3mm	

### 2.4 Optical Inspection

Item	Specification	Measurement Method
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Transparency	$\geq 87.5\%$	Hunterlab
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### 2.5 Environment Conditions

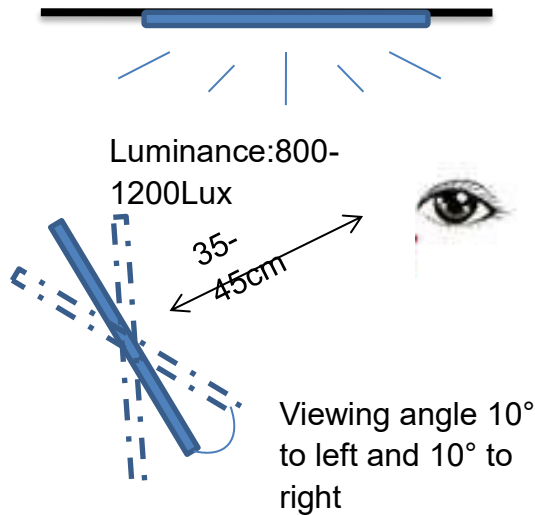
Operating:  $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$ ; 45%~85%RH

Storage:  $-30^{\circ}\text{C} \sim +80^{\circ}\text{C}$ ; 45%~85%RH

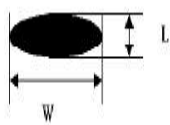
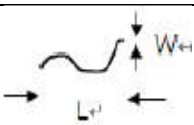
## 3 Inspection


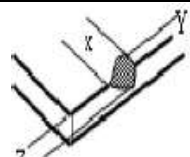
### 3.1 Inspection Condition

- i. The touch panel should be inspected at a clean room of at least class 10,000
- ii. Brightness at test site: 800-1200LUX
- iii. Inspection distance: 35-45cm
- iv. Viewing angle:  $90 \pm 10^{\circ}$
- v. Light source: 40W fluorescent light
- vi. Inspection time:  $25 \pm 5\text{s}$



### 3.3 Cosmetic Inspection ① ②

Defect Type	Criteria	Notes
Dot defects (Bubble/Fiber/Particle /Spot/Dent)	1. $D \leq 0.35\text{mm}$ , Ignored 2. $0.35\text{mm} < D \leq 0.5\text{mm}$ , $N \leq 10$ , $DS \geq 10\text{mm}$ 3. $D > 0.5\text{mm}$ , not allowed	 $D = (W+L)/2$
Linear defects (Scratch/Fiber)	1. $L \leq 15\text{mm}$ , $W \leq 0.2\text{mm}$ , Ignored 2. $0.2\text{mm} < W \leq 0.35\text{mm}$ , $L \leq 15\text{mm}$ , $N \leq 5$ , $DS \geq 10\text{mm}$ 3. $W > 0.35\text{mm}$ , not allowed	

Corner chipping	<ol style="list-style-type: none"> <li><math>X \leq 5\text{mm}</math> &amp; <math>Y \leq 3\text{mm}</math>, <math>Z \leq T</math>, <math>N \leq 3</math></li> <li>Otherwise not allowed</li> </ol>	 <p>X: Length; Y: Width; Z: Thickness</p>
Side chipping	<ol style="list-style-type: none"> <li><math>X \leq 6\text{mm}</math> &amp; <math>Y \leq 1\text{mm}</math>, <math>Z \leq T/2</math>, <math>N \leq 5</math></li> <li>Otherwise not allowed</li> </ol>	 <p>X: Length; Y: Width; Z: Thickness</p>
Smudge	Can be wipe clean within 15 seconds that judged to be OK	/
Color of cover lens/logo typeface/shade of background	Color shows no difference from that of the samples	/
	Clear typeface and clear pattern	
	Good shade of back color	

**Note 1:**

"D" means Diameter;

"L" means Length;

"W" for Width;

"N" for Quantity;

"T" for Glass Thickness;

"DS" for the distance between two defects.

**Note 2:**

Total number of defects for each piece:  $N \leq 10$ ,  $DS \geq 10\text{mm}$

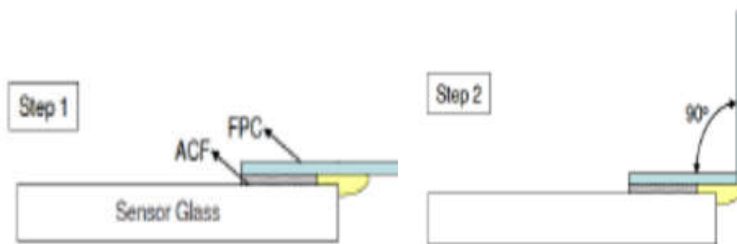
**4 Reliability Test**

Test Item	Test Condition	Criteria
Damp Heat	Temperature: $60^{\circ}\text{C}$ Humidity: 90%RH Time: 240hrs	<ol style="list-style-type: none"> <li>No cosmetic defect</li> <li>Function OK</li> </ol>
Thermal Shock	High temperature: $80^{\circ}\text{C}$ Low temperature: $-30^{\circ}\text{C}$ Time: 30 cycles	<ol style="list-style-type: none"> <li>No cosmetic defect</li> <li>Function OK</li> </ol>
High Temperature	Temperature: $80^{\circ}\text{C}$ Time: 240hrs	<ol style="list-style-type: none"> <li>No cosmetic defect</li> <li>Function OK</li> </ol>
Low Temperature	Temperature: $-30^{\circ}\text{C}$ Time: 240hrs	<ol style="list-style-type: none"> <li>No cosmetic defect</li> <li>Function OK</li> </ol>
Salt Spray	Concentration: 5% NaCl solution	1.No cosmetic defect

Test	Temperature: 35°C Time: 48hrs	2.Function OK
Sweat Test	PH=4.7 sweat Time: 48hrs	1.No cosmetic defect 2.Function OK
Static Electricity	1.Air discharge: 8KV/10KV/12KV 2. Contact discharge: 4KV/6KV/8KV 3.10 times for each point	1.No cosmetic defect 2.Function OK

### 5 FPC Peeling Test

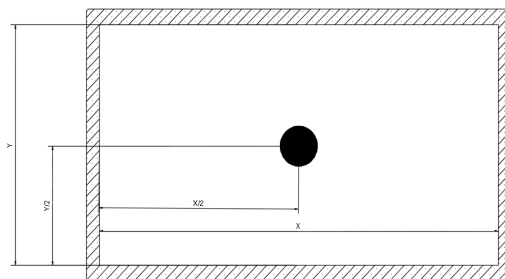
Item	Test Condition	Result
FPC Peeling Test	1. Pulling weight: 500g 2. Pulling speed: 25 mm/min 3. Pulling angle: 90°	1.FPC has no damage 2.Function OK



### 6. Cover Lens Test

Item	Spec
Pressure Value	400 ~500 mPA above 6u
Ball Drop Test ①	227g±2g, 35cm, No damage after one time impact at the central area.
Hardness ②	6H (Pencil: 6H, Pressure: 1N/45)

Note 1: The ball drop test illustration is shown as follows.



Note 2: The hardness test follows the JIS K-5400 serials industry standard and the test illustration is shown as below.

