

---

# OM35APS

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

## **Product Specification**

**DOC. VERSION 1.1**

**ELAN MICROELECTRONICS CORP.**

September 2009

---

## 1 General Description

The OM35APS IC is integrated with a PS/2 Micro-controller Unit (MCU) for computer optical mouse utilization. It is housed in a unique 16 pins staggered dual in-line DIP like package for 3D3K application, or designated as “OMD16.” The chip has a resolution of 800 dots per inch (DPI) and catches the surfaces images at 3200 times per second. Its tracking speed is up to 20 inches per second (IPS).

## 2 Features

- Optical sensor and PS/2 MCU are integrated into a single chip
- Up to 20 IPS high speed motion detection
- Frame rate is up to 3200 frames per second
- 5 volt power supply
- Built-in 3.3V and 1.8V voltage regulators
- 16-pin staggered DIP
- Supports 3D3K and Z/2 mouse scrolling
- Three operating modes, Active, Standby, and Power Down modes
- Automatic Standby mode (takes effect after no motion elapses for more than 1 second)
- Conform with Green Products protocol

**NOTE**

*These are all Green Products which do not contain hazardous substances*

### 3 Pin Configuration (Package)

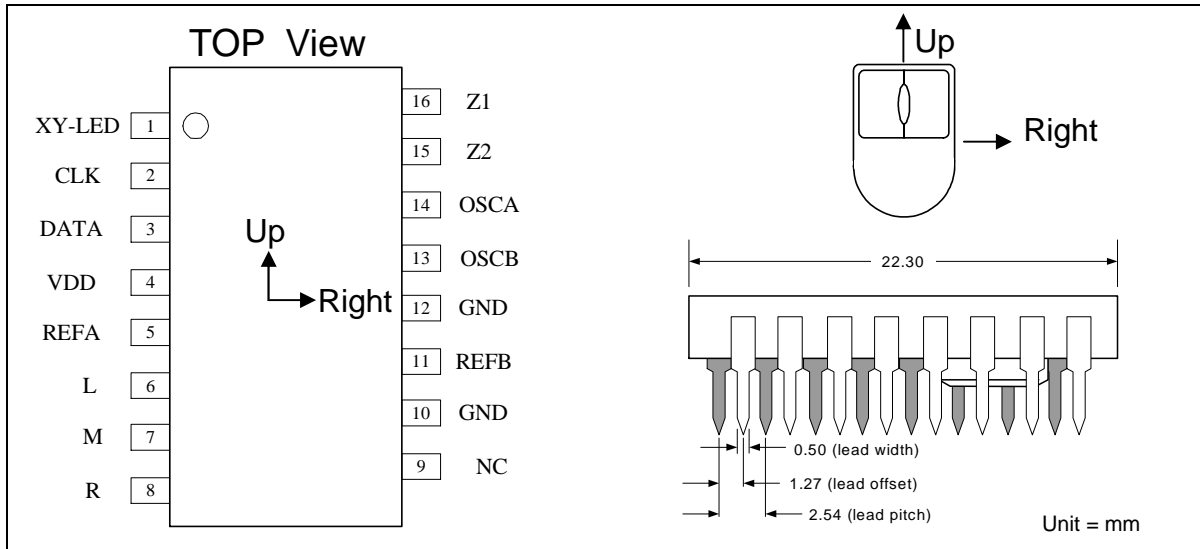


Figure 3-1a OM35APS Pin Configuration (Top View)

