

The R Tiny RDK User Manual

– High Performance Display Controller with 0.5” HD or 0.55” FHD
RAON LCoS Micro-display -

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1 Introduction

About this guide

This user's guide presents and overview of The R Tiny RDK and a general description of the main features and functions. It explains the first steps to get started, and shows a detailed description of connection for USB power supply, HDMI video input and the main connectors. It will give the user a successful start with first The R Tiny RDK.

Terms and Acronyms

Term	Definition
720P HD	720p, 720 progressive scan or non-interlaced horizontal lines high definition
1080P FHD	1080p, 1080 progressive scan or non-interlaced horizontal lines high definition
DP	Display Port
FFC	Flexible Flat Cable
FPC	Flexible Printed Circuit
I2C	Inter-Integrated Circuit
LCoS	Liquid Crystal on Silicon
LVDS	Low-Voltage Differential Signaling
MIPI	Mobile Industry Processor Interface
PCB	Printed Circuit Board
RDI	RAON Display Interface
RDK	Referece Design Kit
SPI	Serial Peripheral Interface

2 Scope

This Document contains both RDP551F and RDP502H Panel respectively.

All below related technical document is released in advance to users who are under designing own system with RDC200 (HD or FHD controller IC) for RDP502H(0.5" HD LCoS panel) or RDP551F (0.55" FHD LCoS Panel).

2.1 Related Documents

2.1.1 Controller IC (RDC200) Datasheet

2.1.2 Panel (RDP502H or RDP551F) Datasheet

2.1.3 Vista series(RAON reference see through optic) Datasheet

- Vista50 : 0.5" LCoS panel(RDP502H) adopted
- Vista55 : 0.55" LCoS panel(RDP551F) adopted

2.1.4 The R Tiny Reference design PCB

The R Tiny EV PCB has two different type. Each Reference schematic and PCB files are noticed in case.

- The R Tiny for RDP502H : the kit is only for RDP502H (0.5" HD LCoS panel)
- The R Tiny for RDP551F : the kit is only for RDP551F (0.55" FHD LCoS panel)

2.1.5 SW Tool kit

2.2 The R TINY RDK Overview

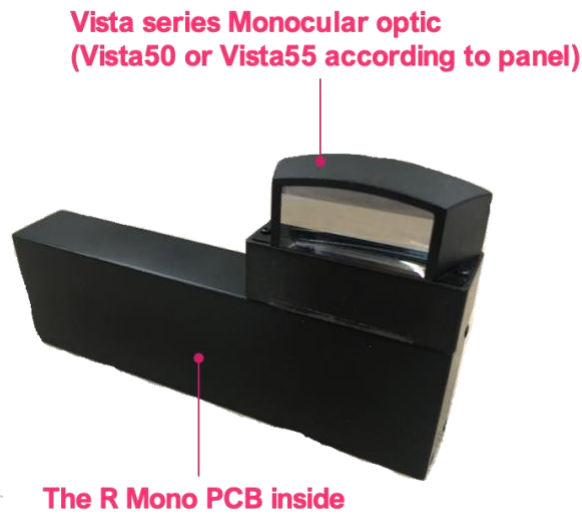


Figure 1. The R Tiny RDK overview



Figure 2. The R Tiny RDK tear down

2.3 The R Tiny for RDP502H RDK

The R Tiny for RDP502H RDK consists of two different part.

- The R Tiny EV PCB(Driver Board part) – includes the RDC200 display controller IC, USB-C (supply power , DP to MIPI).
- Optic part – includes RDP502HF (0.5” HD LCoS panel) , BLU and see through type optic (Vista50)

