

表面声波触摸屏产品说明

# Surface Acoustic Wave Touch Screen Specifications

## 目录

<b>1. SURFACE ACOUSTIC WAVE (SAW) TECHNOLOGY.....</b>	<b>3</b>
1.1 SAW Technology Overview.....	3
1.2 Surface Wave Technology Benefits.....	4
1.3 Surface Wave Technology Applications.....	4
<b>2. SURFACE ACOUSTIC WAVE (SAW) TOUCH SCREEN SPECIFICATIONS.....</b>	<b>5</b>
2.1 Mechanical Specifications.....	5
2.2 Optical Specifications.....	6
<b>3. SURFACE ACOUSTIC WAVE (SAW) TOUCH SCREEN CONNECTION.....</b>	<b>6</b>
<b>4. SAW TOUCHSCREEN CONTROLLER SPECIFICATIONS.....</b>	<b>7</b>
4.1 Electrical Specifications.....	7
4.2 Environmental Specifications.....	7
4.3 Physical Characteristics.....	8

**5. HANDLING REMARKS ..... 9**

    5.1 Storage ..... 9

    5.2 Unpacking ..... 9

    5.3 Handling..... 9

**6. WARRANTY ..... 9**

    6.1 Warranty Period..... 9

    6.2 Warranty Exceptions..... 10

**7. FAQ (FREQUENTLY ASKED QUESTIONS)..... 10**

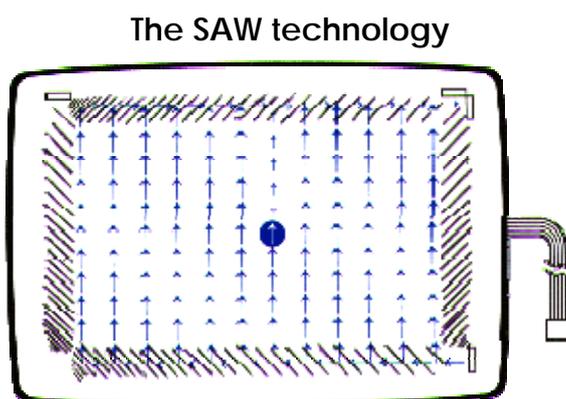
## Surface Acoustic Wave (SAW) Technology Overview

The Surface Acoustic Wave touch screen is using a surface acoustic wave technology.

### 1. Surface Acoustic Wave (SAW) Technology

#### 1.1 SAW Technology Overview

The Surface Acoustic Wave (SAW) technology is one of the most advanced touch screen types. The technology is based on two transducers (transmitting and receiving) placed for the both of X and Y axis on the touch panel. The other important element of SAW is placed on the glass, called reflector. The controller sends electrical signal to the transmitting transducer, and transducer converts the signal into ultrasonic waves and emits to reflectors that are lined up along the edge of the panel. After reflectors refract waves to the receiving transducers, the receiving transducer converts the waves into an electrical signal and sends back to the controller. When a finger touches the screen, the waves are absorbed, thus changing the received signal. The signal is then compared to a stored reference signal, the change recognized, and a coordinate calculated. This process happens independently for both the X and Y axes. By measuring the amount of the signal that is absorbed, a Z-axis is determined.



SAW technology is based on the measuring time. A touch location is determined by relating time to path length, providing reliability and accurate "no-drift" operation.

## 1.2 Surface Wave Technology Benefits

Surface Acoustic Wave (SAW) technology provides superior image clarity, resolution of 4096 x 4096, and higher light transmission. Because the panel is all glass, there are no layers that can be worn, giving this technology the highest durability factor and also the highest clarity.

