Backlight 3D4Key Mouse

A582 Datasheet

USB Optical Mouse

Version 1.01

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1. General Description

A582 Backlight Mouse Sensor is a high performance single chip CMOS process optical mouse sensor. This chip solution is used to implement a non-mechanical tracking engine for USB computer mouse.

A582 is based on algorithm which measures changes of sequential surface images and then determines the movement. It is a 3D4K mouse chip, which has extra one button (CPI).It supports 4 -level CPI resolution (800/1200/1600/2400).The CPI level is indicated by LED lights.

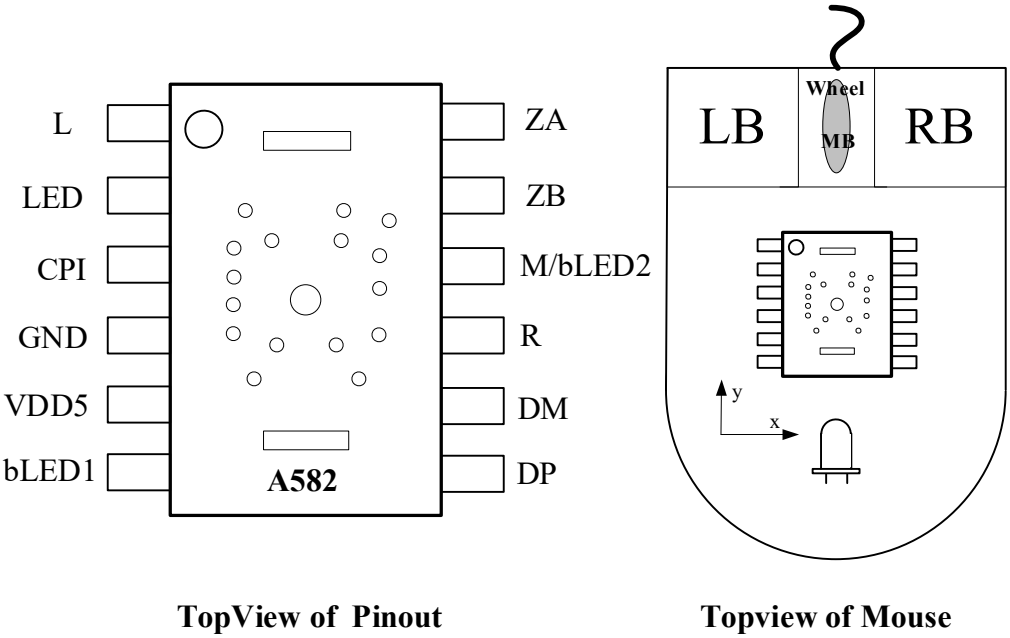
A582 can control backlight (turn on/off LED) by using key combination L+M+R or pressing the CPI button for more than 3 seconds.

A582 is enclosed in 12-pin optical DIP package. It has a built-in LED driver and internal oscillator to minimize the external components.

2. Feature

- Optical Navigation Technology
- Compliant with USB2.0 and USB HID Specification V1.1
- Support Winxp/Win2003/Win2008/Vista/Win7/Win8/Win10/Linux system, MAC OS, and Android system
- 5V Power Supply
- Internal crystal-less oscillator and on-chip LED Driver
- Adjustable 4-level resolution 800/1200/1600/2400 by CPI button
- Support full color backlight LED which breathes with 7 colors in cyclic change and single backlight breathing application
- LED brightness indicates 4-level CPI
- All backlights support long press CPI key over 3s or "L+M+R" combination button switch
- Support L/M/R 3 buttons and X/Y/Z three axis
- IDIP-12 package and RoHS Compliant

3. Pin Assignment



TopView of Pinout **Topview of Mouse**

Figure 1. Pinout

4. Pin Description

	Pin Name	Type	Description
1	L	IN	Left Key Input
2	LED	OUT	LED open drain output
3	CPI	IN	CPI Switch key/ CPI Single LED output
4	GND	GND	Ground
5	VDD5	PWR	Power 5v input
6	bLED1	OUT	7 Colors Backlight LED output.
7	DP	IN/OUT	USB D+
8	DM	IN/OUT	USB D-
9	R	IN	Left Key Input
10	M/bLED2	IN/OUT	Middle Key input/ single backlight breathing output
11	ZB	IN	Z axis input
12	ZA	IN	Z axis input

