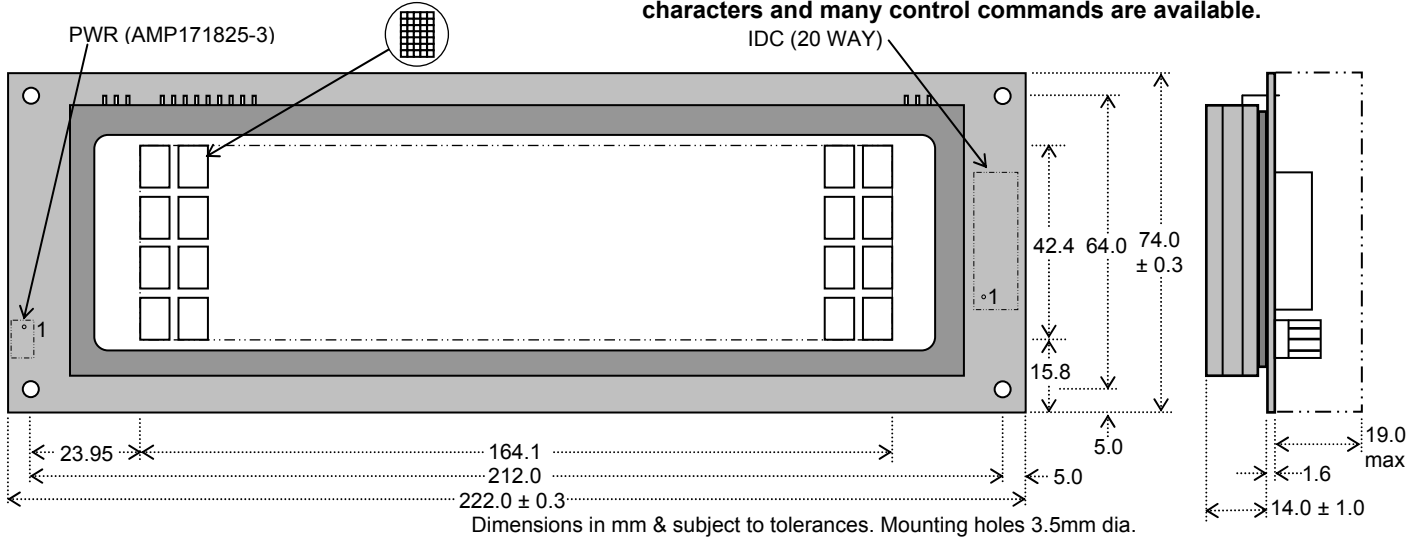


# 5x7 Dot Character VFD Module

# CU20049-KTW222A

- ❑ 4 Lines of 20 Characters 9mm High
- ❑ High Speed Parallel/TTL Serial Interface
- ❑ Operating Temp -40°C to 85°C
- ❑ Single 5V Supply
- ❑ High Brightness Blue Green Display
- ❑ ASCII, Katakana & Extended Character Font
- ❑ 8 User Definable Character RAM

The module includes the Vacuum Fluorescent Display glass, driver and micro-controller ICs with refresh RAM, character generator and interface logic. The high speed 8 bit parallel interface is 5V CMOS compatible suitable for connection to a host CPU bus. The asynchronous serial interface accepts baud rates up to 19,200 with or without parity. Two character font tables can be hardware or software selected. User defined characters and many control commands are available.



## ELECTRICAL SPECIFICATION

| Parameter            | Symbol          | Value         | Condition                |
|----------------------|-----------------|---------------|--------------------------|
| Power Supply Voltage | V <sub>CC</sub> | 5.0VDC +/- 5% | GND=0V                   |
| Power Supply Current | I <sub>CC</sub> | 1100mADC typ. | V <sub>CC</sub> =5V      |
| Logic High Input     | V <sub>IH</sub> | 2.0VDC min.   | V <sub>CC</sub> =5V      |
| Logic Low Input      | V <sub>IL</sub> | 0.8VDC max.   | V <sub>CC</sub> =5V      |
| Logic High Output    | V <sub>OH</sub> | 2.4VDC min.   | I <sub>OH</sub> = -2.0mA |
| Logic Low Output     | V <sub>OL</sub> | 0.5VDC max.   | I <sub>OL</sub> = 2.0mA  |

The power on rise time should be less than 50ms. The inrush current at power on can be 2 x I<sub>CC</sub>.

