

Sony SNOV RF Wireless Keyboard Circuit Description

The keyboard is simply consisted of two major blocks, one is electronic printed circuit board, the keyboard membrane 18x8 key matrix switches, and the wire loop antenna.

A. Electronic Printed Circuit Board

The keyboard is using Freescale MC68HC08JT8 Micro-Controller Unit, The Micro-Controller is supplied by an external 5MHz Oscillator with an external applied Ceramic Resonator, with the divided by 2 circuitry, the CPU frequency is operating at 2.5MHz.

The CPU perform key scanning on 18x8 matrix, the 18 column outputs are open drain and the firmware will keep continue to have a running "0" pattern to scan the columns, the 8 rows input have an internal pull-up resistor about 20K Ohms, the firmware will detect the 8 rows input every time when the firmware change the running "0" pattern for column in order to make sure any key press or key release in the membrane switch.

If a key press or key release is detected, the firmware will de-bounce the events to make sure it is firmly pressed or released, then converge the key location to the keyboard Scan- codes and pass the special scan-codes to RF transmitter.

RF transmitter generates 2 channels as 27.095MHz and 27.145MHz, which are supplied by an external 13.5475MHz and 13.5725MHz Crystals with the multiplied by 2 circuitry. The transmission channel is selectable. RF modulation is Frequency Shift Key (FSK), constructed by L, C, R and Switching Transistor.

The Keyboard and MCU is supplied by DC voltage, at 3.6Vdc to 2.1Vdc with 2 AA batteries and total currents consumption with RF normal operation mode is no more than 15mA and sleep mode is no more than 100uA.

B. Membrane Key Matrix

The membrane key matrix is consisted of three sheets of plastic mylar sheet, the Top and Bottom sheet is the Row and Column Mylar sheet, respectively, which is printed by conducted paints with respect to the key-matrix, the middle sheet is called "Spacer" mylar which does not have any paint to separate the top and bottom sheets but with a hole on the key position to allow the contact between the Row and Column sheet when the key is pressed.

The resistance of a key when it is pressed start from the connector is about 50 Ohms to 500 Ohms depending of the length the traces of such switch location.

C. Wire Loop Antenna

A Wire Loop Antenna is consisted of RF output signal, located in the Keyboard. A wire is 22 AWG, length is 570 millimeters, one side tied to the RF output end and the other side is tied to the Ground those are directly soldered to the PCBA.