ADNK-3043-BRBT
Bluetooth Optical Mouse Designer's Kit

Avago
TECHNOLOGIES

Product Overview

Description

Avago Technologies and Broadcom have collaborated to produce a new Bluetooth LED mouse reference design kit. The mouse is based on Avago Technologies' ADNS-3040 low power LED mouse sensor, and Broadcom's BCM92042MDX-B88 Bluetooth ROM module. The receiver dongle is implemented with a Broadcom BCM2045 Chip. This reference design kit provides a power-efficient and feature-rich solution in one neat package.

The Avago Technologies ADNS-3040 low power LED navigation sensor, an 18-pin staggered dual inline package (DIP), is based on SmartSpeed self-adjusting frame rate for optimum surface- tracking performance. The sensor measures changes in position by optically acquiring sequential surface images (frames) and mathematically determining the direction and magnitude of movement. Its high-performance, low-power architecture is capable of sensing high-speed mouse motion while prolonging battery life, two performance areas essential in demanding wireless applications.

The ADNS-3040 sensor, along with the ADNS-3120-001 lens, ADNS-2220 clip and the HLMP-ED80 LED form a complete and compact LED mouse tracking system. There is no moving part, which means high reliability and less maintenance for the end user. In addition, precision optical alignment is not required, facilitating high-volume assembly.

The Broadcom BCM92042MDX-B88 Bluetooth ROM module is a small size, good RF performance and less power consumption Bluetooth Module support Bluetooth HID solution. The built in BCM2042 Bluetooth single-chip is a Bluetooth 2.0 compliant, standalone baseband processor with an integrated 2.4-GHz transceiver. It helps customer

Features

- Complete LED Bluetooth mouse reference design kit
- Windows® 98SE, Windows 2000, and Windows XP compatibility
- USB 2.0 low-speed compliance
- User identity code to avoid conflict with other devices
- High reliability
- Smooth surface navigation
- Enhanced SmartSpeed self-adjusting frame rate for optimum performance
- High speed motion detection up to 20 ips and 8 G
- 800 cpi resolution
- A high data rate 2.4 GHz Bluetooth link
- Transmission data rate up to 1 Mbps
- 10 meters communication distance
- Self-adjusting power saving modes for longest battery life
- Minimal number of passive components

in developing their own Bluetooth HID products in a short time and less effort on RF performance tuning. The built-in switching regulator in BCM2042 chip enables the BCM92042MDX-B88 module to provide 1.8V and 3.0V power source which are useful to most ICs. For more information about the BCM92042MDX-B88 module or BCM2042 chip, please refer to the datasheet.

The Bluetooth dongle included in this reference design kit is integrated with industry-leading WIDCOMM Bluetooth Software (by Broadcom Coorporation). Bluetooth dongles are needed only on PCs or laptops without built-in Bluetooth capability.

There are two ways of connecting the mouse to a PC. The first way is to connect via the provided USB-enabled Bluetooth dongle for non-Bluetooth enabled PCs. For Bluetooth-ready PCs, you do not have to plug in the dongle to use the mouse.

Based on the 2.4GHz Bluetooth technology, the data generated from displacement detection / button status in the LED mouse is encoded with a pre-defined serial type protocol handled by firmware in BCM2042. In the RF stage, the encoded data is used for GFSK modulation. The captured data from the RF receiver stage is decoded with a corresponding packet format used for mouse applications. The final data is sent to the host through the USB Bluetooth HCI interface via USB transport interface.
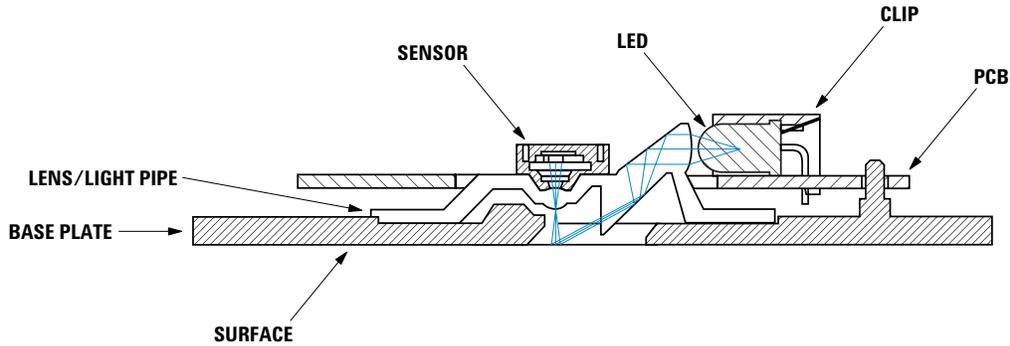

Figure 1. Sectional view of PCB assembly highlighting all optical mouse components (optical mouse sensor, clip, lens, LED, PCB, and base plate)

