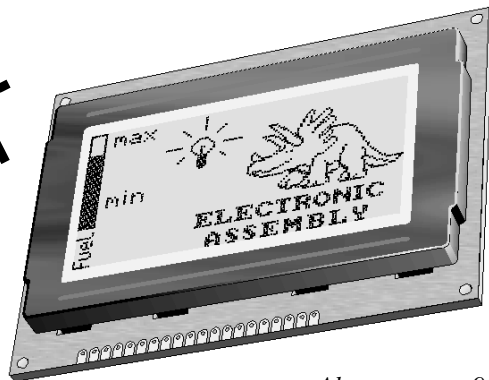


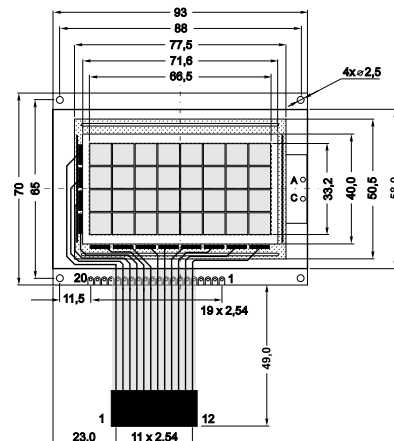
LCD- GRAFIK MODUL

128x64 PIXEL MIT LED-BELEUCHTUNG

-20...+70°C
TOUCH PANEL
MÖGLICH



Abmessungen 93x70x14mm



TECHNISCHE DATEN

- * KONTRASTREICHE SUPERTWIST ANZEIGE (BLAU)
- * GELB-GRÜNE LED-HINTERGRUNDBELEUCHTUNG
- * KONTROLLER HD 61202 INTEGRIERT
- * ANSCHLUß DIREKT AM 8-BIT DATENBUS
- * SPANNUNGSVERSORGUNG +5V typ. 2,5mA (OHNE BELEUCHTUNG)
- * NEGATIVE KONTRASTSPANNUNG (-9V) ON BOARD
- * BETRIEBSTEMPERATUR -20°C ... +70°C

OPTIONAL

- * TOUCH PANEL 8x4, ENTSPIEGELT
- * ANSTEUER-IC MIT RS-232 (NICHT FÜR VERSION TP)
- * EL-HINTERGRUNDBELEUCHTUNG (BLAU)
- * LED-HINTERGRUNDBEL. (GELB-GRÜN, typ. 300mA)
- * SNAP-IN RAHMEN EA 0099-KE (70 x 38mm)

BESTELLBEZEICHNUNG

LCD-GRAFIKMODUL 128x64 PIXEL
 LCD-GRAFIKMODUL 128x64 MIT EL-BELEUCHTUNG
 LCD-GRAFIKMODUL 128x64 PIXEL MIT LED-BEL.
 LCD-GRAFIKMODUL 128x64 MIT TOUCH PANEL 8X4
 HIGH-LEVEL-GRAFIKKONTROLLER MIT RS-232C
 PASSENDER INVERTER FÜR EL-BELEUCHTUNG
 SNAP-IN RAHMEN (SICHTFENSTER 70 x 38mm)

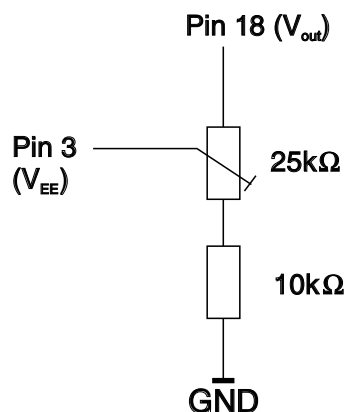
EA P128-6N2
EA P128-6N2EL
EA P128-6N2LED
EA P128-6N2LEDTP
EA IC202-PGH
EA PSEL-93096/5V
EA 0099-KE

Das Grafikdisplay ist in blauer Supertwisttechnik ausgeführt und mit einer grünen LED-Hintergrundbeleuchtung ausgestattet. Dadurch ist es auch bei unterschiedlichsten Lichtverhältnissen und Blickwinkeln sehr gut ablesbar.

Um die LED-Beleuchtung in Betrieb zu nehmen, muß ein externer Vorwiderstand ($5..10\Omega$) verwendet werden.

KONTRASTEINSTELLUNG

Pin	Symbol	Function
1	GND	Ground potential (0V)
2	VDD	Power supply for logic (+5V)
3	VEE	Operating voltage for LC driving (input)
4	$\overline{D/I}$	H: Data input L: Instruction code input
5	$\overline{R/W}$	H: Data Read L: Data Write
6	E	Enable signal (falling edge)
7..14	D0..D7	Data bus line
15	CS1	H: Chip selection left side
16	CS2	H: Chip selection right side
17	\overline{RST}	L: Reset
18	VOUT	Output voltage for LC driving (ca. -9V)
19	A	Anode for LED backlight
20	C	Cathode for LED backlight (insert R8)



The diagram illustrates the internal circuitry of the R8 module. It features an HD61203 decoder connected to an LC-Display (C1 to C64) and two HD61202 ICs (IC1 and IC2). The LC-Display is divided into two sections: S1 - S64 and S65 - S128. The HD61202 ICs are connected to the LC-Display and the LED array (R8) via a series of control lines (CS1, CS2, RST, Vout). The LED array is labeled 'nur EA P128-6N2LED'.

