

SS0920 *World Time, Calendar, Currency Exchange & 8D Calculator*

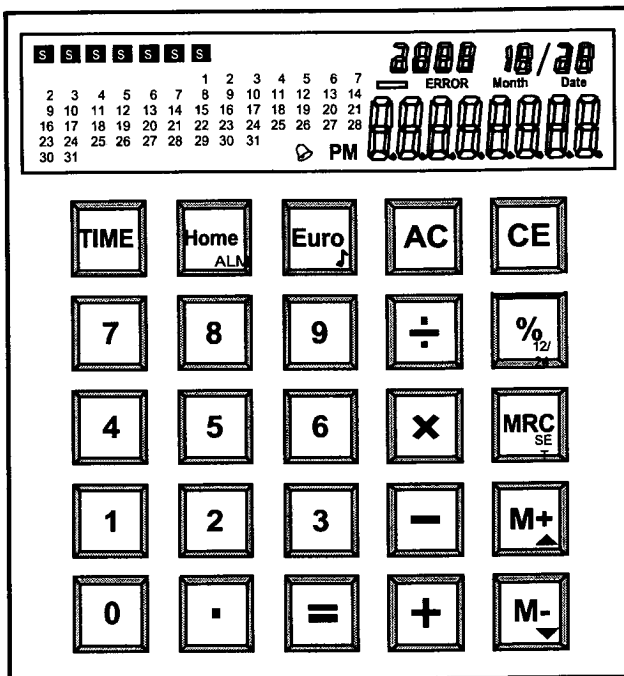
I. Features

- 2 LCD selection, suitable for MC738 & MC739
- 12/24 hours mode clock
- A Perpetual Calendar (year range from 1900 to 2099)
- Month search function
- World time for 16 cities
- An alarm timer (selectable alarm sound can be choice from 3 Bi Bi tones or 4 melodies)
- A Count Down Timer (max. 99hr 59m 59s)
- Smart UP and DOWN keys
- Keytone function
- 8 digits calculator with "+", "-", "x", "÷" and "%" functions
- Memory operation "M+", "M-" and "MRC"
- Two Currencies Exchange
- Two decimal points round up in currencies conversion
- Operating Voltage 3V

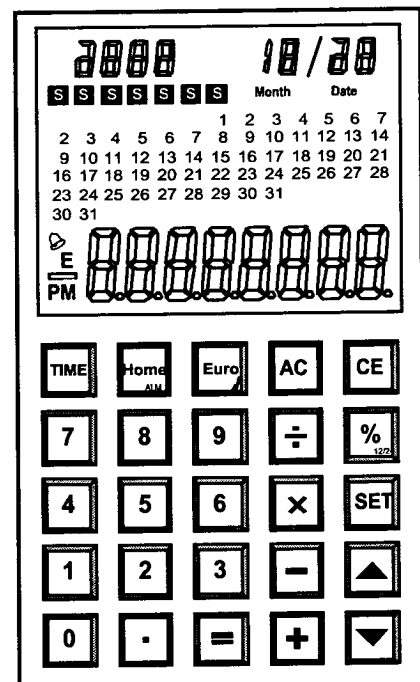
Bonding option for LCD selection and 12/24 hrs mode selection

II. Product Outlook

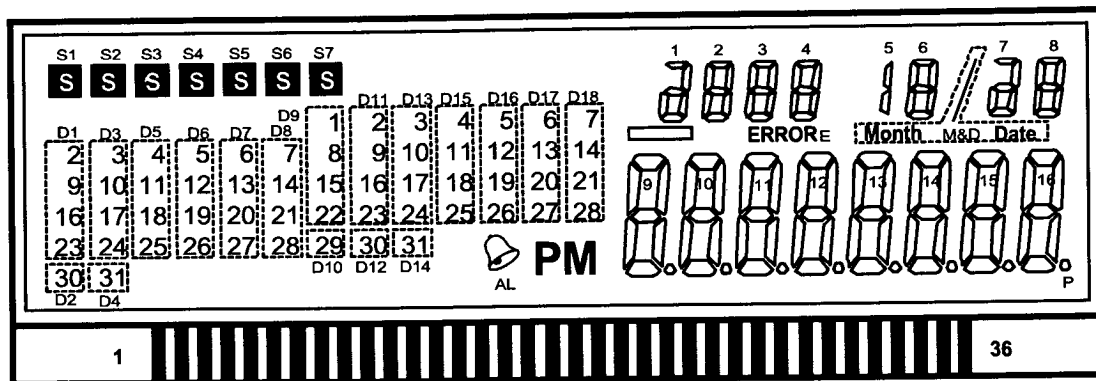
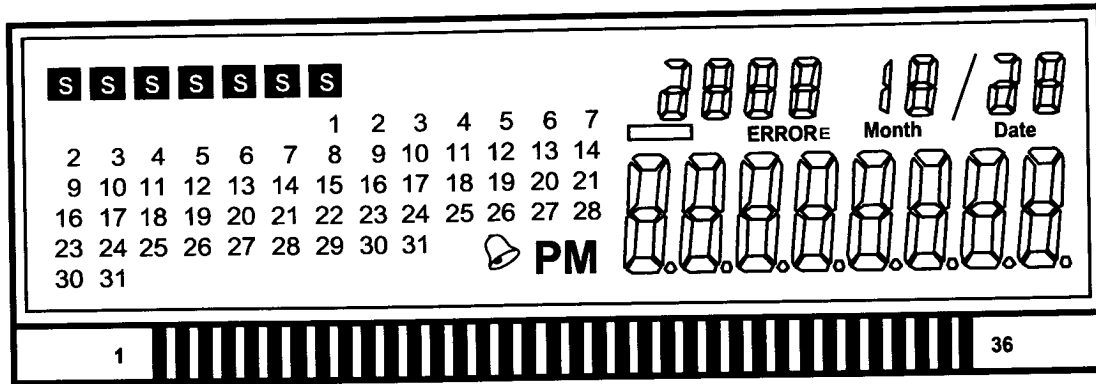
LCD MC739 Model



