Noritake *itron*

RoHS Compliant

TFT LCD Module with
Metallized Projective Capacitive Touch Panel
(FLETAS touch panel)

Specification

Model: GTWX101VHA00P

Specification No: DS-2079-0000-01

Date of Issue: October 9, 2019   (00)

Revision: December 18, 2019   (01)

This specification is subject to change without prior notice.

This product complies with RoHS Directive
Please contact our sales consultant for details and to confirm the current status

FLETAS **are products manufactured by Noritake itron Corporation.**

Notice for the Cautious Handling of LCD Modules

Handling and Usage Precautions:
Please carefully follow the appropriate product application notes and operation standards for proper usage, safe handling, and maximum performance.

【Construction】

❗	The FLETAS touch panel is made of glass. When using this product, please be sure to install a protective overlay such as cover glass, acrylic plate, etc.
❗	Please handle the FLETAS touch panel very carefully as it may crack if it is pressed with excessive force.
❗	If this product is bent or twisted, it may cause the breakage of parts on the product board. Please handle it very carefully without bending or twisting.
🚫	Please do not hold the FPC or other cables on this product as it may disconnect vital components.
❗	The end faces of the FLETAS touch panel are not polished. Please handle it very carefully to avoid injury.
❗	The FLETAS touch panel is made of glass. It may be damaged by falling / impact / excessive vibration. In the unlikely event that the glass shatters, please handle the glass fragments very carefully to avoid injury.
❗	The LCD panel generates heat. Please provide clearance for heat dissipation between this product and its enclosure. Also, if a structure has electronic parts that are densely collected near this product, we recommend that it be cooled with a fan or something similar.

【Cable Connection】

🚫	Please do not remove the power cable and signal cable if the product is in an energized state. It may cause damage to the power supply circuit and/or the I/O circuit of this product.
🚫	As a rule of thumb, please do not input any signals while the product is not receiving adequate power. It may cause damage to the input/ output circuit.
❗	When plugging-in or unplugging the cable for this product, please do not apply excessive force, such as pulling the cable. Please plug-in or unplug in a straight direction (alignment) with the terminal, without bending or twisting forces. If it is not properly plugged-in or unplugged, damage may occur to the cable or connector.
❗	Please avoid sudden bending of the cable from the base of the insert connector part. It may cause damage to the cable or disconnection of the connector. If loads are expected on connectors and cables, please fix cables etc.

【Electrostatic Charge】

❗	Since we are using semiconductor products, please pay attention to the electrostatic breakdown during handling and transportation. (If it is judged that the product is defective due to electrostatic destruction during its return to our company, it may be repaired for a fee.)

【Power】

❗	Please use a fully stabilized power supply. If the poweSr supply's voltage is outside of the product's rated supply voltage, the operation of the power supply circuit may become unstable.
❗	In-rush current flows when turning the power on. Please use a power supply that can withstand more than twice the normal current.
❗	As a safety measure, we recommend using a power supply with overcurrent protection and a fuse.
❗	Please confirm that the power supply voltage is within the rating of the connector. Please use a power cable with the appropriate thickness and length.

【Interface】

❗	Please use an interface cable that has a length that has been thoroughly verified.

【Implementation】

❗	When installing this product, please make sure that the on-board electronic components and FPC do not touch the metal chassis. It may cause the product to malfunction.
❗	If you need to make the product drip-proof, please use waterproof measures for products by using rubber etc.
❗	Please handle the product carefully when you take it out from the case and when you install the product, since it is a precision part.

【Storage and Operating Environment】

❗	Please use this product within the environmental condition range stated in its specification. Exceeding the stated temperature, humidity, vibration, and impact limitations (along with other stated limitations) may cause malfunction.
❗	Please do not exceed the absolute maximum ratings stated in the specification even for a moment. It may cause malfunction.
❗	Under a high temperature environment, the FLETAS touch panel surface also becomes hot. If you touch the FLETAS panel with your bare hand, please be careful of burns, injury, etc.
❗	Malfunction may occur when the product is stored and/or used in environments with a lot of salt, sulfur, dust, etc.

【Disposal】

❗	When disposing of this product, please follow the relevant regulations.

【Others】

🚫	Do not reverse engineer this product (i.e. firmware disassembly).
🚫	Do not modify, disassemble, repair, replace parts, etc. It may cause EMI failure, etc. (We cannot assume responsibility for troubles caused by modifying these products.)
❗	This specification does not give license of the intellectual property rights that our company owns. Also, it does not guarantee the implementation of a third party's rights.
❗	Neither whole nor partial copying of these specifications is permitted without our approval. If necessary, please ask for assistance from one of our sales consultants.
❗	This product is designed with careful attention to EMI and ESD. However, the characteristics of EMI and ESD change when the product is incorporated into a system. Please be sure to perform testing with the finished product. When used in noisy environments, please take measurements against noise around the casing.
❗	This product is not designed for military, aerospace, medical, or other life-critical applications. If you choose to use this product for these applications, please ask us for prior consultation or we cannot accept responsibility for problems that may occur.

❗ Image persistence may occur if the same screen is displayed for a prolonged period of time. The effect will gradually disappear by displaying a screensaver pattern, etc, or by powering off the display. The time needed for the effect to disappear is not fixed, as it depends on the exact usage, screen settings, power settings, and environmental temperature, etc.

To avoid image persistence, it is recommended to avoid displaying a fixed pattern or the same image for a prolonged period of time.

Contents

1 General Description

This specification corresponds to the product specification of GTWX101VHA00P which is TFT - LCD graphic display module with metallized projective capacitive touch (FLETAS touch panel).

1.1 Constitution

This product consists of TFT-LCD, FLETAS touch panel, and control board (touch control, power supply, display control).

The default FLETAS touch panel sensitivity is set for acrylic 3mm front cover with an air gap of 1mm. Sensitivity can be adjusted within a limited range by software command to accommodate differences in material and air gap etc. If adjustment beyond this range is necessary, please contact our sales consultant.

1.2 Block Diagram

Module

Touch control board (MCB-039)

User's Host

USB

Interface controller

Touch controller

X & Y

FLETAS touch panel

UART, I²C

5.0V

Power and display control board (MCB-038)

