

PRODUCT SPECIFICATION

A

A

- 1. PRODUCT : TOUCH PANEL
- 2. PART NUMBER : **TTI : T010-3201 -T580U**
- 3. ATTACHED DRAWING : **Tech Bes TTI-15015**

B

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SIGNATURE FOR YOUR RECEIPT

C

C

DATE:

TRANSTOUCH TECHNOLOGY INC. (TTI)
DOCUMENT No. : TTI PRODUCT TECHNOLOGY Dept.

D

D

MANAGER : Chenchiifu DATE: 2015.5.12

TTI PRODUCT TECHNOLOGY Dept.
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Title: Touch Panel Spec.

Draw No. Tech Bes
TTI-15015

Cust

ED Date Design Check

Des 20150505

Johnny

Kor

App.

Chenchiifu

富晶通科技股份有限公司
Transtouch Technology Inc.

SHEET

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<p>觸控面板製品規格書</p> <p>TOUCH PANEL SPECIFICATION</p>
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富晶通科技股份有限公司
TRANSTOUCH TECHNOLOGY INC.

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觸控面板製品規格書
TOUCH PANEL SPECIFICATION

A

1. 適用範圍 Application

此規格書是適用富晶通科技股份有限公司所製作的觸控面板。

This specification is applied to TOUCH PANEL made by TRANSTOUCH TECHNOLOGY INC. (TTI)。

【製品圖號 Product No.】

品名 Name	製品圖號 P/No.	尺寸 Size	備註 Remark
觸控面板 TOUCH PANEL	T010-3201-T580U	12.1"	指輸入專用 Finger input type (RoHS)

B

2. 概要 Function

此製品是裝置在像 LCD 等平面顯示器上使用投射電容式的觸控面板。以手指按下觸控面板的表面，面板會檢出迴路將觸控點檢測出來。

TTI TOUCH PANEL is projective capacitance type that customer uses with flat display such as LCD. Once user touches it by FINGER directly, the circuit of TOUCH PANEL will send the contact point to PC.

C

3. 製造者 Manufacturer

富晶通科技股份有限公司 TRANSTOUCH TECHNOLOGY INC. (TTI)

所在地:桃園縣龜山鄉(華亞科技園區)華亞三路 50 號 3 樓

Address:3F No.50 Hwa-Ya 3rd Road ,Kwei-san Shian, Tao-yuan ,Taiwan

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4. 外型 Outline

4.1 外型圖 Drawing

詳見最後附加圖面

Please refer the last page of this spec.

部 材	規 格
Sensor Film	Outline : 271.18±0.3mm , 209.3±0.3mm
	View Area : 248.5±0.2mm , 187±0.2mm
	T=0.35mm±0.1mm
Cover Glass	Outline : 281.5±0.3mm , 228±0.3mm
	View Area : 247.5±0.2mm , 186.0±0.2mm
	T=1.8mm±0.15mm

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Structure:



Fig.1 產品結構圖

4.2 用語定義 Definition of words

用 語 Words	定 義 Definition
動作保證範圍 Guaranteed active area	觸控面板的特性保證範圍。 An area to be guaranteed all characteristics stated on this spec.
透明範圍 View (transparent) area	Cover Glass 內側的透明範圍。 A view area which is inside Cover Glass. Top enclosure must not be fixed by this area.

5. 特性 Characteristics

5.1 光學特性 Optical characteristics

項 目 Item	規 格 Specification	備 註 Remarks
1 全光線透過率 TRANSPARENCY	86% Min. (動作保證範圍內) (Inside of guaranteed active area)	JIS K-7105
2 HAZE	1% Typ.	JIS K-7105

5.2 電性特性 Electric characteristics

5.2-1 操作條件 Operation condition

介面 Interface	USB
系統需求 Support OS	Windows 7/Android/Linux
反應時間 Response time	Max 25ms
支援觸控點數 Touch number	10 points
操作電壓 Power Supply Voltage	3.5V~5.5V DC (5.0V Typ.)
操作電流 Power Supply Current	85mA(Active) 5mA(Low Power)

