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## User's Guide

# C40-1405

## VFD

(Vacuum Fluorescent Character Display Module)

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October 31, 2006

# Vacuum Fluorescent Display Specification

**PART NUMBER:** **C40-1405**

**FEATURES:** 140 Segments– 14 x 10 Dot Matrix Grid

**APPLICATION:** Elevator

**RATINGS:** Below

| <b>Outer Dimensions</b>      | Panel Length            | P.L.        | 65.2               | mm          |             |
|------------------------------|-------------------------|-------------|--------------------|-------------|-------------|
|                              | Panel Height            | P.H.        | 40.0               | mm          |             |
|                              | Panel Thickness         | P.T.        | 9.0                | mm          |             |
| <b>Leads</b>                 | Lead Pitch              | L.P.        | 1.50               | mm          |             |
|                              | Lead Out                | -           | SIL                |             |             |
| <b>Character Size</b>        | Character Height        | C.H.        | 1.75               | mm          |             |
|                              | Character Width         | C.W.        | 1.14               | mm          |             |
| <b>Item</b>                  | <b>Symbol</b>           | <b>Min.</b> | <b>Recommended</b> | <b>Max.</b> | <b>Unit</b> |
| <b>Filament Voltage</b>      | Ef                      | 1.89        | 2.1                | 2.31        | Vac         |
| <b>Grid Voltage</b>          | ec                      | -           | 27.0               | 32.0        | Vp-p        |
| <b>Anode Voltage</b>         | eb                      | -           | 27.0               | 32.0        | Vp-p        |
| <b>Cut-off Bias</b>          | Ek                      | -           | 3.5                | -           | Vdc         |
| <b>Duty Cycle</b>            | Du                      | -           | 1/17.5             | -           | -           |
| <b>Pulse Width</b>           | tp                      | -           | 80                 | -           | uS          |
| <b>Operating Temperature</b> | Topr                    | -20         | -                  | + 70        | C           |
| <b>Storage Temperature</b>   | Tstg                    | -55         | -                  | + 80        | C           |
| <b>Color of Illumination</b> | Green: X=0.250, Y=0.440 |             |                    |             |             |

