

LSI

LSI-6015

Rotating Clock

Features

- * 4 digit LCD display (rotating)
- * Hour:Minute or Month:Date Display
- * Rotate in 4 direction
- * 12/24 hour display format
- * 3 key operation
- * Direct drive 1/2 bias 1/3 duty LCD
- * Very low power consumption
- * 32768 Crystal oscillator
- * Single 1.5V operation.

General Description

The LSI6015 is a rotating clock which the clock can be placed in four direction (up/down/left/right) and the LCD display the correct time/date information. It has a 3 key operation : SET, MODE, ADJ. It has 4 direction input to detect the display mode. The LSI6015 can be selected to operate in 12 hour/24 hour format depending on bonding option.

The LSI6015 directly drive a 1/2 duty 1/3 bias LCD. It has a very low current consumption and is suitable for timer application.

Functional Description**Power up**

At power up, the LSI6015 turns on all LCD and starts the clock from 1:00am (Time Mode).

Key operation

The LSI6015 has three key operation MODE, SET, ADJ.

At Time Mode, press MODE key display the current date (Date Mode), press MODE again goes back to Time Mode and display the current time.

SETTING TIME

At Time Mode, press SET over 2 seconds enter Hour Setting Mode.

At Hour Setting Mode, press ADJ to adjust the hour, press MODE key goes to Minute Setting Mode.

At Minute Setting Mode, press ADJ to adjust the minute, press MODE key goes back to Time Mode.

SETTING DATE

At Date Mode, press SET over 2 seconds enter Month Setting Mode.

At Month Setting Mode, press ADJ to adjust the current month, press MODE key goes to Date Setting Mode.

At Date Setting Mode, press ADJ to adjust the current date, press MODE key goes back to Date Mode.

12HOUR/24HOUR OPTION

When 12/24 is connected to VDD, the LSI6015 display the clock in 12 hour format.

When 12/24 is connected to GND, the LSI6015 display the clock in 24 hour format.

ROTATE THE CLOCK

When DOWN/UP/LEFT/RIGHT is connected to GND, the LSI6015 display the clock/date in down/up/left/down position.

Pin Assignment

DESIGNATION	TYPE	DESCRIPTION
BD [0:1]	OUTPUT	Buzzer output
F512, VCAP	OUTPUT	Doubler output
VEE	OUTPUT	-1.5V
T1, T2	INPUT	TEST pin
E1,E2,E3,E4	INPUT	TEST pin
COSCO	OUTPUT	32KHz oscillator output
COSCI	INPUT	32KHz oscillator input
VDD	POWER	+1.5V power supply
GND	POWER	Ground
UP/DOWN/LEFT/RIGHT	INPUT(PH)	Input key
12/24	INPUT(PH)	Bonding option
MODE/SET/ADJ	INPUT(PH)	Input key
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

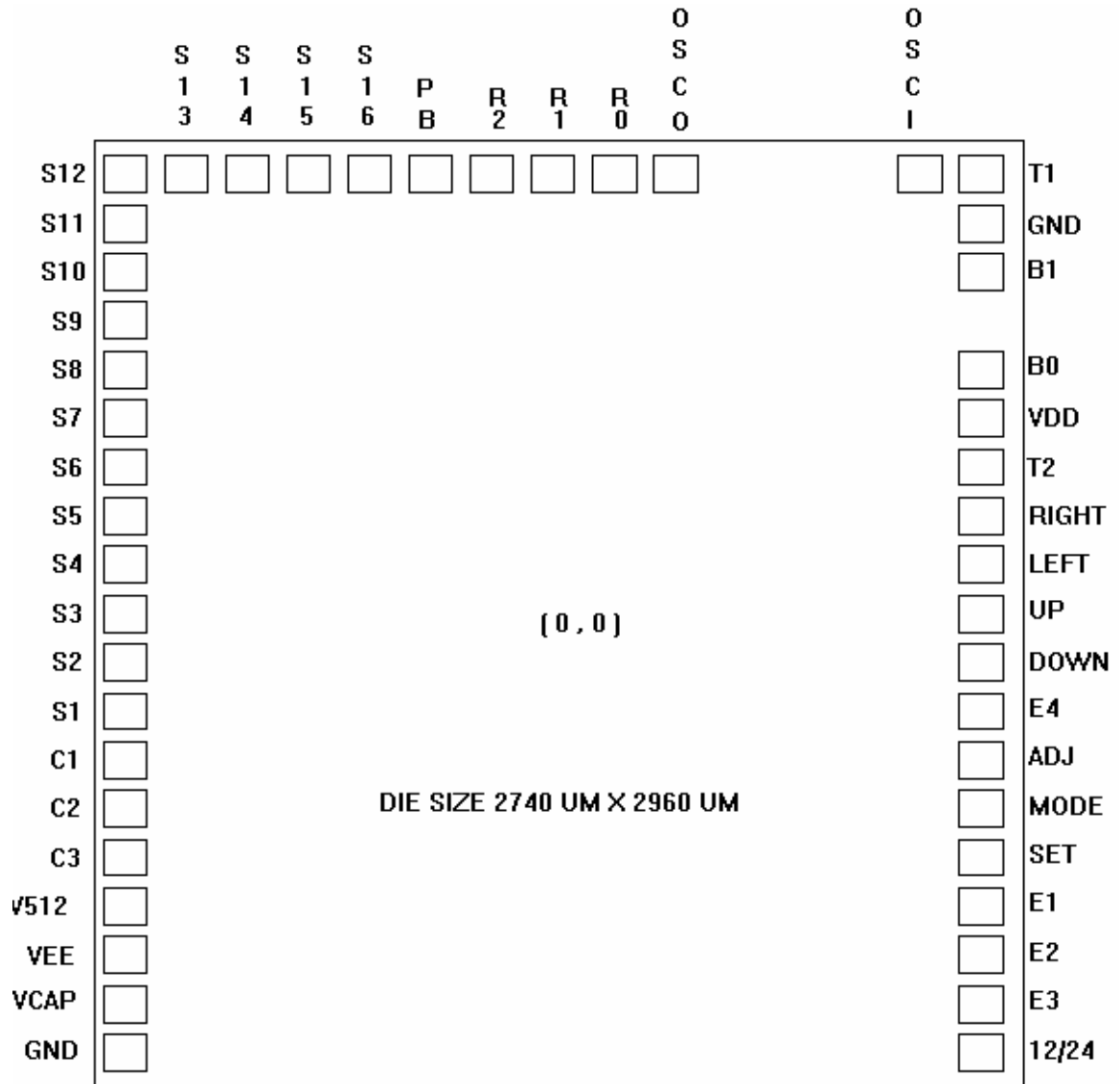
(GND = 0V, Vdd = 1.5V, Ta = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	Vdd	1.2	1.5	1.8	V	
Operating current	Idd	-	2	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=1.6-1.4
Buzzer output current	Ibd	500	-	-	μA	Vbd-Vss=0.5
LCD frequency	Flcd	-	64	-	Hz	
Segment current	Ilcd	0.15	-	-	μA	Vseg=0.2V
Common current	Icom	3.0	-	-	μA	Vcom=0.2V

