

# LSI

# LS6025

*Game (slot machine) AND*

Watch

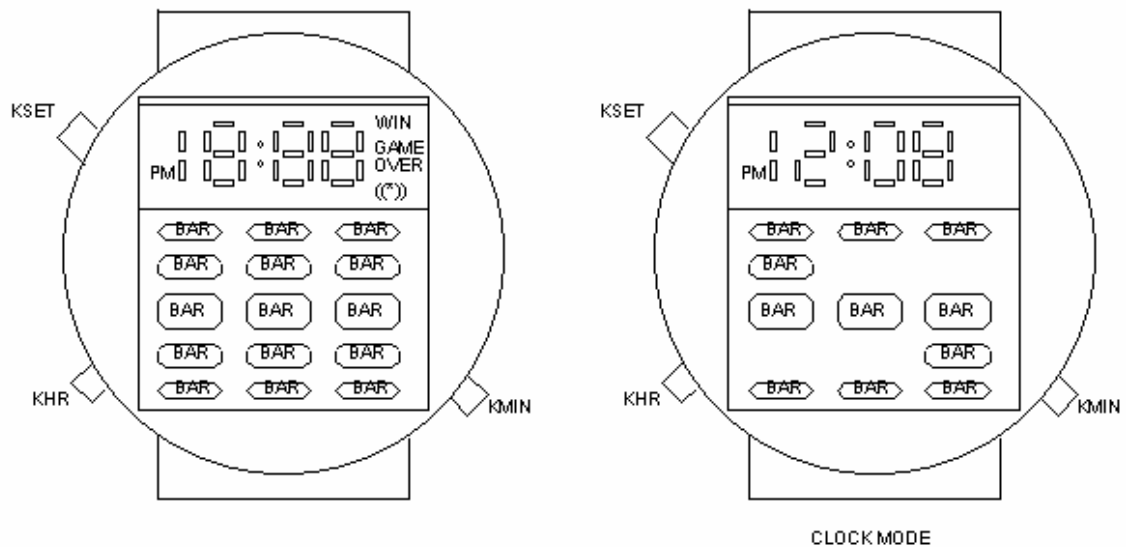
## Features

- \* Real time clock.
- \* Alarm and snooze.
- \* 3 keys operation, KSET, KHR, KMIN.
- \* Slot machine game
- \* 1/2 bias 1/3 duty LCD format
- \* Very low power consumption
- \* 32768 Crystal oscillator
- \* Single 1.5V operation.
- \* Direct buzzer driver.

## General Description

The LS6025 is a slot machine game with 3 1/2 digit LCD for clock display. It is ideal for a low cost watch . gift item or key chain. It is simple three keys operation : KSET, KHR, KMIN.

## LCD Drawing



## Functional Description

### Power Up

At power up, all LCD segment turns on for 1 second.

### Clock Mode

The LS6025 is a digital watch with a slot machine game. At clock mode, the LS6025 has 3 1/2 digit LCD for time display. The LS6025 also provide alarm and snooze function.

### Three key operation

The LS6025 support 3 keys : KSET, KMIN, KHR.

Clock Mode:

1. Press KHR to toggle sound.
2. Press KMIN to enter Game Mode.
3. Press KSET to enter Setting Mode.

Setting Mode :

At Clock Mode, press KSET to enter Setting Mode in the following sequence:

Clock Mode → Set Alarm enable/disable → Set Alarm Hour:Minute → Set Time Hour:Minute  
→ Clock Mode.....

In Set Alarm/Time Mode, press KHR to set hour, press KMIN to set minute.

In Set Alarm Enable/Disable, press KHR/KMIN toggles alarm enable/disable.

In all setting mode, if the value is changed, press KSET set will exit setting mode and goes back to Clock Mode.

At Game Mode,

1. Press KMIN to start the slot machine.
2. Press KHR to toggle sound.
3. Press KSET goes back to Clock Mode.

The Rule of the game.

Every time the KMIN is pressed , 20 marks will be deducted.

