

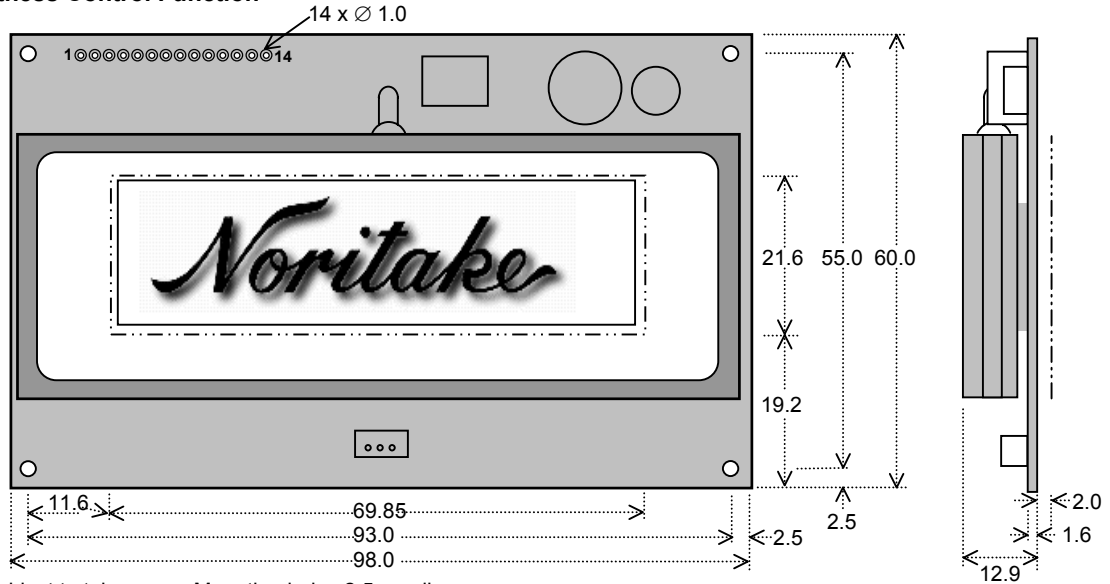
# 140x32 Dot Graphic VFD Module

# GU140x32F-7002

- ❑ Character Graphic ,Transformerless display
- ❑ Size compatible with U-Version
- ❑ Operating Temp -40°C to +85°C
- ❑ Single 5V Supply with Power Save Mode
- ❑ Smooth vertical/Horizontal scroll
- ❑ Proportional and scalable fonts
- ❑ 8 bit parallel & CMOS Serial interface
- ❑ Screen saver & window definition function
- ❑ 8 Level Brightness Control Function

The module includes the Vacuum Fluorescent Display glass, driver and micro-controller ICs with refresh RAM, character generator and interface logic. This module have 8 bit parallel & CMOS syn. Or asyn. Serial Interface.

The module can simultaneously display graphic pattern and / or characters on screen.



Dimensions in mm & subject to tolerances. Mounting holes 2.5mm dia.

## ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Condition
Power Supply Voltage	Vcc	6.0 VDC Max.	GND=0V
Power Supply Current	Icc	400mADC typ.	Vcc=5V
Logic High Input	V <sub>IH</sub>	0.8VCC min.	Vcc=5V
Logic Low Input	V <sub>IL</sub>	0.2VCC max.	Vcc=5V
Logic High Output	V <sub>OH</sub>	3.8VDC min.	I <sub>OH</sub> = -1.5mA
Logic Low Output	V <sub>OL</sub>	0.6VDC max.	I <sub>OL</sub> = 1.6mA

The power on rise time should be less than 50ms. The inrush current at power on can be 2 x Icc. The Icc current is 10mA maximum while in power down mode.