## OPTICAL and ENVIRONMENTAL SPECIFICATIONS

| Parameter                           | Value                               |
|-------------------------------------|-------------------------------------|
| Character Size/Pitch (XxY mm)       | 6.4 x 9.1/8.3 x 11.1                |
| Dot Size/Pitch (XxY mm)             | 1.0 x 1.0/1.35 x 1.35               |
| Luminance                           | 700 cd/m <sup>2</sup> (204 fL) Typ. |
| Colour of Illumination              | Blue-Green (Filter for colours)     |
| Operating Temperature               | -40°C to +85°C                      |
| Storage Temperature                 | -40°C to +85°C                      |
| Operating Humidity (non condensing) | 20 to 80% RH @ 25°C                 |

## SOFTWARE COMMANDS

| Instruction          | D0-D7 | Instruction          | D0-D7   |
|----------------------|-------|----------------------|---------|
| Back Space           | 08H   | Katakana Font        | 19H     |
| Horizontal Tab       | 09H   | Euro Currency Mark   | 1AH     |
| Line Feed            | 0AH   | Escape               | 1BH     |
| Form Feed            | 0CH   | > Send User Font     | +43H    |
| Carriage Return      | 0DH   | > Position cursor    | +48H    |
| Clear Display        | 0EH   | > Software Reset     | +49H    |
| Increment Write Mode | 11H   | > Luminance          | +4CH    |
| Vertical Scroll Mode | 12H   | > Flickerless Write  | +53H    |
| 5x7 Block Cursor On  | 15H   | > Cursor Blink Speed | +54H    |
| Cursor Off           | 16H   | Character Data       | 20H-FFH |
| International Font   | 18H   | User Character Data  | 00H-FFH |

## TIMING PARAMETERS (min)

|                      |       |                                    |
|----------------------|-------|------------------------------------|
| Data Set Up To Write | 100ns | Subject to change without notice.  |
| Write Pulse Width    | 160ns | Detailed specification on request. |
| Hold After Write     | 10ns  | IUK Doc Ref:5045 Iss:3 30Jun05     |

## CHARACTER FONTS

|    | International Font |    |    |    |    |    |    |    |    |    | Additional Katakana Font |    |    |    |    |    |    |    |    |    |
|----|--------------------|----|----|----|----|----|----|----|----|----|--------------------------|----|----|----|----|----|----|----|----|----|
|    | 00                 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 00                       | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| 00 |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 01 |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 02 |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 03 |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 04 |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 05 |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 06 |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 07 |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 08 |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 09 |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 0A |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 0B |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 0C |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 0D |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 0E |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |
| 0F |                    |    |    |    |    |    |    |    |    |    |                          |    |    |    |    |    |    |    |    |    |

## IDC DATA CONNECTOR

| Pin | Sig | Pin | Sig                  |
|-----|-----|-----|----------------------|
| 1   | D7  | 11  | SIN/TEST             |
| 2   | D6  | 12  | BUSY                 |
| 3   | D5  | 13  | GND (0V)             |
| 4   | D4  | 14  | GND (0V)             |
| 5   | D3  | 15  | V <sub>CC</sub> (5V) |
| 6   | D2  | 16  | V <sub>CC</sub> (5V) |
| 7   | D1  | 17  | GND (0V)             |
| 8   | D0  | 18  | /BL                  |
| 9   | /WR | 19  | GND (0V)             |
| 10  | /CS | 20  | /RESET               |

## 3 PIN POWER CONNECTOR

| Pin | Sig                  |
|-----|----------------------|
| 1   | V <sub>CC</sub> (5V) |
| 2   | SIN/TEST             |
| 3   | GND (0V)             |

Mates with AMP171822-3

Defaults: 19200, Even parity, International Font.

## PCB JUMPERS (OPEN/LINK)

| Baud          | J2 | J1  | J0 |
|---------------|----|-----|----|
| 19200         | O  | O   | O  |
| 9600          | O  | O   | L  |
| 4800          | O  | L   | O  |
| 2400          | O  | L   | L  |
| 1200          | L  | O   | O  |
| Parity        | J4 | J3  |    |
| EVEN          | O  | O   |    |
| ODD           | O  | L   |    |
| NONE          | L  | L/O |    |
| Font          | JA |     |    |
| International | O  |     |    |
| Katakana      | L  |     |    |

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