



THE DATASHEET OF EA DIP162-DHNLED



LCD 2x16 - 6.68mm

INCL. CONTROLLER HD44780 OR COMPATIBLE

no mounting
required



EA DIP162-DN3LW
75 x 27 x 11 mm

EA DIP162J-DN3LW
75 x 27 x 11 mm



EA DIP162-DHNLED
68 x 27 x 11 mm

FEATURES

- * HIGH CONTRAST LCD SUPERTWIST DISPLAY
- * EA DIP162-DHNLED: YELLOW/GREEN WITH LED BACKLIGHT
- * EA DIP162-DN3LW BLUE-WHITE WITH WHITE LED B/L., LOW POWER
- * EA DIP162J-DN3LW BLACK&WHITE WITH WHITE LED B/L., LOW POWER
- * INCL. HD 44780 OR COMPATIBLE CONTROLLER
- * INTERFACE FOR 4- AND 8-BIT DATA BUS
- * POWER SUPPLY +5V OR $\pm 2.7V$ OR $\pm 3.3V$
- * OPERATING TEMPERATURE -20~+70°C
- * LED BACKLIGHT Y/G max. 150mA@+25°C
- * LED BACKLIGHT WHITE max. 45mA@+25°C
- * SOME MORE MODULES WITH SAME MECHANIC AND SAME PINOUT:
 - DOTMATRIX 1x8, 4x20
 - GRAPHIC 122x32
- * NO SCREWS REQUIRED: SOLDER ON IN PCB ONLY
- * DETACHABLE VIA 9-PIN SOCKET EA B200-9 (2 PCS. REQUIRED)

ORDERING INFORMATION

LCD MODULE 2x16 - 6.68mm WITH BACKLIGHT Y/G
SAME IN BLUE-WHITE OPTIC.
SAME IN BLACK&WHITE.

9-PIN SOCKET, HEIGHT 4.3mm (1 PC.)

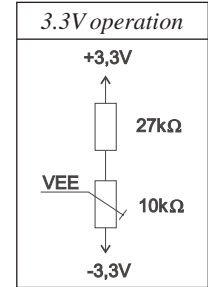
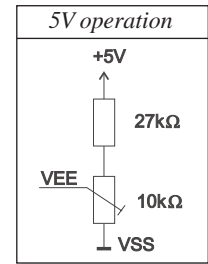
SUITABLE BEZEL (WINDOW 60.0x14.8 mm)

ADAPTOR PCB WITH STANDARD PINOUT PITCH 2.54mm

EA DIP162-DHNLED
EA DIP162-DN3LW
EA DIP162J-DN3LW
EA B200-9
EA 017-2UKE
EA 9907-DIP

PINOUT

Pin	Symbol	Level	Function	Pin	Symbol	Level	Function
1	VSS	L	Power Supply 0V (GND)	10	D3	H/L	Display Data
2	VDD	H	Power Supply +5V	11	D4 (D0)	H/L	Display Data
3	VEE	-	Contrast adjust. (about 0V)	12	D5 (D1)	H/L	Display Data
4	RS	H/L	H=Command, L=Data	13	D6 (D2)	H/L	Display Data
5	R/W	H/L	H=Read, L=Write	14	D7 (D3)	H/L	Display Data, MSB
6	E	H	Enable (falling edge)	15	-	-	NC (see EA DIP122-5N)
7	D0	H/L	Display Data, LSB	16	-	-	NC (see EA DIP122-5N)
8	D1	H/L	Display Data	17	A	-	LED B/L+ Resistor required
9	D2	H/L	Display Data	18	C	-	LED B/L -



CONTRAST ADJUSTMENT

Contrast voltage for all displays of EA DIP162-D series is typ. 5V. That means that for 3.3V operation an additional negative voltage of min. 1.7V is required.

Display modules for -20..+70°C are equipped with an on-board temperature compensation. So there's no more need for contrast adjustment while operation anymore.

BACKLIGHT

Using the LED backlight requires an current source or external current-limiting resistor. Forward voltage for yellow/green backlight is 3.9~4.2V and for white LED backlight 3.0~3.6V. Please take care of derating for $T_a > +25^\circ\text{C}$

Note: Do never drive backlight direct to 5V; immediately damage my happen !

CHARACTER SET

Character set shown below is already built in. In addition to that you are able to define up to 8 characters by yourself.