LCD MC738 Model



III. LCD MC739 Layout Diagram 1



| IC Pin | LCD Pin | COM0 | COM1 | COM2 | COM3 | IC Pin | LCD Pin | COM0 | COM1 | COM2 | COM3 |
|--------|---------|--------|------|--------|-------------------|--------|---------|------|--------|------|------|
| SEG34 | 1 | 8C | 8G | 8E | 1B, M&D, 2ABCD | SEG15 | 20 | 10P | 10C | 10B | 10A |
| SEG33 | 2 | 8B | 8F | 7C | 8D | SEG14 | 21 | 11D | 11E | 11G | 11F |
| SEG32 | 3 | 8A | 7B | 7AGD | 7E | SEG13 | 22 | 11P | 11C | 11B | 11A |
| SEG31 | 4 | 6A | 6B | 6C | 6D | SEG12 | 23 | 12D | 12E | 12G | 12F |
| SEG30 | 5 | 5BC | 6F | 6G | 6E | SEG11 | 24 | 12P | 12C | 12B | 12A |
| SEG29 | 6 | 4B | 4C | 4D | E | SEG10 | 25 | 13D | 13E | 13G | 13F |
| SEG28 | 7 | 4A | 4G | 4E | - | SEG9 | 26 | 13P | 13C | 13B | 13A |
| SEG27 | 8 | 4F | 3B | 3C | 3D | SEG8 | 27 | 14D | 14E | 14G | 14F |
| SEG26 | 9 | 3A | 3F | 3G | 3E | SEG7 | 28 | 14P | 14C | 14B | 14A |
| SEG25 | 10 | D1, S1 | S2 | S3 | S4 | SEG6 | 29 | 15D | 15E | 15G | 15F |
| SEG24 | 11 | D2 | D4 | D3 | D5 | SEG5 | 30 | 15P | 15C | 15B | 15A |
| SEG23 | 12 | D8 | D7 | D6 | S5 | SEG4 | 31 | 16D | 16E | 16G | 16F |
| SEG22 | 13 | D14 | D10 | D9 | S6 | SEG3 | 32 | 16P | 16C | 16B | 16A |
| SEG21 | 14 | D13 | D12 | D11 | S7, D18 | SEG2 | * | *CAL | *TIMER | | |
| SEG20 | 15 | AL | D15 | D16 | D17 | COM1 | 33 | COM0 | | | |
| SEG19 | 16 | P | M | 1C, 2G | 1ADEG, 2E | COM2 | 34 | | COM1 | | |
| SEG18 | 17 | 9D | 9E | 9G | 9F | COM3 | 35 | | | COM2 | |
| SEG17 | 18 | 9P | 9C | 9B | 9A | COM4 | 36 | | | | COM3 |
| SEG16 | 19 | 10D | 10E | 10G | 10F | | | | | | |

