
TCM1229

USB+PS/2 Mouse Controller

Version : V1.0

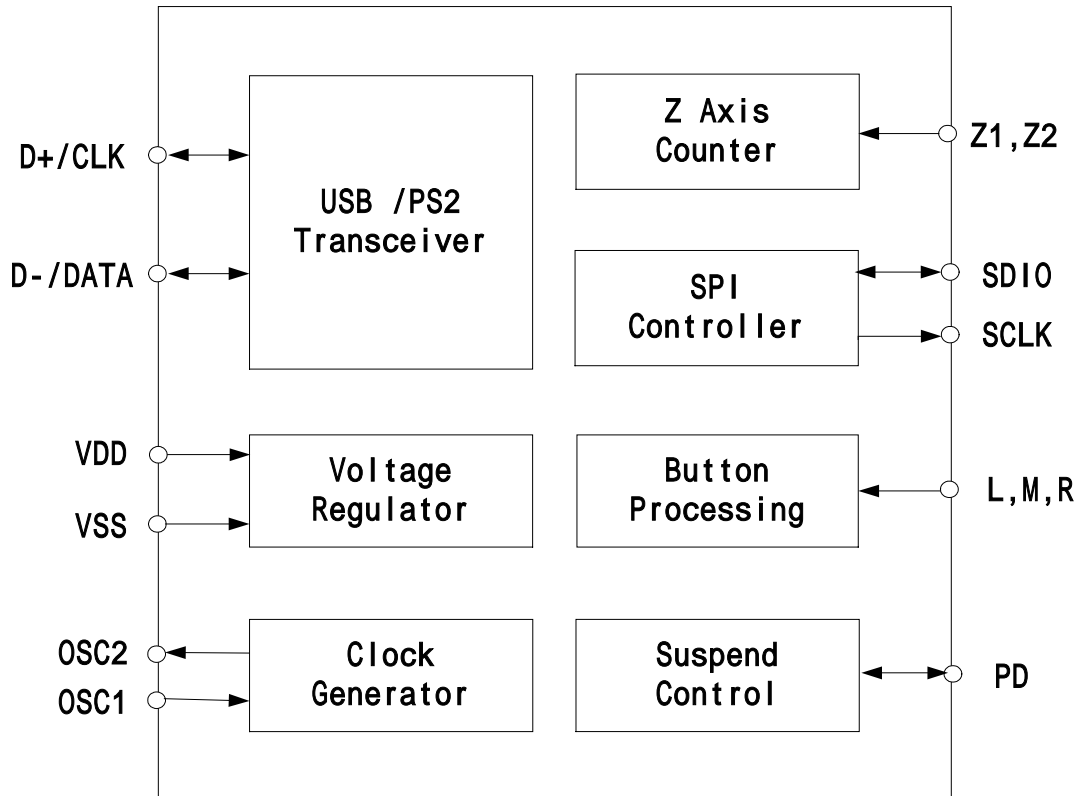
Description

TCM1229 is a 3D optical mouse controller especially designed for USB and PS/2 applications with an Interface identification module inside. It can support the USB Standard v1.1, HID Class Definition v1.1 as well as PS/2 interface. The Z axis can support two kinds of scroller input, opto-mechanical and mechanical. It requires minimal external components to implement 3D USB plus PS/2 mouse.

Features

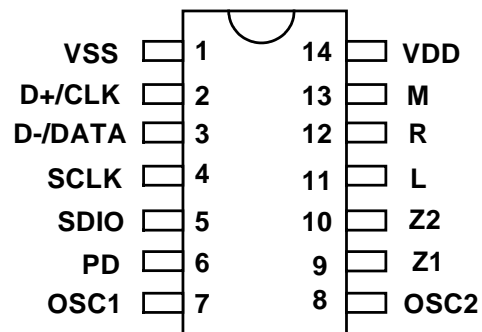
- ◆ 5V power supply
- ◆ Complete USB HID v1.1 compatibility
- ◆ Automatic PS/2 and USB port identification
- ◆ Support selected single USB mode or U+P mode
- ◆ Support three buttons (R, M, L) input
- ◆ Z-axis can support two kinds of scrolled input (opto mechanical and mechanical)
- ◆ Plug and Play functions
- ◆ Built-in power-on reset
- ◆ Built in USB transceiver and DC/DC
- ◆ Built-in 7.5kohm pull-up resistor for D-
- ◆ Support Window98,ME,2000,XP,Vista
- ◆ Passed USB-IF test
- ◆ Passed WHQL test
- ◆ Support ADNS2610, ADNS2620, ADNS5020
- ◆ Support PixArt PAN3101
- ◆ Support Unity MCS-12085, MCS-16085
- ◆ Support Sunplus SPCP6100,SPCP6110
- ◆ Crystal-less design with internal oscillator
- ◆ Clock direct-feed for sensor to implement totally crystal-less system design
- ◆ Minimal external components
- ◆ 14 -pin DIP package

