

# User's Manual

자료번호: RD-071008-2

- MODEL NAME: SPR-8695TUH
- TYPE NAME: USB wired mini track-ball keyboard with high speed HUB
- Product CODE: 903U02210101

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SEJIN ELECTRON INC.

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## 1. SPECIFICATION

### 1.1 SCOPE

This document describes the detail specifications for “SEJIN STD” TrackBall USB keyboard

### 1.2. MECHANICAL PECIFICATION

#### 1.2.1 Key switch

**Operating system:** non-lock RUBBER tactile feeling.

Travel amount :  $3.5 \pm 0.5$ mm with measuring load of 200gf applied.

Operating force :  $55 \pm 25$  gf

#### 1.2.2 Key switch Operation

Key switch operating parameters should comply with those listed below.

Figure on the below represents typical pressure force and displacement values acceptable to SEJIN. The force/displacement curve should not exhibit any significant step or plateau from P2 to the end of full travel. Linear measures are in mm and the values represent the force and displacement of a key switch after it has been preloaded by 10 to 20 grams.

Standard: a. Non-lock rubber tactile feeling

b. P0 (Preloaded Point)

Travel = 0 mm / Force = 10 +10/-5 grams

c. P1 (Break over Point)

Travel =  $1.15 \pm 0.25$  mm / Force =  $60 \pm 20$  grams

d. P2 (Make Point)

Travel =  $2.66 \pm 0.25$  mm / Force = P1 - Delta

Delta = 45% to 60% of the P1 force, but 20 grams minimum.

e. P3 (Normally End Point)

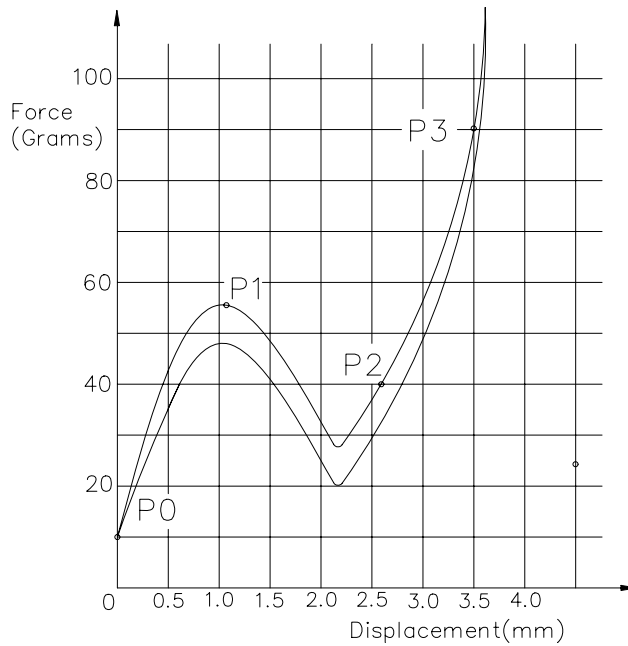
Travel =  $3.8 \pm 0.5$  mm / Force = P1 + 10 to 15 grams

f. Total Displacement at 100 grams

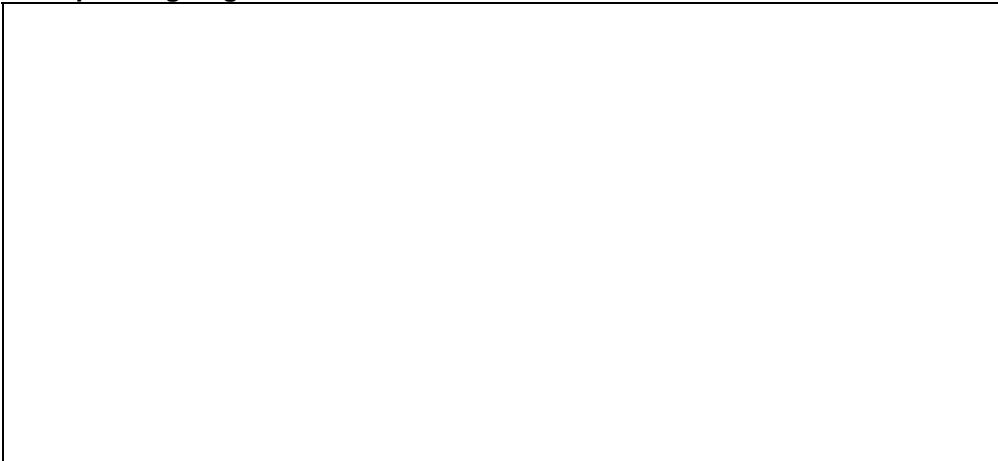
Minimum = 3.2 mm, Nominal = 3.5 mm, Maximum = 4.8 mm

Check Point: a. Operating feeling: No definite stickiness or other abnormality shall be allowed. When force is applied with a finger on the key-top center at the rate of three times a second.

b. Key-top pulling strength: A key-top should come off after applying a force of 0.5Kg to 8Kg range in the vertical direction.



