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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





## User's Guide

# C-28-0605

# VFD

(Vacuum Fluorescent Character Display Module)

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For product support, contact

New haven Display International  
2511 Technology Drive #101  
Elgin , IL 601 24  
Tel: (847) 8 44-8795 Fax: (847) 8 44-8796

October 31, 2006

# Vacuum Fluorescent Display Specification

**PART NUMBER:** C-28-0605

**FEATURES:** 7 Digits, Seven Segmented, with Icons – DVD

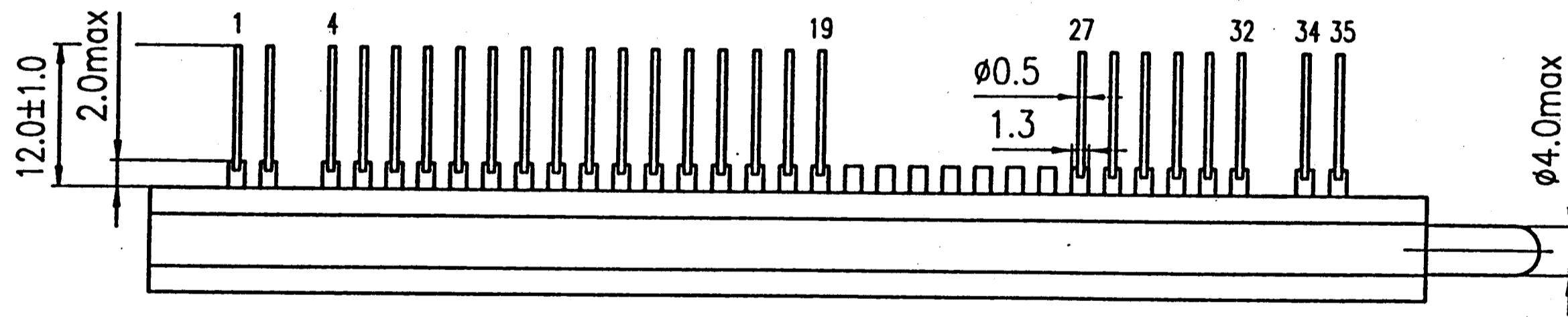
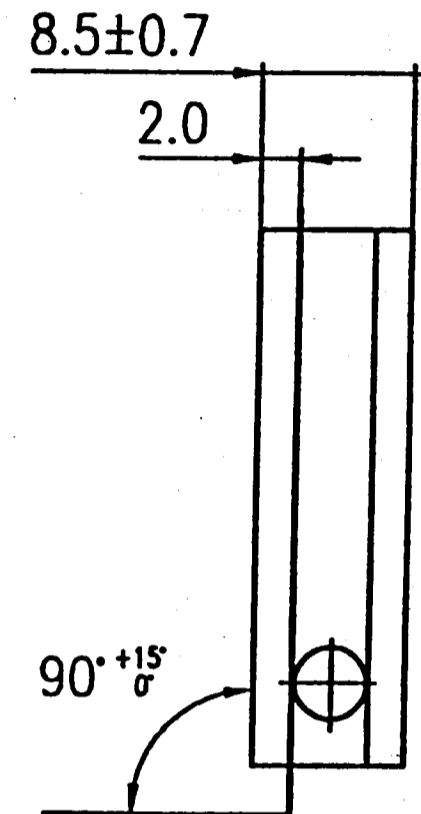
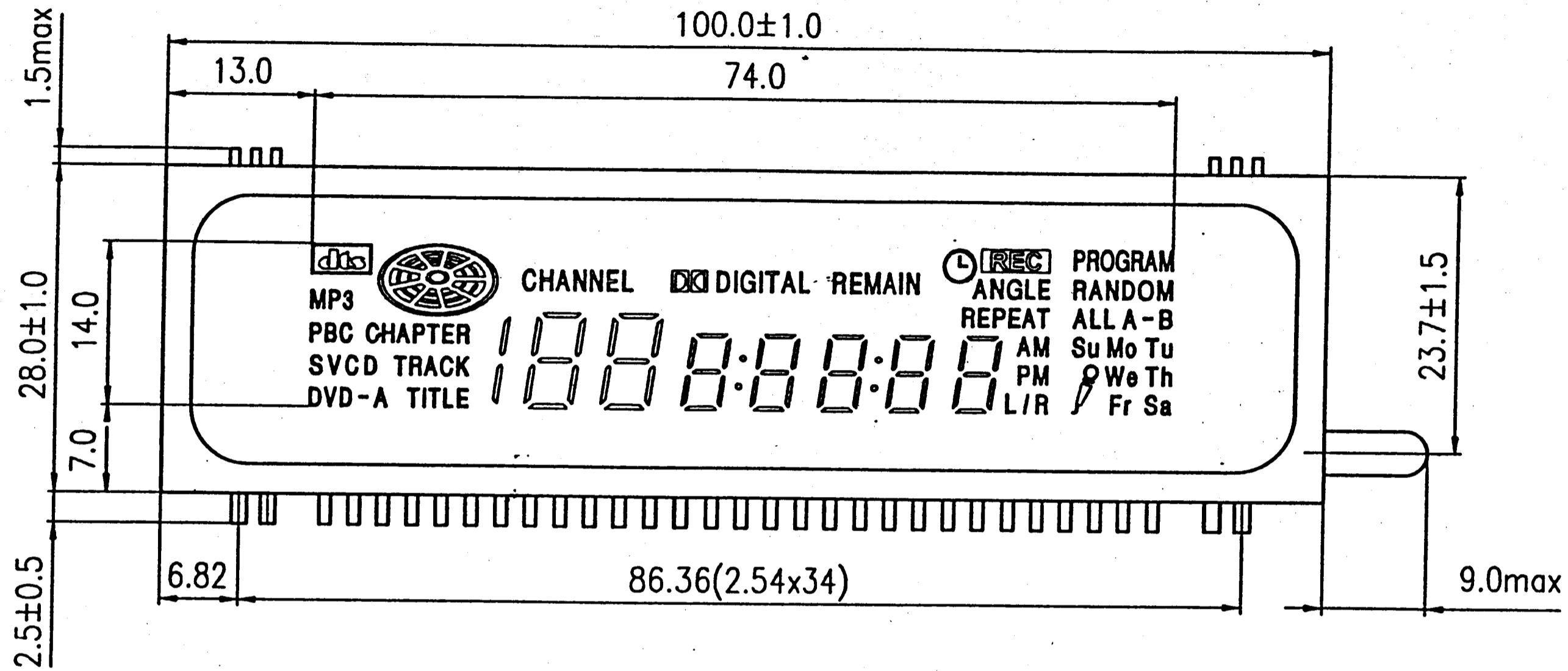
**APPLICATION:** Character Display (7-Seg)