Lower 4 bit	Upper 4 bit	0000 (\$0x)	0010 (\$2x)	0011 (\$3x)	0100 (\$4x)	0101 (\$5x)	0110 (\$6x)	0111 (\$7x)	1010 (\$Ax)	1011 (\$Bx)	1100 (\$Cx)	1101 (\$Dx)	1110 (\$Ex)	1111 (\$Fx)
xxxx0000 (\$x0)	CG RAM (0)		0	1	2	3	4	5	6	7	8	9	A	B
xxxx0001 (\$x1)	(1)	!	!	A	Q	a	q		0	7	7	4	ä	q
xxxx0010 (\$x2)	(2)	"	"	2	B	R	b	r	「	イ	ツ	ノ	ß	ø
xxxx0011 (\$x3)	(3)	#	#	3	C	S	c	s	」	ウ	テ	エ	ε	ω
xxxx0100 (\$x4)	(4)	\$	\$	4	D	T	d	t	、	I	ト	ト	μ	Ω
xxxx0101 (\$x5)	(5)	%	%	5	E	U	e	u	・	オ	ナ	1	ε	Ü
xxxx0110 (\$x6)	(6)	&	&	6	F	V	f	v	ヲ	カ	ニ	ヨ	ρ	Σ
xxxx0111 (\$x7)	(7)	'	'	7	G	W	g	w	ア	キ	ズ	ラ	g	π
xxxx1000 (\$x8)	CG RAM (0)			8	H	X	h	x	イ	ウ	ネ	リ	フ	ÿ
xxxx1001 (\$x9)	(1)	)	)	9	I	Y	i	y	ウ	ケ	ル	ル	フ	ü
xxxx1010 (\$xA)	(2)	*	*	#	J	Z	j	z	エ	コ	ン	レ	j	¥
xxxx1011 (\$xB)	(3)	+	+	;	K	[	k	[	オ	サ	ヒ	口	*	¥
xxxx1100 (\$xC)	(4)	,	,	<	L	¥	l	l	カ	シ	フ	ワ	φ	¥
xxxx1101 (\$xD)	(5)	-	-	=	M	]	m	]	ユ	ズ	へ	ン	€	÷
xxxx1110 (\$xE)	(6)	.	.	>	N	^	n	→	ヨ	セ	ホ	°	ñ	
xxxx1111 (\$xF)	(7)	/	/	?	O	_	o	€	ッ	ッ	マ	°	ö	■

TABLE OF COMMAND

Instruction	Code										Description	Execute Time (max.)
	RS	R/W	DB 7	DB 6	DB 5	DB 4	DB 3	DB 2	DB 1	DB 0		
Clear Display	0	0	0	0	0	0	0	0	0	1	Clears all display and returns the cursor to the home position (Address 0).	1.64ms
Cursor At Home	0	0	0	0	0	0	0	0	1	*	Returns the Cursor to the home position (Address 0). Also returns the display being shifted to the original position. DD RAM contents remain unchanged.	1.64ms
Entry Mode Set	0	0	0	0	0	0	0	1	I/D	S	Sets the Cursor move direction and specifies or not to shift the display. These operation are performed during data write and read.	40µs
Display On/Off Control	0	0	0	0	0	0	1	D	C	B	Sets ON/OFF of all display (D) cursor ON/OFF (C), and blink of cursor position character (B).	40µs
Cursor / Display Shift	0	0	0	0	0	1	S/C	R/L	*	*	Moves the Cursor and shifts the display without changing DD RAM contents.	40µs
Function Set	0	0	0	0	1	DL	N	F	*	*	Sets interface data length (DL) number of display lines (L) and character font (F).	40µs
CG RAM Address Set	0	0	0	1	ACG					Sets the CG RAM address. CG RAM data is sent and received after this setting.		40µs
DD RAM Address Set	0	0	1	ADD					Sets the DD RAM address. DD RAM data is sent and received after this setting.		40µs	
Busy Flag / Address Read	0	1	BF	AC					Reads Busy flag (BF) indicating internal operation is being performed and reads address counter contents.		-	
CG RAM / DD RAM Data write	1	0	Write Data					Writes data into DD RAM or CG RAM		40µs		
CG RAM / DD RAM Data Read	1	1	Read Data					Reads data from DD RAM or CG RAM		40µs		

