

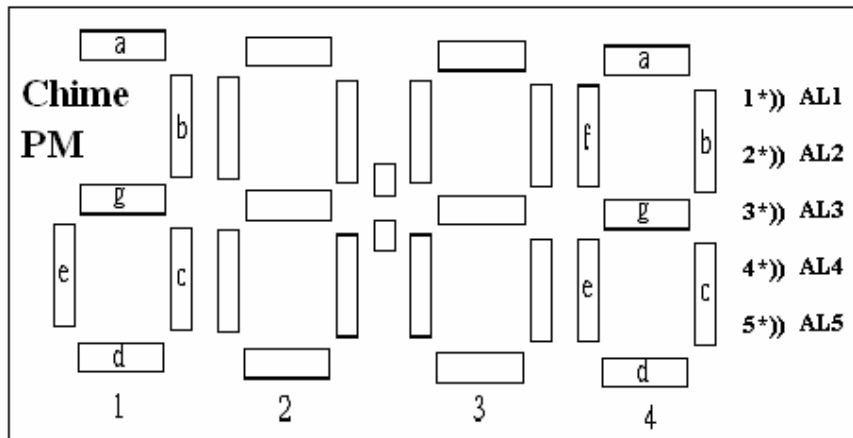
## General Description

This is a low cost single chip 3 keys clock with 5 daily alarm.

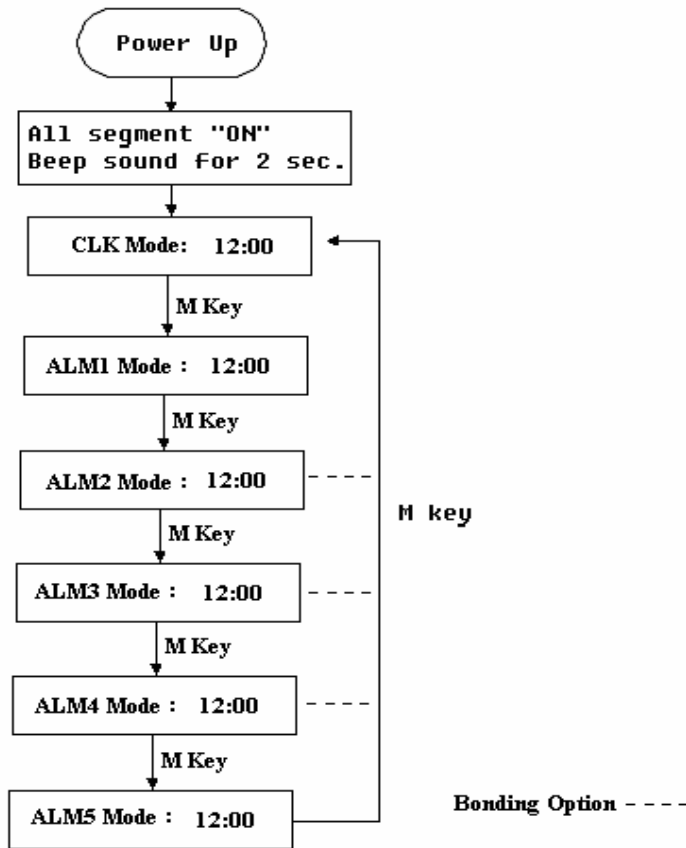
### Features:

- \* Operating voltage 1.5V
- \* Low power consumption
- \* Hour Minute display for different mode.
- \* On-chip, 4-digit, 1/3 duty cycle, 1/2 bias, LCD driver.
- \* LCD bias level: 0.0V, 1.5V, 3.0V.
- \* On chip 32768Hz crystal.
- \* Daily Alarm - It generates a sound (4KHz x 8Hz x 1Hz) for 60 seconds. Pressed any key to stop it.
- \* Chime Function - Every hour on the hour, beep (4KHz x 4Hz x 1Hz) for 1 second.
- \* 4KHz on-chip buzzer output driver to give alarm sound and beep tone.
- \* Bonding option of alarm non-stop until user disable.
- \* Bonding option of 12/24 hour format display.
- \* Bonding option of max. 2 -- 5 selectable daily alarm time.

