

PROJECT SPECIFICATION

- Project Code : SS0904
- Project Title : CALCULATOR CLOCK WITH WORLD TIME
- CPU : SS0904
- Version : A
- Date : 1998-8-21
- File Name : SS0904 a.DOC

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1. GENERAL DESCRIPTION

1. Introduction

The SS0904 is a single chip microcomputer that can support seven kinds of application i.e. clock, alarm, calendar, world time, second time units exchange and calculator.

2. Basic Features

- The operating voltage is 1.5V
- Crystal oscillation operates at 32.768KHz
- Built-in LCD driver directly drive 1/3 Bias and 1/4 duty, Operation on 4.5V
- 7 modes in one chip which are clock, alarm, calendar, world time, second time units exchange and calculator.

Clock mode display hour, minute and second, 12 or 24 hour selectable.

Alarm mode the alarm is a daily alarm and can be set in hour and minute.

Calendar mode a calendar with month, date, day of week

World time mode display 16 city time.

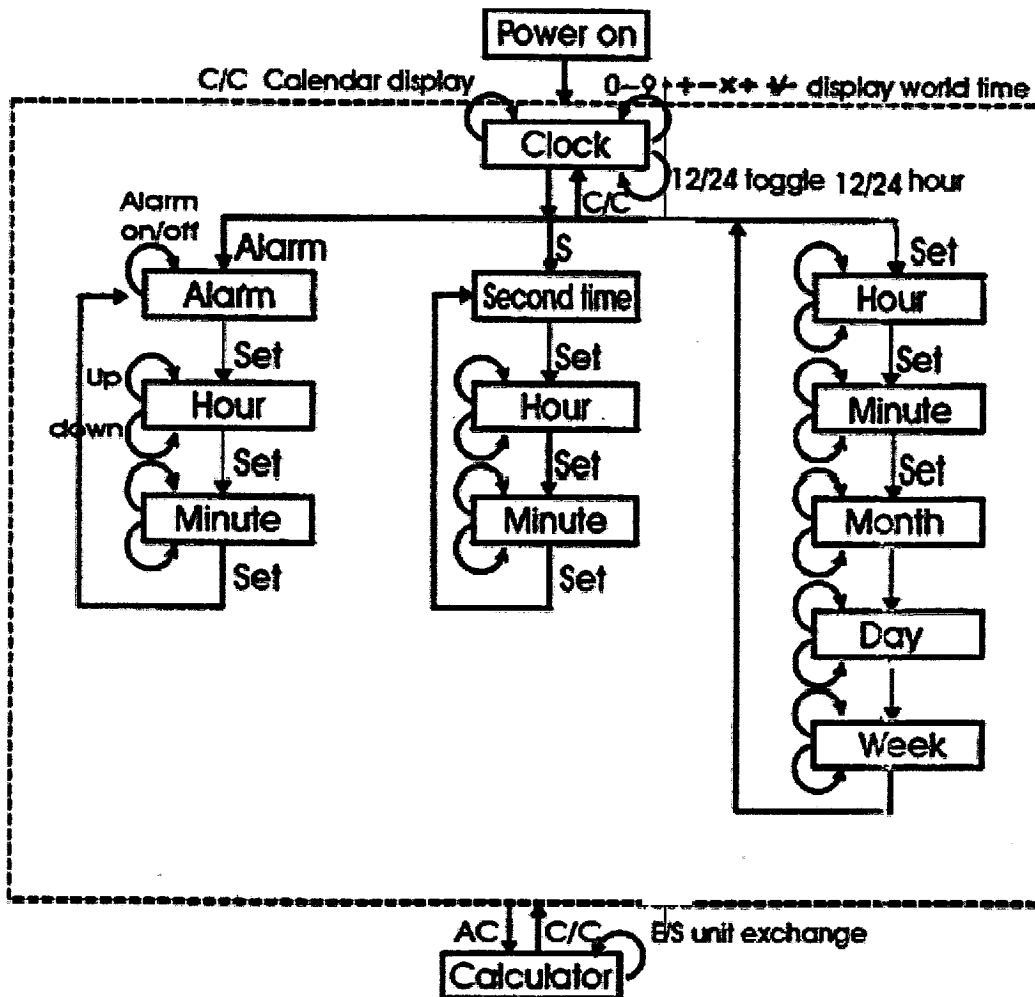
Second time mode display second time.

Units exchange mode 16 kinds of units exchange.

Calculator mode 8 digit calculator with basic arithmetic operation (addition, subtraction, multiplication and division), plus memory operations such as M+, M-, MR and MC

- Auto return to clock mode.

