

The R1 RDK User Manual

High Performance Display Controller with 0.5" HD or 0.55" FHD RAON LCoS Microdisplay

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History and Applicability

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1 Introduction

About this guide

This user manual introduces the R1 RDK and describes its key features and functions. It explains the first step to get started and shows a detailed description to connect USB power supply, HDMI video input, and other connectors.

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	Reference Design Kit
SPI	Serial Peripheral Interface

2 Scope

This document contains examples of both RDP551F and RDP502H panels. Technical documents mentioned below are released to users in advance who are designing their 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 R1 Reference design PCB

There are two different types of the R1 EV PCB. Each reference schematic and PCB files are noticed in the case.

- The R1 for RDP502H : the kit is only for RDP502H (0.5" HD LCoS panel)
- The R1 for RDP551F : the kit is only for RDP551F (0.55" FHD LCoS panel)

2.1.5 SW Tool kit

2.2 The R1 RDK Overview

VISTA series optic (VISTA50 or VISTA55 according to panel)

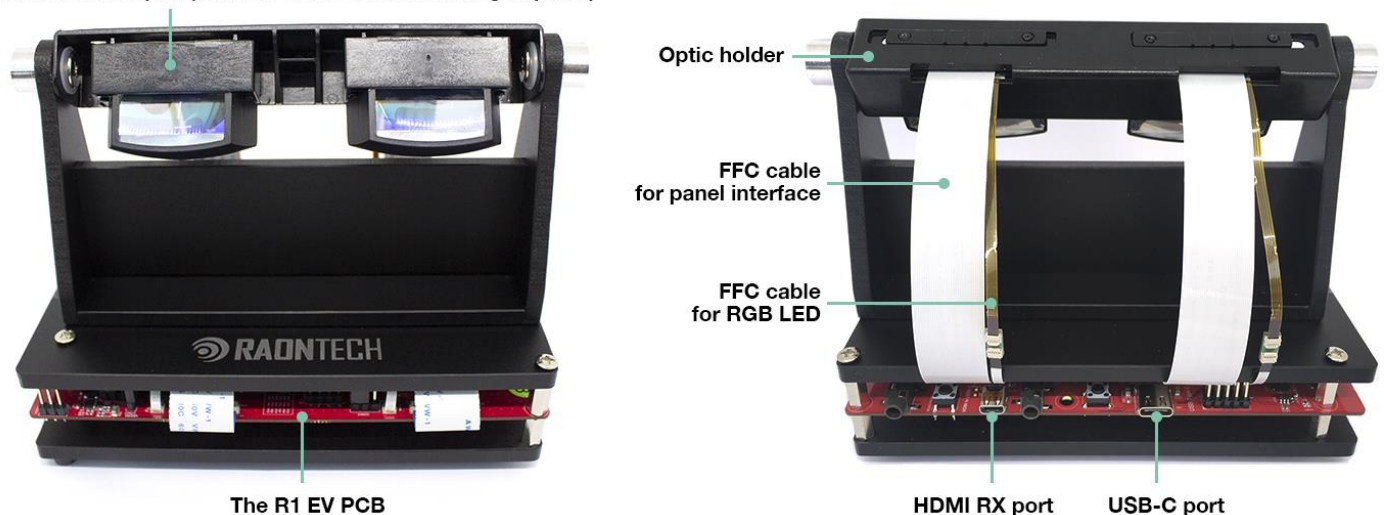


Figure 1. The R1 RDK overview

3 Introduction

3.1 The R1 for RDP502H RDK

The R1 for RDP502H RDK consists of two different part.

- The R1 EV PCB(Driver Board part) – includes the RDC200 display controller IC, USB-C (DP to MIPI) and HDMI

RX IC to input general video source.

