



BYD Microelectronics Co., Ltd.

***BTP11484-202***

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**BTP11484-202 DataSheet**  
**Multi-Finger Sensing Pad Product**  
**PnP ID: BYD1155**

## 1. General Description

The BTP11484-202 is an enhanced version of the Finger-Sensing Touchpad. It supports normal mouse operations, including Tap, Double Tap, Scroll, Tap & Drag and movement.

The core technology of the pad module is a capacitive controller IC. When a finger is moving on the pad surface, the IC will begin to monitor the finger activities and send the information back to the host system to the map screen cursor movements.

The BTP11484-202 currently connects with system host via PS/2® interface and requires only the standard Windows® mouse driver to operate in a PC based system. The device also comes with an optional vendor's driver to support the additional features for the system users, such as on-pad virtual zones for vertical and horizontal scrolling.

To move cursor, the user can slide on the device surface lightly where the Finger-Sensing Pad is mounted as shown in Figure 1.

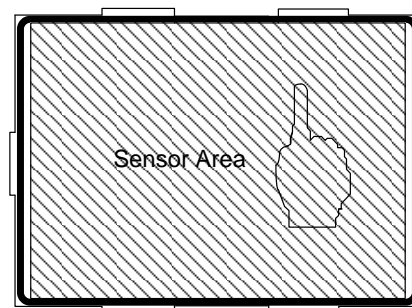


Figure 1. Finger Sensing Pad

## 2. TouchPad Features

### 2.1. Hardware and device driver

- Compatible with Windows® 2000 / XP / Vista / 7 / 8 mouse driver and Linux operating system
- PS/2® & IIC interface
- Provides smooth and reliable finger detection
- Low fatigue pointing action
- Low power consumption
- Relative XY coordination support
- Configurable device mounting orientation
- Light weight
- Supports normal mouse operations, including Tap, Double Tap, Scroll, Tap & Drag and movement
- Optimized parameters
- Driver is certified by Microsoft Windows Hardware Quality Labs (WHQL)
- Multi-finger detecting.
- Provide virtual scrolling zone to emulate the mouse wheel function

## 2.2. Data Packet

The BTP11484-202 is compatible with standard PS/2-compatible mouse and Microsoft IntelliMouse® (3button wheel mouse). By default, the device runs in PS/2-compatible mouse mode.

The packet information is listed as follows:

### PS/2-compatible Mouse (3 bytes)

Byte	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	Comment
Byte1	Y over	X over	Y sign	X sign	1	M	R	L	X/Y overflows and signs, buttons
Byte2	X7	X6	X5	X4	X3	X2	X1	X0	Delta X data byte
Byte3	Y7	Y6	Y5	Y4	Y3	Y2	Y1	Y0	Delta Y data byte

### IntelliMouse-compatible 3-button Wheel Mouse

Byte	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	Comment
Byte1	Y over	X over	Y sign	X sign	1	M	R	L	X/Y overflows and signs, buttons
Byte2	X7	X6	X5	X4	X3	X2	X1	X0	Delta X data byte
Byte3	Y7	Y6	Y5	Y4	Y3	Y2	Y1	Y0	Delta Y data byte
Byte4	Z7	Z6	Z5	Z4	Z3	Z2	Z1	Z0	Z/wheel data byte

## How to get the device ID of BYD TouchPad ?

The following diagram is the handshaking flow between Host and BYD TouchPad. The arrow directed to the right is the command requested from Host to BYD TouchPad.

The arrow directed to the left is the response from BYD TouchPad to Host. The commands or data in hexadecimal is indicated on the arrows while the comments are noted in the parentheses.

It is noteworthy that it is expected the get the value of “01” in the first byte data when using BYD TouchPad if the above handshaking protocol is executed, and the first byte data is the only data needed to be checked.

