

Specification of Surface Acoustic Wave Touch Panel

SURFACE ACOUSTIC WAVE TOUCH PANEL

A. Application

This specification applies to the **Surface Acoustic Wave Touch Panel**.

Three types of offerings available :

- **Standard SAW**
3mm glass with beveled edge.
- **Tempered SAW**
Break Resistance, meets UL-1950, by 6mm heat tempered glass.
- **Protected SAW**
Break Resistance, Dustproof, Waterproof

B. Environmental Conditions

1. Operating Temperature Range

0°C ~ 50°C

2. Operating Humidity Range

90% RH at 40°C (no dew falls)

3. Storage Temperature Range

-40°C ~ 70°C

4. Altitude

Operating : 10,000 feet (3048m)

Storage / Transport : 50,000 feet (15,240m)

5. Chemical Resistance

The active area of the touch panel is resistant to the damage of chemicals which do not influence glass, such as acetone, toluene, methyl ethyl ketone, isopropyl alcohol, methyl alcohol, ethyl acetate, ammonia-based glass cleaners, gasoline, kerosene, vinegar.

SURFACE ACOUSTIC WAVE TOUCH PANEL

C. Electrical Characteristics

1. Supply Voltage

+5VDC

2. Electrostatic Protection

Per EN 61000-4-2, 1995 : Meets Level 4
(15 kV air / 8 kV contact discharges).

3. Resolution

Based on controller resolution of 4096 x 4096.

D. Mechanical Characteristics

1. Construction

There are four transducers attached to the beveled edge of the glass.

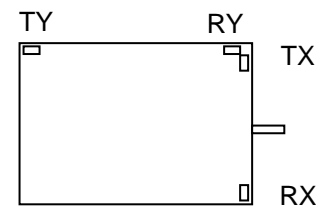
1×TY on left side upper corner

1×RY on right side upper corner

1×TX on right side upper corner

1×RX on right side down corner

(Based on the cable exiting from the right side)



2. Cable and Connector

Cable typically exits from the right side, with a 2 x 6, 0.635 mm square post receptacle.

3. Touch Activation Force

Less than 85 grams.

4. Positional Accuracy

Standard deviation of error is less than $\pm 1\%$.

5. Life Performance

More than 50 million touches in one location.
(Tested by a stylus similar as finger).

6. Input Medium

Finger or gloved hand (rubber, cloth or leather).

7. Surface Durability

Optical glass surface, Mohs' hardness rating : 7.

SURFACE ACOUSTIC WAVE TOUCH PANEL

For Tempered SAW only

1. Construction

Pure 6mm-thickness heat strengthened glass with transducers attached to the beveled edge of the glass.

2. Break Resistance

Meets UL-1950 Steel Ball Drop Test

A 1-pound steel ball drops from height of 130 cm onto the center of the glass without breaking.

For Protected SAW only

1. Construction

Pure 6mm-thickness heat strengthened glass with transducers attached on the edge of the glass surface.

The reflectors and transducers are sealed inside the ABS plastic frame.

2. Break Resistance

Meets UL-1950 Steel Ball Drop Test

3. Dustproof

The ABS plastic frame around the panel prevents dust and dirt from accumulating on the reflectors and transducers.

4. Waterproof

Special glue is applied to the gap between the ABS plastic frame and glass substrate to prevent water infiltration.

Test Method : Set the touchscreen horizontally, and pour water on the panel surface without overflow over the ABS plastic frame. The panel surface is soaked in water for 1 hour. The panel is in normal condition after water poured out and dried.

E. Optical Performance

Light Transmission 90% (per ASTM D1003)

SURFACE ACOUSTIC WAVE TOUCH PANEL

F. Glass Substrate Quality

1. Circular Defects

Description	Length {mm}	Comments {mm}
Glass defects spots, stains, etch defects, surface chips	>0.51	None allowed
	$\geq 0.38, \leq 0.51$	2 per 50.8 diameter circle
	<0.38	Accumulated length must be less than 1.27 in a 50.8 diameter circle
	When evaluating defects with distortion include the entire distorted area when measuring.	