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回報率 Report Rate	100 Hz Min. (Single point) ; 70 Hz Min. (Dual points)
韌體版本 Firmware Version	TBD

5.2-2 介面 Communication Interface
請參考 4.1 外型圖上說明

5.3 環境特性 Environmental characteristics

項 目 Item	規 格 Specification	備 註 Remarks
1 動作溫度 Operation temperature	-5°C ~ 60°C	Max. wet Temp. is 38°C(No dew) 以上條件不代表環境測試規格
2 保存溫度 Storage temperature	-10°C ~ 70°C	
3 動作濕度 Operation Humidity	20% ~ 90%RH	
4 保存濕度 Storage Humidity	10% ~ 90%RH	

5.4 機械特性 Mechanical characteristics

項 目 Item	規 格 Specification	備 註 Remarks
1 表面硬度 Hardness of surface	鉛筆硬度 6H Pencil hardness 6H	JIS K-5600-5-4
2 FPC 剝離強度 FPC peeling strength	5N 以上 5N Min.	向上垂直剝離 Peeling upward by 90°
3 FPC 彎曲 Bending	彎曲 3 回 Bending 3 times	R1.0mm Bending angle: 90°
4 FPC 插拔 FPC Plug in-out	插拔 5 回 Plug in-out 5 times	

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A	MCU – EXC3160	
	Operating Power Management	Power Supply: 3.0~3.6 VDC Internal regulator for analog block Internal regulator for digital core Idle mode Sleep mode
	Operating Temperature	-40 to 85°C
	Storage Temperature	-40 to 125°C
B	ESD	4000V (HBM)
	Package	VFBGA 6mmx12mmx0.8mm Ball Pitch : 0.5mm Ball Count : 220
C	Peripherals	Clocks * External 12MHz crystal * Internal PLL * Internal 32bits RTC * Clock generator for digital modules * Clock generator for analog modules
		Analog Modules * Up to 60 RX channels * Up to 38 TX channels * Signal generator
		Digital Modules * Timer, watch dog timer * Multi-touch algorithm engine * Hardware algorithm accelerator * Hardware scan engine
D		Communication Interface * USB 2.0 compliant full speed with PLM L1 supported * Configurable Serial Interface UART: baud rate 19200, none parity, 8 data bits and 1 stops bits I2C: up to 400KHz, support 1.8V and 3.3V
		Memory * 64KB embedded flash * 32KB SRAM + 1KB (USB FIFO)
	Application	Touch screen Controller

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5.5-2.ELECTRICAL CHARACTERISTIC

MCU – EXC3160

Voltage characteristics

symbol	Parameter	Condition	min	TYP	max	unit
VDD-GND	Supply power		3.0	3.3	3.6	V
Crystal Clock	Crystal clock			12		MHz
VIH	Input high level voltage		VDD-0.8			V
VIL	Input Low level				0.8	V
VOH	Output high voltage	I = 2mA	VDD-0.4			V
VOL	Output Low voltage	I = 2Ma			0.4	V
VDDH	High voltage power		13	13.5	14	

5.5-3 Maximum ratings

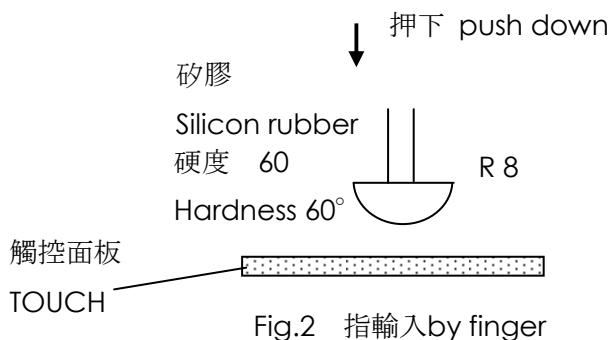
MCU – EXC3160

symbol	Parameter	min	max	unit
VDD-GND	Maximum power supply voltage	-0.3	4	V
Vin	Input I/O pin voltage	GND-0.3	VDD+0.3	V
IVDD	Total current at power		200	mA
IGND	Total current at Gnd		200	mA
Vesd	Electrostatics Discharge Voltage(HBM)	4000		V

