LSI *LS6025*

Game (slot machine) AND

Watch

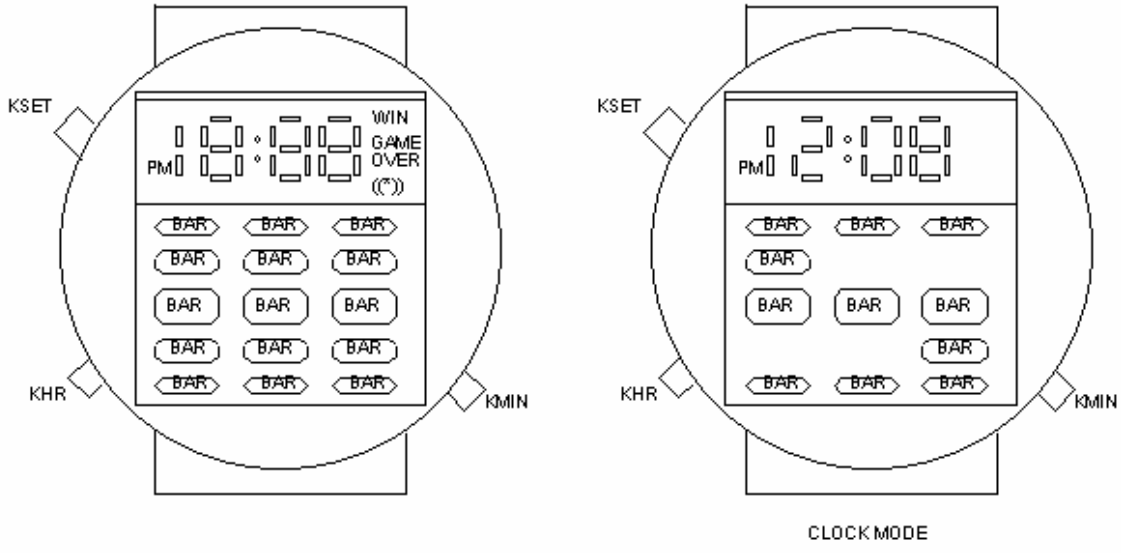
Features

* 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 Enalble/Disable, press KHR/KMIN toggles alarm enalbe/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 BAR BAR BAR XXX XXX XXX	30
CLR CLR CLR BAR BAR BAR CLR CLR CLR	50
BAR BAR BAR BAR BAR BAR XXX XXX XXX	80
BAR BAR BAR BAR BAR BAR BAR BAR BAR	100

Pin Assignment

DESIGNATION	TYPE	DESCRIPTION
B0, B1	OUTPUT	Buzzer output
F512, VCAP	OUTPUT	Doubler output
VEE	OUTPUT	VEE
T1, T2, XT4, XT5, XT6, XT7, XT8, XT9, XT10, XT11, 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

