HT82M91A
3D USB Mouse

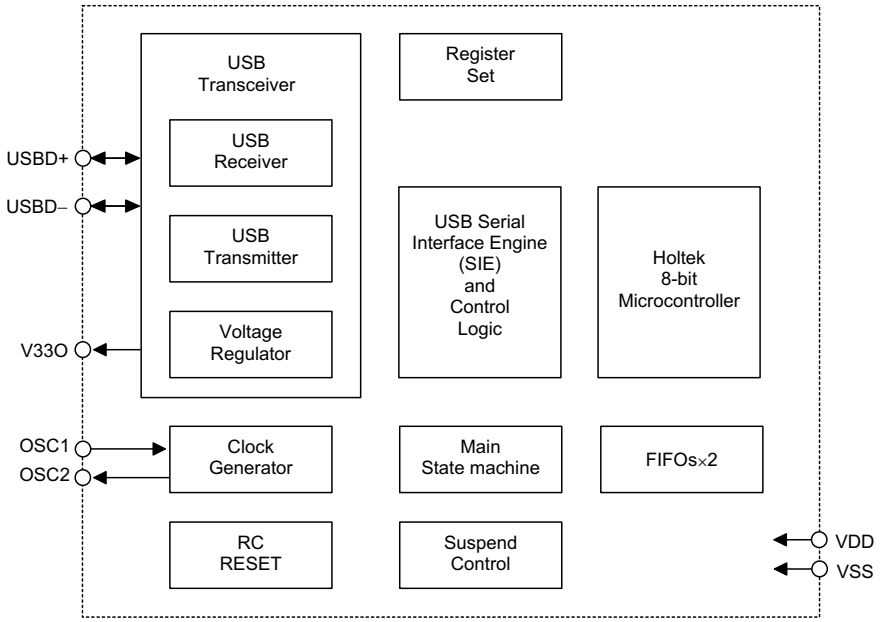
Features

- Complete Universal Serial Bus specification compatibility
- Serial Bus Interface Engine (SIE)
- USB transceiver
- Supports three buttons (R, M, L) and three axes (X, Y, Z) input
- Z axis can support two kinds of scroller input (optomechanical and mechanical)
- Single chip solution especially for USB mouse function
- Halt function and wake-up feature reduce power consumption
- Has plug and Play functions
- Minimal external components
- 6MHz crystal oscillator for system clock
- 18-pin DIP package

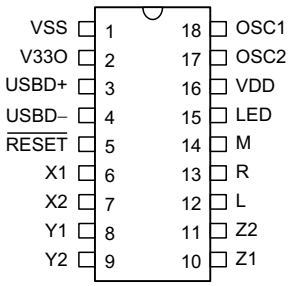
General Description

HT82M91A is a 3D mouse encoder chip especially designed for USB applications. The HT82M91A can support the USB Standard Request as well as HID Class Request version 1.0. It can be briefly described as a Holtek 8-bit μC with an on-chip USB interface logic. It can use minimal external components to implement three key-switches and four photo-coupler mouse. The USB is specified by the *Universal Serial Bus Specification*.

Block Diagram



Pin Assignment



HT82M91A
–18 DIP

Pin Description

Pin No.	Pin Name	I/O	Description
USB Interface (2 pins)			
3	USBD+	I/O	USB data plus
4	USBD–	I/O	USB data minus
General purpose I/O (9 pins)			
6, 7	X1, X2	I	X-axis photo input with built-in Holtek's special dynamic photo input resistor
8, 9	Y1, Y2	I	Y-axis photo input with built-in Holtek's special dynamic photo input resistor
10, 11	Z1, Z2	I	Z-axis input supports two kinds of scroller input; optomechanical and mechanical
12, 13, 14	L, R, M	I	These pins are input port with pull-high resistor. These pads can function as Left, Right and Middle button input lines.
Miscellaneous (7 pins)			
1	VSS	—	Negative power supply, ground
2	V33O	O	3.3V voltage output
5	$\overline{\text{RESET}}$	I	Chip reset input, low active
15	LED	I/O	Drives LED output
16	VDD	—	5V positive power supply
17	OSC2	O	6MHz OSC output
18	OSC1	I	6MHz OSC input

Absolute Maximum Ratings

Supply Voltage.....–0.3V to 6V
μC Input Voltage .....V_{SS}–0.3V to V_{DD}+0.3V
USB Input Voltage .....V_{SS}–0.3V to V_{33O}+0.3V
Storage Temperature.....–50°C to 125°C
Operating Temperature .....–25°C to 70°C

Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

D.C. Characteristics

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Conditions				
V_{DD}	Operating Voltage	—	—	4.5	—	5.5	V
I_{DD}	Operating Current (Crystal OSC)	5V	No load, f_{SYS}=6MHz	—	10	—	mA
I_{STB}	Standby Current	5V	No load, system Halt	—	—	250	μA
V_{IL1}	Input Low Voltage for I/O Ports	5V	—	0	—	1.0	V
V_{IH1}	Input High Voltage for μC I/O Ports	5V	—	3.5	—	5	V
V_{IL2}	Input Low Voltage ($\overline{\text{RESET}}$)	5V	—	0	—	1.8	V
V_{IH2}	Input High Voltage ($\overline{\text{RESET}}$)	5V	—	3.5	—	5	V
V_{IH3}	Input High Voltage for USB I/O Ports	3.3V	—	2.8	—	3.6	V
V_{POR}	Power on Reset V_{DD} Detecting Voltage	5V	—	3	—	3.6	V
I_{OL1}	Output Port Sink Current	5V	V_{OL}=0.5V	—	4	—	mA
I_{OH1}	Output Port Source Current	5V	V_{OL}=4.5V	—	–4	—	mA
I_{OL2}	Outpu Ports Sink Current (LED)	5V	V_{OL}=4.5V	—	50	—	mA

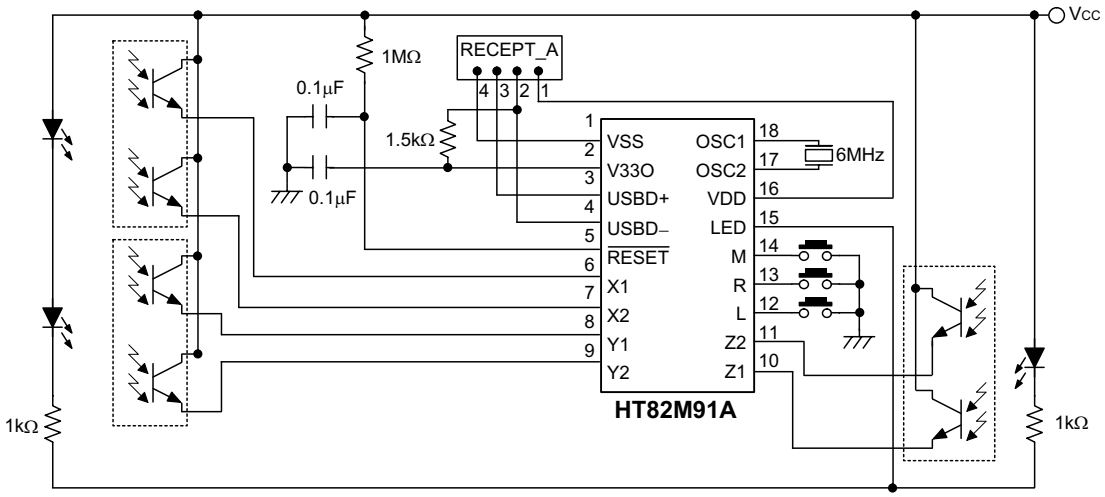
A.C. Characteristics

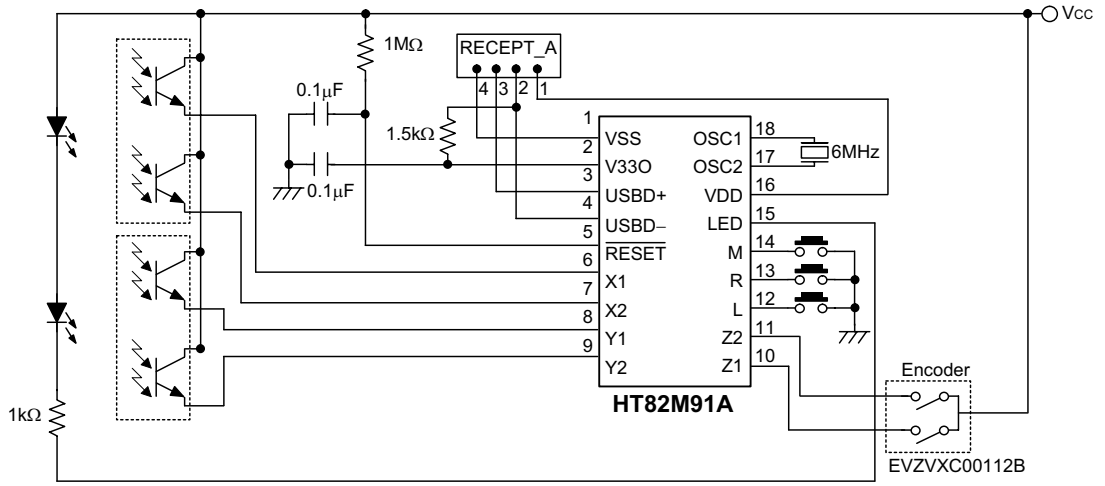
Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Conditions				
f_{SYS}	System Clock (Crystal OSC)	5V	—	0	6000	—	kHz
t_{WDTosc}	Watchdog Oscillator	—	—	93.75	125	156.25	μs
t_{WDT}	Watchdog Time-out Period (RC OSC)	—	—	768	1024	1280	ms
t_{PWRT}	Power-up Timer Period	—	—	—	10	—	ms
t_{OST}	Oscillation Start-up Timer Period	—	Power-up or wake-up form Halt	—	1024	—	t_{SYS}

Note: $t_{SYS}=1/f_{SYS}$

Application Circuits





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