

## 带时间闹铃倒计时 IC

# 产 品 说 明 书

***4 Digit Universal Timer with clock***

**Features**

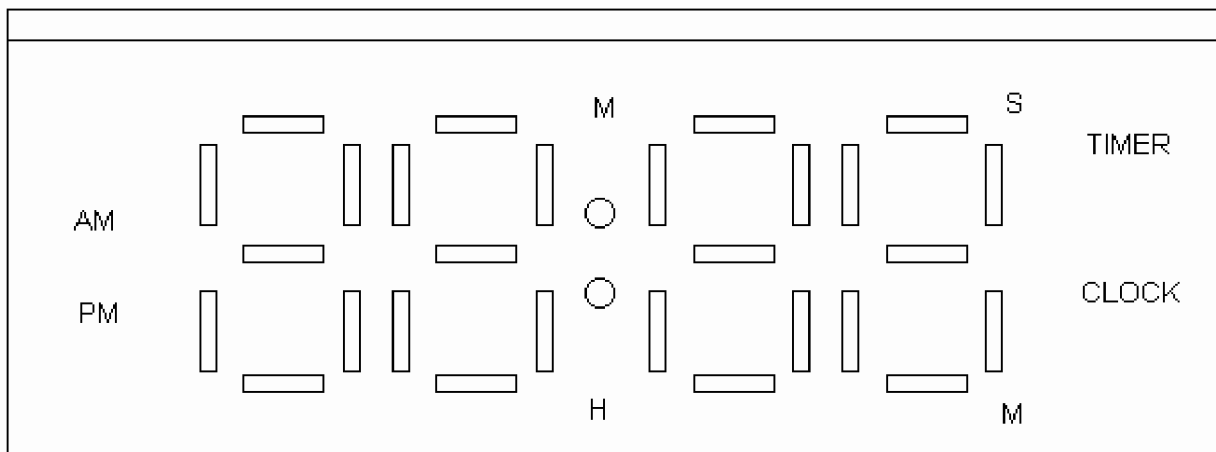
- \* 4 digit LCD display.
- \* HH:MM or MM:SS Display.
- \* Real time Clock.
- \* 3 keys operation.
- \* 5 bonding option.
- \* Direct drive 1/2 bias 1/3 duty LCD.
- \* Very low power consumption
- \* 32768 Crystal oscillator
- \* Single 1.5V operation.

**General Description**

The DL926 is a 4 digit timer with a real time clock. It is three keys operation : KH, KL and KST. It is very universal such that the user can tailor to the specific application as needed by bonding option. There are 5 bonding options :

1. BMMSS : Hour/Minute or Minute/Second timer.
2. BNCLOCK : enable/disable clock function.
3. BSET : enable/disable timer setting in PAUSE mode.
4. BNREP : enable/disable count down repeat function.
5. BOFF : enable/disable LCD off function.

**LCD Drawing**



## Functional Description

### Power up

At power up, buzzer alarm for 1 sec, the DL926 turns on all LCD for 1 second.

If BNCLOCK == VDD, the DL926 display timer.

If BNCLOCK == GND, the DL926 display clock "am 12:00".

### Clock Mode

In Clock Mode, press KH enters clock setting mode.

The setting sequence is : Clock Mode → Set Clock Hour → Set Clock Minute → Clock Mode.

Press KL to set the corresponding value.

Press KST enters Timer Mode.

### Timer Mode Operation

The operation of the DL926 depends on the 5 bonding option .

(Note : All bonding option input has a pull high resistor, therefore, floating == VDD).

1. The Timer will count up when LCD displays 00:00 and KST is pressed
2. Timer will count down when LCD displays non-zero and KST is pressed
3. Setting of timer is by means of KL and KH
4. Maximum range for the counting is 99:59
5. The leftmost digit should have leading zero. For example, if the hour position is 2 hour, the display should be 02:xx

	BONDED	Description
BMS	Open	Minute Second mode. Press KL sets second value, KH sets minute value.
	GND	Hour Minute mode. Press KL sets minute value, KH sets hour value.
BNCL OCK	Open	No Clock
	GND	Enable clock. In timer mode, press KL,KH, KST simultaneously enters clock mode.
BSET	Open	Enable setting in PAUSE mode. While the timer is counting, press KST enters PAUSE mode.
	GND	No setting in PAUSE mode.
BNREP	Open	No repeat function.
	GND	Repeat function enabled. The timer will restart from the setting value by the end of count automatically. The alarm will last for 1 minute
BOFF	Open	If clock is selected (BNCLOCK==GND), the timer return to clock mode after 1 minute of idle state. If clock is not selected (BNCLOCK==VDD), the timer will be off.
	GND	If clock is selected (BNCLOCK==GND), the timer return to clock mode after 1 minute of idle state. If clock is not selected (BNCLOCK==VDD), the timer will be permanently on.

