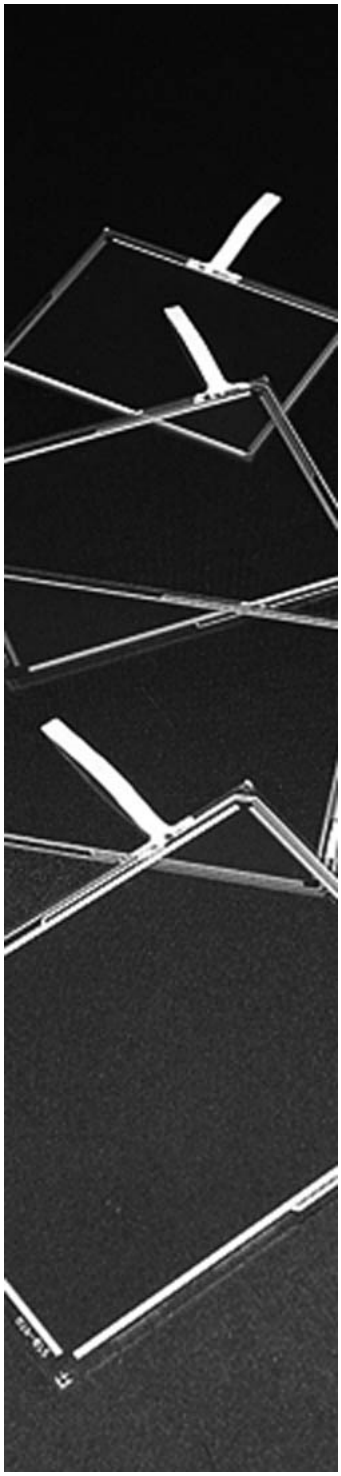


DMC Co., Ltd.

Projected Capacitive Touch Screen with Chip on Flexible Controller
DUS-S Series Product Specifications

No. DEP-S0040B

Table of Contents

1. Product Specifications

1.1 Product Applicable

This specification sheet applies to the projected capacitive touchscreen with Chip on Flexible Controller, DUS-S Series.

1.2 Outline dimensions / Structure

Refer to the outline dimension drawing in a separate document.

1.3 Environmental Specification

Item	Specification
Operating Temperature	-20°C to 70°C (no condensation)
Operating Humidity	20%RH～80%RH (no condensation) Not guaranteed under the environment having both high temperature and high humidity.
Storage Temperature	-25°C to 75°C (no condensation)
Storage Humidity	20%RH～80%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 50,000,000 hits	Must satisfy Electrical Characteristics
Surface Hardness		Pencil hardness testing, complying with JIS K5600－5－4	≧5H
Electrode Matrix Pitch		－	About 5～8mm
FPC Bending Resistivity		R=1mm bended at 180 degrees, See Figure 2 No bendable area, See Figure 3	≦10 times

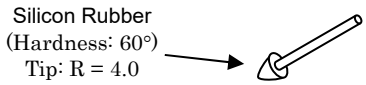


Figure 1. Testing rod

Figure 2. FPC Bending

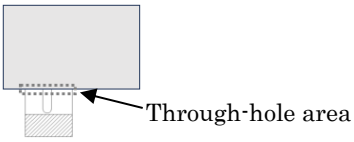


Figure 3 No bendable area

1.5 Optical Characteristics

Item	Testing Condition	Unit	Min.	Typ.	Max.
Light Transmittance	JIS K 7361	%	88	89	—

1.6 Controller (COF) Specification

1.6.1 Controller (COF) Specification

Item		Specification	Remark
Host Interface		I2C Standard mode Fast mode	Support Windows HID over I2C protocol
Input Power-supply Voltage		3.3[V]	
Main IC		MCU 1 [pc]	ILITEK：ILI2131
Number of Electrodes	DUS-S070WAF131	(X28:Y17)	(Electrode X：Y) Dummy is not included
	DUS-S101WAF131	(X31:Y18)	
	DUS-S101WAF131/X2	(X31:Y20)	
Coordinate Performance	Normal Coordinate Number to Output	5 [Finger]	
	Report rate	110Hz	*1
	Coordinate resolution	32767	
	Coordinate accuracy	±3mm	Electrode Matrix Pitch :About 7mm *2
Low Power Mode		Switch by command	Sleep mode
Calibration function		Support	Auto-execution

