



**EuroTouch**  
CRÉATEUR DE SOLUTIONS TACTILES

# Specification of 5 Wire Analog Touch Panel

## 5 WIRE ANALOG RESISTIVE TOUCH PANEL

### A. Application

This specification applies to the **5 Wire Analog Resistive Touch Panel**.

### B. Environmental Conditions

1. **Operating Temperature Range**  
-20°C ~ 70°C
2. **Operating Humidity Range**  
5% ~ 96% RH (no dew falls)
3. **Storage Temperature Range**  
-25°C ~ 80°C
4. **Storage Humidity Range**  
5% ~ 96% RH (no dew falls)
5. **Water Spray**  
Not damaged by running water applied to the active area.
6. **Vibration**  
Withstand 0.01 inches peak to peak excursion, at a frequency of 5 to 455 Hz, for a period of 15 minutes in each of three axes.
7. **Chemical Resistance**  
The touch panel active area of the touchscreen is resistant to the following chemicals when exposed for a period of one hour at a temperature of 21°C:
  - Acetone
  - Ammonia-based glass cleaners
  - Common foods and beverages
  - Hexane
  - Isopropyl alcohol
  - Methylene chloride
  - Methyl ethyl ketone
  - Mineral spirits
  - Turpentine

## 5 WIRE ANALOG RESISTIVE TOUCH PANEL

### C. Electrical Characteristics

**1. Supply Voltage**

+5VDC, nominal.

**2. Lead to Lead Resistance**

50Ω ~ 200Ω ( between X – H )

70Ω ~ 300Ω ( between X – Y )

70Ω ~ 300Ω ( between L – H )

50Ω ~ 200Ω ( between L – Y )

**3. Contact Bounce**

Less than 10 ms (input by finger).

**4. Electrostatic Discharge Protection**

Withstands 20 discharges of 15kV, distributed randomly across the active area with proper transient protection.

(per EN 61000-4-2, 1995)

### D. Mechanical Characteristics

**1. Activation force**

Less than 40gr.

Using by the silicone finger, hardness = 60°of diameter 16mm.

**2. Input Methods**

Finger, glove hand, pen or stylus.

**3. Surface Hardness**

Meets pencil hardness 3H (per ASTM D3363).

**4. Position Accuracy (Linearity)**

Less than 1%.

**5. Resolution**

Based on controller resolution of 4096 x 4096.

**6. Cable**

• Type: F.C.C. (flat conductor cable)

• Standard length: 300mm

## 5 WIRE ANALOG RESISTIVE TOUCH PANEL

- Connecting area with touch panel
  - The tensile force: vertical to touch panel — 2.0 kg
  - straight to touch panel — 1.0 kg
  - Connecting type: 5 points soldering adding UV glue
  - Cable fold : 10 times in 1R, 180 degrees
  - Detail specification: ETC test, No.: ET-88T-12-102-C00

### 7. Connector

Five-position, 0.025 inch (0.635mm) square post receptacle with 2.54mm centers.

The times of insertions and withdrawals : at least 100 times.

## E. Reliability

The following characteristics are generated by evaluating test samples after 2 hours leaving in the room condition when each of the reliability tests finishes.

Test Item	Result	Remark
Storage Temperature-high	80°C for 240hours	At ambient humidity
Storage Temperature-low	-25°C for 240hours	
Thermal Shock	-20°C (1hr.) ~ 70°C (1hr.) 10cycles	
High Temp./Humidity Test	60°C/90%RH : 240hours	
Operating Life 1 : Hitting Key Test (*1)	250g , 2 activations / sec. More than 35,000,000 times	By using Silicone finger (*2)
Operating Life 2 : Writing Test (*1)	250g , 4.5mm / sec. More than 1,000,000 times	By using polyester finger (*3)

\*1 Without supplying Volts.

\*2 Positions of hitting key are between the dots by Silicon finger (hardness 60° silicon rubber) of diameter 16mm.

\*3 Writing test is made by polyester stylus pen with tip radius.

