

**OM21PS**

**USB+PS/2  
MCU+Sensor 2-in-1  
Optical Mouse IC**

**Product  
Specification**

**DOC. VERSION 1.0**

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# OM21PS

## USB + PS/2 MCU + Sensor 2-in-1 Optical Mouse IC

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## 1 General Description

OM21PS is integrated with a USB+PS2 Micro-Controller Unit (MCU) for a computer optical mouse. It is housed in a 16 pins staggered Dual Inline Package (DIP) for 3D3K application. Resolution is 800 DPI. It catches the images of surfaces 3400 times per second. Tracking speed is up to 20 Inches Per Second (IPS).

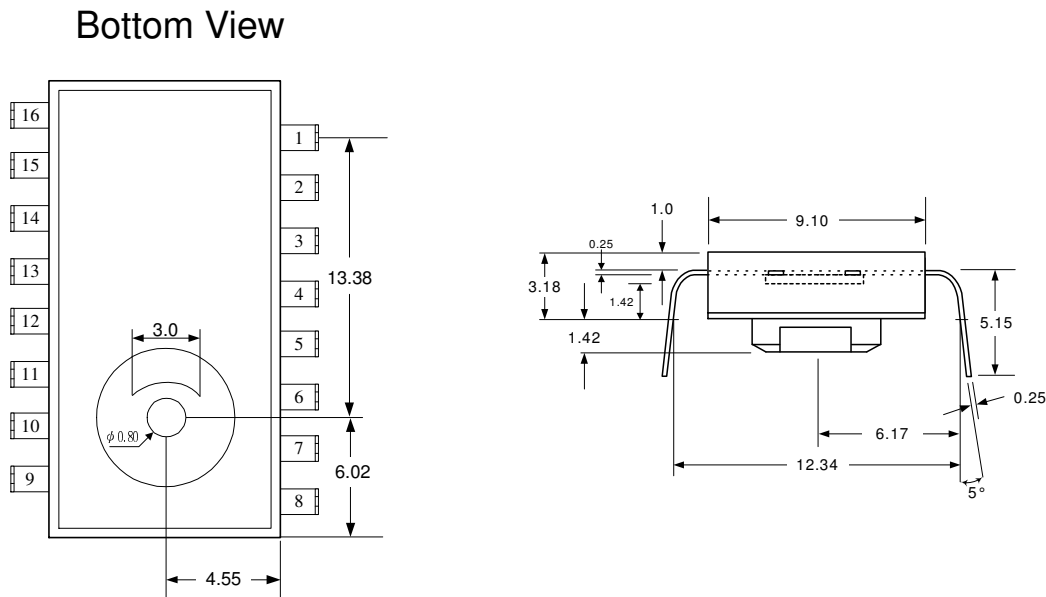
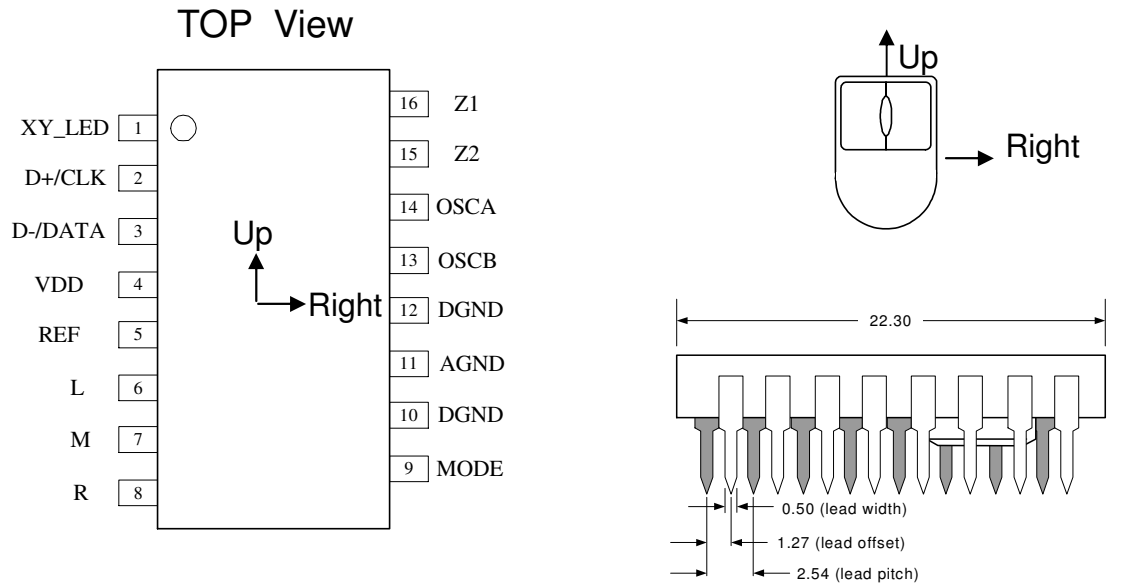
## 2 Features