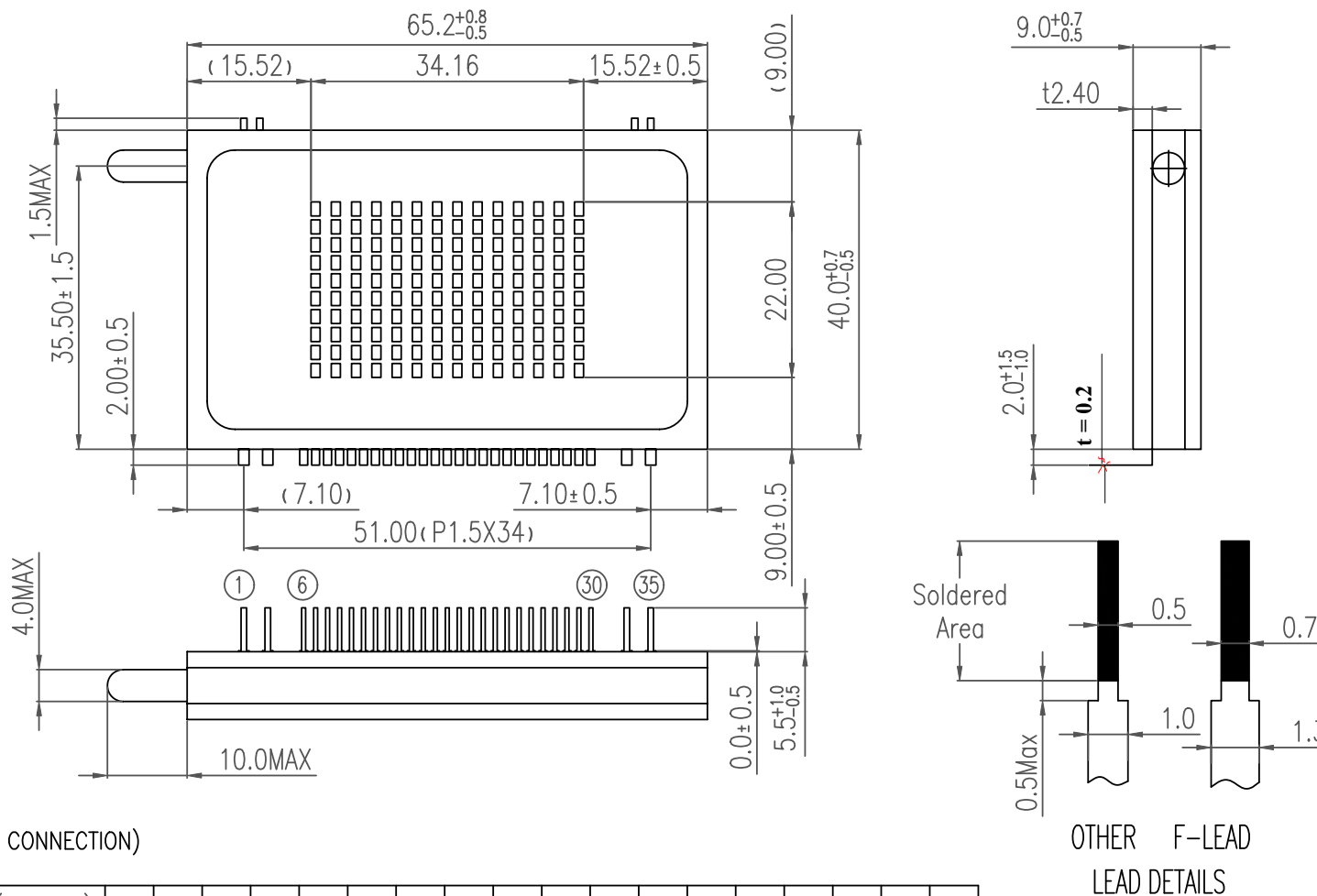
电气特性 Electrical Characteristics

| 项 目<br>Item                     | 符 号<br>Symbol | 测试条件<br>Test Condition  | 最小值<br>Min   | 典型值<br>Typical | 最大值<br>Max | 单 位<br>Unit               |
|---------------------------------|---------------|---|--------------|----------------|------------|---------------------------|
| 灯丝电流<br>Filament Current        | If            | Ef=2.1 Vac<br>eb=ec=0   | 203.0        | 225.0          | 248.0      | mAac                      |
| 阳极电流<br>Anode Current           | ib/1G~14G     | Ef=2.1 Vac  | —            | 5.0            | 10.0       | mAp-p                     |
|                                 | —             | eb=27.0 Vp-p  | —            | —              | —          | mAp-p                     |
|                                 | —             | ec=27.0 Vp-p  | —            | —              | —          | mAp-p                     |
|                                 | —             | Du=1/17.5   | —            | —              | —          | mAp-p                     |
|                                 | —             | tp=80μs<br>tb=20μs  | —            | —              | —          | mAp-p                     |
| 栅极电流<br>Grid Current            | ic/1G~14G     | (笔段全亮)  | —            | 4.5            | 9.0        | mAp-p                     |
|                                 | —             |   | —            | —              | —          | mAp-p                     |
|                                 | —             |   | —            | —              | —          | mAp-p                     |
|                                 | —             |   | —            | —              | —          | mAp-p                     |
|                                 | —             |   | —            | —              | —          | mAp-p                     |
| 亮度<br>Luminance                 | L(G)          |  | 350<br>(102) | 700<br>(204)   | —          | cd/m <sup>2</sup><br>(fl) |
|                                 | —             |   | —            | —              | —          | cd/m <sup>2</sup><br>(fl) |
|                                 | —             |   | —            | —              | —          | cd/m <sup>2</sup><br>(fl) |
|                                 | —             |   | —            | —              | —          | cd/m <sup>2</sup><br>(fl) |
| 位间亮度比<br>Luminance Ratio        | Lmin/Lmax     |   | 50           | —              | —          | %                         |
| 栅极截止电压<br>Grid Cut-off Voltage  | Ecco          | Ef=2.1 Vac<br>Eb=27.0 Vdc   | -3.5         | —              | —          | Vdc                       |
| 阳极截止电压<br>Anode Cut-off Voltage | Ebco          | Ef=2.1 Vac<br>ec=27.0 Vp-p<br>Du=1/17.5<br>tp=80 μs                                 | -3.5         | —              | —          | Vdc                       |

注：驱动方式 动态  
Drive mode:Dynamic state

|             |                     |
|-------------|---------------------|
| control No. | QG/ZBOE 030.07.3-05 |
| Spec. No.   | SPC04.09.09-01      |
| MODEL       | <b>C40-1405</b>     |

附图1: 外形图 Outline Drawing (Unit:mm)



