

A2601

3D USB or PS2 Mouse Controller

1. Description

A2601ZDC is a 3D mouse controller especially designed for USB or PS/2 applications. It is a low cost mouse solution. It can support the USB Standard Requirements as well as HID Class Requirements version 1.1. It is compatible with Microsoft/Intel 3D PS/2 mouse. The X/Y axis photo input with dynamic photo-input resistor and Z axis can support two kinds of scroll wheel input, namely: opto-mechanical and mechanical. It requires minimal external components to implement 3D USB or PS/2 mouse. It can be briefly described as an Apexone ASIC with on-chip USB interface logic. The USB is specified by the *Universal Serial Bus Specification V1.1*.

2. Features

- Complete USB specs V1.1 compatibility
- USB transceiver and controller integrated
- PS/2 mouse compatible
- Three buttons (R, M, L) and three axes (X, Y, Z) inputs
- Single chip solution for USB mouse function
- Fully support of Win2000, XP, ME (with driver), 98 (with driver), DOS(with driver)
- Plug and Play functions
- Compatible with sensors PAN101BOI-204/208 、 PAN101BSI-204/208、 HDNS2000、 ADNS2051 、 OM01/OM02
- Support 800dpi with PAN101BOI-208 or PAN101BSI-208
- 6MHz crystal or ceramic oscillator for system clock
- DIP14 and DIP18 package
- Reduced external component

3. Block Diagram

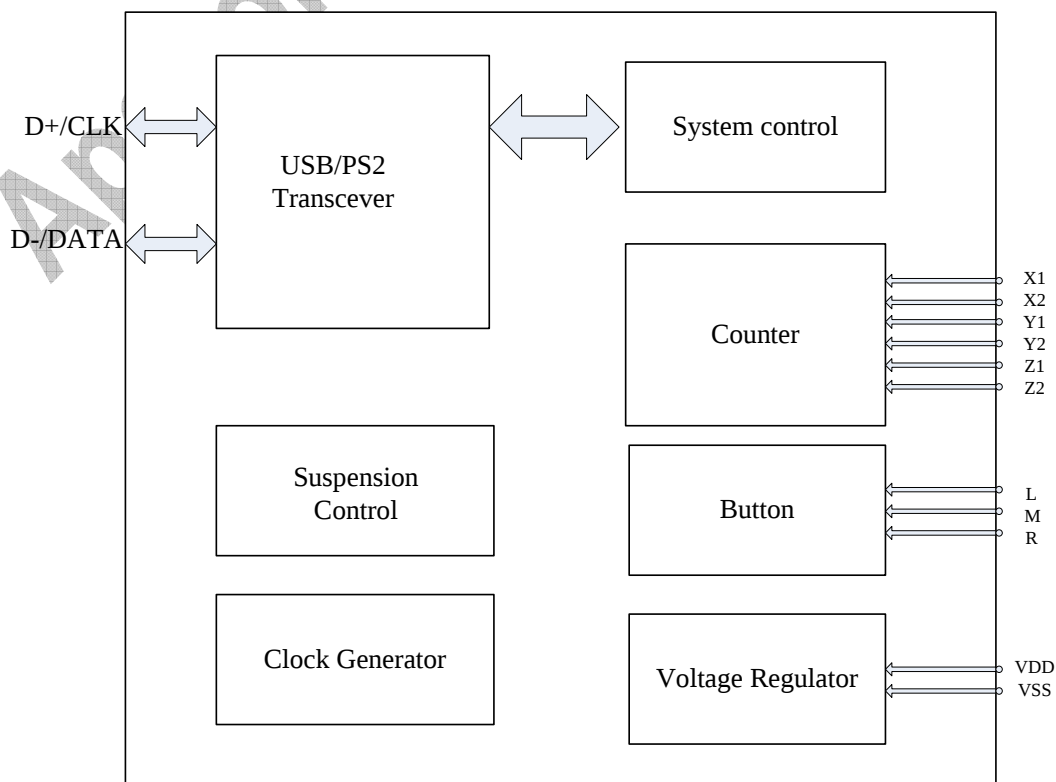
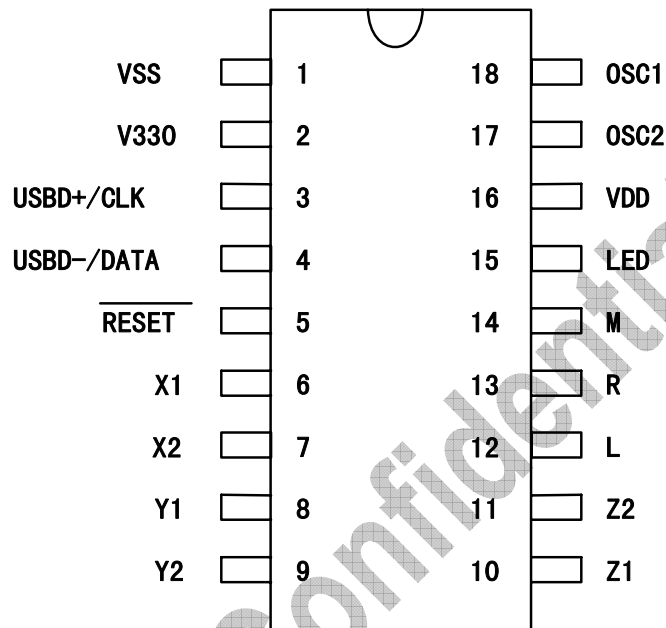


