A2601DC-C
3D USB+PS2 Mouse

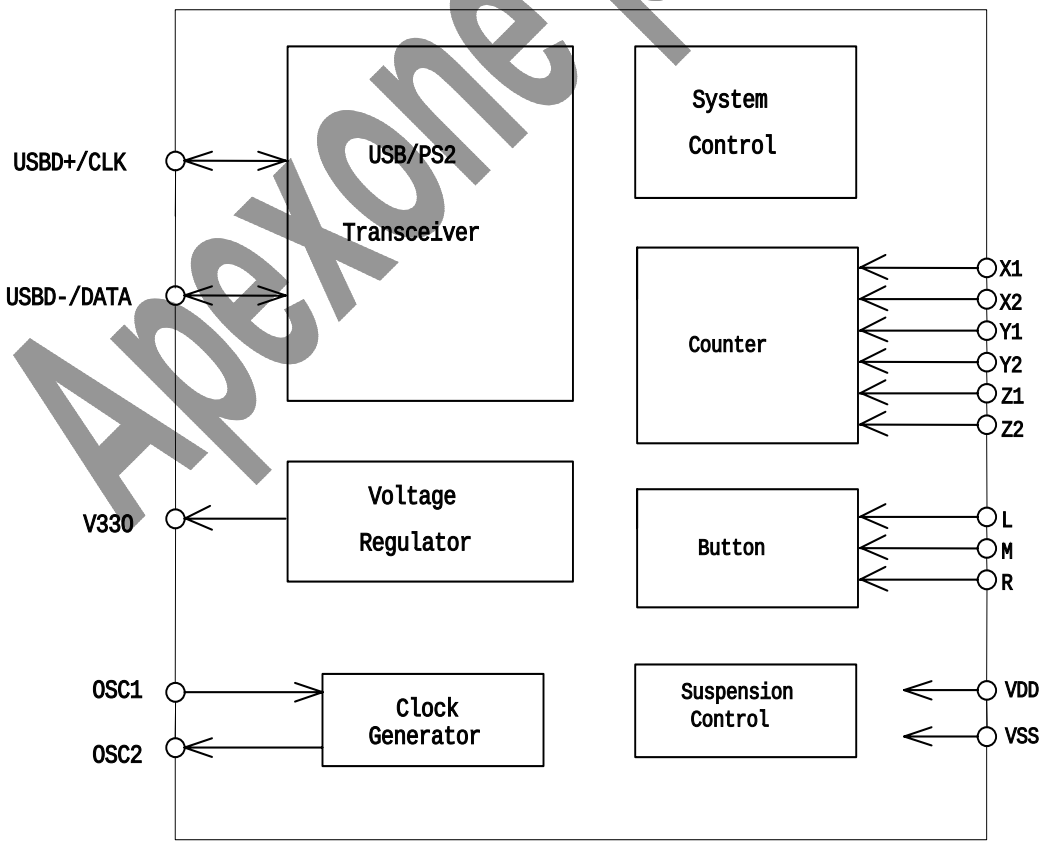
Features

- Complete Universal Serial Bus specs V1.1 compatibility
- USB transceiver and controller integrated
- PS/2 mouse compatible
- Three buttons (R, M, L) and three axes (X, Y, Z) input
- Single chip solution for USB mouse function
- Fully support of Win2000, XP, ME (with driver), 98 (with driver),DOS(with driver)
- Working with PixArt PAN101BOI-204/208 、PAN101BSI-204/208、Agilent HDNS2000 or ADNS2051 、OM01/OM02 to makeup optical mouse
- Support 800dpi with PAN101BOI-208 or PAN101BSI-208
- Plug and Play functions
- 6MHz crystal or ceramic oscillator for system clock
- 18-pin DIP package
- Reduced external components

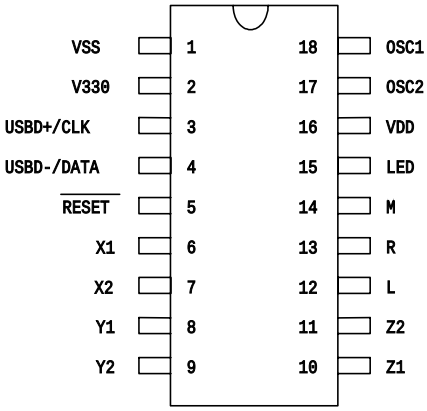
Description

A2601DC-C is a 3D mouse controller especially designed for USB and PS/2 applications. It can support the USB Standard Request as well as HID Class Request version 1.1 draft 4. 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 scroller input, namely: opto-mechanical and mechanical. It requires minimal external components to implement 3D USB mouse plus 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*.

