

**6693D 六位带 EL 控制 IC**

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## 6 Digit LCD Alarm Watch With Blacklight Control 带 EL 控制的六位多功能表芯片 6693D

### FEATURES

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

### 特点

- 可显示时、分、秒、月、日及星期
- 6位计时器：以分、秒、1/100秒计时显示方式计满30分钟后，自动转换至时、分、秒计时显示方式
- 跑表有分段计时功能（准确到1/100秒）
- 可选用12或24小时制4年日历
- 具有间隔4至5分钟再闹的功能
- 整点发声报时
- 按键一次即可校正 $\pm 30$ 秒的时间误差
- 可直接驱动压电蜂鸣片
- 内置三极管驱动闹钟输出
- 振荡器内置电容
- 背光（EL）控制讯号输出

### ELECTRICAL CHARACTERISTICS 电特性 (VDD=3V, Gnd=0V, TA=25°C unless otherwise specified)

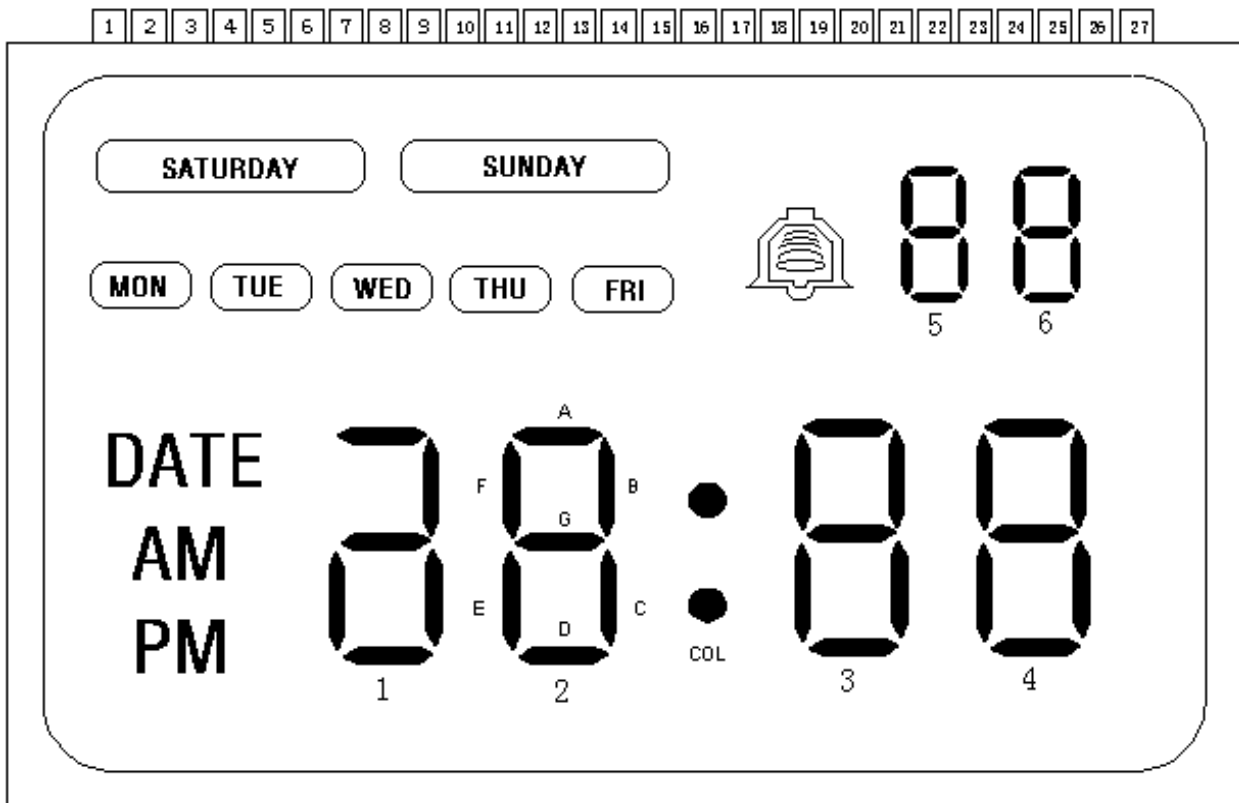
| Parameter                          | Symbol           | Test condition         | Min.    | Type  | Max.     | Unit    |
|------------------------------------|------------------|------------------------|---------|-------|----------|---------|
| Operating voltage 工作电压             | VDD              |                        | 2.7     | 3     | 3.2      | V       |
| Operating current 工作电流             | IDD1             | No load                |         | 2.0   | 3.0      | $\mu$ A |
| Operating current 工作电流             | IDD2             | EL                     |         | 8     |          | mA      |
| Input high voltage 输入高电压           | VIH              |                        | VDD-0.3 |       | VDD      | V       |
| Input low voltage 输入低电压            | VIL              |                        | Gnd     |       | Gnd +0.3 | V       |
| Oscillating input capacitor 振荡起振电压 | VOSC             | Within 2seconds        |         |       | 1.3      | V       |
| Alarm drive current 闹铃驱动电流         | IALA             | V <sub>ALA</sub> =0.5V | 0.5     | 2     |          | mA      |
| Alarm drive current 闹铃驱动电流         | IALB             | V <sub>ALB</sub> =0.5V | 10      | 50    |          | $\mu$ A |
| Oscillating input capacitor 振荡频率   | F <sub>osc</sub> |                        |         | 32768 |          | Hz      |
| LCD frequency LCD 频率               | FLCD             |                        |         | 32    |          | Hz      |
| Time stability 时间稳定度               | TSTB             | VDD=3V                 |         | 1     |          | ppm     |
| Output current for IND,DIS 输出电流    | Io               | V <sub>o</sub> =0.5V   | 1       |       |          | mA      |