2.3.1 The R Tiny for RDP502H RDK block diagram

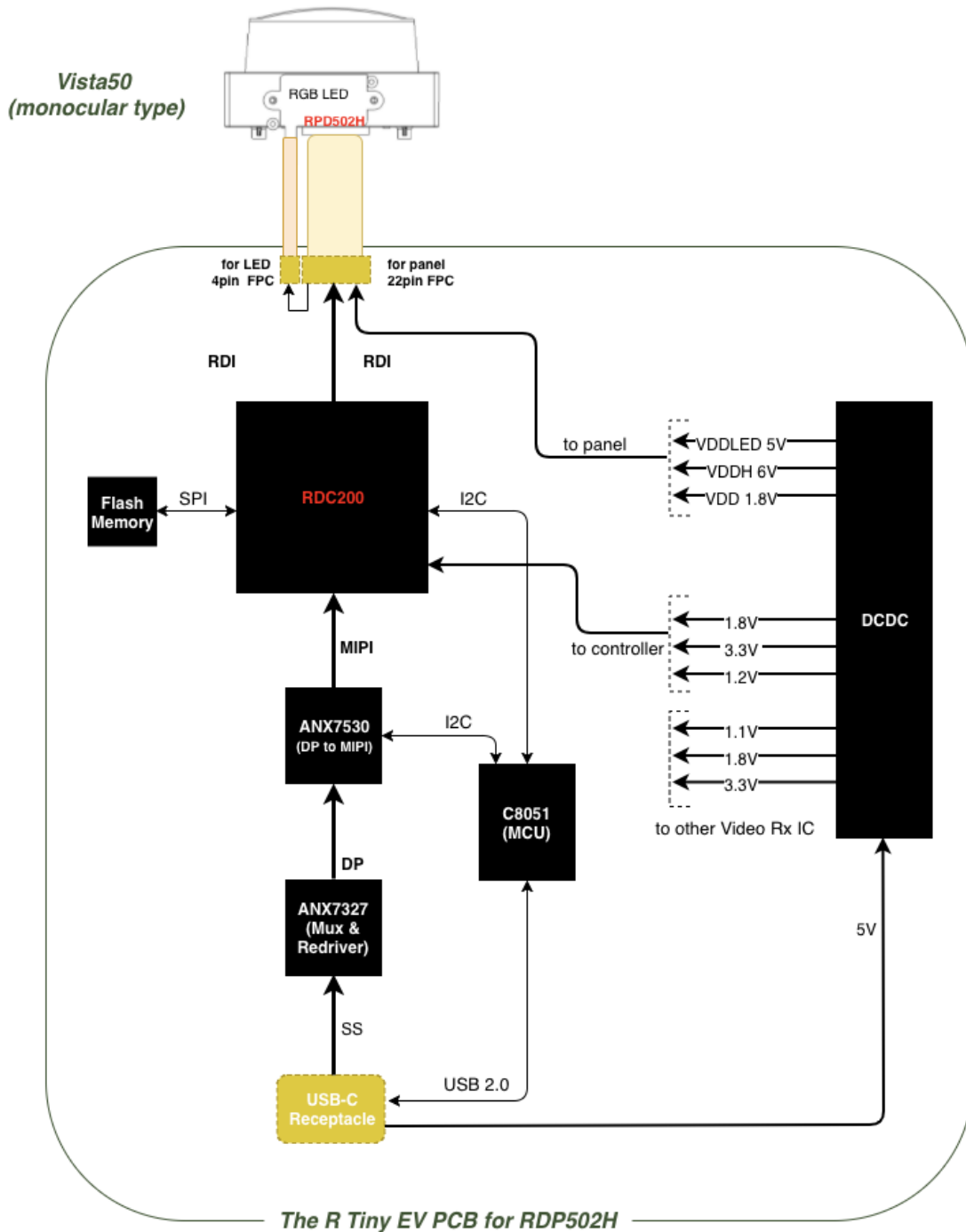


Figure 3. The R Tiny for RDP502H RDK block diagram

2.3.2 The R TINY for RDP502H EV PCB

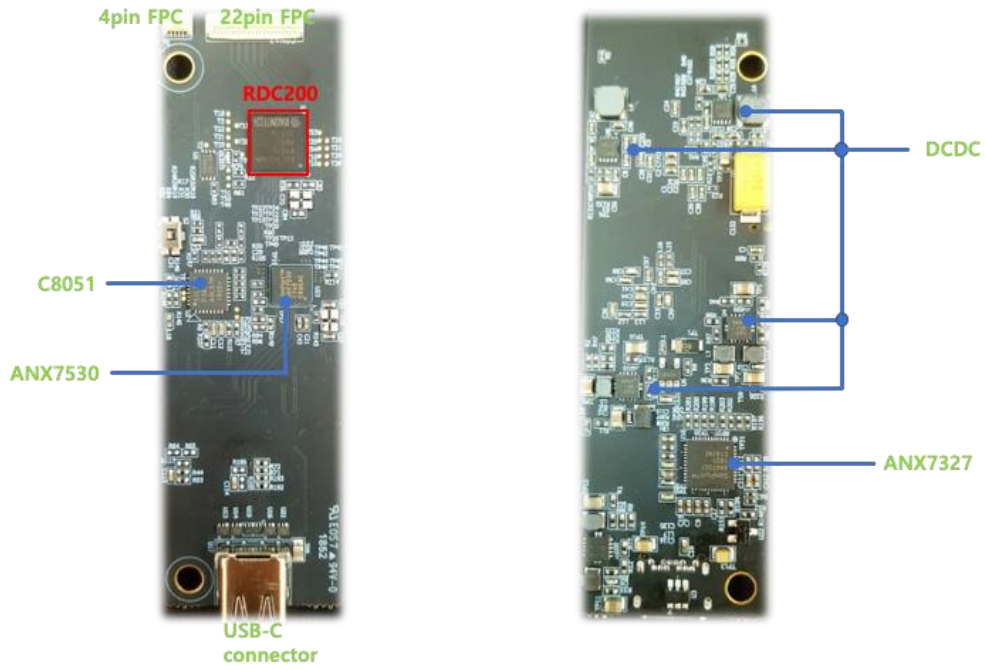


Figure 4. The R Tiny for RDP502H EV PCB (Top / Bottom side)