6. 耐久性 life test condition

6.1 機械特性 Mechanical characteristics

1	打點壽命 Input Life	1000 萬次以上 10 million times min.	動作保證範圍內 "Within" guaranteed active area"
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※ 打點壽命(耐久性)試驗條件 Input life test condition(by finger)
 使用矽膠在同一地方連續打點
 By silicone rubber tapping at same point.

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橡膠尖端 Sharp of rubber end : R8 硬度 Hardness 60°(Refer fig.2)

操作力 Load : 200g

- 操作頻率 Frequency : 5Hz

6.2 環境測試條件 Environmental test condition

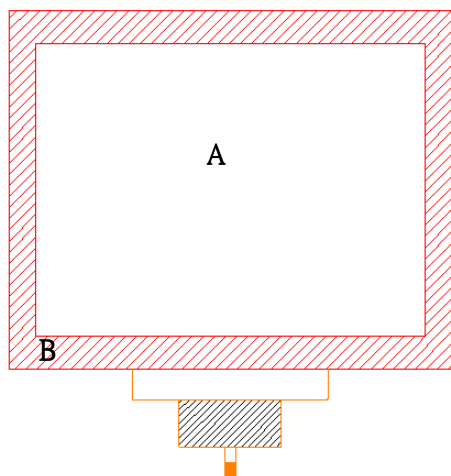
項目 Item	規格 Specification	備註 Remarks
1 高溫保存試驗 High temperature storage	70°C, 240 hr	
3 低溫保存試驗 Low temperature storage	-30°C, 240 hr	
3 高溫高濕保存試驗 High temperature high humidity storage	60°C, 90%RH, 240 hr	
4 溫度衝擊循環試驗 Temperature Cycling	-30°C ~ +70°C (0.5hr each), 100 cycles	

Note1: The test sample have recovery time for 24 hours at room temperature before the function check. In the standard conditions, there is no any touch panel function NG issue occurred.

7. 外觀規格 Appearance.

7.1 外觀基準適用領域(範圍) Scope of reject criteria.

Note: All the cosmetic specifications are judged before the reliability stress.



領域 Area	外觀仕様 Specification
A/B	使用上不會有可視的缺失而影響正常操作。檢查基準依據 7-2 項。 Without any defect point to effect on normal operation.

A : 可視區域

B : 可視區域以外

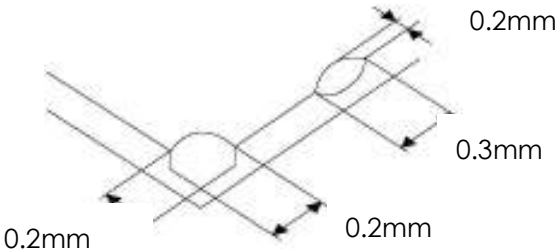
View area.

View area besides.

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項 目 Description	檢 查 基 準 Reject criteria
玻璃瑕疵 Glass flaw	<p>不超過下述的規範值，數量不限。 厚度方向的瑕疵(缺角)最大到板厚為止。 To be no flaw which size is over the drawing Specified as below. Number of flaw doesn't specify. Traveling flaw is none. The maximal flaw of thickness direction size is the glass thickness.</p> 