- Integrated optical sensor and USB+PS/2 MCU into single chip.
- In compliance with USB version 1.1 protocol.
- High speed motion detection up to 20 IPS.
- Navigates over a wide range of surface.
- Frame rate up to 3400 frames per second.
- 5 volt power supply.
- Built-in 3.3V Voltage Regulator.
- 16-pin staggered DIP.
- Support 3D3K and Z/2 scroller mouse.
- Support USB+PS/2 or USB only by pin option (Refer to Page no.5).
- Three operating modes, Active, Standby, and Power Down modes.
- Automatic Standby mode (After no motion occurs more then 1 second).
- Power Down mode for USB suspend.
- OM21PS belongs to green products.

Note : Green products do not contain hazardous substances.

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**3 Pin Configurations (Package)**

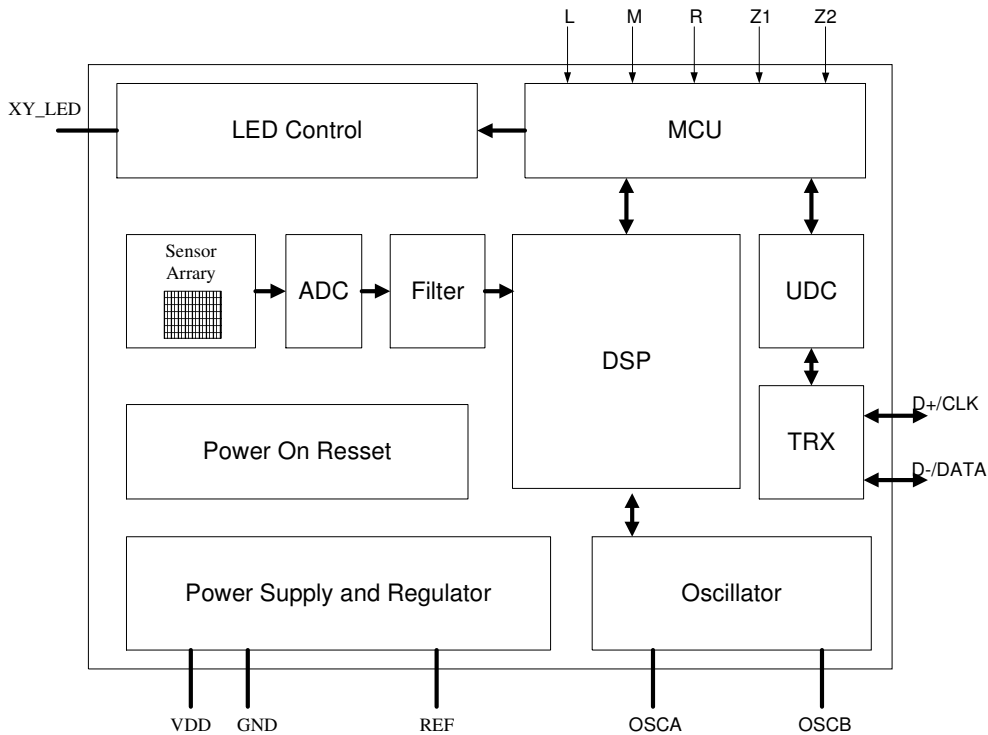


**NOTE**

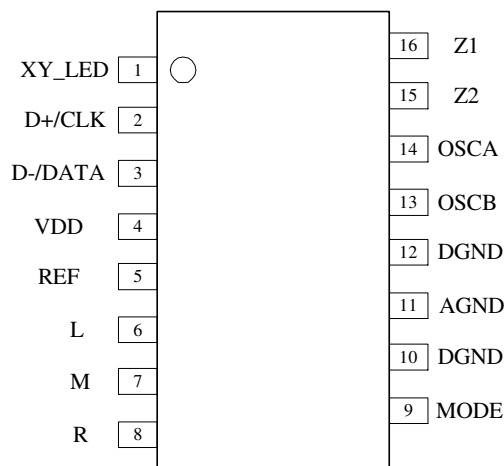
- Dimension in millimeter.
- Dimension tolerance is +/- 0.1 mm.
- Coplanarity of leads is 0.1 mm.
- Lead pitch tolerance is +/- 0.15 mm.
- Cumulative pitch tolerance is +/- 0.15 mm.
- Angular tolerance is +/- 3°.