## LCD display



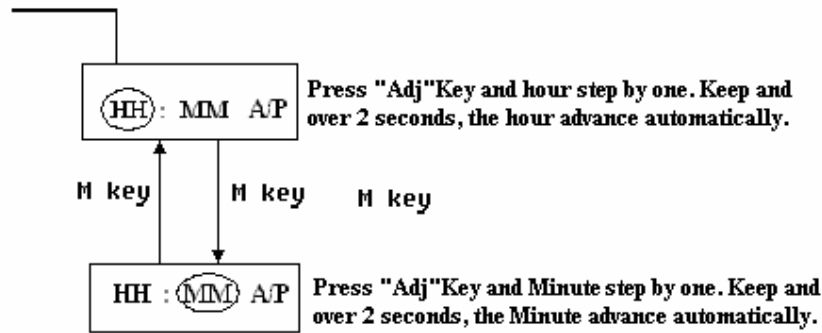
Operation Flow Chart



Note1: While the CLK mode is display, depress "Adj" Key once to changeover the chime function on duty and off duty. The chime mark enable mark will appear when the chime function is on duty.  
 Note2: While the one of alarm mode is display, depress "Adj" Key once to changeover the alarm function on duty and off duty. The daily alarm mark enable mark will appear when the alarm function is on duty.

Setting function(different mode)

Enter Setting (Press "Set" Key and hold for 2 seconds)



Note1: Press "Set" Key to leave setting mode.

**Pin Assignment**

DESIGNATION	TYPE	DESCRIPTION
B0, B1	OUTPUT	Buzzer output
F512, VCAP	OUTPUT	Doubler output
VEE	OUTPUT	-1.5V
T1, T2	INPUT	TEST pin
COSCO	OUTPUT	32KHz oscillator output
COSCI	INPUT	32KHz oscillator input
VDD	POWER	+1.5V power supply
GND	POWER	Ground
KMODE, KSET, KEL	INPUT(PL)	Input key
BAL	INPUT	Bonding option
PB	INPUT(PH)	Power up reset
C[1:3]	OUTPUT	LCD Common output
S[1:17]	OUTPUT	LCD Segment output

Note: (PH) - pull high;

**Absolute Maximum Ratings**

Supply voltage Vdd - Vss.....0 to 5V  
 Input voltage Vin.....Vss to Vdd  
 Operating temperature Top .....-10°C to 60°C  
 Storing temperature Tst .....-40°C to 70°C

**Comments**

Stress above those listed under “absolute Maximum Ratings” may cause permanent damage to the device. These are stress rating only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied and exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**D.C. Electrical Characteristics**

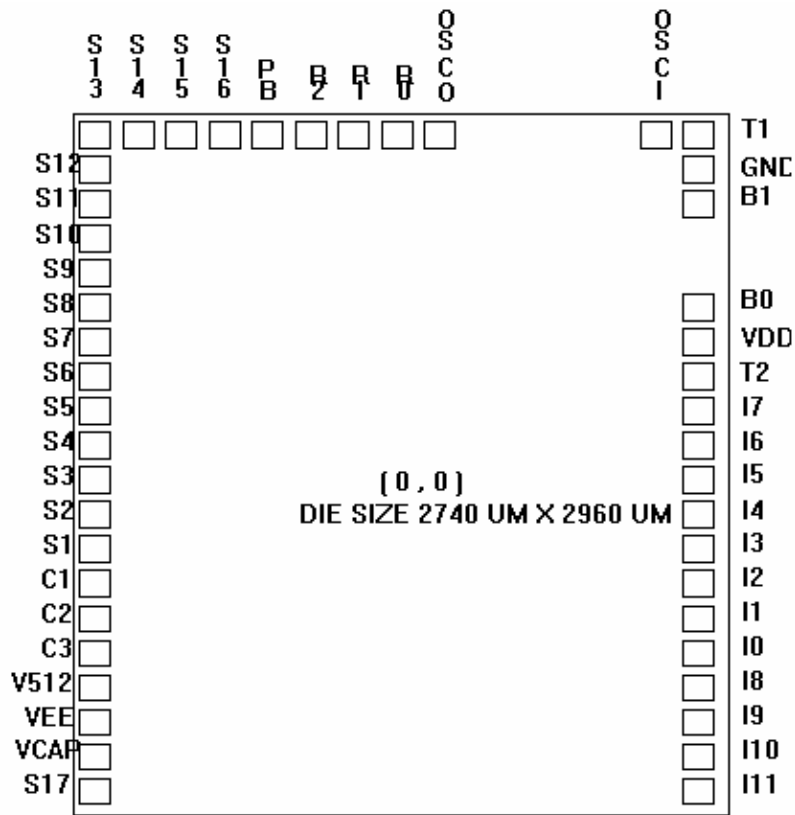
(GND = 0V, Vdd = 1.5V, Ta = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	Vdd	1.25	1.5	1.75	V	
Operating current	Idd	-	2	5	μA	No load
OSC. built-in cap	Cd	-	20	-	pF	
OSC. trimmer cap	Ctrim	5	-	35	pF	
Frequency stability	$\Delta f/f$	-	-	10	ppM	Vdd=1.6-1.4
Buzzer output current	Ib	200	-	-	μA	Vbd-Vss=0.5
LCD frequency	Flcd	-	64	-	Hz	
Segment current	Is	0.15	-	-	μA	Vseg=0.2V
Common current	Ic	3.0	-	-	μA	Vcom=0.2V