B

C

項 目 Description	檢 查 基 準 Reject criteria		
汗漬和斑點 Spot And Dots	Diameter:	0.5mm < D	zero
		0.2mm < D ≤ 0.5mm	Max: 5 points
		d > 20mm	
		D ≤ 0.2mm	Disregard
刮傷 Scratch	Width: Width: Length: Width:	0.1mm < W	zero
		0.06mm < W ≤ 0.1mm	Max: 5 points
		L ≤ 10mm ; d > 20mm	
		W ≤ 0.06mm	Disregard
線狀異物 Linear Foreign Particle	Width: Width: Length: Width:	0.1mm < W	zero
		L > 10mm	
		0.08mm < W ≤ 0.1mm	Max: 5 points
		L < 10mm	
點狀異物 Particle	Diameter:	0.5mm < D	Zero
		0.2mm < D ≤ 0.5mm	Max: 5 points
		d > 20mm	
		D ≤ 0.2mm	disregard
打痕(魚眼) Dent/Fish eye	Diameter:	0.5mm < D	Zero
		0.2mm < D ≤ 0.5mm	Max: 5 points
		d > 20mm	
		D ≤ 0.2mm	disregard

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A	Bubble	Diameter:	0.5mm<D 0.2mm<D≤0.5mm d>20mm	Zero Max: 5 points
			D≤0.2mm	disregard
	漏光 Pin Hole	Diameter:	D≤0.2mm	disregard
B	異色點 Color Stain	有色物質不可存在於 TP 內層中 Color stain/material can not exist inside of sensor.		
	OCA 痕 OCA Waving	依照限度樣品判定 Judged by limited sample.		
	FPC 異物/髒污 Foreign material	Film 內層雜質不可跨越兩迴路。 Foreign material can not short two patterns.		
	FPC 刮傷 FPC Scratch	會造成製品電氣特性障礙的刮傷皆不可。 Any caused scratch which effects electrical characteristic is prohibited		
C	FPC 皺折 FPC Crumple	會造成製品電氣特性障礙的皺折皆不可。 Any caused crumple which effects electrical characteristic is prohibited		

※ D : Diameter[D=(長徑+短徑)/2], W : 寬(Width), L : 長(Length) , d : 距離(distance)

8. 表示方法 Showing

Touch Panel 製造型格及製造年月份表示方法。

Showing to P/No., Production & Year/Month.

製造批號 P/No.	表 示 Showing	意 思 Meaning	備 考 Notes
Production Lot No.	Laser-Marking in film back side 15010001	The fist two numbers: Year(15: 2015); The third and fourth numbers: Month(01:Jan.); Other numbers: Serial code	

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注意事項 Attention

(1) 本產品是使用玻璃所製，因為玻璃的邊、角是銳利的，在使用觸控面板時請多注意。
在使用觸控面版時請戴手套作業。

Since Touch Panel is consist of glass, please be careful your hands to be injured during handling. You must wear gloves during handling.

(2) 本產品是使用玻璃所製，在使用觸控面板時，請注意不要施加強力衝擊。
Do not strike touch panel.

(3) 拿起觸控面板時請勿從 FPC 拿取。
Do not lift touch panel by cable (FPC).

(4) 請勿施加重力於 TP。(例：在組裝時勿從 Cover Glass 吸取移動)
Excessive force onto the TP is prohibited.
(Ex. Don't transfer the panel from TP with vacuum)

(5) 表面清潔時，請使用「乾的柔性布」或「浸泡過中性清潔液擰乾的布」或「沾有酒精的柔性布」。請勿使用有機溶劑、酸、鹼類溶劑。
Please use dry cloth or soft cloth with neutral detergent (after wring dry) or one with ethanol at cleaning. Do not use any organic solvent, acid or alkali solution.

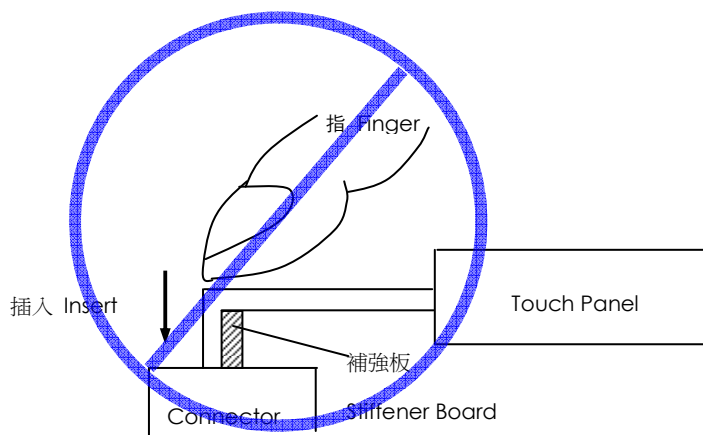
(6) 保存時請勿重疊放置。特別是請勿用重物壓著。
Do not stack the touch panels together. Do not put heavy objects on touch panels.

