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## DL3306 六位带背光手表 IC

# 产 品 说 明 书

**DESCRIPTION**

The DL3306 is a CMOS 6 function watch circuit with EL, alarm and auto ranging chronograph function; designed for a 6 digit duplexes liquid crystal display, 7-day mark, date mark, AM / PM mark, colon.

**FEATURES**

- ◆ Split operative stopwatch (Accurate to 1/100 second)
- ◆ Hour, Minute, Second, Month and Date normal display
- ◆ 6 digit chronograph : Auto ranging after 30 minutes to hour, minute, second from minute, second, 1/100 second
- ◆ Alarm output for melody IC
- ◆ Alarm function with 4 to 5 minutes snooze
- ◆ Chime on every hour
- ◆ User selectable 12/24 format & 4 year calendar
- ◆ One touch correction of time error within  $\pm 30$  seconds
- ◆ Oscillating built-in capacitor
- ◆ Direct drive of piezo buzzer
- ◆ Pad 7 is build-in transistor
- ◆ EL Backlight control output

**特點**

- ◆ 跑表有分段計時功能 (準確至 1/100 秒)
- ◆ 可顯示時、分、秒、月、日及星期
- ◆ 6 位計時器：以分、秒、1/100 秒顯示方式，計滿 30 分後自動轉換至時、分、秒
- ◆ 可接音樂電路芯片作音樂鬧鈴轉出
- ◆ 具有 4~5 分鐘再鬧功能
- ◆ 整點發聲報時
- ◆ 可選用 12 或 24 小時制；4 年日曆
- ◆ 按鍵一次可校正 $\pm 30$  秒時間誤差
- ◆ 振蕩器內置電容
- ◆ 可直接驅動壓電蜂鳴片
- ◆ 7 腳為內置三極管驅動鬧鐘輸出
- ◆ EL 背光控制輸出 (EL 常亮)
- ◆ 60 秒鬧鈴

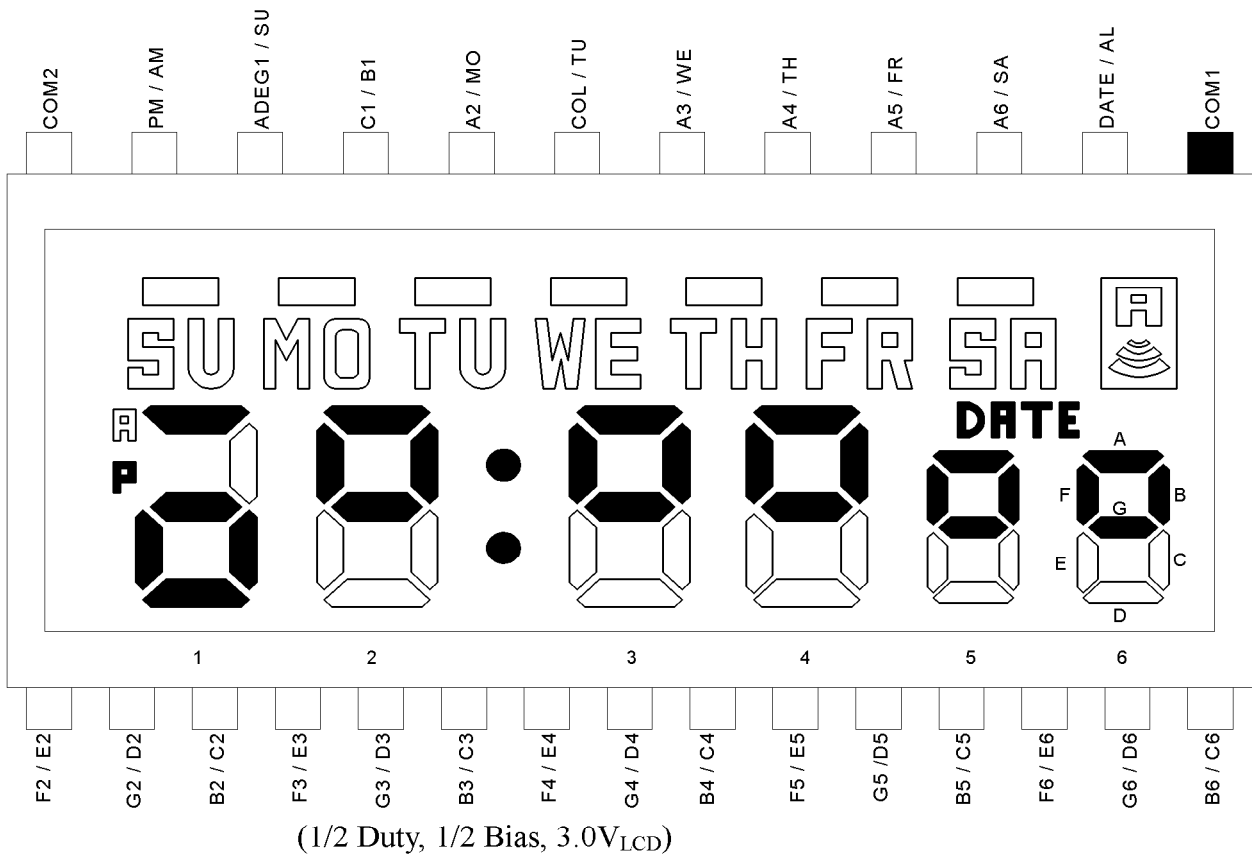
**ABSOLUTE MAXIMUM RATING**(T<sub>A</sub>=25°C)