2. Linear Defects

Description	Width {mm}	Comments {mm}
Glass scratch	>0.102	None allowed
	0.102	12.7max length w/ minimum separation of 6.35
	0.076	25.4 max length w/ minimum separation of 3.81
	0.051	38.1 max length w/ minimum separation of 1.27
	< 0.051	Disregard

3. Edge Chips

Description	Comments {mm}
Four edges excluding four corners	1.27 W × 1.27 L × 1/3 glass thickness
Four corners	2.54 W × 5.08 L × 1/2 glass thickness

**Specification of
Surface Acoustic Wave
USB Control Board
Model No.: SAWUSB**

SURFACE ACOUSTIC WAVE USB CONTROL BOARD

A. Application

This specification applies to the following USB Control Board for Surface Acoustic Wave Touch Panel.

B. Environmental Conditions

1. Operating Temperature Range

0°C ~ 65°C

2. Operating Humidity Range

10%~90% RH (no dew falls)

3. Storage Temperature Range

-25°C ~ 85°C

4. Storage Humidity Range

10%~90% RH (no dew falls)

5. Operating Altitude

10,000 feet (3048m)

6. Shock and Vibration

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

7. Flammability

The PCB substrate and all plastic components, such as headers and connectors are rated UL 94 V0.

C. Electrical Characteristics

1. Supply Voltage

+5VDC (+4.75V to +5.25V)

2. Supply Current

85 mA, typical at +5V DC

Max. current : 150 mA

SURFACE ACOUSTIC WAVE USB CONTROL BOARD

3. Electrostatic Protection

Per EN 61000-4-2, 1995 : Meets Level 4
(15 kV air / 8 kV contact discharges).

4. Interface

USB 1.1
Plug and play compatible

5. Touch Resolution

4096 x 4096, size independent

6. Conversion Time

Approximately 15 ms per coordinate set

7. Reliability

MTBF greater than 300,000 hours
per MIL-HDBK-217-F2 using the part stress calculation method for
ground benign environment with an ambient temperature of 25°C

D. Mechanical Characteristics

1. Construction

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

2. Dimensions

PCB 87.5 x 56 x 11.1 mm
Refer to Appendix A

3. Standard Cables, Connectors and Pin Definitions

- Standard external USB cable connecting the SAW USB controller with
the computer USB port : Refer to Appendix B
- USB Output Connector : P2
2.0 pitch 4 pin connector on board for connection with USB port.
Refer to Appendix A
- Touchscreen Connector : P3
A dual row by six position header with 0.635 mm square pins
spaced on 2.54 centers for connection with touch panel.
Refer to Appendix A

SURFACE ACOUSTIC WAVE USB CONTROL BOARD

E. LED Diagnostic Characteristics

A green LED indicates controller status as follows:

Action & Condition	LED status	Function
The control board is connected with host, not touch panel yet.	Light continuously	The control board is normal condition.
No touch	Snuff out	Untouched state
Touch	Light	Touched state

