

## Specification of 15.6" Capacitive Touch Panel

<b>Product Name</b>	<b>15.6" CTP</b>
<b>Product Model</b>	<b>NF-M-C156-FF-01A</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 15.6" Touch Panel model NF-M-C156-FF-01A 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	15.6"
Aspect Ratio	16:9
Interface	USB(2.0 Full Speed)
Power	5V(USB: 4.75V ~ 5.25V, Typical:5V)
Touch Controller IC	ILI2302
Active Points	Max 10 points
Channel Number	RX:61 ; TX:35
OS	Windows/ Android/ Linux

### 2.2 Dimension Overview

Item	Spec(mm)
Cover Lens OD	376.30 (L) x229.30(W) x 1.8(T)
View Area	346.65 (L) x195.45(W)
Sensor OD	374.30(L) x227.30 (W)

### 2.3 Stack-up

Layer	Thickness	Materials
Cover Lens	1.8 mm	Strengthened glass
Top OCA	0.125mm	Adhesive
Sense side SNW	0.125mm	Conductive Film
Bottom OCA	0.05mm	Adhesive
Drive side SNW	0.125mm	Conductive Film
<b>Total Thickness</b>	<b>2.225±0.1mm</b>	-

### 2.4 Optical

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

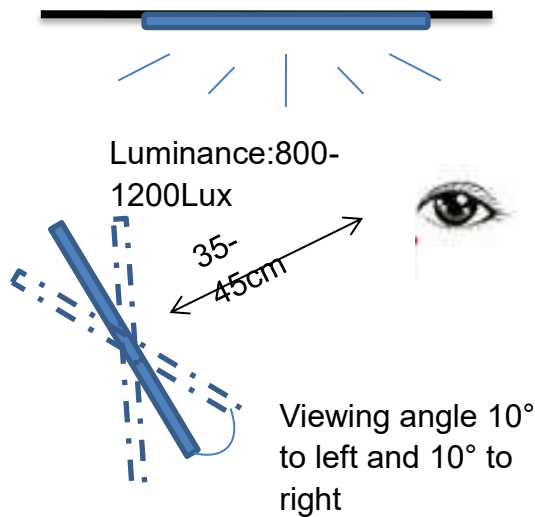
Operating:  $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$ ; 45%~85%RH

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

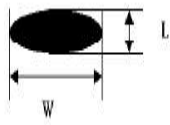
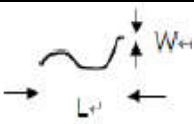
## 3. Visual Inspection


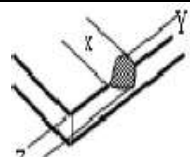
### 3.1 Inspection Condition

- 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:  $35 \pm 5\text{s}$



### 3.2 Cosmetic Inspection ① ②

Defect Type	Criteria	Notes
Dot defects (Bubble/Fiber/Particle /Spot/Dent)	<ol style="list-style-type: none"> <li>1. <math>D \leq 0.35\text{mm}</math>, Ignored</li> <li>2. <math>0.35 &lt; D \leq 0.5\text{mm}</math>, <math>N \leq 10</math>, <math>DS \geq 10\text{mm}</math></li> <li>3. <math>D &gt; 0.5\text{mm}</math>, not allowed</li> </ol>	 $D = (W+L)/2$
Linear defects (Scratch/Fiber)	<ol style="list-style-type: none"> <li>1. <math>L \leq 15\text{mm}</math>, <math>W \leq 0.2\text{mm}</math>, Ignored</li> <li>2. <math>0.2\text{mm} &lt; W \leq 0.35\text{mm}</math>, <math>L \leq 15\text{mm}</math>, <math>DS \geq 10\text{mm}</math></li> <li>3. <math>W &gt; 0.35\text{mm}</math>, not allowed</li> </ol>	