**RATINGS:** Below

| <b>Outer Dimensions</b>      | Panel Length         | P.L.        | 100.0              | mm          |             |
|------------------------------|----------------------|-------------|--------------------|-------------|-------------|
|                              | Panel Height         | P.H.        | 28.0               | mm          |             |
|                              | Panel Thickness      | P.T.        | 8.5                | mm          |             |
| <b>Leads</b>                 | Lead Pitch           | L.P.        | 2.54               | Mm          |             |
|                              | Lead Out             | -           | SIL                |             |             |
| <b>Character Size</b>        | Character Height     | C.H.        | Multi              | mm          |             |
|                              | Character Width      | C.W.        | Multi              | mm          |             |
| <b>Item</b>                  | <b>Symbol</b>        | <b>Min.</b> | <b>Recommended</b> | <b>Max.</b> | <b>Unit</b> |
| <b>Filament Voltage</b>      | Ef                   | 3.2         | 3.5                | 3.9         | Vac         |
| <b>Peak Grid Voltage</b>     | Ec                   | -           | 25.0               | 28.0        | Vp-p        |
| <b>Peak Anode Voltage</b>    | Eb                   | -           | 25.0               | 28.0        | Vp-p        |
| <b>Cut-off Bias</b>          | Ek                   | -           | -                  | -           | -           |
| <b>Duty Cycle</b>            | Du                   | -           | 1/9                | -           | -           |
| <b>Pulse Width</b>           | Tp                   | -           | 100                | -           | uS          |
| <b>Operating Temperature</b> | Topr                 | -20         | -                  | + 70        | C           |
| <b>Storage Temperature</b>   | Tstg                 | -55         | -                  | + 80        | C           |
| <b>Color of Illumination</b> | Green / Red / Yellow |             |                    |             |             |

Electrical Characteristics


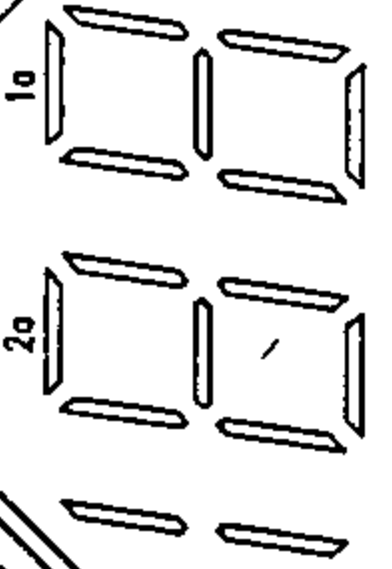
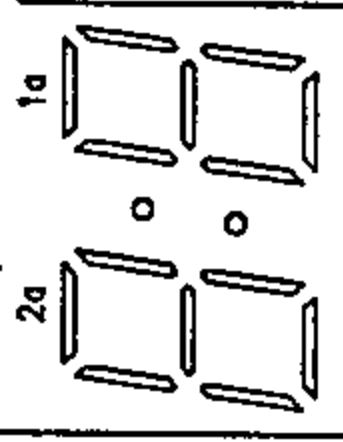
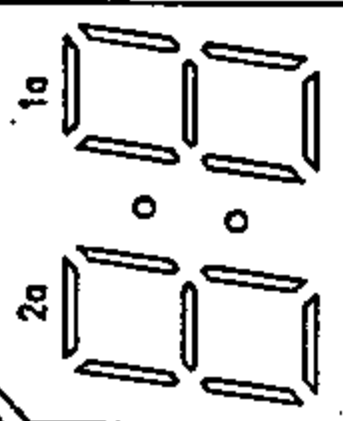