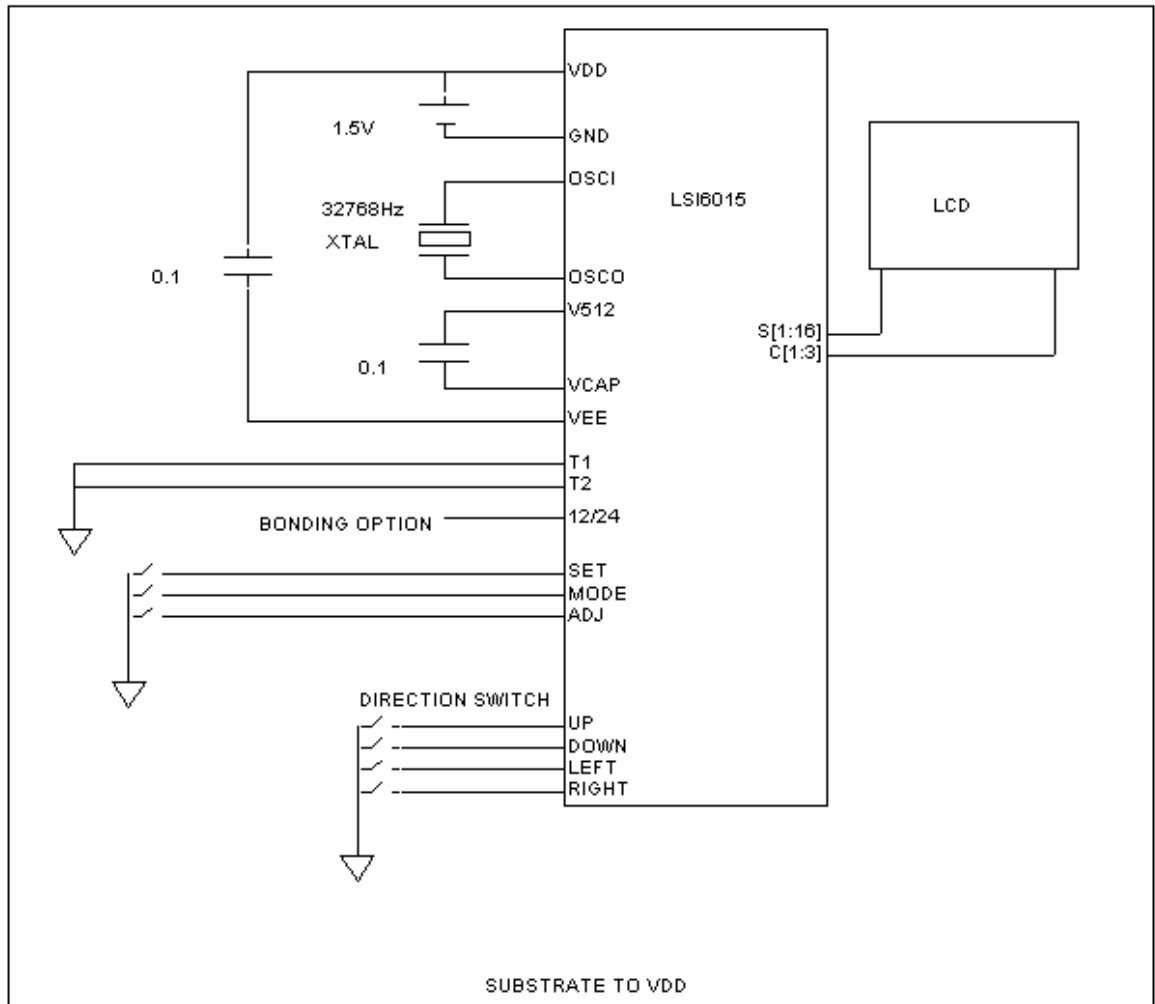
Pad Coordinate

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	RIGHT	+1246.0	+226.0
S7	-1295.0	+440.0	LEFT	+1246.0	+78.0
S8	-1295.0	+580.0	UP	+1246.0	-70.0
S9	-1295.0	+720.0	DOWN	+1246.0	-216.0
S10	-1295.0	+860.0	E4	+1246.0	-365.0
S11	-1295.0	+1000.0	ADJ	+1246.0	-513.0
S12	-1295.0	+1140.0	MODE	+1246.0	-661.0
S13	-1303.0	+1350.0	SET	+1246.0	-809.0
S14	-1163.0	+1350.0	E1	+1246.0	-957.0
S15	-1023.0	+1350.0	E2	+1246.0	-1105.0
S16	-883.0	+1350.0	E3	+1246.0	-1253.0
			12/24	+1246.0	-1400.0