Block Diagram



Pin Assignment



Pin Description

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

Absolute Maximum Ratings (Ta=25°C)

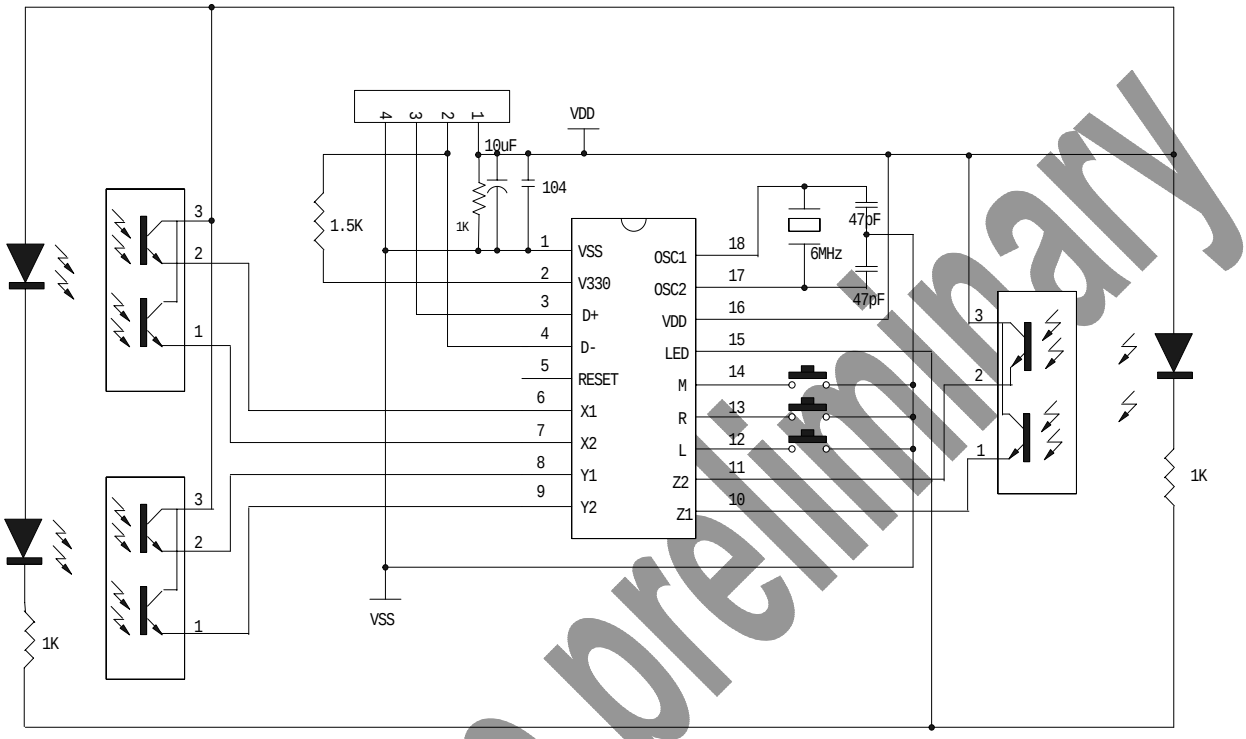
Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	-0.3 ~ 6.0	V
Input Voltage	V_I	V_{SS}-0.3 ~ V_{DD}+0.3 V	V
USB Input Voltage	V_I	V_{SS}-0.3 ~ V_{33O}+0.3 V	V
Operating Temperature	T_{OPR}	-25 ~ +75	°C
Storage Temperature	T_{STG}	-50 ~ +125	°C

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.