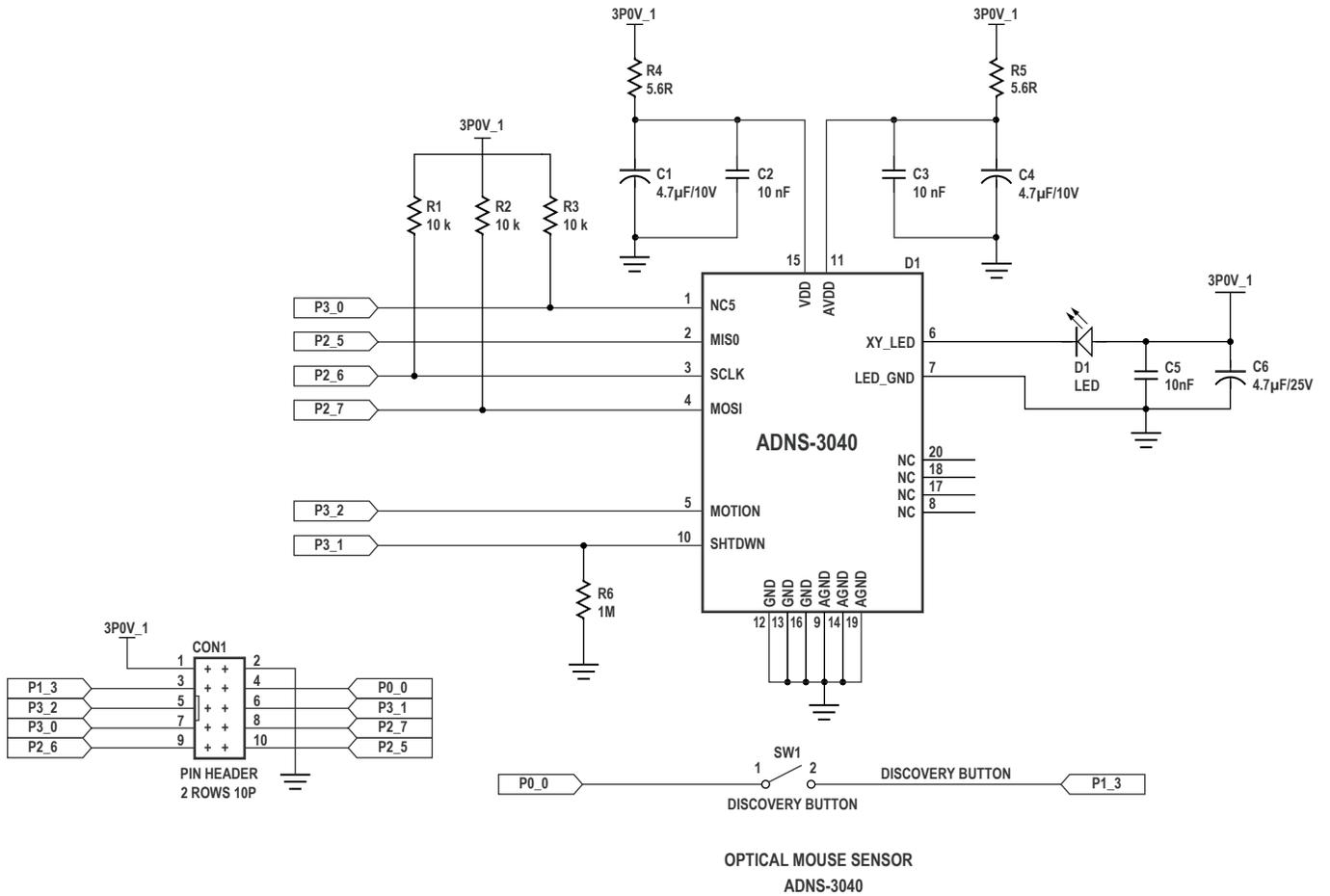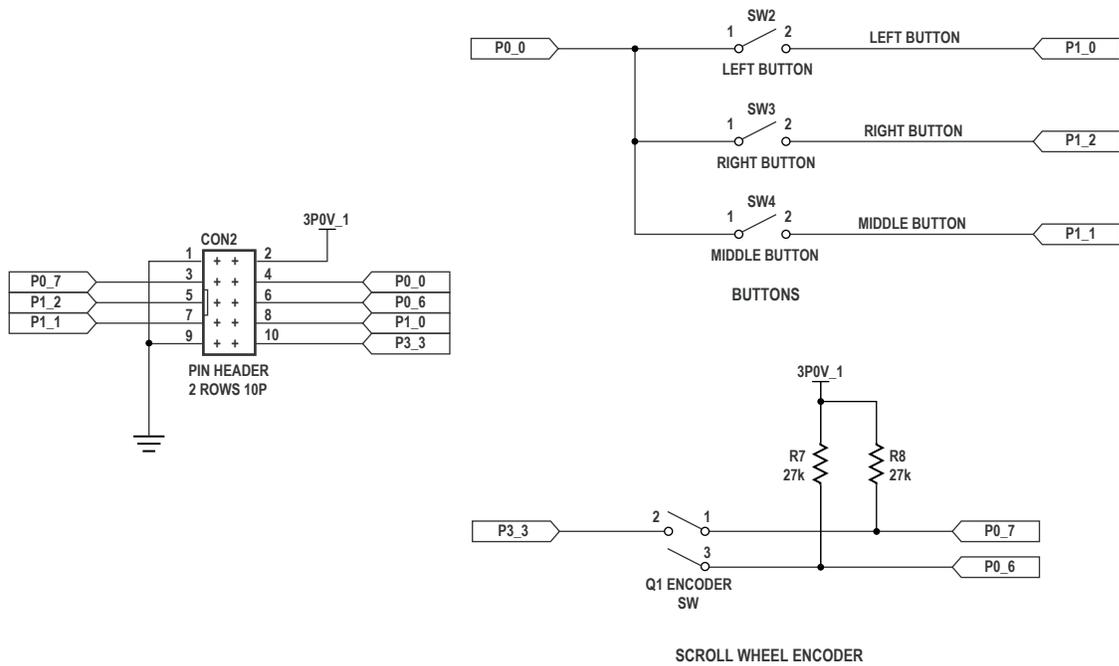**Figure 2. Schematic diagram of Optical Mouse Sensor**