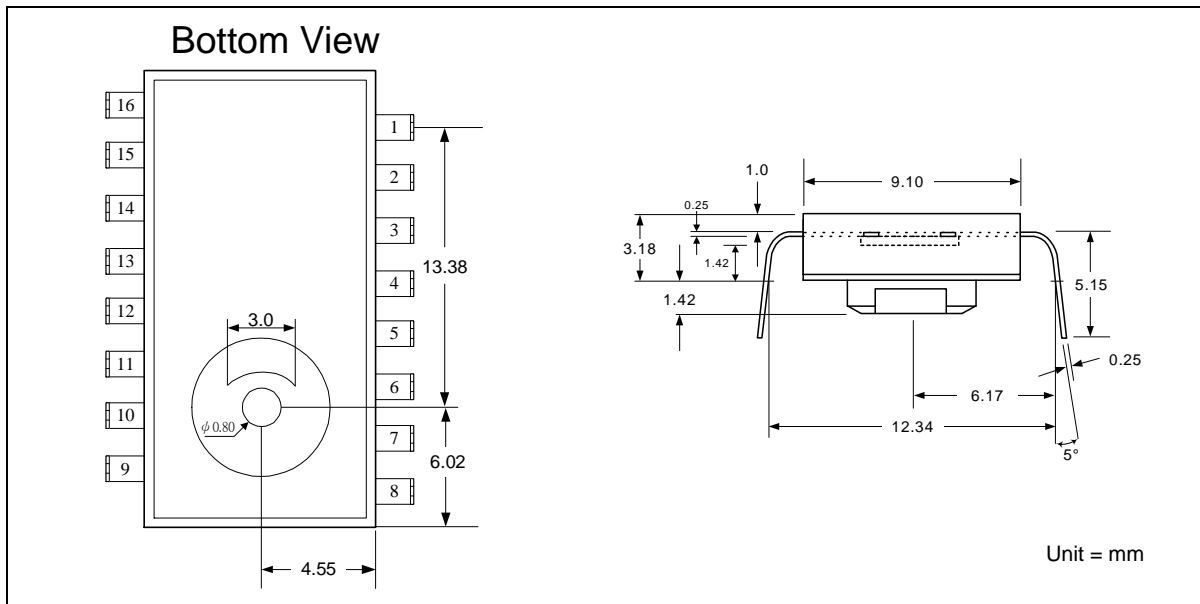


Figure 3-1b OM35APS Pin Configuration (Bottom View)