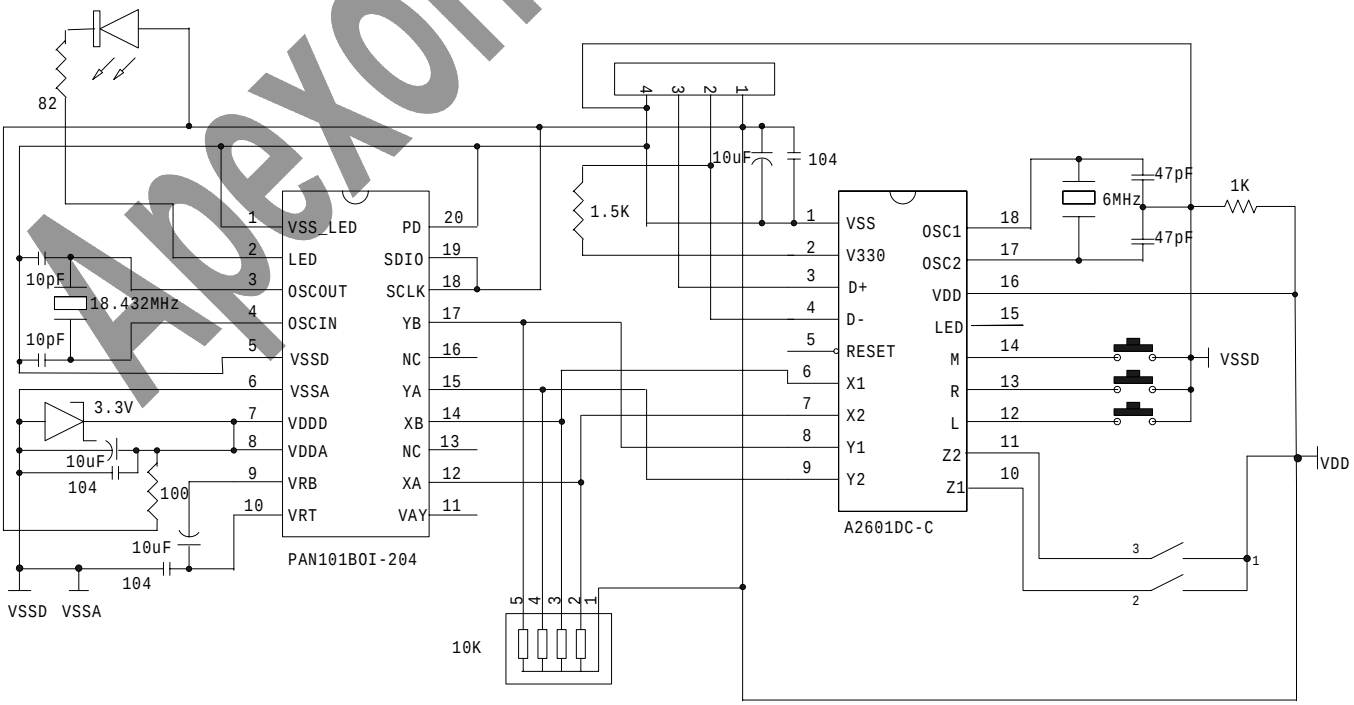
Electrical Characteristics (Ta=25℃)

Symbol	Parameter	Test Conditions			Min.	Typ.	Max.	Unit
		VDD	Conditions					
VDD	Operating Voltage	_	_		4.5	_	5.5	V
IDD	Operating Current (Crystal or Ceramic OSC)	5V	No load, f_{SYS}=6MHz	USB mode	_	2.3	3.0	mA
				PS/2 mode	_	2.1	2.5	mA
I_{STB}	Standby Current	5V	No load, system suspend		_	_	700	uA
V_{IL1}	Input Low Voltage for I/O Ports	5V	_		0	_	1.0	V
V_{IH1}	Input High Voltage for I/O Ports	5V	_		3.5	_	5	V
V_{IH3}	Input High Voltage for USB I/O Ports	3.3V	_		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
f_{SYS}	System Clock (Crystal or Ceramic OSC)	5V	_		0	6000	_	kHz

