



LCDK157CTL1ARH01R1.0

Kit to Interface with LCD157 over HDMI and USB

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Approvals	
Model Number	LCDK157CTL1ARH01
Datasheet Revision	1.1
Drawing Revision	A

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## Document Revision History

Date	Version #	Description	Created by	Checked by	Approved by
Mar 2022	1.0	Customer Release	-	-	-
Oct 2022	1.1	Updated kit part number to new standard	DA	KB	JH

## Ordering Information

LTS Part #	Parts in Kit	Name (Description)
LCDK157CTL1ARH01R1.0	PCB-L0149R1.0	Carrier Board (7 Inch, HB)
	PCB-L0074R1.1	SODIMM (HDMI to MIPI)
	LCD157-070CTL1ARNTR1.1	LCD157 (7" HB Efficient White In-Cell Touch 1200 x 1920)
	0151660429 <sup>1</sup>	FFC (Cable FFC 40Pos 0.50mm 3")
	CHANZON 2ABL024F <sup>1</sup>	Power Supply (12V 2A)

Note 1: these part numbers are subject to change and may be replaced with equivalent parts

## Product Description

LCD157 requires multiple industry standard interfaces (MIPI, I2C, Backlight Driver, and various regulated voltages) which make it well-suited for a cost-efficient and high-performance product integration. However, the required interfaces may not be well supported in all evaluation and product development environments. To ease the initial evaluation and development effort with LCD157, LCDK157 is offered. LCDK157 only requires HDMI for video, USB for touchscreen data, and a single power supply

## Compatibility

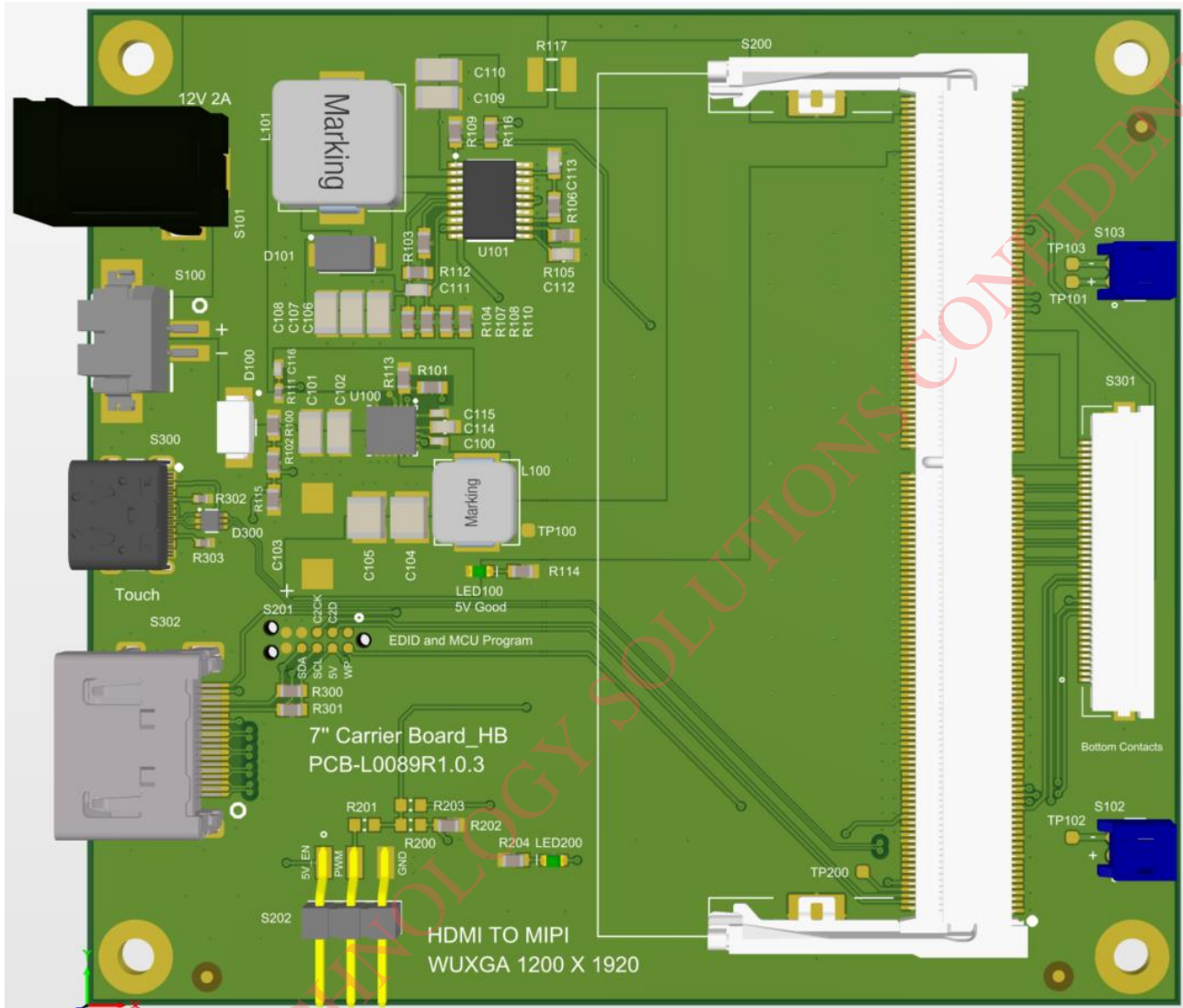
High resolution MIPI panels are most commonly native portrait orientation. The two most common resolutions supported by this module are FHD (1080x1920) and WUXGA (1200x1920). Moreover, the module can drive up to 4K\*2K resolutions so running multiple panels from this SODIMM is also possible. It is expected the host driving HDMI can satisfy the timing requirements as found in the EDID section below. Most Windows OS systems can output the native timing requirements and furthermore are able to rotate and flip the screen. There are dozens of Linux based platforms that are compatible as well. It must be noted that if your application is only designed for landscape mode, the GUI or capable hardware block must buffer and transpose from landscape to portrait, as PCB-L0074 has no external buffering capability.

