

DMC Co., Ltd.

**Multi-touch Resistive Touch Screen (MTR-G Series)
Product Specification**

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1. Product Specifications

1-1. Applicable Products

§ This specification sheet is applied to the Multi-touch Resistive touch screen, MTR-G series.

1-2. Structure

§ As to dimensions, structure, and shape, please refer to the drawing.

1-3. Environmental Specifications

| Specification | Value |
|-----------------------------------|---|
| Operating Temperature | -20°C to 80°C (no condensation) |
| Operating Humidity | -20°C to 60°C Less than 90%RH (no condensation) Exceeding 60°C 133.8g/kg (no condensation) |
| Storage Temperature | -40°C to 80°C (no condensation) |
| Storage Humidity | -40°C to 60°C Less than 95%RH (no condensation) Exceeding 60°C 142.9g/kg (no condensation) |
| Chemical Resistance (top surface) | Toluene, Trichloroethylene, Athetone, Alcohol, Gasoline, Machine Oil, Ammonia, Glass Cleaner, Mayonnaise, Ketchup, Wine, Salad Oil, Vinegar, Lipstick, etc. |

1-4. Mechanical Characteristics

| Specification | Value | |
|----------------------------------|---|--------------------|
| Activation Force | 0.03N~0.3N | |
| Operating Life | Input (finger) | 10,000,000 hits |
| | Character Input (pen) | 100,000 characters |
| Light Transmittance (Film/Glass) | Typ. 79% (typical value at full wavelength) | |
| Surface Hardness | Over 3H (by JIS pencil hardness) | |

1-5. Electrical Characteristics

| Specification | Value | |
|-----------------|---|------------------------|
| Maximum Voltage | DC6V | |
| Maximum Current | Upper electrode | 100mA/ division number |
| | Lower electrode | 100mA/ division number |
| | Between Upper and Lower | 0.5mA |
| Linearity | ±2.5% or less (after 4-point calibration) | |
| Chattering | 10msec or less at ON/OFF. | |

1-6. Appearance

§ Scratch, dust (W = width, L = length, D = average diameter = (longest + shortest) /2)

| Item | Width (mm) | Length (mm) | Acceptable Numbers | Total |
|---|-----------------------|-------------|----------------------------|------------------------|
| Linear(Scratch/Dust) For over 0.1mm in diameter, refer to the Circular. | $0.05 < W \leq 0.1$ | $L \leq 4$ | 1pc. in $\phi 30\text{mm}$ | Within 5pcs. /panel |
| | $0.03 < W \leq 0.05$ | $L \leq 10$ | 2pcs. $\phi 20\text{mm}$ | |
| | $W \leq 0.03$ | $L \leq 20$ | Acceptable | |
| Circular (Scratch/Dust) | $0.3 < D \leq 0.4$ *1 | | 1pc in viewing area *1 | |
| | $0.2 < D \leq 0.3$ | | 2pcs in $\phi 30\text{mm}$ | |
| | $D \leq 0.2$ | | Acceptable | |

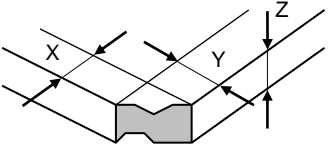
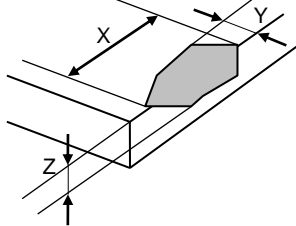
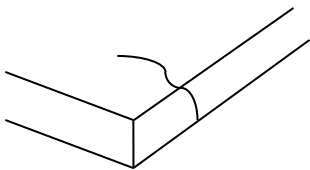
Applied only in the Active Area. Scratches or dusts in the outside of the Active Area are acceptable unless the electrical characteristics are significantly affected.

*1 Applied to the size of 14 inches or larger

§ Dirt

Acceptable if not noticeable on a black mat

§ Chip, crack (t = glass thickness) (applicable only if glass is used in the product)

| Item | Size (mm) | | Acceptable Numbers |
|---|-----------|----------|--------------------|
| Corner  | X | ≤ 3 | 2pcs /panel |
| | Y | ≤ 3 | |
| | Z | $\leq t$ | |
| Side  | X | ≤ 5 | 2pcs /side |
| | Y | ≤ 3 | |
| | Z | $\leq t$ | |
| Crack  | | | Not acceptable |

Applied only in the Active Area. Scratches or dusts in the outside of the Active Area are acceptable unless the electrical characteristics are significantly affected.