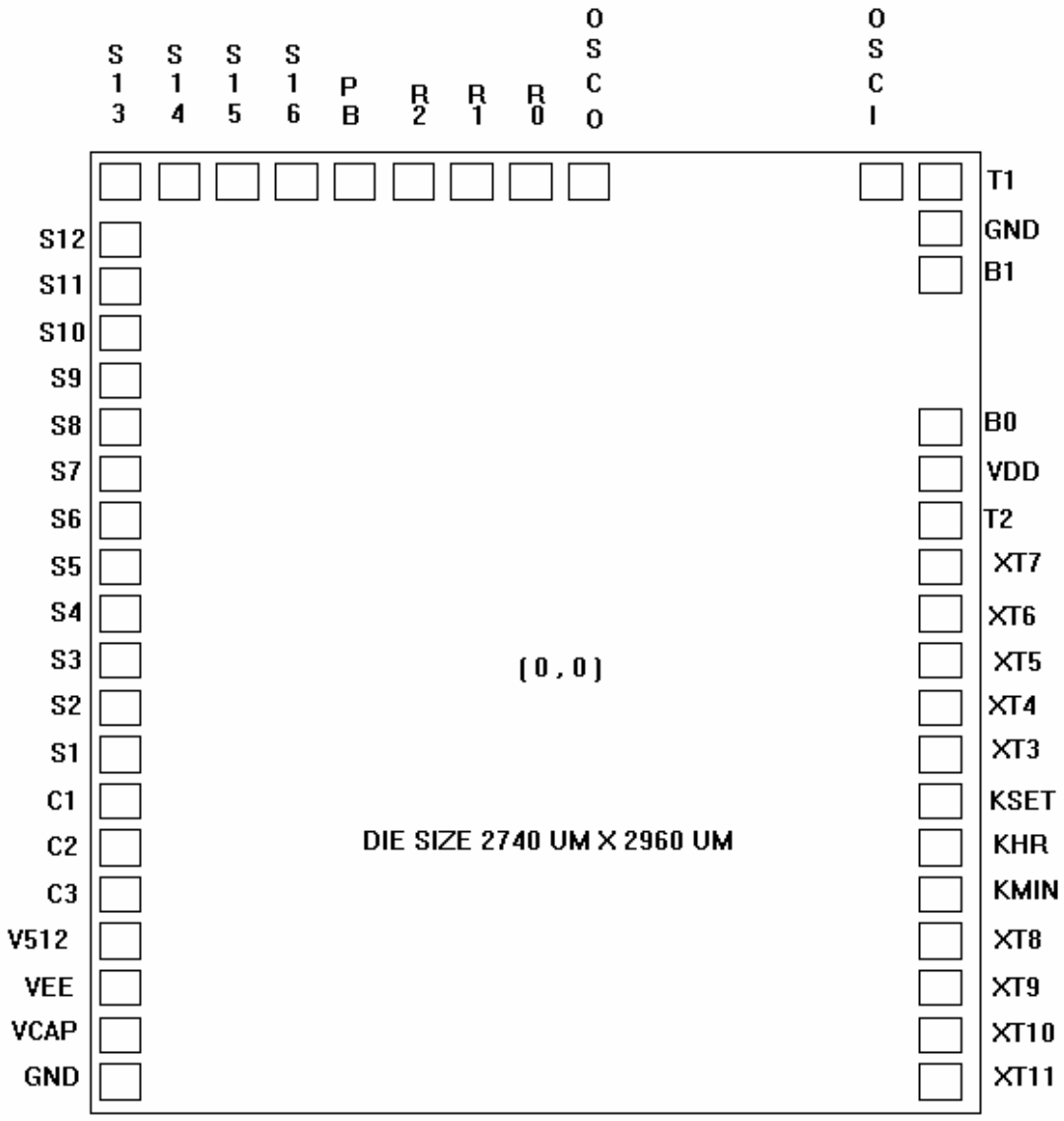
(GND = 0V, Vdd = 1.5V, Ta = 25°C unless otherwise specified)

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	^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