Host (I/O port) BYD TouchPad

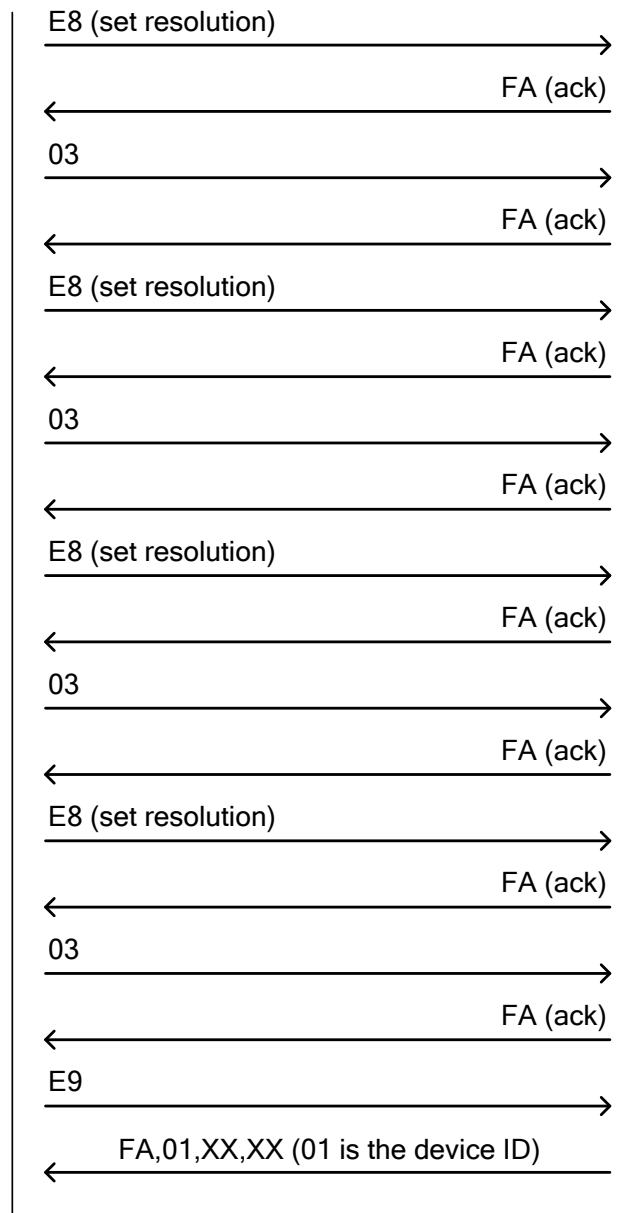
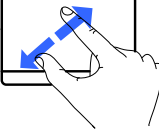
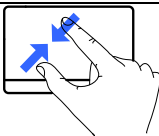
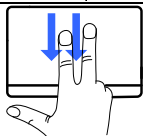
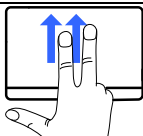
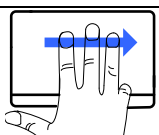
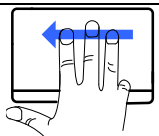
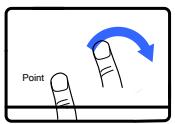
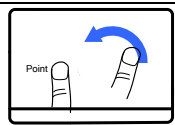


Figure 2. request / response flow between Host and BYD TouchPad

### 3. Multi-Finger Gesture

BTP11484-202 Multi-finger technology provides intuitive one or two-finger gestures, which can be applied to customized functions, like Zoom In/Out, Scrolling, etc.

The gestures and their functions are described as follows:

Illustration	Gesture	Function
	Expand	Zoom out object
	Narrow	Zoom in object
	Scroll Down	Page down
	Scroll Up	Page up
	Flick	Forward
	Flick	Backward
	Rotation	Clock-wise rotate object
	Rotation	Counter Clock-wise rotate object



## 4. BTP11484-202 Specifications

### 4.1. Physical Specifications

PCB Thickness	1.1 ± 0.1mm	Height	84 +0/- 0.2mm
Width	114.0 +0/- 0.2mm	Bezel Opening Height	81.6 +0/-0.2mm
Bezel Opening Width	111.6 ± 0.25mm	Weight	≈ 18.5 g
Connector Thickness	1.5 mm (max)		

### 4.2. Electrical Specifications

Contents	Description	Min	Typ	Max	Conditions
Supply Voltage		4.5	5.0	5.5	V
Current Consumption			6.12		mA
Input High Voltage		2.0		5.5	V
Input Low Voltage		-0.3		0.8	V
Output High Voltage		2.4			V
Operating Temperature		0		60	°C
Operating Humidity	5%~95%RH				
Storage Temperature		-40		70	°C
Module ESD				15	kV
ESD (No error)	10kV, No Error			10kV	EN61000-4-2
ESD (No damage)	15kV, No Damage			15kV	EN61000-4-2
Static Load				9.8	N
Shock Resistance	80g/11ms,Half-sine				IEC68-2-27
Vibrations	5-200Hz,0.015g <sup>2</sup> /Hz, -6dB/oct in 200Hz-500Hz				IEC68-2-36
Tapping	1 million cycles				2.45N(250gf)
Abrasion	1 million cycles				0.49N(50gf)

## 5. Physical Dimensions

All dimensions are in millimeters (mm).

