

4-Bit Electronic Clock DIY Kit

1. Introduction

YSZ-4 four electronic clock, it takes AT89C2051 as its core, a total of 16 electronic components to come true the two channels of the alarm clock, (8:00-20:00) on time alarm ,accurate adjustment , and other functions.

2. Parameter

NO.	Parameter	Value
1	Operating voltage	DC 3V-6V
2	PCB board material	RF-4
3	Size	52mm*42mm

3. Principle

The whole system by MCU minimum system, key input circuit, display circuit, buzzer circuit and power supply parts.

1>. MCU minimum system: including the U1 (AT89C2051), C1, R1 for power on reset circuit .Clock circuit is composed of C2, C3 and Y1.

2>. The pressed key input circuit: composed of S1, S2, short press the button once a loud buzzer rang, long press the button once two loud buzzer rang.

3>. The display circuit: 4bits common cathode and on PR1 Resistors Packs .

4>. Buzzer circuit: composed of Q1, R2 and LS1, short press the button once a loud buzzer rang, long press the button once two loud buzzer rang.

5>. J1 is 5v power supply input terminal, C4 filtering.

4. Operation instruction

It will display 12:59 when Power-on, while is normal interface("hours:minutes").

The both channels of alarm clock are opened. At the same time, the first alarm clock has been set at 13:01. the second alarm clock has been set at 13:02.

After power on, short press S2. The display of digital tube will switch between "hours:minutes" and "minutes:seconds"; Long press S1 to enter the system Settings menu. there are A, B, C, D, E, F, G, H, I submenu. Short press S1 sub-menu plus increase by degrees. finally back to the normal interface

A Sub menu : Correction for hours

Display data will add 1 after press S2. after adjusted the A Submenu, then short press S2 to save the adjusted results and quit A submenu, enter B submenu

B Sub menu : Correction for minutes

Display data will add 1 after press S2. after adjusted the B Submenu, then short press S2 to save the adjusted results and quit B submenu, enter C submenu

C Sub menu: on time alarm switch

The default state is ON (on-time-alarm is open from 8:00 to 20:00)

It will switch between ON and OFF (on-time-alarm is closed) when press S2. Short press S2 to save the adjusted results and quit C submenu, enter D submenu

D Sub menu: The first alarm-clock switch

The default state is ON (the first alarm-clock is opened)

It will switch between ON and OFF (first-alarm-clock is closed) when press S2.

If set to ON, short press S1 to save and quit, then enter E submenu;

If set to OFF, short press S1 to save and quit, then enter G submenu;

E Sub menu: The first alarm clock set for hours

Display data will add 1 after press S2. after adjusted the E Submenu, then short press S2 to save the adjusted results and quit E submenu, enter F submenu

F Sub menu: The first alarm clock set for minutes

Display data will add 1 after press S2. after adjusted the F Submenu, then short press S2 to save the adjusted results and quit F submenu, enter G submenu

G Sub menu: The Second alarm-clock switch

The default state is ON (the second alarm-clock is opened)

It will switch between ON and OFF (second-alarm-clock is closed) when press S2.

If set to ON, short press S1 to save and quit, then enter H submenu;

If set to OFF, short press S1 to save and quit, then enter normal interface;

H Sub menu: The second alarm clock set for hours

Display data will add 1 after press S2. after adjusted the F Submenu, then short press S2 to save the adjusted results and quit H submenu, enter I submenu

