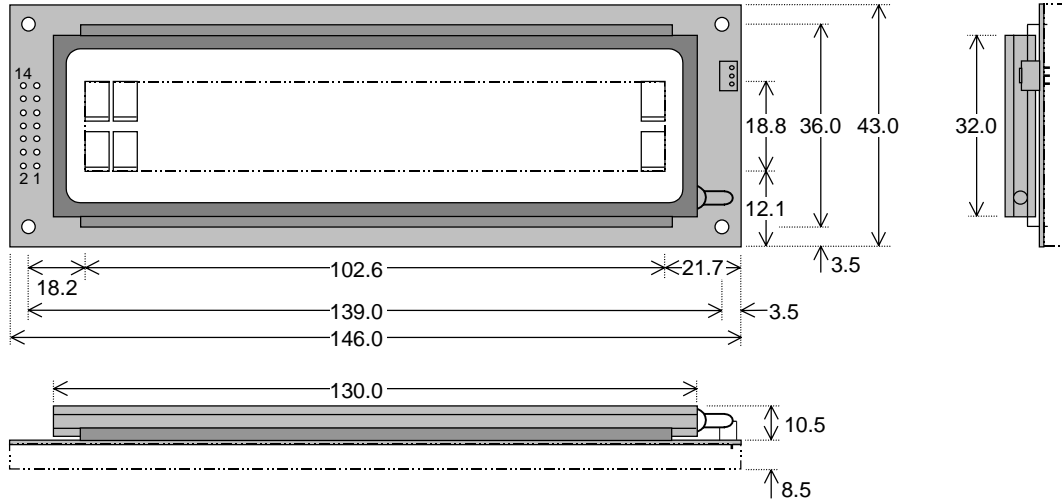


# 5X7 Dot Character VFD Module

# CU20029ECPB-W1J

- ❑ 2 X 20 Characters 8mm High + Cursor
- ❑ LCD Compatible Design
- ❑ Operating Temp -40°C to +85°C
- ❑ Single 5V Supply with Power Save Mode
- ❑ High Brightness Blue Green Display
- ❑ Selectable 4/8 bit M68/i80 Interface
- ❑ ASCII + Extended Character Font
- ❑ 8 User Definable Character RAM
- ❑ 4 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. The high speed 8 bit parallel interface is 5V CMOS compatible suitable for connection to a host CPU bus which can be set to M68 or i80 series interface by a solder link on the module. Brightness control and power down functions are provided. A full data sheet is available.



Dimensions in mm & subject to tolerances. Mounting holes 3.5mm dia.

## ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Condition
Power Supply Voltage	Vcc	5.0VDC +/- 5%	GND=0V
Power Supply Current	Icc	400mADC typ.	Vcc=5V
Logic High Input	V <sub>IH</sub>	2.0VDC min.	Vcc=5V
Logic Low Input	V <sub>IL</sub>	0.8VDC max.	Vcc=5V
Logic High Output	V <sub>OH</sub>	Vcc-0.4VDC min.	I <sub>OH</sub> = -1.6mA
Logic Low Output	V <sub>OL</sub>	0.4VDC 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
Character Size/Pitch (XxY mm)	3.8 x 9.2/5.2 x 9.6
Dot Size/Pitch (XxY mm)	0.6 x 0.975/0.8 x 1.175
Luminance	350 cd/m <sup>2</sup> (100 fL) Typ.
Colour of Illumination	Blue-Green (Filter for more colours)
Operating Temperature	-40°C to +85°C
Storage Temperature	-50°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-03H
Entry Mode Set	L	L	04H-07H
Display ON/OFF	L	L	08H-0FH
Cursor/Display Shift	L	L	10H-1FH
Function Set	L	L	20H-3FH
Brightness Set	L	H	00H-03H
Set CG RAM Addr.	L	L	40H-7FH
Set DD RAM Addr.	L	L	80H-E7H
Read BUSY/Addr.	H	L	00H-FFH
Write Data to RAM	L	H	00H-FFH
Read Data from RAM	H	H	00H-FFH

## PIN CONNECTIONS

Pin	Sig	Pin	Sig
1	GND	2	Vcc
3	(Fnc)	4	RS
5	R/W #	6	E #
7	DB0	8	DB1
9	DB2	10	DB3
11	DB4	12	DB5
13	DB6	14	DB7

## TIMING PARAMETERS (min)

(E)nable Cycle Time	1000ns
(E)nable Pulse Width	450ns
Hold after (E)nable	10ns

## CHARACTER FONT

Hex	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
00			0	1	2	3	4	5	6	7	8	9	-	.	:	;
01			!	"	#	\$	%	&	'	(	)	*	+	,	<	>
02			"	2	B	R	b	r	Δ	E	r	イ	υ	×	β	θ
03			#	3	C	S	c	s	Δ	R	↓	ウ	τ	ε	ο	ϕ
04			\$	4	D	T	d	t	Δ	#	\	И	†	‡	¶	Ω
05			%	5	E	U	e	u	Ε	ο	.	†	‡	ι	ς	υ
06			&	6	F	V	f	v	ϕ	+	‡	‡	‡	‡	‡	‡
07			'	7	G	W	g	w	ϕ	ο	‡	‡	‡	‡	‡	‡
08			(	8	H	X	h	x	ϕ	ι	‡	‡	‡	‡	‡	‡
09			)	9	I	Y	i	y	ϕ	‡	‡	‡	‡	‡	‡	‡
0A			*	:	J	Z	j	z	υ	Δ	‡	‡	‡	‡	‡	‡
0B			+	,	K	k	Δ	Δ	‡	‡	‡	‡	‡	‡	‡	‡
0C			<	>	L	l	Δ	Δ	‡	‡	‡	‡	‡	‡	‡	‡
0D			=	Δ	M	m	Δ	Δ	‡	‡	‡	‡	‡	‡	‡	‡
0E			>	Δ	N	n	Δ	Δ	‡	‡	‡	‡	‡	‡	‡	‡
0F			?	Δ	O	o	Δ	Δ	‡	‡	‡	‡	‡	‡	‡	‡

## JUMPER LINKS

# Interface M68/i80  
When jumper link JP2 is soldered, these inputs change to i80 series CPU control lines.  
Pin 5 = /WR Pin 6 = /RD

Pin 3 (Fnc) Input  
This is normally open circuit. If pads JP3.1 and JP3.2 are linked. Pin 3 = /Reset.

## CONTACT

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

Subject to change without notice.  
IUK Doc Ref: 03013 Iss:1 19SEP00