Product Overview

Description

Avago Technologies and Sunplus Technology Co. have joined forces to produce a new optical mouse reference design kit. Based on the new Avago Technologies ADNS-5020-EN small form factor optical mouse sensor and the powerful Sunplus SPCP18A-13C microcontroller, this reference design kit provides a low cost and yet, feature-rich solution in one neat package.

The Avago Technologies ADNS-5020-EN optical mouse sensor, an 8-pin staggered dual inline package (DIP), is based on an optimized architecture with good navigation performance. It is able to measure changes in position by optically acquiring sequential surface images with auto frame rate feature and mathematically determining the direction and magnitude of movement.

The ADNS-5020-EN along with the ADNS-5100 lens, ADNS-5200 clip and HLMP-ED80-XX000 form a complete, compact optical mouse tracking system. There are no mechanical parts, which mean high reliability and less maintenance for the end user. In addition, precision optical alignment is not required, facilitating high volume assembly. The sensor is programmed via registers through a three-wire serial port.

The Sunplus SPCP18A-13C is a low speed USB microcontroller, specially designed for low speed USB-PS/2 combo wired mouse with ADNS-5020-EN sensor application. The chip supports up to 5 button modes and adjustable resolution (500/1000cpi) via the application straps during power-on reset. 16-pin (3-buttons) or 18-pin (3/5-buttons) PDIP and SOP packages are available.

This kit is connectable to a PC via the USB or PS/2 ports. A single cable with a USB connector and a PS/2 adapter is also provided. The design automatically detects the type of interface is attached, allowing further development of a USB or PS/2 only mouse.

Features

- Complete optical mouse reference design kit
- ADNS-5020-EN small form factor optical mouse sensor with Sunplus SPCP18A-13C controller
- Optimized architecture for simpler circuitry and minimal number of passive components
- No mechanical moving parts for easy maintenance and high reliability
- SmartSpeed self-adjusting frame rate for optimum performance
- Serial port burst mode for fast data transfer
- 500 or 1000 cpi selectable resolution
- Single 5.0 volt power supply
- Three-wire serial port along with reset (NRESET) pin
- USB and PS/2 interface combination for PC connection
- Conforms to USB suspend mode specifications
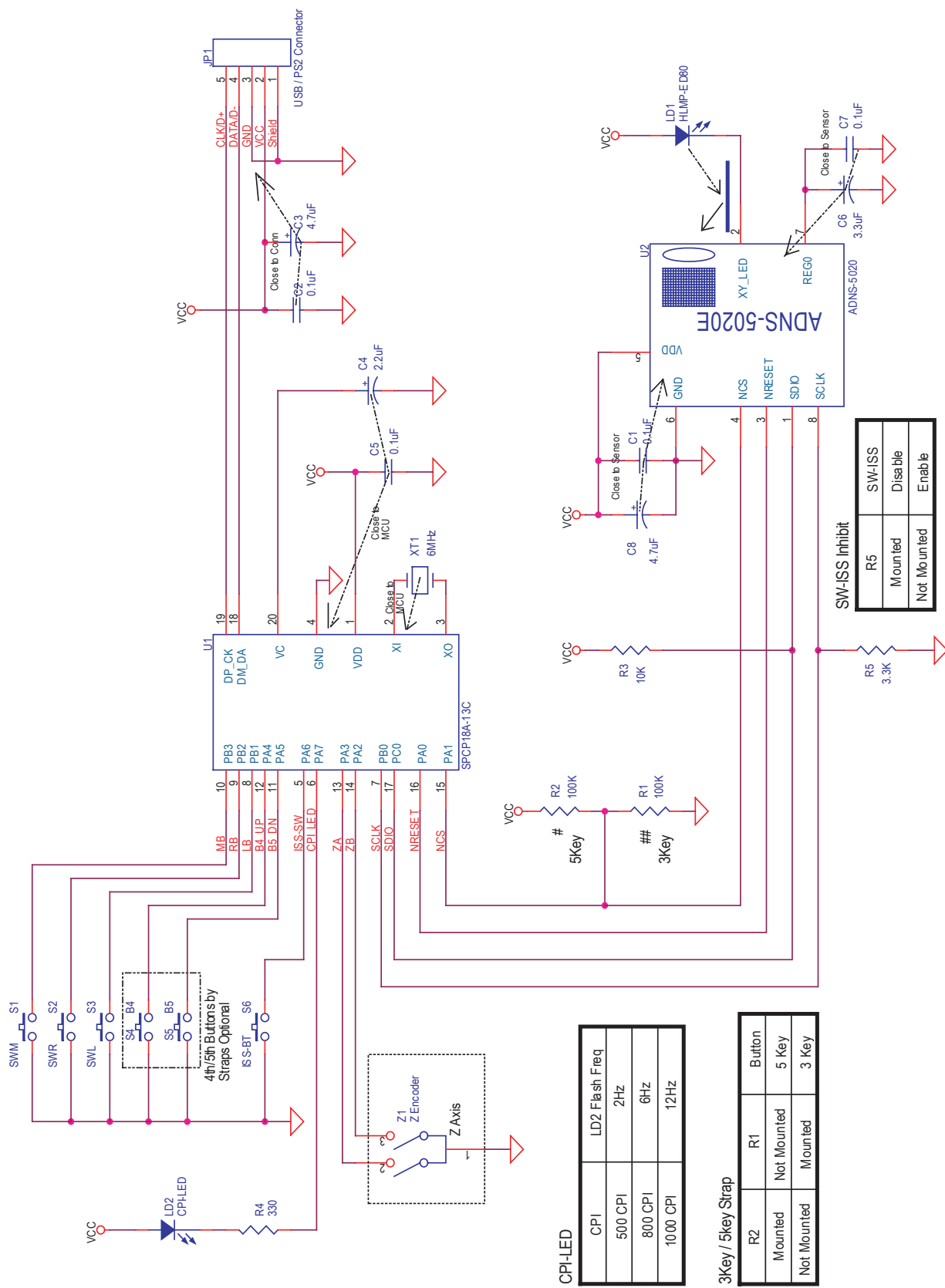
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Figure 1. Circuit-level block diagram for ADNK-5023-SP02 designer's kit optical mouse using the Avago Technologies ADNS-5020-EN optical mouse sensor and Sunplus SPCP18A-13C 20-pin package (1000cpi resolution with 5 buttons).
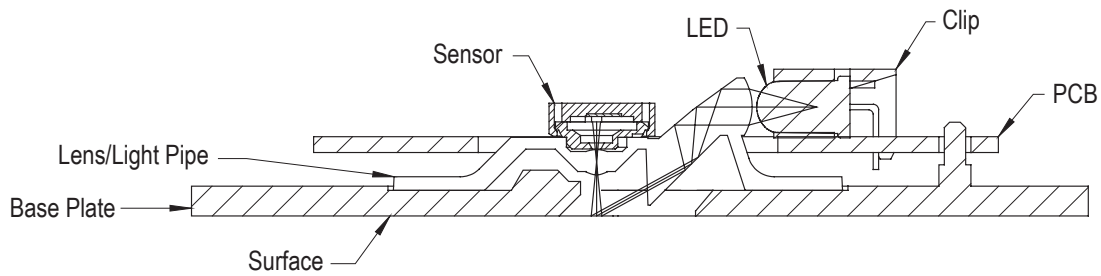
CPI-LED