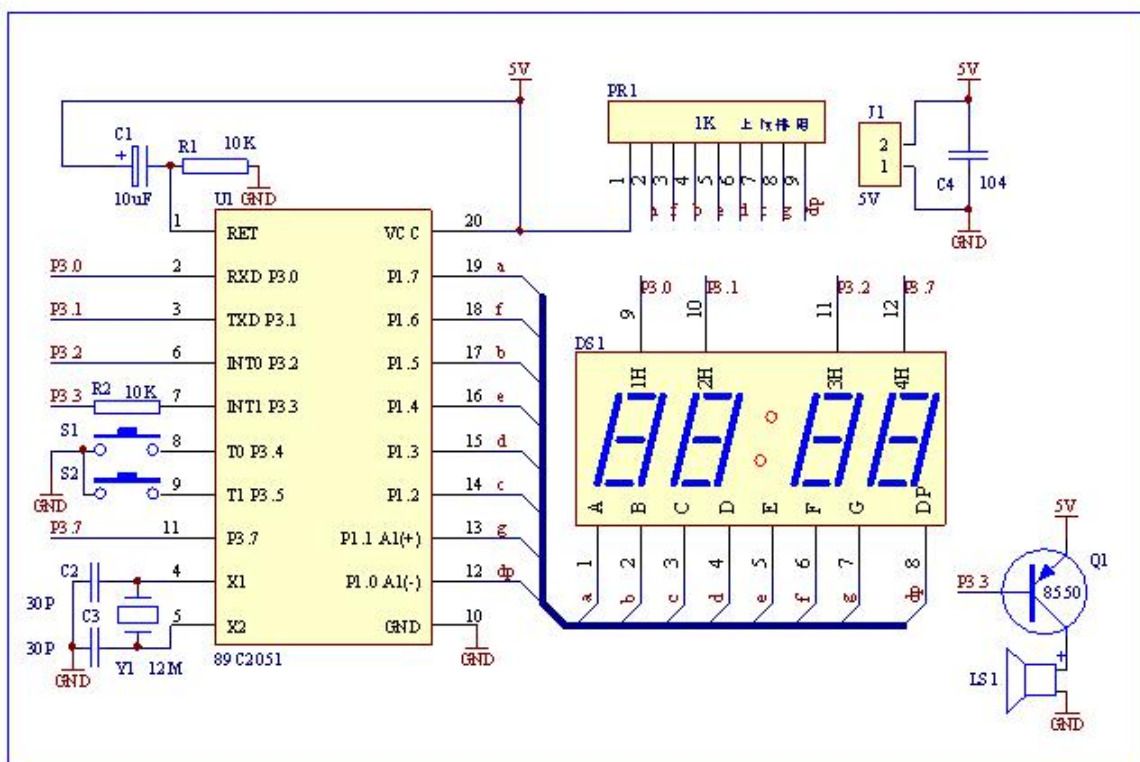
I Sub menu: The second alarm clock set for hours

Display data will add 1 after press S2. after adjusted the I Submenu, then short press S2 to save the adjusted results and quit H submenu, then enter normal interface.

Second correction:

Short press S2 in the normal interface, then enter "minutes : seconds" interface. Long press S2, make the second zero. Then short press S2 twice enter normal interface

5. Schematic



Note: there is direction for PR1 Resistors Packs, there is one side of the word in the direction of the MCU. Pay an attention!!!

