



SiGma Micro
IC Solution Designing

SPECIFICATION

MX8732A

USB/PS2 Single Chip Optical Mouse Sensor

VERSION 1.22

Sigma reserves the right to change this documentation without prior notice

TABLE OF CONTENTS

1. General Description	3
2. Features.....	3
3. Pin Assignment for Sensor Rotate 0°	4
4. Absolute Maximum Rating.....	5
5. Recommend Operating Condition	5
6. Electrical Characteristic.....	5
7. DC Electrical Characteristic.....	6
8. Application Circuit.....	7
9. Package (Dimension In mm).....	8

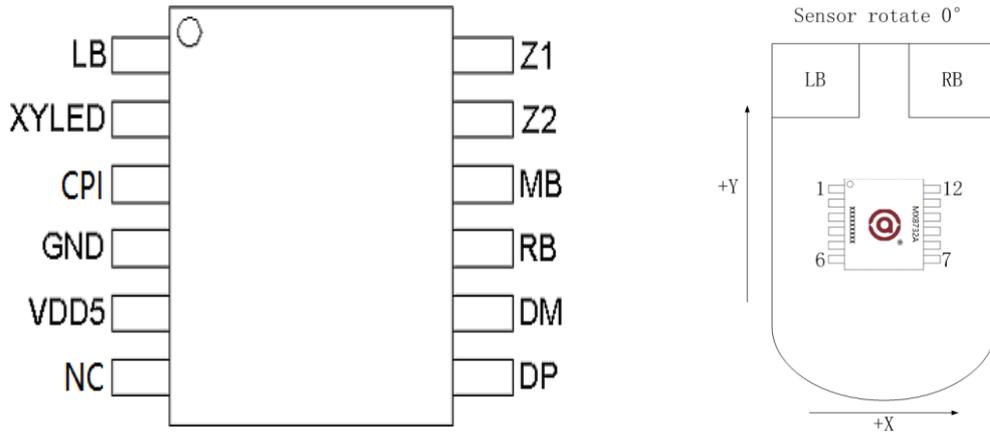
1. General Description

The MX8732A chip is a low cost single chip optical mouse solution used to implement a non-mechanical tracking engine for computer mice. It is based on optical navigation technology with USB/PS2 combo MCU bundled. Which measures changes in position by optically acquiring sequential surface images(frames) and mathematically determining the direction and magnitude of movement. The single chip optical mouse sensor provides a complete and compact mouse solution, There are no moving parts, and precision optical alignment is not required, few outside components use and facilitate high volume assembly. It is a true crystal-less and ultra low cost solution.

2. Features

- Optical Navigation Technology
- Low-cost and powerful solution for PS/2 and low-speed USB combo mouse
- Microsoft 3D Intellimouse and IBM PS/2 mouse compatible
- Internal switch for USB DP/DM and PS2 CLK/Data I/O
- Universal Serial Bus Specification, version 2.0
- USB HID Specification, version 1.1
- USB-IF and WHQL compliable
- 5V Power Supply
- Power Saving During No Motion
- On Chip LED Drive with Regulated Current
- Crystal-less
- CPI resolution optional by DPI button switching:1000(Default)/1600/2000
- Low EMI radiation
- Supports 3D (X, Y, Z) input
- Supports 3 buttons and mechanical wheel encoding

3. Pin Assignment for Sensor Rotate 0°



Pin Assignment

Pin No.	Symbol	I/O	Function
1	LB	I	Left button input
2	XYLED	O	LED control (sink current)
3	CPI	I	CPI_SW NC:1000CPI GND:1600CPI Button:1000(Default)/1600/2000CPI
4	GND	P	GND
5	VDD5	P	5V Power Input
6	NC	-	-
7	DP/CLK	I/O	USB D+ / PS2 CLK
8	DM/DATA	I/O	USB D- / PS2 DATA
9	RB	I	Right button input
10	MB	I	Middle button input
11	Z2	I	Z axis Input 2
12	Z1	I	Z axis Input 1

4. Absolute Maximum Rating

Symbol	Min.	Max.	Unit
Operating Temperature	0	70	°C
Storage Temperature	-65	150	°C
Input voltage	-0.5	6.0	V
Output voltage	-0.5	6.0	V