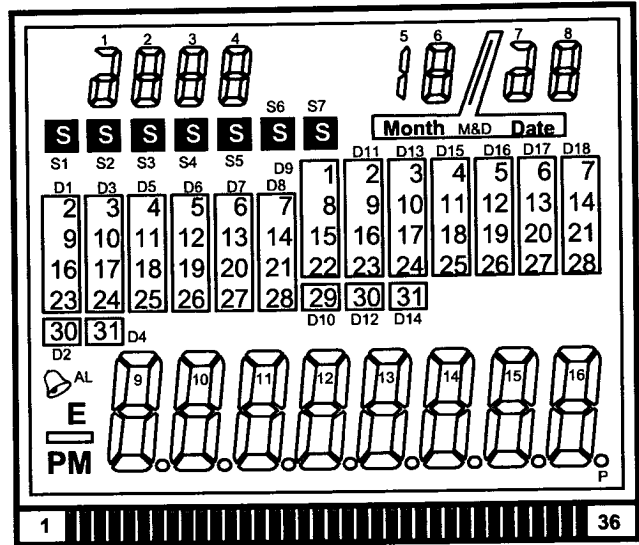
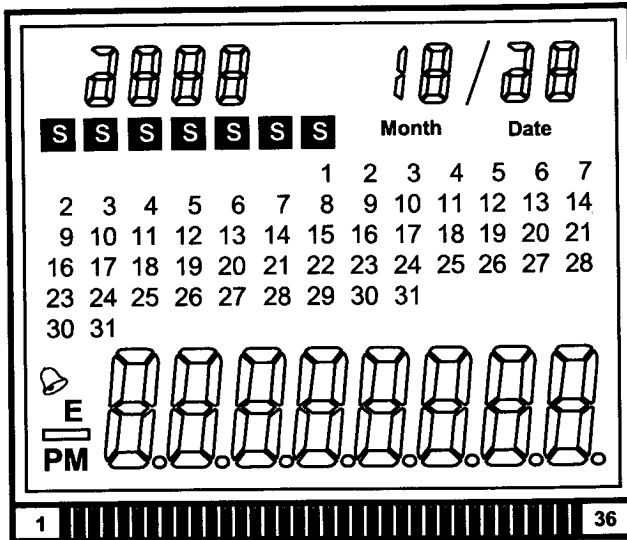
* Additional dots for touch panel LCD, "CAL" for calculator mode and "Timer" for Timer mode.

LCD Voltage = 3 Volt

LCD Duty = 1/4

LCD Bias = 1/3

IV. LCD MC739 Layout Diagram 2



| IC Pin | LCD Pin | COM0 | COM1 | COM2 | COM3 | IC Pin | LCD Pin | COM0 | COM1 | COM2 | COM3 |
|--------|---------|--------|------|--------|---------------------|--------|---------|------|--------|------|------|
| SEG34 | 1 | 8C | 8G | 8E | 1B, M&D, 2ABCD F | SEG15 | 20 | 10P | 10C | 10B | 10A |
| SEG33 | 2 | 8B | 8F | 7C | 8D | SEG14 | 21 | 11D | 11E | 11G | 11F |
| SEG32 | 3 | 8A | 7B | 7AGD | 7E | SEG13 | 22 | 11P | 11C | 11B | 11A |
| SEG31 | 4 | 6A | 6B | 6C | 6D | SEG12 | 23 | 12D | 12E | 12G | 12F |
| SEG30 | 5 | 5BC | 6F | 6G | 6E | SEG11 | 24 | 12P | 12C | 12B | 12A |
| SEG29 | 6 | 4B | 4C | 4D | E | SEG10 | 25 | 13D | 13E | 13G | 13F |
| SEG28 | 7 | 4A | 4G | 4E | - | SEG9 | 26 | 13P | 13C | 13B | 13A |
| SEG27 | 8 | 4F | 3B | 3C | 3D | SEG8 | 27 | 14D | 14E | 14G | 14F |
| SEG26 | 9 | 3A | 3F | 3G | 3E | SEG7 | 28 | 14P | 14C | 14B | 14A |
| SEG25 | 10 | D1, S1 | S2 | S3 | S4 | SEG6 | 29 | 15D | 15E | 15G | 15F |
| SEG24 | 11 | D2 | D4 | D3 | D5 | SEG5 | 30 | 15P | 15C | 15B | 15A |
| SEG23 | 12 | D8 | D7 | D6 | S5 | SEG4 | 31 | 16D | 16E | 16G | 16F |
| SEG22 | 13 | D14 | D10 | D9 | S6 | SEG3 | 32 | 16P | 16C | 16B | 16A |
| SEG21 | 14 | D13 | D12 | D11 | S7, D18 | SEG2 | * | *CAL | *TIMER | | |
| SEG20 | 15 | AL | D15 | D16 | D17 | COM1 | 33 | COM0 | | | |
| SEG19 | 16 | P | M | 1C, 2G | 1A DEG, 2E | COM2 | 34 | | COM1 | | |
| SEG18 | 17 | 9D | 9E | 9G | 9F | COM3 | 35 | | | COM2 | |
| SEG17 | 18 | 9P | 9C | 9B | 9A | COM4 | 36 | | | | COM3 |
| SEG16 | 19 | 10D | 10E | 10G | 10F | | | | | | |