### 5.1. PCB Layer

Designs should be held within the physical dimensions that shown in the figures as below.

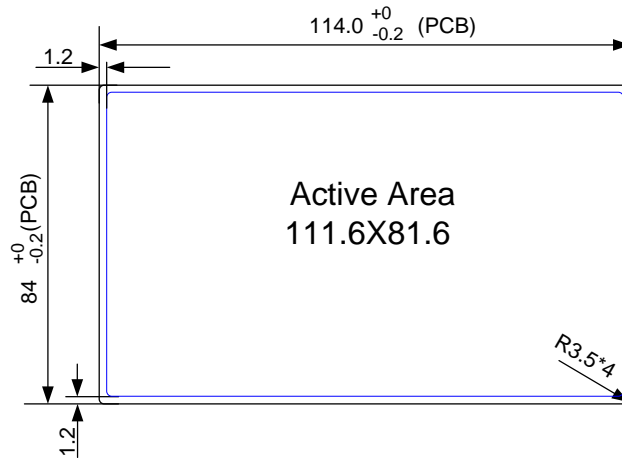


Figure 3. Sensor -- Top View

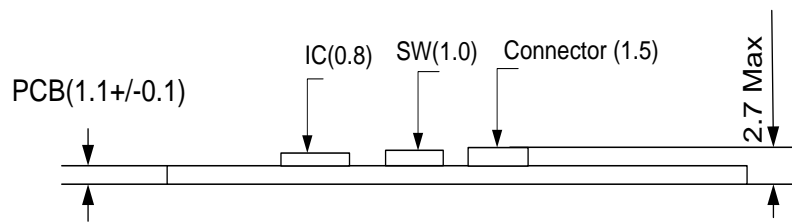


Figure 4. Side View

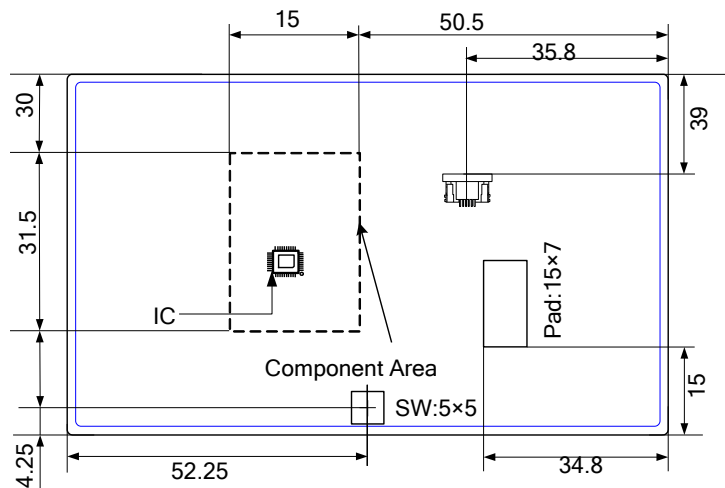


Figure 5. Component -- Bottom View

## 5.2. Module Orientation

In the following figures, the arrow indicates the direction of the user's finger movement.

