

Features

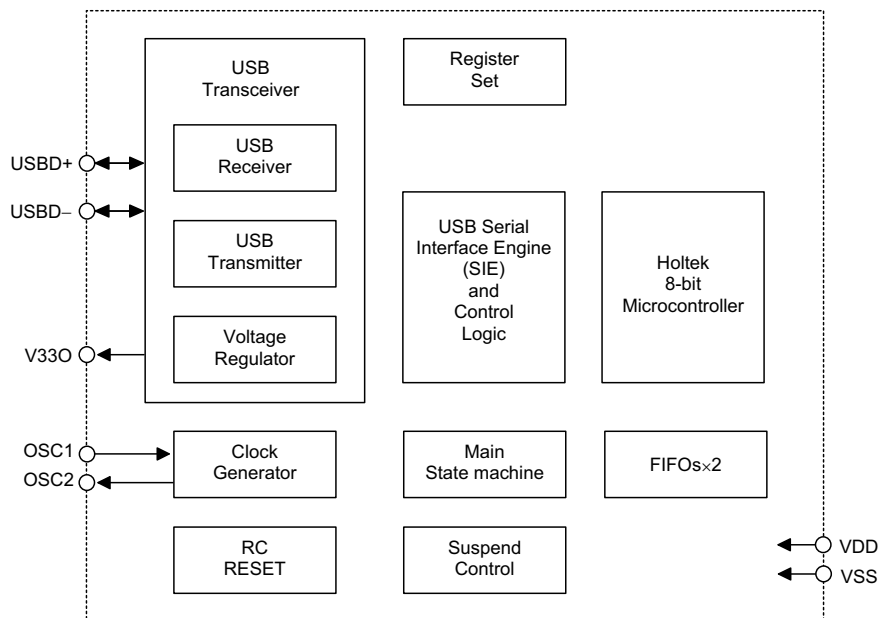
- Complete Universal Serial Bus specification compatibility
- Serial Bus Interface Engine (SIE)
- USB transceiver
- Supports three buttons (R, M, L) and three axes (X, Y, Z) input
- Z axis can support two kinds of scroller input (optomechanical and mechanical)
- Single chip solution especially for USB 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

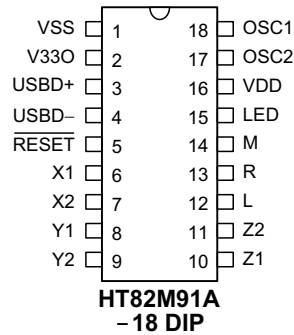
HT82M91A is a 3D mouse encoder chip especially designed for USB applications. The HT82M91A can support the USB Standard Request as well as HID Class Request version 1.0. It can be briefly described as a Holtek 8-bit μ C

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



Pin Description

| Pin No. | Pin Name | I/O | Description |
|-------------------------------------|----------|-----|--|
| USB Interface (2 pins) | | | |
| 3 | USB D+ | I/O | USB data plus |
| 4 | USB D- | 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 | 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 Storage Temperature.....-50°C to 125°C
 μC Input VoltageV_{SS}-0.3V to V_{DD}+0.3V Operating Temperature-25°C to 70°C
 USB Input VoltageV_{SS}-0.3V to V₃₃₀+0.3V

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} | Output Ports Sink Current (LED) | 5V | V _{OL} =4.5V | — | 50 | — | mA |

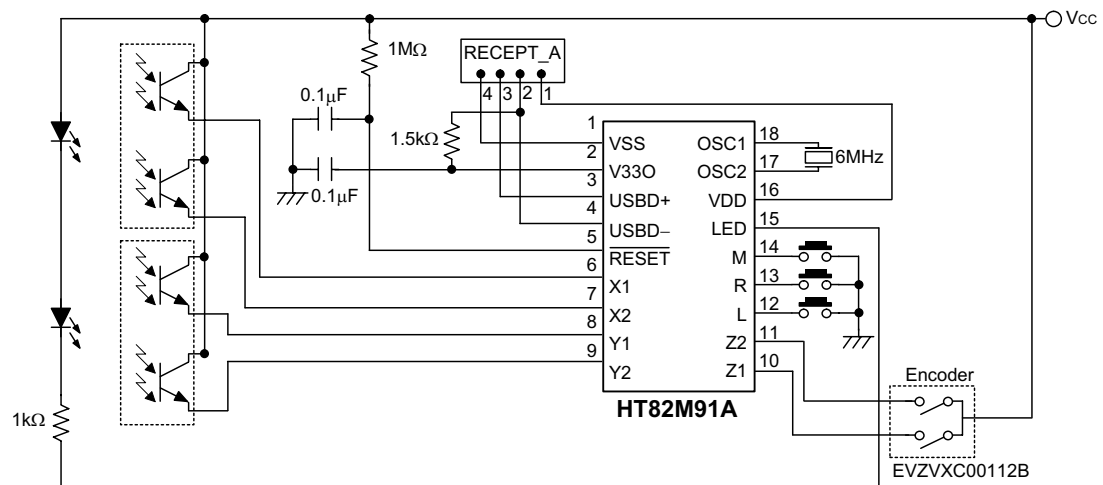
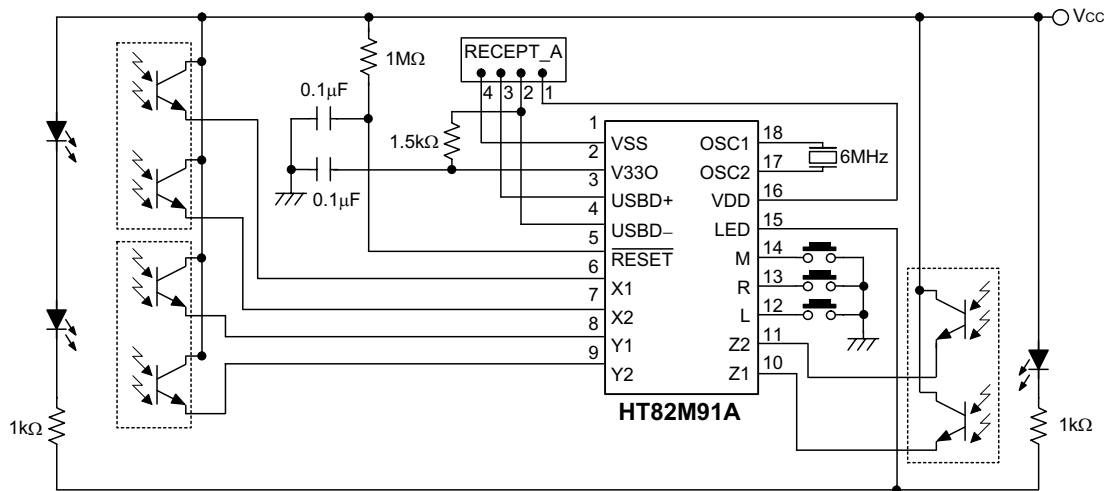
A.C. Characteristics

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 from Halt | — | 1024 | — | t _{SYS} |

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

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