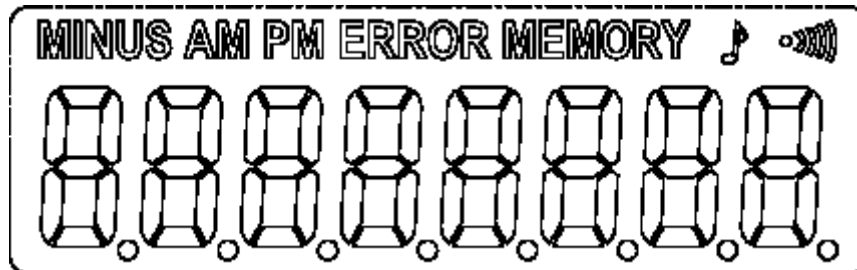


## Calculator Clock



### 1. General Description

DL5525 is single chip micro controller that can support four kinds of applications, i.e. clock alarm, calendar and calculator.

### 2. Features

- Die form
- Crystal oscillator is 32.768KHZ
- Operation voltage is 1.5V
- LCD driver build-in and drive 1/2 Bias, 1/3 Duty LCD panel
- Bonding option to choose desktop or watch version
- At any mode, if key is not pressed for 4 minutes that will auto return to clock mode
- 4 modes in one chip which are clock, alarm, calendar and calculator

**Clock mode:** Display hour, minute and second, 12 or 24 hour is 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. Auto update in leap year.

**Calculator mode:** 8 digit calculator with basic arithmetic operation (Addition, Subtraction, Multiplication and Division) plus memory operations such as M+, M-, MR and MC.

### 3. Key Matrix Mapping

#### 3.1 Desktop Version:

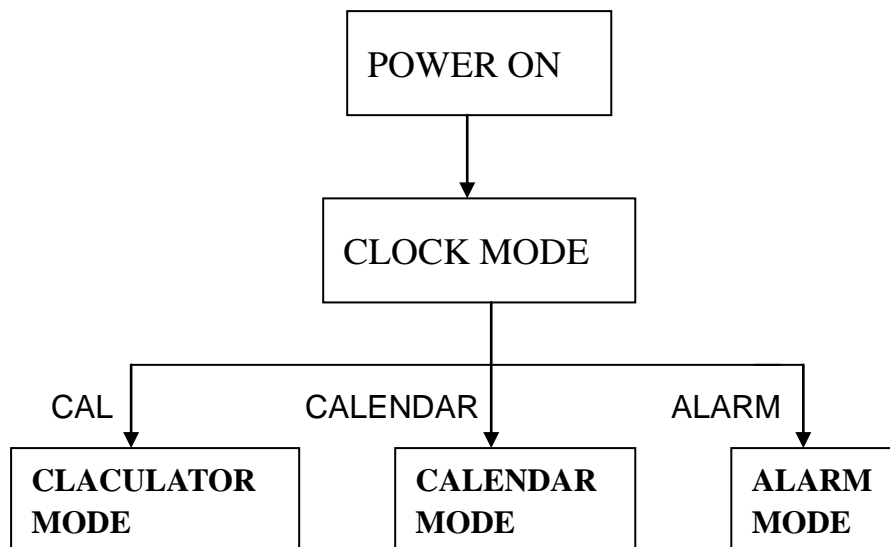
HOUR 7	MIN 8	SEC 9	ALM ON/OFF /	CAL AC/CE	CLOCK CLOCK
MONTH 4	DATE 5	D-WEEK 6	12/24 X	MRC	SET
1	2	3	-	M-	ALARM
0	.	TONE	+/=	M+	CALENDAR

#### 3.2 Watch Version:

HOUR 7	MIN 8	SEC 9	ALM ON/OFF /	CLK/CAL AC/CE
MONTH 4	DATE 5	D-WEEK 6	12/24 X	SET MRC
1	2	3	-	ALARM M-
0	.	TONE	+/=	CALENDAR M+

