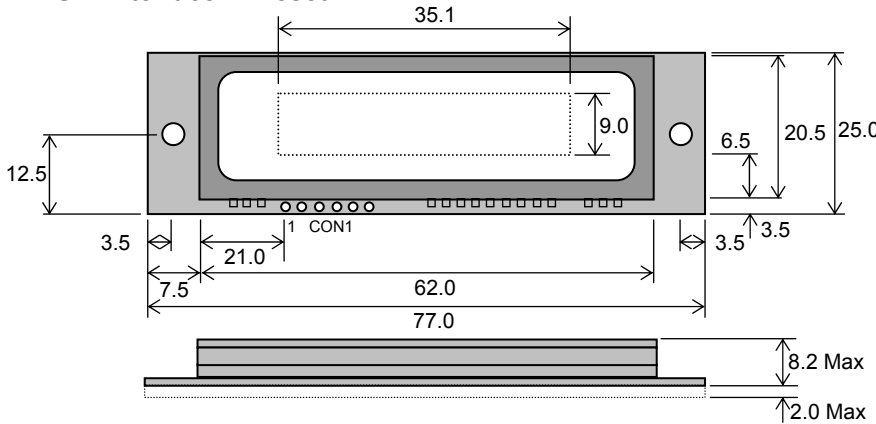


# Graphic VFD Module

# GU84x16D-K610A1

- 84 x 16 Dot Matrix
- Single 5V Supply
- High Brightness Display
- Wide Temperature +105°C
- SPI interface + /Reset

This compact high brightness VF display module provides a solution for ovens and control systems. The unique low profile onboard DC/DC convertor avoids using inductive components or electrolytic capacitors to enable a wide temperature range.



CON1	
Pin	Signal
1	VCC
2	GND
3	Clock
4	Data OUT
5	Data IN
6	/RESET

Dimensions in mm.  
Tolerances +/-0.1mm.  
PCB is 1.6mm thick

## ELECTRICAL SPECIFICATION

Parameter	Sym	Min	Typ	Max	Unit	Condition
Supply Voltage	Vcc	4.5	5.0	5.5	V	Vss=0V
Supply Current	Icc	-	200	250	mA	Vcc=5V All dots
Logic High Input	V <sub>IH</sub>	3.7	-	Vcc	V	Vss=0V
Logic Low Input	V <sub>IL</sub>	0	-	0.3	V	Vss=0V

## ENVIRONMENTAL and OPTICAL SPECIFICATION

Parameter	Value
Display Area (XxY mm)	35.1 x 9.0
Dot Size/Pitch (XxY mm)	0.27 x 0.42/0.42 x 0.57
Luminance	2000 cd/m <sup>2</sup> Typ
Colour of Illumination	Blue-Green (Filter for colours)
Operating Temperature	-40°C to +105°C - 4 hour peak
Storage Temperature	-40°C to +85°C - continuous
Operating Humidity (non condensing)	10 to 90% @ 25°C

## SOFTWARE COMMANDS

Hex	Command
00-07	Display user defined 8x8 icon in EEPROM at cursor
08-0D	Display user defined 16x16 icon in EEPROM at cursor
10+	Position Cursor where top left = 0,0 (10, x, y)
11	Set Pixel On at Cursor
12	Clear Pixel at Cursor
13+	Fill Area, co-ordinates inclusive (13, tx, ty, bx, by)
14+	Clear Area, co-ordinates inclusive (14, tx, ty, bx, by)
15+	Invert Area, co-ordinates inclusive (15, tx, ty, bx, by)
16+	Draw boxed outline, co-ordinates inclusive (16, tx, ty, bx, by)
17+	Clear boxed outline, co-ordinates inclusive (17, tx, ty, bx, by)
18+	Set write mode (18, mode)
19+	Define icon (19, 00-07, n1, ... n8) or (19, 08-0D, n1, ... n32)
1A+	Graphic write (1A, n1, ... n168)
1C+	Set luminance (1C, 00-1F)
1D	Select 5x7 Font
1E	Select 10x14 Font
1F	Software reset
20-7F	Write ASCII Characters (5x7 font)
20-5F	Write ASCII Characters (10x14 font)

The module defaults to a 2 x 14 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. 8 bit data is sent via synchronous SPI on the falling edge of clock.

## 5X7 FONT

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00																
10																
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	{	}	~		

## 10X14 FONT

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00																
10																
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	[	\	]	^	_

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

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