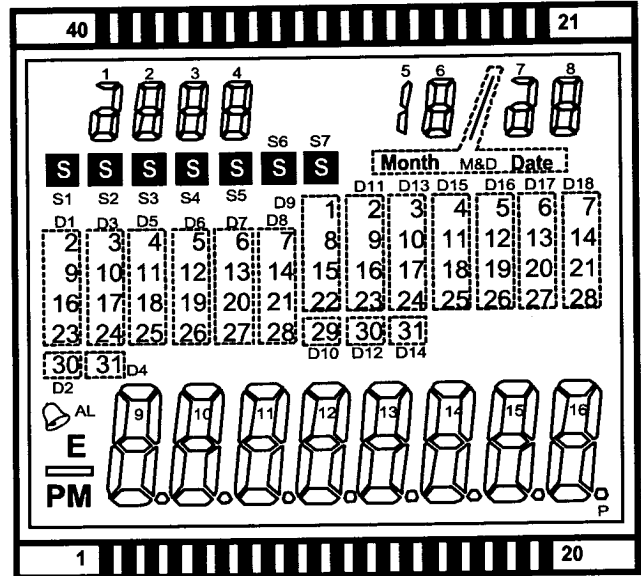
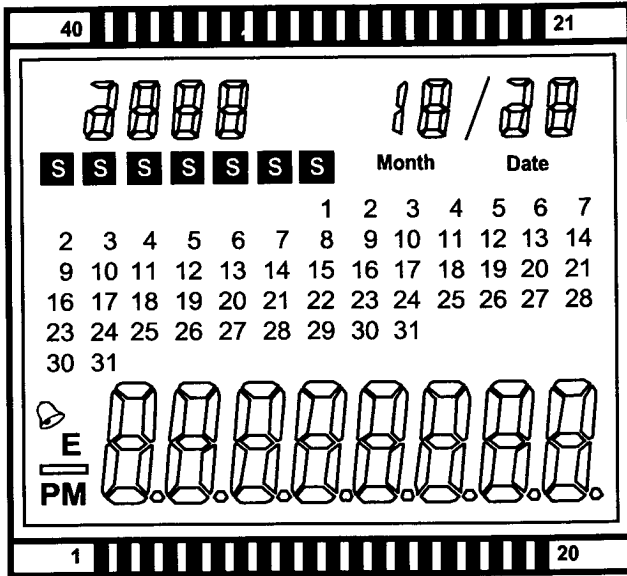
* Additional dots for touch panel LCD, "CAL" for calculator mode and "Timer" for Timer mode.

LCD Voltage = 3 Volt

LCD Duty = 1/4

LCD Bias = 1/3

V. LCD MC738 Layout Diagram



| IC Pin | LCD Pin | COM3 | COM2 | COM1 | COM0 | IC Pin | LCD Pin | COM3 | COM2 | COM1 | COM0 |
|--------|---------|------|------|--------|------|--------|---------|------|--------------|--------|---------------|
| COM2 | 1 | | | COM1 | | SEG34 | 21 | D18 | 8C | 8B | 8A |
| COM1 | 2 | | | | COM0 | SEG33 | 22 | 8D | 8E | 8G | 8F |
| SEG20 | 3 | D1 | D2 | E | AL | SEG32 | 23 | D12 | D17 | 7C | 7B |
| SEG19 | 4 | D3 | D4 | - | PM | SEG31 | 24 | D16 | M&D | 7E | 7ADG |
| SEG18 | 5 | 9F | 9G | 9E | 9D | SEG30 | 25 | D14 | D15 | 6C | 6B |
| SEG17 | 6 | 9A | 9B | 9C | 9P | SEG29 | 26 | D13 | 6D | 6G | 6A |
| SEG16 | 7 | 10F | 10G | 10E | 10D | SEG28 | 27 | D11 | 5BC | 6E | 6F |
| SEG15 | 8 | 10A | 10B | 10C | 10P | SEG31 | 28 | | D9 | | |
| SEG14 | 9 | 11F | 11G | 11E | 11D | SEG27 | 29 | D8 | S7 | 4C | 4B |
| SEG13 | 10 | 11A | 11B | 11C | 11P | SEG26 | 30 | S6 | 4D | 4G | 4A |
| SEG12 | 11 | 12F | 12G | 12E | 12D | SEG25 | 31 | D7 | S5 | 4E | 4F |
| SEG11 | 12 | 12A | 12B | 12C | 12P | SEG24 | 32 | D10 | D6 | 3C | 3B |
| SEG10 | 13 | 13F | 13G | 13E | 13D | SEG23 | 33 | S4 | 3D | 3G | 3A |
| SEG9 | 14 | 13A | 13B | 13C | 13P | SEG22 | 34 | D5 | S3 | 3E | 3F |
| SEG8 | 15 | 14F | 14G | 14E | 14D | SEG31 | 35 | | 1B, 2ABCD | | |
| SEG7 | 16 | 14A | 14B | 14C | 14P | SEG21 | 36 | S1 | S2 | 1C, 2G | 1A DEG, 2E |
| SEG6 | 17 | 15F | 15G | 15E | 15D | COM2 | 37 | | | COM1 | |
| SEG5 | 18 | 15A | 15B | 15C | 15P | COM1 | 38 | | | | COM0 |
| SEG4 | 19 | 16F | 16G | 16E | 16D | COM4 | 39 | COM3 | | | |
| SEG3 | 20 | 16A | 16B | 16C | 16P | COM3 | 40 | | COM2 | | |
| SEG2 | * | | | *TIMER | *CAL | | | | | | |

