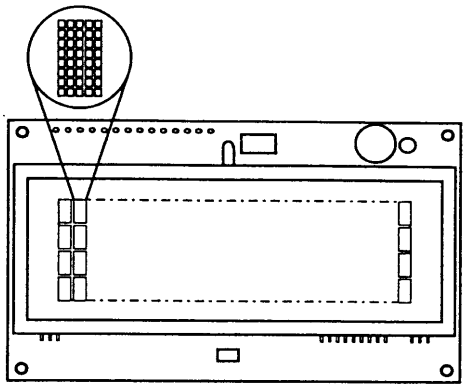
882963

CU20045SCPB-U2J

Vacuum Fluorescent Display Module

- 4 Lines of 20 Characters
- 5mm High 5 x 7 Dot Character
- 98mm x 60mm PCB Dimension
- Single 5V Supply
- High Brightness
- ASCII + Extended Character Font
- Parallel Interface



This single board display module consists of an 80 character VFD gate array which has character generator ROM and RAM and DC/DC converter. The parallel interface level is 5V TTL compatible and can be connected directly to the data bus of the host CPU. The module interface is a 14 way SIL 90° connector on the PCB.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value
Power Supply Voltage	VCC	5VDC +/- 5%
Power Supply Current	ICC	Typ. 275 mADC
Max Input Voltage	VI	≥GND & ≤VCC
Logic High Input	VIH	2.2VDC min. VCC=5V
Logic Low Input	VIL	0.6VDC max. VCC=5V
Logic High Output	VOH	VCC - 0.5
Logic Low Output	VOL	0.4VDC max. VCC=5V

ENVIRONMENTAL SPECIFICATION

Parameter	Value
Operating Temperature	-20°C to + 70°C
Storage Temperature	-40°C to + 85°C
Operating Humidity	20 to 80% RH

OPTICAL CHARACTERISTICS

Dot Size / Pitch (XxY mm)	0.4x x 0.5 / 0.5 x 0.7
Luminance	350 cd/m² (100fL) min.
Colour	Blue Green

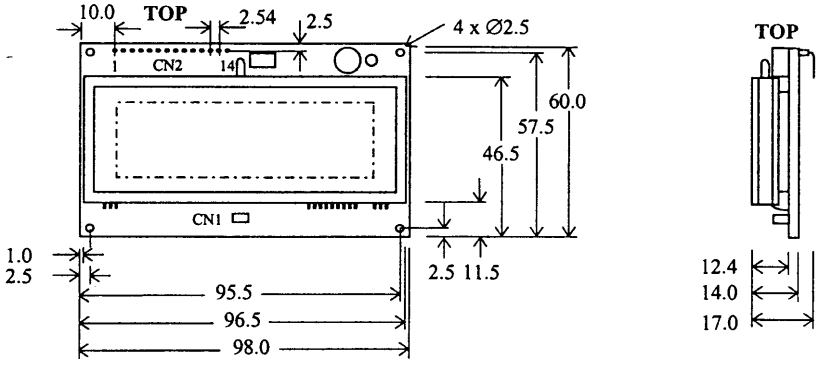
Note: Power On rise time for VCC should be less than 50 milli-seconds if initialisation by instruction is not used.

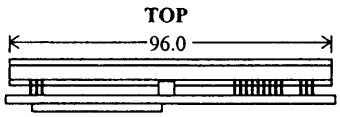
PINOUT

1	GND	2	VCC
3	*NC	4	RS
5	R/$\overline{W}$($\overline{WR}$)	6	E($\overline{RD}$)
7	D0	8	D1
9	D2	10	D3
11	D4	12	D5
13	D6	14	D7

*Pin 3 is a hardware reset input when No.1 & No.2 of JP3 are short.
Short JP4 to select i80 Bus ($\overline{WR}$,$\overline{RD}$)

MECHANICAL DRAWING



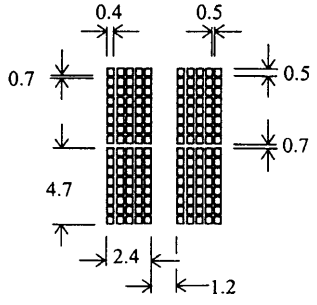


INITIALISE (R/W=0 E=⎍)

RS	D0-D7	Delay≥
0	5V Stable	15mS
0	30H	4.1mS
0	30H	100µS
0	30H	*40µS
0	38H	40µS
0	08H	40µS
0	01H	1.6mS
0	06H	40µS
0	0FH	40µS
1	DATA	40µS

* Option to read BUSY instead of delay after this instruction.

DISPLAY PATTERN



Units in mm.

Display Data RAM Address: Line 1 - 00H to 13H, Line 2 - 40H to 53H, Line 3 - 14H to 27H, Line 4 - 54H to 67H.