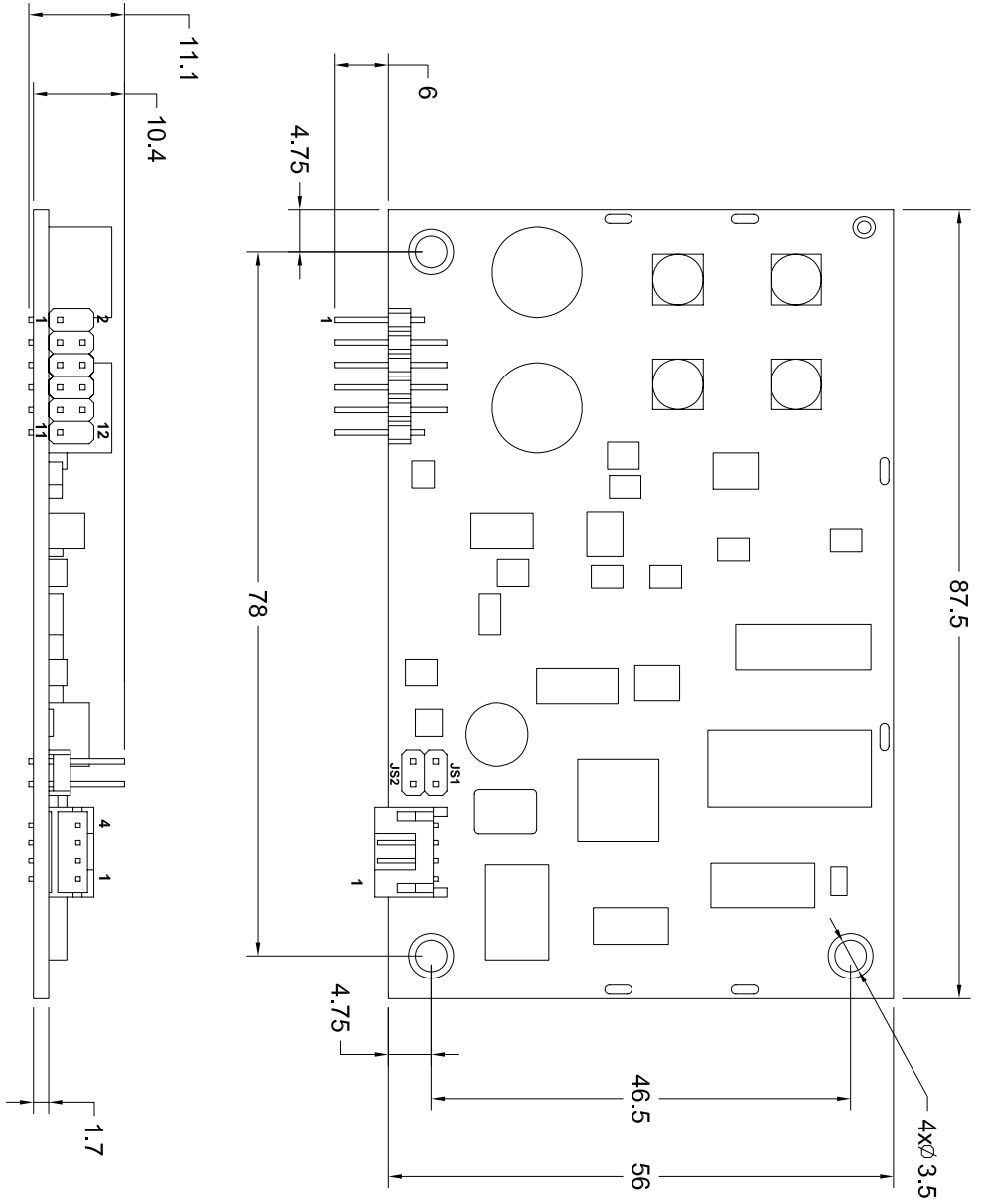
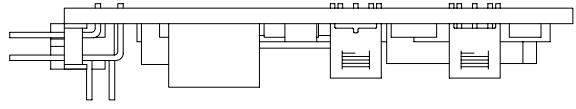
F. Software Driver