#### 4. Operation Flow

##### 4.1 Mode Switching:



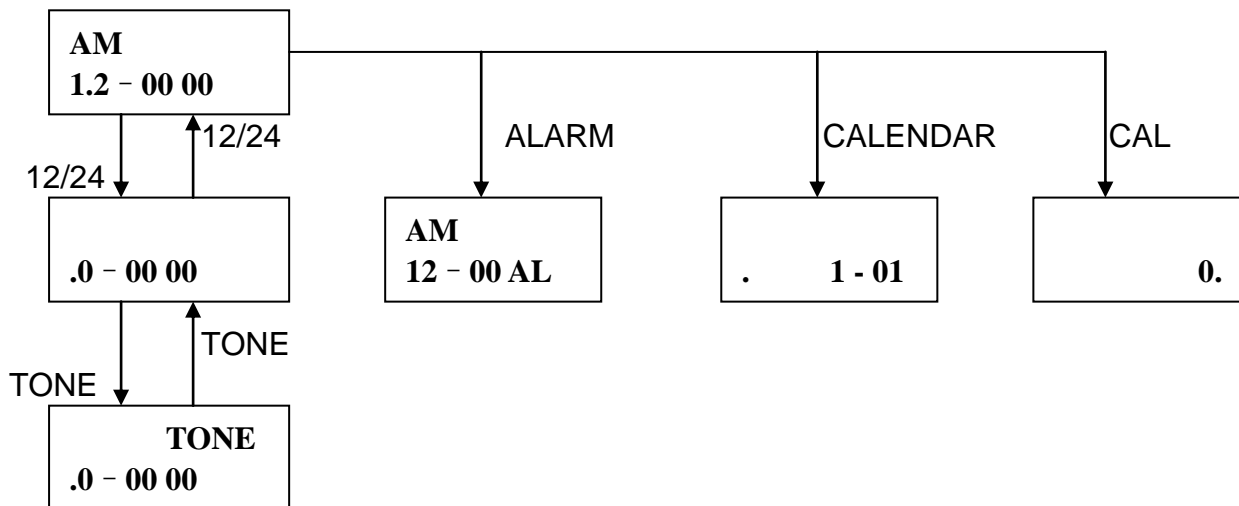
**[NOTE]:**

After power on, the system will initialize its parameters and entered Clock mode.  
The initial value of parameters are as the following:

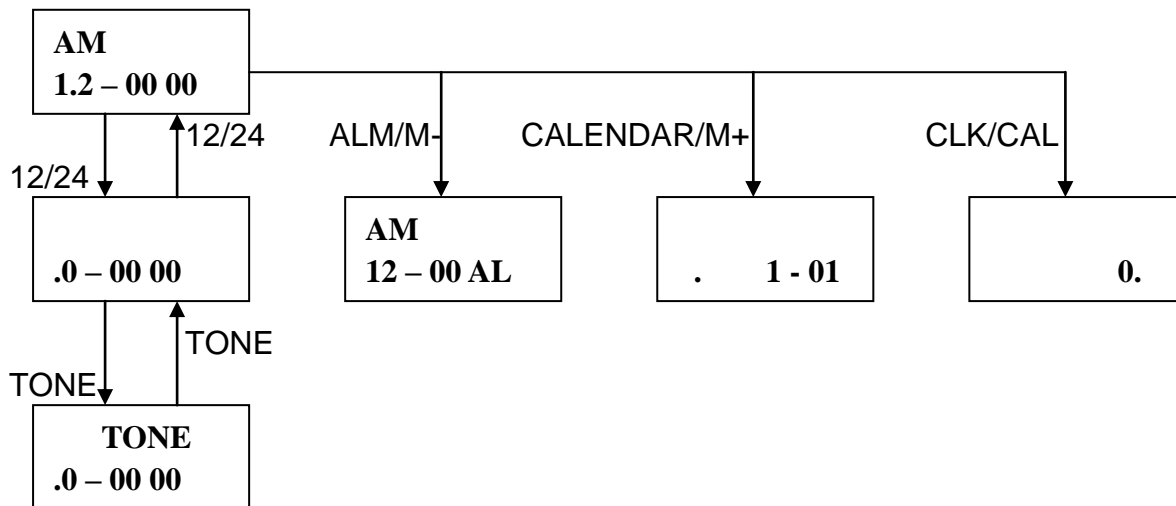
- Clock is set to 12:00 AM
- Alarm time is set to 12:00 AM
- Calendar is set to 1-01 SUN
- Alarm is off