Block Diagram



Pin Configuration and Descriptions

- Pin Configuration



● Pin Description

TCM1229 (DIP-14)

Pin No.	Pin Name	I/O	Description
1	VSS	-	Power ground
2	D+/CLK	I/O	USB D+ or PS/2 Clock
3	D-/DATA	I/O	USB D- or PS/2 Data
4	SCLK	O	SPI Clock for sensor
5	SDIO	I/O	SPI Data for sensor
6	PD	I/O	SPI Cs for sensor
7	OSC1	I	External resistor for frequency tune
8	OSC2	O	CLK output
9	Z1	I	Z-axis input
10	Z2	I	Z-axis input
11	L	I	Left button input, Low active, pull-high resistor inside
12	R	I	Right button input, Low active, pull-high resistor inside
13	M	I	Middle button input, Low active, pull-high resistor inside
14	VDD	-	5V positive power supply

Absolute Maximum Ratings

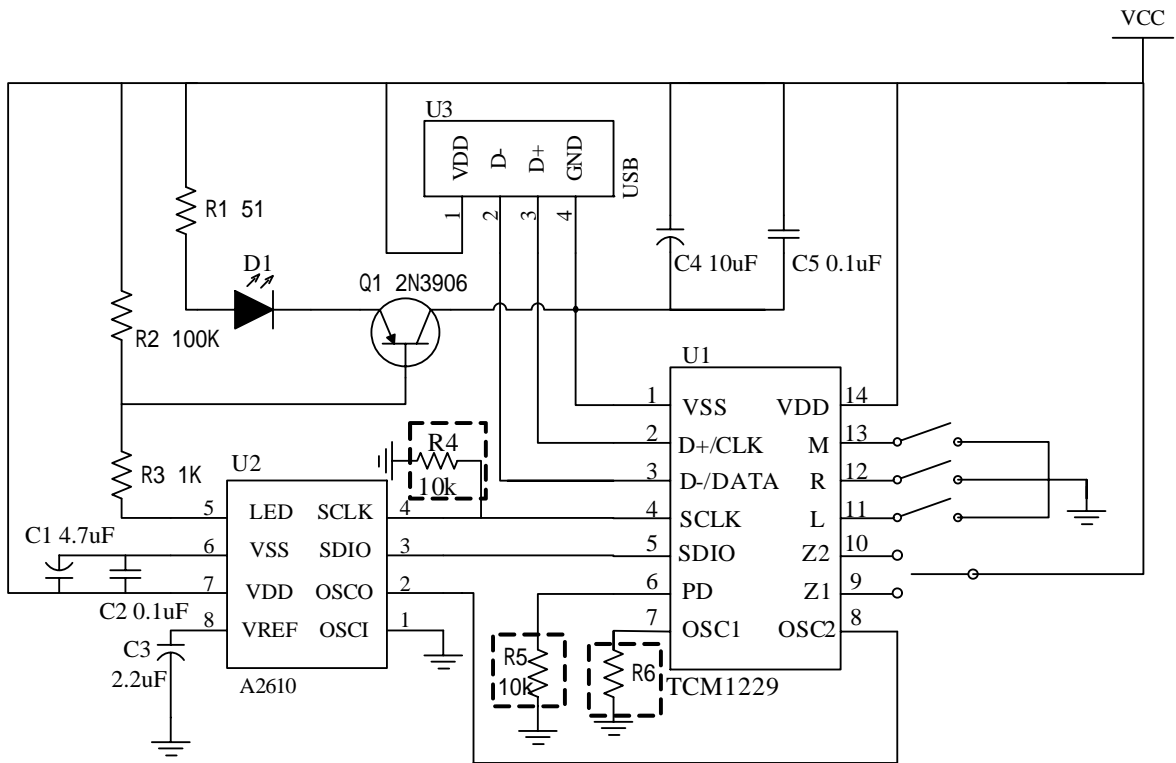
Symbol	Parameter	Minimum	Maximum	Unit
V _{DD}	Supply Voltage	4.5	5.5	V
V _I	Input Voltage	V _{SS} -0.3	V _{DD} +0.3V	V
T _{OPR}	Operating Temperature	0	70	

