LCD-MODULE 2x16 - 6.68mm
INCL. CONTROLLER HD44780

no mounting required

EA DIP162J-DN3LW
75 x 27 x 11 mm

EA DIP162-DN3LW
75 x 27 x 11 mm

EA DIP162-DHNLED
68 x 27 x 11 mm

FEATURES

* HIGH CONTRAST LCD SUPERTWIST DISPLAY
* EA DIP162-DNLED: YELLOW/GREEN WITH LED BACKLIGHT
* EA DIP162-DN3LW AND DIP162J-DN3LW 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 ±2.7V OR ±3.3V
* OPERATING TEMPERATURE 0~+50°C (-DN3LW, -DHNLED: -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	**EA DIP162-DNLED**
SAME BUT WITH $T_{OP.}$ -20..+70°C INCL. TEMP. COMPENSATION	**EA DIP162-DHNLED**
SAME IN BLUE-WHITE OPTIC, $T_{OP.}$ -20..+70°C INCL. TEMP. COMP.	**EA DIP162-DN3LW**
SAME IN BLACK&WHITE, $T_{OP.}$ -20..+70°C INCL. TEMP. COMP.	**EA DIP162J-DN3LW**
9-PIN SOCKET, HEIGHT 4.3mm (1 PC.)	**EA B200-9**
SUITABLE BEZEL (WINDOW 60.0x14.8 mm)	**EA 017-2UKE**
ADAPTOR PCB WITH STANDARD PINOUT PITCH 2.54mm	**EA 9907-DIP**

ELECTRONIC ASSEMBLY
making things easy

EA DIP162-D
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Specifications may be changed without prior notice. Printing error reserved

Pinout

Pin	Symbol	Level	Function
1	VSS	L	Power Supply 0V (GND)
2	VDD	H	Power Supply +5V
3	VEE	-	Contrast adjust. (about 0V)
4	RS	H / L	H=Command, L=Data
5	R/W	H / L	H=Read, L=Write
6	E	H	Enable (falling edge)
7	D0	H / L	Display Data, LSB
8	D1	H / L	Display Data
9	D2	H / L	Display Data

Pin	Symbol	Level	Function
10	D3	H / L	Display Data
11	D4 (D0)	H / L	Display Data
12	D5 (D1)	H / L	Display Data
13	D6 (D2)	H / L	Display Data
14	D7 (D3)	H / L	Display Data, MSB
15	-	-	NC (see EA DIP122-5N)
16	-	-	NC (see EA DIP122-5N)
17	A	-	LED B/L+ Resistor required
18	C	-	LED B/L -

5V operation

+5V

27kΩ

VEE

10kΩ

VSS

3.3V operation

+3,3V

27kΩ

VEE

10kΩ

-3,3V
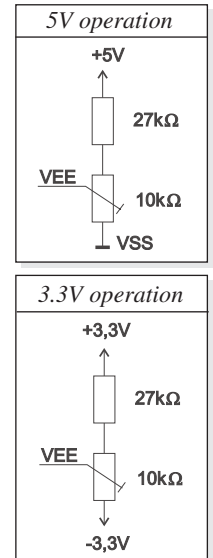
Contrast Adjustment

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°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 yoursself.