- Optic part – includes RDP502HF (0.5" HD LCoS panel), BLU and see through type optic (Vista50)

3.1.1 The R1 for RDP502H RDK block diagram

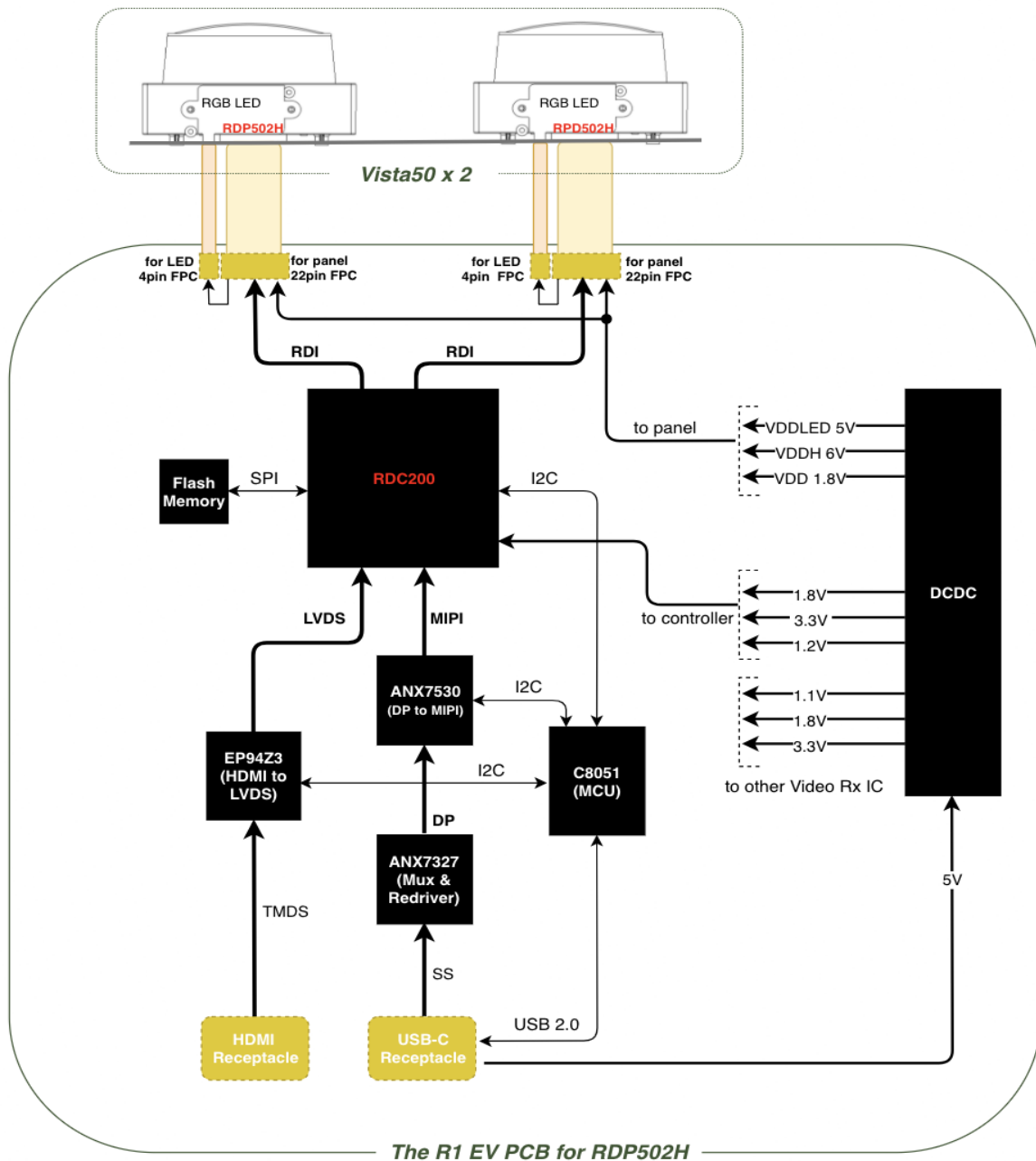


Figure 2. The R1 for RDP502H RDK block diagram

3.1.2 The R1 for RDP502H EV PCB

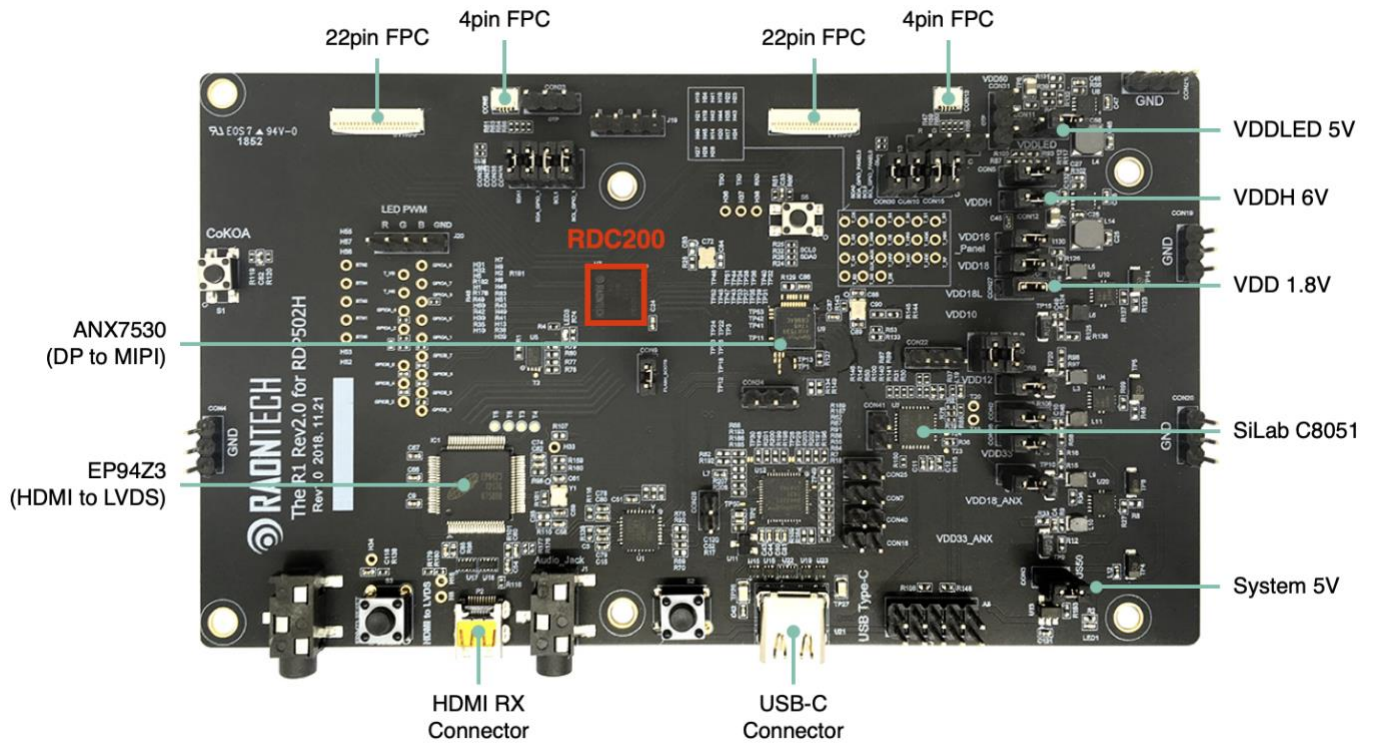


Figure 3. The R1 for RDP502H EV PCB

3.2 The R1 for RDP551F RDK

3.2.1 The R1 for RDP551F RDK block diagram

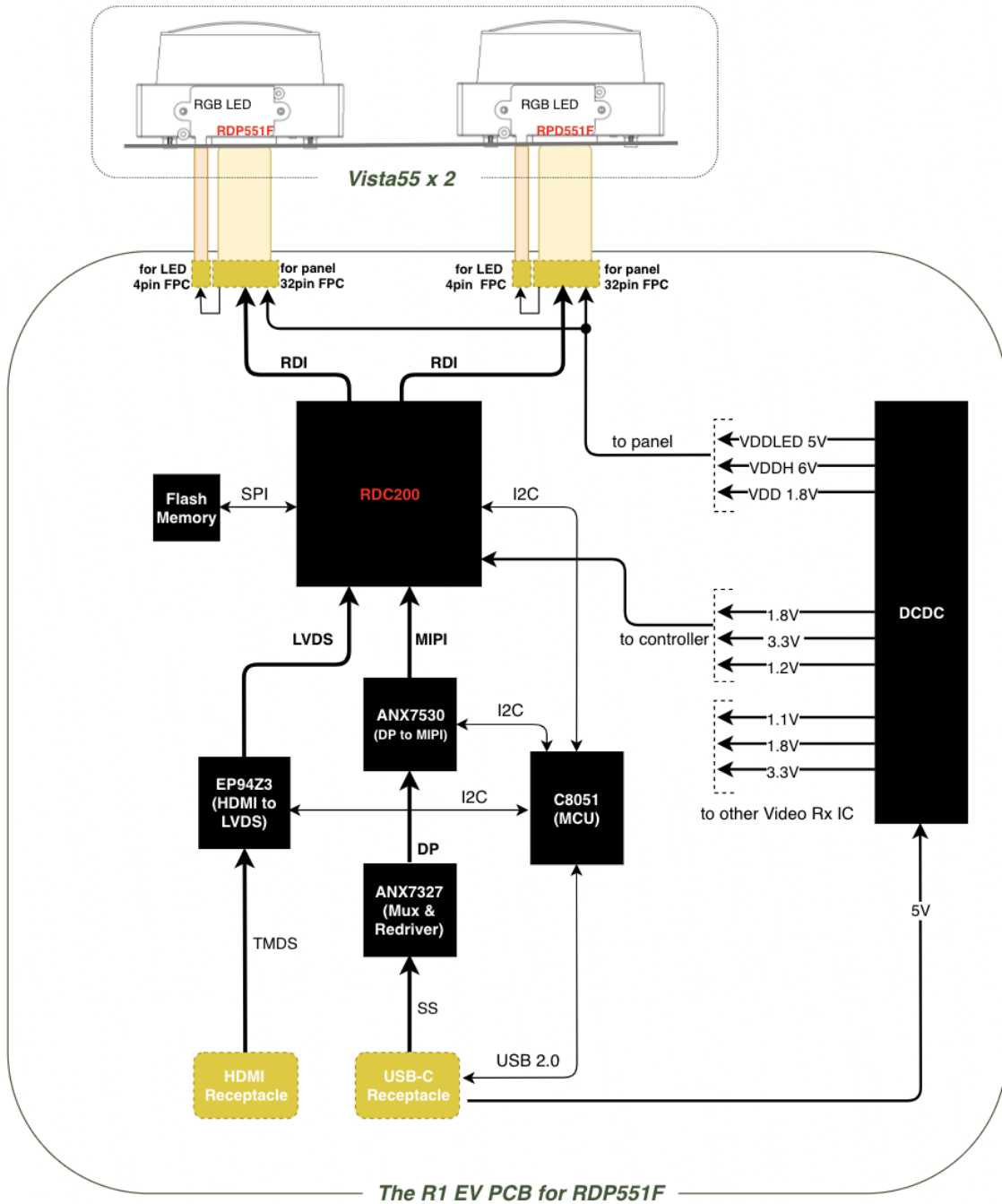


Figure 4. The R1 for RDP551F RDK block diagram

3.2.2 The R1 for RDP551F EV PCB

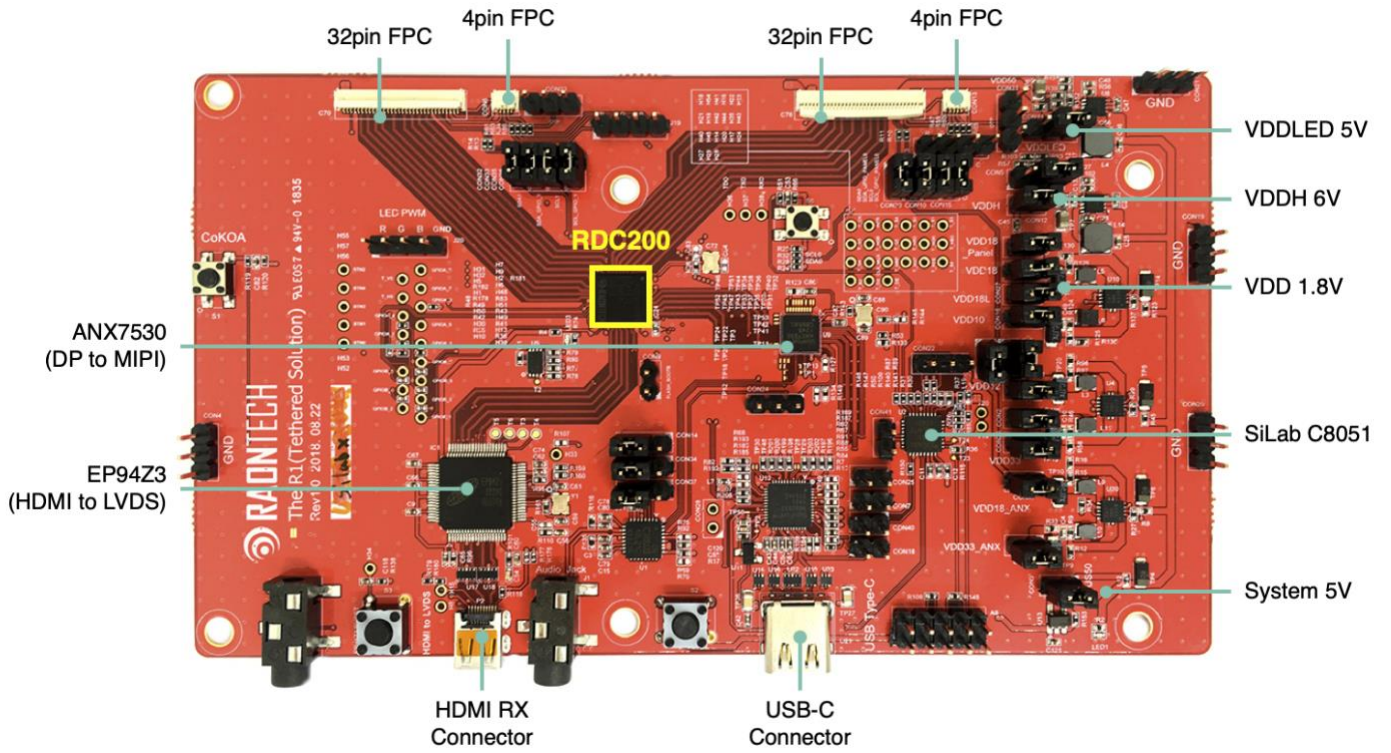