CREATING YOUR OWN CHARACTERS

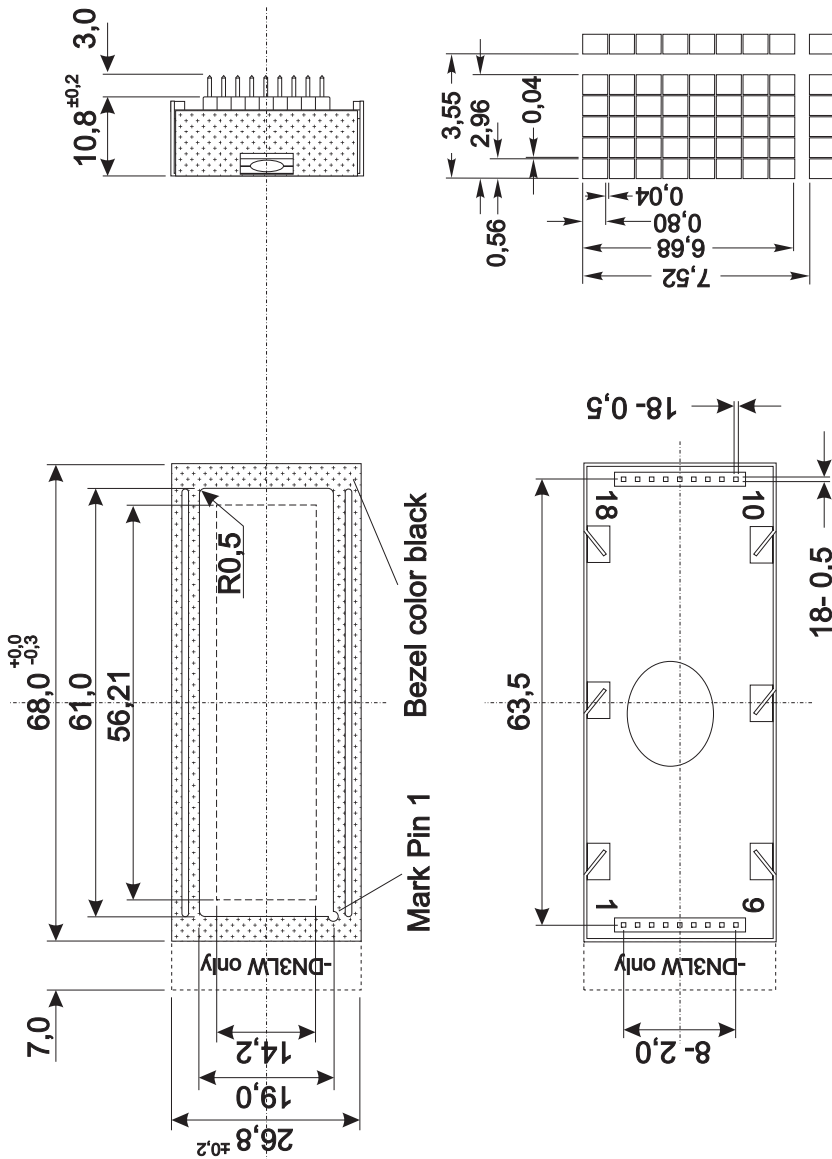
All these character display modules got the feature to create 8 own characters (ASCII Codes 0..7) in addition to the 192 ROM fixed codes.

- 1.) The command "CG RAM Address Set" defines the ASCII code (Bit 3,4,5) and the dot line (Bit 0,1,2) of the new character. Example demonstrates creating ASCII code \$00.
- 2.) Doing 8 times the write command "Data Write" defines line by line the new character. 8th. byte stands for the cursor line.
- 3.) The new defined character can be used as a "normal" ASCII code (0..7); use with "DD RAM Address Set" and "Data Write".

Set CG RAM Address				Data				
Adresse		Hex	Bit		Hex			
7	6	5	4	3	2	1	0	Hex
		0	0	0	0	0	0	\$04
		0	0	1	0	0	0	\$04
		0	1	0	0	0	0	\$04
		0	1	1	0	0	0	\$04
0	1	0	0	0	0	0	0	\$04
		1	0	0	0	0	0	\$15
		1	0	1	0	0	0	\$0E
		1	1	0	0	0	0	\$04
		1	1	1	0	0	0	\$00

INITIALISATION FOR A 2 LINE DISPLAY / 8-BIT MODE											
Command	RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Remark
Function Set	0	0	0	0	1	1	1	0	0	0	8-Bit Data Length, 2/4 lines, 5x7 Font
Display ON/OFF	0	0	0	0	0	0	1	1	1	1	Display on, Cursor visible, Cursor blink
Clear Display	0	0	0	0	0	0	0	0	0	1	Clear Display, Cursor Home
Entry Mode Set	0	0	0	0	0	0	0	1	1	0	Cursor Auto-Increment

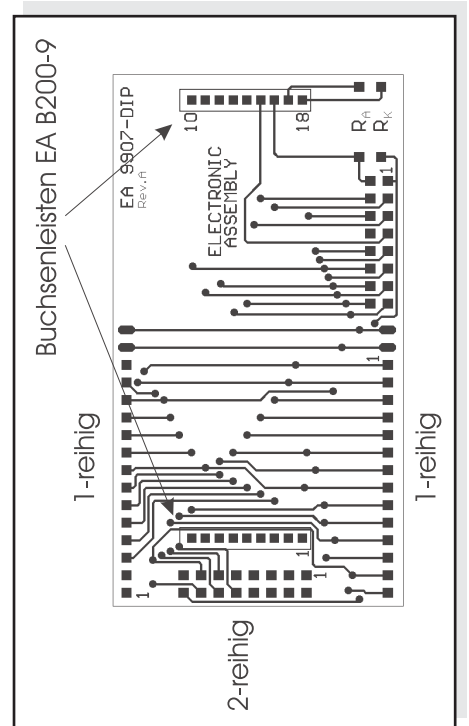
Dimensions



all dimensions are in mm





Test board for standard pinout 2.54mm
 EA 9907-DIP



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