CPI	LD2 Flash Freq
500 CPI	2Hz
800 CPI	6Hz
1000 CPI	12Hz

3Key / 5key Strap

R2	R1	Button
Mounted	Not Mounted	5 Key
Not Mounted	Mounted	3 Key

SW-ISS Inhibit

R5	SW-ISS
Mounted	Disable
Not Mounted	Enable

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Figure 2. Sectional view of PCB assembly highlighting all optical mouse components (optical mouse sensor, clip, lens, LED, PCB, and base plate).

Kit Components

The designer's kit contains components as follows:

Part Number	Description	Name	Quantity
ADNK-5023-SP02 Mouse	Reference Design Mouse	Reference Design Unit	1
ADNS-5020-EN	Solid-State Optical Mouse Sensor	Sensor	5
SPCP18A-13C	Sunplus USB Controller	USB Controller	5
ADNS-5100	Round Lens Plate	Lens	5
ADNS-5100-001	Trim Lens Plate	Lens	5
ADNS-5200	LED Assembly Clip (Transparent)	LED Clip	5
HLMP-ED80-XX000	639 nm T-1¾ (5 mm) Diameter LED	LED	5
ADNK-5023-SP02 CD	Includes Documentation and Support Files for ADNK-5023-SP02 Documentation ADNS-5020-EN Data Sheet CY7C63743-PC Data Sheet ADNS-5100 Data Sheet ADNS-5200 Data Sheet HLMP-ED80-XX000 LED Data Sheet Hardware Support Files ADNK-5023-SP02 BOM List ADNK-5023-SP02 Schematic IGES Base Plate Feature File Gerber File Software Support Files Microcontroller Firmware	1	

Ordering Information

For ordering information, please contact your local Avago Technologies sales representative.

At Avago Technologies call (800)235-0312, visit the website at http://www.avagotech.com/

At Sunplus call +886-3-5786005 ext. 3288 or visit the web site at www.sunplus.com

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For product information and a complete list of distributors, please go to our web site: **www.avagotech.com**

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