### APPLICATION INFORMATION 应用资料

| Pad | Name  | Pad | Name  | Pad | Name  | Pad | Name  |
|-----|-------|-----|-------|-----|-------|-----|-------|
| 1   | M     | 12  | B2/C2 | 23  | G6/D6 | 34  | A5/FR |
| 2   | ALA2  | 13  | F3/E3 | 24  | B6/C6 | 35  | A4/TH |
| 3   | ALA1  | 14  | G3/D3 | 25  | VDD   | 36  | A3/WE |
| 4   | GND   | 15  | B3/C3 | 26  | VEE   | 37  | CL/TU |
| 5   | IND   | 16  | F4/E4 | 27  | CAP   | 38  | A2/MO |
| 6   | DIS   | 17  | G4/D4 | 28  | F1K   | 39  | C1/B1 |
| 7   | L     | 18  | B4/C4 | 29  | S     | 40  | A1/SU |
| 8   | OSCO  | 19  | F5/E5 | 30  | D     | 41  | PM/AM |
| 9   | OSC1  | 20  | G5/D5 | 31  | COM1  | 42  | COM2  |
| 10  | F2/E2 | 21  | B5/C5 | 32  | DM/AL | 43  | AC    |
| 11  | G2/D2 | 22  | F6/E6 | 33  | A6/SA | 44  | T1    |