Characteristic	Symbol	Value	Unit
Supply Voltage	V <sub>SS1</sub>	-0.3 ~ +2.0	V
Supply Voltage	V <sub>SS2</sub>	-0.3 ~ +4.0	V
Operating Temperature	T <sub>OPR</sub>	0 ~ +60	°C
Storage Temperature	T <sub>STG</sub>	-25 ~ +75	°C

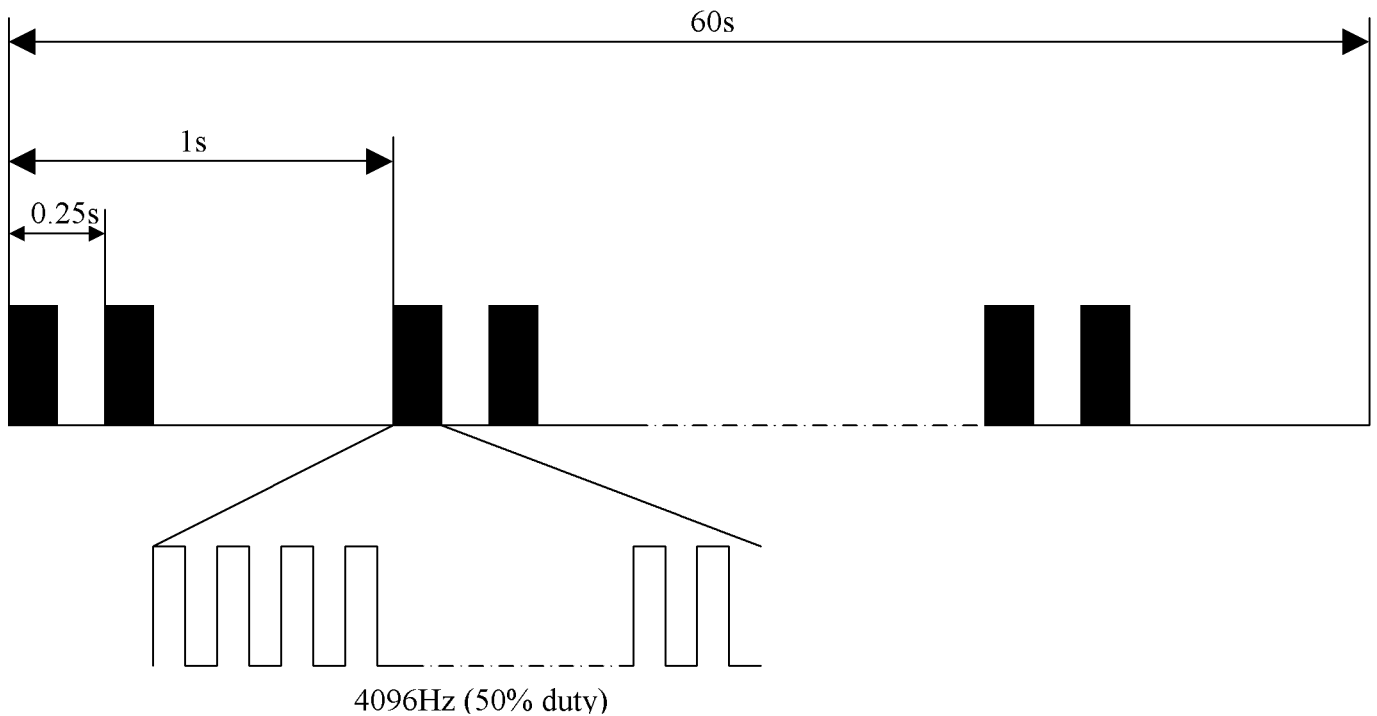
**ELECTRICAL CHARACTERISTICS 電特性**

Characteristics	Sym	Min	Typ	Max	Unit	Remarks
Operating Voltage 工作電壓	V <sub>DD</sub>	1.2	1.5	1.8	V	—
Quiescent Current 靜態電流	I <sub>SB</sub>	—	0.9	1.2	uA	No Load
Operating Current 工作電流	I <sub>OP</sub>	—	6	9	mA	EL
Input High Voltage 輸入高電壓	V <sub>IH</sub>	V <sub>DD</sub> -0.3	—	V <sub>DD</sub>	V	—
Input Low Voltage 輸入低電壓	V <sub>IL</sub>	V <sub>SS</sub>	—	V <sub>SS</sub> +0.3	V	—
Switch Activation Current 按鍵開關消耗電流	I <sub>SW</sub>	—	—	4	uA	V <sub>IN</sub> =V <sub>DD</sub>
Oscillating Start Voltage 振蕩起振電壓	V <sub>OSC</sub>	—	—	1.2	V	Within 3 seconds
Alarm Drive Current 鬧鈴驅動電流	I <sub>ALA</sub>	5	10	—	mA	V <sub>ALA</sub> =0.5V
Oscillation Frequency 振蕩頻率	F <sub>OSC</sub>	—	32768	—	Hz	+/- 30%Tol
LCD Frequency LCD 頻率	F <sub>LCD</sub>	—	32	—	Hz	—
Time Stability 時間穩定度	T <sub>stb</sub>	—	1	—	ppm	—
Output Current for IND, DIS 輸出電流	I <sub>O</sub>	1	—	—	mA	V <sub>O</sub> =0.5V