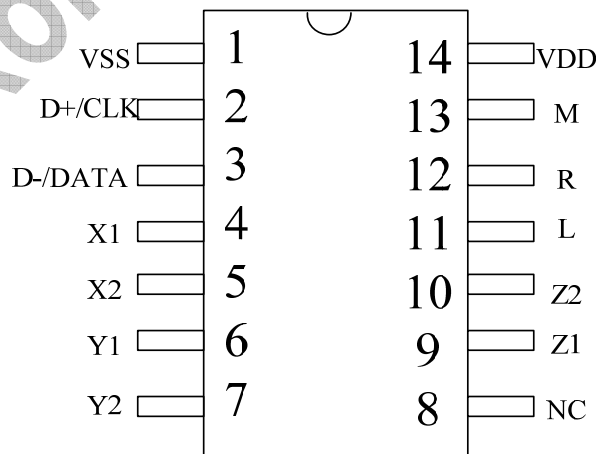
Figure 1: Block Diagram

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4. Pin Assignment



(a) DIP-14 package



(b) DIP-14 package

Figure 2: Pin Assignment (Top View)

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5. Pin Description

Table 1 Pin Description

(a) DIP-14

Pin No.	Pin Name	I/O	Description
1	VSS	—	Negative power supply, ground
2	USBD+/ CLK	I/O	USB data plus or PS2 Clock, F/W auto-detect USBD+ for USB, CLK for PS2
3	USBD-/ DATA	I/O	USB data minus or PS2 Data, F/W auto-detect USB—for USB, DATA for PS2
4, 5	X1, X2	I	X-axis photo input with dynamic photo input resistor
6, 7	Y1, Y2	I	Y-axis photo input with dynamic photo input resistor
8	NC	—	
9, 10	Z1, Z2	I	Z-axis input supports two kinds of scroller input; optomechanical and mechanical
11, 12 13	L, R, M	I	Input ports with pull-high resistor. These pads can function as Left, Right and Middle button input lines
14	VDD	—	5V positive power supply

(b) DIP-18

Pin No.	Pin Name	I/O	Description
1	VSS	—	Negative power supply, ground
2	V33O	O	3.3V voltage output
3	USBD+/ CLK	I/O	USB data plus or PS2 Clock, F/W auto-detect USBD+ for USB, CLK for PS2
4	USBD-/ DATA	I/O	USB data minus or PS2 Data, F/W auto-detect USB—for USB, DATA for PS2
5	RESET	I/O	Chip reset , low active
6, 7	X1, X2	I	X-axis photo input with dynamic photo input resistor
8, 9	Y1, Y2	I	Y-axis photo input with dynamic photo input resistor
10, 11	Z1, Z2	I	Z-axis input supports two kinds of scroller input; optomechanical and mechanical
12, 13, 14	L, R, M	I	Input ports with pull-high resistor. These pads can function as Left, Right and Middle button input lines
15	LED	I/O	Drives LED output
16	VDD	—	5V positive power supply
17	OSC2	O	6MHz OSC output
18	OSC1	I	6MHz OSC input

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6. Absolute Maximum Ratings

Table 2 Absolute Maximum Ratings (Ta=25°C)

Characteristic	Symbol	Value	Unit
Supply Voltage	V _{CC}	-0.3 ~ 6.0	V
Input Voltage	V _I	V _{SS} -0.3 ~ V _{DD} +0.3 V	V
USB Input Voltage	V _I	V _{SS} -0.3 ~ V ₃₃₀ +0.3 V	V
Operating Temperature	T _{OPR}	-20 ~ +75	°C
Storage Temperature	T _{STG}	-50 ~ +125	°C