**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.

## 4 Functional Block Diagram

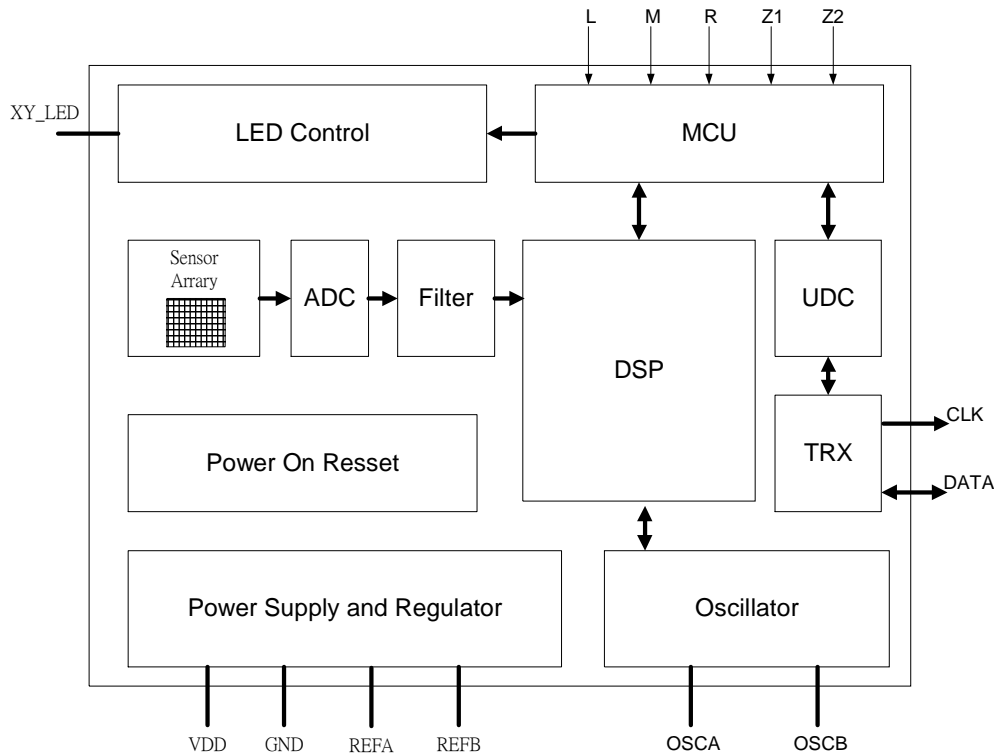


Figure 4-1 OM35APS Functional Block Diagram

## 5 Pin Descriptions

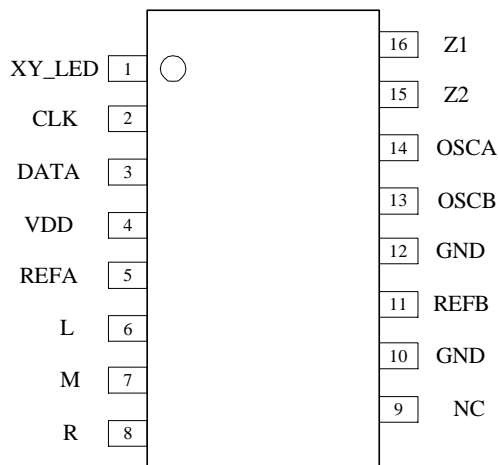


Figure 5-1 OM35APS Pin Assignments

Pin No.	Symbol	I/O	Description
1	XY_LED	O	LED control
2	CLK	I/O	PS/2 CLK
3	DATA	I/O	PS/2 DATA
4	VDD	-	5 V DC power supply
5	REFA	-	3.3V Reference
6	L	I	Left key
7	M	I	Middle key
8	R	I	Right key
9	NC	-	-
10	GND	-	Ground
11	REFB	-	1.8V Reference
12	GND	-	Ground
13	OSCB	-	Oscillator
14	OSCA	-	
15	Z2	I	Scroller
16	Z1	I	

## 6 Absolute Maximum Rating

Parameter	Symbol	Min.	Max	Unit	Notes
Storage Temperature Range	Tstr	-40	85	°C	-
Operating Temperature Range	Totr	-15	40	°C	-
Lead Solder Temperature	-	-	245	°C	For 10 seconds, 1.6mm below seating plane
Supply Voltage	VDD	-0.5	5.5	V	-
Input Voltage	Vin	-0.5	5.5	V	Pin1, Pin2, Pin3
		-0.5	3.6	V	All GPIO pins except Pin1, Pin2, Pin3
ESD	ESD	-	2	KV	All pins, human body model
Distance from Lens Reference Plane to Surface Plane	D	2.2	2.4	mm	This distance actually depends on the lens. 2.2 to 2.4 mm is just the most popular design range. Verify and confirm with your lens supplier for the best distance.

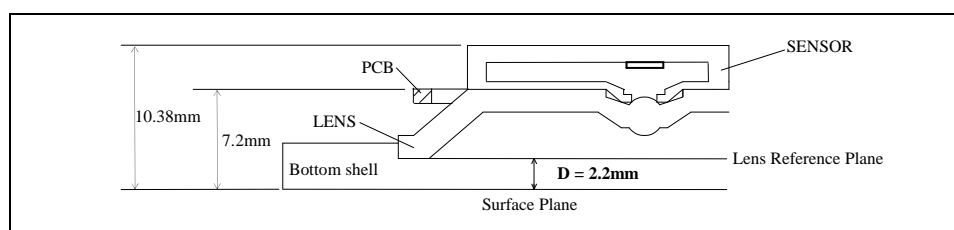


Figure 6-1 Distance from Lens Reference Plane to Surface Plane

## 7 DC Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Supply Voltage	VDD	4.0	5.0	5.5	V	
DC Reference A	VrefA	3.0	3.3	3.6	V	
DC Reference B	VrefB	1.6	1.8	2.0	V	
Input Low Voltage	V <sub>IL</sub>	-	-	0.8	V	
Input High Voltage	V <sub>IH</sub>	2.0	-	-	V	
Output Low Voltage	V <sub>OL</sub>	-	0	0.5	V	
Output High Voltage	V <sub>OH</sub>	2.8	3.3	3.6	V	
Output Low Current	I <sub>OL</sub>		10		mA	
Output High Current	I <sub>OH</sub>	-	-10	-	mA	
Resolution	Res	-	800	-	DPI	
Speed	S	-	20	-	in/sec	
Clock Frequency	FCLK	-	24	-	MHz	
Sensor Frame Rate	f <sub>frame</sub>	-	3000	3200	frames/sec	
LED Current (Average)	I <sub>LED</sub>	2.0	-	17	mA	P_Bin LED R_LED=51Ω
DC Supply Current	Mouse Active	IDDACT	-	6.6	mA	
	Standby	IDDSTB	-	3	mA	