## 4.2 Clock Mode

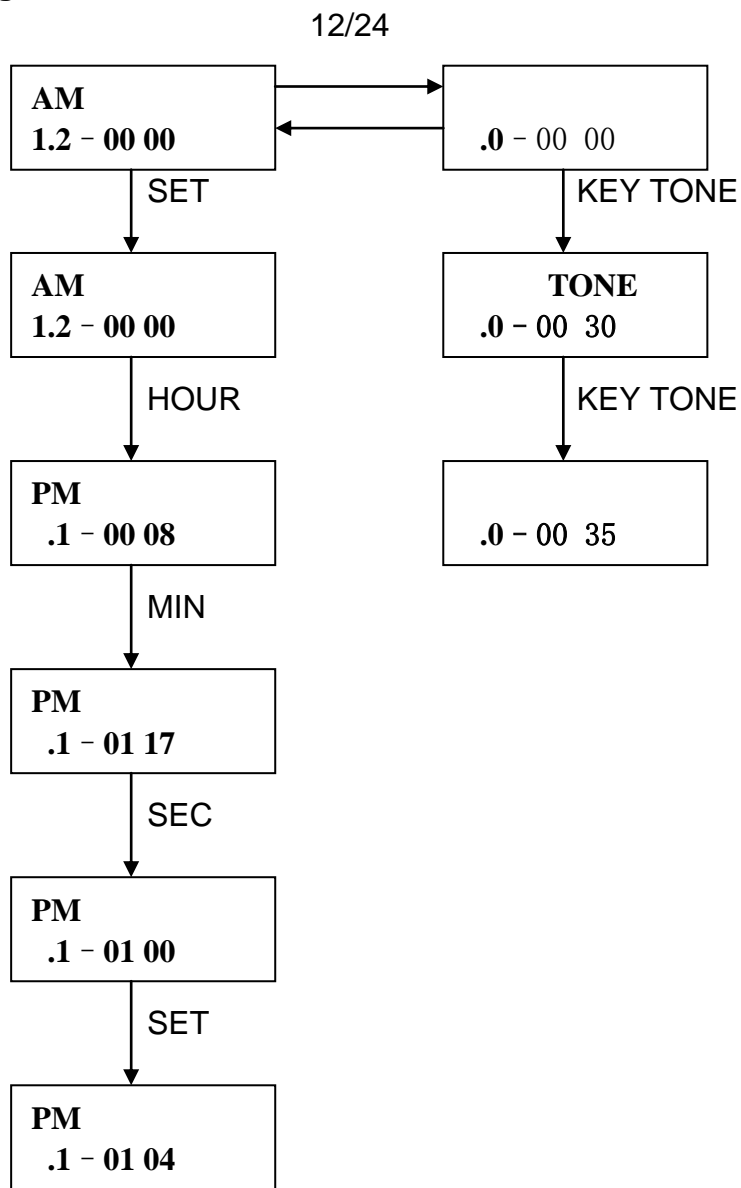
### Desktop Version:



### Watch Version:



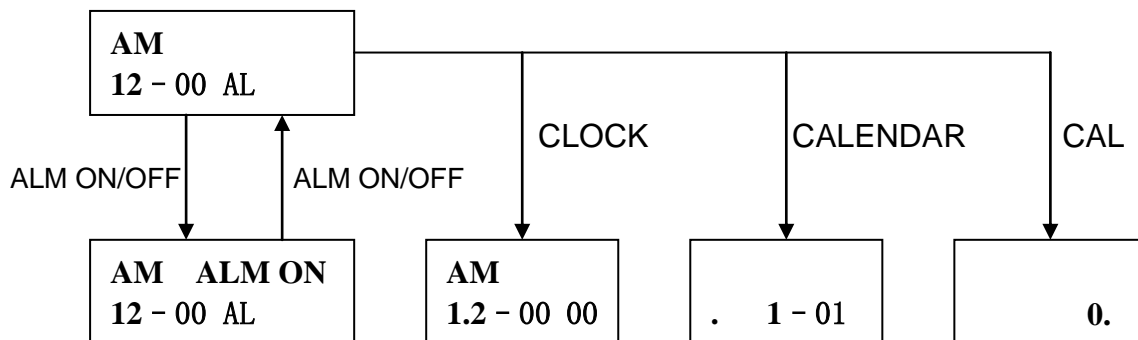
### 4.3 Clock Setting Mode



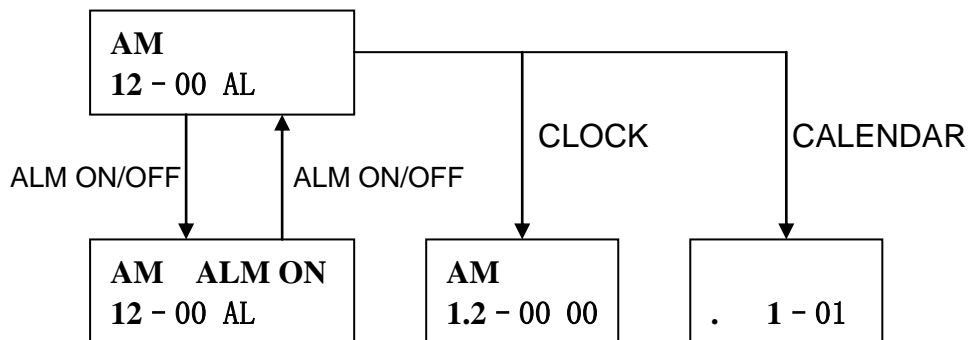
[NOTE]:

The italic stands for flashing. While enter setting status, the display will flash at 1 Hz.