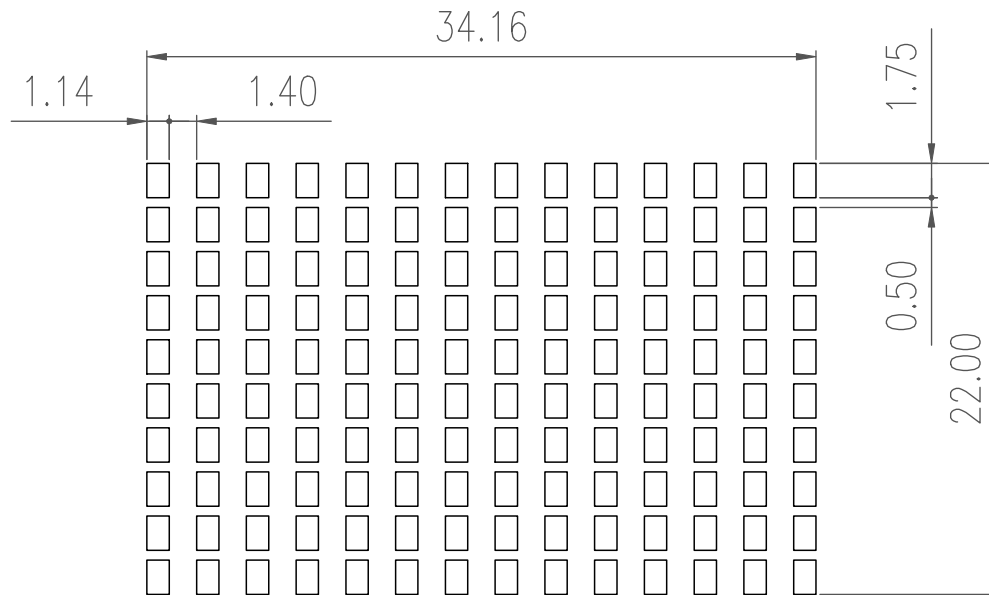
管脚连接 (PIN CONNECTION)

|                 |     |     |     |    |    |    |    |    |    |    |     |    |    |    |    |    |     |     |
|-----------------|-----|-----|-----|----|----|----|----|----|----|----|-----|----|----|----|----|----|-----|-----|
| 端子序号 (PIN NO.)  | 1   | 2   | 3   | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11  | 12 | 13 | 14 | 15 | 16 | 17  | 18  |
| 连接 (CONNECTION) | F1  | NP  | F1  | NP | NP | P1 | P2 | P3 | P4 | P5 | P10 | P9 | P8 | P7 | P6 | NC | 14G | 13G |
| 端子序号 (PIN NO.)  | 19  | 20  | 21  | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29  | 30 | 31 | 32 | 33 | 34 | 35  |     |
| 连接 (CONNECTION) | 12G | 11G | 10G | 9G | 8G | 7G | 6G | 5G | 4G | 3G | 2G  | 1G | NP | NP | F2 | NP | F2  |     |

注: F: 灯丝 (Filament) P: 阳极 (Anode) G: 栅极 (Grid) NC: 无连接 (No connection) NP: 无引出脚 (No pin) NX: 无外引脚 (No extended pin)

|             |                     |
|-------------|---------------------|
| control No. | QG/ZBOE 030.07.3-05 |
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| MODEL       | <b>C40-1405</b>     |

