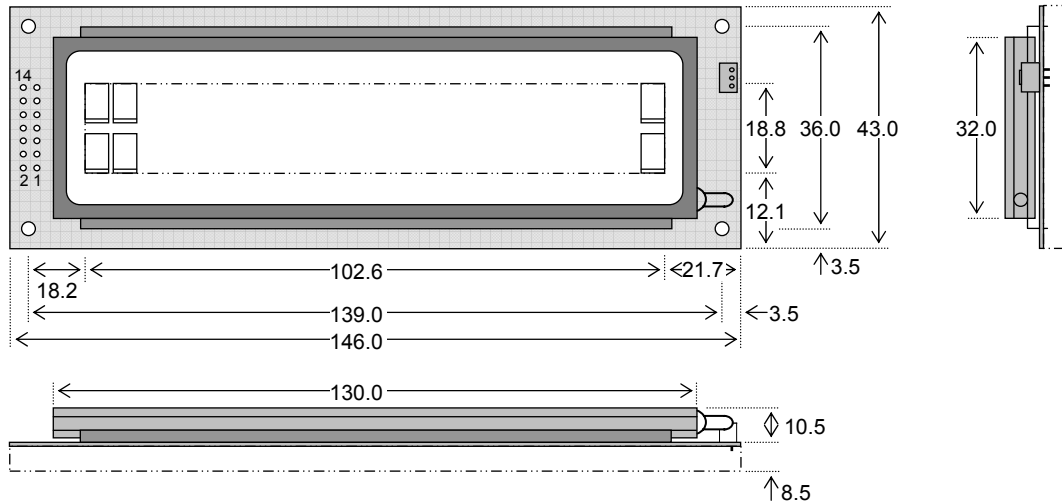


# 5X7 Dot Character VFD Module

# 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 2.5mm dia.

## ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Condition
Power Supply Voltage	V <sub>CC</sub>	5.0VDC +/- 5%	GND=0V
Power Supply Current	I <sub>CC</sub>	400mADC typ.	V <sub>CC</sub> =5V
Logic High Input	V <sub>IH</sub>	2.0VDC min.	V <sub>CC</sub> =5V
Logic Low Input	V <sub>IL</sub>	0.8VDC max.	V <sub>CC</sub> =5V
Logic High Output	V <sub>OH</sub>	V <sub>CC</sub> -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 I<sub>CC</sub>. The I<sub>CC</sub> 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	V <sub>CC</sub>
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	◊	◊
04			\$	4	D	T	d	t	Δ	#	\	И	†	‡	¶	¶
05			%	5	E	U	e	u	E	o	.	†	†	1	5	0
06			&	6	F	V	f	v	0	+	7	h	2	3	ρ	Σ
07			'	7	G	W	g	w	◊	7	†	‡	7	ε	π	π
08			(	8	H	X	h	x	0	1	4	7	3	U	r	X
09			)	9	I	Y	i	y	0	5	6	7	J	L	1	υ
0A			*	:	J	Z	j	z	0	4	ε	◊	◊	◊	◊	◊
0B			+	;	K	Z	k	z	◊	Δ	7	ε	◊	◊	◊	◊
0C			,	<	L	Y	l	y	◊	Δ	7	ε	◊	◊	◊	◊
0D			-	=	M	J	m	j	◊	Δ	7	ε	◊	◊	◊	◊
0E			.	>	N	^	n	^	◊	Δ	7	ε	◊	◊	◊	◊
0F			◊	/	?	0	_	o	+	ε	↓	υ	7	ρ	◊	◊

## 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.

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