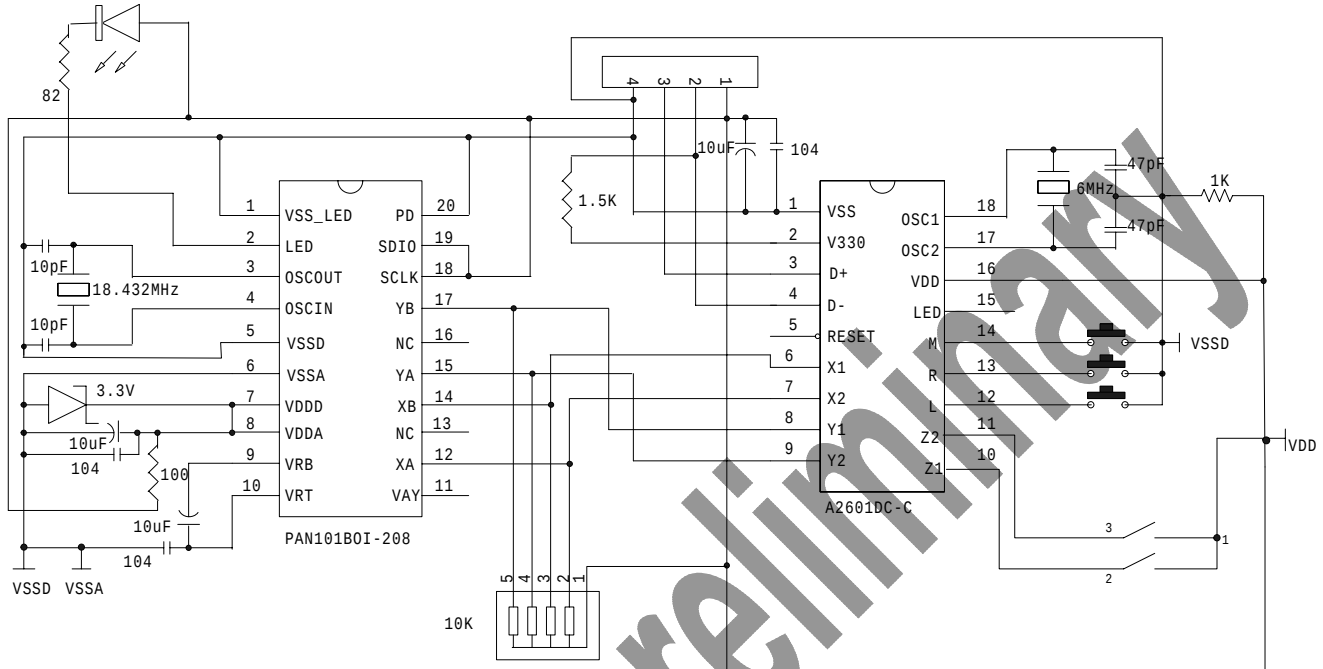
Typical Application Circuits



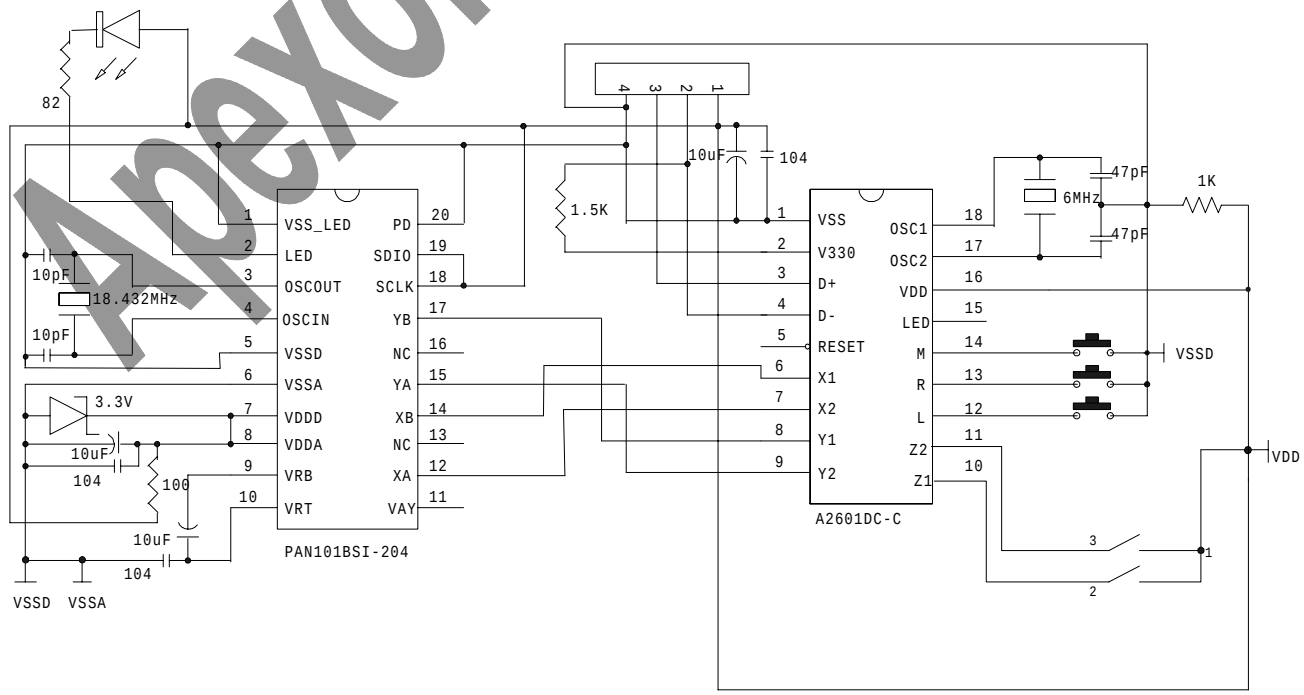
Typical Application with PAN101BOI-204(400DPI)



