

## Next Generation Intelligent LCDs

# **Technical Specification**

DPP-XHC50 DPP-XHC70 DPP-XHC101

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## **Table of Contents**

Table of Contents	1
Introduction	2
LCD Pure X Series	2
DPP-XHC50	3
LCD	3
Electrical Characteristics	3
Mechanical Specification	4
DPP-XHC70	5
LCD	5
Electrical Characteristics	5
Mechanical Specification	6
DPP-XHC101	7
LCD	7
Electrical Characteristics	7
Mechanical Specification	8
Pin Descriptions	0
LVDS Port (LVDS IN)	С
Quality Standards 1	1
Dust Particles	1
Pixel Failures	1
Assembly 1	1
Treatment of the Touch Panel Tail1	1
Treatment of the FFC Tail 1	1
LCD Rear Mount Integration1	1
Compliance with EU Regulation	3
Revision History	4

## **Introduction**

#### LCD Pure X Series

The LCD Pure X series is designed to help users integrate our LCD Pure series even easier and faster. Using the displays of our LCD Pure series, we have added a PCB on the backside, including the FFC-connectors for the display control, the touch panel, the additional power supply (if applicable) and to connect the display to your external board. Together with our DPA-LCDC-40 – a flex PCB cable, specially designed for our LCDs – you will need just this one single cable to connect our LCD Pure X with your control board.

The following graphic illustrates this relationship in combination with our iLCD Linux Mainboard.



## DPP-XHC50

#### <u>LCD</u>

ltem	DPP-XHC50
Screen Size	5.0 inch
Display Resolution	800 x RGB x 480 dots
Active Area	108.00 (H) x 64.80 (V) mm
Display Mode	Normally black / Transmissive
Pixel Arrangement	RGB-Strip
TFT Interface	RGB
Display Color	16.7 M (Display) / 64k (Controller)
Backlight <sup>1</sup> )	White LED, typical lifetime 20.000 hours
Brightness typ.	1000 cd/m <sup>2</sup>
Contrast ratio typ.	800
Viewing Direction	ALL O'clock
Operating	20°C70°C
Temperature	-20 C~70 C
Touch Screen	PCAP (OCA) 5 Fingers <sup>2</sup> )

Notes:

- <sup>1</sup>) Brightness decreased to be 50% of the initial value. Life time; mean time before failure at normal temperature (25°C) and normal humidity (60%)
- <sup>2</sup>) Optically bonded PCAP

#### **Electrical Characteristics**

Item	Symbol	Тур.	Max.	Unit
Current consumption backlight off $@V_{CC} = 5V$	I <sub>cc</sub>	70	75	mA
Current consumption with full backlight $@V_{CC} = 5V$	I <sub>cc</sub>	280	300	mA

#### **Mechanical Specification**



## DPP-XHC70

#### <u>LCD</u>

ltem	DPP-XHC70
Screen Size	7.0 inch
Display Resolution	1024 x RGB x 600 dots
Active Area	154.21 (H) x 85.92 (V) mm
Display Mode	Normally black / Transmissive
Pixel Arrangement	RGB-Strip
Display Color	16.7 M (Display) / 64k (Controller)
Backlight <sup>1</sup> )	27 white LEDs, typical lifetime 50.000 hours
Brightness typ.	1000 cd/m <sup>2</sup>
Contrast ratio typ.	800
Viewing Direction	ALL O'clock
Touch Screen	PCAP 5 Fingers

Notes:

<sup>1</sup>) Brightness decreased to be 50% of the initial value. Life time; mean time before failure at normal temperature (25°C) and normal humidity (60%)

#### **Electrical Characteristics**

Item	Symbol	Тур.	Max.	Unit
Current consumption backlight off $@V_{CC} = 5V$	I <sub>cc</sub>	150	170	mA
Current consumption with full backlight $@V_{CC} = 5V$	I <sub>cc</sub>	820	850	mA

#### **Mechanical Specification**

![](_page_6_Figure_3.jpeg)

## DPP-XHC101

#### <u>LCD</u>

ltem	DPP-XHC101
Screen Size	10.1 inch
Display Resolution	1280 x RGB x 800 dots
Active Area	216.96 (H) x 135.60 (V) mm
Display Mode	Normally black / Transmissive
Pixel Arrangement	RGB-Strip
Display Color	16.7 M (Display) / 64k (Controller)
Backlight <sup>1</sup> )	42 white LEDs, typical lifetime 50.000 hours
Brightness typ.	1000 cd/m <sup>2</sup>
Contrast ratio typ.	1000
Viewing Direction	ALL O'clock
Touch Screen	PCAP 5 Fingers

Notes:

<sup>1</sup>) Brightness decreased to be 50% of the initial value. Life time; mean time before failure at normal temperature (25°C) and normal humidity (60%)

#### **Electrical Characteristics**

Item	Symbol	Тур.	Max.	Unit
Current consumption backlight off $@V_{CC} = 5V$	I <sub>cc</sub>	tbd	tbd	mA
Current consumption with full backlight $@V_{CC} = 5V$	I <sub>cc</sub>	tbd	tbd	mA

### Mechanical Specification

![](_page_8_Figure_3.jpeg)

![](_page_9_Figure_2.jpeg)

## **Pin Descriptions**

#### LVDS Port (LVDS IN)

Marked on LCD Pure X hardware with "To DPP-LMB  $\rightarrow$  LVDS" Marked in datasheet with "LVDS IN". Connection to the LVDS in port is made via a 40-pin FFC/FPC cable with 0.5 mm pitch. The FFC/FPC connector on the board is a top-contact model. Please note that the pin names of the serial port connections are seen from the driving PC / application side, which means a pin with name TX is in fact the output of the PC and an input of the LCD panel. "Direction" is valid only when the primary function is enabled.