### 1.2.3 Operating Region



### 1.2.4 Key-top Deflection

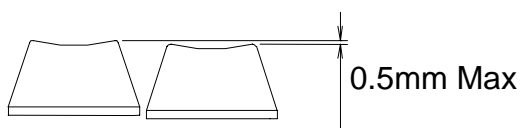
Key-top deflection to on side shall be 0.8mm or less.

### 1.2.5 Operating feeling

No definite stickiness or other abnormality shall be allowed when force is applied with a finger to Key-top center at the rate of 3 times a second.

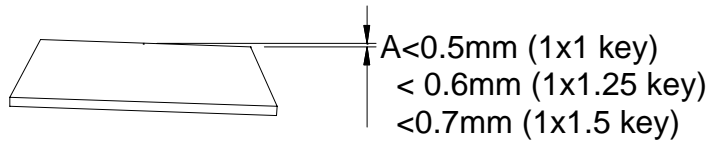
### 1.2.6 Key-top Height Variation

The key top height variation must not greater than 0.5mm when measured between the center to center of keys next to each other. The measurement will be performed with keys in the home positions.



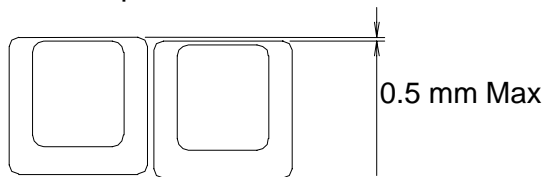
### 1.2.7 Tilt

The keys must not exhibit tilt greater than 0.5mm.for the 1x1 key top, 0.6mm for the 1x1.25 key top and 0.7mm for the 1x1.5 key



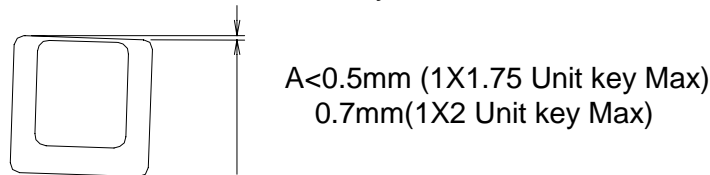
### 1.2.8 Key-top Alignment

The key top alignments will not exceed 0.5mm when top measured between the center to center of keys next to each other. The measurement will be performed with keys in the home positions.



### 1.2.9 Rotational Alignment

The maximum rotation of key shall be less than 0.5mm as shown below.



### 1.2.10 End stroke strength

End stroke should withstand a static load of 500gf applied on the tip of the key stem in the perpendicular direction for 1minute.

### 1.2.11 Key-top pull out force

The Key-top pull out force shall be 0.5kg or more at normal temperature during initial state. The Key-top shall be not pull out by an ordinary typing operation.

### 1.2.12 Information for serial number on the back label

0	C	A	C	0	0	0	0	0	3
Serial No.									
Production line(A=A line, B=B line, C=C line)									
Product revision number(A~Z)									
Produced Month (A~Z)(A=Jan, B=Feb, C=Mar, D=Apr, E=May, F=June, G=July, H=Aug, I=Sept, J=Oct, K=Nov, L=Dec)									
Last Digit of Year(5=2005, 6=2006, 7=2007)									