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 referred 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 being wiped off by cloth.

Judgment: Must be no effect in appearance.

2-3. Mechanical Characteristics

§ Activation Force Test

Condition: Measured by depressing the point between the dots to the conduction by the testing rod (Figure 1).

Judgment: Must satisfy the specification.

§ Operating Life Test (Finger)

Condition: Testing rod: Refer to Figure 1

Voltage: DC5V

Load: 3N

Cycle: 2 hits/sec

Judgment: Must satisfy the following:

Activation Force: Must satisfy the specification.

Linearity: Must satisfy the specification.

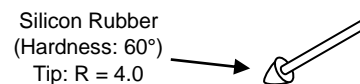


Figure1. Testing rod 1

§ Operating Life Test (Pen)

Condition: Testing rod: Refer to Figure 2

Voltage: DC5V

Load: 2.5N

Input size: 10 x 10 mm

Input character: A to Z/minute

Judgment: Must satisfy the following:

Activation Force: Must satisfy the specification.

Linearity: Must satisfy the specification.

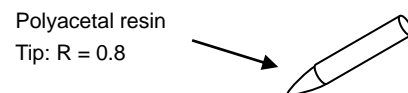


Figure2. Testing rod 2

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.

Judgment: Must satisfy the specification.

3. Reliability Condition

3-1. Temperature Condition

§ Temperature Condition Test

The following tests are performed in the condition with no dew condensation:

Cold Test: Tested after leaving the products 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 products in $80^{\circ}\text{C}\pm 3^{\circ}\text{C}$ for 240 hours and in the room temperature for 2 hours.

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

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

Judgment: Must satisfy the following:

Activation Force: Must satisfy the specification.

Linearity: Must satisfy the specification.

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 depress or scratch the product with any object with a sharp edge or hard end.

§ Do not put this product close to fire.

§ Do not wipe this product with too much load nor strongly rub this product locally. It may cause the product to malfunction.

§ Do not hit the product with a hard object.

§ 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 nor 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.

§ 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 by 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 touch screen when the condensation occurs. The condensation inside of the touch screen is a natural phenomenon and should disappear after the touch screen is warmed up.

4-4. Electrical and Software Notice

The best performance can be obtained when used with the original analog resistive touch screen controller, [MTR200x] series. If the controller software is to be developed by the customer, please note the following:

- § There is a contact resistance between the top and bottom electrodes and it changes by the pressure of a finger or a pen. The data must be read after the contact resistance becomes stabilized.
- § For drawing operations, the line may be intermittent when the pen comes on the dot spacers. A software compensation is needed.

4-5. Mounting Notes

§ At mounting the touch screen, refer to the separate document, [Resistive Touch Screen Mounting Guidance]. The appropriate structure differs according to touchscreen size, LCD, chassis design, usage environment and so on. Please conduct the evaluation with actual products at the trial stage, and confirm that your structure is appropriate prior to fixing the structure design.

5. Warranty

5-1. Warranty Period

- § The warranty period is limited to 1 year from the date of shipment. The warranty for the initial defect such as appearance defect is limited to 1 month.
- § Any defected products under proper use will be examined by the supplier and replaced by the new products if the deflection is considered to be caused by the supplier.
- § The replacement is subject to be included in the next production 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 defections, but the warranty for the production line is not covered.
- § Resistive touch screens are structurally not repairable. All defected products 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 an equipment and then unglued.
- § Any malfunctions and damages caused by an improper usage and handling against the specifications and notes.

5-4. Tools

- § 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 for administrative purpose.

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 notification.

6. Revision history

6-1. Revision history

Rev1 .0 (Mar 14, 2018)

Initial release

Rev2.0 (June 11, 2019)

Change Product Numbers, Surface hardness, Activation force, writing of Appearance.

Rev3.0 (August 24, 2020)

Change Product Numbers

Rev4.0 (November 10, 2020)

Change Operating Temperature -20°C to 70°C \rightarrow -20°C to 80°C

Change writing of Light Transmittance 79% \rightarrow Typ.79%

Rev5 (January 17, 2023)

Website address change

Change of the document number.

Rev6(November 15, 2023)

1-3. Environmental Specifications Corrected the unit [$\text{g}/\text{m}^3 \Rightarrow \text{g}/\text{kg}$]

5-4 Tools Delete comment.

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