| Item                         | Symbol      | Test Condition  | Min.         | Typical      | Max.       | Unit                      |
|------------------------------|-------------|---|--------------|--------------|------------|---------------------------|
| <b>Filament Current</b>      | If<br>-     | Ef = 3.5 Vac<br>eb = ec = 0   | 112.5<br>-   | 125.0<br>-   | 137.5<br>- | mAac<br>-                 |
| <b>Anode Current</b>         | ib/1,2,3,4G | Ef = 3.5 Vac<br>eb = 25.0 Vp-p<br>ec = 25.0 Vp-p<br>Du = 1/9<br>tp = 100 uS | -            | 8.0          | 16.0       | mAp-p                     |
|                              | ib/5,6G     |   | -            | 10.0         | 20.0       | mAp-p                     |
|                              | -           |   | -            | -            | -          | mAp-p                     |
|                              | -           |   | -            | -            | -          | mAp-p                     |
|                              | -           |   | -            | -            | -          | mAp-p                     |
| <b>Grid Current</b>          | ic/1,2,3,4G |   | -            | 8.5          | 17.0       | mAp-p                     |
|                              | ic/5,6G     |   | -            | 11.0         | 22.0       | mAp-p                     |
|                              | -           |   | -            | -            | -          | mAp-p                     |
|                              | -           |   | -            | -            | -          | mAp-p                     |
|                              | -           |   | -            | -            | -          | mAp-p                     |
| <b>Luminance</b>             | L(G)        |   | 350<br>(102) | 700<br>(204) | -          | cd/m <sup>2</sup><br>(fL) |
|                              | L(R)        |   | 35<br>(10)   | 70<br>(20)   |            | cd/m <sup>2</sup><br>(fL) |
|                              | L(Y)        |   | 60<br>(17)   | 120<br>(34)  |            | cd/m <sup>2</sup><br>(fL) |
| <b>Luminance Ratio</b>       | Lmin/Lmax   |   | 50           | -            | -          | %                         |
| <b>Grid Cut-off Voltage</b>  | Ecco        | Ef = 3.5 Vac<br>Eb = 25.0 Vdc   | -4.5         | -            | -          | Vdc                       |
| <b>Anode Cut-off Voltage</b> | Ebco        | Ef = 3.5 Vac<br>ec = 25.0 Vp-p<br>Du = 1/9<br>tp = 100 uS                   | -4.5         | -            | -          | Vdc                       |