2. OPERATION FLOWCHART



Remark:

- Up : increase the setting digit.
- Down : decrease the setting digit.

3. KEY ASSIGNMENT AND FUNCTIONS

3.1 Key Layout


M+	M-	MR	MC	C/C
up	down	set	clear	
7	8	9	/	AC
London	Paris	Cairo	Riyadh	
4	5	6	x	♪
Kiotochi	Bangkok	Hong Kong	Tokyo	
1	2	3	-	E/S
Spokane	Wellington	Hawaii	Los Angeles	
0	.	±	+	=
Denver	Chicago	New York	San De Janeiro	12/24

M+	M-	MR	MC	C/C
up	down	set	clear	
7	8	9	/	AC
inch→cm	cm→inch	foot→metre	metre→foot	
4	5	6	x	♪
yard→metre	metre→yard	mile→km	km→mile	
1	2	3	-	E/S
gallon→litre	litre→gallon	ounce→g	g→ounce	
0	.	±	+	=
pound→kg	kg→pound	°C→°F	°F→°C	12/24

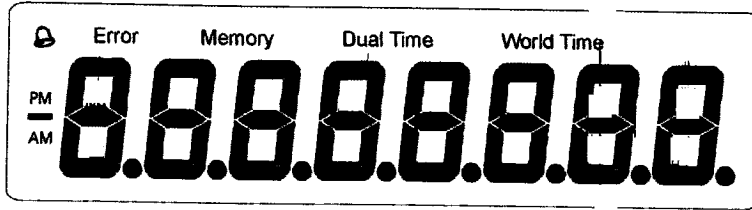
Remark:

- AC : all clear
- C/C: clock/Calendar
- ♪ : key tone
- E/S: units exchange/second time

3.2 Key Function

- 0-9 : decimal digit entry in calculator mode.
display world time in real time clock mode.
units exchange in units exchange mode.
- . : decimal point entry .
display world time in real time clock mode.
unit exchange in unit exchange mode.
- M+/UP : add display value to memory buffer in calculator mode.
increase the setting digit in clock, alarm, calendar, second time setting mode.
- M-/DOWN : subtract display value to memory buffer in calculator mode.
decrease the setting digit in clock, alarm, calendar, second time setting mode.
- MR/SET : memory recall in calculator mode.
enter clock, alarm, calendar, second time setting mode in clock, alarm, calendar, second time mode.
- MC/ALARM : memory clear in calculator mode.
enter alarm mode in clock, calendar, second time mode.
- +/- : change sign in calculator mode.
display world time in real time clock mode.
units exchange in units exchange mode
- +, -, ×, / : operate the four basic arithmetic operation in calculator mode.
display world time in real time clock mode.
units exchange in units exchange mode
- =/12/24 : start calculation in calculator mode.
select 12/24 hour in real time clock mode.
- E/S : units exchange in calculator mode.
enter second time mode in real time clock mode.
- CIC : return to clock in other mode.
enter calendar display mode in real time clock mode.
- AC : clear all calculation procedure.
enter calculator mode in other modes.
-  : toggle on/off key tone.

4. LCD PATTERN



Pin1

Pin22

S17	S16	S15	...	S2	S1	S0	C0	C1	C2	C3
-----	-----	-----	-----	----	----	----	----	----	----	----

- Bias $\frac{1}{3}$
- Duty $\frac{1}{4}$
- Operation Voltage 4.5V
- Total segments 72




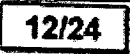


5. OPERATIONAL DESCRIPTION

5.1 Power On Reset Status

Calendar: 1-1 sunday Real time clock: 12:00 00 AM HongKong






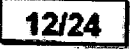
Alarm : 12:00 AM alarm off Second time: 12:00 AM

5.2 Real Time Clock Mode


- Press  key to enter calculator mode
- Press  key to enter calendar display mode.
- Press  key to enter alarm mode.
- Press  key to toggle on/off 12 or 24 hour format.
- Press 0~9 , . , + , - , × , ÷ key to display world time
- Press  key to enter clock setting mode.
- Press  key to toggle on/off key tone.

5.3 World time mode

5.4 Alarm Mode

- Press  key to enter real time clock mode.
- Press  key to enter calculator mode.
- Press  key to enter alarm setting mode.
- Press  key to toggle on/off alarm.
- Press  key to toggle on/off key tone.
- Press  key to toggle on/off 12 or 24 hour format.
- Press 0~9 , . , + , - , × , ÷ key to display world time

5.5 Clock and calendar Setting Mode

- Press  key ,the setting sequence is followed.