5V

Converter

Power supply

Display signal

TFT-LCD

DVI
HDMI connector

DVI signal to LVDS
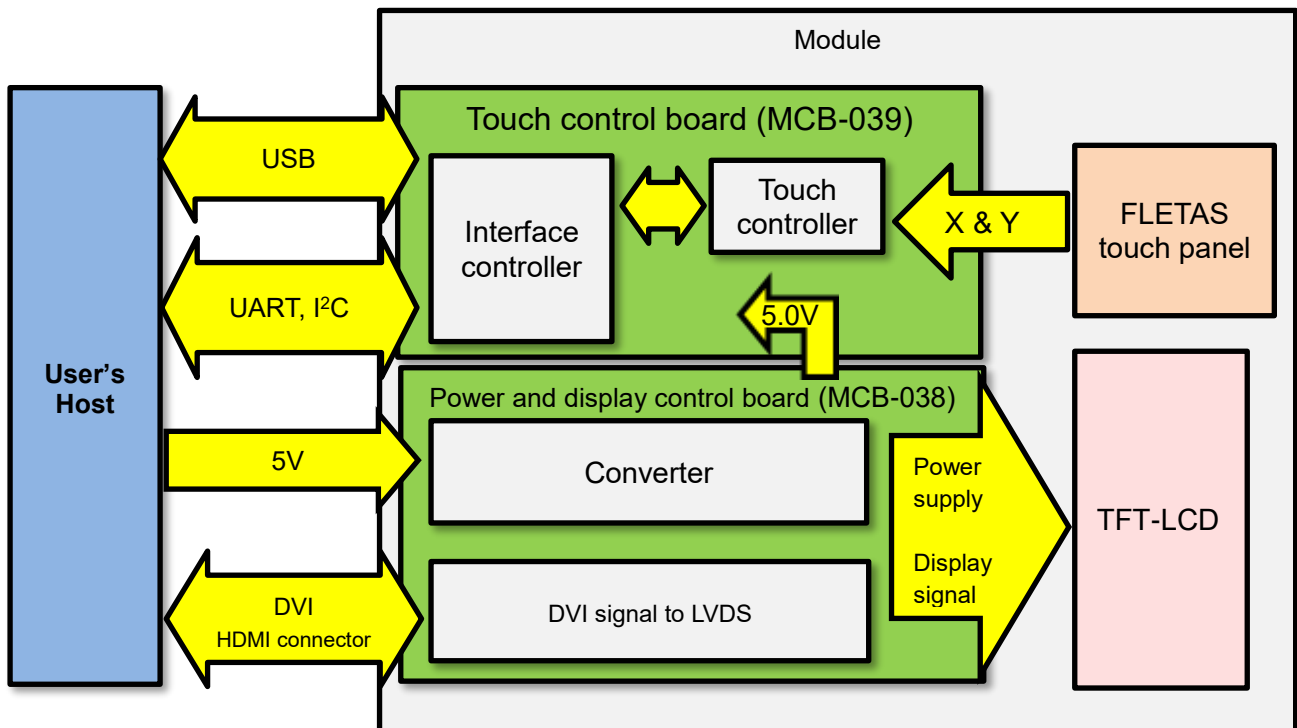
1.3   Basic Specification

Item		Content	Condition
Power Supply	Input voltage	DC 5V +/- 5%	VCC - GND
	Current	TYP. 1.5A	Backlight brightness 100%
Display	Type	TFT-LCD	
	Size	10.1 inches (display area: 216.96 mm x 135.60 mm)	
	Number of pixels	1280 x RGB X 800	
	Colors	16.7M (24-bit color)	
	Recommend viewing direction	ALL	
	Gray scale inversion direction	-	
	Brightness	Min. 500 cd/m^2 (nit)、 Typ. 850 cd/m^2 (nit)	Backlight brightness: 100% (Factory status)
	Display signal interface	DVI	HDMI connector Type A
FLETAS touch panel	Type	Metallized projective capacitive touch	
	Touch active area	218.16 mm x 137.36 mm	
	Number of touches	Max. 10 points (multi-touch enable)	
	Interface	USB2.0 (HID compliance, full speed 12Mbps.) (touch data acquisition by commands) I^{2}C (HID compliance, touch data acquisition by commands) UART (touch data acquisition by commands)	
Control	Display Commands	Backlight (display brightness) adjustment	UART, I^{2}C interface
	Touch Commands	Touch sensitivity adjustment, touch mode selection, touch data send, etc.	
	Other Commands	Memory switch setting, initialize, etc.	

2   Electrical Specifications

2.1   Absolute Maximum Rating

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Power supply	Power supply voltage	VCC	-0.3	—	+6.0	V	—
UART	Logic input voltage RXD	VIN1	-0.3	—	3.6	V	VCC=5V
I²C	Logic input voltage SCL,SDA	VIN2	-0.3	—	3.6	V	VCC=5V
Common	Logic input voltage /RESET	VIN3	-0.3	—	5.0	V	VCC=5V

2.2   Electrical Ratings

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Power supply	Power supply voltage	VCC	4.75	5.0	5.25	VDC	—
UART	Logic input voltage RXD	VIH1	2.7	—	—	VDC	—
		VIL1	—	—	0.6	VDC	—
I²C	Logic input voltage SCL,SDA	VIH2	2.7	—	—	VDC	Internal pull-up resistor 10kΩ
		VIL2	—	—	0.6	VDC	
Common	Logic input voltage /RESET	VIH3	1.5	—	—	VDC	—
		VIL3	—	—	0.3	VDC	—

The TFT-LCD driving voltage is generated by the on-board DC / DC converter.

2.3   Electrical Characteristics

Logic input/ output condition
Measuring conditions: ambient temperature = 25ºC, VCC=5.0VDC
TMDS clock frequency=65MHz, refresh rate=60Hz
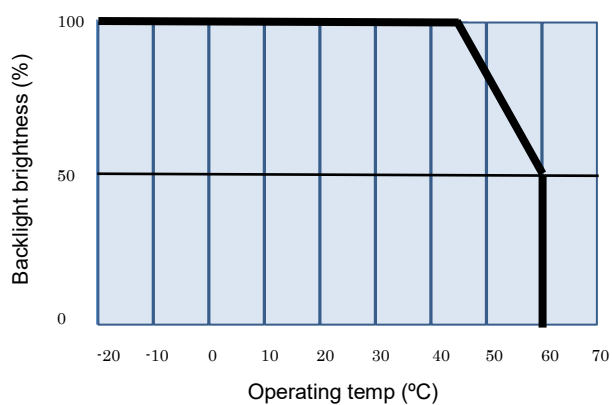
Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
UART	Logic output voltage TXD	VOH1	2.7	—	—	VDC	IOH1 = -4.0mA
		VOL1	—	—	0.5	VDC	IOL1 = 8.0mA
I²C	Logic output voltage SCL, SDA	VOL2	0	—	0.5	VDC	IOL2 = 8.0mA
	Logic output voltage /IRQ	VOH3	2.7	—	—	VDC	IOH3 = -4.0mA
		VOL3	0	—	0.5	VDC	IOL3 = 8.0mA
	Internal pull-up resistor SDA, SCL	Rp	—	220	—	kΩ	Pull-up Voltage 3.3V
Power supply	Power supply current	ICC-1	—	1.5	1.8	ADC	All white display Brightness 100%
		ICC-2	—	1.0	—	ADC	All white display Brightness 50%
		ICC-3	—	55	70	mADC	Energy saving mode
	Power consumption	P-1	—	7.5	9.0	W	All white display Brightness 100%
		P-2	—	5.0	—	W	All white display Brightness 50%
		P-3	—	0.3	0.4	W	Energy saving mode

· The rise time of supply voltage should not exceed 100ms.
· Inrush current at power-on may exceed twice normal current. It is recommended to use a power supply that can secure enough power capacity.