Note: These are stress ratings only. Stresses exceeding the range specified under Absolute Maximum Ratings may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

7. Electrical Characteristics (Ta=25°C)

Table 3 Electrical Characteristics (Ta=25°C)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		VDD	Conditions				
VDD	Operating Voltage	—	—	4.5	—	5.5	V
IDD	Operating Current	5V	No load	—	8.5	12	mA
				—	6.5	10	mA
I _{STB}	Standby Current	5V	System suspend	—	330	—	uA
V _{IL1}	Input Low Voltage for I/O Ports	5V	—	0	—	0.8	V
V _{IH1}	Input High Voltage for I/O Ports	5V	—	0.7*vdd	—	—	V
V _{IH3}	Input High Voltage for USB I/O Ports	5V	—	2.8	—	3.6	V
V _{POR}	Power on Reset V _{DD} Detection Voltage	5V	—	3.5	—	3.9	V
I _{OL1}	Output Port Sink Current (LED)	5V	V _{OL} =0.5V	—	20	—	mA
ESD	ElectroStatic Discharge	—	—	±8000	—	—	V

8. Typical Application Circuits

8.1 Typical Application Circuit 1

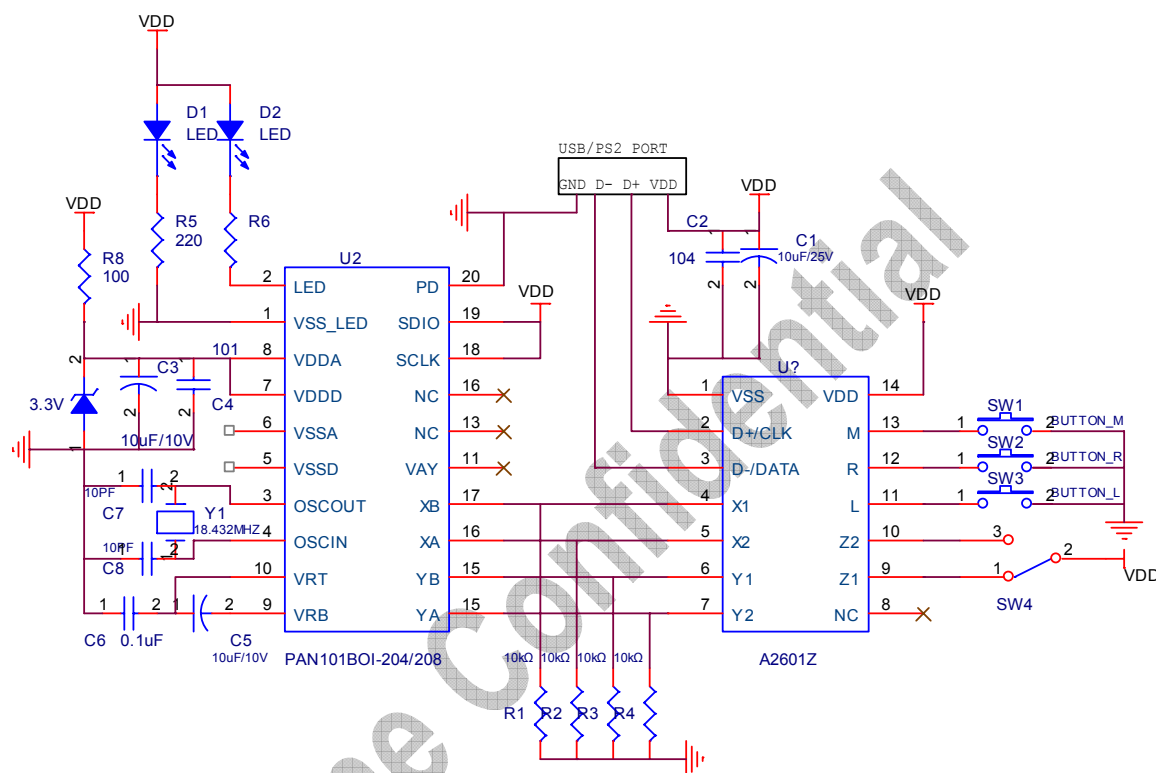
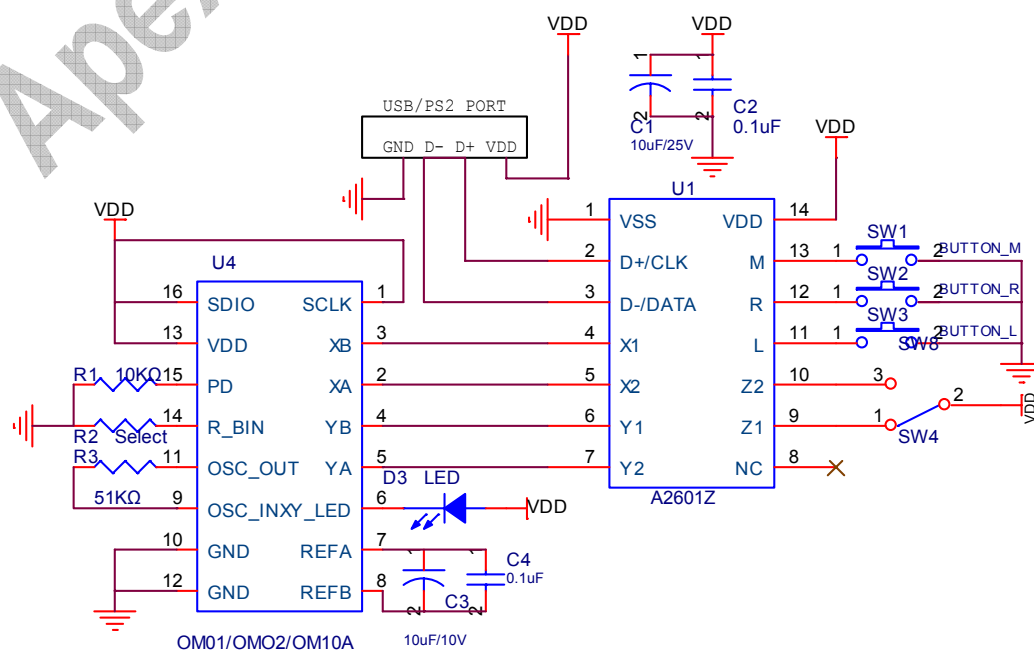


