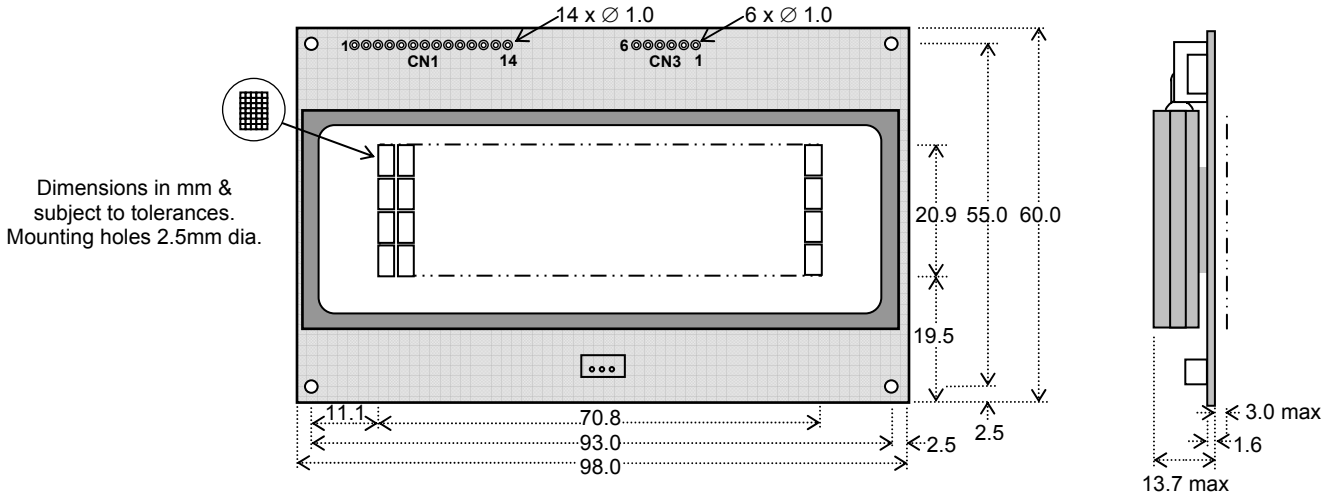


# 5X7 Dot Character VFD Module

# CU20045-UW5J

- 4 X 20 Characters 5mm High
- 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 Parallel & Serial 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. CMOS Serial interface can also be selected by a jumper link. Brightness control and power down functions are provided. A full data sheet is available.



## ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Condition
Power Supply Voltage	Vcc	5.0VDC +/- 5%	GND=0V
Power Supply Current	Icc	250mADC typ.	Vcc=5V
Logic High Input	VIH1	Vss+2.0VDC min.	Vcc=5V
Logic Low Input	VIL1	Vss+0.8VDC max	Vcc=5V
Logic High Output	VOH	Vcc-0.8VDC min.	IOH = -4.0mA
Logic Low Output	VOL	Vss+0.6VDC max	IOL = 4.0mA

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)	2.4 x 4.7/3.6 x 5.4
Dot Size/Pitch (XxY mm)	0.4 x 0.5/0.5 x 0.7
Luminance	700 cd/m <sup>2</sup> (204 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

## PARALLEL CONNECTOR (CN1)

Pin	Sig	Pin	Sig
1	GND	2	Vcc
3	(Fnc)	4	RS
5	R/W #	6	E #
7	D0	8	D1
9	D2	10	D3
11	D4	12	D5
13	D6	14	D7

## SERIAL CONNECTOR (CN3)

Pin	Sig	Pin	Sig
1	Vcc	2	SI/SO
3	GND	4	STB
5	SCK	6	(Fnc)

## TIMING PARAMETERS (min)

(E)nable Cycle Time	500ns
(E)nable Pulse Width	230ns
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	a	P	`	F	Δ	F	-	Δ	Ξ	Ω	P		
01		!	1	A	Q	a	q	Δ	a	e	u	7	7	4	5	9
02		"	2	B	R	b	r	Δ	e	r	ι	μ	×	β	θ	
03		#	3	C	S	c	s	Δ	R	ι	ο	τ	ε	ς	ω	
04		\$	4	D	T	d	t	Δ	a	#	\	ι	†	μ	Ω	
05		%	5	E	U	e	u	Δ	E	o	*	7	†	ι	ς	U
06		&	6	F	V	f	v	Δ	o	+	3	η	ι	μ	ρ	Σ
07		'	7	G	W	g	w	Δ	o	7	†	μ	ρ	ε	π	
08		(	8	H	X	h	x	Δ	l	4	ο	β	υ	ι	χ	
09		)	9	I	Y	i	y	Δ	o	5	o	7	ι	μ	υ	
0A		*	:	J	Z	j	z	Δ	U	Δ	ε	μ	ν	ι	7	
0B		+	;	K	k			Δ	o	Δ	+	μ	ε	o	°	κ
0C		,	<	L	l			Δ	ι	\	2	μ	ρ	7	φ	κ
0D		-	=	M	m			Δ	ι	>	μ	ρ	ε	o	†	
0E		.	>	N	n			Δ	o	†	μ	ρ	ε	o	†	
0F		Δ	/	?	0	_	o	+	3	↓	υ	υ	μ	ρ	°	⊞

## JUMPER LINKS

# Interface M68/i80  
When jumper link JP9 is soldered, these inputs change to i80 series CPU control lines.  
Pin 5= /WR Pin 6 = /RD

Pin 3 & 6 (Fnc) Input  
This is normally open circuit. If pads JP2.1 and JP2.2 are linked. Pin 3 & 6 = /Reset.

Serial / Parallel Interface  
If JP13 is open, Parallel Interface is selected. If JP13 is linked, Serial Interface is selected.

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