***1 This represents the value when using the ILITEK-manufactured I2C to USB Bridge Board and operating it with the standard firmware of the target model. This value is dependent on software noise filters and customer-requested specifications.**

***2 Touch contact size:φ10. The indicated coordinate accuracies are performances under a noise-free environment. The accuracy may significantly drop due to extrinsic noises and surrounding environment.**

1.6.2 I2C Interface

Item	Specification	Note
Slave address	0x41	8 bits
Transfer speed	100kHz 400kHz	Standard mode Fast mode
Slave mode	I2C slave clock stretching function	

1.6.3 Electrical Characteristics

1.6.3.1 Absolute Maximum Ratings

Item	Specification			Unit	Note
	Min.	Typ.	Max.		
Input Power Supply	-0.3	–	3.63	V	

1.6.3.2 DC Characteristics

1.6.3.2.1 Consumption Current (@ Ta= 25℃, Vcc= 3.3V)

*The value is the measurement of DUS-S101WAF131.

Parameter	Specification			Unit	Note
	Min.	Typ.	Max.		
Consumption current (in operation)	–	65	–	mA	
Sleep mode	–	5	–	mA	

1.6.3.2.2 RESETn Signal

Parameter	Specification			Unit	Note
	Min.	Typ.	Max.		
Input High Voltage	0.9	–	3.63	V	
Input Low Voltage	0	–	0.5	V	

1.6.3.2.3 I_2C Signal (SCL、SDA、INT)

Parameter	Specification			Unit	Note
	Min.	Typ.	Max.		
Input High Voltage	0.9	–	3.63	V	
Input Low Voltage	0	–	0.5	V	
Output High Voltage	2.9	–	3.63	V	
Output Low Voltage	0	–	0.4	V	

1.6.4 Connector

1.6.4.1 Applicable Connector

Connector Number	Applicable Connector	Maker
CN3	FH28-10S-0.5SH	HRS

1.6.4.2 Pin Assignment

Connector Number	Terminal Number	Terminal Name	I/O	Description
CN3	1	NC		
	2	NC		
	3	NC		
	4	GND	P	GND
	5	I2C_VDD	P	Power supply 3.3V
	6	SCL	I	I2C Clock Pin
	7	SDA	I/O	I2C Data input / output Pin
	8	INT	I/O	Interrupt pin
	9	RSTN	I	Terminal for external reset signal input. Setting this pin “active Low(L)” makes the chip to the initial state.
	10	GND	P	GND

2. Inspection Standard

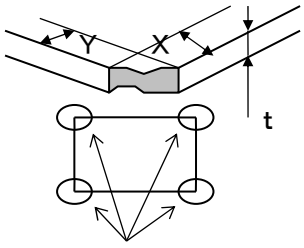
2.1 Appearance Criteria (for viewing area with and cover glass)

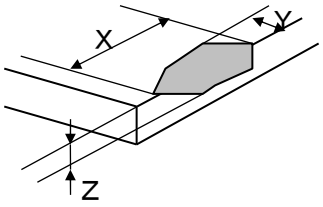
<table>
<tr><th>Item</th><th>W : Width (mm)</th><th>L : Length (mm)</th><th>Acceptable Number</th><th>Total</th></tr>
<tr><td rowspan="3">Liner
(Foreign substance/scratch/ transparent defects)
Defects over 0.2mm in diameter will be judged in circular.
Transparent defects mean bubble. lint *1, etc…</td><td>0.15＜W≦0.2</td><td>L≦10</td><td>Up to 1pc per product</td><td rowspan="6">【10“＜size】
Up to 7 pcs per product