5. Recommend Operating Condition

Parameters	Sym.	Min.	Typ.	Max.	Unit
Operating voltage	VDD	4.5	5.0	5.5	V
Supply Noise	Vn	-	-	0.1	V
Distance from Lens Reference Plane to Surface	Z	2.3	2.4	2.5	mm
Acceleration	A		-	8	g
Frame Rate	FR	-	3000	-	Frames/sec
Speed	S	-	-	28	Inches/sec

6. Electrical Characteristic

Test Condition: T = 25°C, VDD=5.0V, VSS=0V

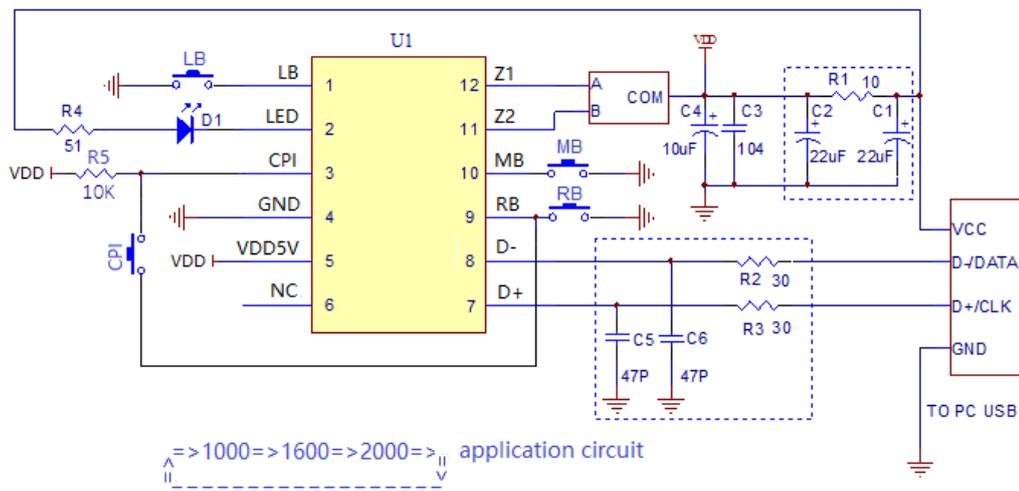
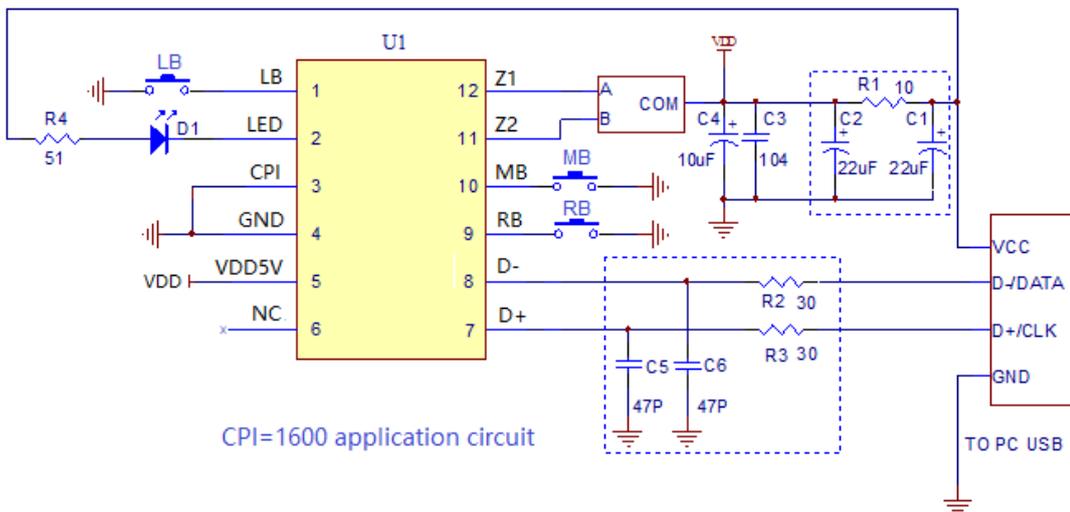
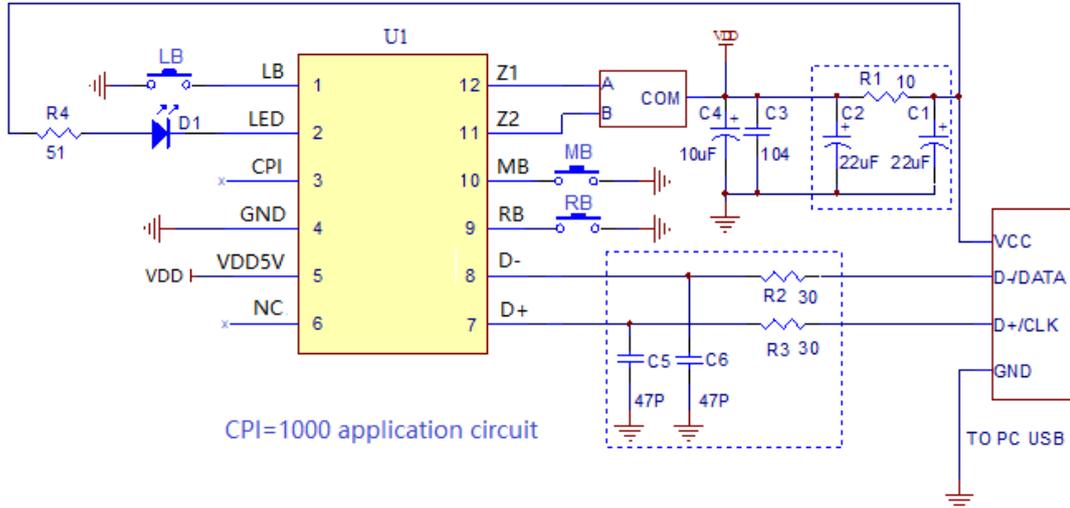
Parameters	Sym.	Min.	Typ.	Max.	Unit
Operating voltage	VDD	4.5	5.0	5.5	V
Operating Current (normal operation)	IOP	-	-	15	mA
Operating Current (Sleep mode)	Isleep	-	6.5	-	mA
USB suspend current	Isuspend	-	-	320	uA
Output voltage of 3.3V regulator	Vreg	3.0	3.3	3.6	V
L, M, R, debounce time	Tb	17	-	-	ms
Z-axis debounce time	Tz	700	-	-	µs