Specifications may be changed without prior notice. Printing error reserved

EA DIP162-D

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Table of command

Instruction	RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Description	Execute Time (max.)
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".
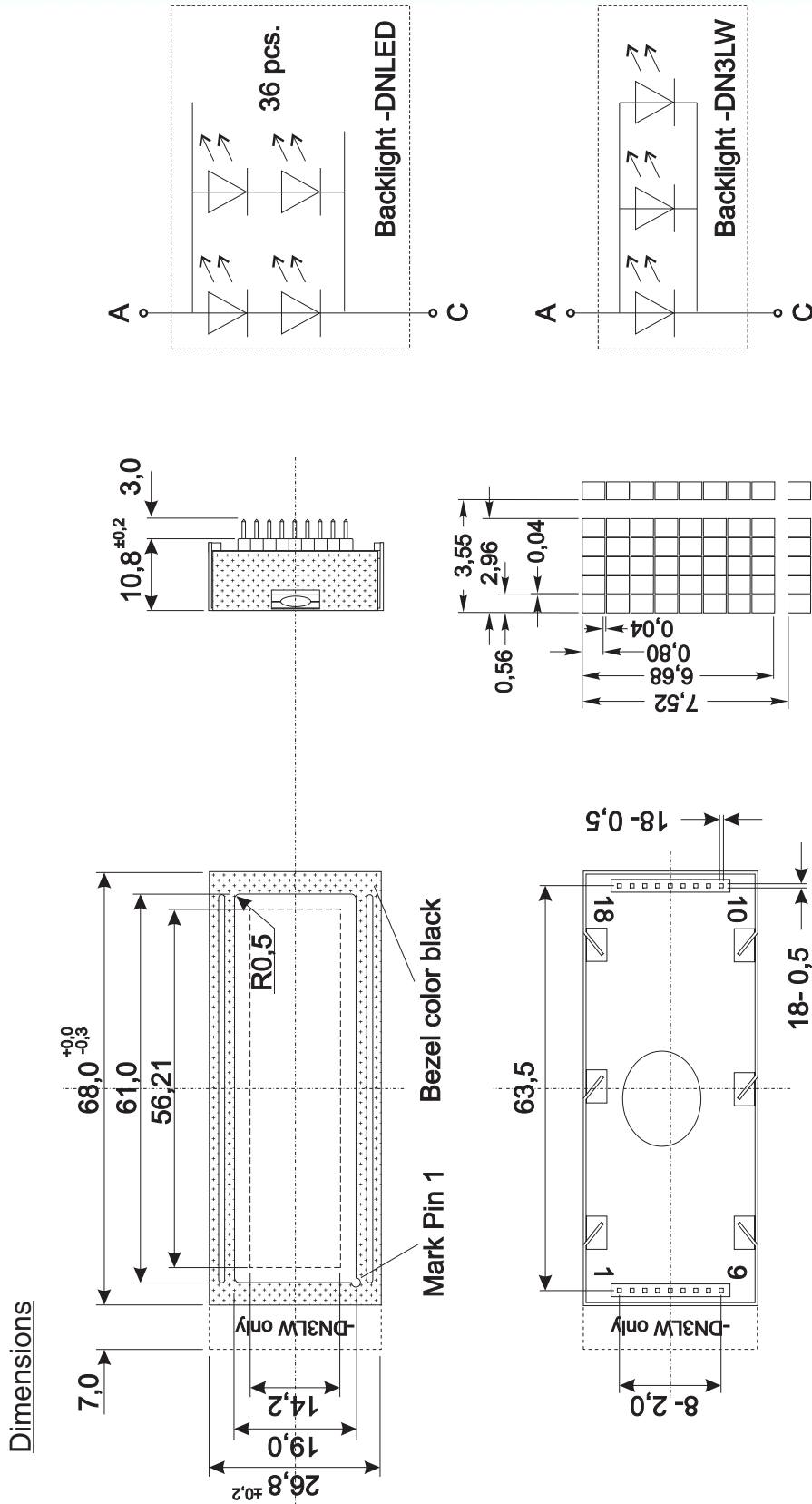
Set CG RAM Address		Data	
Adresse	Hex	Bit 7 6 5 4 3 2 1 0	Hex
0 1 0 0 0 — 0 0 0	$40	X X X — 0 0 — 0 0	$04
0 0 1	$41	0 0 — 0 0	$04
0 1 0	$42	0 0 — 0 0	$04
0 1 1	$43	0 0 — 0 0	$04
1 0 0	$44	0 — 0	$15
1 0 1	$45	1 0	$0E
1 1 0	$46	0 0 — 0 0	$04
1 1 1	$47	0 0 0 0 0	$00

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

Backlight -DNLED 36 pcs.

A C

Backlight -DN3LW

A C

ATTENTION
handling precautions!

Dimensions

Bezel color black

Mark Pin 1

R0,5

68,0 +0,0 -0,3
61,0
56,21

7,0

-DN3LW only
14,2
19,0
26,8 ±0,2

10,8 ±0,2
3,0

3,55
2,96
0,04
0,56
0,04
0,80
6,68
7,52

18
10
1
6
18 - 0,5
63,5
18 - 0,5
-DN3LW only
8 - 2,0

all dimensions are in mm
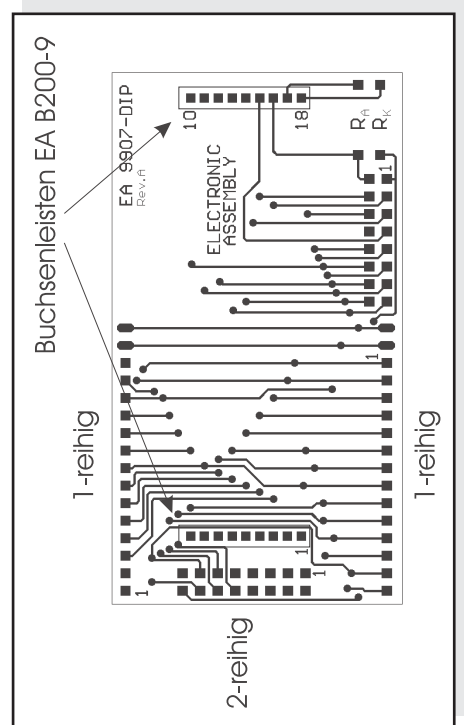
Test board for standard pinout 2.54mm
EA 9907-DIP

Buchsenleisten EA B200-9

EA 9907-DIP
Rev.A

ELECTRONIC ASSEMBLY

10
18
R_A
R_K

1-reihig
1-reihig
2-reihig

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