5. Block Diagram

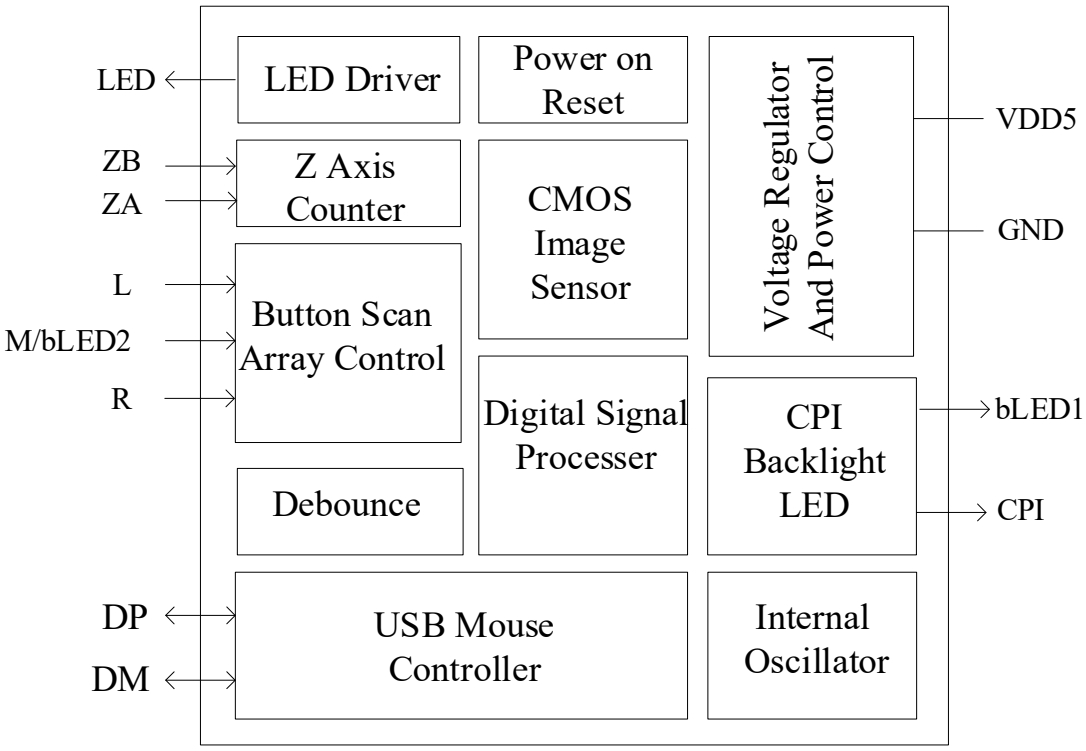


Figure 2. Block Diagram

6. Application Note

6.1 CPI Switching

When switching CPI, corresponding to 4-level CPI(800/1200 (def)/1600/2400), backlight will flicker 1 to 4 times.

6.2 LED for CPI indicating

CPI	Monochrome indication LED
	Brightness
800	Off
1200	Weak
1600	Middle
2400	Strong

In normal mode, monochrome LED indicates different CPI Levels according to different brightness.

6.3 Backlight LED

- Seven-color backlight can be used, which has the effect of seven-color conversion.
- Monochromatic synchronous breathing backlight can be used for breathing effect.
- All backlights support long press CPI key over 3s or "L+M+R" combination key switch.
- Standby automatic lights off.

7. Electrical Characteristics

7.1 Absolute Maximum Rating

Parameters	Symbol	Min	Max	Unit	Notes
Supply Voltage	VDD	-0.5	5.5	V	
Operating Temperature	To	-15	55	ºC	
Storage Temperature	Ts	-40	85	ºC	
Lead Solder Temperature			260	ºC	
Input Voltage	V_{in}	-0.5	5.5	V	
ESD	V_{ESD}		2	KV	All pins, Human Body Model

7.2 Recommend Operating Conditions

Parameter	Symbol	Min	Typical	Max	Units	Notes
Supply Voltage	VDD	4.5	5.0	5.5	V	
Operating Temperature	T_A	0	25	40	ºC	
System Clock	CLK	22	24	26	MHz	
Speed	S	-	-	40	Inch/Sec	
Resolution	R	800	1200	2400	CPI	
Acceleration	A	-	-	10	G	
Frame Rate	Fr	-	-	4000	fps	
Distance from the Bottom of Lens to the Working Surface	Z	2.2	2.3	2.4	mm	

7.3 DC Electrical Characteristic (VDD = 5.0V, Temperature = 25℃)

Parameter	Condition	Symbol	Min	Typical	Max	Units	Notes
Supply Current	In motion	I_{DD}	-	16.5	-	mA	
Supply Current	Static	I_{DD1}	-	7.8	-	mA	
Input Voltage High	Input port	V_{IH1}	2.0	-	-	V	
Input Voltage Low	Input port	V_{IL1}	-	-	0.8	V	
Input Voltage High	I/O port	V_{IH2}	2.0	-	-	V	
Input Voltage Low	I/O port	V_{IL2}	-	-	0.8	V	
Output Voltage High	I/O port	V_{OH1}	2.8	-	3.6	V	
Output Voltage Low	I/O port	V_{OL1}	0	-	0.3	V	