ABSOLUTE MAXIMUM RATING

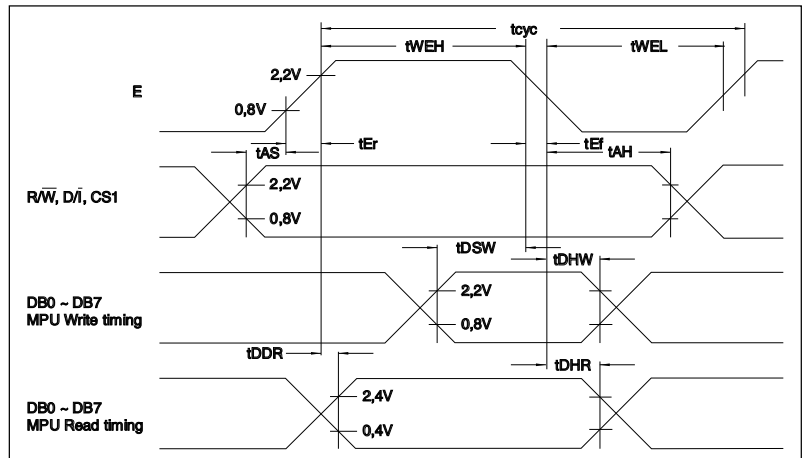
Parameter	Symbol	Min	Max	Unit
Power supply for logic	VDD-VSS	0	7,0	V
Input voltage	VI	VSS	VDD	V
Operating temperature	Ta	-20	+70	°C
Storage temperature	Tstg	-30	+80	°C

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Supply voltage	VDD	-	4,5	5,0	5,5	V
Supply current	IDD	VDD=5V	-	2,0	3,0	mA
High level input voltage for logic	VIH	-	2,4	-	VDD	V
Low level input voltage for logic	VIL	-	0	-	0,7	V
High level output voltage for logic	VOH	-IOH=0,6mA	VDD-0,4	-	VDD	V
Low level output voltage for logic	VOL	IOL=1,6mA	0	-	0,4	V
RES input high voltage	VIHR	-	0,7xVDD	-	VDD	V

TIMING CHARACTERISTICS

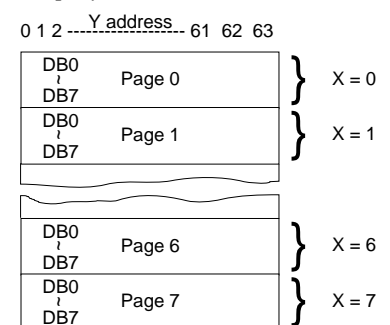
Parameter	Symb	Min	Typ	Max	Unit
Enable cycle time	tcyc	1000	-	-	ns
Enable Puls width	tWEH	450	-	-	ns
	tWEL	450	-	-	ns
Enable raise time	tEr	-	-	25	ns
Enable fall time	tEf	-	-	25	ns
Set-up time	tAS	140	-	-	ns
Data set-up time	tDSW	200	-	-	ns
Data delay time	tDDR	-	-	320	ns
Address hold time	tAH	10	-	-	ns
Data hold time (Write)	tDHW	10	-	-	ns
Data hold time (Read)	tDHR	20	-	-	ns



INSTRUCTION SET HD61202

Instructions	Code											
	R/W	D/I	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0		
Display ON/OFF	0	0	0	0	1	1	1	1	1	1/0	Controls the ON/OFF of display. RAM data and internal status are not affected. 1:ON, 0:OFF	
Display start line	0	0	1	1	display start line (0 - 63)					Specifies a RAM line displayed at the top of screen		
Set page(X address)	0	0	1	0	1	1	1	Page (0 - 7)			Sets the page (x address) of RAM at the page of (x address) register.	
4. Set address	0	0	0	1	Y address (0 - 63)					Sets the Y address at the Y address counter		
5. Status Read	1	0	B U S Y	0	ON / OFF	R E S E T	0	0	0	0	Read the status. RESET 1:reset 0:normal ON/OFF 1:display OFF 2:display ON BUSY 1:on the internal operation 0:Ready	
Write display data	0	1	Write data							Writes data DB0 (LSB) to DB7 (MSB) on the data bus into display RAM.		Can access to the address of the display RAM specified in advance. After the access, Y address is increased by 1
Read display data	1	1	Read data							Reads data DB0 (LSB) to DB7 (MSB) from the display RAM to the data bus.		