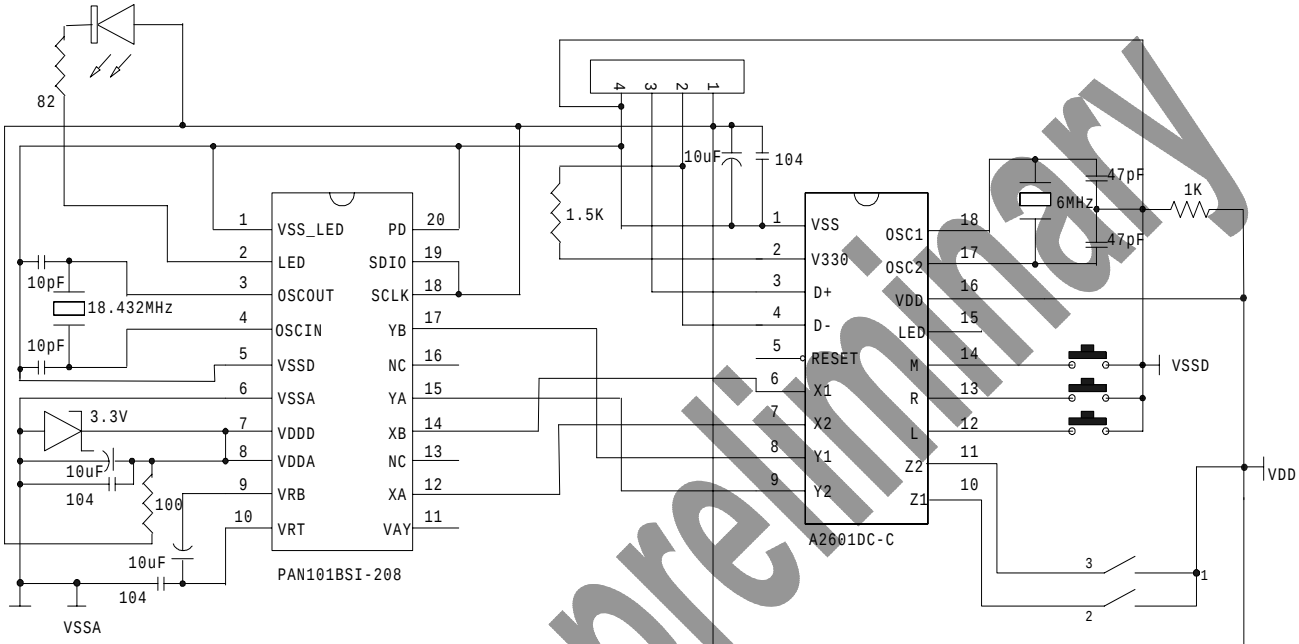
Typical Application with PAN101BOI-208(800DPI)



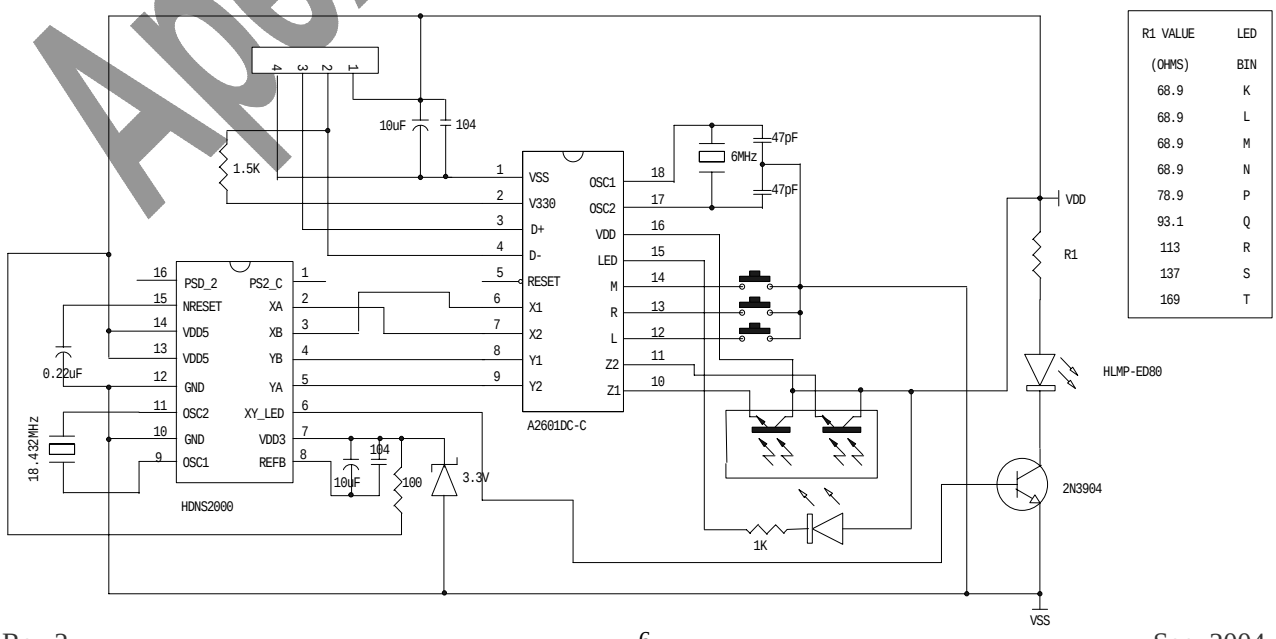
Typical Application with PAN101BSI-204(400DPI)