## 5 WIRE ANALOG RESISTIVE TOUCH PANEL

### F. Optical Performance

**Light Transmission** 75~ 85% (typical value) (per ASTM D1003)

### G. Cosmetic Performance

#### G.1 Surface Quality

Surface quality criteria recognize cosmetic irregularities appearing on or between the glass and plastic surfaces of the touchscreen. Cosmetic irregularities are normally classified into two parts, circular criteria and linear criteria.

##### G.1.1 Circular Criteria

Circular criteria recognize surface irregularities that are circular in nature, including dirt, hard coat flaws, particles, glass bubbles, etc.

Circular defect size will be measured across its diameter. Irregularly shaped circular defect diameters will be designated by the smallest diameter into which the defects could be completely covered, i.e. the length at the widest point of the defect.

Area	Diameter of Circular Defect	Comment	Accept or Fail
Active Area	$D > 0.51$ (0.02")		Fail
	$0.51$ (0.02") $\geq D \geq 0.38$ (0.015")	No more than two defects contained within 50.8 (2") $\varnothing$	Accept
	The sum of the diameters of all circular defects $\leq 1.27$ (0.05")	Within 50.8 (2") $\varnothing$	Accept
	Black-colored specks or dirt, $D \leq 0.13$ (0.005")		Accept
View Area	$D > 1.02$ (0.04")		Fail
Outside View Area	$D > 1.91$ (0.075")		Fail

Unit : mm

## 5 WIRE ANALOG RESISTIVE TOUCH PANEL

### G.1.2 Linear Criteria

Linear criteria recognize surface irregularities that are linear in nature. Linear defect size will be measured across the width of the defect at its widest point.

Linear defects smaller than 0.025 mm (0.001") will not be considered in the evaluation of surface quality.

Area	Width Range	Maximum Length	Minimum Separation	Comment	Accept or Fail
Active Area	$W > 0.102$ (0.004")				Fail
	0.076 (0.003") ~ 0.102 (0.004")	12.7 (0.500")		A single defect	Accept
	1. The combined length of multiple linear defects within a 50.8 mm (2") diameter area shall not exceed the criteria listed below. 2. The distance between two linear defects shall not be less than the separation defined below. 3. When two linear defects are in different width ranges, the largest width range shall be used to decide minimum separation.				
	0.079 (0.0031") ~ 0.102 (0.0040")	12.7 (0.500")	6.35 (0.250")	Within 50.8 (2") $\varnothing$	Accept
	0.053 (0.0021") ~ 0.076 (0.0030")	25.4 (1.000")	3.81 (0.150")	Within 50.8 (2") $\varnothing$	Accept
	0.025 (0.0010") ~ 0.051 (0.0020")	38.1 (1.500")	1.27 (0.050")	Within 50.8 (2") $\varnothing$	Accept
	$W \leq 0.025$ (0.0010")				Accept
	Outside Active Area	$W > 0.305$ (0.012")			

Unit : mm

## 5 WIRE ANALOG RESISTIVE TOUCH PANEL

### G.2 Coversheet Fit Criteria

Coversheet fit criteria relate to the degree of tightness of the coversheet to the touchscreen glass.

#### G.2.1 Proper Fit

Definition:

- Proper fit is characterized by a tight fitting coversheet.

Method:

- Put a plastic straight edge diagonally across the entire coversheet surface.
- Apply pressure in one corner in the area over the adhesive.

Criteria of determination:

- If the straight edge rests on the opposite corner, this is an acceptable fit ( Figure 1 ).
- If the coversheet in the active area not to touch the straight edge when the straight edge is extended across the sensor on top of the adhesive, this is an acceptable fit (Figure 2).

Figure 1. Proper Coversheet Fit

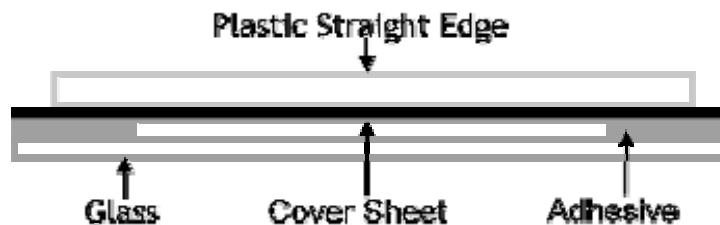


Figure 2. Proper Coversheet Fit



## 5 WIRE ANALOG RESISTIVE TOUCH PANEL

### G.2.2 Ripple Criteria

Definition:

- Ripple criteria are characterized by a wave or ridge in the coversheet which usually stretches from a high point on the screen, for example the cable contact area.

