Product Specification of YCL-6 Multi-function Electronic Clock Suite

YCL-6 makes the full use of the single-chip resources which is featured with the function of alarm clock, countdown clock, stopwatch and counter.

1. Principle of Operating

The circuit is mainly composed by the single-chip circuit, display circuit, keyboard input, signal ringing circuit and power circuit.

1.single-chip circuit: It's based on AT89C2051 which including the Power-on Reset and clock circuit.

2. Display Circuit: The main component is 2-bit digital tube in red. The driver uses the PNP transistor and it's equipped with current-limiting resistance at every port. It's with scanning-driven way and uses P1.0~P1.6. The colon part use four pieces of diode in Φ3 red with scanning-driven way. And it uses P1.7.

3. keyboard input: The key S1~S3 are with reused function which reused with the display part of P3.5、P3.4 and P3.2. And here is the operating principle.

Output high level at the related PIN to read out the status of keys and debounce via single-chip system to give the keys with corresponding value.

4. Signal Ringing circuit: It's composed by buzzer and PNP transistor. And the operating principle is that the buzzer will send sound in fixed frequency after the PNP transistor turns on. It's with independent port-driven way and uses P3.7. J1 is used for connecting the extrocontrol equipments which will output the low level when there is no ringing signal, or high level with ringing signal.

5. Power Circuit: It's composed by three terminal integrated circuit which will supply the whole system with the stable voltage.

2. Operating Specification

1) Specification of function Keys

S3 is for function choosing key , S2 for function expansion and the S1 for adding the value with one.

2) Operating

It works well if all the components are welded in the right way. And the operating DC voltage is 7V--12V. Please be noted the polarity when connect the power. During the operation, below six functions can be chosen to work, if press the S3 continuously in a short time. And the interval is less than 1 second. Or it goes to the clock function if press the S3 for more than 2 seconds.

Clock Function: It displays 10：10：00 when it's on.

Time checking Function: The time and colon start flashing after Press the S3 for a short time. Press S2 to add one hour and Pree S1 to add 1 minute. But the second time is unadjustable.

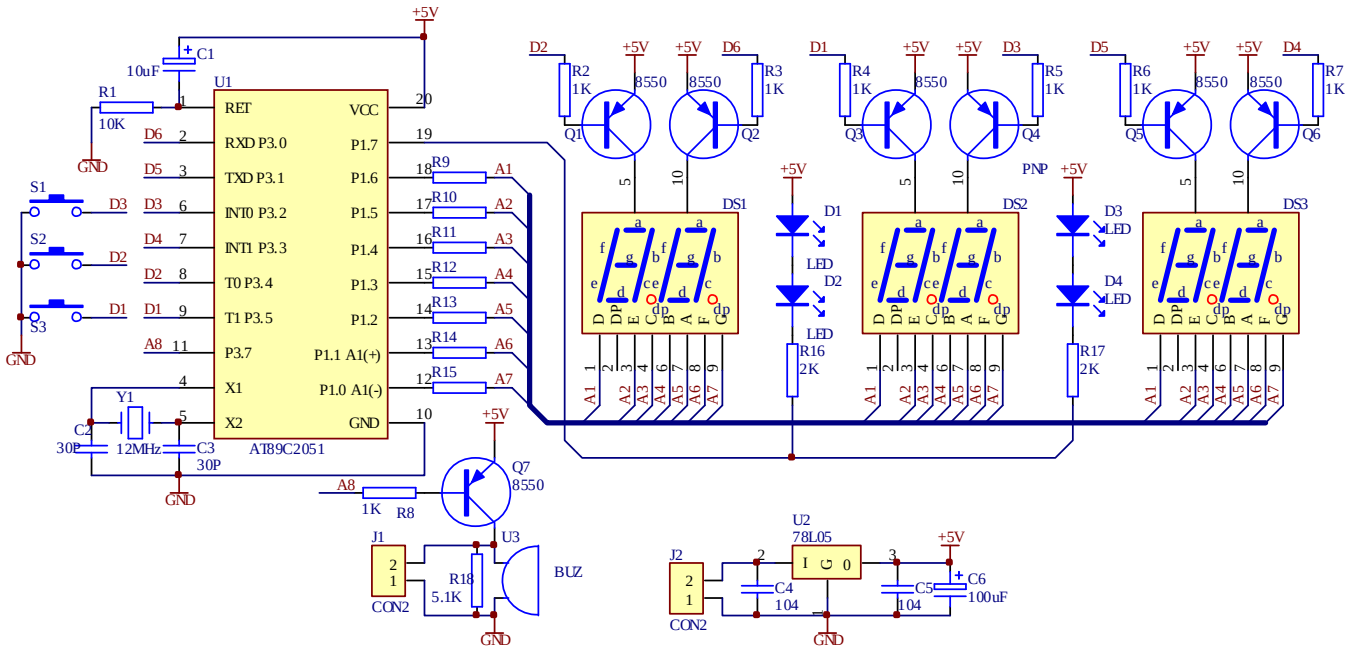
Alarming Function: It displays 22：10：00 and the colon lights after press S3 twice in a short time. Press S2 to add one hour and Pree S1 to add 1 minute. But the second time is unadjustable. When the value of hour is over 23:00pm, it displays ||：||：|| which is the function for turn off the alarming function.

Countdown Function: It displays O and the colon is in dark after press S3 three times in a short time. The hour time is added after pressing S2 and 1 minute is added after pressing S1. It'll start to countdown when press S2 for the sixth time. The time can be adjusted again after pressing S2 for one more time. And the countdown function is off.

Stopwatch Function: It displays 00：00：00 and the colon lights after press S3 four times in a short time. It starts clocking with the stopwatch after pressing S2. And if press S2 one more time, the clocking will be end. And the stopwatch goes to reset status after pressing S1 at this time.

Counter Function: It displays 00 ：00 ：00 and the colon is in dark after press S3 five times in a short time. Press S2 to add the value with one for counter and Pree S1 to let the counter in reset status.

3. Circuit Diagram



4. List of Components

Item Order	Item Name	Specifications	Code	Item Order	Item Name	Specifications	Code
01	Resistor	1K	R9~R15	20	Transistor	S8550	Q1
02		1K	R2~R8	21		S8550	Q2
03		2K	R16~R17	22		S8550	Q3
04		5.1K	R18	23		S8550	Q4
05		10K	R1	24		S8550	Q5
06	Ceramic Capacitor	30P	C2	25		S8550	Q6
07		30P	C3	26		S8550	Q7
08		104	C4	27	Single-chip Circuit	AT89C2051	U1
09		104	C5	28	Three Terminal IC	78L05	U2
10	Electrolytic Capacitor	10uF/25V	C1	29	Quartz Crystal	12MHz	Y1
11		100uF/16V	C6	30	IC Socket	XH2.54(Horizontal) 2P	J2
12	LED	Φ3 Red-to-Red	D1	31		XH2.54(Vertical) 2P	J1
13		Φ3 Red-to-Red	D2	32	Keys	6*6*4.3	S1
14		Φ3 Red-to-Red	D3	33		6*6*4.3	S2
15		Φ3 Red-to-Red	D4	34		6*6*4.3	S3

16	Digital Tube	4 inches 2-bit Red	DS1	35	IC Socket	20P	U1
17		4 inches 2-bit Red	DS2	36	PCB	49*97.5mm	1
18		4 inches 2-bit Red	DS3	37	Power Wire	2P (Single)150mm	1
19	Buzzer	5V	U3	38			