7. DC Electrical Characteristic

(T=25°C, Vdd=5V, Vss=0V)

Symbol	Parameter	Condition	Min	Type	Max	Unit
3.3V Regulator						
Vreg	Output voltage of 3.3v Regulator	Vdd=4.4V~5.25V	3.0	3.3	3.6	V
VresetL	Low Power Reset detecting low Voltage	-	-	-	3.3	V
VresetH	Low Power Reset detecting high Voltage	-	3.6	-	-	V
MCU operation						
Iil	Input Leakage Current for input pins	VIN=VDD, VSS	-	-	±1	uA
Icc	VDD operating supply current Normal frequency operation mode	Output pins floating	-	-	10	mA
USB Interface						
Voh	Static Output High	USB operation Mode	2.8	-	3.6	V
Vol	Static Output Low		-	-	0.3	V
Vdi	Differential Input Sensitivity		0.2	-	-	V
Vcm	Differential Input Command Mode Range		0.8	-	2.5	V
Vse	Single Ended Receiver Threshold		0.8	-	2.0	V
Cin	Transceiver Capacitance		-	-	20	PF
Vrg	Output Voltage of internal Regulator		3.0	-	3.6	V

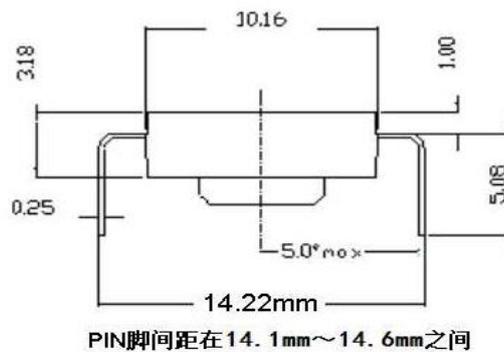
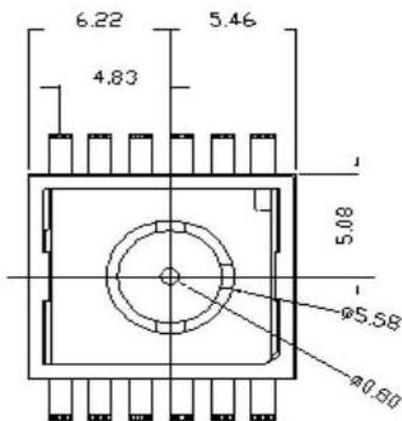
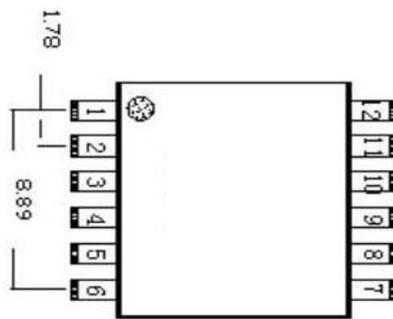
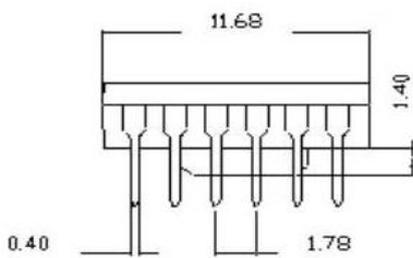
8. Application Circuit