【size＜10“】
Up to 5 pcs per product</td></tr>
<tr><td>0.1＜W≦0.15</td><td>L≦20</td><td>Up to 1pc in φ25mm including other kinds of defects</td></tr>
<tr><td>W≦0.1</td><td>Acceptable</td><td>Acceptable</td></tr>
<tr><td rowspan="4">Circular
(Foreign substance/scratch/ transparent defects)
Transparent defects mean bubble, lint *1, etc…</td><td colspan="2">0.5＜D≦0.7</td><td>Up to 1pc per product</td></tr>
<tr><td colspan="2">0.3＜D≦0.5</td><td>Up to 1pc in φ25mm including other kinds of defects</td></tr>
<tr><td colspan="2">D≦0.3</td><td>Acceptable</td></tr>
<tr><td colspan="3">D : average diameter ＝(longest＋shortest diameters) / 2</td></tr>
<tr><td>Dirt</td><td colspan="4">Not easily noticeable on black sheet</td></tr>
</table>

*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 touch screen)

<table>
<tr><td>Item</td><td colspan="6">Chips at areas other than electrode sections</td></tr>
<tr><td rowspan="4">Judgement Criteria</td><td colspan="3"> 

Chip at Corners</td><td colspan="3"> 

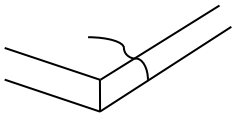
Chip other than at corners</td></tr>
<tr><td>X</td><td>Y</td><td>Z</td><td>X</td><td>Y</td><td>Z</td></tr>
<tr><td colspan="2">0.5≦X≦2.0(mm)
0.5≦Y≦2.0(mm)</td><td>≦t</td><td>≦5.0(mm)</td><td>0.5≦Y≦2.0(mm)</td><td>≦t/2</td></tr>
<tr><td colspan="3">Up to 2 pcs per product</td><td colspan="3">Up to 8 pcs per product, but each defects must be 20mm away from each other at each side.</td></tr>
<tr><td>Acceptable Numbers</td><td colspan="6">X＜0.5mm is acceptable
But, if the chip reaches to Ag pattern, it is unacceptable.</td></tr>
</table>

2.3 Chip (exclusively for cover glass)

※See the figure in the section 2.2 for locations

<table>
<tr><td>Site</td><td colspan="6">Chips at areas other than color printing</td></tr>
<tr><td rowspan="3">Judgement Criteria</td><td>X</td><td>Y</td><td>Z</td><td>X</td><td>Y</td><td>Z</td></tr>
<tr><td colspan="2">1.0≦X≦2.0(mm)
1.0≦Y≦2.0(mm)</td><td>≦t</td><td>≦5.0(mm)</td><td>1.0≦Y≦2.0(mm)</td><td>≦t/2</td></tr>
<tr><td colspan="3">Up to 2 pcs per product</td><td colspan="3">Up to 8 pcs per product, but each defects must be 20mm away from each other at each side.</td></tr>
<tr><td rowspan="2">Acceptable Numbers</td><td colspan="3">X＜1.0mm is acceptable
But, if the chip reaches to color printing, it is unacceptable.</td><td colspan="3" rowspan="2">Y<1.0mm is acceptable
But, if the chip reaches to color printing, it is unacceptable.</td></tr>
<tr><td colspan="3">Y＜1.0mm is acceptable
But, if the chip reaches to color printing, it is unacceptable.</td></tr>
</table>

2.4 Progressive Crack (apply to both cover glass and touch screen.)

Defect illustration	Judgement
	Unacceptable

3. Standard Testing Condition

Temperature: 20～30℃

Humidity: 20～80%RH

4. Reliability Testing Result

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

・Operation may become unstable, depending on the surrounding environment.
Do not use the product under environments that affect capacitance values (the affecting factors are such as power-supply noise).

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 the COF part.

・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.

・Keep the product away from conductive objects during use.

・Do not touch the conductive part of the product to avoid damage from electrostatic discharge.
Follow proper handling procedures.

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

This product is a controller-equipped projective capacitive touch screen. In the case of developing custom software such as drivers, please design with an understanding of the characteristics of both the touch screen and the controller.

5.5 Attention on Mounting

In designing installation mechanism, please refer to the separate document, [Projected Capacitive Touch Panel with COF, 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 defection such as appearance defection 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 defection 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.

7. Revision History

Rev	Date	Description / Reason
1	November 16, 2023	Newly released
2	December 25, 2023	1.6.1. Controller (COF) Specification: Revised the description (model number and annotations). 5. Attention in Handling: Revised the description

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