- Maximum flash is +0.2 mm.
- Chamfer (25° X 2) on the taper side of the lead.

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## 4 Functional Block Diagram



## 5 Pin Description



Pin No.	Symbol	I/O	Description
1	XY_LED	O	LED control
2	D+/CLK	I/O	D+ or PS/2 CLK
3	D-/DATA	I/O	D- or PS/2 DATA
4	VDD	-	5 volt DC power supply
5	REF	-	3.3V Reference
6	L	I	Left key
7	M	I	Middle key
8	R	I	Right key
9	MODE	-	To select two modes, USB+PS/2 or USB only.
10	DGND	-	Digital Ground
11	AGND	-	Analog Ground
12	DGND	-	Digital Ground
13	OSCB	-	Oscillator
14	OSCA	-	
15	Z2	I	Scroller
16	Z1	I	

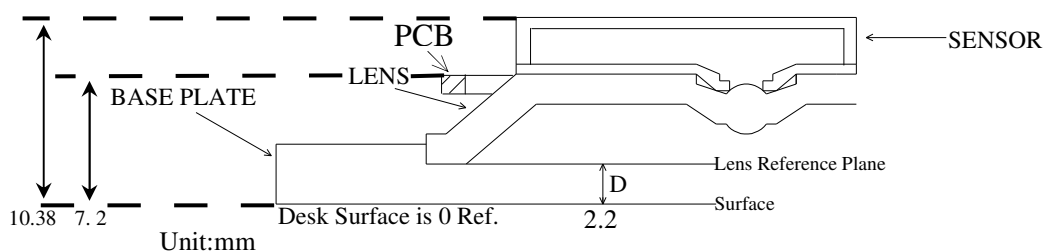
## OM21PS USB + PS/2 MCU + Sensor 2-in-1 Optical Mouse IC

### 6 Absolute Maximum Rating

Parameter	Symbol	Min.	Max	Unit	Notes
Storage Temperature Range	TSTR	-40	85	°C	
Operating Temperature Range	TOPR	0	40	°C	
Lead solder Temperature	-	-	245	°C	For 10 seconds, 1.6mm below seating plane.
Supply Voltage	VDD	4.5	5.5	V	
Reference Voltage	Vref	3.0	3.6	V	
ESD	-	-	2	KV	All pins, human body model
Input Voltage	-	-0.5	3.6	V	All GPIO except pin2, pin3