OPTICAL MOUSE SENSOR
ADNS-3040

Figure 3. Schematic diagrams of buttons and Z-Wheel Main Board

BUTTONS

SCROLL WHEEL ENCODER
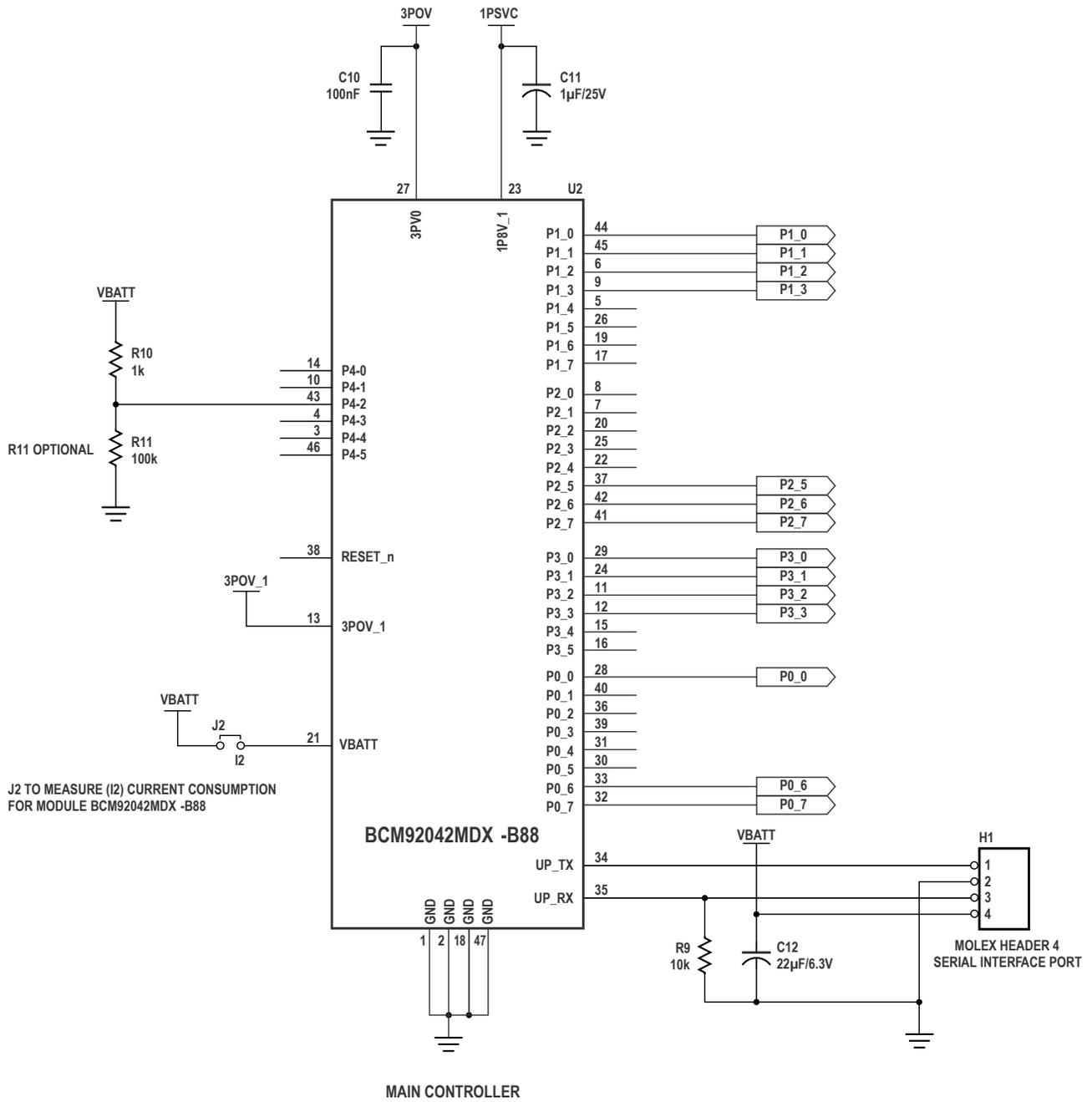
Figure 4. Schematic diagram of Bluetooth ROM module Main Board