Figure 5. The R1 for RDP551F EV PCB

3.3 VISTA series optic part overview

VISTA series (see-through type optic) in the R1 EV kit has different name according to the panel size. Each optic consists of the following three components.

3.3.1 VISTA50

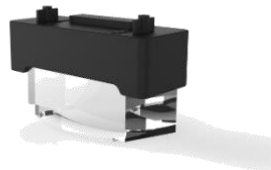
- RDP502H : 0.5" LCoS udisplay module
- VB1125LNA : BLU (Back Light Unit)
- See-through optic lens and optic case

3.3.2 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 3.1 Vista series basic performance



4 Quick start procedure

4.1 Start procedure

The R1 EV kit can be simply controlled and checked on the user side.

1. Connect RAONTECH panel(s) to the R1 board RDI Tx connector by FFC or FPCB.
2. Connect RAONTECH BLU(s) to the R1 board BLU connector by FFC.
3. Plug in USB 2.0 cable through the USB-C adaptor.
(In normal operation, RAONTECH logo appears.)
4. Plug in HDMI cable with suitable Video resolution.

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

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

5 Product handling notes

5.1 ESD protection

As the handling picture below, the user must use ESD protection gloves when handling LCoS module. RAONTECH cannot guarantee ESD damage caused by not using ESD protection gloves.