Marks will be added according to the following mark table :

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| Pattern                                   | Add Marks |
|-------------------------------------------|-----------|
| XXX XXX XXX<br>BAR BAR BAR<br>XXX XXX XXX | 30        |
| CLR CLR CLR<br>BAR BAR BAR<br>CLR CLR CLR | 50        |
| BAR BAR BAR<br>BAR BAR BAR<br>XXX XXX XXX | 80        |
| BAR BAR BAR<br>BAR BAR BAR<br>BAR BAR BAR | 100       |

## Pin Assignment

| DESIGNATION                                                    | TYPE      | DESCRIPTION             |
|----------------------------------------------------------------|-----------|-------------------------|
| B0, B1                                                         | OUTPUT    | Buzzer output           |
| F512, VCAP                                                     | OUTPUT    | Doubler output          |
| VEE                                                            | OUTPUT    | VEE                     |
| T1, T2,<br>XT4, XT5, XT6, XT7,<br>XT8, XT9, XT10, XT11,<br>XT3 | INPUT     | TEST pin                |
| COSCO                                                          | OUTPUT    | 32KHz oscillator output |
| COSCI                                                          | INPUT     | 32KHz oscillator input  |
| VDD                                                            | POWER     | +3.0V power supply      |
| GND                                                            | POWER     | Ground                  |
| KSET, KMIN, KHR                                                | INPUT(PH) | Input key               |
| PB                                                             | INPUT(PH) | Power up reset          |
| C[1:3]                                                         | OUTPUT    | LCD Common output       |
| S[1:16]                                                        | 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

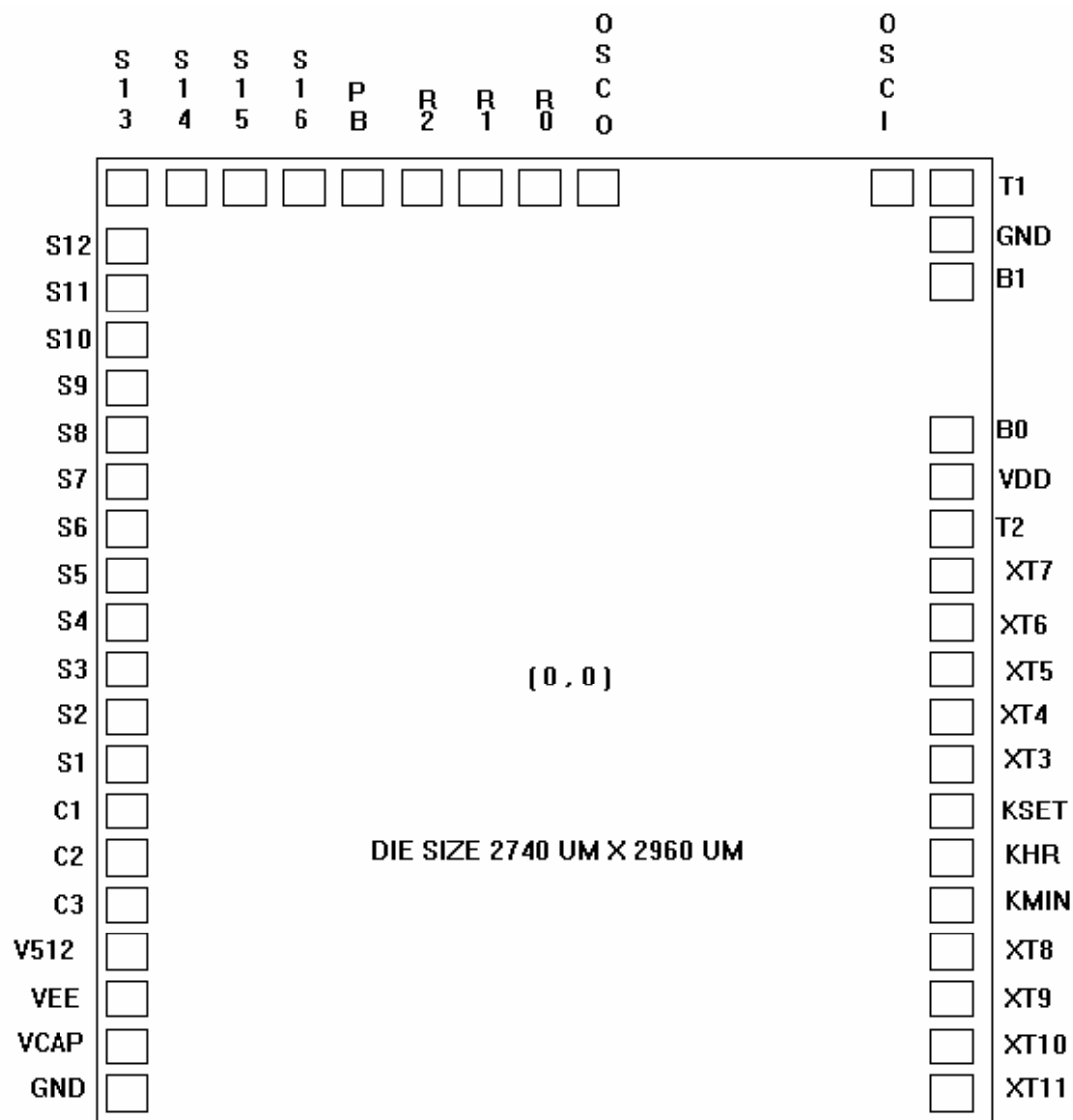
(GND = 0V, Vdd = 1.5V, Ta = 25°C unless otherwise specified)