### Absolute Maximum Ratings

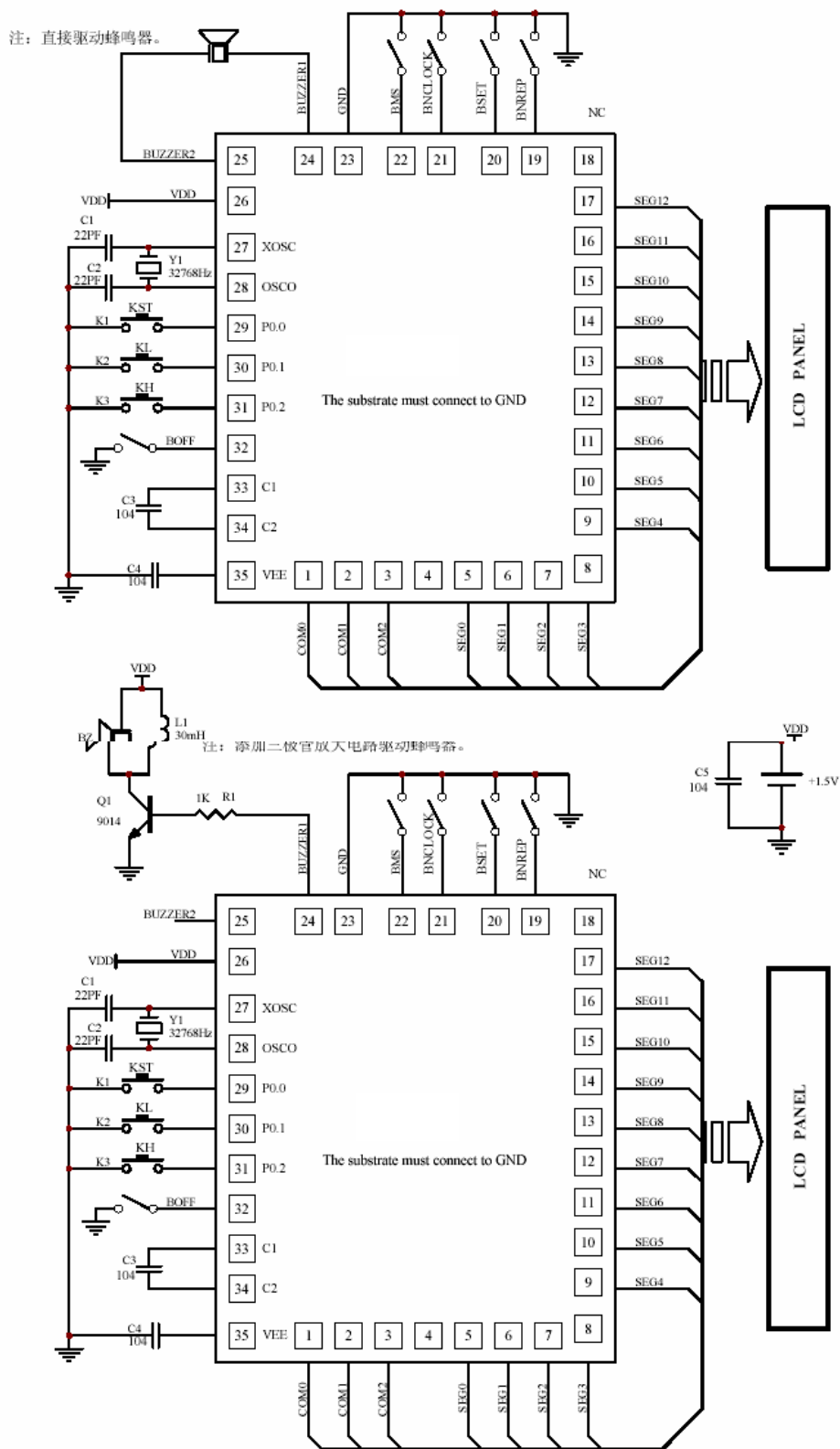
Supply voltage Vdd - Vss.....0 to 5V  
 Input voltage Vin.....Vss to Vdd  
 Operating temperature Top .....-10°C to 60°C  
 Storing temperature Tst .....-40°C to 70°C