7.4 AC Electrical Characteristic (VDD = 5.0V, Temperature = 25 ºC)

Parameter	Symbol	Min	Typical	Max	Units	Notes
Internal Ring Oscillator Frequency	F_{ROSC}		10		kHz	
Power-up Reset delay	T_{PU}	-	10	-	us	POR signal from 0 to 3.5
Debounce Time on Button	T_{DB}	9.5	11.5	13.5	ms	
Z-axis Sampling Time	T_Z	-	125	-	us	

8. Typical Application Circuit

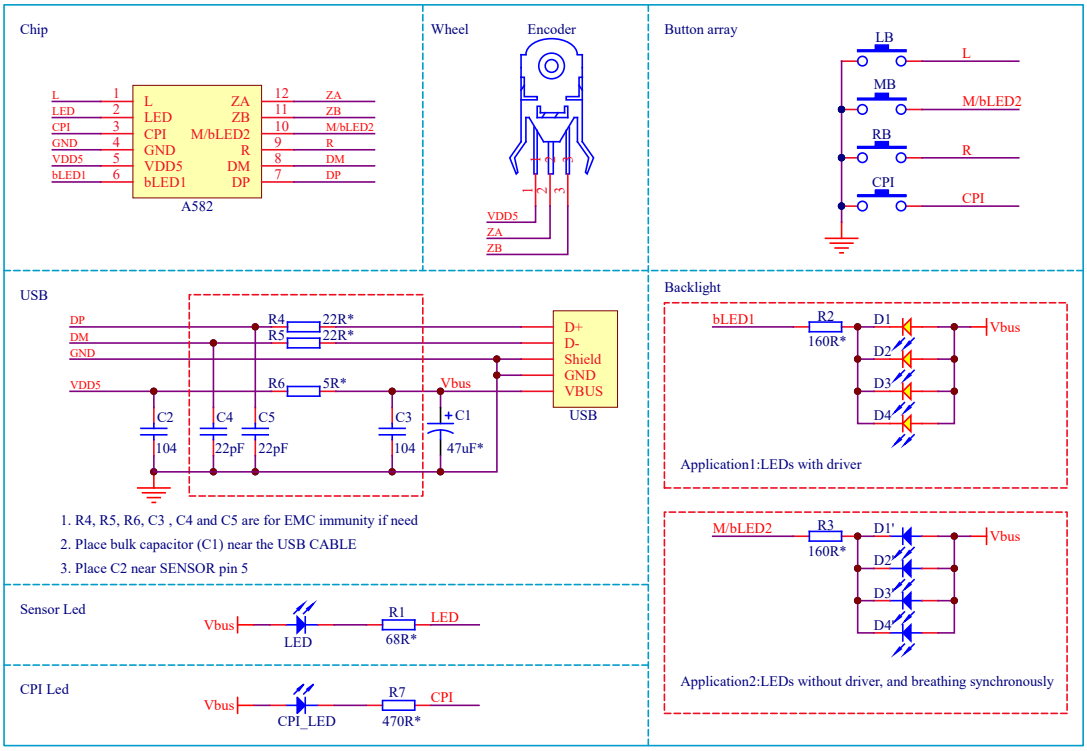