## 1.3 ELECTRICAL SPECIFICATION

### 1.3.1 Power supply voltage

DC 5.0V

### 1.3.2 Power supply current consumption

Max 500mA

### 1.3.3 Insulation resistance

More than 100M ohm at 250V DC

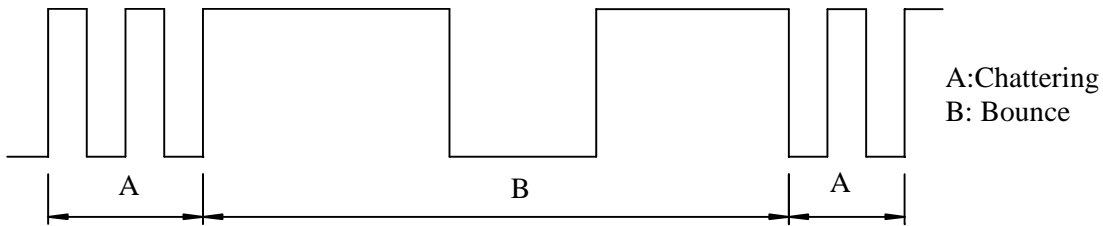
# SPR-8695TUH USB 2.0 HUB KBD

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## 1.3.4 Chattering and bounce

Operation force shall be applied according to the normal operating method at 5V DC, 5mA. There shall be no bounce and chattering within 10msec when it is measured using a specially prepared tester or a synchroscope.

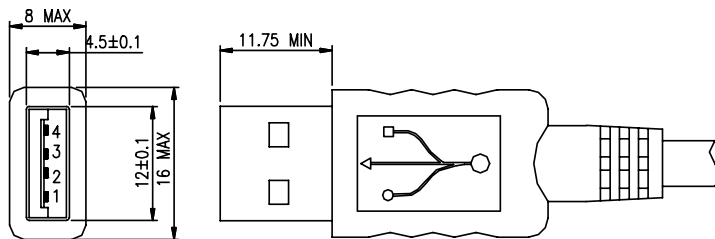
※ Chattering and bounce are defined in the following diagram :



## 1.3.5 "A" plug USB CABLE

### 1.3.5.1 Contact terminating assignment.

Contact Number	Signal Name
1	V <sub>BUS</sub>
2	D-
3	D+
4	GND
Shell	Shield



### 1.3.5.2 Cable length: Straight 1.6 M

## 1.3.6 USB Soft Ware I/F

Compliant with USB Serial Bus Specification (Revision 1.1 September 23, 1998)  
Low speed USB standard for keyboard interface

## 1.3.7 USB HUB

Bus powered USB 2.0 high speed HUB functionality

Two internal USB ports are used for keyboard and smart card reader

Two USB 2.0 high speed downstream ports available for external low power USB devices

The external USB devices that attached on the downstream ports must be low power USB devices which maximum 100mA of power current

## 1.4 ENVIRONMENTAL CHARACTERISTIC

### 1.4.1 Operational ambient temperature and humidity

Temperature : 0 ~ 50°C

Humidity: 85%RH (without condensation)

### 1.4.2 Storage ambient temperature and humidity

Temperature : -20 ~ 60°C

Humidity: 95%RH

## 1.5 ENVIRONMENTAL PERFORMANCE

### 1.5.1 Shock

There shall be no abnormality in operation and appearance of the keyboard when an impact of 10G has been applied to the package keyboard. The testing method shall be in accordance with 213B of MIL-STD-202E

### 1.5.2 Vibration

The keyboard shall not be damaged electrically and mechanically when the following vibration has been applied to the packaged keyboard. The testing method shall be in accordance with 201A of MIL-STD-202E.

Frequency: 10~55Hz

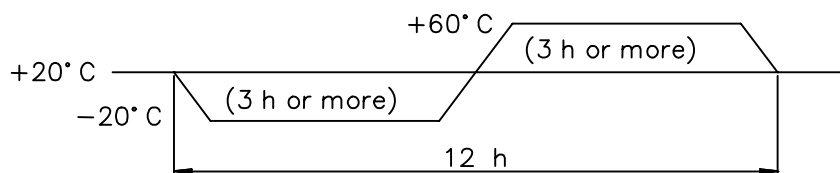
Amplitude: 0.5mm

Direction of vibration: Direction X, Y and Z individually

Time of vibration: 2 hours

### 1.5.3 Heat Cycle Test

Check Method: By the condition shown in the figure below, repeat heat cycle test for 2 times.



Standard: When the test is finished, followings must be satisfied.

- a. All functions operate normally.
- b. There are no defects which harm commercial value, e.g., change of color, rust or change of form.

### 1.5.4 Key life Test

Standard: a. key-switch life: 10,000,000 cycles

- b. Keyboard is qualified using Hasco pneumatic life tester using soft cushion actuator with a 4cycles / second actuation speed 120 ~ 150gf air pressure.

### 1.5.5 Low Temperature Test

Check Method: Leave for 96 hours under -25°C.

Standard: The keyboard operates normally after the test.

