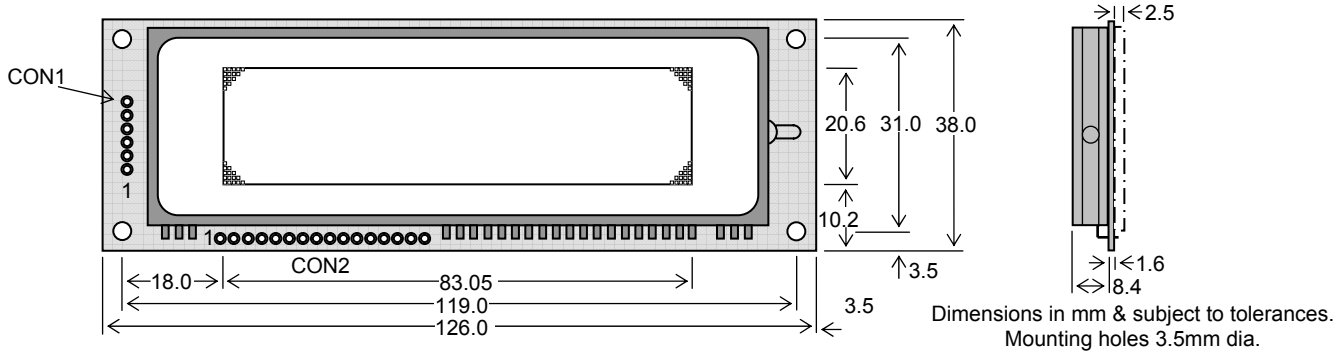


# Dot Graphic VFD Module

# GU126x32F-K611A4

- ❑ 126 x 32 High Brightness Dot Graphic Display
- ❑ Single 5V DC Supply
- ❑ 3 ASCII Fonts ( 5 x 5, 5 x 7, and 10 x 14 )
- ❑ SPI & RS485 Asynchronous Serial Interface
- ❑ 8 User I/O Pins with Key Scanning Capability
- ❑ Transformerless PSU (patent pending)
- ❑ Low Profile Construction

The module includes the VFD glass, VF drivers and micro-controller with refresh RAM, character generation, interface logic and patented transformerless DC/DC converter. The RS485 serial interface is full duplex and accepts various baud rates up to 38,400. The module features a low profile design with numerous custom options available including special fonts and application specific commands.



## ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Condition
Power Supply Voltage	VDD	5.0VDC +/- 10%	GND=0V
Power Supply Current	IDD	400mA typ.	VDD=5VDC
RS485 Diff Input	VIL / VIH	-0.2V min / +0.2V max	VDD=5VDC
RS485 Diff Output	VOL / VOH	2.0VDC max / 4.0VDC min	VDD=5VDC
Logic Input	VIL / VIH	0.8VDC max / 2.0VDC min	VDD=5VDC
Logic Output	VOL / VOH	0.5VDC max / 2.4VDC min	IOH=-2.0mA

## OPTICAL & ENVIRONMENTAL SPECIFICATION

Parameter	Value
Display Area (X x Ymm)	83.05 x 20.65
Dot Size/Pitch (XxY mm)	0.5 x 0.5 / 0.65 x 0.65
Luminance	600 cd/m <sup>2</sup> (200 fL) Typ.
Colour of Illumination	Blue-Green (505nm)
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Operating Humidity	20 to 85% RH @ 25°C

Optical filters can provide violet, red, yellow, blue & green output.

## SOFTWARE COMMANDS

Hex	Command	Hex	Command
01-07	Run Macro	19	Reset
08	Backspace	1A + data	Write Mode
09	Horizontal Tab	1B + macro+len+data	Set Macro
0A	Line Feed	1B + 4D	Erase All Macros
0B	Home	1B + 4C/55	Lock/Unlock EEPROM
0C	Vertical Tab	1B + 43	Request Checksum
0D	Carriage Return	1B + 50/46	Power On/Off
0E	Clear End of Line	1B + 48/42	Hex Write On/Off
0F	Test	1B + 49 + data	Set Comms
10 + x + y	Cursor Position	1B + 44 + data	Enable I/O Port
11 +xl+yt+xr+yb	Set Area	1B + 4F + data	Set Port Lines
12 +xl+yt+xr+yb	Clear Area	1B + 52	Read Port
13 +xl+yt+xr+yb	Invert Area	1B + 4B	Enable key scanning
14 +xl+yt+xr+yb	Set Outline	1B + F8-FF	Brightness
15 +xl+yt+xr+yb	Clear Outline	1C / 1D / 1E	Select Font
16	Set Pixel	1F +xl+yl+xr+yb+data	Graphic Area Write <sup>1</sup>
17	Clear Pixel	20 - 7F	Character Write
18 + len + data	Graphic Write		

<sup>1</sup> Applies to version 3 software only.

The module defaults to a 4 line of 21 character display using the 5x7 font with single pixel spacing. The cursor position auto increments after each character write. The bottom left of a character is placed at the cursor x,y. To send commands as hexadecimal, prefix the 2 bytes using character 60H. Example: `10`3F`01 = Position dot x=64 y=1. To send character 60H to the display, send 60H twice.

## CHARACTER SETS

### MINI FONT (PROPORTIONAL SPACING)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
20	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	
50	p	q	r	s	t	u	v	w	x	y	z	[	\	]	^	_

### 5x7 & 10x14 FONTS (FIXED SPACING)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
20	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	
50	p	q	r	s	t	u	v	w	x	y	z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	P	q	r	s	t	u	v	w	x	y	z	{		}	~	€

### CON1

Pin	Signal
1	VDD
2	B (RS485 out)
3	0V
4	A (RS485 out)
5	B (RS485 in)
6	A (RS485 in)

### CON2

Pin	Signal	Pin	Signal
1	/SS	6	MISO
2	0V	7	SCK
3	VDD	8	/IRQ
4	/RES	9-16	P0-P7
5	MOSI		

Connect MISO and MOSI at power-up to enable the test mode and restore factory defaults.

## 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-iron.com](http://www.noritake-iron.com)

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