SPECIFICATION
FOR
CTP Module
KDCTP070001A

MODULE:	**KDCTP070001A**
CUSTOMER:	

REV	DESCRIPTION	DATE
1.0	FIRST ISSUE	2015.07.03

STARTEK	INITIAL	DATE
PREPARED BY		
CHECKED BY		
APPROVED BY		

CUSTOMER	INITIAL	DATE
APPROVED BY		

Revision History

Data	Rev. No.	Page	Summary
2015.07.03	V1.0	ALL	FIRST ISSUE

Contents

General Description

*** Description**

This is a Projective CTP(Capacitive Touch Panel) which shall apply to metal pen or finger input. This model is composed of a Cover Lens, ITO Sensor, Driver circuit, OCA and Foam. This CTP is suitabl e for a 7.0'TFT(Thin Film Transistor) LCD(liquid crystal display), and the view area of the CTP shall be a little more than the display area of TFT-LCD.

*** Features**

-Low Input Voltage: 2.8V~3.3V(TYP)
-view area of CTP: 155.08(H)* 86.92(V)
-Interface: I2C

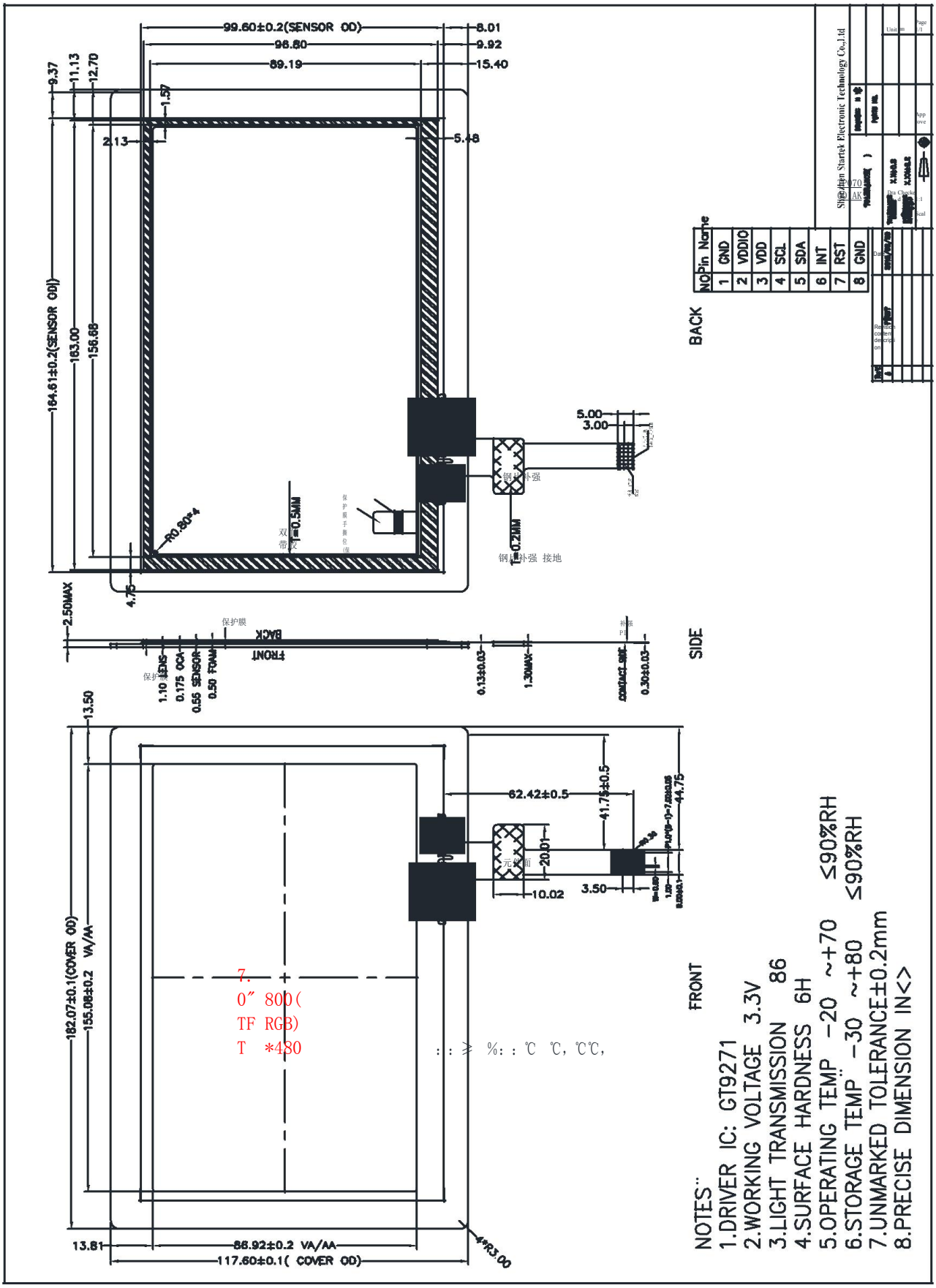
General Information Items	Specification	Unit	Note
	Main Panel		
View Area (VA)	155.08(H)*86.92(V) (7.0inch)	mm	-
Transparency	≥86%		-
Haze	＜3%		
screen	TX25*RX14		-
Hardness	≥6H	-	-
Driver IC	GT9271	-	-
Interface	I2C		
Touch type	Projective Capacitive	-	-
Simultaneous Touch Points	5		
Structure	G+G(Cover Glass + ITO Glass)		
Operating temperature	-20～+70	℃	-
Storage temperature	-30～+80	℃	-

