

DMC Co., Ltd.

**Projected Capacitive Type Touch Screen
DUS-LD Series Product Specifications**

No. DEP-S0038A

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1. Product Specifications

1.1 Product Applicable

This specification is applied to the projected capacitive touchscreen with structure of glass/glass type, DUS-LD Series. The top glass also serves as cover glass.

1.2 Outline dimensions / Structure

Refer to the Outline dimension drawing in separate.

1.3 Environmental Specification

Item	Specification
Operating Temperature	-40°C to 80°C (no condensation)
Operating Humidity	20%RH~90%RH (no condensation) Not guaranteed under the environment having both high temperature and high humidity.
Storage Temperature	-40°C to 80°C (no condensation)
Storage Humidity	20%RH~90%RH (no condensation) Not guaranteed under the environment having both high temperature and high humidity.
Chemical Resistivity (Applied to sensor surface)	Toluene, Trichloroethylene, Acetone, Methanol, Ethanol IPA, Gasoline, Ammonia, Glass Cleaner, Machine oil(oil designated by DMC) Testing condition : Attach the above chemical on the surface of the touch screen for 12 hours and wipe it up with a cloth. Judgement criteria : No change in appearance.

※The above specifications are not meant for use in all combination of humidity and temperature.

1.4 Mechanical Characteristics

Item		Testing Condition	Specification
Operating Life	Input (finger)	Testing rod: See Figure 1 Voltage: 5V DC Load: 3N Cycle: 2 hits/sec 50,000,000 hits	Must satisfy Electrical Characteristics
Surface Hardness		Pencil hardness testing, complying with JIS K5600-5-4	≥ 5H
Electrode Matrix Pitch		—	About 5~7mm
FPC Bending Resistivity		R=1mm bended at 180 degrees, See Figure 2 No bendable area, See Figure 3	≤ 10 times

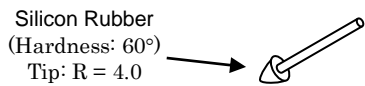


Figure 1. Testing rod



Figure 2. FPC Bending

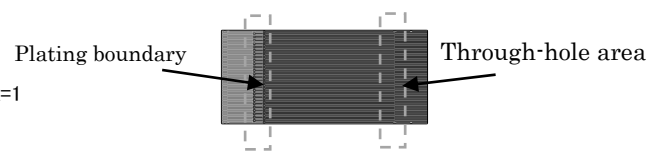


Figure 3 No bendable area

1.5 Electrical Characteristics

Check with the applicable controller specifications since electrical characteristics are determined by the matching between the controller used and the touch screen.

Controller used: DUS3000 Series
 DUS3200 Series

1.6 Optical Characteristics

Item	Testing Condition	Thickness of CG	Unit	Min.	Typ.	Max.
Light Transmittance	JIS K 7361	1.1mm	%	87	89	—
		1.8mm	%	87	89	—

2. Inspection Standard

2.1 Appearance Criteria (for viewing area with bottom glass and cover glass)

Item	W : Width (mm)	L : Length (mm)	Acceptable Number	Total
Liner (Foreign substance/scratch/ transparent defects) Defects over 0.2mm in diameter will be judged in circular. Transparent defects mean bubble, lint *1, etc...	$0.15 < W \leq 0.2$	$L \leq 10$	Up to 1pc per product	【14" < size \leq 22"】 Up to 10 pcs per product 【10" < size \leq 14"】 Up to 7 pcs per product
	$0.1 < W \leq 0.15$	$L \leq 20$	Up to 1pc in $\phi 25\text{mm}$ including other kinds of defects	
	$W \leq 0.1$	Acceptable	Acceptable	
Circular (Foreign substance/scratch/ transparent defects) Transparent defects mean bubble, lint *1, etc...	$0.5 < D \leq 0.7$		Up to 1pc per product	【size < 10"】 Up to 5 pcs per product
	$0.3 < D \leq 0.5$		Up to 1pc in $\phi 25\text{mm}$ including other kinds of defects	
	$D \leq 0.3$		Acceptable	
	D: average diameter = (longest + shortest diameters) / 2			
Dirt	Not easily noticeable on black sheet			

*1 Lint is a defect having a foreign material in it that is different in vision from other transparent parts due to the elevated surface.

2.2 Chip (exclusively for bottom glass)

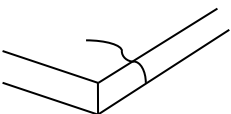
Item	Chips at areas other than electrode sections					
Judgement Criteria	<p>Chip at Corners</p>			<p>Chip other than at corners</p>		
	X	Y	Z	X	Y	Z
	$0.5 \leq X \leq 2.0(\text{mm})$		$\leq t$	$\leq 5.0(\text{mm})$	$0.5 \leq Y \leq 2.0(\text{mm})$	$\leq t/2$
$0.5 \leq Y \leq 2.0(\text{mm})$						
Acceptable Numbers	Up to 2 pcs per product			Up to 8 pcs per product, but each defects must be 20mm away from each other at each side.		
	<p style="text-align: center;">$X < 0.5\text{mm}$ is acceptable But, if the chip reaches to Ag pattern, it is unacceptable.</p>					