Figure 6. ESD protection glove and handling guide

5.2 Panel handling

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

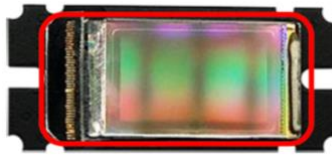
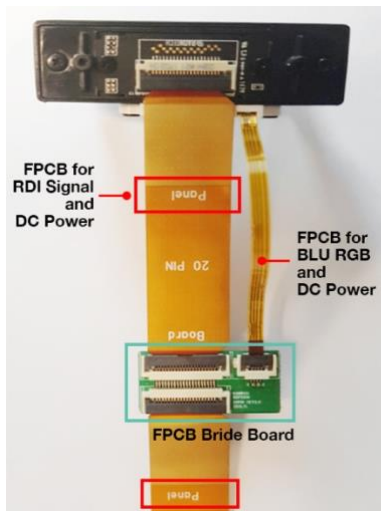


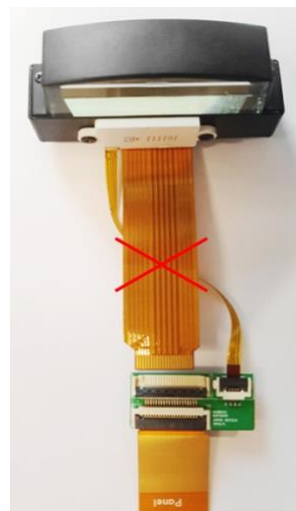
Figure 7. Panel handling note

5.3 FPC cable or FFC cable connection

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



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



(b) Incorrect connection

Figure 8. Cable connection

6 EXHIBIT

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