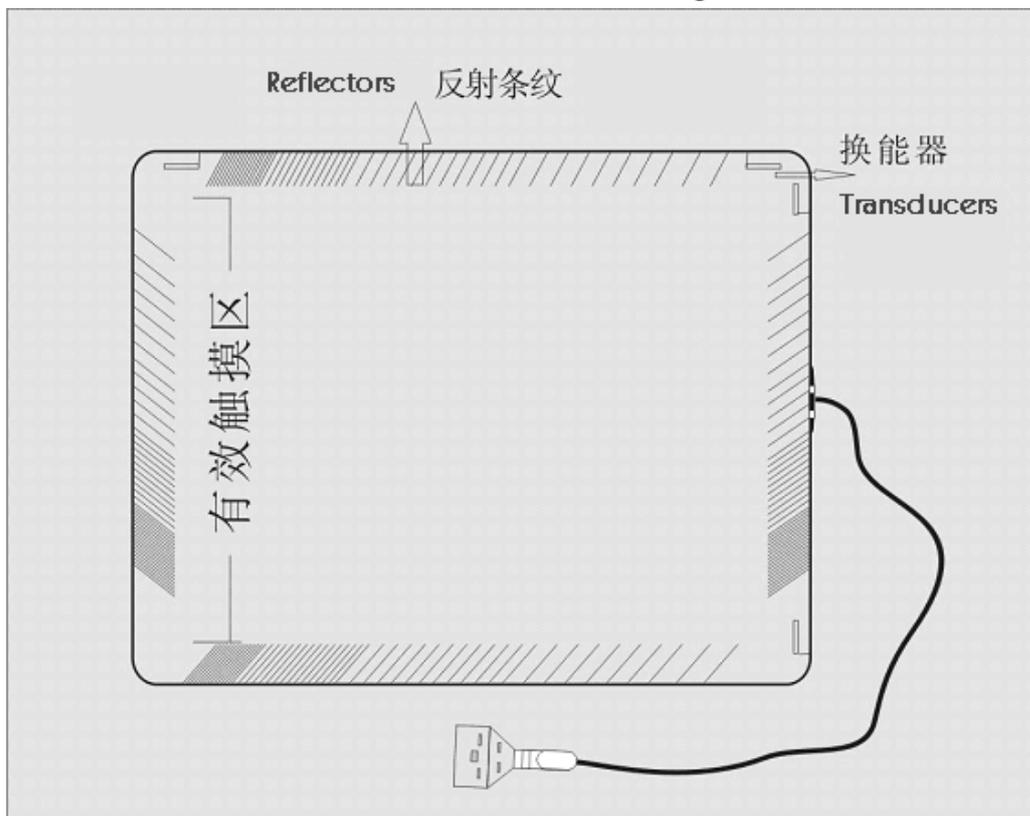
- Advanced Surface Wave Technology
- Pure-glass touch screens for superior image clarity, high resolution, and very high light transmission
- Durable, scratch-resistant glass surface - continues to work if scratched
- Stable "drift-free" operation - for a touch response that's always accurate
- Smart touch response—no false touches
- Fast, sensitive touch response
- Sensitive touch response - recognizes location and amount of pressure applied
- Finger, gloved hand, and soft stylus activation
- Flat and spherical touch screen options for design flexibility
- Antiglare-glass option
- Secure Touch option on fully tempered glass
- X-, Y-, and Z-axis Response

## 1.3 Surface Wave Technology Applications

- Point-of-information kiosks
- Vending and ticket sales
- Electronic catalogs
- Gaming, lottery, and amusement
- Public pay phones
- Multimedia marketing
- Banking/financial transactions
- Industrial control rooms
- Computer-based training

## 2. Surface Acoustic Wave (SAW) Touch Screen Specifications

The SAW Touch Screen Diagram



### 2.1 Mechanical Specifications

- Construction: Glass panel with transducers attached to the front surface of the glass
- Glass Thickness: 3.0mm, 4.0mm, 6.0mm (anti-crashed)
- Resolution: 4096 x 4096 touch points per square inch
- Z-axis: 256 levels of pressure
- Accuracy: Extremely Consistent, Very Stable, No-Drift
- Conversion Time: Approximately 10.4 ms per coordinate report
- Baud Rate: 9600 only
- Reliability: MTBF: greater than 450,000 hours per MIL-HDBK-217-F2 using the parts stress calculation method for ground benign environment with an ambient temperature of 35° C
- Touch Activation Force: Typically 2 to 3 ounces (55 to 85 grams)
- Surface Durability: Surface durability is that of glass, Mohs hardness rating of 7
- Expected Life Performance: not known wear-out mechanism as there are no layers or coatings. The SAW technology has been operationally tested to more than 50 million touches in one location without any failure, using a stylus similar to a finger