(7) FPC 請勿折彎，有可能使迴路線斷裂。特別是對於連結器的插入部分，因為貼有補強板，在插入連結器時請勿施加過多的力量。請避免以下圖方式插入。
Do not bend the cable (FPC) of touch panel to prevent the circuit broken.
Please don't use following method for inserting into FPC tail to connector.

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(8) 在實際組裝設計時，請注意以下事項。

Please pay attention for the matters stated below at mounting design of touch panel & enclosure

- 1. 觸控面板的上蓋支撐物請設定在透明範圍的外側。
(上蓋請勿壓在透明範圍上，會有誤動作的情況發生)
Enclosure support to fix touch panel must be out of view (transparent) area. (Do not design enclosure presses the view area to protect from miss input)
- 2. 上蓋的外框請設定在透明範圍的內側、動作保證範圍的外側。
(上蓋的外框請勿接觸到透明範圍)。
The enclosure edge must be between view area & Guaranteed active area. (Enclosure edge must not touch the view area)
- 3. 觸控面板上下部的壓合，請以橡膠等彈性材質。
Elastic materials are recommended as a support to fix touch panel.
- 4. 觸控面板上部的邊角，因為玻璃導電層有傳導性，在組裝設計時請注意不要與金屬材質接觸。
The corners and edges of touch panel (fig.*) may be conductive. Do not touch it with metallic components after mounting.
- 5. 有防水需求時，請考慮用橡膠等材質對迴路週邊做防水。
Special design is required for water resistance.
- 6. 當使用 Air gun 向觸控面板吹氣時，建議 Air 壓力調整為 2kg/cm² 以下，並且勿從玻璃側朝 FPC 直接吹氣，以免 FPC 在強烈 Air 壓力下，造成脫落。
Cleaning touch panel by Air gun, pressure below 2kg/cm² is suggested.

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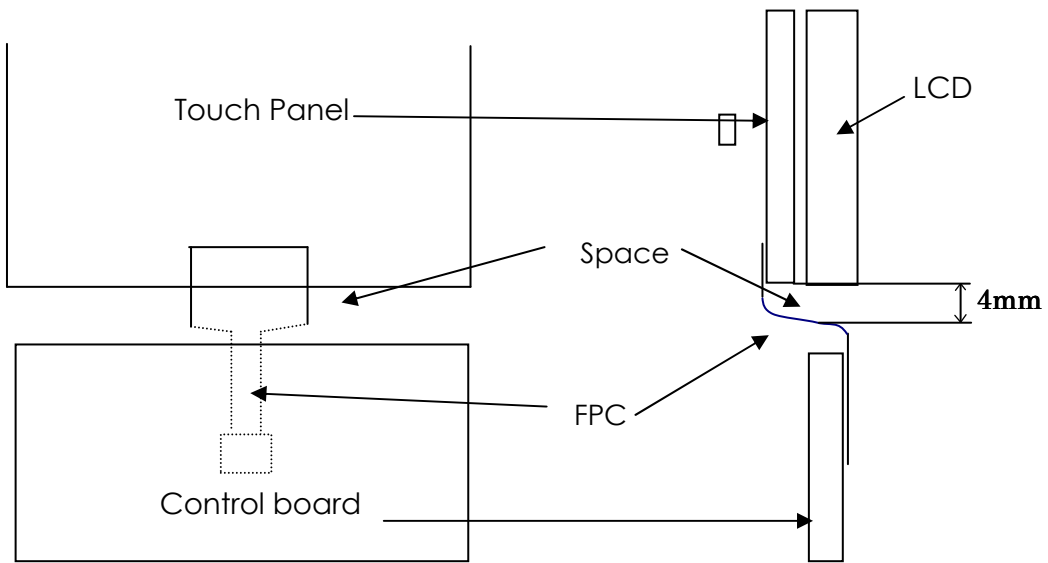
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To prevent FPC to be peeled off, air blowing to the FPC is avoided from glass side.

