A2636

3D USB or PS2 CMOS Optical Mouse SOC

ApexONE Microelectronics

General Description

A2636 is a CMOS optical SOC, designed for a USB and PS/2 optical mouse. It is compatible with Microsoft 3D IntelliMouse and IBM PS/2 mouse. Comparing with conventional controller plus sensor solutions, this single chip provides same or better performance but at lower peripheral component cost. Furthermore, A2636 is pip-to-pin compatible with A2633 (another SOC for PS/2 mice), and saves PCB tooling cost and cuts down the time from testing to production.

Feature

- Both USB and PS2 interfaces
- Single 5.0 volt power supply
- Compatible with Microsoft Intelli 3D PS/2 and IBM PS/2 mouse
- Complete USB v1.1 1.5Mbps compatibility
- Compatible with Microsoft Windows Vista, 2000, XP, ME, and 98
- Compatible with WHQL and USB-IF
- Support three buttons (L, M, R) and three axis (X, Y, Z) inputs
- Optical motion estimation technology
- Flexible external resolution setting between 800DPI/1600DPI (800DPI at default)
- One button dynamic resolution toggle setting between 800DPI and 1600DPI
- Built-in de-bounce circuits
- Built-in power on reset
- Built-in regulators
- Built-in LED driver
- Internal oscillator, crystal-less design
- Minimal external components
- Support mechanical encoder
- ROHS compliant
- Staggered DIP12 package

Key Specification

Power supply	4.5~5.5V
Interface	USB + PS2
Optical Lens	1:1
System clock	24MHz internal clock
Resolution 800/1600	CPI
Frame Rate	Up to 4000fps
Operating Current	Less than 20mA at mouse moving
	Less than 10mA at mouse not moving
	Less than 0.4mA at USB suspend mode
Package Staggered	DIP12

Applications
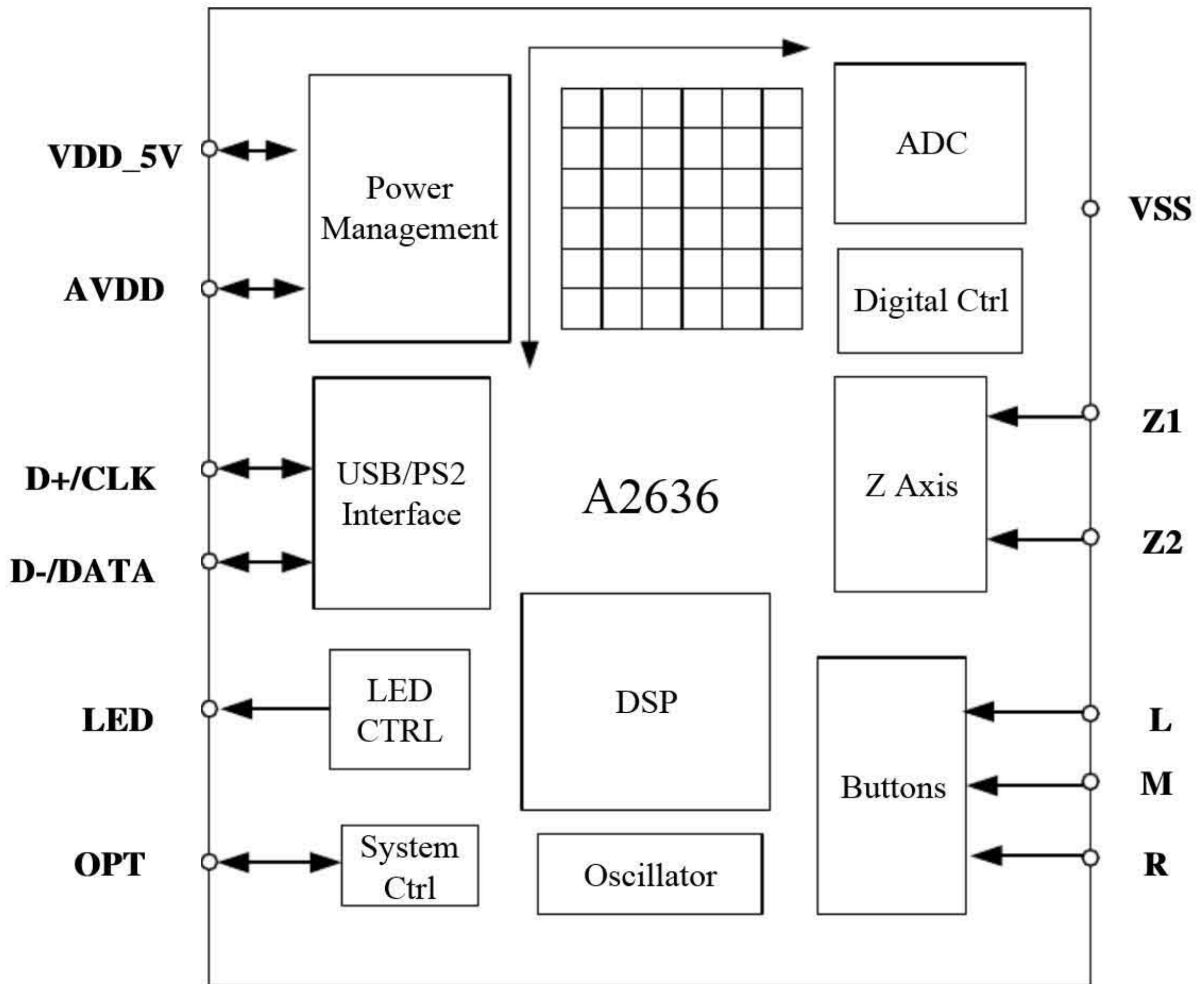
Optical USB or PS/2 mice for desktop PC, workstation and laptop