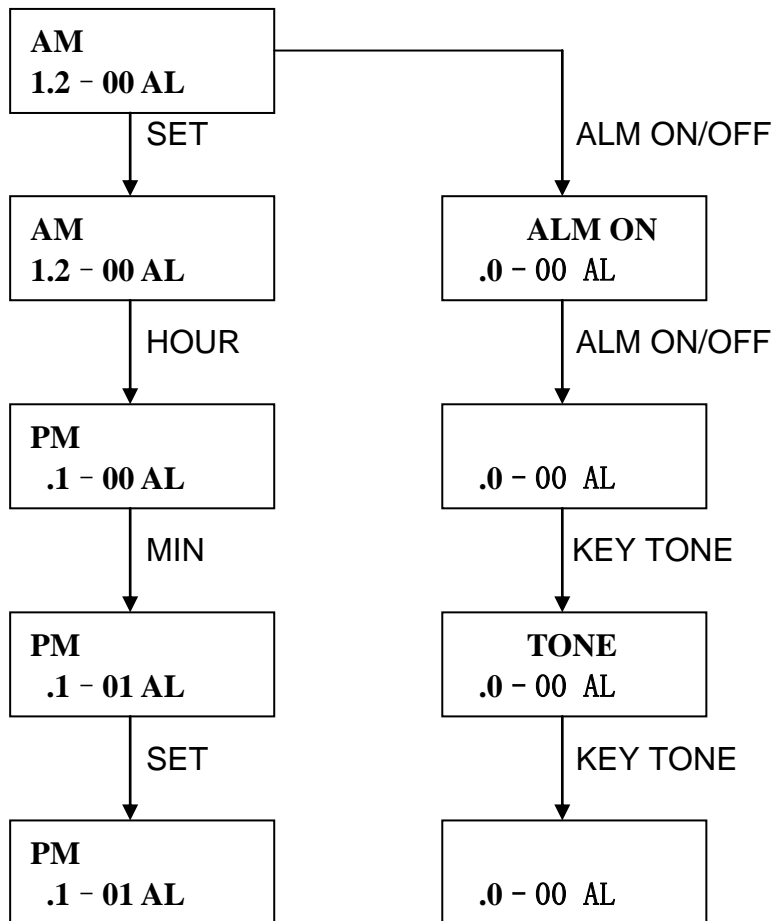
**4.4 Alarm Mode**  
**Desktop Version:**



**Watch Version:**



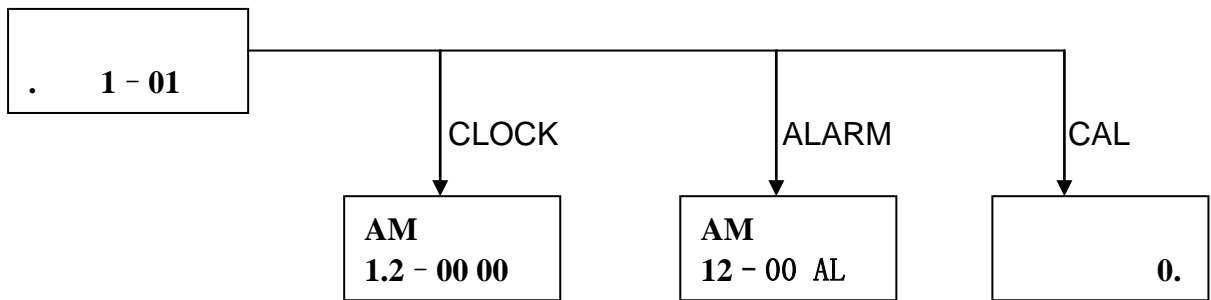
### 4.5 Alarm Setting Mode



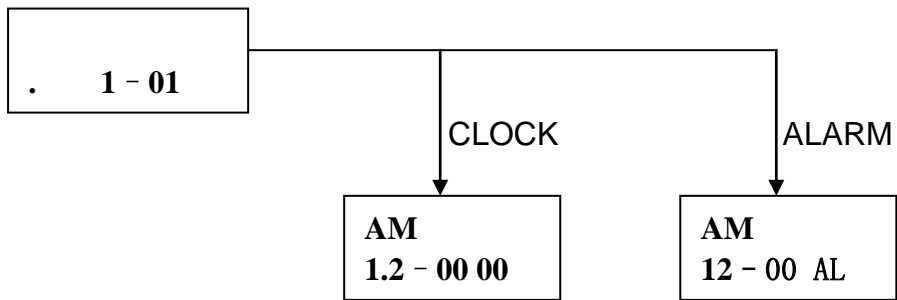
**[NOTE]:**

The italic stands for flashing. While enter setting status, the display will flash at 1 Hz.