**PINOUT CONNECTIONS**

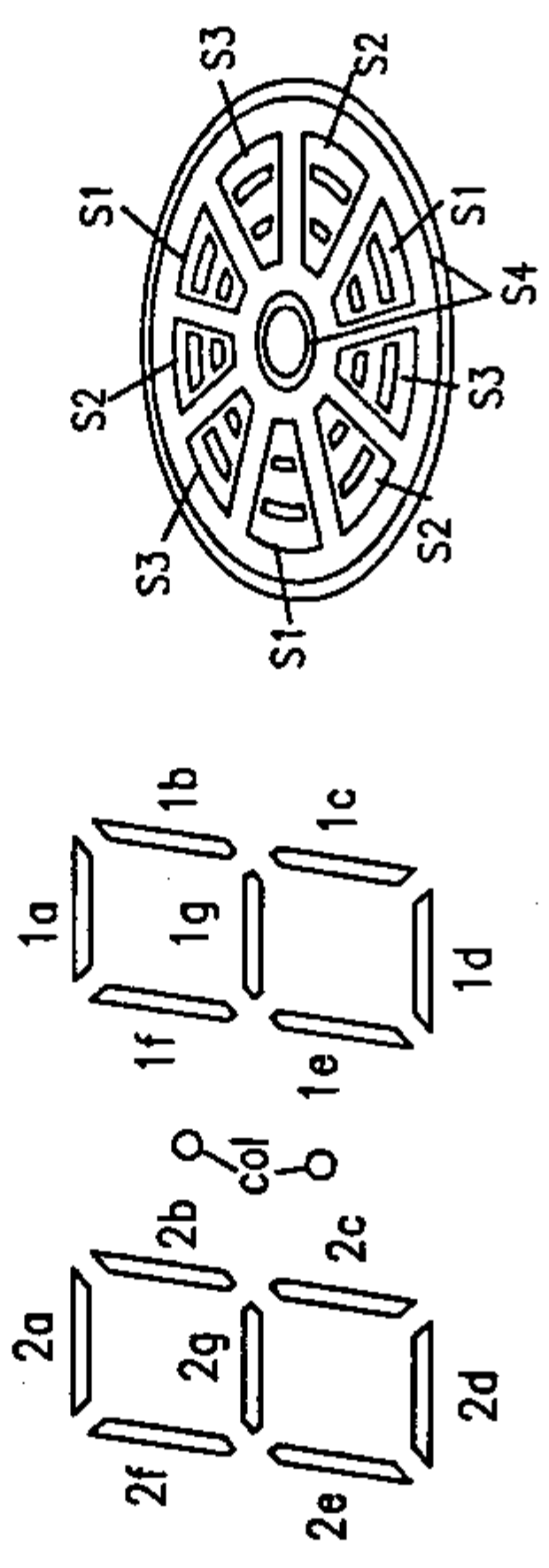
|            |     |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |
|------------|-----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| Pin No.    | 1   | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13  | 14  | 15  | 16  | 17  | 18  |
| Connection | F   | F  | NP | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 | P10 | P11 | P12 | P13 | P14 | P15 |
| Pin No.    | 19  | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31  | 32  | 33  | 34  | 35  |     |
| Connection | P16 | NC | NC | NC | NC | NC | NC | NC | 6G | 5G | 4G | 3G | 2G  | 1G  | NP  | F   | F   |     |

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

|  |   |  |  |   |   |
|--|---|--|--|---|---|
| <br>MP3<br>PBC CHAPTER<br>SVCD TRACK<br>DVD-A TITLE | CHANNEL<br> | DIGITAL<br> | REMAIN<br> |  ANGLE<br>REPEAT<br> AM<br> PM<br>L/R | PROGRAM<br>RAN DOM<br>ALL A - B<br>Su Mo Tu<br> We Th<br>Fr Sa |
|--|---|--|--|---|---|

6G 5G 4G 3G 2G 1G

CHAPTER, TRACK, TITLE, 5G



|     |                                     |                |   |               |                                     |                |
|-----|-------------------------------------|----------------|---|---------------|-------------------------------------|----------------|
|     | 6G                                  | 5G             | 4G                                      | 3G            | 2G                                  | 1G             |
| P1  | <b>CHAPTER</b>                      | <b>CHANNEL</b> | col                                     | col           | L                                   |                |
| P2  | <b>TRACK</b>                        | /              | <input type="checkbox"/> <b>DIGITAL</b> | <b>REMAIN</b> | /                                   | <b>PROGRAM</b> |
| P3  | <input type="checkbox"/> <b>MP3</b> | 1a             | 1a                                      | 1a            | R                                   | <b>RANDOM</b>  |
| P4  | <b>MP3</b>                          | 1b             | 1b                                      | 1b            | <input type="checkbox"/> <b>G</b>   | <b>A-</b>      |
| P5  | S1                                  | 1c             | 1c                                      | 1c            | <b>REPEAT</b>                       | <b>ALL</b>     |
| P6  | S3                                  | 1d             | 1d                                      | 1d            | <b>PM</b>                           |                |
| P7  | S2                                  | 1e             | 1e                                      | 1e            | <b>AM</b>                           | <b>Su</b>      |
| P8  |                                     | 1f             | 1f                                      | 1f            | <input type="checkbox"/> <b>REC</b> | <b>B</b>       |
| P9  | S4                                  | 1g             | 1g                                      | 1g            | <b>ANGLE</b>                        |                |
| P10 | <b>PBC</b>                          | 2a             | 2a                                      | 2a            | d                                   | <b>Mo</b>      |
| P11 | <b>CD</b>                           | 2b             | 2b                                      | 2b            | b                                   | <b>Tu</b>      |
| P12 | <b>DVD</b>                          | 2c             | 2c                                      | 2c            | c                                   | <b>Th</b>      |
| P13 | <b>TITLE</b>                        | 2d             | 2d                                      | 2d            | d                                   | <b>Sa</b>      |
| P14 | <b>-A</b>                           | 2e             | 2e                                      | 2e            | e                                   | <b>Fr</b>      |
| P15 | <b>V</b>                            | 2f             | 2f                                      | 2f            | f                                   | <b>Sa</b>      |
| P16 | <b>S</b>                            | 2g             | 2g                                      | 2g            | g                                   | <b>We</b>      |