- Controllers Available: RS232 or USB

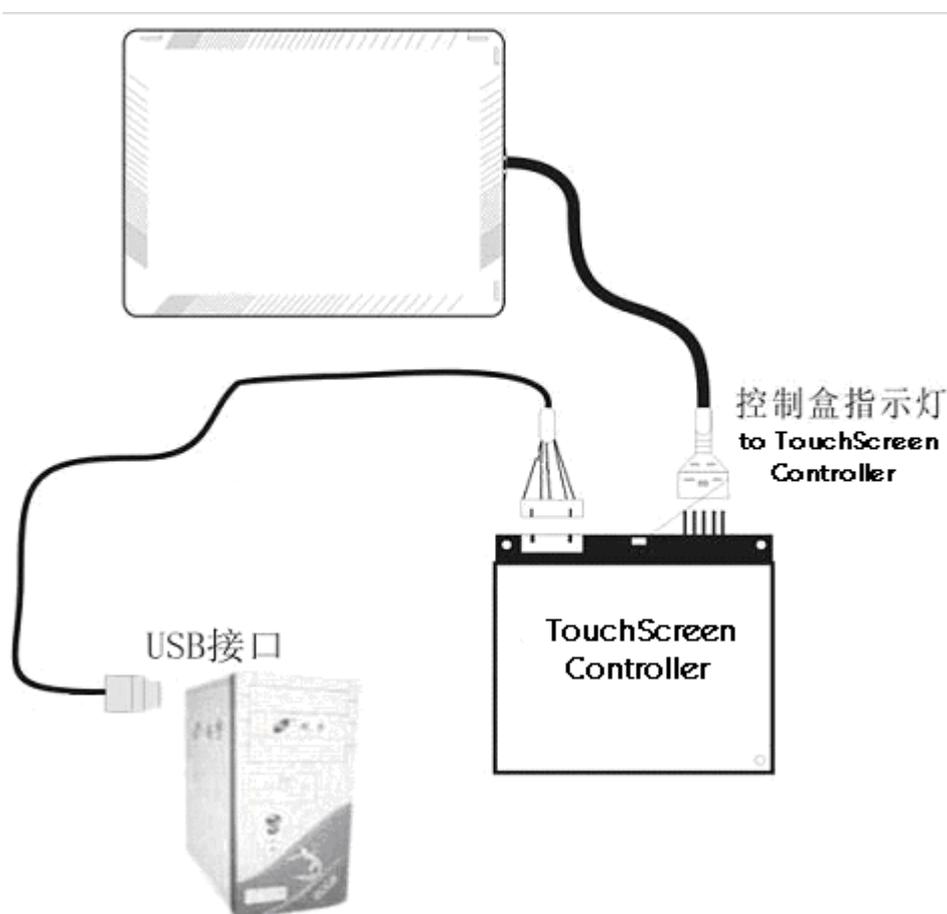
## 2.2 Optical Specifications

- Light Transmission: over 90% per ASTM D1003-61
- Visual Resolution:
  - Clear Surface: Excellent with no noticeable degradation
  - Antiglare surface: 5:3 minimum
- Gloss:
  - Clear Surface: N/A
  - Antiglare Surface: 60 +/- 20 gloss units per ASTM D2457-70, using a 60-Degree gloss meter
- Operating temperature: -20°C - +50°C
- Storage temperature: -40°C - +70°C
- Humidity: 10% - 90%

## 3. Surface Acoustic Wave (SAW) Touch Screen Connection

Please refer to the Connection Diagram below to properly connect your SAW Touch Screen to the PC.

Connection Diagram



## 4. SAW TouchScreen Controller Specifications

### 4.1 Electrical Specifications

#### 4.1.1 Supply Voltage and Current

- +5 VDC, nominal (+4.75 to +5.25 VDC)
- 50 mA typical @ +5 VDC. Average power dissipation is 0.25 W, typical
- Supply must be capable of sourcing 100mA, minimum
- Total noise and ripple requirement must be less than 100mV (p-p) for frequencies below
- 1MHz and less than 50mV (p-p) for frequencies above 1MHz

#### 4.1.2 Interface

- USB / RS232 (user selectable)
- Plug and play compatible

#### 4.1.3 Touch Resolution

- Approximately 4096x4096, size independent, 256 levels of Z (pressure)