**4.6 Calendar Mode**  
**Desktop Version:**

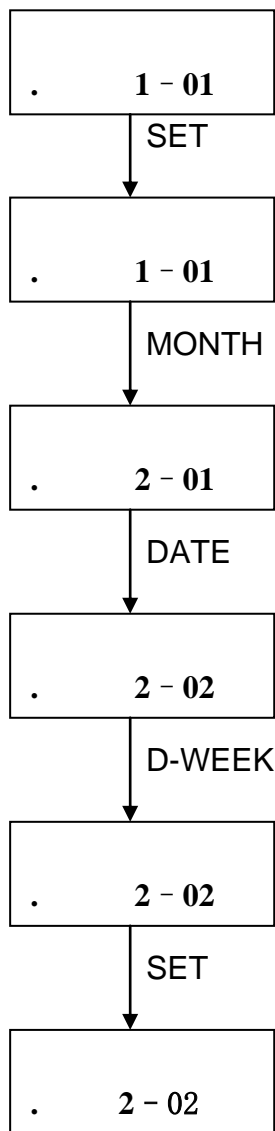


**Watch Version:**





### 4.7 Calendar Setting Mode



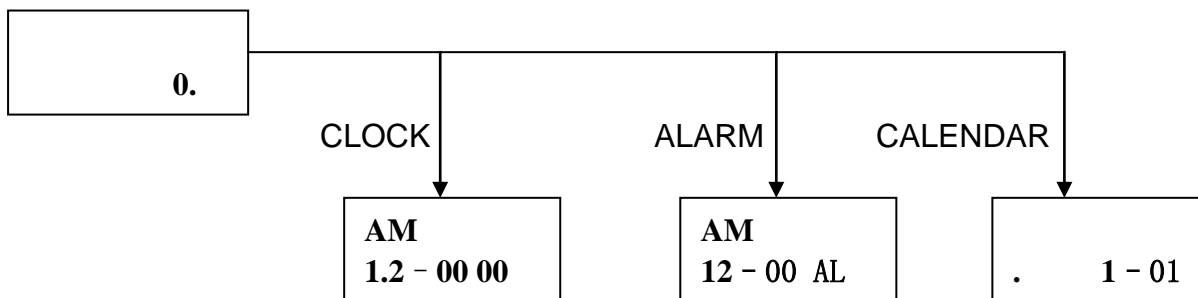
\* The dot stands for day of week, press D-WEEK the dot will shift one grid.

**[NOTE]:**

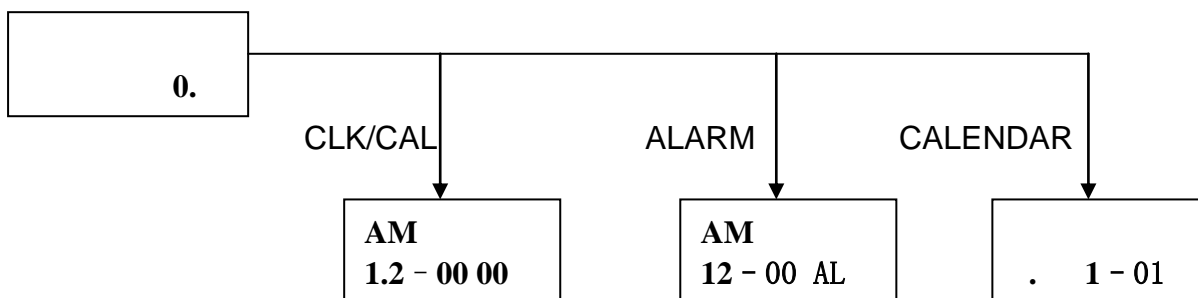
The italic stands for flashing. While enter setting status, the display will flash at 1 Hz.