Corner chipping	<ol style="list-style-type: none"> <li><math>X \leq 3\text{mm}</math> &amp; <math>Y \leq 3\text{mm}</math>, <math>Z \leq T/2</math>, <math>N \leq 5</math> acceptable</li> <li>Otherwise not allowed</li> </ol>	 X: Length; Y: Width; Z: Thickness
Side chipping	<ol style="list-style-type: none"> <li><math>X \leq 8\text{mm}</math> &amp; <math>Y \leq 3\text{mm}</math>, <math>Z \leq T/2</math>, <math>N \leq 5</math> (not user side)</li> <li>Otherwise not allowed</li> </ol>	 X: Length; Y: Width; Z: Thickness
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:  $N \leq 10$ ,  $DS \geq 15\text{mm}$

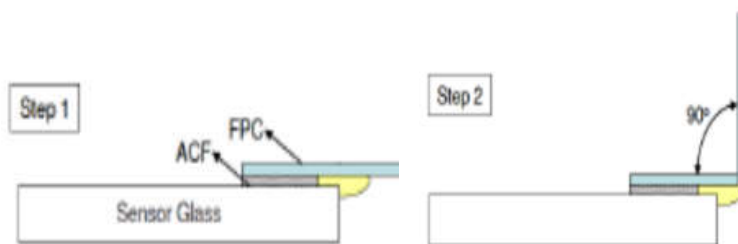
**4. Reliability Test**

Test Item	Test Condition	Criteria
Damp Heat	Temperature: $60^{\circ}\text{C}$ Humidity: 90%RH Time: 120hrs	<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: $-30^{\circ}\text{C}$ 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: 120hrs	<ol style="list-style-type: none"> <li>No cosmetic defect</li> <li>Function OK</li> </ol>
Low	Temperature: $-30^{\circ}\text{C}$	<ol style="list-style-type: none"> <li>No cosmetic defect</li> </ol>

Temperature	Time: 120hrs	2.Function OK
Salt Spray Test	Concentration: 5% NaCl solution Temperature: 35°C Time: 48hrs	1.No cosmetic defect 2.Function OK
Sweat Test	PH=4.7 sweat Time: 48hrs	1.No cosmetic defect 2.Function OK
Static Electricity	1.Air discharge: 8KV 2. Contact discharge: 6KV 3.10 times for each point	1.No cosmetic defect 2.Function OK

### 5. FPC Peeling Test

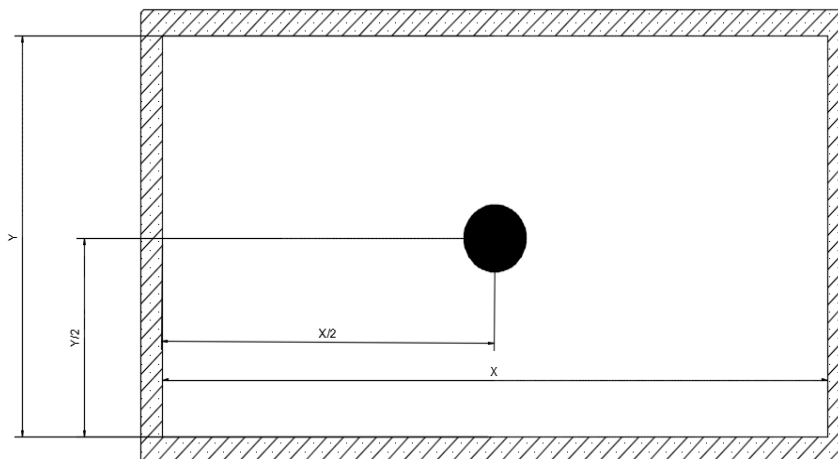
Item	Test Condition	Result
FPC Peeling Test	1. Pulling weight: 500g 2. Pulling speed: 25 mm/min 3. Pulling angle: 90°	1.FPC has no damage 2.Function OK



### 6. Cover Lens Test

Item	Spec
Warpage	Warpage 0.1% $\cong$ Length
Ball Drop Test ①	227g $\pm$ 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.