#### 4.1.4 Conversion Time

- Approximately 10.4 ms per coordinate set

#### 4.1.5 Reliability

- MTBF greater than 450,000 hours per MIL-HDBK-217-F2 using the parts stress calculation method for the ground benign environment with an ambient temperature of 35°C

### 4.2 Environmental Specifications

#### 4.2.1 Temperature

- Operating temperature: -20°C - +50°C
- Storage temperature: -40°C - +70°C

#### 4.2.2 Humidity

- Operating: 10% to 90% RH, non-condensing
- Storage: 10% to 90% RH, non-condensing

#### 4.2.3 Operating Altitude

- 10,000 feet

#### 4.2.4 Shock and Vibration

- Three axis sine wave, 50Hz to 2kHz, 1G, 2 minutes/Octave with dwell on resonance

#### 4.2.5 ESD

- Per EN 6100-4-2 1995: Level 4. Contact discharge 8kV, air discharge 15kV

#### 4.2.6 Flammability

- The printed circuit board substrate is rated 94V0. All plastic components, such a headers and connectors, are also rated 94V0

### 4.3 Physical Characteristics

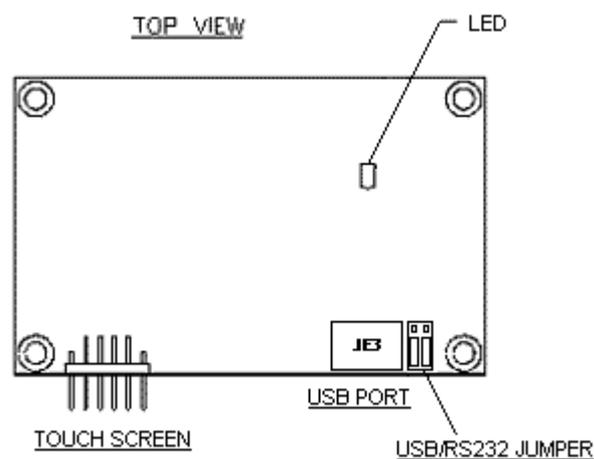
#### 4.3.1 Construction

- Four-layer surface-mount design with internal ground plane for EMI suppression

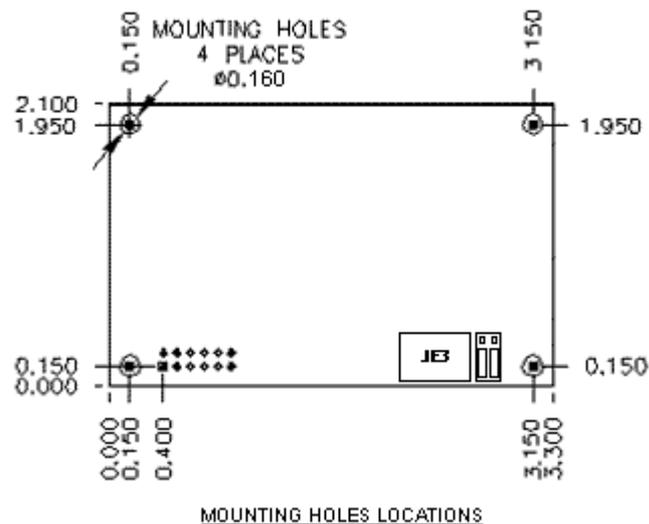
#### 4.3.2 Dimensions

- Total Width: 2.37 inches (60.35 mm), including connector
- Total Length: 3.31 inches (84.22 mm)
- Total Height: 0.49 inches (12.45 mm)
- All mounting holes are plated through-holes for chassis ground connection.

#### The SAW TouchScreen Controller Diagram (Top View)



#### The SAW TouchScreen Controller Diagram (Mounting Holes Locations)



## 5. Handling Remarks

This product is intended for use in standard applications (computers, office automation, and other office equipment, industrial, commercial, and measurement equipment, personal and household devices, etc.) Please avoid using this product in 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.)

### 5.1 Storage

- 5.1.1 When the product is stored, make sure it is stored in storage temperature and humidity ranges, eliminating any outside load.
- 5.1.2 When the product is stored, make sure it is packed in a proper packing box.
- 5.1.3 Do not expose the product to the direct sunlight.