Figure 3: A2601Z+PAN101BOI-204(400CPI)

8.2 Typical Application Circuit 2



LED BIN	K/L/M/N/P	Q	R	S	T	U
R2 Value (kΩ)	8.2-12	8.2-15	8.2-18	8.2-22	8.2-27	8.2-33

Figure 4: A2601Z+OM01/ OM02

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9. Package Information

A2601 is available in DIP-14 and DIP-18.

DIP14 Dimensions

Unit: mm

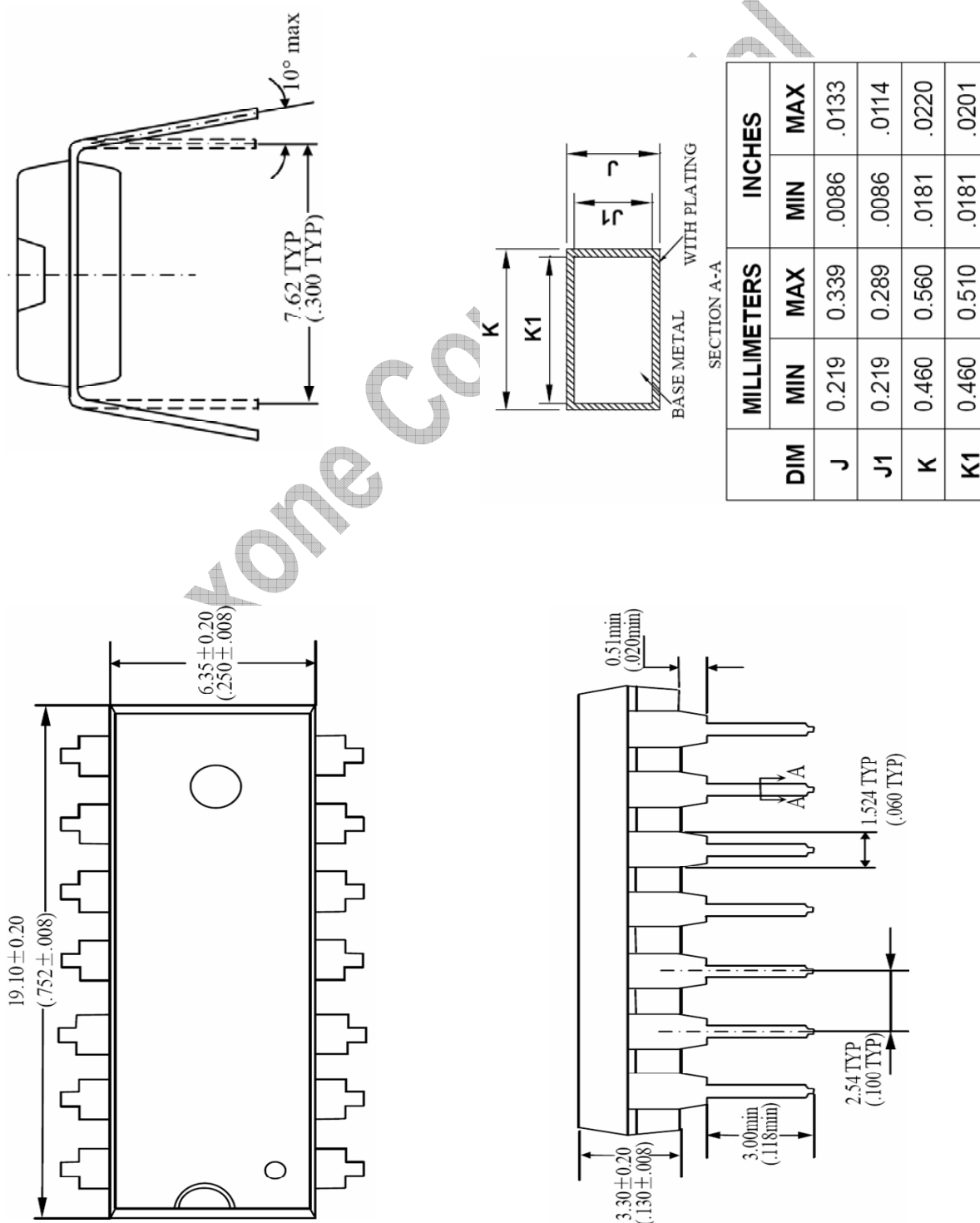


Figure 5: DIP14 Package Information

• DIP18

(Units : mm)