3 **Environmental Specifications**

Parameter	Content
Operating temperature	- 20ºC to + 60ºC
Storage temperature	- 20ºC to + 80ºC
Operating humidity	Temp. ≦60 ºC, 80% RH MAX. (no condensation) Temp. > 60 ºC , absolute humidity shall be less than 80% RH at 60 ºC. (no condensation)
Vibration (non-operating)	10-55-10Hz, all amplitude 1mm, 30 minutes, X-Y-Z
Shock (non-operating)	392m/s2 (40G) 9ms X-Y-Z, 3 times each direction
Brightness derating	

4 **Physical Specifications**

Parameter	Content
Number of pixels	1280 × RGB × 800
Display area	216.96mm × 135.6mm (X × Y)
Pixel pitch	0.1695mm × 0.1695mm (X × Y)
Weight	Approximately 550g

5 **Applicable Specifications**

Applicable reliability specification:	TT-99-3102x
Applicable module production specification:	TT-98-3413x
Applicable touch panel production specification:	TT-17-3301x

* The revision number is indicated by "x".

6   Interfaces

Interface *2		Protocol	Connector details
USB	HID *1	HID class standard (touch screen)	10.3
	WinUSB *1		
UART		Noritake original commands *3	10.1
I²C			
		HID class standard (touch screen)	
DVI		DVI Signal	10.1

*1 Both protocols are available simultaneously.
*2 All interfaces are available simultaneously.
*3 If multiple interfaces are used and there is data to be transmitted from this product, transmit
    data is transmitted from the interface on which data was most recently received.

6.1   USB interface : MCB-039_CN3

6.1.1   USB Interface – summary

The USB interface is USB 2.0 full-speed (12 Mbps) capable. The USB interface implements a HID class interface for the Touch Screen, and a WinUSB-compatible interface for Noritake original commands, both of which may be used simultaneously. The display module can be used as a HID and/or WinUSB device, using the standard HID and/or WinUSB drivers respectively.   Alternatively, refer to USB Interface – Technical details (below) if using the USB interface with a custom driver or embedded system, etc.

Refer to the USB 2.0 Specification (http://www.usb.org/developers/docs/usb20_docs/) for further details.

* Power supply VCC can not be supplied from VBUS. Please use the power connector (MCB - 038 - CN 2).

6.1.2   USB Interface – Technical Details

The device has a single configuration, with two interfaces, supporting three endpoints for data transfer:

Endpoint	Type	Maximum packet size
Endpoint 0	Control	64 bytes
Endpoint 1	Bulk IN	64 bytes
Endpoint 2	Bulk OUT	64 bytes
Endpoint 3	Interrupt IN	64 bytes

Vendor ID: 0EDA (hex)
Product ID: 12DF (hex)
Device Class: 00 (hex) (refer to Interface Class)

Interface 0: Class: 03 (hex) (HID)
Interface 1: Class: FF (hex) (vendor-specific)

Interface 0 uses endpoint 3 (Interrupt IN) for sending touch reports to the host.
Interface 1 uses endpoints 1 (Bulk IN) and 2 (Bulk OUT) for bi-directional data transfer.

Refer to the Device Class Definition HID for further details.
https://www.usb.org/hid

WinUSB compatibility:
The USB interface supports Microsoft OS String Descriptors, which enable automatic recognition of WinUSB compatibility for applicable operating systems (manual configuration, using an .inf file, is also possible). The GUID below is used by applications on the host in order to access the device.

Device Interface GUID : 6120D798-D192-4463-B0DE-2B65ED2F4870

Refer to WinUSB documentation from Microsoft for further details:
https://msdn.microsoft.com/en-us/library/windows/hardware/ff540196(v=vs.85).aspx

6.1.3   USB Connection Indicator

LED is illuminated when USB cable is inserted and VBUS signal is supplied.
USB cable can be plugged in and unplugged even when it is energized.

6.2   UART : MCB-039_CN1

Interface conditions:

Baud rate	4,800 to 115,200bps (set by memory switch) **Default setting: 38,400bps**
Parity	None, Even, Odd (set by memory switch) **Default setting: None**
Format	Start (1 bit) + data (8 bit) + parity (0 or 1 bit) + stop (1 bit)
Communication control signal	-
Transmit buffer	128 bytes
Receive buffer	512 bytes

6.3   I^{2}C : MCB-039_CN1

Working as an I^{2}C slave.

Communication Parameters

Communication speed	Max. 400Kbps
Format	I^{2}C
Slave address(es)	Set by memory switch
Supported function	ACK response, clock stretch
Communication control signals	/IRQ (*1)

*Note: If clock stretch is applied during processing of a command, the host (master) will not be able to send or receive any more data until command processing has finished.

*1 /IRQ signal indicates when data is available to be read by the host, but this signal can only be used by one of the I^{2}C functions. The HID function has priority, such that the signal is controlled exclusively by the HID over I^{2}C function, unless HID over I^{2}C is disabled (by setting MSW46 invalid). If HID over I^{2}C is disabled, the /IRQ signal is controlled by the Noritake original commands function.

For Noritake original commands, FF(hex) is returned in response to a read if no data is available.

For technical details on HID over I^{2}C, refer to the "HID Over I^{2}C Protocol Specification" document:
http://msdn.microsoft.com/en-us/library/windows/hardware/hh852380.aspx

The HID descriptor address of this product is 0x0001.

Data write sequence

S (Sr)	SLAVE ADDRESS			R/*W	ACK	DATA			ACK	...	DATA			ACK	P
	b7	...	b1	b0		b7	...	b0			b7	...	b0		

Data read sequence

S (Sr)	SLAVE ADDRESS			R/*W	ACK	DATA			ACK	...	DATA			NACK	P
	b7	...	b1	b0		b7	...	b0			b7	...	b0		
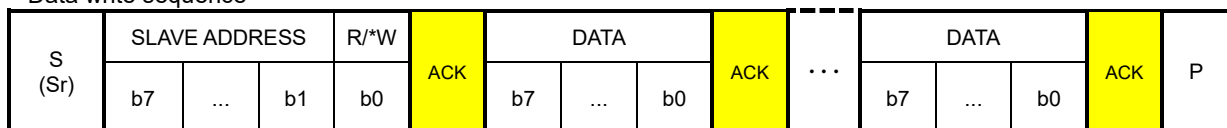
☐ Host (master) is transmitter, display module (slave) is receiver