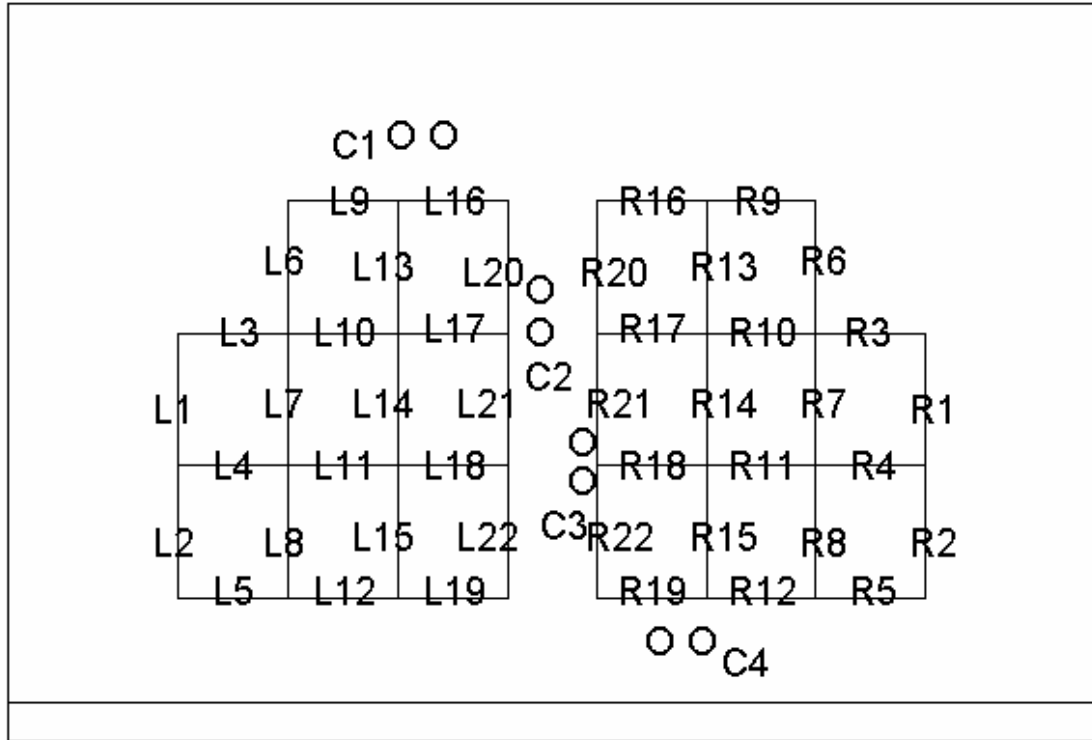
Pad Location



Application Circuit



Lcd pinout



PIN1

LCD table

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
NAME	S16	S15	S14	S13	S12	S11	S10	S9	S8	S7	S6	S5	S4	S3	S2	S1	C1	C2	C3
C1	C1	L2	L5	L8	L12	L15	L19	L22	C4	R22	R19	R15	R12	R8	R5	R2	C1	/	/
C2	C2	L1	L4	L7	L11	L14	L18	L21	C3	R21	R18	R14	R11	R7	R4	R1	/	C2	/
C3	L16	L9	L3	L6	L10	L13	L17	L20	R9	R16	R17	R20	R10	R13	R3	R6	/	/	C3

Note: Lcd Pinout at the bottom of the LCD.

Lcd is 1/3 duty, 1/2 bias, Lcd on = 3.0V.

LCD In 4 Direction

