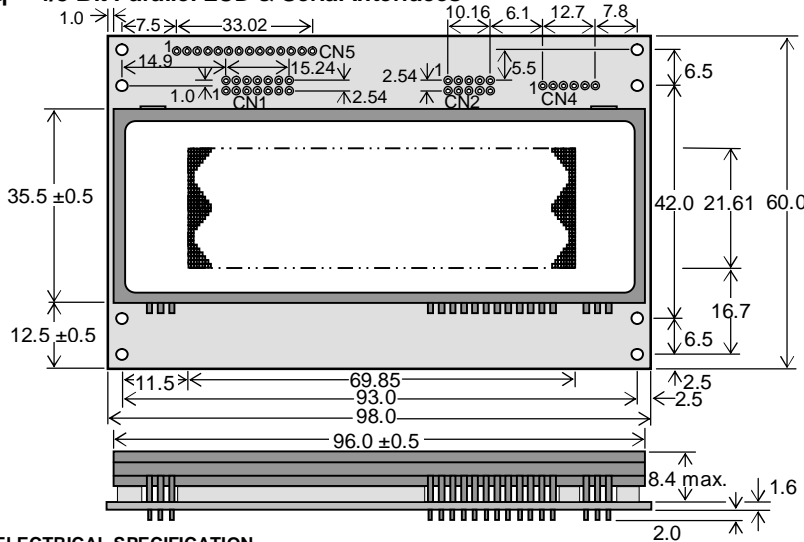


Dot Graphic VFD Module

GU140x32F-7806A

- q 140x32 Dot Graphic (4x20 characters)
- q Single 5V Supply
- q High Brightness Blue Green Display
- q Operating Temp -40°C to +85°C
- q 3 Multi Sized Fonts
- q 4/8 Bit Parallel LCD & Serial Interfaces

The module includes the Vacuum Fluorescent Display glass, VF drivers and micro-controller ICs with refresh RAM, character generator and interface logic. The 4/8 bit parallel & serial bi-directional interfaces are 5V TTL/CMOS compatible. The command set is LCD compatible with extended graphic functions.



Dimensions in mm & subject to tolerances (±0.2mm unless stated otherwise)
Mounting holes 3.2mm dia.

CN2 – SERIAL INTERFACE

Pin	Async	SPI
1	5V	5V
2	NC	SCK
3	RXD	/SS
4	LINK1	SIN
5	0V	0V
6	LINK2	SOUT
7	TXD	NC
8	/RES	/RES
9	MB	MB
10	HB	HB

NC = Do Not Connect

CN1/5 - PARALLEL INTERFACE

Pin	Sig	Pin	Sig
1	GND	2	VCC
3	NC*	4	RS
5	R/W	6	E
7	D0	8	D1
9	D2	10	D3
11	D4	12	D5
13	D6	14	D7

Pin 3 can be changed to /RESET or BUSY terminal and selectable by jumper J3 (2-3) or J3 (1-2)

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Condition
Power Supply Voltage	VCC	5.0VDC +/- 5%	GND=0V
Power Supply Current	ICC	350mADC typ.	VCC=5V
Logic High Input	VIH	0.8VDC min. Vcc max.	VCC=5V
Logic Low Input	VIL	0VDC min. 0.6VDC max.	VCC=5V
Logic High Output	VOH	3.5VDC min. Vcc max.	IOH=-10uA
Logic Low Output	VOL	0VDC min. 0.6VDC max.	IOL =4mA

OPTICAL and ENVIRONMENTAL SPECIFICATIONS

Parameter	Value
Display Area (XxY mm)	69.85 x 21.61
Dot Size/Pitch (XxY mm)	0.35 x 0.53 / 0.5 x 0.68
Luminance	700 cd/m ² Typ.
Colour of Illumination	Blue-Green (Filter for colours)
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Operating Humidity	20 to 80% RH @ 25°C (Non-condensing)
Vibration	10-55-10Hz, all amp 1mm, 30Min X-Y-Z (non-op)
Shock	392m/s ² (40G) 9mS X-Y-Z (non-operating)

SOFTWARE COMMAND SUMMARY

Instruction	R/W	RS	D0-D7
Clear Display	L	L	01H
Cursor Return Home	L	L	02H
Entry Mode Set	L	L	04H-07H
Display ON/OFF	L	L	08H-0FH
Cursor Shift Left	L	L	10H
Cursor Shift Right	L	L	14H
Display Shift Left	L	L	18H
Display Shift Right	L	L	1CH
Select 4/8 bit interface	L	L	20H (4Bit) / 30H (8Bit) + luminance
Display Luminance	L	H	00H-03H (must follow above command)
Set CG RAM Addr.	L	L	40H-7FH
Set DD RAM Addr.	L	L	80H-E7H
Read BUSY/Addr.	H	L	00H-FFH D7 Busy = High
Read Data from RAM	H	H	00H-FFH
Set Graphic Cursor	L	L	F0H + xpos + ypos
Set Area Commands	L	L	F1H + x1 + y1 + x2 + y2 + cmd
	L	H	where cmd 49H = Invert Area
	L	H	46H = Fill Area
	L	H	43H = Clear Area
	L	H	4FH = Set Outline Box
	L	H	6FH = Clear Outline Box
Write Graphic Image	L	L	F1H + x1 + y1 + x2 + y2 + cmd + data
Set Font / Spacing	L	L	F2H + font style
Set RS Low			0FH Serial Comms. only
Read Data			FEH Serial Comms. only
Read Cursor Position			FFH Serial Comms. only

CHARACTER SET

5x7 & 10x14 Font

UDF#	00	10	20	30	40	50	60	70	80	90	AO	BO	CO	DO	EO	FO
00	UDF1	!	!"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]
01	UDF2	!"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
02	UDF3	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
03	UDF4	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
04	UDF5	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
05	UDF6	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
06	UDF7	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
07	UDF8	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
08	UDF1	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
09	UDF2	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
0A	UDF3	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
0B	UDF4	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
0C	UDF5	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
0D	UDF6	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
0E	UDF7	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~
0F	UDF8	"#\$%	&'()*	+,-./	:;<=>	?@AB	CD	EFG	HIJK	LMNO	PQRS	TUV	WXYZ	[]	~

LCD Font

International Font

NOTE: UDF characters are available using 5x7 font only.

Proportional Mini Font

UDF#	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
20	!	"	#	\$	%	&	'	()	*	+	,	.	:	;	<
30	0	1	2	3	4	5	6	7	8	9	:	<	=	>	?	
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[]	^	_	~

Serial / Parallel Selection

J6	Interface
Open	Sync Serial / Parallel (default)
Link	Asynchronous Serial

CN1 Pin 3 Function

J3	Font
2 & 3	/ Reset
1 & 2	Busy

All J12 links & J6 should be open for Parallel operation.

Parallel Interface type (M68 / i80)

J2	J4	Mode	Signals
1-2	1-2	i80	Pin 5 = /WR, Pin 6 = /RD
2-3	2-3	M68	Pin 5 = R/W, Pin 6 = E

SERIAL MODE

J12	Configuration		
1-2	3-4	7-8	
O	O	O	9600, N, 8, 1
L	O	O	19200, N, 8, 1
O	L	O	38400, N, 8, 1
X	X	L	Self Test Mode

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