▨ Host (master) is receiver, display module (slave) is transmitter

I²C Timing
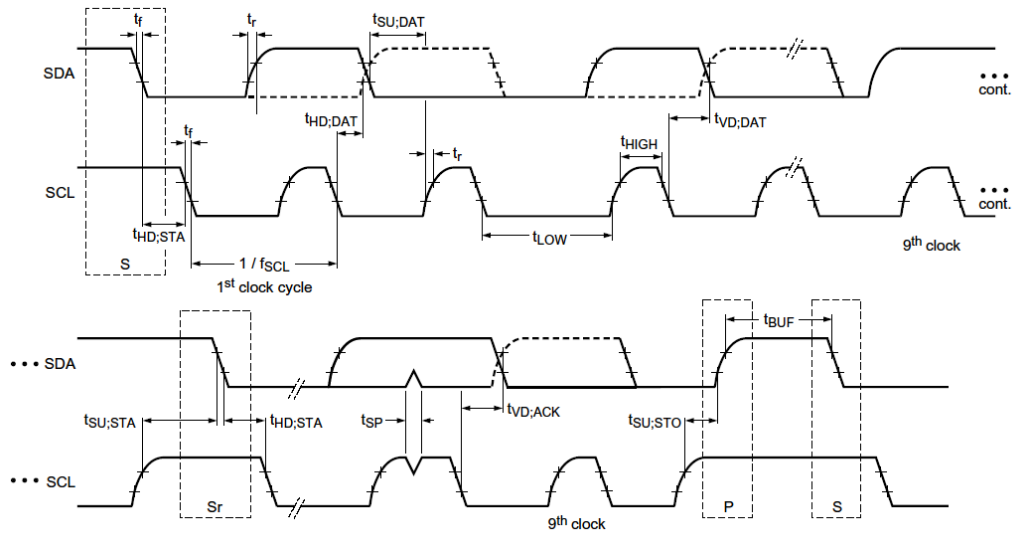
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
SCL clock frequency	fSCL	-	0	-	400	kHz
Start condition hold time	tHD;STA	-	0.6	-	-	µs
SCL 'L' time	tLOW	-	1.3	-	-	µs
SCL 'H' time	tHIGH	-	0.6	-	-	µs
Start condition setup time	tSU;STA	-	0.6	-	-	µs
Data hold time	tHD;DAT	-	0	-	-	µs
Data setup time	tSU;DAT	-	100	-	-	ns
SCL, SDA rise time	Tr	-	20	-	300	ns
SCL, SDA fall time	Tf	-	-	-	300	ns
Stop condition setup time	tSU;STO	-	0.6	-	-	µs
Stop condition – start condition bus idle time	tBUF	-	20	-	-	µs

Data Write Sequence
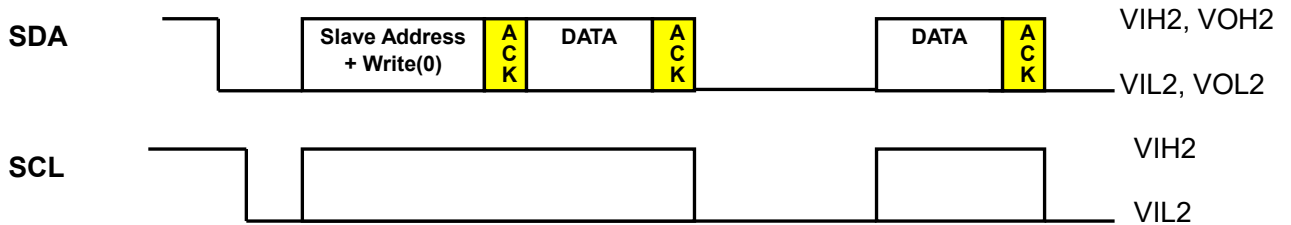
Data Read Sequence
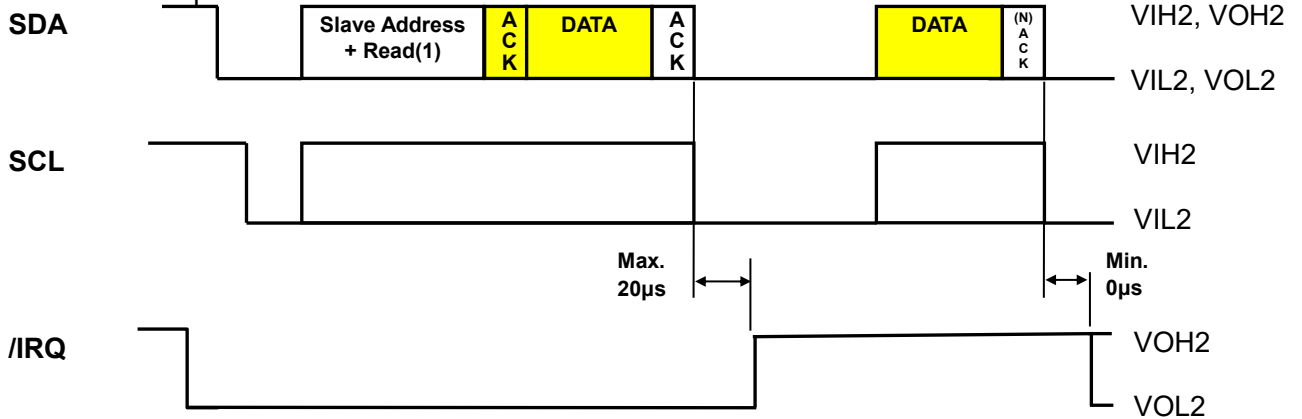
6.4   DVI : MCB-038_CN4

HDMI connector (Type A) for video signal input. This product receives DVI signals from the customer host and displays the image by converting it to a signal suitable for the display unit (TFT - LCD).

There is no audio signal output function etc. This product does not support communication standards such as HDCP.

LED2 is illuminated when the display signal is active.

HDMI cable can be plugged in and unplugged even when it is powered.

EDID is supported for plug and play operation when connecting to EDID compatible equipment.

TMDS clock frequency should be within the allowable range.

Parameter	Min.	Typ.	Max.	Unit
TMDS clock frequency	61.5	65.0	85.0	MHz

If EDID is not supported, or host settings cause TMDS clock frequency to be outside the allowable range, display image distortion may occur.

6.5   RESET

Reset pulse (active low) should be longer than 1ms.
After a reset pulse, a minimum of 200ms must be allowed before attempting to send data. After poer on, a minimum 0f 200ms must be allowed. Data loss may occur if these time periods are not adhered to.

