

DMC Co., Ltd.

Controller Board for Projected Capacitive Touch Screen
DUS1200 Product Specification

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1. Applicable Product

This specification sheet is applied to DUS1200 touch screen controller board.

2. Product Specification

2.1. Touch Screen Board Specification

Item		Specification	Note
Touch Detection Principle		Projected Capacitive	
Host Interface		USB Full Speed UART	
Input Power-supply Voltage		4.75 to 5.25V	
Driving Voltage		18V	
Operating Temperature		-20 [°C] to 85 [°C]	No dew condensation
Storing Temperature		-20 [°C] to 85 [°C]	No dew condensation
Main IC		MCU 1 [pc]	
		Sensor IC 1 [pc]	
Number of Electrodes	Electrode (X)	38 max.	
	Electrode (Y)	24 max.	
Coordinate Performance	Normal Coordinate Number to Output	5 [Finger]	Maximum 30
	Report rate (1 finger)	100 [Hz]	*2
	Report rate (2 finger)	100 [Hz]	*2
	Report rate (2 finger at same axis)	100 [Hz]	*2
	Electrode resolution	256 [1/Electrode]	
	2 finger minimum distance (X)	3.5 [Electrode]	21[mm] @ 6[mm]◇
	2 finger minimum distance (Y)	3.5 [Electrode]	21[mm] @ 6[mm]◇
	Coordinate Accuracy (1 finger: high accuracy area)	±2% max.	Active area ratio *1
	Coordinate Accuracy (2 fingers: high accuracy area)	±4% max.	Active area ratio *1
	Coordinate Accuracy (1 finger: low accuracy area)	±5% max.	Active area ratio *1
	Coordinate Accuracy (2 fingers: low accuracy area)	±8% max.	Active area ratio *1
	Low accuracy area	3 [Electrode]	3 electrodes from edge.
Low Power Mode		USB Suspend mode	
Calibration	Calibration function	Support	
	Calibration Time	Max 10 [sec]	*3

*1 Coordinate accuracy is the value at the contact size of φ10 where influence of noise doesn't exist.
The value may vary depending on extrinsic noise.

*2 The indicated values depend on software noise filter and CR values of the sensor glass. This specification is of the operation by normal clock scan.

*3 Calibration Time varies according to size of the touch screen.

2.2. Host Interface

2.2.1 USB Interface

Item	Specification	Note
Host Interface	USB 2.0 Full speed 12[Mbps]	
Power supply	Bus-powered	
Power type	High power device	
VendorID/ProductID	0x0AFA / 0x07D7 (Firmware update: 0x0AFA / 0x07D6)	
Power save mode	USB Suspend mode (Complying with USB specification)	Except current.

2.2.2. I2C Interface

Item	Specification	Note
Slave adress	0x5C	
Transfer speed	400 kbps	Fast mode
Transfer data length	Maximum 255 bits + Length 1 bits	
Slave mode	Single master IC only. Multi-master IC is not supported	

2.2.3. Serial Interface

Item	Value	Note
Host Interface	UART Baud Rate 57.6[Kbps]	
Data bits	8	
Stop bit	1	
Parity check	None	

2.3. Electrical Specification

2.3.1. Absolute Maximum Rating

Item	Specifications			Unit	Note
	Min.	Typ.	Max.		
Touch Panel Power Supply	-0.3	—	6	V	

2.3.2. DC Characteristics

Board Consumption Current Test Condition : Ta = 25°C, Vcc = 5V

Item	Specifications			Unit	Note
	Min.	Typ.	Max.		
Touch Panel Power Supply	4.75	5	5.25	V	
Consumption current(In Operation)	—	75	—	mA	Report rate:100Hz 10 Finger USBVBUS
Suspend mode	—	30	—	mA	USBVBUS

2.3.3 RESETn Signal

Item	Specifications			Unit	Note
	Min.	Typ.	Max.		
Input High Voltage	2.3	—	—	V	
Input Low Voltage	—	—	0.9	V	
Minimum pulse width	1	—	—	ms	

2.3.4 USB Signal (D+, D-) Characteristics

Item	Specification			Unit	Note
	Min.	Typ.	Max.		
Input High Voltage	2.0	—	—	V	
Input Low Voltage	—	—	0.8	V	
Output High Voltage	2.8	—	3.6	V	
Output Low Voltage	0	—	0.3	V	