6. Component listing

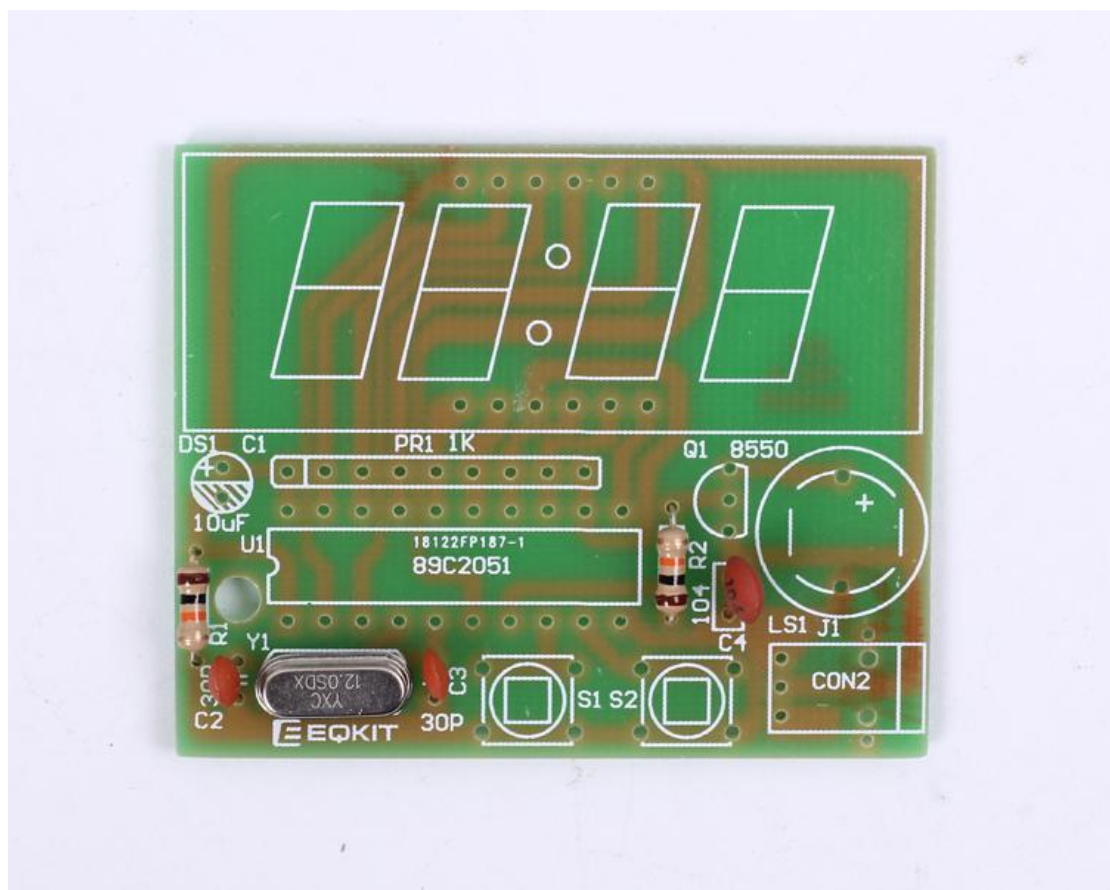
NO.	Component Name	PCB Marker	Parameter	QTY
1	Metal Film Resistor	R1,R2	10K	2
2	Ceramic Capacitor	C2,C3	30pf	2
3	Ceramic Capacitor	C4	0.1uf 104	1

4	Electrolytic Capacitor	C1	10uF/25V	1
5	Network Resistor	PR1	1K	1
6	Crystal Oscillator	Y1	12MHz	1
7	S8550	Q1	TO-92	1
8	Button	S1,S2	6*6*5mm	2
9	AT89C2051	U1	DIP-20	1
10	IC Socket	U1	DIP-20	1
11	Active Buzzer	LS1	5V	1
12	Digital Tube	DS1	4Bit Red	1
13	DC Socket	J1	3.5mm	1
14	Power Cable		USB to 3.5mm	1