## OPTICAL and ENVIRONMENTAL SPECIFICATIONS

Parameter	Value
PCB size/Display area ( in mm)	98.0x60.0/ 69.85x21.61
Dot Size/Pitch (XxY mm)	0.35x0.53/ 0.50x0.68
Luminance	700 cd/m <sup>2</sup> (204 fL) Typ.
Color of Illumination	Blue-Green (Filter for more colors)
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	Code
Character display	20H-FFH
Cursor set	1FH 24H xL xH yL yH
Display clear	0CH
Initialize display	1BH 40H
Specify International font	1BH 52H n
Vertical scroll mode	1FH 02H
Horizontal scroll mode	1FH 03H
Brightness level Setting	1FH 58H n
Scroll Display Action	1FH 28H 61H 10H wL wH cL cH s
Display Blank	1FH 28H 61H 11H p t1 t2 c
Screen Saver	1FH 28H 61H 40H p
Bit Image Display group	1FH 28H 66H 11H xL xH
Font magnified Display	1FH 28H 67H 40H x y

## Parallel interface connector

Pin	Sig	Pin	Sig
1	Gnd	2	Vcc
3	NC	4	RS
5	/W	6	/RD
7	D0	8	D1
9	D2	10	D3
11	D4	12	D5
13	D6	14	D7

## Serial Connector

Pin	Asyn. Sig	Syn. Sig
1	Vcc	Vcc
2	SIN	SIN
3	Gnd	Gnd
4	SBUSY	SBUSY
5	NC	SCK
6	/ RESET	/ RESET

## COMMON FONT

	2	3	4	5	6	7
x0H	00P'p	01P'p	02P'p	03P'p	04P'p	05P'p
x1H	06P'p	07P'p	08P'p	09P'p	0AP'p	0BP'p
x2H	0CP'p	0DP'p	0EP'p	0FP'p	0GP'p	0HP'p
x3H	0IP'p	0JP'p	0KP'p	0LP'p	0MP'p	0NP'p
x4H	0OP'p	0PP'p	0QP'p	0RP'p	0SP'p	0TP'p
x5H	0UP'p	0VP'p	0WP'p	0XP'p	0YP'p	0ZP'p
x6H	0aP'p	0bP'p	0cP'p	0dP'p	0eP'p	0fP'p
x7H	0gP'p	0hP'p	0iP'p	0jP'p	0kP'p	0lP'p
x8H	0mP'p	0nP'p	0oP'p	0pP'p	0qP'p	0rP'p
x9H	0sP'p	0tP'p	0uP'p	0vP'p	0wP'p	0xP'p
xAH	0yP'p	0zP'p	0[P'p	0]P'p	0^P'p	0_ P'p
xBH	0`P'p	0aP'p	0bP'p	0cP'p	0dP'p	0eP'p
xCH	0fP'p	0gP'p	0hP'p	0iP'p	0jP'p	0kP'p
xDH	0lP'p	0mP'p	0nP'p	0oP'p	0pP'p	0qP'p
xEH	0rP'p	0sP'p	0tP'p	0uP'p	0vP'p	0wP'p
xFH	0xP'p	0yP'p	0zP'p	0[P'p	0]P'p	0^P'p

## CHARACTER CODE (n=0)

	8	9	A	B	C	D	E	F
x0H	00	01	02	03	04	05	06	07
x1H	08	09	0A	0B	0C	0D	0E	0F
x2H	10	11	12	13	14	15	16	17
x3H	18	19	1A	1B	1C	1D	1E	1F
x4H	20	21	22	23	24	25	26	27
x5H	28	29	2A	2B	2C	2D	2E	2F
x6H	30	31	32	33	34	35	36	37
x7H	38	39	3A	3B	3C	3D	3E	3F
x8H	40	41	42	43	44	45	46	47
x9H	48	49	4A	4B	4C	4D	4E	4F
xAH	50	51	52	53	54	55	56	57
xBH	58	59	5A	5B	5C	5D	5E	5F
xCH	60	61	62	63	64	65	66	67
xDH	68	69	6A	6B	6C	6D	6E	6F
xEH	70	71	72	73	74	75	76	77
xFH	78	79	7A	7B	7C	7D	7E	7F

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