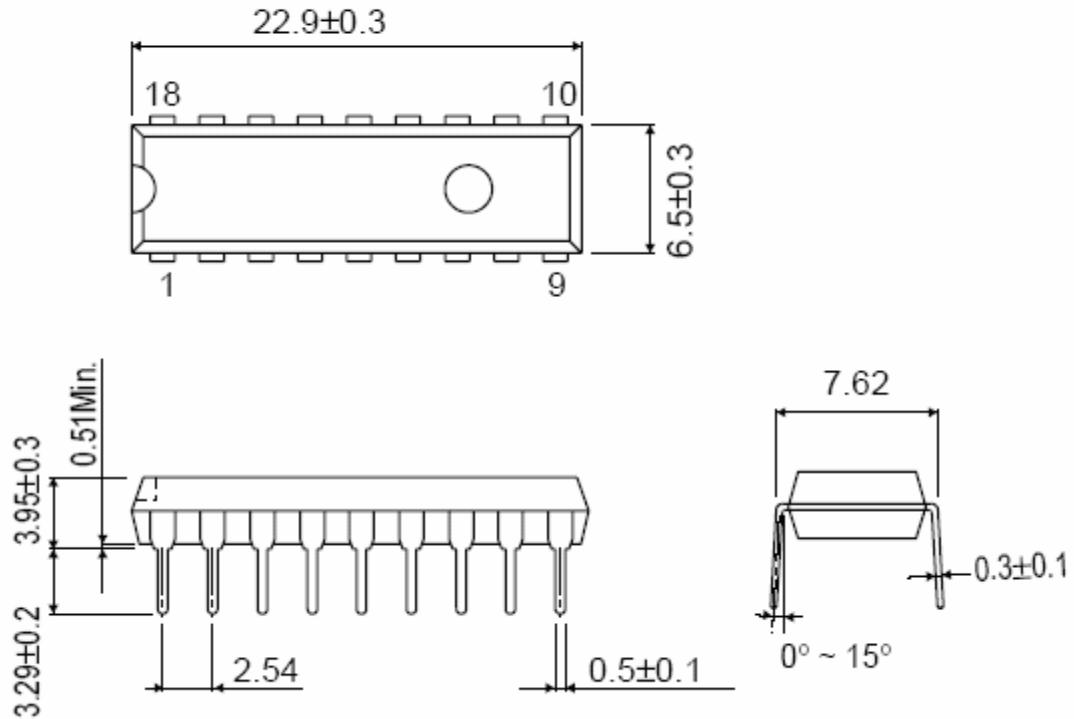


Figure 6: DIP18 Package Information

10. Revision History

Version	Change Date	Description of Change
1.0	2005-07-12	Original version
1.3	2005-02-16	Revised version
1.4	2006-03-03	Added new feature for crystal less of controller
1.6	2007-02-08	Added DIP14 Package & pin information, updated application circuits, corrected some wording



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