## General Specification

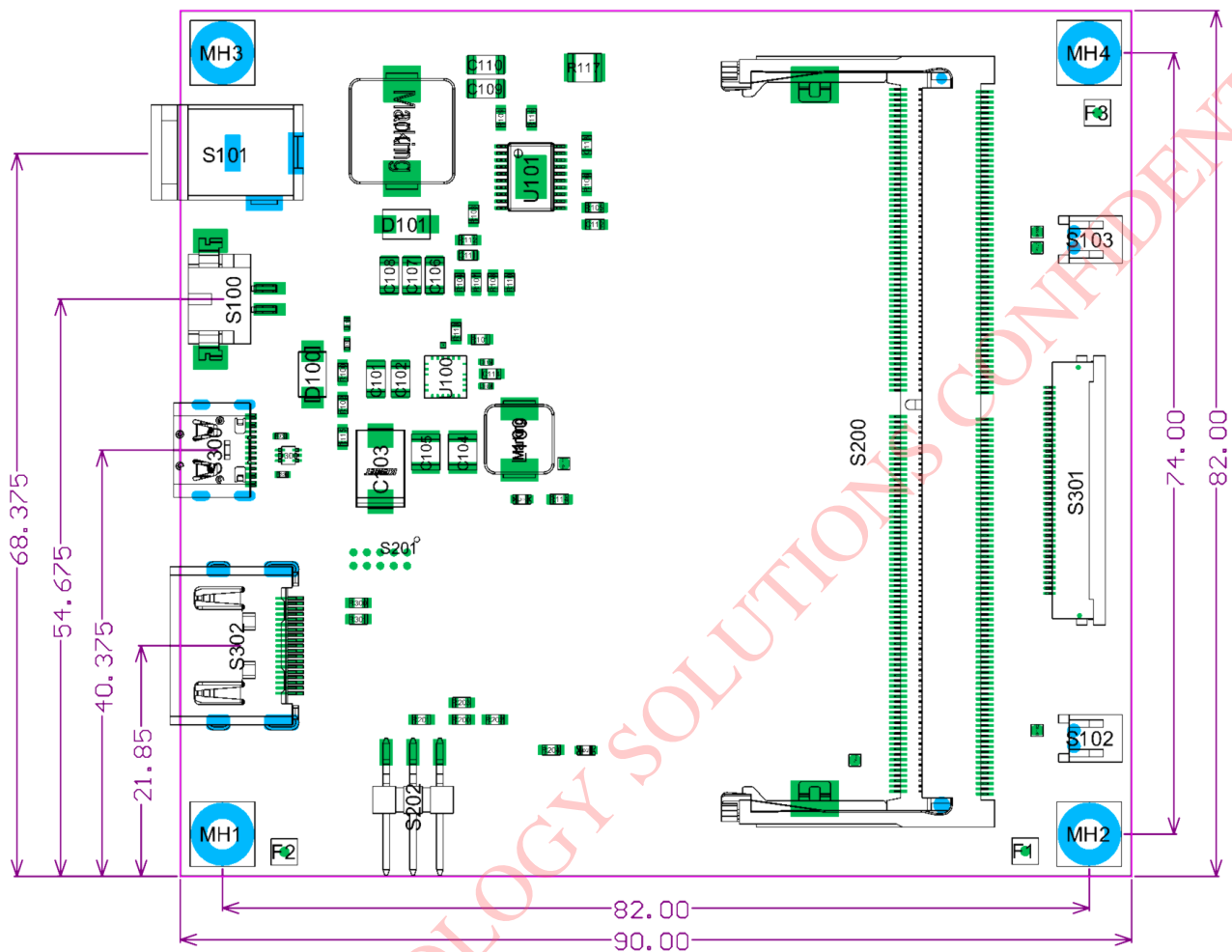
Item	Specification	Unit
Outline Dimensions – Carrier Board + SODIMM	82(W) x 90(L) x 14(H)	mm
Outline Dimensions – LCD157 (to cabled connectors)	116(W) x 262(L) x 6(H)	mm
Outline Dimensions – Overall, Maximum	116(W) x 352(L) x 14(H)	mm
Adapted Display	LCD157	-
Display Size	7.02	inches