-7. 當觸控面板組裝時，在 LCD 外框與觸控面板間必須留有間隔，以避免 LCD 的電磁波造成的雜訊影響觸控面板的特性。建議機構預留 0.5mm 以上組裝空間。
 The mounting structure must has a reserved space between LCD and TP to avoid the noise from LCD influence the performance of TP. Assembly space is recommended at least 0.5mm. Refer to mounting condition example 2 & 3.

-8. 必須在靠近 FPC 位置處預留 FPC 線路空間，絕對避免外殼或其他零件碰觸或擠壓 FPC, 造成 FPC 脫落。建議機構預留 4mm 以上組裝空間，請參考實裝構造圖。
 The mounting structure must has a reserved space for the FPC tail and never touch or squeeze the FPC by case or another components preventing FPC to peel off. Assembly space is recommended at least 4mm. Refer to mounting condition example 2 & 3.

【實裝構造例 Mounting condition example】

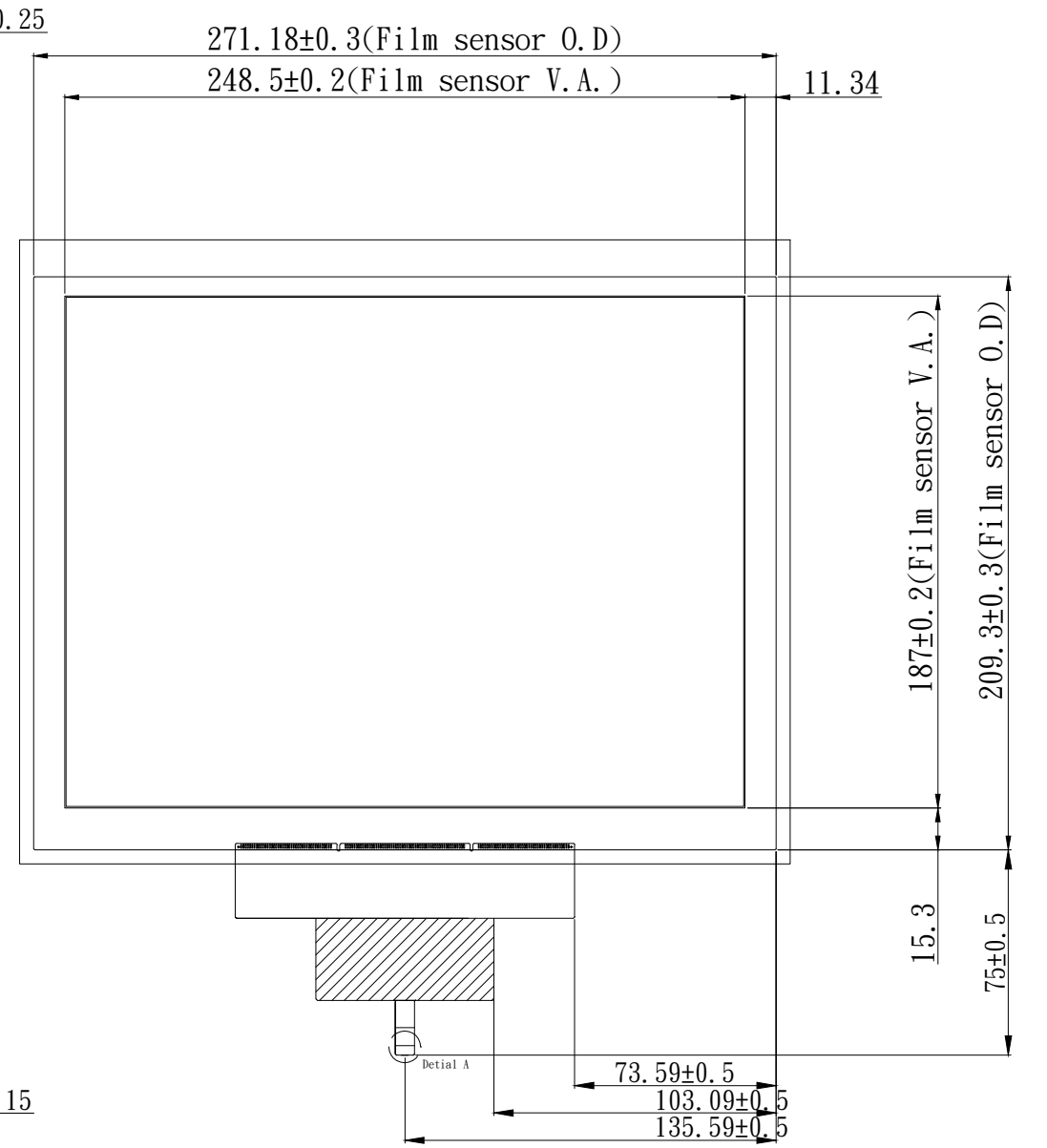
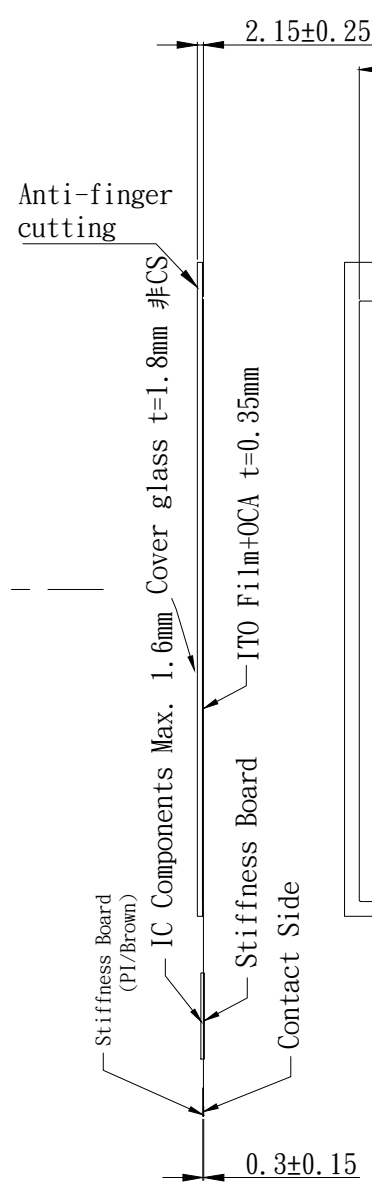
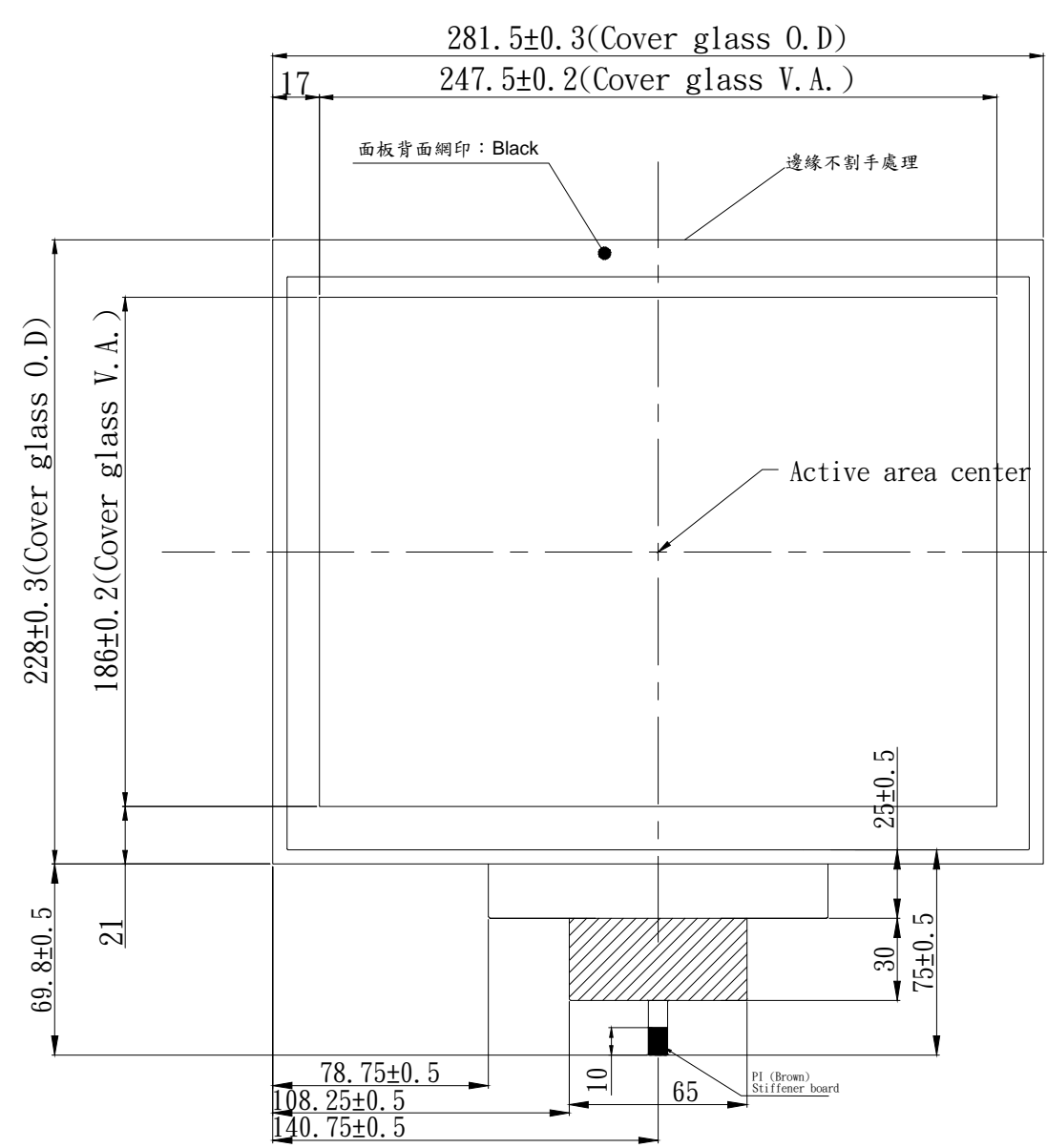


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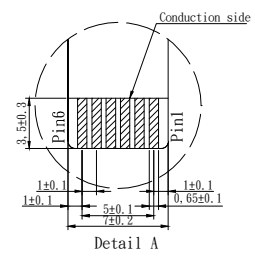
				Title: Touch Panel Spec.	
				Draw No. Tech Bes TTI-15015	
				Cust	
ED	Date	Design	Check	富晶通科技股份有限公司 Transtouch Technology Inc.	
Des	20150505	Johnny		App.	SHEET 14/14

Front VIEW

Back VIEW



Pin Define USB	
Pin01	GND
Pin02	D-
Pin03	D+
Pin04	VDD
Pin05	NC
Pin06	RST



- Note:
1. Tolerance: ± 0.3
 2. IC Solution: EETI EXC3160
 3. Surface Hardness: 6H
 4. Transmittance: $>86\%$ (JIS-K7105)
 5. Film: Clear Type
 6. Channel Numbers: 35*44 (Include Dummy & Ground)

日期原圖管元

材料	處理	名稱	FCTP	比例	
		圖號	Tech Bes TTI-15015	提出先	
版年月日設計	2015/05/05	Johnny	審查	變更內容	富晶通科技股份有限公司
設計			承認		頁次 1/1