2.3.5 UART Signal (Rx, Tx) DC Characteristics

Parameter	Specifications			Unit	Note
	Min.	Typ.	Max.		
Input High Voltage (Rx)	2.0	-	-	V	
Input Low Voltage (Rx)	-	-	0.6	V	
Output High Voltage (Tx)	2.4	-	-	V	
Output Low Voltage (Tx)	-	-	0.4	V	

2.3.6 I2C (SCL, SDA, I2C_INT)

Item	Specification			Unit	Note
	Min.	Typ.	Max.		
Input High Voltage	2.0	—	—	V	5V tolerant
Input Low Voltage	—	—	0.6	V	
Output Low Voltage	—	—	0.4	V	

SCL, SDA, I2C_INT is output by Open drain.

SCL, SDA, I2C_INT is Pullup on DUS1200. (SCL, SDA=3.3V_4.7kΩ, I2C_INT =3.3V_10kΩ)

2.4. Connector

2.4.1. Applicable Connector

Connector Number	Model Number	Maker
CN1	SM06B-SRSS-TB	JST
CN2	SM11B-SRSS-TB	JST
CN4	FH34SRJ-26S-0.5H(50)	Hirose
CN5	FH34SRJ-40S-0.5H(50)	Hirose

2.4.2. Pin Assignment

Connector Number	Terminal Number	Terminal Name	Description
CN1	1	VBUS	USB power input
	2	D-	USB D-
	3	D+	USB D+
	4	GND	USB GND
	5	RESETn	Reset Terminal Active Low Minimum Pulse Width 1ms
	6	GND	Reset GND
CN2	1	ICE_CK	Unused
	2	ICE_DAT	Unused
	3	RESETn	Reset Terminal Active Low Minimum Pulse Width 1ms
	4	Tx	UART Communication (5VTTL Level) DUS Board to Host Computer
	5	Rx	UART Communication (5VTTL Level) Host Computer to DUS Board
	6	SCL	I2C
	7	SDA	I2C
	8	I2C_INT / GPIO	For Interrupt signal when using I2C
	9	VCC_IN	DC 5V Power Input
	10	ICE_VCC	Unused
	11	GND	Power GND
CN4			Connector for touch sensor, 24 pins
CN5			Connector for touch sensor, 38 pins

3. Precautions

Operation may become unstable depending on the surrounding environment.

Do not use the controller under environments that affect capacitive values (Possible affecting factor is power supply noise.).

The application tool, TPOffset must be executed in advance of the use of touch screens.

TP-Offset, the application software, which can be downloaded from the DMC's website shown in below. It is executable on Windows OS.

DMC's website: TPOffset download page

<http://www.dmccoltd.com/english/download/tpoffset.asp>

4. Change History

Ver1.0 (October 25, 2019)

First release

Ver2.0 (June 3, 2020)

Specification for UART interface is added.

5. Attention in Handling

5.1. Handling Notes

Keep the product away from any conductive materials while in use.

Do not touch the conductive part of the product to avoid being damaged by the electrostatic discharge.

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 in the severe condition like following:

Wet environment or a condition where the product is likely to get wet. Where dew condensation is likely to occur. Near solvent or acid.

Do not disassemble, take apart, or alter the product.

5.2. Others

The contents of this document are subject to change without notice.

The manufacturer or sales representatives will not be liable for any damages or loss arising from use of this product.

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.).

Any semiconductor devices have inherently a certain rate of failure. The user must protect against injury, damage, or loss from such failures by incorporating safety design measures into the user's facility and equipment.

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 the 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 deflections, but the warranty for the production line is not covered.

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.