- 12 -
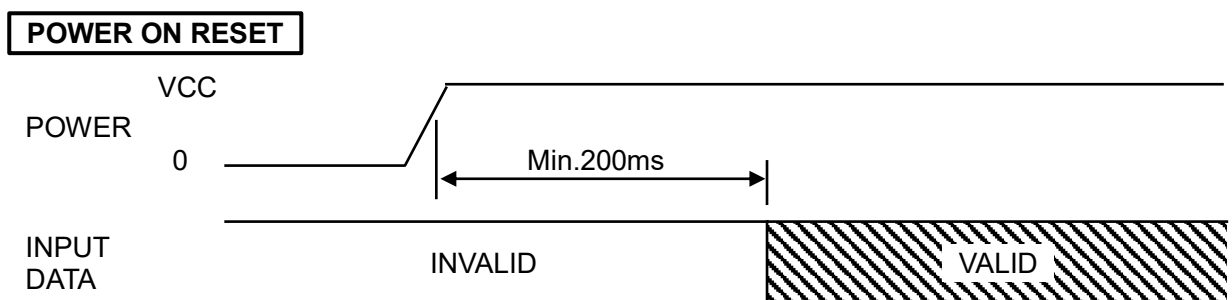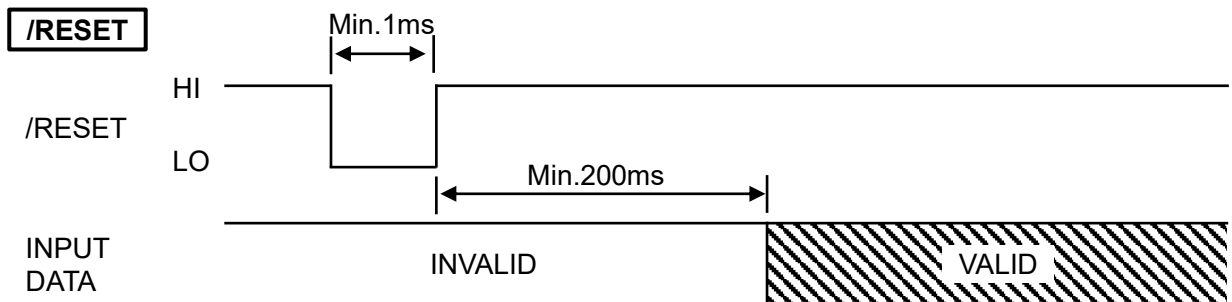
7 FLETAS Touch Panel

7.1 Outline

Detection method: Metallized Projective Capacitive Touch Panel (FLETAS touch panel)
Touch reporting methods: HID class standard (touch screen) (10-point multi-touch)
Noritake original commands

7.2 Basic Operation

The display module features a touch panel for handling input by fingertip or touch pen, etc.
FLETAS touch panel function sends data for the input position coordinates.

Touch action (Contact by fingertip, touch pen, etc)	Touch sensed →	Calculation (Input position)
Data transmit (USB, UART I²C)	←	Transmit buffer (1) (2) (Data format in coordinates mode: x, y)
Data transmit (USB, I²C)	←	HID touch report
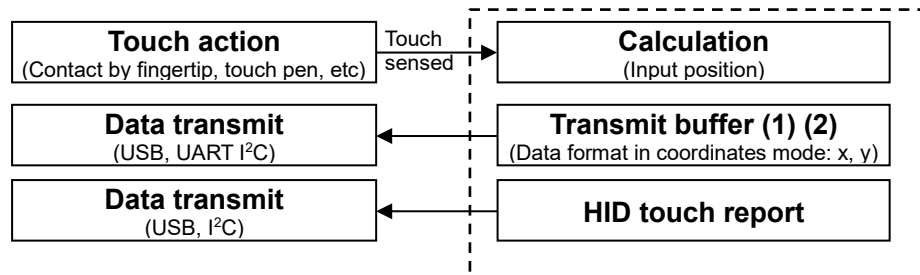
Notes:
(1) The number of simultaneous touches recognized depends on the touch mode.
  * For Noritake original format
(2) Touch information is queued when touch panel data transmit is ON and sufficient space is available in the transmit buffer (buffer capacity: 128 bytes). When there is insufficient space, touch actions are not queued, so the queued data should be periodically read.
  * For Noritake original format
(3) At power on, please wait absolutely 1second and do not touch the panel until hardware calibration is finished.

7.3 Touch Modes

There are two touch modes. Single-touch mode (default) recognizes only one touch at a time, generating continuous touch reports while the touch continues, stopping the reports when touch is released. This mode is software-compatible with resistive touch-panel modules. Multi-touch mode recognizes a maximum of 1 to 10 (configurable) touches, generating touch reports only when changes (touch / release / touch position change) occur.
  * For Noritake original format

7.4 Touch Data Read Format

FLETAS touch panel is configured as a display area. The (x, y) coordinate values of the input position (in 1-pixel units) are reported.

0（0000h）$\leqq$ x $\leqq$ 1279（04FFh）
0（0000h）$\leqq$ y $\leqq$ 799（031Fh）
* The upper left is the origin (0, 0).

Send touch data in the following format.
Transmit data format (single-touch mode)

Transmitted data	Hex	Data length
(1) Header	10h	1 byte
(2) Identifier	00h	1 byte
(3) Data	00h–FFh	4 bytes tXL: x-coordinate, lower byte tXH: x-coordinate, upper byte tYL: y-coordinate, lower byte tYH: y-coordinate, upper byte

Touch data is transmitted when FLETAS touch panel is touched.

Transmitted data format (multi-touch mode):

Transmitted data	Hex	Data length
(1) Header	10h	1 byte
(2) Identifier	10h, 11h	1 byte 10h: Released 11h: Touched
(3) Touch number	01h–0Ah	1 byte
(4) Data	00h–FFh	4 bytes tXL: x-coordinate, lower byte tXH: x-coordinate, upper byte tYL: y-coordinate, lower byte tYH: y-coordinate, upper byte

Touch data is transmitted, for each detected touch, when FLETAS touch panel is touched or released, or a touch position changes.

8   Commands List

Command Name	Hex Code	Operation	Page
Touch Mode selection Single-Touch Mode / Multi-Touch Mode	1Fh 50h 01h n	Set the specified channel to Coordinates mode. n: Select Touch Mode and maximum simultaneous touch detection (for multi-touch mode)	P16
Touch Panel Data Transmit ON/OFF for command control	1Fh 50h 20h m	Set whether or not touch operation data is transmitted when command control. m: Transmit ON/OFF	P16
Touch Panel Data Transmit ON/OFF for HID	1Fh 50h 22h m	Set whether or not touch operation data is transmitted via HID. m: Transmit ON/OFF	P16
Touch Parameter Setting	1Fh 4Bh 70h a b	Set touch parameter a: parameter selection b: set value	P17
Brightness Level Setting (for Backlight)	1Fh 58h n	Set backlight brightness level for entire display screen. Brightness level = (n / 255) * 100 [%]	P17
Initialize	1Bh 40h	Initialize all settings.	P17
Memory Switch Setting	1Fh 28h 65h 03h a b 1Fh 28h 65h 03h a b c(1) d(1) [...c(b) d(b)]	Set memory switch a: Memory switch selection - Memory switch individual setting $00h \leqq a \leqq 3Fh$ $00h \leqq b \leqq FFh$ - Memory switch multi-setting $a = FFh$ $01h \leqq b \leqq FFh$ $00h \leqq c \leqq 3Fh$ $00h \leqq d \leqq FFh$	P18
Memory Switch Data Send	1Fh 28h 65h 04h a 1Fh 28h 65h 04h a b c(1) [...c(b)]	Send contents of memory switch - Single-sending a: Memory switch No. - Multi-sending (a = FFh) b: Number of sending byte c: Memory switch No.	P18
Product Status Send	1Fh 28h 65h 40h a [b c]	Send product status information each. a: name of infromtion a = 01h: Boot verion information a = 02h: Firmware version information a = 20h: Memory checksum information a = 30h: Product type information a = 40h: Display x pixel information a = 41h: Display x pixel information b: Start address c: Data length	P19

9   Commands

These commands can be sent by USB (WinUSB-compatible interface), UART and I^{2}C.