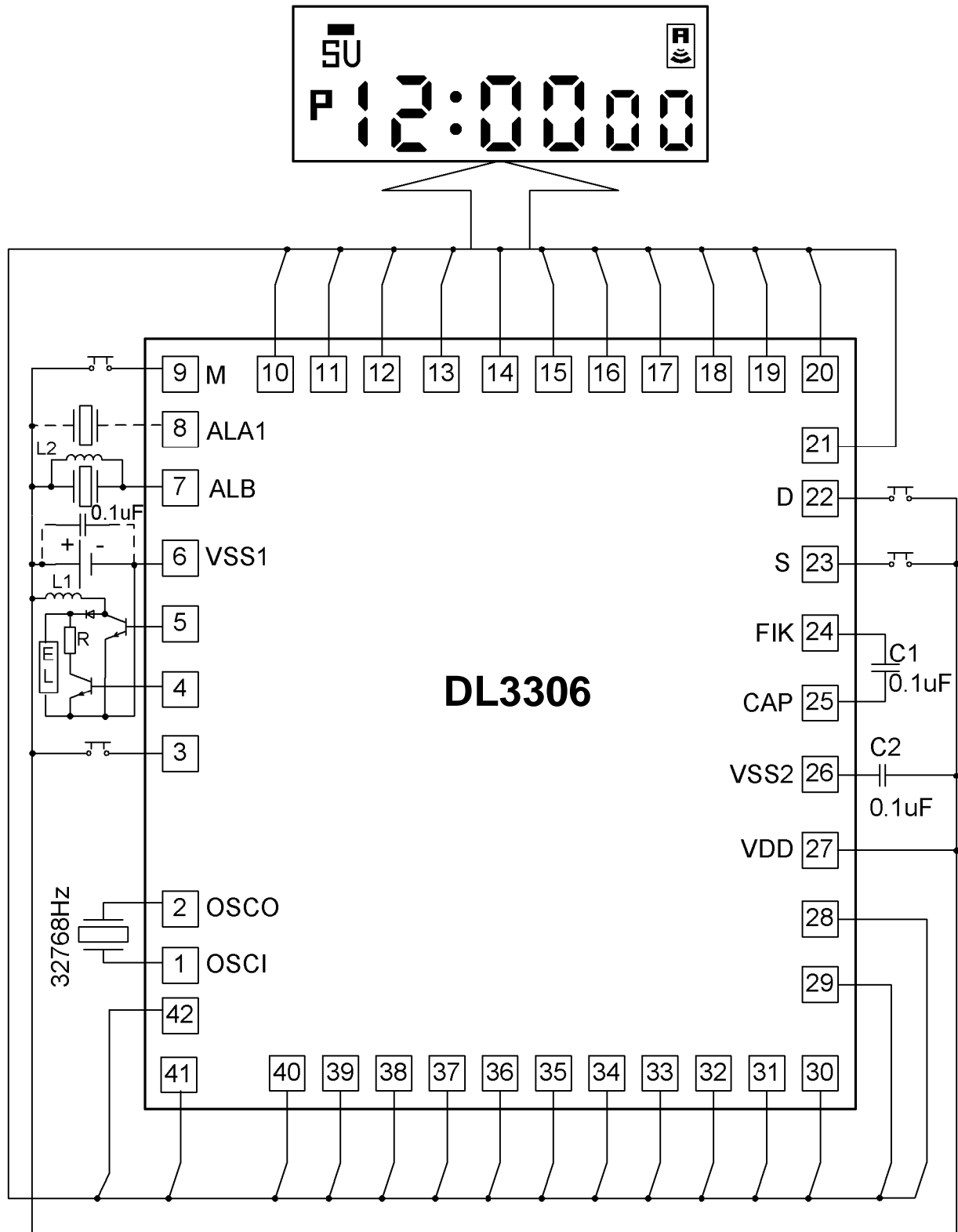
LCD FORMAT



ALARM OUTPUT WAVEFORMS

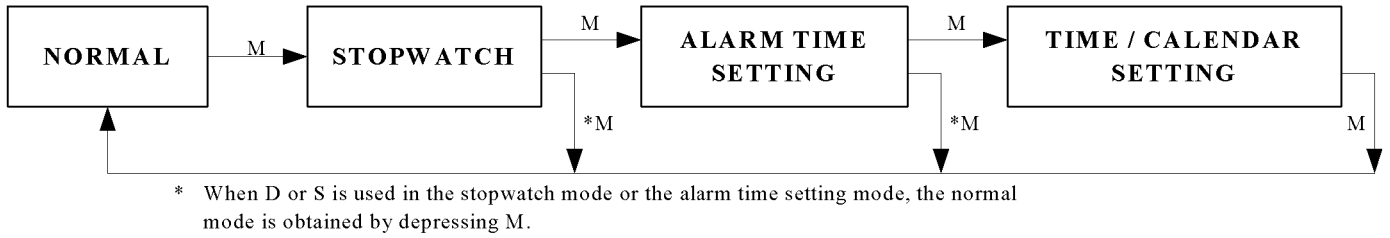


RECOMMEND APPLICATION CIRCUIT