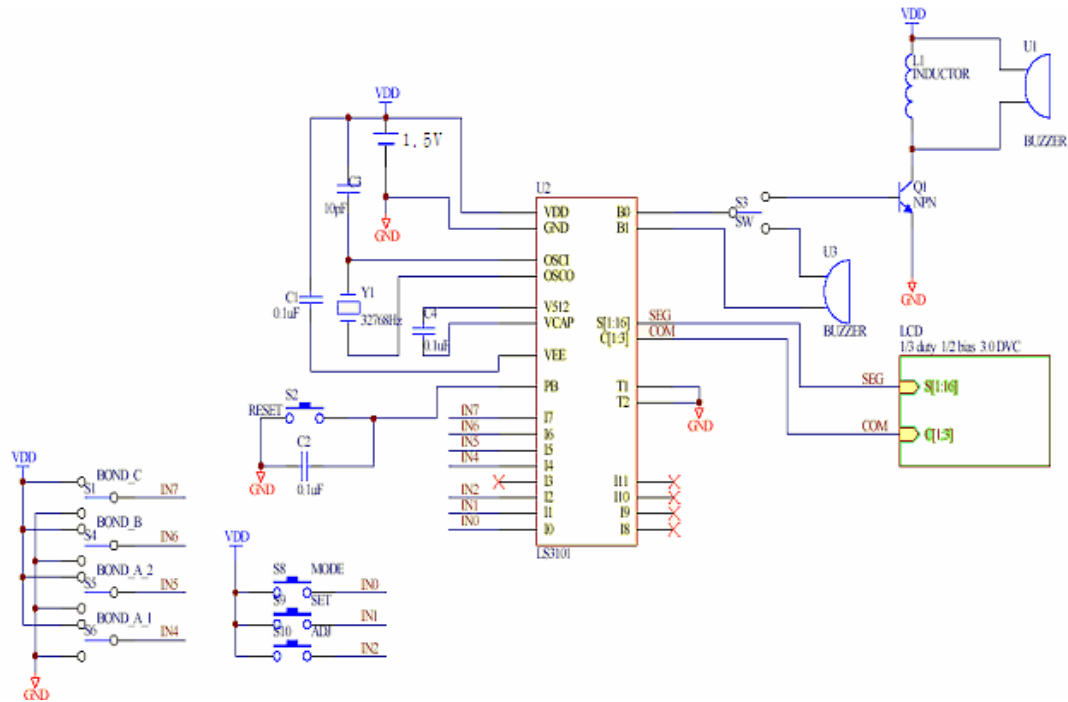
**Pad Coordinate**

<b>PAD</b>	<b>X(<math>\mu</math>m)</b>	<b>Y(<math>\mu</math>m)</b>	<b>PAD</b>	<b>X(<math>\mu</math>m)</b>	<b>Y(<math>\mu</math>m)</b>
S17	-1295.0	-1394.0	PB	-743.0	+1350.0
VCAP	-1295.0	-1251.0	R2(BEEP)	-593.0	+1350.0
VEE	-1295.0	-1110.0	R1	-449.0	+1350.0
V512	-1295.0	-965.0	R0(TRIG)	-225.0	+1350.0
C3	-1295.0	-825.0	OSCO	-75.0	+1350.0
C2	-1295.0	-685.0	OSCI	+1105.0	+1340.0
C1	-1295.0	-545.0	T1	+1246.0	+1340.0
S1	-1295.0	-400.0	GND	+1246.0	+1140.0
S2	-1295.0	-260.0	B1(MOTOR)	+1246.0	+988.0
S3	-1295.0	-120.0	B0(MOTOR)	+1246.0	+678.0
S4	-1295.0	+20.0	VDD	+1246.0	+543.0
S5	-1295.0	+160.0	T2	+1246.0	+395.0
S6	-1295.0	+300.0	I7	+1246.0	+226.0
S7	-1295.0	+440.0	I6	+1246.0	+78.0
S8	-1295.0	+580.0	I5	+1246.0	-70.0
S9	-1295.0	+720.0	I4	+1246.0	-216.0
S10	-1295.0	+860.0	I3	+1246.0	-365.0
S11	-1295.0	+1000.0	I2	+1246.0	-513.0
S12	-1295.0	+1140.0	I1(KAL)	+1246.0	-661.0