The Commands (section 9) refer to operation using the optional Noritake original commands. These commands are not needed for the standard HID protocol.

9.1   US P 01h n   (Single-Touch Mode/ Multi-Touch Mode)
Code: 1Fh 50h 01h n
n: Select single/ multi-touch mode and maximum simultaneous touch detection
  (for multi-touch mode)
00h: Single-touch mode
01h ≤ n ≤ 0Ah: Multi-touch mode (n = maximum simultaneous touches)
Default = 00h
Definable area: 00h ≤ n ≤ 0Ah
Function: Selection single/ multi-touch mode.

9.2   US P 20h m   (Touch Panel Data Transmit ON/OFF for command control)
Code: 1Fh 50h 20h m
 m: Transmit ON/OFF
Definable area: m = 00h, 01h
                    m = 00h: Transmit OFF
                    m = 01h: Transmit ON
Default: m = 00h (transmit OFF)
Function: Sets whether or not touch operation data is transmitted to the host when command control.
When transmit OFF, touch operation data is not placed in the transmit buffer.

9.3   US P 22h m   (Touch Panel Data Transmit ON/OFF for HID)
Code: 1Fh 50h 22h m
 m: Transmit ON/OFF
Definable area: 00h ≤ m ≤ 03h

m	USB	I^{2}C
00h	OFF	OFF
01h	ON	OFF
02h	OFF	ON
03h	ON	ON

Default: m = 03h
Function: Sets whether or not touch operation data is transmitted to the host via HID.
When transmit ON, the touch report is generated and transmitted according to HID (USB or I^{2}C).
When transmit OFF, no touch report is generated.

9.4   US K 70h   （Touch Parameter Setting)
Code: 1Fh 4Bh 70h a b
    a   : parameter selection
    b   : value

9.4.1   a = 00h: Sensitivity
Definable area: $00h \le b \le 03h$

b	Sensitivity
00h ～ 0Fh	High
10h ～ 1Fh	↑
20h ～ 2Fh	
30h ～ 3Fh	
40h ～ 4Fh	
50h ～ 5Fh	
60h ～ 6Fh	
70h ～ 7Fh	
80h ～ 8Fh	
90h ～ 9Fh	↓
A0h ～ FFh	Low

Default: b = 50h (memory switch value)
Function: Set touch sensitivity.
Decreasing the "b" value makes the sensitivity high, and increasing it becomes low.
When b = 50h, Sensitivity is set for acrylic 3mm front cover with an air gap 1mm.

9.5   US X n   (Brightness Level Setting (for Backlight))
Code: 1Fh 58h n
    n: Brightness level setting
Definable area: $00h \le n \le FFh$
Default: Memory switch setting (default: n = FFh).
Function: Set display brightness level.

Brightness level = (n / 255) × 100 [%]

9.6   ESC @   (Initialization)
Code: 1Bh 40h
Function: Set various settings to the initial state.
    Restore the software setting value to the power-on state.
    The contents of the receive buffer are retained.
    MSW 46, 47, 48 and 49 are not reflected even if initialize command is executed after MSW setting. It is reflected by turning on the power again.

9.7   US (e 03h a b   (Memory Switch Setting)
Code: 1Fh 28h 65h 03h a b
   a: Memory switch number
   b: Setting data
Definable area:
        Single memory switch setting:
                00h ≤ a ≤ 3Fh
                00h ≤ b ≤ FFh
        Multiple memory switch setting:
                a = FFh
                01h ≤ b ≤ FFh
                00h ≤ c ≤ 3Fh
                00h ≤ d ≤ FFh
 Function: Set memory switch.
   A single memory switch can be set (a=00h–3Fh) or multiple memory switches can be set (a=FFh).
   Single setting (a=00h–3Fh): a = memory switch number, b = setting value.
   Multiple setting (a=FFh): b = number of settings, c = memory switch number, d = setting value.
   Memory switch details: refer to section 12 Memory Switch.

9.8   US (e 04h a   (Memory Switch Data Send)
Code: 1Fh 28h 65h 04h a
      1Fh 28h 65h 04h a b c[1] [… c[b]]
   a: Memory switch number
Definable area:
        Single memory switch read:
            00h ≤ a ≤ 3Fh
        Multiple read:
            a = FFh
            01h ≤ b ≤ FFh
            00h ≤ c ≤ 3Fh
Function: Send the the contents of memory switch data.

   A single memory switch can be read (a=00h–3Fh).
   Single read (a=00h–3Fh): a = memory switch number.
   Multiple read (a=FFh): b = number of reads, c = memory switch number.

   The following data is transmitted from the currently-active interface:

Transmitted data	Hex	Data length
(1) Header	28h	1 byte
(2) Identifier 1	65h	1 byte
(3) Identifier 2	04h	1 byte
(4) Data	00h–FFh	1 byte/ b byte

   Memory switch details: Refer to section 12 Memory Switch.

9.9   US (e 40h a [b c]   (Product Status Send)

Code: 1Fh 28h 65h 40h a [b c]
Definable area: a = 01h, 02h, 10h, 11h, 20h, 30h, 40h, 41h
                    a = 01h: Boot version information (b, c not used)
                    a = 02h: Firmware version information (b, c not used)
                    a = 20h: Memory checksum information
                         00h ≤ b ≤ FFh: Start address (effective address = b×10000h)
                         01h ≤ c ≤ FFh: Data length (effective data length = c×10000h)
                    a = 30h: Product type information (b, c not used)
                    a = 40h: Display x pixel information (b, c not used)
                    a = 41h: Display y pixel information (b, c not used)
Function: Send product status information each.

The following data is transmitted from the currently-active interface:

Transmitted data	Hex	Data length
(1) Header	28h	1 byte
(2) Identifier 1	65h	1 byte
(3) Identifier 2	40h	1 byte
(4) Data	00h–FFh	a = 01h: 4 bytes a = 02h: 4 bytes a = 20h: 4 bytes a = 30h: 15 bytes a = 40h: 4 bytes a = 41h: 4 bytes

10 Connectors

10.1 UART, I²C : MCB-039_CN1

Connector : JST SM12GB-GHS-TB, or equivalent

Pin No.	Terminal	Content
1	IC	Internal connection
2	IC	Internal connection
3	IC	Internal connection
4	IC	Internal connection
5	SDA	I²C data
6	/IRQ	Interrupt output (I²C data available)
7	SCL	I²C clock
8	/RESET	Reset input
9	NC	No connection
10	GND	Ground
11	TXD	UART send
12	RXD	UART receive

10.2 Power connector : MCB-038_CN2

Connector : JST S5B-XH-A, or equivalent

Pin No.	Terminal	Content
1	VCC	+5V
2	GND	Ground
3	VCC	+5V
4	GND	Ground
5	NC	No connection

10.3 USB : MCB-039_CN3

Connector : Micro-USB

Pin No.	Terminal	Content
1	VBUS	VBUS
2	D-	Data -
3	D+	Data +
4	ID	No connection
5	GND	Ground

* Power supply VCC can not be supplied from VBUS. Please use the power connector (MCB-038-CN 2).