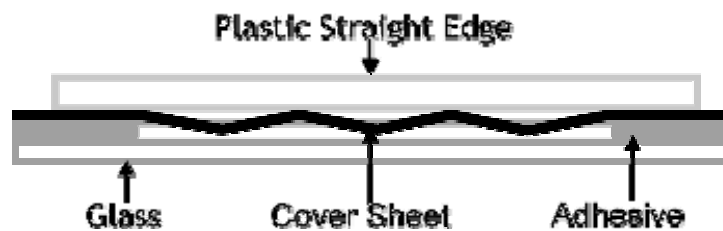
Method :

- Place a plastic straight edge diagonally across the entire coversheet surface.
- Apply pressure in one corner in the area over the adhesive.

Criteria of determination:

- If the straight edge rests on the opposite corner, this is an acceptable fit.
- If the coversheet drops below the straight edge and then rises and falls three times, the touchscreen should fail for improper fit (Figure 3).

Figure 3. Improper Coversheet Fit—Ripple







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Specification of  
5 Wire Analog Resistive  
USB Control Board  
Model No.: 5WRUSBS

## 5 WIRE ANALOG RESISTIVE USB CONTROL BOARD

### A. Application

This specification applies to the following

**USB Control Board for 5 Wire Analog Resistive Touch Panel.**

**Model No. : 5WRUSBS**

### B. Environmental Conditions

**1. Operating Temperature Range**

-10°C ~ 60°C

**2. Operating Temperature Humidity**

5% to 95% RH (no dew falls)

**3. Storage Temperature Range**

-25°C ~ 85°C

**4. Storage Temperature Humidity**

5% to 95% RH (no dew falls)

**5. Shock and Vibration**

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

**6. Flammability**

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

### C. Electrical Characteristics

**1. Power Requirement**

+5V DC ( ±10%)

**2. Power Consumption**

Operating : 80~90mA

Non-operating : 120~130 mA

Max. current : 140mA

Min. current : 80mA

**3. Expend Power**

124 mA

## 5 WIRE ANALOG RESISTIVE USB CONTROL BOARD

### 4. Interface

USB 1.1

Plug and play compatible

### 5. Electrostatic Protection

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

### 6. Touch Resolution

4096x4096

### 7. Conversion Time

Approximately 10 ms per coordinate set.

## D. Mechanical Characteristics

### 1. Dimensions

PCB board outside dimension : 55 (L) x 22.5 (W) x 11 (H) mm.

Refer to Appendix A

### 2. Standard Cables, Connectors and Pin Definitions

- Standard external USB cable connecting the 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

1x5 male header with pins on 2.54mm centers for connection with the touch panel.

Refer to Appendix A.