# Pictorial

## Carrier Board – 3D Rendering



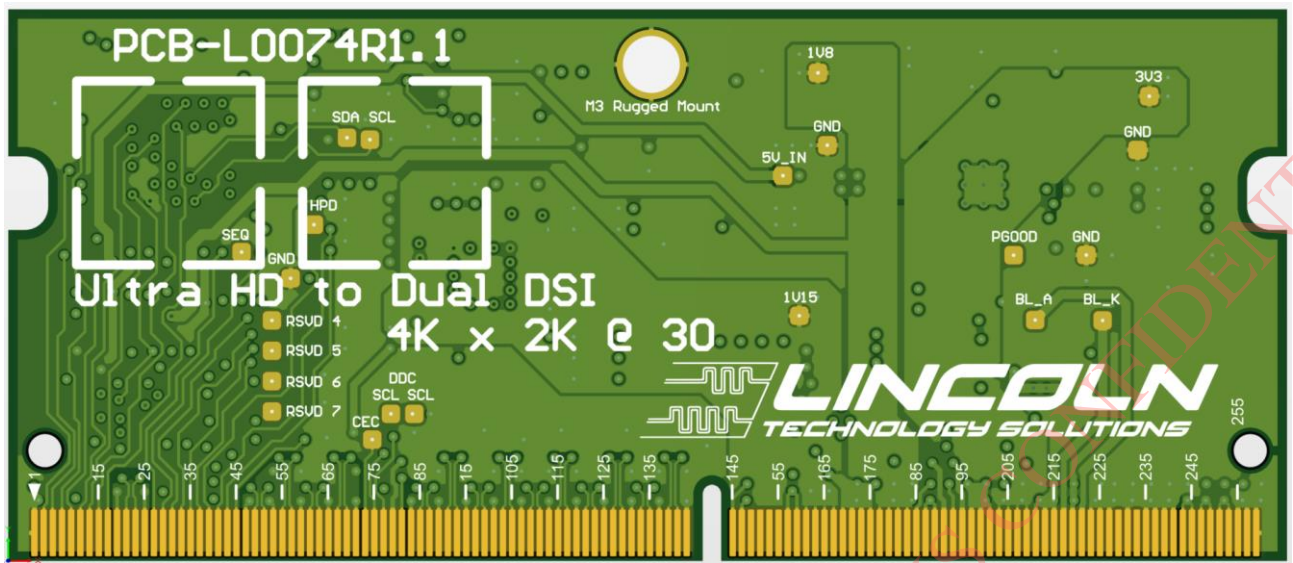
### Carrier Board – Mechanical Drawing



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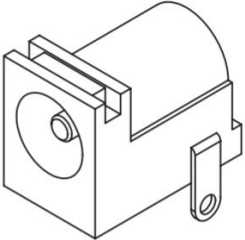
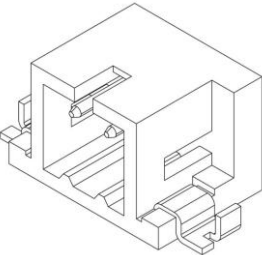
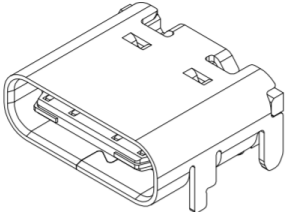
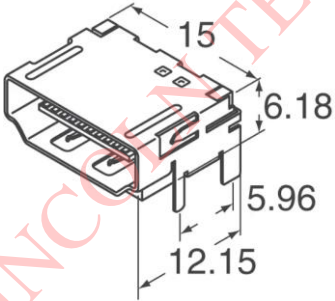