## 8 Application Circuit

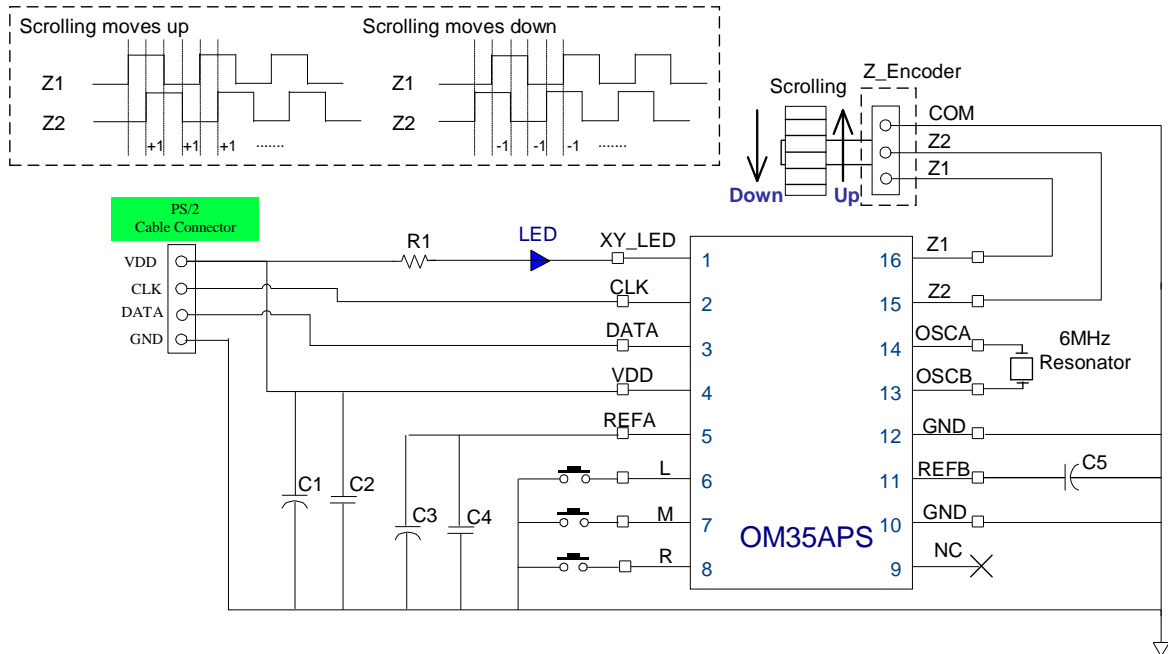


Figure 8-1 MODE-I for Basic Circuit

Where: **R1**: 33 ~51 Ohm, **C1**: 10uF, **C2**: 0.1uF, **C3**: 10uF, **C4**: 0.1uF, **C5**: 4.7uF,

### NOTE

1. For the P bin LED (3600- 4700mcd), the LED maximum average current (when working on black surfaces) of LED is about 17mA and the LED minimum average current (when working on white surfaces) is 2mA with R1=51 Ohm.
2. If the LED illumination is less than P bin, then R1=33 Ohm is recommended. It will allow the LED maximum average current to reach 25mA.
3. The cable connector is better located at the left side of the sensor to shorten the track length of D+ and D-.
4. C1, C2, C3, C4, C5 and 6MHz Resonator must be as close to sensor as possible.
5. A Large and complete ground is better than several small and separated grounds. If necessary, add 0 ohm resistor jumps on the quiet I/O pins (L, M, R, Z1, and Z2) to make the ground as large (or completed) as possible.