## 5 WIRE ANALOG RESISTIVE 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

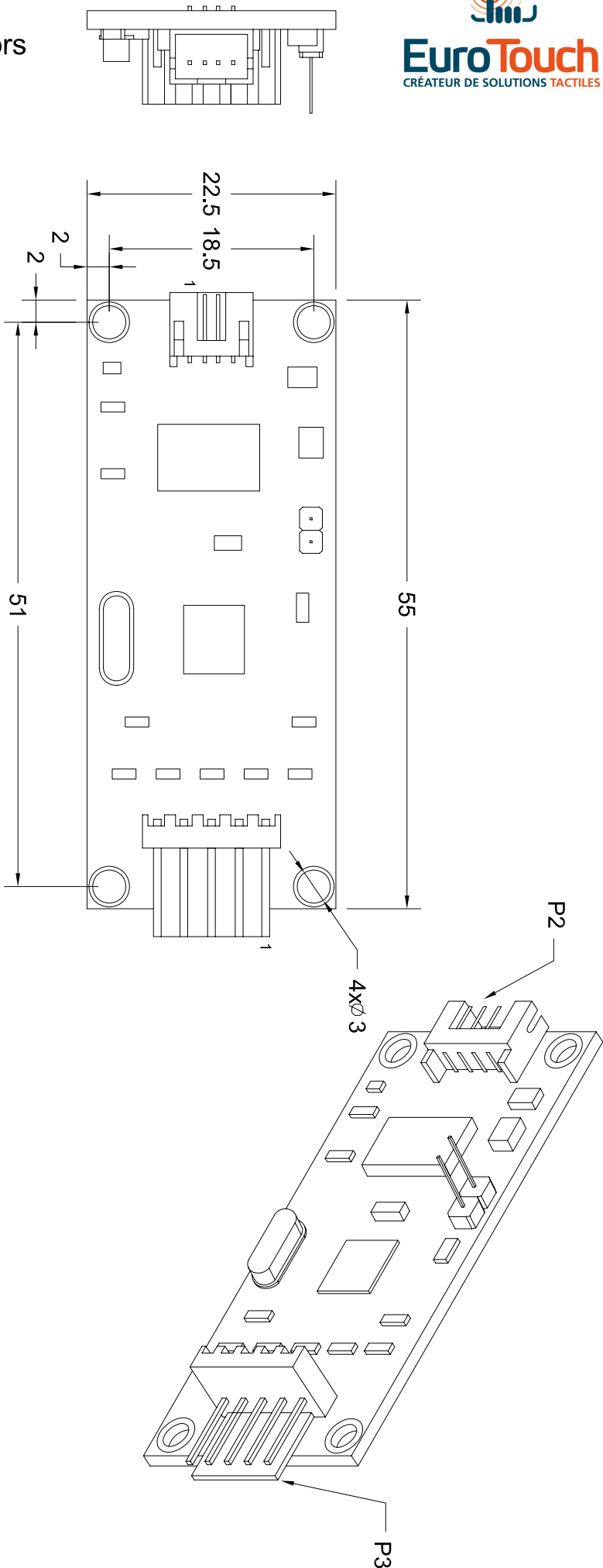
### G. Reliability

The following characteristics are generated by evaluating test samples after 2 hours leaving in the room condition when each of the reliability tests finishes.

Test Item	Result	Remark
Storage Temperature-high	85°C for 240hours	At ambient humidity
Storage Temperature-low	-25°C for 240hours	
Thermal Shock	-10°C (1 hr.)~ 60°C (1 hr.) 10cycles	
High Temp./Humidity Test	60°C/95%RH : 240hours	



# Appendix A Dimension Drawing and Pin Definitions of Connectors



**CONNECTOR P2**

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

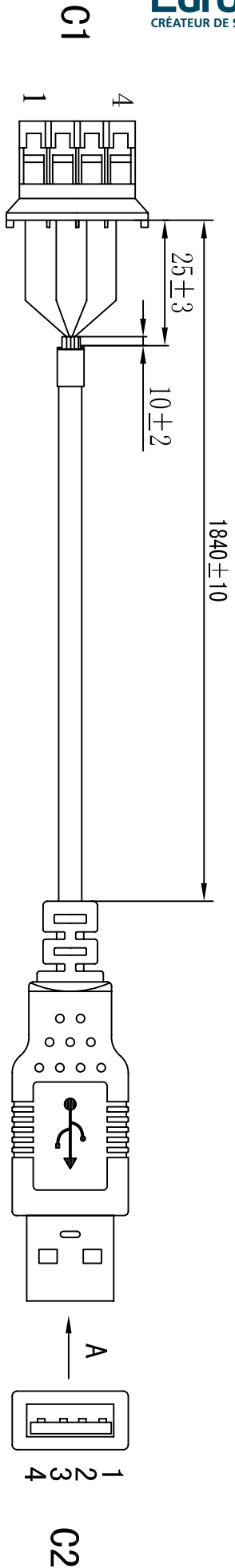
**CONNECTOR P3**

PIN #	SIGNAL NAME
1	H
2	X
3	S
4	Y
5	L

P/N: 5WRUSBSAS			
DRAWN BY HATTIE	DIMENSION UNIT mm	ISSUE DATE 08/31/05	
CHECKED BY ANSON	SCALE NOT TO SCALE	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