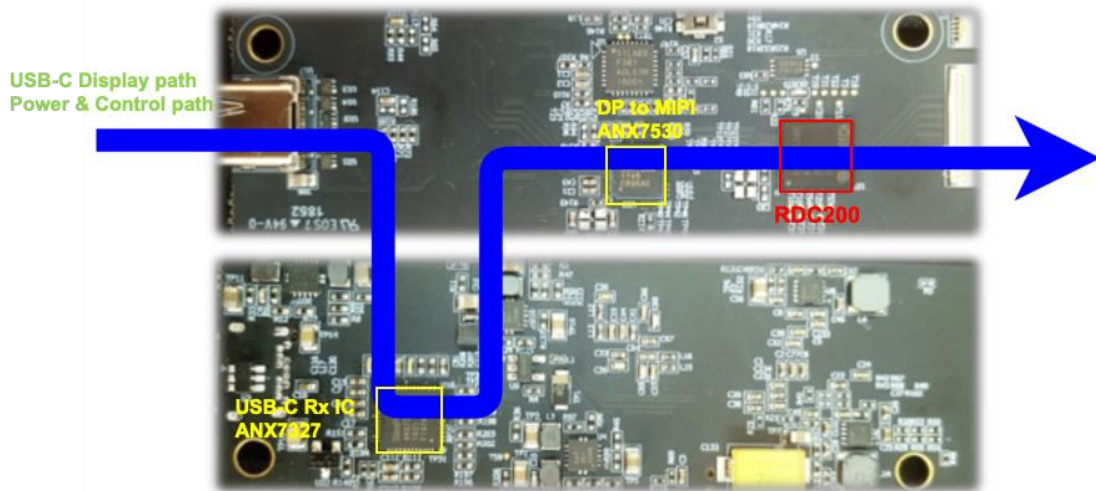


Figure 5. The R Tiny for RDP502H EV PCB Display path flow

2.4 The R Tiny for RDP551F RDK

2.4.1 The R TINY for RDP551F RDK block diagram

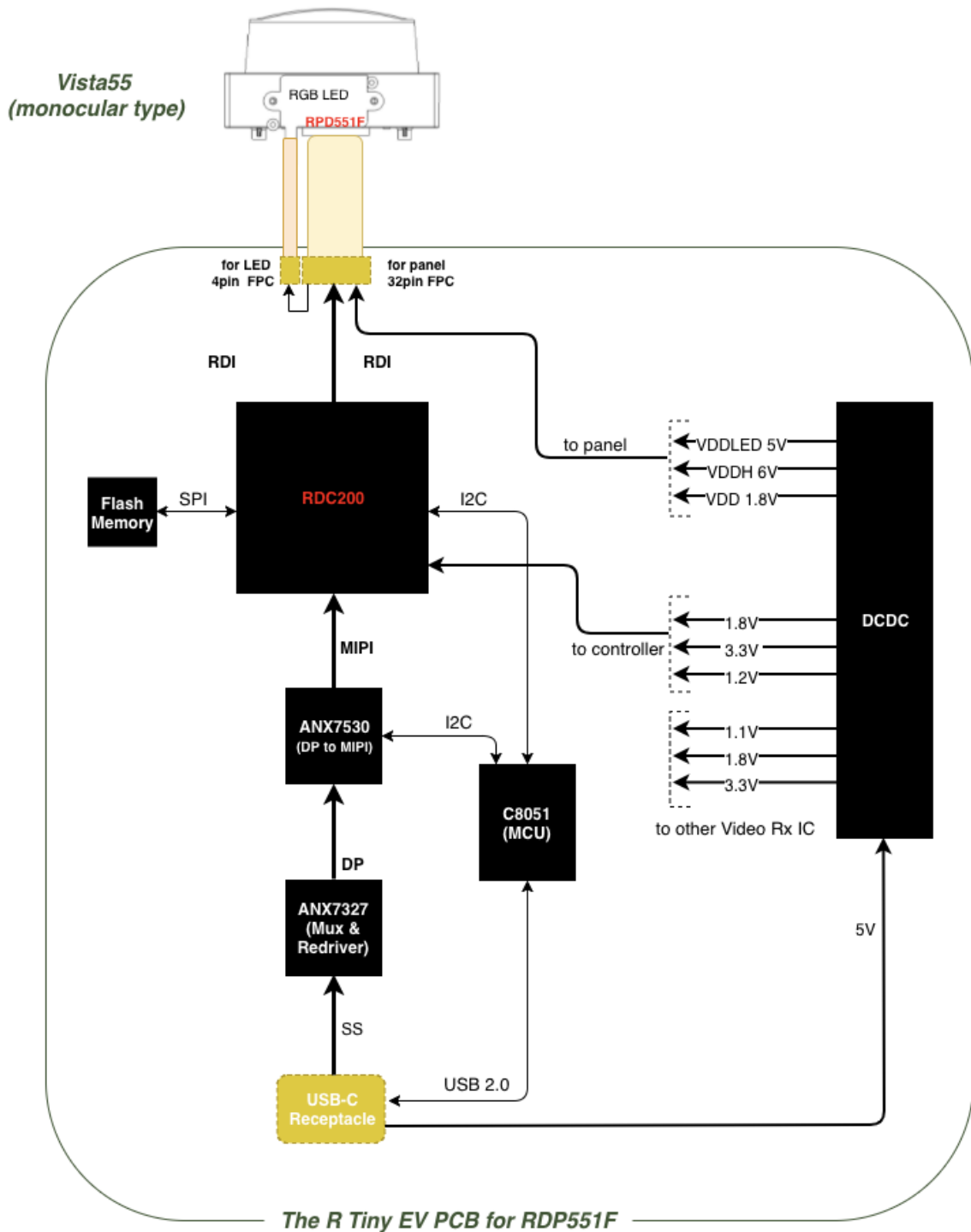


