

## User's Guide

# C-20-1301

# VFD

(Vacuum Fluorescent Character Display Module)

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# Vacuum Fluorescent Display Specification

**PART NUMBER:** C-20-1301

**FEATURES:** 10 Digits, Custom Alphanumeric, with Icons – DVD

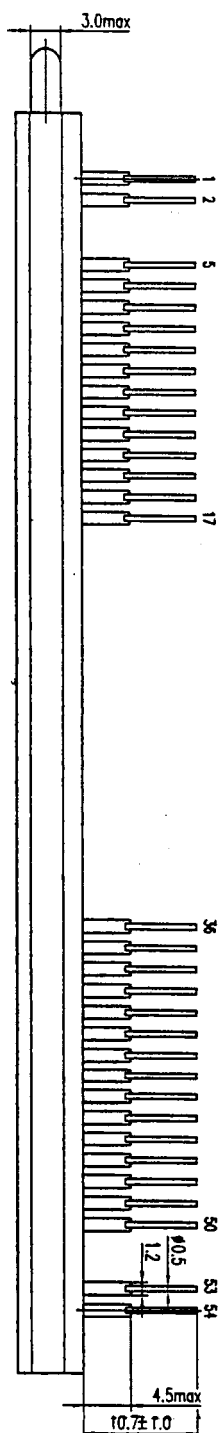
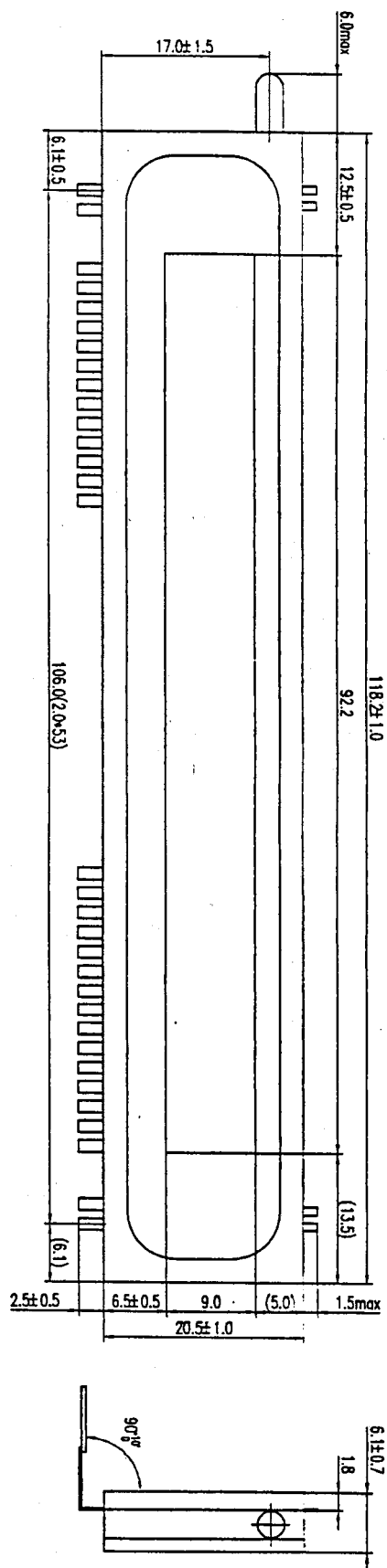
**APPLICATION:** Character Display (Custom Alpha)

**RATINGS:** Below

|                       |                  |      |             |      |      |
|-----------------------|------------------|------|-------------|------|------|
| Outer Dimensions      | Panel Length     | P.L. | 118.2       | mm   |      |
|                       | Panel Height     | P.H. | 20.5        | mm   |      |
|                       | Panel Thickness  | P.T. | 6.1         | mm   |      |
|                       |                  |      |             |      |      |
| Leads                 | Lead Pitch       | L.P. | 2.0         | Mm   |      |
|                       | Lead Out         | -    | SIL         |      |      |
|                       |                  |      |             |      |      |
| Character Size        | Character Height | C.H. | 7.0         | mm   |      |
|                       | Character Width  | C.W. | 3.7         | mm   |      |
|                       |                  |      |             |      |      |
| Item                  | Symbol           | Min. | Recommended | Max. | Unit |
| Filament Voltage      | Ef               | 3.08 | 4.2         | 4.62 | Vac  |
| Peak Grid Voltage     | Ec               | -    | 31.0        | 37.0 | Vp-p |
| Peak Anode Voltage    | Eb               | -    | 31.0        | 37.0 | Vp-p |
| Cut-off Bias          | Ek               | -    | -           | -    | -    |
| Duty Cycle            | Du               | -    | 1/14        | -    | -    |
| Pulse Width           | Tp               | -    | 100         | -    | uS   |
| Operating Temperature | Topr             | -20  | -           | + 70 | C    |
| Storage Temperature   | Tstg             | -55  | -           | + 80 | C    |
| Color of Illumination | Green / Red      |      |             |      |      |