### 4.8 Calculator Mode

#### Desktop Version:



#### Watch Version:

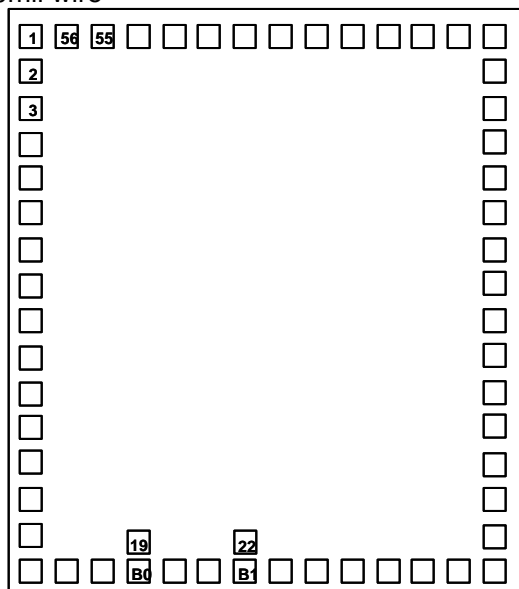


\* Press AC/CE to clear to 0 and press AC/CE (CLK/CAL) again to return to clock mode.

### 5.Mask IC Pad Assignment

1770um x 2050um

Bonding wire should be 1.0mil wire

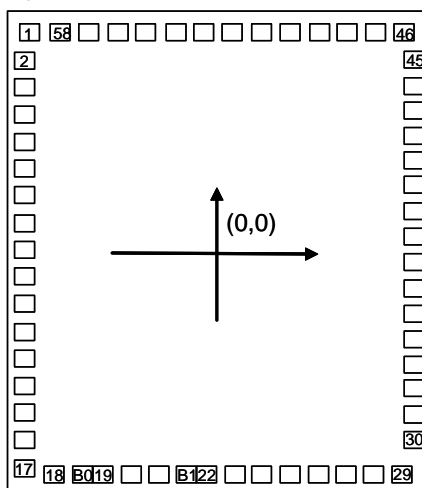


Pad No.	Designation	X	Y	Pad No.	Designation	X	Y
1	SEG25	-760	900	28	VP1	637.5	-900
2	SEG26	-760	757.5	29	COM1	760	-900
3	PORTC0	-760	637.5	30	COM2	760	-757.5
4	PORTC1	-760	517.5	31	COM3	760	-637.5
5	PORTC2	-760	402.5	32	COM4	760	-517.5
6	PORTC3	-760	287.5	33	SEG1	760	-402.5
7	PORTD0	-760	172.5	34	SEG2	760	-287.5
8	PORTD1	-760	57.5	35	SEG3	760	-172.5
9	PORTD2	-760	-57.5	36	SEG4	760	-57.5
10	PORTD3	-760	-172.5	37	SEG5	760	57.5
11	PORTA0	-760	-287.5	38	SEG6	760	172.5
12	PORTA1	-760	-402.5	39	SEG7	760	287.5
13	PORTA2	-760	-517.5	40	SEG8	760	402.5
14	PORTA3	-760	-637.5	41	SEG9	760	517.5
15	PORTB0	-760	-757.5	42	SEG10	760	637.5
16	PORTB1	-760	-900	43	SEG11	760	757.5
17	PORTB2	-637.5	-900	44	SEG12	760	900
18	PORTB3	-517.5	-900	45	SEG13	637.5	900
19	VDD	-402.5	-808	46	SEG14	517.5	900
	B0	-402.5	-900	47	SEG15	402.5	900
20	OSCO	-287.5	-900	48	SEG16	287.5	900
21	OSCI	-172.5	-900	49	SEG17	172.5	900
22	GND	-57.5	-808	50	SEG18	57.5	900
	B1	-57.5	-900	51	SEG19	-57.5	900
23	RESET	57.5	-900	52	SEG20	-172.5	900
24	TEST	172.5	-900	53	SEG21	-287.5	900
25	CUP1	287.5	-900	54	SEG22	-402.5	900
26	CUP2	402.5	-900	55	SEG23	-517.5	900
27	VP2	517.5	-900	56	SEG24	-637.5	900