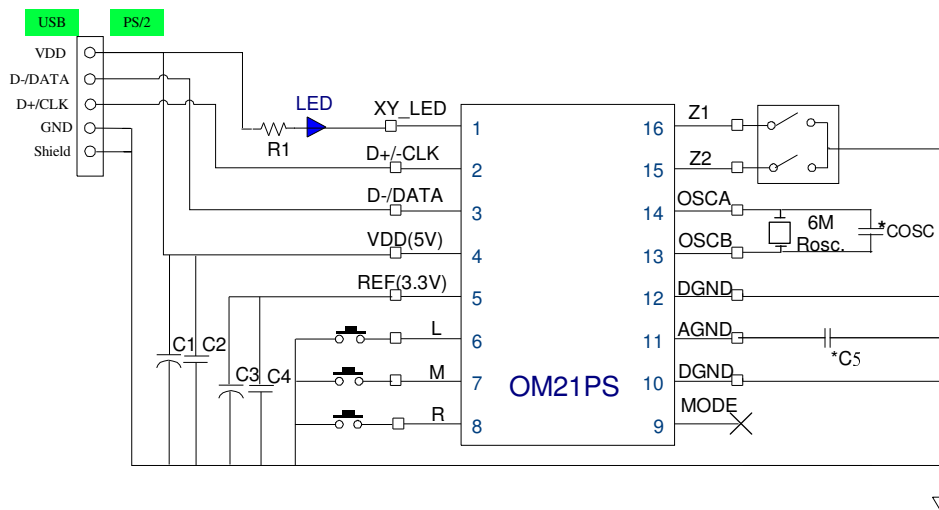
### 7 Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes	
Supply Voltage	VDD	4.5	5.0	5.5	V		
Reference Voltage	Vref	3.0	3.3	3.6	V		
Resolution	Res	-	800	-	DPI		
Speed	S	-	20	25	in/sec		
Acceleration	A	-	-	3.0	g		
Clock Frequency	FCLK	-	24	-	MHz		
Sensor Frame Rate	fframe	1800	2600	3400	frames/sec		
Resonator	Rosc	-	6	-	MHz		
DC Supply Current	Mouse Active	IDDACT	-	25	-	mA	No load on GPIO. Excluding LED current.
	Standby	IDDSTB	-	23	-	mA	
	Power Down	IDDPD	-	320	-	uA	
LED Frame Rate	Mouse Active	1800	2600	3400	frames/sec		
	Standby	-	100	-	frames/sec	After no motion occurs more then 1 second	
	Power Down	-	0	-	frames/sec		
LED Duty Cycle	Mouse Active	-	-	70%	-		
	Standby	-	-	12%	-		
	Power Down	-	-	0%	-		
Distance from Lens Reference Plane to Surface	D	-	2.2	2.4	mm		