* Additional dots for touch panel LCD, "CAL" for calculator mode and "Timer" for Timer mode.

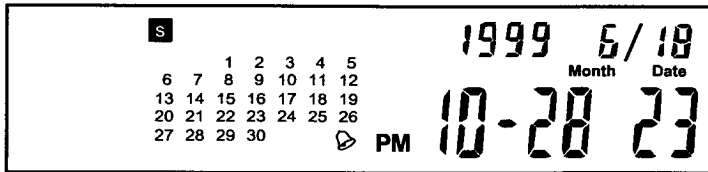
LCD Voltage = 3 Volt

LCD Duty = 1/4

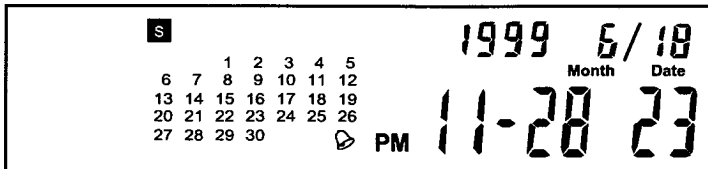
LCD Bias = 1/3

VI. Display Mode (Use MC739 as example)

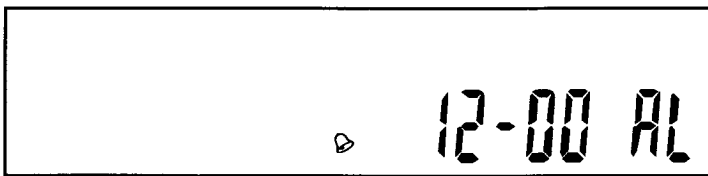
Time / Normal Mode



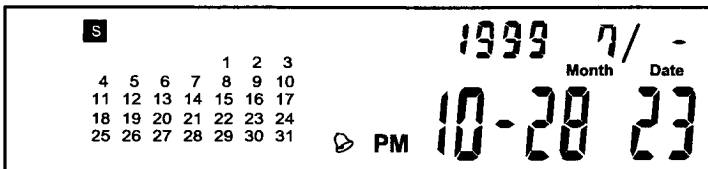
World Time Mode



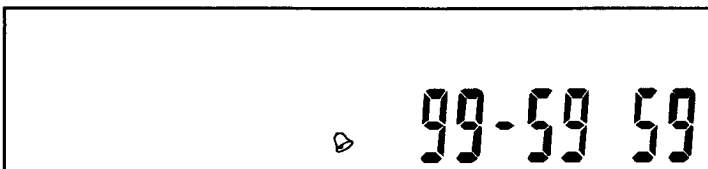
Alarm Mode



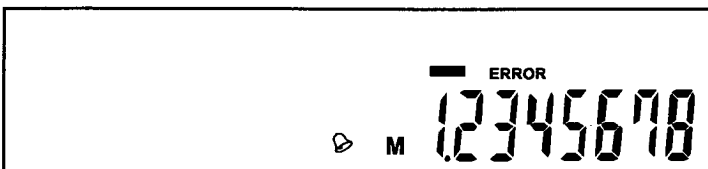
Month Search Mode



Count Down Timer



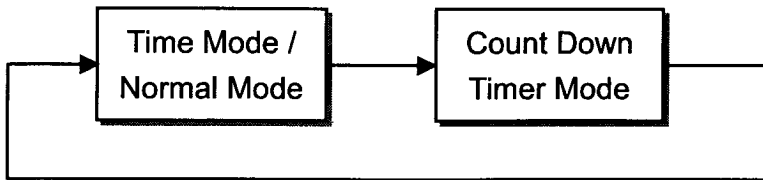
Calculator Mode



VII. Operation Description

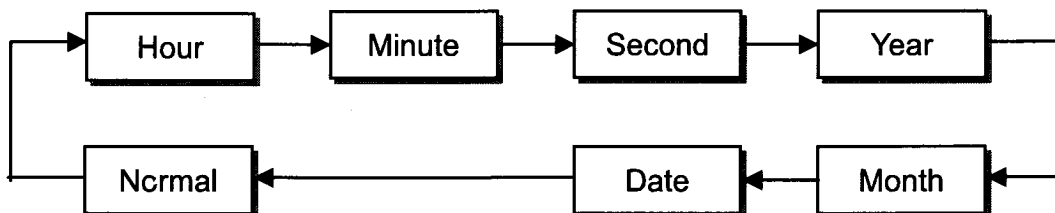
● Time Mode / Count Down Timer Mode

- Press **MODE** key to toggle time mode or count down timer mode.




● Setting of Real Time Clock

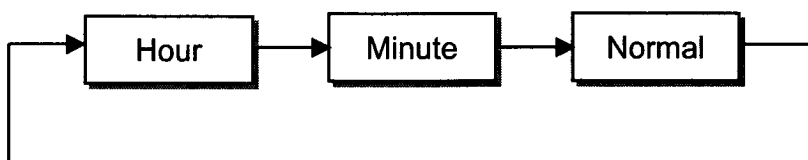
- At normal mode press **SET** key to set the real time clock and date, month, year.
- The setting sequence as follows:



- The setting object will be flash, then press **UP** or **DOWN** key to adjust. Adjust of second will to zero.

● Setting of alarm

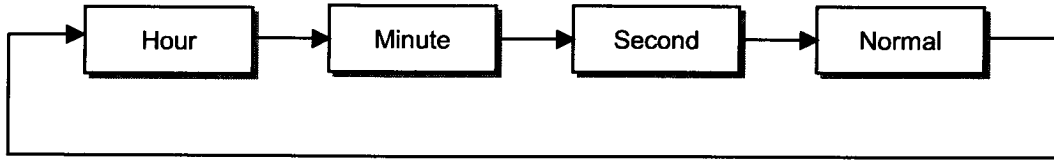
- Press **ALM** key go to alarm mode.
- Press **ALM** key again to toggle alarm ON/OFF, indicate by the  icon.
- Press **SET** key to set alarm time.
- The setting sequence as follows:



- That setting similar to real time clock setting.
- Press number keys **1** , **2** or **3** choose any one Bi Bi tone to be alarm sound.
- Or press number keys **4** , **5** , **6** or **7** choose any one melody to be alarm sound.

● **Setting of Count Down Timer**

- Press **MODE** key go to Count Down Timer mode.
- Press **SET** key to adjust the Count Down Timer.
- The setting sequence as follows:



