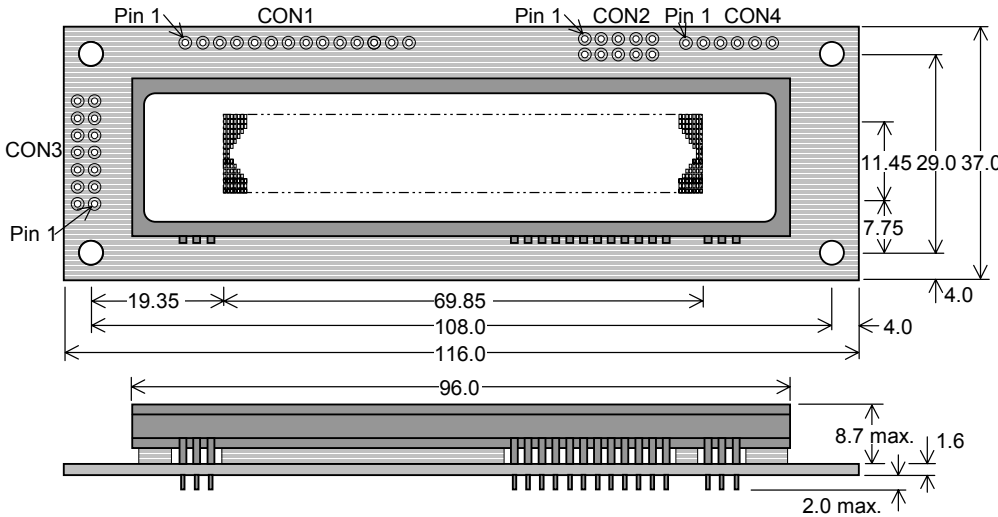


Dot Graphic VFD Module

GU140x16G-7806

- ❑ 140x16 Dot Graphic (2x20 characters)
- ❑ Single 5V Supply
- ❑ High Brightness Blue Green Display
- ❑ Operating Temp -40°C to +85°C
- ❑ 3 Multi Sized Fonts
- ❑ 4/8 Bit Parallel LCD & Serial Interfaces

The module includes the Vacuum Fluorescent Display glass, VF drivers and micro-controller ICs with refresh RAM, character generator and interface logic. The 4/8 bit parallel & serial bi-directional interfaces are 5V TTL/CMOS compatible. The command set is LCD compatible with extended graphic functions.



SERIAL INTERFACE-CON2

| Pin | Async | SPI |
|-----|-------|------|
| 1 | 5V | 5V |
| 2 | NC | SCK |
| 3 | RXD | /SS |
| 4 | NC | SIN |
| 5 | 0V | 0V |
| 6 | NC | SOUT |
| 7 | TXD | NC |
| 8 | /RES | /RES |
| 9 | MB | MB |
| 10 | HB | HB |

Dimensions in mm & subject to tolerances. Mounting holes 3.2mm dia.

NC = Do Not Connect

PARALLEL INTERFACE - CON1

| Pin | Sig | Pin | Sig |
|-----|-----------|-----|---------|
| 1 | GND | 2 | VCC |
| 3 | NC* | 4 | RS |
| 5 | R/W (W/R) | 6 | E (R/D) |
| 7 | D0 | 8 | D1 |
| 9 | D2 | 10 | D3 |
| 11 | D4 | 12 | D5 |
| 13 | D6 | 14 | D7 |

* /RESET = Jumper J6.1 & J6.2
BUSY = Jumper J6.2 & J6.3

ELECTRICAL SPECIFICATION

| Parameter | Symbol | Value | Condition |
|----------------------|--------|----------------------|-----------|
| Power Supply Voltage | VCC | 5.0VDC +/- 5% | GND=0V |
| Power Supply Current | ICC | 250mADC typ. | VCC=5V |
| Logic High Input | VIH | 0.8VDC min. Vcc max. | VCC=5V |
| Logic Low Input | VIL | 0VDC min 0.6VDC max. | VCC=5V |
| Logic High Output | VOH | 3.5VDC min. Vcc max. | IOH=-10uA |
| Logic Low Output | VOL | 0VDC min 0.6VDC max. | IOL =4mA |