### 5.2 Unpacking

- 5.2.1 When you handle the product, hold the product by its body. Do not hold by the FPC tail.
- 5.2.2 Before opening the box, check the "UP / DOWN" indicator.

### 5.3 Handling

- 5.3.1 When holding the product, hold the product outside of the viewing area in order to avoid damage to the touch panel.
- 5.3.2 Please pay the best attention not to create any stress to the heat-sealed FPC tail. Heavy stress may cause disconnection.
- 5.3.3 The edge of the glass is not rounded and may cause injury.
- 5.3.4 Do not depress or scratch the product with any object with a sharp edge to avoid scratch to the product's surface.
- 5.3.5 Do not forcibly bend or fold the product.
- 5.3.6 Do not put heavy objects on the product.
- 5.3.7 Clean the product with a soft cloth or a soft cloth with neutral detergent or alcohol. Under normal circumstances, you can directly use a dry soft cloth to wipe the dust off the glass surface. When contaminated by chemicals, wipe them off immediately with caution not to cause injury to human body.

## 6. Warranty

### 6.1 Warranty Period

- 6.1.1 Shall be capable of meeting all characteristics for a minimum period of 1 (one) year from the date of purchase when stored or used as

specified under normal conditions within contents of these sheets. The warranty for the initial deflection such as appearance deflection is limited to 1 month.

## 6.2 Warranty Exceptions

Following conditions are not covered by the warranty and are subject to change.

6.2.1 Any malfunctions and damages during transportation and transfer by user.

6.2.2 Any malfunctions and damages caused by static electricity.

6.2.3 Any malfunctions and damages caused by a natural disaster or a fire.

6.2.4 Any malfunctions and damages caused by the failure of the associated equipment.

6.2.5 Any malfunctions and damages caused by an improper installation, usage and handling against the specifications and notes.

6.2.6 If the product is remodeled, disassembled or repaired by the user or unauthorized personnel.

6.2.7 If the product is glued onto the equipment and then uninstalled.

6.2.8. Custom products are Not eligible for Warranty Replacement.

## 7. FAQ (Frequently Asked Questions)

**Q:** Do I need to modify my application program for the touch screen?

**A:** No. You only need to install the driver for your specific operating system.

**Q:** What are the advantages of the surface acoustic wave touch screens as compared to the other types of touch screens?

**A:** Very good light transmission, it can reach 92% (the maximum) without any distortion, while the other types of touch screens can reach 85% at most. The SAW touch screen is less prone to scratching and smashing. SAW has a strong electromagnetic interference-resistance.

**Q:** How often does the touch screen require cleaning?

**A:** It all depends on the application of the touch screen. If the touch screen is installed inside the display and the outer cover of the display and the touch screen are well sealed up, generally speaking, it won't need cleaning until more than a year of use.

**Q:** Is the dust on the screen influencing the touch?

**A:** The dust on the active display area of the touch screen does not influence the touch, but if the reflection streaks on the four sides of the touch screen are covered with a lot of dust, the touch screen will gradually lose its touch effect. So to wash the touch screen just clean the reflection streaks on the four sides of the touch screen.

**Q:** How to clean the touch screen?

**A:** Clean the product with a soft cloth or a soft cloth with neutral detergent or alcohol. Under normal circumstances, you can directly use a dry soft cloth to

wipe the dust off the glass surface. When contaminated by chemicals, wipe them off immediately with caution not to cause injury to human body.

**Q:** What is the normal working state of the LED indicator light of the controller board?

**A:** Under normal conditions, the LED indicator light is on for about one or two seconds after the computer is started, and then goes off. When the finger touches the touch screen, the LED indicator light is on and remains in this state until the finger leaves the touch screen. If the other state occurs, please check the hardware connection.

**Q:** What is the maximum length of the touch screen cable?

**A:** The length of the touch screen cable is unlimited in theory, so the distance from the touch screen to the PC is decided by the length of the display signal cable. The touch screen cable and the signal cable require customization or can be made by customers themselves.

**Q:** Does the surface acoustic wave interfere with the other electronic components?

**A:** No, it doesn't because there is only a 5MHz ultrasonic wave on the shallow surface of the screen.

**Q:** Does the controller board influence the display when the controller board is installed in the display?

**A:** No, it doesn't.

This document can be freely distributed, but any alternation to this document is prohibited.