- That setting also similar to real time clock setting.
- When counter is non zero press **⏸** to start count down, press again to pause the counter. At this time press **UP** or **DOWN** reset counter to [00-00 00].
- When counter is start, display keep on the Count Down Timer Mode, except key is press. Display will back to normal mode on count down finish and count down alarm tone end.

● **Calendar Month Search**

- At normal mode press **UP** or **DOWN** key to search the month.

● **Smart **UP** and **DOWN** keys**

- The **UP** and **DOWN** keys are smart keys, it is useful on the setting and month search. Hold that key on one second will automatically roll up/down, then hold with more than 5 second roll up/down will go faster.

● **World Time Search**

- At normal mode press number keys or **+**, **-**, **x**, **=**, **≡** to search other city time.
- Press **SET** key to set the current city time to be local time.
- Press **MODE** key back to local time.

Table of time different for the cities

| Time Zone | Time different | Key | City Code | Name of City |
|-----------|----------------|-----|-----------|----------------|
| 10 | 0 | 7 | LON | LONDON |
| 15.5 | +5.5 | 4 | IND | INDIA |
| 20 | +10 | 1 | SYD | SYDNEY |
| 3 | -7 | 0 | DEV | DENVER |
| 11 | +1 | 8 | PAR | PARIS |
| 17 | +7 | 5 | BKK | BANGKOK |
| 22 | +12 | 2 | WLG | WELLINGTON |
| 4 | -6 | . | CHI | CHICAGO |
| 12 | +2 | 9 | CAI | CAIRO |
| 18 | +8 | 6 | HKG | HONG KONG |
| 0 | -10 | 3 | HNL | HONOLULU |
| 5 | -5 | = | NYC | NEW YORK |
| 13 | +3 | ÷ | MCW | MOSCOW |
| 19 | +9 | x | TYO | TOKYO |
| 2 | -8 | - | LAX | LOS ANGELES |
| 7 | -3 | + | RIO | RIO DE JANEIRO |

- **12/24 Hours Mode Setting**












- At normal mode press  key to toggle 12/24 hours mode.