VFD CHARACTER MODULES (LCD Compatible - SCPB)

MODULE INTERFACE

The module can interface to a 4 or 8 bit parallel bus using data lines D0 to D7. All data is TRUE such that H=1, L=0.
Data flow is acheived using 3 control lines from the host system:

Register Select (RS) determines if the data bus is carrying command data (RS=0) or character data (RS=1).
Read/Write (R/W) determines data direction on the data bus. Write is host to module. Read is module to host.
Enable (E) is a synchronous clock which is toggled when data is valid on RS, R/W, and D0 to D7. (Low-High-Low)

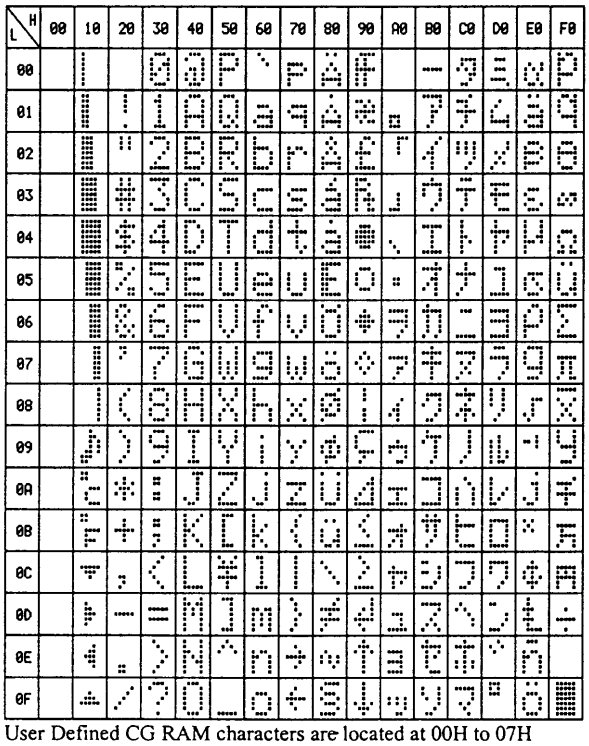
SOFTWARE COMMAND AND CHARACTER CONTROL CODES

(ExcTime=us)

Instruction	RS	R/W	D7	D6	D5	D4	D3	D2	D1	D0	Description	Exc
Clear Display	L	L	0	0	0	0	0	0	0	1	Clears entire display and returns cursor to top left position.	1K8
Return Home	L	L	0	0	0	0	0	0	1	x	Positions cursor at top left character and returns shift to start.	5
Entry Mode Set	L	L	0	0	0	0	0	1	I/D	S	Auto R/W Cursor (I)nc=1, (D)ec=0. If S=1 display shifts, see S/C	5
Display ON/OFF	L	L	0	0	0	0	1	D	C	B	(D)isplay On=1, (C)ursor On=1, (B)link Cursor Character =1	5
Cursor/Display Shift	L	L	0	0	0	1	S/C	R/L	x	x	Set Display (S)hift=1 / Move (C)ursor=0, to the (R)ight=1 / (L)eft=0	5
Function Set	L	L	0	0	1	D	N	F	x	x	(D)ata:8bit=1,4bit=0;(N)o.Line:Two=1,One=0;(F)ont:5x10=1,5x7=0	5
Brightness Set	H	L	x	x	x	x	x	x	B	B	Data byte sent after Function Set: 00H = 100%, 03H = 25% illumination.	5
Set CG RAM Addr.	L	L	0	1	Character 0-7			Dot Row 0-7			Set location of next data byte in Character Generator RAM.	5
Set DD Cursor Addr.	L	L	1	See Note on Display Data RAM							Set location of cursor and next character byte in Display Data RAM	5
Read BUSY /Addr	L	H	BF	Addr. counter value of CG or DD							Module is busy if BF=1. Send data when BF=0.	5
Write Data to RAM	H	L	Data to be written								Data will be sent to the CG or DD RAM according to last command	5
Read Data from RAM	H	H	Data to be read								Data will be read from CG or DD RAM according to last command	5

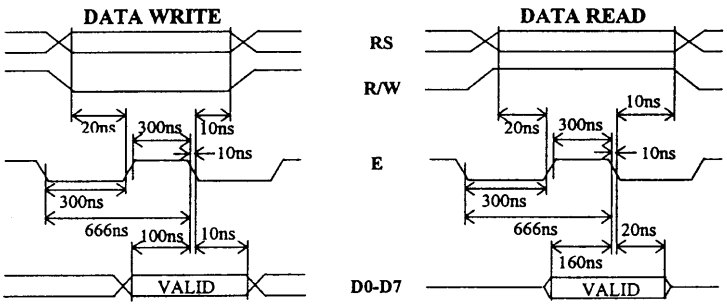
Note: 'x' indicates the bit can be set to 1 or 0. Data sent to CG RAM has D4 - D0 assigned to column 1 to 5 of the dot matrix character.
At power on the module defaults to display clear and off, cursor and blink off, auto increment, no shift, 8 bit data, 1 line and 5x7 font.

CHARACTER SET

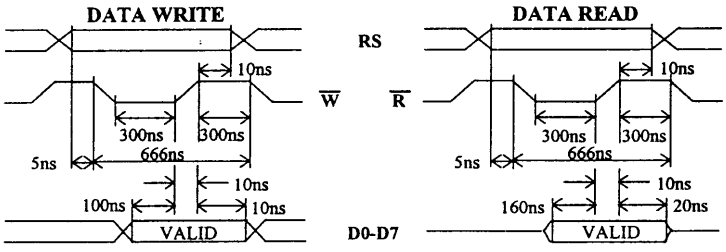


User Defined CG RAM characters are located at 00H to 07H

M68 BUS INTERFACE TIMING



i80 BUS INTERFACE TIMING



JUMPERS

Jumpers are available on board to connect Pin 3 as a hardware reset & to select an M68 or i80 CPU Bus interface.

HANDLING PRECAUTIONS

Do not drop, bend, twist or modify the display module.
Do not push, rub or mark the display face.
Do not wash or over heat the module.
Use anti-static precautions when handling the module.

WARRANTY

Broken VFD glass, PCB damage or modifications are exempt.
This product is classed as a component for CE purposes.
Please contact the sales office prior to return of product.
Return product in an anti-static bag with a failure report.

For further details, contact

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