## 9 PCB Through-Holes (Vias) Layout

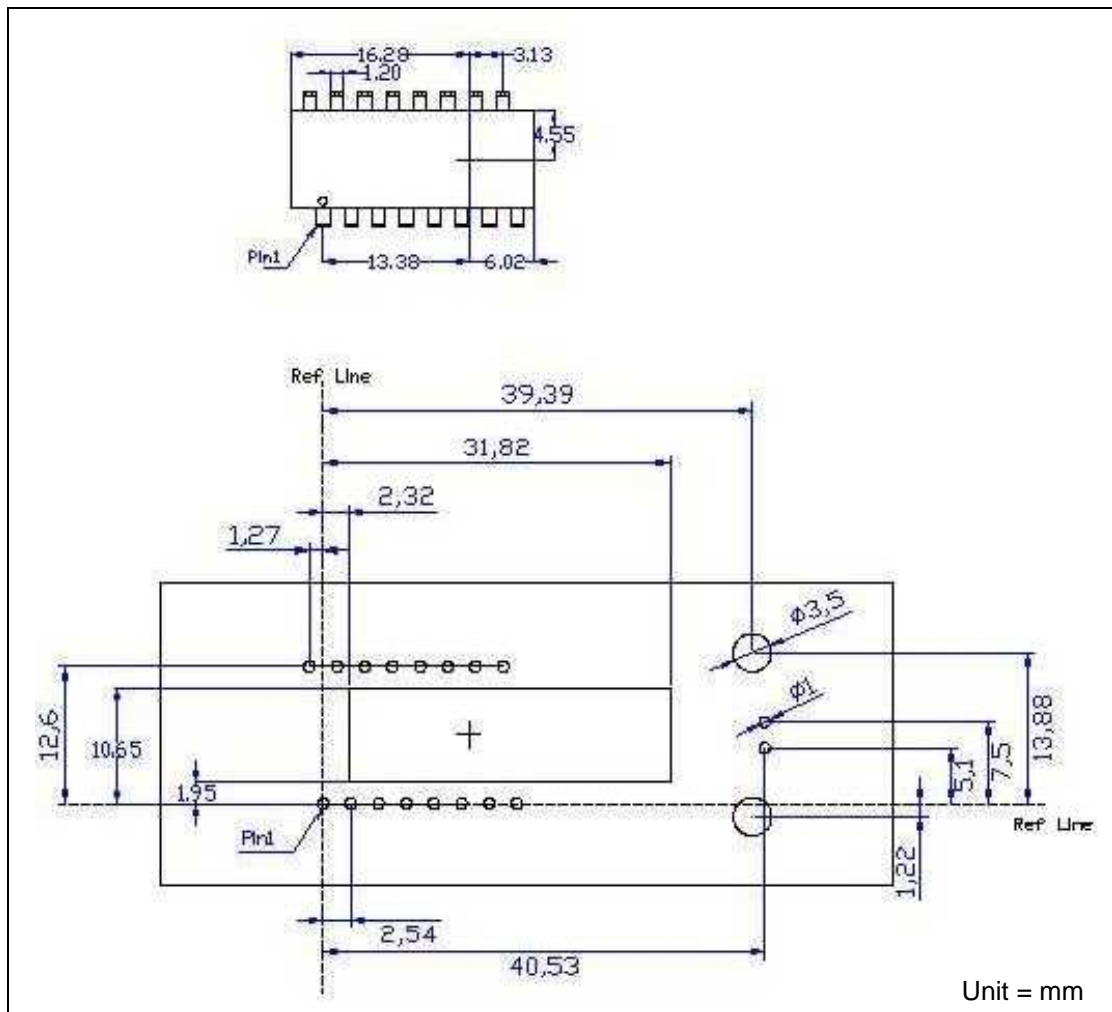


Figure 10-1 PCB Vias Layout for OM35APS

## 10 Package Type

MCU+Sensor 2-in-1 Optical Mouse IC	Package Type	Pin Count
OM35APS	OMD16	16 pins

Where: "AP" stands for "OMD16" package type

"S" stands for compliance with Sony SS-00259 standard