### 6.OTP Pad Assignment

1850um x 2220um

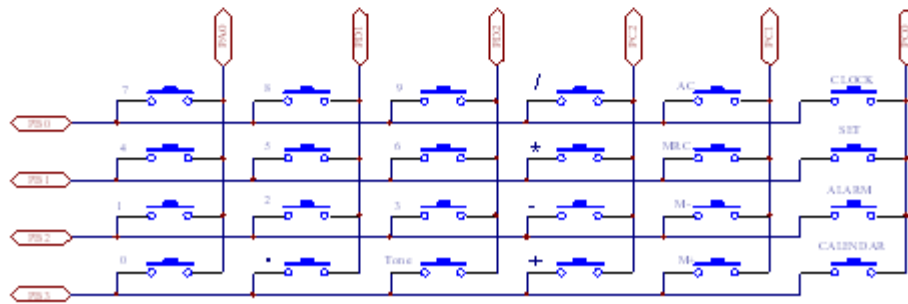
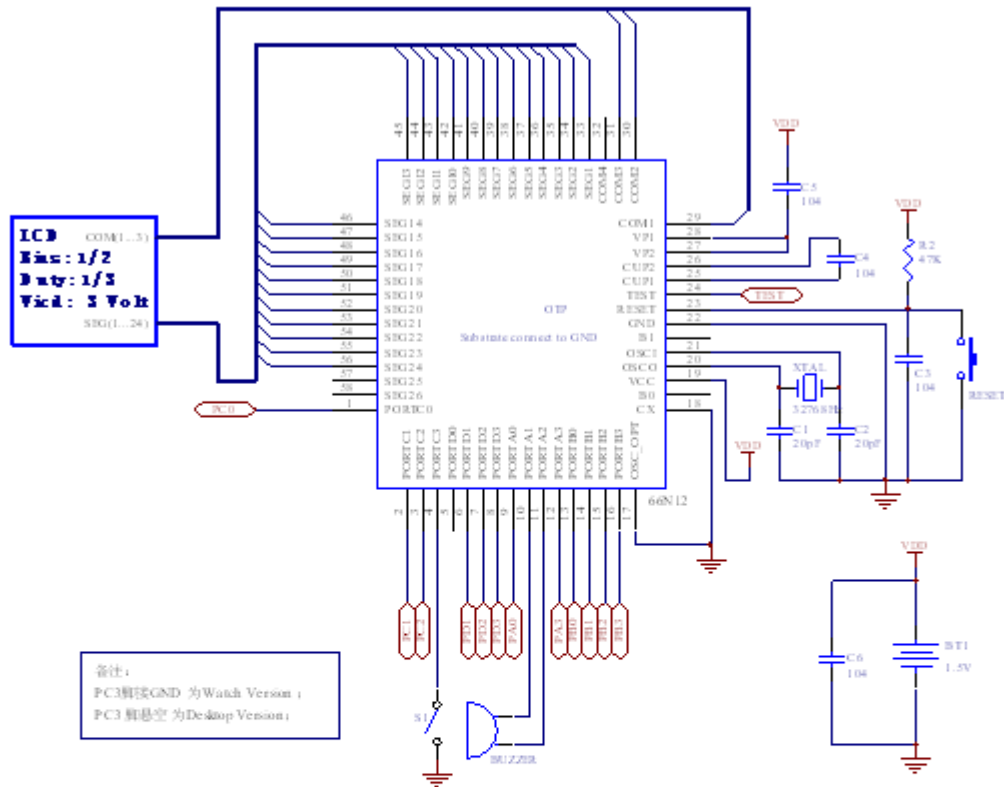
Bonding should use 1um bonding wire



Pad	Designation	X	Y	Pad	Designation	X	Y
1	PORTC0	-791.2	982.5	29	COM1	773.8	-982.5
2	PORTC1	-799	847.45	30	COM2	799	-827.5
3	PORTC2	-799	717.45	31	COM3	799	-707.5
4	PORTC3	-799	592.45	32	COM4	799	-592.5
5	PORTD0	-799	472.45	33	SEG1	799	-428.5
6	PORTD1	-799	357.45	34	SEG2	799	-372.5
7	PORTD2	-799	242.45	35	SEG3	799	-262.5
8	PORTD3	-799	127.45	36	SEG4	799	-152.5
9	PORTA0	-799	12.45	37	SEG5	799	-42.5
10	PORTA1	-799	-102.55	38	SEG6	799	67.5
11	PORTA2	-799	-217.55	39	SEG7	799	177.5
12	PORTA3	-799	-332.55	40	SEG8	799	287.5
13	PORTB0	-799	-447.55	41	SEG9	799	397.5
14	PORTB1	-799	-567.55	42	SEG10	799	507.5
15	PORTB2	-799	-692.55	43	SEG11	799	617.5
16	PORTB3	-799	-817.55	44	SEG12	799	732.5
17	OSC_OPT	-799	-947.55	45	SEG13	799	852.5
18	CX	-669	-982.5	46	SEG14	775.8	982.5
	B0	-548	-982.5	47	SEG15	645.8	982.5
19	VCC	-460.95	-982.5	48	SEG16	515.8	982.5
20	OSCO	-341.4	-982.5	49	SEG17	394.8	982.5
21	OSCI	-231.4	-982.5	50	SEG18	279.8	982.5
	B1	-121.4	-982.5	51	SEG19	164.8	982.5
22	GND	-33.9	-982.5	52	SEG20	49.8	982.5
23	/RESET	76.1	-982.5	53	SEG21	-65.2	982.5
24	TEST	193.2	-982.5	54	SEG22	-180.2	982.5
25	CUP1	310.3	-982.5	55	SEG23	-295.2	982.5
26	CUP2	420.3	-982.5	56	SEG24	-410.2	982.5
27	VP2	530.3	-982.5	57	SEG25	-531.2	982.5
28	VP1	648.8	-982.5	58	SEG26	-661.2	982.5

