

DMC Co., Ltd.

**Projected Capacitive Touchscreen
DUS series Product Specifications**

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1. Product Specifications

1-1. Product Applicable

§ This specification is applied to the Projected Capacitive DUS series.

1-2. Structure

§ For Dimensional and structural information, refer to the attached drawing.

1-3. Environmental Specifications

Specification	Value
Operating Temperature	-20°C to 70°C (no condensation)
Operating Humidity	-20°C to 60°C Less than 90%RH (no condensation) Exceeding 60°C Less than 133.8g/m ³ (no condensation)
Storage Temperature	-40°C to 75°C (no condensation)
Storage Humidity	-40°C to 60°C Less than 95%RH (no condensation) Exceeding 60°C Less than 142.9g/m ³ (no condensation)
Chemical Resistance (top surface)	Toluene, Trichloroethylene, Acetone, Alcohol, Gasoline, Machine Oil, Ammonia, Glass Cleaner, Mayonnaise, Ketchup, Wine, Salad Oil, Vinegar, Lipstick, etc.

1-4. Mechanical Characteristics

Specification	Value
Operating Life	Input (finger) 50,000,000 hits
Light Transmittance	91% (typical value at full wavelength)
Surface Hardness	Over 5H (by JIS pencil hardness)
Electrode Matrix Pitch	Approximately 5-7mm
FPC Bending	R=3mm / Up to one time

1-5. Electrical Characteristics

§ For the electrical characteristics, refer to the product specification sheet of the controller boards.

2. Testing Conditions

2-1. Testing Conditions

§ If the condition is not specified, the test is performed under the supplier's standard testing condition.

§ Tests are performed under the room temperature unless specified. The room temperature is regarded as follows:

Temperature: 20°C±5°C

Humidity: 65%±10%RH

2-2. Environmental Specifications

§ Chemical Resistance Test

Condition: Tested after leaving the chemical on the surface for 12 hours then wiping it off by cloth.

Judgement: Must be no effect in appearance.

2-3. Mechanical Characteristics

§ Operating Life Test

Condition: Testing rod: Refer to Figure 1

Load: 3N

Cycle: 2 hits/sec

Judgement: Must operate properly after the test

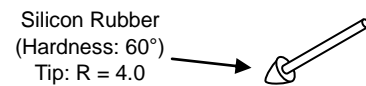


Figure 1. Testing rod 1

2-4. Appearance

§ Appearance Test

Condition: Tested by an examiner with over 1.0 eyesight at 30cm away from the product under the transmittable light at angle of over 60° to surface of the product.

Judgement: Must satisfy the specifications described in the separate document, [Visual Inspection Criteria].

3. Reliability Condition

3-1. Temperature Condition

§ Temperature Condition Test

Following test are performed in the condition with no dew condensation:

Cold Test: Tested after leaving the parts in $-40^{\circ}\text{C}\pm 3^{\circ}\text{C}$ for 240 hours and in the room temperature for 2 hours.

Heat Test: Tested after leaving the parts in $75^{\circ}\text{C}\pm 3^{\circ}\text{C}$ for 240 hours and in the room temperature for 2 hours.

Humidity Test: Tested after leaving the parts in the temperature $60^{\circ}\text{C}\pm 3^{\circ}\text{C}$, humidity 90 to 95% for 240 hours and in the room temperature for 2 hours.

Cycle Test: Tested after 5 cycles of leaving the parts in the temperature $-30^{\circ}\text{C}\pm 3^{\circ}\text{C}$ for 1 hour and in the room temperature for 0.5 hours, then leaving the parts in the temperature $70^{\circ}\text{C}\pm 3^{\circ}\text{C}$ for 1 hour and in the room temperature for 0.5 hours.

Judgement: Must satisfy the following:

Function : Operate properly.

Appearance: Must satisfy the specifications described in the separate document, [Visual Inspection Criteria].

4. Handling Notes

4-1. Precautions

§ This product is intended for use in standard applications (computers, office automation, and other office equipment, industrial, communications, and measurement equipment, personal and household devices, etc.) Please avoid using this product for special applications where failure or abnormal operation may directly affect human lives, or cause physical injury or property damage, or where extremely high levels of reliability are required (such as aerospace systems, vehicle operating control, atomic energy controls, medical devices for life support, etc.).

4-2. Handling Notes

§ Do not press or scratch the product with any object with a sharp edge or end.

§ Do not forcibly bend or fold the product.

§ When the product is stored, make sure it is packed in a packing box and stored in a storage temperature range, eliminating any outside load.

§ Do not use or store the product under a condition where the product will be exposed to water, organic solution or acid.

§ Do not use the product under the direct sunlight if a film material is used on it.

§ Do not disassemble the product.