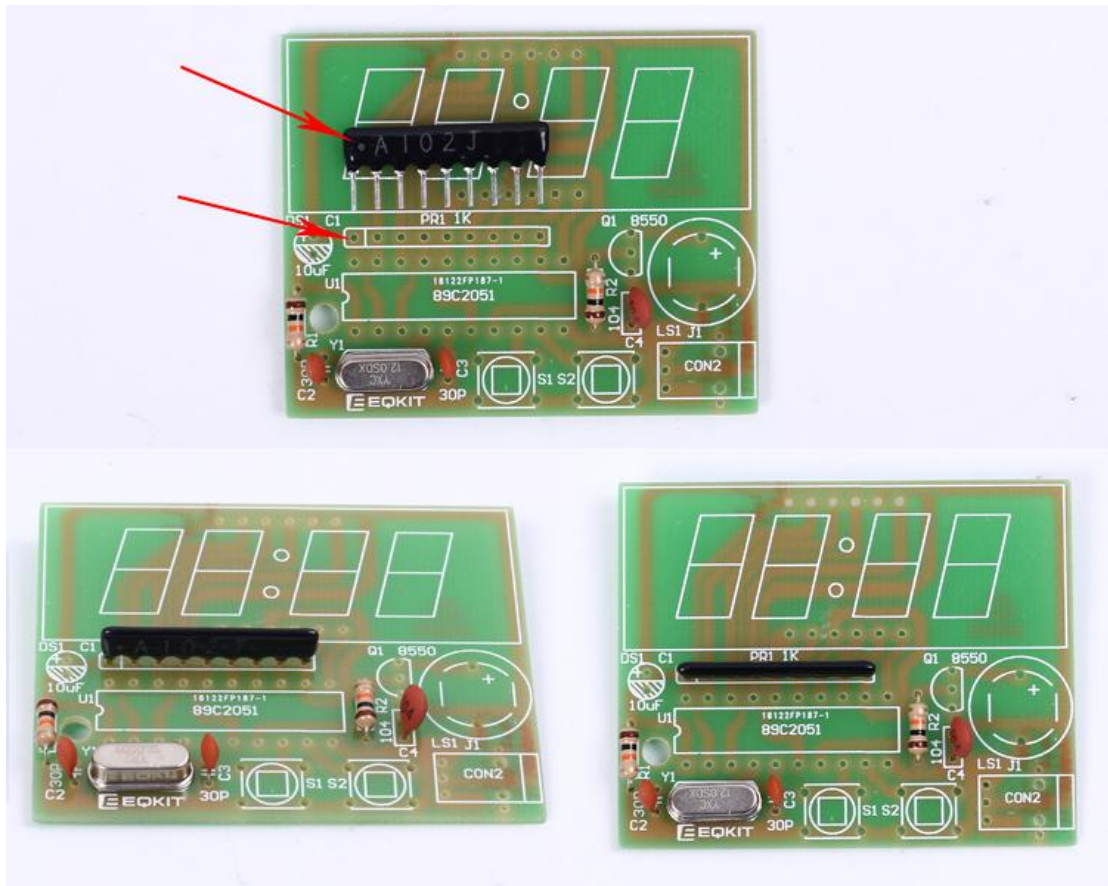
NOTE:Users can complete the installation by PCB silk screen and component listing

7. Installation Steps

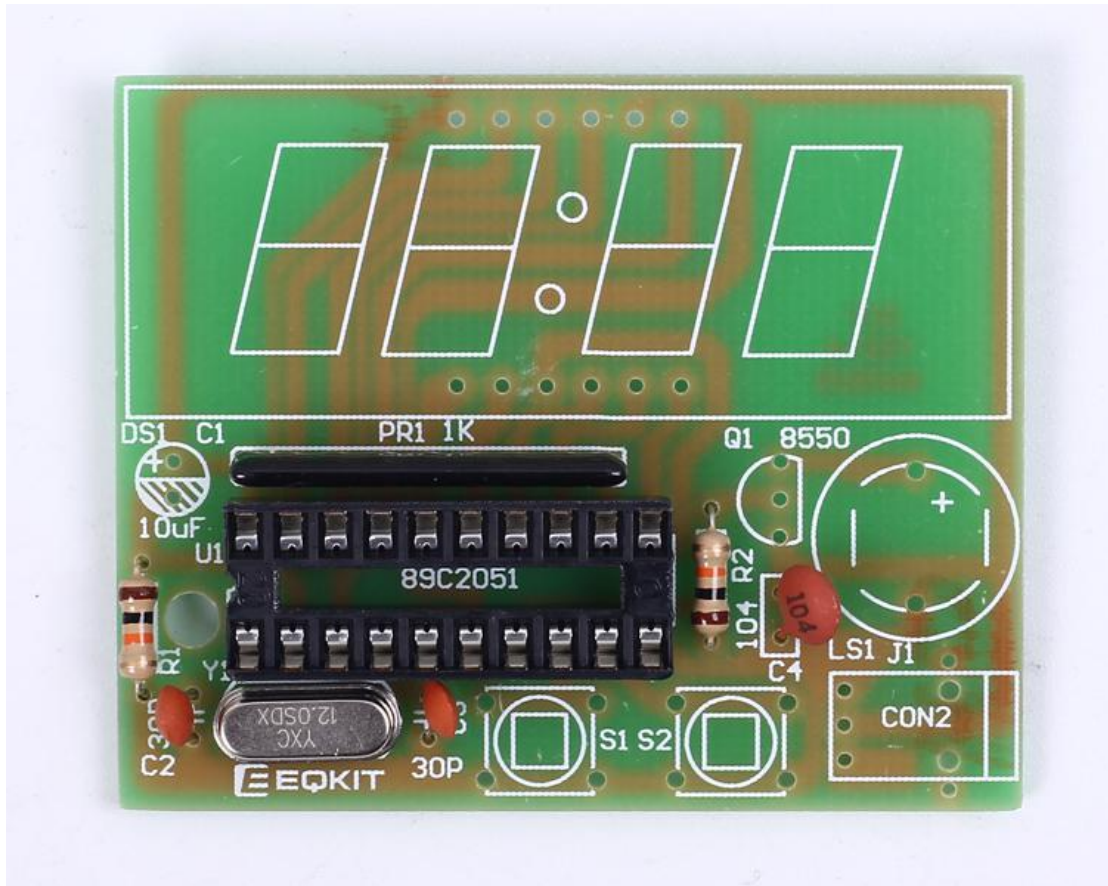
Step 1:Install 2pcs Resistor,3pcs ceramic capacitor,1pcs Crystal Oscillator