2.3 Chip (exclusively for cover glass)

※See the figure in the section 2.2 for locations

Site	Chips at areas other than color printing					
Judgement Criteria	X	Y	Z	X	Y	Z
	$1.0 \leq X \leq 2.0(\text{mm})$		$\leq t$	$\leq 5.0(\text{mm})$	$1.0 \leq Y \leq 2.0(\text{mm})$	$\leq t/2$
	$1.0 \leq Y \leq 2.0(\text{mm})$					
Acceptable Numbers	Up to 2 pcs per product			Up to 8 pcs per product, but each defects must be 20mm away from each other at each side.		
	<p style="text-align: center;">$X < 1.0\text{mm}$ is acceptable But, if the chip reaches to color printing, it is unacceptable.</p>			<p style="text-align: center;">$Y < 1.0\text{mm}$ is acceptable But, if the chip reaches to color printing, it is unacceptable.</p>		
	<p style="text-align: center;">$Y < 1.0\text{mm}$ is acceptable But, if the chip reaches to color printing, it is unacceptable.</p>					

2.4 Progressive Crack (apply to both cover glass and bottom glass)

Defect illustration	Judgement
	Unacceptable

2.5 Appearance criteria for color-printed area of cover glass (judged from surface view.)

Item	Description of defect	Acceptable range	
Color Tone	Different color tone from original color	Color Sample etc.	
Color Peeling	Color print coming off	Unacceptable	
Color Lacking	Color print partly missing	Unacceptable	
Color Running	Ink bleed	Bleeding should not cover edge face.	
Scratch	Scratch on color-printed part	Base glass should not appear.	
Color Unevenness	Color thickness is uneven	It should not be easily detected. (It should not be detectable by gaze for 4 – 6 seconds)	
<ul style="list-style-type: none"> • Pinholes that can see through the base glass. • Adhering foreign materials whose color are different from the original printing color. 	D: average diameter = (longest + shortest diameters) / 2	Acceptable quantity	Total acceptable quantity
	$0.2 < D \leq 0.3$ $D \leq 0.2$	Up to 2 pcs in $\phi 30\text{mm}$ Acceptable	Up to 5 pcs per product
Tilt & Misalignment	Tilt & Misalignment of cover printing to the design	Should be within tolerances indicated in the drawing	

3. Standard Testing Condition

Temperature: 20~30°C

Humidity: 20~80%RH

4. Reliability Testing Result

Item	Sample Number	Condition	Criteria	Result (NG/Sample)
Low temperature storage	5	-40°C, 240H	To pass Electric Characteristic and Appearance Criteria	0/5
High temperature storage	5	80°C, 240 H		0/5
High temperature & High humidity storage	5	60°C, 90%RH, 240H		0/5
Cycle Test	5	- 30°C, 1H →25°C, 0.5H →70°C, 1H→25°C, 0.5H 1 cycles Repeat 5 cycles		0/5

5. Attention in Handling

5.1 Precautions

This product is intended for use in standard applications such as computers, office automation, industrial, communication, measurement, and home appliance equipment, etc. Avoid using this product in application where failure or malfunction of the systems which incorporate the touch screen may lead to the danger of human lives, physical injury, property damage, or in application where extremely high levels of reliability are required such as aerospace, vehicle operating control, and atomic energy control, medical devices for life support, etc.

5.2 Handling Notes

- Do not apply force or scratch the product with a sharp-edged tool or pointed 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 or store the product under the condition where the product can be exposed to water, organic solution or acid.
- Do not use the product under direct sunlight.
- Do not disassemble, take apart, or alter the product.
- When handling the product, hold the product with its main 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 may not be rounded and may cause injury.

5.3 Attention on Function & Performance

- The Environmental specifications, Mechanical and Optical characteristics are only applicable to the Active Area.
- Do not use the product when condensation may occur.

5.4 Attention on Electrical characteristics & Software

Projected Capacitive Touch screen was designed to work with our controller board.

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

5.5 Attention on Mounting

In designing installation mechanism, please refer to the separate document, [Projected Capacitive Touch Screen with Color-printed Glass/Glass Structure Mounting Guidance], and ensure to avoid external factors may affect the touch screen performance.

6. Warranty

6.1 Warranty Period

- The warranty period is limited to one(1) year from the date of shipping. The warranty for the initial deflection such as appearance deflection is limited to one(1) month.
- Any supposedly defected parts under proper use will be examined by the supplier and replaced with new parts if alleged deflection is determined to be caused by the supplier.
- The replacement may be subject to be included in the next production lot.

6.2 Warranty Scope

- The warranty only covers the product itself and does not cover any secondly damage caused by using the concerned product. Onsite repair or replacement is not supported.
- We will sincerely respond to delivery problem and product defections, but the warranty for the client's production lines is not covered.
- Capacitive touch screens are structurally not repairable. All defected parts are subject to be replaced.

6.3 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 force majeure.
- Any malfunctions and damages caused by static electricity.
- Any malfunctions and damages caused by the failure of the associated equipment.
- In the case the product is remodeled, disassembled or repaired by the user.
- In the case the product is uninstalled after glued onto equipment.
- Any malfunctions and damages caused by an improper usage and handling against the clauses in this specifications.

6.4 Tools

All the tools and designing information, such as CAD data, printing screens, and die-cut plates are not to be provided the client from proprietary and/or administrative reasons.

6.5 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 do not affect the environmental, electrical, and mechanical characteristics such as 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.

6.6 RoHS Compliance

This product complies with RoHS.