OPTICAL and ENVIRONMENTAL SPECIFICATIONS

| Parameter | Value |
|-------------------------------------|---------------------------------|
| Display Area (XxY mm) | 69.85 x 11.45 |
| Dot Size/Pitch (XxY mm) | 0.35 x 0.575 / 0.5 x 0.725 |
| Luminance | 700 cd/m ² 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 | R/W | RS | D0-D7 |
|------------------------|-----|----|---------------------------------|
| Clear Display | L | L | 01H |
| Cursor Return Home | L | L | 02H |
| Entry Mode Set | L | L | 04H-07H |
| Display ON/OFF | L | L | 08H-0FH |
| Cursor Shift Left | L | L | 10H |
| Cursor Shift Right | L | L | 14H |
| Display Shift Left | L | L | 18H |
| Display Shift Right | L | L | 1CH |
| Select 4 bit interface | L | L | 20H + optional luminance data |
| Select 8 bit interface | L | L | 30H + optional luminance data |
| Set CG RAM Addr. | L | L | 40H-7FH |
| Set DD RAM Addr. | L | L | 80H-E7H |
| Read BUSY/Addr. | H | L | 00H-FFH D7 Busy = High |
| Read Data from RAM | H | H | 00H-FFH |
| Set Graphic Cursor | L | L | F0H + xpos + ypos |
| Set Area Commands | L | L | F1H + x1 + y1 + x2 + y2 + cmd |
| | L | H | where cmd 49H = Invert Area |
| | L | H | 46H = Fill Area |
| | L | H | 43H = Clear Area |
| | L | H | 4FH = Set Outline Box |
| | L | H | 6FH = Clear Outline Box |
| | L | H | + others for graphic data write |
| Set Font / Spacing | L | L | F2H + font style |
| Set RS Low | | | 0FH Serial Comms. only |
| Read Data | | | FEH Serial Comms. only |
| Read Cursor Position | | | FFH Serial Comms. only |

CHARACTER SET

| 5x7 & 10x14 Font | LCD Font | International Font | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|----------|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 0A | 0B | 0C | 0D | 0E | 0F | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 1A | 1B | 1C | 1D | 1E | 1F | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 2A | 2B | 2C | 2D | 2E | 2F | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 3A | 3B | 3C | 3D | 3E | 3F | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 4A | 4B | 4C | 4D | 4E | 4F | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 5A | 5B | 5C | 5D | 5E | 5F | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 6A | 6B | 6C | 6D | 6E | 6F | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 7A | 7B | 7C | 7D | 7E | 7F | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 8A | 8B | 8C | 8D | 8E | 8F | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 9A | 9B | 9C | 9D | 9E | 9F | A0 | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | AA | AB | AC | AD | AE | AF | B0 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | B9 | BA | BB | BC | BD | BE | BF | C0 | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | CA | CB | CC | CD | CE | CF | D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | DA | DB | DC | DD | DE | DF | E0 | E1 | E2 | E3 | E4 | E5 | E6 | E7 | E8 | E9 | EA | EB | EC | ED | EE | EF | F0 | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | FA | FB | FC | FD | FE | FF |

Mini Font

| 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 0A | 0B | 0C | 0D | 0E | 0F |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 2A | 2B | 2C | 2D | 2E | 2F |
| 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 3A | 3B | 3C | 3D | 3E | 3F |
| 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 4A | 4B | 4C | 4D | 4E | 4F |
| 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 5A | 5B | 5C | 5D | 5E | 5F |

The default font can be changed by J3. Other fonts can then be selected by software command.

FONT SELECTION

| J3 | Font |
|------|---------------|
| Open | LCD (default) |
| Link | International |

SERIAL/PARALLEL SELECTION

| J8 | Interface |
|------|--------------------|
| Open | Parallel (default) |
| Link | Serial |

SERIAL MODE

| J9 | J10 | Configuration |
|----|-----|--------------------------|
| O | O | SPI / Clock Serial (def) |
| L | O | Async 9600,N,8,1 |
| O | L | Async 19200,N,8,1 |
| L | L | Async 38400,N,8,1 |

CONTACT

Noritake Sales Office Tel Nos
 Nagoya Japan: +81 (0)52-561-9867
 Canada: +1-416-291-2946
 Chicago USA: +1-847-439-9020
 Munchen (D): +49 (0)89-3214-290
 Itron UK: +44 (0)1493 601144
 Rest Europe: +49 (0)61-0520-9220
www.noritake-itron.com

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