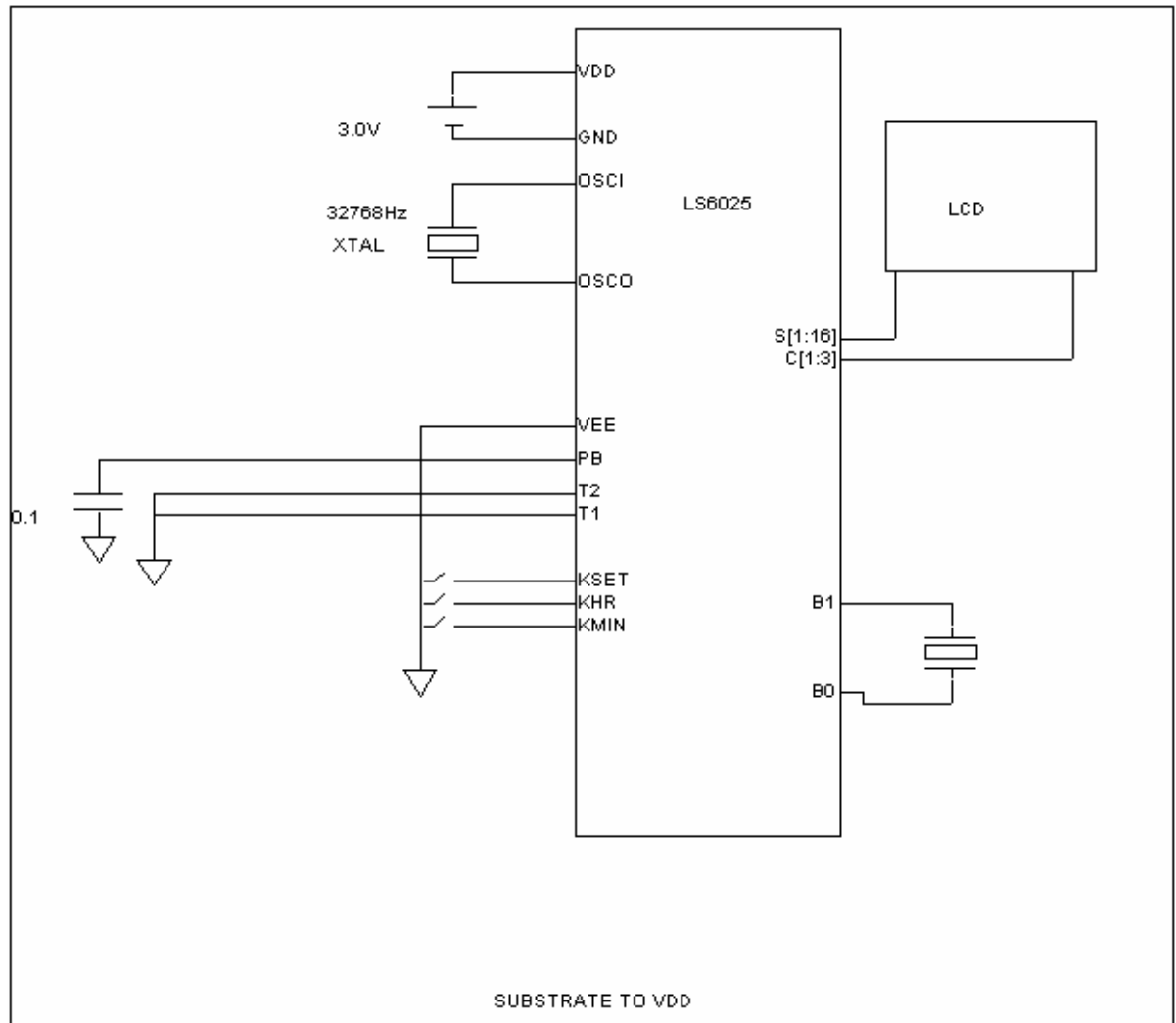
| Parameter             | Symbol       | Min. | Typ. | Max. | Unit | Conditions  |
|-----------------------|--------------|------|------|------|------|-------------|
| Supply Voltage        | Vdd          | 2.4  | 3.0  | 3.6  | V    |             |
| Operating current     | Idd          | -    | 3    | 6    | 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=3.0     |
| Buzzer output current | Ib           | 500  | -    | -    | 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**