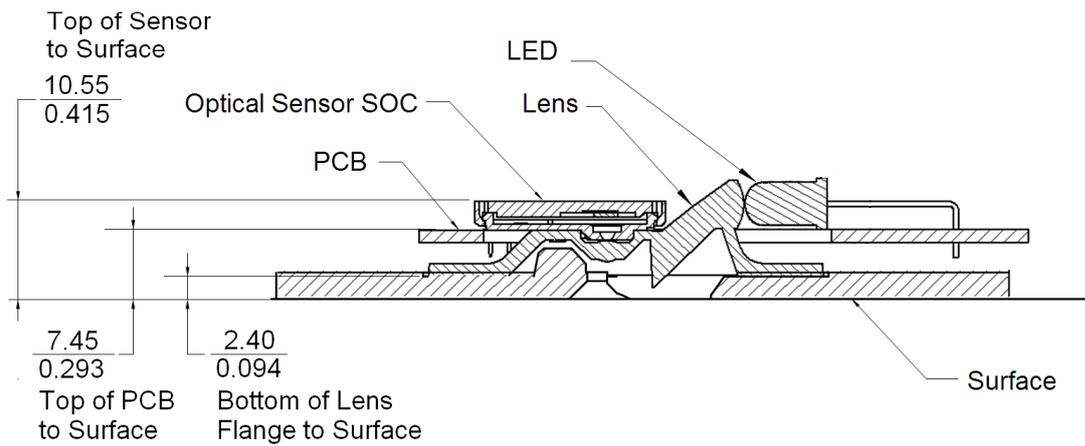


Note:

1. C1, R1 as close USB/PS2 line solder pad on PCB as possible, PCB layout should be designed in such a way as to ensure that the VDD is stable and pass through RC filter.
2. The capacitance C2&C3 have to close to IC.
3. D+/CLK and D-/DATA signal line have the short trace to IC.
4. Recommend to have ground grid on the PCB periphery.
5. Components in dotted line are used for EMC issue.

9. Package (Dimension In mm)

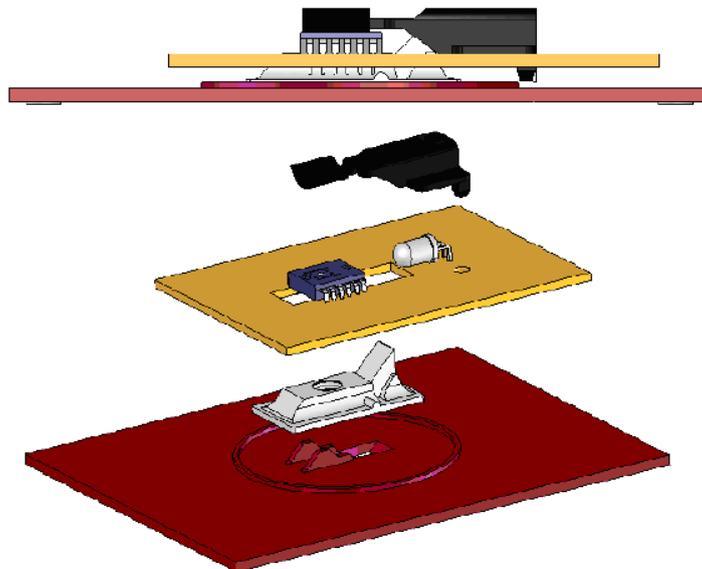




Notes:

- (1) Dimensions in mm/inchs
- (2) All tolerance $\pm 0.1\text{mm}$

Assembly drawing



3D Assembly for Mounting Instructions