S13	-1303.0	+1350.0	I0(KTIME)	+1246.0	-809.0
S14	-1163.0	+1350.0	I8	+1246.0	-957.0
S15	-1023.0	+1350.0	I9	+1246.0	-1105.0
S16	-883.0	+1350.0	I10	+1246.0	-1253.0
			I11	+1246.0	-1400.0

Pad Location



## Application Circuit



### Bonding option A(Total number of daily alarm)

	I5 without resistance	I4 without resistance
Two Alarm	GND	GND
Three Alarm	GND	VDD
Four Alarm	VDD	GND
Five Alarm	VDD	VDD

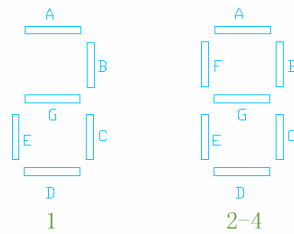
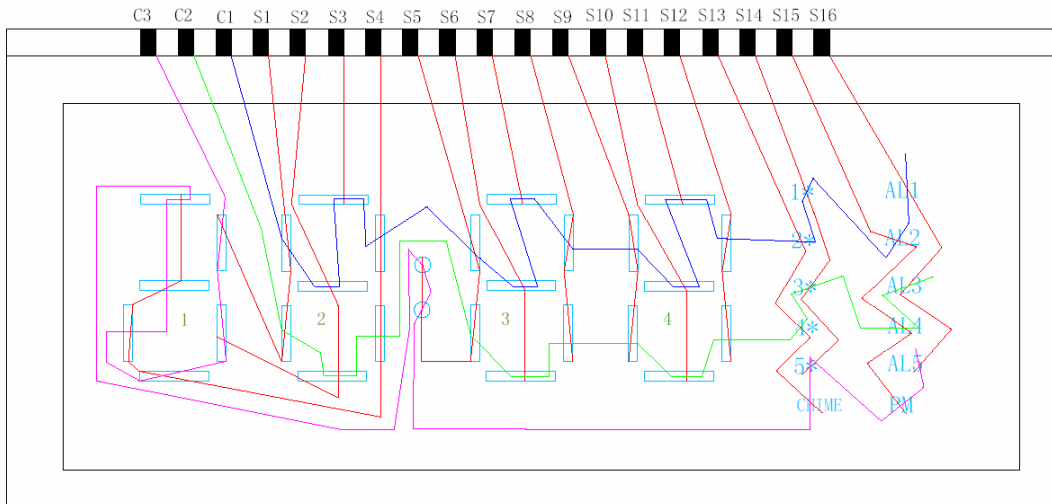
### Bonding option B

	Pin connection	Pin connection
I6 without resistance	VDD: 24 hour format	GND: 12 hour format

### Bonding option C

	Pin connection	Pin connection
I7 without resistance	VDD: press key to stop alarm	GND: 60 seconds alarm

LCD DRAWING



LCD TABLE

	C1	C2	C3
S1	2F	2E	1B
S2	2G	2D	1C
S3	2A		
S4	2B	2C	1A/D/E/G
S5	3F	3E	COL
S6	3G	3D	
S7	3A		
S8	3B	3C	
S9	4F	4E	
S10	4G	4D	
S11	4A		
S12	4B	4C	
S13	2*	4*	Chime
S14	1*	3*	5*
S15	AL2	AL4	PM
S16	AL1	AL3	AL5