*** Mechanical Information**

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)		162.07		mm	-
	Vertical(V)		117.60		mm	-
	Depth(D)			2.50	mm	-

	Weight		TBD		g	-

1. Outline dimension



Part. No	KDCTP070001A	REV	V1.1	Page 6 of 19

常 备 库 存 Standing Stock | 长 期 供 货 Long Availability | 支持小量 NO MOQ | 品 种 齐 全 In Full Range

2. Input terminal Pin Assignment

NO.	SYMBOL	DISCRIPTION	I/O
1	GND	Ground.	P
2	VDDIO	I/O power supply voltage.	P
3	VDD	Supply voltage.	P
4	SCL	I2C clock input.	I
5	SDA	I2C data input and output	I/O
6	INT	External interrupt to the host.	I
7	RST	External Reset, Low is active.	I
8	GND	Ground.	P

3. Electrical Characteristics

3.1 Absolute Maximum Rating

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	VDD	-0.3	3.47	V	1
I/O Digital Voltage	VDDIO	-0.3	3.47	V	1
Operating temperature	T_{OP}	-20	+70	℃	-
Storage temperature	T_{ST}	-30	+80	℃	-

NOTES:

1. *If used beyond the absolute maximum ratings, GT9271 may be permanently damaged. It is strongly recommanded that the device be used within the electrical characteristics in normal operations. If exposed to the condition not within the electrical characteristics, it may affect the reliability of the device.*

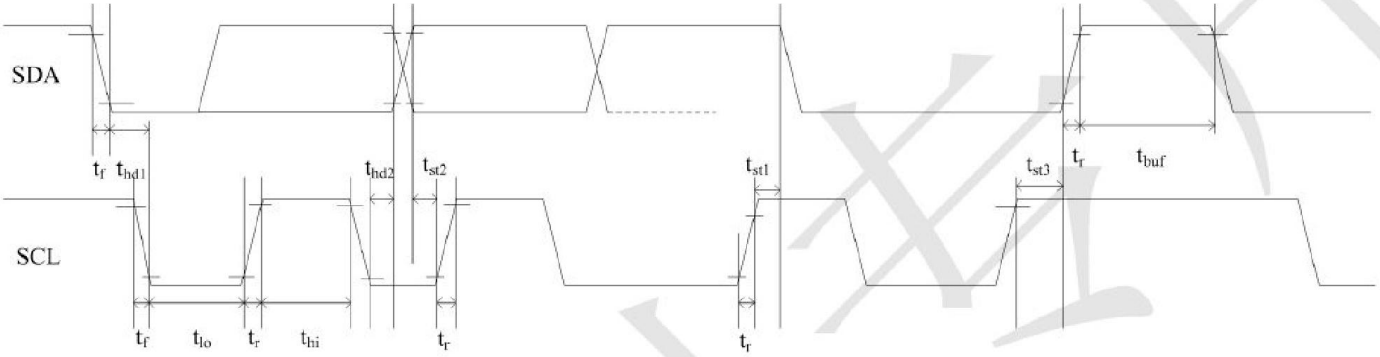
3.2 DC Electrical Characteristics (Ta=25℃)

