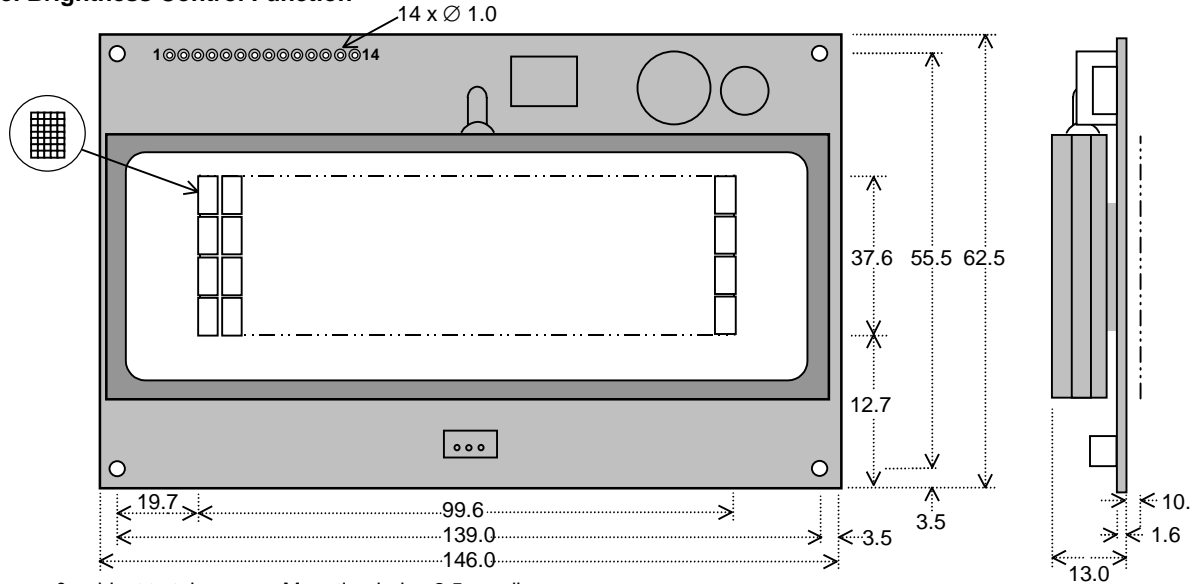


# 5X7 Dot Character VFD Module

# CU20049SCP-B-W2J

- ❑ 4 X 20 Characters 9mm 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 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>	650mADC typ.	V <sub>CC</sub> =5V
Logic High Input	V <sub>IH</sub>	2.2VDC min.	V <sub>CC</sub> =5V
Logic Low Input	V <sub>IL</sub>	0.6VDC max.	V <sub>CC</sub> =5V
Logic High Output	V <sub>OH</sub>	V <sub>CC</sub> -0.6VDC min.	I <sub>OH</sub> = -1.6mA
Logic Low Output	V <sub>OL</sub>	V <sub>SS</sub> +0.6 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)	3.65x8.8/5.05x9.6
Dot Size/Pitch (XxY mm)	0.57x0.84/0.77x1.14
Luminance	700 cd/m <sup>2</sup> (204 fL) Typ.
Colour of Illumination	GreenBlue-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	D0	8	D1
9	D2	10	D3
11	D4	12	D5
13	D6	14	D7

## TIMING PARAMETERS (min)

(E)nable Cycle Time	666ns
(E)nable Pulse Width	300ns
Hold after (F)nable	10ns

## CHARACTER FONT

h <sub>EX</sub>	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	&	E	r	'	Y	X	0	
03			#	3	C	S	c	s	&	R	J	'	T	E	e	.
04			\$	4	D	T	d	t	&	#	'	I	K	P	P	Q
05			%	5	E	U	e	u	E	O	.	'	+	1	0	U
06			&	6	F	V	f	v	O	+	'	7	0	2	3	P
07			'	7	G	U	g	u	e	o	'	7	7	7	7	7
08			(	8	M	X	h	x	0	1	'	0	1	0	1	X
09			)	9	I	V	i	v	o	'	0	7	1	0	'	Y
0A			*	:	J	Z	j	z	U	4	'	0	1	0	1	7
0B			+	=	K	K	<	Q	Δ	'	0	7	0	0	'	7
0C			,	<	L	¥	l	l	\	'	0	7	0	7	0	7
0D			-	=	M	I	m	>	'	0	7	0	7	0	7	÷
0E			.	>	N	^	n	÷	'	0	7	0	7	0	7	0
0F			±	/	?@	0	1	0	+	'	0	7	0	7	0	7

## 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  
Munchn (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