§ When you handle the product, hold the product by its body. Do not hold by the tail.

§ Clean the product with a soft cloth or a soft cloth with neutral detergent or alcohol. When contaminated with chemicals, wipe them off immediately with caution not to cause injury to human body.

§ The edge of the glass is not rounded and may cause injury.

4-3. Construction Notes

§ The environmental specifications, mechanical characteristics, and electrical characteristics are only applied to the Active Area.

§ Do not use the touchscreen when the condensation occurs. The condensation inside of the touchscreen is a natural phenomenon and should disappear after the touchscreen is warmed up.

4-4. Electrical & Software Notice

Projected Capacitive Touchscreen was designed to work with our controller board.

If the driver software is to be developed by the customer, please study the characteristics of touch screen and controller before development.

4-5. Mounting Notes

At structure design, please refer to the separate document, [Glass/Glass structure Projected Capacitive Touch Screen, Mounting Guidance], and ensure to avoid the external factors from affecting the touch screen as much as possible.

5. Warranty

5-1. Warranty Period

- § The warranty period is limited to 1 year from the date of shipment. The warranty for the initial defects such as appearance deflection is limited to 1 month.
- § Any defected parts under proper use will be examined by the supplier and replaced by the new parts if the defect is considered to be caused by the supplier.
- § The replacement is subject to be included in the next lot.

5-2. Warranty Target

- § The warranty only covers the product itself and does not cover any damage to others caused by using this product. Onsite repair or replacement is not supported.
- § We will do our best for delivery problem and product defect, but the warranty for the production line is not covered.
- § Capacitive touchscreens are structurally not repairable. All defected parts are subject to replacement.

5-3. Warranty Exceptions

Following conditions are not covered with the warranty and subject to charge.

- § Any malfunctions and damages during transportation and transfer by the user.
- § Any malfunctions and damages caused by a natural disaster or a fire.
- § Any malfunctions and damages caused by static electricity
- § Any malfunctions and damages caused by the failure of the associated equipment.
- § If the product is remodeled, disassembled or repaired by the user.
- § If the product is glued onto the equipment and uninstalled.
- § Any malfunctions and damages caused by an improper usage and handling against the specifications and notes.

5-4. Tools

- § To maintain the quality, the printing screens and the die-cut plates are generally limited to use up to 1 year. Reorders after 1 year from the initial order or from the last renewal are subject to the tooling charge for replacing the printing screens and the die-cut plates. Reorders for the discontinued standard parts are also subject to tooling charge.
- § All the tools, such as CAD data (except for the drawing for approval), block copies (films), printing screens, and die-cut plates are not to be provided due to administrative reason.

5-5. Changes

- § Because of the manufacturing process, changing the dimensions, circuit pattern, and the tail position requires replacing most of the tools and is subject to high tooling charge. Please be careful when ordering and approving the drawing.
- § Circuit pattern and the materials that does not affect the environmental, electrical, and mechanical characteristics such as film, glass, ink and glue are subject to change for the supplier's reason or for improvement within the specifications.
- § Standard products are subject to change for improvement without notice.

6. Revision history

Rev 1.0(October 01, 2012)

Initial release

Rev 1.1 (January 01, 2013)

Visual Inspection Criteria was added as a separate document.

Rev 1.2 (October 08, 2013)

Building name of the head office was changed.

Nisseki Takanawa Bldg., → Takanawa Sengakuji Ekimae Bldg.,

Title of the document was changed.

Projected Capacitive Touchscreen DUS series Reference

→ Projected Capacitive Touchscreen DUS series Product Specification

Rev 1.3 (June 25, 2015)

The document of [Visual Inspection Criteria] was separated from this specification document.

(The document of [Visual Inspection Criteria] will be managed separately.)

- 2-4 Appearance

Judgement: Must satisfy the specification.

→ Judgement: Must satisfy the specifications described in the separate document, [Visual Inspection Criteria].

- 3-1 Temperature Condition

Judgement

Appearance: Must satisfy the specification.

→ Appearance: Must satisfy the specifications described in the separate document, [Visual Inspection Criteria].

Rev 1.4 (December 17, 2015)

1-5 Electrical Characteristics

Specification information was omitted, and the following sentence was added. (due to review of description method)

“For the electrical characteristics, refer to the product specification sheet of the controller boards.”

Rev1.5 (June 22, 2017)

- 1-4 Mechanical Characteristics: [FPC Bending] was added.

- 4-5 Mounting Notes: Details were omitted, and the following description was added.

[At structure design, please refer to the separate document, [Glass/Glass structure Projected Capacitive Touch Screen, Mounting Guidance], and ensure to avoid the external factors from affecting the touch screen as much as possible.]

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Rev. 1.5, June 22, 2017

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