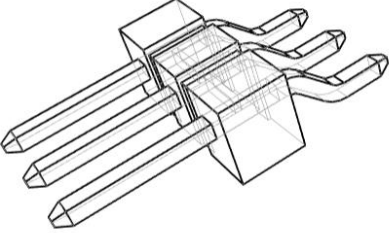
SODIMM – 3D Rendering



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## Connectors

Connector Type	MPN	Description
Power Jack S101 	PJ-002AH	Power input (VCC) 2.10mm ID (0.083") 5.50mm OD (0.217") 12V/2A input
2 POS Power Connector S100 	DF3EA-2P-2H(21)	Alternate power input connector 12V/2A input
USB Type C S300 	TYPE-C-31-M-12	Touch output USB-C 16 position
HDMI S302 	0471510001	Graphic input Standard Type A 19 position

<p>3 POS Header S202</p> 	<p>TSM-103-01-T-SH</p>	<p>3 position header for 5V enable and external PWM control</p>
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## Pin Out – S300, USB-C

The USB-C is a standard connector supporting USB connection between the Carrier Board and a USB Host (i.e. PC). The Carrier Board translates the in-cell touchscreen data from I2C to USB-HID at full speed data rates.

## Pin Out – S302, HDMI

The HDMI connector is a standardized type A. It is plug and play with standard equipment. The graphical input must be capable of providing a WUGXA portrait image (1200x1920). There is onboard EDID that communicates with user equipment specifying timing and display size.

## Pin Out – S101, Power Jack

Number	Pin Name	Description
1	VCC	12V power supply input
2	GND	Ground
3	GND	Ground

## Pin Out – S100, 2 pin Power

Number	Pin Name	Description
1	VCC	12V power supply input
2	GND	Ground

## Pin Out – S202, PWM

A 0.1" pitch header is provided as optional user flexibility. It is possible to control the enabling aka power on of the SODIMM. It is also possible to provide an external PWM signal.

Number	Pin Name	Description
1	5V_EN	Enable for 5V, enable: 1.6V ~ 6V, disable: <0.5V
2	PWMO_EXT	External PWM control
3	GND	Ground

The PWM signal is pulled high by default making the backlight fully on. There are three different ways to control PWM signal.

1. PWM control by SODIMM.
2. PWM control by LCD157.
3. PWM control by external signal using the connector S202 pin2.

If assistance with control of LCD dimming is needed, contact LTS.

## EDID

Below is the EDID stored on the SODIMM. This is communicated over the DDC bus to the host. The host must be capable of generating timing based on these parameters. In the absence of EDID communication, it is expected the host is capable of video output using these timing specifications.