CALCULATOR CLOCK WITH WORLD TIME

SS0904



- Press **UP** key to increase the setting digit.
- Press **DOWN** key to decrease the setting digit.
- Press **ALARM** key to enter alarm mode.
- Press **AC** key to enter calculator mode.
- Press **C/C** key to enter clock mode.
- Press **♪** key to toggle on/off key tone.
- Press **12/24** key to toggle on/off 12 or 24 hour format.
- Press **0-9** , **.** , **+** , **-** , **×** , **÷** key to display world time

5.6 Alarm Setting Mode



- Press **SET** key to select the setting digit.







- Press **UP** key to increase the setting digit.
- Press **DOWN** key to decrease the setting digit.
- Press **ALARM** key to enter alarm mode.
- Press **AC** key to enter calculator mode
- Press **C/C** key to enter clock mode.
- Press **♪** key to toggle on/off key tone.
- Press **12/24** key to toggle on/off 12 or 24 hour format.
- Press **0-9** , **.** , **+** , **-** , **×** , **÷** key to display world time

5.7 Second time Mode





- Press **ALARM** key to enter alarm mode.
- Press **C/C** key to enter real time clock mode
- Press **AC** key to enter calculator mode.
- Press **SET** key to enter second time setting mode.

- Press  key to toggle on/off key tone.
- Press  key to toggle on/off 12 or 24 hour format.
- Press 0~9 , . , + , - , × , ÷ key to display world time



5.8 Second time setting mode

- Press  key to enter alarm mode.
- Press  key to enter real time clock mode.
- Press  key to enter calculator mode
- Press  key to select the setting digit.



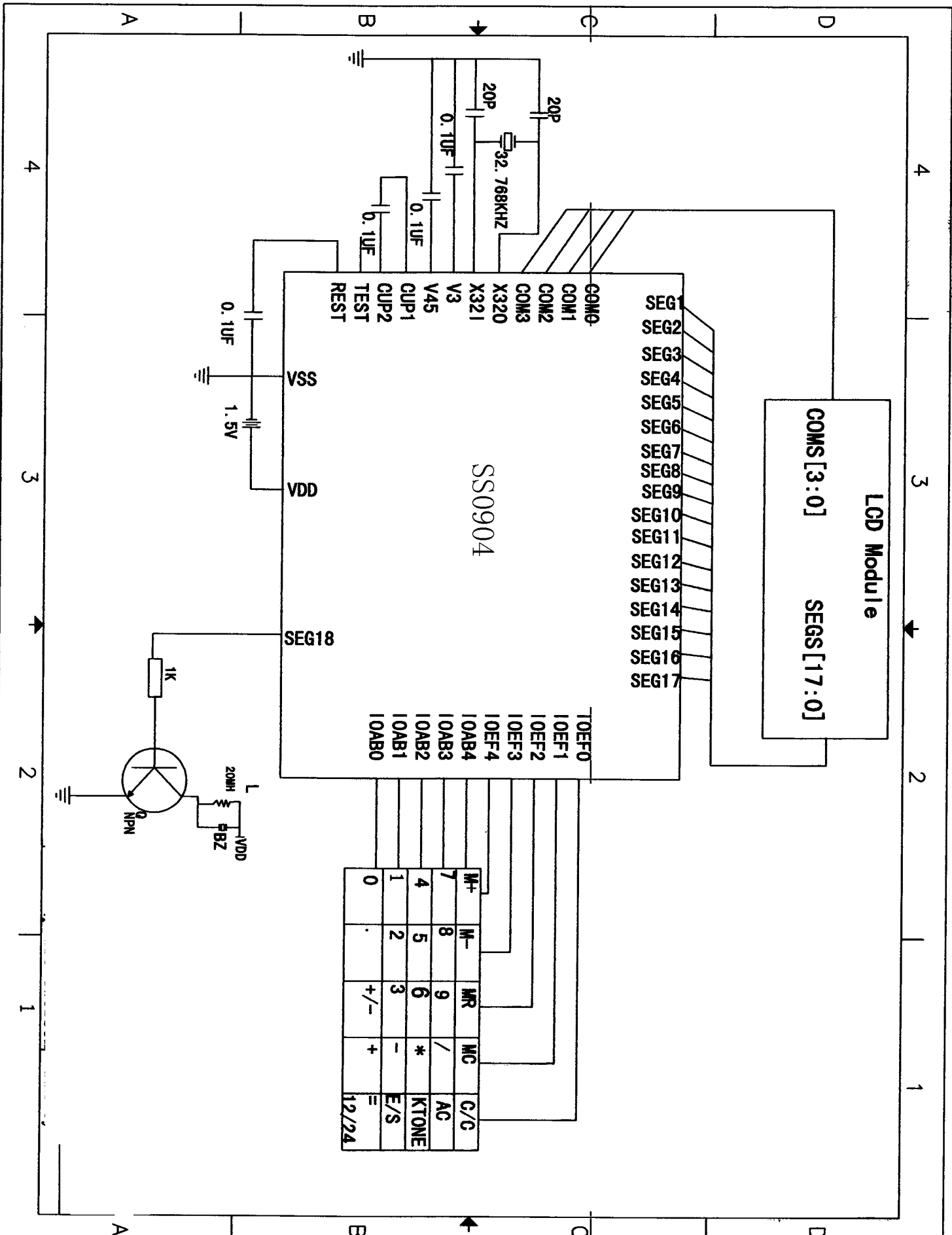
- Press  key to increase the setting digit.
- Press  key to decrease the setting digit.
- Press  key to toggle on/off key tone.
- Press  key to toggle on/off 12 or 24 hour format.
- Press 0~9 , . , + , - , × , ÷ key to display world time .