### 1.5.6 High Temperature Test

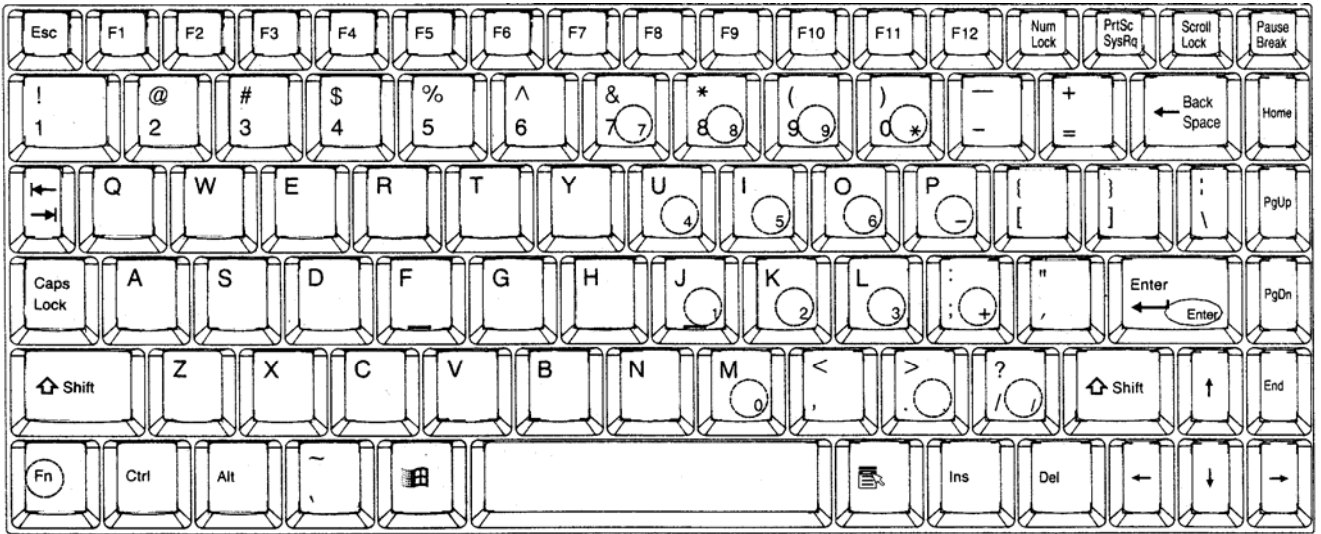
Check Method: Leave for 96hours under +70°C.

Standard: The keyboard operates normally after the test.

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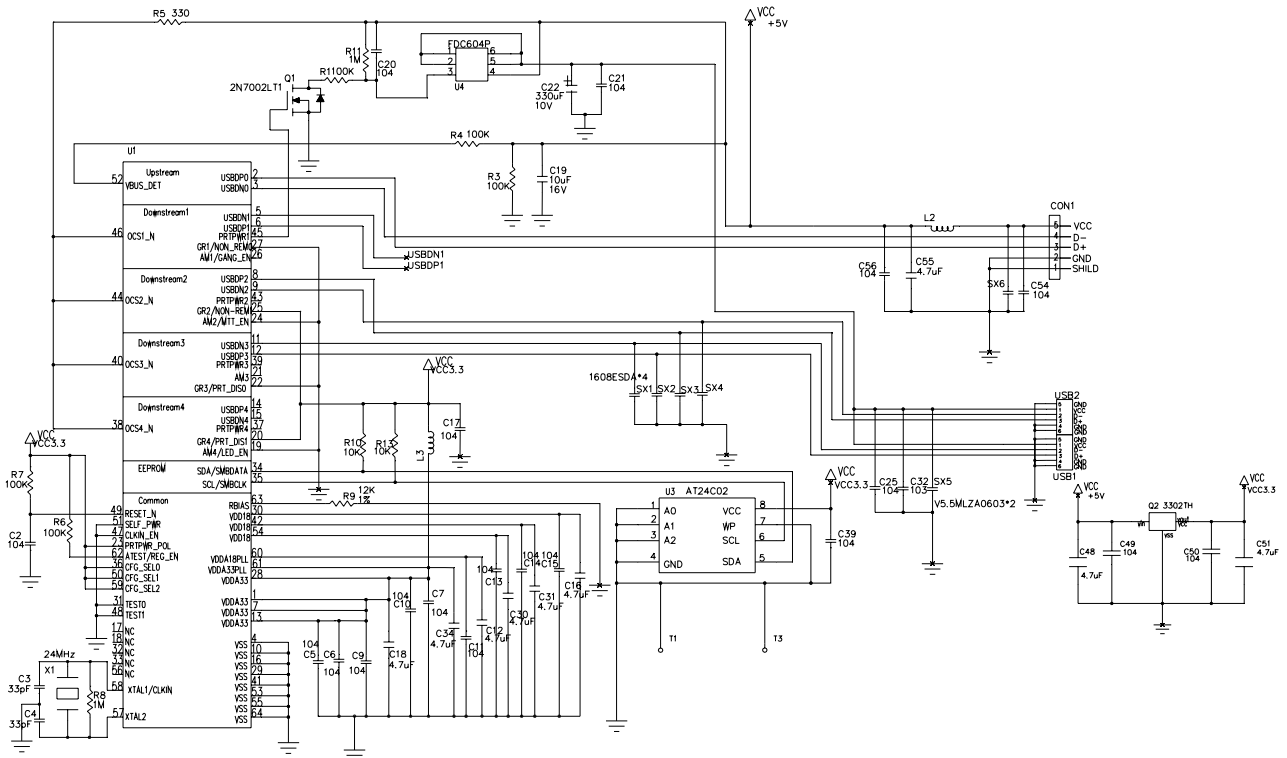
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## 1.6. Layout