### 7" WUXGA

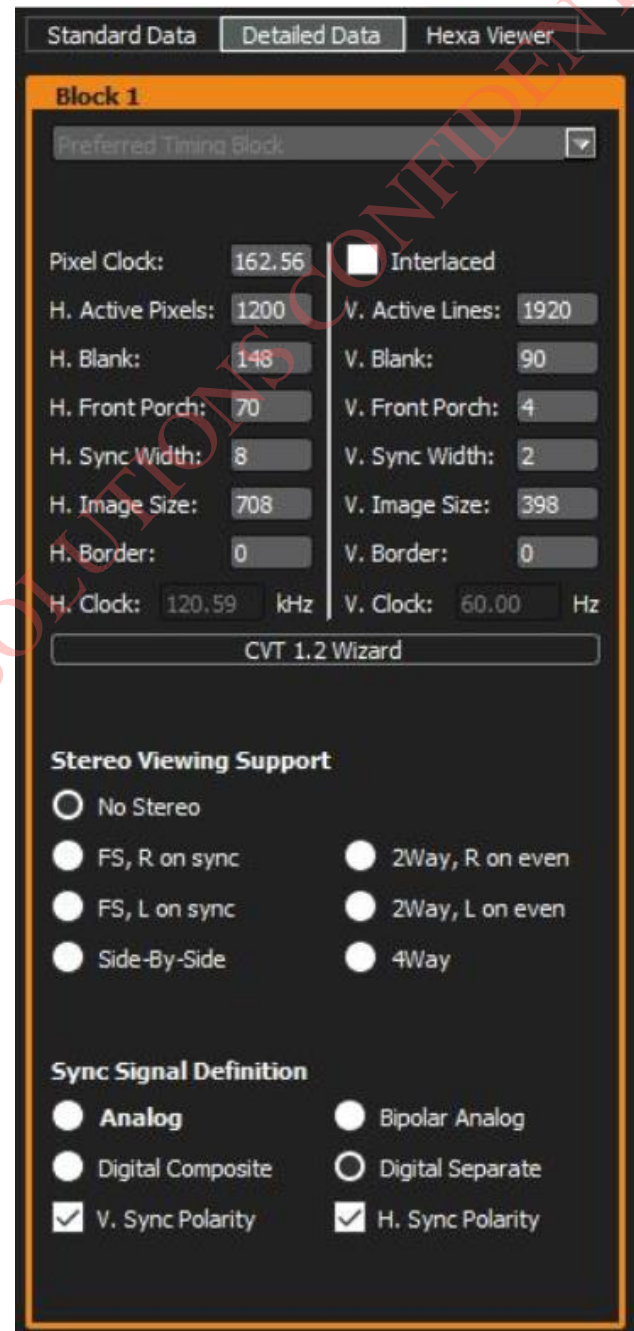
Native Portrait 1200x1920

EDID BYTES:

```

0x 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
-----
00 | 00 FF FF FF FF FF FF 00 32 8D 00 00 00 00 00 00
01 | 2D 1B 01 04 80 58 32 78 22 EE 91 A3 54 4C 99 26
02 | 0F 50 54 00 00 00 01 01 01 01 01 01 01 01 01
03 | 01 01 01 01 01 01 80 3F B0 94 40 80 5A 70 46 08
04 | 42 00 C4 8E 21 00 00 1E 00 00 00 10 00 00 00 00
05 | 00 00 00 00 00 00 00 00 00 00 00 00 00 10 00 00
06 | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FC
07 | 00 31 32 30 30 06 35 08 32 30 0A 20 20 20 00 76
08 | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
09 | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0A | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0B | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0C | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0D | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0E | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0F | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

```



## Absolute Max Ratings

Item	Symbol	Value		Unit
		Min.	Max.	
Power Supply Voltage	VCC	-0.3	13	V
Operating Temperature	T <sub>OPR</sub>	-10	50	°C
Storage Temperature	T <sub>STG</sub>	-20	70	°C

## Electrical Characteristics

Total Power is for SODIMM + Carrier Board + LCD157 (with backlight). Backlight Power can be reduced with the PWM signal that is available on S202 on the Carrier Board.

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Supply Voltage	VCC	11.4	12.0	12.6	V	Ta = 25°C
Total Power	P <sub>TOT</sub>	-	11	-	W	Ta = 25°C, PWM = 100%
Backlight Power	P <sub>BL</sub>	-	9.5	-	W	Ta = 25°C, PWM = 100%

**NOTE:** LCD157 has a maximum brightness of 2500nits. However, due to a Carrier Board backlight power limitation, LCDK157 nominal brightness is 2000nits (at 100% PWM).

**NOTE:** Operating LCDK157 backlight at 100% PWM for extended periods and/or in enclosed spaces or high ambient temperatures can lead to thermal concerns. If any component surface temperature reaches 60°C, use some form of thermal management (active or passive) or use External PWM control to prevent further temperature increase.