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Digital supply voltage	VDD	2.8	-	3.3	V	
I/O Digital supply voltage	VDDIO	1.8	-	3.3	V	
Normal operation mode Current consumption	I_{opr}	-	13		mA	
Green mode Current consumption	I_{mon}	-	4.5	-	mA	
Sleep mode Current consumption	I_{slp}	70	-	120	uA	
Level input voltage	V_{IH}	$0.75V_{DDIO}$	-	V_{DDIO}+0.3	V	
	V_{IL}	-0.3	-	$0.25V_{DDIO}$	V	
Level output voltage	V_{OH}	$0.85V_{DDIO}$	-	-	V	
	V_{OL}	-	-	$0.15V_{DDIO}$	V	

4. AC Characteristics

4.1 I2C Interface

GT9271 provides a standard I2C interface for SCL and SDA to communicate with the host. GT9271 always serves as slave device in the system with all communication being initialized by the host. It is strongly recommended that transmission rate be kept at or below 400Kbps. The I2C timing is shown below:



Test condition 1: 1.8V host interface voltage, 400Kbps transmission rate, 2K pull-up resistor

Parameter	Symbol	Min.	Max.	Unit
SCL low period	t_{lo}	1.3	-	us
SCL high period	t_{hi}	0.6	-	us
SCL setup time for Start condition	t_{st1}	0.6	-	us
SCL setup time for Stop condition	t_{st3}	0.6	-	us
SCL hold time for Start condition	t_{hd1}	0.6	-	us
SDA setup time	t_{st2}	0.1	-	us
SDA hold time	t_{hd2}	0	-	us

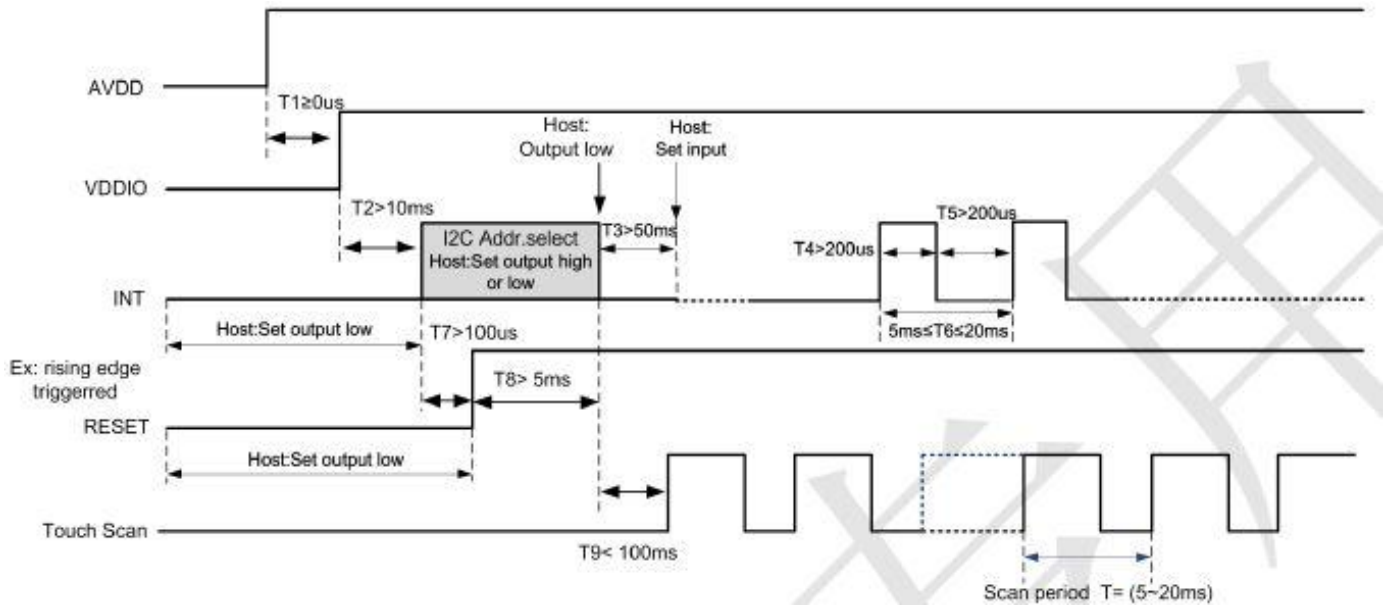
Test condition 2: 3.3V host interface voltage, 400Kbps transmission rate, 2K pull-up resistor