## 1.7. Circuit Diagram

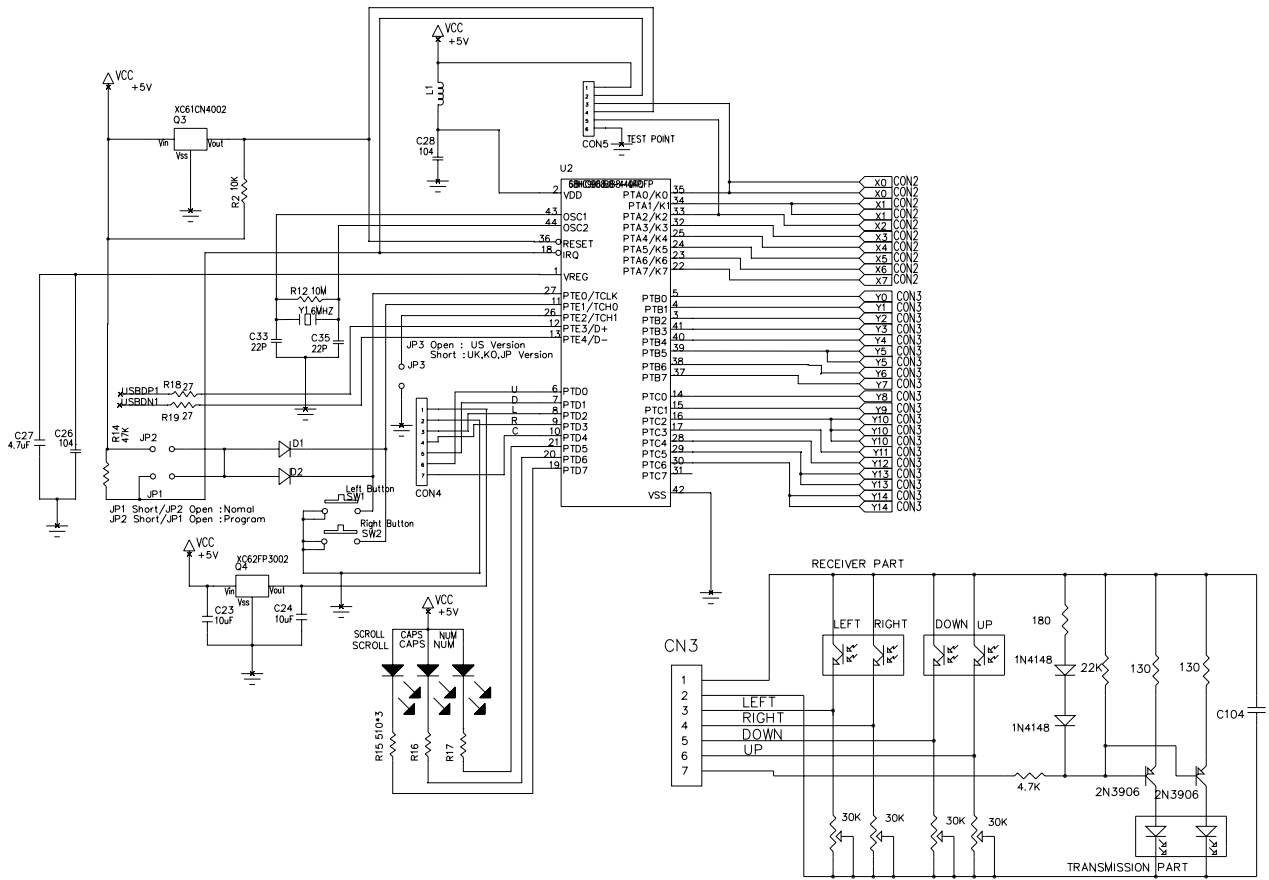
### 1.7.1 HUB 2.0





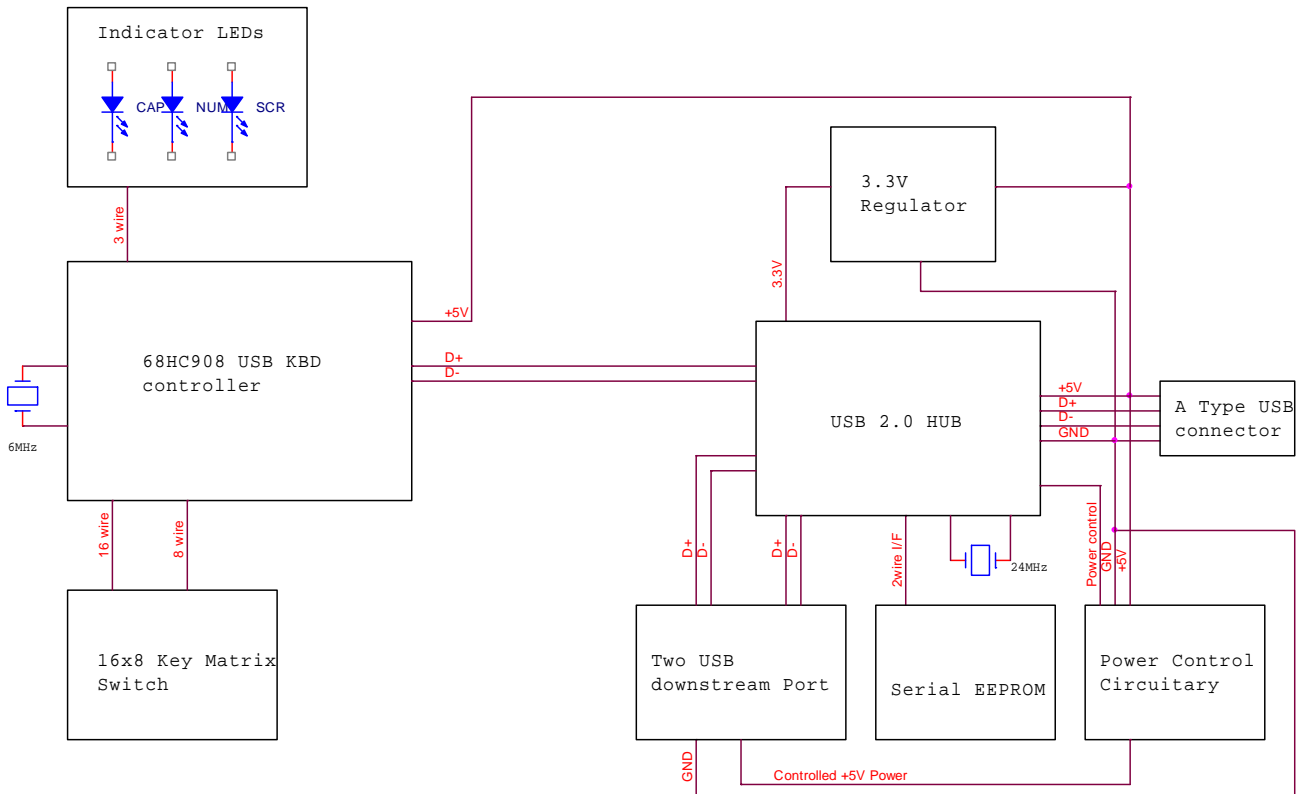
# SPR-8695TUH USB 2.0 HUB KBD

## 1.7.2 KEYBOARD



## 1.8. BLOCK Diagram

SPR-8695TUH Keyboard Block Diagram



## 2. User instruction

**NOTE:** THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.