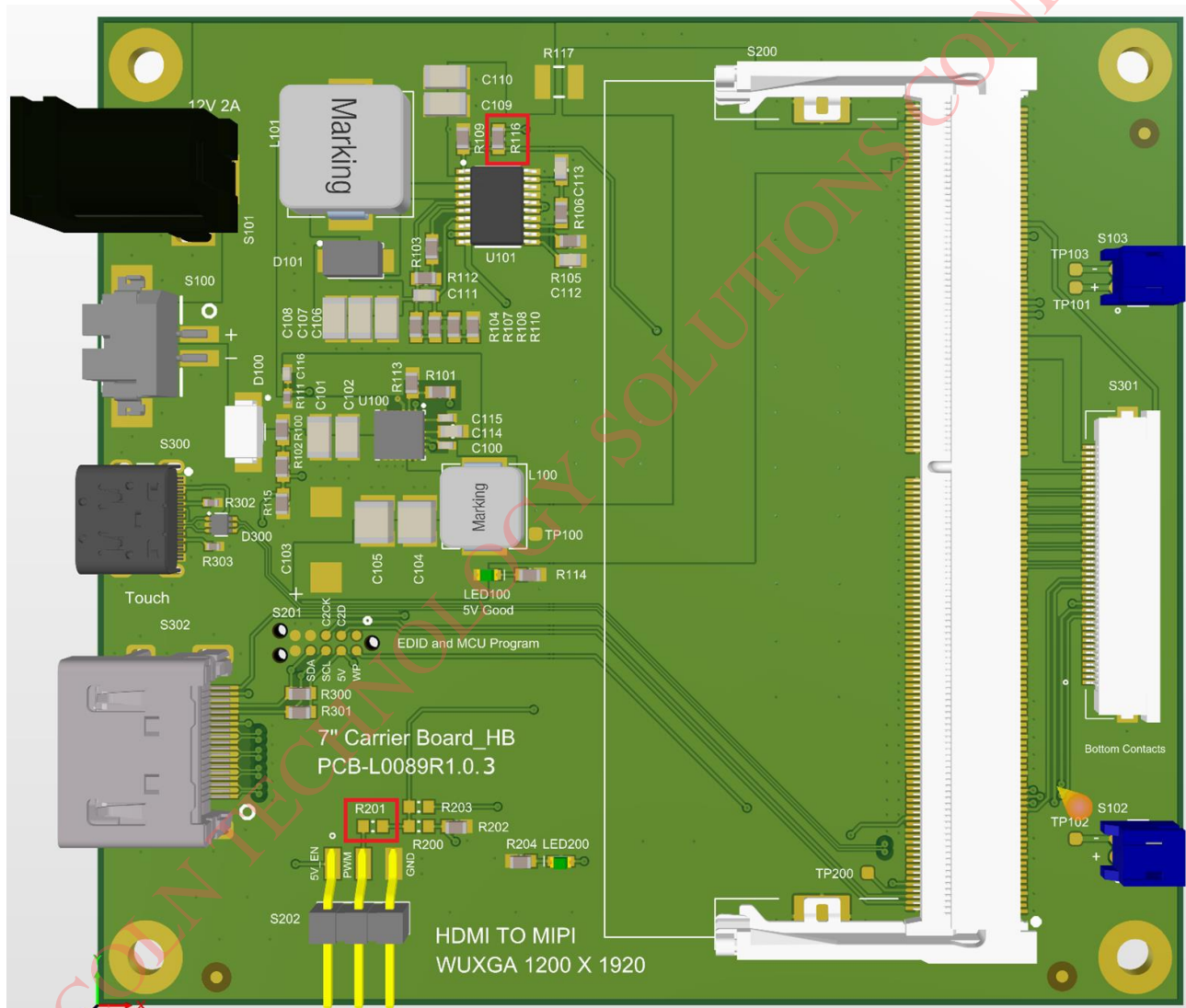
## Use Case

1. Insert the SODIMM into the Carrier Board.
2. Use the FFC to connect LCD157 to S301 on the Carrier Board.
3. Connect the two LCD157 cabled backlight connectors to S102 and S103 on the Carrier Board.
4. Apply power using the Power Supply.
5. To send video data to LCD157, connect an HDMI cable between the video source (e.g. PC) and S302 on the Carrier Board.
6. To read touchscreen data, connect a USB cable between a PC and S300 on the Carrier Board.

## External PWM Control

Implement the following steps on the Carrier Board to use external PWM control.

1. Remove R116 (0-ohm resistor) and place it on R201.
2. Connect external PWM signal to S202 pin2 (PWM), signal high level range from 1.17V to 6V.
3. A 0% duty cycle turns off the backlight, a 100% duty cycle provides full brightness.
4. Recommended frequency is 200Hz.





## Warnings

1. Insert the SODIMM into the Carrier Board and connect LCD157 before applying power to the Carrier Board.
2. Removing the SODIMM with power connected may cause permanent damage to both the SODIMM and the Carrier Board.

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## Appendix 1: Mechanical Drawing