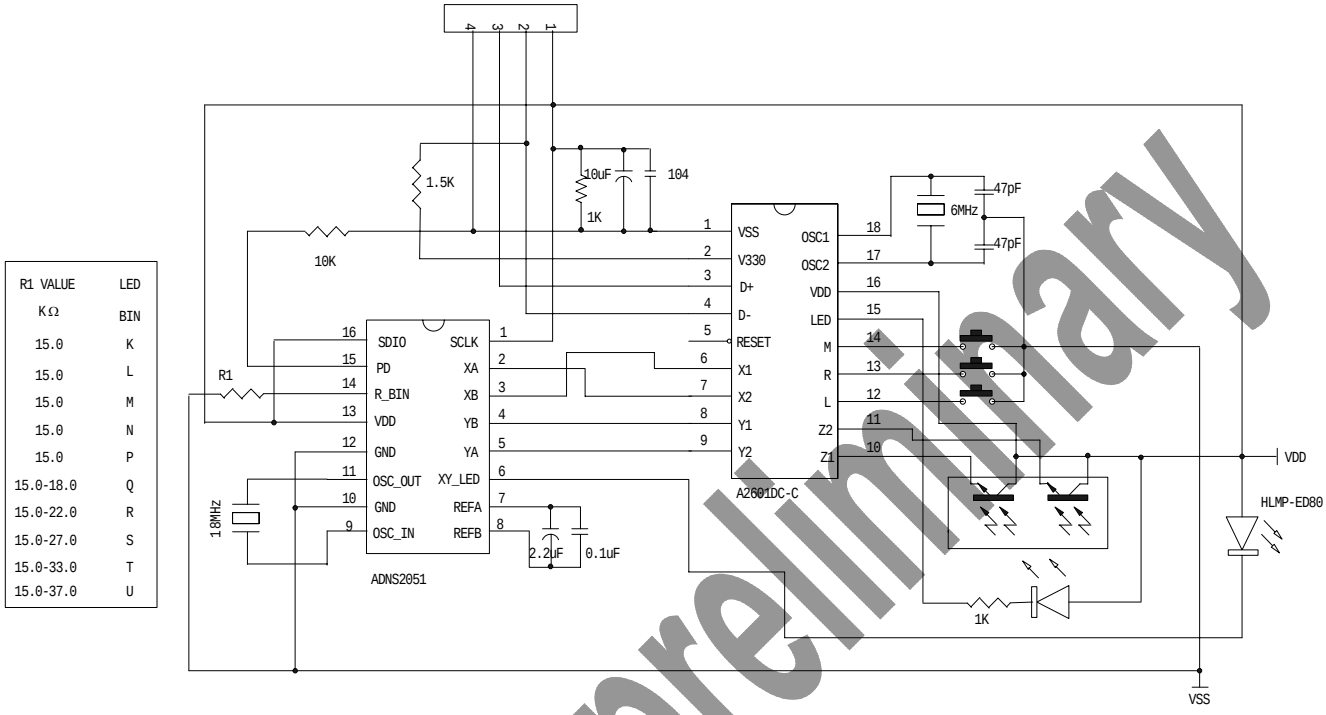
Typical Application with PAN101BSI-208(800DPI)