10.4 DVI : MCB-038_CN4

Connector : TCX3253-611187 (HDMI connector type A), or equivalent

Pin No.	Terminal	Content	Pin No.	Terminal	Content
1	TMDS data2 +	-	2	TMDS data2 shield	Ground
3	TMDS data2 -	-	4	TMDS data1 +	-
5	TMDS data1 shield	Ground	6	TMDS data1 -	-
7	TMDS data0 +	-	8	TMDS data0 shield	Ground
9	TMDS data0 -	-	10	TMDS clock +	-
11	TMDS clock shield	Ground	12	TMDS clock -	-
13	CEC	+5V	14	NC	No connection
15	SCL	DDC clock	16	SDA	DDC data
17	DDC/ CEC ground	Ground	18	VCC	+5V
19	Hot plug detect	+5V			

10.5 Connector and LED Position
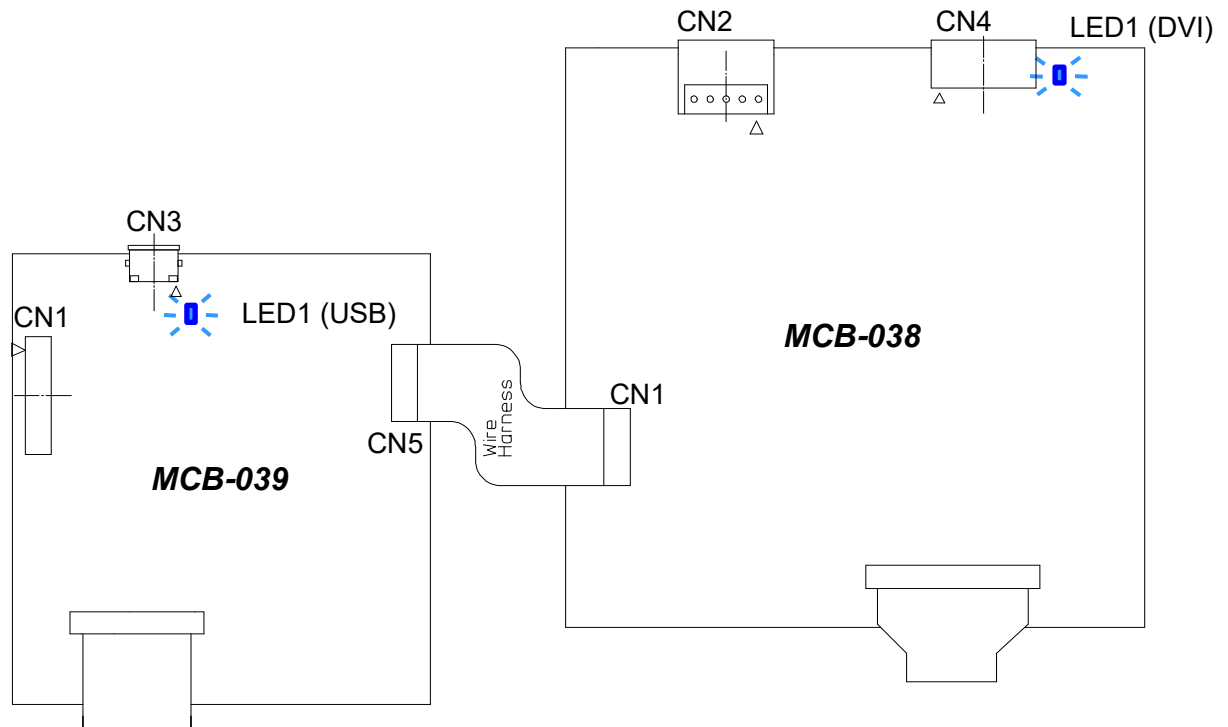
11 Installation Method

FLETAS touch panels are made of glass. When using this product, please be sure to install a protective overlay such as cover glass, acrylic plate, etc. Since this touch panel is capacitive type, touch won't work if a conductive material is placed on the touch area or bezel area. Please use non-conductive material like a glass or acrylic panel as a cover. An example is shown below.
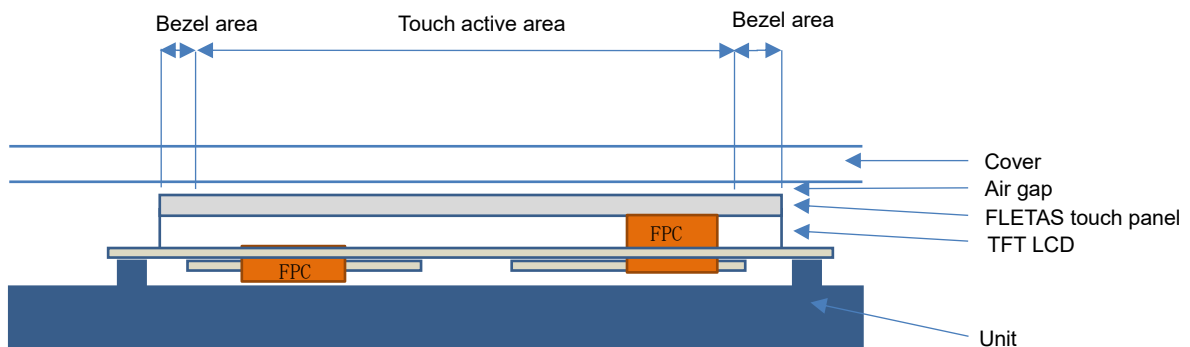
Installation example