Parameter	Symbol	Min.	Max.	Unit
SCL low period	t_{lo}	1.3	-	us
SCL high period	t_{hi}	0.6	-	us
SCL setup time for Start condition	t_{st1}	0.6	-	us
SCL setup time for Stop condition	t_{st3}	0.6	-	us
SCL hold time for Start condition	t_{hd1}	0.6	-	us
SDA setup time	t_{st2}	0.1	-	us
SDA hold time	t_{hd2}	0	-	us

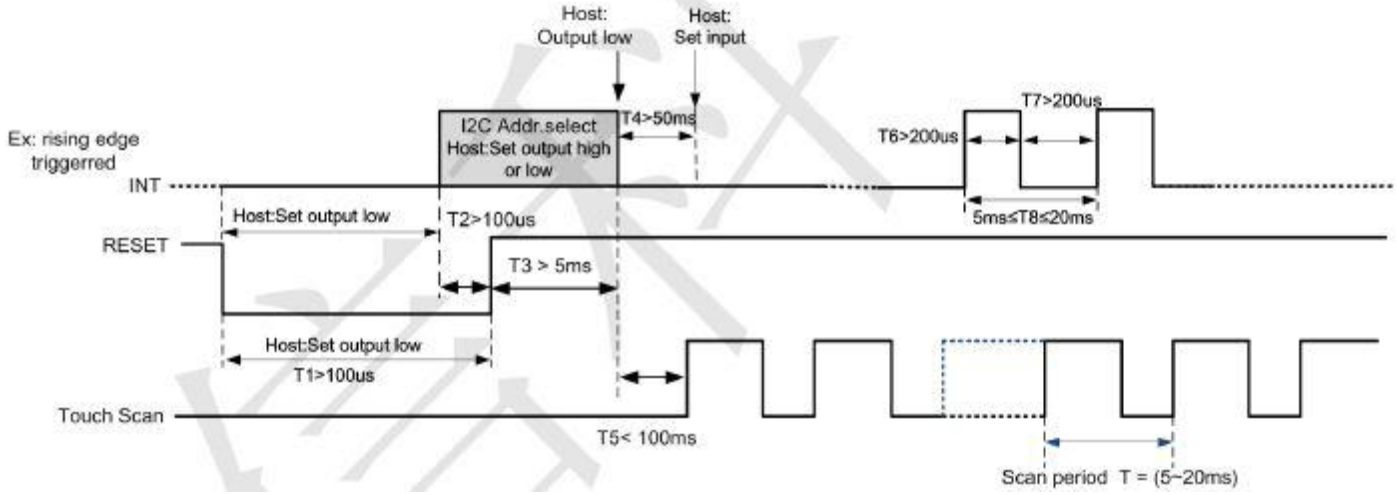
GT9271 supports two I2C slave addresses: 0xBA/0xBB and 0x28/0x29. The host can select the address by changing the status of Reset and INT pins during the power-on initialization phase. See the

diagram below for configuration methods and timings:

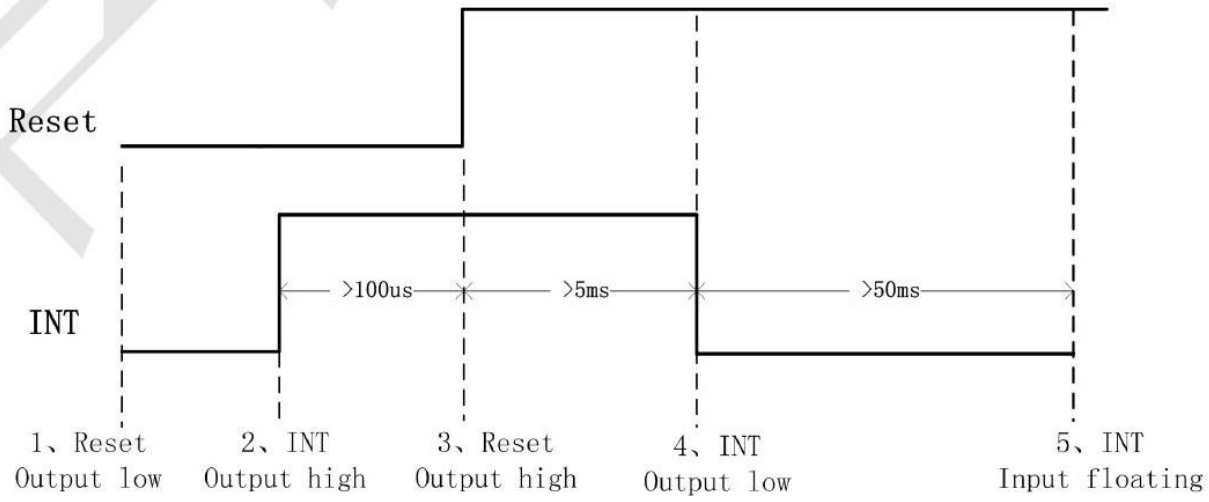
Power-On Timing:



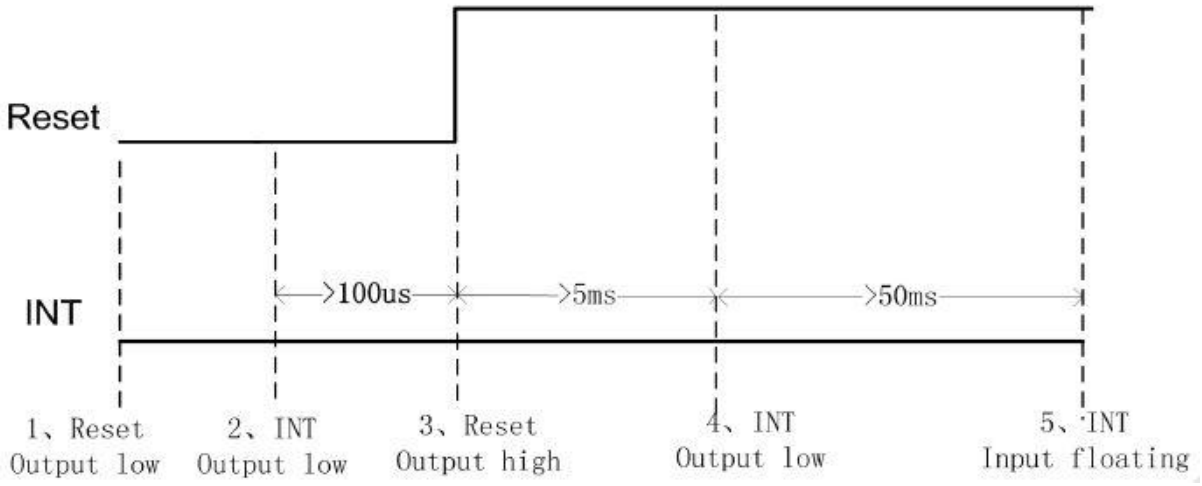
Timing for host resetting GT911:



Timing for setting slave address to 0x28/0x29:



Timing for setting slave address to 0xBA/0xBB:



a) Data Transmission

(For example：slave address is 0xBA/0xBB)

Communication is always initiated by the host. Valid Start condition is signaled by pulling SDA line from high to low when SCL line is high. Data flow or address is transmitted after the Start condition.

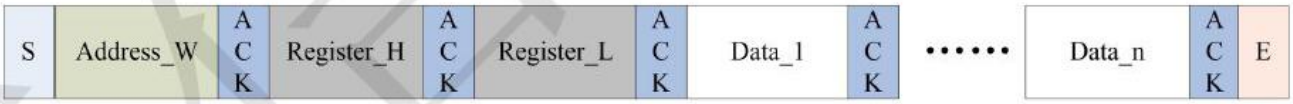
All slave devices connected to I^2C bus should detect the 8-bit address issued after Start condition and send the correct ACK. After receiving matching address, GT9271 acknowledges by configuring SDA line as output port and pulling SDA line low during the ninth SCL cycle. When receiving unmatched address, namely, not 0XBA or 0XBB, GT9271 will stay in an idle state.

For data bytes on SDA, each of 9 serial bits will be sent on nine SCL cycles. Each data byte consists of 8 valid data bits and one ACK or NACK bit sent by the recipient. The data transmission is valid when SCL line is high.

