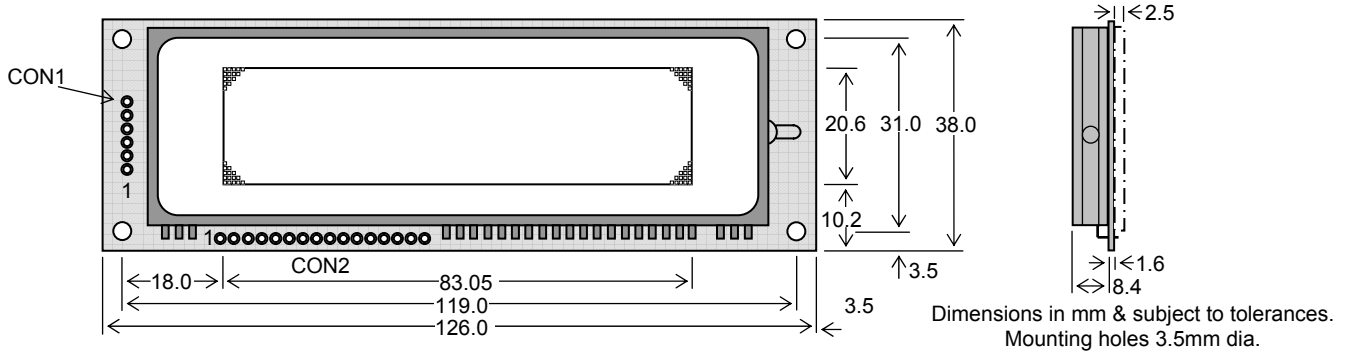


# Dot Graphic VFD Module

# GU126x32F-K612A4

- ❑ 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 & RS232 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 RS232 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
RS232 Input	VSIL / VSIH	-24V max / +24V max	VDD=5VDC
RS232 Output	VSOL / VSOH	-5VDC min / +5VDC 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	RXD
3	0V
4	TXD
5	MB
6	HB

### 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		

The Module Busy line (MB) indicates the module is busy when low. If handshaking is not required, connect the Host Busy (HB) input to the Module Busy output.

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)

Subject to change without notice.  
 IUK Doc. No. 03926 Iss.5  
 25 Oct 06