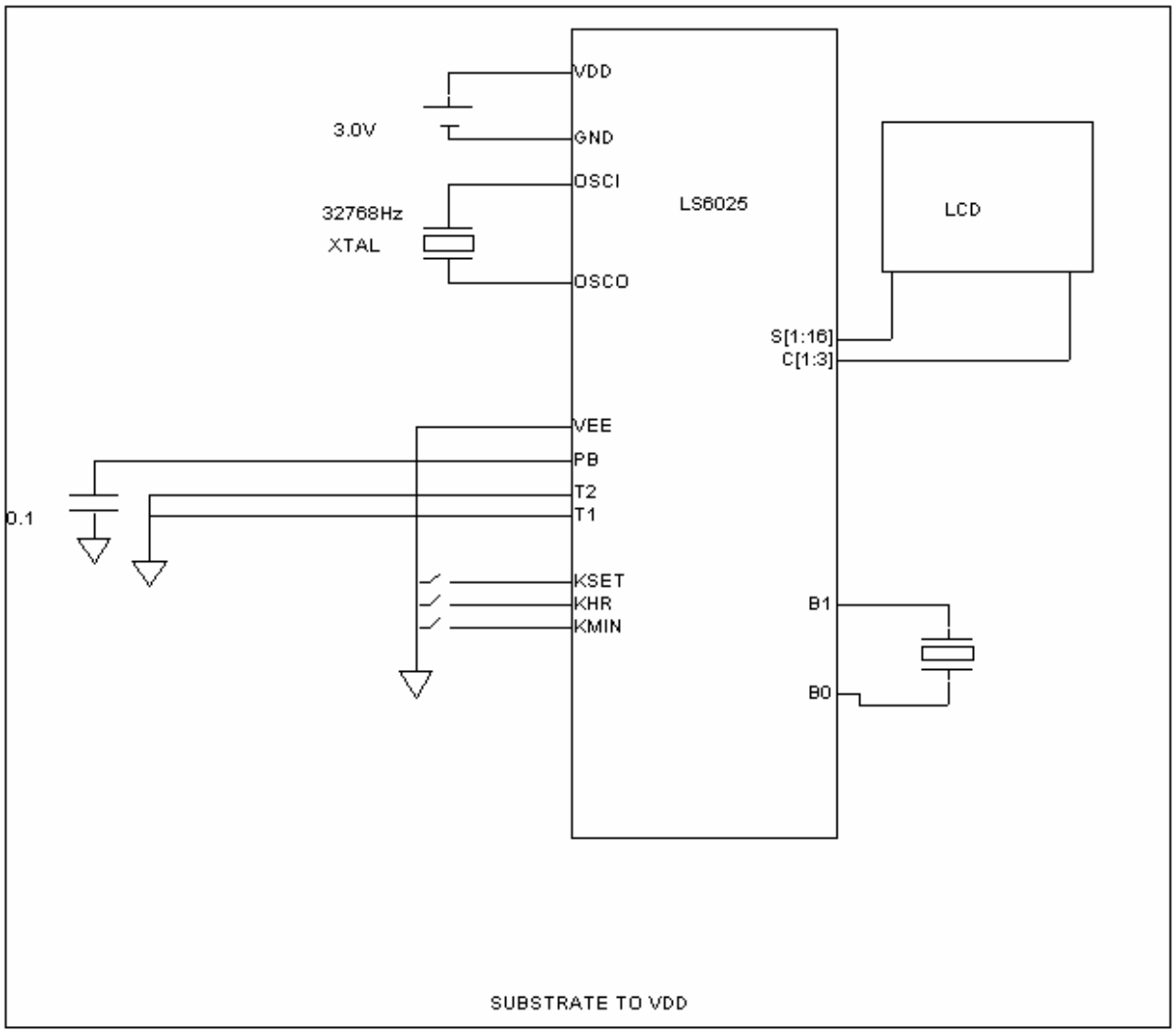
Pad Coordinate

PAD	X(μm)	Y(μm)	PAD	X(μm)	Y(μm)
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

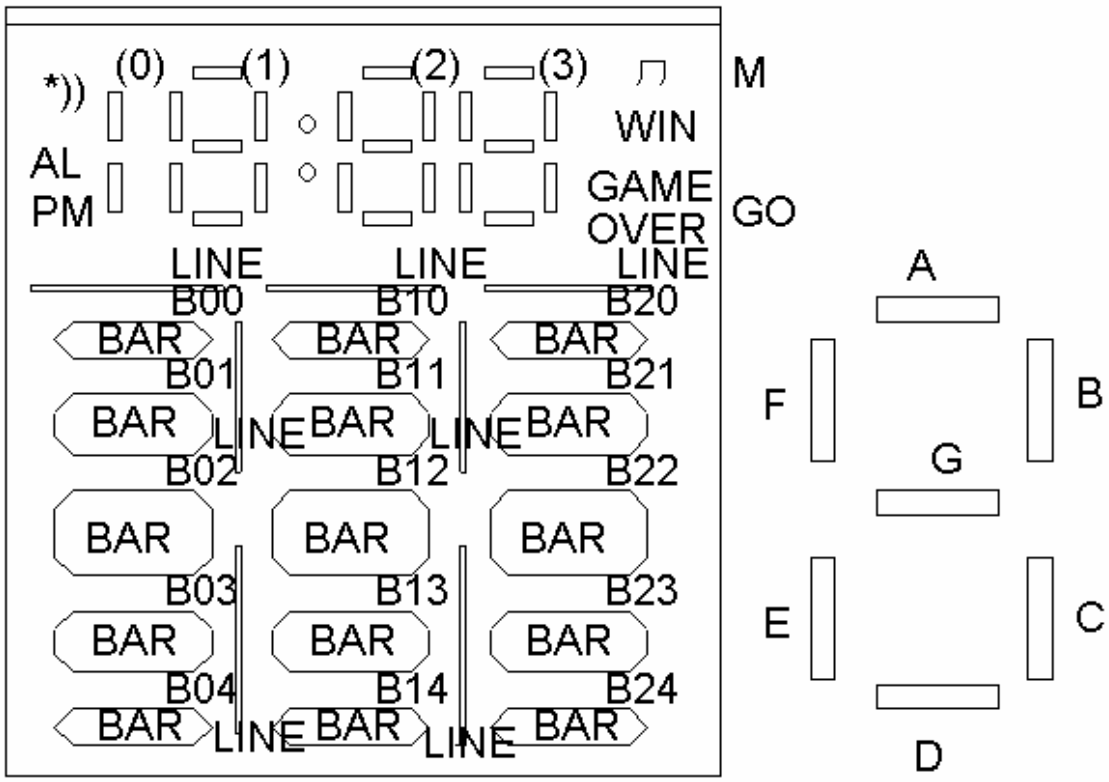
Pad Location



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.