When communication is completed, the host will issue the Stop condition which implies the transition of SDA line from low to high when SCL line is high.

b) Writing Data to GT9271

(For example：slave address is 0xBA/0xBB)



Timing for Write Operation

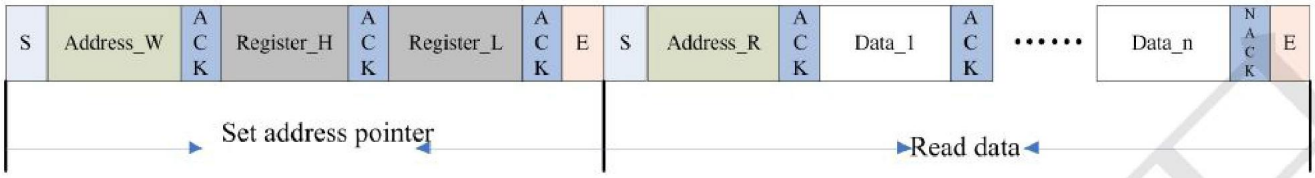
The diagram above displays the timing sequence of the host writing data onto GT9271. First, the host issues a Start condition. Then, the host sends 0XBA (address bits and R/W bit; R/W bit as 0 indicates Write operation) to the slave device.

After receiving ACK, the host sends the 16-bit register address (where writing starts) and the 8-bit data bytes (to be written onto the register).

The location of the register address pointer will automatically add 1 after every Write Operation. Therefore, when the host needs to perform Write Operations on a group of registers of continuous addresses, it is able to write continuously. The Write Operation is terminated when the host issues the Stop condition.

c) Reading Data from GT9271

(For example：slave address is 0xBA/0xBB)



Timing for Read Operation

The diagram above is the timing sequence of the host reading data from GT9271. First, the host issues a Start condition and sends 0XBA (address bits and R/W bit; R/W bit as 0 indicates Write operation) to the slave device.

After receiving ACK, the host sends the 16-bit register address (where reading starts) to the slave device. Then the host sets register addresses which need to be read.

Also after receiving ACK, the host issues the Start condition once again and sends 0XBB (Read Operation). After receiving ACK, the host starts to read data.

GT9271 also supports continuous Read Operation and, by default, reads data continuously. Whenever receiving a byte of data, the host sends an ACK signal indicating successful reception. After receiving the last byte of data, the host sends a NACK signal followed by a STOP condition which terminates communication.

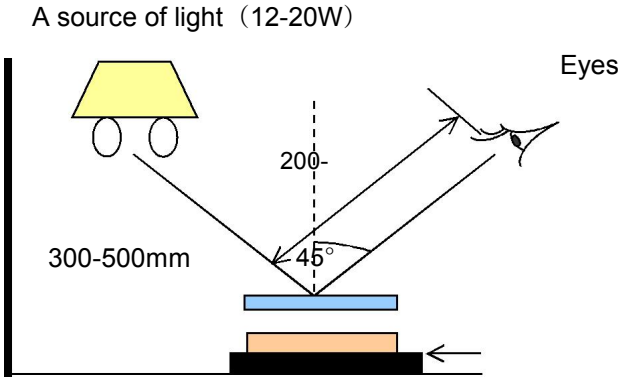
5. Appearance limit standard

5.1 Scope

Touch panel visible side.

5.2 Inspection Conditions

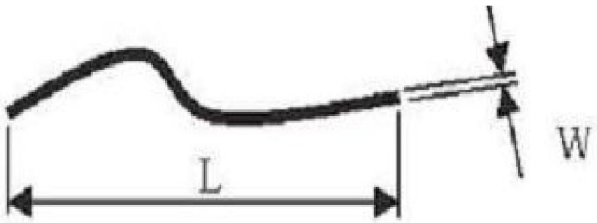
1. The brightness in text site: 500LUX.
2. Inspection distance: 30cm.
3. Visual angle: >60°.
4. Light source: 40W natural light.



(Remark: D=diameter; L=length; W=width; GT=glass thickness)

5.3 Visual Area

5.3.1 Scratch



Criteria	Decision
W<0.03mm	Ignored.
0.03mm≤W≤0.05mm	L≤3mm, two objects are ignored. 5mm >L>3mm, one objects are ignored.
W>0.05mm	The T/P is regarded as a defect.

5.3.2 Dot-like Foreign Matter

Criteria	Decision
D<0.2mm	Ignored.
0.2mm≤D≤0.25mm	The object is>10mm in distance from any other foreign obje ct. Two objects are allowed.
0.25mm≤D≤0.3mm	One object is allowed.
D≥0.3mm	The T/P is regarded as a defect.