附图2：显示内容 Display Pattern

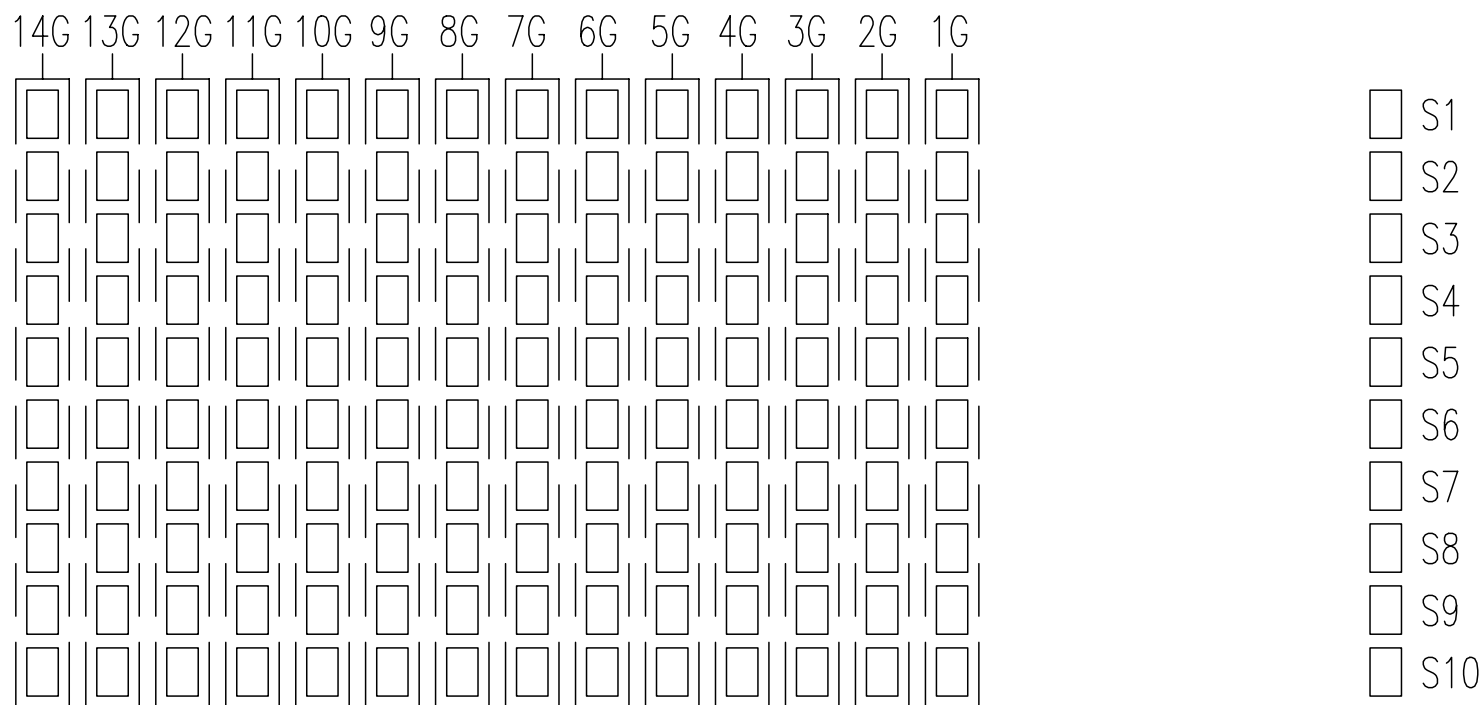


显示颜色(Color of illumination)

绿色 (Green:x=0.250,y=0.440): 全部 All

|             |                     |
|-------------|---------------------|
| control No. | QG/ZBOE 030.07.3-05 |
| Spec. No.   | SPC04.09.09-01      |
| MODEL       | <b>C40-1405</b>     |

# 附图3: 栅网分割 Grid Assignment



(14G~1G)

|             |                     |
|-------------|---------------------|
| control No. | QG/ZBOE 030.07.3-05 |
| Spec. No.   | SPC04.09.09-01      |
| MODEL       | <b>C40-1405</b>     |

附图4：阳极连接 Anode Connection

|     | 14G | 13G | 12G | 11G | 10G | 9G  | 8G  | 7G  | 6G  | 5G  | 4G  | 3G  | 2G  | 1G  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| P1  | S1  | S1  | S1  | S1  | S1  | S1  | S1  | S1  | S1  | S1  | S1  | S1  | S1  | S1  |
| P2  | S2  | S2  | S2  | S2  | S2  | S2  | S2  | S2  | S2  | S2  | S2  | S2  | S2  | S2  |
| P3  | S3  | S3  | S3  | S3  | S3  | S3  | S3  | S3  | S3  | S3  | S3  | S3  | S3  | S3  |
| P4  | S4  | S4  | S4  | S4  | S4  | S4  | S4  | S4  | S4  | S4  | S4  | S4  | S4  | S4  |
| P5  | S5  | S5  | S5  | S5  | S5  | S5  | S5  | S5  | S5  | S5  | S5  | S5  | S5  | S5  |
| P6  | S6  | S6  | S6  | S6  | S6  | S6  | S6  | S6  | S6  | S6  | S6  | S6  | S6  | S6  |
| P7  | S7  | S7  | S7  | S7  | S7  | S7  | S7  | S7  | S7  | S7  | S7  | S7  | S7  | S7  |
| P8  | S8  | S8  | S8  | S8  | S8  | S8  | S8  | S8  | S8  | S8  | S8  | S8  | S8  | S8  |
| P9  | S9  | S9  | S9  | S9  | S9  | S9  | S9  | S9  | S9  | S9  | S9  | S9  | S9  | S9  |
| P10 | S10 | S10 | S10 | S10 | S10 | S10 | S10 | S10 | S10 | S10 | S10 | S10 | S10 | S10 |

|             |                     |
|-------------|---------------------|
| control No. | QG/ZB0E 030.07.3-05 |
| Spec. No.   | SPC04.09.09-01      |
| MODEL       | <b>C40-1405</b>     |