PAW3515DB SERIES USB OPTICAL MOUSE SINGLE CHIP

General Description

The PAW3515DB is an ultra low cost CMOS process optical mouse sensor single chip with USB interface that serves as a non-mechanical motion estimation engine for implementing a computer mouse. The PAW3515DB also embedded internal RC function to replace external resonator for BOM cost reduction and supported flexibility function change by programmer for easy and fast production.

Features

- **USB interface**
- **Single power supply**
- **Optical motion estimation technology**
- **Complete 2-D motion sensor**
- **Accurate motion estimation over a wide range of surfaces**
- **High speed motion detection up to 30 inches/sec**
- **Power saving mode during times of no movement**
- **Supports three buttons (R, M, L) and three axes (X, Y, Z) output**
- **Z-axis support mechanical input**
- **Internal RC oscillation without external resonator**
- **USB spec.**
  - **Complete Universal Serial Bus specs V2.0 compatibility**
  - **Compliant to the USB specification version 2.00**
  - **Complete USB HID specs V1.11 compatibility**
  - **Integrated USB transceiver and 1.5Mbps USB serial interface engine**
- **Flexibility function change**

Key Specification

Power Supply	**Wide operating supply range 4.25V ~ 5.5V**
Interface	**USB**
Optical Lens	**1:1**
Speed	**Up to 30 inches/sec**
Acceleration	**Up to 8g**
Resolution	**400/500/600/800/1000(default)/ 1200/1600**
Frame Rate	**3300 frames/sec**
Operating Current	**10mA @Mouse moving (Normal) 5mA @Mouse not moving (Sleep) 480uA @USB suspend (Suspend)**
Package	**Staggered DIP8 type**

Ordering Information

Sensor Part Number	CPI	Type	Interface
PAW3515DB-VJZA	1000	3D3B	U+P
PAW3515DB-VJYA	1000	3D3B	U

PixArt Imaging Inc.
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1. Pin Configuration

1.1 Pin Description

Pin #	Name	Type	Definition
1	MFIO_1 (LED)	I/O	Share pin for LED power/BM
2	VDD5V	PWR	Chip power VDD, 5.0V
3	Z1	I/O	Z axis, support mechanical scroller input
4	Z2	I/O	Z axis, support mechanical scroller input
5	MFIO_2 (SW)	I/O	Share pin for LED control pin/BL/BR
6	VSS	GND	Chip ground
7	D-/DATA	I/O	USB D- or PS/2 mouse data line
8	D+/CLK	I/O	USB D+ or PS/2 mouse clock line