Electrical Characteristics

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
V _{DD}	Operating Voltage	V _{DD}		4.5	5.0	5.5	V
I _{OP}	Operating Current	5.0		4.5	5.0	5.5	mA
V _{IL}	Digital Input Low Voltage	5.0		—	—	0.8	V
V _{IH}	Digital Input High Voltage	5.0		2	—	—	V
V _{OL}	Digital Output Low Voltage	5.0		0	—	0.4	V
V _{OH}	Digital Output High Voltage	5.0		2.4	—	5.0	V
I _{IL}	Input Low Current	5.0	V _{in} =V _{ss}	-10	—	10	uA
I _{IH}	Input High Current	5.0	V _{in} =V _{dd}	-10	—	10	uA
I _O	Digital Output Source or Sink Current	5.0		—	—	4	mA

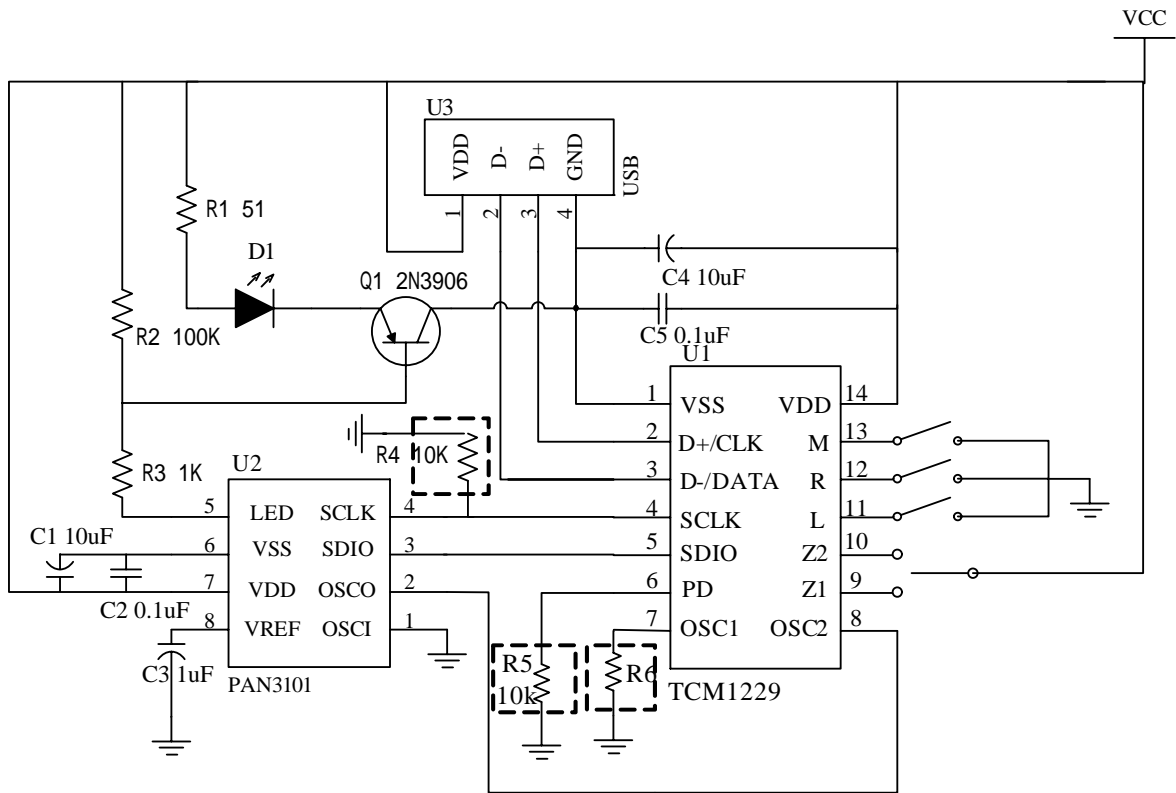
Application Circuits

Typical Application with ADNS2610/2620 /MCS-12085/SPCP6100



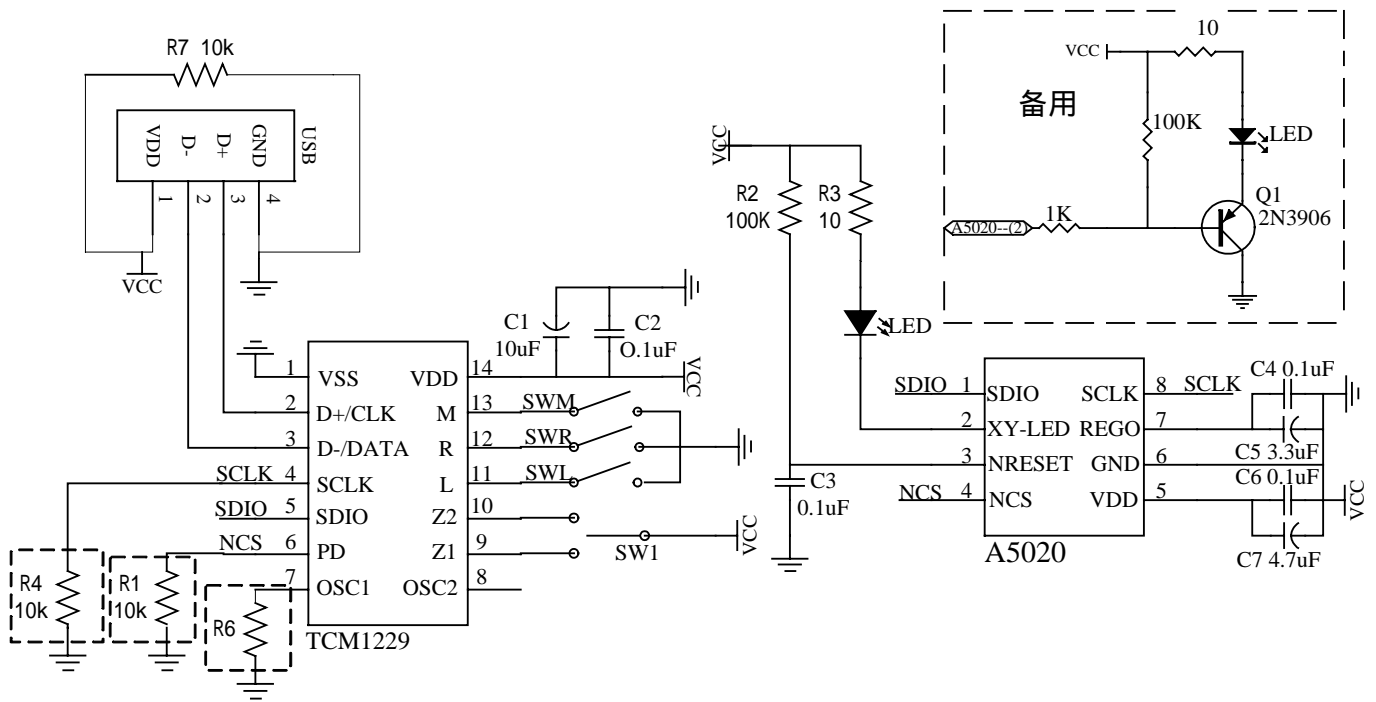
Note: please reserve the footprint of the R6 on PCB
 Use R4, stop TCM1229 double resolution function
 Not use R4, use TCM1229 double resolution function
 Use R5, single USB mode