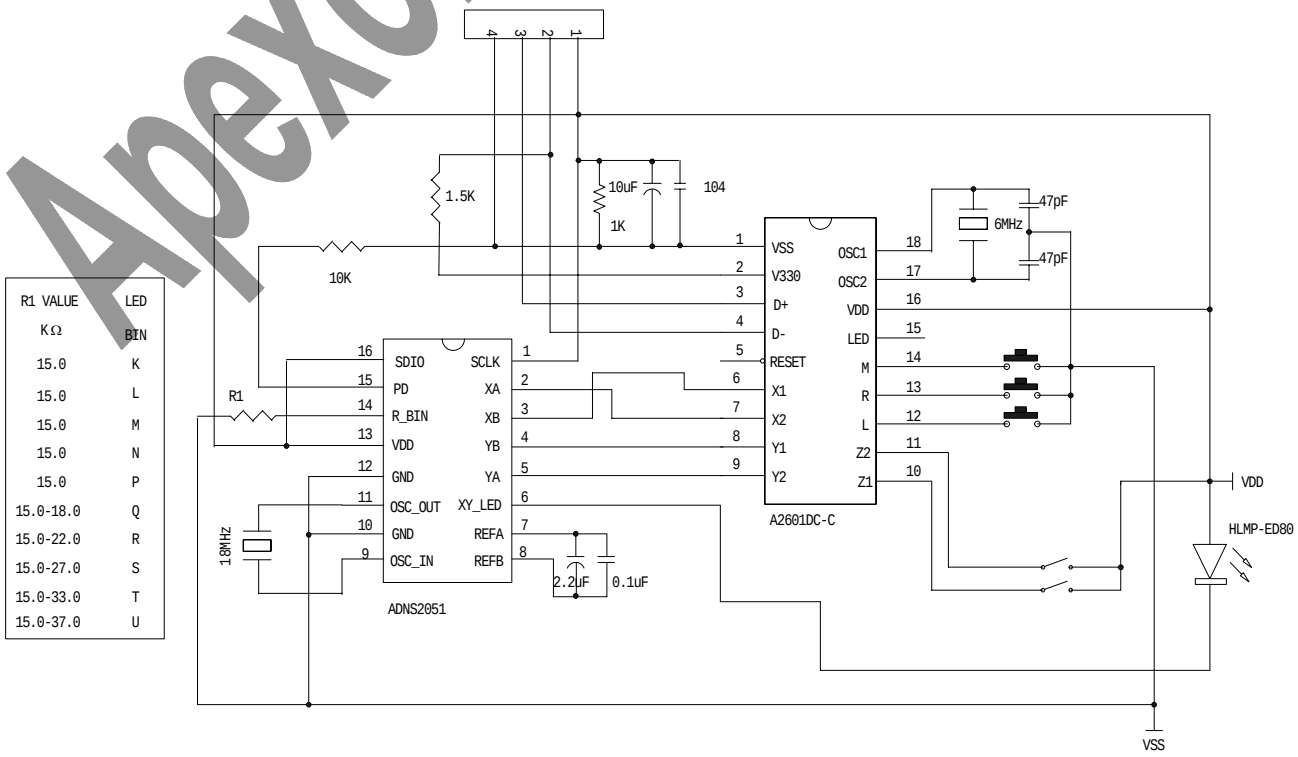
Typical Application with HDNS2000



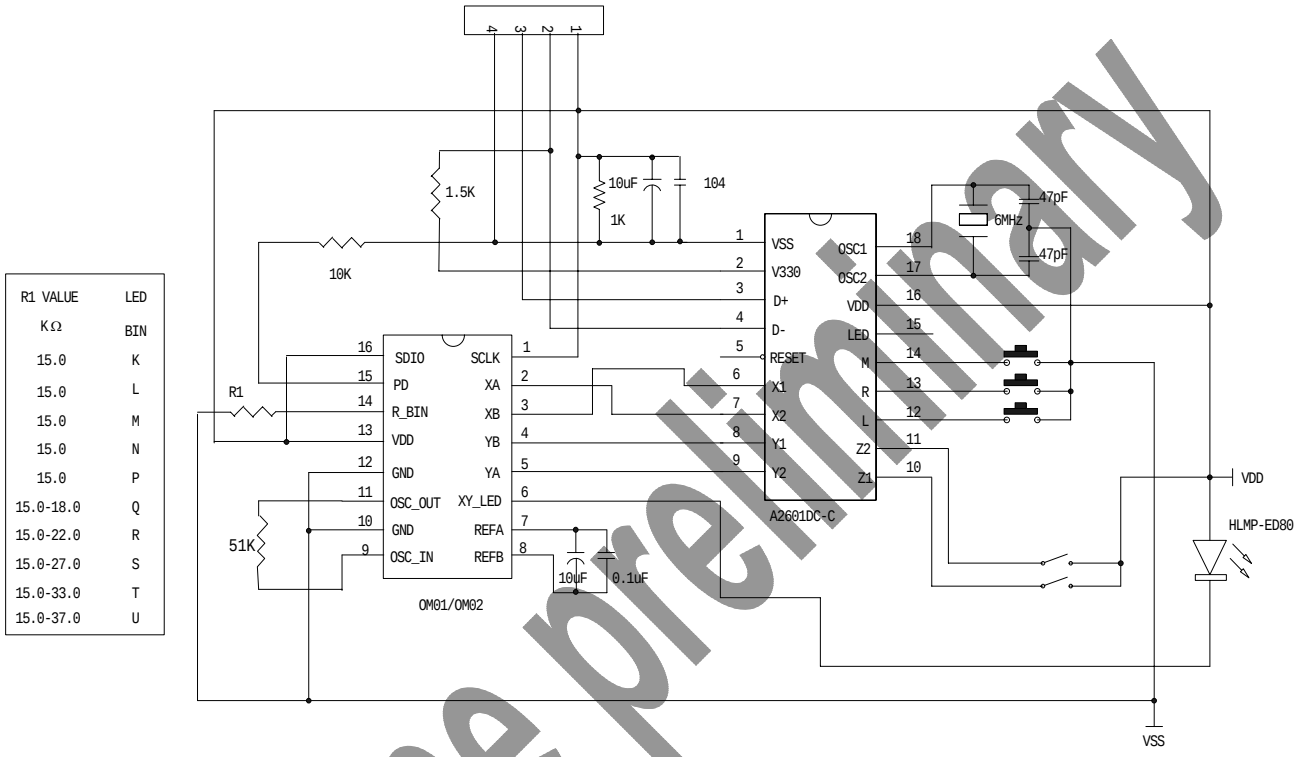
Typical Application with ADNS2051(Z axis is opto-mechanical)



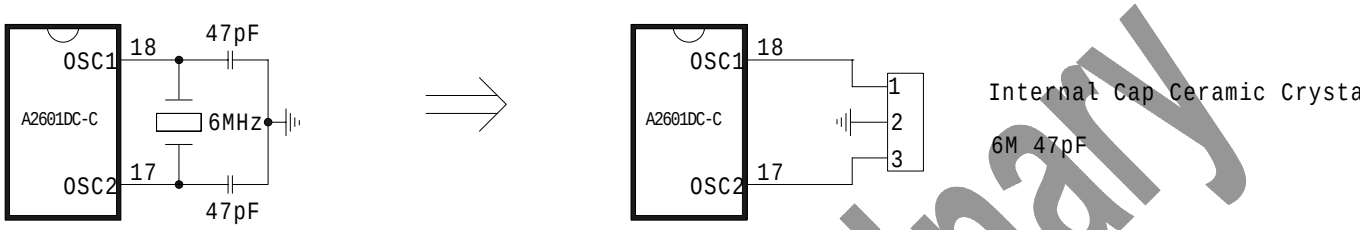
Typical Application with ADNS2051(Z axis is mechanical)



Typical Application with OM01/OM02(Z axis is mechanical)



If an internal cap ceramic crystal connect to A2601C (pin-OSC1 and pin-OSC2), which can cut down two 47pF caps, simplify the external circuit.



Version History

Version	Modify content	Data	Engineer
A2601DC-C_REV1	First version	Sep. 2004	HSH, QJM
A2601DC-C_REV2	Add 1K resistance between VDD and VSS in application of mechanical mouse and application with A2051 and OM01/OM02	Sep. 2004	HSH, QJM
A2601DC-C_REV3	Add 1K resistance between VDD and VSS in application with PAN101B204/208	Oct. 2004	HSH,QJM

NOTICE:

1. The information here contained could be changed without notice owing to product and/or technical improvements. Please make sure before using the product that the information you are referring to is up-to-date.

2. No responsibilities are assumed by us for any consequence resulting from any wrong or improper operation, etc. of the product.

Apexone Microelectronics Inc.

Building 18 No. 115 Lane 572 BiBo Road, ZhangJiang High-Tech Park
Shanghai, P.R. China 201203

TEL: 86-21-50809600

FAX: 86-21-50270551

http://www.apexonemicro.com