Figure 6. The R Tiny for RDP551F RDK block diagram

2.4.2 The R Tiny for RDP551F EV PCB

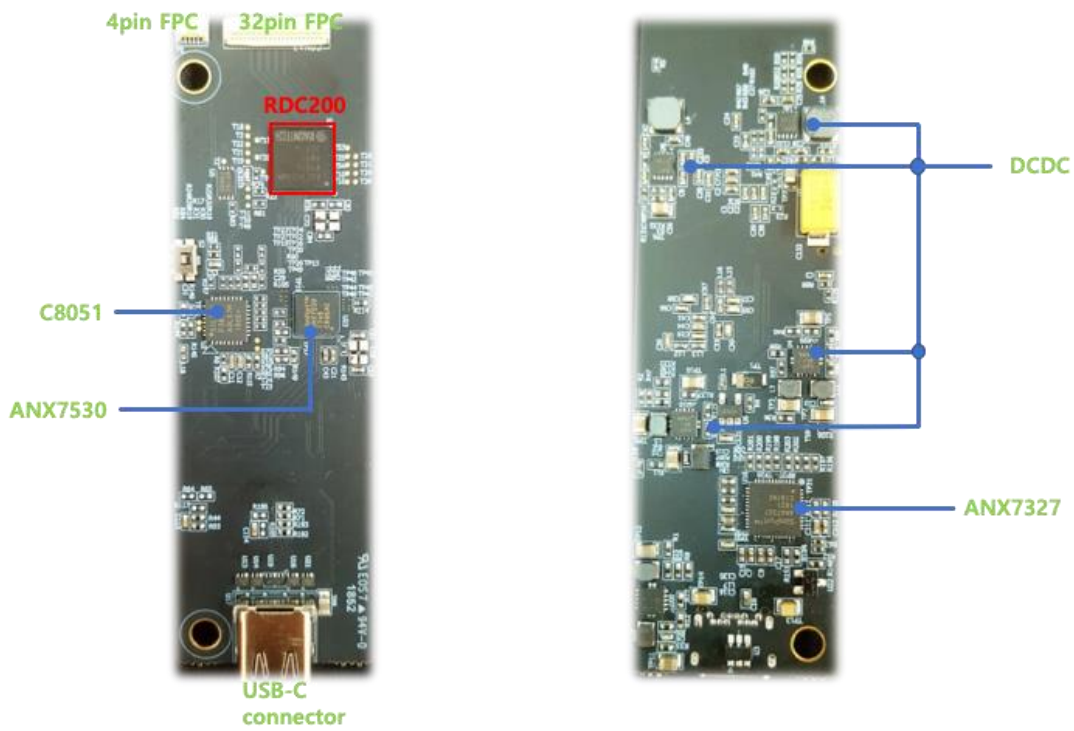


Figure 7. The R Tiny for RDP551F EV PCB

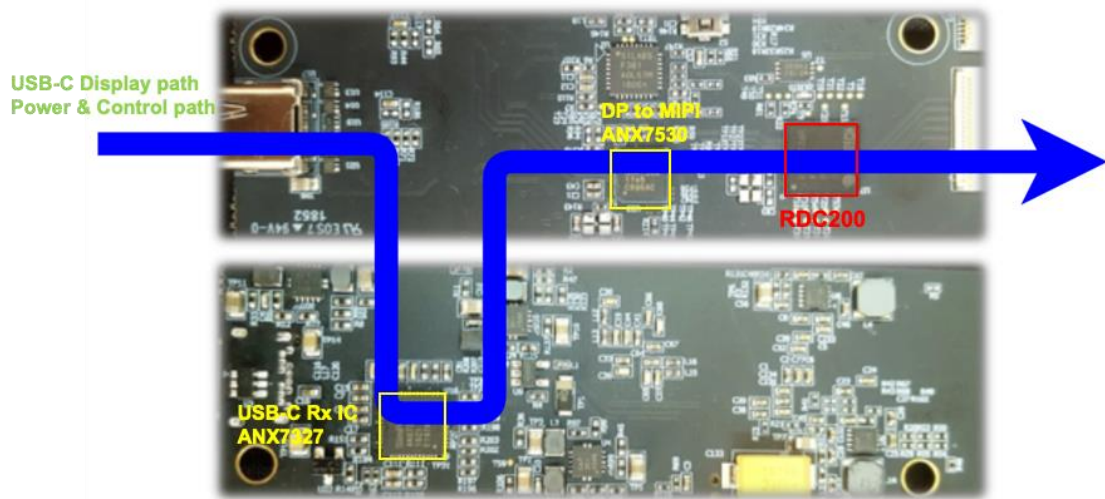


Figure 8. The R Tiny for RDP551F EV PCB Display path flow

2.5 Vista series optic part overview

Vista series (see through type optic) in The R Tiny RDK is included different name according to panel size. The optic consists of the following 3 different components.