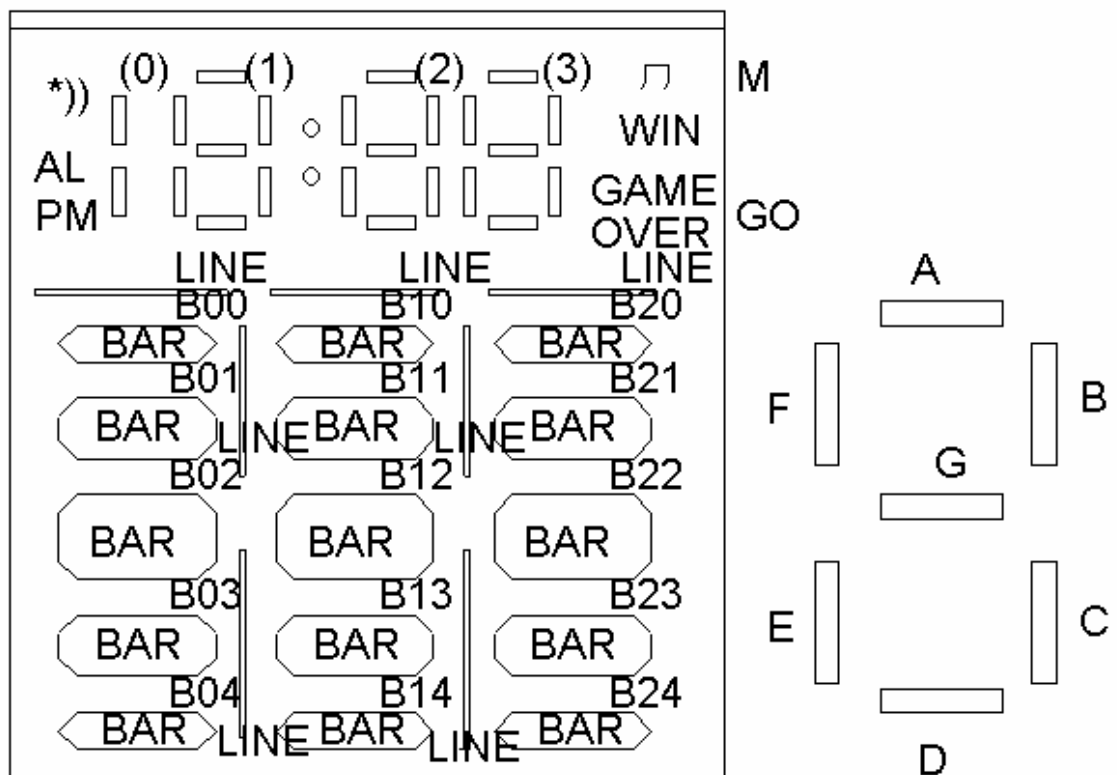
| <b>PAD</b> | <b>X(μm)</b> | <b>Y(μm)</b> | <b>PAD</b> | <b>X(μm)</b> | <b>Y(μm)</b> |
|------------|--------------|--------------|------------|--------------|--------------|
| GND        | -1295.0      | -1394.0      | PB         | -743.0       | +1350.0      |
| VCAP       | -1295.0      | -1251.0      | R2         | -593.0       | +1350.0      |
| VEE        | -1295.0      | -1110.0      | R1         | -449.0       | +1350.0      |
| V512       | -1295.0      | -965.0       | R0         | -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         | +1246.0      | +988.0       |
| S3         | -1295.0      | -120.0       | B0         | +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       | XT7        | +1246.0      | +226.0       |
| S7         | -1295.0      | +440.0       | XT6        | +1246.0      | +78.0        |
| S8         | -1295.0      | +580.0       | XT5        | +1246.0      | -70.0        |
| S9         | -1295.0      | +720.0       | XT4        | +1246.0      | -216.0       |
| S10        | -1295.0      | +860.0       | XT3        | +1246.0      | -365.0       |
| S11        | -1295.0      | +1000.0      | KSET       | +1246.0      | -513.0       |
| S12        | -1295.0      | +1140.0      | KHR        | +1246.0      | -661.0       |
| S13        | -1303.0      | +1350.0      | KMIN       | +1246.0      | -809.0       |
| S14        | -1163.0      | +1350.0      | XT8        | +1246.0      | -957.0       |
| S15        | -1023.0      | +1350.0      | XT9        | +1246.0      | -1105.0      |
| S16        | -883.0       | +1350.0      | XT10       | +1246.0      | -1253.0      |
|            |              |              | XT11       | +1246.0      | -1400.0      |