- Because edges and corners are sharp of FLETAS touch panel, please be careful with installation.
- If it gives a strong shock it may cause destruction.
- Do not hold a cable (FPC) of FLETAS touch panel. Also, do not install such as to stress the cable.
- Please handle this product carefully because it is a precision part. When holding this product, please touch PCB edge, not FLETAS touch panel.
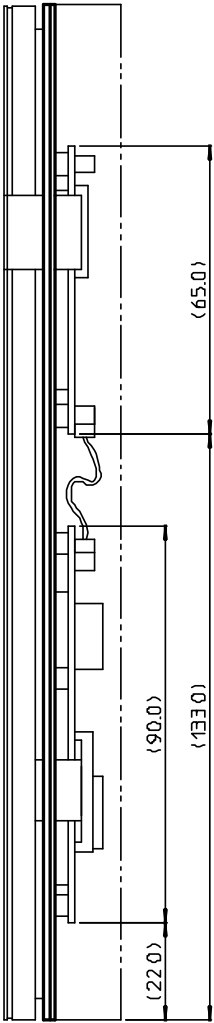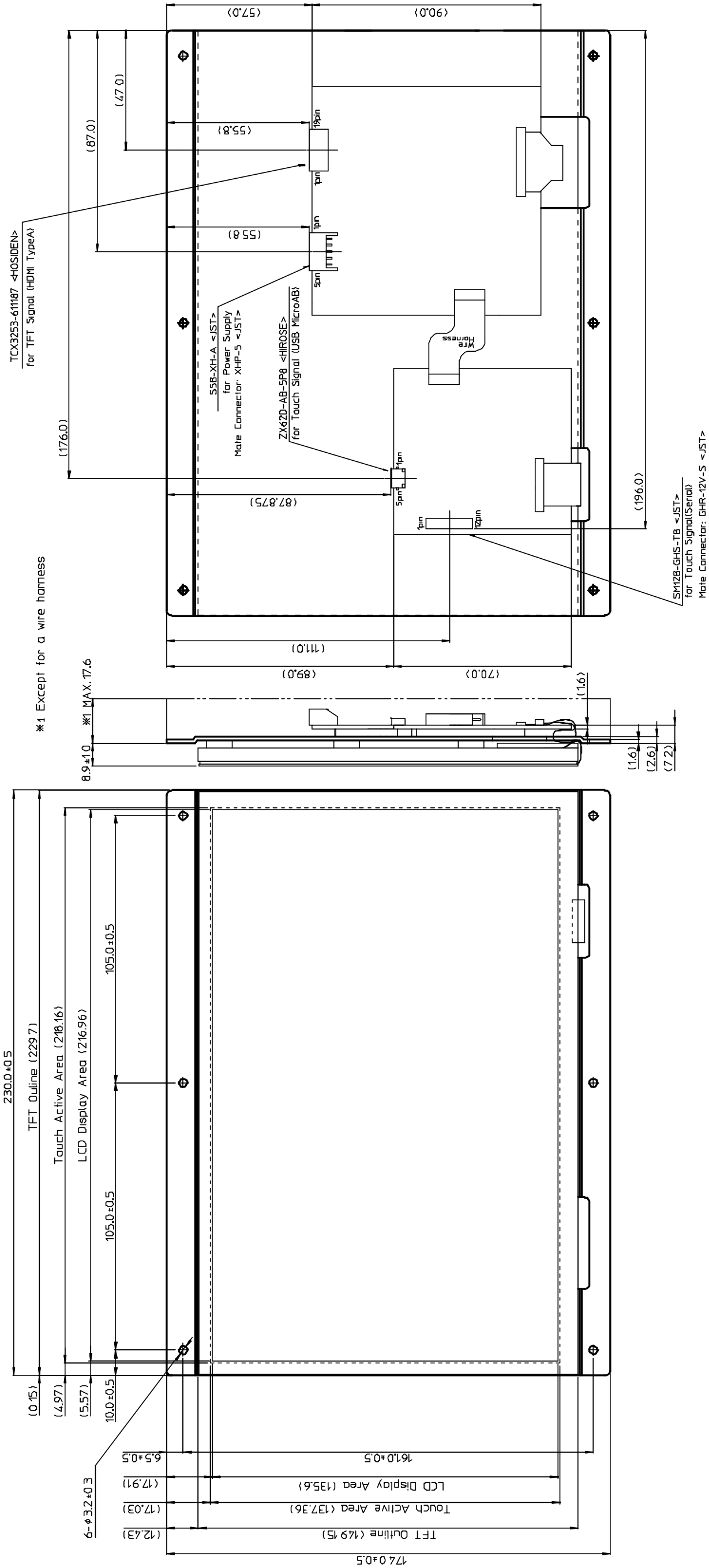
12 Memory Switch

Each parameter shown in the below table is set by the value of each memory switch at power-on.

MSW No.	Function	Valid range	Default
0-4	Reserved	-	-
5	Brightness level setting	00h–FFh	FFh
6-45	Reserved	-	-
46	I^{2}C slave address setting for HID (*1)	08h–77h, FFh (invalid)	51h
47	I^{2}C slave address setting for Noritake original commands	00h, 08h–77h, 88h–F7h (*2)	50h
48	UART baud rate setting 00h: 38,400bps (default) 01h: 4,800bps 02h: 9,600bps 03h: 19,200bps 04h: 38,400bps 05h: 57,600bps 06h: 115,200bps	00h–06h	00h
49	UART Parity 00h: None 01h: Even 02h: Odd	00h–02h	00h
50-58	Reserved	-	-
59	Touch sensitivity setting	00h–FFh	50h
60	Touch maintainence mode (Communication settings for the sensitivity adjustment tool)	(Factory use only)	00h
61-63	Reserved	-	-

Note: Module operates with default value if memory switch value is outside the valid range.

*1: If MSW46 value is the same with MSW47 value, MSW46 becomes invalid, and MSW47 takes precedence.

*2: If bit 7 is '1', this product will also respond on the general call address (00h).

13 Outline

( ): Reference only
Unit: mm

DS-2079-0100-00

TCX3253-611187 <HOSIDEN>
for TFT Signal (HDMI TypeA)

S5B-XH-A <JST>
for Power Supply
Mate Connector: XHP-5 <JST>

ZX62D-AB-5P8 <HIROSE>
for Touch Signal (USB MicroAB)

SM12B-GHS-TB <JST>
for Touch Signal(Serial)
Mate Connector: GHR-12V-S <JST>

Wire Harness

※1 Except for a wire harness

※ MAX. 17.6

TFT Outline (229.7)
Touch Active Area (218.16)
LCD Display Area (216.96)

230.0±0.5
105.0±0.5
105.0±0.5

8.9±1.0

(1.6)
(2.6)
(7.2)

(65.0)
(90.0)
(133.0)
(22.0)

TFT Outline (149.15)
Touch Active Area (137.36)
LCD Display Area (135.6)

172.0±0.5
161.0±0.5
6.5±0.5
(17.91)
(17.03)
(12.43)

6-φ3.2±0.3
10.0±0.5
(5.57)
(4.97)
(0.15)

14　Firmware Version Revision History

Firmware virsion	Contents
F110, or later	Initial issue

* Please contact our sales representative for the latest firmware version.

Revision history

Spec. No.	Date	Revision
DS-2079-0000-00	Oct. 9, 2019	Initial issue This product is basically identical to the GT1280X800A-1303P.

DS-2079-0000-01	Dec.18, 2019	2.2 Electrical Ratings
		    Error correction
		    I^2C Condition
		        External pull-up resistor 10kΩ
		        ↓
		        Internal pull-up resistor 10kΩ
		2.3 Electrical Characteristics
		    Change notation
		    Power supply Condition
		        Display ON → All white display
		6.5 RESET
		    Error correction
		        /RESET : Max.100ms → Min. 200ms
		        POWER ON RESET : Max 200ms → Min. 200ms
		9.5 US X n
		    Change notation
		    (Backlight Brightness Level Setting)
		        ↓
		    (Brightness Level Setting (for Backlight))
		10.1 UART, I2C : MCB-039_CN1
		    Corrected SDA and SCL contents
		        Pin No. 5 SDA: I2C clock → I2C data
		        Pin No. 7 SCL: I2C data → I2C clock
		12 Memory Switch
		    Error correction
		    MSW No. 60 - Function
		      Touch maintainence mode (factory use only)
		        ↓
		      Touch maintainence mode (Communication settings for the sensitivity adjustment tool)