2.5.1 Vista50

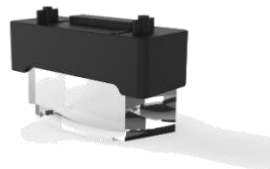
- RDP502H : 0.5" LCoS udisplay module
- VB1125LNA : BLU (Back Light Unit)
- See through optic lens and optic case

2.5.2 Vista55

- RDP551F : 0.55" LCoS udisplay module
- VB1125LNB : BLU (Back Light Unit)
- See through optic lens and optic case

	Vista50	Vista55
Type	See through	See through
Panel	RDP502H	RDP551F
Resolution	1280x720	1920x1080
Eye Pupil(mm)	H7 / V4	H7 / V4
Eye Relief Distance(mm)	14	14
FOV (deg)	40°	45°
Distortion	5.0 %	5.5 %
Transmittance	45%	40%
Weight(Single)	17g	17g

Table 2.1 Vista series basic performance



3 Quick start procedure

3.1 Start procedure

The R TINY EV kit is simply controlled and checked in user side.

1. Connect RAONTECH panel(s) to the R TINY board RDI Tx connector by FFC or FPCB.
2. Connect RAONTECH BLU(s) to the R TINY board BLU connector by FFC.
3. Plug in USB-C adaptor.

The running guide and SW Tool kit is on RAON web site as well.

<http://developer.raon-tech.com/index.php/vistastudio/>

4 Product handling notes

4.1 ESD protection

As below handling picture, user must use ESD protection gloves when handling LCoS module. Without using ESD protection gloves, RAONTECH cannot guarantee any other ESD damage.



Figure 9. ESD protection glove and handling guide

4.2 Panel handling

When user handles panel, do not touch below picture's red box to prevent any wire-bonding pressure and reflective glass scratch. Handle only PCB area in edge side and do not bend the PCB board.

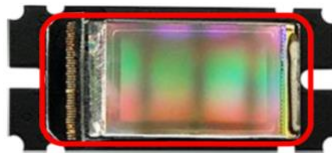
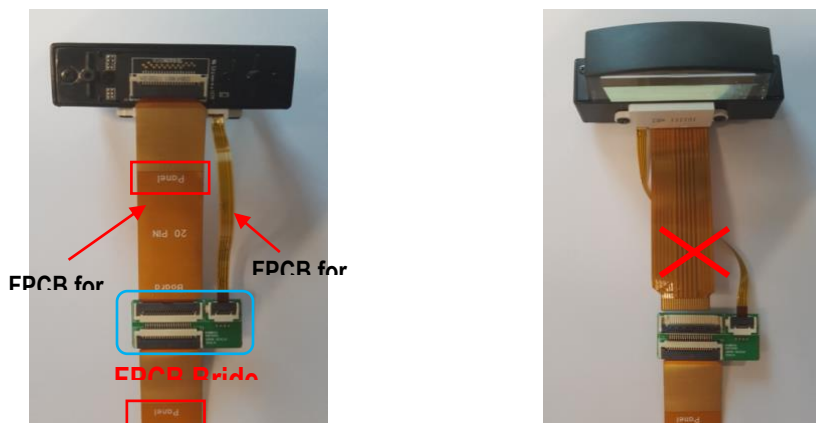


Figure 10. Panel handling note

4.3 FPC cable or FFC cable connection

Before connection, separate the front and back of the FPCB.



(a) FPCB Connection between panel module and FPCB Bride Board

(b) Incorrect connection

Figure 11. Cable connection

5 EXHIBIT

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