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Specification of  
5 Wire Analog Resistive  
RS-232 Control Board  
Model No. : 5WR232S

## 5 WIRE ANALOG RESISTIVE RS-232 CONTROL BOARD

### A. Application

This specification applies to the

**RS-232 Control Board for 5 Wire Analog Resistive Touch Panel.**

**Model No. : 5WR232S**

### B. Environmental Conditions

**1. Operating Temperature Range**

-10°C ~ 60°C

**2. Operating Temperature Humidity**

5% to 95% RH (no dew falls)

**3. Storage Temperature Range**

-25°C ~ 85°C

**4. Storage Temperature Humidity**

5% to 95% RH (no dew falls)

**5. Shock and Vibration**

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

**6. Flammability**

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

### C. Electrical Characteristics

**1. Power Requirement**

+5V DC ( $\pm 10\%$ )

**2. Power Consumption**

Operating : 80~90mA

Non-operating : 120~130 mA

Max. current : 140mA

Min. current : 80mA



## 5 WIRE ANALOG RESISTIVE RS-232 CONTROL BOARD

### 3. Expend Power

124 mA

### 4. Interface

Serial RS-232

### 5. Baud Rate

9600

### 6. Electrostatic Protection

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

### 7. Touch Resolution

4096 x 4096

### 8. Conversion Time

Approximately 10 ms per coordinate set.

## D. Mechanical Characteristics

### 1. Dimensions

PCB board outside dimension : 55 (L) x 22.5 (W) x 11 (H) mm.

Refer to Appendix A.

### 2. Standard Cables, Connectors and Pin Definitions

- Standard external RS-232 cable connecting the controller with the computer serial port. Refer to Appendix B.

- Serial Connector : P2

2.0 pitch 5 pin connector on board for connection with RS-232 port.

Refer to Appendix A.

- Touchscreen Connector : P3

1x5 male header with pins on 2.54mm centers for connection with the touch panel.

Refer to Appendix A.

## 5 WIRE ANALOG RESISTIVE RS-232 CONTROL BOARD

### E. LED Diagnostic Characteristics

A green LED indicates controller status as follows:

Action and Condition	LED status	Function
The control board is connected with host, not touch panel yet.	Light continuously	The control board is in 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
- MS-DOS