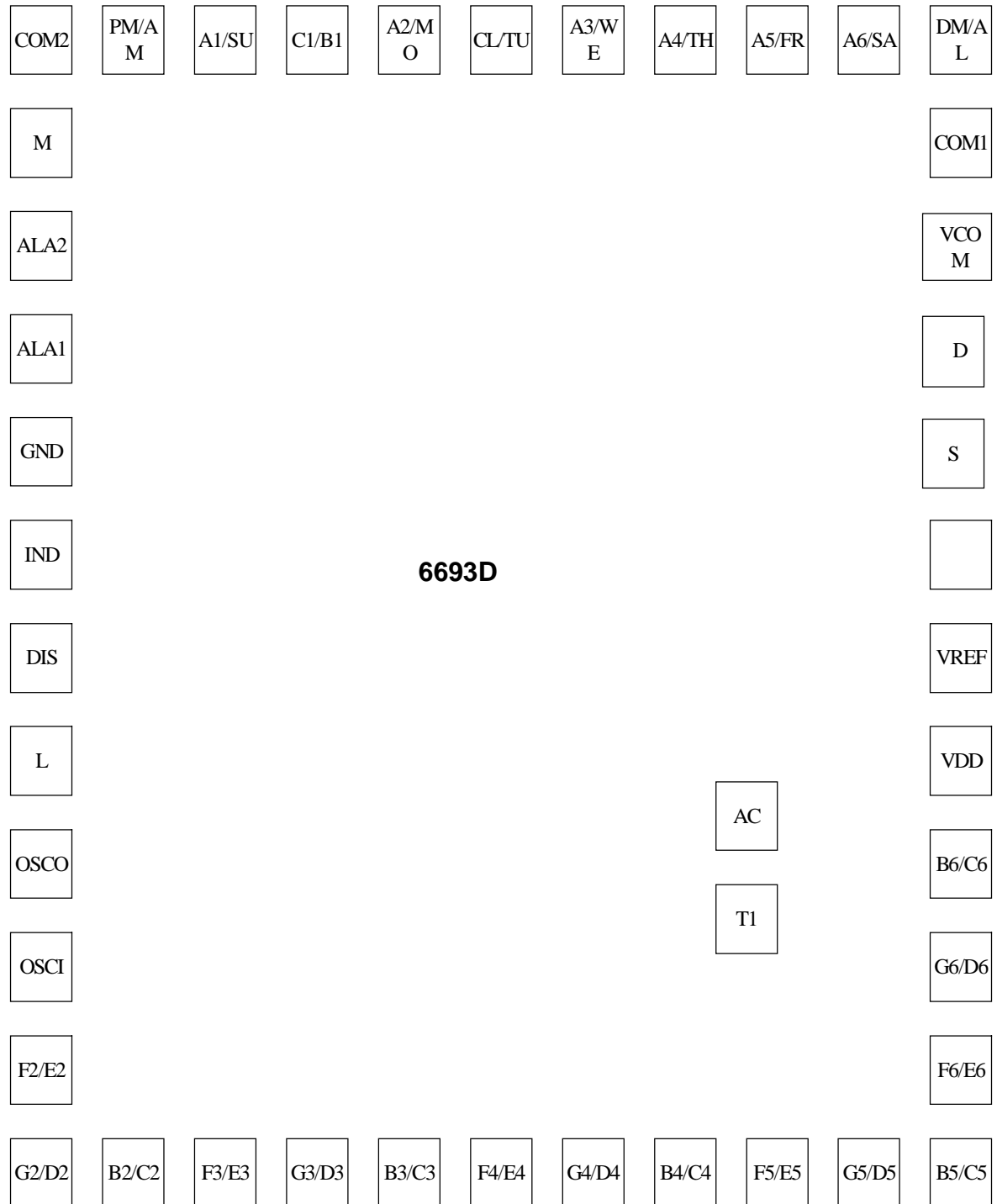
LCD 连接关系图表

|      |       |        |       |       |       |       |       |
|------|-------|--------|-------|-------|-------|-------|-------|
| SEG  | PM/AM | A1/SUN | C1/B1 | A2/MO | CL/TU | A3/WE | A4/TH |
| COM1 | PM    | A1     | C1    | A2    | CL    | A3    | A4    |
| COM2 | AM    | SU     | B1    | MO    | TU    | WE    | TH    |
| SEG  | A5/FR | A6/SA  | DM/AL | B6/C6 | G6/D6 | F6/E6 | B5/C5 |
| COM1 | A5    | A6     | DM    | B6    | G6    | F6    | B5    |
| COM2 | FR    | SA     | AL    | C6    | D6    | E6    | C5    |
| SEG  | G5/D5 | F5/E5  | B4/C4 | G4/D4 | F4/E4 | B3/C3 | G3/D3 |
| COM1 | G5    | F5     | B4    | G4    | F4    | B3    | G3    |
| COM2 | D5    | E5     | C4    | D4    | E4    | C3    | D3    |
| SEG  | F3/E3 | B2/C2  | G2/D2 | F2/E2 |       |       |       |
| COM1 | F3    | B2     | G2    | F2    |       |       |       |
| COM2 | E3    | C2     | D2    | E2    |       |       |       |



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管脚图:



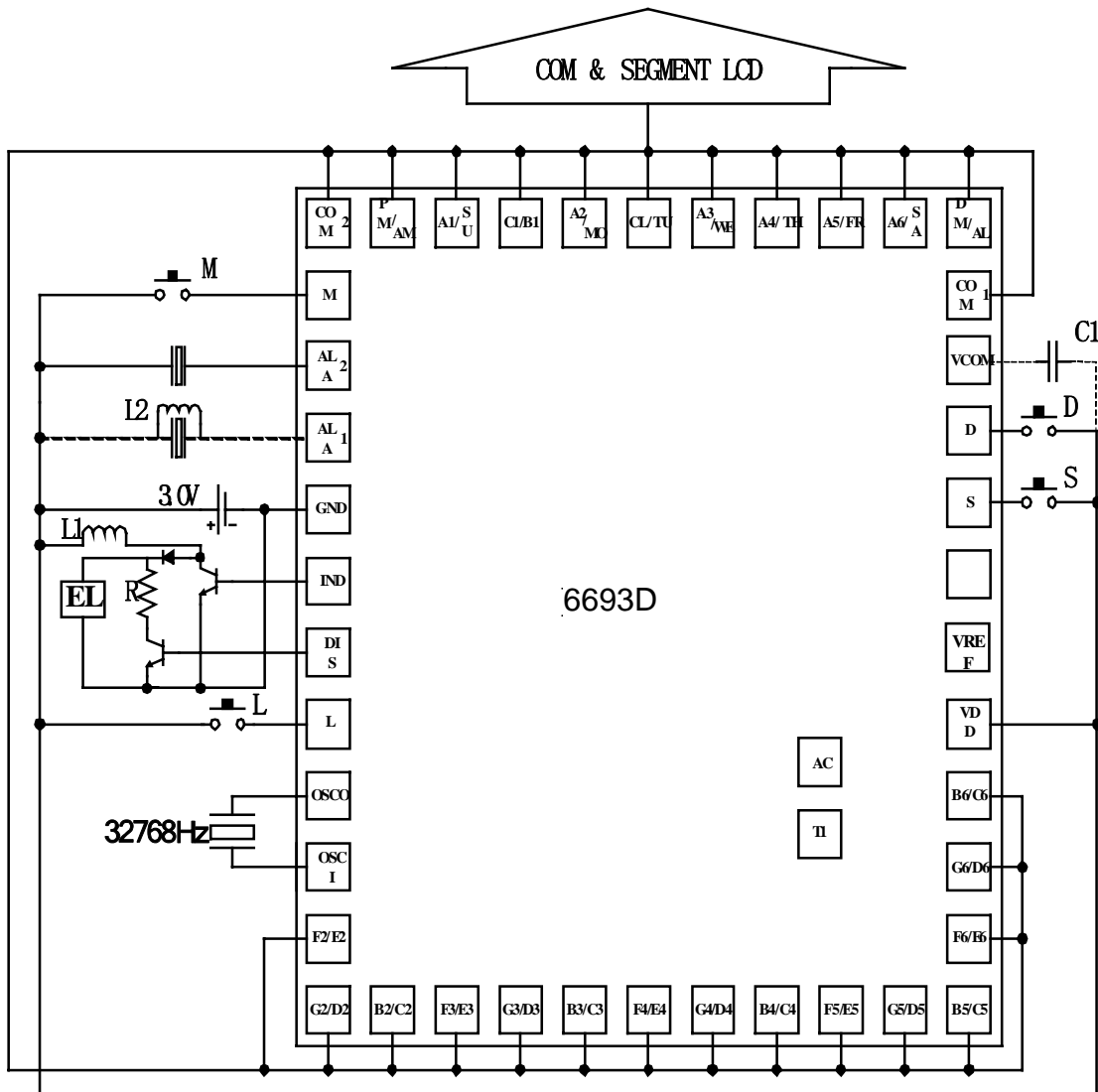
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### 管脚说明:

表一: 6693D 管脚功能说明

| Pad NO | Symbol | Description                                 | Pad NO | Symbol | Description         |
|--------|--------|---|--------|--------|---------------------|
| 1      | M      | M key input                                 | 23     | G6D6   | Segment Output      |
| 2      | ALA2   | ALARM Pin 2                                 | 24     | B6C6   | Segment Output      |
| 3      | ALA1   | ALARM Pin 1                                 | 25     | VDD    | Battery positive 3V |
| 4      | GND    | Battery negative                            | 26     | VREF   | 1.8V Output         |
| 5      | IND    | EL Pin 1                                    | 27     | --     | --                  |
| 6      | DIS    | EL Pin 2                                    | 28     | vcom   | 1.5v for LCD        |
| 7      | L      | L key input                                 | 29     | S      | S key input         |
| 8      | OSCO   | Oscillator output (with internal capacitor) | 30     | D      | D key input         |
| 9      | OSCI   | Oscillator output (with internal capacitor) | 31     | COM1   | Common              |
| 10     | F2E2   | Segment Output                              | 32     | DMAL   | Segment Output      |
| 11     | G2D2   | Segment Output                              | 33     | A6SA   | Segment Output      |
| 12     | B2C2   | Segment Output                              | 34     | A5FR   | Segment Output      |
| 13     | F3E3   | Segment Output                              | 35     | A4TH   | Segment Output      |
| 14     | G3D3   | Segment Output                              | 36     | A3WE   | Segment Output      |
| 15     | B3C3   | Segment Output                              | 37     | CLTU   | Segment Output      |
| 16     | F4E4   | Segment Output                              | 38     | A2MO   | Segment Output      |
| 17     | G4D4   | Segment Output                              | 39     | C1B1   | Segment Output      |
| 18     | B4C4   | Segment Output                              | 40     | A1SU   | Segment Output      |
| 19     | F5E5   | Segment Output                              | 41     | PMAM   | Segment Output      |
| 20     | G5D5   | Segment Output                              | 42     | COM2   | Common              |
| 21     | B5C5   | Segment Output                              | 43     | AC     | Test Pin 2          |
| 22     | F6E6   | Segment Output                              | 44     | T1     | Test Pin 1          |