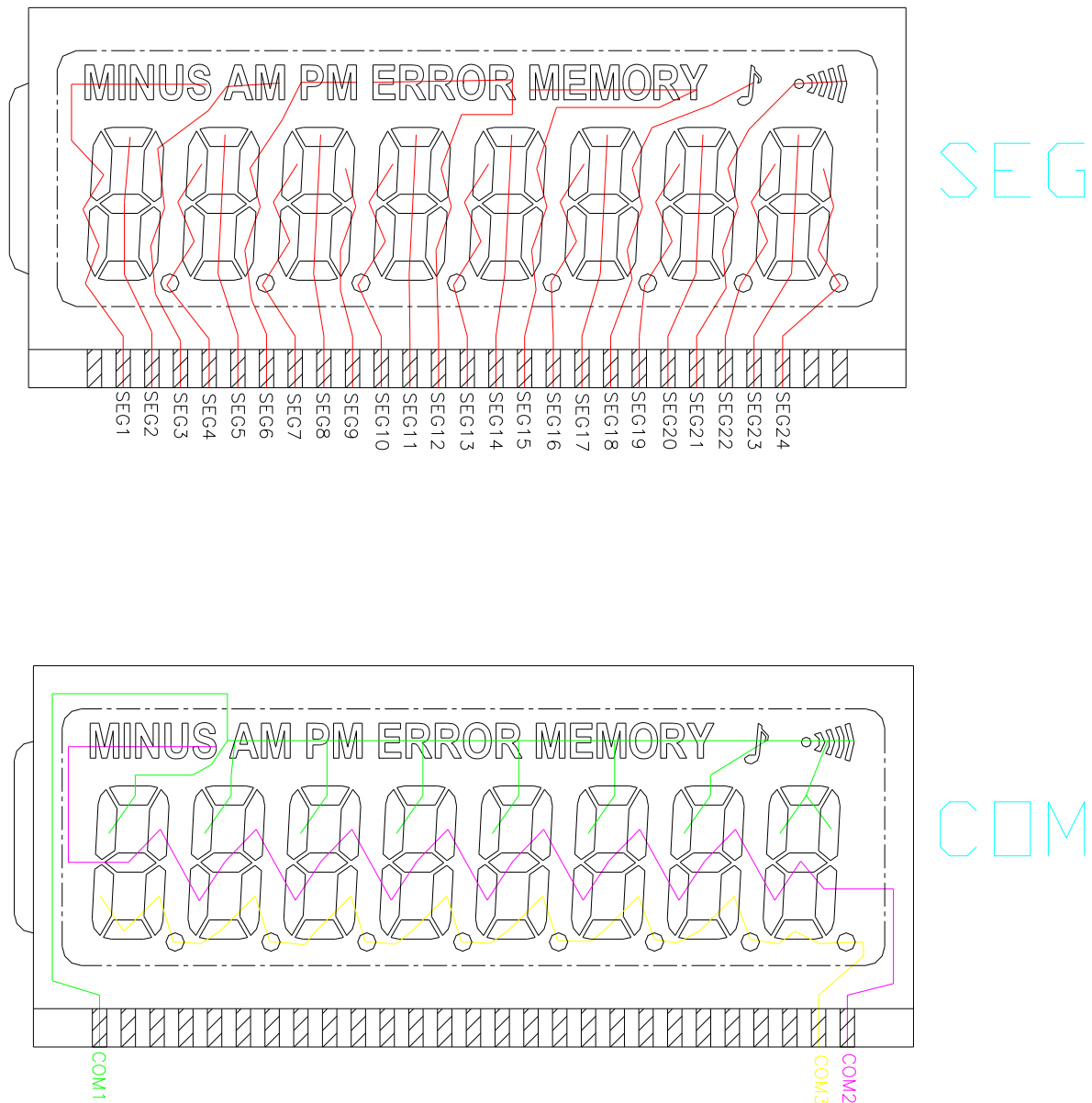


## 8. OTP IC Application Circuit



To burn the OTP: VDD, GND, RESET, TEST, OSC1, PD1, PD2 and PD3 should be lead out.

### 9. LCD Layout



**LCD Characteristics**  
 Operating Voltage : 3.0V  
 1/3Duty , 1/2 Bias