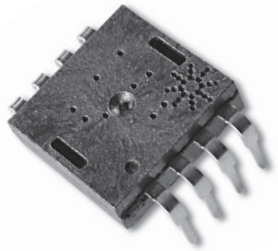
Agilent ADNS-2610 Optical Mouse Sensor

Product Overview



Description

Small Form Factor, Entry-Level Optical Mouse Sensor for Precise Navigation.

The ADNS-2610 is a new entry level, small form factor optical mouse sensor. It is used to implement a non-mechanical tracking engine in computer mice. Unlike its predecessor, this new optical mouse sensor allows for more compact and affordable optical mice designs.

It is based on optical navigation technology which measures changes in position by optically acquiring sequential surface images up to 1500 times per second and mathematically determining the direction and magnitude of movement at the maximum of 400 counts per inch (cpi) and at speeds up to 12 inches per second (ips).

Agilent provides the complete optical mouse sample kit (Part #ADNK-2610). The CMOS based sensor is mounted in an 8-pin staggered dual inline package (DIP) and designed for use with the HDNS-2200 (LED Assembly Clip) and HLMP-ED80-XXXXX (639 nm LED illumination source) and HDNS-2100 (lens). There are no moving parts, so precision optical alignment is not required, thereby facilitating high volume assembly.

Theory of Operation

The ADNS-2610 is based on Optical Navigation Technology. It contains an Image Acquisition System (IAS), a Digital Signal Processor (DSP) and a two wire serial port.

The IAS acquires microscopic surface images via the lens and illumination system provided by the HDNS-2100, HDNS-2200, and HLMP-ED80-XXXXX. These images are processed by the DSP to determine the direction and distance of motion.

Other available optical mouse sensors from Agilent Technologies:

- ADNS-2030
- ADNS-2051
- HDNS-2000
- ADNS-2620

Features

- **Precise optical navigation technology**
- **Small form factor (10 mm x 12.5 mm footprint)**
- **No mechanical moving parts**
- **Complete 2D motion sensor**
- **Common interface for general purpose controller**
- **Smooth surface navigation**
- **1500 frames per second**
- **Accurate motion up to 12 ips**
- **400 cpi resolution**
- **High reliability**
- **High speed motion detector**
- **Wave solderable**
- **Single 5.0 volt power supply**
- **Conforms to USB suspend mode specifications**
- **Power conservation mode during times of no movement**
- **Serial port registers**
  - **Programming**
  - **Data transfer**
- **8-pin staggered dual inline package (DIP)**

Applications

- **Mice for desktop PCs, workstations, and portable PCs**
- **Trackballs**
- **Integrated input devices**

Navigation by Two Images Comparison

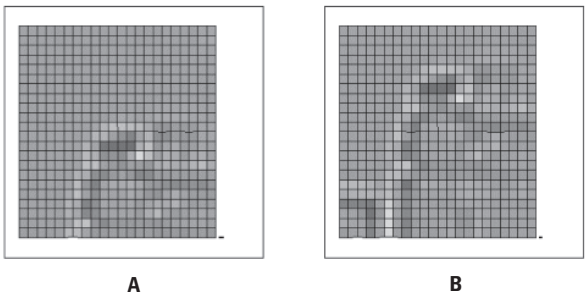


Figure 1. The Navigation Engine identifies common features in sequential images to determine the direction and amount of mouse movement. Image B was taken while the mouse was moving, a short time after image A.