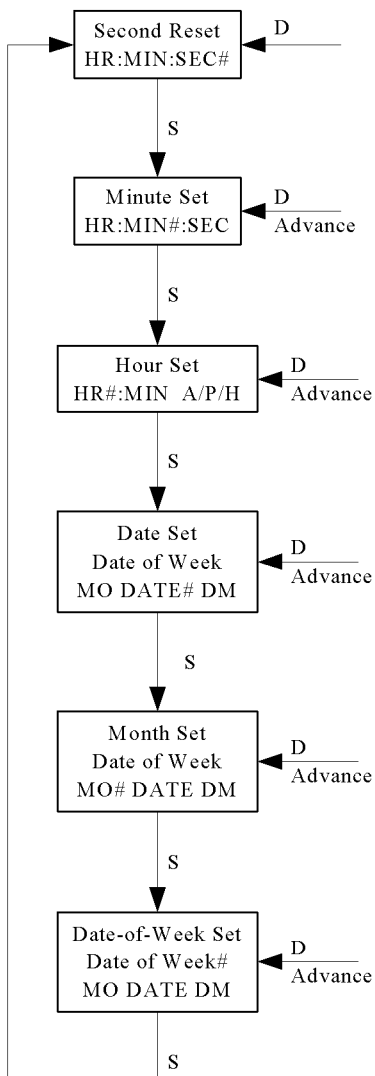


- Note :
1. 芯片底部接 VDD
  2. L1 : 1.8 ~ 2.0mH / 17 ~ 12Ω，根據 EL 片的電容值選擇；R : 10kΩ； L2 : 30mH
  3. PAD7, 8 腳為響鬧輸出，應用時只選其一