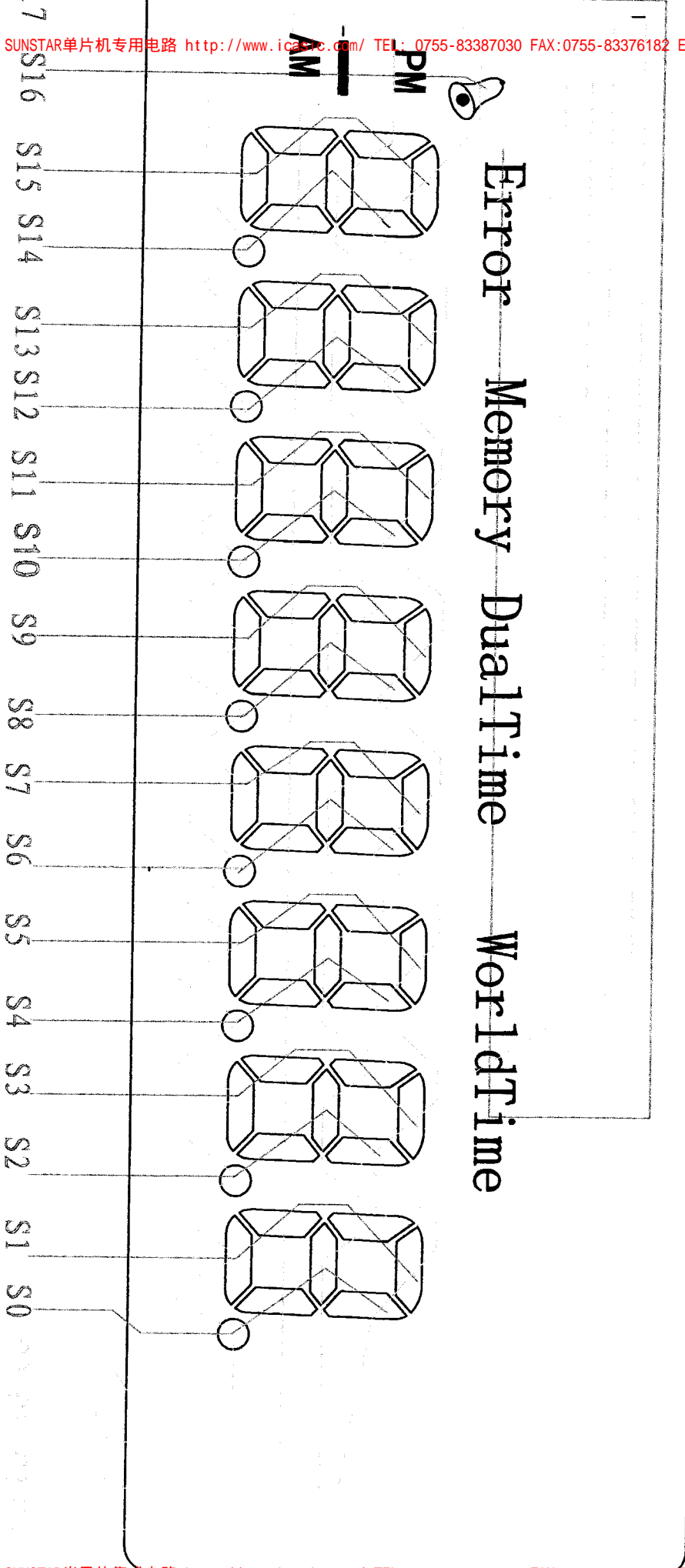
5.9 Calculator Mode

- Press  key to enter real time clock mode.
- Press  key to toggle on/off key tone.
- 8 digit simple calculator with memory.
- Input digits ,then press E/S key to enter units exchange mode, press 0-9 , +/- key to exchange.