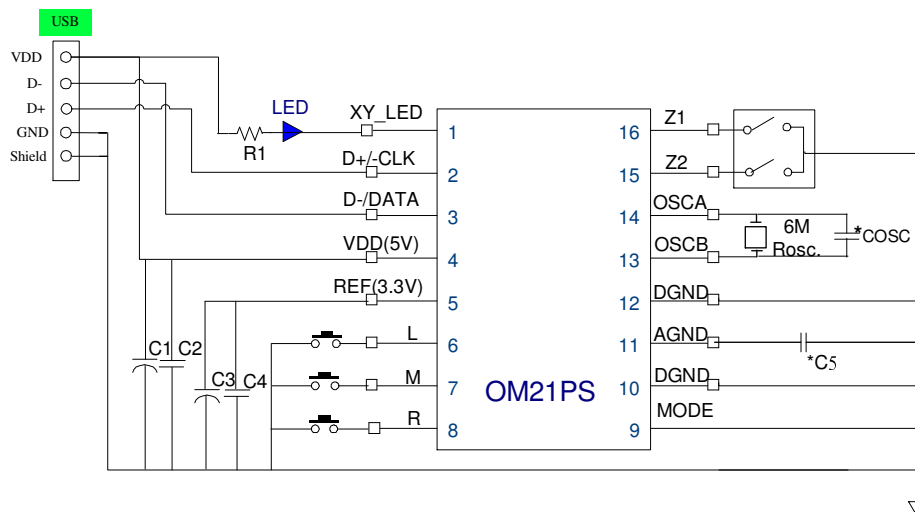


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### 8 Application Circuit



MODE-I (Pin9 floating), USB+PS/2 mode



MODE-II (Pin9 short to GND), USB only

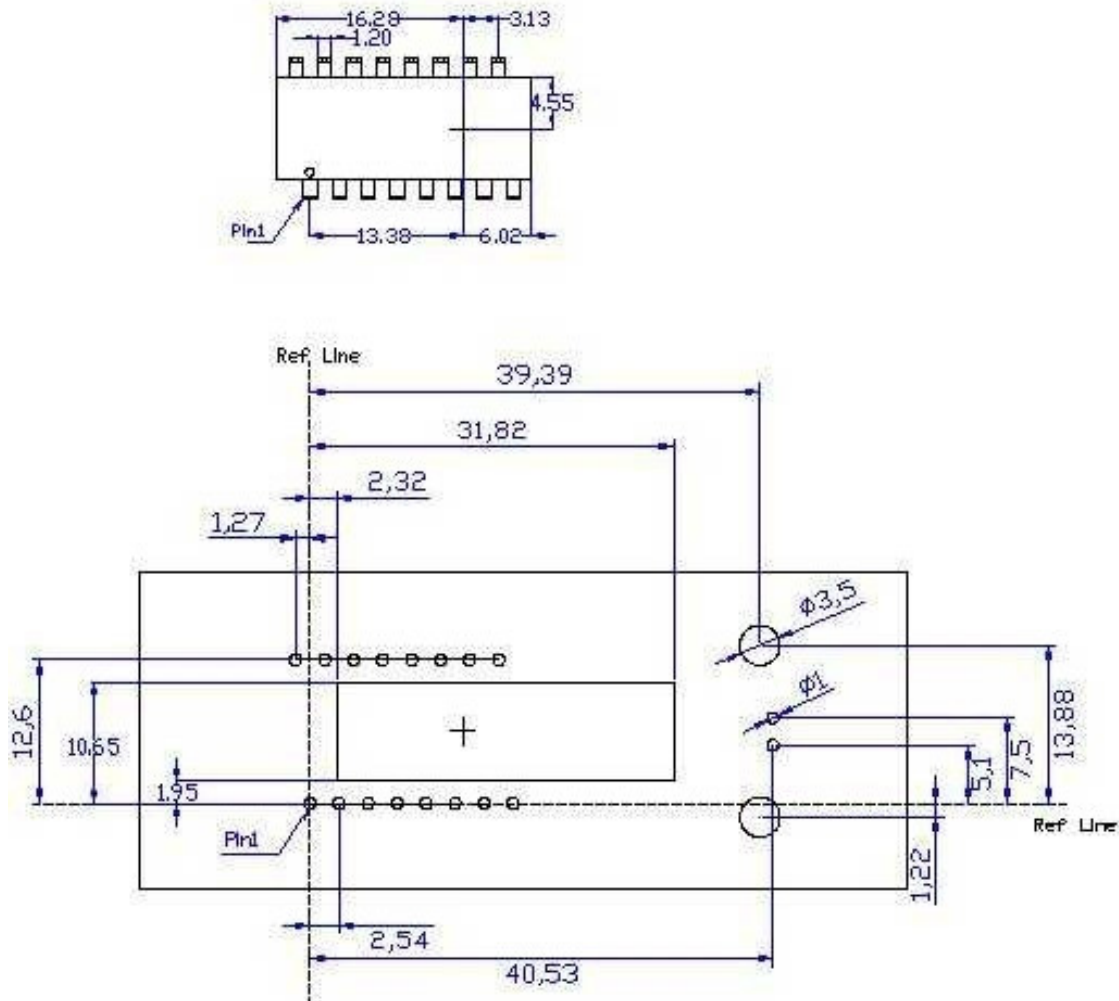
**R1 : 33 Ohm, C1 : 10uF, C2 : 0.1uF, C3 : 10uF, C4 : 0.1uF, \*C5 : Short, \*COSC : Open**

#### NOTE

1. \*COSC : for future use
2. \*C5 : for future use
3. For P bin LED (3600- 4700mcd), the max. average current (when working on black surfaces) of LED is about 30mA and the min. average current (when working on white surfaces) is 6mA with R1=33 Ohm.

## OM21PS USB + PS/2 MCU + Sensor 2-in-1 Optical Mouse IC

### 9 PCB Holes Map



### 10 Package Type

MCU+Sensor 2-in-1 Optical Mouse IC	Package Type	Pin Count
OM21PS	OMD16	16 pins

OM21PS : “P” : Package Type

OM21S : “S” : OM21PS comply with Sony SS-00259 standard.