- **The function of  key**




- Press that key at time mode to toggle keytone ON/OFF.

Note: At above modes if no key press after 8 sec will back to normal mode.




- **Calculator Mode**

- Press  key change to calculator mode.
- Press number keys with  ,  ,  ,  ,  ,  keys to calculation.
- Press  ,  ,  keys for memory operation.
- Press  key back to time mode.

- **Exchange Rate Setting**

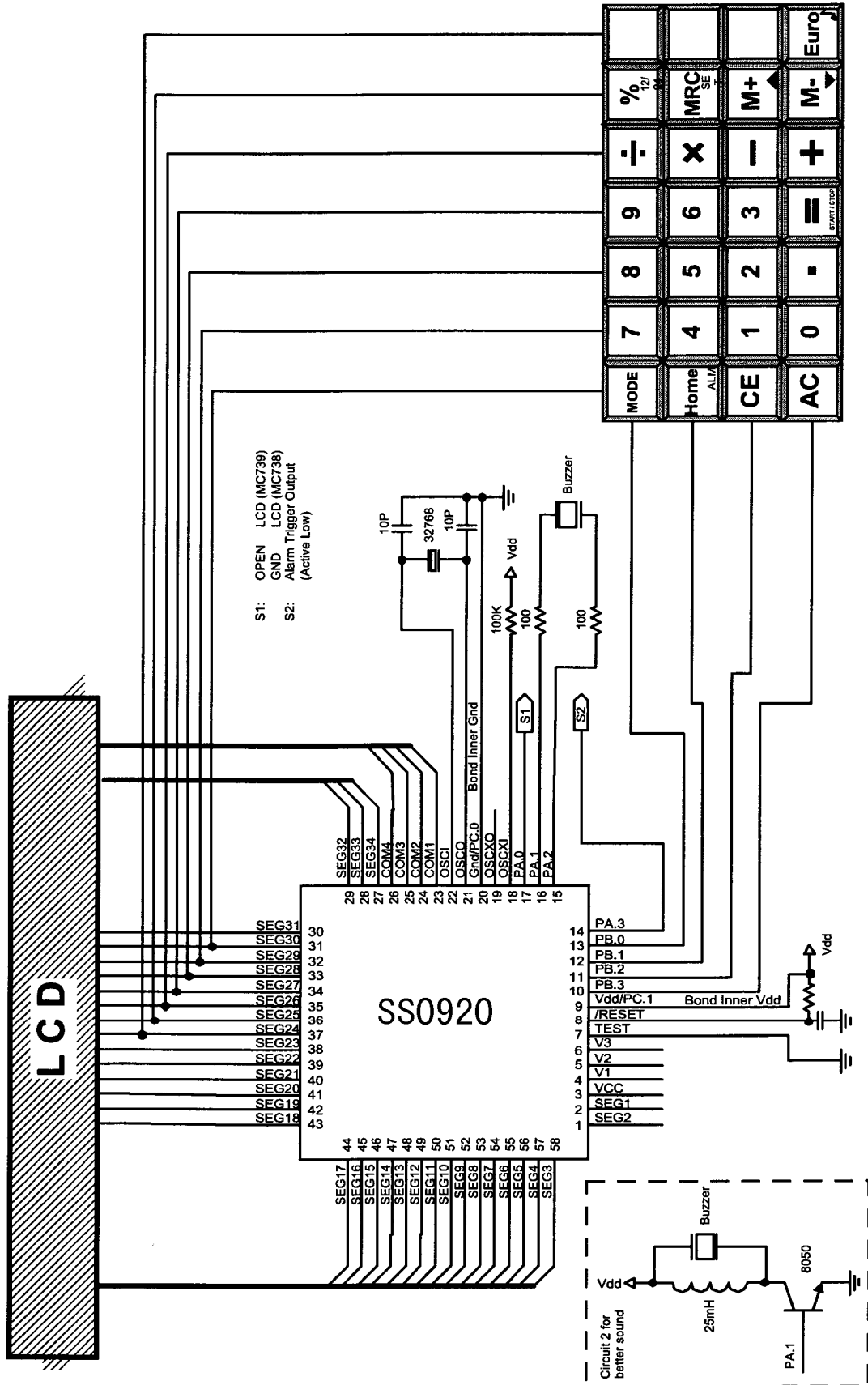
- Press  key then press  key twice to set exchange rate.
- Display will flash the numbers.
- Key in six decimal places number of exchange rate.
- Press  key again to end of setting.