5.3.3 Linear Foreign Matter

Criteria	Decision
W<0.05mm	L≤2mm Ignored.
W<0.05mm	2<L≤3mm, the object is >10mm, two object is ignored.
W>0.05mm or L>3mm	The T/P is regarded as a defect.

5.3.4 OCA bubbles and bend

Criteria	Decision

5.3 Non- visual Area (overlay)

5.4.1 Dot-like Foreign Matter

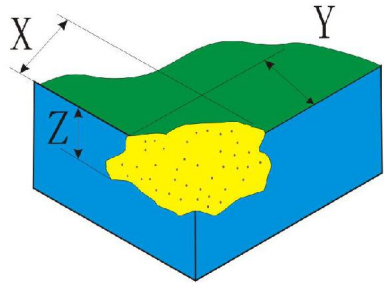
Criteria	Decision
W<2mm	Ignored.
0.2mm≤W≤0.3mm	Two objects are ignored.
W>0.3mm	The T/P is regarded as a defect.

5.4.2 Chip and Crack

Corner fragment: X<2.0mm and Y<2.0mm and Z<GT it is ignored

1) Corner fragment in the golden finger that seriously affects the product function is regarded as a defect.

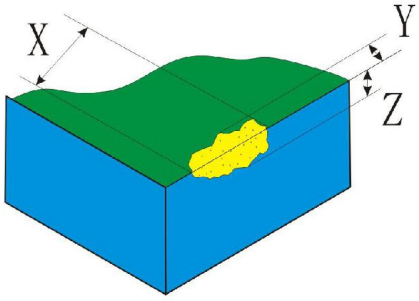
2) Corner fragment in the circuit that seriously affects product function is regarded as a defect.



Side fragment: X<5.0mm and Y<1.0mm and Z<GT it is ignored

1) Side fragment in the golden finger that seriously affects the product function is regarded as a defect.

2) Side fragment in the circuit that seriously affects product function is regarded as a defect.



6. Reliability Specification

Item	Specification	Remarks
Operating temperature and humidity	-20～70℃, 20～85% RH	Except for dew gathering
Storage temperature and humidity	-30～80℃, 20～85% RH	Except for dew gathering
Humidity resistance	The requirement in 6 shall be satisfied after exposing at 60℃, 90% RH for 240 hours and at normal temperature and humidity for 24 hours.	Except for dew gathering
Heat resistance	The requirements in 6 shall be satisfied after exposing at 70℃, for 240 hours and at normal temperature and humidity for 24 hours.	Except for dew gathering
Cold resistance	The requirements in 6 shall be satisfied after exposing at -20℃, for 240 hours and at normal temperature and humidity for 24	Except for dew gathering

	hours.	
Thermal shock	The requirements in 6 shall be satisfied after exposing under the conditions of -30℃(0.5hour)→80℃(0.5hour) by 10 cycles ,and at normal temperature and humidity for 24 hours.	Except for dew gathering
Vibration resistance	The requirements in “Operation force” of the item 3-1 Mechanical .Characteristics and 6 Electric characteristics shall be satisfied after sweep vibration of 20 m/s^2, 10 Hz to 55 Hz (1 min) is given for 30 min. each in the directions of X, Y, Z.	

7. Handing Precautions

Storage

Store the products at the temperature and humidity range presented in the specification.

Store the products in the state of package.

Do not expose the product to a direct ray of the sun.

Unpacking

Do not hold FPC/Copper tail to take out touch panels in the package.

Use gloves and finger coat to prevent stains on the touch panel and injury by the sharp edge of the touch panel.

Do not take hold of FPC /Copper tail when handing the touch panel.

Do not pile up touch panels.

Handling

Do not put anything on the touch panel.

Do not fold the FPC /Copper tail.

Clean off the touch panel with alcohol and soft clothes when necessary

Prevent alcohol from penetrating into the touch panel.

Do not use organic solvents except for alcohol.

Assembly

Avoid excessive force on the touch panel.

Do not give unnecessary strain to the FPC /Copper tail while assembling.

Operation

Do not operate touch panel by applying excessive force.

Do not use a sharp thing for input.

We recommend calibration after long time use.

8. Packing

---TBD----