Ordering Information

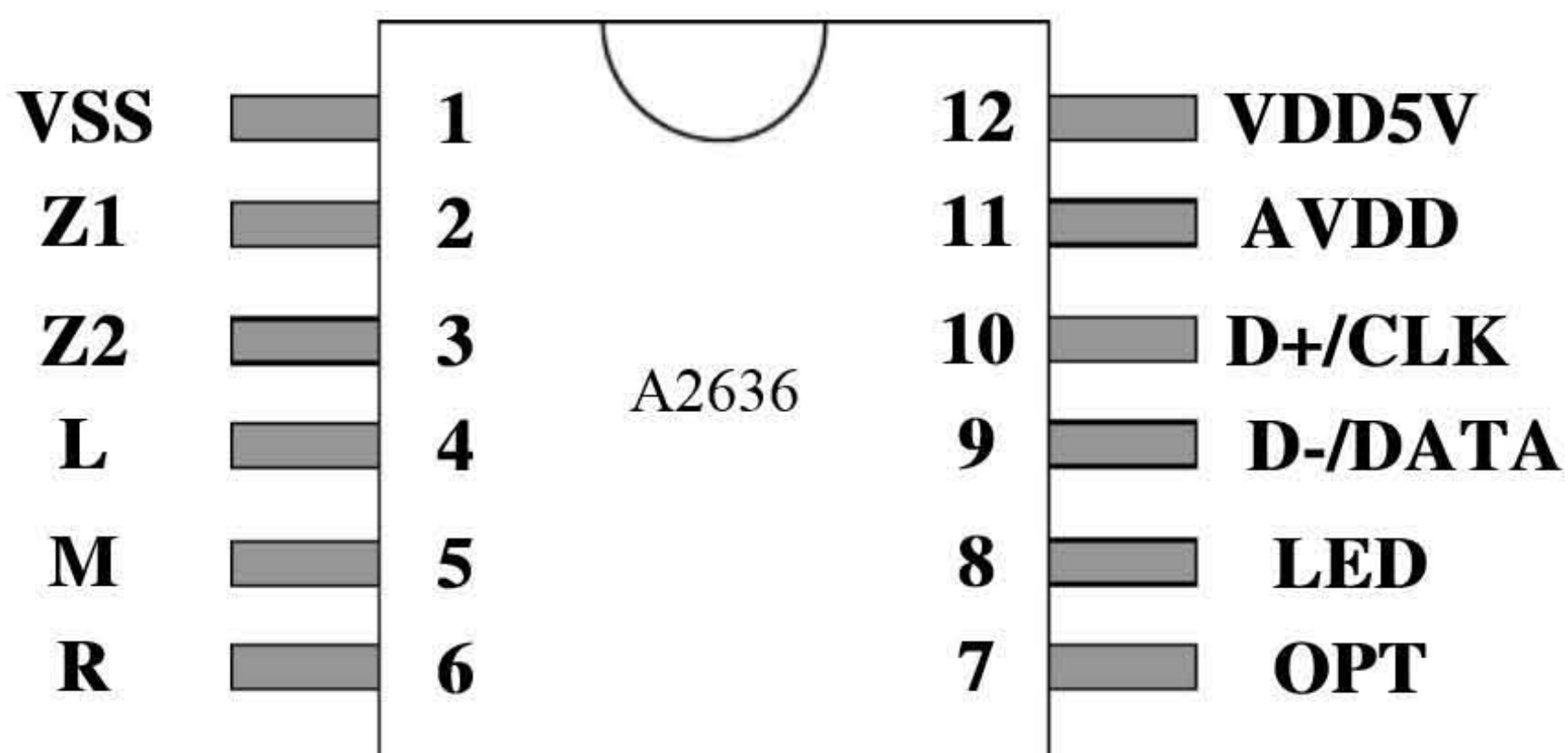| Part Number	Package	Description
A2636	Staggered DIP12	USB or PS/2 optical mouse SOC