3POV_1

J1 TO MEASURE (I1) CURRENT CONSUMPTION
FOR ADNS-3040 SENSOR

J1   I1

CON1

1	+ +	2
3	+ +	4
5	+ +	6
7	+ +	8
9	+ +	10

P1_3
P3_2
P3_0
P2_6

P0_0
P3_1
P2_7
P2_5

PCB SOCKET
2 ROWS 10P

VBATT   T. POINT1

BT1
AA BATTERY
1.5 V

BT2
AA BATTERY
1.5 V

C9
68µF/10V

T. POINT2

3POV_1

CON2

1	+ +	2
3	+ +	4
5	+ +	6
7	+ +	8
9	+ +	10

P0_7
P1_2
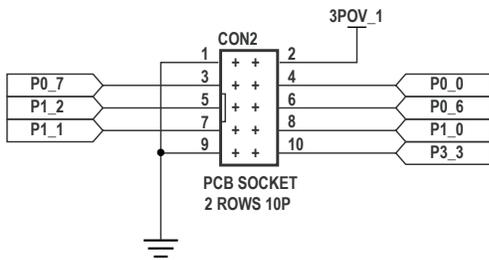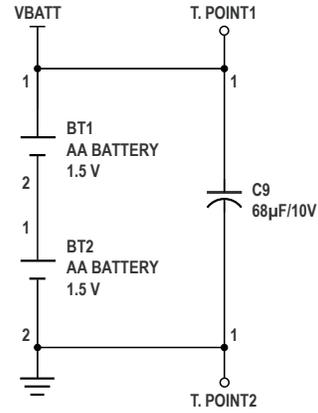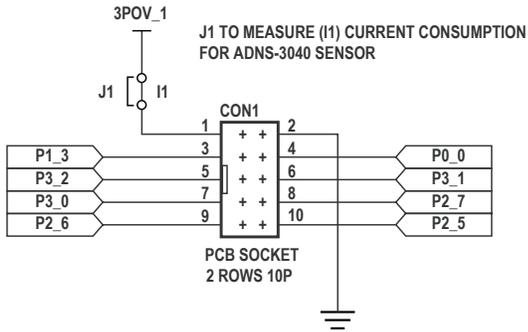P1_1

P0_0
P0_6
P1_0
P3_3

PCB SOCKET
2 ROWS 10P

Figure 5: Sub-schematic diagram of Bluetooth ROM module Main Board

Note: For technical information related to the USB Bluetooth dongle, please contact Broadcom.

The designer's kit contains components as follows:

Part Number	Description	Name	Quantity
ADNK-3043-BRBT Mouse Set	Optical Mouse Reference Design Unit includes: - Wireless Mouse - USB-Bluetooth Dongle	Reference Design Unit	1
ADNS-3040	Solid-State Optical Mouse Sensor	Sensor	5
ADNS-3120-001	Trim Lens Plate	Lens	5
ADNS-2220	LED Assembly Clip (Black)	LED Clip	5
HLMP-ED80-PS000	639 nm T 1 3/4 (5 mm) Diameter LED	LED	5
ADNK-3043-BRBT CD	Includes Documentation and Support Files for ADNK-3043-BRBT Documentation a. ADNS-3040 Data Sheet b. BCM2042 Product Brief c. BCM2045 Product Brief d. ADNS-3120-001 Data Sheet e. ADNS-2220 Data Sheet f. HLMP-ED80-XX000 LED Data Sheet Hardware Support Files a. ADNK-3043-BRBT Mouse BOM List b. ADNK-3043-BRBT Mouse Schematic c. ADNK-3043-BRBT Mouse Layout Drawing d. IGES Base Plate Feature File Software Support Files a. WIDCOMM Bluetooth Software *For more information regarding BCM92040MDX-B88 and software/firmware, please contact Broadcom directly.		1