1.2 Pin Assignment for Sensor Rotate 0˚, +90˚, -90˚, 180˚

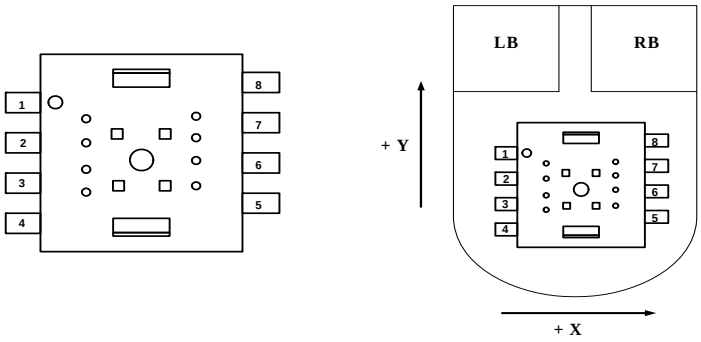


Figure 1. Top View Pinout

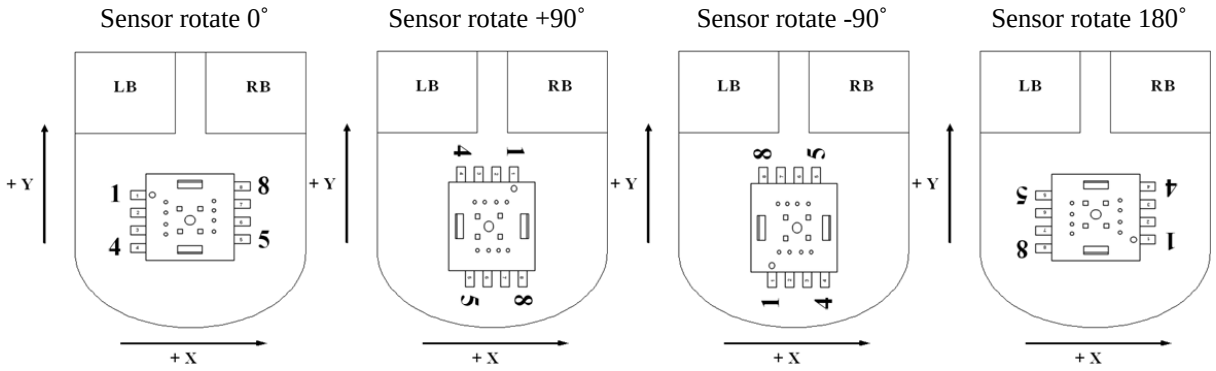


Figure 2. Top View of Mouse

2. Block Diagram and Operation

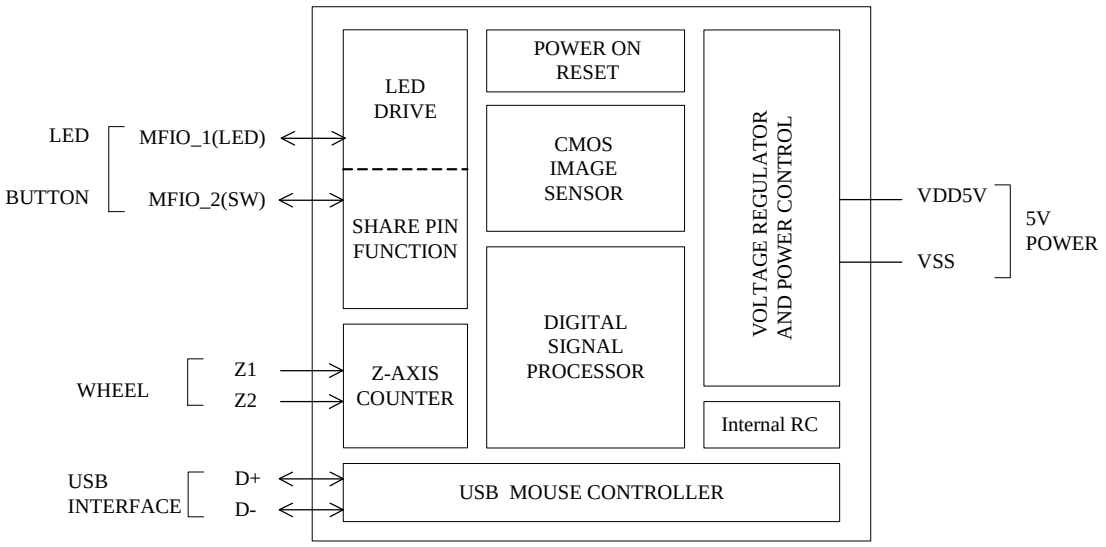


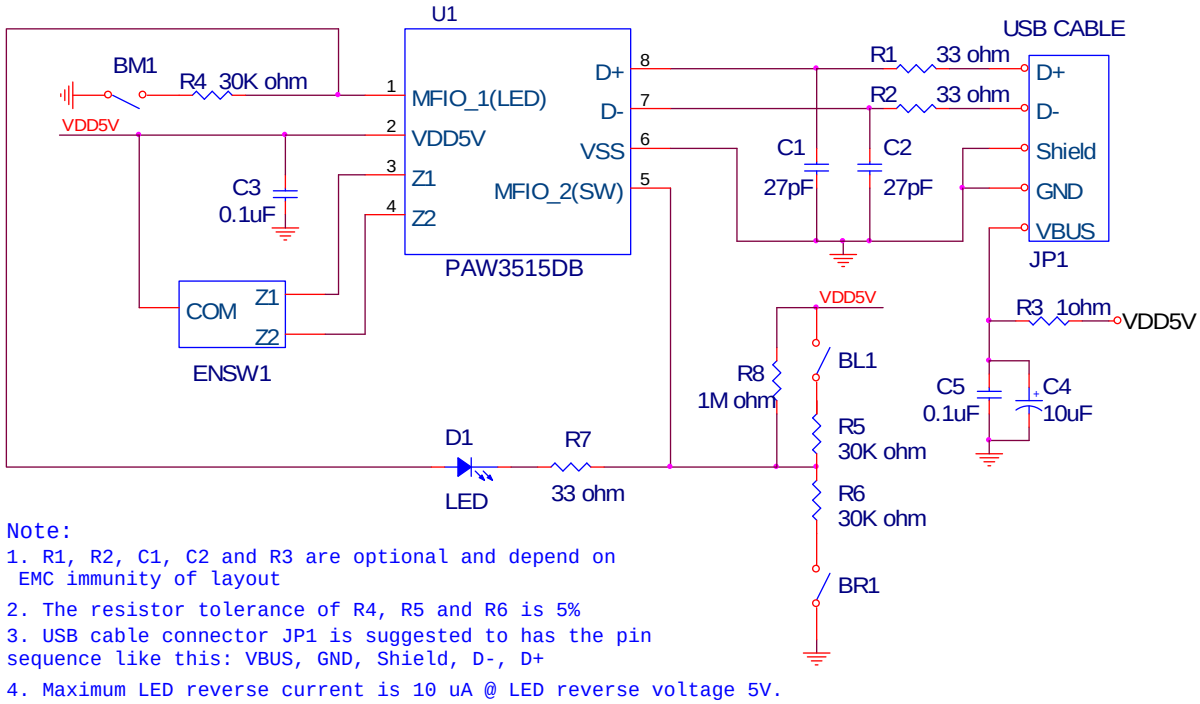
Figure 3. Block Diagram

The PAW3515DB supports X, Y, Z three axes, and L, R, M three buttons under USB mode. It is a CMOS process optical mouse sensor single chip with USB interface that serves as a non-mechanical motion estimation engine for implementing a computer mouse.

The PAW3515DB is in a 8-pin optical package and comes with the resolution of 1000 counts per inch (CPI) and the rate of motion up to 30 inches per second. It includes USB interface so that no mouse controller is needed to interface through USB. The PAW3515DB can receive command and echo status or data format, both complete Universal Serial Bus® spec V2.0 and USB HID spec V1.11 compatibility. It is also a cost effective solution to support USB Mouse.

3. Referencing Application Circuit

3.1 3D3B Application Circuit



Note:

1. R1, R2, C1, C2 and R3 are optional and depend on EMC immunity of layout
2. The resistor tolerance of R4, R5 and R6 is 5%
3. USB cable connector JP1 is suggested to has the pin sequence like this: VBUS, GND, Shield, D-, D+
4. Maximum LED reverse current is 10 uA @ LED reverse voltage 5V.

Figure 4. Application Circuit for PAW3515DB