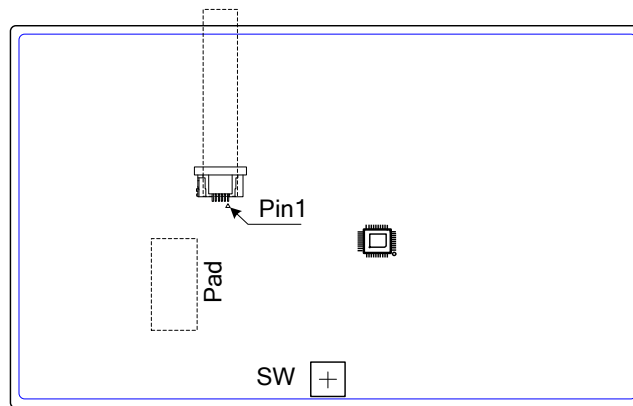


Figure 6. Sensor - Top View - Left Orientation

## 5.3. Connector Information

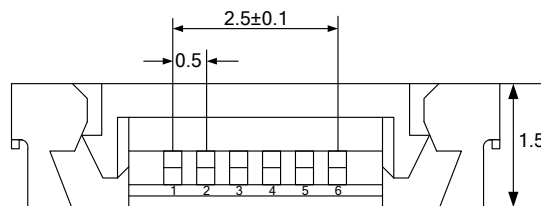


Figure 7. Module Connector J1 Reference Drawing

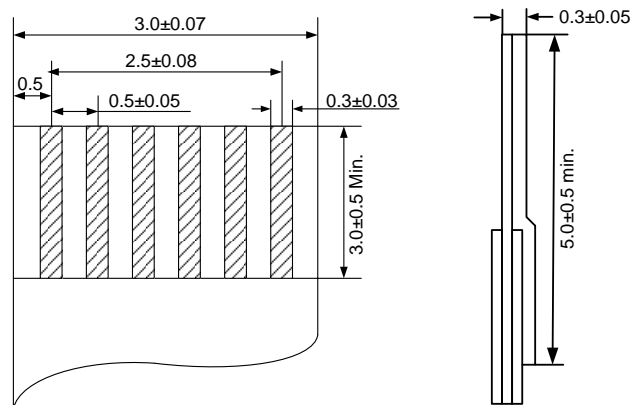


Figure 8. Dimensions of 6-pin 0.5mm pitch FFC/FPC Cable



## 5.4. J1 Pin Assignments and Definitions

In this model, a 6-pin connector with 0.5mm-pin pitch is applied. The following table lists the pin assignment information. Please refer to the mechanical drawing page for detail connector drawing. Connector Information (shown in Figure 7)

Table 1: BTP11484-202 Module Pin

Pin Number	Pin Name	Description	Pin Number	Pin Name	Description
1	VDD	VDD input	4	GND	Ground
2	DAT	PS/2 Data	5	SWL/R	SWL/R
3	CLK	PS/2 Clock	6	NA	NA

## 6. Product Marking & Order Information

The Product marking of the Finger-Sensing Pad Series is composed of two sections.

The first section of the marking specifies is the model name. The second part contains touchpad information : PCB size, Hardware information, Control mode and Version number.

Table 2: Finger-Sensing Pad model name and marking template

BYD TOUCHPAD			X0	X1	X2	X3	X4
B	T	P	11484	—	2	0	2

- BTP: BYD TouchPad Module
- X0: Define PCB size
- X1: “—”
- X2: Hardware information
- X3: Control mode. Please refer to Figure 6
- X4: Defines version number

## 7. Environmental Specification

### 7.1. Low Temperature Functional Test

+0°C, Relative Humidity, 96 hrs

### 7.2. High Temperature Functional Test

+60°C, Relative Humidity, 96 hrs

### 7.3. Low Temperature Storage Test

-40°C, 96 hours (the sample shall be left in standard conditions for at least 2 hours before measurements are made).

### 7.4. High Temperature Storage Test

+70°C, Relative Humidity, 96 hours (the sample shall be left in standard



conditions for at least 2 hours before measurements are made).

### 7.5. High Temperature and High Humidity Functional Test

+60°C, 95%RH, 96hours (water drops shall be removed before measurements are made).

### 7.6. High Temperature and High Humidity Storage Test

+60°C, 95%RH, 96 hours (the sample shall be left in standard conditions for at least 2 hours before measurements are made).

### 7.7. Temperature Cycling Test

-40°C/ +70°C, 100 cycles, 2 hrs/cycle (-40°C: 0.5hrs, from -40°C to +70°C: 0.5hrs, +70°C: 0.5hrs, from +70°C to -40°C : 0.5hrs/cycle ) (The sample shall be left in standard conditions for at least 2 hours before measurements are made).

### 7.8. ESD Test

Refer to EN61000-4-2:

Up to 10 kV No errors (use proper ESD mounting)

Up to 15 kV No damage (use proper ESD mounting)

Failure criteria:

Error: temporary degradation or loss of function which requires operator intervention or system reset.

Damage: degradation or loss of function which is not recoverable due to damage of equipment or some of its components.

### 7.9. Shocks

80g /11ms, Half-Sine pulse, +/-X、 +/-Y、 +/-Z (6 directions), 3 shocks/direction.

### 7.10. Vibrations

5-200 Hz , 0.015g<sup>2</sup>/Hz, -6dB/oct in 200Hz -500 Hz, Random wave, X、 Y、 Z(3 axes), 2hrs/axis IEC 68-2-36

### 7.11. Tapping

2.45N(250gf), 1million times. An artificial rubber finger is used, tapping the same spot at rate of 60-120 taps/minute.

The artificial finger for tapping test should have the following characteristics:

Material: Rubber of 45deg Shore D hardness

Finger height: H = 10 mm min.