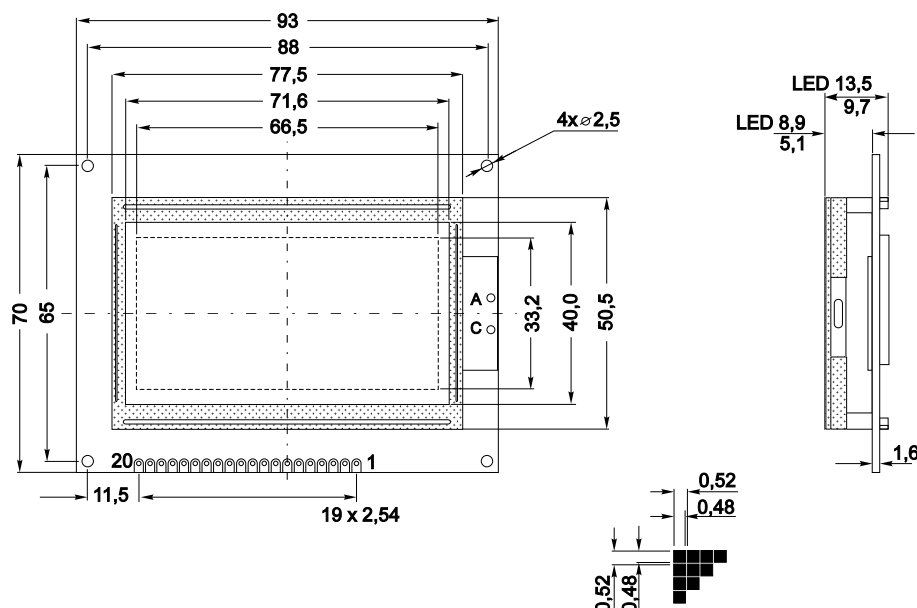
Address Configuration of Display Data RAM



EA P128-6N2LED

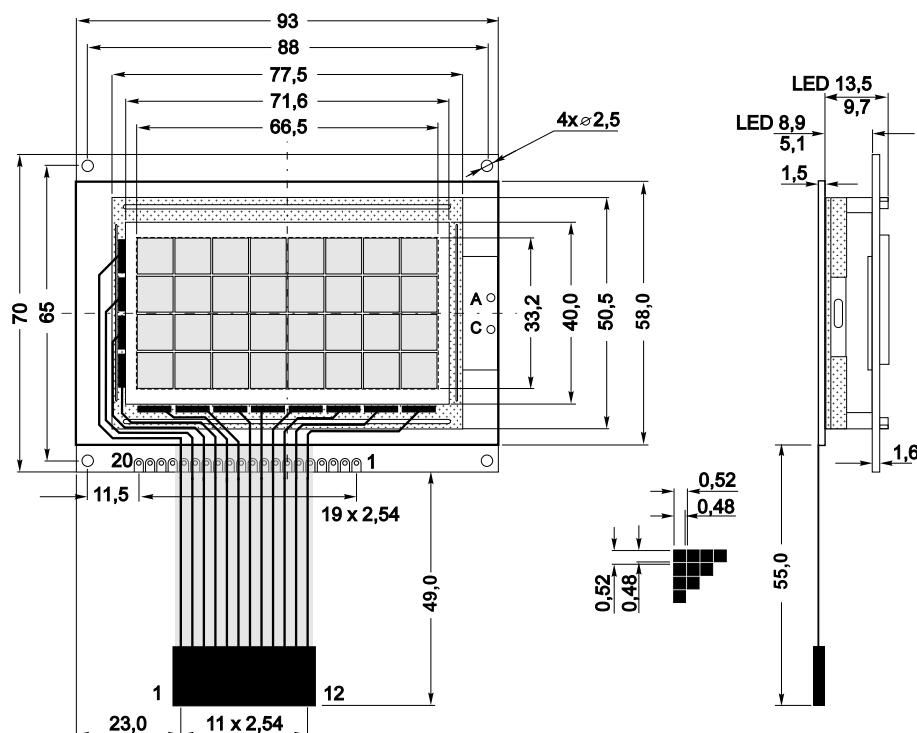
ABMESSUNGEN

ohne Touch Panel

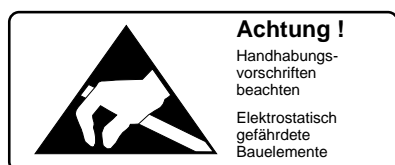


EA P128-6N2LED
alle Maße in mm

mit Touch Panel



EA P128-6N2LEDTP
alle Maße in mm



TOUCH PANEL

Die Oberfläche des Touch Panels ist entspiegelt und kratzfest.

Technik: resistiver Matrix Touch mit 8x4 festen Feldern. Die Abfrage erfolgt wie bei einer Folientastatur: Scannen von Zeilen oder Spalten.

Technische Daten				
Spezifikation	min	typ	max	Einheit
On-Widerstand	300		10.000	Ω
Spannung	0,5		5	V
Schaltstrom	10u		10m	A
Betätigungskraft	150		200	g
Kontaktprellen		10		ms
Temperaturbereich	-30		+75	°C
Lebensdauer	1.000.000			Schaltspiele