## Electrical Characteristics

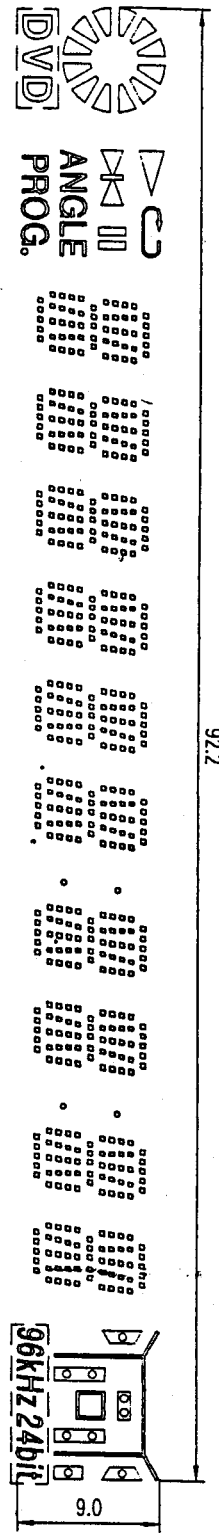
| Item                  | Symbol                                   | Test Condition                                                               | Min.            | Typical                                  | Max.         | Unit                      |
|-----------------------|------------------------------------------|------------------------------------------------------------------------------|-----------------|------------------------------------------|--------------|---------------------------|
| Filament Current      | If<br>-                                  | Ef = 4.2 Vac<br>eb = ec = 0                                                  | 90.0<br>-       | 100.0<br>-                               | 110.0<br>-   | mAac<br>-                 |
| Anode Current         | ib/1G<br>ib/2~11G<br>ib/12,13G<br>-<br>- | Ef = 4.2 Vac<br>eb = 31.0 Vp-p<br>ec = 31.0 Vp-p<br>Du = 1/14<br>tp = 100 uS | -               | 13.0                                     | 26.0         | mA <sub>p-p</sub>         |
|                       |                                          |                                                                              | -               | 5.0                                      | 10.0         | mA <sub>p-p</sub>         |
|                       |                                          |                                                                              | -               | 9.0                                      | 18.0         | mA <sub>p-p</sub>         |
|                       |                                          |                                                                              | -               | -                                        | -            | mA <sub>p-p</sub>         |
|                       |                                          |                                                                              | -               | -                                        | -            | mA <sub>p-p</sub>         |
|                       |                                          |                                                                              | Grid Current    | ic/1G<br>ic/2~11G<br>ic/12,13G<br>-<br>- | -            | 13.0                      |
|                       |                                          |                                                                              | -               | 6.0                                      | 12.0         | mA <sub>p-p</sub>         |
|                       |                                          |                                                                              | -               | 9.0                                      | 18.0         | mA <sub>p-p</sub>         |
|                       |                                          |                                                                              | -               | -                                        | -            | mA <sub>p-p</sub>         |
|                       |                                          |                                                                              | -               | -                                        | -            | mA <sub>p-p</sub>         |
|                       |                                          |                                                                              | Luminance       | L(G)<br><br>L(R)                         | 500<br>(146) | 1000<br>(292)             |
|                       |                                          |                                                                              | 55<br>(16)      | 110<br>(32)                              |              | cd/m <sup>2</sup><br>(fL) |
|                       |                                          |                                                                              |                 |                                          |              | cd/m <sup>2</sup><br>(fL) |
|                       |                                          |                                                                              | Luminance Ratio | Lmin/Lmax                                | 50           | -                         |
| Grid Cut-off Voltage  | Ecco                                     | Ef = 4.2 Vac<br>Eb = 31.0 Vdc                                                | -3.5            | -                                        | -            | Vdc                       |
| Anode Cut-off Voltage | Ebco                                     | Ef = 4.2 Vac<br>ec = 31.0 Vp-p<br>Du = 1/14<br>tp = 100 uS                   | -3.5            | -                                        | -            | Vdc                       |