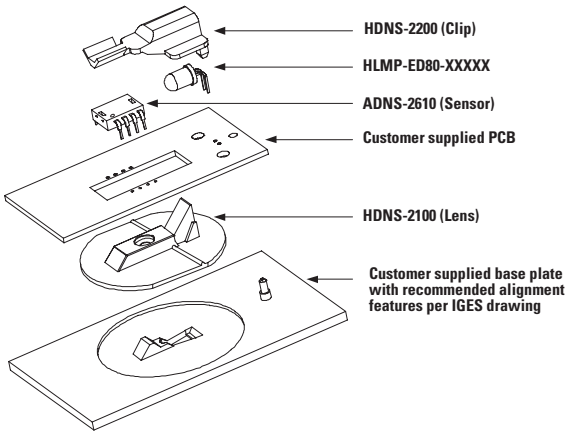
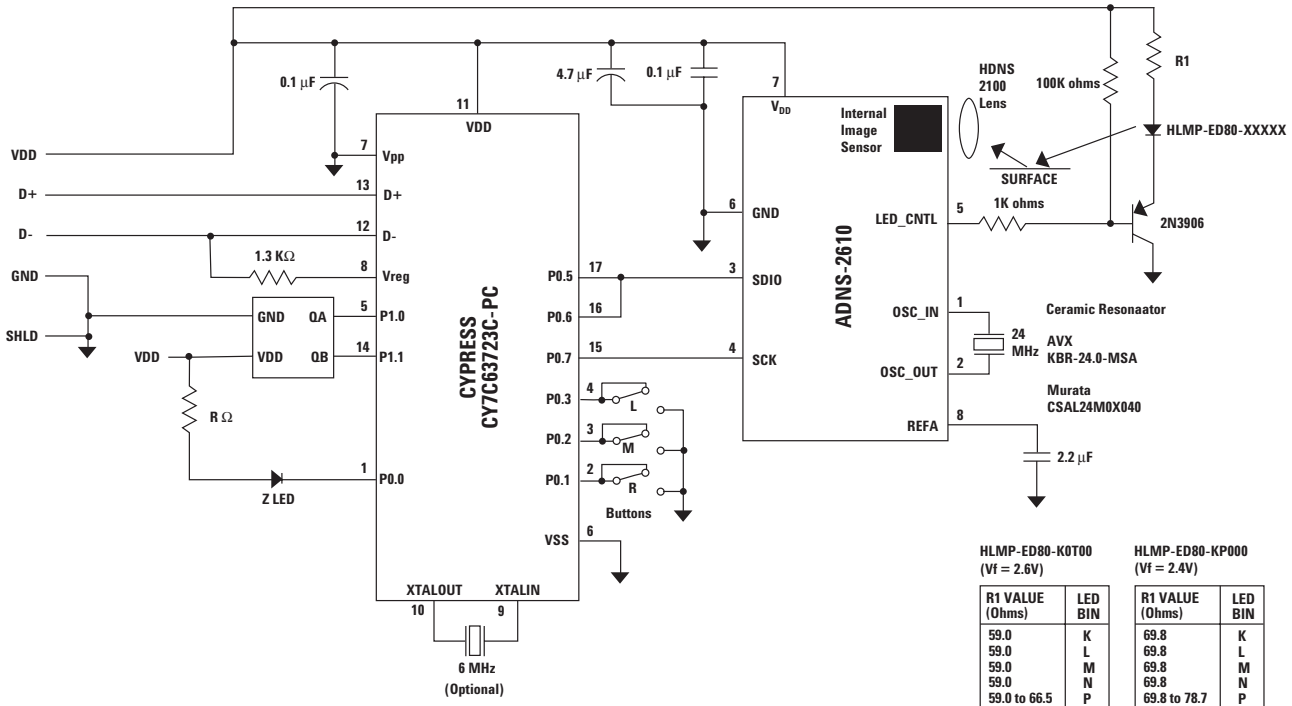


Figure 2. Exploded view drawing of optical mouse components.



HLMP-ED80-K0T00 (Vf = 2.6V)

R1 VALUE (Ohms)	LED BIN
59.0	K
59.0	L
59.0	M
59.0	N
59.0 to 66.5	P
59.0 to 78.7	Q
59.0 to 93.1	R
59.0 to 110	S
59.0 to 143	T

HLMP-ED80-KP000 (Vf = 2.4V)

R1 VALUE (Ohms)	LED BIN
69.8	K
69.8	L
69.8	M
69.8	N
69.8 to 78.7	P
69.8 to 93.1	Q
69.8 to 113	R
69.8 to 137	S
69.8 to 169	T

Figure 3. Circuit-level block diagram for optical mouse solution using an Agilent ADNS-2610 optical mouse sensor.

ADNS-2610 Specifications

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Operating Temperature	T_A	0		40	°C	
Power Supply Voltage	V_{DD}	4.1	5.0	5.5	V	Register values retained for voltage transients below 4.10V but greater than 3.9V.
DC Supply Current (mouse moving)	$I_{DD\ AVG}$		15	30	mA	
DC Supply Current (mouse not moving)	I_{DD}		12		mA	
DC Supply Current (power down)	I_{DDPD}		170	230	µA	
Clock Frequency	f_{CLK}	23.0	24.0	25.0	MHz	Set by ceramic resonator
Resonator Impedance	X_{RES}			55	Ω	
Distance from lens reference plane to surface	Z	2.3	2.4	2.5	mm	Results in ±0.2 mm DOF
Speed	S	0		12	in/sec	@ frame rate = 1500 fps
Acceleration	A			0.25	g	@ frame rate = 1500 fps
Light level onto IC	IRR_{INC}	80 100		25,000 30,000	mW/m^2	λ = 639 nm λ = 875 nm
Resolution	RES		400		counts/in	
Frame Rate	FR			1500	frames/s	

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For product information and a complete list of distributors, please go to our web site.

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Data subject to change.

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