

## **Operational Description**

### **DS-2135-Z**

Mouse DS-2135-Z is a modern device with multi-functions. It is a wire mouse but also a wireless mouse. It contains 2 pieces of rechargeable battery and may be charged from USB port.

The mouse is designed with 4 ICs: Optical sensor U2 (PAN301), RF MCU U1 (MA6221), Wire mouse U301 (MA6162) and EEPROM U302 (93C46B). Q2, Q3 and Q503 etc. form circuits of charging and RF automatic stop function.

RF MCU U1 integrates a DC-DC converter to convert battery voltage to a stable DC 3V for supplying the mouse. U1 receives signals of SWR, SWL and SWM when working. When the mouse moved by a user, Optical sensor U2 detects the movement and send a signal to U1. All signals are processed in U1 and encoded. X1 is an oscillator of RF generator with frequency 27.042MHz. The frequency is modulated to frequency  $27.045\text{MHz} \pm 3\text{kHz}$ , then amplified and transmitted by an antenna.

When the mouse is connected to a computer at USB port, U301 bridges the computer and RF MCU U1. Q503 switches off RF transmission. Signals are sent to the computer via wire. U301 can memory the working status so that communication can be recovered when the computer reset.

Q2 and Q3 etc. form a charging circuit to charge batteries when their voltage less than 2.9V. Charging is stop automatically when batteries are fully charged. If D4 flashes when the mouse in use, it means batteries should be charged.

The receiver can be inserted to the transmitter unit of the mouse when wire connected to a computer. D3, D5 and D6 just forward power to the mouse. If the mouse works at wireless, the transmitter is changed to standby status once the receiver is inserted to it.