### G. Reliability

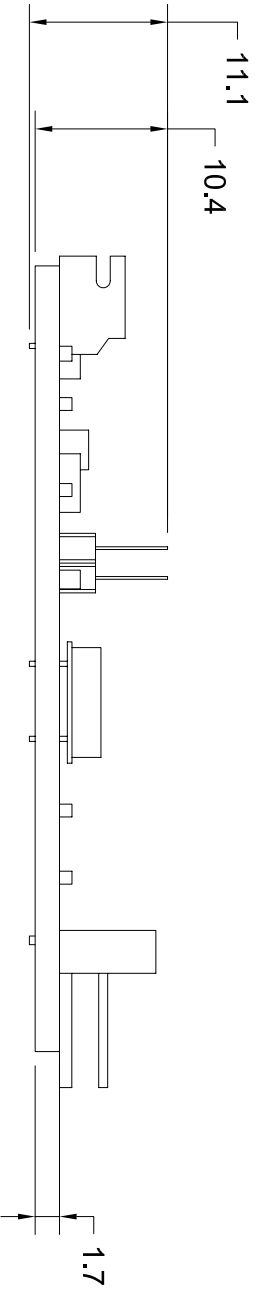
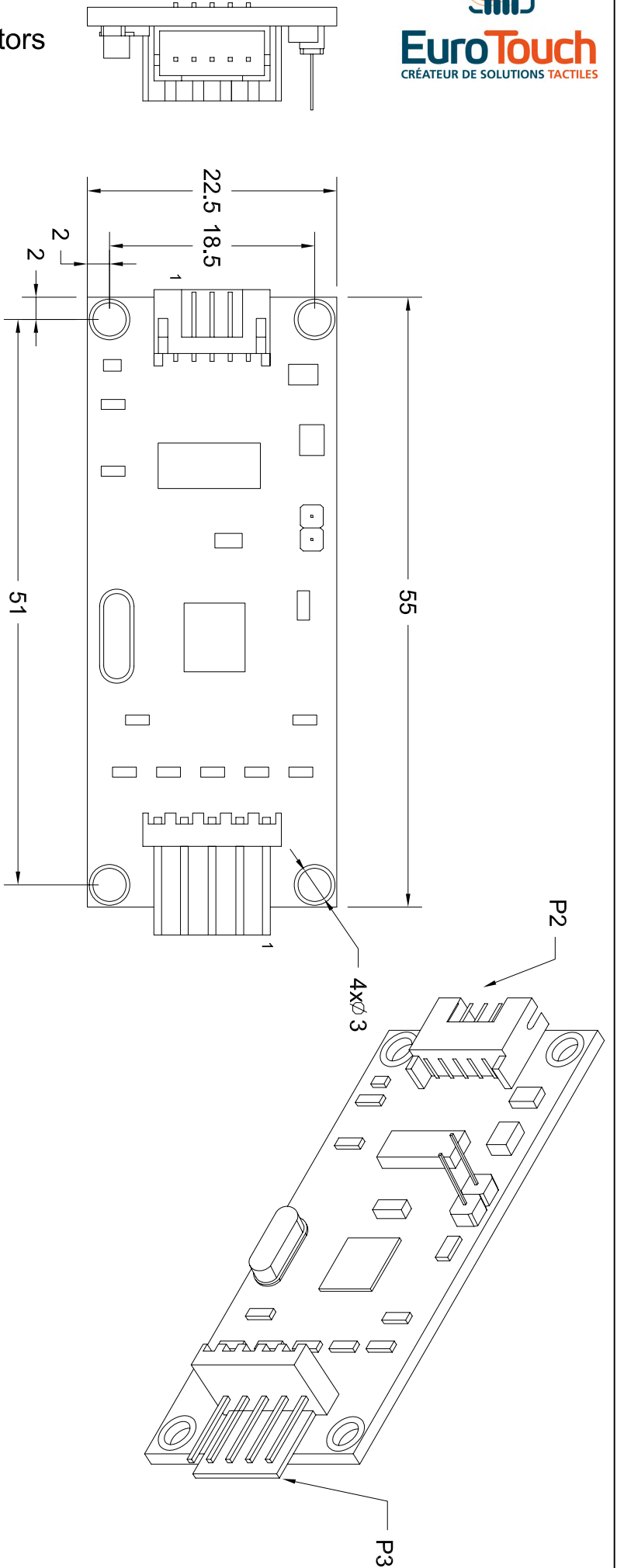
The following characteristics are generated by evaluating test samples after 2 hours leaving in the room condition when each of the reliability tests finishes.

Test Item	Result	Remark
Storage Temperature-high	85°C for 240hours	At ambient humidity
Storage Temperature-low	-25°C for 240hours	
Thermal Shock	-10°C (1 hr.)~ 60°C (1 hr.) 10cycles	
High Temp./Humidity Test	60°C/95%RH : 240hours	



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# Appendix A Dimension Drawing and Pin Definitions of Connectors