 Not use R5, U+P mode

Typical Application with PAN3101



Note: please reserve the footprint of the R6 on PCB
 Use R4, stop TCM1229 double resolution function
 Not use R4, use TCM1229 double resolution function
 Use R5, single USB mode
 Not use R5, U+P mode

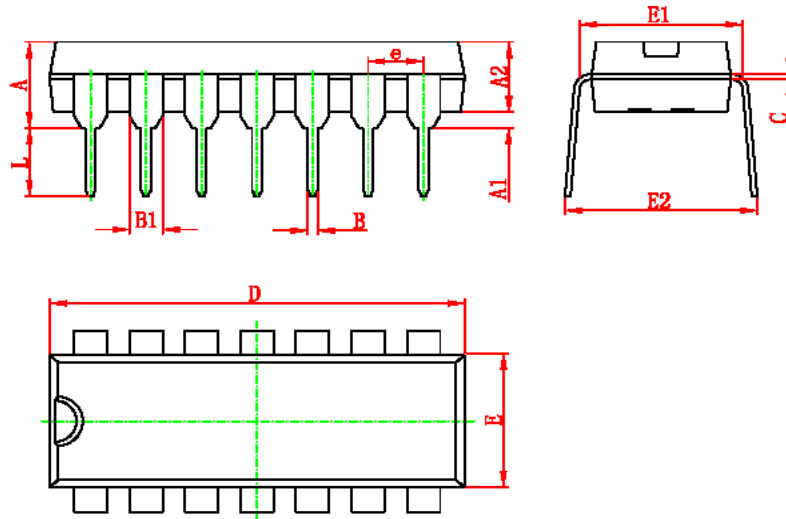
Typical Application with ADNS5020/MCS-16085/SPCP6110



Note: please reserve the footprint of the R6 on PCB
 Use R1, single USB mode
 Not use R1, U+P mode
 Use R4 , A5020 1000CPI, stop TCM1229 double resolution function
 Not use R4, A5020 500CPI, use TCM1229 double resolution function

Package Information

DIP14 package outline dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524 (BSC)		0.060 (BSC)	
C	0.204	0.360	0.008	0.014
D	18.800	19.200	0.740	0.756
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540 (BSC)		0.100 (BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354