应用电路:



NOTE: 1.  $L1=1.0\sim 2.5\text{mH}$ ,  $10\sim 20$  欧姆, 由发光片 EL 的面积决定,  $R=10\text{K}$ ; VCOM端电容 ( $C1=0.1\mu$ ) 可接或不接。

2. EL 驱动输出 IND 及 DIS 线路应尽可能远离各触发控制端 (M.L.S.D) 的连线, 且走线粗短。

3. EL 高压部分线路用地线 GND 或电源 VDD 线隔离, 以降低其对其他连线的干扰。

4. ALA1脚和 ALA2脚可选择 (应用时只能选择其中一脚), 蜂鸣片声音大小可调整 L2 电感值, 建议  $L2=15\sim 20\text{mH}$ 。

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### Pad Coordinate

| Pad No. | Pad Name | X      | Y       | Pad No. | Pad Name | X      | Y       |
|---------|----------|--------|---------|---------|----------|--------|---------|
| 1       | G2/D2    | 22.5   | 26      | 23      | COM1     | 1215.7 | 1183.25 |
| 2       | F2/E2    | 22.5   | 148.25  | 24      | D        | 1215.7 | 1068.25 |
| 3       | OSCI     | 22.5   | 263.25  | 25      | S        | 1215.7 | 953.25  |
| 4       | OSCO     | 22.5   | 378.25  | 26      | VCOM     | 1215.7 | 838.25  |
| 5       | L        | 22.5   | 493.25  | 27      | ---      | 1215.7 | 723.25  |
| 6       | DIS      | 22.5   | 608.25  | 28      | VREF     | 1215.7 | 608.25  |
| 7       | IND      | 22.5   | 723.25  | 29      | AC       | 987.55 | 441.5   |
| 8       | GND      | 22.5   | 838.25  | 30      | T1       | 987.55 | 326.5   |
| 9       | ALA1     | 22.5   | 953.25  | 31      | VDD      | 1215.7 | 493.25  |
| 10      | ALA2     | 22.5   | 1068.25 | 32      | B6/C6    | 1215.7 | 378.25  |
| 11      | M        | 22.5   | 1183.25 | 33      | G6/D6    | 1215.7 | 263.25  |
| 12      | COM2     | 29.7   | 1324    | 34      | F6/E6    | 1215.7 | 148.25  |
| 13      | PM/AM    | 162.7  | 1324    | 35      | B5/C5    | 1215.7 | 26      |
| 14      | A1/SU    | 277.7  | 1324    | 36      | G5/D5    | 1082.7 | 26      |
| 15      | C1/B1    | 392.7  | 1324    | 37      | F5/E5    | 967.7  | 26      |
| 16      | A2/MC    | 507.7  | 1324    | 38      | B4/C4    | 852.7  | 26      |
| 17      | CL/TU    | 622.7  | 1324    | 39      | G4/D4    | 737.7  | 26      |
| 18      | A3/WE    | 737.7  | 1324    | 40      | F4/E4    | 622.7  | 26      |
| 19      | A4/TH    | 852.7  | 1324    | 41      | B3/C3    | 507.7  | 26      |
| 20      | A5/FR    | 967.7  | 1324    | 42      | G3/D3    | 392.7  | 26      |
| 21      | A6/SA    | 1082.7 | 1324    | 43      | F3/E3    | 277.7  | 26      |
| 22      | DM/AL    | 1215.7 | 1324    | 44      | B2/C2    | 162.7  | 26      |