Figure 3. Application Circuit

9. Package

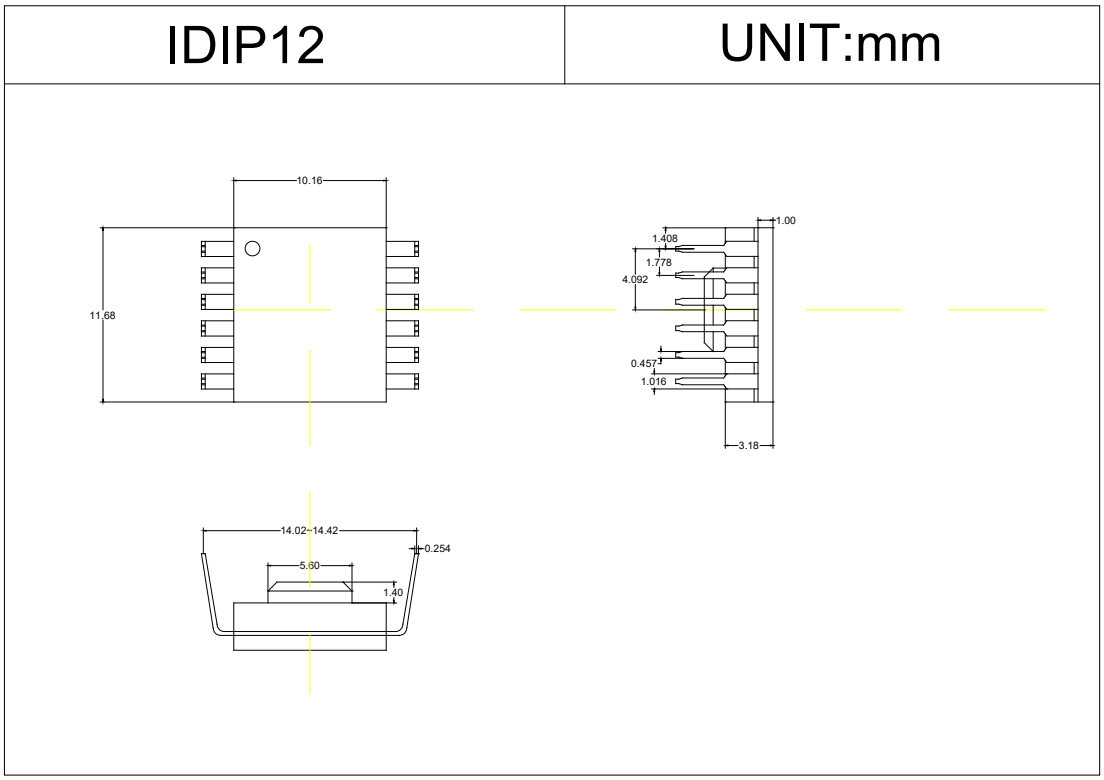


Figure 4. Package Outline Drawing

10. Assembly Drawing

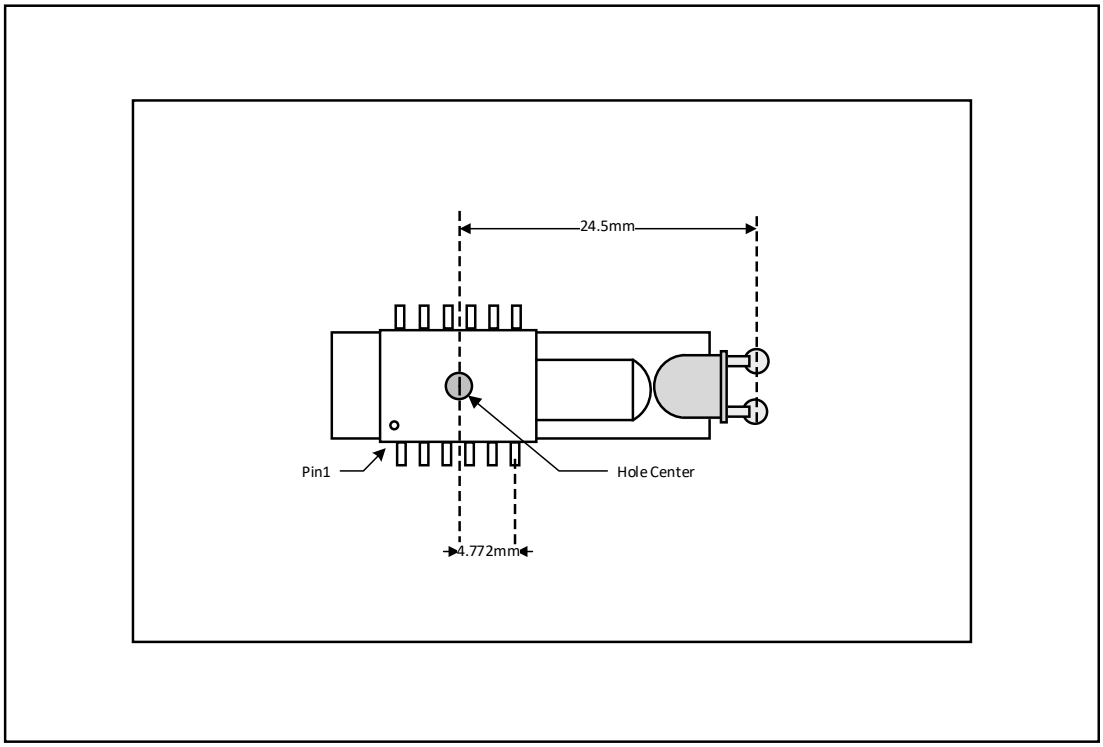


Figure 5. 2D Assembly drawing of A582 (Top View)

11. Revision History

Version	Description	Date
A582_SPEC_EN.V1.00	Create Preliminary Version	2019/07/18
A582_SPEC_EN.V1.01	Modify the circuit，connect encoder pin 1 to VDD5	2019/12/25