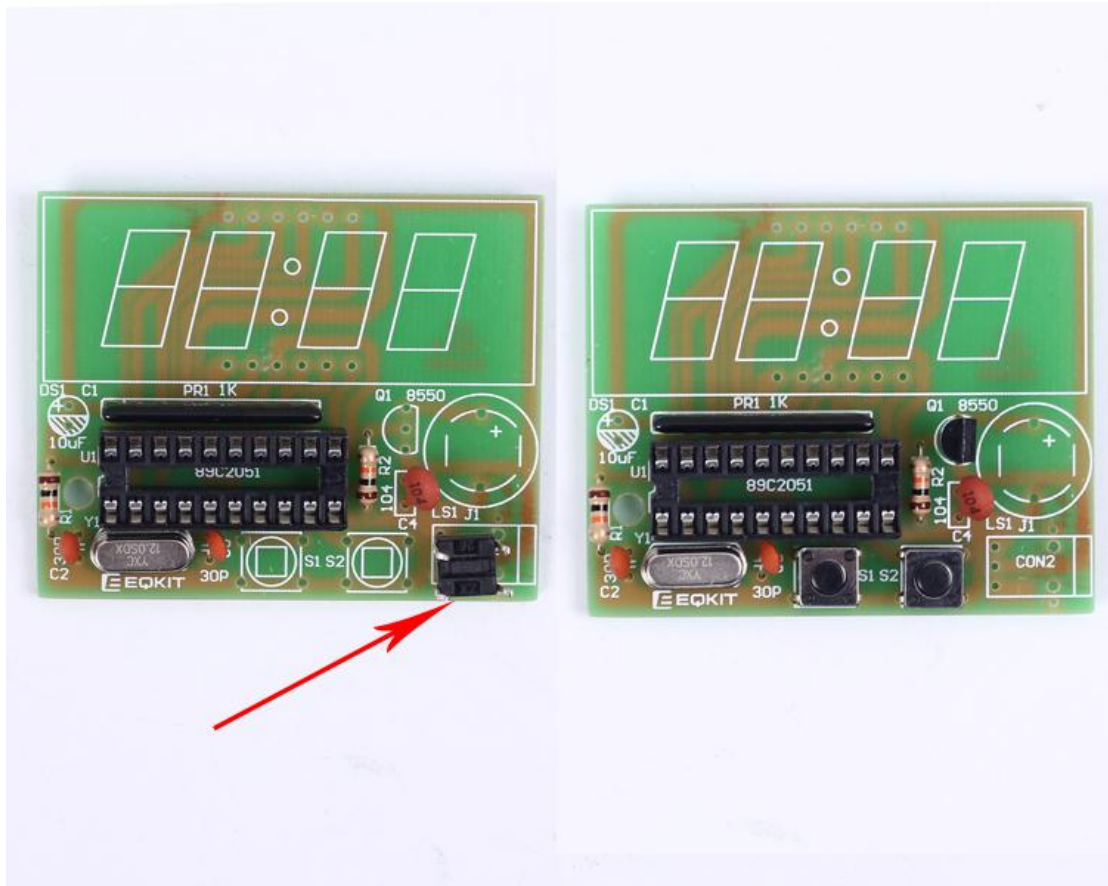
Step 2: Install 1 pcs Network Resistor. Pay attention to the installation direction.