SETTING SEQUENCE AND SWITCH OPERATION

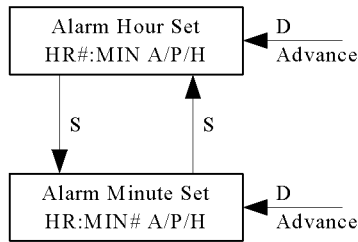


TIME / CALENDAR SETTING



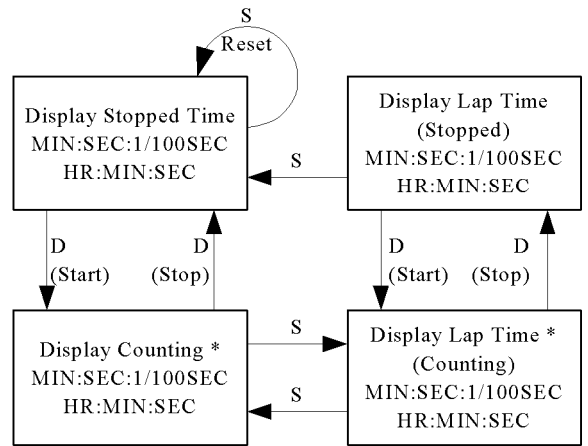
# Flashing at 2Hz rate

ALARM TIME SETTING



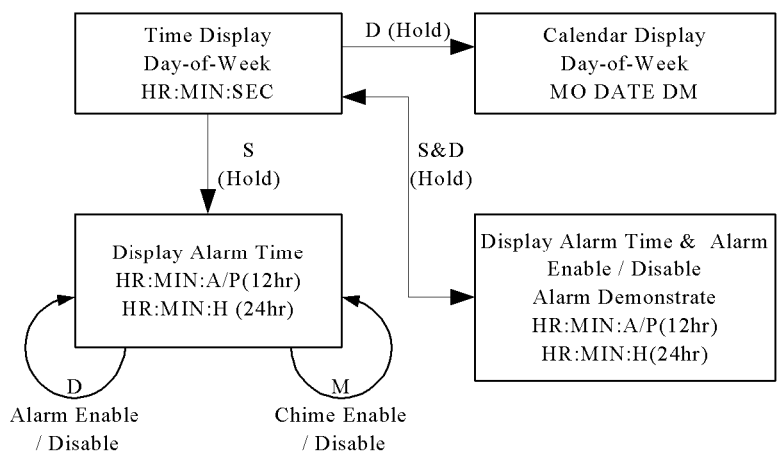
\* 12Hr mode or 24Hr mode is selected alternately on every 24-Hour cycle during hour advance

STOPWATCH



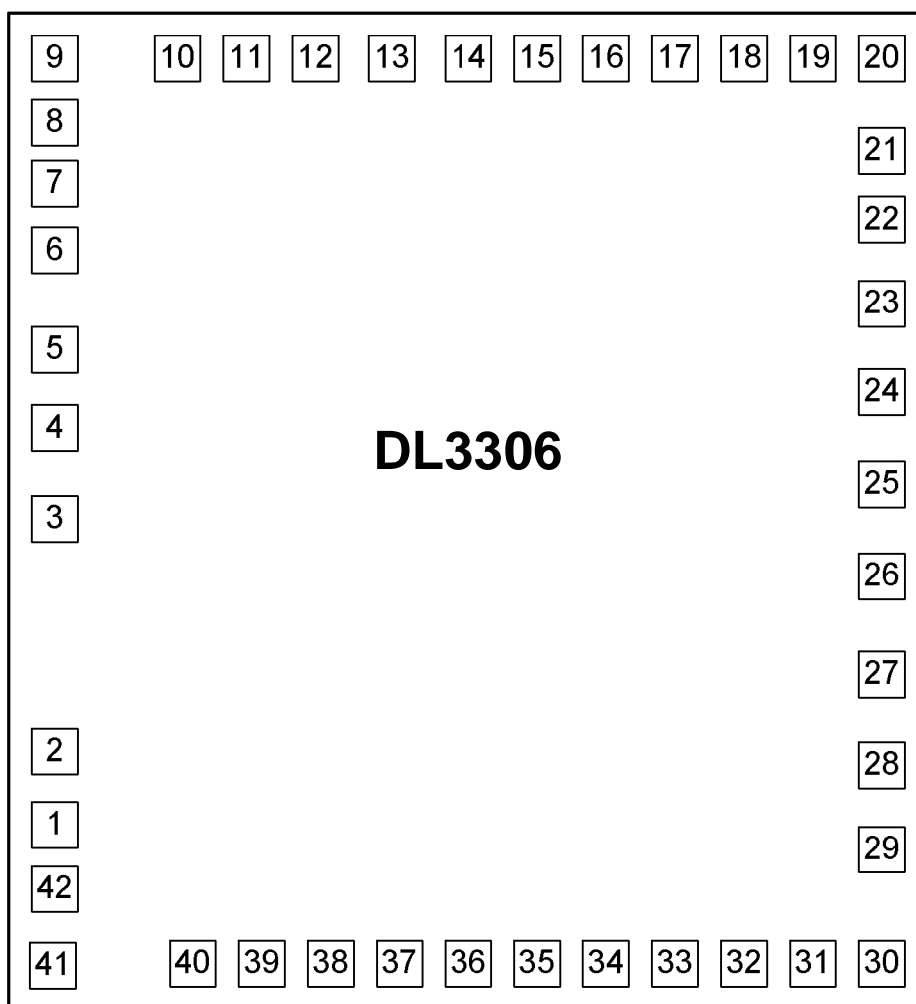
\* Colon flashes at 1Hz rate when the stopwatch is running