1. Block Diagram

Figure 1. A2636 Block Diagram

2. Pin Assignment

Figure 2. Top view of A2636 pin out

3. Pin Description

Pin No.	Pin Name	I/O	Description
1	VSS	-	Negative power supply, ground
2	Z1	I	Z axis, mechanical input
3	Z2	I	Z axis, mechanical input
4 L		I	Left button
5 M		I	Middle button
6 R		I	Right Button
7	OPT	I/O	Dynamic acceleration resolution toggle button, outputs resolution state
8 LED		O	LED driver
9	D-/DATA	I/O	USB D- or PS/2 Data
10	D+/CLK	I/O	USB D+ or PS/2 Clock
11 AVDD		I	Analog voltage reference
12	VDD5V	-	5V positive power supply

4. Absolute Maximum Ratings (Ta=25°C)

Symbol	Characteristic	Min	Max	Unit	Notes
T_{STG}	Storage Temperature	-50	+125	°C	
T_{OPR}	Operating Temperature	-15	+55	°C	
	Lead Solder Temp		260	°C	For 10 seconds, 1.6mm below seating plane
V_{CC}	Supply Voltage	-0.3	5.5	V	
V_I	Input Voltage	V_{SS}-0.3	5.5	V	
ESD			4	kV	All pins, human body mode, MIL STD 883G method 3015.7

Note:　Absolute maximum ratings set the limits, over the limits may cause permanent damage to the device.

5. Recommend Operating Condition

Symbol	Parameter	Min	Typ	Max	Unit	Notes
T_{OPR}	Operating temperature	0		40	°C	
V_{DD}	DC supply voltage	4.5	5.0	5.5	V	
V_{IN}	Supply noise			100	mV	
FR	Frame rate	2000		4000	frames/s	
Z	Distance from lens reference plane to surface	2.3	2.4	2.5	mm	
S	Moving speed	0		24 inches/sec		
A	Acceleration			16	g	
R	Resolution		800	1600	DPI	800 or 1600