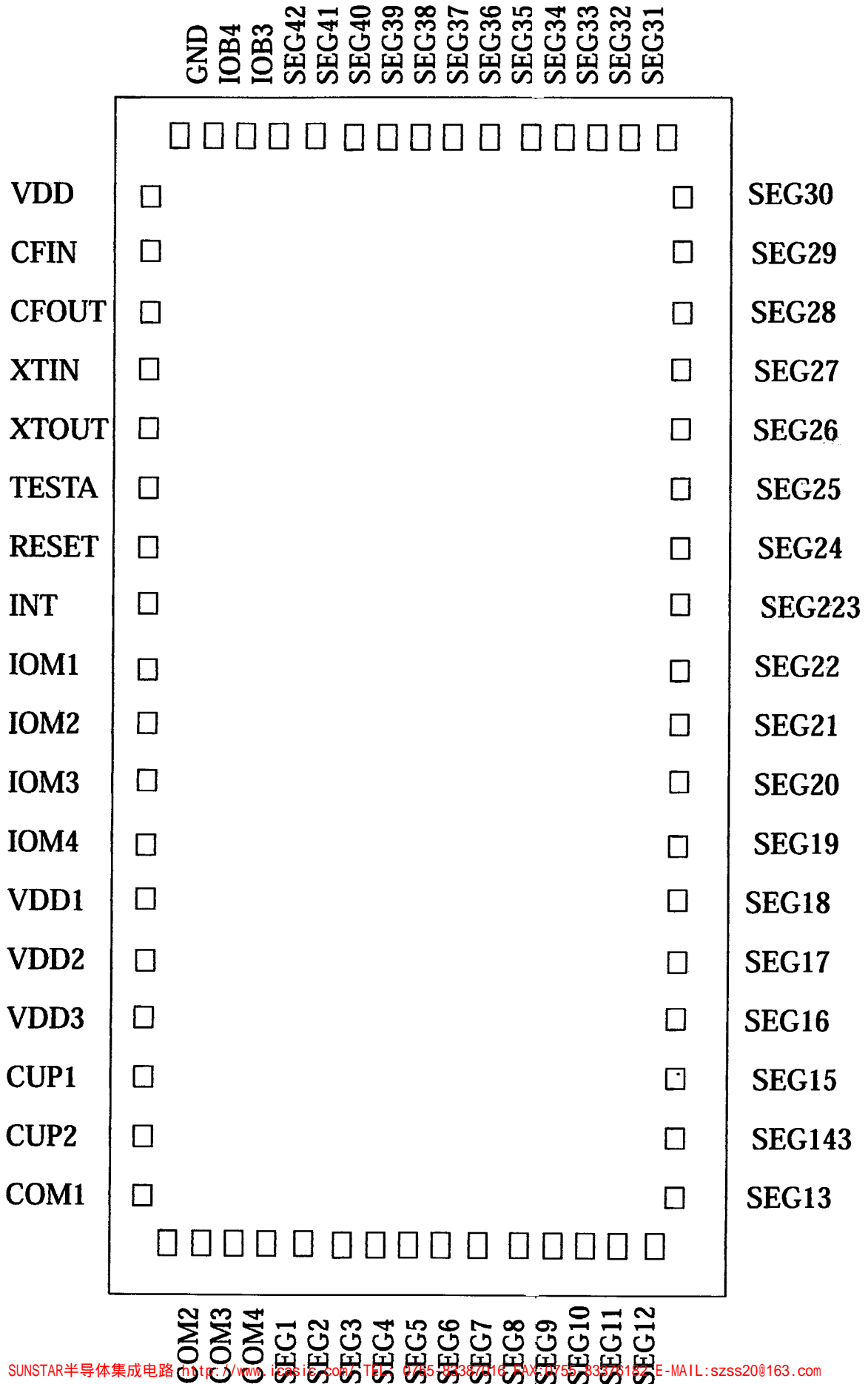
6. APPLICATION CIRCUIT

See attached pages.





IC 脚位图:



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