Under Windows : Mouse emulation

Support Operating System

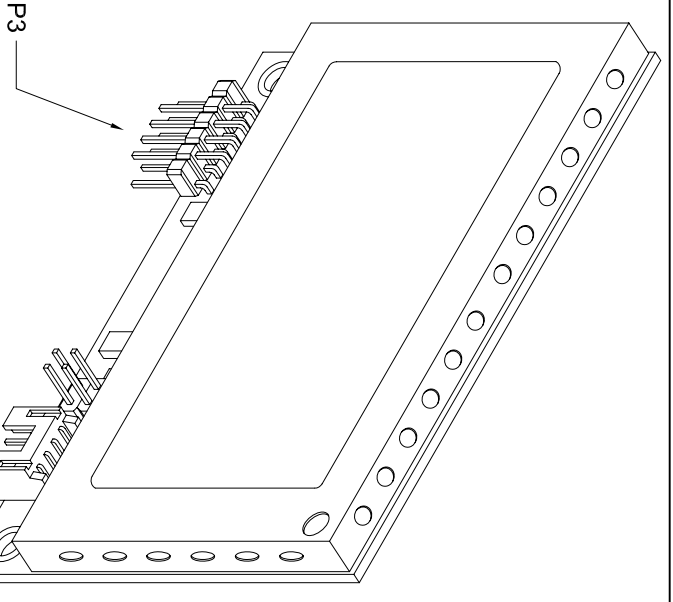
- Microsoft Windows NT4.0/XP/2000/ME/98/95
- Linux : Red Hat 9.0, Mandrake 10.0, SuSE9.2, Fedora Core I & II & III, Yellow Dog 3. x

Appendix A Dimension Drawing and Pin Definitions of Connectors



CONNECTOR P2

PIN #	SIGNAL NAME
1	GND
2	D+
3	D-
4	+5V

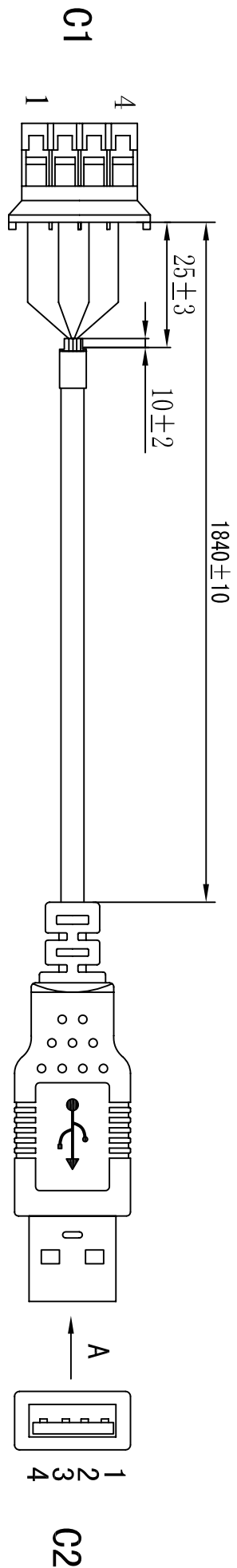


CONNECTOR P3 (SENSOR)

PIN #	SIGNAL NAME
1	GND
2	NC
3	Y-R
4	Y-T
5	Y-R'
6	GND
7	GND
8	GND
9	X-R
10	X-T
11	X-R'
12	NC

P/N: SAWUSBDAS	
DRAWN BY HATTIE	DIMENSION UNIT mm
CHECKED BY ANSON	SCALE NOT TO SCALE
ISSUE DATE 09/12/05	
REV A	

Appendix B Standard External USB Cable



PIN ASSEMBLY

	C1	C2	
+5V	4	1	RED
D-	3	2	WHITE
D+	2	3	GREEN
GND	1	4	BLACK

MATERIAL LIST:

CONNECTOR:

C1: 2.0 PITCH 4PIN HOUSING COLOR: BLACK.

C2: USB A MALE PVC MOLDED COLOR: BLACK.

CABLE:

UL2464 #26*4C+AE OD: 5.0mm COLOR: BLACK.

CORE:

12*5.6*20mm PVC MOLDED COLOR: BLACK

DESCRIPTION: USB A M/PH-4	ISSUE: 05/9/27
PART No.: CABUSB6B5	PAGE: 1 OF 1
DRAWN BY: HATTIE	REV: A
CHECKED BY: ANSON	UNIT: mm