### D.C. Electrical Characteristics

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

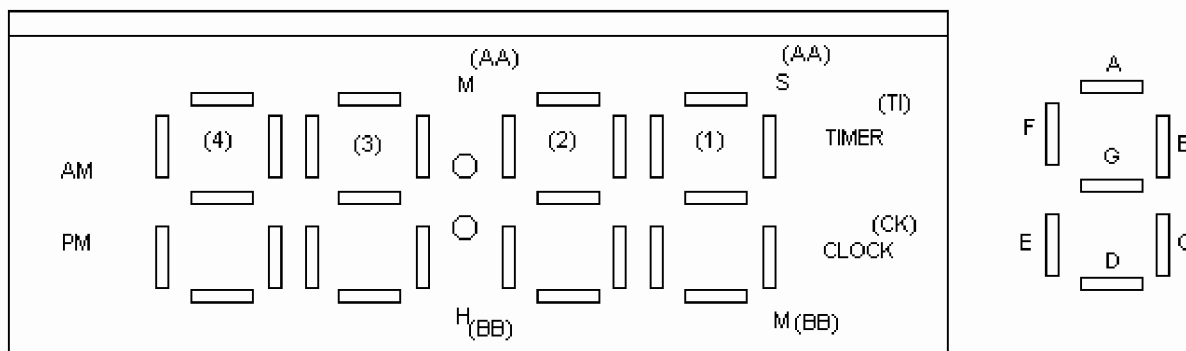
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	Vdd	1.2	1.5	1.8	V	
Operating current	Idd	-	3	6	μA	No load
OSC. built-in cap	Cd	-	20	-	pF	
OSC. trimmer cap	Ctrim	5	-	35	pF	
Frequency stability	$\Delta f/f$	-	-	10	ppM	Vdd=1.6-1.4
Buzzer output current	Ibd	500	-	-	μA	Vbd-Vss=0.5
LCD frequency	Flcd	-	128	-	Hz	
Segment current	Ilcd	0.15	-	-	μA	Vseg=0.2V
Common current	Icom	3.0	-	-	μA	Vcom=0.2V

## Application Circuit



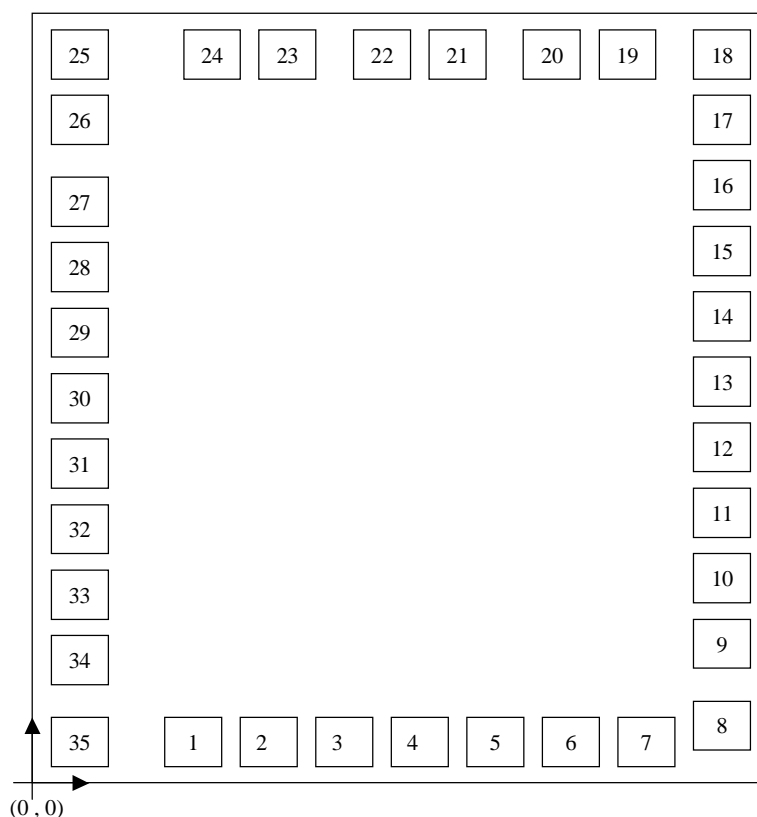
## LCD DRAWING(1/3DUTY,1/2BIAS,3.0V)

PIN 1.....



PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SIGNAL	C0	C1	C2	S12	S11	S10	S9	S8	S7	S6	S5	S4	S3	S2	S1	S0
COM1	/	/	C2	4F	4A	4B	3F	3A	3B	AA	2F	2A	2B	1F	1A	1B
COM2	/	C1	/	4E	4G	4C	3E	3G	3C	:	2E	2G	2C	1E	1G	1C
COM3	C0	/	/	AM	4D	PM	/	3D	/	BB	/	2D	/	CK	1D	TI

## PAD DIAGRAM:



## PAD DESCRIPTIONS:

No	Symbol	Description	No	Symbol	Description
1	COM0	LCD COM	19	BNREP	Bonding options
2	COM1	LCD COM	20	BSET	Bonding options
3	COM2	LCD COM	21	BNCLOCK	Bonding options
4	COM3	LCD COM	22	BMS	Bonding options
5	SEG0	LCD Segment	23	GND	Negative Power
6	SEG1	LCD Segment	24	BUZ1	Sound Output
7	SEG2	LCD Segment	25	BUZ2	Sound Output
8	SEG3	LCD Segment	26	VDD	Positive Power
9	SEG4	LCD Segment	27	XOSC	Osc. Input
10	SEG5	LCD Segment	28	OSCO	Osc. output
11	SEG6	LCD Segment	29	PO.0	Key Input
12	SEG7	LCD Segment	30	PO.1	Key Input
13	SEG8	LCD Segment	31	PO.2	Key Input
14	SEG9	LCD Segment	32	BOFF	Bonding options
15	SEG10	LCD Segment	33	C1	Doubler Cap
16	SEG11	LCD Segment	34	C2	Doubler Cap
17	SEG12	LCD Segment	35	VEE	Double Voltage
18	NC	NC			