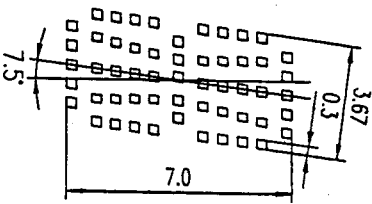
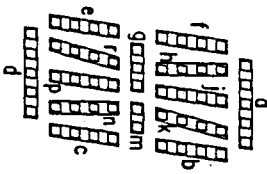
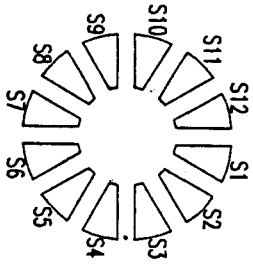
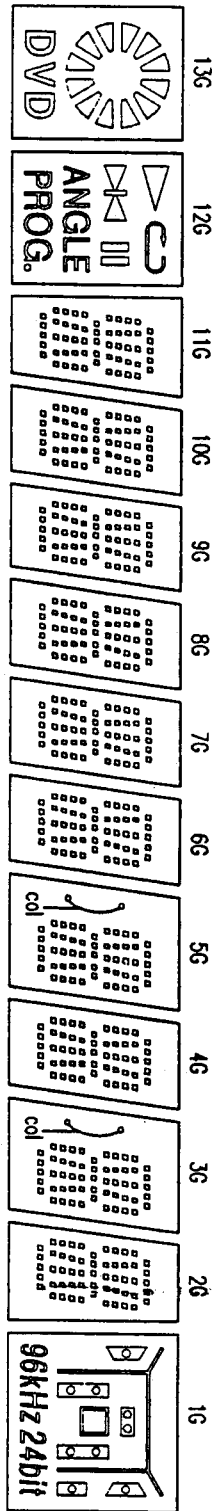
## Pinout Connections

|         |    |    |    |    |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Pin No. | 1  | 2  | 3  | 4  | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| Connect | F  | F  | NP | NP | G13 | G12 | G11 | G10 | G9  | G8  | G7  | G6  | G5  | G4  | G3 | G2 | G1 | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP |
| Pin No. | 28 | 29 | 30 | 31 | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  | 41  | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 |
| Connect | NP | NP | NP | NP | NP  | NP  | NP  | NP  | P15 | P14 | P13 | P12 | P11 | P10 | P9 | P8 | P7 | P6 | P5 | P4 | P3 | P2 | P1 | NP | NP | F  | F  |

F: Filament      G: Grid      P: Anode      NP: No Pin



92.2



|     | 13G | 12G   | 11G | 10G | 9G | 8G | 7G | 6G | 5G  | 4G | 3G  | 2G | 1G    |
|-----|-----|-------|-----|-----|----|----|----|----|-----|----|-----|----|-------|
| P1  | S12 |       | a   | a   | a  | a  | a  | a  | a   | a  | a   | a  |       |
| P2  | S1  |       | h   | h   | h  | h  | h  | h  | h   | h  | h   | h  |       |
| P3  | S2  |       | j   | j   | j  | j  | j  | j  | j   | j  | j   | j  |       |
| P4  | S3  |       | k   | k   | k  | k  | k  | k  | k   | k  | k   | k  |       |
| P5  | S4  |       | b   | b   | b  | b  | b  | b  | b   | b  | b   | b  |       |
| P6  | S5  |       | f   | f   | f  | f  | f  | f  | f   | f  | f   | f  |       |
| P7  | S6  |       | m   | m   | m  | m  | m  | m  | m   | m  | m   | m  |       |
| P8  | S7  | ANGLE | g   | g   | g  | g  | g  | g  | g   | g  | g   | g  |       |
| P9  | S8  |       | c   | c   | c  | c  | c  | c  | c   | c  | c   | c  | 24bit |
| P10 | S9  |       | e   | e   | e  | e  | e  | e  | e   | e  | e   | e  | 96kHz |
| P11 | S10 |       | r   | r   | r  | r  | r  | r  | r   | r  | r   | r  |       |
| P12 | S11 |       | p   | p   | p  | p  | p  | p  | p   | p  | p   | p  |       |
| P13 | DVD |       | n   | n   | n  | n  | n  | n  | n   | n  | n   | n  |       |
| P14 |     | PROG. | d   | d   | d  | d  | d  | d  | d   | d  | d   | d  |       |
| P15 |     |       |     |     |    |    |    |    | col |    | col |    |       |