Pin	Pin	Direction	Primary Function Description
#	Name	Direction	rinnary runchon Description
1		Т	n.c.
2-4	VCC	-	3.3V power supply
5	LVDS DISP Reset	IN	Display reset <sup>1</sup> )
6	LVDS DISP Disable	IN	Display disable <sup>2</sup> )
7	GND	-	
8	lvds do n	IN	Differential pair 0 for data transmission to the display
9	LVDS DO P	IN	Differential pair 0 for data transmission to the display
10	GND	-	
11	LVDS D1 N	IN	Differential pair 1 for data transmission to the display
12	LVDS D1 P	IN	Differential pair 1 for data transmission to the display
13	GND	-	
14	LVDS D2 N	IN	Differential pair 2 for data transmission to the display
15	LVDS D2 P	IN	Differential pair 2 for data transmission to the display
16	GND	-	
17	lvds clk n	IN	Differential Pair for clock line transmission to the display
18	LVDS CLK P	IN	Differential Pair for clock line transmission to the display
19	GND	-	
20	lvds d3 n	IN	Differential pair 3 for data transmission to the display
21	LVDS D3 P	IN	Differential pair 3 for data transmission to the display
22	GND	-	
23	LCDS PCAP SCL	IN	I2C interface for PCAP – clock line
24	LCDS PCAP SDA	IN/OUT	I2C interface for PCAP – data line
25	GND	-	
26	LCDS PCAP INT	OUT	I2C interface for PCAP – interrupt
27	LCDS PCAP RES	IN	I2C Interface for PCAP – reset. <sup>3</sup> )
28	GND	-	
29-30		Т	n.c.
31-33	LVDS BL GND	-	GND pin for 5V supply of backlight, connected to GND.
34-36	LVDS BL HV VCC	Т	n.c.
37	LVDS BL PWM	ln	PWM line for setting the brightness of the display backlight. 4)
38-40	LVDS BL VCC	-	5V power supply for backlight

Notes:

<sup>1</sup>) Pull to GND to reset the display. Must be applied on or after power up of VCC for > 50ms, but is not connected/used on all models. Can be left open during normal operation or tied to 3.3V.

- <sup>2</sup>) Pull to GND to enable the display. When left open or tied to 3.3V the display is disabled.
- <sup>3</sup>) Pull to GND to reset the PCAP. Must be applied on or after power up of VCC for > 50ms. Can be left open during normal operation or tied to 3.3V.

<sup>4</sup>) When left open or tied to GND, backlight is disabled. Can be tied to 3V3 for maximum brightness.

PLEASE NOTE: This pin description is also valid for the DPA.LCDC-40 – the flex PCB cable to connect the LCD Pure X to an external control board.

## **Quality Standards**

#### **Dust Particles**

The TFT display modules are assembled under clean room conditions. The following table specifies the allowed number and size of particles incorporated.

Dimension (Diameter D)	Acceptance (Qty N)
$D \leq 0.25 \text{ mm}$	lgnored
$0.25 \le D \le 0.50$	$N \leq 5$
D ≥ 0.50	0
Total	$N \leq 5$
Dimension (Diameter D)	Acceptance (Qty N)

#### Pixel Failures

For our LCD Panels we deploy A-grade TFT display modules. We accept a maximum of sub-pixel failures as follows:

Defect Type	Acceptance (Qty N)
Bright Dots	N = 0
Dark Dots	$N \leq 3$
Total	$N \leq 3$

#### <u>Assembly</u>

#### Treatment of the Touch Panel Tail

The touch panel is connected to the LCD processor via an FPC tail. It is mounted already on LCDs with touch functionality. In order to guarantee correct function and to prevent physical damages, please observe the following notes when taking out the LCD panels from the package and during manufacturing:

- Do not exert lateral or shearing forces on the tail. This can happen when fitting the LCD panel into a housing through a narrow aperture.
- Do not crease, twist or pull the tail.
- Do not touch the tail conductors.

#### Treatment of the FFC Tail

The FFC cable connects the iLCD to the application electronics.

- The FFC cable bending radius must be  $\geq$  3 mm.
- Do not exert lateral or shearing forces on the FFC cable.
- Do not crease or twist the FFC cable.

#### LCD Rear Mount Integration

One integration method is mounting the LCD behind a bezel with a rectangular cut out. Rubber or foamed rubber gaskets (cushion) hereby ensure a balancing of tolerances and an environmental sealing. The bezel edge shall be positioned between the LCD Active Area and the View Area. If the bezel edge touches the LCD Active Area, it may press the resistive touch panel unintendedly and cause activation. A gap of approximately 0.5 mm is needed between the bezel and the top electrode. It may cause unexpected activation if the gap is too narrow. There shall be a distance from the panel edge of minimum 1.0 mm for TPC tail protection.

![](_page_12_Figure_2.jpeg)

#### **Compliance with EU Regulation**

demmel products gmbh declares compliance with the applicable RoHS directive and REACH regulation:

- Restriction of the use of certain Hazardous Substances (RoHS), directive 2011/65/EU
- Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), regulation EC No 1907/2006

We provide the declarations of conformity for each of our products upon request – please contact us.

## **Revision History**

Date	Rev. #	Revision Details
June 1, 2022	1.0	Initial release
June 15, 2023	1.1	Products updated
July 5, 2023	1.2	Added Pin Description for LVDS Port
July 31, 2023	1.3	Minor corrections
October 31, 2023	1.4	LVDS Specification improved for clarity

If you find any errors in this document, please contact demmel products at <a href="mailto:support@demmel.com">support@demmel.com</a>