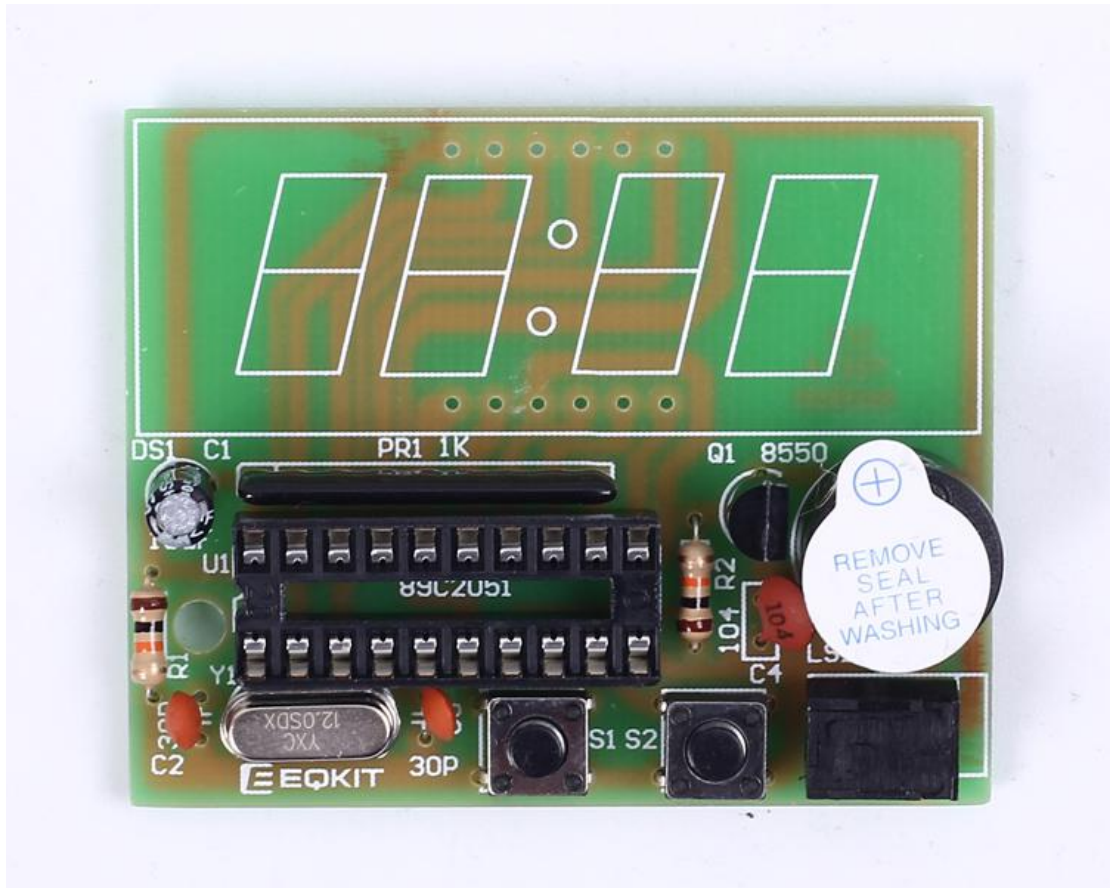
Step 3: Install IC Socket. But pay attention to the installation direction.



Step 4: Install 2pcs button. But pay attention to the installation direction. Install 1pcs S8850.



Step 5: Install 1pcs Power socket;1pcs Electrolytic Capacitor;1pcs Buzzer.



Step 6: Install 4Bit Digital Tube and IC.And then test!



8.Effect demonstration(Only for appreciation)