**Pad Location**



**Application Circuit**

## LCD Drawing



| PIN | 1   | 2    | 3   | 4  | 5  | 6  | 7  | 8  | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21 |  |
|-----|-----|------|-----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|--|
| SX  | S4  | S3   | S2  | C3 | C1 | C2 | S1 | S2 | S5  | S6  | S7  | S8  | S9  | S10 | S11 | S12 | S13 | S14 | S15 | S16 | S2 |  |
| C1  | WIN | LINE | /   | /  | C1 | /  | *) | /  | 1D  | 1C  | 1G  | 1B  | 2D  | 2C  | 2G  | 2B  | 3D  | 3C  | 3G  | 3B  | M  |  |
| C2  | GO  | /    | /   | /  | /  | C2 | AL | PM | 0BC | 1E  | 1F  | 1A  | :   | 2E  | 2F  | 2A  |     | 3E  | 3F  | 3A  | /  |  |
| C3  | B24 | B14  | B04 | C3 | /  | /  | /  | /  | B00 | B01 | B02 | B03 | B10 | B11 | B12 | B13 | B20 | B21 | B22 | B23 | /  |  |

S16 S15 S14 S13 S12 S11 S10 S9 S8 S7 S6 S5 S4 S3 S2 S1  
 COM1:3B 3G 3C 3D 2B 2G 2C 2D 1B 1G 1C 1D WIN LINE M \*)  
 COM2:3A 3F 3E 2A 2F 2E : 1A 1F 1E 0BC GO PM AL  
 COM3:B23 B22 B21 B20 B13 B12 B11 B10 B03 B02 B01 B00 B24 B14 B04

- Note:
1. Pin out at top of the LCD
  2. Twisted Nematic Display
  3. View Direction: 6 o'clock
  4. Polarizer : reflective/ positive
  5. Drive Method : 1/3 duty, 1/2 bias
  6. Operating Voltage : 3.0V
  7. Operating Temp. : 0 – 50C
  8. Connector : Zebra.