**CONNECTOR P2**

PIN #	SIGNAL NAME
1	CTS
2	TXD
3	RXD
4	GND
5	+5V

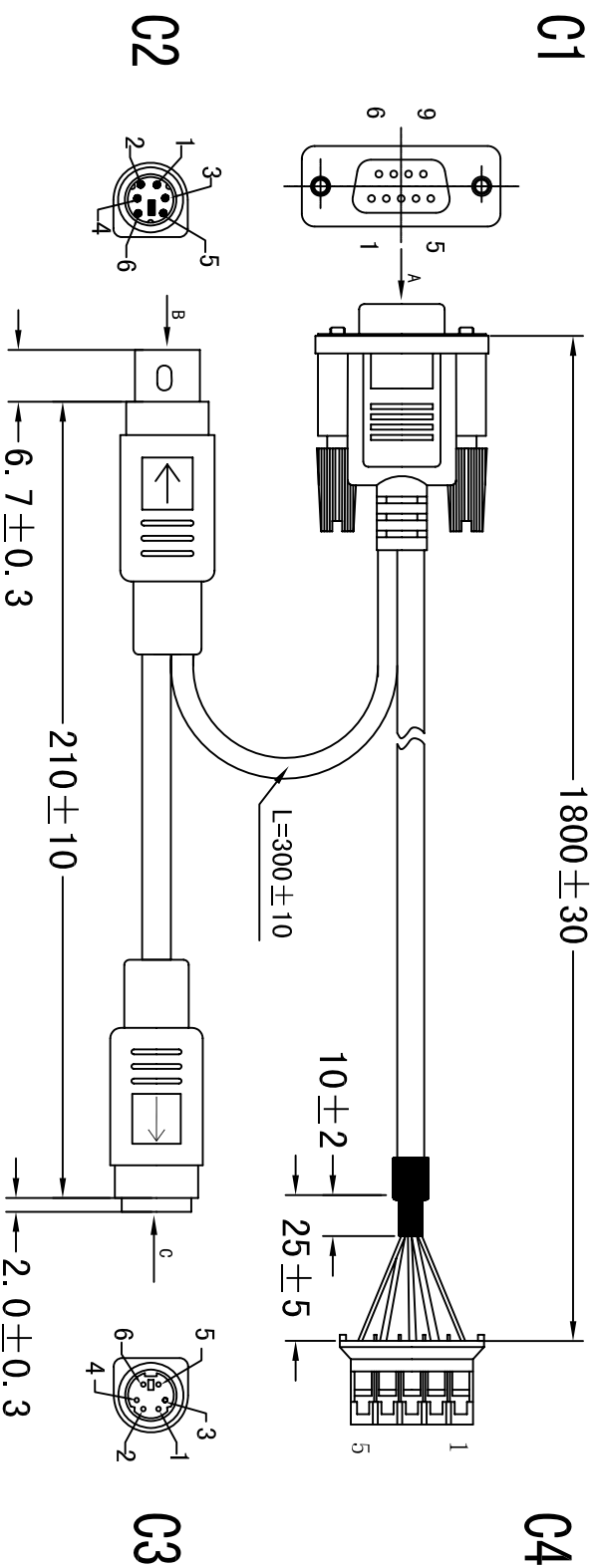
**CONNECTOR P3**

PIN #	SIGNAL NAME
1	H
2	X
3	S
4	Y
5	L

P/N: 5WR232SA5			
ATouch Technologies Co., Ltd.			
DRAWN BY	HATTIE	DIMENSION UNIT	SCALE
CHECKED BY	ANSON	NOT TO SCALE	ISSUE DATE
			08/31/05
			REV A

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ATouch Technologies Co., Ltd.

# Appendix B Standard External RS-232 Cable



## MATERIAL LIST:

### CONNECTOR:

- C1:DB9 FEMALE PVC MOLDED COLOR:BLACK.
- C2:MINI DIN 6PIN MALE PVC MOLDED COLOR:BLACK.
- C3:MINI DIN 6PIN FEMALE PVC MOLDED COLOR:BLACK.
- C4:2.0PITCH SPIN HOUSING COLOR:WHITE.

### CABLE:

- UL2464 #26\*6C+AE OD:5.0mm COLOR:BLACK.
- UL2464 #26\*4C+AE OD:5.0mm COLOR:BLACK.
- UL2462 #26\*5C+AE OD:5.0mm COLOR:BLACK.
- CORE:
- 12\*5.6\*20mm PVC MOLDED COLOR:BLACK

## PIN ASSEMBLY

C3	C2	C1	C4
1	1	2	2
WHITE	BROWN	YELLOW	TXD
2	2	3	3
BROWN	BLACK	ORANGE	RXD
3	3	5	4
BLACK	RED	BLACK	GND
4	4	1+6	5
RED	ORANGE	RED	+5V
5	5	8	1
ORANGE	GREEN	GREEN	CTS
6	SHELL	GND	
GND	SHELL	SHELL	

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ATouch Technologies Co., Ltd.

DESCRIPTION:MD6F/MD6M/DB9F/PH5 ISSUE:05/9/27

PART No.:CAB232E6B5 PAGE:1 OF 1

DRAWN BY:HA TTIE REV:A

CHECKED BY:ANSON UNIT:mm