NORMAL MODE



- \* DM denotes date-mark
- \* Alarm-mark appears in any mode when the alarm is enabled
- \* All day-of-Week mark appear when the chime is enabled
- \* During Alarm, press
  - S : alarm and snooze stop
  - D : alarm stop and restart after 4 ~ 5 min

## PAD DIAGRAM



Pad No	Name	Pad No	Name	Pad No	Name	Pad No	Name
1	OSCI	12	A1 / SUN	23	S	34	B4 / C4
2	OSCO	13	C1 / B1	24	FIK	35	G4 / D4
3	L	14	A2 / MON	25	CAP	36	F4 / E4
4	DIS	15	COL / TUE	26	VSS2	37	B3 / C3
5	IND	16	A3 / WED	27	VDD	38	G3 / D3
6	VSS1	17	A4 / THU	28	B6 / C6	39	F3 / E3
7	ALB	18	A5 / FRI	29	G6 / D6	40	B2 / C2
8	ALA1	19	A6 / SAT	30	F6 / E6	41	G2 / D2
9	M	20	DATE / AL	31	B5 / C5	42	F2 / E2
10	COM 2	21	COM 1	32	G5 / D5		
11	PM / AM	22	D	33	F5 / E5		

- 注： 1. 芯片底部接 VDD  
2. 芯片面積：1.48 mm x 1.49 mm

## PAD LOCATION

Pad	Name	X, Y	Pad	Name	X, Y
1	OSCI	72.4, 281.6	22	D	1409.7, 1170.3
2	OSCO	72.4, 393.1	23	S	1409.7, 1063.3
3	L	70.6, 738.7	24	IKO	1409.7, 956.3
4	DIS	70.6, 848.7	25	CAP	1409.7, 849.3
5	IND	70.6, 958.7	26	GND	1410.4, 721.1
6	VSS	70.6, 1068.7	27	VDD	1410.4, 593.0
7	ALAB	70.6, 1182.7	28	B6 / C6	1410.4, 464.8
8	ALA1	71.2, 1295.7	29	G6 / D6	1410.4, 357.8
9	M	81.1, 1420.7	30	F6 / E6	1416.9, 69.0
10	COM 2	211.5, 1420.7	31	B5 / C5	1298.0, 69.0
11	PM_AM	331.7, 1420.7	32	G5 / D5	1179.1, 69.0
12	A1 / SUN	452.0, 1420.7	33	F5 / E5	1060.2, 69.0
13	C1 / B1	572.2, 1420.7	34	B4 / C4	941.3, 69.0
14	A2 / MON	692.5, 1420.7	35	G4 / D4	822.4, 69.0
15	CL / TUE	812.7, 1420.7	36	F4 / E4	703.5, 69.0
16	A3 / WED	933.0, 1420.7	37	B3 / C3	584.6, 69.0
17	A4 / THU	1053.2, 1420.7	38	G3 / D3	465.7, 69.0
18	A5 / FRI	1173.5, 1420.7	39	F3 / E3	346.8, 69.0
19	A6 / SAT	1293.8, 1420.7	40	B2 / C2	227.9, 69.0
20	DATE / AL	1414.0, 1420.7	41	G2 / D2	72.4, 58.5
21	COM 1	1409.7, 1277.3	42	F2 / E2	72.4, 170.1