DUS1200 Product Specification

Ver2.0 issued on June 3, 2020

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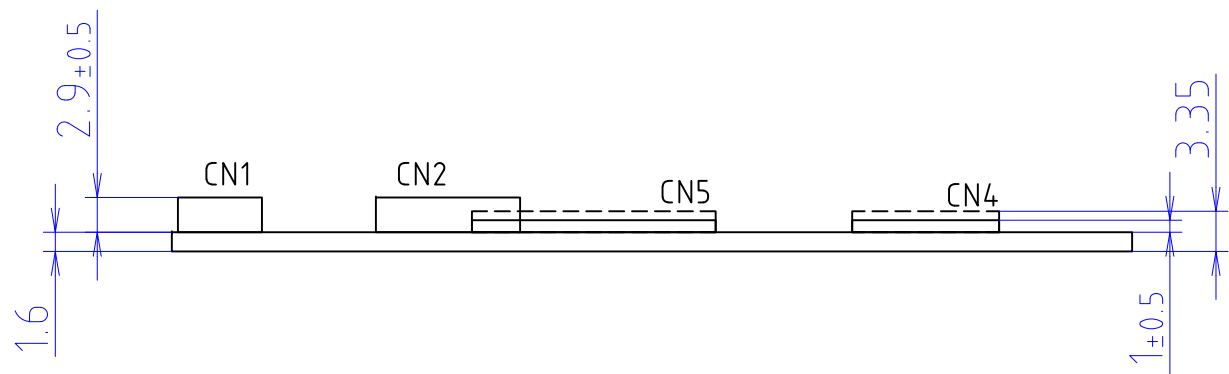
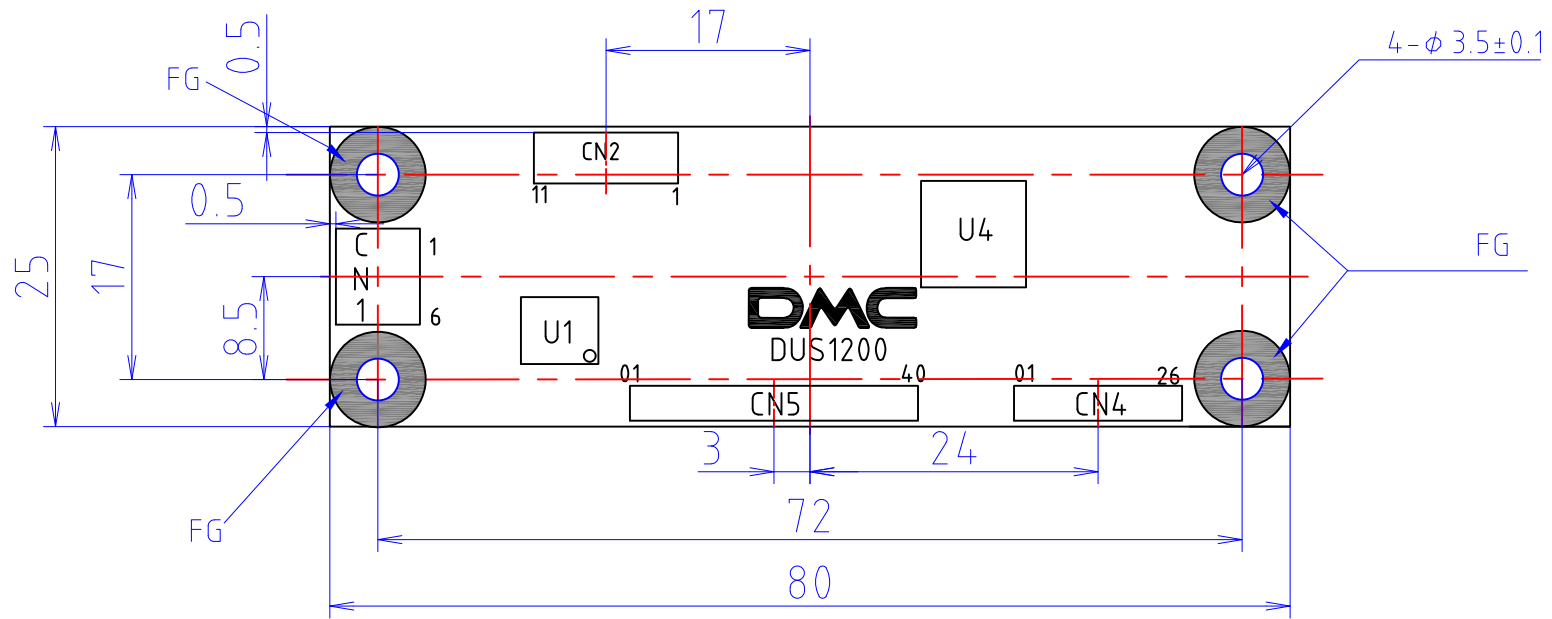


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TOLERANCE = $\pm 0.3\text{mm}$ except for hole diameter
 Material: FR-4
 Mass: TYP 9g
 UNIT = mm

Date	P/N
October 25, 2019	DUS1200
Name	
Dimensional Drawing	Rev.1.0
DMC Co., Ltd.	