- **Currency Exchange**

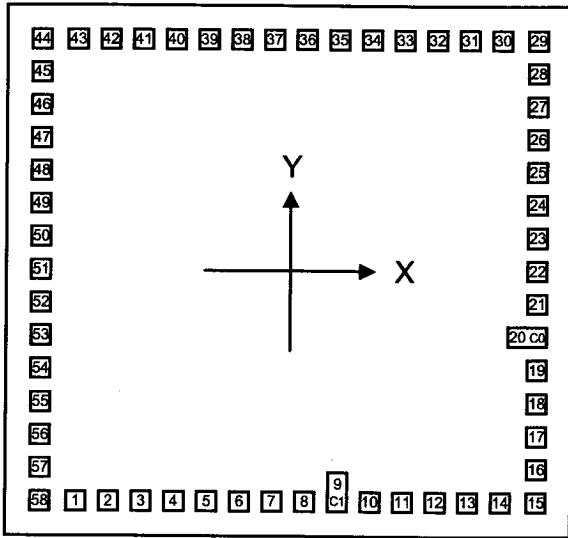
- Press  key and enter the numbers.
- Press either  or  key for currency exchange, indicate by Eu or Hc.
- The rounded up result will be show on the display.

Note: At calculator mode if no key press after 5 minute will back to Time mode.


VIII. SS0920 Circuit Diagram




IX. SS0920 Bonding Pad Diagram



Chip size : 2050 x 1930 mm²
Substrate connect to GND

Pad 20  Bond outer portion to select C0+GND

Pad 20  Bond inner portion to select GND only

Pad 9  Bond outer portion to select C1+Vdd

Pad 9  Bond inner portion to select Vdd only

| Pad | Name | X (μm) | Y (μm) | Pad | Name | X (μm) | Y (μm) |
|-----|------------|--------|--------|-----|------------|--------|--------|
| 1 | SEG2 | -770 | -840 | 29 | COM7/SEG32 | 900 | 840 |
| 2 | SEG1 | -640 | -840 | 30 | COM8/SEG31 | 770 | 840 |
| 3 | VCC | -520 | -840 | 31 | SEG30 | 640 | 840 |
| 4 | V1 | -405 | -840 | 32 | SEG29 | 520 | 840 |
| 5 | V2 | -290 | -840 | 33 | SEG28 | 405 | 840 |
| 6 | V3 | -175 | -840 | 34 | SEG27 | 290 | 840 |
| 7 | TEST | -60 | -840 | 35 | SEG26 | 175 | 840 |
| 8 | /RESET | 55 | -840 | 36 | SEG25 | 60 | 840 |
| 9 | Vdd | 180 | -746 | 37 | SEG24 | -60 | 840 |
| | PC.1 | 176 | -849 | 38 | SEG23 | -175 | 840 |
| 10 | PB.3 | 295 | -840 | 39 | SEG22 | -290 | 840 |
| 11 | PB.2 | 410 | -840 | 40 | SEG21 | -405 | 840 |
| 12 | PB.1 | 525 | -840 | 41 | SEG20 | -520 | 840 |
| 13 | PB.0 | 640 | -840 | 42 | SEG19 | -640 | 840 |
| 14 | PA.3 | 770 | -840 | 43 | SEG18 | -770 | 840 |
| 15 | PA.2 | 900 | -840 | 44 | SEG17 | -900 | 840 |
| 16 | PA.1 | 900 | -710 | 45 | SEG16 | -900 | 710 |
| 17 | PA.0 | 900 | -590 | 46 | SEG15 | -900 | 590 |
| 18 | OSCXI | 900 | -470 | 47 | SEG14 | -900 | 470 |
| 19 | OSCXO | 900 | -355 | 48 | SEG13 | -900 | 355 |
| 20 | Gnd | 806 | -240 | 49 | SEG12 | -900 | 240 |
| | PC.0 | 908 | -248 | 50 | SEG11 | -900 | 120 |
| 21 | OSCO | 900 | -120 | 51 | SEG10 | -900 | 0 |
| 22 | OSCI | 900 | 0 | 52 | SEG9 | -900 | -120 |
| 23 | COM1 | 900 | 120 | 53 | SEG8 | -900 | -240 |
| 24 | COM2 | 900 | 240 | 54 | SEG7 | -900 | -355 |
| 25 | COM3 | 900 | 355 | 55 | SEG6 | -900 | -470 |
| 26 | COM4 | 900 | 470 | 56 | SEG5 | -900 | -590 |
| 27 | COM5/SEG34 | 900 | 590 | 57 | SEG4 | -900 | -710 |
| 28 | COM6/SEG33 | 900 | 710 | 58 | SEG3 | -900 | -840 |

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