Finger diameter: D = 9 ± 1 mm

Contact diameter: C = 8 ±1 mm

### 7.12. Abrasion

0.49N(50gf), 1million cycles.

An artificial finger is used, moving diagonally back and forth on the pad at a rate of 60-120 cycles/minute.

The information of artificial finger is described in "tapping" section.

## 8. Assembly instructions

8.1 Recommended room temperature for good adhesion 20~30°C

### 8.2 Assembly instructions

The purpose of this instruction is to eliminate any gaps between the Touchpad and contact surface of the plastic part.

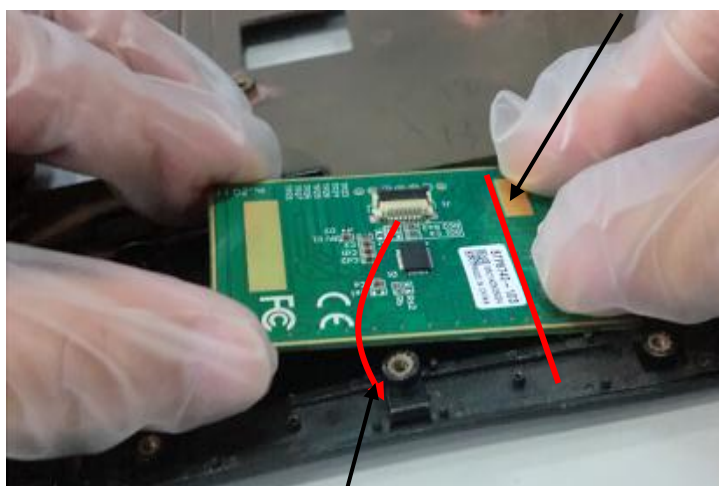
#### Step1. Remove separator from the top surface of Touchpad

Take peeling off tab



#### Step2 .Temporary fixing to designated place on the plastic part

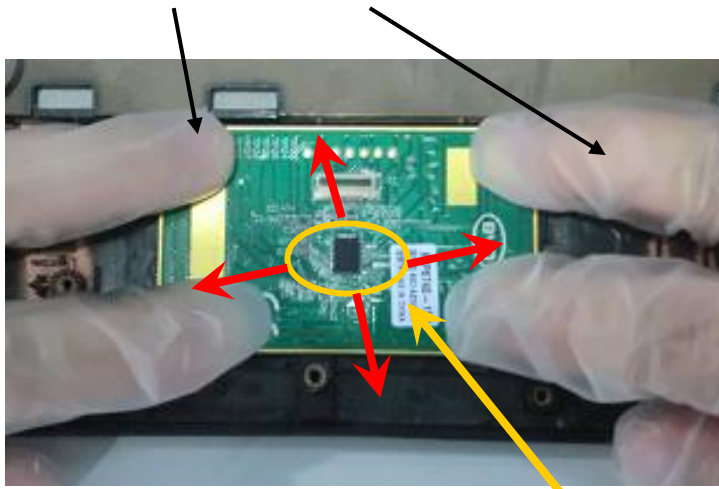
(1) One edge should contact with the surface first



(2) Then the other side touches down

### Step3.Press down to adhere firmly

Press down by finger or thumb Pressure : 98kPa



Press down motion from center to perimeter

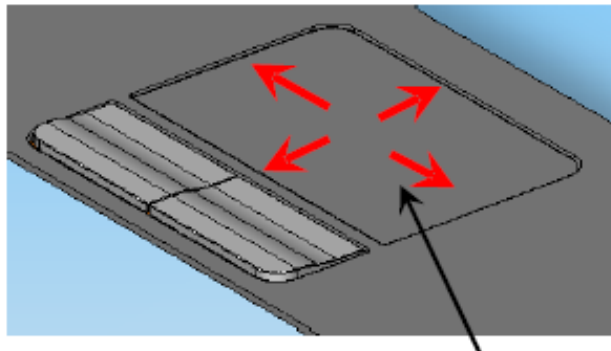
Operator should not touch the electrical components on the Touchpad

### Step4. Rub the operating surface of plastic part

Apply pressure to operating surface to complete the adhesion

Pressure: 98 kPa

The bottom of Touchpad should be supported.



Rubbing motion:from center to perimeter

### 8.3 Other instructions for installation

In order to prevent IC from being hurt by static electricity, the operator should be grounded while operating.

The frame ground (FG) of the GlidePoint must be connected with FG of the system to maintain the performance of Touchpad.

The Touchpad which was adhered once and removed from plastic part should not be reused, because of potential damage by stress while removal process.



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